

**DRAFT ENVIRONMENTAL IMPACT ASSESSMENT  
AND  
ENVIRONMENT 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 = 37.54.5 hectares**

**ROUGHSTONE QUARRY**

**At**

**Kamandoddi Village, Shoolagiri Taluk, Krishnagiri District,  
Tamil Nadu State**

**TOR File No.12003**

**TOR Letter No. TO25B0108TN5757195N Dated:23.05.2025**

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

| <b>Name and Address</b>                                                                                                             | <b>Extent &amp; S.F.No.</b>                | <b>Production</b>                   |
|-------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------------------------------------|
| <b>Mr.V.Venkatesulu<br/>S/o.Venkatasamy,<br/>No.741,D.M.G Kotta,<br/>Chappadi post, Shoolagiri Taluk,<br/>Krishnagiri District.</b> | <b>4.00.0 &amp; 754 &amp;<br/>760(P-6)</b> | <b>Rough stone-<br/>1859055Tons</b> |

**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),

NABET ACC. NO: NABET/EIA/23-26/RA 0319

Valid till: 31.12.2026



**ENVIRONMENTAL LAB**

|                                                                                                                                                                                                                                        |                                                                                                                                                                                                 |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>EKDANT ENVIRO SERVICES (P) LTD</b><br><b>No R7/1, AVK Tower, North Main Road,</b><br><b>Anna Nagar West Extn., Chennai-101,</b><br><b>Tamil Nadu</b><br><b>NABL Certificate Number: TC-11742,</b><br><b>Valid Until: 31.05.2025</b> | <b>GREEN LINK ANALYTICAL &amp; RESERCH LAB</b><br><b>S.F.No,414/1, Tex Park Road, Opp.Good Luck</b><br><b>Syndicate, Civil Aerodrome Post, Coimbatore-641</b><br><b>014, Tamil Nadu, India.</b> |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

**Baseline Study Period – October 2023 through December 2023**

TERMS OF REFERENCE (ToR) COMPLIANCE  
ToR File No.12003  
ToR Identification No. TO25B0108TN5757195N, dated. 23/05/2025,  
Thiru. V. Venkatesulu, Rough Stone Quarry,

**1. SEAC Conditions - Site Specific**

| S. No | Terms of Reference |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Remarks                                                                                                                                            |
|-------|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.1   | 1                  | The PP shall furnish the transport route for transporting the quarried minerals                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | The Approach Road Execution Video Will submitted in final Presentation.                                                                            |
|       | 2                  | A Cluster Management Committee (CMC) shall be constituted including all the mines in the cluster as Committee Members for the effective management of the mining operation in the cluster through systematic & scientific approach with appointment of required statutory personnel, appropriate environmental management, system of maintaining the haul roads and village/panchayat roads, authorized blasting operation, Monitoring system of the environmental & other statutory compliances & its reporting methodology, etc. The PP shall submit the following details in the form of an Affidavit during the EIA appraisal: |                                                                                                                                                    |
|       | (a)                | Copy of the agreement forming CMC.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | The Cluster Management Committee (CMC) regarding following these conditions and same documents will be submitted during the EIA appraisal meeting. |
|       | (b)                | The Organisation chart of the Committee with defining the role of the members                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                    |
|       | (c)                | The 'Standard Operating Procedures' (SoP) executing the planned activities                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                    |
|       | 3                  | The PP shall ensure the installation of CCTV at the proposed quarry site and ensure its inclusion during the EIA presentation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | The Photocopy of CCTV installation will be submitted in final Presentation.                                                                        |

**2. SEAC Standard Conditions**

| S.No | Terms of Reference |                                                                                                                                                 | Remarks |
|------|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| 2.1  | 1                  | In the case of existing/operating mines, a letter obtained from the concerned AD (Mines) shall be submitted and it shall include the following: |         |

|  |   |                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                       |                                                                                                                                             |
|--|---|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
|  |   | (i)                                                                                                                                                                                                                                                                                                                                                                           | Original pit dimension                                                                                                | As it is a fresh quarry, the conditions are not applicable.                                                                                 |
|  |   | (ii)                                                                                                                                                                                                                                                                                                                                                                          | Quantity achieved vs EC Approved Quantity                                                                             |                                                                                                                                             |
|  |   | (iii)                                                                                                                                                                                                                                                                                                                                                                         | Balance Quantity as per Mineable Reserve calculated.                                                                  |                                                                                                                                             |
|  |   | (iv)                                                                                                                                                                                                                                                                                                                                                                          | Mined out Depth as on date Vs EC Permitted depth                                                                      |                                                                                                                                             |
|  |   | (v)                                                                                                                                                                                                                                                                                                                                                                           | Details of illegal/illicit mining                                                                                     |                                                                                                                                             |
|  |   | (vi)                                                                                                                                                                                                                                                                                                                                                                          | Violation in the quarry during the past working.                                                                      |                                                                                                                                             |
|  |   | (vii)                                                                                                                                                                                                                                                                                                                                                                         | Quantity of material mined out outside the mine lease area                                                            |                                                                                                                                             |
|  |   | (viii)                                                                                                                                                                                                                                                                                                                                                                        | Condition of Safety zone/ benches                                                                                     |                                                                                                                                             |
|  |   | (ix)                                                                                                                                                                                                                                                                                                                                                                          | Revised/Modified Mining Plan showing the benches of not exceeding 6 m height and ultimate depth of not exceeding 50m. |                                                                                                                                             |
|  | 2 | Details of habitations around the proposed mining area and latest VAO certificate regarding the location of habitations within 300m radius from the periphery of the site.                                                                                                                                                                                                    |                                                                                                                       | The VAO certificate is attached in Annexure IV.                                                                                             |
|  | 3 | The proponent is requested to carry out a survey and enumerate on the structures located within the radius of (i) 50 m, (ii) 100 m, (iii) 200 m and (iv) 300 m (v) 500m shall be enumerated with details such as dwelling houses with number of occupants, whether it belongs to the owner (or) not, places of worship, industries, factories, sheds, etc with indicating the |                                                                                                                       | The map showing the details of structures within the radius of 500m is shown in the Figure 4.3 under Chapter IV in the EIA report page 128. |

|  |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                      |
|--|---|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
|  |   | owner of the building, nature of construction, age of the building, number of residents, their profession and income, etc                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                      |
|  | 4 | The PP shall submit a detailed hydrological report indicating the impact of proposed quarrying operations on the waterbodies like lake, water tanks, etc are located within 1 km of the proposed quarry.                                                                                                                                                                                                                                                                                                                                                                                                               | Detailed hydrological study will be submitted in the final EIA report.                               |
|  | 5 | The Proponent shall carry out Bio diversity study through reputed Institution and the same shall be included in EIA Report.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | The details of Bio diversity from the reputed institution will be submitted in the final EIA report. |
|  | 6 | The DFO letter stating that the proximity distance of Reserve Forests, Protected Areas, Sanctuaries, Tiger reserve etc, up to a radius of 25 km from the proposed site.                                                                                                                                                                                                                                                                                                                                                                                                                                                | The DFO letter will be submitted in the final EIA report.                                            |
|  | 7 | In the case of proposed lease in an existing (or old) quarry where the benches are not formed (or) partially formed as per the approved Mining Plan, the Project Proponent (PP) shall the PP shall carry out the scientific studies to assess the slope stability of the working benches to be constructed and existing quarry wall, by involving any one of the reputed Research and Academic Institutions - CSIR-Central Institute of Mining & Fuel Research / Dhanbad, NIRM/Bangalore, Division of Geotechnical Engineering-IIT-Madras, NIT-Dept of Mining Engg, Surathkal, and Anna University Chennai-CEG Campus. | As it is a fresh lease area, the Slope Stability report is not required.                             |



|  |    |                                                                                                                                                                                                                                                                                             |                                                                                                                                         |
|--|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
|  |    | The PP shall submit a copy of the aforesaid report indicating the stability status of the quarry wall and possible mitigation measures during the time of appraisal for obtaining the EC.                                                                                                   |                                                                                                                                         |
|  | 8  | However, in case of the fresh/virgin quarries, the Proponent shall submit a conceptual 'Slope Stability Plan' for the proposed quarry during the appraisal while obtaining the EC, when the depth of the working is extended beyond 30 m below ground level.                                | As it is a fresh lease area, the Slope Stability report is not required.                                                                |
|  | 9  | The PP shall furnish the affidavit stating that the blasting operation in the proposed quarry is carried out by the statutory competent person as per the MMR 1961 such as blaster, mining mate, mine foreman, II/I Class mines manager appointed by the proponent.                         | The affidavit for blasting will be enclosed in the final EIA report.                                                                    |
|  | 10 | The PP shall present a conceptual design for carrying out only controlled blasting operation involving line drilling and muffle blasting in the proposed quarry such that the blast-induced ground vibrations are controlled as well as no fly rock travel beyond 30 m from the blast site. | A conceptual design of blasting has been given in Section 2.6.6 under Chapter II in the EIA report page 23.                             |
|  | 11 | The EIA Coordinators shall obtain and furnish the details of quarry/quarries operated by the proponent in the past, either in the same location or elsewhere in the State with video and photographic evidences.                                                                            | The details and the photographic evidence showing the project proponents of past mining activities will be submitted in the EIA report. |

|    |                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                  |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 12 | If the proponent has already carried out the mining activity in the proposed mining lease area after 15.01.2016, then the proponent shall furnish the following details from AD/DD, mines,                                                                                                                                                             |                                                                                                                                                                                  |
| 13 | What was the period of the operation and stoppage of the earlier mines with last work permit issued by the AD/DD mines?                                                                                                                                                                                                                                | As it is a new quarry, the conditions are not applicable.                                                                                                                        |
| 14 | Quantity of minerals mined out.                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                  |
|    | <ul style="list-style-type: none"> <li>Highest production achieved in any one year.</li> </ul>                                                                                                                                                                                                                                                         |                                                                                                                                                                                  |
|    | <ul style="list-style-type: none"> <li>Detail of approved depth of mining.</li> </ul>                                                                                                                                                                                                                                                                  |                                                                                                                                                                                  |
|    | <ul style="list-style-type: none"> <li>Actual depth of the mining achieved earlier.</li> </ul>                                                                                                                                                                                                                                                         |                                                                                                                                                                                  |
|    | <ul style="list-style-type: none"> <li>Name of the person already mined in that leases area.</li> </ul>                                                                                                                                                                                                                                                |                                                                                                                                                                                  |
|    | <ul style="list-style-type: none"> <li>If EC and CTO already obtained, the copy of the same shall be submitted.</li> </ul>                                                                                                                                                                                                                             | All corner coordinates of the mine lease area have been superimposed on a high-resolution Google Earth Image, as shown in Figure 2.3 under Chapter II in the EIA report page 13. |
|    | <ul style="list-style-type: none"> <li>Whether the mining was carried out as per the approved mine plan (or EC if issued) with stipulated benches.</li> </ul>                                                                                                                                                                                          |                                                                                                                                                                                  |
| 15 | All corner coordinates of the mine lease area, superimposed on a High-Resolution Imagery/Toposheet, topographic sheet, geomorphology, lithology and geology of the mining lease area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone). |                                                                                                                                                                                  |
| 16 | The PP shall carry out Drone video survey covering the cluster, green belt, fencing, etc.                                                                                                                                                                                                                                                              |                                                                                                                                                                                  |
| 17 | The proponent shall furnish photographs of adequate fencing, green belt along the                                                                                                                                                                                                                                                                      |                                                                                                                                                                                  |
|    |                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                  |

|  |    |                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                               |
|--|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  |    | periphery including replantation of existing trees & safety distance between the adjacent quarries & water bodies nearby provided as per the approved mining plan.                                                                                                                                                                                                   | periphery of the project area and the photographs showing nearby water bodies will be included in final EIA Presentation.                                                                                                                                                     |
|  | 18 | The Project Proponent shall provide the details of mineral reserves and mineable reserves, planned production capacity, proposed working methodology with justifications, the anticipated impacts of the mining operations on the surrounding environment, and the remedial measures for the same.                                                                   | The Resources and Reserves of Rough Stone were calculated based on cross-section method by plotting sections to cover the maximum lease area for the proposed project. The details reserve estimation has been shown in Table 2.3 under Chapter II in the EIA report page 17. |
|  | 19 | The Project Proponent shall provide the Organization chart indicating the appointment of various statutory officials and other competent persons to be appointed as per the provisions of the Mines Act'1952 and the MMR, 1961 for carrying out the quarrying operations scientifically and systematically in order to ensure safety and to protect the environment. | Details of manpower required for this project have been given in Table 2.14 under Chapter II in the EIA report page 27.                                                                                                                                                       |
|  | 20 | The Project Proponent shall conduct the hydro-geological study considering the contour map of the water table detailing the number of groundwater pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds, etc. within 1 km (radius) along with the collected water level data for both monsoon and                                      | The hydrogeological study is discussed in the Section 3.3.3 under Chapter III in the EIA report page 49-58.                                                                                                                                                                   |

|  |    |                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                     |
|--|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  |    | non-monsoon seasons from the PWD / TWAD so as to assess the impacts on the wells due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided.                                                                                                                                                            |                                                                                                                                                                                                                                     |
|  | 21 | The proponent shall furnish the baseline data for the environmental and ecological parameters with regard to surface water/ground water quality, air quality, soil quality & flora/fauna including traffic/vehicular movement study.                                                                                                                                                                                                     | The baseline data were collected for the environmental components including land, soil, water, air, noise, biology, socio-economy, and traffic and the results have been discussed under Chapter III in the EIA report page 28-116. |
|  | 22 | The Proponent shall carry out the Cumulative impact study due to mining operations carried out in the quarry specifically with reference to the specific environment in terms of soil health, biodiversity, air pollution, water pollution, climate change and flood control & health impacts. Accordingly, the Environment Management plan should be prepared keeping the concerned quarry and the surrounding habitations in the mind. | Results of cumulative impact study due to mining operations are given in Section 7.4 under Chapter VII in the EIA report page 147-150.                                                                                              |
|  | 23 | Rain water harvesting management with recharging details along with water balance (both monsoon & non-monsoon) be submitted.                                                                                                                                                                                                                                                                                                             | As part of rainwater harvesting measures, the rain water from garland drainage system will be diverted to nearby check dams after treating the water in settling tanks. The detailed rain water                                     |

|    |                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |                                                                                                                                                                                                                                                                                                                                                                                                                                          | harvesting report will be submitted in the final EIA report.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 24 | Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given. | Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features has been discussed in Section 3.1 under Chapter III in the EIA report page 30-37. The details of surrounding sensitive ecological features have been provided in Table 3.37 under Chapter III in the EIA report page 116-117. Land use plan of the project area showing pre-operational, operational and post-operational phases are discussed in Table 2.8 under Chapter II in the EIA report page 23. |
| 25 | Details of the land for storage of Overburden/Waste Dumps (or) Rejects outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be provided.                                                                                                                                                                                                                              | This condition is not applicable to this project because no dumps have been proposed outside the lease area.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 26 | Proximity to Areas declared as 'Critically Polluted' (or) the Project areas which attracts the court restrictions for mining operations, should also be indicated and where so required, clearance certifications                                                                                                                                                                                                                        | Not Applicable.<br>Project area / Study area is not declared in 'Critically Polluted' Area and does not come under 'Aravalli Range.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

|  |    |                                                                                                                                                                                                   |                                                                                                                                                                                                                                     |
|--|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  |    | from the prescribed Authorities, such as the TNPCB (or) Dept. of Geology and Mining should be secured and furnished to the effect that the proposed mining activities could be considered.        |                                                                                                                                                                                                                                     |
|  | 27 | Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.            | As part of rainwater harvesting measures, the rain water from garland drainage system will be diverted to nearby check dams after treating the water in settling tanks.                                                             |
|  | 28 | Impact on local transport infrastructure due to the Project should be indicated.                                                                                                                  | Details regarding the impact of the project on traffic are given in Section 3.9 under Chapter III in the EIA report page 111-113.                                                                                                   |
|  | 29 | A tree survey study shall be carried out (nos., name of the species, age, diameter etc.,) both within the mining lease applied area & 300m buffer zone and its management during mining activity. | A detailed tree survey was carried out within 300 m radius and the results have been discussed in Section 3.7 under Chapter III in the EIA report page 81-100.                                                                      |
|  | 30 | A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific.                                                                          | A progressive mine closure plan has been attached with the approved mining plan report in Annexure III. The budget details for the progressive mine closure plan are shown in Table 2.9 under Chapter II in the EIA report page 23. |
|  | 31 | As a part of the study of flora and fauna around the vicinity of the proposed site, the EIA coordinator shall strive to educate the local students on the importance of                           | The EIA coordinator and the FAE for ecology and biodiversity visited the study area and educated the local students about                                                                                                           |

|  |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                         |
|--|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  |    | preserving local flora and fauna by involving them in the study, wherever possible.                                                                                                                                                                                                                                                                                                                                                                                                                                      | the importance of protecting the biological environment.                                                                                                                                                                                                                                                |
|  | 32 | The purpose of green belt around the project is to capture the fugitive emissions, carbon sequestration and to attenuate the noise generated, in addition to improving the aesthetics. A wide range of indigenous plant species should be planted as given in the appendix-I in consultation with the DFO, State Agriculture University. The plant species with dense/moderate canopy of native origin should be chosen. Species of small/medium/tall trees alternating with shrubs should be planted in a mixed manner. | A detailed greenbelt development plan has been provided in Section 4.6 under Chapter IV in the EIA report page 128-133.                                                                                                                                                                                 |
|  | 33 | Taller/one year old Saplings raised in appropriate size of bags; preferably ecofriendly bags should be planted as per the advice of local forest authorities/botanist/Horticulturist with regard to site specific choices. The proponent shall earmark the greenbelt area with GPS coordinates all along the boundary of the project site with at least 3 meters wide and in between blocks in an organized manner.                                                                                                      | The FAE of ecology and biodiversity has advised the project proponent that saplings of one year old raised in the eco-friendly bags should be purchased and planted with the spacing of 3 m between each plant around the proposed project area as per the advice of local forest authorities/botanist. |
|  | 34 | A Disaster management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.                                                                                                                                                                                                                                                                                                                                                      | A disaster management plan for the project has been provided in Section 7.3 under Chapter VII in the EIA report page 146-147.                                                                                                                                                                           |

|  |    |                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                          |
|--|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 35 | A Risk Assessment and management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.                                                                                                                                                                                                             | A risk assessment plan for the project has been provided in Section 7.2 under Chapter VII in the EIA report page 143-145.                                                                                                                                                |
|  | 36 | Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed. | Occupational health impacts of the project and preventive measures have been discussed in detail in Section 4.8 under Chapter IV in the EIA report 133-135.                                                                                                              |
|  | 37 | Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.                                                                                                                                                          | No public health implications are anticipated due to this project. Details of CSR and CER activities have been discussed in Sections 8.6 and 8.7 under Chapter VIII in the EIA report page 155-156.                                                                      |
|  | 38 | The Socio-economic studies should be carried out within a 5 km buffer zone from the mining activity. Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.                                      | No negative impact on socio-economic environment of the study area is anticipated and this project shall benefit the socio-economic environment by offering employment for 23 people directly as discussed in Section 8.1 under Chapter VIII in the EIA report page 154. |
|  | 39 | Details of litigation pending against the project, if any, with direction /order passed                                                                                                                                                                                                                                                                                                    | No litigation is pending in any court against this project.                                                                                                                                                                                                              |



|  |    |                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                           |
|--|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  |    | by any Court of Law against the Project should be given.                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                           |
|  | 40 | Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.                                                                                                                                                    | The benefits of the project are discussed in the Chapter VIII in the EIA report page 154-156.                                                                                                                                                                             |
|  | 41 | If any quarrying operations were carried out in the proposed quarrying site for which now the EC is sought, the Project Proponent shall furnish the detailed compliance to EC conditions given in the previous EC with the site photographs which shall duly be certified by MoEF&CC, Regional Office, Chennai (or) the concerned DEE/TNPCB. | It is fresh lease area and the condition is not applicable.                                                                                                                                                                                                               |
|  | 42 | The PP shall prepare the EMP for the entire life of mine and also furnish the sworn affidavit stating to abide the EMP for the entire life of mine.                                                                                                                                                                                          | A detailed environment management plan has been prepared following the suggestion made by SEAC, as shown in Chapter X in the EIA report page 158-164. The sworn affidavit stating to abide the EMP for the entire life of mine will be submitted during final EIA report. |
|  | 43 | Concealing any factual information or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this Terms of Conditions besides attracting penal provisions in the Environment (Protection) Act, 1986.                                                               | The EIA report has been prepared keeping in mind the fact that concealing any factual information or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may                                                             |

|  |  |  |                                                                                                                              |
|--|--|--|------------------------------------------------------------------------------------------------------------------------------|
|  |  |  | lead to withdrawal of this terms of reference besides attracting penal provisions in the Environment (Protection) Act, 1986. |
|--|--|--|------------------------------------------------------------------------------------------------------------------------------|

### 3.SEIAA Standard Conditions:

| S.No | Terms of Reference                  |                                                                                                                                                                                      | Remarks                                                                                                                                                                                                                                                    |
|------|-------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      | <b>Cluster Management Committee</b> |                                                                                                                                                                                      |                                                                                                                                                                                                                                                            |
| 3.1  | 1                                   | Cluster Management Committee shall be framed which must include all the proponents in the cluster as members including the existing as well as proposed quarry.                      | A cluster management committee including all the proponents of the rough stone quarrying projects within the cluster of 500 m radius will be constituted for the effective implementation of green belt development plan, water sprinkling, blasting, etc. |
|      | 2                                   | The members must coordinate among themselves for the effective implementation of EMP as committed including Green Belt Development, Water sprinkling, tree plantation, blasting etc. | The members of the cluster management committee will be instructed to carry out EMP in coordination.                                                                                                                                                       |
|      | 3                                   | The List of members of the committee formed shall be submitted to AD/Mines before the execution of mining lease and the same shall be updated every year to the AD/Mines.            | The list of members of the committee formed will be submitted to AD/Mines before the execution of mining lease.                                                                                                                                            |
|      | 4                                   | Detailed Operational Plan must be submitted which must include the blasting frequency with respect to the nearby quarry situated in the cluster, the usage of haul roads by the      | All the information has been discussed in Section 2.6 under Chapter II in the EIA report page 20-27.                                                                                                                                                       |

|  |                                            |                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                    |
|--|--------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  |                                            | individual quarry in the form of route map and network.                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                    |
|  | 5                                          | The committee shall deliberate on risk management plan pertaining to the cluster in a holistic manner especially during natural calamities like intense rain and the mitigation measures considering the inundation of the cluster and evacuation plan.                       | It will be informed to the committee.                                                                                                                                                                                                                              |
|  | 6                                          | The Cluster Management Committee shall form Environmental Policy to practice sustainable mining in a scientific and systematic manner in accordance with the law. The role played by the committee in implementing the environmental policy devised shall be given in detail. | It will be advised to the cluster management committee to practice sustainable mining in a scientific and systematic manner in accordance with the law. The role played by the committee in implementing the environmental policy devised will be given in detail. |
|  | 7                                          | The committee shall furnish action plan regarding the restoration strategy with respect to the individual quarry falling under the cluster in a holistic manner.                                                                                                              | A proper action plan regarding the restoration will be followed by the committee.                                                                                                                                                                                  |
|  | 8                                          | The committee shall deliberate on the health of the workers/staff involved in the mining as well as the health of the public in the vicinity.                                                                                                                                 | The information on the health of the workers and the local people will be updated periodically.                                                                                                                                                                    |
|  | <b>Agriculture &amp; Agro-Biodiversity</b> |                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                    |
|  | 9                                          | Impact on surrounding agricultural fields around the proposed mining 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, as shown in Section 4.6 under Chapter IV in the EIA report page 128-133.                                                                                                                                                                                                                                                                                |
| 10 | Impact on soil flora & vegetation around the project site.                                                                                                                                                                          | The details on flora have been provided in Section 3.7.1 under Chapter III in the EIA report page 81-93. There is no schedule I species of animals observed within study area as per Wildlife Protection Act, 1972 and no species falls in vulnerable, endangered or threatened category as per IUCN. There is no endangered red list species found in the study area. |
| 11 | Details of type of vegetations including no. of trees & shrubs within the proposed mining area and. If so, transplantation of such vegetations all along the boundary of the proposed mining area shall committed mentioned in EMP. | Details of vegetation in the lease area have been provided in Section 3.7.1 under Chapter III in the EIA report page 81-93. Details about transplantation of plants have been provided in Section 4.6 under Chapter IV in the EIA report page 128-133.                                                                                                                 |
| 12 | The Environmental Impact Assessment should study the biodiversity, the natural ecosystem, the soil micro flora, fauna and soil seed banks and suggest measures to maintain the natural Ecosystem.                                   | The ecological details have been provided in Section 3.7 under Chapter III in the EIA report page 81-100 and measures have been provided in Section 4.6 under Chapter IV in the EIA report page 128-133.                                                                                                                                                               |
| 13 | Action should specifically suggest for sustainable management of the area and restoration of ecosystem for flow of goods and services.                                                                                              | All the essential environmental protective measures will be followed by the proponent to manage the surrounding environment and restore the ecosystem, as discussed in Chapter IV in the EIA report page 117-136.                                                                                                                                                      |

|  |                          |                                                                                                                                                                                                                          |                                                                                                                                                                                              |
|--|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 14                       | The project proponent shall study and furnish the impact of project on plantations in adjoining patta lands, Horticulture, Agriculture and livestock.                                                                    | The impact of project on the land environment has been discussed in Section 4.1 under Chapter IV in the EIA report page 117.                                                                 |
|  | <b>Forests</b>           |                                                                                                                                                                                                                          |                                                                                                                                                                                              |
|  | 15                       | The project proponent shall detail study on impact of mining on Reserve forests free ranging wildlife.                                                                                                                   | The project proponent shall do barbed wire fencing work and develop a green belt around the lease area to prevent wildlife from entering the site.                                           |
|  | 16                       | The Environmental Impact Assessment should study impact on forest, vegetation, endemic, vulnerable and endangered indigenous flora and fauna.                                                                            | The impacts of the project on ecology and biodiversity have been discussed in Section 4.6 under Chapter IV in the EIA report page 128-133.                                                   |
|  | 17                       | The Environmental Impact Assessment should study impact on standing trees and the existing trees should be numbered and action suggested for protection.                                                                 | The impacts of the project on standing trees and the existing trees have been discussed in Section 4.6 under Chapter IV in the EIA report page 128-133.                                      |
|  | 18                       | The Environmental Impact Assessment should study impact on protected areas, Reserve Forests, National Parks, Corridors and Wildlife pathways, near project site.                                                         | The protected areas, National Parks, Corridors and Wildlife pathways near project site within 10 km radius has been provided in Table 3.46 under Chapter III in the EIA report page 114-115. |
|  | <b>Water Environment</b> |                                                                                                                                                                                                                          |                                                                                                                                                                                              |
|  | 19                       | Hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) | The detailed hydro-geology will be submitted in the final EIA report.                                                                                                                        |

|  |    |                                                                                                                                                                                                                                                                                           |                                                                                                                                                                            |
|--|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  |    | so as to assess the impacts on the nearby waterbodies due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided, covering the entire mine lease period. |                                                                                                                                                                            |
|  | 20 | Erosion Control measures.                                                                                                                                                                                                                                                                 | Garland drainage structures will be constructed around the lease area to control the erosion, as discussed in Section 4.3 under Chapter IV in the EIA report page 118-119. |
|  | 21 | Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area on the nearby Villages, Water-bodies/ Rivers, & any ecological fragile areas.                                                                                                       | The matter has been discussed under Chapter IV in the EIA report page 117-136.                                                                                             |
|  | 22 | The project proponent shall study impact on fish habitats and the food WEB/ food chain in the water body and Reservoir.                                                                                                                                                                   | An analysis for food chain in aquatic ecosystem has been discussed in Section 3.7 under Chapter III in the EIA report page 81-100.                                         |
|  | 23 | The project proponent shall study and furnish the details on potential fragmentation impact on natural environment, by the activities.                                                                                                                                                    | The impacts of the proposed project on the surrounding environment have discussed in Chapter IV in the EIA report page 117-136.                                            |
|  | 24 | The project proponent shall study and furnish the impact on aquatic plants and animals in water bodies and possible scars on the landscape, damages to nearby caves, heritage site, and archaeological sites possible                                                                     | The impact of the proposed project on aquatic plants and animals in water bodies has been discussed in Section 4.6 under Chapter IV in the EIA report page 128-136.        |

|        |                                                                                                                                                        |                                                                                                                                                                                                                                                                             |
|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|        | land form changes visual and aesthetic impacts.                                                                                                        |                                                                                                                                                                                                                                                                             |
| 25     | The Terms of Reference should specifically study impact on soil health, soil erosion, the soil physical, chemical components and microbial components. | The impact of mining on soil environment has been discussed in Section 4.2 under Chapter IV in the EIA report page 118.                                                                                                                                                     |
| 26     | The Environmental Impact Assessment should study on wetlands, water bodies, rivers streams, lakes and farmer sites.                                    | The impacts on water bodies, streams, lakes have been discussed in Section 4.3 under Chapter IV in the EIA report page 118-119.                                                                                                                                             |
| 27     | The EIA shall include the impact of mining activity on the following:                                                                                  |                                                                                                                                                                                                                                                                             |
|        | a. Hydrothermal / Geothermal effect due to destruction in the Environment.                                                                             | a. The average geothermal gradient of earth is 25 <sup>0</sup> C/km. As the proposed depth of mining is 40m below the local ground level, the temperature will increase by 1 <sup>0</sup> C at the depth of mining.                                                         |
|        | b. Bio-geochemical processes and its foot prints including environmental stress.                                                                       | b. No, Bio-geochemical processes and its foot prints including environmental stress are anticipated and at the end of life of mine the proposed quarry shall be left as an artificial reservoir structure and allowed to collect rain water and shall enrich the ecosystem. |
|        | c. Sediment geochemistry in the surface streams                                                                                                        | c. The details of sediment geochemistry are discussed in the Table 3.4 under Chapter III in the EIA report page 41.                                                                                                                                                         |
| Energy |                                                                                                                                                        |                                                                                                                                                                                                                                                                             |

|  |                          |                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                     |
|--|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 28                       | The measures taken to control Noise, Air, Water, Dust Control and steps adopted to efficiently utilise the Energy shall be furnished.                                                                                                                                          | The measures taken to control noise, air, water, and dust have been given under Chapter IV in the EIA report page 117-136.                                                                                                          |
|  | <b>Climate Change</b>    |                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                     |
|  | 29                       | The Environmental Impact Assessment shall study in detail the carbon emission and also suggest the measures to mitigate carbon emission including development of carbon sinks and temperature reduction including control of other emission and climate mitigation activities. | The carbon emission and the measures to mitigate carbon emission have been discussed in Section 4.6 under Chapter IV in the EIA report page 128-136.                                                                                |
|  | 30                       | The Environmental Impact Assessment should study impact on climate change, temperature rise, pollution and above soil & below soil carbon stock, soil health and physical, chemical & biological soil features.                                                                | The matter has been discussed in Chapter IV in the EIA report page 117-136.                                                                                                                                                         |
|  | 31                       | Impact of mining on pollution leading to GHGs emissions and the impact of the same on the local livelihood.                                                                                                                                                                    | There is no emission impact to local livelihood from this quarry project. All the vehicles used for transportation of the quarry materials will be maintained regularly to keep the GHGs emissions within statutory limits.         |
|  | <b>Mine Closure Plan</b> |                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                     |
|  | 32                       | Detailed Mine Closure Plan covering the entire mine lease period as per precise area communication order issued.                                                                                                                                                               | A progressive mine closure plan has been attached with the approved mining plan report in Annexure III. The budget details for the progressive mine closure plan are shown in Table 2.9 under Chapter II in the EIA report page 23. |



|                                 |                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                             |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| <b>EMP</b>                      |                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                             |
| 33                              | Detailed Environment Management Plan along with adaptation, mitigation & remedial strategies covering the entire mine lease period as per precise area communication order issued.                                                                                                                                                                                                         | A detailed Environment Management plan has been given under Chapter X in the EIA report page 158-164.                                       |
| 34                              | The Environmental Impact Assessment should hold detailed study on EMP with budget for green belt development and mine closure plan including disaster management plan.                                                                                                                                                                                                                     | A detailed Environment Management plan has been given in Tables 10.1 & 10.2 under Chapter X in the EIA report page 158-164.                 |
| <b>Risk Assessment</b>          |                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                             |
| 35                              | To furnish risk assessment and management plan including anticipated vulnerabilities during operational and post operational phases of Mining.                                                                                                                                                                                                                                             | The risk assessment and management plan for this project has been provided in Section 7.2 under Chapter VII in the EIA report page 143-145. |
| <b>Disaster Management Plan</b> |                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                             |
| 36                              | To furnish disaster management plan and disaster mitigation measures in regard to all aspects to avoid/reduce vulnerability to hazards & to cope with disaster/unfavorable accidents in & around the proposed mine lease area due to the proposed method of mining activity & its related activities covering the entire mine lease period as per precise area communication order issued. | The disaster management plan for this project has been provided in Section 7.3 under Chapter VII in the EIA report page 146-147.            |
| <b>Others</b>                   |                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                             |
| 37                              | The project proponent shall furnish VAO certificate with reference to 300m radius regard to approved                                                                                                                                                                                                                                                                                       | The VAO certificate is attached in the attached in the Annexure IV.                                                                         |

|  |    |                                                                                                                                                                                                                                                                                                                     |                                                                                                              |
|--|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
|  |    | habitations, schools, Archaeological sites, Structures, railway lines, roads, water bodies such as streams, odai, vaari, canal, channel, river, lake pond, tank etc.                                                                                                                                                |                                                                                                              |
|  | 38 | As per the MoEF& CC office memorandum F.No.22-65/2017-IA.III dated: 30.09.2020 and 20.10.2020 the proponent shall address the concerns raised during the public consultation and all the activities proposed shall be part of the Environment Management Plan.                                                      | The concerns raised during the public consultation will be submitted in the final EIA report.                |
|  | 39 | The project proponent shall study and furnish the possible pollution due to plastic and microplastic on the environment. The ecological risks and impacts of plastic & microplastics on aquatic environment and fresh water systems due to activities, contemplated during mining may be investigated and reported. | The plastic waste management has been given in Section 7.5 under Chapter VII in the EIA report page 152-153. |

### Standard Terms of Reference for (Mining of minerals)

#### 1.

| S.No | Terms of Reference                                                                                                                                                                                                                                                                                                                    | Remarks                                                                                          |
|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| 1.1  | Year-wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification 1994 came into force, w.r.t. the highest production achieved prior to 1994 | Not applicable. This is not a violation category project. This proposal falls under B1 category. |

|     |                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                       |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.2 | A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given                                                                                                                                                                                                            | The proposed site for quarrying is a Government Poramboke land.                                                                                                                       |
| 1.3 | All documents including approved mine plan, EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee                                                               | All the documents are in the name of the lessee.                                                                                                                                      |
| 1.4 | All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery/ toposheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone) | All corner coordinates of the mine lease area have been superimposed on a high- resolution Google Earth Image, as shown in Figure 2.3 under Chapter II, p.13.                         |
| 1.5 | Information should be provided in Survey of India Toposheet in 1:50,000 scale indicating geological map of the area, geomorphology of land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics                                            | Toposheets of Survey of India have been used for showing sampling locations of air, soil, water, and noise, as shown in Chapter III.                                                  |
| 1.6 | Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority                                                                  | The lease area was inspected by the officers of Department of Geology along with revenue officials and found that the land is fit for quarrying under the policy of State Government. |
| 1.7 | It should be clearly stated whether the proponent Company has a well laid down                                                                                                                                                                                                                                                 | The proponent has framed Environmental Policy and the same                                                                                                                            |

|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     | <p>Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating process/procedures to bring into focus any infringement/deviation/ violation of the environmental or forest norms/ conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large, may also be detailed in the EIA Report</p> | <p>has been discussed in Section 10.1 under Chapter X, pp.158-164.</p>                                                                                                                                                                                                                                                                                                                                                                                                              |
| 1.8 | <p>Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided</p>                                                                                                                                                                                                                                                                                                                                                                                                                      | <p>It is an opencast quarrying operation proposed to operate in Manual method. The Rough Stone formation is a hard, compact and homogeneous body. The height and width of the bench will be maintained as 5m with 90<sup>0</sup> bench angles. Quarrying activities will be carried out under the supervision of Competent Persons like Mines Manager, Mines Foreman and Mining Mate. Necessary permissions will be obtained from DGMS after obtaining Environmental Clearance.</p> |
| 1.9 | <p>The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <p>The study area considered for this study is of 5 km radius for air, soil, water, and noise level sample</p>                                                                                                                                                                                                                                                                                                                                                                      |

|      |                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      | waste generation etc. should be for the life of the mine / lease period                                                                                                                                                                                                                                                                                                                                                                 | collections, while the study area is 10 km radius for ecology and biodiversity studies and all data contained in the EIA report such as waste generation etc., is for the life of the mine / Lease period.                                                                                                                                                                                                                                                                                                                                                      |
| 1.10 | Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given | Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features has been discussed in Section 3.1 under Chapter III, pp.30-37. The details of surrounding sensitive ecological features have been provided in Table 3.46 under Chapter III, p.114-115. Land use plan of the project area showing pre- operational, operational and post- operational phases are discussed in Table 2.8 under Chapter II, p.23. |
| 1.11 | Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given                                                                                                                                                                                                                                                          | It is not applicable as no dumps have been proposed outside the lease area.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 1.12 | A Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest                                                                                                                        | It is not applicable as there is no forest land involved within the proposed project area. The details have been discussed in Table 3.46 under Chapter III, p.114-115.                                                                                                                                                                                                                                                                                                                                                                                          |

|      |                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                      |
|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      | Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the State Expert Appraisal Committees |                                                                                                                                                                                                                                                                                                                                                                      |
| 1.13 | Status of forestry clearance for the broken up area and virgin forestland involved in the Project including deposition of net present value (NPV) and compensatory afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished                                                  | It is not applicable as the proposed project area does not involve any forest land.                                                                                                                                                                                                                                                                                  |
| 1.14 | Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated                                                                                                                                   | Not Applicable.<br><br>The project doesn't attract Recognition of Forest Rights Act, 2006 as there are neither forests nor forest dwellers / forest dependent communities in the mine lease area. There shall be no forest impacted families (PF) or people (PP). Thus, the rights of Traditional Forest Dwellers will not be compromised on account of the project. |
| 1.15 | The vegetation in the RF / PF areas in the study area, with necessary details, should be given.                                                                                                                                                                                                                       | No Reserve Forest is found within the study area. The details of reserve forest within 10km have been discussed Table 3.46 under Chapter III, p.114-115. Flora and Fauna vegetation details are given in section 3.7.1 and 3.7.2 under chapter III, p.81-100.                                                                                                        |

|      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                            |
|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.16 | A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly, detailed mitigative measures required, should be worked out with cost implications and submitted                                                                                                                                                                                                    | There is no any wildlife/protected area from the periphery of the project area. Information regarding wildlife /protected area within 10km has been given in Table 3.46 under Chapter III, p.114-115. Flora and Fauna vegetation details are given in section 3.7.1 and 3.7.2 under chapter III, p.81-100. |
| 1.17 | Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves/ (existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished | The details of National Parks, Biosphere Reserves, Wildlife Corridors, and Tiger/Elephant Reserves within 10 km radius from the periphery of the project area has been given in Table 3.46 under Chapter III, p.114-115.                                                                                   |
| 1.18 | A detailed biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled- I fauna found in the study area, the necessary plan along with budgetary provisions for their conservation            | A detailed biological study was carried out in both core and buffer zones and the results have been discussed in Section 3.7 under Chapter III, pp.81-100.                                                                                                                                                 |

|      |                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                          |
|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      | should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost.                                                                                                                                                                                                                       |                                                                                                                                                                          |
| 1.19 | Proximity to Areas declared as Critically Polluted or the Project areas likely to come under the Aravali Range, (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Dept. Should be secured and furnished to the effect that the proposed mining activities could be considered | Not Applicable.<br><br>Project area / Study area is not declared in 'Critically Polluted' Area and does not come under 'Aravalli Range.                                  |
| 1.20 | Similarly, for coastal Projects, A CRZ map duly authenticated by one of the authorized agencies demarcating LTL, HTL, CRZ area, location of the mine lease w.r.t CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority)                                                    | Not Applicable<br><br>The project doesn't attract the C.R.Z. Notification, 2018.                                                                                         |
| 1.21 | R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need based sample survey, family-wise, should be undertaken to assess their                                              | Not Applicable.<br><br>There are no approved habitations of SCs/STs and other weaker sections in the lease area. Therefore, R&R Plan / Compensation Plan for the Project |



|      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                       |
|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      | <p>requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be clearly brought out whether the village(s) located in the mine lease area will be shifted or not. The issues relating to shifting of village(s) including their R&amp;R and socio-economic aspects should be discussed in the Report</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                       |
| 1.22 | <p>One season (non-monsoon) [i.e. March-May (Summer Season); October-December (post monsoon season); December-February (winter season)] primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM<sub>10</sub>, particularly for free silica, should be given</p> | <p>Baseline data were collected for the period of October 2023 - December 2023 as per CPCB notification and MoEF &amp; CC Guidelines. Primary baseline data and the results have been included in Sections 3.1-3.9 under Chapter III, pp. 30-113.</p> |

|      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                      |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.23 | Air quality modeling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of mineral. The details of the model used and input parameters used for modeling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map | Air quality modelling for prediction of incremental GLCs of pollutants was carried out using AERMOD view 11.2.0. The model results have been given in Section 4.4 under the Chapter IV, pp.119-123.                                                                                                                  |
| 1.24 | The water requirement for the Project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the Project should be indicated.                                                                                                                                                                                                                                                                                                                                                               | The water requirement for the project, its availability and source have been provided in Table 2.11 under Chapter II, p.26.                                                                                                                                                                                          |
| 1.25 | Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided                                                                                                                                                                                                                                                                                                                                                                                                                                         | Not Applicable.<br>Water for dust suppression, greenbelt development and domestic use will be sourced from accumulated rainwater/seepage water in mine pits and purchased from local water vendors through water tankers on daily requirement basis. Drinking water will be sourced from the approved water vendors. |
| 1.26 | Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided                                                                                                                                                                                                                                                                                                                                                                                | Part of the working pit will be allowed to collect rain water during the spell of rain. The water thus collected will be used for greenbelt development and dust suppression. The mine closure                                                                                                                       |

|      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                       |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | plan has been prepared for converting the excavated pit into rain water harvesting structure and serve as water reservoir for the project village during draught season.                                                                                                                                                              |
| 1.27 | Impact of the Project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided                                                                                                                                                                                                                                                                                                                                                                                                                               | Impact studies and mitigation measures of water environment including surface water and ground water have been discussed in Section 4.3 under Chapter IV, pp. 118-119.                                                                                                                                                                |
| 1.28 | Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. The Report inter-alia, shall include details of the aquifers present and impact of mining activities on these aquifers. Necessary permission from State Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished | Not Applicable.<br><br>The ground water table is found at the depth of 80 m below ground level. The ultimate depth of quarry is 55 m BGL. Therefore, the mining activity will not intersect the ground water table. Data regarding the occurrence of groundwater table have been provided in Section 3.3 under Chapter III, pp.42-58. |
| 1.29 | Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion proposed, if any, and the impact of the same on the hydrology should be brought out                                                                                                                                                                                                                                                                                                                                                                                                    | Not Applicable.<br><br>There are no streams, seasonal or other water bodies passing within the project area. Therefore, no modification or diversion of water bodies is anticipated.                                                                                                                                                  |
| 1.30 | Information on site elevation, working depth, groundwater table etc. Should be                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | The highest elevation of the project area is 776 m AMSL. Ultimate depth                                                                                                                                                                                                                                                               |

|      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                      |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      | provided both in AMSL and bgl. A schematic diagram may also be provided for the same.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | of the mine is 55m BGL. Depth to the water level in the area is 60 m BGL                                                                                                                                                                                                                                             |
| 1.31 | A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution | Greenbelt development plan has been given in Section 4.6 under Chapter IV, pp.128-133.                                                                                                                                                                                                                               |
| 1.32 | Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those outside the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as State Government) should be covered. Project Proponent shall conduct Impact of                                                                                                                                                                                                                                     | Traffic density survey was carried out to analyze the impact of transportation in the study area as per IRC guidelines 1961 and it is inferred that there is no significant impact due to the proposed transportation from the project area. Details have been provided in Section 3.9 under Chapter III, p.111-113. |

|      |                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                    |
|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      | Transportation study as per Indian Road Congress Guidelines                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                    |
| 1.33 | Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.                                                                                                                                                                                                                                                                     | Infrastructure & other facilities will be provided to the mine workers after the grant of quarry lease and the same has been discussed in Section 2.6.7 under Chapter II, p.23-25. |
| 1.34 | Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report                                                                                                                                                                                                                    | Progressive mine closure plan has been prepared for this project and is given in Table 2.9 under Section 2.6.5 under Chapter II, p.23.                                             |
| 1.35 | Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed | Occupational health impacts of the project and preventive measures have been explained in detail in Section 4.8 under Chapter IV, pp.133-135.                                      |
| 1.36 | Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations                                                                                                                                                          | No public health implications are anticipated due to this project. Details of CSR and CER activities have been discussed in Sections 8.6 and 8.7 under Chapter VIII, pp.155-156.   |
| 1.37 | Measures of socio economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as                                                                                                                                                                                                                              | No negative impact on socio-economic environment of the study area is anticipated and this project shall benefit the socio-economic environment by offering employment             |

|      |                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      | possible, quantitative dimensions may be given with time frames for implementation                                                                                                                                                                                                       | for 23 people directly as discussed in Section 8.1 under Chapter VIII, p.154.                                                                                                                                                                                                                                                                                                                                                                                                               |
| 1.38 | Detailed environmental management plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project | A detailed Environment Management Plan has been prepared and provided in Tables 10.1 & 10.2 under Chapter X, pp.158-164.                                                                                                                                                                                                                                                                                                                                                                    |
| 1.39 | Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project                                   | The outcome of public hearing will be submitted during the final EIA report.                                                                                                                                                                                                                                                                                                                                                                                                                |
| 1.40 | Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given                                                                                                                                          | No litigation is pending in any court against this project.                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 1.41 | The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out                                                                                                                                                  | Project Cost is Rs.8,84,95,000/-<br>CER Cost is Rs. 5,00,000/-<br>In order to implement the environmental protection measures, an amount of <b>Rs. 9032180</b> as capital cost and recurring cost as <b>Rs. 3206856</b> 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 <b>Rs. 26752084</b> , as shown in Tables |

|      |                                                                                                                                                                                                                                                 |                                                                                                               |
|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
|      |                                                                                                                                                                                                                                                 | 10.1 & 10.2 under Chapter X, pp.158-164.                                                                      |
| 1.42 | A Disaster management Plan shall be prepared and included in the EIA/EMP Report                                                                                                                                                                 | The disaster management plan for this project has been provided in Section 7.3 under Chapter VII, pp.146-147. |
| 1.43 | Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.                                                       | Benefits of the project details have been given under Chapter VIII, pp.154-156.                               |
| 1.44 | Besides the above, the below mentioned general points are also to be followed                                                                                                                                                                   |                                                                                                               |
| a)   | All documents to be properly referenced with index and continuous page numbering                                                                                                                                                                | All the documents have been properly referenced with index and continuous page numbering                      |
| b)   | Where data are presented in the Report especially in Tables, the period in which the data were collected and the sources should be indicated                                                                                                    | List of tables and source of the data collected have been mentioned.                                          |
| c)   | Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF&CC/NABL accredited laboratories. All the original analysis/testing reports should be available during appraisal of the Project. | Original Baseline monitoring report will be submitted in final EIA report.                                    |
| d)   | Where the documents provided are in a language other than English, an English translation should be provided.                                                                                                                                   | All the documents provided here are in English language.                                                      |
| e)   | The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted.                                                                                                         | The questionnaire will be submitted in final EIA report.                                                      |
| f)   | While preparing the EIA report, the instructions for the Proponents and                                                                                                                                                                         | Instructions issued by MoEF & CC O.M. No. J-11013/41/2006-IA. II (I)                                          |

|    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                      |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|
|    | instructions for the Consultants issued by MoEF vide O.M. No. J-11013/41/2006-IA.II(I) dated 4th August, 2009, which are available on the website of this Ministry, should be followed.                                                                                                                                                                                                                                                                                                | dated 4 <sup>th</sup> August, 2009 have been followed while preparing the EIA report.                                |
| g) | Changes, if any made in the basic scope and project parameters (as submitted in Form-I and the PFR for securing the TOR) should be brought to the attention of MoEF&CC with reasons for such changes and permission should be sought, as the TOR may also have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH again with the revised documentation. | No changes are made in the basic scope and the project parameters.                                                   |
| h) | As per the circular no. J 11011/618/2010-IA.II(I) dated 30.5.2012, certified report of the status of compliance of the conditions stipulated in the environment clearance for the existing operations of the project, should be obtained from the Regional Office of Ministry of Environment, Forest and Climate Change, as may be applicable.                                                                                                                                         | It is a new lease area, the condition is not applicable.                                                             |
| i) | The EIA report should also include<br>(i) surface plan of the area indicating contours of main topographic features, drainage and mining area, (ii) geological maps and sections and (iii) sections of the mine pit and external dumps, if any, clearly showing the land features of the adjoining area.                                                                                                                                                                               | All the plans including surface & geological plans, and progressive closure plan have been included in Annexure III. |



**SEIAA Specific Conditions:**

| <b>S.No</b> | <b>Terms of Reference</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>Remarks</b>                                                                                              |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| 1           | The authority noted that the subject was placed in the 551 <sup>st</sup> SEAC-I meeting held on 16.04.2025. After detailed discussions, the Authority accepts the recommendation of SEAC-I and decided to grant Terms of Reference (ToR) along with Public Hearing for the quantity of 6,76,020 m <sup>3</sup> upto the depth of 55m BGL as per the approved mining plan, under cluster for undertaking the combined Environment Impact Assessment Study and preparation of separate Environment Management Plan subject to the conditions as recommended by SEAC-I & normal conditions & the conditions mentioned in 'Annexure B' of this minutes | After the detailed discussions of SEAC, as per the ToR conditions the quantity of production has not exceed |

**A. Standard Terms of Reference**

|    |                                                                                                                                                                                                                                                                                                                                        |                                                                                                  |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| 1. | Year-wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification 1994 came into force, w.r.t. the highest production achieved prior to 1994. | Not applicable. This is not a violation category project. This proposal falls under B1 category. |
| 2. | A copy of the document in support of the fact that the proponent is the rightful lessee of the mine should be given.                                                                                                                                                                                                                   | The proposed site for quarrying is a Government Poramboke land.                                  |

|    |                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                       |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3. | All documents including approved mine plan, EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee.                                                               | All the documents are in the name of the lessee.                                                                                                                                      |
| 4. | All corner coordinates of the mine lease area, superimposed on a High-Resolution Imagery/ toposheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone). | All corner coordinates of the mine lease area have been superimposed on a high-resolution Google Earth Image, as shown in Figure 2.3 under Chapter II in the EIA report page 13.      |
| 5. | Information should be provided in Survey of India Toposheet in 1:50,000 scale indicating geological map of the area, geomorphology of land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics.                                            | Toposheets of Survey of India have been used for showing sampling locations of air, soil, water, and noise, as shown in Chapter III in the EIA report page 30-113.                    |
| 6. | Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority.                                                                  | The lease area was inspected by the officers of Department of Geology along with revenue officials and found that the land is fit for quarrying under the policy of State Government. |
| 7. | It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the.                                                                                                                     | The Environmental Policy is discussed in the Section 10.1 under Chapter X in the EIA report page 158.                                                                                 |

|    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | <p>prescribed operating process/ procedures to bring into focus any infringement/ deviation/ violation of the environmental or forest norms/conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large, may also be detailed in the EIA Report</p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 8. | <p>Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided</p>                                                                                                                                                                                                                                                                                           | <p>It is an opencast quarrying operation proposed to operate in Manual method. The rough stone formation is a hard, compact and homogeneous body. The height and width of the bench will be maintained as 5m with 90° bench angles. Quarrying activities will be carried out under the supervision of Competent Persons like Mines Manager, Mines Foreman and Mining Mate. Necessary permissions will be obtained from DGMS after obtaining Environmental Clearance.</p> |
| 9. | <p>The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc., should be for the life of the mine / lease period.</p>                                                                                                                                                                                                                                                                                                                                    | <p>The study area considered for this study is of 5 km radius for air, soil, water, and noise level sample collections, while the study area is 10 km radius for ecology and biodiversity studies and all data contained in the EIA report such as waste generation</p>                                                                                                                                                                                                  |

|     |                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     |                                                                                                                                                                                                                                                                                                                                                                                                                                          | etc., is for the life of the mine / lease period.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 10. | Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given. | Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features has been discussed in Section 3.1 under Chapter III in the EIA report page 30-37. The details of surrounding sensitive ecological features have been provided in Table 3.46 under Chapter III in the EIA report page 114-115. Land use plan of the project area showing pre-operational, operational and post-operational phases are discussed in Table 2.8 under Chapter II in the EIA report page 23. |
| 11. | Details of the land for any over burden dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given.                                                                                                                                                                                                                                                          | It is not applicable as no dumps have been proposed outside the lease area. The entire quarried out rough stone will be transported to the needy customers.                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 12. | Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the         | It is not applicable as there is no forest land involved within the proposed project area. The details have been discussed in Table 3.46 under Chapter III in the EIA report page 114-115.                                                                                                                                                                                                                                                                                                                                                                                                                               |

|     |                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                      |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     | Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                      |
| 13. | Status of forestry clearance for the broken-up area and virgin forestland involved in the Project including deposition of net present value (NPV) and compensatory afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.                           | It is not applicable as the proposed project area does not involve any forest land.                                                                                                                                                                                                                                                                                  |
| 14. | Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.                                                                                                            | Not Applicable.<br><br>The project doesn't attract Recognition of Forest Rights Act, 2006 as there are neither forests nor forest dwellers / forest dependent communities in the mine lease area. There shall be no forest impacted families (PF) or people (PP). Thus, the rights of Traditional Forest Dwellers will not be compromised on account of the project. |
| 15. | The vegetation in the RF / PF areas in the study area, with necessary details, should be given.                                                                                                                                                                                                 | There is no any reserve forest in the study area. The details of reserve forest is discussed in the Table 3.46 under Chapter III in the EIA report page 114-115.                                                                                                                                                                                                     |
| 16. | A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly, detailed mitigative measures required, should be worked out | There is no any wildlife/protected area within 10 km radius from the periphery of the project area. Information regarding the same has been given in Table 3.46 under Chapter III in the EIA report page 114-115.                                                                                                                                                    |

|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                            |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     | with cost implications and submitted.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                            |
| 17. | Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves/ (existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished.                                                                                                                                                                                            | There are No National Parks, Biosphere Reserves, Wildlife Corridors, and Tiger/Elephant Reserves within 10 km radius from the periphery of the project area. Information regarding the same has been given in Table 3.46 under Chapter III in the EIA report page 114-115. |
| 18. | A detailed biological study of the study area [core zone and buffer zone (10 KM radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled-I fauna found in the study area, the necessary plan along with budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost. | A detailed biological study was carried out in both core and buffer zones and the results have been discussed in Section 3.7 under Chapter III in the EIA report page 81-100.                                                                                              |

|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                  |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 19. | Proximity to Areas declared as 'Critically Polluted' or the Project areas likely to come under the 'Aravalli Range', (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Department should be secured and furnished to the effect that the proposed mining activities could be considered.                                                                                                     | Not Applicable.<br><br>Project area / Study area is not declared. in 'Critically Polluted' Area and does not come under 'Aravalli Range.                                                                         |
| 20. | Similarly, for coastal Projects, A CRZ map duly authenticated by one of the authorized agencies demarcating LTL, HTL, CRZ area, location of the mine lease w.r.t CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority).                                                                                                                                                                  | Not Applicable<br><br>The project doesn't attract the C.R.Z. Notification, 2018.                                                                                                                                 |
| 21. | R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need-based sample survey, family-wise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It | Not Applicable.<br><br>There are no approved habitations of SCs/STs and other weaker sections in the lease area. Therefore, R&R Plan / Compensation Plan for the Project Affected People (PAP) are not provided. |

|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                         |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     | may be clearly brought out whether the village(s) located in the mine lease area will be shifted or not. The issues relating to shifting of village(s) including their R&R and socio-economic aspect should be discussed in the Report                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                         |
| 22. | One season (non-monsoon) [i.e., March-May (Summer Season); October-December (post monsoon season); December-February (winter season)] primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM10, particularly for free silica, should be given. | Baseline data were collected for the period of October - December 2024 as per CPCB notification and MoEF & CC Guidelines. Primary baseline data and the results have been included in Sections 3.1-3.9 under Chapter III in the EIA report page 30-113. |
| 23. | Air quality modelling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of mineral.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Air quality modelling for prediction of incremental GLCs of pollutants was carried out using AERMOD view 11.2.0. The model results have been given in                                                                                                   |



|     |                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                         |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     | The details of the model used and input parameters used for modelling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map | Section 4.4 under the Chapter IV in the EIA report page 119-123.                                                                                                                                                                                                                                                                                                        |
| 24. | The water requirement for the project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the project should be indicated.                                                                                                                                          | The water requirement for the project, its availability and source have been provided in Table 2.11 under Chapter II in the EIA report page 26.                                                                                                                                                                                                                         |
| 25. | Necessary clearance from the competent Authority for drawl of requisite quantity of water for the project should be provided.                                                                                                                                                                                                                   | Not Applicable.<br>Water for dust suppression, greenbelt development and domestic use will be sourced from accumulated rainwater/seepage water in mine pits and purchased from local water vendors through water tankers on daily requirement basis. Drinking water will be sourced from the approved water vendors.                                                    |
| 26. | Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.                                                                                                                                                          | Part of the working pit will be allowed to collect rain water during the spell of rain. The water thus collected will be used for greenbelt development and dust suppression. The mine closure plan has been prepared for converting the excavated pit into rain water harvesting structure and serve as water reservoir for the project village during draught season. |
| 27. | Impact of the Project on the water quality, both surface and groundwater, should be                                                                                                                                                                                                                                                             | Impact studies and mitigation measures of water environment including surface                                                                                                                                                                                                                                                                                           |

|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                    |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     | assessed and necessary safeguard measures, if any required, should be provided.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | water and ground water have been discussed in Section 4.3 under Chapter IV in the EIA report page 118-119.                                                                                                                                                                                                                         |
| 28. | Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. The Report inter-alia, shall include details of the aquifers present and impact of mining activities on these aquifers. Necessary permission from Central Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished. | The ground water table is found at the depth of 60-65m below ground level. The ultimate depth of quarry is 55m BGL. Therefore, the mining activity will not intersect the ground water table. Data regarding the occurrence of groundwater table have been provided in Section 3.3 under Chapter III in the EIA report page 42-58. |
| 29. | Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion proposed, if any, and the impact of the same on the hydrology should be brought out                                                                                                                                                                                                                                                                                                                                                                                                       | Not Applicable.<br>There are no streams, seasonal or other water bodies passing within the project area. Therefore, no modification or diversion of water bodies is anticipated                                                                                                                                                    |
| 30. | Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and BGL. A schematic diagram may also be provided for the same.                                                                                                                                                                                                                                                                                                                                                                                                                                | The highest elevation of the project area is 776m AMSL. Ultimate depth of the mine is 55m BGL. Depth to the water level in the area is 60-65m below the ground level.                                                                                                                                                              |
| 31. | A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted,                                                                                                                                                                                                                                                                                                                                                                                                              | Greenbelt development plan has been given in Section 4.6 under Chapter IV in the EIA report page 128-133.                                                                                                                                                                                                                          |

|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                  |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     | <p>keeping in mind, the same will have to be executed up. Front on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution.</p>               |                                                                                                                                                                                                                                                                                                                                                  |
| 32. | <p>Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those outside the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as State Government) should be covered. Project Proponent shall conduct Impact of Transportation study as per Indian Road Congress Guidelines.</p> | <p>Traffic density survey was carried out to analyses the impact of transportation in the study area as per IRC guidelines 1961 and it is inferred that there is no significant impact due to the proposed transportation from the project area. Details have been provided in Section 3.9 under Chapter III in the EIA report page 111-113.</p> |
| 33. | <p>Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <p>Infrastructure &amp; other facilities will be provided to the mine workers after the grant of quarry lease and the same has been discussed in Section 2.6.7 under Chapter II in the EIA report page 23-26.</p>                                                                                                                                |

|     |                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                   |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 34. | Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report.                                                                                                                                                                                                                    | Progressive mine closure plan has been prepared for this project and is given in Section 2.6.5 under Chapter II in the EIA report page 23.                                                                                                        |
| 35. | Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed. | Occupational health impacts of the project and preventive measures detail have been explained in Section 4.8 under Chapter IV in the EIA report page 133-135.                                                                                     |
| 36. | Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.                                                                                                                                                          | No public health implications are anticipated due to this project. Details of CSR and CER activities have been discussed in Sections 8.6 and 8.7 under Chapter VIII in the EIA report page 155-156.                                               |
| 37. | Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.                                                                                                                                           | No negative impact on socio-economic environment of the study area is anticipated and this project shall benefit the socio-economic environment by offering employment for 23 people directly as discussed in Section 8.1 under Chapter VIII 154. |
| 38. | Detailed environmental management plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any,                                                                                                                                                                                      | A detailed Environment Management Plan has been prepared and provided in Table 10.1 & 10.2 under Chapter X in the EIA report page 158-164.                                                                                                        |

|     |                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     | occupational health impacts besides other impacts specific to the proposed Project.                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 39. | Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project. | The outcome of public hearing will be submitted during the final EIA report.                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 40. | Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given                                                                                                         | No litigation is pending in any court against this project.                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 41  | The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.                                                                                                                | Project Cost is Rs.8,84,95,000/-<br>CER Cost is Rs. 5,00,000/-<br>In order to implement the environmental protection measures, an amount of <b>Rs. 9032180</b> as capital cost and recurring cost as <b>Rs. 3206856</b> 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 <b>Rs. 26752084</b> , as shown in Tables 10.1 & 10.2 under Chapter X, pp.158-164. |
| 42. | A disaster management plan shall be prepared and included in the EIA/EMP Report.                                                                                                                                                                        | The disaster management plan for this project has been provided in Section 7.3 under Chapter VII in the EIA report page 146-147.                                                                                                                                                                                                                                                                                                                                                                                                     |

|     |                                                                                                                                                                                                                                                   |                                                                                                                                                           |
|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| 43. | Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.                                                         | Benefits of the project details have been given under Chapter VIII in the EIA report page 154-156.                                                        |
| 44  | Besides the above, the below mentioned general points are also to be followed:                                                                                                                                                                    |                                                                                                                                                           |
| a)  | Executive Summary of the EIA/EMP Report.                                                                                                                                                                                                          | Executive summary has been enclosed as a separate booklet.                                                                                                |
| b)  | All documents to be properly referenced with index and continuous page numbering.                                                                                                                                                                 | All the documents have been properly referenced with index and continuous page numbering.                                                                 |
| c)  | Where data are presented in the Report especially in Tables, the period in which the data were collected and the sources should be indicated.                                                                                                     | List of tables and source of the data collected have been mentioned.                                                                                      |
| d)  | Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF & CC/NABL accredited laboratories. All the original analysis/testing reports should be available during appraisal of the Project. | Original Baseline monitoring reports will be submitted in the final EIA report.                                                                           |
| e)  | Where the documents provided are in a language other than English, an English translation should be provided.                                                                                                                                     | All the documents provided here are in English language.                                                                                                  |
| f)  | The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted.                                                                                                           | The questionnaire will be submitted in the final EIA report.                                                                                              |
| g)  | While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF & CC vide O.M. No. J- 11013/41/2006-IA. II(I) dated 4th August, 2009, which are                                           | Instructions issued by MoEF & CC O.M. No. J-11013/41/2006-IA. II (I) dated 4 <sup>th</sup> August, 2009 have been followed while preparing the EIA report |

|    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                      |
|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|
|    | available on the website of this Ministry, should be followed.                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                      |
| h) | Changes, if any made in the basic scope and project parameters (as submitted in Form- I and the PFR for securing the TOR) should be brought to the attention of MoEF & CC with reasons for such changes and permission should be sought, as the TOR may also have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH again with the revised documentation | No changes are made in the basic scope and the project parameters.                                                   |
| i) | As per the circular no. J-11011/618/2010- IA. II(I) Dated: 30.5.2012, certified report of the status of compliance of the conditions stipulated in the environment clearance for the existing operations of the project, should be obtained from the Regional Office of Ministry of Environment, Forest and Climate Change, as may be applicable.                                                                                                                                        | As it is a new lease area, the condition is not applicable.                                                          |
| j) | The EIA report should also include (i) surface plan of the area indicating contours of main topographic features, drainage and mining area, (ii) geological maps and sections and (iii) sections of the mine pit and external dumps, if any, clearly showing the land features of the adjoining area.                                                                                                                                                                                    | All the plans including surface & geological plans, and progressive closure plan have been included in Annexure III. |

## TABLE OF CONTENTS

| <b>S No.</b> | <b>TITLE</b>                                       | <b>PAGE No.</b> |
|--------------|----------------------------------------------------|-----------------|
| <b>I</b>     | <b>INTRODUCTION</b>                                | <b>1-8</b>      |
| 1.0          | Preamble                                           | 1               |
| 1.1          | Purpose of the Report                              | 3               |
| 1.2          | Environmental Clearance                            | 3               |
| 1.3          | Terms of Reference (ToR)                           | 6               |
| 1.4          | Post Environment Clearance Monitoring              | 6               |
| 1.5          | Transferability of Environmental Clearance         | 6               |
| 1.6          | Identification of the Project Proponent            | 6               |
| 1.7          | Brief Description of the Project                   | 7               |
| 1.8          | Scope of the Study                                 | 7               |
| 1.9          | Legislation Applicable to Mining of Mineral Sector | 8               |
| <b>II</b>    | <b>PROJECT DESCRIPTION</b>                         | <b>9-27</b>     |
| 2.0          | General Introduction                               | 9               |
| 2.1          | Description of the Project                         | 9               |
| 2.2          | Location and Accessibility                         | 10              |
| 2.3          | Leasehold Area                                     | 12              |
| 2.3.1        | Corner Coordinates                                 | 12              |
| 2.4          | Geology                                            | 12              |
| 2.5          | Quantity of Reserves                               | 17              |
| 2.6          | Mining Method                                      | 20              |
| 2.6.1        | Conceptual Blasting Design                         | 20              |
| 2.6.2        | Magnitude of Operation                             | 22              |
| 2.6.3        | Extent of Mechanization                            | 22              |
| 2.6.4        | Progressive Quarry Closure Plan                    | 22              |
| 2.6.5        | Progressive Quarry Closure Budget                  | 23              |
| 2.6.6        | Conceptual Mining Plan                             | 23              |
| 2.6.7        | Infrastructures                                    | 23              |
| 2.6.7.1      | Other Infrastructure Requirement                   | 26              |
| 2.6.8        | Water Requirement                                  | 26              |
| 2.6.9        | Energy Requirement                                 | 26              |
| 2.6.10       | Capital Requirement                                | 27              |
| 2.7          | Manpower Requirement                               | 27              |
| 2.8          | Project Implementation Schedule                    | 27              |
| <b>III</b>   | <b>DESCRIPTION OF THE ENVIRONMENT</b>              | <b>28-116</b>   |
| 3.0          | General                                            | 28              |



|         |                                          |     |
|---------|------------------------------------------|-----|
| 3.1     | Land Environment                         | 30  |
| 3.1.1   | Geology and Geomorphology                | 30  |
| 3.1.2   | Land Use/Land Cover                      | 30  |
| 3.1.3   | Topography                               | 31  |
| 3.1.4   | Drainage Pattern                         | 31  |
| 3.1.5   | Seismic Sensitivity                      | 31  |
| 3.2     | Soil Environment                         | 38  |
| 3.2.1   | Soil Characteristics                     | 38  |
| 3.3     | Water Environment                        | 42  |
| 3.3.1   | Ground Water Resources and Quality       | 43  |
| 3.3.1.1 | Physical Parameter of Ground Water       | 43  |
| 3.3.1.2 | Chemical Parameters of Water             | 43  |
| 3.3.2   | Surface Water                            | 44  |
| 3.3.3   | Hydrogeological                          | 49  |
| 3.3.3.1 | Rainfall                                 | 50  |
| 3.3.3.2 | Groundwater Levels and Flow Direction    | 50  |
| 3.3.3.3 | Electrical Resistivity Investigation     | 57  |
| 3.4     | Air Environment                          | 59  |
| 3.4.1   | Meteorology                              | 59  |
| 3.4.2   | Secondary Data                           | 59  |
| 3.4.3   | Site Specific Meteorological Data - 2023 | 62  |
| 3.4.4   | Site Specific Meteorological Data - 2025 | 64  |
| 3.4.5   | Ambient Air Quality Study                | 65  |
| 3.5     | Noise Environment                        | 71  |
| 3.6     | Vibration Monitoring                     | 74  |
| 3.7     | Biological Environment                   | 81  |
| 3.7.1   | Flora                                    | 81  |
| 3.7.1.1 | Objectives of the Study                  | 81  |
| 3.7.1.2 | Study Approach & Methodology             | 81  |
| 3.7.1.3 | Survey Methodology                       | 82  |
| 3.7.1.4 | Important Value Index (IVI)              | 82  |
| 3.7.1.5 | Floral diversity Analysis                | 83  |
| 3.7.2   | Fauna                                    | 94  |
| 3.7.2.1 | Methodology                              | 94  |
| 3.8     | Socio-Economic Environment               | 100 |
| 3.8.1   | Objectives of the Study                  | 102 |

|           |                                                                  |         |
|-----------|------------------------------------------------------------------|---------|
| 3.8.2     | Socio- Economic Profile of Kamandoddi Village – Study Area       | 102     |
| 3.8.3     | Working Population- Kamandoddi Village, Shoolagiri Taluk         | 103     |
| 3.8.4     | Habitations Wise Population Details in Kamandoddi Village        | 103     |
| 3.8.5     | Demographic Profile of Krishnagiri District                      | 104     |
| 3.8.6     | Recommendation and Suggestion                                    | 110     |
| 3.8.7     | Conclusion                                                       | 111     |
| 3.9       | Traffic Density                                                  | 111     |
| 3.10      | Site Specific Features                                           | 114     |
| <b>IV</b> | <b>ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES</b> | 117-136 |
| 4.0       | General                                                          | 117     |
| 4.1       | Land Environment                                                 | 117     |
| 4.1.1     | Anticipated Impact                                               | 117     |
| 4.1.2     | Mitigation Measures from Proposed Project                        | 117     |
| 4.2       | Soil Environment                                                 | 118     |
| 4.2.1     | Anticipated Impact on Soil Environment                           | 118     |
| 4.2.2     | Common Mitigation Measures from Proposed Project                 | 118     |
| 4.3       | Water Environment                                                | 118     |
| 4.3.1     | Anticipated Impact                                               | 118     |
| 4.3.2     | Common Mitigation Measures from Proposed Project                 | 118     |
| 4.4       | Air Environment                                                  | 119     |
| 4.4.1     | Anticipated impact from Proposed Project                         | 119     |
| 4.4.2     | Emission Estimation                                              | 119     |
| 4.4.2.1   | Modelling of Incremental Concentration                           | 120     |
| 4.4.2.2   | Model Results                                                    | 120     |
| 4.4.2     | Mitigation Measures                                              | 123     |
| 4.5       | Noise Environment                                                | 124     |
| 4.5.1     | Anticipated Impact                                               | 124     |
| 4.5.2     | Common Mitigation Measures                                       | 125     |
| 4.5.3     | Ground Vibrations                                                | 126     |
| 4.5.3.1   | Common Mitigation Measures                                       | 127     |
| 4.6       | Biological Environment                                           | 128     |
| 4.6.1     | Impact on Flora                                                  | 128     |
| 4.6.2     | Mitigation Measures on Flora                                     | 129     |
| 4.6.3     | Impact on Fauna                                                  | 131     |

|            |                                                            |                |
|------------|------------------------------------------------------------|----------------|
| 4.6.4      | Mitigation Measures on Fauna                               | 132            |
| 4.6.5      | Impact on agriculture and horticulture crops in 1km Radius | 132            |
| 4.6.6      | Mitigation Measures on agriculture and horticulture crops. | 132            |
| 4.7        | Socio Economic Environment                                 | 133            |
| 4.7.1      | Anticipated Impact from Proposed and Existing Projects     | 133            |
| 4.7.2      | Common Mitigation Measures for Proposed Project            | 133            |
| 4.8        | Occupational Health and Safety                             | 133            |
| 4.8.1      | Respiratory Hazards                                        | 134            |
| 4.8.2      | Noise                                                      | 134            |
| 4.8.3      | Physical Hazards                                           | 134            |
| 4.8.4      | Occupational Health Survey                                 | 134            |
| 4.9        | Mine Waste Management                                      | 135            |
| 4.10       | Mine Closure                                               | 135            |
| 4.10.1     | Mine Closure Criteria                                      | 135            |
| 4.10.1     | Physical Stability                                         | 135            |
| 4.10.1.2   | Chemical Stability                                         | 136            |
| 4.10.1.3   | Biological Stability                                       | 136            |
| <b>V</b>   | <b>ANALYSIS OF ALTERNATIVES (TECHNOLOGY AND SITE)</b>      | <b>137</b>     |
| 5.0        | Introduction                                               | 137            |
| 5.1        | Factors behind the Selection of Project Site               | 137            |
| 5.2        | Analysis of Alternative Site                               | 137            |
| 5.3        | Factors behind Selection of Proposed Technology            | 137            |
| 5.4        | Analysis of Alternative Technology                         | 137            |
| <b>VI</b>  | <b>ENVIRONMENTAL MONITORING PROGRAM</b>                    | <b>138-142</b> |
| 6.0        | General                                                    | 138            |
| 6.1        | Methodology of Monitoring Mechanism                        | 138            |
| 6.2        | Implementation Schedule of Mitigation Measures             | 140            |
| 6.3        | Monitoring Schedule and Frequency                          | 140            |
| 6.4        | Budgetary provision for Environment Monitoring Program     | 142            |
| 6.5        | Reporting schedules of monitored data                      | 142            |
| <b>VII</b> | <b>ADDITIONAL STUDIES</b>                                  | <b>143-153</b> |
| 7.0        | General                                                    | 143            |
| 7.1        | Public Consultation for Proposed Project                   | 143            |

|             |                                                       |                |
|-------------|-------------------------------------------------------|----------------|
| 7.2         | Risk Assessment for Proposed Project                  | 143            |
| 7.3         | Disaster Management Plan for Proposed Project         | 146            |
| 7.3.1       | Emergency Control Procedure                           | 146            |
| 7.4         | Cumulative Impact Study                               | 147            |
| 7.4.1       | Air Environment                                       | 149            |
| 7.4.1.1     | Cumulative Impact of Air Pollutants                   | 150            |
| 7.4.2       | Noise Environment                                     | 150            |
| 7.4.3       | Socio Economic Environment                            | 151            |
| 7.4.4       | Ecological Environment                                | 151            |
| 7.5         | Plastic Waste management Plan for Proposed Project    | 152            |
| 7.5.1       | Objective                                             | 152            |
| <b>VIII</b> | <b>PROJECTS BENEFITS</b>                              | <b>155-157</b> |
| 8.0         | General                                               | 155            |
| 8.1         | Employment Potential                                  | 155            |
| 8.2         | Socio-Economic Welfare Measures Proposed              | 155            |
| 8.3         | Improvement in Physical Infrastructure                | 155            |
| 8.4         | Improvement in Social Infrastructure                  | 156            |
| 8.5         | Other Tangible Benefits                               | 156            |
| 8.6         | Corporate Social Responsibility                       | 156            |
| 8.7         | Corporate Environment Responsibility                  | 157            |
| <b>IX</b>   | <b>ENVIRONMENTAL COST BENEFIT ANALYSIS</b>            | <b>158</b>     |
| <b>X</b>    | <b>ENVIRONMENTAL MANAGEMENT PLAN</b>                  | <b>159-176</b> |
| 10.0        | General                                               | 159            |
| 10.1        | Environmental Policy                                  | 159            |
| 10.1.1      | Description of the Administration and Technical setup | 159            |
| 10.2        | Land Environment Management                           | 160            |
| 10.3        | Soil Management                                       | 161            |
| 10.4        | Water Management                                      | 161            |
| 10.5        | Air Quality Management                                | 161            |
| 10.6        | Noise Pollution Control                               | 162            |
| 10.7        | Ground Vibration and Fly rock control                 | 163            |
| 10.8        | Biological Environment Management                     | 164            |
| 10.8.1      | Green Belt Development Plan                           | 164            |
| 10.9        | Occupational Safety & Health Management               | 165            |
| 10.9.1      | Medical Surveillance and Examinations                 | 165            |
| 10.9.2      | Proposed Occupational Health and Safety Measures      | 166            |

|            |                                                                                |                |
|------------|--------------------------------------------------------------------------------|----------------|
| 10.9.3     | Health and Safety Training Program                                             | 168            |
| 10.9.4     | Budgetary Provision for Environmental Management                               | 169            |
| 10.10      | Conclusion                                                                     | 176            |
| <b>XI</b>  | <b>SUMMARY AND CONCLUSION</b>                                                  | <b>177-187</b> |
| 11.0       | Introduction                                                                   | 177            |
| 11.1       | Project Description                                                            | 177            |
| 11.2       | Description of the Environment                                                 | 178            |
| 11.2.1     | Land Environment                                                               | 178            |
| 11.2.2     | Soil Characteristics                                                           | 178            |
| 11.2.3     | Water Environment                                                              | 179            |
| 11.3       | Air Environment                                                                | 179            |
| 11.4       | Noise Environment                                                              | 180            |
| 11.5       | Biological Environment                                                         | 180            |
| 11.6       | Socio-Economic Environment                                                     | 180            |
| 11.7       | Anticipated Environmental Impacts and Mitigation Measures for Proposed Project | 181            |
| 11.8       | Analysis of Alternatives                                                       | 185            |
| 11.9       | Environmental Monitoring Program                                               | 185            |
| 11.10      | Additional Studies                                                             | 185            |
| 11.11      | Project Benefits for Proposed Project                                          | 186            |
| 11.12      | Environment Management Plan                                                    | 187            |
| 11.13      | Conclusion                                                                     | 187            |
| <b>XII</b> | <b>DISCLOSURE OF CONSULTANT</b>                                                | <b>188-192</b> |

### **LIST OF TABLES**

| <b>TABLE No.</b> | <b>CONTENTS</b>                                             | <b>PAGE No.</b> |
|------------------|-------------------------------------------------------------|-----------------|
| 1.1              | Details of Quarries within the cluster area of 500 m radius | 2               |
| 1.2              | Details of project proponent                                | 6               |
| 1.3              | Salient Features of the Proposed Project                    | 7               |
| 2.1              | Site connectivity to the project area                       | 12              |
| 2.2              | Corner coordinates of proposed project                      | 12              |
| 2.3              | Estimated resources and reserves of the project             | 17              |
| 2.4              | Year-wise production details                                | 17              |
| 2.5              | Conceptual Blasting Design                                  | 21              |

|      |                                                                                |    |
|------|--------------------------------------------------------------------------------|----|
| 2.6  | Operational details for proposed project                                       | 22 |
| 2.7  | Machinery details                                                              | 22 |
| 2.8  | Land use data at present, during scheme of mining, and at the end of mine life | 28 |
| 2.9  | Mine closure budget                                                            | 23 |
| 2.10 | Ultimate pit dimension                                                         | 23 |
| 2.11 | Water requirement for the project                                              | 26 |
| 2.12 | Fuel requirement details                                                       | 26 |
| 2.13 | Capital requirement details                                                    | 27 |
| 2.14 | Employment potential for the proposed project                                  | 27 |
| 2.15 | Expected time schedule                                                         | 27 |
| 3.1  | Monitoring attributes and frequency of monitoring                              | 29 |
| 3.2  | LULC Statistics of the Study Area                                              | 30 |
| 3.3  | Soil Sampling Locations                                                        | 38 |
| 3.4  | Soil Quality of the Study Area                                                 | 41 |
| 3.4a | Assigning Scores to Soil Quality Indicators                                    | 42 |
| 3.5  | Water Sampling Locations                                                       | 42 |
| 3.6  | Ground Water Quality Result                                                    | 46 |
| 3.6a | Surface Water Quality Result                                                   | 47 |
| 3.7  | Water Quality Results                                                          | 47 |
| 3.8  | Pre-monsoon water level of Open wells within 2 km radius                       | 51 |
| 3.9  | Post-monsoon water level of Open wells within 2 km radius                      | 51 |
| 3.10 | Pre-monsoon water level of bore wells within 2 km radius                       | 52 |
| 3.11 | Post-monsoon water level of bore wells within 2 km radius                      | 52 |
| 3.12 | Vertical electrical sounding data                                              | 57 |
| 3.13 | Onsite Meteorological Data                                                     | 59 |
| 3.14 | Onsite Meteorological Data                                                     | 62 |
| 3.15 | Onsite Meteorological Data                                                     | 64 |
| 3.16 | Methodology and Instrument used for AAQ analysis                               | 65 |
| 3.17 | National Ambient Air Quality Standards                                         | 66 |
| 3.18 | Ambient Air Quality (AAQ) Monitoring Locations                                 | 66 |
| 3.19 | Summary of AAQ Result                                                          | 68 |

|      |                                                                               |     |
|------|-------------------------------------------------------------------------------|-----|
| 3.20 | Noise Monitoring Locations                                                    | 71  |
| 3.21 | Ambient Noise Quality Result                                                  | 71  |
| 3.22 | Method of Blasting                                                            | 76  |
| 3.23 | Summary of the Blasts Conducted                                               | 76  |
| 3.24 | Method of Blasting                                                            | 79  |
| 3.25 | Summary of the Blasts Conducted                                               | 79  |
| 3.26 | Flora in Mine Lease Area                                                      | 85  |
| 3.27 | Flora in 300-Meter Radius                                                     | 88  |
| 3.28 | Calculation of Species Diversity in 300-meter radius                          | 90  |
| 3.29 | Species Richness (Index) in 300-meter radius                                  | 91  |
| 3.30 | Flora in 10km radius                                                          | 92  |
| 3.31 | Methodology applied during survey of fauna                                    | 94  |
| 3.32 | Fauna in Core Zone                                                            | 95  |
| 3.33 | Fauna in Buffer Zone                                                          | 96  |
| 3.34 | Aquatic Fauna and Flora                                                       | 98  |
| 3.35 | Major Crops in 1km radius                                                     | 99  |
| 3.36 | Major Field Crops & Horticulture cultivation in 1km radius                    | 99  |
| 3.37 | Kamandoddi Village Population Facts                                           | 103 |
| 3.38 | Details of Population, Households, Caste in Habitations of Kamandoddi Village | 104 |
| 3.39 | Population and Literacy Rate of Study Area                                    | 106 |
| 3.40 | Workers Profile of Study Area                                                 | 107 |
| 3.41 | Basic Amenities Services of the Study Area                                    | 108 |
| 3.42 | Traffic Survey Locations                                                      | 112 |
| 3.43 | Existing Traffic Volume                                                       | 112 |
| 3.44 | Rough Stone Transportation Requirement                                        | 112 |
| 3.45 | Summary of Traffic Volume                                                     | 112 |
| 3.46 | Details of Environmentally Sensitive Ecological Features in the Study Area    | 114 |
| 4.1  | Empirical formula for emission rate from overall mine                         | 119 |
| 4.2  | Estimated Emission Rate                                                       | 119 |
| 4.3  | Incremental & Resultant GLC of PM <sub>2.5</sub>                              | 120 |
| 4.4  | Incremental & Resultant GLC of PM <sub>10</sub>                               | 120 |

|      |                                                                                                     |         |
|------|-----------------------------------------------------------------------------------------------------|---------|
| 4.5  | Activity and noise level produced by machinery                                                      | 124     |
| 4.6  | Predicted noise incremental values                                                                  | 125     |
| 4.7  | Predicted PPV Values due to Blasting                                                                | 126     |
| 4.8  | Predicted PPV Values due to Blasting at 100-500 radius                                              | 127     |
| 4.9  | Carbon Released During Five Years of Rough Stone and Gravel Production                              | 129     |
| 4.10 | CO <sub>2</sub> Sequestration                                                                       | 130     |
| 4.11 | Recommended Species for Greenbelt Development Plan                                                  | 130     |
| 4.12 | Greenbelt development plan                                                                          | 130     |
| 4.13 | Budget for greenbelt development plan                                                               | 131     |
| 6.1  | Implementation Schedule for Proposed Project                                                        | 140     |
| 6.2  | Proposed monitoring schedule post EC for the proposed quarry                                        | 141     |
| 6.3  | Environment monitoring budget                                                                       | 142     |
| 7.1  | Risk assessment& control measures for proposed project                                              | 139-140 |
| 7.2  | Proposed teams for emergency situation                                                              | 142     |
| 7.3  | Proposed fire extinguishers at different locations in (P1)                                          | 144     |
| 7.4  | Salient Features of Proposed Projects Site (P2)                                                     | 145     |
| 7.5  | Salient Features of the Proposed Project P2                                                         | 146     |
| 7.6  | Cumulative Production Load of Rough Stone                                                           | 148     |
| 7.7  | Cumulative Production Load of Gravel                                                                | 148     |
| 7.8  | Cumulative Impact Results from 3 proposed project                                                   | 148     |
| 7.9  | Cumulative Impact of Noise from 3 Proposed Quarries on Nagappalayam Habitation                      | 149     |
| 7.10 | Cumulative impact of Noise from 3 proposed quarries on Vellaiyankattu pudur Habitation              | 149     |
| 7.11 | Cumulative Effect of Ground Vibrations Resulting from 3 Mines on Habitation of Nagappalayam         | 150     |
| 7.12 | Cumulative Effect of Ground Vibrations resulting from 3 Mines on Habitation of Vellaiyankattu pudur | 150     |
| 7.13 | Socio Economic Benefits from 3 Mines                                                                | 150     |
| 7.14 | Employment Benefits from 3 Mines                                                                    | 151     |



|       |                                                                      |         |
|-------|----------------------------------------------------------------------|---------|
| 7.15  | Greenbelt Development Benefits from Mine                             | 151     |
| 7.16  | Action Plan to Manage Plastic Waste                                  | 152     |
| 8.1   | CER – action plan                                                    | 157     |
| 8.2   | Project Benefits to the state Government                             | 157     |
| 10.1  | Proposed controls for land environment                               | 160     |
| 10.2  | Proposed controls for water management                               | 161     |
| 10.3  | Proposed controls for air environment                                | 162     |
| 10.4  | Proposed controls for noise environment                              | 162     |
| 10.5  | Proposed controls for ground vibrations & fly rock                   | 163     |
| 10.6  | Proposed greenbelt development plan                                  | 165     |
| 10.7  | Medical examination schedule                                         | 166     |
| 10.8  | List of periodical trainings proposed for employees                  | 168     |
| 10.9  | EMP budget for proposed project                                      | 170-175 |
| 10.10 | Estimation of overall EMP budget after adjusting 5% annual inflation | 176     |
| 11.1  | Anticipated impacts & mitigation measures                            | 181-184 |

### **LIST OF FIGURES**

| <b>FIGURE NO.</b> | <b>TITLE</b>                                                                             | <b>PAGE NO.</b> |
|-------------------|------------------------------------------------------------------------------------------|-----------------|
| 1.1               | Location of the proposed and existing rough stone quarries in the cluster of 500m radius | 5               |
| 2.1               | Overall view of proposed project site                                                    | 10              |
| 2.2               | Key map showing location of the project site                                             | 11              |
| 2.3               | Google Earth Image Showing Lease Area with Pillars                                       | 13              |
| 2.4               | Mine Lease Plan                                                                          | 14              |
| 2.5               | Surface & Geological Plan and Sections                                                   | 15              |
| 2.6               | Year wise Development and Production Plan                                                | 18              |
| 2.6a              | Year wise Production Plan & Sections                                                     | 19              |
| 2.7               | Conceptual Plan                                                                          | 24              |
| 2.8               | Conceptual Plan & Sections                                                               | 25              |
| 3.1               | Geology Map of 5Km Radius from proposed project site                                     | 32              |

|       |                                                                                                                     |    |
|-------|---------------------------------------------------------------------------------------------------------------------|----|
| 3.2   | Geology Map of 500m Radius from Proposed Project Site                                                               | 33 |
| 3.3   | Geomorphology Map of 5Km Radius from proposed project site                                                          | 34 |
| 3.4   | Geomorphology Map of 500m Radius from proposed project site                                                         | 35 |
| 3.5   | LULC map of 5km radius from the proposed project site                                                               | 36 |
| 3.6   | Drainage map of 5 km radius from the proposed project site                                                          | 37 |
| 3.7   | Showing Soil Sampling Locations within 5 km Radius around Proposed Project Site                                     | 40 |
| 3.8   | Map Showing Water Sampling Locations within 5 km Radius around Proposed Project Site                                | 45 |
| 3.9   | Long-Term Monthly Average Rainfall Vs Monthly Rainfall                                                              | 50 |
| 3.10  | Open Well Static Groundwater Elevation Map Showing Direction of Groundwater Flow during Pre- Monsoon Season         | 53 |
| 3.11  | Open Well Static Groundwater Elevation Map Showing Direction of Groundwater Flow during Post-Monsoon Season         | 54 |
| 3.12  | Borewell Static Groundwater Elevation Map Showing Direction of Groundwater Flow during Pre-Monsoon Season           | 55 |
| 3.13  | Borewell Static Groundwater Elevation Map Showing Direction of Groundwater Flow during Post-Monsoon Season          | 56 |
| 3.14  | Graph Showing Occurrence of Water Bearing Fracture Zones at the Depth of 80m Below Ground Level in Proposed Project | 58 |
| 3.15  | Windrose Diagram for 2019 and 2020 (October to December)                                                            | 60 |
| 3.15a | Windrose Diagram for 2021 and 2022 (October to December)                                                            | 61 |
| 3.16  | Onsite Rose Diagram (2023)                                                                                          | 63 |
| 3.17  | Onsite Rose Diagram (2025)                                                                                          | 65 |

|      |                                                                                                                                            |     |
|------|--------------------------------------------------------------------------------------------------------------------------------------------|-----|
| 3.18 | Map Showing Ambient Air Quality Monitoring Station Locations Around 5 km Radius from Proposed Project Site                                 | 67  |
| 3.19 | Bar Chart Showing Maximum, Minimum, and Average Concentrations of PM2.5 Measured from 9 Air Quality Monitoring Stations within 5 km Radius | 68  |
| 3.20 | Bar Chart Showing Maximum, Minimum, and Average Concentrations of PM10 Measured from 9 Air Quality Monitoring Stations within 5 km Radius  | 69  |
| 3.21 | Bar Chart Showing Maximum, Minimum, and Average Concentrations of SO2 Measured from 9 Air Quality Monitoring Stations within 5 km Radius.  | 69  |
| 3.22 | Bar Chart Showing Maximum, Minimum, and Average Concentrations of Nox Measured from 9 Air Quality Monitoring Stations within 5 km Radius   | 70  |
| 3.23 | Bar Chart Showing Maximum, Minimum, And Average Concentrations of Pollutants in Atmosphere within 5 km Radius                              | 70  |
| 3.24 | Map Showing Noise Level Monitoring Station Locations around 5 km Radius from Proposed Project Site                                         | 72  |
| 3.25 | Bar Chart Showing Day Time Noise Levels Measured in Core and Buffer Zones                                                                  | 73  |
| 3.26 | Bar Chart Showing Night Time Noise Levels Measured in Core and Buffer Zones                                                                | 73  |
| 3.27 | Overall, View of the Quarry & Close View of the Study Area                                                                                 | 74  |
| 3.28 | Google image of the Cluster Quarry (Mallikarjuna) Blasting Location                                                                        | 75  |
| 3.29 | Monitoring Result Graph                                                                                                                    | 77  |
| 3.30 | Google image of the Cluster Quarry (Murugesh)Blasting Location                                                                             | 78  |
| 3.31 | Monitoring Result Graph                                                                                                                    | 80  |
| 3.32 | Quadrates Sampling Methods of Flora                                                                                                        | 82  |
| 3.33 | Species Richness paten in 300m Radius                                                                                                      | 91  |
| 3.34 | 5km radius Socio Economic Study area                                                                                                       | 101 |

|      |                                                                           |     |
|------|---------------------------------------------------------------------------|-----|
| 3.35 | Details of Population, Literacy Level and Workers Profile of the Villages | 109 |
| 3.36 | Field Photos of Kamandoddi Village                                        | 111 |
| 3.37 | Traffic Density Map                                                       | 113 |
| 3.38 | Field Study Photographs                                                   | 116 |
| 4.1  | Predicted incremental concentration of PM <sub>2.5</sub>                  | 121 |
| 4.2  | Predicted incremental concentration of PM <sub>10</sub>                   | 122 |
| 4.3  | Predicted PPV Values due to Blasting at 100-500 m radius                  | 128 |
| 6.1  | Proposed Environmental Monitoring Chart                                   | 139 |
| 7.1  | Disaster management team layout for proposed project                      | 146 |

#### **LIST OF ANNEXURES**

| <b>Annexure No.</b> | <b>Contents</b>                                                                      | <b>Page No.</b> |
|---------------------|--------------------------------------------------------------------------------------|-----------------|
| I                   | Copy of ToR letter                                                                   | 185-207         |
| II                  | Copy of 500 m radius letter                                                          | 208-212         |
| III                 | Approved mining plan along with mining plan AD/DD letter/original mining plan plates | 213-308         |
| IV                  | VAO 300m radius letter                                                               | 309             |
| IV                  | NABET certificate of EIA consultant                                                  | 311             |

## CHAPTER I

### INTRODUCTION

#### 1.0 PREAMBLE

Environmental Impact Assessment (EIA) study is a process used to identify the environmental, social and economic impacts of a project prior to decision-making. EIA systematically examines both beneficial and adverse consequences of the proposed project and ensure that these impacts are considered during the project designing. According to the Ministry of Environment and Forests, Govt. of India, EIA notification S.O. 1533(E) of 14<sup>th</sup> September 2006 and its subsequent amendments as per Gazette Notification S.O. 3977 (E) of 14<sup>th</sup> August 2018, all the mining projects are broadly classified into two categories, i.e., category A and category B, based on the spatial extent of the projects. The category B projects are further divided in to B1 and B2 on the basis of the guidelines issued of the Ministry of Environment and Forests. All mining projects included in category B1 require an EIA report for obtaining environmental clearance from the State Environment Impact Assessment Authority (SEIAA). As the proposed project falls within the cluster of quarries of overall extent of greater than 5 ha and less than 50 ha in the case of non-coal mine lease, the proposed project falls under the category B1 and the project requires preparation and submission of an EIA report after public consultation to SEIAA for obtaining environmental clearance as per the order dated 04.09.2018 & 13.09.2018 passed by Hon'ble National Green Tribunal, New Delhi in O.A. No. 173 of 2018 & O.A. No, 186 of 2016 and MoEF & CC Office Memorandum F. No. L-11011/175/2018-IA-II (M) Dated: 12.12.2018.

In compliance with ToR Identification No: **TO25B0108TN5757195N**, **dated: 23.05.2025** this EIA report has been prepared for the project proponent, **Thiru. V. Venkatesulu**, applied for rough stone quarry lease in the Govt land falling in S.F.No.754 & 760(P-6) over an extent of 4.00.00 ha in Kamandoddi Village, Shoolagiri Taluk, Krishnagiri District, Tamil Nadu. Special publication in Krishnagiri District Gazette Notification No Rc.No.2023/2023/Mines, dated 15.11.2024 for eligible Govt Poramboke Land quarry lease has issued notice inviting tender under Krishnagiri District Gazette (Extra- Ordinary) No.12 (English) & 20 (Tamil) dated 16.11.2024 and received applications through online from the interested bidders for conducting e-tender cum auction. E-tender cum auction held on 03.01.2025, since, Mr.V.Venkatesulu has quoted highest bid amount of Rs.8,30,50,000/-. 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 three proposed projects known as P1, P2, P3 and ten existing projects E1, E2, E3, E4, E5, E6, E7, E8, E9 and E10. 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 37.54.5 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 Quarries within the cluster area of 500 m radius**

| Proposed Quarries |                           |                                                           |            |             |                                |
|-------------------|---------------------------|-----------------------------------------------------------|------------|-------------|--------------------------------|
| Code              | Name of the Owner         | S.F. No                                                   | Village    | Extent (ha) | Status                         |
| P1                | Thiru.V.Venkatesulu       | 754 & 760 (P-6)                                           | Kamandoddi | 4.00.0      | Proposed Area                  |
| P2                | Thiru.Mallikarjuna        | 754 & 760 (P-4)                                           |            | 3.50.0      | Instant Proposal               |
| P3                | Thiru.S.R.Sampangi        | 1151,1155,1212<br>To<br>1219,1222,1225&<br>1226/A (P-4)   |            | 2.23.0      | Instant Proposal               |
| Existing Quarry   |                           |                                                           |            |             |                                |
| E1                | Thiru.G.Ashoka            | 754 &<br>760(P-3)                                         | Kamandoddi | 2.75.0      | 17.02.2022To<br>16.02.2032     |
| E2                | Thiru.V.Karunanithi       | 754,<br>760(Part-5)                                       |            | 4.30.0      | 24.06.2022<br>To<br>23.06.2032 |
| E3                | M/s.<br>Royal blue Metals | 1151, 1155,<br>1212, 1219,<br>1222, 1225<br>&1226/A (P-1) |            | 2.70.0      | 04.07.2024<br>To<br>03.07.2034 |
| E4                | M/s.<br>Royal blue Metals | 1151, 1155,<br>1212, 1219,<br>1222, 1225<br>&1226/A (P-2) |            | 2.87.0      | 24.06.2022<br>To<br>23.06.2032 |
| E5                | Thiru.K.Murugesh          | 1151,1155,1212,121<br>9,1222,1225<br>&1226/A 9P-3)        |            | 2.82.0      | 30.03.2023<br>To<br>29.06.2032 |
| E6                | Thiru.C.Surendiran        | 1269/2A                                                   |            | 1.66.5      | 13.10.2017<br>To               |

|                             |                      |                                                            |                |                                |
|-----------------------------|----------------------|------------------------------------------------------------|----------------|--------------------------------|
|                             |                      |                                                            |                | 12.10.2027                     |
| <b>E7</b>                   | Thiru.S.Madhu        | 1151, 1155,<br>1212, 1219,<br>1222, 1225 &<br>1226/A (P-5) | 1.27.0         | 06.12.2019<br>To<br>05.12.2029 |
| <b>E8</b>                   | Thiru.R.Rajappa      | 1266                                                       | 4.04.5         | 13.10.2017<br>To<br>12.10.2027 |
| <b>E9</b>                   | Thiru.K.Govindappa   | 754 & 760(P-2)                                             | 2.10.0         | 25.03.2025<br>To<br>24.03.2035 |
| <b>E10</b>                  | Thiru.P.Venkat Reddy | 1267/2 & 1268/2&3                                          | 2.38.5         | 10.11.2022<br>To<br>09.11.2027 |
| <b>Expired Quarries</b>     |                      |                                                            |                |                                |
| <b>Total Cluster Extent</b> |                      |                                                            | <b>37.54.5</b> | <b>---</b>                     |

**Source:** DD Letter - Rc.No.19/Mines/2025, Dated:27.03.2025.

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

## 1.1 PURPOSE OF THE REPORT

The purpose of the EIA report is to study baseline environmental conditions in and around the proposed project area as per the Terms of Reference (ToR).

The baseline study Air, Water, Soil, & Noise was already conducted in the month of Oct to Dec, 2023, named Rajappa rough stone quarry falls in the same cluster according to the provisions of MoEF & CC Office Memorandum dated 29.08.2017 and MoEF & CC Notification, S.O. 996 (E) dated 10.04.2015, to analyse impacts and provide mitigation measures.

## 1.2 ENVIRONMENTAL CLEARANCE

The Environmental Clearance process for the project will comprise of four stages. These stages are screening, scoping, public consultation & appraisal.

### ***Screening***

Screening is the first stage of the EIA process. In this stage, the State level Expert Appraisal Committee (SEAC) examined the application of EC made by the proponent in Form 1 through online (Proposal No. SIA/TN/ MIN/ 531779/2025, dated 28.03.2025) and decided that the project requires detailed environmental studies for the preparation of EIA report. Therefore, the proponent submitted application for Terms of Reference (ToR) on 28.03.2025.

### ***Scoping***

The proposal was placed in the 551<sup>th</sup> meeting of SEAC on 16.04.2025. Based on the presentation and documents furnished by the project proponent, SEAC decided to recommend the proposal for the grant of Terms of Reference (ToR) and the recommendation for ToR is subjected to the outcome of the Honourable NGT, Principal Bench, New Delhi (O.A No.186 of 2016 (M.A.No.350/2016) and O.A. No.200/2016 and O.A.No.580/2016 (M.A.No.1182/2016) and O.A.No.102/2017 and O.A.No.404/2016 (M.A.No. 758/2016, M.A.No.920/2016, M.A.No.1122/2016, M.A.No.12/2017 & M.A. No. 843/2017) and O.A.No.405/2016 and O.A.No.520 of 2016 (M.A.No. 981/2016, M.A.No.982/2016 & M.A.No.384/2017).

### ***Public Consultation***

In this stage, an application along with the draft of EIA and EMP report will be made to the Member Secretary of the Tamil Nadu Pollution Control Board (TNPCB) to conduct Public Hearing ensuring public participation at the project site or in its close proximity in the district. During public hearing, an opportunity will be given to the people living nearby the project site to express their opinions about the impact of the proposed project on the environment. The outcome of the public hearing meeting will be submitted in the final EIA report.



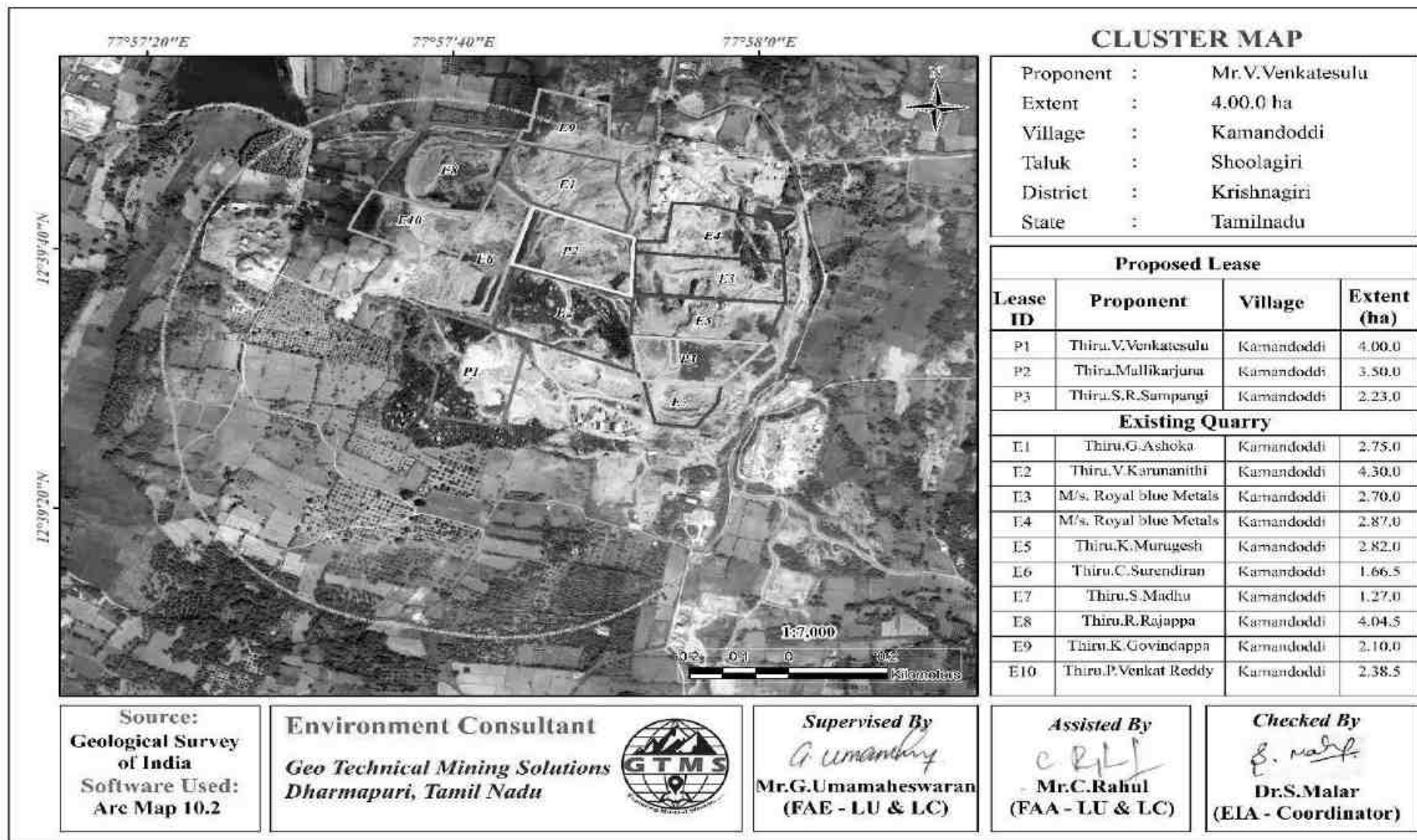


Figure 1.1 Location of the proposed and existing rough stone quarries in the cluster of 500m radius

## ***Appraisal***

In this stage, an application along with final EIA report including the outcome of the public consultations will be made to the SEIAA. The application thus made will be scrutinized by the SEAC. Then, the SEAC will make recommendations to grant EC or reject the application to the SEIAA.

### **1.3 TERMS OF REFERENCE (ToR)**

The SEAC framed a comprehensive Terms of Reference (ToR) based on the information provided in the Form 1 and information collected from the proposed project site visit and issued ToR to the proponent vide ToR Identification No. TO25B0108TN5757195N Dated:23.05.2025 File No : 12003 for the preparation of an EIA report.

### **1.4 POST ENVIRONMENT CLEARANCE MONITORING**

For category B projects, irrespective of its clearance by MoEF & CC/SEIAA, the project proponent shall prominently advertise in the newspapers indicating that the project has been accorded environmental clearance and the details of MoEF&CC website where it is displayed.

After obtaining EC, the project proponent will submit a half-yearly compliance report of stipulated environmental clearance terms and conditions to MoEF & CC Regional Office & SEIAA on 1<sup>st</sup> June and 1<sup>st</sup> December of every year.

### **1.5 TRANSFERABILITY OF ENVIRONMENTAL CLEARANCE**

A prior environmental clearance granted for a specific project or activity to an applicant may be transferred during its validity to another legal person entitled to undertake the project or activity on application by the transferor or the transferee with a written “no objection” by the transferor, to, and by the regulatory authority concerned, on the same terms and conditions under which the prior environmental clearance was initially granted, and for the same validity period (EIA Guidance Manual for Mining of Minerals, 2010).

### **1.6 IDENTIFICATION OF THE PROJECT PROPONENT**

The profile of the project proponent who has involved in this quarrying project has been given in Table 1.2.

**Table 1.2 Details of Project Proponent**

|                                      |                                                                                                       |
|--------------------------------------|-------------------------------------------------------------------------------------------------------|
| <b>Name of the Project Proponent</b> | <b>Mr.V.Venkatesulu</b>                                                                               |
| Address                              | S/o.Venkatasamy,<br>No.741, D.M.G Kotta,<br>Chappadi post, Shoolagiri Taluk,<br>Krishnagiri District. |
| Status                               | Proprietor                                                                                            |

## 1.7 BRIEF DESCRIPTION OF THE PROJECT

The proposed project deals with excavation of rough stone which is primarily used in construction projects. The method adopted for rough stone excavation is Open Cast Semi Mechanized mining method involving formation of benches with 5m height and 5 m width. The proposed project site is located in Kamandoddi Village, Shoolagiri Taluk, Krishnagiri District, Tamil Nadu. Some of the important features of the proposed project have been provided in Table 1.3.

**Table 1.3 Salient Features of the Proposed Project**

|                                  |                                                                  |                  |
|----------------------------------|------------------------------------------------------------------|------------------|
| Name of the Quarry               | <b>Thiru.V. Venkatesulu</b>                                      |                  |
| Type of Land                     | Government Poramboke Land                                        |                  |
| Extent                           | 4.00.0 Ha                                                        |                  |
| S.F.No                           | 754 & 760 (P-6)                                                  |                  |
| Toposheet No                     | 57-H/14                                                          |                  |
| Location of Project Site         | 12°39'26.93"N to 12°39'35.28"N<br>77°57'37.60"E to 77°57'44.84"E |                  |
| Highest Elevation                | 776 m AMSL                                                       |                  |
| Ultimate depth of Mining         | 55 m (BGL)                                                       |                  |
| Geological Resources             | Rough Stone in Tons                                              | Top Soil in Tons |
|                                  | 49,50,248                                                        | 400020           |
| Mineable Reserves                | Rough Stone in Tons                                              | Top Soil in Tons |
|                                  | 18,59,055                                                        | 3,26,560         |
| Proposed reserves for five years | Rough Stone in Tons                                              | Top Soil in Tons |
|                                  | 18,59,055                                                        | 3,26,560         |
| Method of Mining                 | Open-Cast Mechanized mining                                      |                  |
| Topography                       | Elevated Topography                                              |                  |
| Machinery proposed               | Jack Hammer                                                      | 4                |
|                                  | Compressor                                                       | 2                |
|                                  | Tipper                                                           | 8                |
|                                  | Excavator                                                        | 2                |
| Proposed Manpower Deployment     | 23 Nos                                                           |                  |
| Project Cost                     | Rs.8,84,95,000/-                                                 |                  |
| Proposed Water Requirement       | 3.0 KLD                                                          |                  |

## 1.8 SCOPE OF THE STUDY

The main scope of the EIA study is to quantify the cumulative impact of the quarries in the cluster on the study area and formulate the effective mitigation measures for the Cluster. A detailed account of the emission sources, emissions control equipment, background air quality levels, meteorological measurements, dispersion model and all other aspects of pollution like effluent discharge, and dust generation has been provided in this report. The baseline monitoring study has been carried out during the period of **October 2023 to December 2023**

for various environmental components such as land, soil, air, water, noise & vibration, ecology and Socio economics to assess the anticipated impacts of the cluster quarry projects on the environment and suggest suitable mitigation measures for likely adverse impacts due to the proposed project. The sampling methodologies for the various environmental parameters required for the study, frequency of sampling, method of sample analysis, etc., are given in Table 3.1 in chapter III.

### **1.9 Legislation Applicable to Mining of Mineral Sector**

A few important legislations are given below:

- ❖ The Mines Act, 1952.
- ❖ The Mines and Mineral (Development and Regulation) Act, 1957.
- ❖ Mines Rules, 1955.
- ❖ Mineral Concession Rules, 1960
- ❖ Mineral Conservation and Development Rules, 1988.
- ❖ Tamil Nadu Minor Minerals concession rules, 1959.
- ❖ The Water (Prevention and Control of pollution) Act, 1974.
- ❖ The Air (Prevention and Control of pollution) Act, 1981.
- ❖ The Environment (Protection) Act, 1986.
- ❖ The Forest (Conservation) Act, 1988.
- ❖ The Wildlife (Protection) Act, 1972.

## CHAPTER II

### PROJECT DESCRIPTION

#### 2.0 GENERAL INTRODUCTION

The open cast mining method, also known as open-pit mining has been proposed to extract the mineral deposit. It is the most commonly used surface mining method all over the world and is generally suitable for mining low-grade mineral deposits that are found close to the surface of the earth and distributed uniformly over a large area. Open pits are also termed quarries when the pits are used for the extraction of building materials and dimension stones.

Opencast mining starts with the development of benches, the widths of which will be determined in such a way to accommodate the use of heavy machinery. The walls of open pits will be dug at an angle that will be decided based on well-established industry standards to provide safety. In some cases where the walls are composed of weak material such as soil and highly weathered rocks, dewatering holes will be drilled horizontally to relieve the water pressure to avoid wall collapse inside the mine site.

The required mine-related infrastructures will be established close to the open pit. The mining infrastructures may include an administration building, a maintenance garage, and a warehouse. The materials mined from open pits will be brought to the surface using trucks. The waste rocks will be piled up in a suitable location, usually close to the open pit. The structure produced by the waste rock pile is known as a waste dump. The dimension of the waste dump will be determined based on industrial safety standards to prevent the rocks from falling into the surrounding area.

#### 2.1 DECSRIPTION OF THE PROJECT

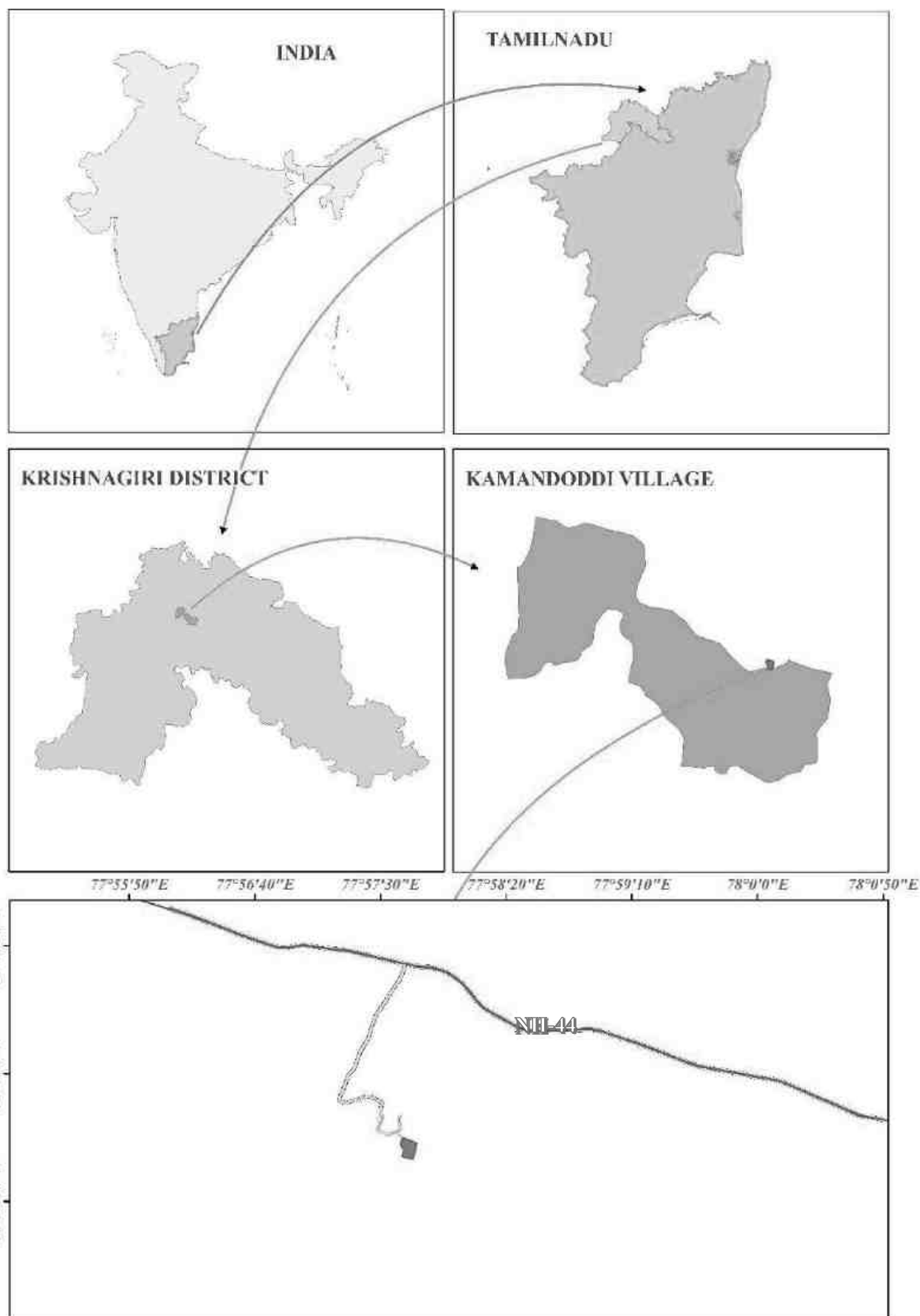
The proponent, **Mr. V. Venkatesulu** is involved in the undertaking of establishment, construction, development, and closure of opencast mines. He, through the exploration phase, identified the proposed project site as the one that has a great potential of producing an economically viable quantity of rough stone. Therefore, the proponent had applied through online from the interested bidders for conducting e-Tender cum auction. E-tender cum auction held on 03.01.2025 to extract rough stone. The precise area communication letter was issued by Department of Geology and Mining, Krishnagiri vide Rc.No.19/Mines/2025 Dated: 27.02.2025. Based on the precise area communication letter, mining plan was prepared. The mining plan thus prepared was approved by Deputy Director Department of Geology and Mining, Krishnagiri Rc.No.19/2025/Mines, dated:25.03.2025. The overall view of the project site is shown in Figure 2.1.



**Figure 2.1 Overall View of Proposed Project Site**

## **2.2 LOCATION AND ACCESSIBILITY**

The proposed quarry project is located in Kamandoddi Village, Shoolagiri Taluk, Krishnagiri District, Tamil Nadu as shown in Figure 2.2 & 2.3 The area lies between Latitudes from om 12°39'26.30"N to 12°39'35.28"N and Longitudes from 77°57'37.60"E to 77°57'44.84"E. The maximum altitude of the project area is 776 m AMSL. Accessibility details to the proposed project site have been given in Table 2.1.



**Figure 2.2 Key Map Showing Location of the Project Site**

**Table 2.1 Site Connectivity to the Project Area**

|                         |                            |            |
|-------------------------|----------------------------|------------|
| Nearest Roadways        | Village Road               | 0.89 km W  |
|                         | NH-44 -Krishnagiri - Hosur | 1.82 km N  |
| Nearest Town            | Shoolagiri                 | 5.11 km E  |
| Nearest Railway Station | Kelamangalam               | 11.4 km SW |
| Nearest Airport         | Salem                      | 97.0 km S  |
| Nearest Seaport         | Chennai                    | 257 km NE  |
| Nearest Villages        | Koneripalli                | 2.10 km N  |
|                         | Chappadi                   | 1.14 km E  |
|                         | Tirumalaigovunikottai      | 1.8 km SW  |
|                         | Kukkalapalli               | 1.79 km W  |

**2.3 LEASEHOLD AREA**

- ❖ The extent of the proposed project site is 4.00.0 ha Which fall in Government Poramboke land.
- ❖ The proposed project is site specific.
- ❖ There is no mineral beneficiation or processing proposed inside the project area.
- ❖ There is no forest land involved in the proposed area and is devoid of major vegetation and trees.

**2.3.1 Corner Coordinates**

The boundary corner geographic coordinates are given in Table 2.2 and the proposed project site with boundary coordinates has been shown in Figure 2.3.

**Table 2.2 Corner Coordinates of Proposed Project**

| Pillar ID | Latitude      | Longitude     |
|-----------|---------------|---------------|
| 1         | 12°39'32.93"N | 77°57'44.84"E |
| 2         | 12°39'26.30"N | 77°57'43.20"E |
| 3         | 12°39'27.10"N | 77°57'38.30"E |
| 4         | 12°39'30.28"N | 77°57'39.00"E |
| 5         | 12°39'32.09"N | 77°57'37.60"E |
| 6         | 12°39'35.28"N | 77°57'38.64"E |

**2.4 GEOLOGY**

The lease area geologically occurs Grey Hornblende–Biotite Gneiss. It is commercially called as Roughstone occurs within the migmatite rock. Also, the lease area geomorphologically occurs pediment pediplain complex.

There is a waste dump available in the lease area with average dimension (Area 3.65.0Hect x height 11.78m) = Total Volume of dump is 859940 Tons. The waste dump will be removed and Stocked in quarry Adjacent area and this will be used for quarry closure. The mining plan with progressive Quarry closure plan has been prepared under rule 41 and submitted under rule 42 of Tamil Nadu Minor Minerals Concession Rules, 1959 for mining lease as per conditions mentioned in the precise area communication letter Roc.No.19/2025/Mines Dated:27.02.2025.



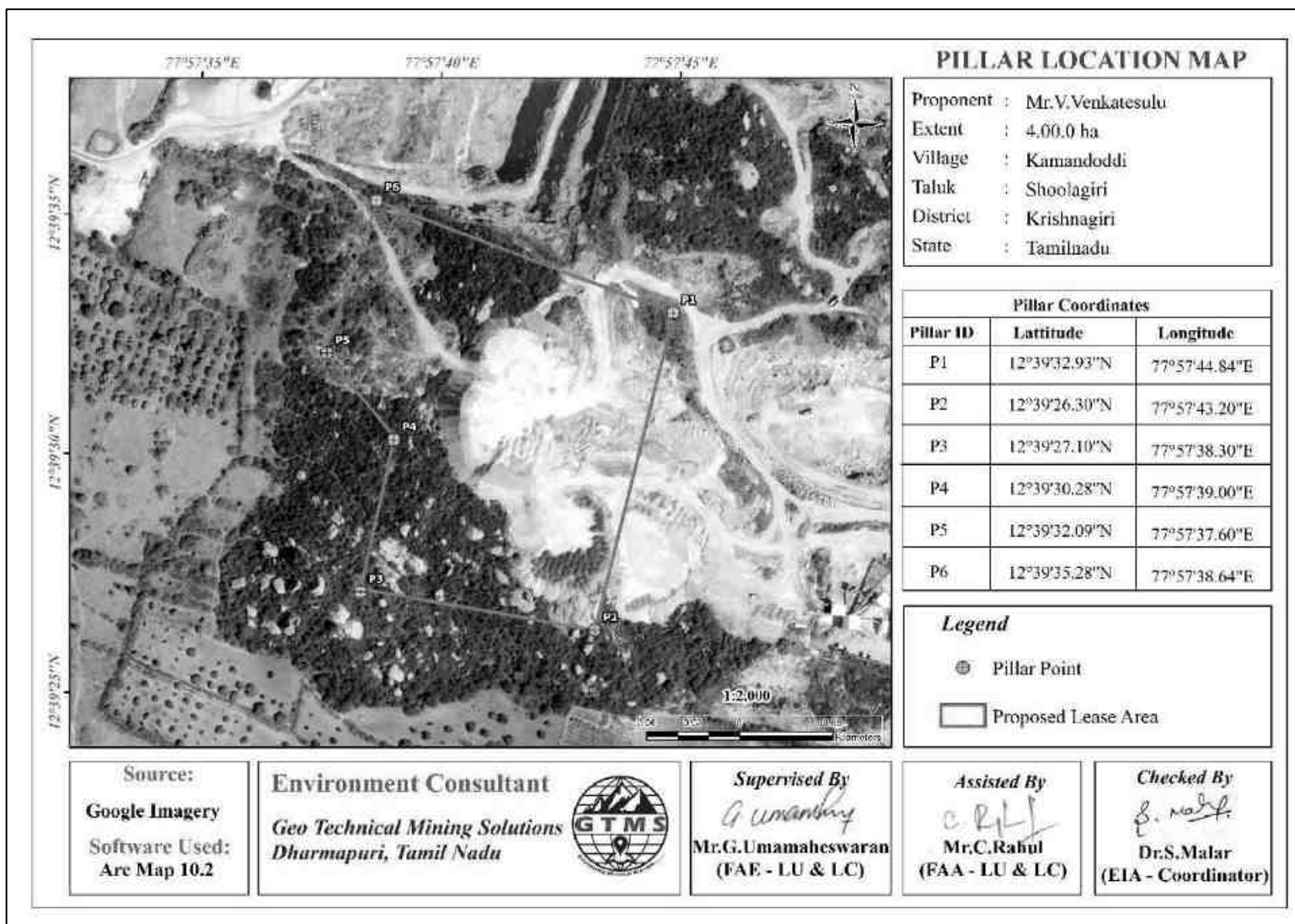


Figure 2.3 Google Earth Image Showing Lease Area with Pillars

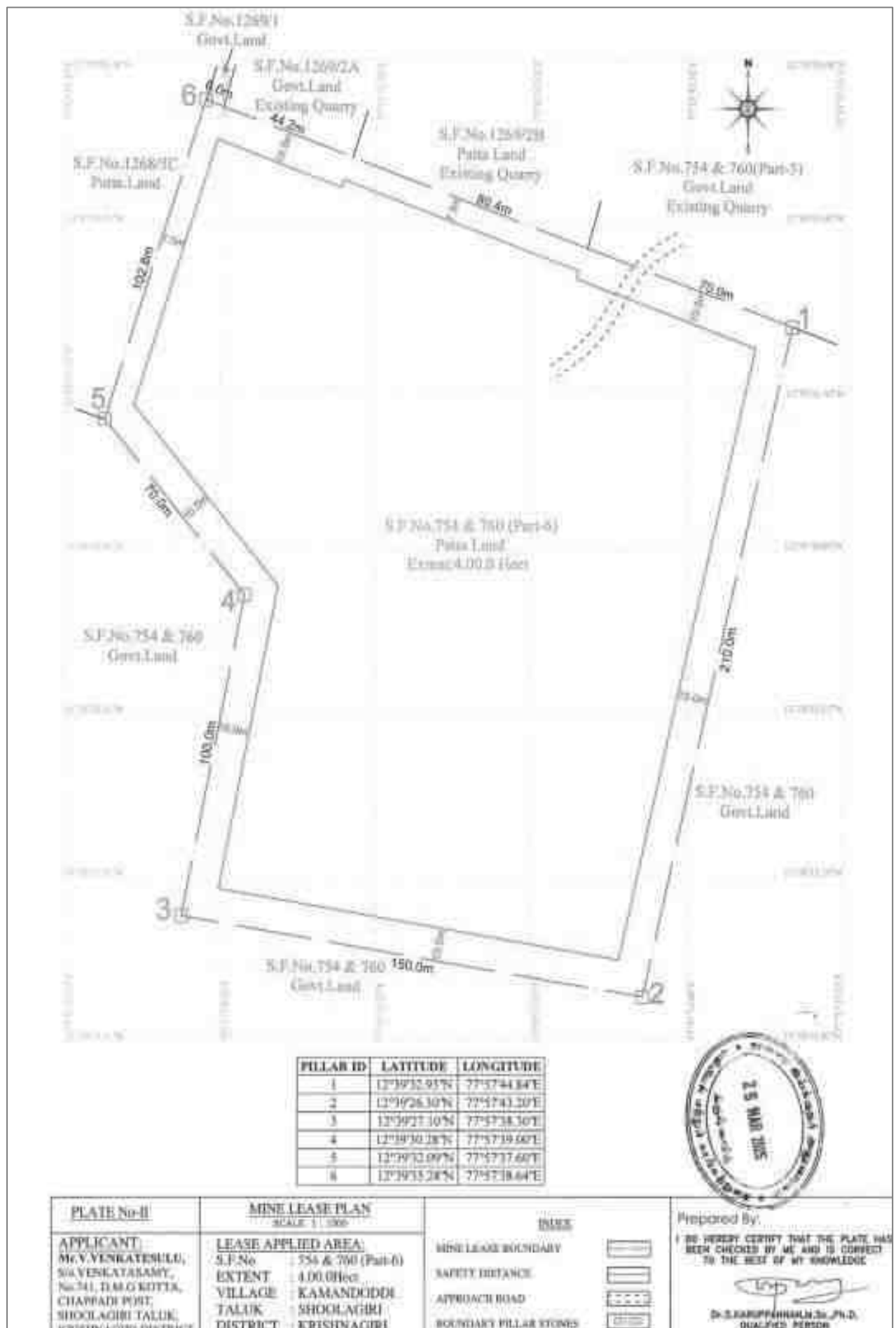
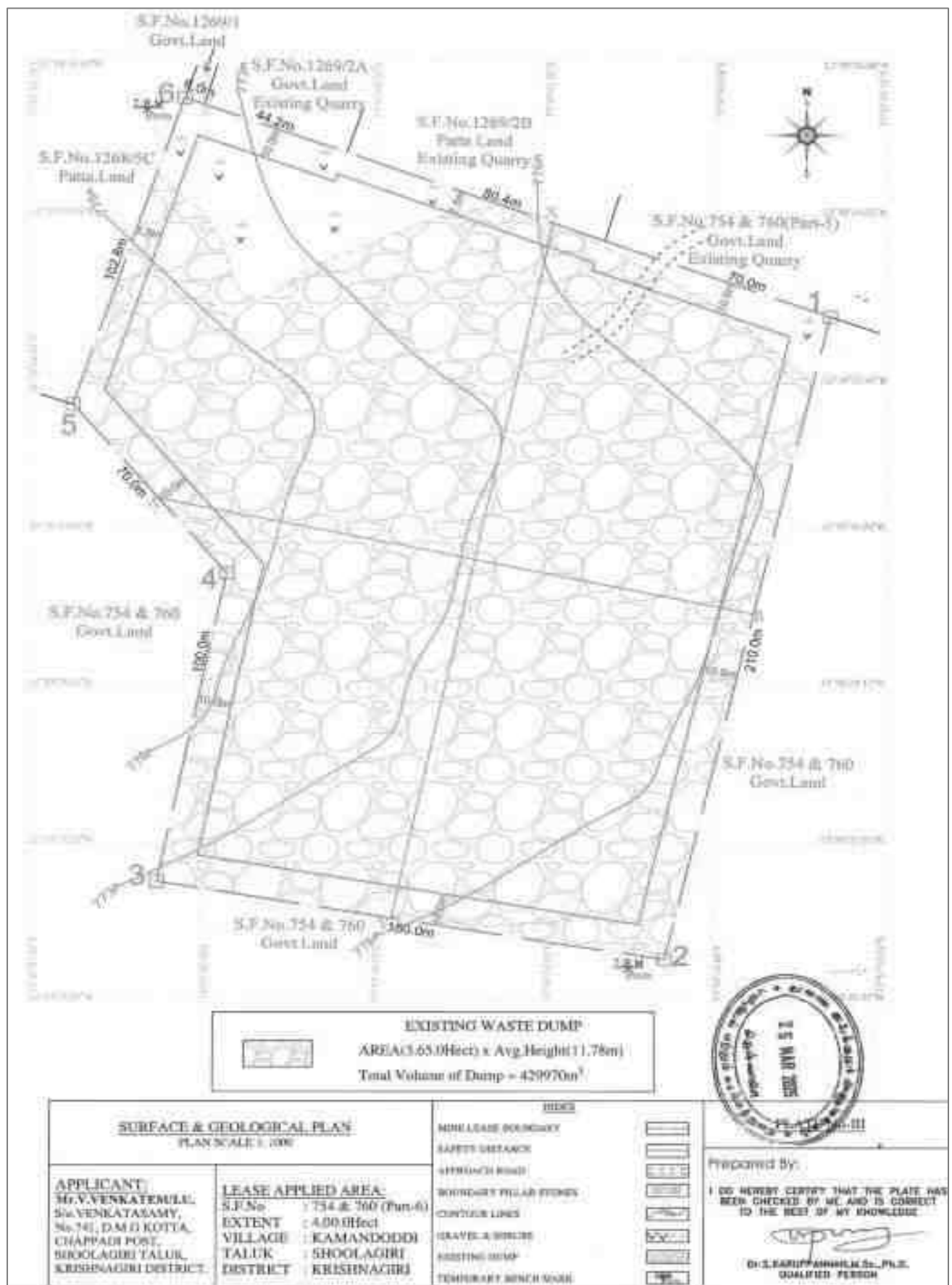


Figure 2.4 Mine Lease Plan



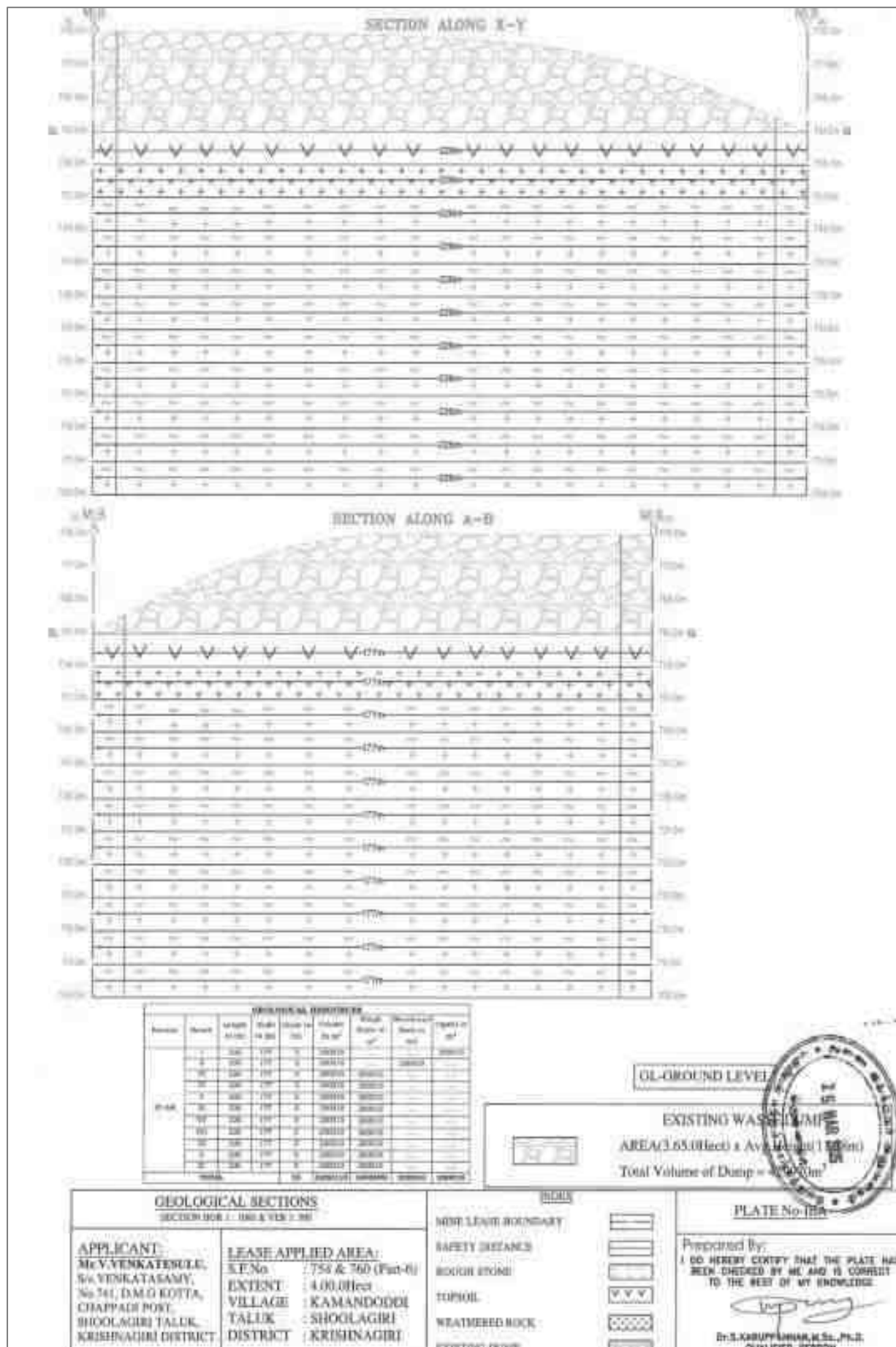


Figure 2.5 Surface & Geological Plan and Sections

## 2.5 QUANTITY OF RESERVE

The Resources and Reserve of Rough Stone were calculated based on cross-section method by plotting sections to cover the maximum lease area for the proposed project. Based on the availability of geological resources, the mineable reserves are calculated by considering excavation system of bench formation and leaving essential safety distance of 7.5 m and 10 m safety distance as per precise area communication letter and deducting the locked-up reserves during bench formation (also called as Bench Loss). The mineable reserves are calculated up to the depth of 55 m BGL considering there is no waste / overburden / side burden (100% Recovery anticipated) for the proposed project. The plate used for reserve estimation has been shown in Figure 2.6 and 2.6a results of Mine Lease Plan, Surface & geological resources and reserves have been shown in Table 2.3.

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

| <b>Resource Type</b>                            | <b>Rough Stone in Tons</b> | <b>Top Soil in Tons</b> |
|-------------------------------------------------|----------------------------|-------------------------|
| Geological Resource in m <sup>3</sup>           | 4950248                    | 400020                  |
| Mineable Reserves in m <sup>3</sup>             | 1859055                    | 326560                  |
| Proposed production for 10 years m <sup>3</sup> | 1859055                    | 326560                  |

Based on the year wise development and production plan and sections, the year wise production results have been given in Table 2.4 & Figure 2.6 & 2.6a.

**Table 2.4 Year-Wise Production Details**

| <b>Year</b>  | <b>Rough Stone in Tons</b> | <b>Top Soil in Tons / 1 year</b> |
|--------------|----------------------------|----------------------------------|
| I            | 273144                     | 326560                           |
| II           | 273088                     | --                               |
| III          | 273185                     | --                               |
| IV           | 273254                     | --                               |
| V            | 272429                     | --                               |
| VI           | 101681                     | --                               |
| VII          | 95164                      | --                               |
| VIII         | 103758                     | --                               |
| IX           | 108707                     | --                               |
| X            | 84645                      | --                               |
| <b>Total</b> | <b>1859055</b>             | <b>326560</b>                    |

*Source: Approved Mining Plan & ToR*

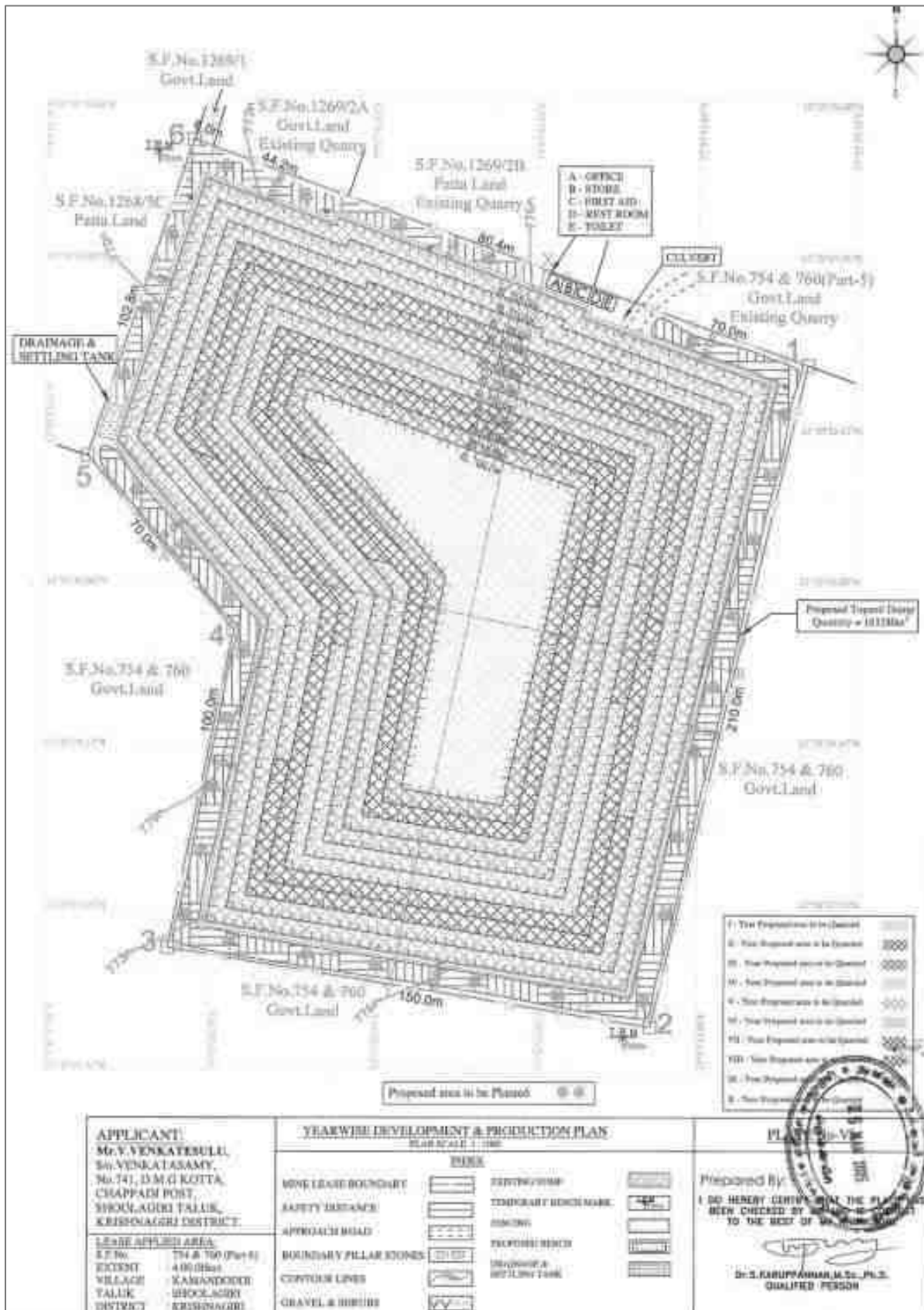


Figure 2.6 Yearwise Development and Production Plan

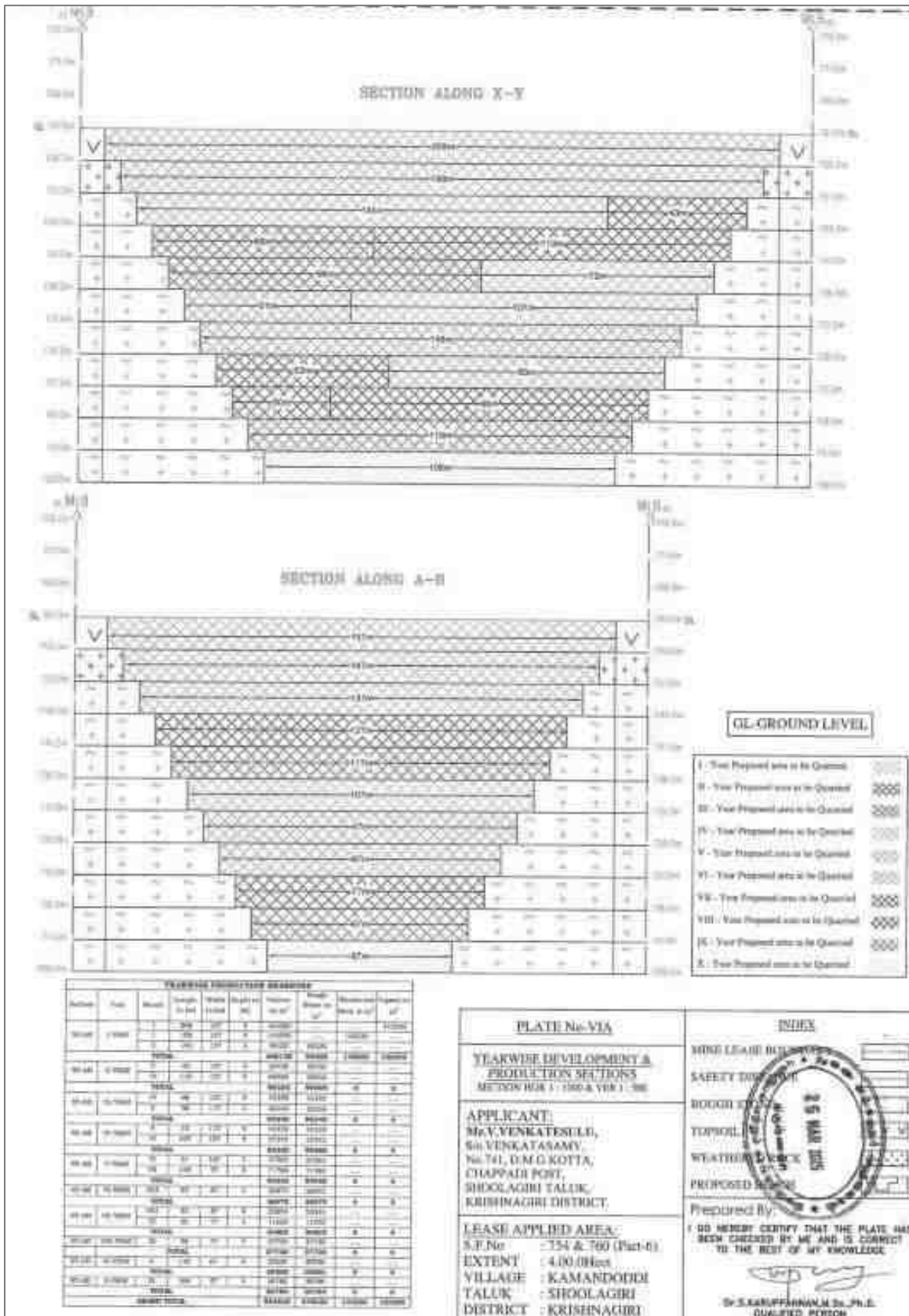


Figure 2.6a Year wise Production Plan & Sections

## 2.6 MINING METHOD

The Quarrying operation is proposed to be carried out by open cast semi-mechanized mining method with the bench height and width of 5m each. The open cast semi-mechanized method involving drilling and blasting is proposed to extract rough stone and gravel. The extracted rough stone will be loaded manually to the trucks for dispatch to the customers. In this project, NONEL blasting will be adopted to extract rough stone.

### 2.6.1 Conceptual Blasting Design

In this project, NONEL blasting will be employed to win rough stone. This method will involve closed spaced perimeter holes to reduce the overbreak/backbreak on a blast. The objective of the blasting design is to prevent fly rocks from damaging the nearby structures.

#### Rules of Thumb for Blast Design

Based on practical experience and technical information, a set of rules for blasting have been provided as below ([Chapter8 \(nps.gov\)](#)). These rules will be applied to blast rocks in the proposed project.

**Rule 1: The detonation velocity (VOD) of the explosive should be close to the same value of the sonic velocity (VSO) of the rock to be blasted.**

The sonic velocity of a rock is considered to be a reliable indicator of its structural integrity and resistance to fragmentation. As the VOD of the explosive approaches close to the VSO of the rock, the blasting would result in relatively smaller size of fragmentation with uniformity. There is no value in using an explosive that has a VOD greatly in excess of the VSO of the rock, since there is little or no improvement in fragmentation above the VSO. When selecting an explosive to match up the VSO of a rock mass, variance of <10% in the velocities is acceptable.

**Rule 2: Generally, select the densest explosive possible.**

When the density of explosives is higher, the potential energy of the explosives can be greater and the more of it can be placed within a borehole of a given size.

**Rule 3: Select explosives according to the characteristics of the rock formation to be blasted.**

When planes of separation in the rock are smaller than the degree of fragmentation required, the rock can often be blasted by using lower density and lower detonation velocity explosives.



**Rule 4: When using slurry or water gel explosives, always determine the critical temperature below which the explosive will fail to reliably detonate.**

Almost all slurry explosives have a critical temperature below which they may not detonate, or may not sustain detonation in elongated columns. The explosives should not be used when the temperature of the explosive at time of loading is below that critical temperature.

**Rule 5: The distance between holes (spacing) should not be greater than one-half the depth of the borehole.**

When the distance between holes in a row is greater than one-half the depth of the hole, the angles of breakage intersect above the bottom of the holes. This causes both a great deal of vertical throw and a very uneven bottom.

**Rule 6: Stemming should be equal to the burden.**

Stemming is useful to confine and maximize efficient use of the explosive's energy. It also reduces noise as much as possible. If the stemming is greater than the burden, the rock at the top of the borehole will have less cracking from reflection and refraction of compressive and tensile waves. Therefore, stemming should be equal to burden. Drill fines can be used for loading the borehole.

**Rule 7: Subdrill (if necessary) should be between 0.3 and 0.5 of spacing/burden.**

Subdrill should be equal to 0.3 of burden. It will work when there is row-for-row delay. In blasts where the delay system is both row-for-row and hole-for-hole, the subdrill should be determined by the largest dimension, which can be the spacing or the burden. An average subdrill of 0.4 of spacing is best to use for planning purposes. Based on the above-mentioned rules, blasting design has been conceptualized and has been provided in Table 2.5.

**Table 2.5 Conceptual Blasting Design**

|                              |       |
|------------------------------|-------|
| Blasthole Diameter (D) in mm | 32    |
| Burden (B) in m              | 1.2   |
| Spacing (S) in m             | 1.38  |
| Subdrill in m                | 0.5   |
| Charge length (C) in m       | 0.70  |
| Stemming                     | 0.5   |
| Hole Length (L) in m         | 1.2   |
| Bench Height (BH) in m       | 2.5   |
| Mass of explosive/hole in g  | 437.5 |
| Stemming material size in mm | 3.2   |
| Burden stiffness ratio       | 2.08  |

|                                       |           |
|---------------------------------------|-----------|
| Blast volume/hole in m <sup>3</sup>   | 4.14      |
| Production of rough stone/day in Tons | 1378      |
| Number of blastholes/day              | 120       |
| Blasthole pattern                     | Staggered |
| Mass of explosive /day in kg          | 48.18     |
| Powder factor in kg/m <sup>3</sup>    | 0.11      |
| Loading density                       | 0.63      |
| Type of explosives                    | Slurry    |
| Diameter of packaging in mm           | 25        |
| Initiation system                     | NONEL     |

### 2.6.2 Magnitude of Operation

Based on the results of estimated production for the 10 years, details about the size of operation have been provided in Table 2.6.

**Table 2.6 Operational Details for Proposed Project**

|                                  | <b>Rough Stone in Tons 10 years</b> |
|----------------------------------|-------------------------------------|
| Proposed production for 10 years | 1859055                             |
| Number of Working Days /Annum    | 270                                 |
| Production of /Day (Ts)          | 1378                                |
| No. of Lorry Loads               | 84                                  |

### 2.6.3 Extent of Mechanization

List of machineries proposed for the quarrying operation is given in Table 2.7.

**Table 2.7 Machinery Details**

| <b>S. No.</b> | <b>Type</b>         | <b>No of Unit</b> | <b>Size /Capacity</b> | <b>Make</b> | <b>Motive Power</b> |
|---------------|---------------------|-------------------|-----------------------|-------------|---------------------|
| 1             | Jack Hammers        | 4                 | Hand held             | --          | Diesel              |
| 2             | Compressor          | 2                 | Air                   | --          | Diesel              |
| 3             | Hydraulic Excavator | 2                 | 2.9-4.5 MT            | --          | Diesel              |
| 4             | Tipper              | 8                 | --                    | --          | Diesel              |

### 2.6.4 Progressive Quarry Closure Plan

The progressive quarry closure plan of the proposed project shows past, present, and future land use statistics. According to the land use results, at Present, about 0.32.5 ha of land is designated as unutilized area. Whereas, at the end of the mine life, about 3.28.0 ha of land would have been quarried; about 0.02.0 ha of land would have been used for establishing infrastructures; about 0.05.0 ha of land would have been used for road development; about 0.57.0 ha of land would have been used for green belt development.

**Table 2.8 Land use data at present, during scheme of mining, and at the end of mine life**

| <b>Description</b>       | <b>Present Area (ha)</b> | <b>Area at the end of life of quarry (ha)</b> |
|--------------------------|--------------------------|-----------------------------------------------|
| Area under quarry        | Nil                      | 3.28.0                                        |
| Infrastructure           | Nil                      | 0.02.0                                        |
| Roads                    | Nil                      | 0.05.0                                        |
| Green Belt               | Nil                      | 0.57.0                                        |
| Drainage & Settling Tank | Nil                      | Nil                                           |
| Unutilized area          | 0.32.5                   | Nil                                           |
| Dump                     | 3.67.50                  | Nil                                           |
| Drainage & Settling Tank | Nil                      | 0.08.0                                        |
| <b>Total</b>             | <b>4.00.0</b>            | <b>4.00.0</b>                                 |

**2.6.5 Progressive Quarry Closure Budget**

As the proposed project has the enormous potential for continuous operations even after the expiry of lease period, mine closure plan is not proposed for now. Based on the progressive mine closure plan for the scheme period, the mine closure cost is given in Table 2.9.

**Table 2.9 Mine Closure Budget**

| <b>Activity</b>                    | <b>Capital Cost</b> |
|------------------------------------|---------------------|
| 800 plants inside the lease area   | 1,60,000            |
| 1200 plants outside the lease area | 3,60,000            |
| Wire Fencing                       | 8,00,000            |
| Renovation of Garland Drain        | 40,000              |
| <b>Total</b>                       | <b>13,60,000</b>    |

*Source: Environment Management Plan*

**2.6.6 Conceptual Mining Plan**

The ultimate pit size is designed based on certain practical parameters such as economical depth of mining, safety zones, permissible area, etc. Details of ultimate pit dimensions have been derived from given in Table 2.10 and Figure 2.7.

**Table 2.10 Ultimate Pit Dimension**

| <b>Pit</b> | <b>Length (m)</b> | <b>Width (m) (Max)</b> | <b>Depth (m)</b> |
|------------|-------------------|------------------------|------------------|
| I          | 208               | 157                    | 55               |

*Source: Approved Mining Plan & ToR*

**2.6.7 Infrastructures**

Infrastructures like mines office, temporary rest shelters for workers, latrine and urinal facilities have been proposed as per the mine rule and will be established after the grant of quarry lease. There is no proposal for the mineral processing or ore beneficiation plants in this project.

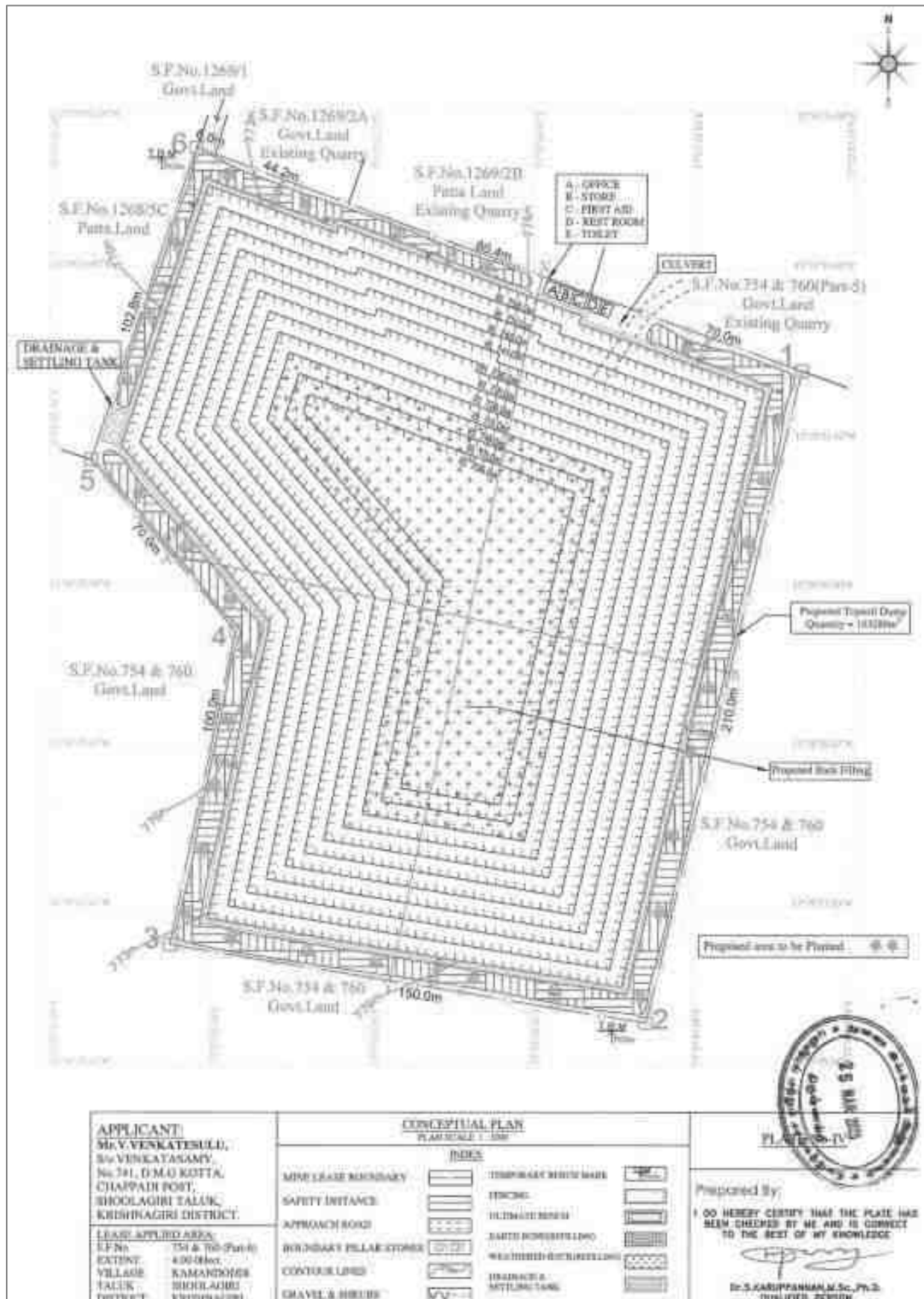


Figure 2.7 Conceptual Plan

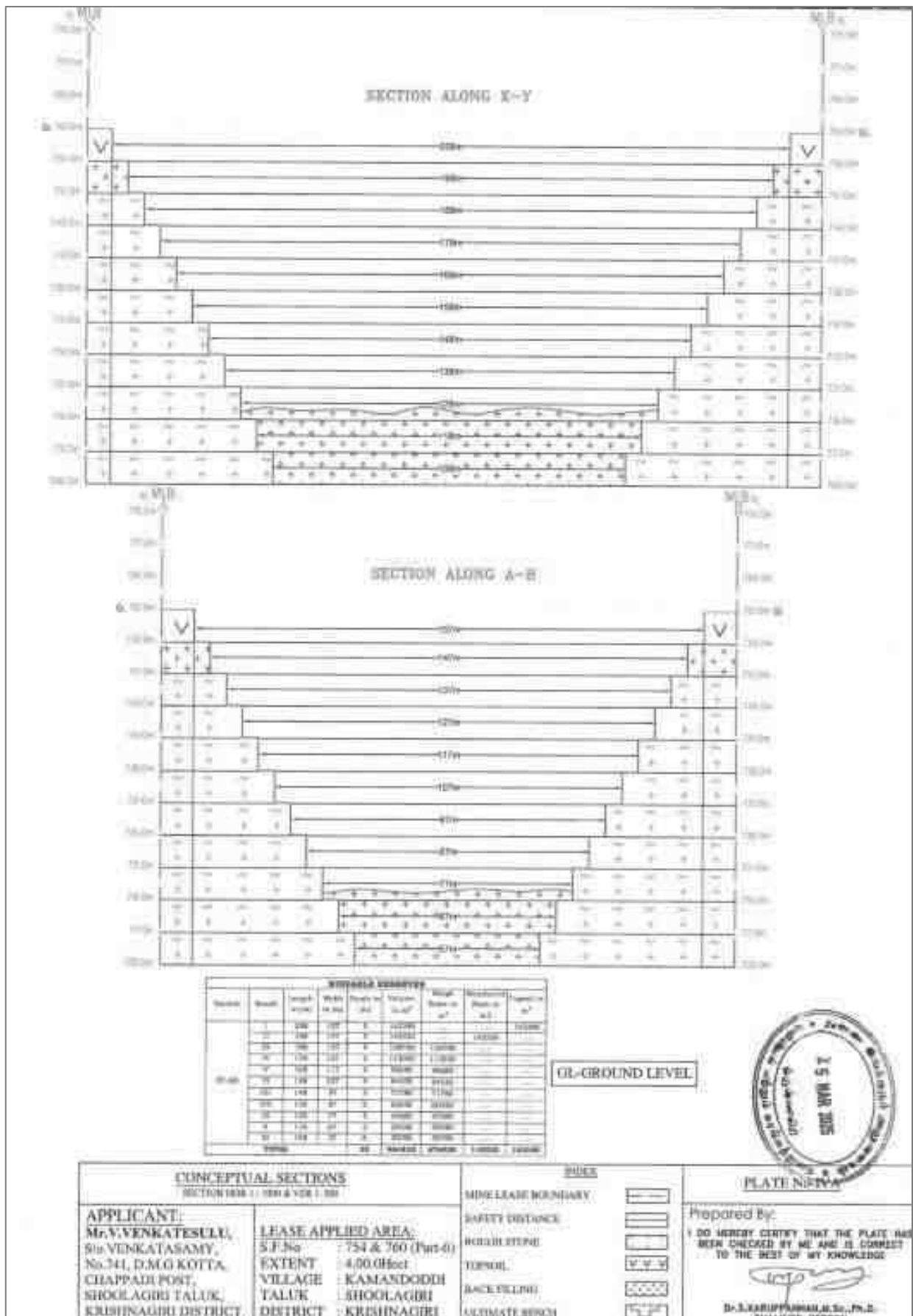


Figure 2.8 Conceptual Plan & Sections

### 2.6.7.1 Other Infrastructure Requirement

No workshops are proposed inside the project area. Hence, there will not be any process effluent generation from the proposed lease area. Domestic effluent from the mine office will be discharged to septic tank and soak pit. As there is no toxic effluent expected to generate in the form of solid, liquid or gaseous form, there is no requirement of waste treatment plant.

### 2.6.8 Water Requirement

Detail of water requirement in 3.0 KLD given in Table 2.11.

**Table 2.11 Water Requirement for the Project**

| Purpose                | Quantity       | Source                                         |
|------------------------|----------------|------------------------------------------------|
| Dust Suppression       | 1.0 KLD        | Existing bore wells nearby the lease area      |
| Green Belt development | 1.0 KLD        | Existing bore wells nearby the lease area      |
| Drinking & Domestic    | 1.0 KLD        | Existing bore wells and approved water vendors |
| <b>Total</b>           | <b>3.0 KLD</b> |                                                |

*Source: Prefeasibility Report*

### 2.6.9 Energy Requirement

High speed Diesel (HSD) will be used for quarrying machineries. As per the data shown in Table 2.12, Around 3430496 of HSD will be used for rough stone and gravel extraction during this 10 years plan period. The diesel will be brought to the site from nearby diesel pumps.

**Table 2.12 Fuel Requirement Details**

| <b>Fuel Requirement for Excavator</b>                               |                             |                        |                         |
|---------------------------------------------------------------------|-----------------------------|------------------------|-------------------------|
| Details                                                             | Rough Stone<br>(1859055 Ts) | Top Soil<br>(326560Ts) | Total Diesel<br>(litre) |
| Average Rate of Fuel Consumption (l/hr)                             | 16                          | 10                     | ---                     |
| Working Capacity (tons/hr)                                          | 55                          | 120                    | ---                     |
| Time Required (hours)                                               | 33801                       | 2721                   | ---                     |
| Total Diesel Consumption for 10 years<br>(litre)                    | 540816                      | 27213                  | <b>568029</b>           |
| <b>Fuel Requirement for Compressor</b>                              |                             |                        |                         |
| Average Rate of Fuel Consumption/hole<br>(litre)                    | 0.4                         | ---                    | ---                     |
| Number of Drillholes/day                                            | 120                         | ---                    | ---                     |
| Total Diesel Consumption for 10 years<br>(litre)                    | 64800                       | ---                    | <b>64800</b>            |
| <b>Fuel Requirement for Tipper</b>                                  |                             |                        |                         |
| Average Rate of Fuel Consumption/Trip<br>(litre)                    | 20                          | 20                     | ---                     |
| Carrying Capacity in tons                                           | 16.5                        | 12                     | ---                     |
| Number of Trips / days                                              | 83                          | 34                     | ---                     |
| Number of Trips / 10 years                                          | 112670                      | 27213                  | ---                     |
| Total Diesel Consumption for 10 years<br>(litre)                    | 2253400                     | 544267                 | <b>2797667</b>          |
| <b>Total Diesel Consumption by Excavator, Compressor and Tipper</b> |                             |                        | <b>3430496</b>          |

### 2.6.10 Capital Requirement

The project proponent will invest **Rs. 8,84,95,000/-** to the Project. The breakup summary of the investments has been given in Table 2.13.

**Table 2.13 Capital Requirement Details**

| S. No.                    | Description      | Cost (Rs.)         |
|---------------------------|------------------|--------------------|
| 1                         | Fixed Asset Cost | 8,39,00,000        |
| 2                         | Machinery cost   | 20,00,000          |
| 3                         | EMP Cost         | 25,95,000          |
| <b>Total Project Cost</b> |                  | <b>8,84,95,000</b> |

*Source: Approved Mining Plan*

### 2.7 MANPOWER REQUIREMENT

The skilled, competent qualified statutory persons will be engaged for quarrying operation, preference will be given to the local community. Number of employees required for this project have been provided in Table 2.14.

**Table 2.14 Employment Potential for the proposed project**

| S. No.       | Category       | Role             | Nos.      |
|--------------|----------------|------------------|-----------|
| 1.           | Highly Skilled | Mine manager     | 1         |
|              |                | Mine Engineer    | 1         |
|              |                | Mine Geologist   | --        |
|              |                | Blaster          | 1         |
|              |                | Hitachi Operator | --        |
| 2.           | Unskilled      | Musdoor/ Labours | 20        |
| <b>Total</b> |                |                  | <b>23</b> |

*Source: Prefeasibility Report*

### 2.8 PROJECT IMPLEMENTATION SCHEDULE

The commercial operation will commence after the grant of Environmental Clearance. CTO and CTE will be obtained from the Tamil Nadu State Pollution Control Board. The conditions imposed during the environmental clearance will be compiled before the start of mining operation. Expected time schedule for the quarrying operation is given Table 2.15.

**Table 2.15 Expected Time Schedule**

| S. No.                                                                                   | Particulars             | Time Schedule (in Months) |                 |                 |                 |                 | Remarks if any               |
|------------------------------------------------------------------------------------------|-------------------------|---------------------------|-----------------|-----------------|-----------------|-----------------|------------------------------|
|                                                                                          |                         | 1 <sup>st</sup>           | 2 <sup>nd</sup> | 3 <sup>rd</sup> | 4 <sup>th</sup> | 5 <sup>th</sup> |                              |
| 1                                                                                        | Environmental Clearance |                           |                 |                 |                 |                 |                              |
| 2                                                                                        | Consent to Establish    |                           |                 |                 |                 |                 | Project Establishment Period |
| 3                                                                                        | Consent to operate      |                           |                 |                 |                 |                 | Production starting period.  |
| Time line may vary; subjected to rules and regulations /& other unforeseen circumstances |                         |                           |                 |                 |                 |                 |                              |

## CHAPTER III

### DESCRIPTION OF THE ENVIRONMENT

#### 3.0 GENERAL

This chapter presents a regional background to the baseline data at the very onset, which will help in better appreciation of micro-level field data, generated on several environmental and ecological attributes of the study area. The baseline status of the project environment is described section wise for better understanding of the broad-spectrum conditions. The baseline environment quality represents the background environmental scenario of various environmental components such as land, water, air, noise, biological and socio-economic status of the study area. The environmental consultant for both the clusters are the same. The monitoring of ambient air quality, noise levels, water quality and soil analysis for the nearby cluster were done in winter from **October through December 2023 with CPCB** through the third party NABL accredited **Ekdant Enviro Services (P) Limited**.

The baseline monitoring done for 5km radius (TERMS OF REFERENCE [TOR] FOR EIA REPORT FOR ACTIVITIES/ PROJECTS REQUIRING ENVIRONMENTAL CLEARANCE) Prepared by Administrative Staff College of India, Bellavista, Khairatabad, AUGUST 2009, Page No.86) not varied as much. Therefore, we utilize the baseline data for this cluster which is collected for the adjacent cluster in the year between **October through December 2023** as per the Office Memorandum F. No. IA3-22/10/2022-IA.III [E 177258] issued by Government of India Ministry of Environment, Forest and Climate Change (IA Division) dated 8<sup>th</sup> June 2022. We also collected the baseline data in maximum locations i.e, in the core and buffer zone for the present cluster in the 29.05.2025 (**one Day**), for cross verification. Field monitoring studies to evaluate the base line status of the project site were carried out with CPCB guidelines. Environmental baseline data were collected by an NABL accredited and MoEF notified **Greenlink Analytical and Research Laboratory (India) Private Ltd** for the environmental attributes including soil, water, air, and noise and by FAEs for ecology and biodiversity, traffic, and socio-economy.

#### ***Study Area***

The study area has been divided into two zones: core zone and buffer zone. Core zone is considered as lease area and buffer zone as 5km radius from the periphery of the cluster, except for ecological study, which considers 10km as buffer zone. Both core and buffer zones are taken as the study area. The data was collected from the study area to understand the existing environment conditions of the above-mentioned environmental components. Sampling methodologies for the various environmental parameters, including frequency of sampling, method of sample analysis, etc., are briefly given in Table 3.1.



**Table 3.1 Monitoring Attributes and Frequency of Monitoring**

| <b>Attribute</b>             | <b>Parameters</b>                                                                                                            | <b>Frequency of Monitoring</b>                                 | <b>No. of Locations</b>                          | <b>Protocol</b>                                                                                 |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|--------------------------------------------------|-------------------------------------------------------------------------------------------------|
| Land Use/<br>Land Cover      | Land-use<br>Pattern within<br>5 km radius of<br>the study area                                                               | Once during the<br>study period                                | Study Area                                       | Satellite Imagery &<br>Primary Survey                                                           |
| *Soil                        | Physico-<br>Chemical<br>characteristics                                                                                      | Once during the<br>study period                                | 8<br>(2 in nearby<br>core & 6 in<br>buffer zone) | IS 2720<br>Agriculture<br>Handbook - Indian<br>Council of<br>Agriculture<br>Research, New Delhi |
| *Water<br>Quality            | Physical,<br>Chemical and<br>Bacteriological<br>Parameters                                                                   | Once during the<br>study period                                | 10<br>(4 surface<br>water & 6<br>ground water)   | IS 10500& CPCB<br>Standards                                                                     |
| Meteorology                  | Wind speed<br>Wind direction<br>Temperature<br>Cloud cover<br>Dry bulb<br>temperature<br>Rainfall                            | 1 hourly continuous<br>mechanical/automatic<br>weather station | 1                                                | Site specific primary<br>data &<br>secondary data from<br>IMD Station                           |
| *Ambient<br>Air Quality      | PM <sub>10</sub><br>PM <sub>2.5</sub><br>SO <sub>2</sub><br>NO <sub>x</sub>                                                  | 24 hours, twice a<br>week                                      | 9<br>(2 core & 7<br>buffer zone)                 | IS 5182 Part 1-23<br>National Ambient<br>Air Quality<br>Standards, CPCB                         |
| *Noise<br>Levels             | Ambient noise                                                                                                                | Hourly observation<br>for 24 hours per<br>location             | 8<br>(2 core & 6<br>Buffer zone)                 | IS 9989<br>As per CPCB<br>Guidelines                                                            |
| Ecology                      | Existing flora<br>and fauna                                                                                                  | Through field visit<br>during the study<br>period              | Study area                                       | Primary Survey by<br>Quadrat & Transect<br>Study<br>Secondary Data –<br>Forest Working Plan     |
| Socio<br>Economic<br>Aspects | Socio-<br>economic<br>characteristics,<br>Population<br>statistics and<br>existing<br>infrastructure<br>in the study<br>area | Site visit & Census<br>Handbook, 2011                          | Study area                                       | Primary Survey,<br>census handbook &<br>need based<br>assessments.                              |

*\*All monitoring and testing have been carried out as per the Guidelines of CPCB and MoEF & CC.*

### 3.1 LAND ENVIRONMENT

#### 3.1.1 Geology and Geomorphology

The proposed quarry lease area is falling under grey hornblend biotite gneiss as shown in Figure 3.1 and 3.2. It is a metamorphic rock characterized by its banding, foliation, and the presence of hornblende and biotite minerals. It's a medium-to coarse-grained rock with a grey to pale grey color. The rock exhibits a distinct foliation due to the parallel arrangement of biotite and hornblende minerals. It also shows a well-developed gneissosity, which is a banded structure formed by alternating layers of quartz-feldspar rich and hornblende-biotite rich materials. The presence of grey hornblend biotite gneiss mineral is a key indicator of this high-grade rough stone process.

#### ***Geomorphology:***

The geomorphic unit's pediment and pediplain complex dominate the study area as shown in Figure 3.3 and 3.4. Pediments are gently sloping bedrock surfaces typically found at the base of mountains that are formed by lateral erosion and sheet flooding. Pediplains are broad, flat plains formed by the joining of multiple pediments resulting in a vast featureless landscape. This process known as pediplanation occurs primarily in arid and semi-arid regions.

#### 3.1.2 Land Use/ Land Cover

Land Use and Land Cover (LULC) map, as shown in Figure 3.5 was prepared using Sentinel II image for the study area of 5 km radius to provide a baseline status of the study area covering 5 km radius around the proposed mine site. Totally, 7 LULCs were mapped. The areal extent of each LULC is provided in Table 3.2. The total mining area covers only 119.24ha accounting for 1.37 %, of which lease area of 4.00.0Hectares contributes only about 0.045 %. This small percentage of mining activities shall not have any significant impact on the land environment.

**Table 3.2 LULC Statistics of the Study Area**

| S. No.       | LU/LC Type             | Extend (ha)    | Percentage   |
|--------------|------------------------|----------------|--------------|
| 1            | Water                  | 33.7           | 0.39         |
| 2            | Trees                  | 62.31          | 0.71         |
| 3            | Crops                  | 4541.87        | 52.00        |
| 4            | Built area             | 2309.73        | 26.44        |
| 5            | Mining/Industrial area | 119.24         | 1.37         |
| 6            | Bare Land              | 31.07          | 0.36         |
| 7            | Range land             | 1636.71        | 18.74        |
| <b>Total</b> |                        | <b>8734.63</b> | <b>100.0</b> |

*Source: Sentinel II Satellite Imagery*

### 3.1.3 Topography

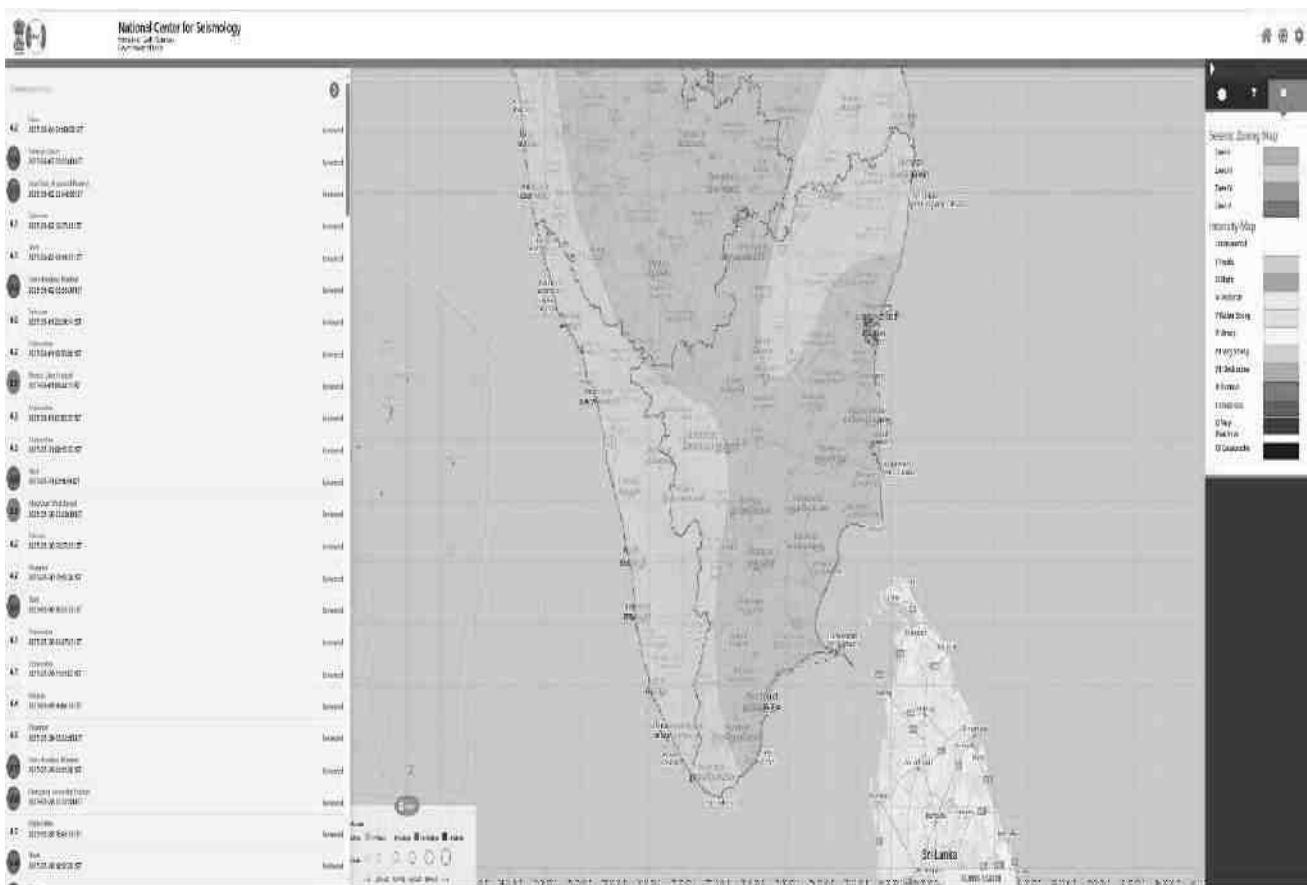
The proposed lease area is located in an elevated terrain with an altitude range of 751-762m AMSL, Showing relief 11m.

### 3.1.4 Drainage Pattern

Drainage pattern is the pattern formed by the streams, rivers, and lakes in a particular drainage basin over time that reveals characteristics of the kind of rocks and geological structures in a landscape. The proposed area shows dendritic drainage pattern indicating uniform lithology beneath the surface, as shown in Figure 3.6.

### 3.1.5 Seismic Sensitivity

The proposed lease area is situated in a Seismic Zone II, as defined by National Centre for Seismology ([Official Website of National Centre of Seismology](#)). The Zone II is defined as the region where only minor damage is expected from seismic events. In this respect, the proposed lease area is located in a low earthquake hazard area.



Seismic Zone map

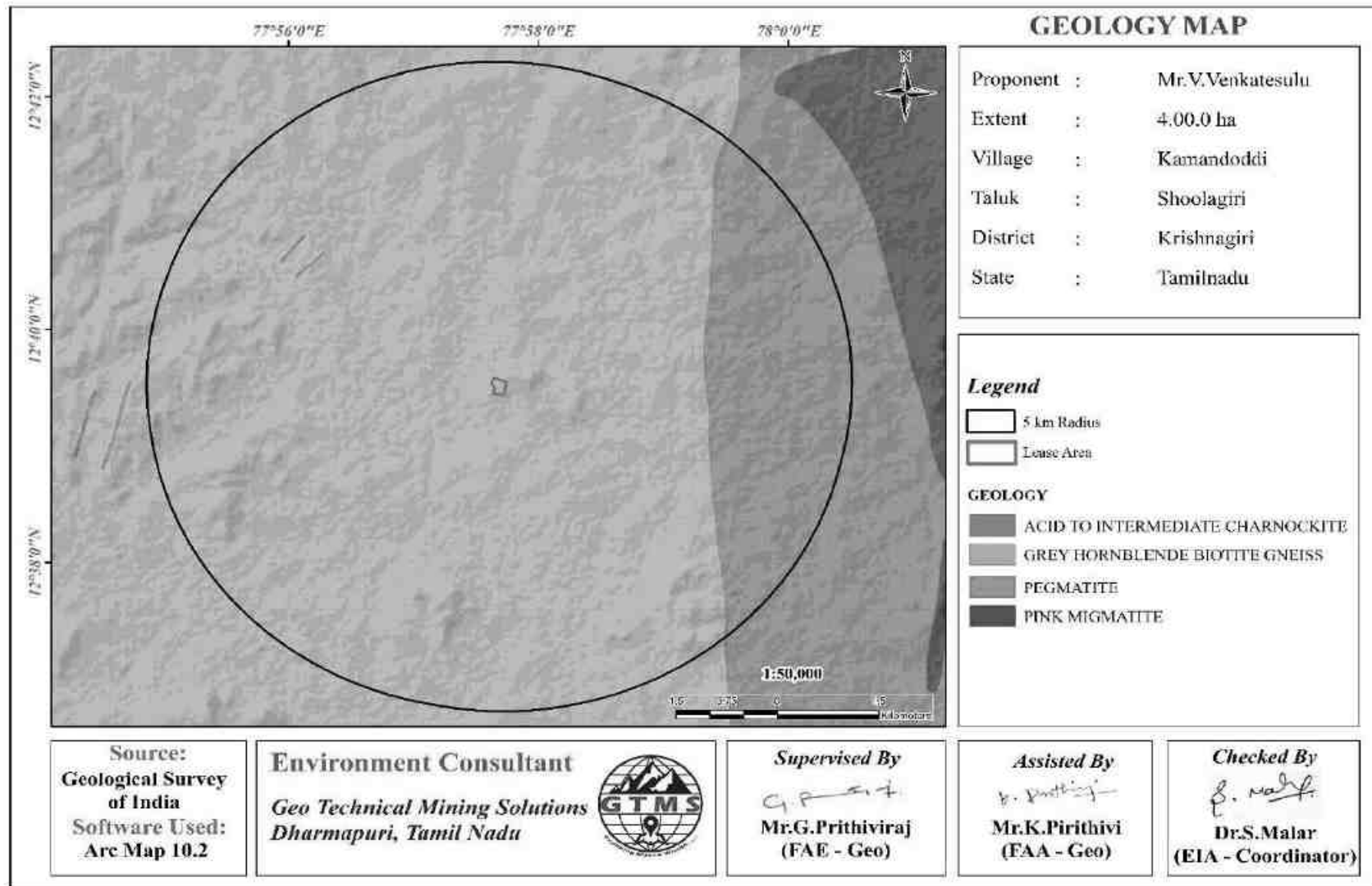


Figure 3.1 Geology Map of 5 km Radius from Proposed Project Site

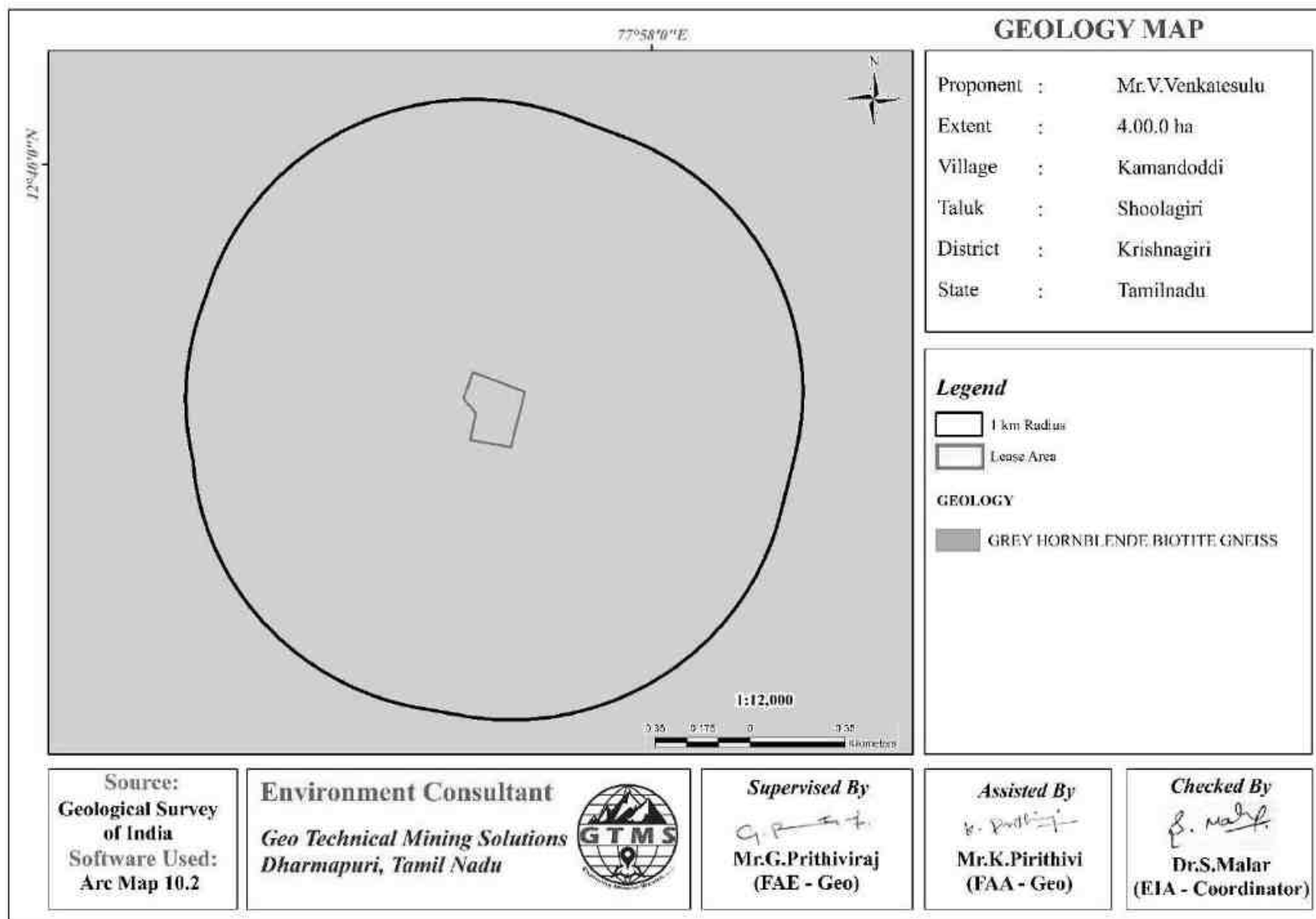
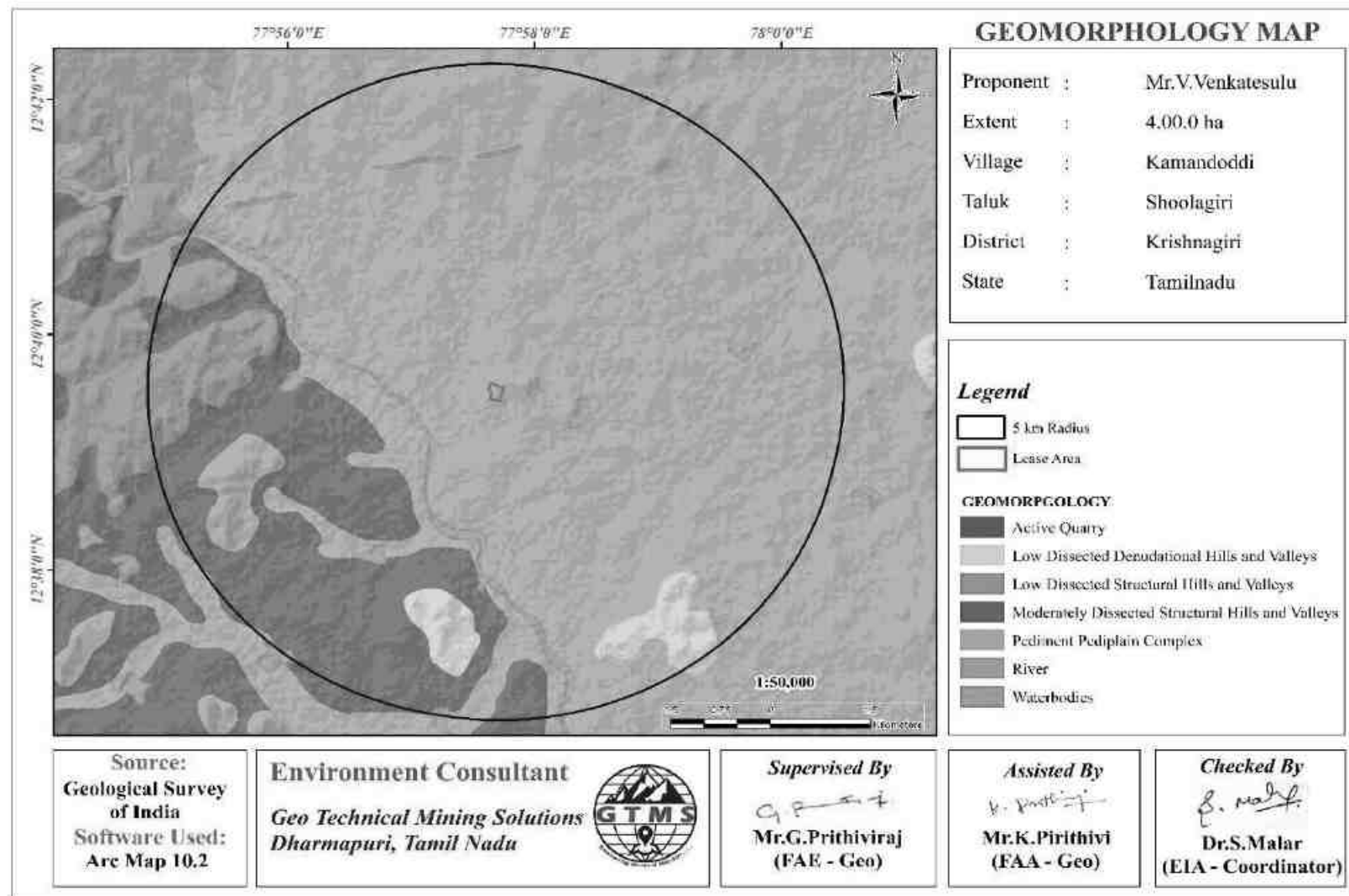
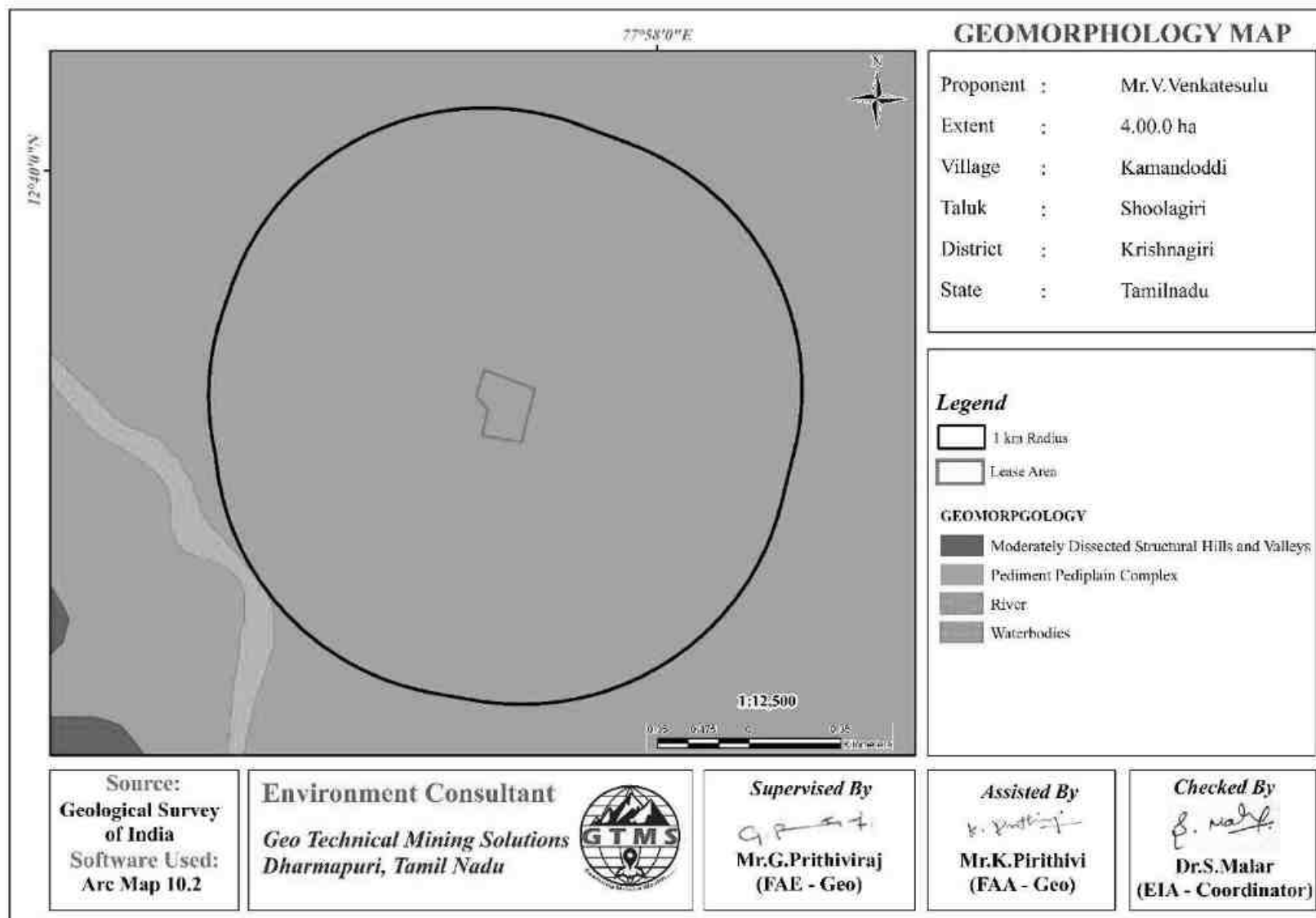


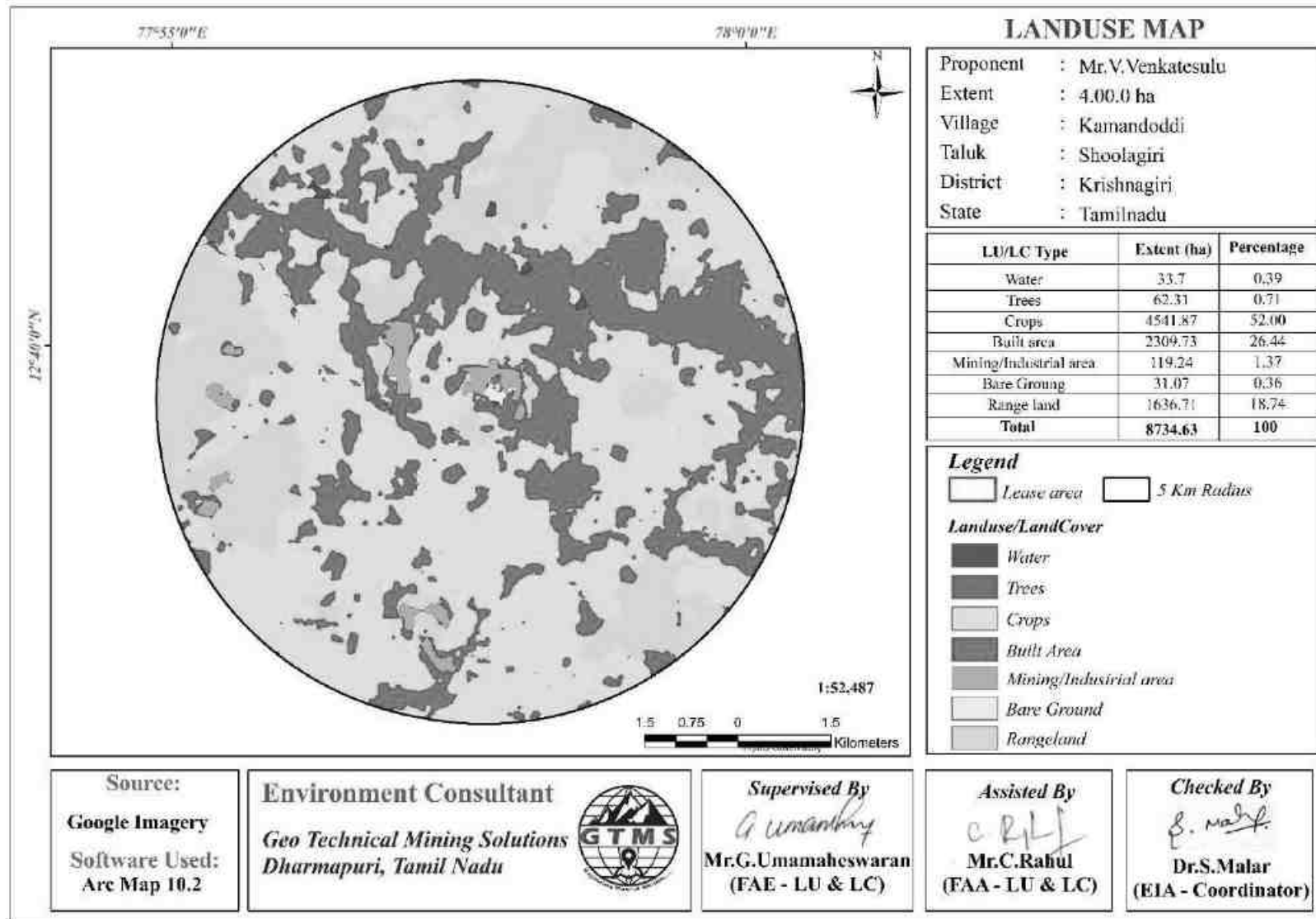
Figure 3.2 Geology Map of 500m Radius from Proposed Project Site



**Figure 3.3 Geomorphology Map of 5 km Radius from Proposed Project Site**

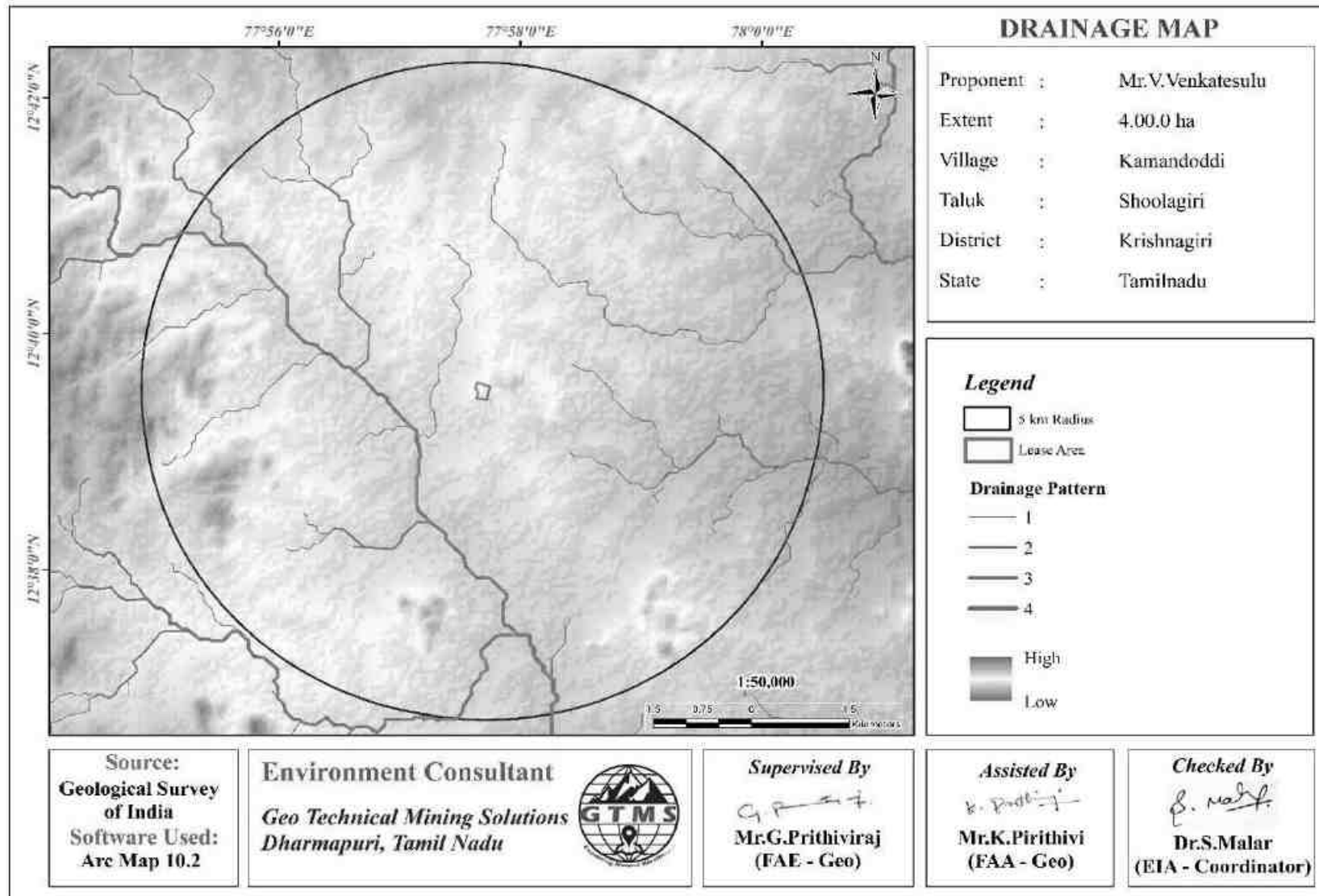


**Figure 3.4 Geomorphology Map of 500m Radius from Proposed Project Site**



**Figure 3.5 LULC Map of 5 km Radius from Proposed Project Site**





**Figure 3.6 Drainage Map of 5 km Radius from Proposed Project Site**

## 3.2 SOIL ENVIRONMENT

The soil samples were collected from 8 locations of the study area to determine the baseline soil characteristics of the soil. The locations were selected for soil sampling based on soil types, Remove the surface litter at the sampling spot. Drive the auger to a plough depth of 90cm and draw the soil sample filled collect the sample in a clean cloth or polythene bag. Label the bag with information like name of the farmer, location of the farm, survey number, previous crop grown, present crop, crop to be grown in the next season, date of collection, name of the sampler etc. The locations of the sampling sites are shown in Table 3.3 and Figure 3.5. The samples thus collected were analysed for physical and chemical characteristics. The physical and chemical characteristic results of soil samples are provided in Table 3.3.

**Table 3.3 Soil Sampling Locations**

| Sampling ID                          | Location              | Distance (km) | Direction | Coordinates                 |
|--------------------------------------|-----------------------|---------------|-----------|-----------------------------|
| S01                                  | Nearby core           | 0.31          | N         | 12°39'44.83"N 77°57'35.81"E |
| S02                                  | Thirumalaigowni kotta | 0.72          | SW        | 12°39'12.59"N 77°57'19.61"E |
| S03                                  | Chinnabatakanapalli   | 3.41          | SW        | 12°38'1.13"N 77°56'26.57"E  |
| S04                                  | Shoolagiri            | 3.59          | E         | 12°38'55.18"N 77°59'37.91"E |
| S05                                  | Koneripalli           | 3.77          | N         | 12°41'15.21"N 77°58'52.75"E |
| S06                                  | Gunduguriki           | 1.60          | N         | 12°40'26.59"N 77°57'29.30"E |
| S07                                  | Kamanthoddi           | 3.85          | NW        | 12°40'39.35"N 77°55'48.61"E |
| Green link analytical & Research LAB |                       |               |           |                             |
| S08                                  | Nearby core           | 0.22          | W         | 12°39'33.51"N 77°57'30.44"E |

Source: On-site monitoring/sampling by Ekdant Enviro Services (P) Limited, and Green link analytical & Research LAB in association with GTMS.

### 3.2.1 Soil Characteristics

#### A. Physical Characteristics of soil

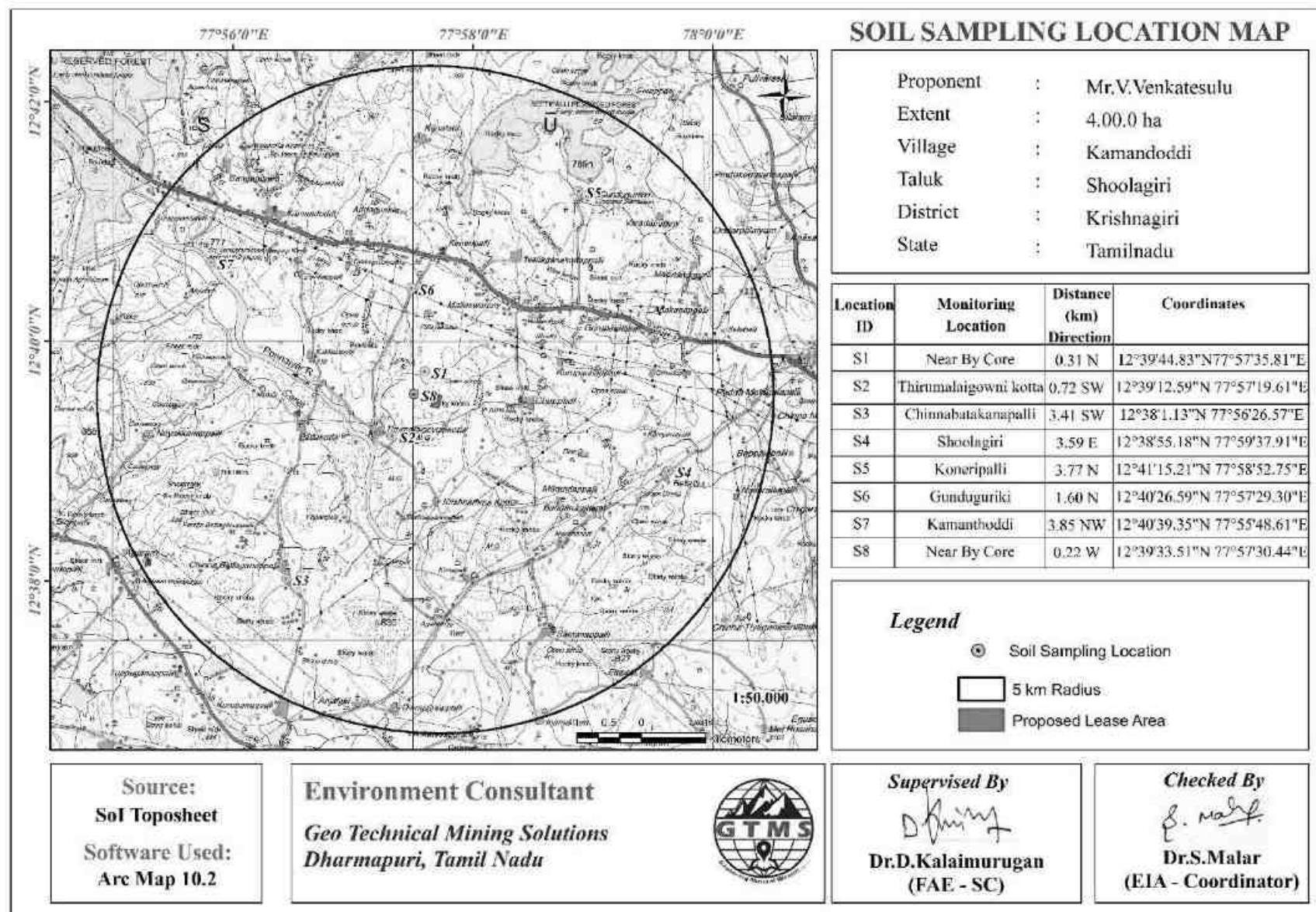
Physical characteristics of soils were determined through specific parameters viz. particle size distribution, bulk density, porosity, water holding capacity, texture are presented in Table 3.4.

- **Texture:** In lease area the soil is red calcareous. They are mostly sandy to loamy and characterised by the hard and compact layer of lime. In other places the soil found is brown in colour.
- **Structure:** The grain size is greater than 2mm in the lease area and in other places where the samples collected ranges from 0.002mm to 2mm.
- **Porosity:** The porosity of the soils is significantly impacted by the degree of weathering and fracture development in the underlying bedrock. The 500m radius cluster consists of Charnockite formations affect the porosity found in this study.

- **Density:** The soil samples collected within 5km radius are generally characterized by higher bulk densities typically ranging from 1.25 to 1.66g/cm<sup>3</sup>. This is due to the presence of red sandy and in some areas with red loamy soil. The dominant soil types include red calcareous and red non-calcareous. Sandy soils have larger pore spaces between them compared to finer-grained soils like silt and clay.
- **Consistence:** Coarse (sandy) soils may require slightly higher moisture content while fine (clay) soils may require slightly lower. A soil moisture content between 12.5% to 18.4% is generally considered optimal for plant growth in medium-textured soils (like loams). This range falls within the 50-75% available water zone where plants are at risk of stress if a water deficit is prolonged.

#### ***B. Chemical Characteristics of Soil***

- Chemical characteristics of soils through selected parameters viz. pH, soluble cations and anions, exchangeable cations, organic content and fertility status in the form of NPK values and organic matter are presented in Table 3.5. pH is an important parameter indicative of alkaline or acidic nature of soil. It greatly affects the microbial population as well as solubility of metal ions and regulates nutrient availability. Variation in the pH of the soil in the study area is presented in Table 3.5 and it is found to be from slightly acidic to neutral (6.8 – 7.6) in reaction. Electrical conductivity a measure of soluble salts in the soil is in the range of 165 – 298μS/cm as shown in Table 3.5.
- The important water-soluble cations in the soil are nitrogen, phosphorus, potassium, calcium and magnesium whose concentration levels ranged from N- 13.67mg kg<sup>-1</sup> to 26.86mg kg<sup>-1</sup>, P- 1.37mg kg<sup>-1</sup> to 3.42mg kg<sup>-1</sup>, K- 39.91mg kg<sup>-1</sup> to 52.3mg kg<sup>-1</sup>, C- 1127mg/Kg- 18564mg/Kg & M- 16737mg kg<sup>-1</sup> - 22937mg kg<sup>-1</sup> respectively.
- The soil samples in the study area show loamy textures varying between Silt Loam and sandy loam. pH of the soil varies from 6.8 – 7.6 indicating slightly acidic to slightly alkaline nature. Electrical conductivity of the soil varies from 165 – 298μS/cm. The physical and chemical properties of soil is shown in the Table 3.4.



**Figure 3.7 Showing Soil Sampling Locations within 5 km Radius around Proposed Project Site**

**Table 3.4 Soil Quality of the Study Area**

| S. No                      | Parameters             | Unit                | S1        | S8                      | Minimum                                                        | Maximum | Average |
|----------------------------|------------------------|---------------------|-----------|-------------------------|----------------------------------------------------------------|---------|---------|
| <b>Physical Parameters</b> |                        |                     |           |                         |                                                                |         |         |
| 1                          | pH @ 10% solution      | -                   | 7.3       | 7.41                    | 6.8                                                            | 7.6     | 7.1     |
| 2                          | EC @ 10% solution      | μs/cm               | 165       | 212                     | 175                                                            | 298     | 232.0   |
| 3                          | Moisture               | %                   | 14.5      | 12.48                   | 12.5                                                           | 18.4    | 15.3    |
| 4                          | Texture                | -                   | Clay Loam | Clay Loam               | Sandy Clay Loam, sandy loam, silty loam, clay loam, clay loam. |         |         |
| 5                          | Sand                   | %                   | 43.60     | 25.48                   | 33.2                                                           | 72.3    | 49.2    |
| 6                          | Slit                   | %                   | 32.50     | 22.88                   | 11.3                                                           | 36.4    | 23.4    |
| 7                          | Clay                   | %                   | 23.90     | 30.16                   | 14.3                                                           | 53.1    | 27.4    |
| 8                          | Water Holding Capacity | %                   | 18.6      | -                       | 13.51                                                          | 18.9    | 16.5    |
| 9                          | Bulk Density           | g cm <sup>-3</sup>  | 1.63      | 960.0Kg/cm <sup>3</sup> | 1.25                                                           | 1.66    | 1.4     |
| <b>Chemical Parameters</b> |                        |                     |           |                         |                                                                |         |         |
| 10                         | Nitrogen (N)           | mg kg <sup>-1</sup> | 23.4      | 148.0Kg/ha              | 13.67                                                          | 26.86   | 21.3    |
| 11                         | Phosphorus (P)         | mg kg <sup>-1</sup> | 2.65      | 6.10                    | 1.37                                                           | 3.42    | 2.6     |
| 12                         | Potassium (K)          | mg kg <sup>-1</sup> | 46.8      | 710.0 Kg/ha             | 39.91                                                          | 52.3    | 45.9    |
| 13                         | Calcium (Ca)           | mg kg <sup>-1</sup> | 1250      | 630.0                   | 1127                                                           | 1856    | 1504.7  |
| 14                         | Magnesium (Mg)         | mg kg <sup>-1</sup> | 202       | 280.0                   | 167                                                            | 229     | 192.8   |
| 15                         | Sodium (Na)            | mg kg <sup>-1</sup> | 212       | -                       | 157                                                            | 263     | 195.2   |
| 16                         | Sulphur (S)            | mg kg <sup>-1</sup> | 74        | -                       | 48                                                             | 72      | 59.3    |
| 17                         | Copper (Cu)            | mg kg <sup>-1</sup> | 0.38      | 20.12ppm                | 0.26                                                           | 0.43    | 0.4     |
| 18                         | Iron (Fe)              | mg kg <sup>-1</sup> | 3.23      | 2680.0ppm               | 2.22                                                           | 3.45    | 3.0     |
| 19                         | Manganese (Mn)         | mg kg <sup>-1</sup> | 2.18      | 280.0                   | 1.69                                                           | 2.91    | 2.0     |
| 20                         | Zinc (Zn)              | mg kg <sup>-1</sup> | 1.46      | 15.68ppm                | 1.16                                                           | 1.72    | 1.4     |
| 21                         | Boron (B)              | mg kg <sup>-1</sup> | 1.36      | -                       | 0.89                                                           | 1.88    | 1.4     |
| 22                         | Organic carbon         | %                   | 0.98      | 0.70                    | 0.63                                                           | 0.9     | 0.8     |
| 23                         | Organic matter         | %                   | 1.65      | 1.55                    | 1.2                                                            | 1.62    | 1.4     |
| 24                         | CEC                    | meq/100g            | 1.63      | -                       | 1.42                                                           | 2.62    | 2.1     |

Source: Sampling Results by **Ekdant Enviro Services (P) Limited & Green link analytical & Research LAB** in Association with GTMS FAEs.

**Table 3.4a Assigning Scores to Soil Quality Indicators**

| Soil Quality Score |    |    |    |     |    |             | The Soil Requires Major and Immediate Treatment |
|--------------------|----|----|----|-----|----|-------------|-------------------------------------------------|
| S. No.             | OM | BD | pH | CEC | EC | Total Score |                                                 |
| S01                | 30 | 12 | 12 | 6   | 10 | 60          |                                                 |
| S02                | 30 | 2  | 12 | 2   | 10 | 72          |                                                 |
| S03                | 30 | 2  | 18 | 6   | 10 | 66          |                                                 |
| S04                | 30 | 2  | 18 | 6   | 10 | 72          |                                                 |
| S05                | 30 | 2  | 12 | 6   | 10 | 66          |                                                 |
| S06                | 30 | 6  | 18 | 6   | 10 | 72          |                                                 |
| S07                | 30 | 2  | 18 | 2   | 10 | 66          |                                                 |
| S08                | 30 | 12 | 12 | 6   | 10 | 60          |                                                 |

OM (Organic Matter) BD (Bulk Density) pH (Potential of Hydrogen) EC (Electrical Conductivity) Source: PSS-2262\_Soil\_Quality\_Monitoring.pdf (okstate.edu)

The soil sample result was compared to previous report on the month **Oct- 2023 to Dec- 2023** in N, P, K and EC, Density was slightly increased in soil sample for **29 May 2025**, study period because of does change based on rain season, soil test results can vary significantly between seasons. Factors like rainfall, temperature, and plant uptake influence nutrient levels and pH, making it crucial to consider seasonal variations when interpreting soil tests.

### 3.3 WATER ENVIRONMENT

The water resources, both surface and groundwater play a significant role in the development of the area. The purpose of this study is to assess the baseline quality of surface and ground water.

**Table 3.5 Water Sampling Locations**

| Sampling ID                          | Location                              | Distance (km) | Direction | Coordinates                 |
|--------------------------------------|---------------------------------------|---------------|-----------|-----------------------------|
| SW 1                                 | Addakurukki Lake                      | 0.22          | W         | 12°39'49.52"N,77°57'30.40"E |
| SW 2                                 | Thenpennai River Thirumalaigownikotta | 1.10          | SW        | 12°39'14.16"N, 77°57'4.70"E |
| SW 3                                 | Kamandoddi Lake                       | 2.82          | NW        | 12°40'52.34"N,77°56'48.04"E |
| BW 1                                 | Chappadi                              | 1.44          | E         | 12°39'33.01"N,77°58'32.15"E |
| BW 2                                 | Addraganapalli                        | 4.08          | NE        | 12°40'17.40"N,77°59'52.27"E |
| BW 3                                 | Kamandoddi                            | 3.73          | NW        | 12°41'5.77"N, 77°56'16.43"E |
| OW 1                                 | Thuppuganapalli                       | 3.32          | SW        | 12°37'54.20"N,77°56'42.45"E |
| Green link analytical & Research LAB |                                       |               |           |                             |
| SW4                                  | Addakurukki Lake                      | 0.22          | W         | 12°39'50.47"N,77°57'28.92"E |
| OW2                                  | Nearby Core                           | 0.38          | W         | 12°39'33.21"N,77°57'24.98"E |
| BW4                                  | Nearby Core                           | 0.51          | SW        | 12°39'15.94"N,77°57'26.03"E |

Source: Sampling Results by Ekdant Enviro Services (P) Limited, and Green link analytical & Research LAB in Association with GTMS.

### 3.3.1 Ground Water Quality Result

#### 3.3.1.1 Physical Parameter of ground water:

The basic physical parameters of water include

##### **Colour:**

- Value observed in Project Site (True/Apparent Color): 1 Hazen unit.
- Acceptable and permissible limits: 5 Hazen units and 15 Hazen units respectively. The value in the project site is as same as the acceptable limits prescribed by IS 10500: 2012 (referred as “*Standards*” from herein).

##### **Odour & Taste:**

- The water is odour less. The taste of the water is slightly salty which is due to the presence of hardness in water which is attributed to the presence of calcium and magnesium in the water. As per the standards the odour and taste should be agreeable.

##### **pH:**

- Value observed in the Project Site: Min.-6.9 & Max. 7.3 mg/L.
- Acceptable and permissible limits: 6.5-8.5. The pH value is the measure of acid – base equilibrium. The value of pH in the project site clearly indicates that water is neutral in nature.

##### **Turbidity:**

- Value observed in the Project Site: less than 1.
- Acceptable and permissible limits: 1 NTU & 5 NTU respectively. The value of turbidity generally indicates the presence of phytoplankton and other sediments.

##### **Total Dissolved Solids:**

- Value observed in the Project Site: Min.-592 & Max. 807 mg/L.
- Acceptable and permissible limits: 500 mg/L and 2000 mg/L respectively.
- TDS is the presence of inorganic salts and small amounts of organic matter present in the water.

#### 3.3.1.2 Chemical parameters of water:

The chemical parameters of the drinking water include,

##### **Calcium:**

- Value observed in Min.- 51 & Max.94 mg/L.
- Acceptable and permissible limits: 75mg/L and 200 mg/L respectively.
- Calcium is an essential macronutrient. The value of the calcium is within the prescribed permissible standards. The higher level of calcium may cause hardening in domestic equipment and will also reduce the detergent efficiency. Higher levels of calcium will lead to constipation, gas, and bloating. Apart from that, extra calcium may also increase the risk of kidney stones. If the calcium deposit in blood is high, it may lead to hypercalcemia.

**Magnesium:**

- Value observed in Min.- 17 & Max. 49 mg/L.
- Acceptable and permissible limits: 30 mg/L and 100 mg/L respectively.
- The value of Magnesium in the project site is below in acceptable limit and less than the permissible limit. The increase in the level of magnesium will cause diarrhea and vomiting in children.

**Chloride**

- Value observed in Min.- 174 & Max. 310 mg/L.
- Acceptable and permissible limits: 250 mg/L and 1000 mg/L respectively.
- The chloride level in the project site is within the acceptable and permissible limit. If the level of chloride is more, it may cause galvanic and pitting corrosion, increases level of metals. It imparts bitter taste to the water.

**Total Alkalinity as CaCO<sub>3</sub>:**

- Value observed in 196 mg/L.
- Acceptable and permissible limits: 200 mg/L and 600 mg/L respectively.
- Total Alkalinity is the measure of the concentration of all alkaline substances dissolved in the water which includes carbonates, bicarbonates and hydroxides, which will impart soda taste to the water. The value of the total alkalinity is within acceptable and permissible limits in the project site.

**Hardness:**

- Value observed in Min.- 610 & Max. 824 mg/L.
- Acceptable and permissible limits: 200 mg/L and 600 mg/L respectively.
- The value of Hardness in the project site is higher than acceptable and permissible limit. The increase in the level of hardness may cause corrosion and scaling problems, increased soap consumption and it also contributes to the salty taste of water.

**3.3.2 Surface Water**

**Inference:** The surface water quality is compared with the CPCB Water Quality Criteria against A, B, C, D & E class of water. From the test result, it is found that both the water does not fit Class A (Drinking Water Source without conventional treatment but after disinfection). But they can be used for outdoor bathing as it meets the requirements shown for class B water.

Surface and ground water quality result are more or less same as compared to previous report. TDS, EC and hardness was slightly increased in ground water for 29 May 2025, study period because of water quality does change based on season, primarily due to fluctuations in temperature, precipitation and sunlight. These changes can affect factors like dissolved oxygen, pH, and nutrient levels. The warmer temperatures in summer can lead to increased TDS, EC and Total Hardness (TH). Conversely, increased rainfall in certain seasons can dilute hard water minerals.



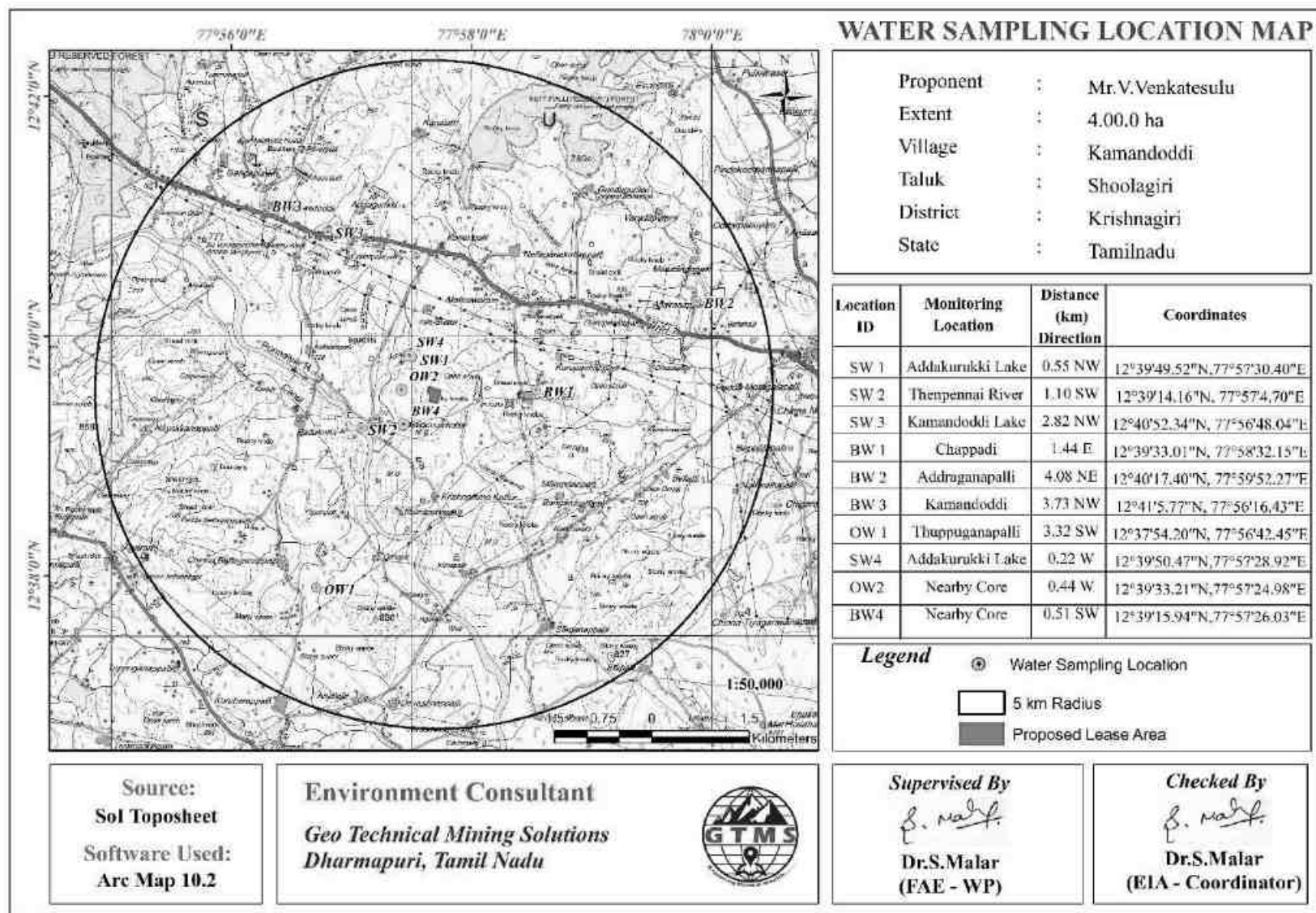


Figure 3.8 Map Showing Water Sampling Locations within 5 km Radius around Proposed Project Site

**Table 3.6 Ground Water Quality Result**

| S. No | Parameters                          | Units     | Ground Water Samples |           |           | 10500:2012<br>(Acceptable)                      | 10500:2012<br>(Permissible)                     |
|-------|-------------------------------------|-----------|----------------------|-----------|-----------|-------------------------------------------------|-------------------------------------------------|
|       |                                     |           | Mini                 | Max       | Avg       |                                                 |                                                 |
| 1     | Colour                              | CU        | 1                    | 1         | 1         | 5                                               | 15                                              |
| 2     | Odour                               | --        | Agreeable            | Agreeable | Agreeable | Agreeable                                       | Agreeable                                       |
| 3     | Turbidity                           | NTU       | ≤1                   | ≤1        | ≤1        | 5                                               | 15                                              |
| 4     | EC @ 25°C                           | μS/Cm     | 986                  | 1349      | 1176.8    | -                                               | -                                               |
| 5     | TDS                                 | mg/l      | 592                  | 807       | 702.8     | 500                                             | 2000                                            |
| 6     | pH value @ 25°C                     | --        | 6.9                  | 7.3       | 7.0       | 6.5-8.5                                         | 6.5-8.5                                         |
| 7     | TH (CaCO <sub>3</sub> )             | mg/l      | 610                  | 824       | 722.6     | 200                                             | 600                                             |
| 8     | Calcium (Ca)                        | mg /l     | 51                   | 94        | 67.3      | 75                                              | 200                                             |
| 9     | Magnesium (Mg)                      | mg/l      | 17                   | 49        | 32.1      | 30                                              | 100                                             |
| 10    | Sodium (Na)                         | mg/l      | 13                   | 32        | 23.3      | 50                                              | 200                                             |
| 11    | Potassium (K)                       | mg/l      | 2                    | 7         | 4.5       | 12                                              | 12                                              |
| 12    | Biocarbonate<br>(HCO <sub>3</sub> ) | mg/l      | 49                   | 82        | 65.1      | 50                                              | 400                                             |
| 13    | Sulphates (SO <sub>4</sub> )        | mg/l      | 178                  | 267       | 219.3     | 200                                             | 400                                             |
| 14    | Chloride (Cl)                       | mg /l     | 174                  | 310       | 256.1     | 250                                             | 1000                                            |
| 15    | Nitrate (NO <sub>3</sub> )          | mg /l     | 11                   | 19        | 15        | 45                                              | 45                                              |
| 16    | Fluoride (F)                        | mg /l     | 1.1                  | 1.4       | 1.2       | 1                                               | 1.5                                             |
| 17    | <i>Coliforms Bacteria</i>           | MPN/100ml | Present              | Present   | Present   | Shall not be detectable in<br>any 100 ml sample | Shall not be detectable in any<br>100 ml sample |
| 18    | <i>E.Coli</i>                       | MPN/100ml | Absent               | Absent    | Absent    | Shall not be detectable in<br>any 100 ml sample | Shall not be detectable in any<br>100 ml sample |

Source: Sampling Results by Ekdant Enviro Services (P) Limited, in association with GTMS.

**Table 3.6a Surface Water Quality Results**

| S. No. | Parameters                      | Units                | RESULTS   |           |           | CPCB designated best use |
|--------|---------------------------------|----------------------|-----------|-----------|-----------|--------------------------|
|        |                                 |                      | Min       | Max       | Avg       |                          |
| I      | Physical Parameters             |                      |           |           |           |                          |
| 1.     | Color                           | Hazen                | 1         | 2         | 1.6       | 300                      |
| 2.     | Odor                            | -                    | Agreeable | Agreeable | Agreeable | Not specified            |
| 3.     | pH@ 25°C                        | -                    | 6.9       | 7.3       | 7.1       | 6.5-8.5                  |
| 4.     | Turbidity                       | NTU                  | 2         | 3         | 2.6       | 10                       |
| 5.     | Electrical conductivity @ 25°C  | µS/Cm                | 956       | 1083      | 1015.2    | Not specified            |
| II     | Chemical Parameters             |                      |           |           |           |                          |
| 6.     | TDS                             | mg /l                | 583       | 668       | 622.6     | 1500                     |
| 7.     | Total Hardness                  | mg/l                 | 176       | 294       | 234.8     | Not specified            |
| 8.     | Calcium (Ca)                    | mg/l                 | 65        | 84        | 73.8      | Not specified            |
| 9.     | Magnesium (Mg)                  | mg/l                 | 29        | 39        | 34.2      | Not specified            |
| 10.    | Sodium (Na)                     | mg/l                 | 59        | 71        | 64        | 200(WHO)                 |
| 11.    | Potassium (K)                   | mg/l                 | 3         | 5         | 4         | 3                        |
| 12.    | Bicarbonate (HCO <sub>3</sub> ) | mg/l                 | 59        | 67        | 62.6      | 400(WHO)                 |
| 13.    | Sulphate (SO <sub>4</sub> )     | mg/l                 | 122       | 142       | 132       | 400                      |
| 14.    | Chloride (Cl)                   | mg/l                 | 196       | 234       | 218.8     | 600                      |
| 15.    | Nitrates (NO <sub>3</sub> )     | mg/l                 | 21        | 29        | 24.8      | 50                       |
| 16.    | Fluoride (F)                    | mg /l                | 0         | 0         | 0         | 1.5                      |
| 17.    | BOD3days@ 27°C                  | mg O <sub>2</sub> /l | 1         | 3         | 2         | 5                        |
| 18.    | COD                             | mg O <sub>2</sub> /l | 2         | 6         | 4         | 20                       |
| III    | Biological Parameters           |                      |           |           |           |                          |
| 19     | <i>Total Coliform</i>           | MPN/100ml            | Present   | Present   | Present   | 5000                     |
| 20     | <i>Escherichia Coli</i>         | MPN/100ml            | Present   | Present   | Present   | Not specified            |

Source: Sampling Results by Ekdant Enviro Services (P) Limited, in association with GTMS.

**Table 3.7 Water Quality Results**

| S. No. | Parameters      | Units | Results |        |        |
|--------|-----------------|-------|---------|--------|--------|
|        |                 |       | SW1     | OW1    | BW1    |
| 1      | pH value @ 25°C | No.   | 7.62    | 7.58   | 7.88   |
| 2      | TDS             | mg/l  | 96.0    | 1020.0 | 1350.0 |
| 3      | EC @ 25°C       | µS/cm | 150.0   | 1410.0 | 1660.0 |
| 4      | Turbidity       | NTU   | <0.1    | <0.1   | <0.1   |
| 5      | Colour          | Hazen | <1.0    | <1.0   | <1.0   |
| 6      | Calcium (Ca)    | mg /l | 8.81    | 100.2  | 120.2  |
| 7      | Magnesium (Mg)  | mg/l  | 4.37    | 65.66  | 68.09  |
| 8      | Chlorides (Cl)  | mg /l | 15.6    | 168.0  | 175.0  |

|    |                                       |        |             |              |              |
|----|---------------------------------------|--------|-------------|--------------|--------------|
| 9  | Sulphates (SO <sub>4</sub> )          | mg/l   | 4.80        | 70.0         | 74.0         |
| 10 | Silica (as SiO <sub>2</sub> )         | mg/l   | 3.60        | 18.5         | 20.1         |
| 11 | Total Residual Chlorine               | mg/l   | BDL(DL-0.1) | BDL(DL-0.1)  | BDL(DL-0.1)  |
| 12 | Sodium (Na)                           | mg/l   | 2.95        | 50.4         | 54.1         |
| 13 | Total Hardness (CaCO <sub>3</sub> )   | mg/l   | 40.0        | 520.0        | 580.0        |
| 14 | Total Alkalinity (CaCO <sub>3</sub> ) | mg/l   | 56.0        | 180.0        | 196.0        |
| 15 | Fluoride (F)                          | mg/l   | BDL(DL-0.1) | 0.75         | 0.84         |
| 16 | Odour                                 | -      | Agreeable   | Agreeable    | Agreeable    |
| 17 | Taste                                 | -      | Agreeable   | Disagreeable | Disagreeable |
| 18 | Total Solids                          | mg/l   | 104.0       | 1048.0       | 1396.0       |
| 19 | Dissolved Oxygen                      | mg/l   | 5.80        | 5.2          | 5.5          |
| 20 | Phosphorous                           | mg/l   | 0.54        | 2.32         | 2.18         |
| 21 | Potassium                             | mg/l   | BDL(DL-0.1) | 11.6         | 10.5         |
| 22 | Nitrite (NO <sub>2</sub> )            | mg/l   | BDL(DL-0.1) | BDL(DL-0.1)  | BDL(DL-0.1)  |
| 23 | Phenolphthalein Alkalinity            | mg/l   | Nil         | 20.2         | 24.1         |
| 24 | <i>Total Coliform</i>                 | CFU/ml | Present     | Absent       | Absent       |
| 25 | <i>Escherichia Coli</i>               | CFU/ml | Present     | Absent       | Absent       |

CFU: Colony Forming Uni, BDL: Below Detectable level, DL: Detectable level

Source: Sampling Results by **Greenlink Analytical and Research Laboratory (India) Private Ltd**, in association with GTMS

### 3.3.3 Hydrogeology

Krishnagiri district is underlined by Archaean crystalline formations with Recent alluvial deposits of limited areal extent and thickness along the courses of major rivers (Plate-II). The occurrence and movement of ground water are controlled by various factors such as physiography, climate, geology and structural features. Weathered, and fractured crystalline rocks constitute the important aquifer systems in the district.

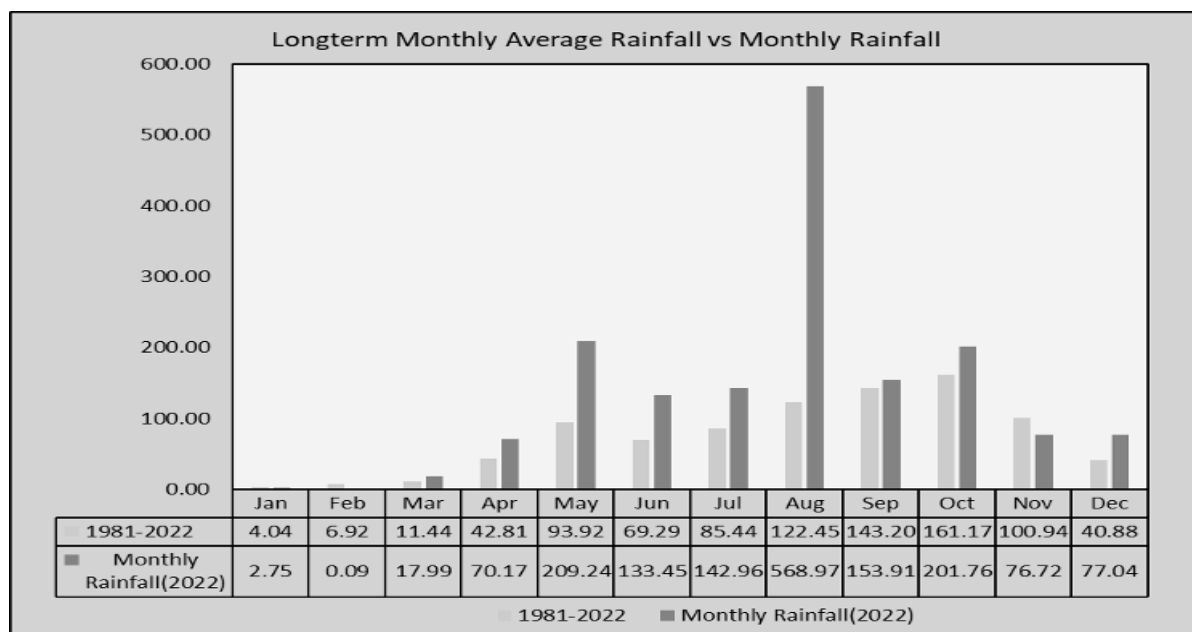
Ground water generally occurs under phreatic conditions in the weathered mantle and under semi-confined conditions in the fractured zones at deeper levels. The thickness of weathered zones in the district ranges from less than a meter to more than 15m. The yield of large diameter dug wells in the district, tapping the weathered mantle of crystalline rocks ranges from 100 to 500 lpm. These wells normally sustain pumping for 2 to 6 hours per day, depending upon the local topography and characteristics of the weathered mantle.

The depth to water level (DTW) during pre-monsoon (May 2006) ranged between 0.5 and 9.9 m bgl (Plate-III) in the district. In major part of the district the DTW is more than 5.5 mbgl. Whereas it ranged between 2 and 9.9 m bgl (Plate-IV) during post monsoon, in the district and the DTW is in the range of 5 – 10 m bgl in the entire district except a few isolated pockets.

The yield of successful exploratory wells drilled in the district ranged from 0.78 lps to 26 lps. As per the studies the wells drilled in granitic gneiss have higher yields than the wells drilled in charnockites. The specific capacity of the wells ranged from 1.2 to 118.0 lpm/m/dd. The piezometric head of fracture zones varied between 0.50 and 18.45 m bgl.

### 3.3.3.1 Rainfall

Rainfall data for the study area were collected for the period of 1981-2021([POWER | Data Access Viewer \(nasa.gov\)](#)). Long term monthly average rainfall was estimated from the data of 1981-2021 and compared with the monthly rainfall for the year 2022, shown in Figure 3.8. The Figure 3.9 shows that rainfall is generally high in the months of September through November in every year. Particularly, rainfall in April through August and October of 2022 is higher than the previous years.



**Figure 3.9 Long-Term Monthly Average Rainfall Vs Monthly Rainfall**

### 3.3.3.2 Groundwater Levels and Flow Direction

Data regarding depth to groundwater levels are essential to infer the direction of groundwater movement within the study area. Knowledge of groundwater flow direction is must in choosing location for background groundwater quality monitoring well and in locating recharge and discharge areas. Therefore, data regarding groundwater elevations were collected from 9 open wells and 8 bore wells at various locations within 2 km radius around the proposed project sites for the period from March through May 2023 (Pre-Monsoon Season) and from October through December 2023, (Post Monsoon Season).

The open well water level data thus collected onsite are provided in Tables 3.8 and 3.9. According to the data, average depths to the static water table in open wells range from 18.96 to 21.00 m BGL in pre monsoon and 14.33 to 16.00 m BGL in post 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 (Post-Monsoon Season) vary from 62.3 to 65.8 m and from 72.7 to 75.5 m for the period of March

through May, (Pre- Monsoon Season). Data on the depths to static water table and potentiometric surface were used to draw contour lines connecting groundwater elevation (also known as equipotential hydraulic head) to determine the groundwater flow direction perpendicular to the contour lines.

From the maps of open well groundwater flow direction shown in Figures 3.11, it is understood that most of the open well groundwater for the post- and pre-monsoon seasons flows towards the open well number 5 located in northwestern direction of the proposed project site. The groundwater flow maps in Figures 3.10-3.12&3.13 show that most of the bore well groundwater for the post- and pre-monsoon seasons flow towards the bore well number 5 and 7. It is located in northwestern and northern direction of the proposed project site. On the basis of the groundwater flow information, both open wells and bore wells mentioned above can be chosen for water quality monitoring purpose as the wells may get easily affected by the contaminants resulting from the mining activities of the sites in future.

**Table 3.8 Pre-Monsoon Water Level of Open Wells within 2 km Radius**

| Station ID | Depth to Water Table BGL (m) |          |          |         | Latitude      | Longitude     |
|------------|------------------------------|----------|----------|---------|---------------|---------------|
|            | Mar-2023                     | Apr-2023 | May-2023 | Average |               |               |
| DW01       | 20.5                         | 21.2     | 23.1     | 21.60   | 12°40'0.87"N  | 77°57'30.30"E |
| DW02       | 20.9                         | 21.9     | 22.9     | 21.90   | 12°39'33.86"N | 77°57'13.16"E |
| DW03       | 20.6                         | 21.1     | 22.8     | 21.50   | 12°39'7.81"N  | 77°58'6.75"E  |
| DW04       | 20.9                         | 21.8     | 22.1     | 21.60   | 12°40'26.24"N | 77°56'54.48"E |
| DW05       | 20.1                         | 21.6     | 22.8     | 21.50   | 12°40'29.04"N | 77°58'16.29"E |
| DW06       | 20.8                         | 21.5     | 22.9     | 21.73   | 12°39'49.31"N | 77°58'17.34"E |
| DW07       | 20.2                         | 25.8     | 26.8     | 24.27   | 12°39'17.57"N | 77°57'23.30"E |
| DW08       | 20.5                         | 24.9     | 27.1     | 24.17   | 12°39'46.96"N | 77°56'52.12"E |
| DW09       | 20.90                        | 24.5     | 26.7     | 24.03   | 12°39'0.05"N  | 77°56'50.38"E |

Source: Onsite monitoring data

**Table 3.9 Post-Monsoon Water Level of Open Wells within 2 km Radius**

| Station ID | Depth to Water Table BGL(m) |         |         |         | Latitude      | Longitude     |
|------------|-----------------------------|---------|---------|---------|---------------|---------------|
|            | Oct2023                     | Nov2023 | Dec2023 | Average |               |               |
| DW01       | 19.2                        | 17.5    | 16.2    | 17.63   | 12°40'0.87"N  | 77°57'30.30"E |
| DW02       | 19.3                        | 17.1    | 16.5    | 17.63   | 12°39'33.86"N | 77°57'13.16"E |
| DW03       | 19.7                        | 18.9    | 16.8    | 18.47   | 12°39'7.81"N  | 77°58'6.75"E  |
| DW04       | 19.6                        | 18.2    | 16.4    | 18.07   | 12°40'26.24"N | 77°56'54.48"E |

|      |       |      |      |       |               |               |
|------|-------|------|------|-------|---------------|---------------|
| DW05 | 19.8  | 19.1 | 16.9 | 18.60 | 12°40'29.04"N | 77°58'16.29"E |
| DW06 | 19.8  | 18.9 | 16.2 | 18.30 | 12°39'49.31"N | 77°58'17.34"E |
| DW07 | 19.2  | 19.3 | 16.5 | 18.33 | 12°39'17.57"N | 77°57'23.30"E |
| DW08 | 20.1  | 19.1 | 16.1 | 18.43 | 12°39'46.96"N | 77°56'52.12"E |
| DW09 | 20.90 | 18.5 | 16.9 | 18.77 | 12°39'0.05"N  | 77°56'50.38"E |

Source: Onsite monitoring data

**Table 3.10 Pre-Monsoon Water Level of Bore Wells within 2 km Radius**

| Station ID | Depth to Potentiometric Surface BGL(m) |          |          |         | Latitude      | Longitude     |
|------------|----------------------------------------|----------|----------|---------|---------------|---------------|
|            | Mar-2023                               | Apr-2023 | May-2023 | Average |               |               |
| BW01       | 76.5                                   | 78.9     | 81.28    | 78.89   | 12°39'19.01"N | 77°57'10.95"E |
| BW02       | 76.1                                   | 79.1     | 82.1     | 78.89   | 12°39'55.46"N | 77°56'39.13"E |
| BW03       | 75.9                                   | 78.3     | 82.5     | 78.90   | 12°40'8.01"N  | 77°58'34.34"E |
| BW04       | 75.2                                   | 78.5     | 83.2     | 78.97   | 12°39'48.40"N | 77°58'44.93"E |
| BW05       | 75.6                                   | 78.9     | 83.1     | 79.20   | 12°39'29.29"N | 77°58'28.02"E |
| BW06       | 75.4                                   | 78.5     | 82.4     | 78.77   | 12°38'46.68"N | 77°57'39.25"E |
| BW07       | 76.1                                   | 78.6     | 83.4     | 79.37   | 12°40'15.79"N | 77°57'43.22"E |
| BW08       | 76.5                                   | 79.2     | 82.1     | 79.27   | 12°39'55.99"N | 77°57'16.26"E |
| BW09       | 75.1                                   | 78.5     | 81.8     | 78.47   | 12°40'43.52"N | 77°57'29.48"E |

Source: Onsite monitoring data

**Table 3.11 Post-Monsoon Water Level of Bore Wells within 2 km Radius**

| Station ID | Depth to Potentiometric Surface BGL(m) |          |          |         | Latitude      | Longitude     |
|------------|----------------------------------------|----------|----------|---------|---------------|---------------|
|            | Oct-2023                               | Nov-2023 | Dec-2023 | Average |               |               |
| BW01       | 85                                     | 82       | 79.2     | 82.07   | 12°39'19.01"N | 77°57'10.95"E |
| BW02       | 86.1                                   | 83.1     | 79.1     | 82.77   | 12°39'55.46"N | 77°56'39.13"E |
| BW03       | 85.2                                   | 82.1     | 78.1     | 81.80   | 12°40'8.01"N  | 77°58'34.34"E |
| BW04       | 84.9                                   | 81.9     | 78.5     | 81.77   | 12°39'48.40"N | 77°58'44.93"E |
| BW05       | 85                                     | 82.5     | 78.6     | 82.03   | 12°39'29.29"N | 77°58'28.02"E |
| BW06       | 85.6                                   | 82.6     | 78.5     | 82.23   | 12°38'46.68"N | 77°57'39.25"E |
| BW07       | 84.2                                   | 82.2     | 78.9     | 81.77   | 12°40'15.79"N | 77°57'43.22"E |
| BW08       | 85.6                                   | 82.1     | 79.1     | 82.27   | 12°39'55.99"N | 77°57'16.26"E |
| BW09       | 85.2                                   | 79.8     | 78.5     | 81.17   | 12°40'43.52"N | 77°57'29.48"E |

Source: Onsite monitoring data



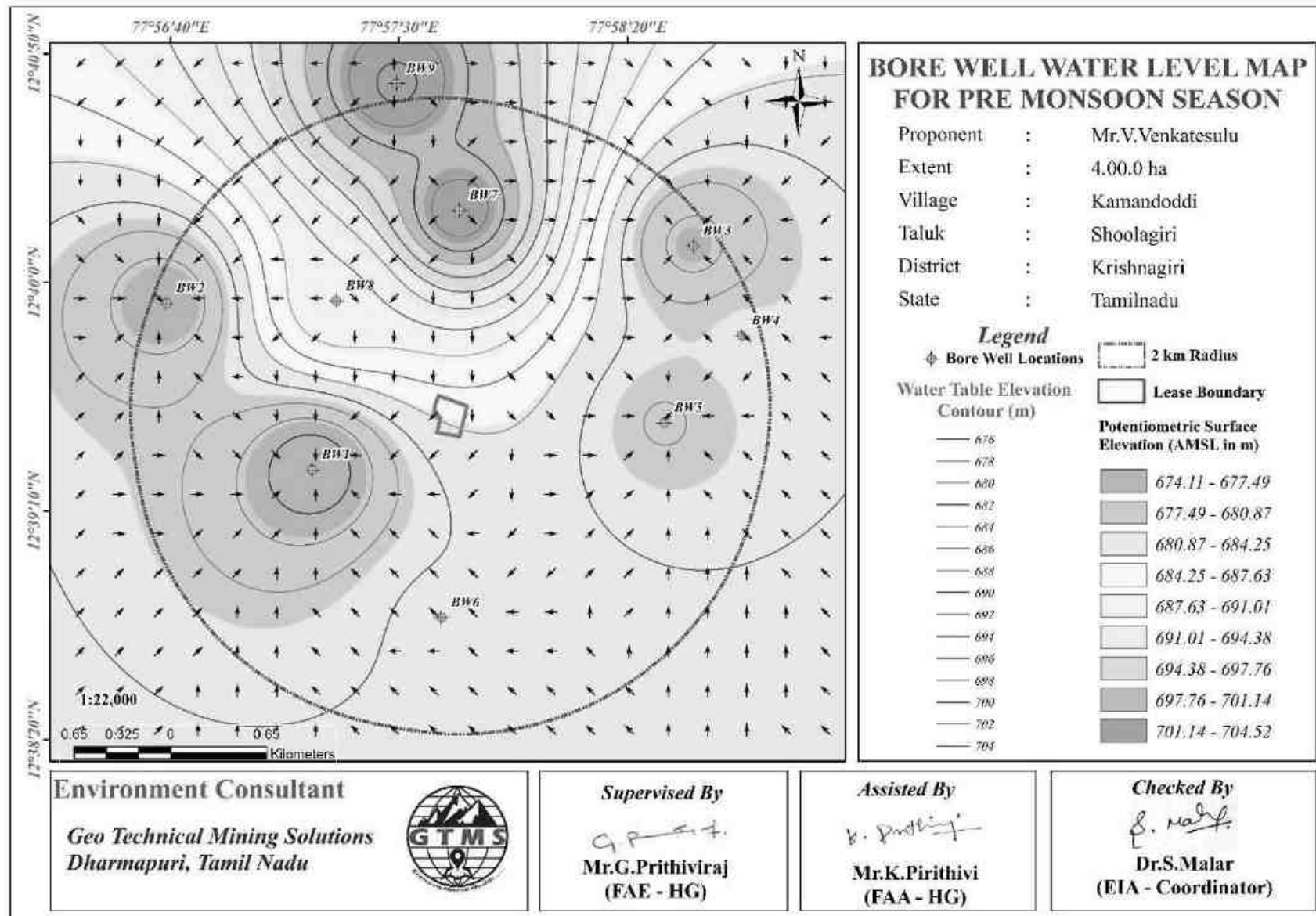


Figure 3.10 Open Well Static Groundwater Elevation Map Showing Direction of Groundwater Flow during Pre- Monsoon Season

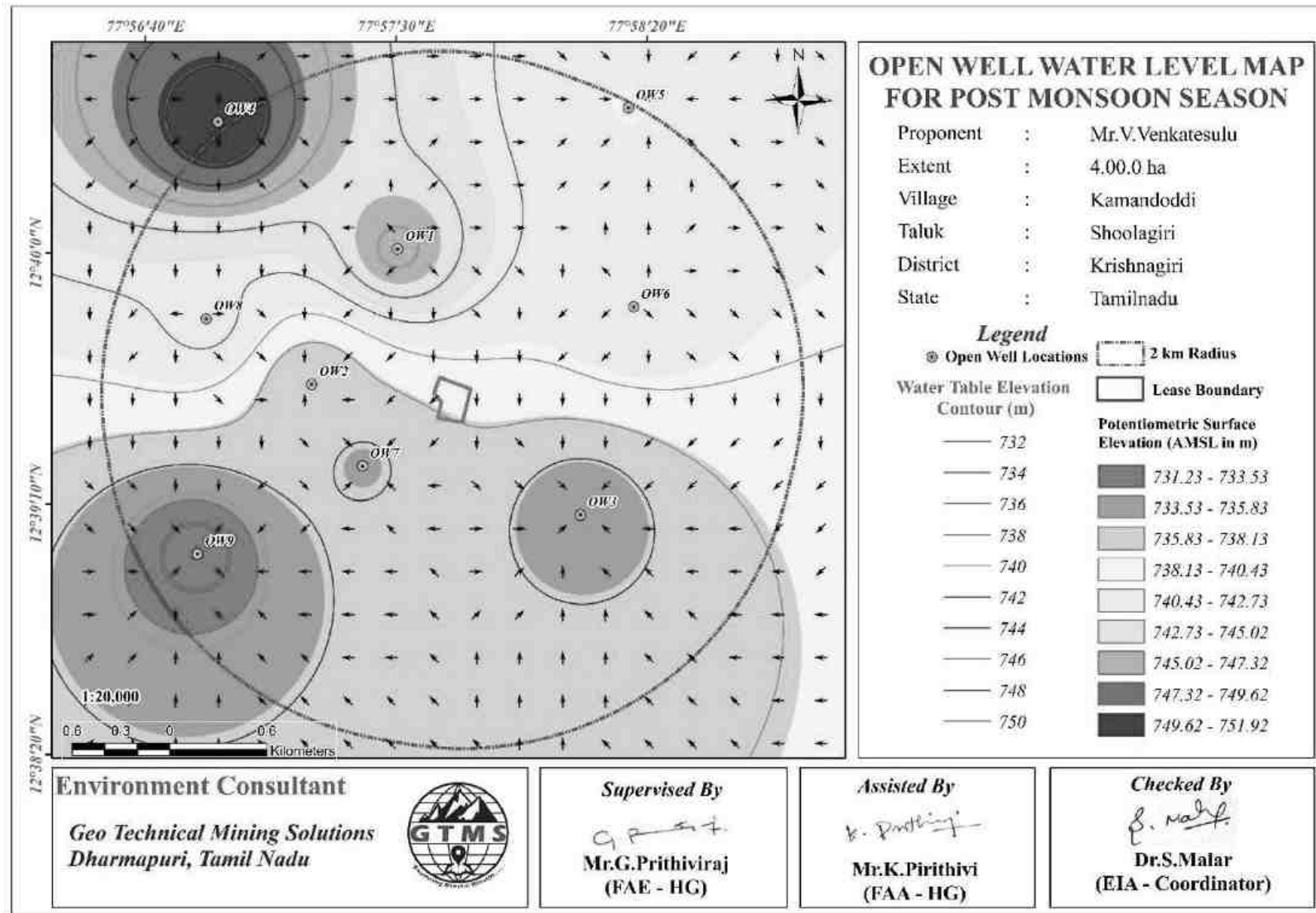


Figure 3.11 Open Well Static Groundwater Elevation Map Showing Direction of Groundwater Flow during Post-Monsoon Season

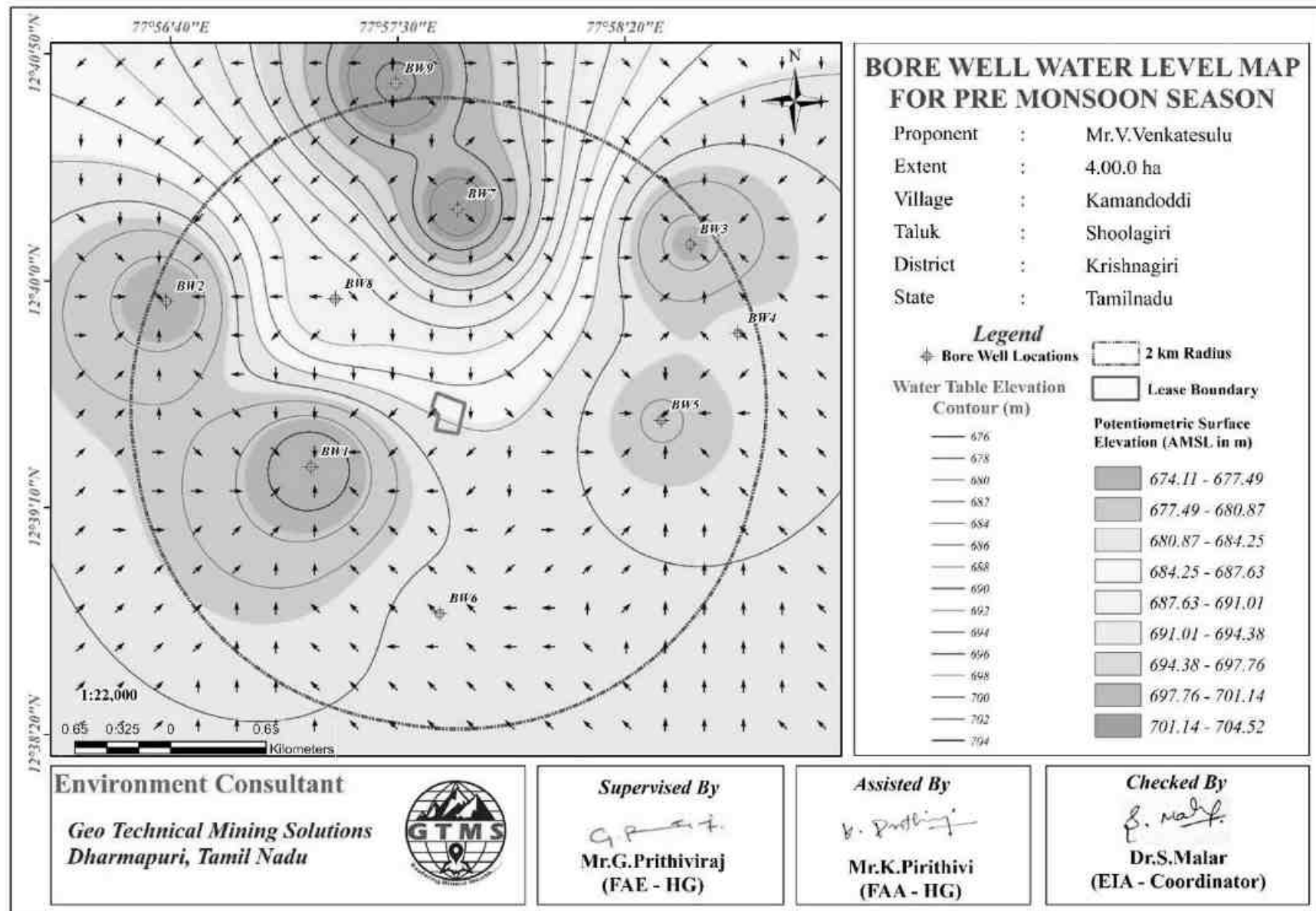


Figure 3.12 Borewell Static Groundwater Elevation Map Showing Direction of Groundwater Flow during Pre-Monsoon Season

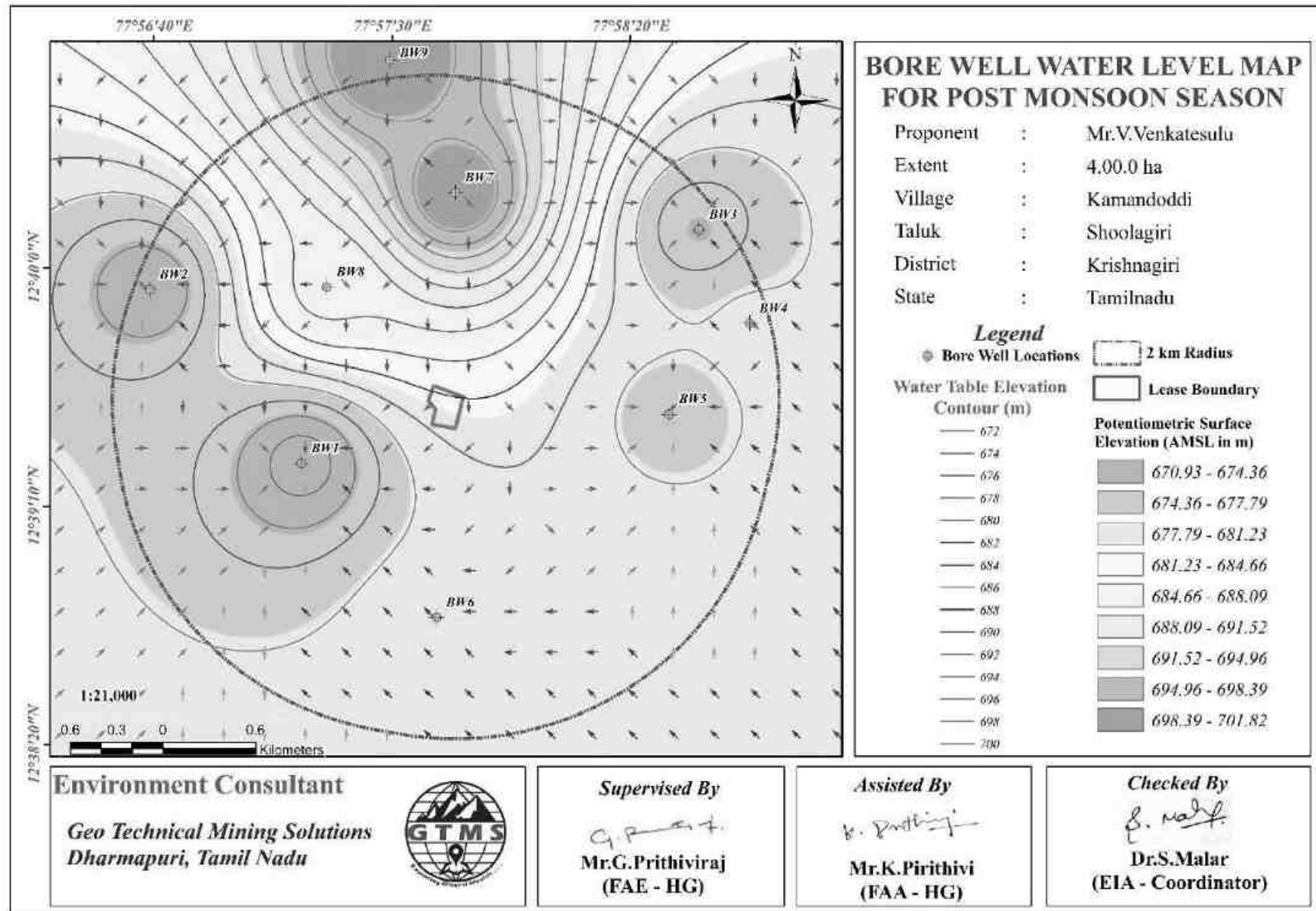


Figure 3.13 Borewell Static Groundwater Elevation Map Showing Direction of Groundwater Flow during Post-Monsoon Season

### 3.3.3.3 Electrical Resistivity Investigation

Electrical resistivity investigation is especially useful in the areas where there are no adequate exploratory well data about the aquifer conditions. The present study makes use of vertical electric sounding (VES) to delineate earth's subsurface layers. The electrical resistivity investigation uses four electrodes set up where current is sent through outer electrodes into the ground and the inner electrodes measure the potential difference.

#### Soil Resistivity

In a geophysical survey report, soil resistance, also known as earth resistivity, refers to the ability of the soil to resist the flow of an electric current. This property is influenced by factors like soil composition, water content, and the arrangement of voids. Resistivity surveys use electrical current to map subsurface variations, helping to identify features like buried structures, geological formations, and water table depths.

In this study area the soil resistance is very high, so in rainy season the water will be not seepage in the shallow depth and not through intrusion to water table. Identified the aquifer for proposed mining area through the geophysical investigation the water table thickness is 80m below ground level, the proposed ultimate mining depth is 55m below ground level. So, this mining activity is not disturbing to the ground water table through entire mining periods.

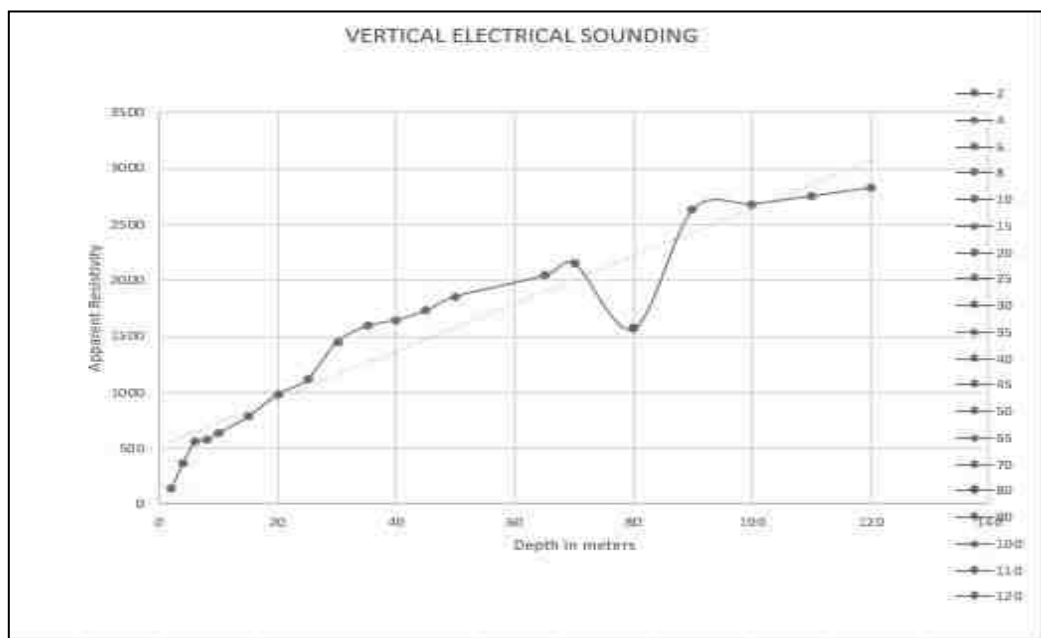
#### Result

The Geophysical VES data obtained from the project site have been shown in Table 3.12. The field data obtained from a detailed geophysical investigation were plotted using excel spreadsheet for interpretation. The plot for the purpose of interpretation has been shown in Figure 3.14.

**Table 3.12 Vertical Electrical Sounding Data**

| Location Coordinates - 12°39'33.53"N 77°57'42.74"E |             |             |                           |                           |                                       |
|----------------------------------------------------|-------------|-------------|---------------------------|---------------------------|---------------------------------------|
| S. No.                                             | AB/2<br>(m) | MN/2<br>(m) | Geometrical<br>Factor (G) | Resistance in<br>$\Omega$ | Apparent<br>Resistivity in $\Omega m$ |
| 1                                                  | 2           | 2           | 11.78                     | 12.44                     | 146.5                                 |
| 2                                                  | 4           | 2           | 49.46                     | 7.42                      | 367.04                                |
| 3                                                  | 6           | 5           | 112.26                    | 4.98                      | 559.28                                |
| 4                                                  | 8           | 5           | 200.18                    | 2.86                      | 572.71                                |
| 5                                                  | 10          | 5           | 75.36                     | 8.49                      | 640.03                                |
| 6                                                  | 15          | 10          | 173.49                    | 4.53                      | 786.42                                |
| 7                                                  | 20          | 10          | 310.86                    | 3.18                      | 987.56                                |

|    |     |    |        |      |         |
|----|-----|----|--------|------|---------|
| 8  | 25  | 10 | 487.49 | 2.29 | 1118.76 |
| 9  | 30  | 10 | 274.75 | 5.28 | 1451.78 |
| 10 | 35  | 10 | 376.8  | 4.22 | 1590.54 |
| 11 | 40  | 10 | 494.55 | 3.33 | 1649.12 |
| 12 | 45  | 10 | 628    | 2.75 | 1729.18 |
| 13 | 50  | 10 | 777.15 | 2.39 | 1857.16 |
| 14 | 65  | 20 | 453.6  | 4.50 | 2041.05 |
| 15 | 70  | 20 | 989.1  | 2.17 | 2149.5  |
| 16 | 80  | 20 | 1256   | 1.25 | 1567.45 |
| 17 | 90  | 20 | 1554.3 | 1.69 | 2630.93 |
| 18 | 100 | 20 | 1653.6 | 1.62 | 2680.44 |



**Figure 3.14 Graph Showing Occurrence of Water Bearing Fracture Zones at the Depth of 80m Below Ground Level in Proposed Project**

The rock formation of low resistivity values indicates occurrence of water at the depth of about 80m below ground level. The maximum depth proposed for the proposed project is 55m below ground level. Therefore, the mining operation will not affect the aquifer throughout the entire mine life period.

### 3.4 AIR ENVIRONMENT

The baseline studies on air environment include identification of specific air pollutants and their existing levels in ambient air. The sources of air pollution in the region are mostly due to vehicular traffic, dust arising from unpaved village road and domestic & agricultural activities.

#### 3.4.1 Meteorology

Meteorological data was collected near the mine lease area for the period of October to December 2023 to assess site-specific climatic conditions. Additionally, secondary data for the same period over the past four years was sourced from the NASA Power Data Access Viewer. This meteorological analysis provides vital information on prevailing weather patterns, particularly the predominant downwind direction, which is essential for forecasting the potential increase in pollution levels resulting from project-related activities.

#### 3.4.2 Secondary Data

Secondary data from NASA Power Data Access Viewer has been collected for wind, wind speed, wind direction, humidity and temperature. The Monthly maximum, minimum and average values are collected for all the parameters. Significant parameters are summarized in table 3.13.

**Table 3.13 Onsite Meteorological Data**

| S. No. | Parameters              |     | OCT,2023 | NOV,2023 | DEC,2023 |
|--------|-------------------------|-----|----------|----------|----------|
| 1      | Temperature (°C)        | Min | 21.01    | 20.08    | 17.73    |
|        |                         | Max | 37.13    | 32.82    | 32.26    |
|        |                         | Avg | 27.98    | 26.06    | 24.67    |
| 2      | Relative Humidity (%)   | Min | 26.06    | 46.12    | 40.19    |
|        |                         | Max | 99.62    | 100.00   | 100.00   |
|        |                         | Avg | 70.38    | 82.75    | 80.15    |
| 3      | Wind Speed (m/s)        | Min | 0.04     | 0.50     | 0.80     |
|        |                         | Max | 9.41     | 6.92     | 7.37     |
|        |                         | Avg | 2.31     | 2.63     | 3.18     |
| 4      | Wind Direction (degree) | Min | 0.00     | 0.00     | 0.12     |
|        |                         | Max | 359.75   | 359.23   | 359.22   |
|        |                         | Avg | 158.80   | 81.51    | 111.69   |
| 5      | Surface Pressure(kPa)   | Min | 98.03    | 98.24    | 97.98    |
|        |                         | Max | 98.98    | 99.07    | 99.42    |
|        |                         | Avg | 98.59    | 98.66    | 98.64    |

Source: On-site monitoring/sampling by **Excellence Laboratory** in association with GTMS

## Secondary Data Wind Pattern

Wind pattern will largely influence the dispersion pattern of air pollutants and noise from the proposed project site. Analysis of wind pattern requires hourly site-specific data of wind speed and direction. The wind rose were generated: historical seasonal wind rose for the period of October to December of the years from 2019 to 2023. The wind rose diagrams thus produced are shown in Figures 3.15 and 3.15a.

- ❖ Predominant wind was dominant in the directions ranging from Northeast to Southeast.

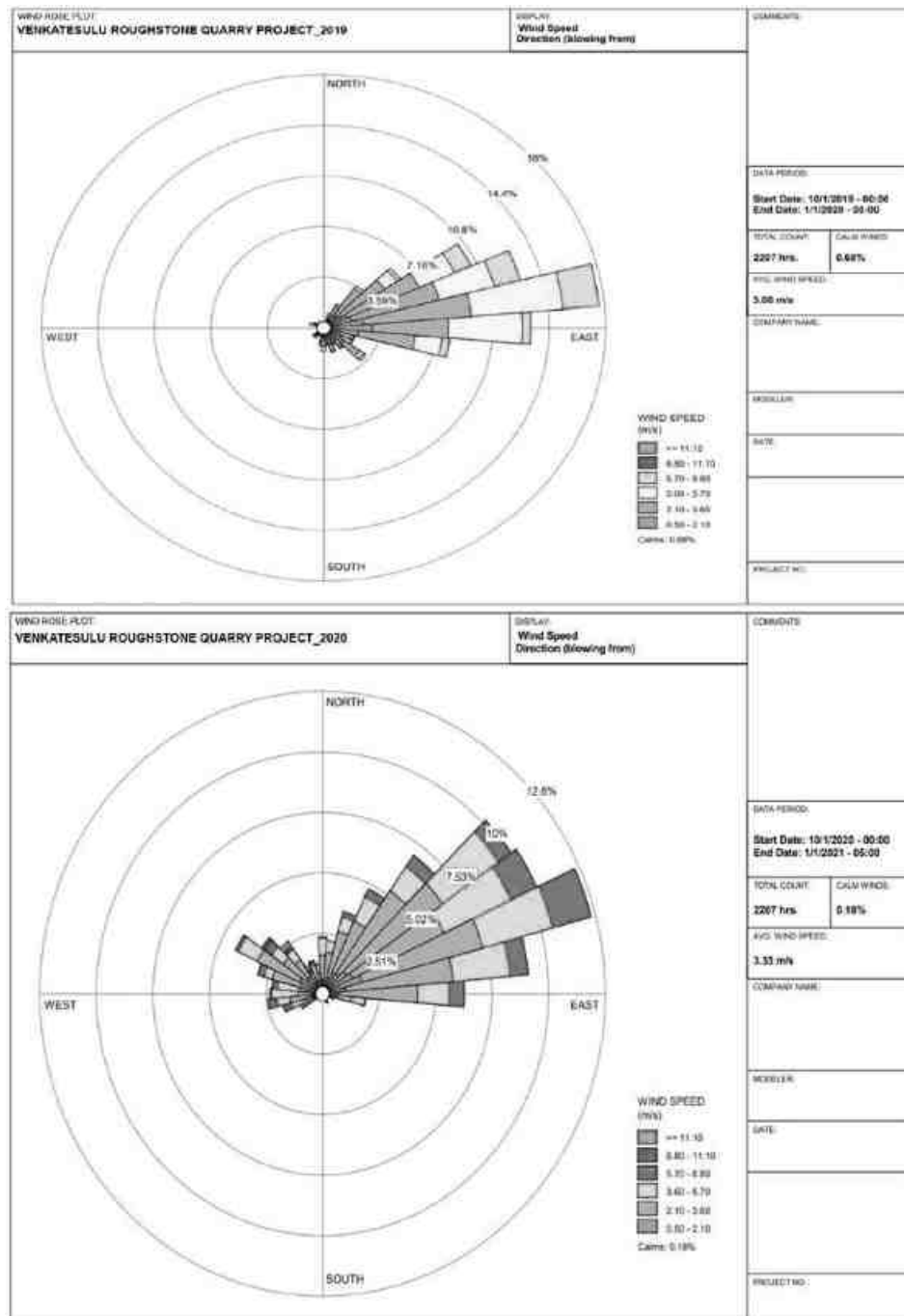


Figure 3.15 Windrose Diagram for 2019 and 2020 (October to December)



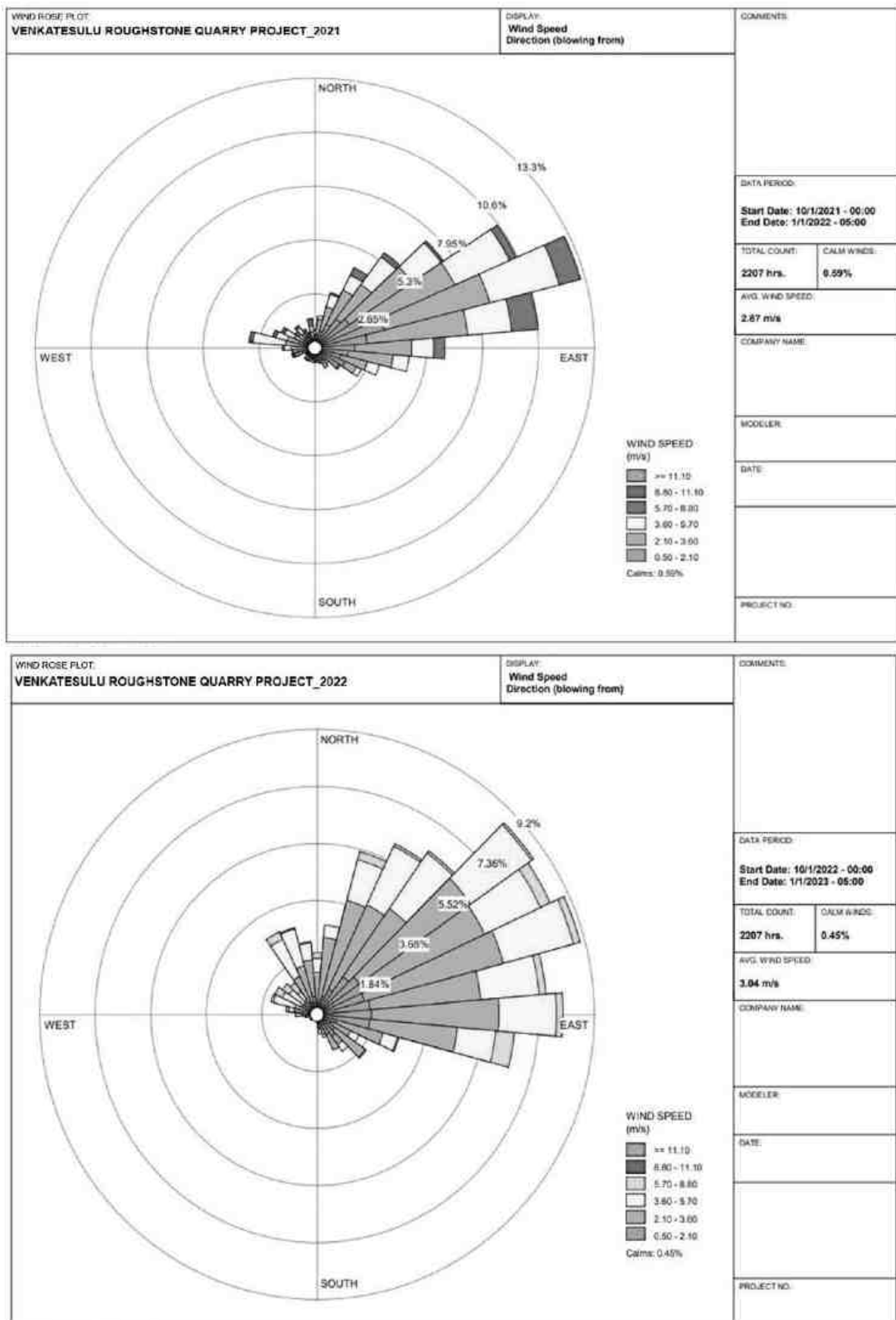


Figure 3.15a Windrose Diagram for 2021 and 2022 (October to December)

### 3.4.3 Site Specific Meteorological Data - 2023

Site specific meteorological data was collected by installing weather station near to project site. The meteorological data was obtained for anemometer fixed in the lease area on 17<sup>th</sup> October, November and December 2023 to cross check the secondary data. Brief summary of site-specific data has been presented in the table below– Meteorological data obtained from the onsite monitoring station are provided in Table 3.14.

**Table 3.14 Onsite Meteorological Data**

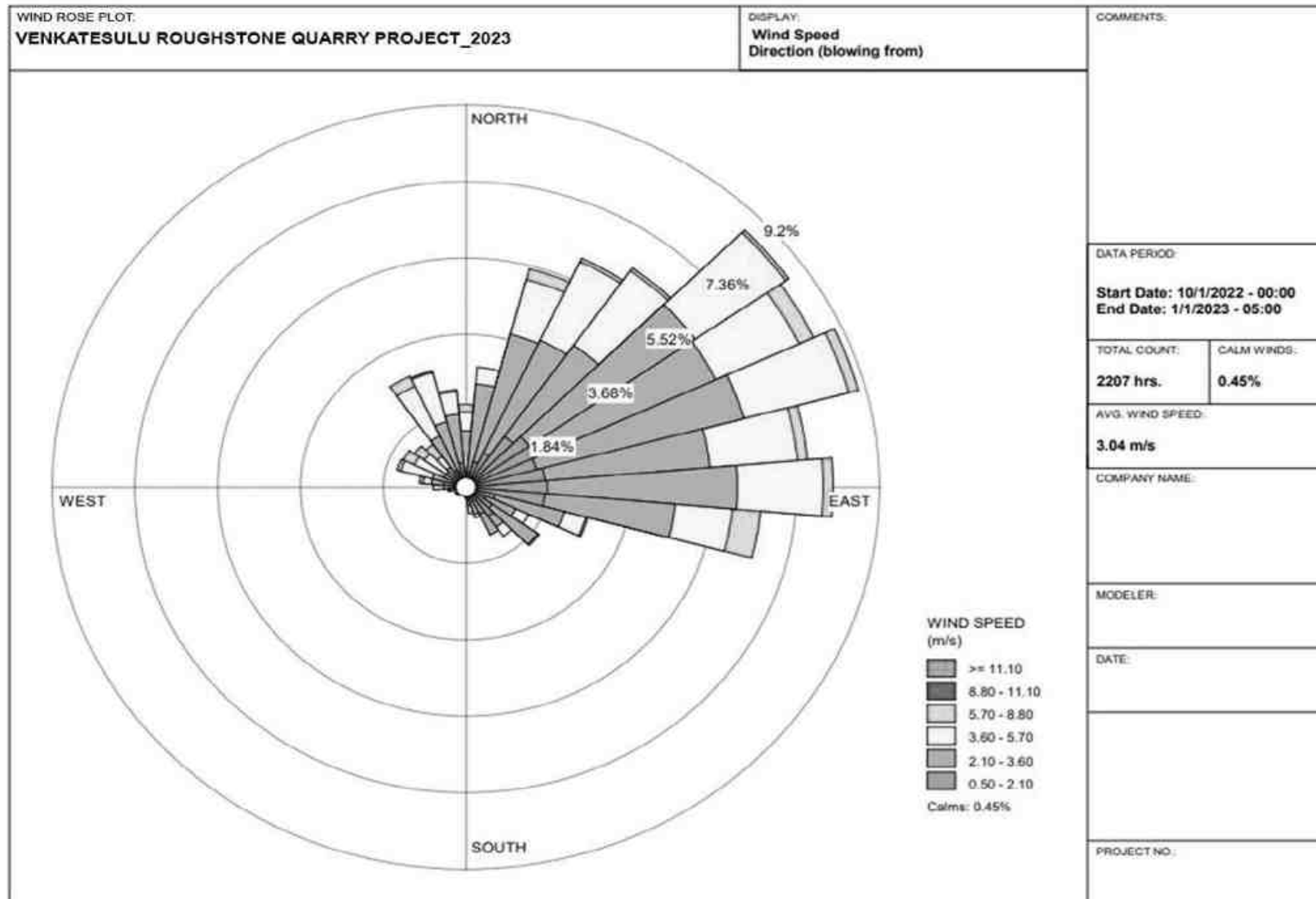
| S. No. | Parameters                 |     | OCT, 2023 | NOV, 2023 | DEC, 2023 |
|--------|----------------------------|-----|-----------|-----------|-----------|
| 1      | Temperature<br>(°C)        | Min | 18.45     | 16.30     | 14.40     |
|        |                            | Max | 28.55     | 27.05     | 28.63     |
|        |                            | Avg | 22.90     | 21.64     | 21.64     |
| 2      | Relative<br>Humidity (%)   | Min | 62.12     | 63.62     | 38.50     |
|        |                            | Max | 100.00    | 100.00    | 100.00    |
|        |                            | Avg | 88.96     | 87.62     | 85.03     |
| 3      | Wind Speed<br>(m/s)        | Min | 0.08      | 0.35      | 0.15      |
|        |                            | Max | 4.10      | 4.78      | 5.52      |
|        |                            | Avg | 1.62      | 2.15      | 2.12      |
| 4      | Wind Direction<br>(degree) | Min | 6.01      | 0.00      | 0.68      |
|        |                            | Max | 358.97    | 359.42    | 358.19    |
|        |                            | Avg | 214.80    | 96.47     | 135.27    |
| 5      | Surface<br>Pressure(kPa)   | Min | 91.94     | 91.82     | 91.72     |
|        |                            | Max | 92.63     | 92.73     | 92.93     |
|        |                            | Avg | 92.29     | 92.38     | 92.41     |

Source: On-site monitoring/sampling by **Ekdant Enviro Services (P) Limited** in association with GTMS

#### **Site Specific Meteorological Data Wind Pattern**

Wind pattern will largely influence the dispersion pattern of air pollutants and noise from the proposed project site. The seasonal Windrose for the study period of October through December 2023. The wind rose diagrams thus produced are shown in Figure 3.16 reveals that:

- ❖ The measured average wind velocity during the study period is 3.04 m/s.
- ❖ Predominant wind was dominant in the directions ranging from Northeast to Southwest.



**Figure 3.16 Onsite Rose Diagram (2023)**

### 3.4.4 Site Specific Meteorological Data - 2025

Site specific meteorological data was collected by installing weather station near to project site. The meteorological data was obtained for anemometer fixed in the lease area on April 30 2025- May 5 2025 to cross check the secondary data. Brief summary of site-specific data has been presented in the table below– Meteorological data obtained from the onsite monitoring station are provided in Table 3.15.

**Table 3.15 Onsite Meteorological Data**

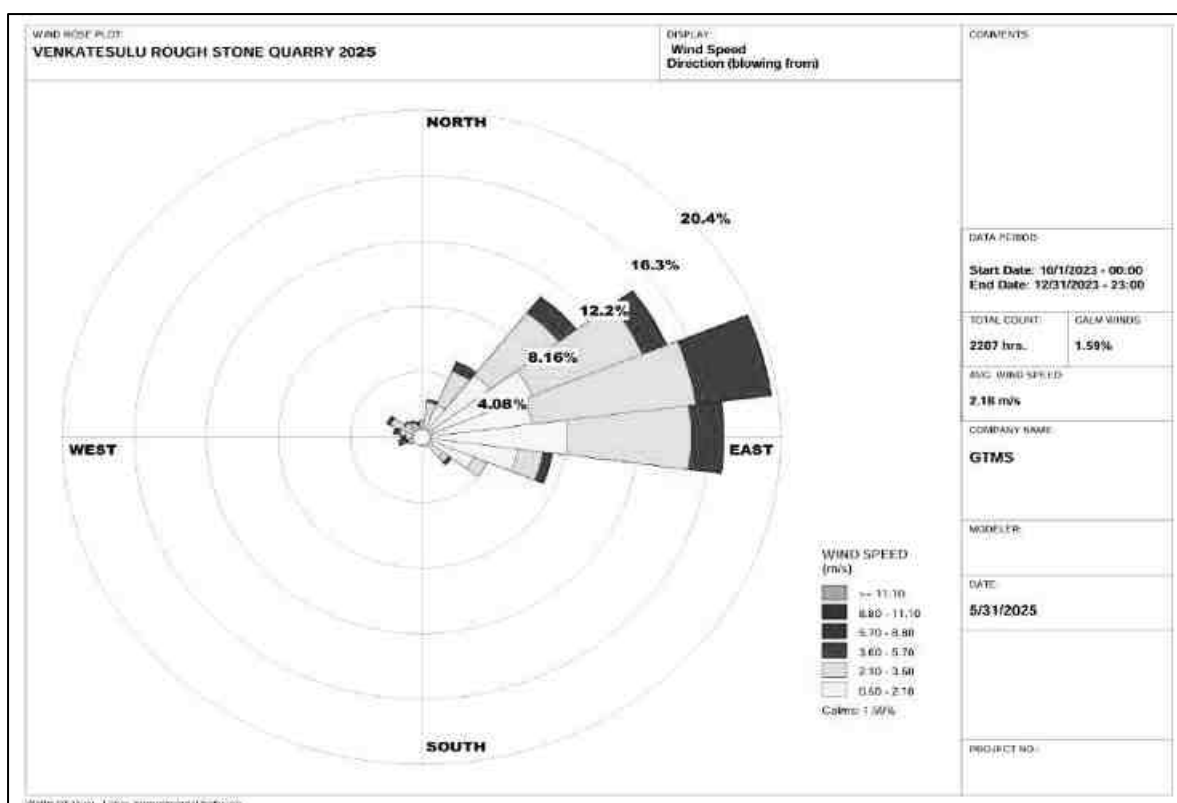
| S. No. | Parameters              |     | April30 – May 5 2025 |
|--------|-------------------------|-----|----------------------|
| 1      | Temperature (°C)        | Min | 23.10                |
|        |                         | Max | 38.08                |
|        |                         | Avg | 30.70                |
| 2      | Relative Humidity (%)   | Min | 24.23                |
|        |                         | Max | 85.04                |
|        |                         | Avg | 47.98                |
| 3      | Wind Speed (m/s)        | Min | 0.32                 |
|        |                         | Max | 3.48                 |
|        |                         | Avg | 1.48                 |
| 4      | Wind Direction (degree) | Min | 6.5                  |
|        |                         | Max | 352.1                |
|        |                         | Avg | 155.06               |
| 5      | Surface Pressure(kPa)   | Min | 93.32                |
|        |                         | Max | 94.02                |
|        |                         | Avg | 93.68                |

Source: On-site monitoring/sampling by **Greenlink Analytical and Research Laboratory (India) Private Ltd** in association with GTMS

#### **Site Specific Meteorological Data Wind Pattern**

Wind pattern will largely influence the dispersion pattern of air pollutants and noise from the proposed project site. The seasonal Windrose for the study period of April30 through May 2025. The wind rose diagrams thus produced are shown in Figure 3.17 reveals that:

- ❖ The measured average wind velocity during the study period is 2.18m/s.
- ❖ Predominant wind was dominant in the directions ranging from Northeast to Southwest.



**Figure 3.17 Onsite Rose Diagram (2025)**

### 3.4.5 Ambient Air Quality Study

The baseline ambient air quality is studied through a scientifically designed ambient air quality monitoring network considering the followings

- ❖ Meteorological condition on synoptic scale
- ❖ Topography of the study area
- ❖ Representatives of regional background air quality for obtaining baseline status
- ❖ Location of residential areas representing different activities
- ❖ Accessibility and power availability

**Table 3.16 Methodology and Instrument Used for AAQ Analysis**

| Parameter         | Method                                                   | Instrument                                      |
|-------------------|----------------------------------------------------------|-------------------------------------------------|
| PM <sub>2.5</sub> | Gravimetric method<br>Beta attenuation method            | Fine Particulate Sampler                        |
| PM <sub>10</sub>  | Gravimetric method<br>Beta attenuation method            | Respirable Dust Sampler                         |
| SO <sub>2</sub>   | IS-5182 Part II<br>(Improved West & Gaeke method)        | Respirable Dust Sampler with gaseous attachment |
| NO <sub>x</sub>   | IS-5182 Part II<br>(Jacob & Hoch heiser modified method) | Respirable Dust Sampler with gaseous attachment |
| Free Silica       | NIOSH – 7601                                             | Visible Spectrophotometry                       |

Source: Sampling Methodology based **Ekdant Laboratory** & CPCB Notification

**Table 3.17 National Ambient Air Quality Standards**

| S. No. | Pollutant                              | Time Weighted Average      | Concentration in ambient air                 |                                                         |
|--------|----------------------------------------|----------------------------|----------------------------------------------|---------------------------------------------------------|
|        |                                        |                            | Industrial, Residential, Rural & other areas | Ecologically Sensitive area (Notified by Central Govt.) |
| 1      | SO <sub>2</sub> (µg/m <sup>3</sup> )   | Annual Avg.*<br>24 hours** | 50.0<br>80.0                                 | 20.0<br>80.0                                            |
| 2      | NO <sub>x</sub> (µg/m <sup>3</sup> )   | Annual Avg.<br>24 hours    | 40.0<br>80.0                                 | 30.0<br>80.0                                            |
| 3      | PM <sub>10</sub> (µg/m <sup>3</sup> )  | Annual Avg.<br>24 hours    | 60.0<br>100.0                                | 60.0<br>100.0                                           |
| 4      | PM <sub>2.5</sub> (µg/m <sup>3</sup> ) | Annual Avg.<br>24 hours    | 40.0<br>60.0                                 | 40.0<br>60.0                                            |

Source: NAAQS CPCB Notification No. B-29016/20/90/PCI-I Dated: 18<sup>th</sup> Nov 2009

### Methodology

Ambient air quality monitoring was carried out with a frequency of two samples per week at nine (07 locations, adopting a continuous 24 hourly (3 shift of 8-hour) schedule for the period October to December, 2023 as per the CPCB, MoEF guidelines and notifications.

It was ensured that the equipment was placed preferably at a height of at least  $3 \pm 0.5$ m above the ground level at each monitoring station for negating the effects of wind-blown ground dust. The equipment was placed at space free from trees and vegetation which otherwise act as a sink of pollutants resulting in lower levels in monitoring results. The baseline data of ambient air were generated for PM<sub>2.5</sub>, PM<sub>10</sub>, sulphur dioxide (SO<sub>2</sub>) and nitrogen dioxide (NO<sub>x</sub>). The sampling locations are shown in Figure 3.18 and average concentrations of air pollutants are summarized in Tables 3.18 and are shown in Figures 3.19-3.23.

**Table 3.18 Ambient Air Quality (AAQ) Monitoring Locations**

| S. No.                              | Location Code | Monitoring Locations | Distance (km) | Direction | Coordinates   |               |
|-------------------------------------|---------------|----------------------|---------------|-----------|---------------|---------------|
|                                     |               |                      |               |           | Latitude      | Longitude     |
| 1                                   | AAQ1          | Near Core            | 0.30          | N         | 12°39'44.57"N | 77°57'35.60"E |
| 2                                   | AAQ2          | Pillaikothur         | 1.17          | N         | 12°40'13.04"N | 77°57'37.11"E |
| 3                                   | AAQ3          | Pathakotta           | 1.93          | WSW       | 12°39'19.80"N | 77°56'35.88"E |
| 4                                   | AAQ4          | Nayakanapalli        | 4.29          | WSW       | 12°39'12.85"N | 77°55'16.28"E |
| 5                                   | AAQ5          | Keeranapalli         | 3.15          | S         | 12°38'1.33"N  | 77°57'56.68"E |
| 6                                   | AAQ6          | Shoolagiri           | 4.96          | E         | 12°39'56.50"N | 78° 0'28.44"E |
| 7                                   | AAQ7          | Kanalatti            | 3.40          | N         | 12°41'40.17"N | 77°57'32.75"E |
| Green link analytical & Reserch LAB |               |                      |               |           |               |               |
| 8                                   | AAQ8          | Sun Granites         | 1.14          | E         | 12°39'38.40"N | 77°58'21.92"E |
| 9                                   | AAQ9          | Near Core            | 0.37          | w         | 12°39'35.22"N | 77°57'26.22"E |

Source: On-site monitoring/sampling by Ekdant Enviro Services (P) Limited and Green link analytical & Reserch LAB in association with GTMS

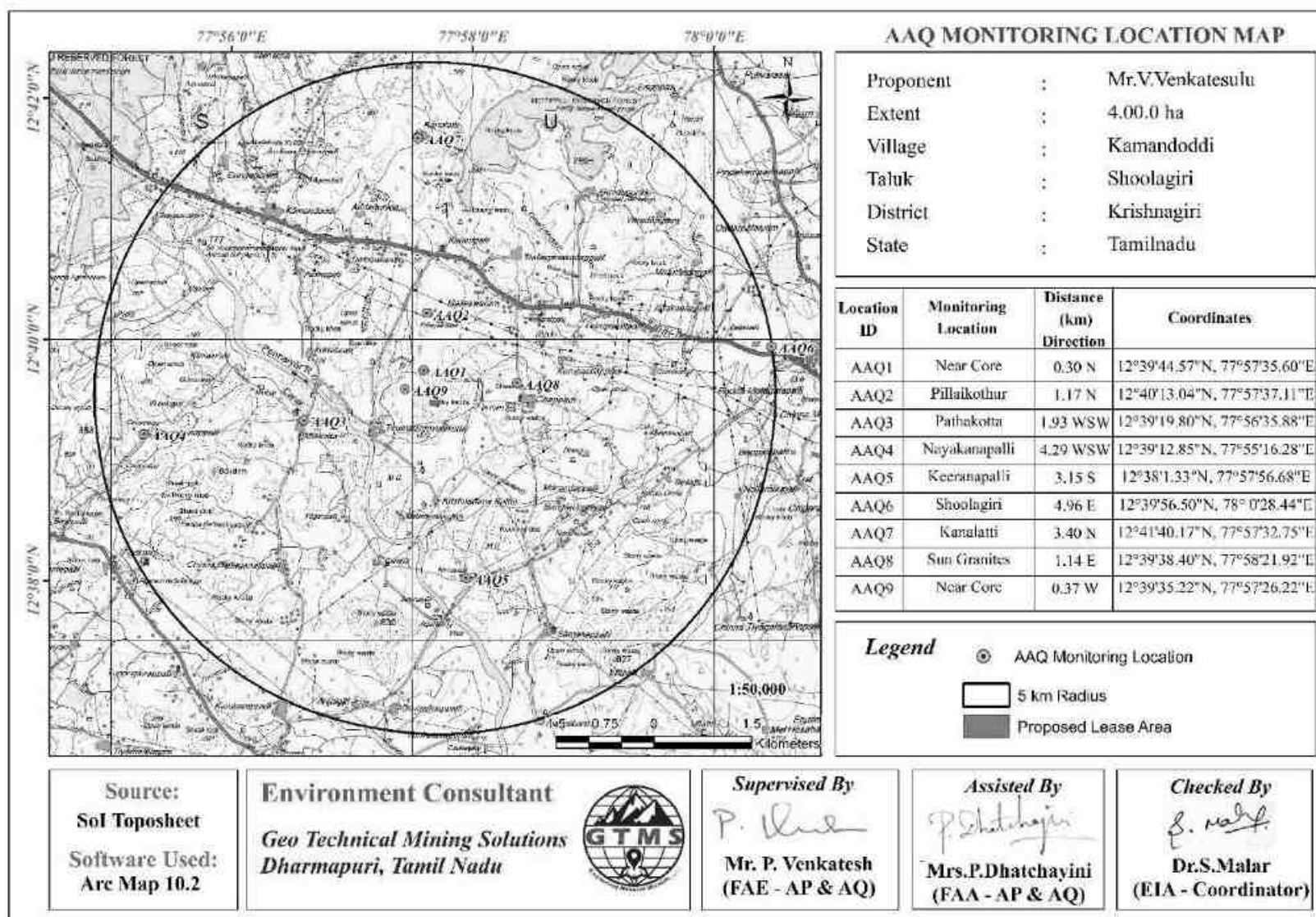
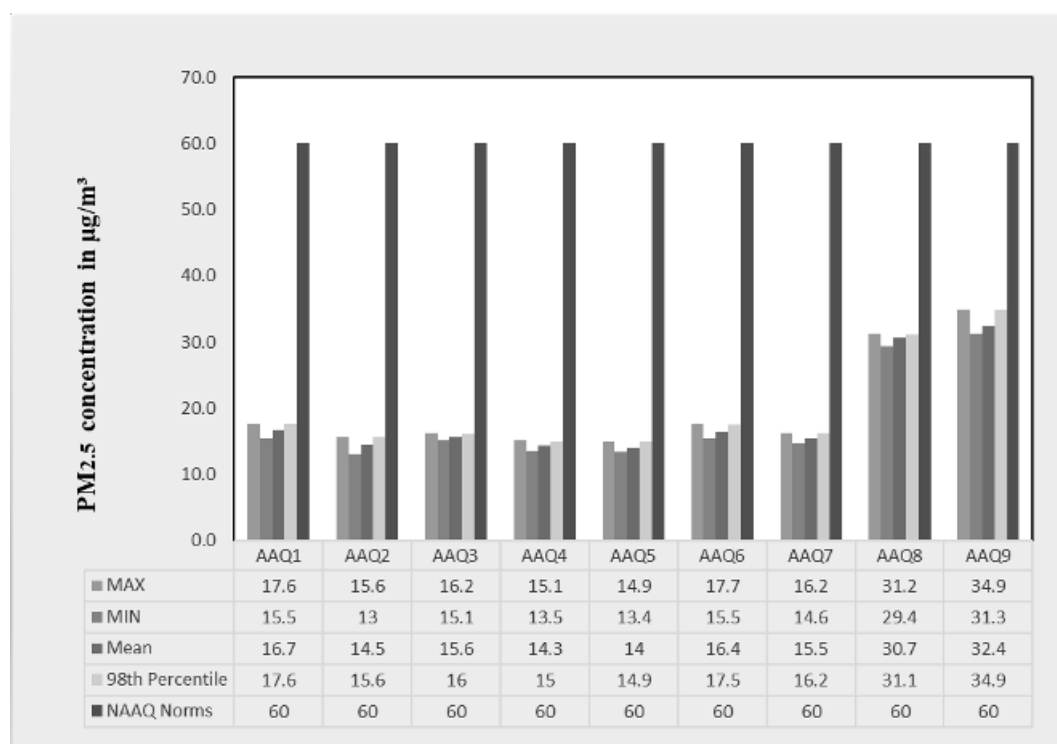


Figure 3.18 Map Showing Ambient Air Quality Monitoring Station Locations Around 5 km Radius from Proposed Project Site

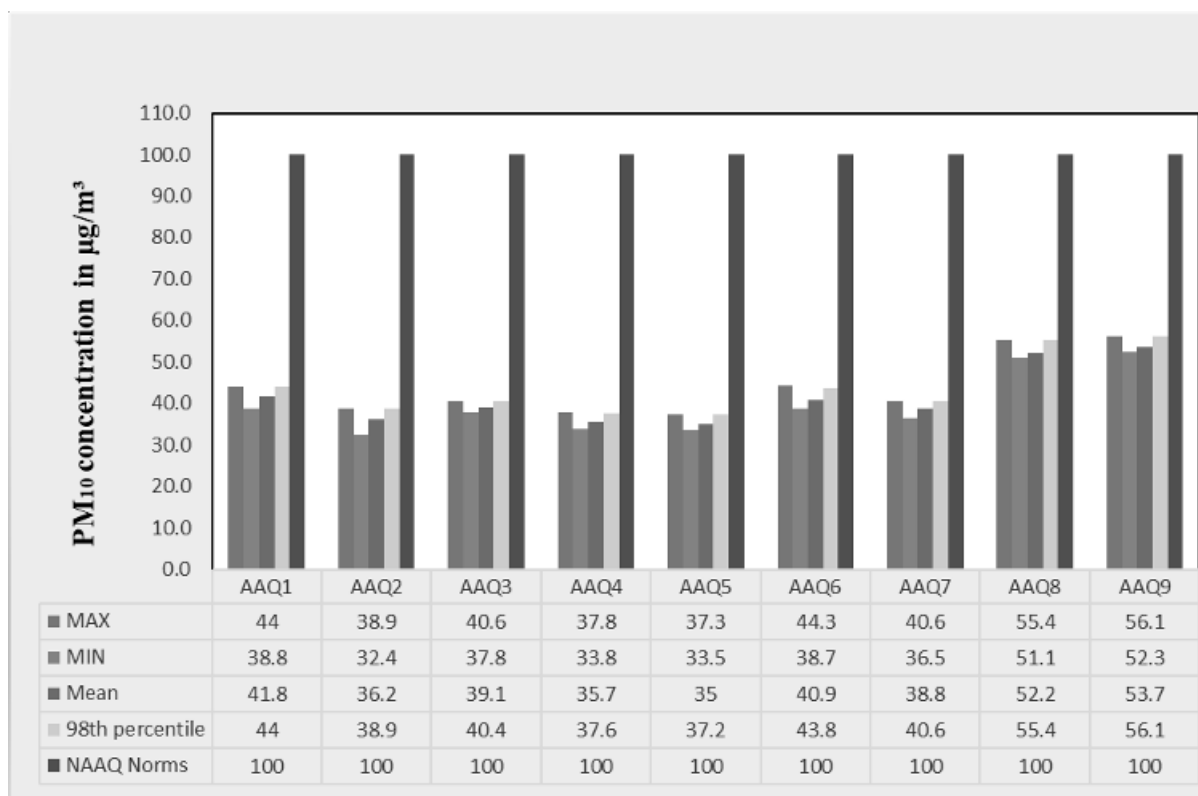
**Table 3.19 Summary of AAQ Result**

| PM <sub>2.5</sub> |      |      |      |                             | PM <sub>10</sub> |      |      |                             |
|-------------------|------|------|------|-----------------------------|------------------|------|------|-----------------------------|
| Station ID        | Max  | Min  | Mean | 98 <sup>th</sup> Percentile | Max              | Min  | Mean | 98 <sup>th</sup> Percentile |
| AAQ1              | 17.6 | 15.5 | 16.7 | 17.6                        | 44.0             | 38.8 | 41.8 | 44.0                        |
| AAQ2              | 15.6 | 13.0 | 14.5 | 15.6                        | 38.9             | 32.4 | 36.2 | 38.9                        |
| AAQ3              | 16.2 | 15.1 | 15.6 | 16.0                        | 40.6             | 37.8 | 39.1 | 40.4                        |
| AAQ4              | 15.1 | 13.5 | 14.3 | 15.0                        | 37.8             | 33.8 | 35.7 | 37.6                        |
| AAQ5              | 14.9 | 13.4 | 14.0 | 14.9                        | 37.3             | 33.5 | 35.0 | 37.2                        |
| AAQ6              | 17.7 | 15.5 | 16.4 | 17.5                        | 44.3             | 38.7 | 40.9 | 43.8                        |
| AAQ7              | 16.2 | 14.6 | 15.5 | 16.2                        | 40.6             | 36.5 | 38.8 | 40.6                        |
| AAQ8              | 31.2 | 29.4 | 30.7 | 31.1                        | 55.4             | 51.1 | 52.2 | 55.4                        |
| AAQ9              | 34.9 | 31.3 | 32.4 | 34.9                        | 56.1             | 52.3 | 53.7 | 56.1                        |
| SO <sub>2</sub>   |      |      |      |                             | NO <sub>x</sub>  |      |      |                             |
| AAQ1              | 5.1  | 3.8  | 4.4  | 5.0                         | 15.8             | 11.8 | 13.6 | 15.5                        |
| AAQ2              | 4.9  | 3.2  | 4.2  | 4.9                         | 15.4             | 10.1 | 13.1 | 15.4                        |
| AAQ3              | 4.9  | 2.9  | 3.9  | 4.2                         | 15.2             | 9.0  | 12.0 | 15.0                        |
| AAQ4              | 4.0  | 2.1  | 2.6  | 3.8                         | 12.4             | 6.5  | 8.2  | 11.8                        |
| AAQ5              | 3.2  | 1.3  | 1.8  | 3.0                         | 9.9              | 4.0  | 5.7  | 9.3                         |
| AAQ6              | 5.5  | 4.1  | 4.7  | 5.4                         | 17.1             | 12.7 | 14.5 | 16.8                        |
| AAQ7              | 2.9  | 2.1  | 2.5  | 2.9                         | 9.1              | 5.3  | 6.4  | 7.0                         |
| AAQ8              | 9.75 | 7.4  | 8.3  | 9.7                         | 17.3             | 15.2 | 16.1 | 17.3                        |
| AAQ9              | 8.25 | 6.1  | 7.5  | 8.2                         | 16.7             | 13.5 | 15.2 | 16.6                        |

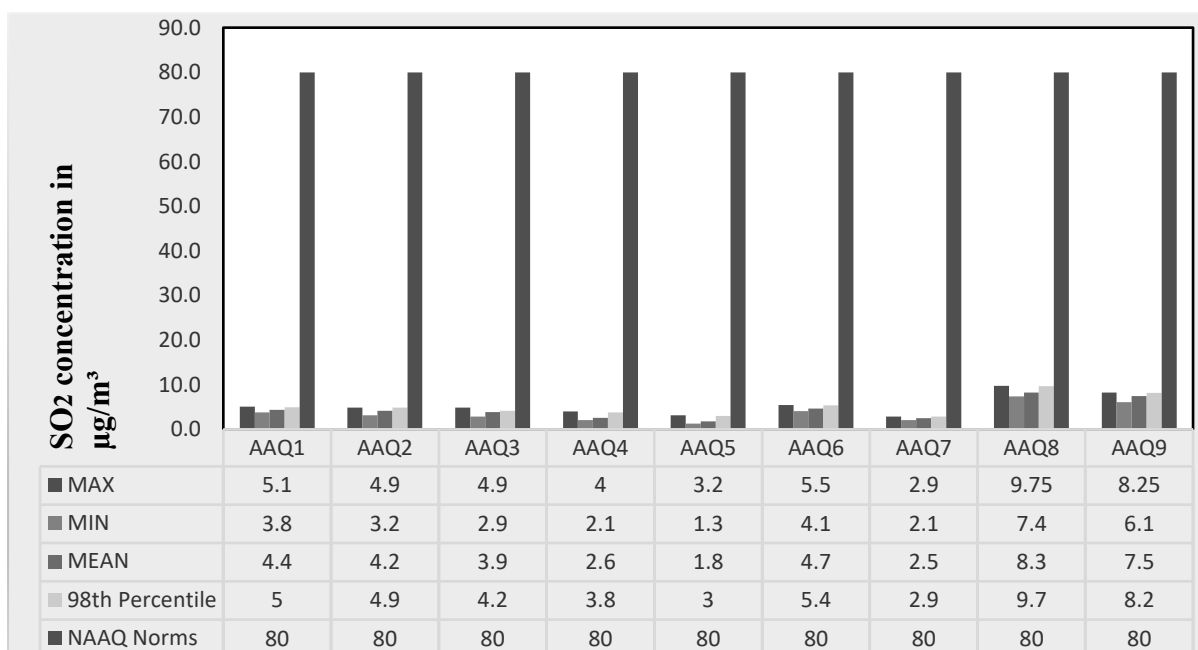


**Figure 3.19 Bar Chart Showing Maximum, Minimum, and Average Concentrations of PM<sub>2.5</sub> Measured from 9 Air Quality Monitoring Stations within 5 km Radius**

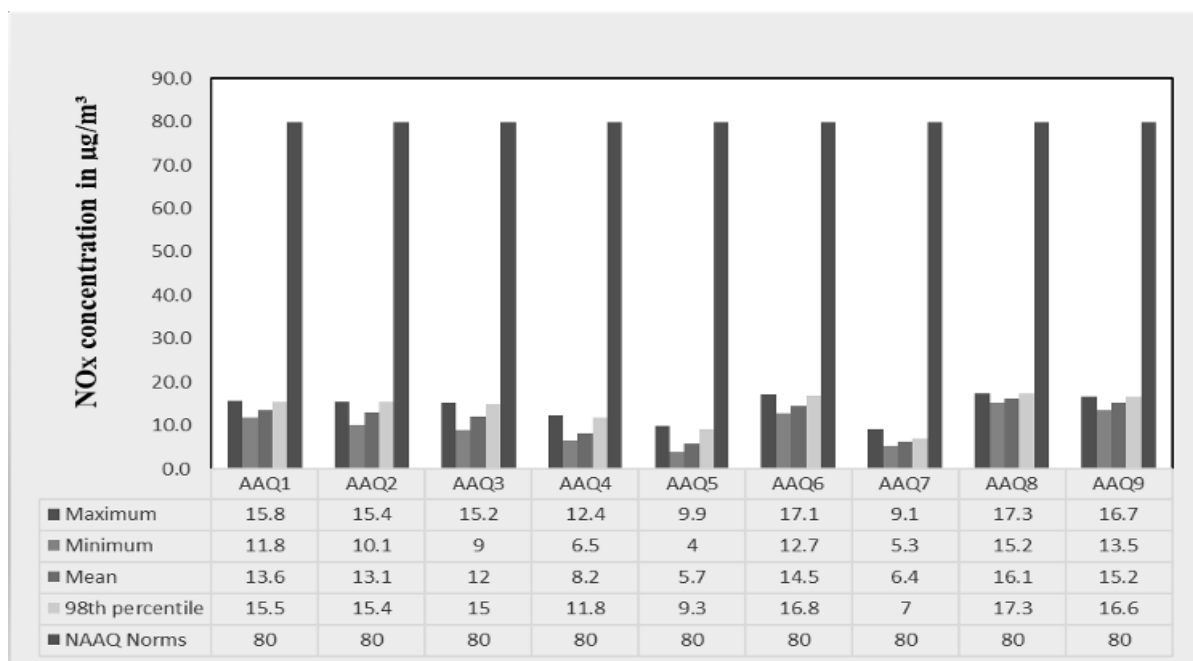




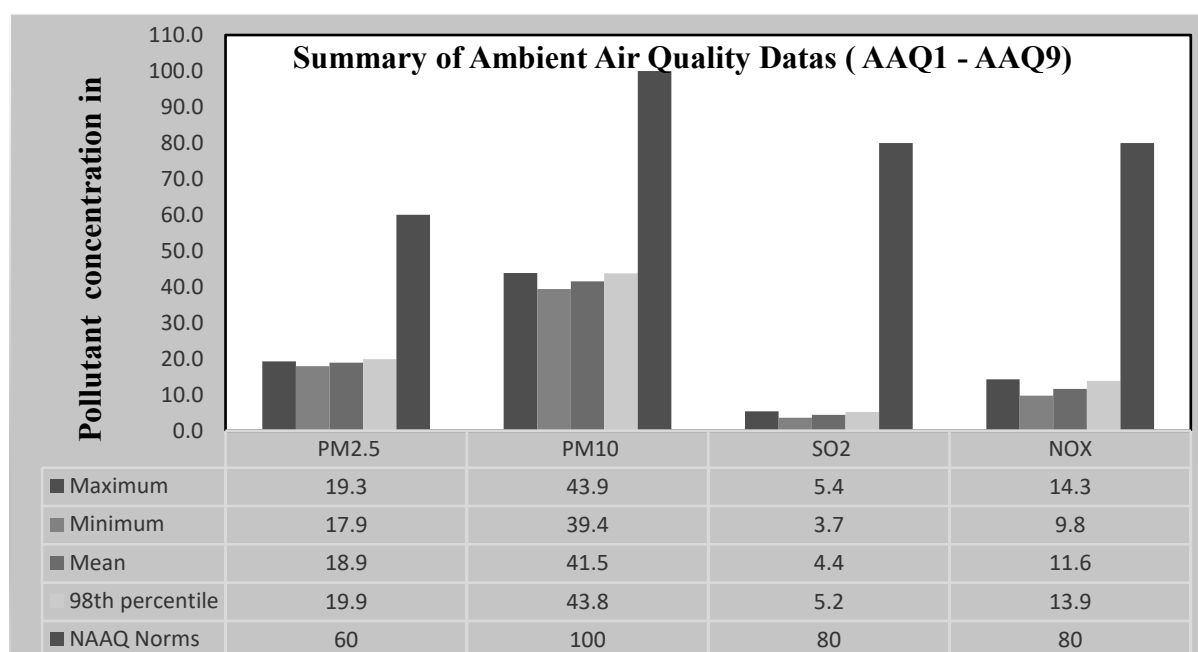
**Figure 3.20 Bar Chart Showing Maximum, Minimum, and Average Concentrations of PM10 Measured from 9 Air Quality Monitoring Stations within 5 km Radius**



**Figure 3.21 Bar Chart Showing Maximum, Minimum, and Average Concentrations of SO2 Measured from 9 Air Quality Monitoring Stations within 5 km Radius.**



**Figure 3.22 Bar Chart Showing Maximum, Minimum, and Average Concentrations of Nox Measured from 9 Air Quality Monitoring Stations within 5 km Radius**



**Figure 3.23 Bar Chart Showing Maximum, Minimum, And Average Concentrations of Pollutants in Atmosphere within 5 km Radius**

## Results

As per the monitoring data, PM<sub>2.5</sub> ranges from 13.0 µg/m<sup>3</sup> to 31.3 µg/m<sup>3</sup>, PM<sub>10</sub> from 37.3 µg/m<sup>3</sup> to 56.1µg/m<sup>3</sup>, SO<sub>2</sub> from 1.3 µg/m<sup>3</sup> to 9.75µg/m<sup>3</sup>, NO<sub>x</sub> from 4µg/m<sup>3</sup> to 17.3g/m<sup>3</sup>. The concentration levels of the pollutants fall within the acceptable limits of NAAQS prescribed by CPCB.

### Air quality Index

The AQI shows that the air quality of the study area falls within good category 38 causing minimal impact to human health.

### 3.5 NOISE ENVIRONMENT

The vehicular movement on road and mining activities is the major sources of noise in the study area. The main objective of noise monitoring in the study area is to establish the baseline noise level, which will in turn be used to assess the impact of the total noise expected to be generated during the project operations around the project site. In order to assess the ambient noise levels within the study area, noise monitoring was carried out at thirteen (13) locations covering commercial, residential, rural areas within the radius of 5 km. Details of noise monitoring locations are provided in Table 3.17 and spatial occurrence of the locations are shown in Figure 3.24.

**Table 3.20 Noise Monitoring Locations**

| S. No.                               | Location Code | Monitoring Locations | Distance (km) | Direction | Coordinates   |               |
|--------------------------------------|---------------|----------------------|---------------|-----------|---------------|---------------|
|                                      |               |                      |               |           | Latitude      | Longitude     |
| 1                                    | N1            | Near Core            | 0.42          | N         | 12°39'48.99"N | 77°57'37.41"E |
| 2                                    | N2            | Pillaikothur         | 1.19          | N         | 12°40'14.00"N | 77°57'38.17"E |
| 3                                    | N3            | Pathakotta           | 1.91          | W         | 12°39'18.94"N | 77°56'35.49"E |
| 4                                    | N4            | Nayakanapalli        | 4.27          | W         | 12°39'13.21"N | 77°55'17.43"E |
| 5                                    | N5            | Keeranapalli         | 2.63          | SE        | 12°38'1.95"N  | 77°57'58.19"E |
| 6                                    | N6            | Shoolagiri           | 4.81          | E         | 12°39'53.64"N | 78° 0'22.85"E |
| 7                                    | N7            | Kanalatti            | 3.91          | N         | 12°41'42.08"N | 77°57'34.81"E |
| Green link analytical & Research LAB |               |                      |               |           |               |               |
| 8                                    | N8            | Near Core            | 0.55          | NE        | 12°39'47.90"N | 77°57'54.91"E |

Source: On-site monitoring/sampling by Ekdant Enviro Services (P) Limited and Green link analytical & Research LAB in association with GTMS

**Table 3.21 Ambient Noise Quality Result**

| Station ID                          | Location      | Environmental setting | Average day time noise level (dB(A)) | Average night time noise level (dB(A)) | Day time (6.00 AM – 10.00 PM)        | Night time (10.00 PM – 6.00 AM) |
|-------------------------------------|---------------|-----------------------|--------------------------------------|----------------------------------------|--------------------------------------|---------------------------------|
|                                     |               |                       |                                      |                                        | Standard (L <sub>eq</sub> in dB (A)) |                                 |
| N1                                  | Near Core     | Industrial Area       | 47.2                                 | 35.4                                   | 75                                   | 70                              |
| N2                                  | Pillaikothur  |                       | 43.8                                 | 36.9                                   | 55                                   | 45                              |
| N3                                  | Pathakotta    | Residential Area      | 44.8                                 | 36.4                                   |                                      |                                 |
| N4                                  | Nayakanapalli |                       | 41.2                                 | 34.4                                   |                                      |                                 |
| N5                                  | Keeranapalli  |                       | 39.8                                 | 30.6                                   |                                      |                                 |
| N6                                  | Shoolagiri    |                       | 52.4                                 | 40.2                                   |                                      |                                 |
| N7                                  | Kanalatti     |                       | 42.2                                 | 34.2                                   |                                      |                                 |
| Green link analytical & Reserch LAB |               |                       |                                      |                                        |                                      |                                 |
| N8                                  | Near Core     | Industrial Area       | 43.5                                 | 41.1                                   | 75                                   | 70                              |

Source: On-site monitoring/sampling by Ekdant Enviro Services (P) Limited and Green link analytical & Research LAB in association with GTMS

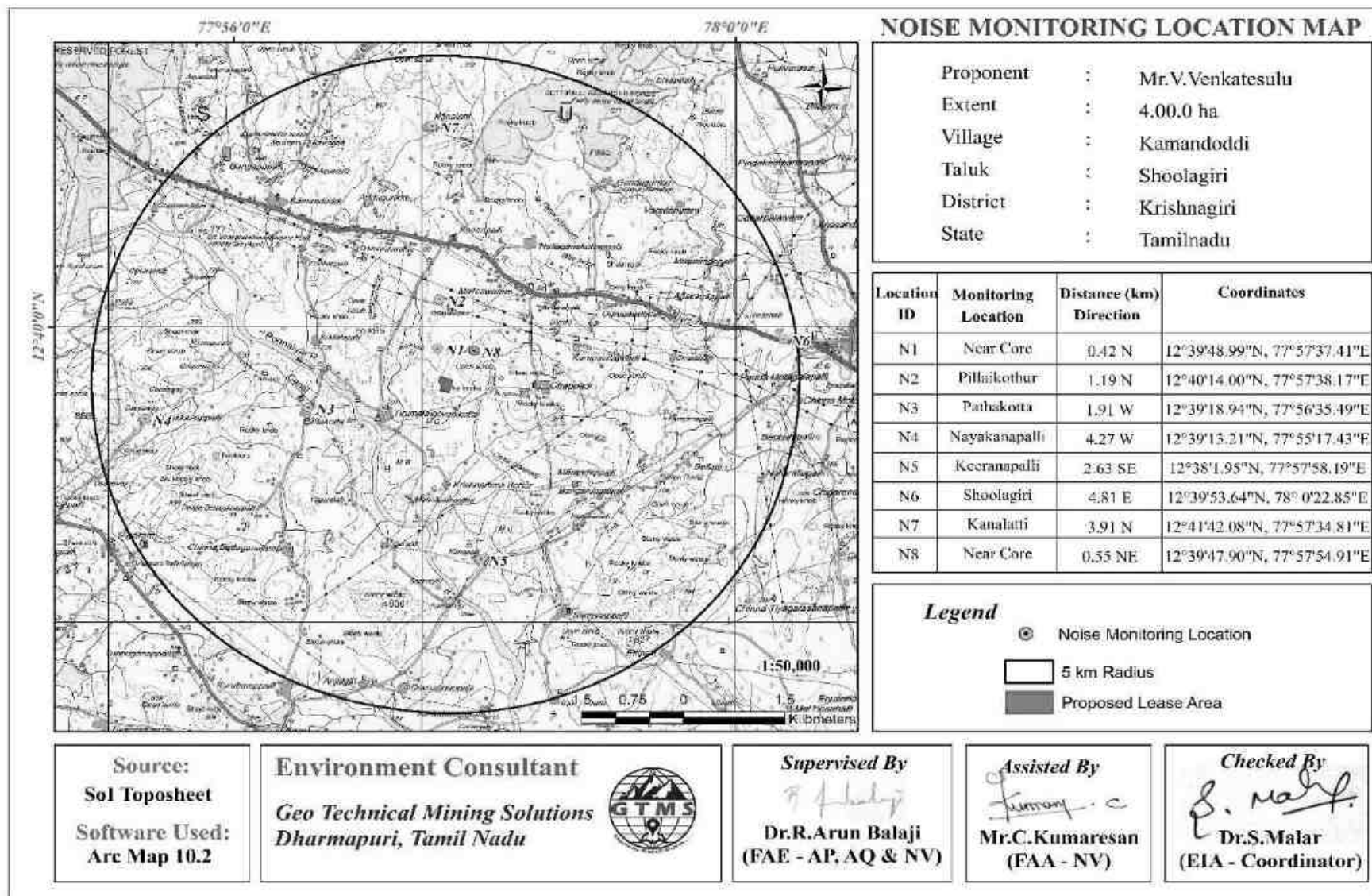
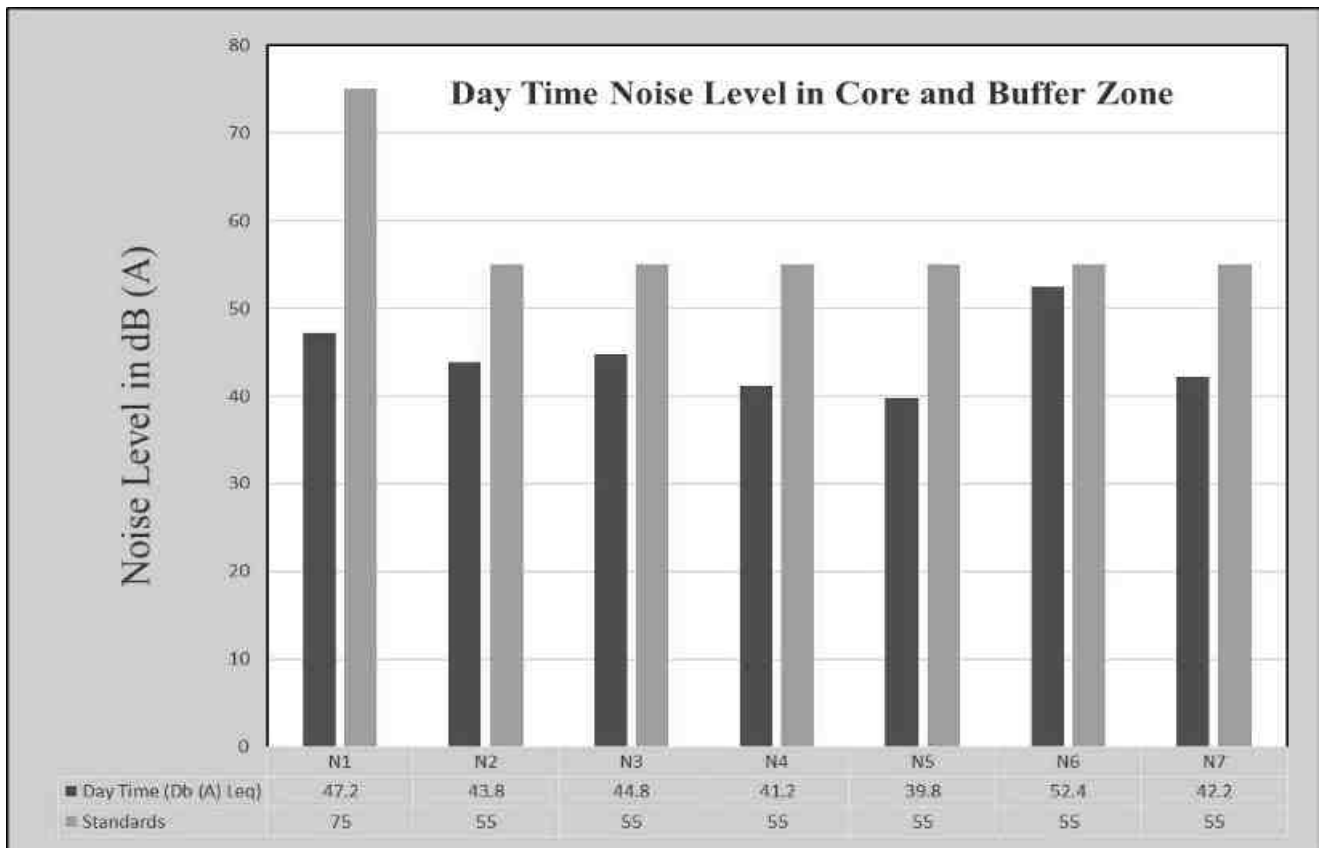
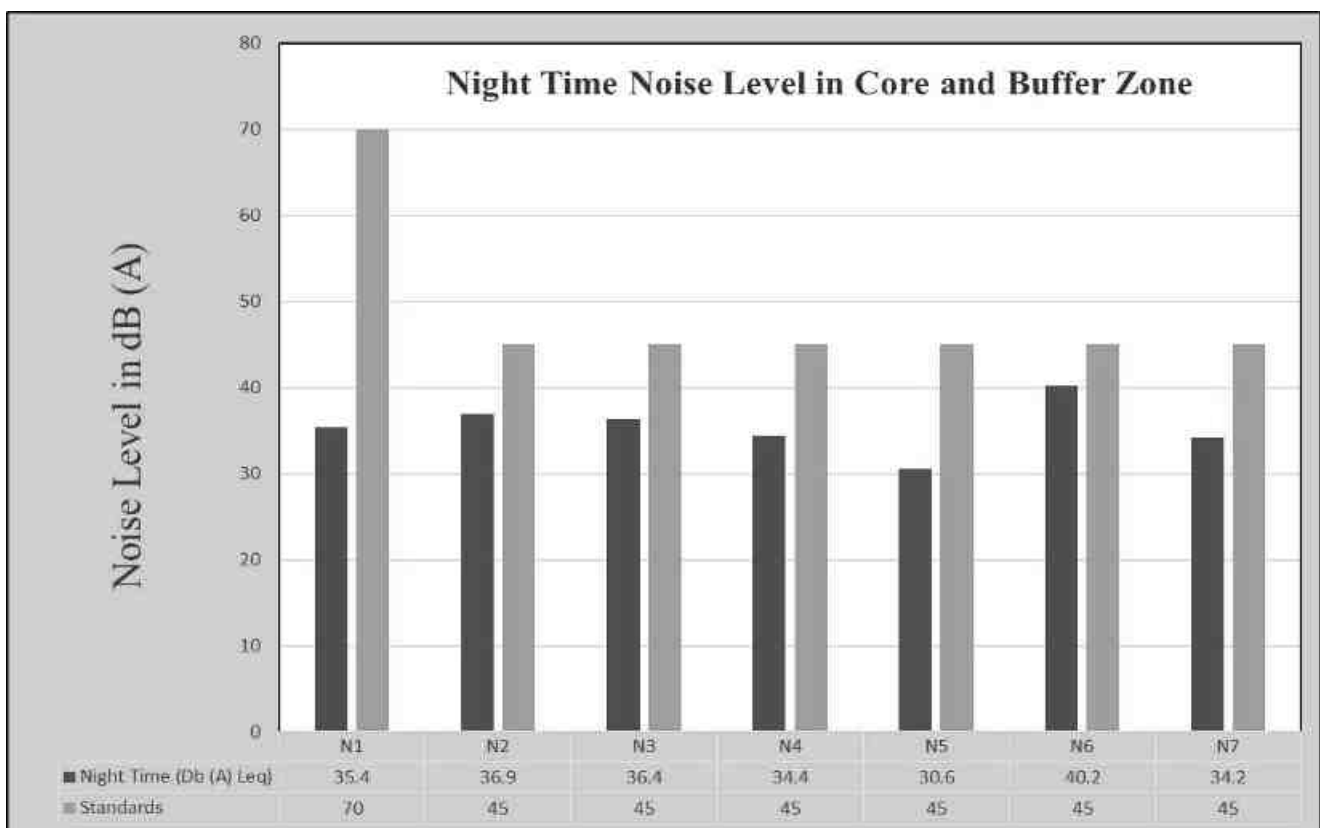


Figure 3.24 Map Showing Noise Level Monitoring Station Locations around 5 km Radius from Proposed Project Site



**Figure 3.25 Bar Chart Showing Day Time Noise Levels Measured in Core and Buffer Zones**



**Figure 3.26 Bar Chart Showing Night Time Noise Levels Measured in Core and Buffer Zones**

## Results

The Table 3.18 shows that noise level in core zone was 47.2 dB (A) Leq during day time and 35.4 dB(A) Leq during night time. Noise levels recorded in buffer zone during day time varied from 38.6 to 52.4dB (A) Leq and during night time from 30.6 to 42.2dB (A) Leq. Thus, the noise level for industrial and residential area meets the requirements of CPCB. The results are also depicted below in Figures 3.25 and 3.26

### 3.6 VIBRATION MONITORING

Blasting is an essential technique in stone quarrying used to fragment large rock formations into smaller, manageable pieces for construction and infrastructure development. However, the process generates significant ground vibrations, air overpressure, and noise, which may pose potential risks to nearby structures, temples, archaeological places, eco Sensitive Areas, and the environment. Understanding the extent and impact of these vibrations is crucial for ensuring compliance with safety regulations and minimizing adverse effects on local communities and ecosystems.

#### *Methodology*

- A preliminary reconnaissance survey was done.
- One blast is conducted in the quarry.
- Ground vibrations and noise generated from blasting operations were monitored
- The data was analyzed and assessed the impact of PPV on the structure.
- Suitable blasting methodology is suggested.

#### **Blast Location**

A vibration study for the cluster quarry project was conducted on May 29, 2025, to assess the potential impact of blasting activities. Notably, there are no permanent structures within a 300m radius of the lease area. The monitoring was specifically carried out in the direction of a structure situated approximately 100 meters from the blasting zone to evaluate any potential effects on nearby structure.



**Figure 3.27 Overall View of the Quarry & Close View of the Study Area**



**Figure 3.28 Google image of the Cluster Quarry(Mallikarjuna) Blasting Location**

## Method of Blasting

The rough stone quarry is fully mechanized mine being operated by drill and blast method for primary breakage rock breaker for the handling of oversize fragmentation. Jack hammer drill machine is being used for regular drilling and blasting operation with 5m bench height. A sample initiation pattern given below depicts the blasting of each hole one after another. General blasting pattern followed in the mine and charging pattern are shown in Table.3.22.

**Table 3.22 Method of Blasting**

|                              | 8 Feet Hole | 5 Feet Hole  |
|------------------------------|-------------|--------------|
| Blasthole Diameter (D) in mm | 32          | 32           |
| Burden (B) in m              | 1.5         | 1.5          |
| Spacing (S) in m             | 1.3         | 1.3          |
| Hole Length (L) in m         | 2.4         | 1.5          |
| Bench Height (BH) in m       | 2.1         | 1.2          |
| Mass of explosive/hole in kg | 0.5         | 0.375        |
| Number of blastholes/Delay   | 60          | 50           |
| Blasthole pattern            | Staggered   | Staggered    |
| Mass of explosive /day in kg | <b>30</b>   | <b>18.75</b> |
| Type of explosives           | Slurry      | Slurry       |
| Initiation system            | NONEL       | NONEL        |

## Results

- Ground Vibration and noise levels were recorded from the instruments the figure 3.29it can be observed that the vertical Peak Particle Velocity (PPV) recorded was 1.801mm/s at nearby bare land at distance of 100m.
- Air Over-Pressure (AOP) was 103.5dB and 0.003kPa at nearby Study area at distance of 100m.

**Table 3.23 Summary of the Blasts conducted**

| Blast no | Number of holes | Maximum charge in kg | Hole depth in m | Distance (m) | Peak Particle Velocity (mm/s) | Air Over-Pressure (dB) & kPa |
|----------|-----------------|----------------------|-----------------|--------------|-------------------------------|------------------------------|
| 1        | 110             | 49                   | 1.5 to 2.4      | 100          | 1.801                         | 103.5 & 0.003                |



## SuperGraphics - Report

Telephone: (203)503-2488 x 23

Company: GEO TECHNICAL MINING SOLUTIONS

29-05-2025 at 09:25:47 Event # 52

Location: KRISHNAGIRI

Graph: 22372

Operator: KUMARESAN

Last Calibration: 27-02-2025

Notes:

Record Duration: 3 sec

Sample Rate: 1024/sec

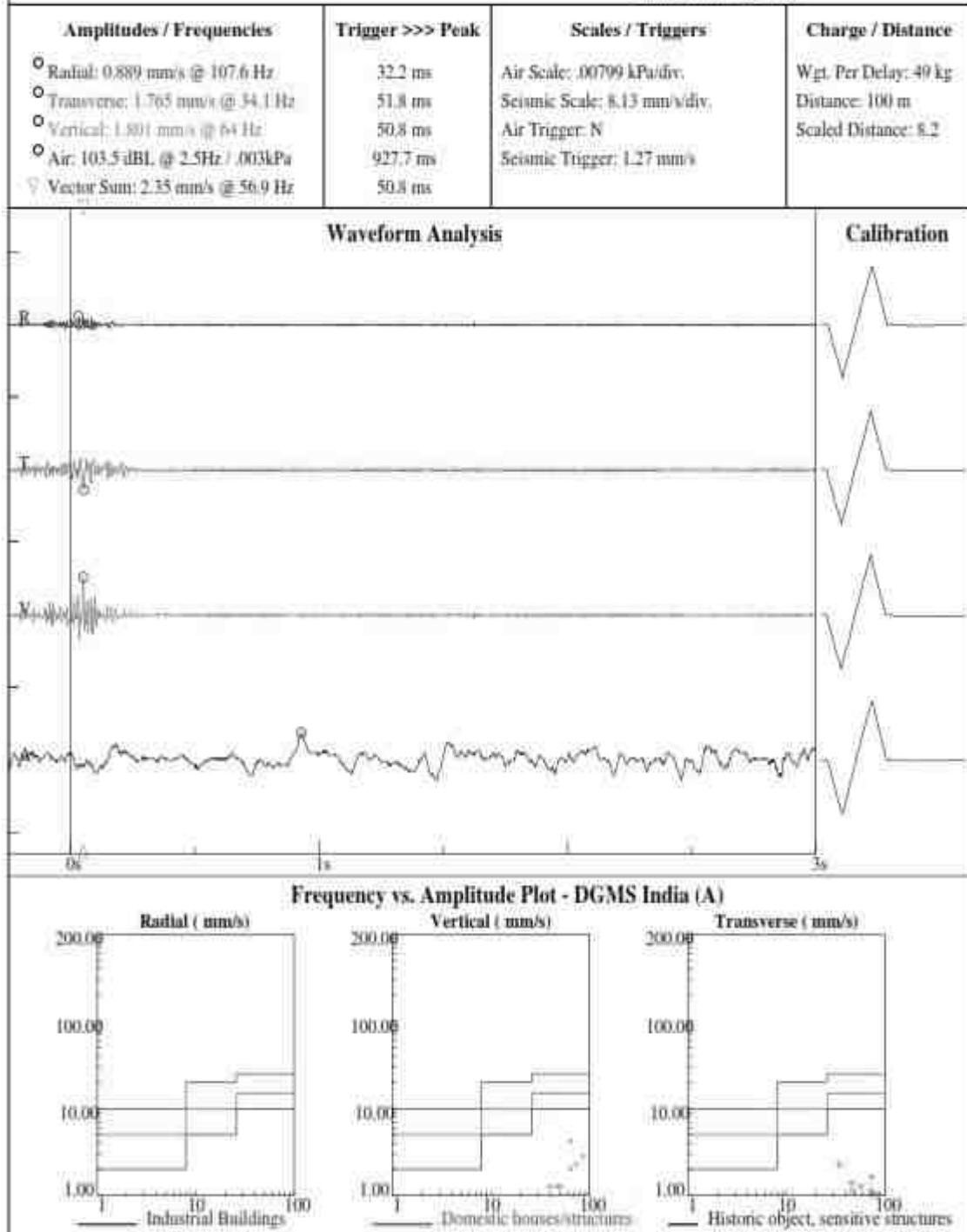


Figure 3.29 Monitoring Result Graph

### **Blast Location (Cluster Quarry of Murugesh)**

A vibration study for the cluster quarry project was conducted on May 29, 2025, after the mallikarjuna quarry blasting.



**Figure 3.30 Google image of the Cluster Quarry (Murugesh)Blasting Location**

**Table 3.24 Method of Blasting**

|                              | 8 Feet Hole | 5 Feet Hole |
|------------------------------|-------------|-------------|
| Blasthole Diameter (D) in mm | 32          | 32          |
| Burden (B) in m              | 1.5         | 1.5         |
| Spacing (S) in m             | 1.3         | 1.3         |
| Hole Length (L) in m         | 2.4         | 1.5         |
| Bench Height (BH) in m       | 2.1         | 1.2         |
| Mass of explosive/hole in kg | 0.5         | 0.375       |
| Number of blastholes/Delay   | 50          | 40          |
| Blasthole pattern            | Staggered   | Staggered   |
| Mass of explosive /day in kg | <b>25</b>   | <b>15</b>   |
| Type of explosives           | Slurry      | Slurry      |
| Initiation system            | NONEL       | NONEL       |

**Results**

- Ground Vibration and noise levels were recorded from the instruments the figure 3.31
- it can be observed that the vertical Peak Particle Velocity (PPV) recorded was 1.286mm/s at nearby bare land at distance of 200m.
- Air Over-Pressure (AOP) was 100.0dB and 0.002kPa at nearby Study area at distance of 200m.

**Table 3.25 Summary of the Blasts conducted**

| <b>Blast no</b> | <b>Number of holes</b> | <b>Maximum charge in kg</b> | <b>Hole depth in m</b> | <b>Distance (m)</b> | <b>Peak Particle Velocity (mm/s)</b> | <b>Air Over-Pressure (dB) &amp; kPa</b> |
|-----------------|------------------------|-----------------------------|------------------------|---------------------|--------------------------------------|-----------------------------------------|
| 1               | 90                     | 40                          | 1.5 to 2.4             | 200                 | 1.286                                | 100.0&0.002                             |

- This vibration study in cluster quarry operations has demonstrated that blasting activities can produce ground vibrations and air overpressure that may affect nearby structures. The field investigation shows there is no permanent structures within the 500m radius around the quarry.
- The analysis of vibration data revealed that while most recorded values remain within regulatory safety thresholds.

## SuperGraphics - Report

Telephone: (203)592-2400 x 23

**Company:** GEO TECHNICAL MINING SOLUTIONS  
**Location:** KRISHNAGIRI  
**Operator:** KUMARESAN  
**Notes:**

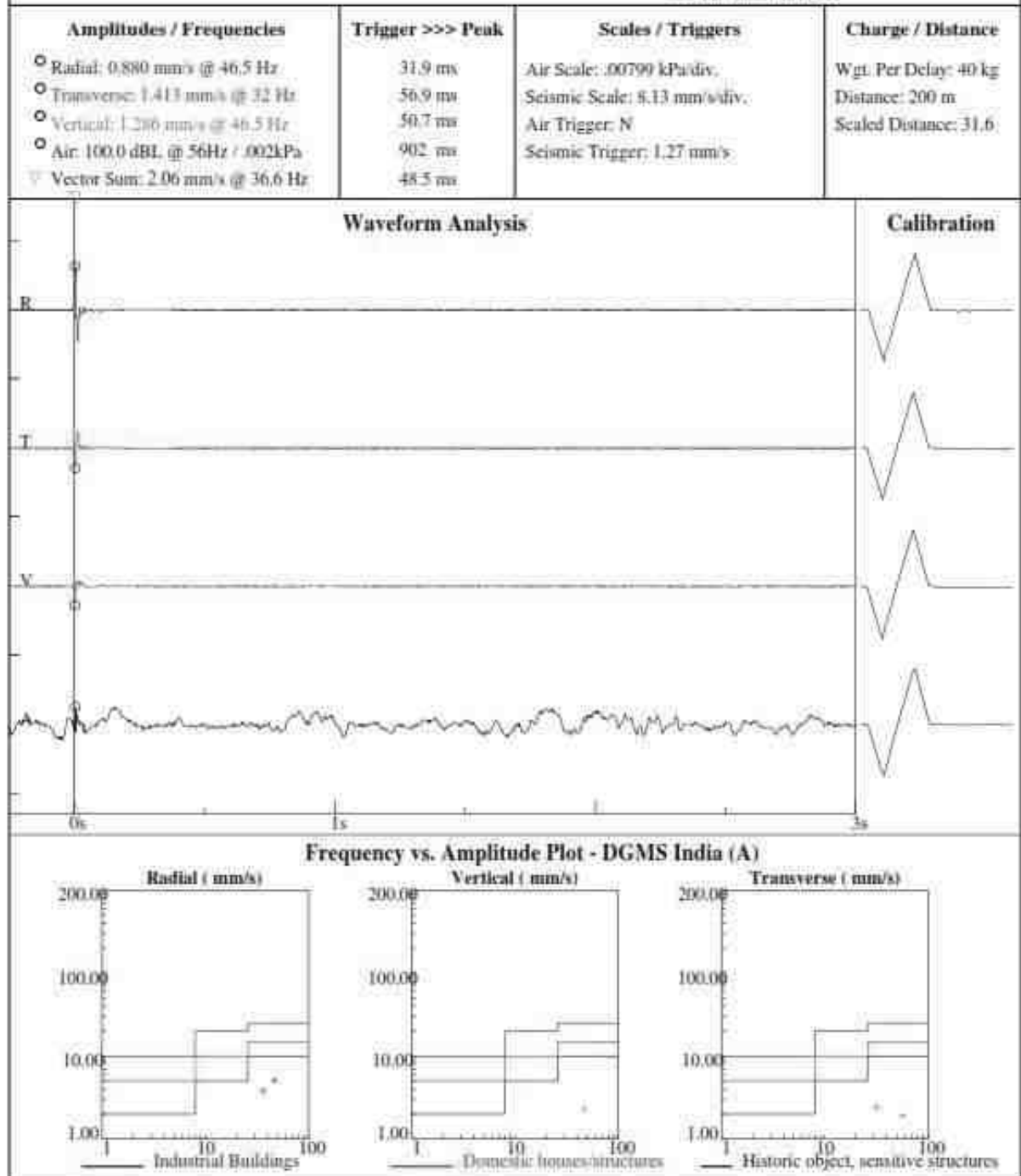
**29-05-2025 at 11:17:00 Event # 55**

Graph: 22372

Last Calibration: 27-02-2025

Record Duration: 3 sec

Sample Rate: 1024/sec



**Figure 3.31 Monitoring Result Graph**

### **3.7 BIOLOGICAL ENVIRONMENT**

Collection of comprehensive baseline information on flora and fauna is a prerequisite for assessment of impacts of any extractive industries/ activities. Biological environment is an important component of the environment of any area. It covers flora & fauna in the region, details of forests and wildlife sanctuaries in the region, with list of endangered species. Over the years ecological and along with it the loss of biological diversity has become a national and a global concern. Ecological assessment therefore is very critical for decision making and for the setting of a developmental project or an industry. An ecological study of the ecosystem is essential to understand the impact of industrialization and urbanization on existing flora and fauna of the area. Studies on various aspects of ecosystem play an important role in identifying sensitive issues for undertaking appropriate action to mitigate the impact, if any.

The objective of this Section is to characterize and understand the present status of the ecosystems in the study area to assess the bio-diversity and to identify the critical areas. The present study was undertaken as a part of EIA report to understand the present status of ecosystem prevailing in the study area, to compare it with the past condition with the help of available data, to predict changes as a result of present activities and to suggest measures for maintaining the conditions.

#### **3.7.1 Flora**

##### **3.7.1.1 Objectives of the Study**

The ecological study of the area was conducted in order to understand the existing status of the flora and fauna to generate baseline information and evaluate the possible impacts on biological environment. The present study highlights the various issues pertaining to floristic diversity and faunal wealth in the surrounding area up to 10km radius from the proposed expansion project.

##### **3.7.1.2 Study Approach & Methodology**

The baseline study for existing ecological environment was carried out during study period. A participatory and consultative approach was followed. Field visits were undertaken for survey of the aquatic and terrestrial vegetation and animals in the study area.

Nested quadrat sampling method was used for the study of community structure of the vegetation. The sampling consisted of randomly placed quadrats of 10m × 10m were laid down to assess trees, and sub quadrats of 5 m × 5 m were laid down for shrubs, 1m x 1m were laid down for herbs. The size and number of quadrats needed were determined using the species-

area curve (Misra, 1968). The data on vegetation were quantitatively analysed for abundance, density, frequency as per Curtis & McIntosh (1950). The Important Value Index (IVI) for trees was determined as the sum of relative density, relative frequency and relative dominance (Curtis, 1959).



**Figure 3.32 Quadrates Sampling Methods of Flora**

### **3.7.1.3 Survey Methodology**

The baseline study for existing biological environmental was carried out in Nov 2024. Study of flora and fauna carried out as per prescribed method addressed in SOP. Field visits were under taken for survey of the vegetation and animals in the study area. The study area is divided into three parts as project site area along with 500m from all direction surrounding site is being considered as core area and rest of 5km study area is buffer part of the study area.

### **3.7.1.4 Important Value Index (IVI)**

The concept of 'Important Value Index (IVI)' has been developed for expressing the dominance and ecological success of any species, with a single value (Mishra, 1968, Sharma, 2005). This index utilizes three characteristics, they are (i) Relative frequency and (ii) Relative density. The three characteristics computed using frequency, density and abundance for all the species falling in all the quadrat by using the following formula. The relative frequency, relative density and relative abundance has been calculated to calculate the IVI value

$$\text{IVI} = \text{Relative frequency} + \text{Relative abundance} + \text{Relative density} [\text{RF} + \text{RA} + \text{RD}]$$

$$\text{Relative Value Index (RVI)} = \text{Relative Density} + \text{Relative Frequency} [\text{RD} + \text{RF}].$$

Relative Value Index used for Expressing dominance and Ecological success of Shrub and herb Species in a particular area.

### **Shannon – Wiener Index, Evenness and Richness**

Biodiversity index is a quantitative measure that reflects how many different types of species, there are in a dataset, and simultaneously takes into account how evenly the basic entities (such as individuals) are distributed among those types of species. The value of biodiversity index increases both when the number of types increases and when evenness increases. For a given number of type of species, the value of a biodiversity index is maximized when all type of species is equally abundant.

The **Shannon Diversity Index** (sometimes called the Shannon-Wiener Index) is a way to measure the diversity of species in a community.

The species diversity index (H) for floral and faunal diversity is calculated by the use of Shannon Wiener Index (Shannon Wiener, 1963) as:

$$H = - \sum (n_i/n) \times \ln (n_i/n)$$

- Where,  $n_i$  is individual density of a species and  $n$  is total density of all the species
- The Evenness Index (E) is calculated by using Shannon's Evenness formula (Magurran, 2004).
- The higher the value of H, the higher the diversity of species in a particular community. The lower the value of H, the lower the diversity. A value of  $H = 0$  indicates a community that only has one species

$$\text{Evenness Index (E)} = H / \ln(S)$$

Where, H is Shannon Wiener Diversity index; S is number of species

The Shannon evenness Index is a way to measure the evenness of species in a community. The term “evenness” simply refers to how similar the abundances of different species are in the community.

#### **3.7.1.5 Floral diversity Analysis**

Flora study was conducted using the above said methodology to inventory the existing terrestrial plants in both core and buffer zones. Details of plants have been described in the succeeding sections.

##### ***Flora in core zone***

There are no trees in the quarry lease area, only shrubs, herbs and grasses. Taxonomically total of 23 species belonging to 18 families were recorded. Among them are herbs (19) and shrubs (4). Majority of the species belongs to the family of Fabaceae and

Poaceae. The species richness (Margalef index) and plant details are given in Table 3.26-3.29. There are no endangered or threatened plant species in the quarry lease area.

#### ***Flora in 300m radius***

The vegetation habit analysis indicates that the flora of the 300m radius of the study area consists of 60 species belonging to 31 families. Among the 60 species, 22 herbs, 24 shrubs and 14 trees. the highest number of species were from the Poaceae family (7), followed by Fabaceae (6), Malvaceae (4), and Mimosaceae (4). Three species were recorded from the Amaranthaceae, Apocynaceae, and Asteraceae families, while six species each were recorded from the Arecaceae, Boraginaceae, Convolvulaceae, Cucurbitaceae, Euphorbiaceae, and Lamiaceae families. The endangered or threatened and Species Richness (margalef Index) in the study area it mentioned in Table 3.27- 3.29. The Settupalli Reserve Forest is located 2.64km for Northeast of the quarry lease area. The reserve forest is predominantly populated with *Albizia amara*, *Azadirachta indica*, *Vachellia leucophloea*, *Chloroxylon swietenia*, and *Ziziphus mauritiana*. The classification of plants in the reserve forest is given in Table 3.26-3.29.

#### ***Flora in 10km radius zone***

The 10km radius A total of 102 species of invasive alien species belonging to 82 general and 39 families were recorded in 10km radius (Table 3.30). Herbs (73.83%) formed the predominant life form followed by shrubs (10.28%), climbers (8.42%), trees (4.67%) and grasses (2.80%).



Table 3.26 Flora in mine lease area

| S. No            | Local Name      | Scientific name                | Family name    | Total No. of species | Total of Quadrants with species | Total No. of Quadrants | Density | Frequency (%) | Abundance | Relative Density | Relative Frequency | IVI   | UCN Conservation Status |
|------------------|-----------------|--------------------------------|----------------|----------------------|---------------------------------|------------------------|---------|---------------|-----------|------------------|--------------------|-------|-------------------------|
| SHRUBS           |                 |                                |                |                      |                                 |                        |         |               |           |                  |                    |       |                         |
| 1                | Avaram chedi    | <i>Senna auriculata</i>        | Fabaceae       | 10                   | 4                               | 5                      | 2.0     | 80            | 2.5       | 19.61            | 19.05              | 38.66 | LC                      |
| 2                | Earuku          | <i>Calotropis gigantea</i>     | Apocynaceae    | 8                    | 3                               | 5                      | 1.6     | 60            | 2.7       | 15.69            | 14.29              | 29.97 | NL                      |
| 3                | communist pacha | <i>Chromolaena odorata</i>     | Asteraceae     | 13                   | 5                               | 5                      | 2.6     | 100           | 2.6       | 25.49            | 23.81              | 49.30 | NL                      |
| 4                | Unni sedei      | <i>Lantana camara</i>          | Verbenaceae    | 6                    | 4                               | 4                      | 1.8     | 80            | 2.6       | 25.49            | 25.81              | 47.45 | NL                      |
| HERBS & CLIMBERS |                 |                                |                |                      |                                 |                        |         |               |           |                  |                    |       |                         |
| 1.               | Kolunji chedi   | <i>Tephrosia purpurea</i>      | Fabaceae       | 23                   | 5                               | 5                      | 4.6     | 100           | 4.6       | 7.64             | 5.05               | 12.69 | NL                      |
| 2.               | Nayuruvi        | <i>Achyranthes aspera</i>      | Amaranthaceae  | 18                   | 5                               | 5                      | 3.6     | 100           | 3.6       | 5.98             | 5.05               | 11.03 | NL                      |
| 3.               | Nearunji mull   | <u><i>Tribulus zeyheri</i></u> | Zygophyllaceae | 13                   | 5                               | 5                      | 2.6     | 100           | 2.6       | 4.32             | 5.05               | 9.37  | NL                      |
| 4.               | American mint   | <i>Hyptis suaveolens</i>       | Lamiaceae      | 11                   | 5                               | 5                      | 2.2     | 100           | 2.2       | 3.65             | 5.05               | 8.70  | NL                      |
| 5.               | Mukkirattai     | <i>Boerhaavia diffusa</i>      | Nyctaginaceae  | 12                   | 4                               | 5                      | 2.4     | 80            | 3.0       | 3.99             | 4.04               | 8.03  | NL                      |

|     |                  |                                |                |    |   |   |     |     |     |      |      |       |    |
|-----|------------------|--------------------------------|----------------|----|---|---|-----|-----|-----|------|------|-------|----|
| 6.  | Kuppaimeni       | <i>Acalypha indica</i>         | Euphorbiaceae  | 9  | 5 | 5 | 1.8 | 100 | 1.8 | 2.99 | 5.05 | 8.04  | NL |
| 7.  | Arivalmanaipondu | <i>Sida acuta</i>              | Malvaceae      | 13 | 5 | 5 | 2.6 | 100 | 2.6 | 4.32 | 5.05 | 9.37  | NL |
| 8.  | Nilatutti        | <i>Sida cordifolia</i>         | Malvaceae      | 25 | 5 | 5 | 5   | 100 | 5.0 | 8.31 | 5.05 | 13.36 | NL |
| 9.  | Korai grass      | <i>Cyperus sesquiflorus</i>    | Poaceae        | 28 | 5 | 5 | 5.6 | 100 | 5.6 | 9.30 | 5.05 | 14.35 | LC |
| 10. | Amman pacharisi  | <i>Euphorbia hirta</i>         | Euphorbiaceae  | 16 | 4 | 5 | 3.2 | 80  | 4.0 | 5.32 | 4.04 | 9.36  | NL |
| 11. | Karaikai         | <i>Canthium coromandelicum</i> | Rubiaceae      | 2  | 2 | 5 | 0.4 | 40  | 1.0 | 0.66 | 2.02 | 2.68  | NL |
| 12. | Keelanelli       | <i>Phyllanthus amarus</i>      | Phyllanthaceae | 15 | 4 | 5 | 3   | 80  | 3.8 | 4.98 | 4.04 | 9.02  | NL |
| 13. | Chevvarakupul    | <i>Chloris barbata</i>         | Poaceae        | 11 | 4 | 5 | 2.2 | 80  | 2.8 | 3.65 | 4.04 | 7.69  | NL |
| 14. | Mullukkeerai     | <i>Amaranthus spinosus</i>     | Amaranthaceae  | 9  | 5 | 5 | 1.8 | 100 | 1.8 | 2.99 | 5.05 | 8.04  | NL |
| 15. | Vishnukarandi    | <i>Evolvulus alsinoides</i>    | Convolvulaceae | 12 | 4 | 5 | 2.4 | 80  | 3.0 | 3.99 | 4.04 | 8.03  | NL |
| 16. | Thulasi          | <i>Ocimum sanctum</i>          | Lamiaceae      | 8  | 3 | 5 | 1.6 | 60  | 2.7 | 2.66 | 3.03 | 5.69  | NL |
| 17. | Natthai choori   | <i>Spermacoce hispida L</i>    | Rubiaceae      | 13 | 5 | 5 | 2.6 | 100 | 2.6 | 4.32 | 5.05 | 9.37  | NL |
| 18. | Thuthi           | <i>Abutilon indicum</i>        | Malvaceae      | 9  | 4 | 5 | 1.8 | 80  | 2.3 | 2.99 | 4.04 | 7.03  | NL |
| 19. | Pill             | <i>Cenchrus ciliaris</i>       | Poaceae        | 7  | 5 | 5 | 2.4 | 80  | 2.4 | 3.94 | 3.06 | 7.15  | NL |

### ***The Flora in lease area and 300m radius (buffer zone)***

Taxonomically 36 species belonging to 23 families have been recorded from the 300 m radius buffer zone. Based on habitat classification of the enumerated plants the majority of species were seven Tree 7 followed by Herbs & Climbers & Grass 21, Shrubs 8. Details of flora with the scientific name and species richness index were mentioned in Table. 3.27- 3.29.

### ***Flora in 10km radius buffer zone***

Similar type of environment also in buffer area but with more flora diversity compare than core zone area, because of nearby agriculture land was found to be dominate in all the directions. Majority of the flat landscape around project unit is occupied by agriculture fields. It contains a total of 57 species belonging to 34 families have been recorded from the buffer zone. The floral (89) varieties among them Trees 26 Shrubs 9 and Herbs & Climbers & Creeper & Cactus 22. Details of flora with the scientific name were mentioned in Table.3.27.

Table 3.27 Flora in 300 m Radius

| S. No  | Local Name        | Scientific name                  | Family name   | Total No. of species | Total of Quadrants with species | Total No. of Quadrants | Density | Frequency (%) | Abundance | Relative Density | Relative Frequency | IVI   | IUCN Conservation Status |
|--------|-------------------|----------------------------------|---------------|----------------------|---------------------------------|------------------------|---------|---------------|-----------|------------------|--------------------|-------|--------------------------|
| Trees  |                   |                                  |               |                      |                                 |                        |         |               |           |                  |                    |       |                          |
| 1      | Velikathanmaram   | <i>Prosopis juliflora</i>        | Fabaceae      | 5                    | 3                               | 5                      | 1.0     | 60            | 1.67      | 18.52            | 16.67              | 35.19 | Not Listed               |
| 2      | Pongam oiltree    | <i>Pongamia pin nata</i>         | Fabaceae      | 3                    | 2                               | 5                      | 0.6     | 40            | 1.50      | 11.11            | 11.11              | 22.22 |                          |
| 3      | Panai maram       | <i>Borassus flabellifer</i>      | Arecaceae     | 2                    | 1                               | 5                      | 0.4     | 20            | 2.00      | 7.41             | 5.56               | 12.97 |                          |
| 4      | Nochi             | <i>Vitex negundo</i>             | Lamiaceae     | 4                    | 3                               | 5                      | 0.8     | 60            | 1.33      | 14.81            | 16.67              | 31.48 |                          |
| 5      | Karuvelam maram   | <i>Vachellia nilotica</i>        | Fabaceae      | 3                    | 2                               | 5                      | 0.6     | 40            | 1.50      | 11.11            | 11.11              | 22.22 |                          |
| 6      | Nuna maram        | <i>Morinda citrifolia</i>        | Rubiaceae     | 5                    | 3                               | 5                      | 1.0     | 60            | 1.67      | 18.52            | 16.67              | 35.19 |                          |
| 7      | Vembu             | <i>Azadirachta indica</i>        | Meliaceae     | 5                    | 4                               | 5                      | 1.0     | 80            | 1.25      | 18.52            | 22.22              | 40.74 |                          |
| Shrubs |                   |                                  |               |                      |                                 |                        |         |               |           |                  |                    |       |                          |
| 1      | Icham             | <i>Calotropis gigantea</i>       | Apocynaceae   | 8                    | 7                               | 10                     | 0.8     | 70.0          | 1.1       | 21.6             | 21.9               | 43.5  | Not Listed               |
| 2      | Unichedi          | <i>Datura metel</i>              | Solanaceae    | 6                    | 5                               | 10                     | 0.6     | 50.0          | 1.2       | 16.2             | 15.6               | 31.8  |                          |
| 3      | Sundaika          | <i>Abutilon indicum</i>          | Meliaceae     | 7                    | 6                               | 10                     | 0.7     | 60.0          | 1.2       | 18.9             | 18.8               | 37.7  |                          |
| 4      | Erukku            | <i>Senna auriculata</i>          | Fabaceae      | 9                    | 8                               | 10                     | 0.9     | 80.0          | 1.1       | 24.3             | 25.0               | 49.3  |                          |
| 5      | Avarai            | <i>Lantana camara</i>            | Verbenaceae   | 7                    | 6                               | 10                     | 0.7     | 60.0          | 1.2       | 18.9             | 18.8               | 37.7  |                          |
| 6      | Sappathikalli     | <i>Cereus pterogonus</i>         | Cactaceae     | 5                    | 4                               | 10                     | 1.25    | 40            | 1.25      | 8.62             | 8.16               | 16.78 |                          |
| 7      | Kattamanaku       | <i>Jatropha gossypiiifolia L</i> | Euphorbiaceae | 7                    | 6                               | 10                     | 1.17    | 60            | 1.17      | 12.07            | 12.24              | 24.31 |                          |
| 8      | Karunochi         | <i>Vitex negundo</i>             | Lamiaceae     | 9                    | 8                               | 10                     | 1.13    | 80            | 1.13      | 15.52            | 16.33              | 31.85 |                          |
| Herbs  |                   |                                  |               |                      |                                 |                        |         |               |           |                  |                    |       |                          |
| 1      | Thumbai           | <i>Leucas aspera</i>             | Lamiaceae     | 6                    | 5                               | 15                     | 0.40    | 33.33         | 1.20      | 5.22             | 5.38               | 10.6  | Not Listed               |
| 2      | Kantang kathrikai | <i>Solanum virginianum</i>       | Solanaceae    | 3                    | 2                               | 15                     | 0.20    | 13.33         | 1.50      | 2.61             | 2.15               | 4.76  |                          |
| 3      | Arugampul         | <i>Cynodon dactylon</i>          | Poaceae       | 6                    | 5                               | 15                     | 0.40    | 33.33         | 1.20      | 5.22             | 5.38               | 10.6  |                          |

|    |                  |                                           |                |   |   |    |      |       |      |      |      |       |  |
|----|------------------|-------------------------------------------|----------------|---|---|----|------|-------|------|------|------|-------|--|
| 4  | Poolai poondu    | <i>Aerva lanata</i>                       | Amaranthaceae  | 5 | 4 | 15 | 0.33 | 26.67 | 1.25 | 4.35 | 4.30 | 8.65  |  |
| 5  | Korai            | <i>Cyperus rotundus</i>                   | Cyperaceae     | 4 | 3 | 15 | 0.27 | 20.00 | 1.33 | 3.48 | 3.23 | 6.71  |  |
| 6  | Nerunji          | <i>Tribulus terrestris</i>                | Zygophyllales  | 2 | 1 | 15 | 0.13 | 6.67  | 2.00 | 1.74 | 1.08 | 2.82  |  |
| 7  | Nayuruv          | <i>Achyranthes aspera</i>                 | Amaranthaceae  | 7 | 6 | 15 | 0.47 | 40.00 | 1.17 | 6.09 | 6.45 | 12.54 |  |
| 8  | Thottalchinungi  | <i>Mimosa pudica</i>                      | Mimosaceae     | 8 | 7 | 15 | 0.53 | 46.67 | 1.14 | 6.96 | 7.53 | 14.49 |  |
| 9  | Mulli            | <i>Solanum violaceum</i><br><i>Ortega</i> | Solanaceae     | 5 | 4 | 15 | 0.33 | 26.67 | 1.25 | 4.35 | 4.30 | 8.65  |  |
| 10 | Kombumul         | <i>Acanthospermum</i><br><i>hispidum</i>  | Asteraceae     | 5 | 3 | 15 | 0.33 | 20.00 | 1.67 | 4.35 | 3.23 | 7.58  |  |
| 11 | Ponnangani       | <i>Alternanthera pungens</i>              | Amaranthaceae  | 8 | 7 | 15 | 0.53 | 46.67 | 1.14 | 6.96 | 7.53 | 14.49 |  |
| 12 | wild thulasi     | <i>Hyptis suaveolens (L.)</i>             | Lamiaceae      | 7 | 6 | 15 | 0.47 | 40.00 | 1.17 | 6.09 | 6.45 | 12.54 |  |
| 13 | Gopuram Tangi    | <i>Andrographis echiioides</i>            | Acanthaceae    | 4 | 3 | 15 | 0.27 | 20.00 | 1.33 | 3.48 | 3.23 | 6.71  |  |
| 14 | Amman Paccharisi | <i>Euphorbia hirta</i>                    | Euphorbiaceae  | 6 | 5 | 15 | 0.40 | 33.33 | 1.20 | 5.22 | 5.38 | 10.6  |  |
| 15 | Paca poondu      | <i>Pavonia gallaensis</i>                 | Malvaceae      | 5 | 4 | 15 | 0.33 | 26.67 | 1.25 | 4.35 | 4.30 | 8.65  |  |
| 16 | Perandai         | <i>Cissus quadrangularis</i>              | Vitaceae       | 3 | 2 | 15 | 0.20 | 13.33 | 1.50 | 2.61 | 2.15 | 4.76  |  |
| 17 | Vishnukrandi     | <i>Evolvulus alsinoides</i>               | Convolvulaceae | 6 | 5 | 15 | 0.40 | 33.33 | 1.20 | 5.22 | 5.38 | 10.6  |  |
| 18 | Musumusukkai     | <i>Mukia maderaspatana</i>                | Cucurbitaceae  | 8 | 7 | 15 | 0.53 | 46.67 | 1.14 | 6.96 | 7.53 | 14.49 |  |
| 19 | Sirupunaikkali   | <i>Passiflora foetida</i>                 | Passifloraceae | 6 | 5 | 15 | 0.40 | 33.33 | 1.20 | 5.22 | 5.38 | 10.6  |  |
| 20 | Nagathali        | <i>Opuntia dillenii</i>                   | Cactaceae      | 5 | 4 | 15 | 0.33 | 26.67 | 1.25 | 4.35 | 4.30 | 8.65  |  |
| 21 | Agave            | <i>Agave weberi</i>                       | Asparagaceae   | 6 | 5 | 15 | 0.40 | 33.33 | 1.20 | 5.22 | 5.38 | 10.6  |  |

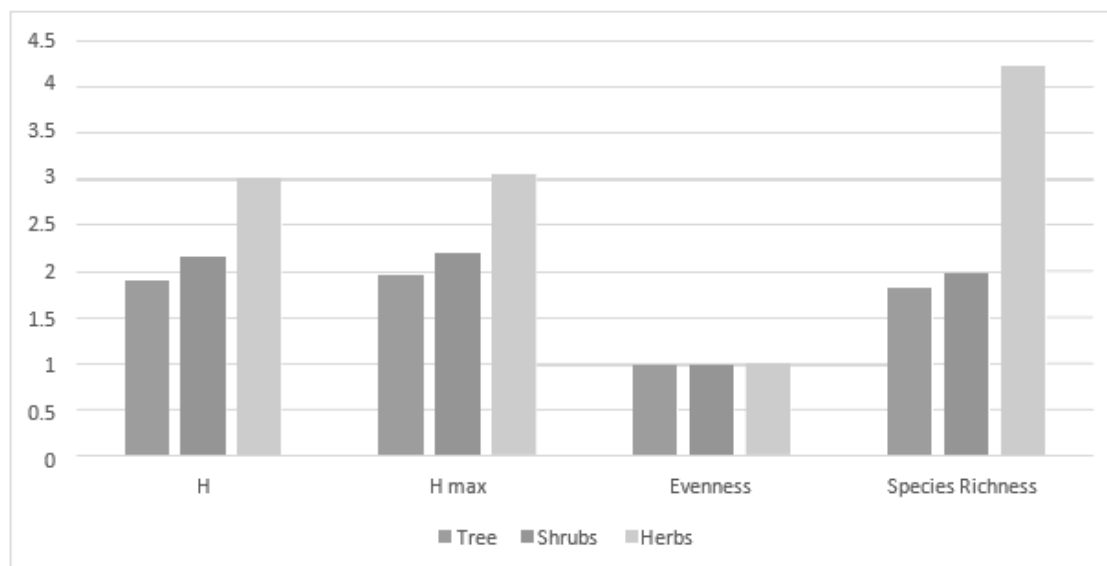
**Table 3.28 Calculation of Species Diversity in 300m Radius**

| S. No.                             | Common name      | Scientific name                | No. of Species | Pi   | In (Pi) | Pi x in (Pi) |
|------------------------------------|------------------|--------------------------------|----------------|------|---------|--------------|
| <b>Trees</b>                       |                  |                                |                |      |         |              |
| 1                                  | Velikathan maram | <i>Prosopis juliflora</i>      | 5              | 0.19 | -1.69   | -0.31        |
| 2                                  | Pongam oiltree   | <i>Pongamia pin nata</i>       | 3              | 0.11 | -2.20   | -0.24        |
| 3                                  | Panai maram      | <i>Borassus flabellifer</i>    | 2              | 0.07 | -2.60   | -0.19        |
| 4                                  | Nochi            | <i>Vitex negundo</i>           | 4              | 0.15 | -1.91   | -0.28        |
| 5                                  | Karuvelam maram  | <i>Vachellia nilotica</i>      | 3              | 0.11 | -2.20   | -0.24        |
| 6                                  | Nuna maram       | <i>Morinda citrifolia</i>      | 5              | 0.19 | -1.69   | -0.31        |
| 7                                  | Vembu            | <i>Azadirachta indica</i>      | 5              | 0.19 | -1.69   | -0.31        |
| H (Shannon Diversity Index) = 1.90 |                  |                                |                |      |         |              |
| <b>Shrubs</b>                      |                  |                                |                |      |         |              |
| 1                                  | Icham            | <i>Phoenix pusilla</i>         | 2              | 0.03 | -3.37   | -0.12        |
| 2                                  | Unichedi         | <i>Lantana camara</i>          | 7              | 0.12 | -2.11   | -0.26        |
| 3                                  | Sundaika         | <i>Solanum torvum</i>          | 8              | 0.14 | -1.98   | -0.27        |
| 4                                  | Erukku           | <i>Calotropis gigantea</i>     | 6              | 0.10 | -2.27   | -0.23        |
| 5                                  | Avarai           | <i>Senna auriculata</i>        | 9              | 0.16 | -1.86   | -0.29        |
| 6                                  | Sappathikalli    | <i>Cereus pterogonus</i>       | 5              | 0.09 | -2.45   | -0.21        |
| 7                                  | Kattamanaku      | <i>Jatropha gossypifolia L</i> | 7              | 0.12 | -2.11   | -0.26        |
| 8                                  | Karunochi        | <i>Vitex negundo</i>           | 9              | 0.16 | -1.86   | -0.29        |
| H (Shannon Diversity Index) = 2.14 |                  |                                |                |      |         |              |
| <b>Herbs</b>                       |                  |                                |                |      |         |              |
| 1                                  | Nayuruv          | <i>Achyranthes aspera</i>      | 6              | 0.05 | -2.95   | -0.15        |
| 2                                  | Nearunji mull    | <i>Tribulus zeyheri Sond</i>   | 3              | 0.03 | -3.65   | -0.10        |
| 3                                  | Pill             | <i>Cenchrus ciliaris</i>       | 6              | 0.05 | -2.95   | -0.15        |
| 4                                  | pulapoo          | <i>Aerva lanata</i>            | 5              | 0.04 | -3.14   | -0.14        |
| 5                                  | kapok bush       | <i>Aerva javani</i>            | 4              | 0.03 | -3.36   | -0.12        |
| 6                                  | Rail poondu      | <i>Croton bonplandianus</i>    | 2              | 0.02 | -4.05   | -0.07        |
| 7                                  | Mookuthi poondu  | <i>pedalium murex</i>          | 7              | 0.06 | -2.80   | -0.17        |
| 8                                  | Perandai         | <i>Cissus quadrangularis</i>   | 8              | 0.07 | -2.67   | -0.19        |
| 9                                  | Thumbai chadi    | <i>Leucas aspera</i>           | 5              | 0.04 | -3.14   | -0.14        |

|                                    |                  |                               |   |      |       |       |
|------------------------------------|------------------|-------------------------------|---|------|-------|-------|
| 10                                 | Umathai          | <i>Datura metel</i>           | 5 | 0.04 | -3.14 | -0.14 |
| 11                                 | Sethamutti       | <i>Sida cordata</i>           | 8 | 0.07 | -2.67 | -0.19 |
| 12                                 | Kolunji          | <i>Tephrosia purpurea</i>     | 7 | 0.06 | -2.80 | -0.17 |
| 13                                 | Ishappukol Vitai | <i>Plantago coronopus</i>     | 4 | 0.03 | -3.36 | -0.12 |
| 14                                 | Vealiparuthi     | <i>Pergularia daemia</i>      | 6 | 0.05 | -2.95 | -0.15 |
| 15                                 | Seppu neringi    | <i>Indigofera linnaei</i> Ali | 5 | 0.04 | -3.14 | -0.14 |
| 16                                 | Sapathikalli     | <i>Opuntia ficus-indica</i>   | 3 | 0.03 | -3.65 | -0.10 |
| 17                                 | Pal kodi         | <i>Cynanchum viminale</i>     | 6 | 0.05 | -2.95 | -0.15 |
| 18                                 | Ilia perandai    | <i>Cissus rotundifolia</i>    | 8 | 0.07 | -2.67 | -0.19 |
| 19                                 | Katralai         | <i>Aloe vera</i>              | 6 | 0.05 | -2.95 | -0.15 |
| 20                                 | Seammulli        | <i>Barleria prionitis</i>     | 5 | 0.04 | -3.14 | -0.14 |
| 21                                 | Agave            | <i>Agave weberi</i>           | 6 | 0.05 | -2.95 | -0.15 |
| H (Shannon Diversity Index) = 3.00 |                  |                               |   |      |       |       |

**Table 3.29 Species Richness (Index) in 300m radius**

|               | <b>H</b> | <b>H max</b> | <b>Evenness</b> | <b>Species Richness</b> |
|---------------|----------|--------------|-----------------|-------------------------|
| <b>Trees</b>  | 1.90     | 1.95         | 0.98            | 1.82                    |
| <b>Shrubs</b> | 2.14     | 2.20         | 0.97            | 1.97                    |
| <b>Herbs</b>  | 3.00     | 3.04         | 0.99            | 4.22                    |



**Figure 3.33 Species Richness pattern in 300m Radius**

**Table 3.30 Flora in 10km radius**

| S.No. | Species Name                               | Family          | Habitat | Uses                  |
|-------|--------------------------------------------|-----------------|---------|-----------------------|
| 20.   | <i>Acacia auriculiformis L.</i>            | Mimosaceae      | Tree    | Fuel wood, Timber     |
| 21.   | <i>Acanthospermum hispidum DC</i>          | Asteraceae      | Herb    | Medicinal             |
| 22.   | <i>Aerva javanica (Burm. f.)</i>           | Amaranthaceae   | Herb    | Medicina              |
| 23.   | <i>Ageratina adenophora (Spreng.</i>       | Asteraceae      | Herb    | Fodder                |
| 24.   | <i>Ageratum conyzoides L</i>               | Asteraceae      | Herb    | Medicinal             |
| 25.   | <i>Alternanthera pungens Humb</i>          | Amaranthaceae   | Herb    | Fodder                |
| 26.   | <i>Alternanthera tenella Colla.</i>        | Amaranthaceae   | Herb    | Fodder, Vegetable     |
| 27.   | <i>Amaranthus spinosus L.</i>              | Amaranthaceae   | Herb    | Vegetable, Medicinal  |
| 28.   | <i>Antigonon leptopus</i>                  | Polygonaceae    | Climber | Ornamental            |
| 29.   | <i>Bidens pilosa L.</i>                    | Asteraceae      | Herb    | Fodder                |
| 30.   | <i>Blainvillea acmella (L.) Philipson</i>  | Asteraceae      | Herb    | None                  |
| 31.   | <i>Borassus flabellifer L.</i>             | Arecaceae       | Tree    | Fruit edible, Timber  |
| 32.   | <i>Calotropis gigantea (L.) R. Br.</i>     | Asclepiadaceae  | Shrub   | Medicinal, Ornamental |
| 33.   | <i>Cassia alata L.</i>                     | Caesalpiniaceae | Shrub   | Medicinal             |
| 34.   | <i>Cassia tora L.</i>                      | Caesalpiniaceae | Herb    | Medicinal             |
| 35.   | <i>Cassia uniflora Miller</i>              | Caesalpiniaceae | Herb    | Medicinal             |
| 36.   | <i>Catharanthus pusillus</i>               | Apocynaceae     | Herb    | Fodder                |
| 37.   | <i>Chenopodium ambrosioides L.</i>         | Chenopodiaceae  | Herb    | Fodder                |
| 38.   | <i>Chrozophora rottleri (Geis.) Spreng</i> | Euphorbiaceae   | Herb    | Fodder                |
| 39.   | <i>Cleome gynandra L.</i>                  | Cleomaceae      | Herb    | Medicinal             |
| 40.   | <i>Cleome monophylla L.</i>                | Cleomaceae      | Herb    | Vegetable             |
| 41.   | <i>Cleome rutidosperma DC.</i>             | Cleomaceae      | Herb    | Fodder                |
| 42.   | <i>Corchorus tridens L.</i>                | Tiliaceae       | Herb    | Fodder, Fibre         |
| 43.   | <i>Crotalaria pallida Dryand</i>           | Fabaceae        | Herb    | Fodder                |
| 44.   | <i>Crotalaria retusa L.</i>                | Fabaceae        | Herb    | Ornamental            |
| 45.   | <i>Croton bonplandianum Baill.</i>         | Euphorbiaceae   | Herb    | Fodder, Medicinal     |
| 46.   | <i>Cuscuta reflexa Roxb.</i>               | Cuscutaceae     | Climber | None                  |
| 47.   | <i>Cyperus difformis L.</i>                | Cyperaceae      | Herb    | Fodder                |
| 48.   | <i>Datura metel L.</i>                     | Solanaceae      | Shrub   | Medicinal             |
| 49.   | <i>Digera muricata (L.) Mart</i>           | Amaranthaceae   | Herb    | Medicinal, Vegetable  |
| 50.   | <i>Echinochloa colona (L.) Link.</i>       | Poaceae         | Grass   | Fodder                |
| 51.   | <i>Eclipta prostrata (L.) Mant.</i>        | Asteraceae      | Herb    | Medicinal             |
| 52.   | <i>Eichornia crassipes (C. Martius)</i>    | Pontederiaceae  | Herb    | Medicinal             |
| 53.   | <i>Euphorbia cyathophora Murray</i>        | Euphorbiaceae   | Herb    | Ornamental            |
| 54.   | <i>Euphorbia hirta L</i>                   | Euphorbiaceae   | Herb    | Medicinal             |
| 55.   | <i>Gnaphalium polycaulon Pers.</i>         | Asteraceae      | Herb    | Fodder                |
| 56.   | <i>Gomphrena serrata L.</i>                | Amaranthaceae   | Herb    | Fodder                |
| 57.   | <i>Hyptis suaveolens (L.) Poit.</i>        | Lamiaceae       | Herb    | Medicinal             |
| 58.   | <i>Imperata cylindrica (L.) Raeusch</i>    | Poaceae         | Grass   | Fodder                |



|      |                                             |                  |         |              |
|------|---------------------------------------------|------------------|---------|--------------|
| 59.  | <i>Indigofera linifolia (L.f.) Retz.</i>    | Fabaceae         | Herb    | Fodder       |
| 60.  | <i>Indigofera linnaei Ali</i>               | Fabaceae         | Herb    | Fodder       |
| 61.  | <i>Indigofera trita L.</i>                  | Fabaceae         | Shrub   | Fodder       |
| 62.  | <i>Ipomoea carnea Jacq</i>                  | Convolvulaceae   | Shrub   | Manure       |
| 63.  | <i>Ipomoea obscura (L.) Ker. - Gawal.</i>   | Convolvulaceae   | Climber | Fodder       |
| 64.  | <i>Ipomoea pes-tigridis L</i>               | Convolvulaceae   | Climber | Medicinal    |
| 65.  | <i>Ipomoea quamoclit L.</i>                 | Convolvulaceae   | Climber | Ornamental   |
| 66.  | <i>Martynia annua L.</i>                    | Pedaliaceae      | Herb    | Medicinal    |
| 67.  | <i>Mikania micrantha Kunth</i>              | Asteraceae       | Climber | None         |
| 68.  | <i>Mimosa pudica L.</i>                     | Mimosaceae       | Herb    | Medicinal    |
| 69.  | <i>Mirabilis jalapa L.</i>                  | Nyctaginaceae    | Herb    | Ornamental   |
| 70.  | <i>Monochoria vaginalis Burm. f.</i>        | Pontederiaceae   | Herb    | None         |
| 71.  | <i>Ocimum americanum L.</i>                 | Lamiaceae        | Herb    | Medicinal    |
| 72.  | <i>Opuntia stricta Haw.</i>                 | Cactaceae        | Shrub   | Fruit edible |
| 73.  | <i>Oxalis corniculata L.</i>                | Oxalidaceae      | Herb    | Vegetable    |
| 74.  | <i>Parthenium hysterophorus L.</i>          | Asteraceae       | Herb    | Fodder       |
| 75.  | <i>Passiflora foetida L.</i>                | Passifloraceae   | Climber | Medicinal    |
| 76.  | <i>Cactaceae</i>                            | Pedaliaceae      | Herb    | Medicinal    |
| 77.  | <i>Oxalidaceae</i>                          | Piperaceae       | Herb    | None         |
| 78.  | <i>Asteraceae</i>                           | Acanthaceae      | Herb    | Fodder       |
| 79.  | <i>Physalis minima L.</i>                   | Solanaceae       | Herb    | Medicinal    |
| 80.  | <i>Pilea microphylla (L.) Liebm.</i>        | Urticaceae       | Herb    | Medicinal    |
| 81.  | <i>Pistia stratiotes L.</i>                 | Araceae          | Herb    | Medicinal    |
| 82.  | <i>Portulaca oleracea L</i>                 | Portulacaceae    | Herb    | Vegetable    |
| 83.  | <i>Prosopis juliflora (Sw.) DC.</i>         | Mimosaceae       | Herb    | Fuel wood    |
| 84.  | <i>Ruellia tuberosa L.</i>                  | Acanthaceae      | Herb    | Ornamental   |
| 85.  | <i>Scoparia dulcis L.</i>                   | Scrophulariaceae | Herb    | Medicinal    |
| 86.  | <i>Sesbania bispinosa (Jacq.) Wight.</i>    | Fabaceae         | Shrub   | Fibre        |
| 87.  | <i>Sida acuta Burm. f.</i>                  | Malvaceae        | Herb    | Medicinal    |
| 88.  | <i>Solanum nigrum L.</i>                    | Solanaceae       | Herb    | Vegetable    |
| 89.  | <i>Solanum torvum Sw.</i>                   | Solanaceae       | Shrub   | Vegetable    |
| 90.  | <i>Spermacoce hispida L.</i>                | Rubiaceae        | Herb    | Medicinal    |
| 91.  | <i>Spilanthes acmella (L.) Murr.</i>        | Asteraceae       | Herb    | Fodder       |
| 92.  | <i>Stachytarpheta jamaicensis (L.) Vahl</i> | Verbenaceae      | Herb    | Ornamental   |
| 93.  | <i>Stylosanthes hamata L.</i>               | Fabaceae         | Herb    | Fodder       |
| 94.  | <i>Sy adenium grantii Hook. f.</i>          | Euphorbiaceae    | Shrub   | Ornamental   |
| 95.  | <i>Synedrella nodiflora (L.) Gaertn.</i>    | Asteraceae       | Herb    | Ornamental   |
| 96.  | <i>Tamarindus indica L.</i>                 | Caesalpiniaceae  | Tree    | Vegetable    |
| 97.  | <i>Tribulus terrestris L.</i>               | Zygophyllaceae   | Herb    | Medicinal    |
| 98.  | <i>Tridax procumbens L.</i>                 | Asteraceae       | Herb    | Medicina     |
| 99.  | <i>Triumfetta rhomboidea Jacq.</i>          | Tiliaceae        | Herb    | Medicinal    |
| 100. | <i>Typha angustata Bory &amp; Chaup.</i>    | Typhaceae        | Herb    | Ornamental   |
| 101. | <i>Waltheria indica L.</i>                  | Sterculiaceae    | Herb    | Medicinal    |
| 102. | <i>Xanthium indicum Koeing</i>              | Asteraceae       | Herb    | Medicinal    |

### 3.7.2 Fauna

The fauna study was both direct & indirect observation methods were used to survey the fauna, the study area was restricted up to 10km radius from the lease area. The study area is divided into two parts as core zone and buffer zone. The data was generated with reference to topography, land use, vegetation pattern, animals etc. Core zone has been considered within the cluster area and buffer zone has been considered outside the cluster area up to 10 km from Project boundary. The faunal like was carried out for Mammals, Birds, Reptiles, Amphibians and Butterflies. There are no rare, endangered, threatened (RET) and endemic species present in core area. indirect evidence such as calls, nests, burrows, droppings, scats, tracks etc. All available types of habitats at the site were evaluated and marked.

**Table 3.31 Methodology applied during survey of fauna**

| S. No. | Taxa              | Method of Sampling                       | References                      |
|--------|-------------------|------------------------------------------|---------------------------------|
| 1      | <b>Insects</b>    | Random walk, Opportunistic observations  | Pollard (1977); Kunte (2000)    |
| 2      | <b>Reptiles</b>   | Visual encounter survey (Direct Search)  | Daniel J.C (2002)               |
| 3      | <b>Amphibians</b> | Visual encounter survey (Direct Search)  |                                 |
| 4      | <b>Mammals</b>    | Tracks and Signs                         | Menon V (2014)                  |
| 5      | <b>Avian</b>      | Random walk, Opportunistic observations. | Grimmett R (2011); Ali S (1941) |

#### 3.7.2.1 Methodology

Field observations of fauna were carried out. The commonly available mammals, amphibians, reptiles, butterflies, with 10km surroundings were enumerated. The method followed for avifauna survey has been outlined in respective section. To prepare a detailed report on the status of faunal diversity within study area, field studies were conducted. Both direct (sighting) and indirect (evidences) observations methods were used to survey the faunal species around the study area. Further, information towards faunal diversity from secondary sources was collected on interaction with the local people and Forest Dept. officials.

#### ***Fauna Composition in the Core Zone***

The faunal species observed in the study area are listed in Table 3.22. A total of 25 species were recorded in core zone of the project area. The core zone exhibited fewer species, with only a small number of insects, mammals, and reptiles, whereas the buffer zone showed greater species diversity. Among the 25 species recorded, the distribution was as follows: (08) 32% insects, (03) 12% reptiles, (05) 20% mammals & 9 (36%) Avian. These species were cross-checked against the IUCN Red List Database version 3.1 to identify any threatened species. Data analysis revealed that 8 species are categorized as Least Concern on the Red List, while 17 species were not listed. The analysis indicates that there are no REET species in the core zone of the proposed quarry site.

### ***Fauna Composition in the buffer Zone***

The faunal species observed in the study area are listed in Table 3.32. Taxonomically a total of 50 species belonging to 35 families have been recorded from the buffer zone area. Based on habitat classification the majority of species were Birds 15 (30%), followed by Insects 14 (28%), Reptiles 13 (26%), Mammals 5 (10%) and amphibians 3 (6%). There are 4 schedule II species and 24 schedule IV species according to Indian wild life Act 1972. Totally, 19 species of bird were sighted in the study area.

**Table 3.32 Fauna in Core Zone**

| <b>S. No</b>    | <b>Common name/English Name</b> | <b>Family Name</b> | <b>Scientific Name</b>        | <b>Schedule list wildlife Protection act 1972</b> | <b>IUCN Red List data</b> |
|-----------------|---------------------------------|--------------------|-------------------------------|---------------------------------------------------|---------------------------|
| <b>INSECTS</b>  |                                 |                    |                               |                                                   |                           |
| 1               | Plain Tiger                     | Nymphalidae        | <i>Danauus chrysippus</i>     | NL                                                | NE                        |
| 2               | Tawny coster                    | Nymphalidae        | <i>Danaus chrysippus</i>      | Schedule IV                                       | LC                        |
| 3               | Red-veined darter               | Libellulidae       | <i>Sympetrum fonscolombii</i> | NE                                                | LC                        |
| 4               | Grasshopper                     | Acrididae          | <i>Hieroglyphus sp</i>        | NL                                                | LC                        |
| 5               | Termite                         | Blattodea          | <i>Hamitermes silvestri</i>   | NE                                                | LC                        |
| 6               | Blue tiger                      | Nymphalidae        | <i>Tirumala limniace</i>      | Schedule IV                                       | LC                        |
| 7               | Striped tiger                   | Nymphalidae        | <i>Danaus plexippus</i>       | Schedule IV                                       | LC                        |
| 8               | Ant                             | Formicidae         | <i>Camponotus Vicinus</i>     | NL                                                | NL                        |
| <b>REPTILES</b> |                                 |                    |                               |                                                   |                           |
| 1               | Garden lizard                   | Agamidae           | <i>Calotes versicolor</i>     | NE                                                | NE                        |
| 2               | Common house gecko              | Gekkonidae         | <i>Hemidactylus frenatus</i>  | NE                                                | NE                        |
| 3               | Rat snake                       | Colubridae         | <i>Ptyas mucosa</i>           | Sch II (Part II)                                  | LC                        |
| 4               | Common krait                    | Elapid snakes      | <i>Bungarus caeruleus</i>     | Schedule IV                                       | LC                        |
| 5               | Fan-Throated Lizard             | Agamidae           | <i>Sitanaponticeriana</i>     | NL                                                | LC                        |
| <b>MAMMALS</b>  |                                 |                    |                               |                                                   |                           |
| 1               | Indian Field Mouse              | Muridae            | <i>Mus booduga</i>            | Schedule IV                                       | LC                        |
| 2               | Asian Small Mongoose            | Herpestidae        | <i>Herpestes javanicus</i>    | Schedule II                                       | LC                        |
| 3               | Rat                             | Murids             | <i>Rattusrattus</i>           | Schedule IV                                       | LC                        |
| 4               | Rat snake                       | Colubridae         | <i>Ptyas mucosa</i>           | Sch II (Part II)                                  | LC                        |
| <b>AVES</b>     |                                 |                    |                               |                                                   |                           |
| 1               | Common myna                     | Sturnidae          | <i>Acridotheres tristis</i>   | NE                                                | LC                        |
| 2               | Black drongo                    | Dicruridae         | <i>Dicrurus macrocerus</i>    | NE                                                | LC                        |
| 3               | Koel                            | Cucalidae          | <i>Eudynamys scolopaceus</i>  | Schedule IV                                       | LC                        |
| 4               | Common cuckoo                   | Cucalidae          | <i>Cuculus canorus</i>        | NE                                                | LC                        |
| 5               | House crow                      | Corvidae           | <i>Corvus splendens</i>       | NE                                                | LC                        |
| 6               | Crow Pheasant                   | Cucalidae          | <i>Centropus sinensis</i>     | Schedule IV                                       | LC                        |

|   |                       |               |                           |             |    |
|---|-----------------------|---------------|---------------------------|-------------|----|
| 7 | Rose-ringed parakeet  | Psittaculidae | <i>Psittacula krameri</i> | Schedule IV | LC |
| 8 | Asian green bee-eater | Meropidae     | <i>Meropsorientalis</i>   | NL          | LC |
| 9 | Cattle egret          | Ardeidae      | <i>Bubulcus ibis</i>      | NE          | LC |

\*NE- Not Evaluated; LC- Least Concern, NT –Near Threatened, T-Threatened

**Table 3.33 Fauna in Buffer Zone**

| S. No.          | Common Name/English Name    | Family Name    | Scientific Name               | Schedule List Wildlife Protection Act 1972 | IUCN Red List Data |
|-----------------|-----------------------------|----------------|-------------------------------|--------------------------------------------|--------------------|
| <b>INSECTS</b>  |                             |                |                               |                                            |                    |
| 1               | Indian honey bee            | Apidae         | <i>Apis cerana</i>            | Schedule IV                                | LC                 |
| 2               | Blue tiger                  | Nymphalidae    | <i>Tirumala limniace</i>      | Schedule IV                                | LC                 |
| 3               | Common Indian crow          | Nymphalidae    | <i>Euploea core</i>           | Schedule IV                                | LC                 |
| 4               | Tawny coster                | Nymphalidae    | <i>Danaus chrysippus</i>      | Schedule IV                                | LC                 |
| 5               | Grasshopper                 | Acrididae      | <i>Hieroglyphus sp</i>        | NL                                         | LC                 |
| 6               | Jewel beetle                | Buprestidae    | <i>Eurythyrea austriaca</i>   | Schedule IV                                | NA                 |
| 7               | Red-veined darter           | Libellulidae   | <i>Sympetrum fonscolombii</i> | NL                                         | LC                 |
| 8               | Ant                         | Formicidae     | <i>Camponotus Vicinus</i>     | NL                                         | NL                 |
| 9               | Indian honey bee            | Mantidae       | <i>mantis religiosa</i>       | NL                                         | NL                 |
| 10              | Dragonfly                   | Gomphidae      | <i>Ceratogomphus pictus</i>   | Schedule IV                                | LC                 |
| 11              | Milkweed butterfly          | Nymphalidae    | <i>Danainae</i>               | NL                                         | LC                 |
| 12              | Striped tiger               | Nymphalidae    | <i>Danaus plexippus</i>       | Schedule IV                                | LC                 |
| 13              | Lesser grass blue           | Lycaenidae     | <i>Zizina Otis indica</i>     | Schedule IV                                | LC                 |
| 14              | Common Tiger                | Nymphalidae    | <i>Danaus genutia</i>         | Schedule IV                                | LC                 |
| <b>REPTILES</b> |                             |                |                               |                                            |                    |
| 1               | Garden lizard               | Agamidae       | <i>Calotes versicolor</i>     | NL                                         | LC                 |
| 2               | Chameleon                   | Chamaeleonidae | <i>Chameleon zeylanicus</i>   | Schedule II                                | LC                 |
| 3               | Fan-Throated Lizard         | Agamidae       | <i>Sitanaponticeriana</i>     | NL                                         | LC                 |
| 4               | Common house gecko          | Gekkonidae     | <i>Hemidactylus frenatus</i>  | NL                                         | LC                 |
| 5               | Rat snake                   | Colubridae     | <i>Ptyas mucosa</i>           | Sch II (Part II)                           | LC                 |
| 6               | Olive keel back water snake | Natricidae     | <i>Atrretium schistosum</i>   | Sch II (Part II)                           | LC                 |
| 7               | Whip Snake                  | Elapidae       | <i>Dryphis nasutus</i>        | Sch II (Part II)                           | LC                 |
| 8               | Common krait                | Elapid snakes  | <i>Bungarus caeruleus</i>     | Schedule IV                                | NL                 |

|                   |                         |                |                                                          |                    |    |
|-------------------|-------------------------|----------------|----------------------------------------------------------|--------------------|----|
| 9                 | Indian wall lizard      | Gekkonidae     | <i>Hemidactylus flaviviridis</i>                         | Schedule IV        | LC |
| 10                | Saw scaled viper        | Elapidae       | <i>Echis carinatus</i>                                   | Sch II (Part II)   | LC |
| 11                | Brahminy skink          | Scincidae      | <i>Eutropis carinata</i>                                 | NL                 | LC |
| 12                | Russell's viper         | Viperidae      | <i>Vipera russeli</i>                                    | Sch II (Part II)   | LC |
| 13                | Common skink            | Scincidae      | <i>Mabuya carinatus</i>                                  | NL                 | LC |
| <b>MAMMALS</b>    |                         |                |                                                          |                    |    |
| 1                 | Indian palm squirrel    | Sciuridae      | <i>Funambulus palmarum</i>                               | Schedule IV        | LC |
| 2                 | Indian Field Mouse      | Muridae        | <i>Mus booduga</i>                                       | Schedule IV        | LC |
| 3                 | Indian hare             | Leporidae      | <i>Lepus nigricollis</i>                                 | Schedule IV        | LC |
| 4                 | Asian Small Mongoose    | Herpestidae    | <i>Herpestes javanicus</i>                               | Schedule (Part II) | LC |
| 5                 | Brown rat               | Muridae        | <i>Rattus norwegicus</i>                                 | Schedule IV        | LC |
| <b>AVES</b>       |                         |                |                                                          |                    |    |
| 1                 | Koel                    | Cuculidae      | <i>Eudynamis</i>                                         | Schedule IV        | LC |
| 2                 | Cattle egret            | Ardeidae       | <i>Bubulcus ibis</i>                                     | NL                 | LC |
| 3                 | Common myna             | Sturnidae      | <i>Acridotheres tristis</i>                              | NL                 | LC |
| 4                 | House crow              | Corvidae       | <i>Corvus splendens</i>                                  | NL                 | LC |
| 5                 | Asian green bee-eater   | Meropidae      | <i>Merops orientalis</i>                                 | NL                 | LC |
| 6                 | Red-vented Bulbul       | Pycnonotidae   | <i>Pycnonotus cafer</i>                                  | Schedule IV        | LC |
| 7                 | Rose-ringed parakeet    | Psittaculidae  | <i>Psittacula krameri</i>                                | Schedule IV        | LC |
| 8                 | Shikra                  | Accipitridae   | <i>Accipiter badius</i>                                  | NL                 | LC |
| 9                 | Common quail            | Phasianidae    | <i>Coturnix coturnix</i>                                 | Schedule IV        | LC |
| 10                | Black drongo            | Dicruridae     | <i>Dicrurus macrocercus</i>                              | Schedule IV        | LC |
| 11                | Two-tailed Sparrow      | Dicruridae     | <i>Passer domesticus</i>                                 | Schedule IV        | LC |
| 12                | Grey Francolin          | Phasianidae    | <i>Francolinus pondicerianus</i>                         | Schedule IV        | LC |
| 13                | Common Quail            | Phasianidae    | <i>Coturnix coturnix</i>                                 | Schedule IV        | LC |
| 14                | White-breasted waterhen | Rallidae       | <i>Amaurornis phoenicurus</i>                            | NL                 | LC |
| 15                | Rose-ringed parakeet    | Rallidae       | <i>Fulica atra</i>                                       | Schedule IV        | LC |
| <b>AMPHIBIANS</b> |                         |                |                                                          |                    |    |
| 1                 | Indian Burrowing frog   | Dicroglossidae | <i>Sphaerotheca breviceps</i>                            | Schedule IV        | LC |
| 2                 | Green Pond Frog         | Ranidae        | <i>Rana hexadactyla</i>                                  | Schedule IV        | LC |
| 3                 | Tiger Frog              | Chordata       | <i>Hoplobatrachus tigerinus</i> ( <i>Rana tigerina</i> ) | Schedule IV        | LC |

## Aquatic Vegetation

The Field Survey for Assessing the Aquatic Vegetation Was Also Undertaken During the Study Period. The List of Aquatic Plants Observed in The Study Area Is Given in Table 3.34.

**Table 3.34 Aquatic Fauna and Flora**

| Sl. No       | Common Name    | Scientific name              | Family Name    | IUCN Red List of Threatened Species |
|--------------|----------------|------------------------------|----------------|-------------------------------------|
| <b>Flora</b> |                |                              |                |                                     |
| 1            | Water hyacinth | <i>Eichornia crassipes</i>   | Pontederiaceae | NA                                  |
| 2            | Blue waterlily | <i>Nymphaea nouchali</i>     | Nymphaeaceae   | LC                                  |
| 3            | Cross Grass    | <i>Carex cruciata</i>        | Cyperaceae     | NA                                  |
| <b>Fauna</b> |                |                              |                |                                     |
| 5            | Thilapia       | <i>Oreochromis niloticus</i> | Cichlidae      | LC                                  |
| 6            | Catla          | <i>Catla catla</i>           | Cyprinidae     | LC                                  |
| 7            | Koravi meen    | <i>Channa striata</i>        | Channidae      | LC                                  |
| 8            | Roghu          | <i>Labeo rohita</i>          | Cyprinidae     | LC                                  |

\*LC- Least Concern, NA-Not yet assessed

## Food chain

The food chain in aquatic ecosystems often begins with the algae or phytoplankton producers, and then the zooplankton that feed on them. This type of food chain is found in nearby lakes and rivers with phytoplankton, zooplankton, fish *Artiola gray* and humans.

Ex: Phytoplankton→Zooplankton→small fish→large fish → Human.

## Endangered and endemic species as per the IUCN Red List

There are no rare, endangered and endemic species found in the study area. There are no biosphere reserves or wildlife sanctuaries or National parks or Important Bird Areas (IBAs), ecologically sensitive zone in 10km radius.

## Agriculture & Horticulture in Krishnagiri district:

Krishnagiri district is one of the potential districts for cultivation of horticultural crops. Total area under cultivation is 1,82,888ha. In that, Horticultural crops have been cultivated in about 80499 ha and the prominent crops under cultivation are Mango, Banana, Tomato, Beans, Cabbage, Cauliflower, Brinjal, Coriander, Potato, Carrot, Beetroot, Knol Khol, Turmeric, Rose, Gerbera, Carnation, Jasmine and Chrysanthemum. Mango is the major crop grown in this district. The average rainfall for the district is 842mm per annum.

To increase the production, productivity and income of farmers, various schemes are being implemented through Department of Horticulture and Plantation crops. Hi-tech production techniques among farmers are being introduced by various schemes like poly-green house construction, shade net house, mulching, distribution of Vegetable portray seedlings of

high yielding varieties and Grafted / Seedlings of fruit crops of high yielding varieties are being Implemented.

### **Major Agricultural Crops**

Major horticulture crops cultivated in this district are vegetables crops like tomato, brinjal, chillies, onion and turmeric. Details of major field crops and horticulture in 1km radius is given in Table. 3.35.

**Table 3.35 Major Crops in 1km radius**

| S. No | Crop       | Scientific Name              | Family    |
|-------|------------|------------------------------|-----------|
| 1.    | Paddy      | <i>Oryza sativa</i>          | Poaceae   |
| 2.    | Cholam     | <i>Sorghum</i>               | Poaceae   |
| 3.    | Bajra      | <i>Pennisetum glaucum</i>    | Poaceae   |
| 4.    | Ragi       | <i>Eleusine coracana</i>     | Poaceae   |
| 5.    | Redgram    | <i>Cajanus cajan</i>         | Fabaceae  |
| 6.    | Bengalgram | <i>Cicer arietinum</i>       | Fabaceae  |
| 7.    | Greengram  | <i>Vigna radiata</i>         | Fabaceae  |
| 8.    | Blackgram  | <i>Vigna mungo</i>           | Fabaceae  |
| 9.    | Horsegram  | <i>Macrotyloma uniflorum</i> | Fabaceae  |
| 10.   | Ground Nut | <i>Arachis hypogaea</i>      | Fabaceae  |
| 11.   | Cotton     | <i>Gossypium</i>             | Malvaceae |
| 12.   | Sugar cane | <i>Saccharum officinarum</i> | Poaceae   |

### **Major Horticulture Crops 1km radius**

Horticulture includes cultivation of fruits, vegetables, nuts, seeds, herbs, sprouts, mushrooms, algae, flowers, seaweeds and non-food crops such as grass and ornamental trees and plants. It also includes plant conservation, landscape restoration, landscape and garden design.

### **Horticulture 1km radius**

Major horticulture crops cultivated in Krishnagiri district are fruit crops like mango, banana, Sapota and guava, vegetables like tomato, brinjal, Veandai, chillies, onion and tapioca, spices like turmeric. Details of major field crops and horticulture cultivation in 1km radius is given in Table 3.36.

**Table 3.36 Major Field Crops & Horticulture cultivation in 1km radius.**

| S. No                            | Common Name | Scientific Name              | Family        |
|----------------------------------|-------------|------------------------------|---------------|
| <b>Major Horticultural Crops</b> |             |                              |               |
| 1.                               | Mango       | <i>Mangifera indica</i>      | Anacardiaceae |
| 2.                               | Banana      | <i>Musa paradisiaca</i> Linn | Musaceae      |
| 3.                               | Tomato      | <i>Solanum lycopersicum</i>  | Solanaceae    |
| 4.                               | Beans       | <i>Phaseolus</i>             | Fabaceae      |
| 5.                               | Cabbage     | <i>Brassica oleracea</i> var | Brassicaceae  |
| 6.                               | Cauliflower | <i>Brassica oleracea</i>     | Brassicaceae  |
| 7.                               | Brinjal     | <i>Solanum melongena</i>     | Solanaceae    |

|     |           |                              |                 |
|-----|-----------|------------------------------|-----------------|
| 8.  | Onion     | <i>Allium cepa</i>           | Amaryllidaceae  |
| 9.  | Tapioca   | <i>Manihot esculenta</i>     | Euphorbiaceae   |
| 10. | Coriander | <i>Coriandrum sativum</i>    | Apiaceae        |
| 11. | Potato    | <i>Solanum tuberosum</i>     | Solanaceae      |
| 12. | Carrot    | <i>Daucus carota subsp</i>   | Apiaceae        |
| 13. | Beetroot  | <i>Beta vulgaris</i>         | Chenopodiaceae  |
| 14. | Turmeric  | <i>Curcuma longa</i>         | Zingiberaceae   |
| 15. | Rose      | <i>Rosa rubiginosa</i>       | Rosaceae        |
| 16. | Carnation | <i>Dianthus caryophyllus</i> | Caryophyllaceae |

### Results

The biodiversity assessment of the proposed project site has identified no ecologically sensitive areas within the core or buffer zones. The flora and fauna observed in the study area are commonly occurring species, with no IUCN-listed rare, endangered, endemic, or threatened (REET) species present, except for some species classified as of least concern. Additionally, the site is not located on any migratory routes for fauna. Operations at the stone and gravel quarry may generate dust particles. Implementing a green belt composed of native trees could help mitigate the dust effect on nearby flora and fauna. Key recommendations from the assessment include adopting green mining strategies to minimize environmental impact and developing a green belt with native trees to reduce dust movement from mining activities. This small mining operation over short period of time will not have any significant impact on the surrounding flora and fauna.

### 3.8 SOCIO ECONOMIC ENVIRONMENT

The major developmental activities in mining/Industrial sector are required for economic development as well as creation of employment opportunities (direct and indirect) and to meet the basic/modern needs of the society, which ultimately results in overall improvement of the quality of life through upliftment of social, economic, health, education and nutritional status in the project region, state as well as the country. In this manner all developmental projects have direct as well as indirect relationships with socioeconomic aspects, which also include public acceptability for new developmental projects. Thus, the study of socioeconomic component incorporating various facets related to prevailing social and cultural conditions and economic status of the rough stone and granite quarry project region is an important part of EIA study. The study of these parameters helps in identification, prediction and evaluation of the likely impacts on the socio economics and parameters of human interest due to the project.



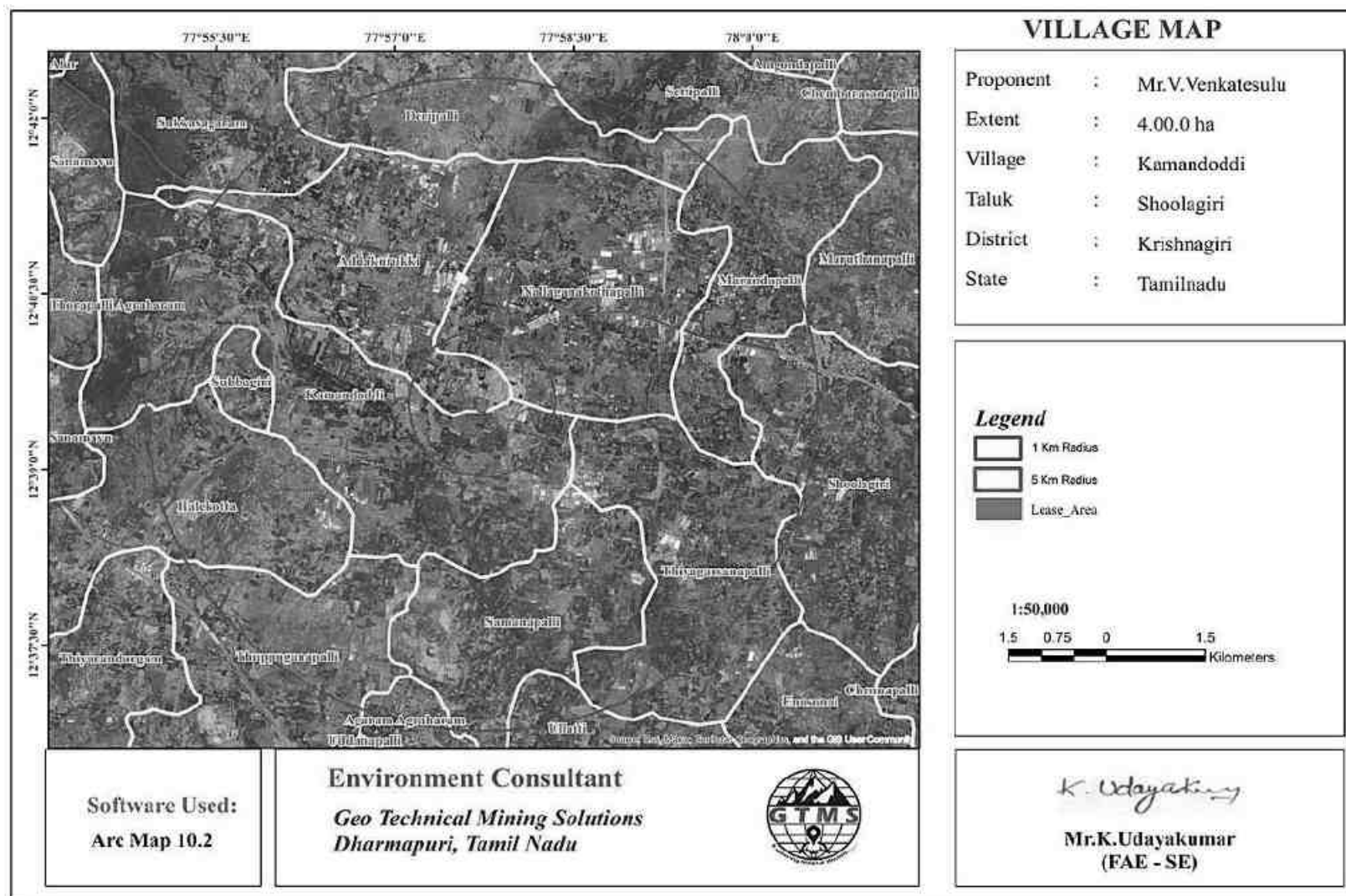


Figure 3.34 5km radius Socio Economic Study area

### 3.8.1 Objectives of the Study

*The objectives of the socio-economic impact assessment are as follows:*

- a) To study the socio-economic status of the people living in the study area of the project.
- b) To identify the basic needs of the nearby villages within the study area.
- c) To assess the impact on socio-economic environment due to the project.
- d) To provide the employment and improved living standards.
- e) To analysis of impact of socio economic and Environmental Infrastructure facilities and road accessibility.

### Methodology

The study employed cluster sampling to outline two zones around the proposed project site: Zone 1 (Core Zone): (0–1 km) and Zone 2 (Low Impact Zone): (1–5 km). Primary data were collected through structured interviews, field observations, and focus group discussions in Kamandoddi Village, Tamil Nadu, using simple random sampling. Secondary data were collected from the Census report 2011 and official records, covering demographics and basic services. These included information on population, number of households, literacy rates, sex ratios, and the availability of basic services. The data were analysed to assess the community impacts (both positive and negative) of the proposed project, and recommendations were made for improvement. The study area is illustrated in Figure 3.34.

### 3.8.2 Socio- Economic Profile of Kamandoddi Village – Study Area

Kamandoddi village is located in Shoolagiri Taluk of Krishnagiri District, Tamil Nadu, with total 1450 families residing. There are approximately 1450 households in Kamandoddi. The average household size in the village is about 4 persons per house. The Kamandoddi village has population of 6524 of which 3394 are males while 3130 are females as per Population Census report 2011. In Kamandoddi village population of children with age 0-6 is 797 which makes up 12.22 % of total population of village. Average Sex Ratio of Kamandoddi village is 922 which is lower than Tamil Nadu state average of 996. Child Sex Ratio for the Kamandoddi as per census is 920, lower than Tamil Nadu average of 943. Kamandoddi village has lower literacy rate compared to Tamil Nadu. In 2011, literacy rate of Kamandoddi village was 62.88 % compared to 80.09 % of Tamil Nadu. In Kamandoddi Male literacy stands at 70.26 % while female literacy rate was 54.88 %. The Village of Kamandoddi appears to be a relatively well-populated and literate village with a stable workforce, though gender gaps in literacy and employment remain areas for improvement.

**Table. 3.37 Kamandoddi Village Population Facts**

| Particulars         | Total   | Male    | Female  |
|---------------------|---------|---------|---------|
| Total No. of Houses | 1,450   | -       | -       |
| Population          | 6,524   | 3,394   | 3,130   |
| Child (0-6)         | 797     | 415     | 382     |
| Schedule Caste      | 878     | 460     | 418     |
| Schedule Tribe      | 130     | 76      | 54      |
| Literacy %          | 62.88 % | 70.26 % | 54.88 % |
| Total Workers       | 3,003   | 1,982   | 1,021   |
| Main Worker         | 2,221   | -       | -       |
| Marginal Worker     | 782     | 446     | 336     |

Source: <https://www.census2011.co.in/data/village/643813-kamandoddi-tamil-nadu.html>

### 3.8.3 Working Population- Kamandoddi Village, Shoolagiri Taluk

In Kamandoddi village out of total population, 3003 were engaged in work activities. 73.96 % of workers describe their work as Main Work (Employment or Earning more than 6 Months) while 26.04 % were involved in Marginal activity providing livelihood for less than 6 months. Of 3003 workers engaged in Main Work, 863 were cultivators (owner or co-owner) while 403 were Agricultural labourer.

#### **Benefits:**

The local people have been provided with either direct employments or indirect employment such as business, contract works and development work like roads, etc. and other welfare amenities such as medical facilities, conveyance, free education, drinking water supply etc. The number of villages and settlements within a radius of 5 km from the project site along with population, literacy status, basic facilities surrounding villages etc. are given in the table 3.38-3.41.

### 3.8.4 Habitations Wise Population Details in Kamandoddi Village

The Kamandoddi village has a total population of 8,128 individuals living in 1,715 households, averaging approximately 4.74 persons per household. Kamandoddi is the largest habitation with 1,774 people and 382 households, followed by Sappadi (1,088) and TMG Kottai (952), while Therveethi (110) and Pannapalli (250) are the smallest. The General category constitutes the majority of the population (7,310 or 89.95%), with Scheduled Castes (SCs) making up 672 individuals (8.27%) and Scheduled Tribes (STs) only 146 (1.8%).

**Table 3.38 Details of Population, Households, Caste in Habitations of Kamandoddi Village**

| Habitation Name   | Total Population | No. of Households | Scheduled Castes | Scheduled Tribes | General     |
|-------------------|------------------|-------------------|------------------|------------------|-------------|
| Therveethi        | 110              | 20                | 1                | 92               | 17          |
| Podur             | 218              | 36                | 25               | 0                | 193         |
| Aliyalam          | 269              | 40                | 18               | 0                | 251         |
| Dinnur            | 227              | 48                | 104              | 0                | 123         |
| Gangapuram        | 539              | 81                | 0                | 0                | 539         |
| Gopasandiram      | 549              | 148               | 94               | 0                | 455         |
| Kukkalapalli      | 338              | 92                | 127              | 0                | 211         |
| Kamandoddi        | 1,774            | 382               | 34               | 0                | 1740        |
| Karishnammakothur | 451              | 20                | 0                | 0                | 451         |
| Pillaikothur      | 487              | 88                | 0                | 0                | 487         |
| Pannapalli        | 250              | 40                | 0                | 0                | 250         |
| Kurubasapadi      | 876              | 216               | 119              | 0                | 757         |
| Sappadi           | 1,088            | 228               | 0                | 0                | 1088        |
| TMG kottai        | 952              | 276               | 150              | 54               | 748         |
| <b>Total</b>      | <b>8128</b>      | <b>1715</b>       | <b>672</b>       | <b>146</b>       | <b>7310</b> |

**Source:** JJM, 2018-19. Govt. of India

*Note: This data has been uploaded by the respective states after calculating the population based on census 2011 and the decadal growth rate.*

### 3.8.5 Demographic Profile of Krishnagiri District

Krishnagiri district is bounded by Vellore and Thiruvannamalai districts in the East, Karnataka state in the west, State of Andhra Pradesh in the North Dharmapuri District in the south. Its area is 5143 Sq. Kms. The average rainfall is 830 mm per annum. Three languages namely Tamil, Telugu and Kannada are predominantly spoken in this district.

In 2011, Krishnagiri had population of 1,879,809 of which male and female were 960,232 and 919,577 respectively. In 2001 census, Krishnagiri had a population of 1,561,118 of which males were 803,077 and remaining 758,041 were females. The literacy rate is 71.46% overall, with 78.72% for males and 63.91% for females. For 2001 census, same figures stood at 72.50 and 51.62 in Krishnagiri District. Total literate in Krishnagiri District were 1,187,958 of which male and female were 667,062 and 520,896 respectively. In 2001, Krishnagiri District had 838,547 in its district. Hinduism is the dominant religion, accounting for 91.70% of the population, followed by Islam at 6.13%. Scheduled Castes and Scheduled Tribes make up 14.22% and 1.19% of the population, respectively.

With regards to Sex Ratio in Krishnagiri, it stood at 958 per 1000 male compared to 2001 census figure of 944. The average national sex ratio in India is 940 as per latest reports of Census 2011 Directorate. In 2011 census, child sex ratio is 926 girls per 1000 boys compared to figure of 869 girls per 1000 boys of 2001 census data. In census enumeration, data regarding child under 0-6 age were also collected for all districts including Krishnagiri. There were total 217,323 children under age of 0-6 against 214,954 of 2001 census. Of total 217,323 male and female were 112,832 and 104,491 respectively. Child Sex Ratio as per census 2011 was 926 compared to 869 of census 2001. In 2011, Children under 0-6 formed 11.56 percent of Krishnagiri District compared to 13.77 percent of 2001. There was net change of -2.21 percent in this compared to previous census of India.

**Source:** <https://www.census2011.co.in/data/town/803410-krishnagiri-tamil-nadu.html>

**Table 3.39 Population and Literacy Rate of Study Area**

| Name of Village     | No. of Households | Population   |              |              | Literate Person |              |              | No. of Illiterate Person |              |              |
|---------------------|-------------------|--------------|--------------|--------------|-----------------|--------------|--------------|--------------------------|--------------|--------------|
|                     |                   | Total        | Male         | Female       | Total           | Male         | Female       | Total                    | Male         | Female       |
| Bukkasagaram        | 460               | 2126         | 1109         | 1017         | 1213            | 742          | 471          | 913                      | 367          | 546          |
| Doripalli           | 852               | 3681         | 1898         | 1783         | 2013            | 1165         | 848          | 1668                     | 733          | 935          |
| Addakurukki         | 581               | 2504         | 1288         | 1216         | 1298            | 758          | 540          | 1206                     | 530          | 676          |
| Nallaganakothapalli | 968               | 3933         | 2028         | 1905         | 2309            | 1378         | 931          | 1624                     | 650          | 974          |
| Marandapalli        | 963               | 4663         | 2355         | 2308         | 2363            | 1355         | 1008         | 2300                     | 1000         | 1300         |
| Shoolagiri          | 2101              | 9530         | 4788         | 4742         | 6403            | 3480         | 2923         | 3127                     | 1308         | 1819         |
| Thiyagarsanapalli   | 990               | 4479         | 2291         | 2188         | 2286            | 1304         | 982          | 2193                     | 987          | 1206         |
| Kamandoddi          | 1450              | 6524         | 3394         | 3130         | 3601            | 2093         | 1508         | 2923                     | 1301         | 1622         |
| Subbagiri           | 158               | 656          | 333          | 323          | 360             | 194          | 166          | 296                      | 139          | 157          |
| Halekotta           | 707               | 2990         | 1535         | 1455         | 1831            | 1071         | 760          | 1159                     | 464          | 695          |
| Samanapalli         | 721               | 3198         | 1635         | 1563         | 1652            | 922          | 730          | 1546                     | 713          | 833          |
| Ullatti             | 737               | 3311         | 1762         | 1549         | 1638            | 1023         | 615          | 1673                     | 739          | 934          |
| Agaram Agraharam    | 288               | 1219         | 620          | 599          | 687             | 389          | 298          | 532                      | 231          | 301          |
| Thuppuganapalli     | 989               | 4281         | 2192         | 2089         | 2328            | 1340         | 988          | 1953                     | 852          | 1101         |
| Thiyarandurgam      | 919               | 4143         | 2136         | 2007         | 2245            | 1337         | 908          | 1898                     | 799          | 1099         |
| Uddanapalli         | 1091              | 4691         | 2387         | 2304         | 2779            | 1563         | 1216         | 1912                     | 824          | 1088         |
| <b>Total</b>        | <b>13975</b>      | <b>61929</b> | <b>31751</b> | <b>30178</b> | <b>35006</b>    | <b>20114</b> | <b>14892</b> | <b>26923</b>             | <b>11637</b> | <b>15286</b> |

**Source:** DCHB Census 2011, Tamil Nadu.

**Table 3.40 Workers Profile of Study Area**

| <b>Name of Village</b> | <b>Total Worker</b> | <b>Male Worker</b> | <b>Female Worker</b> | <b>Main Workers</b> | <b>Main Male Workers</b> | <b>Main Female Workers</b> | <b>Total Cultivator</b> | <b>Total Agricultural Labourers</b> | <b>Other Workers</b> | <b>Non-Workers</b> |
|------------------------|---------------------|--------------------|----------------------|---------------------|--------------------------|----------------------------|-------------------------|-------------------------------------|----------------------|--------------------|
| Bukkasagaram           | 364                 | 246                | 118                  | 278                 | 201                      | 77                         | 104                     | 53                                  | 99                   | 1762               |
| Doripalli              | 1140                | 775                | 365                  | 1056                | 732                      | 324                        | 353                     | 243                                 | 444                  | 2541               |
| Addakurukki            | 1023                | 709                | 314                  | 682                 | 505                      | 177                        | 199                     | 272                                 | 210                  | 1481               |
| Nallaganakothapalli    | 1659                | 1201               | 458                  | 1383                | 1012                     | 371                        | 489                     | 118                                 | 751                  | 2274               |
| Marandapalli           | 2427                | 1411               | 1016                 | 1688                | 1053                     | 635                        | 796                     | 651                                 | 204                  | 2236               |
| Shoolagiri             | 3600                | 2652               | 948                  | 3292                | 2473                     | 819                        | 473                     | 393                                 | 2281                 | 5930               |
| Thiyagarsanapalli      | 2369                | 1437               | 932                  | 1772                | 1177                     | 595                        | 459                     | 961                                 | 337                  | 2110               |
| Kamandoddi             | 3003                | 1982               | 1021                 | 2221                | 1536                     | 685                        | 863                     | 403                                 | 906                  | 3521               |
| Subbagiri              | 208                 | 190                | 18                   | 208                 | 190                      | 18                         | 174                     | 18                                  | 16                   | 448                |
| Halekotta              | 1263                | 809                | 454                  | 1098                | 726                      | 372                        | 493                     | 397                                 | 192                  | 1727               |
| Samanapalli            | 1630                | 954                | 676                  | 1585                | 925                      | 660                        | 443                     | 894                                 | 221                  | 1568               |
| Ullatti                | 1854                | 1068               | 786                  | 1727                | 1031                     | 696                        | 877                     | 586                                 | 231                  | 1457               |
| Agaram Agraharam       | 741                 | 416                | 325                  | 692                 | 391                      | 301                        | 290                     | 276                                 | 112                  | 478                |
| Thuppuganapalli        | 2395                | 1381               | 1014                 | 2322                | 1346                     | 976                        | 445                     | 1563                                | 290                  | 1886               |
| Thiyarandurgam         | 2137                | 1306               | 831                  | 1692                | 1092                     | 600                        | 598                     | 524                                 | 551                  | 2006               |
| Uddanapalli            | 2306                | 1473               | 833                  | 1820                | 1176                     | 644                        | 1049                    | 81                                  | 619                  | 2385               |
| <b>Total</b>           | <b>28119</b>        | <b>18010</b>       | <b>10109</b>         | <b>23516</b>        | <b>15566</b>             | <b>7950</b>                | <b>8105</b>             | <b>7433</b>                         | <b>7464</b>          | <b>33810</b>       |

**Source:** DCHB Census 2011, Tamil Nadu.

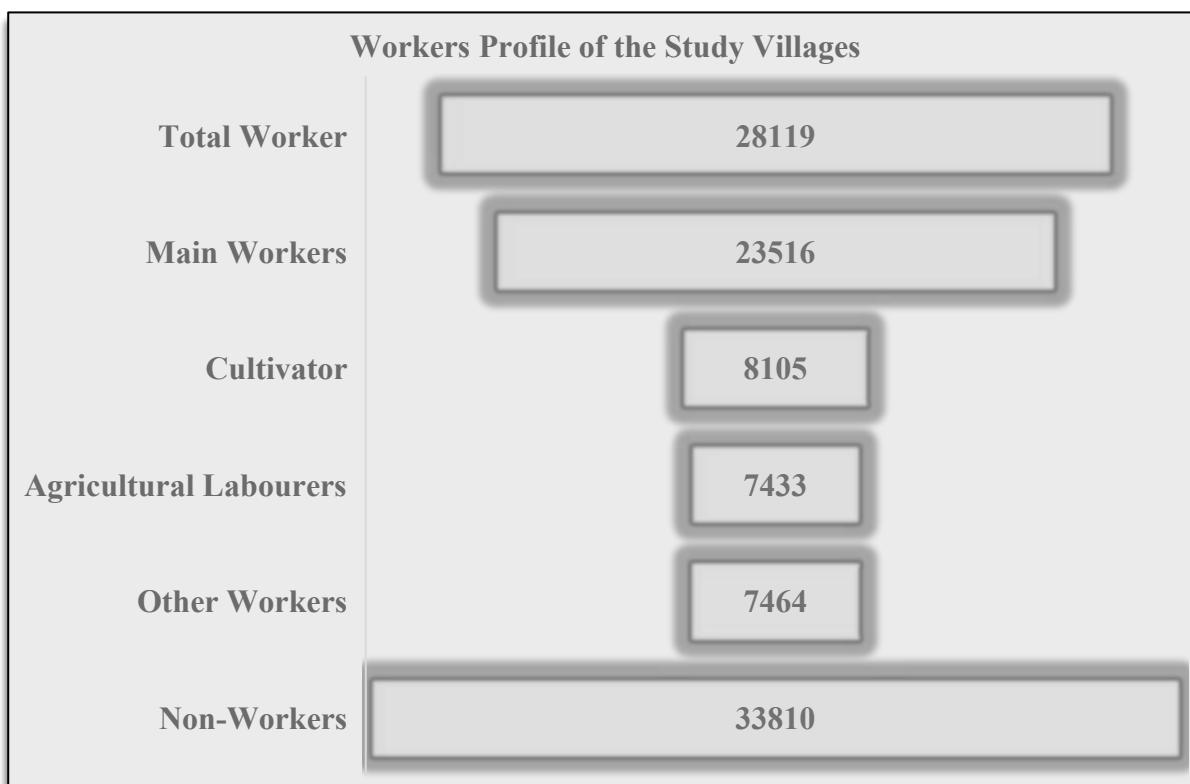
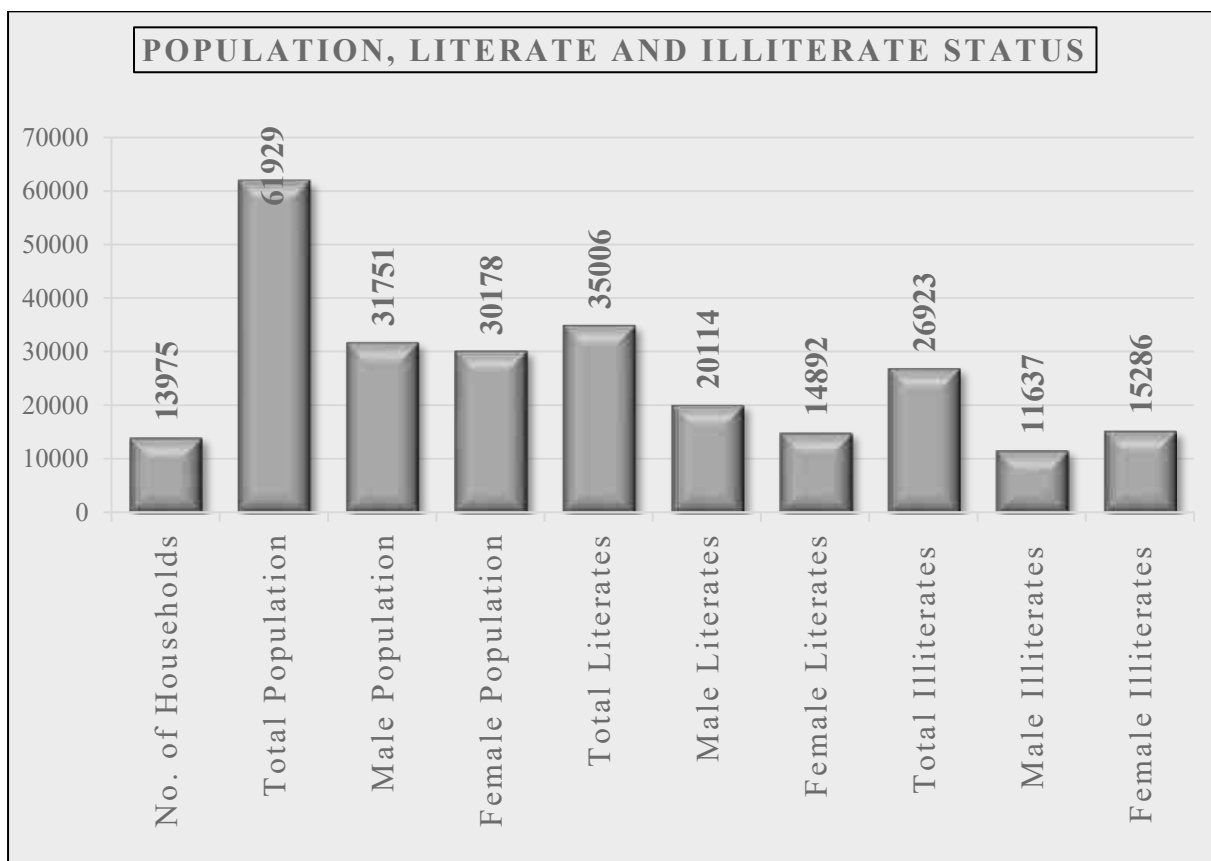
**Table 3.41 Basic Amenities Services of the Study Area**

| Village             | Primary School | Training Institutions | Primary Health Centre | Tap Water Facilities | Public Bus Service | Gravel (kutcha) Roads | Commercial Bank | Agricultural Credit Societies | Self - Help Group (SHG) | Anganwadi Centre | Community Centre | Electricity Services |
|---------------------|----------------|-----------------------|-----------------------|----------------------|--------------------|-----------------------|-----------------|-------------------------------|-------------------------|------------------|------------------|----------------------|
| Bukkasagaram        | 2              | 2                     | 2                     | 1                    | 2                  | 1                     | 2               | 2                             | 1                       | 1                | 1                | 1                    |
| Doripalli           | 2              | 2                     | 2                     | 1                    | 2                  | 1                     | 2               | 1                             | 1                       | 1                | 1                | 1                    |
| Addakurukki         | 2              | 2                     | 1                     | 1                    | 1                  | 1                     | 2               | 1                             | 1                       | 1                | 1                | 1                    |
| Nallaganakothapalli | 1              | 2                     | 2                     | 1                    | 1                  | 1                     | 2               | 2                             | 1                       | 1                | 1                | 1                    |
| Marandapalli        | 2              | 2                     | 2                     | 1                    | 2                  | 1                     | 2               | 1                             | 1                       | 1                | 1                | 1                    |
| Shoolagiri          | 2              | 2                     | 2                     | 1                    | 1                  | 1                     | 2               | 2                             | 1                       | 1                | 1                | 1                    |
| Thiyagarsanapalli   | 2              | 2                     | 2                     | 1                    | 1                  | 1                     | 2               | 1                             | 1                       | 1                | 1                | 1                    |
| Kamandoddi          | 2              | 2                     | 2                     | 1                    | 1                  | 1                     | 2               | 2                             | 1                       | 1                | 1                | 1                    |
| Subbagiri           | 1              | 2                     | 2                     | 1                    | 1                  | 1                     | 2               | 1                             | 1                       | 1                | 1                | 1                    |
| Halekotta           | 1              | 2                     | 2                     | 1                    | 2                  | 1                     | 2               | 2                             | 1                       | 1                | 2                | 1                    |
| Samanapalli         | 2              | 2                     | 2                     | 1                    | 1                  | 1                     | 2               | 2                             | 1                       | 1                | 2                | 1                    |
| Ullatti             | 2              | 1                     | 1                     | 1                    | 1                  | 1                     | 2               | 2                             | 1                       | 1                | 1                | 1                    |
| Agaram Agraharam    | 1              | 2                     | 2                     | 1                    | 1                  | 1                     | 2               | 2                             | 1                       | 1                | 2                | 1                    |
| Thuppuganapalli     | 2              | 1                     | 2                     | 1                    | 1                  | 1                     | 2               | 2                             | 1                       | 1                | 1                | 1                    |
| Thiyarandurgam      | 2              | 2                     | 2                     | 1                    | 1                  | 1                     | 2               | 2                             | 1                       | 1                | 1                | 1                    |
| Uddanapalli         | 2              | 1                     | 2                     | 1                    | 1                  | 1                     | 2               | 2                             | 1                       | 1                | 1                | 1                    |

**Source:** DCHB Census 2211, Tamil Nadu.

**Note:** Available of Service = 1, Not Available = 2.





**Figure 3.35 Details of Population, Literacy Level and Workers Profile of the Villages**

As per SEAC recommendation the project proponent should spend minimum of 5 lakhs to the nearby school from the proposed project site as part of CER cost. Also, the village panchayat will get direct benefit from the government through District mineral Resource fund (DMF) for infrastructure development activities.

Awareness and Opinion of the People About the Project, to assess public awareness and opinions regarding the proposed project, the following key observations were recorded:

- ❖ During the survey, it was observed that only residents of nearby villages were aware of the proposed project, while those in more distant villages were largely unaware.
- ❖ People in the region expressed expectations that the project would generate employment opportunities and lead to improvements in education, transportation, and sanitation facilities provided by the project authorities.

### **3.8.6 Recommendation and Suggestion**

The village development plans are made in consultation with the community through Gram Sabha; these appear to address the needs of the community. However, it may be noted that at the implementation stage these plans often are fraught with problem of inadequate funds, lack of proper planning, corruption, vested interests and political agendas. Hence while ascertaining the scope for convergence with the government activities, care must be taken to ascertain realistic possibilities for implementation.

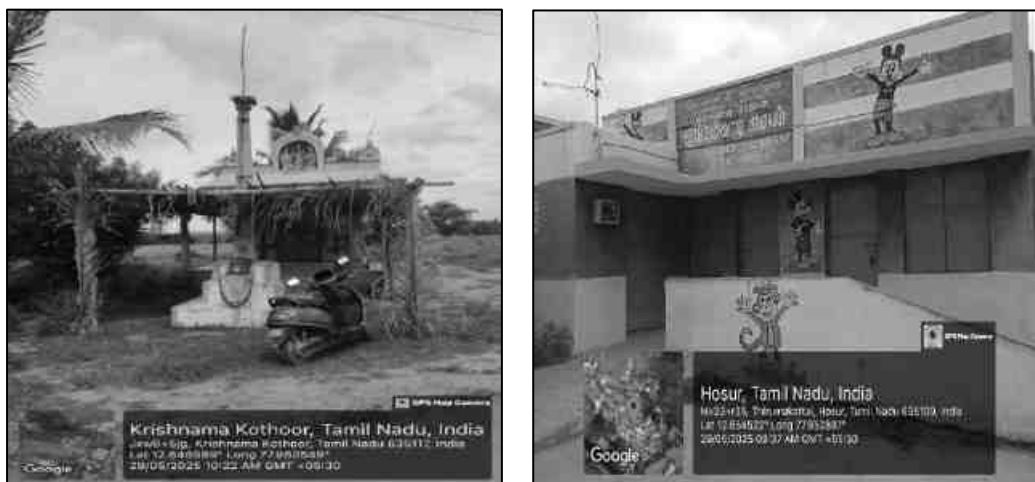
- Women empowerment– Home based income generation activities, vocational training programs and common education centre for increasing the literacy rate.
- Education – Free uniform, construction of common rooms and library, computer education and physical education, furniture and equipment in schools, up-gradation of existing school infrastructure.
- Agriculture/livestock – Infrastructure such as agricultural practices, electricity connections, assistance with buying improved tools and equipment, capacity building, supply and/or knowledge of better variety of seeds, pasture land development and trainings on animal husbandry& facility of veterinary doctor.
- Health – Improvements in sanitary conditions of villages, assistance with construction of latrines, improvement in drainage system, health camps and awareness campaigns for diseases like common cold, malaria, typhoid, tuberculosis, yellow fever and pneumonia. Repairing of PHCs and Anganwadi centres.
- People with disability – Establishment of centre for special education, sensitization of the community towards disabled and awareness on Government schemes.

- While Developing an Action Plan, it is very important to identify the population who falls under the marginalized and vulnerable groups. So that special attention can be given to these groups with special provisions while making action plans.
- Connectivity –Transport connectivity to easiness accessibility to the region.
- While developing an Action Plan, it is very important to identify the population who falls under the marginalized and vulnerable groups. So that special attention can be given to these groups with special provisions while making action plans.

### 3.8.7 Conclusion

This study was carried out the baseline socio-economic conditions of the study area. It examined parameters including the population, number of households, literacy rate, sex ratio, workforce details, and the availability of essential amenities like transportation, drinking water, road connectivity, and educational facilities. The study revealed both positive and negative socio-economic implications associated with the proposed project and cluster quarries. While potential environmental and social impacts must be addressed, the project is expected to provide significant economic benefits in terms of local employment and improved livelihood opportunities in directly and indirectly.

Therefore, with the implementation of effective mitigation and management measures, the project can contribute positively to the socio-economic development of the area while minimizing adverse impacts.



**Figure. 3.36 Field Photos of Kamandoddi Village**

### 3.9 TRAFFIC DENSITY

The traffic survey conducted based on the transportation route of material, the Rough Stone is proposed to be transported mainly through Village Road (Nallaganakothapalli) Hosur to Krishnagiri (NH-44) as shown in Table 3.42 and in Figure 3.37. Traffic density measurements were made continuously for 24 hours by visual observation and counting of

vehicles under three categories, viz., Heavy motor vehicles, light motor vehicles and two/three wheelers. As traffic densities on the roads are high, two skilled persons were deployed simultaneously at each station. During each, shift one person on either direction for counting the traffic. At the end of each hour, fresh counting and recording was undertaken. Direction for counting the traffic. At the end of each hour, fresh counting and recording was undertaken.

**Table 3.42 Traffic Survey Locations**

| Station Code | Road Name                    | Distance and Direction | Type of Road                 |
|--------------|------------------------------|------------------------|------------------------------|
| TS1          | Village Road                 | 0.89 km-W              | Village Road                 |
| TS2          | Hosur to Krishnagiri (NH-44) | 1.82 km-N              | Hosur to Krishnagiri (NH-44) |

Source: On-site monitoring by GTMS FAE & TM

**Table 3.43 Existing Traffic Volume**

| Station code | HMV |     | LMV |     | 2/3 Wheelers |    | Total PCU PCU |
|--------------|-----|-----|-----|-----|--------------|----|---------------|
|              | No  | PCU | No  | PCU | No           | No |               |
| TS1          | 218 | 654 | 45  | 45  | 78           | 39 | 738           |
| TS2          | 235 | 705 | 97  | 97  | 108          | 54 | 856           |

Source: On-site monitoring by GTMS FAE & TM

\* PCU conversion factor: HMV (Trucks and Bus) = 3, LMV (Car, Jeep and Auto) = 1 and 2/3 Wheelers = 0.5

**Table 3.44 Rough Stone Transportation Requirement**

| Transportation of Rough Stone Per day |                      |               |
|---------------------------------------|----------------------|---------------|
| Capacity of trucks                    | No. of Trips per day | Volume in PCU |
| 15 tonnes                             | 84                   | 252           |

Source: Approved Mining Plan

**Table 3.45 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                 | 738                            | 252                                    | 990                  | 1200                                                |
| Hosur to Krishnagiri (NH-44) | 856                            | 252                                    | 1108                 | 1200                                                |

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

- Due to these projects the existing traffic volume will not exceed the traffic limit. As per the IRC 1960 this existing village road can handle 1,200 PCU in hour and Major district road can handle 1500 PCU in hour. Hence there will not be any conjunction due to this proposed transportation.

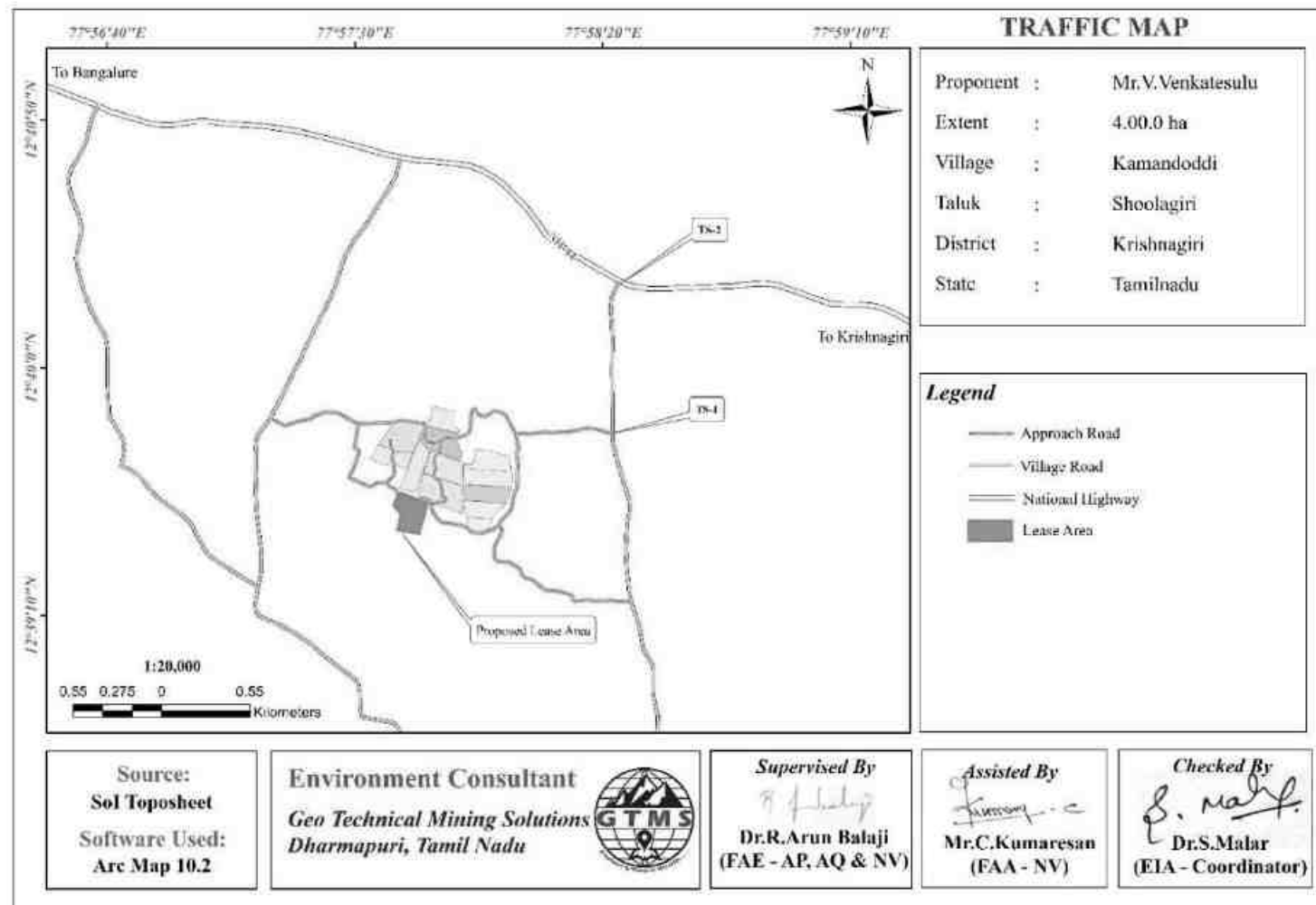


Figure 3.37 Traffic Density Map

### 3.10 SITE SPECIFIC FEATURES

There are no Wildlife Sanctuaries, Reserve Forest and National Park within 10 km radius. Therefore, there will be no need of acquisition/diversion of forest land. The details related to the environmentally sensitive areas around the proposed mine lease area i.e., 10 km radius and the nearby water bodies are given in the Table 3.46.

**Table 3.46 Details of Environmentally Sensitive Ecological Features in the Study Area**

| S. No. | Sensitive Ecological Features            | Name                | Areal Distance in km    |
|--------|------------------------------------------|---------------------|-------------------------|
| 1      | National Park /<br>Wild life Sanctuaries | None                | Nil within 10 km radius |
|        |                                          | None                | Nil within 10 km radius |
| 2      | Reserve Forest                           | Thekkalapalli R.F   | 9.80 -East              |
|        |                                          | Sulagiri R.F        | 3.5 -North              |
|        |                                          | Errandapalli R.F    | 10.94 -East             |
|        |                                          | Kariyanapalli R.F   | 15.65-NE                |
|        |                                          | Melumalai R.F       | 11.48 -East             |
|        |                                          | Sulagunda R.F       | 15.5-SE                 |
|        |                                          | Settipatti R.F      | 3.04 - North            |
|        |                                          | Sanamavu R.F        | 7.28-SW                 |
|        |                                          | Udedurgam R.F       | 13.70- South            |
|        |                                          | Perandapalli R.F    | 4.04-West               |
|        |                                          | Veppanapalli R.F    | 23.92-NE                |
| 3      | Lakes/Reservoirs/<br>Dams/Streams/Rivers | Ponnaiyar River     | 1.31-SW                 |
|        |                                          | Pillayakottur lake  | 0.230-NW                |
|        |                                          | Kurupachappadi Lake | 1.37- East              |
|        |                                          | Chappadi North lake | 1.66-NE                 |
|        |                                          | Chappadi South lake | 1.82-SE                 |
|        |                                          | Kottoor lake        | 2.58-SE                 |
|        |                                          | Narur Lake          | 2.70-West               |
|        |                                          | Pannapalli lake     | 2.23-NW                 |
|        |                                          | Kamandoddi lake     | 2.88-NW                 |

|    |                                                   |                 |                         |
|----|---------------------------------------------------|-----------------|-------------------------|
|    |                                                   | Sivapellai lake | 1.80-North              |
| 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  | Centrally Protected 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





**Figure 3.38 Field Study Photographs**



## **CHAPTER IV**

### **ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES**

#### **4.0 GENERAL**

In order to maintain the environmental commensuration with the mining operation, it is essential to undertake studies on the existing environmental scenario and assess the impact on different environmental components. This would help in formulating suitable management plans sustainable resource extraction. This chapter discusses the anticipated impacts on soil, land, water, air, noise, biological, and socioeconomic environments.

#### **4.1 LAND ENVIRONMENT**

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

- ❖ Permanent or temporary change on land use and land cover.
- ❖ Change in topography of the mine lease area will change at the end of the life of the mine.
- ❖ 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

##### **4.1.2 Mitigation Measures from Proposed Project**

- ❖ The mining activity will be gradual confined in blocks and excavation will be undertaken progressively along with other mitigate 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., 7.5m, 10m and 50m 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**

### **4.2.1 Anticipated Impact on Soil Environment**

Following impacts are anticipated due to mining operations:

- ❖ Removal of protective vegetation cover
- ❖ Exposure of subsurface materials which are unsuitable for vegetation establishment

### **4.2.2 Common Mitigation Measures from proposed project**

- ❖ 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**

### **4.3.1 Anticipated Impact**

- ❖ Surface and ground water resources may be contaminated due to pit water discharge, domestic sewage, discharge of oil and grease bearing waste water from washing of vehicles and machineries, and washouts from surface exposure or working areas
- ❖ As the proposed project acquires 3.0KLD of water from water vendors, it will not extract water by developing abstraction structures in the lease area. Therefore, the project will not have impact on depletion of aquifer beneath the lease area.

### **4.3.2 Common Mitigation Measures for the Proposed Project**

- ❖ Rain water from mine pit will be treated in settling tanks before being used for dust suppression and tree plantation purposes.
- ❖ Domestic sewage from site office will be discharged in bio-septic tank and then directed to soak pits.
- ❖ Water from the tipper wash-down facility and machinery maintenance yard will be passed through interceptor traps/oil separators prior to its reuse.
- ❖ 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.

- ❖ Periodic (every 6 month once) analysis of ground water quality of quarry pit water and ground water of nearby villages will be conducted.
- ❖ Artificial recharge structures will be established in suitable locations as part of the rainwater harvesting management program.

#### 4.4 AIR ENVIRONMENT

##### 4.4.1 Anticipated Impact

The proposed rough stone quarry project involves activities such as formation of benches, approach roads, drilling, blasting, excavation, and transportation, all of which may lead to dust generation and pose potential health risks. To mitigate these impacts, dust suppression measures like water sprinkling at loading/unloading points and along haul roads will be implemented. Quarrying will be carried out using opencast semi-mechanized methods, where drilling and blasting will be conducted in a controlled manner to reduce dust and vibration. The primary air pollutant expected is particulate matter (PM<sub>10</sub>), while emissions of Sulphur Dioxide (SO<sub>2</sub>) and Nitrogen Dioxide (NO<sub>2</sub>) from vehicle movement are anticipated to be minimal. Air quality impact assessment has been conducted based on the proposed production levels and estimated emissions.

##### 4.4.2 Emission Estimation

Emission resulting from different mining activities is estimated using relevant empirical formulae developed by Chaulya et al., 2001. The equations used for SPM, SO<sub>2</sub>, and NO<sub>x</sub> emission estimation have been given in Table 4.1.

**Table 4.1 Empirical Formula for Emission Rate from Overall Mine**

|              | Pollutant | Source Type | Empirical Equation                             | Parameters                                                                                                                                                    |
|--------------|-----------|-------------|------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Overall Mine | SPM       | Area        | $E = [u0.4a0.2\{9.7 + 0.01p + b/(4 + 0.3b)\}]$ | u = Wind speed(m/s); p = Mineral production (Mt/yr); b = Overburden handling (Mm <sup>3</sup> /yr); a = Lease area(km <sup>2</sup> ); E = Emission rate(g/s). |

The emission rate thus calculated using the empirical formula is used as one of the inputs in the AERMOD modelling. It is important to note that PM<sub>10</sub> emission rate is derived from the SPM estimation in the background that PM<sub>10</sub> constitutes 52% of SPM emission. The PM<sub>2.5</sub> and PM<sub>10</sub> emission results have been given in Table 4.2.

**Table 4.2 Estimated Emission Rate**

| Activity     | Pollutant         | Calculated Value (g/s) | Lease Area in m <sup>2</sup> | Calculated Value (g/s/m <sup>2</sup> ) |
|--------------|-------------------|------------------------|------------------------------|----------------------------------------|
| Overall Mine | PM <sub>2.5</sub> | 0.181077037            | 40000                        | 1.50898E-05                            |
| Overall Mine | PM <sub>10</sub>  | 1.207180237            |                              | 3.01795E-05                            |

#### 4.4.2.1 Modelling of Incremental Concentration

Anticipated incremental concentration and net increase in emissions due to quarrying activities within 500 m around the project area is predicted by open pit source modelling using AERMOD Software and the incremental values of the air pollutants were added to the base line data monitored at the proposed site to predict total GLC of the pollutants, as shown in Tables 4.3-4.4.

#### 4.4.2.2 Model Results

The post project resultant concentrations of PM<sub>10</sub>, PM<sub>2.5</sub> (GLC) is given in Tables 4.3- 4.4.

**Table 4.3 Incremental & Resultant GLC of PM<sub>2.5</sub>**

| Station ID | Distance to core area (km) | Direction | PM 2.5 concentrations( $\mu\text{g}/\text{m}^3$ ) |           |       | Comparison against air quality standard ( $60 \mu\text{g}/\text{m}^3$ ) | Magnitude of change (%) | Significance    |
|------------|----------------------------|-----------|---------------------------------------------------|-----------|-------|-------------------------------------------------------------------------|-------------------------|-----------------|
|            |                            |           | Baseline                                          | Predicted | Total |                                                                         |                         |                 |
| AAQ1       | 0.31                       | N         | 16.7                                              | 5.6       | 22.3  | Below standard                                                          | 33.5                    | Not significant |
| AAQ2       | 1.17                       | N         | 14.5                                              | 1.0       | 15.5  |                                                                         | 6.9                     |                 |
| AAQ3       | 1.90                       | W         | 15.6                                              | 0.3       | 15.9  |                                                                         | 1.9                     |                 |
| AAQ4       | 4.31                       | W         | 14.3                                              | 0.3       | 14.6  |                                                                         | 2.1                     |                 |
| AAQ5       | 2.64                       | S         | 14.0                                              | 0.3       | 14.3  |                                                                         | 2.1                     |                 |
| AAQ6       | 4.99                       | E         | 16.4                                              | 0.06      | 16.46 |                                                                         | 0.4                     |                 |
| AAQ7       | 3.85                       | N         | 15.5                                              | 0.06      | 15.56 |                                                                         | 0.4                     |                 |
| AAQ8       | 1.14                       | E         | 30.7                                              | 1.0       | 31.7  |                                                                         | 3.3                     |                 |
| AAQ9       | 0.37                       | W         | 32.4                                              | 0.3       | 32.7  |                                                                         | 0.93                    |                 |

**Table 4.4 Incremental & Resultant GLC of 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    |
|------------|----------------------------|-----------|-------------------------------------------------------------|-----------|-------|--------------------------------------------------------------------------|-------------------------|-----------------|
|            |                            |           | Baseline                                                    | Predicted | Total |                                                                          |                         |                 |
| AAQ1       | 0.31                       | N         | 41.8                                                        | 8.89      | 50.69 | Comparison against air quality standard ( $100 \mu\text{g}/\text{m}^3$ ) | 21.3                    | Not significant |
| AAQ2       | 1.17                       | W         | 36.2                                                        | 0.5       | 36.7  |                                                                          | 1.4                     |                 |
| AAQ3       | 1.90                       | W         | 39.1                                                        | 0.5       | 39.6  |                                                                          | 1.3                     |                 |
| AAQ4       | 4.31                       | S         | 35.7                                                        | 0.5       | 36.2  |                                                                          | 1.4                     |                 |
| AAQ5       | 2.64                       | E         | 35.0                                                        | 0.5       | 35.5  |                                                                          | 1.4                     |                 |
| AAQ6       | 4.99                       | N         | 40.9                                                        | 0.1       | 41    |                                                                          | 0.2                     |                 |
| AAQ7       | 3.85                       | E         | 38.8                                                        | 0.5       | 39.3  |                                                                          | 1.3                     |                 |
| AAQ8       | 1.14                       | W         | 52.2                                                        | 5.0       | 57.2  |                                                                          | 9.6                     |                 |
| AAQ9       | 0.37                       | N         | 53.7                                                        | 0.5       | 54.2  |                                                                          | 0.93                    |                 |

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.

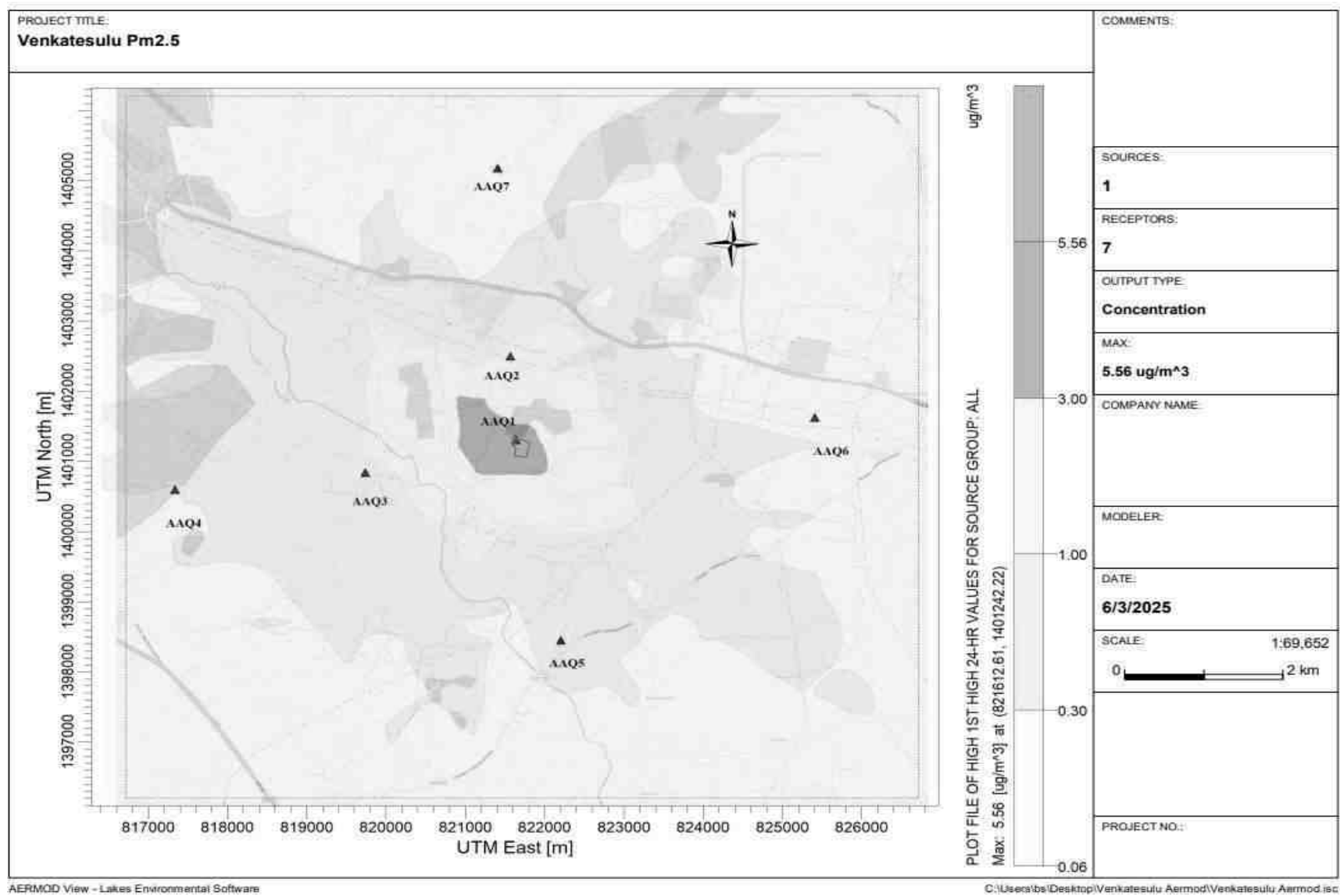


Figure 4.1 Predicted Incremental Concentration of PM<sub>2.5</sub>

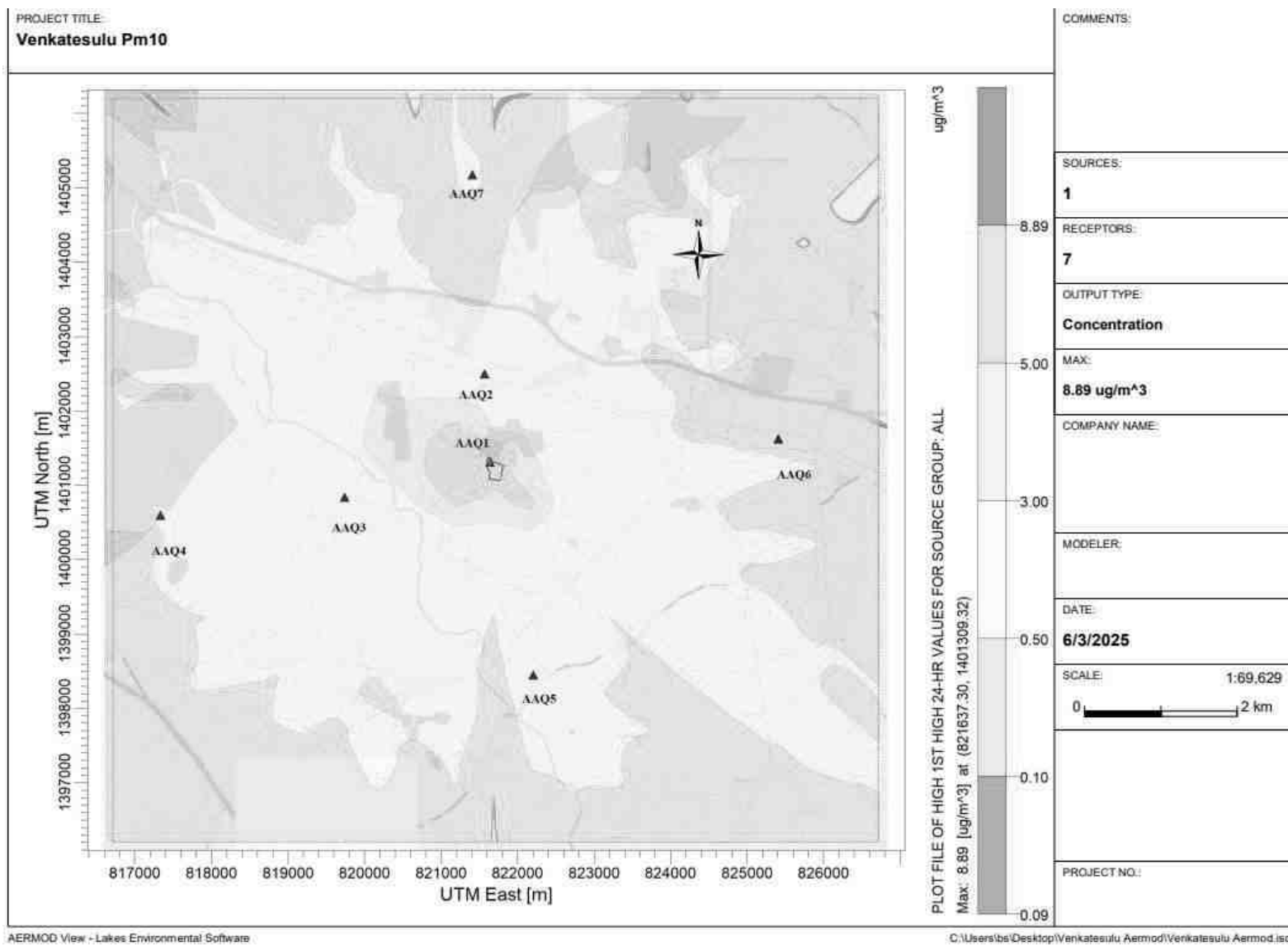


Figure 4.2 Predicted Incremental Concentration of PM<sub>10</sub>

**The Air quality results is less or more same as compared to the previous report on the month Oct- 2023 to Dec- 2023 due to vehicle movements, blasting, drilling. Fugitive dust Emission resulting from different mining activities is slightly increased from March to May 2025 study period. it leads to dust generation.**

#### **4.4.2 Mitigation Measures**

- ❖ To mitigate air pollution and dust generation in the rough stone quarry, a range of dust control measures will be implemented. Regular water sprinkling will be carried out at key locations such as drilling sites, blasting areas, haul roads, and loading/unloading points. This will help suppress fugitive dust emissions and improve air quality around the project site. Additionally, mist spray systems will be used in dust-prone areas for enhanced control, ensuring effective dust suppression during operations.
- ❖ Drilling and blasting activities, which are common in quarrying, will be carefully controlled to minimize air pollution. Wet drilling methods will be used to reduce the amount of dust generated during drilling operations. For blasting, controlled techniques with optimized charge and timing will be employed to limit dust dispersion. Furthermore, blasting will only be carried out during favourable conditions, such as low wind speeds, to prevent the dust from being carried towards nearby habitations and sensitive areas.
- ❖ Vehicle emissions from haul trucks and machinery will also be managed through regular maintenance and the use of PUC-certified vehicles. These measures will help reduce exhaust emissions, especially on unpaved roads where dust generation is higher. Additionally, vehicle speed will be restricted on haul roads to minimize the lifting of dust.
- ❖ To further reduce air pollution, a greenbelt will be developed around the quarry boundary and along internal roads. This will act as a barrier to trap dust particles and reduce their spread. Regular air quality monitoring will also be conducted at strategic locations to ensure that air quality remains within permissible limits, and that the quarry operations do not negatively impact the surrounding environment or human health.

#### **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

Noise modelling has been carried out to assess the impact on surrounding ambient noise levels. Basic phenomenon of the model is the geometric attenuation of sound. Noise at a point generates spherical waves which are propagated outwards from the source through the air at a speed of 1,100 ft/sec with the first wave making an ever-increasing sphere with time. As the wave spreads the intensity of noise diminishes as the fixed amount of energy is spread over an increasing surface area of the sphere. The assumption of the model is based on point source relationship i.e., for every doubling of the distance the noise levels are decreased by 6 dB (A).

For hemispherical sound wave propagation through homogeneous loss free medium, one can estimate noise levels at various locations at different sources using a mathematical model based on first principle.

$$L_{p2} = L_{p1} - 20 \log (r_2/r_1) - Ae_{1,2}$$

Where,

$L_{p1}$  &  $L_{p2}$  are sound levels at points located at distances  $r_1$  and  $r_2$  from the source

$Ae_{1,2}$  is the excess attenuation due to environmental conditions. Combined effect of all sources can be determined at various locations by logarithmic addition.

$$L_{p \text{ total}} = 10 \log \{10^{(L_{p1}/10)} + 10^{(L_{p2}/10)} + 10^{(L_{p3}/10)} + \dots\}$$

### 4.5.1 Anticipated Impact

Noise generated at the quarry will mainly result from semi-mechanized operations such as drilling, controlled blasting, and transportation of materials; however, the noise levels are expected to dissipate within the quarry boundary, and due to the considerable distance of nearby villages from the quarrying area, the impact on the surrounding community is expected to be negligible.

The attenuation due to several factors including ground reflection, atmosphere, wind speed, temperature, trees, and buildings as 35.5 dB (A), the barrier effect. Attenuation due to Green Belt has been taken to be 4.9 dB (A). The inputs required for the model are: source data, receptor data, and attenuation factor. Source data has been computed taking into account of all the machinery and activities used in the mining process. Same has been listed in Table 4.5.

**Table 4.5 Activity and Noise Level Produced by Machinery**

| S. No. | Machinery / activity | Impact on environment? | Noise produced in dB(A) at 50 ft from source* |
|--------|----------------------|------------------------|-----------------------------------------------|
| 1      | Blasting             | Yes                    | 94                                            |



|              |             |     |             |
|--------------|-------------|-----|-------------|
| 2            | Jack hammer | Yes | 88          |
| 3            | Compressor  | No  | 81          |
| 4            | Excavator   | No  | 85          |
| 5            | Tipper      | No  | 84          |
| <b>Total</b> |             |     | <b>95.8</b> |

The total noise to be produced by mining activity is calculated to be 95.8 dB (A). We have considered the total noise to be produced by mining activity to be 95.8 dB (A).

**Table 4.6 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> |
|----------------------------------|---------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|------------------------------------|--------------------|
| Near Core                        | 420                                                                                                                 | 47.2                                               | 31.5                               | 47.3               |
| Pillaikothur                     | 1190                                                                                                                | 43.8                                               | 22.4                               | 43.8               |
| Pathakotta                       | 1910                                                                                                                | 44.8                                               | 18.3                               | 44.8               |
| Nayakanapalli                    | 4270                                                                                                                | 41.2                                               | 11.4                               | 41.2               |
| Keeranapalli                     | 2630                                                                                                                | 39.8                                               | 15.6                               | 39.8               |
| Shoolagiri                       | 4810                                                                                                                | 52.4                                               | 10.3                               | 52.4               |
| Kanalatti                        | 3910                                                                                                                | 42.2                                               | 12.1                               | 42.2               |
| Near Core                        | 550                                                                                                                 | 43.5                                               | 29.1                               | 43.6               |
| 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) |                                                    |                                    |                    |

From the above table, it can be seen that the ambient noise levels at all the locations near habitations are within permissible limits of Residential Area (buffer zone) as per **THE NOISE POLLUTION (REGULATION AND CONTROL) RULES, 2000**. Therefore, no impact is anticipated on the noise environment due to the project.

#### **4.5.2 Common Mitigation Measures**

- ❖ To reduce noise from the rough stone quarry, drilling will be done using well-maintained and low-noise equipment. Wet drilling methods will also be used to help reduce the amount of noise generated during the process.
- ❖ Blasting will be carried out in a controlled manner using limited charge and proper timing. All blasting activities will take place only during the daytime to avoid disturbing nearby areas during early morning or night hours.

- ❖ Vehicles and machines used in the quarry will be regularly serviced to keep noise levels low. Wherever possible, silencers and noise-dampening systems will be installed on machinery to reduce loud sounds.
- ❖ A greenbelt with trees and shrubs will be developed around the quarry to act as a natural barrier against noise. Workers will be given ear protection, such as earplugs, when working near loud equipment, and noise levels will be monitored regularly to make sure they stay within safe limits.

#### 4.5.3 Ground Vibrations

Ground vibrations due to the proposed mining activities are anticipated due to operation of mining machines like excavators, drilling and blasting, transportation vehicles, etc., however, the major source of ground vibration from the quarry is blasting. The major impact of the ground vibrations is observed on the domestic houses located in the villages nearby the mine lease area. The kutcha houses are more prone to cracks and damage due to the vibrations induced by blasting whereas RCC framed structures can withstand more ground vibrations. Apart from this, the ground vibrations may develop a fear factor in the nearby settlements.

Another impact due to blasting activities is fly rocks. These may fall on the houses or agricultural fields nearby the mining lease area and may cause injury to persons or damage to the structures. The ground vibrations due to the blasting in the quarry are calculated using the empirical equation.

The empirical equation for assessment of peak particle velocity (PPV) is given below:

$$V = K [R/Q^{0.5}]^{-B}$$

Where,

V = peak particle velocity (mm/s)

K = site and rock factor constant (500)

Q = maximum instantaneous charge (kg)

B = constant related to the rock and site (usually 1.6)

R = distance from charge (m)

**Table 4.7 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          | 48.18                 | 804                     | 0.249       | 19                     | 0.11           | 135              |

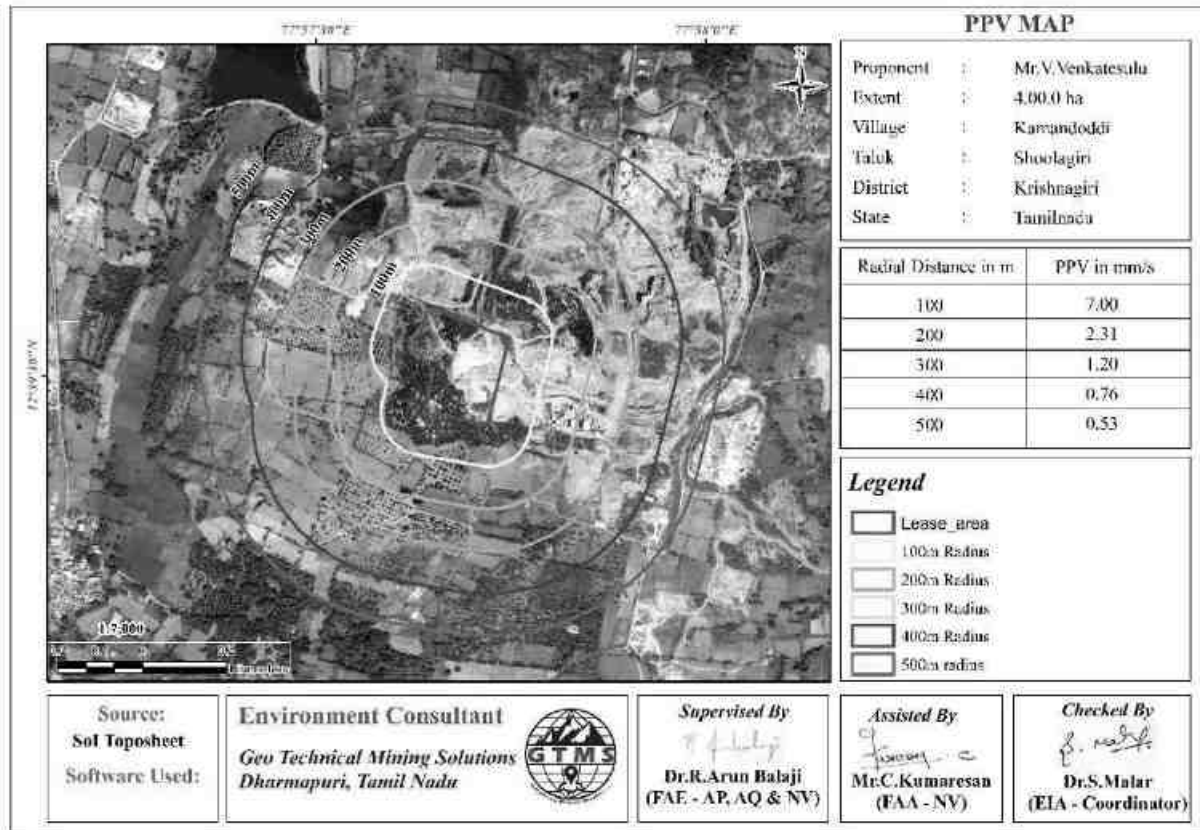
**Table 4.8 Predicted PPV Values due to Blasting at 100-500 m radius**

| 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          | 48.18                 | 100                  | 7.00        | 19                     | 1.37           | 157              |
|             |                       | 200                  | 2.31        |                        | 0.60           | 150              |
|             |                       | 300                  | 1.20        |                        | 0.37           | 145              |
|             |                       | 400                  | 0.76        |                        | 0.25           | 142              |
|             |                       | 500                  | 0.53        |                        | 0.20           | 140              |

**4.5.3.1 Common Mitigation Measures**

- ❖ 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, 2<sup>nd</sup> Class Mines Manager/ 1<sup>st</sup> Class Mines Manager) will be appointed.
- ❖ A set of shot firing rules will be drawn up and blasting shall commence outlining the detailed operating procedures that will be followed to ensure that shot firing operations on site take place without endangering the workforce or public.
- ❖ 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 0.251mm/s.
- ❖ Vibration monitoring will be carried out every 6 months to check the efficacy of blasting practices.



**Figure 4.3: Predicted PPV Values due to Blasting at 100-500 m radius**

#### 4.6 BIOLOGICAL ENVIRONMENT

There will not be any clearance of vegetation due to the proposed mining project since there is no vegetation within the mining lease area. The fauna in the vicinity of the mine is restricted to few common small species. There will be no impact on fauna due to this mining project.

##### 4.6.1 Impact on Flora

- ❖ As it is a mining project of stone quarry activities will be confined to core zone only.
- ❖ The activities related to mining as transportation of material and passage of workers to and from mining area may have an adverse impact on the road side flora, if adequate control measures will not be taken into consideration.

- ❖ 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. There are no trees in mine lease area.
- ❖ Carbon released from quarrying machineries and tippers during quarrying would be 5505kg per day, 1486373kg per year and 7431864kg over five years, as provided in Table 4.9.

**Table 4.9 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    | 389            | 104905          | 524527                |
| Fuel consumption of compressor   | 46.8           | 12636           | 63180                 |
| Fuel consumption of tipper       | 1619           | 437075          | 2185377               |
| Total fuel consumption in liters | 2054           | 554617          | 2773083               |
| Co <sub>2</sub> emission in kg   | 5505           | 1486373         | 7431864               |

#### **4.6.2 Mitigation Measures on Flora**

- ❖ Plantation will be carried out on approach roads and nearby vicinity at river banks areas.
- ❖ Native plant species which are resistant and pollution tolerant and comparatively well acclimatized should be grown along roadsides.
- ❖ Selection of plant species, shall be preferred to consider certain factors as agro climatic suitability, height and canopy architecture, growth rate and habit and aesthetic looks (foliage, conspicuous and attractive flower colour).
- ❖ 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.
- ❖ Annual bio-monitoring of roadside plants exposed to vehicular pollution will be done to assess the impact of dust load.

#### ***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 35544kg 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 (Table 4.10), about 1393 trees will be planted within three months from the beginning of mining. These trees, when grown up would sequester carbon of about 177722kg of the total carbon, as provided in Table 4.10.

**Table 4.10 CO<sub>2</sub> Sequestration**

|                                                          |       |         |         |
|----------------------------------------------------------|-------|---------|---------|
| CO <sub>2</sub> sequestration in kg                      | 180   | 48491   | 242457  |
| Remaining CO <sub>2</sub> not sequestered in kg          | 5325  | 1437881 | 7189406 |
| Trees required for environmental compensation            | 59912 |         |         |
| Area required for environmental compensation in hectares | 120   |         |         |

**Table 4.11 Recommended Species for Greenbelt Development Plan**

| S. No | Botanical Name of the Plant  | Family Name | Common Name     | Category | Dust Capturing Efficiency Features                                                                                                                                                               |
|-------|------------------------------|-------------|-----------------|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1     | <i>Azadirachta indica</i>    | Meliaceae   | Neem, Vembu     | Tree     | Well distinct thick at both the layer<br>Well distinct in Palisade & Spongy parenchyma.<br>Spongy parenchyma is present at lower epidermis Many vascular bundles arranged almost parallel series |
| 2     | <i>Tectona grandis</i>       | Lamiaceae   | Teak            | Tree     |                                                                                                                                                                                                  |
| 3     | <i>Polyalthia longifolia</i> | Annonaceae  | Nettilling      | Tree     |                                                                                                                                                                                                  |
| 4     | <i>Albizia lebbeck</i>       | Fabaceae    | Vagai           | Tree     |                                                                                                                                                                                                  |
| 5     | <i>Delonix regia</i>         | Fabaceae    | Cemmayir-konrai | Tree     |                                                                                                                                                                                                  |
| 6     | <i>Bauhinia racemose</i>     | Fabaceae    | Aathi           | Tree     |                                                                                                                                                                                                  |
| 7     | <i>Cassia fistula</i>        | Fabaceae    | Sarakondrai     | Tree     |                                                                                                                                                                                                  |
| 8     | <i>Aegle marmelos</i>        | Rutaceae    | Vilvam          | Tree     |                                                                                                                                                                                                  |
| 9     | <i>Pongamia pinnata</i>      | Fabaceae    | Pungam          | Tree     |                                                                                                                                                                                                  |
| 10    | <i>Thespesia populnea</i>    | Malvaceae   | Puvarasu        | Tree     |                                                                                                                                                                                                  |

**Table 4.12 Greenbelt Development Plan**

|                                                 | No. of trees proposed for plantation         | No. of trees expected to survive @ 80% | Area to be covered(m <sup>2</sup> ) |
|-------------------------------------------------|----------------------------------------------|----------------------------------------|-------------------------------------|
| Plantation in the construction phase (3 months) | Number of plants inside the mine lease area  |                                        |                                     |
|                                                 | 800                                          | 640                                    | 7,200                               |
|                                                 | Number of plants outside the mine lease area |                                        |                                     |
|                                                 | 1,200                                        | 960                                    | 10,800                              |
| <b>Total</b>                                    | <b>2,000</b>                                 | <b>1,600</b>                           | <b>18,000</b>                       |

**Table 4.13 Budget for Greenbelt Development Plan**

| Activity                                                  | Plantation in the construction Phase (3Months) | Cost                                                                                                                                                                                                                     | Capital Cost (Rs.) | Recurring Cost/ annum |
|-----------------------------------------------------------|------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-----------------------|
| Plantation inside the mine lease area (in safety margins) | 800                                            | Site clearance, preparation of land, digging of pits /trenches, soil amendments, transplantation of saplings @ 200 per plant (capital) for plantation inside the lease area and @ 30 per plant maintenance (recurring))" | 1,60,000           | 24,000                |
| Plantation outside the area                               | 1,200                                          | Avenue Plantation @ 300 per plant (capital) for plantation outside the lease area and @ 30 per plant maintenance (recurring)                                                                                             | 3,60,000           | 36,000                |
| <b>Total</b>                                              |                                                |                                                                                                                                                                                                                          | <b>5,20,000</b>    | <b>60,000</b>         |

*Source: EMP budget*

After complete extraction of mineral, the excavated pits will be allowed to collect rainwater and seepage water to serve as a reservoir to charge the nearby wells. Fish culture will also be attempted. A bund will be constructed around the pits. In order to minimize the impact of mining on the vegetation outside the mine lease area, it is recommended that adequate protection measures must be implemented. As mining involves movement of vehicles and increased anthropogenic activities, some of the areas can be fenced by involving local people and educating them about increased benefits of such activities.

#### **4.6.3. Impact on Fauna**

- ❖ The mining, specifically, will have no adverse impact on fauna whereas the operational activities such as human activity, transportation and noise generation may have an adverse impact on fauna.
- ❖ No wild life sanctuary is present within 5 km radius of study area. No major wildlife observed within mine lease area during the survey period. Considering size of mine and management practice by scientific method of mining with proper Environmental Management Plan including pollution control measures especially for air and noise, which will not cause any adverse impact on the surrounding animals.
- ❖ Fencing around the entire mine lease area is recommended in order to restrict the entry of stray animals into the mining area.

- ❖ Green belt development will be carried out which will help in arresting dust and minimizing sound level arising from the mining operation.
- ❖ Some fauna will move from the area of the road side as a result of habitat loss and physical disturbance.

#### **4.6.4 Mitigation Measures on Fauna**

- ❖ All equipment should have sound-control devices not less effective than those provided on the original equipment. Motorized equipment used should be adequately muffled and maintained.
- ❖ Mining will be carried out on the dry part of the lease area to avoid disturbance to the aquatic habitat.
- ❖ Operation and storage of heavy equipment within riparian habitat will be restricted.
- ❖ Fencing will be constructed around the proposed mine lease area to restrict the entry of stray animals
- ❖ The workers shall be trained not to harm any wildlife near the project site

#### **4.6.5 Impact on agriculture and horticulture crops in 1km Radius**

- ❖ Problems to agricultural and horticulture land due to dust caused by movement of heavy vehicles.
- ❖ Soil erosion and sediment deposition in the nearby water bodies due to earthworks during the rainy season.
- ❖ The fugitive dust released from the mining operations may cause effect on the agricultural and horticulture land who are directly exposed to the fugitive dust.
- ❖ Dust from the quarries is likely to affect reproductive systems in nearby agricultural and horticulture lands.
- ❖ Dust from quarries can affect plant growth and reduce vegetable yields.

#### **4.6.6 Mitigation Measures on agriculture and horticulture crops.**

- ❖ The main objective of the green belt is to provide a barrier between the source of pollution and the surrounding areas. In order to compensate the loss of vegetation cover, it is suggested to carry out afforestation program mainly inside and outside of the lease area in different phases.
- ❖ Quarry approach roads are sprayed with water 3 times a day to control dust. Thus, the damage to the nearby farmlands is controlled.
- ❖ A green belt will be created in 7.5m safety zone around the quarry to contain the dust from the quarry and prevent the dust from spreading to the adjacent agricultural land.



- ❖ 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.

#### ***Aquatic Biodiversity***

Mining activities will not disturb the existing aquatic ecology as there is no effluent discharge proposed from the rough stone and gravel quarry. There is no natural perennial surface water body within the mine lease area. Hence, aquatic biodiversity is not observed in the mine lease area.

### **4.7 SOCIO ECONOMIC ENVIRONMENT**

#### **4.7.1 Anticipated Impact from Proposed and Existing Projects**

- ❖ 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.

#### **4.7.2 Common Mitigation Measures for Proposed Project**

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

### **4.8 OCCUPATIONAL HEALTH AND SAFETY**

Occupational health and safety hazards occur during the operational phase of mining and primarily include the following:

- ❖ Respiratory hazards
- ❖ Noise

- ❖ Physical hazards
- ❖ Explosive storage and handling

#### **4.8.1 Respiratory Hazards**

Long- term exposure to silica dust may cause silicosis the following measures are proposed:

- ❖ Cabins of excavators and tippers will be enclosed with AC and sound proof
- ❖ Use of personal dust masks will be made compulsory

#### **4.8.2 Noise**

Workers are likely to get exposed to excessive noise levels during mining activities. The following measures are proposed for implementation

- ❖ No employee will be exposed to a noise level greater than 85 dB(A) for a duration of more than 8 hours per day without hearing protection
- ❖ The use of hearing protection will be enforced actively when the equivalent sound level over 8 hours reaches 85 dB(A), the peak sound levels reach 140 dB(C), or the average maximum sound level reaches 110 dB(A)
- ❖ Ear muffs provided will be capable of reducing sound levels at the ear to at least 85 dB(A)
- ❖ Periodic medical hearing checks will be performed on workers exposed to high noise levels.

#### **4.8.3 Physical Hazards**

The following measures are proposed for control of physical hazards

- ❖ Specific personnel training on work-site safety management will be taken up;
- ❖ Natural barriers, temporary railing, or specific danger signals will be provided along rock benches or other pit areas where work is performed at heights more than 2m from ground level;
- ❖ Maintenance of yards, roads and footpaths, providing sufficient water drainage and preventing slippery surfaces with an all-weather surface, such as coarse gravel will be taken up.

#### **4.8.4 Occupational Health Survey**

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, Spirometric 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.

#### **4.9 MINE WASTE MANAGEMENT**

No waste is anticipated from any of the proposed quarries.

#### **4.10 MINE CLOSURE**

Mine closure plan is the most important environmental requirement in mining project. The mine closure plan should cover technical, environmental, social, legal and financial aspects dealing with progressive and post closure activities. The closure operation is a continuous series of activities starting from the decommissioning of the project. Therefore, progressive mine closure plan should be specifically dealt with in the mining plan and is to be reviewed along with mining plan. As progressive mine closure is a continuous series of activities, it is obvious that the proposals of scientific mining have included most of the activities to be included in the closure plan. While formulating the closure objectives for the site, it is important to consider the existing or the pre-mining land use of the site; and how the operation will affect this activity.

The primary aim is to ensure that the following broad objectives along with the abandonment of the mine can be successfully achieved:

- ❖ To create a productive and sustainable after-use for the site, acceptable to mine owners, regulatory agencies, and the public
- ❖ To protect public health and safety of the surrounding habitation
- ❖ To minimize environmental damage
- ❖ To conserve valuable attributes and aesthetics
- ❖ To overcome adverse socio-economic impacts.

##### **4.10.1 Mine Closure Criteria**

The criteria involved in mine closure are discussed below:

###### **4.10.1.1 Physical Stability**

All anthropogenic structures, which include mine workings, buildings, rest shelters etc., remaining after mine decommissioning should be physically stable. They should present no hazard to public health and safety as a result of failure or physical deterioration and they should continue to perform the functions for which they were designed. The design periods and factors of safety proposed should take full account of extreme events such as floods, hurricane, winds or earthquakes, etc. and other natural perpetual forces like erosion, etc.,

#### **4.10.1.2 Chemical Stability**

The solid wastes on the mine site should be chemically stable. This means that the consequences of chemical changes or conditions leading to leaching of metals, salts or organic compounds should not endanger public health and safety nor result in the deterioration of environmental attributes. If the pollutant discharges likely to cause adverse impacts is predicted in advance, appropriate mitigation measures like settling of suspended solids or passive treatment to improve water quality as well as quantity, etc., could be planned. Monitoring should demonstrate that there is no adverse effect of pollutant concentrations exceeding the statutory limits for the water, soil and air qualities in the area around the closed mine.

#### **4.10.1.3 Biological Stability**

The stability of the surrounding environment is primarily dependent upon the physical and chemical characteristics of the site, whereas the biological stability of the mine site itself is closely related to rehabilitation and final land use. Nevertheless, biological stability can significantly influence physical or chemical stability by stabilizing soil cover, prevention of erosion/wash off, leaching, etc.,

A vegetation cover over the disturbed site is usually one of the main objectives of the rehabilitation programme, as vegetation cover is the best long- term method of stabilizing the site. When the major earthwork components of the rehabilitation programme have been completed, the process of establishing a stable vegetation community begins. For re-vegetation, management of soil nutrient levels is an important consideration. Additions of nutrients are useful under three situations.

- ❖ Where the nutrient level of spread topsoil is lower than material in-situ e.g., for development of social forestry
- ❖ Where it is intended to grow plants with a higher nutrient requirement than those occurring naturally.
- ❖ Where it is desirable to get a quick growth response from the native flora during those times when moisture is not a limiting factor. For example, development of green barriers

The Mine closure plan should be as per the approved mining plan. The mine closure is a part of approved mine plan and activities of closure shall be carried out as per the process described in mine closure plan.

## **CHAPTER V**

### **ANALYSIS OF ALTERNATIVES (TECHNOLOGY AND SITE)**

#### **5.0 INTRODUCTION**

Consideration of alternatives to a proposed project is a requirement of EIA process. During the scoping process, alternatives to a proposed project can be considered or refined, either directly or by reference to the key issues identified. A comparison of alternatives helps to determine the best method of achieving the project objectives with minimum environmental impacts or indicates the most environmentally friendly and cost-effective options.

#### **5.1 FACTORS BEHIND THE SELECTION OF PROJECT SITE**

The proposed project is site specific and has the following advantages:

- ❖ The mineral deposit occurs in a non-forest area.
- ❖ There is no habitation within the project area; hence no R & R issues exist.
- ❖ There is no river, stream, nallah and water bodies in the applied mine lease area.
- ❖ Availability of skilled, semi-skilled and unskilled workers in this region.
- ❖ All the basic amenities such as medical, firefighting, education, transportation, communication and infrastructural facilities are well connected and accessible.
- ❖ The mining operations will not intersect the ground water level. Hence, no impact on ground water environment.
- ❖ As the proposed project area falls in seismic zone II, there is no major history of landslides, earthquake, subsidence etc., recorded in the past history.

#### **5.2 ANALYSIS OF ALTERNATIVE SITE**

No alternatives are suggested as the mine site is mineral specific.

#### **5.3 FACTORS BEHIND SELECTION OF PROPOSED TECHNOLOGY**

Manual open cast mining method with secondary blasting will be applied to extract rough stone and gravel in the area. The proposed mining lease areas have following advantages:

- ❖ As the mineral deposition is homogeneous and batholith formation, opencast method of working is preferred over underground method.
- ❖ The material will be loaded with the help of excavators into tractors/tippers and transported to the need by customers.
- ❖ Semi-skilled labours fit for quarrying operations are easily available around the nearby villages.

#### **5.4 ANALYSIS OF ALTERNATIVE TECHNOLOGY**

Open cast mechanized method has been selected for this project. This technology is having least gestation period, economically viable, safest and less labour intensive. The method has inbuilt flexibility for increasing or decreasing the production as per market condition.

## **CHAPTER VI**

### **ENVIRONMENTAL MONITORING PROGRAMME**

#### **6.0 GENERAL**

The monitoring and evaluation of environmental parameters indicates potential changes occurring in the environment, which paves way for implementation of rectifying measures wherever required to maintain the status of the natural environment. Evaluation is also a very effective tool to judge the effectiveness or deficiency of the measures adopted and provides insight for future corrections. The main objective of environmental monitoring is to ensure that the obtained results in respect of environmental attributes and prevailing conditions during operation stage are in conformity with the prediction during the planning stage. In case of substantial deviation from the earlier prediction of results, this forms as base data to identify the cause and suggest remedial measures. Environmental monitoring is mandatory to meet compliance of statutory provisions under the Environment (Protection) Act, 1986, relevant conditions regarding monitoring covered under EC orders issued by the SEIAA-TN as well as the conditions set forth under the order issued by Tamil Nadu Pollution Control Board while granting CTE/CTO.

#### **6.1 METHODOLOGY OF MONITORING MECHANISM**

Implementation of EMP and periodic monitoring will be carried out by respective project proponents. A comprehensive monitoring mechanism has been devised for monitoring of impacts due to proposed project; Environmental protection measures like dust suppression, control of noise and blast vibrations, maintenance of machinery and vehicles, housekeeping in the mine premises, plantation, implementation of Environmental Management Plan and environmental clearance conditions will be monitored by the respective mine management. On the other hand, implementation of area level protection measures like green belt development, environmental quality monitoring etc., are taken up by a senior executive who reports to their Mine Management.

An Environment monitoring cell (EMC) will be constituted to monitor the implementation of EMP and other environmental protection measures in the proposed quarry. The responsibilities of this cell will be:

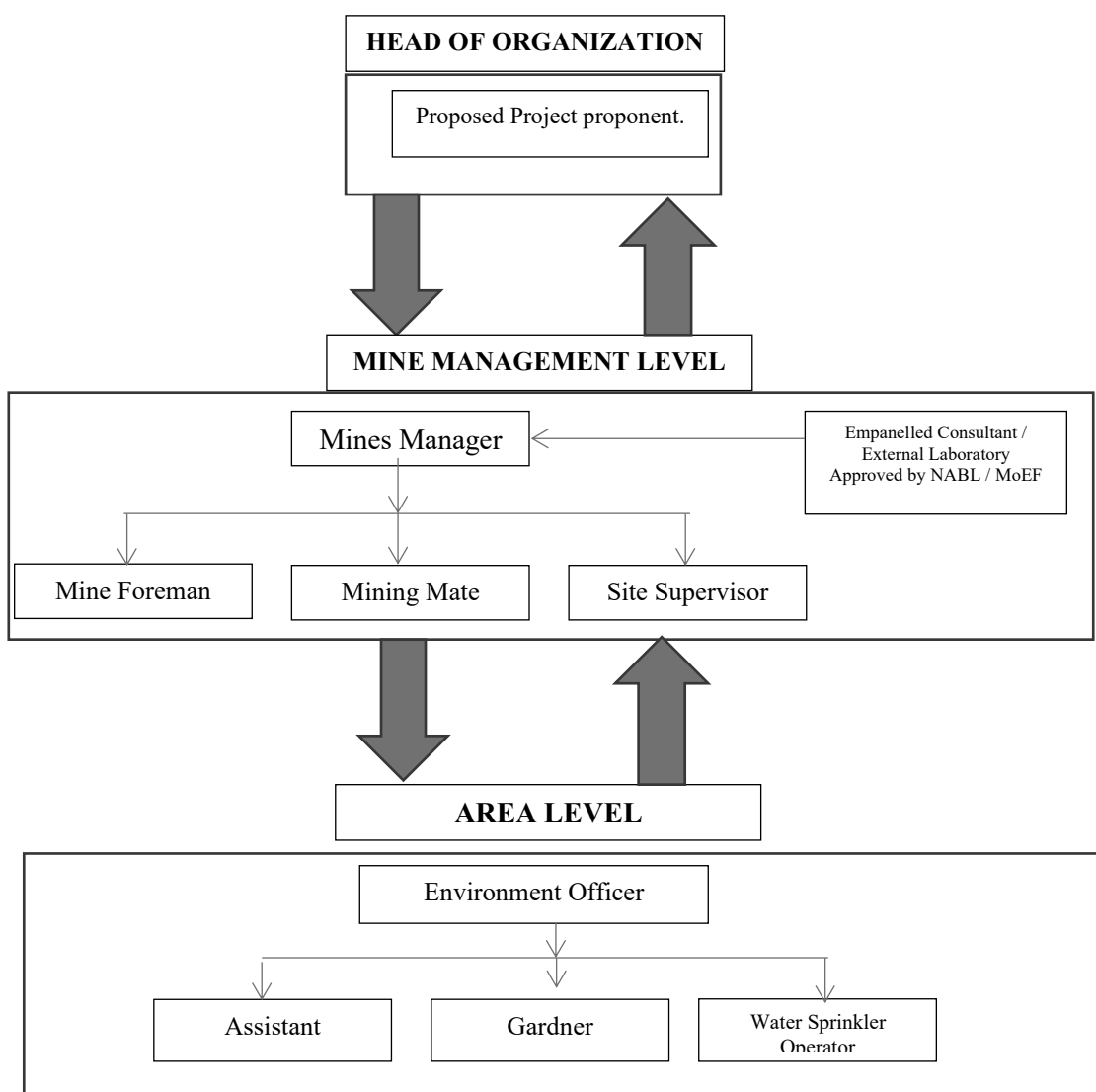
- ❖ Implementation of pollution control measures
- ❖ Monitoring programme implementation
- ❖ Post-plantation care
- ❖ To check the efficiency of pollution control measures taken
- ❖ Any other activity as may be related to environment

- ❖ Seeking expert's advice when needed.

The environmental monitoring cell will co-ordinate all monitoring programs at site and data thus generated will be regularly furnished to the State regulatory agencies as compliance status reports.

The sampling and analysis report of the monitored environmental attributes will be submitted to the Tamil Nadu Pollution Control Board (TNPCB) at a frequency of half-yearly and yearly by the proposed project proponent. The half-yearly reports are submitted to Ministry of Environment and Forest, Regional Office and SEIAA-TN as well.

The sampling and analysis of the environmental attributes will be as per the guidelines of Central Pollution Control Board (CPCB)/Ministry of Environment, Forest and Climate Change (MoEF & CC). The Environmental Monitoring Cell will be formed for the proposed project. The structure of the cell will be as shown in Figure 6.1.



**Figure 6.1 Proposed environmental monitoring chart**

## 6.2 IMPLEMENTATION SCHEDULE OF MITIGATION MEASURES

The mitigation measures proposed in chapter IV will be implemented so as to reduce the impact on the environment due to the operations of the proposed project. Implementation schedule of mitigation measures is given in Table 6.1.

**Table 6.1 Implementation Schedule for Proposed Project**

| S. No. | Recommendations                   | Time Period                                                         | Schedule                                      |
|--------|-----------------------------------|---------------------------------------------------------------------|-----------------------------------------------|
| 1      | Land Environment Control Measures | Before commissioning of the project                                 | Immediately after the commencement of project |
| 2      | Soil Quality Control Measures     | Before commissioning of the project                                 | Immediately after the commencement of project |
| 3      | Water Pollution Control Measures  | Before commissioning of the project and along with mining operation | Immediately and as project progress           |
| 4      | Air Pollution Control Measures    | Before commissioning of the project and along with mining operation | Immediately and as project progress           |
| 5      | Noise Pollution Control measures  | Before commissioning of the project and along with mining operation | Immediately and as project progress           |
| 6      | Ecological Environment            | Phase wise implementation every year along with mine operations     | Immediately and as project progress           |

## 6.3 MONITORING SCHEDULE AND FREQUENCY

Monitoring shall confirm that commitments are being met. This may take the form of direct measurement and recording of quantitative information, such as amounts and concentrations of discharges, emissions and wastes, for measurement against statutory standards. Monitoring may include socio-economic interaction, through local liaison activities or even assessment of complaints.

The environmental monitoring will be conducted in the mine operations as follows:

- ❖ Air quality
- ❖ Water and wastewater quality
- ❖ Noise levels
- ❖ Soil quality and



❖ Greenbelt development

The details of proposed monitoring schedule have been provided in Table 6.2.

**Table 6.2 Proposed Monitoring Schedule Post EC for the Proposed Quarry**

| 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      | Vibration                | At the nearest habitation (in case of reporting)                         | –              | During blasting operation    | Peak particle velocity                                                                      |
| 7      | Soil                     | 2 Locations (1 Core & 1 Buffer)                                          | –              | Once in six months           | Physical and chemical characteristics                                                       |
| 8      | Greenbelt                | Within the project area                                                  | Daily          | Monthly                      | Maintenance                                                                                 |

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

#### 6.4 BUDGETARY PROVISION FOR ENVIRONMENT MONITORING PROGRAM

The cost in respect of monitoring of environmental attributes, parameter to be monitored, sampling/monitoring locations with frequency and cost provision against each proposal is shown in Table 6.3. Monitoring work will be outsourced to external laboratory approved by NABL / MoEF. The proposed recurring cost for Environmental Monitoring Programme is Rs 2,95,000 /- per annum for the proposed project site.

**Table 6.3 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>Rs 2,95,000 /-</b>    |

*Source: Field Data*

#### 6.5 REPORTING SCHEDULES OF MONITORED DATA

The monitored data on air quality, water quality, noise levels and other environmental attributes will be periodically examined by the Cluster Mine Management Coordinator and Respective Head of Organization for taking necessary corrective measures. The monitoring data will be submitted to Tamil Nadu State Pollution Control Board in the Compliance to CTO Conditions & environmental audit statements every year to MoEF & CC and Half-Yearly Compliance Monitoring Reports to MoEF & CC Regional Office and SEIAA.

Periodical reports to be submitted to:

- ❖ MoEF & CC – Half yearly status report
- ❖ TNPCB - Half yearly status report
- ❖ Department of Geology and Mining: quarterly, half yearly annual reports

Besides the Mines Manager/Agent of respective project will submit the periodical reports to:

- ❖ Director of mines safety
- ❖ Labour enforcement officer
- ❖ Controller of explosives as per the norms stipulated by the department.

## **CHAPTER VII**

### **ADDITIONAL STUDIES**

#### **7.0 GENERAL**

Additional studies deal with:

- ❖ Public Consultation for Proposed Project
- ❖ Risk Assessment
- ❖ Disaster Management Plan
- ❖ Cumulative Impact Study
- ❖ Plastic Waste Management

#### **7.1 PUBLIC CONSULTATION FOR PROPOSED PROJECT**

Application to the Member Secretary of the Tamil Nadu Pollution Control Board (TNPCB) to conduct Public Hearing in a systematic, time bound and transparent manner ensuring widest possible public participation at the project site or in its close proximity in the district was made and the public opinions on the proposed project will be updated in the final EIA/EMP report.

#### **7.2 RISK ASSESSMENT FOR PROPOSED PROJECT**

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 all operations and assess the risk levels of those hazards in order to prioritize those that need immediate attention. Further, mechanisms responsible for these hazards are identified and their control measures, set to timetable are recorded along with pinpointed responsibilities. The whole quarry operation will be carried out under the direction of a Qualified Competent Mine Manager holding certificate of competency to manage a metalliferous mine granted by the DGMS, Dhanbad for proposed project.

Factors of risks involved due to human induced activities in connection with these proposed mining & allied activities with detailed analysis of causes and control measures for the mine is given in Table 7.1.

**Table 7.1 Risk Assessment & Control Measures for Proposed Project**

| S. No. | Risk factors                                              | Causes of risk                                                                                               | Control measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|--------|-----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1      | Accidents due to explosives and heavy mining machineries. | Improper handling and unsafe working practice                                                                | <ul style="list-style-type: none"> <li>✓ All safety precautions and provisions of Mine Act, 1952, Metalliferous Mines Regulation, 1961 and Mines Rules, 1955 will be strictly followed during all mining operations.</li> <li>✓ Workers will be sent to the Training in the nearby Group Vocational Training Centre Entry of unauthorized persons will be prohibited.</li> <li>✓ Fire-fighting and first-aid provisions in the mine office complex and mining area.</li> <li>✓ Provisions of all the safety appliances such as safety boot, helmets, goggles etc. will be made available to the employees and regular check for their use.</li> <li>✓ Working of quarry, as per approved plans and regularly updating the mine plans.</li> <li>✓ Cleaning of mine faces on daily basis shall be daily done in order to avoid any overhang or undercut.</li> <li>✓ Handling of explosives, charging and firing shall be carried out by competent persons only under the supervision of a Mine Manager.</li> <li>✓ Maintenance and testing of all mining equipment as per manufacturer's guidelines.</li> </ul> |
| 2      | Drilling                                                  | Improper and unsafe practices; Due to high pressure of compressed air, hoses may burst; Drill Rod may break; | <ul style="list-style-type: none"> <li>✓ Safe operating procedure established for drilling (SOP) will be strictly followed.</li> <li>✓ Only trained operators will be deployed.</li> <li>✓ No drilling shall be commenced in an area where shots have been fired until the blaster/blasting foreman has made a thorough Examination of all places,</li> <li>✓ Drilling shall not be carried on simultaneously on the benches at places directly one above the other.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

|   |                                       |                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|---|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|   |                                       |                                                                                                                                                                                                                                   | <ul style="list-style-type: none"> <li>✓ Periodical preventive maintenance and replacement of worn-out accessories in the compressor and drill equipment as per operator manual.</li> <li>✓ All drills unit shall be provided with wet drilling shall be maintained in efficient working in condition.</li> <li>✓ Operator shall regularly use all the personal protective equipment.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                               |
| 3 | Transportation                        | <p>Potential hazards and unsafe workings contributing to accident and injuries</p> <p>Overloading of material</p> <p>While reversal &amp; overtaking of vehicle</p> <p>Operator of truck leaving his cabin when it is loaded.</p> | <ul style="list-style-type: none"> <li>✓ Before commencing work, drivers personally check the truck/tipper for oil(s), fuel and water levels, tyre inflation, general cleanliness and inspect the brakes, steering system, warning devices including automatically operated audio-visual reversing alarm, rear view mirrors, side indicator lights etc., are in good condition.</li> <li>✓ Not allow any unauthorized person to ride on the vehicle nor allow any unauthorized person to operate the vehicle.</li> <li>✓ Concave mirrors should be kept at all corners</li> <li>✓ All vehicles should be fitted with reverse horn with one spotter at every tipping point</li> <li>✓ Loading according to the vehicle capacity</li> <li>✓ Periodical maintenance of vehicles as per operator manual</li> </ul> |
| 4 | Natural calamities                    | Unexpected happenings                                                                                                                                                                                                             | <ul style="list-style-type: none"> <li>✓ Escape Routes will be provided to prevent inundation of storm water</li> <li>✓ Fire Extinguishers &amp; Sand buckets</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 5 | Failure of Mine Benches and Pit Slope | Slope geometry, Geological structure                                                                                                                                                                                              | <ul style="list-style-type: none"> <li>✓ Ultimate or over all pit slope shall be below 60° and each bench height shall be 5m.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

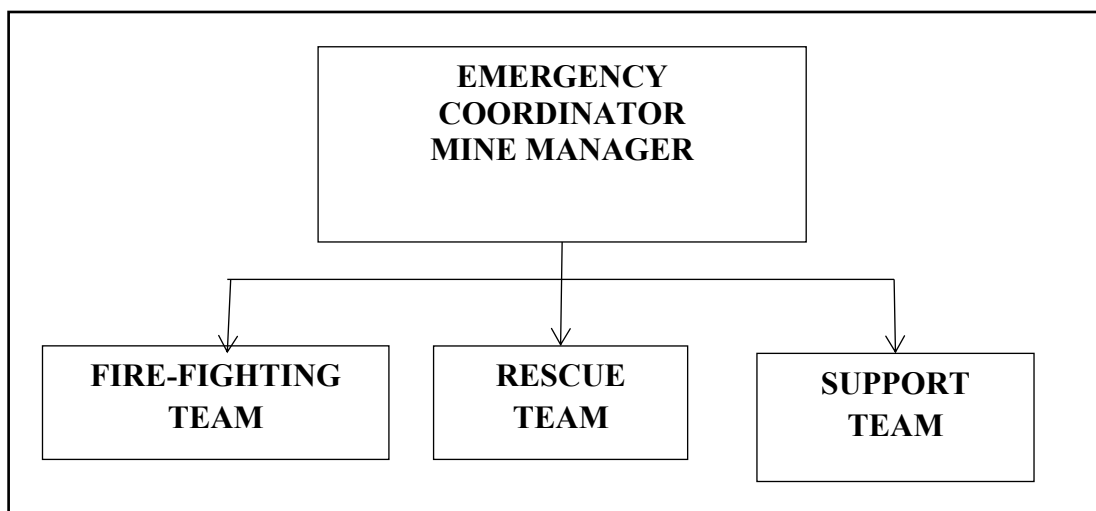
*Source: Analysed and proposed by FAE & EC*

### 7.3 DISASTER MANAGEMENT PLAN FOR PROPOSED PROJECT

Natural disasters like Earthquake, Landslides have not been recorded in the past history as the terrain is categorized under seismic zone II. The area is far away from the sea. Hence, the disaster due to heavy floods and tsunamis are not anticipated. The Disaster Management Plan is aimed to ensure safety of life, protection of environment, protection of installation, restoration of production and salvage operations in this same order of priorities. The objective of the Disaster Management Plan is to make use of the combined resources of the mine and the outside services to achieve the following:

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

In case a disaster takes place, despite preventive actions, disaster management will have to be done in line with the descriptions below. There is an organization proposed for dealing with the emergency situations. Structure of the team has been shown in Figure 7.1.



**Figure 7.1 Disaster management team layout for proposed project**

#### 7.3.1 Emergency Control Procedure

The onset of emergency, will in all probability, commence with a major fire or explosion or collapse of wall along excavation and shall be detected by various safety devices and also by members of operational staff on duty. If located by a staff member on duty, he (as per site emergency procedure of which he is adequately briefed) will go to nearest alarm call

point, break glass and trigger off the alarms. He will also try his best to inform about location and nature of accident to the emergency control room. In accordance with work emergency procedure the following key activities will immediately take place to interpret and take control of emergency.

- ❖ On site fire crew led by a fireman will arrive at the site of incident with fire foam tenders and necessary equipment.
- ❖ Emergency security controller will commence his role from main gate office
- ❖ Incident controller shall rush to the site of emergency and with the help of rescue team and will start handling the emergency.
- ❖ Site main controller will arrive at MECR with members of his advisory and communication team and will assume absolute control of the site.
- ❖ He will receive information continuously from incident controller and give decisions and directions to:
  - ❖ Incident controller
  - ❖ Mine control rooms
  - ❖ Emergency security controller

#### 7.4 CUMULATIVE IMPACT STUDY

The Cumulative Impact is mainly anticipated due to drilling & blasting and excavation and transportation activities in all the quarries within the cluster and major impact anticipated is on Air & Noise Environment and Ground Vibrations due to blasting. For this cumulative study, 3 proposed projects, known as P1, P2, P3 are taken into consideration. The details of P1 have been given in Table 1.3 and the details of P2 and P3 are given in the Table 7.2 and 7.3.

**Table 7.2 Salient Features of the Proposed Project P2**

|                                            |                                                                  |           |           |
|--------------------------------------------|------------------------------------------------------------------|-----------|-----------|
| Name of the Quarry                         | Thiru.P.Mallikarjuna Rough Stone Quarry                          |           |           |
| Type of Land                               | Government Poramboke Land                                        |           |           |
| Extent                                     | 3.50.0                                                           |           |           |
| S.F.No                                     | 754 & 760 (Part 4)                                               |           |           |
| Toposheet No                               | 57 – H/14                                                        |           |           |
| Location of Project Site<br>(Centre Point) | 12°39'36.15"N to 12°39'43.54"N<br>77°57'43.80"E to 77°57'51.81"E |           |           |
| Ultimate Pit Dimensions                    | Length (m)                                                       | Width (m) | Depth (m) |
|                                            | 36                                                               | 91        | 127       |
| Depth of Mining                            | 120 m BGL                                                        |           |           |
| Geological Resources                       | Rough Stone in m <sup>3</sup>                                    |           |           |
|                                            | 4145337                                                          |           |           |

|                                  |                                                                                                                                                                                                                       |   |
|----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| Mineable Reserves                | Rough Stone in m <sup>3</sup>                                                                                                                                                                                         |   |
|                                  | 6948771                                                                                                                                                                                                               |   |
| Proposed reserves for five years | Rough Stone in m <sup>3</sup>                                                                                                                                                                                         |   |
|                                  | 3135433                                                                                                                                                                                                               |   |
| Method of Mining                 | Open-Cast Semi Mechanized mining                                                                                                                                                                                      |   |
| Topography                       | Hilly Terrain                                                                                                                                                                                                         |   |
| Machinery proposed               | Jack Hammer                                                                                                                                                                                                           | 6 |
|                                  | Compressor                                                                                                                                                                                                            | 1 |
|                                  | Tipper                                                                                                                                                                                                                | 4 |
|                                  | Excavator                                                                                                                                                                                                             | 1 |
| Blasting Method                  | The quarrying operation is proposed to carried out by open cost, using jack hammer drilling followed by manual breaking will be adopted to release the rough stone and nonel blasting is proposed in this lease area. |   |
| Proposed Manpower Deployment     | 18 Nos                                                                                                                                                                                                                |   |
| Project Cost                     | Rs. 32,930,000/-                                                                                                                                                                                                      |   |
| CER Cost                         | Rs. 5,00,000/-                                                                                                                                                                                                        |   |
| Proposed Water Requirement       | 2.5 KLD                                                                                                                                                                                                               |   |

**Table 7.3 Salient Features of the Proposed Project P3**

|                                            |                                                              |                           |           |
|--------------------------------------------|--------------------------------------------------------------|---------------------------|-----------|
| Name of the Quarry                         | S.R.SAMBANGI                                                 |                           |           |
|                                            | Rough Stone Quarry                                           |                           |           |
| Type of Land                               | Government Poramboke Land                                    |                           |           |
| Extent                                     | 2.23.0                                                       |                           |           |
| S.F.No                                     | 1151,1155,1212 to 1219, 1222, 1225 and<br>1226/A (Part – IV) |                           |           |
| Toposheet No                               | 57 – H/14                                                    |                           |           |
| Location of Project Site<br>(Centre Point) | 12°39'29.49"N to 12°39'33.28"N                               |                           |           |
|                                            | 77°57'51.63"E to 77°58'00.55"E                               |                           |           |
| Ultimate Pit Dimensions                    | Length (m)                                                   | Width (m)                 | Depth (m) |
|                                            | 67                                                           | 105                       | 99        |
| Depth of Mining                            | 70 m BGL                                                     |                           |           |
| Geological Resources                       | Rough Stone in m <sup>3</sup>                                | Topsoil in m <sup>3</sup> |           |
|                                            | 2129351                                                      | 16699                     |           |



|                                  |                                                                                                                                                                                                                       |                                  |
|----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| Mineable Reserves                | Rough Stone in m <sup>3</sup>                                                                                                                                                                                         | Topsoil in m <sup>3</sup>        |
|                                  | 1708616                                                                                                                                                                                                               | 16205                            |
| Proposed reserves for five years | Rough Stone in m <sup>3</sup>                                                                                                                                                                                         | Gravel in m <sup>3</sup> /1 year |
|                                  | 542101                                                                                                                                                                                                                | 16205                            |
| Method of Mining                 | Open-Cast Semi Mechanized mining                                                                                                                                                                                      |                                  |
| Topography                       | Hilly Terrain                                                                                                                                                                                                         |                                  |
| Machinery proposed               | Jack Hammer                                                                                                                                                                                                           | 6                                |
|                                  | Compressor                                                                                                                                                                                                            | 1                                |
|                                  | Tipper                                                                                                                                                                                                                | 3                                |
|                                  | Excavator                                                                                                                                                                                                             | 1                                |
| Blasting Method                  | The quarrying operation is proposed to carried out by open cost, using jack hammer drilling followed by manual breaking will be adopted to release the rough stone and nonel blasting is proposed in this lease area. |                                  |
| Proposed Manpower Deployment     | 20 Nos                                                                                                                                                                                                                |                                  |
| Project Cost                     | Rs.30630000/-                                                                                                                                                                                                         |                                  |
| CER Cost                         | Rs. 5,00,000/-                                                                                                                                                                                                        |                                  |
| Proposed Water Requirement       | 2.5 KLD                                                                                                                                                                                                               |                                  |

#### 7.4.1 Air Environment

As the production of rough stone and gravel plays a vital role in affecting the air environment. The data on the cumulative production resulting from four proposed project have been given in Tables 7.4 and 7.5.

**Table 7.4 Cumulative Production Load of Rough Stone**

| Proposed Production Details |                           |                            |                           |                              |
|-----------------------------|---------------------------|----------------------------|---------------------------|------------------------------|
| Quarry                      | 5 Years in m <sup>3</sup> | Per Year in m <sup>3</sup> | Per Day in m <sup>3</sup> | Number of Lorry Load Per Day |
| P1                          | 676020                    | 135204                     | 500                       | 83                           |
| P2                          | 3135433                   | 627087                     | 2322                      | 387                          |
| P3                          | 542101                    | 108420                     | 402                       | 67                           |
| <b>Grand Total</b>          | <b>4353554</b>            | <b>870711</b>              | <b>3224</b>               | <b>537</b>                   |

The cumulative study shows that the overall production of rough stone from the quarry is 3224 m<sup>3</sup> per day with a capacity of 537 trips of rough stone per day.

#### 7.4.1.1 Cumulative Impact of Air Pollutants

The results on the cumulative impact of the 1 proposed projects on air environment of the cluster have been provided in Table 7.5. The cumulative values resulting from the 1 projects for each pollutant do not exceed the permissible limits set by CPCB.

**Table 7.5 Cumulative Impact Results from the Cluster**

| Pollutants        | Baseline Data<br>( $\mu\text{g}/\text{m}^3$ ) | Incremental Values ( $\mu\text{g}/\text{m}^3$ ) |       |       | Cumulative Value<br>( $\mu\text{g}/\text{m}^3$ ) |
|-------------------|-----------------------------------------------|-------------------------------------------------|-------|-------|--------------------------------------------------|
|                   |                                               | P1                                              | P2    | P3    |                                                  |
| PM <sub>2.5</sub> | 18.9                                          | 5.6                                             | 8.80  | 7.61  | 40.91                                            |
| PM <sub>10</sub>  | 41.5                                          | 8.89                                            | 13.39 | 11.58 | 75.36                                            |
| SO <sub>2</sub>   | 4.4                                           | 5.30                                            | 5.07  | 4.38  | 19.15                                            |
| NO <sub>x</sub>   | 11.6                                          | 7.55                                            | 7.22  | 6.24  | 32.61                                            |

#### 7.4.2 Noise Environment

Noise pollution is mainly due to operation like drilling & blasting and plying of trucks & HEMM. Cumulative Noise modelling has been carried out considering blasting and compressor operation (drilling) and transportation activities. Predictions have been carried out to compute the noise level at various distances around the different quarries within the 500 m radius.

**Table.7.6 Cumulative Impact of Noise from Cluster Quarries**

| Location ID               | Distance (m) | Direction | Background Value (Day) dB(A) | Incremental Value dB(A) | Total Predicted dB(A) | Residential Area Standards dB(A) |
|---------------------------|--------------|-----------|------------------------------|-------------------------|-----------------------|----------------------------------|
| Habitation Near P1        | 550          | N         | 43.8                         | 27.58                   | 43.81                 | 55                               |
| Habitation Near P2        | 960          | N         | 43.8                         | 24.31                   | 43.85                 |                                  |
| Habitation Near P3        | 1310         | N         | 43.8                         | 21.61                   | 43.83                 |                                  |
| Cumulative Noise (dB (A)) |              |           |                              |                         | 45.52                 |                                  |

Source: Lab Monitoring Data

The cumulative analysis of noise due to Cluster projects shows that habitation of Cluster will receive about 45.52 dB (A) respectively. The cumulative results for all the villages in consideration do not exceed the limit set by CPCB for residential areas for day time.

### Ground Vibrations

Cumulative results of ground vibrations due to mining activities in the Cluster Quarries have been shown in Table 7.7.

**Table 7.7 Cumulative Effect of Ground Vibrations Resulting from Cluster**

| Location ID  | Nearest Habitation in m | Maximum Charge in kgs | PPV in mm/s  |
|--------------|-------------------------|-----------------------|--------------|
| P1           | 804                     | 48.18                 | 0.249        |
| P2           | 960                     | 223.5                 | 0.64         |
| P3           | 1310                    | 38.6                  | 0.06         |
| <b>Total</b> |                         |                       | <b>0.949</b> |

Results from the above tables 7.8 indicate that the cumulative PPV value of each habitation is well below the peak particle velocity of 8 mm/s as per Directorate General of Mines Safety for safe level criteria through Circular No. 7 dated 29/8/1997.

### 7.4.3 Socio Economic Environment

Socio Economic benefits of the four proposed project were calculated and the results have been shown in Table 7.8 the three quarries together will contribute Rs. 15,00,000/-towards CER fund.

**Table 7.8 Socio Economic Benefits from Cluster**

| Location ID        | Project Cost           | CER Cost             |
|--------------------|------------------------|----------------------|
| P1                 | 88495000               | 500000               |
| P2                 | 32930000               | 500000               |
| P3                 | 30630000               | 500000               |
| <b>Grand Total</b> | <b>Rs.15,20,55,000</b> | <b>Rs. 15,00,000</b> |

**Table 7.9 Employment Benefits from Cluster**

| Location ID        | Employment |
|--------------------|------------|
| P1                 | 23         |
| P2                 | 18         |
| P3                 | 20         |
| <b>Grand Total</b> | <b>61</b>  |

A total of 61 people will get employment due to mines in cluster

### 7.4.4 Ecological Environment

**Table 7.10 Greenbelt Development Benefits from Cluster**

| Code | Number of Trees proposed | Area to be covered (m <sup>2</sup> ) | No. of Trees expected to be grown @ 80% survival rate | Species recommended                |
|------|--------------------------|--------------------------------------|-------------------------------------------------------|------------------------------------|
| P1   | 2000                     | 18000                                | 1600                                                  | <i>Azadirachta indica, Albizia</i> |
| P2   | 1750                     | 15750                                | 560                                                   |                                    |

|              |             |              |             |                                                       |
|--------------|-------------|--------------|-------------|-------------------------------------------------------|
| P3           | 1115        | 10035        | 892         | <i>lebbeck, Delonix regia, Tectona grandis, etc.,</i> |
| <b>Total</b> | <b>4865</b> | <b>43785</b> | <b>3052</b> |                                                       |

Cumulative studies show that the proposed project will plant about 4865 native tree species like *Azadirachta indica*, *Albizia lebbeck*, *Delonix regia*, *Tectona grandis*, etc inside and outside the lease area. It is expected that 80 % of trees, i.e., 3052 trees will survive in this green belt development program.

## 7.5 PLASTIC WASTE MANAGEMENT PLAN FOR PROPOSED PROJECT

All 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.

### 7.5.1 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.

A detailed action plan to manage plastic waste has been provided in Table 7.11.

**Table 7.11 Action Plan to Manage Plastic Waste**

| 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    |

*Source: Proposed by FAEs and EC*

## **CHAPTER VIII**

### **PROJECT BENEFITS**

#### **8.0 GENERAL**

The proposed project at Kamandoddi Village aims to produce **676020 m<sup>3</sup>** of rough stone over a period of 5 years. This will enhance the socio-economic activities in the adjoining areas and will result in the following benefits:

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

#### **8.1 EMPLOYMENT POTENTIAL**

It is proposed to provide employment to about 23 persons for carrying out mining operations and give preference to the local people in providing employment in this cluster. In addition, there will be an opportunity for indirect employment to the form of contractual jobs, business opportunities, and service facilities etc. Because of this, the economic status of the local people will improve.

#### **8.2 SOCIO-ECONOMIC WELFARE MEASURES PROPOSED**

The impact of mining activity in the area will be more positive on the socio-economic environment in the immediate project impact area. The employment opportunities both direct and indirect will contribute to enhanced money incomes to job seekers with minimal skill sets especially among the local communities.

#### **8.3 IMPROVEMENT IN PHYSICAL INFRASTRUCTURE**

The proposed quarry project is located in Kamandoddi Village, Shoolagiri Taluk, Krishnagiri District, Tamil Nadu. The area has already well-established communications roads and other facilities. The following physical infrastructure facilities will further improve due to proposed project.

- ❖ Road transport facilities
- ❖ Communications
- ❖ Medical, Educational and social benefits will be made available to the nearby civilian population in addition to the workmen employed in the mine.

## **8.4 IMPROVEMENT IN SOCIAL INFRASTRUCTURE**

Employment is expected during civil construction period, in trade, garbage lifting, sanitation and other ancillary services, Employment in these sectors will be primarily temporary or contractual and involvement of unskilled labour will be more. A major part of the labour force will be mainly from local villagers who are expected to engage themselves both in agriculture and mining activities. This will enhance their income and lead to overall economic growth of the area.

## **8.5 OTHER TANGIBLE BENEFITS**

The proposed mine is likely to have other tangible benefits as given below

- ❖ Indirect employment opportunities to local people in contractual works like construction of infrastructural facilities, transportation, sanitation for supply of goods and services to the mine and other community services
- ❖ Additional housing demand for rental accommodation will increase
- ❖ Cultural, recreation and aesthetic facilities will also improve
- ❖ Improvement in communication, transport, education, community development and medical facilities and overall change in employment and income opportunity
- ❖ The State Government will also benefit directly from the proposed mine, through increased revenue from royalties, cess, DMF, GST etc.,

## **8.6 CORPORATE SOCIAL RESPONSIBILITY**

Individual project proponents will take responsibility to develop awareness among all levels of their staff about CSR activities and the integration of social processes with business processes. Those involved with the undertaking of CSR activities will be provided with adequate training and re-orientation.

Under this programme, the project proponents will take-up following programmes for social and economic development of villages within 5 km of the project site. For this purpose, separate budget will be provided every year. For finalization of these schemes, proponent will interact with LSG. The schemes will be selected from the following broad areas –

- ❖ Health Services
- ❖ Social Development
- ❖ Infrastructure Development
- ❖ Education & Sports
- ❖ Self-Employment
- ❖ CSR Cost Estimation

- ❖ CSR activities mainly contributing to education, health, training of women self-help groups and infrastructure etc., will be taken up in the Kamandoddi Village. CSR budget is allocated.

## 8.7 CORPORATE ENVIRONMENT RESPONSIBILITY

Allocation for Corporate Environment Responsibility (CER) shall be made as per Government of India, MoEF & CC Office Memorandum F.No.22-65/2017-IA.III dated 01.05.2018. As per para 6 (II) of the office memorandum, being a green field project & capital investment is  $\leq 100$  crores, the proposed project shall contribute 2% of capital investment towards CER as per directions of EAC/SEAC. However, the SEAC has suggested to allocate CER fund on the basis of the extent of the project. Therefore, Rs. 5,00,000 is allocated for CER. The proposed utilization of the budget of CER activities is given in Table 8.1.

**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*

## 8.8 SUMMARY OF PROJECT BENEFITS

The project would pay about **Rs. 7,35,10,160** to the state government through various ways, as provided in Table 8.2.

**Table 8.2 Project Benefits to the State Government**

| Particulars                                          | Budget for Rough Stone (Rs.) |
|------------------------------------------------------|------------------------------|
| CER                                                  | 5,00,000                     |
| Seigniorage @ Rs.90/m <sup>3</sup> of rough stone    | 6,08,41,800                  |
| District Mineral Foundation Tax @ 10% of Seigniorage | 60,84,180                    |
| Green Tax @ 10% of Seigniorage                       | 60,84,180                    |
| <b>Total</b>                                         | <b>7,35,10,160</b>           |



**CHAPTER IX**  
**ENVIRONMENTAL COST BENEFIT ANALYSIS**

Not Applicable, Since Environmental Cost Benefit Analysis not recommended at the Scoping stage.

## CHAPTER X

### ENVIRONMENTAL MANAGEMENT PLAN

#### 10.0 GENERAL

Environment Management Plan (EMP) aims at the preservation of ecological system by considering in-built pollution abatement facilities at the proposed site. Good practices of environmental management plan will ensure to keep all the environmental parameters of the project in respect of ambient air quality, water quality, socio economic improvement standards. Mitigation measures at the source level and an overall environment management plan at the study area are elicited so as to improve the supportive capacity of the receiving bodies. The EMP presented in this chapter discusses the administrative aspects ensuring that mitigative measures are implemented and their effectiveness monitored after approval of the EIA.

#### 10.1 Budgetary Provision for Environmental Management

Adequate budgetary provision has been made by the company for execution of Environmental Management Plan. The Table 10.1 gives overall investment on the environmental safeguards and recurring expenditure for successful monitoring and implementation of control measures.

**Table 10.1 EMP Budget for Proposed Project**

| Attribute              | Mitigation measures                                                                | Provision for Implementation                                                                                                   | Capital Cost | Recurring Cost/annum |
|------------------------|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|--------------|----------------------|
|                        |                                                                                    |                                                                                                                                | (Rs.)        | (Rs.)                |
| <b>Air Environment</b> | Compaction, gradation and drainage on both sides                                   | Rental Dozer & drainage construction on haul road @ Rs. 10,000/- per hectare and yearly maintenance @ Rs. 10,000/- per hectare | 40000        | 40000                |
|                        | Fixed Water Sprinkling Arrangements + Water sprinkling by own water tankers        | Fixed sprinkler installation and new water tanker cost for capital; and water sprinkling (thrice a day) cost for recurring     | 800000       | 50000                |
|                        | Air quality will be regularly monitored as per norms within ML area & ambient area | Yearly compliance as per CPCB norms                                                                                            | 0            | 50000                |

|                              |                                                                                               |                                                                                                                 |                |               |
|------------------------------|-----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|----------------|---------------|
|                              | Muffle blasting – To control fly rocks during blasting                                        | Blasting face will be covered with sand bags / steel mesh / old tyres / used conveyor belts                     | 0              | 5000          |
|                              | Wet drilling procedure / latest eco-friendly drill machine with separate dust extractor unit  | Dust extractor @ Rs. 25,000/- per unit deployed as capital & @ Rs. 2500 per unit recurring cost for maintenance | 100000         | 10000         |
|                              | No overloading of trucks/tippers/tractors                                                     | Manual Monitoring through Security guard                                                                        | 0              | 5000          |
|                              | Stone carrying trucks will be covered by tarpaulin to avoid escape of fines to the atmosphere | Monitoring if trucks will be covered by tarpaulin                                                               | 0              | 10000         |
|                              | Enforcing speed limits of 20 km/hr within ML area                                             | Installation of Speed Governors @ Rs. 5000/- per tipper/dumper deployed                                         | 40000          | 0             |
|                              | Regular monitoring of exhaust fumes as per RTO norms                                          | Monitoring of Exhaust Fumes                                                                                     | 0              | 10000         |
|                              | Regular sweeping and maintenance of roads for at least about 200 m from quarry entrance       | Provision for 2 labours @ Rs.10,000/labour (Contractual) / hectare                                              | 0              | 80000         |
|                              | Installing wheel wash system near exit gate of quarry                                         | Installation + Maintenance + Supervision                                                                        | 50000          | 20000         |
| <b>Total Air Environment</b> |                                                                                               |                                                                                                                 | <b>1030000</b> | <b>280000</b> |
| <b>Noise Environment</b>     | Source of noise will be transportation vehicles, and HEMM. For this, proper maintenance will  | Provision made in Operating Cost                                                                                | 0              | 0             |

|  |                                                                                                                        |                                                             |       |         |
|--|------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|-------|---------|
|  | be done at regular intervals.                                                                                          |                                                             |       |         |
|  | Oiling & greasing of Transport vehicles and HEMM at regular interval will be done.                                     | Provision made in Operating Cost                            | 0     | 0       |
|  | Adequate silencers will be provided in all the diesel engines of vehicles.                                             | Provision made in Operating Cost                            | 0     | 0       |
|  | It will be ensured that all transportation vehicles carry a fitness certificate.                                       | Provision made in Operating Cost                            | 0     | 0       |
|  | Safety tools and implementations that are required will be kept adequately near blasting site at the time of charging. | Provision made in OHS part                                  | 0     | 0       |
|  | Line Drilling all along the boundary to reduce the PPV from blasting activity and implementing controlled blasting.    | Provision made in Operating Cost                            | 0     | 0       |
|  | Proper warning system before blasting will be adopted and clearance of the area before blasting will be ensured.       | Blowing Whistle by Mining Mate / Blaster / Competent Person | 0     | 0       |
|  | Provision for Portable blaster shed                                                                                    | Installation of portable blasting shelter                   | 50000 | 2000    |
|  | NONEL Blasting will be practiced to control                                                                            | Rs. 30/- per 6 tons of blasted material                     | 0     | 1892856 |

|                                                               |                                                                                                    |                                                                                                                                         |              |                |
|---------------------------------------------------------------|----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|--------------|----------------|
|                                                               | Ground vibration and fly rocks                                                                     |                                                                                                                                         |              |                |
| <b>Total Noise Environment</b>                                |                                                                                                    |                                                                                                                                         | <b>50000</b> | <b>1894856</b> |
| <b>Water Environment</b>                                      | Water Management                                                                                   | Provision for garland drain @ Rs. 10,000/- per hectare with maintenance of Rs. 5,000/- per annum                                        | 40000        | 20000          |
| <b>Total Water Environment</b>                                |                                                                                                    |                                                                                                                                         | <b>40000</b> | <b>20000</b>   |
| <b>Waste Management</b>                                       | Waste management (Spent Oil, Grease etc.,)                                                         | Provision for domestic waste collection and disposal through authorized agency (capital cost, recurring cost for collection /disposal). | 25000        | 20000          |
|                                                               |                                                                                                    | Installation of dust bins                                                                                                               | 5000         | 2000           |
|                                                               | Bio toilets will be made available outside mine lease on the land of owner itself                  | Provision made in Operating Cost                                                                                                        | 0            | 0              |
| <b>Total Waste Management</b>                                 |                                                                                                    |                                                                                                                                         | <b>30000</b> | <b>22000</b>   |
| <b>Implementation of EC, Mining Plan &amp; DGMS Condition</b> | Size 6' X 5' with blue background and white letters as mentioned in MoM Appendix II by the SEAC TN | Fixed display board at the quarry entrance as permanent structure                                                                       | 10000        | 1000           |
| <b>Total Implementation of EC, Mining Plan</b>                |                                                                                                    |                                                                                                                                         | <b>10000</b> | <b>1000</b>    |
| <b>Occupational Health and Safety</b>                         | Workers will be provided with Personal Protective Equipment                                        | Provision of PPE @ Rs. 4000/- per employee with recurring based on wear and                                                             | 92000        | 23000          |

|  |                                                                                                                                                                                          |                                                                                                                                                                                                                                |        |        |
|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------|
|  |                                                                                                                                                                                          | tear (say, @ Rs. 1000/- per employee)                                                                                                                                                                                          |        |        |
|  | Health checkup for workers will be provisioned                                                                                                                                           | IME & PME Health checkup @ Rs. 1000/- per employee                                                                                                                                                                             | 0      | 23000  |
|  | First aid facility will be provided                                                                                                                                                      | Provision of 2 Kits per Hectare @ Rs. 2000/-                                                                                                                                                                                   | 0      | 16000  |
|  | Mine will have safety precaution signages, boards.                                                                                                                                       | Provision for signages and boards made                                                                                                                                                                                         | 10000  | 2000   |
|  | Barbed Wire Fencing to quarry area will be provisioned.                                                                                                                                  | Per Hectare fencing Cost @ Rs. 2,00,000/- with Maintenance of Rs 10,000/- per annum (4.00.0 hectare)                                                                                                                           | 800000 | 40000  |
|  | No parking will be provided on the transport routes. Separate provision on the south side of the hill will be made for vehicles /HEMMs. Flaggers will be deployed for traffic management | Parking area with shelter and flags @ Rs. 50,000/- per hectare project and Rs. 10,000/- as maintenance cost                                                                                                                    | 200000 | 40000  |
|  | Installation of CCTV cameras in the mines and mine entrance                                                                                                                              | Camera 4 Nos, DVR, Monitor with internet facility                                                                                                                                                                              | 30000  | 5000   |
|  | Implementation as per Mining Plan and ensure safe quarry working                                                                                                                         | Mines Manager (1 <sup>st</sup> Class / 2 <sup>nd</sup> Class / Mine Foreman) under regulation 34 / 34 (6) of MMR, 1961 and Mining Mate under regulation 116 of MMR,1961 @ 40,000/- for Manager & @ 25,000/- for Foreman / Mate | 0      | 780000 |

| Total Occupational Health and Safety |                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                               | 1132000 | 929000  |
|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|---------|
| Developm<br>ent of<br>Green Belt     | Green belt development<br>- 500 trees per hectare<br>(200 Inside Lease Area &<br>300 Outside Lease Area)                                                                                                                                      | Site clearance, preparation<br>of land, digging of pits<br>/trenches, soil amendments,<br>transplantation of saplings<br>@ 200 per plant (capital) for<br>plantation inside the lease<br>area and @ 30 per plant<br>maintenance (recurring))" | 160000  | 24000   |
|                                      |                                                                                                                                                                                                                                               | Avenue Plantation @ 300<br>per plant (capital) for<br>plantation outside the lease<br>area and @ 30 per plant<br>maintenance (recurring)                                                                                                      | 360000  | 36000   |
| Total Development of Green Belt      |                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                               | 520000  | 60000   |
| Mine<br>Closure                      | Closure includes 10% of the amount allotted for<br>Greenbelt development, wire fencing, and garland<br>drainage (Rule 27 in MCDR 2017 for Cat B mines will<br>pay 2 lakhs per hectare or minimum amount of financial<br>assurance of 5 lakhs) |                                                                                                                                                                                                                                               | 136000  | 0       |
|                                      | G.O.(Ms)No.23, Dated:<br>28.09.2021                                                                                                                                                                                                           | Section IVA of TNMMCR<br>1959 (@10% of Seigniorage<br>Fee) (Seigniorage Fee for<br>Roughstone = Rs.90)                                                                                                                                        | 6084180 | 0       |
| TOTAL                                |                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                               | 9032180 | 3206856 |

**Table 10.2 Estimation of Overall EMP Budget after Adjusting 5% Annual Inflation**

| <b>I<sup>st</sup><br/>Year</b> | <b>II<sup>nd</sup><br/>Year</b> | <b>III<sup>rd</sup><br/>Year</b> | <b>IV<sup>th</sup><br/>Year</b> | <b>V<sup>th</sup> Year<br/>(including<br/>Mine Closure<br/>Cost)</b> | <b>Total<br/>Recurring<br/>Cost</b> | <b>Total<br/>EMP<br/>Cost</b> |
|--------------------------------|---------------------------------|----------------------------------|---------------------------------|----------------------------------------------------------------------|-------------------------------------|-------------------------------|
| 3206856                        | 3367199                         | 3535559                          | 3712337                         | 3897954                                                              | <b>17719904</b>                     | <b>26752084</b>               |

In order to implement the environmental protection measures, an amount of **Rs. 9032180** as capital cost and recurring cost as **Rs. 3206856** 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. 26752084** as shown in Table 10.2.

### **10.3 CONCLUSION**

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



## CHAPTER XI

### SUMMARY AND CONCLUSION

#### 11.1 INTRODUCTION

As the proposed rough stone mining project (P1) falls within the quarry cluster of 500 m radius with the total extent of 37.54.5ha, it requires submission of EIA report for grant of Environmental Clearance (EC) after conducting public hearing. The proposed project falling in S.F.No's. 754 & 760 (P-6) over the extent of 4.00.0ha is situated in the cluster falling in Kamandoddi Village, Shoolagiri Taluk, Krishnagiri District, Tamil Nadu. The quarries involved in the calculation of cluster extent are three proposed quarries, ten existing quarries.

#### 11.2 PROJECT DESCRIPTION

The proposed project area is located between Latitudes from 12°39'26.93"N to 12°39'35.28"N Longitudes from 77°57'37.60"E to 77°57'44.84"E in Kamandoddi Village, Shoolagiri Taluk, Krishnagiri District, Tamil Nadu. According to the approved mining plan, about 676020m<sup>3</sup> of rough stone will be mined up to the ultimate depth of 55m BGL in the ten years. The quarrying operation is proposed to be carried out by open cast semi mechanized mining method involving drilling, blasting, and formation of benches of the prescribed dimensions.

#### 11.3 DESCRIPTION OF THE ENVIRONMENT

Baseline data were collected maximum locations i.e, in the core and buffer zone for the present cluster in the 29.05.2025 (**one Day**), for cross verification. Field monitoring studies to evaluate the base line status of the project site were carried out with CPCB guidelines. Environmental baseline data were collected by an NABL accredited and MoEF notified **Greenlink Analytical and Research Laboratory (India) Private Ltd** for the environmental attributes including soil, water, air, and noise and by FAEs for ecology and biodiversity, traffic, and socio-economy.

##### 11.3.1 Land Environment

Land use pattern of the area of 5km radius was studied using Sentinel II imagery. LULC types and their extent are given in Table 11.1.

**Table.11.1 LULC Statistics of the Study Area**

| S. No. | LU/LC Type | Extend (ha) | Percentage |
|--------|------------|-------------|------------|
| 1      | Water      | 33.7        | 0.39       |
| 2      | Trees      | 62.31       | 0.71       |
| 3      | Crops      | 4541.87     | 52.00      |

|              |                        |                |              |
|--------------|------------------------|----------------|--------------|
| 4            | Built area             | 2309.73        | 26.44        |
| 5            | Mining/Industrial area | 119.24         | 1.37         |
| 6            | Bare Land              | 31.07          | 0.36         |
| 7            | Range land             | 1636.71        | 18.74        |
| <b>Total</b> |                        | <b>8734.63</b> | <b>100.0</b> |

Source: Sentinel II Satellite Imagery

### 11.3.2 Soil Environment

#### A. Physical Characteristics of Soil

- **Texture:** In lease area the soil is red calcareous. They are mostly sandy to loamy and characterised by the hard and compact layer of lime. In other places the soil found is brown in colour.
- **Structure:** The grain size is greater than 2mm in the lease area and in other places where the samples collected ranges from 0.002mm to 2mm.
- **Porosity:** The 500m radius cluster consists of Charnockite formations affect the porosity found in this study.
- **Density** The soil samples collected within 5km radius are generally characterized by higher bulk densities typically ranging from 1.25 to 1.66g/cm<sup>3</sup>. This is due to the presence of red sandy and in some areas with red loamy soil.
- **Consistence:** A soil moisture content between 12.5% to 18.4% is generally considered optimal for plant growth in medium-textured soils (like loams). This range falls within the 50- 75% available water zone where plants are at risk of stress if a water deficit is prolonged.

#### B. Chemical Characteristics of Soil

- pH is found to be from slightly acidic to neutral (6.8- 7.6) in reaction. Electrical conductivity a measure of soluble salts in the soil is in the range of 165 – 298μS/cm. The important water-soluble cations in the soil are nitrogen, phosphorus, potassium, calcium and magnesium whose concentration levels ranged from N- 13.67mg kg<sup>-1</sup> to 26.86mg kg<sup>-1</sup>, P- 1.37mg kg<sup>-1</sup> to 3.42mg kg<sup>-1</sup>, K- 39.91mg kg<sup>-1</sup> to 52.3mg kg<sup>-1</sup>, C- 1127mg/Kg- 18564mg/Kg & M- 16737mg kg<sup>-1</sup> - 22937mg kg<sup>-1</sup> respectively.

- The soil samples in the study area show loamy textures varying between Silt Loam and sandy loam. pH of the soil varies from 6.8 – 7.6 indicating slightly acidic to slightly alkaline nature. Electrical conductivity of the soil varies from 165 – 298 $\mu$ S/cm. The physical and chemical properties of soil is shown in the Table 3.5.

### **11.3.3 Water Environment**

#### **11.3.3.1 Physical Parameter of ground water:**

The basic physical parameters of water include

##### **Colour:**

- Value observed in Project Site (True/Apparent Color): 1 Hazen unit.
- Acceptable and permissible limits: 5 Hazen units and 15 Hazen units respectively. The value in the project site is as same as the acceptable limits prescribed by IS 10500: 2012 (referred as “*Standards*” from herein).

##### **Odour & Taste:**

The water is odour less. The taste of the water is slightly salty which is due to the presence of hardness in water which is attributed to the presence of calcium and magnesium in the water. As per the standards the odour and taste should be agreeable.

##### **pH:**

- Value observed in the Project Site: Min.-6.9 & Max. 7.3 mg/L.
- Acceptable and permissible limits: 6.5-8.5. The pH value is the measure of acid – base equilibrium. The value of pH in the project site clearly indicates that water is neutral in nature.

##### **Turbidity:**

Value observed in the Project Site: less than 1. Acceptable and permissible limits: 1 NTU & 5 NTU respectively. The value of turbidity generally indicates the presence of phytoplankton and other sediments.

##### **Total Dissolved Solids:**

- Value observed in the Project Site: Min.-592 & Max. 807 mg/L.
- Acceptable and permissible limits: 500 mg/L and 2000 mg/L respectively.
- TDS is the presence of inorganic salts and small amounts of organic matter present in the water.

### 3.3.3.2 Chemical parameters of water:

#### **Calcium:**

Value observed in Min.- 51 & Max. 94 mg/L. Acceptable and permissible limits: 75mg/L and 200 mg/L respectively.

#### **Magnesium:**

Value observed in Min.- 17 & Max. 49mg/L. Acceptable and permissible limits: 30 mg/L and 100 mg/L respectively.

#### **Chloride**

Value observed in Min.- 174 & Max. 310 mg/L. Acceptable and permissible limits: 250 mg/L and 1000 mg/L respectively.

#### **Total Alkalinity as CaCO<sub>3</sub>:**

Value observed in 196mg/L. Acceptable and permissible limits: 200 mg/L and 600 mg/L respectively.

#### **Hardness:**

Value observed in Min.- 610 & Max. 824 mg/L. Acceptable and permissible limits: 200 mg/L and 600 mg/L respectively.

#### **Surface water**

The surface water quality is compared with the CPCB Water Quality Criteria against A, B, C, D & E class of water. From the test result, it is found that both the water does not fit Class A (Drinking Water Source without conventional treatment but after disinfection). But they can be used for outdoor bathing as it meets the requirements shown for class B water.

### 11.3.4 Air Environment

As per the monitoring data, PM<sub>2.5</sub> ranges from 13.0 µg/m<sup>3</sup> to 31.3 µg/m<sup>3</sup>, PM<sub>10</sub> from 37.3 µg/m<sup>3</sup> to 56.1 µg/m<sup>3</sup>, SO<sub>2</sub> from 1.3 µg/m<sup>3</sup> to 9.75 µg/m<sup>3</sup>, NO<sub>x</sub> from 4 µg/m<sup>3</sup> to 17.3 µg/m<sup>3</sup>. The concentration levels of the pollutants fall within the acceptable limits of NAAQS prescribed by CPCB.

#### *Air quality Index*

The AQI shows that the air quality of the study area falls within good category 40 causing minimal impact to human health.

### 11.3.5 Noise Environment

Noise level in core zone was 47.2 dB (A) Leq during day time and 35.4 dB(A) Leq during night time. Noise levels recorded in buffer zone during day time varied from 38.6 to 52.4 dB (A) Leq and during night time from 30.6 to 42.2 dB (A) Leq. Thus, the noise level for industrial and residential area meets the requirements of CPCB.

### 11.3.6 VIBRATION MONITORING

- ✚ Ground Vibration and noise levels were recorded from the instruments the figure 3.33 it can be observed that the vertical Peak Particle Velocity (PPV) recorded was 1.801mm/s at nearby bare land at distance of 100m.
- ✚ Air Over-Pressure (AOP) was 103.5dB and 0.003kPa at nearby Study area at distance of 100m.

### 11.3.7 Biological Environment

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.

#### ***Flora in core zone***

There are no trees in the quarry lease area, only shrubs, herbs and grasses. Taxonomically total of 23 species belonging to 18 families were recorded. Among them are herbs (19) and shrubs (4). Majority of the species belongs to the family of Fabaceae and Poaceae.

#### ***Flora in 300 m radius zone***

The vegetation habit analysis indicates that the flora of the 300m radius of the study area consists of 60 species belonging to 31 families. Among the 60 species, 22 herbs, 24 shrubs and 14 trees. the highest number of species were from the Poaceae family (7), followed by Fabaceae (6), Malvaceae (4), and Mimosaceae (4). Three species were recorded from the Amaranthaceae, Apocynaceae, and Asteraceae families, while six species each were recorded from the Arecaceae, Boraginaceae, Convolvulaceae, Cucurbitaceae, Euphorbiaceae, and Lamiaceae families. The endangered or threatened and Species Richness (margalef Index) in the study area it mentioned in Table 3.27- 3.29. The Settipalli Reserve Forest is located 2.64km for Northeast of the quarry lease area. The reserve forest is predominantly populated with *Albizia amara*, *Azadirachta indica*, *Vachellia leucophloea*, *Chloroxylon swietenia*, and *Ziziphus mauritiana*.

#### ***Flora in 10 km radius buffer zone***

The 10km radius A total of 102 species of invasive alien species belonging to 82 general and 39 families were recorded in 10km radius (Table 3.30). Herbs (73.83%) formed the predominant life form followed by shrubs (10.28%), climbers (8.42%), trees (4.67%) and grasses (2.80%).

### ***Fauna in Core Zone***

The faunal species observed in the study area are listed in Table 3.22. A total of 25 species were recorded in core zone of the project area. The core zone exhibited fewer species, with only a small number of insects, mammals, and reptiles, whereas the buffer zone showed greater species diversity. Among the 25 species recorded, the distribution was as follows: (08) 32% insects, (03) 12% reptiles, (05) 20% mammals & 9 (36%) Avian. These species were cross-checked against the IUCN Red List Database version 3.1 to identify any threatened species. Data analysis revealed that 8 species are categorized as Least Concern on the Red List, while 17 species were not listed. The analysis indicates that there are no REET species in the core zone of the proposed quarry site.

### ***Fauna in Buffer Zone***

The faunal species observed in the study area are listed in Table 3.32. Taxonomically a total of 50 species belonging to 35 families have been recorded from the buffer zone area. Based on habitat classification the majority of species were Birds 15 (30%), followed by Insects 14 (28%), Reptiles 13 (26%), Mammals 5 (10%) and amphibians 3 (6%). There are 4 schedule II species and 24 schedule IV species according to Indian wild life Act 1972. Totally, 19 species of bird were sighted in the study area.

## **11.3.8 Socio Economic Environment**

The proposed project will provide direct and indirect employment and improve the infrastructural facilities in that area, thus leading to the improvement of people's standard of living.

## **11.4 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES**

### **11.4.1 Land Environment**

#### **Anticipated Impact**

- ✚ Permanent change on land use and land cover.
- ✚ Change in topography of the mine lease area will change at the end of the life of the mine.
- ✚ 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 mitigate 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,10m 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.

### **11.4.2 Soil Environment**

#### **Anticipated Impact**

- ✦ Removal of protective vegetation cover
- ✦ Exposure of subsurface materials which are unsuitable for vegetation establishment

#### **Mitigation Measures**

- ✦ 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.

### **11.4.3 Water Environment**

#### **Anticipated Impact**

- ✚ Surface and ground water resources may be contaminated due to pit water discharge, domestic sewage, discharge of oil and grease bearing waste water from washing of vehicles and machineries, and washouts from surface exposure or working areas
- ✚ As the proposed project acquires 3.0KLD of water from water vendors, it will not extract water by developing abstraction structures in the lease area. Therefore, the project will not have impact on depletion of aquifer beneath the lease area.

#### **Mitigation Measures**

- Rain water from mine pit will be treated in settling tanks before being used for dust suppression and tree plantation purposes.
- Domestic sewage from site office will be discharged in septic tank and then directed to soak pits.
- Water from the tipper wash-down facility and machinery maintenance yard will be passed through interceptor traps/oil separators prior to its reuse.
- 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.
- Periodic (every 6 month once) analysis of ground water quality of quarry pit water and ground water of nearby villages will be conducted.
- Artificial recharge structures will be established in suitable locations as part of the rainwater harvesting management program.

### **11.4.4 AIR ENVIRONMENT**

#### **Anticipated Impact**

The proposed rough stone quarry project involves activities such as formation of benches, approach roads, drilling, blasting, excavation, and transportation, all of which may lead to dust generation and pose potential health risks. To mitigate these impacts, dust suppression measures like water sprinkling at loading/unloading points and along haul roads will be implemented. Quarrying will be carried out using opencast semi-mechanized methods, where drilling and blasting will be conducted in a controlled manner to reduce dust and vibration. The primary air pollutant expected is particulate matter (PM10), while emissions of Sulphur Dioxide (SO<sub>2</sub>) and Nitrogen Dioxide (NO<sub>2</sub>) from vehicle movement are anticipated to be minimal. Air quality



impact assessment has been conducted based on the proposed production levels and estimated emissions.

### **Mitigation Measures**

- ✚ To mitigate air pollution and dust generation in the rough stone quarry, a range of dust control measures will be implemented. Regular water sprinkling will be carried out at key locations such as drilling sites, blasting areas, haul roads, and loading/unloading points. This will help suppress fugitive dust emissions and improve air quality around the project site. Additionally, mist spray systems will be used in dust-prone areas for enhanced control, ensuring effective dust suppression during operations.
- ✚ Drilling and blasting activities, which are common in quarrying, will be carefully controlled to minimize air pollution. Wet drilling methods will be used to reduce the amount of dust generated during drilling operations. For blasting, controlled techniques with optimized charge and timing will be employed to limit dust dispersion. Furthermore, blasting will only be carried out during favourable conditions, such as low wind speeds, to prevent the dust from being carried towards nearby habitations and sensitive areas.
- ✚ Vehicle emissions from haul trucks and machinery will also be managed through regular maintenance and the use of PUC-certified vehicles. These measures will help reduce exhaust emissions, especially on unpaved roads where dust generation is higher. Additionally, vehicle speed will be restricted on haul roads to minimize the lifting of dust.
- ✚ To further reduce air pollution, a greenbelt will be developed around the quarry boundary and along internal roads. This will act as a barrier to trap dust particles and reduce their spread. Regular air quality monitoring will also be conducted at strategic locations to ensure that air quality remains within permissible limits, and that the quarry operations do not negatively impact the surrounding environment or human health.

### **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.

#### **11.4.5 Noise Environment**

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

Noise generated at the quarry will mainly result from semi-mechanized operations such as drilling, controlled blasting, and transportation of materials; however, the noise levels are expected to dissipate within the quarry boundary, and due to the considerable distance of nearby villages from the quarrying area, the impact on the surrounding community is expected to be negligible.

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

- ✚ To reduce noise from the rough stone quarry, drilling will be done using well-maintained and low-noise equipment. Wet drilling methods will also be used to help reduce the amount of noise generated during the process.
- ✚ Blasting will be carried out in a controlled manner using limited charge and proper timing. All blasting activities will take place only during the daytime to avoid disturbing nearby areas during early morning or night hours.
- ✚ Vehicles and machines used in the quarry will be regularly serviced to keep noise levels low. Wherever possible, silencers and noise-dampening systems will be installed on machinery to reduce loud sounds.
- ✚ A greenbelt with trees and shrubs will be developed around the quarry to act as a natural barrier against noise. Workers will be given ear protection, such as earplugs, when working near loud equipment, and noise levels will be monitored regularly to make sure they stay within safe limits.

#### **11.4.6 Ground Vibrations**

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

Ground vibrations due to the proposed mining activities are anticipated due to operation of mining machines like excavators, drilling and blasting, transportation vehicles, etc., however, the major source of ground vibration from the quarry is blasting. The major impact of the ground vibrations is observed on the domestic houses located in the villages nearby the mine lease area. The kutcha houses are more prone to cracks and damage due to the vibrations induced by blasting whereas RCC framed structures can withstand more ground vibrations. Apart from this, the ground vibrations may develop a fear factor in the nearby settlements.

Another impact due to blasting activities is fly rocks. These may fall on the houses or agricultural fields nearby the mining lease area and may cause injury to persons or damage to the structures.

### ***Mitigation Measures***

- ✦ 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, 2<sup>nd</sup> Class Mines Manager/ 1<sup>st</sup> Class Mines Manager) will be appointed
- ✦ A set of shot firing rules will be drawn up and blasting shall commence outlining the detailed operating procedures that will be followed to ensure that shot firing operations on site take place without endangering the workforce or public
- ✦ 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 0.251mm/s.
- ✦ Vibration monitoring will be carried out every 6 months to check the efficacy of blasting practices.

### **11.4.7 Biological Environment**

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

- During loading the truck, dust generation will be likely. This shall be a temporary effect and not anticipated to affect the surrounding vegetation significantly

- The Number of plants in the mining lease area is given in Chapter 3 which vegetation in the lease area may be removed during mining.
- Carbon released from quarrying machineries and tippers during quarrying would be 4113 kg per day, 14810kg per year and 177722kg over ten years.

#### ***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.
- ✦ 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 35544kg 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 (Table 4.11), about 2000 trees will be planted within three months from the beginning of mining. These trees, when grown up would sequester carbon of about 177722kg of the total carbon.

### **11.4.8 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.

#### 11.4.9 Occupational Health

- All the persons will undergo pre-employment and periodic medical examination
- Employees will be monitored for occupational diseases by conducting medical tests: General physical tests, Audiometric tests, Full chest, X-ray, Lung function tests, Spirometric tests, Periodic medical examination – yearly, Lung function test – yearly, those who are exposed to dust and 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.

#### 11.5 Environment Monitoring Program

| 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 | Vibration | At the nearest habitation (in case of reporting)                       | –              | During blasting operation | Peak particle velocity                |
| 7 | Soil      | 2 Locations (1 Core & 1 Buffer)                                        | –              | Once in six months        | Physical and chemical characteristics |
| 8 | Greenbelt | Within the project area                                                | Daily          | Monthly                   | Maintenance                           |

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

## 11.6 ADDITIONAL STUDIES

### 11.6.1 Risk Assessment

The DGMS risk assessment process is intended to identify existing and probable hazards in the work environment and all operations and assess the risk levels of those hazards in order to prioritize those that need immediate attention. The whole quarry operation will be carried out under the direction of a Qualified Competent Mine Manager holding certificate of competency to manage a metalliferous mine granted by the DGMS, Dhanbad for proposed project.

### 11.6.2 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.

### **11.6.3 Cumulative Impact Study**

The results on the cumulative impact of the four 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 three proposed project is well below the permissible limit of Peak Particle Velocity of 5 mm/s
- The proposed three projects will allocate Rs. 15,00,000/- towards CER as recommended by SEAC
- The proposed three projects will directly provide jobs to 61 local people, in addition to indirect jobs
- The proposed three projects will plant 7287 about trees in and around the lease area
- The proposed three projects will add 2817 PCU per day to the nearby roads.

### **11.7 Project Benefits**

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

- Direct employment to 61 local people
- 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.
- Rs. 5,00,000 will be allocated for CER

### **11.8 ENVIRONMENT MANAGEMENT PLAN**

In order to implement the environmental protection measures, an amount of **Rs.90,32,180** as capital cost and recurring cost as **Rs.32,06,856** 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.2,67,52,084.**

## CHAPTER XII

### DISCLOSURES OF CONSULTANT

The Project Proponent, **Thiru. V. Venkatesulu** has engaged **Geo Technical Mining Solutions**, a NABET accredited consultancy for carrying out the EIA study as per the ToR issued.

**Address of the consultancy:**

No: 1/213B Natesan Complex,  
Oddapatti, Dharmapuri – 636705,  
Tamil Nadu, India.  
Email: [info.gtmsdpi@gmail.com](mailto:info.gtmsdpi@gmail.com)  
Web: [www.gtmsind.com](http://www.gtmsind.com)  
Phone: 04342 232777.

The accredited experts and associated members who were engaged in this EIA study are given below:

| S. No                                            | Name of the expert | In house/<br>Empanelled          | Sector              | Functional Area | Category |
|--------------------------------------------------|--------------------|----------------------------------|---------------------|-----------------|----------|
| <b>Approved Functional Area Experts &amp; EC</b> |                    |                                  |                     |                 |          |
| 1                                                | Dr. S. Malar       | EIA Coordinator (EC)<br>In-house | 1(a)(i)             | WP, SC          | B        |
| 2                                                | Dr. G. Prabakaran  | In-house, FAE                    | 1(a)(i)             | SE              | B        |
| 3                                                | Dr. R. Arunbalaji  | In-house, FAE                    | 1(a)(i)             | AP, AQ          | B        |
| 4                                                | J.N. Manikandan    | Empanelled FAE                   | 1(a)(i)             | RH, SHW, AP     | B        |
| 7                                                | Dr. S. Malar       | In-house, FAE                    | 1(a)(i)             | WP              | B        |
| 8                                                | G. Umamaheswaran   | In-house, FAE                    | 1(a)(i)             | HG, LU, GEO     | B        |
| 9                                                | C. Kumaresan       | In-house, FAE                    | 1(a)(i)             | NV              | B        |
| 10                                               | P. Venkatesh       | In-house, FAE                    | 1(a)(i)             | AP              | B        |
| 11                                               | Dr. D.Kalaimurugan | In-house, FAE                    | 1(a)(i)             | SC              | B        |
| <b>Approved Functional Area Associates</b>       |                    |                                  |                     |                 |          |
| 12                                               | K. Prithiviraj     | FAA                              | 1(a)(i)             | HG, GEO         | B        |
| 13                                               | R. Srikrishna      | FAA                              | 1(a)(i)             | LU, LC          | B        |
| 14                                               | Moorthi            | FAA                              | 1(a)(i)             | AP, AQ          | B        |
| 15                                               | V. Malavika        | FAA                              | 1(a)(i)             | NV, SHW         | B        |
| <b>Abbreviations</b>                             |                    |                                  |                     |                 |          |
| EC                                               | EIA Coordinator    | NV                               | Noise and Vibration |                 |          |



|     |                                                    |     |                                                |
|-----|----------------------------------------------------|-----|------------------------------------------------|
| FAE | Functional Area Expert                             | SE  | Socio Economics                                |
| FAA | Functional Area Associates                         | HG  | Hydrology, ground water and water conservation |
| TM  | Team Member                                        | SC  | Soil conservation                              |
| GEO | Geology                                            | RH  | Risk assessment and hazard management          |
| WP  | Water pollution monitoring, prevention and control | SHW | Solid and hazardous wastes                     |
| AP  | Air pollution monitoring, prevention and control   | MSW | Municipal Solid Wastes                         |
| LU  | Land Use                                           | ISW | Industrial Solid Wastes                        |
| AQ  | Meteorology, air quality modelling, and prediction | HW  | Hazardous Wastes                               |
| EB  | Ecology and bio-diversity                          | GIS | Geographical Information System                |

**DECLARATION BY EXPERTS CONTRIBUTING TO THE EIA & EMP**

I, hereby, certify that I was a part of the EIA team in the following capacity that developed the EIA & EMP report.

Signature : 

Date :

Name : **Dr. S. Malar**

Designation : EIA Coordinator

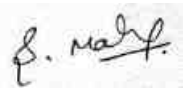
Name of the EIA Consultant Organization : Geo Technical Mining Solutions

Period of Involvement : Till date

We, the FAEs and FAAs hereby declare that information furnished in this EIA/EMP report for **Thiru.R. Rajappa** rough stone quarry project with the extent of 4.04.50 ha situated in the cluster with the extent of 36.48.5 ha in Kamandoddi Village, Shoolagiri Taluk, Krishnagiri District of Tamil Nadu is true and correct to the best of our knowledge.

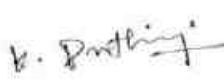
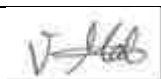
**List of Functional Area Experts Engaged in this Project**

| S. No. | Functional Area | Involvement                                                                              | Name of the Experts | Signature                                                                             |
|--------|-----------------|------------------------------------------------------------------------------------------|---------------------|---------------------------------------------------------------------------------------|
| 1      | AP              | ○ Identification of different sources of air pollution due to the proposed mine activity | Dr.R. Arun Balaji   |  |

|   |     |                                                                                                                                                                                                                                                                                                                      |                     |                                                                                       |
|---|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|---------------------------------------------------------------------------------------|
|   |     | <ul style="list-style-type: none"> <li>○ Prediction of air pollution and propose mitigation measures / control measures</li> </ul>                                                                                                                                                                                   | P.Venkatesh         |    |
| 2 | WP  | <ul style="list-style-type: none"> <li>○ Suggesting water treatment systems, drainage facilities</li> <li>○ Evaluating probable impacts of effluent/waste water discharges into the receiving environment/water bodies and suggesting control measures.</li> </ul>                                                   | Dr.S. Malar         |    |
| 3 | HG  | <ul style="list-style-type: none"> <li>○ Interpretation of ground water table and predict impact and propose mitigation measures.</li> <li>○ Analysis and description of aquifer Characteristics</li> </ul>                                                                                                          | G. Uma Maheswaran   |    |
| 4 | GEO | <ul style="list-style-type: none"> <li>○ Field Survey for assessing the regional and local geology of the area.</li> <li>○ Preparation of mineral and geological maps.</li> <li>○ Geology and Geo morphological analysis/description and Stratigraphy/Lithology.</li> </ul>                                          | G. Uma Maheswaran   |  |
| 5 | SE  | <ul style="list-style-type: none"> <li>○ Revision in secondary data as per Census of India, 2011.</li> <li>○ Impact Assessment &amp; Preventive Management Plan</li> <li>○ Corporate Environment Responsibility.</li> </ul>                                                                                          | Dr. G. Prabhakaran  |  |
| 6 | EB  | <ul style="list-style-type: none"> <li>○ Collection of Baseline data of Flora and Fauna.</li> <li>○ Identification of species labelled as Rare, Endangered and threatened as per IUCN list.</li> <li>○ Impact of the project on flora and fauna.</li> <li>○ Suggesting species for greenbelt development.</li> </ul> | Dr. D. Kalaimurugan |  |

|    |     |                                                                                                                                                                                                                                                                                    |                    |                                                                                       |
|----|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------------------------------------------------------------------------------|
| 7  | RH  | <ul style="list-style-type: none"> <li>○ Identification of hazards and hazardous substances</li> <li>○ Risks and consequences analysis</li> <li>○ Vulnerability assessment</li> <li>○ Preparation of Emergency Preparedness Plan</li> <li>○ Management plan for safety.</li> </ul> | J.N. Manikandan    |    |
| 8  | LU  | <ul style="list-style-type: none"> <li>○ Construction of Land use Map</li> <li>○ Impact of project on surrounding land use</li> <li>○ Suggesting post closure sustainable land use and mitigative measures.</li> </ul>                                                             | G. Uma Maheswaran  |    |
| 9  | NV  | <ul style="list-style-type: none"> <li>○ Identify impacts due to noise and vibrations</li> <li>○ Suggesting appropriate mitigation measures for EMP.</li> </ul>                                                                                                                    | C. Kumaresan       |    |
| 10 | AQ  | <ul style="list-style-type: none"> <li>○ Identifying different source of emissions and propose predictions of incremental GLC using AERMOD.</li> <li>○ Recommending mitigations measures for EMP</li> </ul>                                                                        | Dr.R. Arun Balaji  |  |
| 11 | SC  | <ul style="list-style-type: none"> <li>○ Assessing the impact on soil environment and proposed mitigation measures for soil conservation</li> </ul>                                                                                                                                | Dr. D.Kalaimurugan |  |
| 12 | SHW | <ul style="list-style-type: none"> <li>○ Identify source of generation of non-hazardous solid waste and hazardous waste.</li> <li>○ Suggesting measures for minimization of generation of waste and how it can be reused or recycled.</li> </ul>                                   | J.N. Manikandan    |  |

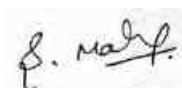
**List of Functional Area Associate Engaged in this Project**

| S.No. | Name           | Functional Area | Involvement                                                                                                                                                | Signature                                                                           |
|-------|----------------|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| 1     | R. Srikrishna  | LU, LC          | <ul style="list-style-type: none"> <li>○ Site visit with FAE</li> <li>○ Provide inputs &amp; Assisting FAE for LU and HG</li> </ul>                        |  |
| 2     | K. Prithiviraj | HG & GEO        | <ul style="list-style-type: none"> <li>○ Field visits along with FAE</li> <li>○ Assistance to FAE in both primary and secondary data collection</li> </ul> |  |
| 3     | Moorthi        | AP              | <ul style="list-style-type: none"> <li>○ Site visit with FAE</li> <li>○ Assistance to FAE in collection of both primary and secondary data</li> </ul>      |  |
| 4     | V. Malavika    | NV, SHW         | <ul style="list-style-type: none"> <li>○ Site visit along with FAE</li> <li>○ Assistance in report preparation</li> </ul>                                  |  |

**DECLARATION BY THE HEAD OF THE ACCREDITED CONSULTANT ORGANIZATION**

I, **Dr. S. KARUPPANNAN**, Managing Partner, **Geo Technical Mining Solutions**, hereby, confirm that the above-mentioned functional area experts and team members prepared the EIA/EMP report for **Thiru. V. Venkatesulu** rough stone quarry project with the extent of 4.00.0ha situated in the cluster with the extent of 37.54.5ha in Kamandoddi Village, Shoolagiri Taluk, Krishnagiri District of Tamil Nadu is true and correct to the best of my knowledge.

Signature :



Date :

Name : **Dr. S. Malar**

Designation : EIA Coordinator

Name of the EIA Consultant Organization : Geo Technical Mining Solutions

NABET Certificate No & Issue Date : **NABET/EIA/23-26/RA 0319**

Validity : **Till 31.12.2026.**



**File No: 12003**  
**Government of India**  
**Ministry of Environment, Forest and Climate Change**  
**(Issued by the State Environment Impact Assessment Authority(SEIAA),**  
**TAMIL NADU)**

\*\*\*



Dated 23/05/2025



To,

Thiru.VENKATESULU V  
 S/o. Venkatasamy, No.741, D.M.G Kotta, Chappadi Post, Shoolagiri Taluk, Krishnagiri District.,  
 Krishnagiri, TAMIL NADU, 635117  
 venkateshlu698@gmail.com

**Subject:** Grant of Terms of Reference **along with Public Hearing** under the provision of the EIA Notification 2006-as amended regarding.

**Sir/Madam,**

Sub:SEIAA, Tamil Nadu – Proposed Rough Stone Quarry of over an extent of 4.00.0 Ha at S.F. No's: 754 & 760(Part-6) in Kamandoddi Village, Shoolagiri Taluk, Krishnagiri District, Tamil Nadu by Thiru V.Venkatesulu - under project category – “B1” and Schedule S.No. 1(a) – ToR issued along with Public Hearing- preparation of EIA report – Regarding.

Ref:

1. Online proposal No. SIA/TN/MIN/531779/2025 dated 28.03.2025.
2. Your application submitted for Terms of Reference dated: 28.03.2025.
3. Minutes of the 551st meeting of SEAC held on 16.04.2025.
4. Minutes of the 824th Authority meeting held on 19.05.2025.

2. The particulars of the proposal are as below :

|                                             |                                                  |
|---------------------------------------------|--------------------------------------------------|
| (i) TOR Identification No.                  | TO25B0108TN5757195N                              |
| (ii) File No.                               | 12003                                            |
| (iii) Clearance Type                        | TOR                                              |
| (iv) Category                               | B1                                               |
| (v) Project/Activity Included Schedule No.  | 1(a) Mining of minerals, 1(a) Mining of minerals |
| (vii) Name of Project                       | Kamandoddi Village Rough Stone Mining Lease      |
| (viii) Name of Company/Organization         | VENKATESULU V                                    |
| (ix) Location of Project (District, State)  | KRISHNAGIRI, TAMIL NADU                          |
| (x) Issuing Authority                       | SEIAA                                            |
| (xii) Applicability of General Conditions   | no                                               |
| (xiii) Applicability of Specific Conditions | no                                               |

3. In view of the particulars given in the Para 1 above, the project proposal interalia including Form-1(Part A and B) were submitted to the SEIAA for an appraisal by the SEAC under the provision of EIA notification 2006 and its subsequent amendments. The above-mentioned proposal has been considered by SEIAA in the meeting held on 19.05.2025. The minutes of the meeting and all the Application and documents submitted [(viz. Form-1 Part A, Part B,)] are available on PARIVESH portal which can be accessed by scanning the QR Code above.
4. The State Expert Appraisal Committee (SEAC), based on the information & clarifications provided by the project proponent and after detailed deliberations on all technical aspects recommended the proposal for grant of Terms of Reference with public hearing under the provision of EIA Notification, 2006 and as amended thereof subject to the stipulation of specific and general conditions as detailed in Annexure (2).
5. The SEIAA has examined the proposal in accordance with the Environment Impact Assessment (EIA) Notification, 2006 & further amendments thereto and after accepting the recommendations of the SEAC hereby decided to issue the following Terms of Reference with public hearing for instant proposal by Thiru V.Venkatesulu under the provisions of EIA Notification, 2006 and as amended thereof.
6. The Ministry/SEIAA-TN reserves the right to stipulate additional conditions, if found necessary.
7. The Terms of Reference with public hearing to the aforementioned project is under provisions of EIA Notification, 2006. It does not tantamount to approvals/consent/permissions etc. required to be obtained under any other Act/Rule/regulation. The Project Proponent is under obligation to obtain approvals /clearances under any other Acts/ Regulations or Statutes, as applicable, to the project.
8. This issues with the approval of the Competent Authority.
9. The TORs with public hearing prescribed shall be **valid for a period of three years** from the date of issue, for submission of the EIA/EMP report as per OMNo.J-11013/41/2006-IA-II(I)(part) dated 29th August, 2017.

#### **Copy To**

1. The Secretary, Ministry of Mines, Government of India, Shastri Bhawan, New Delhi.
2. The Principal Secretary to Government, Environment and Forests Department, Tamil Nadu.
3. The Additional Chief Secretary to Government, Natural Resources Department, Tamil Nadu.
4. The Chairman, Central Pollution Control Board, Parivesh Bhawan, CBD-Cum-Office Complex, East Arjun Nagar, New Delhi-110 032.
5. The Chair Person, TNPC Board, 76, Mount Salai, Guindy, Chennai-32
6. The District Collector, Krishnagiri District
7. The Commissioner of Geology and Mines, Guindy, Chennai-32
8. The Assistant Director, Department of Geology & Mining, Krishnagiri District
9. EI Division, Ministry of Environment & Forests, Paryavaran Bhawan, New Delhi.
10. Integrated Regional office of MoEF&CC, Sasthri Bhawan, Nungambakkam, Chennai
11. File Copy

#### **Annexure 1**

#### **Specific Terms of Reference for (Mining Of Minerals)**

##### **1. Seac Conditions - Site Specific**

| <b>S. No</b> | <b>Terms of Reference</b>                                                                                                                                                                                                                                                                                                                                                                                                                     |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1.1</b>   | <ol style="list-style-type: none"> <li>1. The PP shall furnish the transport route for transporting the quarried minerals.</li> <li>2. A Cluster Management Committee (CMC) shall be constituted including all the mines in the cluster as Committee Members for the effective management of the mining operation in the cluster through systematic &amp; scientific approach with appointment of statutory personnel, appropriate</li> </ol> |

| S. No | Terms of Reference                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       | <p>environmental monitoring, good maintenance of haul roads and village/panchayat roads, authorized blasting operation etc. The PP shall submit the following details in the form of an Affidavit during the EIA appraisal:</p> <ol style="list-style-type: none"> <li>Copy of the agreement forming CMC.</li> <li>The Organisation chart of the Committee with defining the role of the members</li> <li>The 'Standard Operating Procedures' (SoP) executing the planned activities.</li> </ol> <p>3. The PP shall ensure the installation of CCTV at the proposed quarry site and ensure its inclusion during the EIA presentation.</p> |

## 2. Seac Standard Conditions

| S. No | Terms of Reference                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2.1   | <ol style="list-style-type: none"> <li>In the case of existing/operating mines, a letter obtained from the concerned AD (Mines) shall be submitted and it shall include the following: <ol style="list-style-type: none"> <li>Original pit dimension</li> <li>Quantity achieved Vs EC Approved Quantity</li> <li>Balance Quantity as per Mineable Reserve calculated.</li> <li>Mined out Depth as on date Vs EC Permitted depth</li> <li>Details of illegal/illicit mining</li> <li>Violation in the quarry during the past working.</li> <li>Quantity of material mined out outside the mine lease area</li> <li>Condition of Safety zone/benches</li> <li>Revised/Modified Mining Plan showing the benches of not exceeding 6 m height and ultimate depth of not exceeding 50m.</li> </ol> </li> <li>Details of habitations around the proposed mining area and latest VAO certificate regarding the location of habitations within 300m radius from the periphery of the site.</li> <li>The proponent is requested to carry out a survey and enumerate on the structures located within the radius of (i) 50 m, (ii) 100 m, (iii) 200 m and (iv) 300 m (v) 500m shall be enumerated with details such as dwelling houses with number of occupants, whether it belongs to the owner (or) not, places of worship, industries, factories, sheds, etc with indicating the owner of the building, nature of construction, age of the building, number of residents, their profession and income, etc.</li> <li>The PP shall submit a detailed hydrological report indicating the impact of proposed quarrying operations on the waterbodies like lake, water tanks, etc are located within 1 km of the proposed quarry.</li> <li>The Proponent shall carry out Bio diversity study through reputed Institution and the same shall be included in EIA Report.</li> <li>The DFO letter stating that the proximity distance of Reserve Forests, Protected Areas, Sanctuaries, Tiger reserve etc., up to a radius of 25 km from the proposed site.</li> <li>In the case of proposed lease in an existing (or old) quarry where the benches are not formed (or) partially formed as per the approved Mining Plan, the Project Proponent (PP) shall the PP shall carry out the scientific studies to assess the slope stability of the working benches to be constructed and existing quarry wall, by involving any one of the reputed Research and Academic Institutions - CSIR-Central Institute of Mining &amp; Fuel Research / Dhanbad, NIRM/Bangalore, Division of Geotechnical Engineering-IIT-Madras, NIT-Dept of Mining Engg, Surathkal, and Anna University Chennai-CEG Campus. The PP shall submit a copy of the aforesaid report indicating the stability status of the quarry wall and possible mitigation measures during the time of appraisal for obtaining the EC.</li> <li>However, in case of the fresh/virgin quarries, the Proponent shall submit a conceptual 'Slope Stability Plan' for the proposed quarry during the appraisal while obtaining the EC, when the depth of the working is extended beyond 30 m below ground level.</li> </ol> |

| S. No | Terms of Reference                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       | <p>9. The PP shall furnish the affidavit stating that the blasting operation in the proposed quarry is carried out by the statutory competent person as per the MMR 1961 such as blaster, mining mate, mine foreman, II/I Class mines manager appointed by the proponent.</p> <p>10. The PP shall present a conceptual design for carrying out only controlled blasting operation involving line drilling and muffle blasting in the proposed quarry such that the blast-induced ground vibrations are controlled as well as no fly rock travel beyond 30 m from the blast site.</p> <p>11. The EIA Coordinators shall obtain and furnish the details of quarry/quarries operated by the proponent in the past, either in the same location or elsewhere in the State with video and photographic evidences.</p> <p>12. If the proponent has already carried out the mining activity in the proposed mining lease area after 15.01.2016, then the proponent shall furnish the following details from AD/DD, mines,</p> <p>13. What was the period of the operation and stoppage of the earlier mines with last work permit issued by the AD/DD mines?</p> <p>14. Quantity of minerals mined out.</p> <ul style="list-style-type: none"> <li>· Highest production achieved in any one year</li> <li>· Detail of approved depth of mining.</li> <li>· Actual depth of the mining achieved earlier.</li> <li>· Name of the person already mined in that leases area.</li> <li>· If EC and CTO already obtained, the copy of the same shall be submitted.</li> <li>· Whether the mining was carried out as per the approved mine plan (or EC if issued) with stipulated benches.</li> </ul> <p>15. All corner coordinates of the mine lease area, superimposed on a High-Resolution Imagery/Topo sheet, topographic sheet, geomorphology, lithology and geology of the mining lease area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).</p> <p>16. The PP shall carry out Drone video survey covering the cluster, green belt, fencing, etc.,</p> <p>17. The proponent shall furnish photographs of adequate fencing, green belt along the periphery including replantation of existing trees &amp; safety distance between the adjacent quarries &amp; water bodies nearby provided as per the approved mining plan.</p> <p>18. The Project Proponent shall provide the details of mineral reserves and mineable reserves, planned production capacity, proposed working methodology with justifications, the anticipated impacts of the mining operations on the surrounding environment, and the remedial measures for the same.</p> <p>19. The Project Proponent shall provide the Organization chart indicating the appointment of various statutory officials and other competent persons to be appointed as per the provisions of the Mines Act 1952 and the MMR, 1961 for carrying out the quarrying operations scientifically and systematically in order to ensure safety and to protect the environment.</p> <p>20. The Project Proponent shall conduct the hydro-geological study considering the contour map of the water table detailing the number of groundwater pumping &amp; open wells, and surface water bodies such as rivers, tanks, canals, ponds, etc. within 1 km (radius) along with the collected water level data for both monsoon and non-monsoon seasons from the PWD / TWAD so as to assess the impacts on the wells due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided.</p> <p>21. The proponent shall furnish the baseline data for the environmental and ecological parameters with regard to surface water/ground water quality, air quality, soil quality &amp; flora/fauna including traffic/vehicular movement study.</p> <p>22. The Proponent shall carry out the Cumulative impact study due to mining operations carried out in the quarry specifically with reference to the specific environment in terms of soil health, biodiversity, air pollution, water pollution, climate change and flood control &amp; health impacts. Accordingly, the Environment Management plan should be prepared keeping the concerned quarry and the surrounding habitations in the mind.</p> |



| S. No | Terms of Reference                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       | <p>23. Rain water harvesting management with recharging details along with water balance (both monsoon &amp; non-monsoon) be submitted.</p> <p>24. Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.</p> <p>25. Details of the land for storage of Overburden/Waste Dumps (or) Rejects outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&amp;R issues, if any, should be provided.</p> <p>26. Proximity to Areas declared as 'Critically Polluted' (or) the Project areas which attracts the court restrictions for mining operations, should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the TNPCB (or) Dept. of Geology and Mining should be secured and furnished to the effect that the proposed mining activities could be considered.</p> <p>27. Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.</p> <p>28. Impact on local transport infrastructure due to the Project should be indicated.</p> <p>29. A tree survey study shall be carried out (nos., name of the species, age, diameter etc.,) both within the mining lease applied area &amp; 300m buffer zone and its management during mining activity.</p> <p>30. A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific.</p> <p>31. As a part of the study of flora and fauna around the vicinity of the proposed site, the EIA coordinator shall strive to educate the local students on the importance of preserving local flora and fauna by involving them in the study, wherever possible.</p> <p>32. The purpose of Green belt around the project is to capture the fugitive emissions, carbon sequestration and to attenuate the noise generated, in addition to improving the aesthetics. A wide range of indigenous plant species should be planted as given in the appendix-I in consultation with the DFO, State Agriculture University. The plant species with dense/moderate canopy of native origin should be chosen. Species of small/medium/tall trees alternating with shrubs should be planted in a mixed manner.</p> <p>33. Taller/one year old Saplings raised in appropriate size of bags, preferably ecofriendly bags should be planted as per the advice of local forest authorities/botanist/Horticulturist with regard to site specific choices. The proponent shall earmark the greenbelt area with GPS coordinates all along the boundary of the project site with at least 3 meters wide and in between blocks in an organized manner</p> <p>34. A Disaster management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.</p> <p>35. A Risk Assessment and management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.</p> <p>36. Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.</p> <p>37. Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.</p> <p>38. The Socio-economic studies should be carried out within a 5 km buffer zone from the mining activity. Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.</p> |

| S. No | Terms of Reference                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       | <p>39. Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.</p> <p>40. Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.</p> <p>41. If any quarrying operations were carried out in the proposed quarrying site for which now the EC is sought, the Project Proponent shall furnish the detailed compliance to EC conditions given in the previous EC with the site photographs which shall duly be certified by MoEF&amp;CC, Regional Office, Chennai (or) the concerned DEE/TNPCB.</p> <p>42. The PP shall prepare the EMP for the entire life of mine and also furnish the sworn affidavit stating to abide the EMP for the entire life of mine.</p> <p>43. Concealing any factual information or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this Terms of Conditions besides attracting penal provisions in the Environment (Protection) Act, 1986.</p> |

### 3. Seiaa Standard Conditions:

| S. No | Terms of Reference                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3.1   | <p><b><u>Cluster Management Committee</u></b></p> <p>1. Cluster Management Committee shall be framed which must include all the proponents in the cluster as members including the existing as well as proposed quarry.</p> <p>2. The members must coordinate among themselves for the effective implementation of EMP as committed including Green Belt Development, Water sprinkling, tree plantation, blasting etc.,</p> <p>3. The List of members of the committee formed shall be submitted to AD/Mines before the execution of mining lease and the same shall be updated every year to the AD/Mines.</p> <p>4. Detailed Operational Plan must be submitted which must include the blasting frequency with respect to the nearby quarry situated in the cluster, the usage of haul roads by the individual quarry in the form of route map and network.</p> <p>5. The committee shall deliberate on risk &amp; emergency management plan, fire safety &amp; evacuation plan and sustainable development goals pertaining to the cluster in a holistic manner especially during natural calamities like intense rain and the mitigation measures considering the inundation of the cluster and evacuation plan.</p> <p>6. The Cluster Management Committee shall form Environmental Policy to practice sustainable mining in a scientific and systematic manner in accordance with the law. The role played by the committee in implementing the Environmental policy devised shall be given in detail in the EIA Report.</p> <p>7. The committee shall furnish action plan regarding the restoration strategy with respect to the individual quarry falling under the cluster in a holistic manner.</p> <p>8. The committee shall deliberate on the health of the workers/staff involved in the mining as well as the health of the public in the vicinity.</p> <p><b><u>Agriculture &amp; Agro-Biodiversity</u></b></p> <p>9. Impact on surrounding agricultural fields around the proposed mining Area.</p> <p>10. Impact on soil flora &amp; vegetation around the project site.</p> <p>11. Details of type of vegetation including no. of trees &amp; shrubs within the proposed mining area and. If so, transplantation of such vegetation all along the boundary of the proposed mining area shall committed mentioned in EMP.</p> <p>12. The Environmental Impact Assessment should study the agro-biodiversity, agro- forestry, horticultural plantations, the natural ecosystem, the soil micro flora, fauna and soil seed banks and suggest measures to maintain the natural Ecosystem.</p> <p>13. Action should specifically suggest for sustainable management of the area and restoration of ecosystem for flow of goods and services.</p> |

| S. No | Terms of Reference                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       | <p>14. The project proponent shall study and furnish the impact of project on plantations in adjoining patta lands, Horticulture, Agriculture and livestock.</p> <p><b><u>Forests</u></b></p> <p>15. The project proponent shall detailed study on impact of mining on Reserve forests and free ranging wildlife.</p> <p>16. The Environmental Impact Assessment should study impact on forest, vegetation, endemic, vulnerable and endangered indigenous flora and fauna.</p> <p>17. The Environmental Impact Assessment should study impact on standing trees and the existing trees should be numbered and action suggested for protection.</p> <p>18. The Environmental Impact Assessment should study impact on protected areas, Reserve Forests, National Parks, Corridors and Wildlife pathways, near project site.</p> <p><b><u>Water Environment</u></b></p> <p>19. Hydro-geological study considering the contour map of the water table detailing the number of ground water pumping &amp; open wells, and surface water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) so as to assess the impacts on the nearby waterbodies due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided, covering the entire mine lease period.</p> <p>20. Erosion Control measures.</p> <p>21. Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area on the nearby Villages, Water-bodies/ Rivers, &amp; any ecological fragile areas.</p> <p>22. The project proponent shall study impact on fish habitats and the food WEB/ food chain in the water body and Reservoir.</p> <p>23. The project proponent shall study and furnish the details on potential fragmentation impact on natural Environment, by the activities.</p> <p>24. The project proponent shall study and furnish the impact on aquatic plants and animals in water bodies and possible scars on the landscape, damages to nearby caves, heritage site, and archaeological sites possible land form changes visual and aesthetic impacts.</p> <p>25. The Terms of Reference should specifically study impact on soil health, soil erosion, the soil physical, chemical components and microbial components.</p> <p>26. The Environmental Impact Assessment should study on wetlands, water bodies, rivers streams, lakes and farmer sites.</p> <p>27. The EIA shall include the impact of mining activity on the following:</p> <ol style="list-style-type: none"> <li>Hydrothermal/Geothermal effect due to destruction in the Environment.</li> <li>Bio-geochemical processes and its foot prints including Environmental stress.</li> <li>Sediment geochemistry in the surface streams.</li> </ol> <p><b><u>Energy</u></b></p> <p>28. The measures taken to control Noise, Air, Water, Dust Control and steps adopted to efficiently utilise the Energy shall be furnished.</p> <p><b><u>Climate Change</u></b></p> <p>29. The Environmental Impact Assessment shall study in detail the carbon emission and also suggest the measures to mitigate carbon emission including development of carbon sinks and temperature reduction including control of other emission and climate mitigation activities.</p> <p>30. The Environmental Impact Assessment should study impact on climate change, temperature rise, pollution and above soil &amp; below soil carbon stock, soil health and physical, chemical &amp; biological soil features.</p> <p>31. Impact of mining on pollution leading to GHGs emissions and the impact of the same on the local livelihood.</p> <p><b><u>Mine Closure Plan</u></b></p> <p>32. Detailed Mine Closure Plan covering the entire mine lease period as per precise area communication order issued.</p> <p><b><u>EMP</u></b></p> |

| S. No | Terms of Reference                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       | <p>33. Detailed Environment Management Plan along with adaptation, mitigation &amp; remedial strategies covering the entire mine lease period as per precise area communication order issued and the scope for achieving SDGs.</p> <p>34. The Environmental Impact Assessment should hold detailed study on EMP with budget for Green belt development and mine closure plan including disaster management plan.</p> <p><b><u>Risk Assessment</u></b></p> <p>35. To furnish risk assessment and management plan including anticipated vulnerabilities during operational and post operational phases of Mining.</p> <p><b><u>Disaster Management Plan</u></b></p> <p>36. To furnish disaster management plan and disaster mitigation measures in regard to all aspects to avoid/reduce vulnerability to hazards &amp; to cope with disaster/unfavorable accidents in &amp; around the proposed mine lease area due to the proposed method of mining activity &amp; its related activities covering the entire mine lease period as per precise area communication order issued.</p> <p><b><u>Others</u></b></p> <p>37. The project proponent shall furnish VAO certificate with reference to 300m radius regard to approved habitations, schools, Archaeological sites, Structures, railway lines, roads, water bodies such as streams, odai, vaari, canal, channel, river, lake pond, tank etc.</p> <p>38. As per the MoEF&amp; CC office memorandum F.No.22-65/2017-IA.III dated: 30.09.2020 and 20.10.2020 the proponent shall address the concerns raised during the public consultation and all the activities proposed shall be part of the Environment Management Plan.</p> <p>39. The project proponent shall study and furnish the possible pollution due to plastic and microplastic on the Environment. The ecological risks and impacts of plastic &amp; microplastics on aquatic Environment and fresh water systems due to activities, contemplated during mining may be investigated and reported.</p> |

**Standard Terms of Reference for (Mining of minerals)**

**1.**

| S. No      | Terms of Reference                                                                                                                                                                                                                                                                                                                    |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1.1</b> | Year-wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification 1994 came into force, w.r.t. the highest production achieved prior to 1994 |
| <b>1.2</b> | A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given                                                                                                                                                                                                                   |
| <b>1.3</b> | All documents including approved mine plan, EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee                                                                      |
| <b>1.4</b> | All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery/toposheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone)         |
| <b>1.5</b> | Information should be provided in Survey of India Toposheet in 1:50,000 scale indicating geological map of the area, geomorphology of land forms of the area, existing minerals and mining                                                                                                                                            |

| S. No | Terms of Reference                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       | history of the area, important water bodies, streams and rivers and soil characteristics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 1.6   | Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 1.7   | It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating process/procedures to bring into focus any infringement/deviation/ violation of the environmental or forest norms/ conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large, may also be detailed in the EIA Report |
| 1.8   | Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 1.9   | The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc. should be for the life of the mine / lease period                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 1.10  | Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given                                                                                                                                                                                                                                                                                                                |
| 1.11  | Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 1.12  | A Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the State Expert Appraisal Committees                                                                                                                 |
| 1.13  | Status of forestry clearance for the broken up area and virgin forestland involved in the Project including deposition of net present value (NPV) and compensatory afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 1.14  | Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 1.15  | The vegetation in the RF / PF areas in the study area, with necessary details, should be given                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 1.16  | A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

| S. No | Terms of Reference                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       | protected area and accordingly, detailed mitigative measures required, should be worked out with cost implications and submitted                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 1.17  | Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves/(existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished                                                                                                                                                                                                                                                                                                                           |
| 1.18  | A detailed biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled- I fauna found in the study area, the necessary plan alongwith budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost                                                                                                                               |
| 1.19  | Proximity to Areas declared as Critically Polluted or the Project areas likely to come under the Aravali Range, (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Dept. Should be secured and furnished to the effect that the proposed mining activities could be considered                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 1.20  | Similarly, for coastal Projects, A CRZ map duly authenticated by one of the authorized agencies demarcating LTL, HTL, CRZ area, location of the mine lease w.r.t CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 1.21  | R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need based sample survey, family-wise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be clearly brought out whether the village(s) located in the mine lease area will be shifted or not. The issues relating to shifting of village(s) including their R&R and socio-economic aspects should be discussed in the Report                                                                             |
| 1.22  | One season (non-monsoon) [i.e. March-May (Summer Season); October-December (post monsoon season) ; December-February (winter season)] primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM10, particularly for free silica, should be given |
| 1.23  | Air quality modeling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

| S. No | Terms of Reference                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       | mineral. The details of the model used and input parameters used for modeling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map                                                                                                                                                                                                                                                                                                                                                                                                  |
| 1.24  | The water requirement for the Project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the Project should be indicated                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 1.25  | Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 1.26  | Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 1.27  | Impact of the Project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 1.28  | Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. The Report inter-alia, shall include details of the aquifers present and impact of mining activities on these aquifers. Necessary permission from State Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished                                                                                                                                                         |
| 1.29  | Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion proposed, if any, and the impact of the same on the hydrology should be brought out                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 1.30  | Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and bgl. A schematic diagram may also be provided for the same                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 1.31  | A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution |
| 1.32  | Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those outside the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as State Government) should be covered. Project Proponent shall conduct Impact of Transportation study as per Indian Road Congress Guidelines                                                                                                                                                                         |
| 1.33  | Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

| S. No | Terms of Reference                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.34  | Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 1.35  | Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 1.36  | Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 1.37  | Measures of socio economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 1.38  | Detailed environmental management plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 1.39  | Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 1.40  | Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 1.41  | The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 1.42  | A Disaster management Plan shall be prepared and included in the EIA/EMP Report                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 1.43  | Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 1.44  | Besides the above, the below mentioned general points are also to be followed:- a) All documents to be properly referenced with index and continuous page numbering. b) Where data are presented in the Report especially in Tables, the period in which the data were collected and the sources should be indicated. c) Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF&CC/NABL accredited laboratories. All the original analysis/testing reports should be available during appraisal of the Project. d) Where the documents provided are in a language other than English, an English translation should be provided. e) The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted. f) While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF vide O.M. No. J-11013/41/2006-IA.II(I) dated 4th August, 2009, which are available on the website of this Ministry, should be followed. g) Changes, if any made in the basic scope and project parameters (as submitted in Form-I and the PFR for securing the TOR) should be brought to the attention of MoEF&CC with reasons for such changes and permission should be sought, as the TOR may also have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will |



| S. No | Terms of Reference                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       | entail conducting the PH again with the revised documentation. h) As per the circular no. J-11011/618/2010-IA.II(I) dated 30.5.2012, certified report of the status of compliance of the conditions stipulated in the environment clearance for the existing operations of the project, should be obtained from the Regional Office of Ministry of Environment, Forest and Climate Change, as may be applicable. i) The EIA report should also include (i) surface plan of the area indicating contours of main topographic features, drainage and mining area, (ii) geological maps and sections and (iii) sections of the mine pit and external dumps, if any, clearly showing the land features of the adjoining area |



### **SEIAA SPECIFIC CONDITIONS:**

The authority noted that the subject was placed in the 551<sup>st</sup> SEAC-I meeting held on 16.04.2025. After detailed discussions, the Authority accepts the recommendation of SEAC-I and decided to grant **Terms of Reference (ToR) along with Public Hearing for the quantity of 6,76,020 m<sup>3</sup> upto the depth of 55m BGL** as per the approved mining plan, under cluster for undertaking the combined Environment Impact Assessment Study and preparation of separate Environment Management Plan subject to the conditions as recommended by SEAC-I & normal conditions & the conditions mentioned in 'Annexure B' of this minutes.

### **A. STANDARD TERMS OF REFERENCE**

- 1) Year-wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification 1994 came into force, w.r.t. the highest production achieved prior to 1994.
- 2) A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given.
- 3) All documents including approved mine plan, EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee.
- 4) All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery/ topo sheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).
- 5) Information should be provided in Survey of India Topo sheet in 1:50,000 scale indicating geological map of the area, geomorphology of land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics.
- 6) Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority.
- 7) It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating process/procedures to bring into focus any infringement/deviation/ violation of the environmental or forest norms/

conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large, may also be detailed in the EIA Report.

- 8) Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided.
- 9) The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc. should be for the life of the mine / lease period.
- 10) Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.
- 11) Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given.
- 12) Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.
- 13) Status of forestry clearance for the broken up area and virgin forestland involved in the Project including deposition of Net Present Value (NPV) and Compensatory Afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.
- 14) Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.
- 15) The vegetation in the RF / PF areas in the study area, with necessary details, should be

given.

- 16) A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly, detailed mitigative measures required, should be worked out with cost implications and submitted.
- 17) Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves/(existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished.
- 18) A detailed biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled-I fauna found in the study area, the necessary plan along with budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost.
- 19) Proximity to Areas declared as 'Critically Polluted' or the Project areas likely to come under the 'Aravali Range', (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Department should be secured and furnished to the effect that the proposed mining activities could be considered.
- 20) Similarly, for Coastal Projects, a CRZ map duly authenticated by one of the authorized agencies demarcating LTL, HTL, CRZ area, location of the mine lease with respect to CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority).
- 21) R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker

sections of the society in the study area, a need based sample survey, family-wise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be clearly brought out whether the village(s) located in the mine lease area will be shifted or not. The issues relating to shifting of village(s) including their R&R and socio-economic aspects should be discussed in the Report.

- 22) One season (non-monsoon) [i.e. March-May (Summer Season); October-December (post monsoon season) ; December-February (winter season)] primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM<sub>10</sub>, particularly for free silica, should be given.
- 23) Air quality modeling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of Vehicles for transportation of mineral. The details of the model used and input parameters used for modeling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.
- 24) The water requirement for the Project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the Project should be indicated.
- 25) Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.
- 26) Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.
- 27) Impact of the Project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided.

- 28) Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. The Report inter-alia, shall include details of the aquifers present and impact of mining activities on these aquifers. Necessary permission from Central Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished.
- 29) Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion proposed, if any, and the impact of the same on the hydrology should be brought out.
- 30) Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and bgl. A schematic diagram may also be provided for the same.
- 31) A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution.
- 32) Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those outside the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as State Government) should be covered. Project Proponent shall conduct Impact of Transportation study as per Indian Road Congress Guidelines.
- 33) Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.
- 34) Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report.
- 35) Occupational Health impacts of the Project should be anticipated and the proposed

preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.

- 36) Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.
- 37) Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.
- 38) Detailed Environmental Management Plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project.
- 39) Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project.
- 40) Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.
- 41) The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.
- 42) A Disaster management Plan shall be prepared and included in the EIA/EMP Report.
- 43) Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.
- 44) Besides the above, the below mentioned general points are also to be followed:-
  - a) Executive Summary of the EIA/EMP Report
  - b) All documents to be properly referenced with index and continuous page numbering.
  - c) Where data are presented in the Report especially in Tables, the period in which the data were collected and the sources should be indicated.
  - d) Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF&CC/NABL accredited laboratories. All the original analysis/testing reports should be available during appraisal of the Project.

- e) Where the documents provided are in a language other than English, an English translation should be provided.
- f) The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted.
- g) While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF&CC vide O.M. No. J-11013/41/2006-IA.II(I) dated 4th August, 2009, which are available on the website of this Ministry, should be followed.
- h) Changes, if any made in the basic scope and project parameters (as submitted in Form-I and the PFR for securing the TOR) should be brought to the attention of MoEF&CC with reasons for such changes and permission should be sought, as the ToR may also have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH again with the revised documentation.
- i) As per the circular no. J-11011/618/2010-IA.II(I) dated 30.5.2012, certified report of the status of compliance of the conditions stipulated in the Environment Clearance for the existing operations of the project, should be obtained from the Regional Office of Ministry of Environment, Forest and Climate Change, as may be applicable.
- j) The EIA report should also include (i) surface plan of the area indicating contours of main topographic features, drainage and mining area, (ii) geological maps and sections and (iii) sections of the mine pit and external dumps, if any, clearly showing the land features of the adjoining area.

**In addition to the above, the following shall be furnished:-**

**The Executive summary of the EIA/EMP report in about 8-10 pages should be prepared incorporating the information on following points:**

1. Project name and location (Village, District, State, Industrial Estate (if applicable)).
2. Process description in brief, specifically indicating the gaseous emission, liquid effluent and solid and hazardous wastes.
3. Measures for mitigating the impact on the environment and mode of discharge or disposal.
4. Capital cost of the project, estimated time of completion.
5. The proponent shall furnish the contour map of the water table detailing the number of wells located around the site and impacts on the wells due to mining activity.



6. A detailed study of the lithology of the mining lease area shall be furnished.
7. Details of village map, “A” register and FMB sketch shall be furnished.
8. Detailed mining closure plan for the proposed project approved by the Geology of Mining department shall be submitted along with EIA report.
9. Obtain a letter /certificate from the Assistant Director of Geology and Mining standing that there is no other Minerals/resources like sand in the quarrying area within the approved depth of mining and below depth of mining and the same shall be furnished in the EIA report.
10. EIA report should strictly follow the Environmental Impact Assessment Guidance Manual for Mining of Minerals published February 2010.
11. Detail plan on rehabilitation and reclamation carried out for the stabilization and restoration of the mined areas.
12. The EIA study report shall include the surrounding mining activity, if any.
13. Modeling study for Air, Water and noise shall be carried out in this field and incremental increase in the above study shall be substantiated with mitigation measures.
14. A study on the geological resources available shall be carried out and reported.
15. A specific study on agriculture & livelihood shall be carried out and reported.
16. Impact of soil erosion, soil physical chemical and biological property changes may be assumed.
17. Site selected for the project - Nature of land - Agricultural (single/double crop), barren, Govt./ private land, status of its acquisition, nearby (in 2-3 km.) water body, population, within 10km other industries, forest, eco-sensitive zones, accessibility, (note - in case of industrial estate this information may not be necessary)
18. Baseline environmental data - air quality, surface and ground water quality, soil characteristic, flora and fauna, socio-economic condition of the nearby population
19. Identification of hazards in handling, processing and storage of hazardous material and safety system provided to mitigate the risk.
20. Likely impact of the project on air, water, land, flora-fauna and nearby population
21. Emergency preparedness plan in case of natural or in plant emergencies
22. Issues raised during public hearing (if applicable) and response given
23. CER plan with proposed expenditure.
24. Occupational Health Measures
25. Post project monitoring plan
26. The project proponent shall carry out detailed hydro geological study through

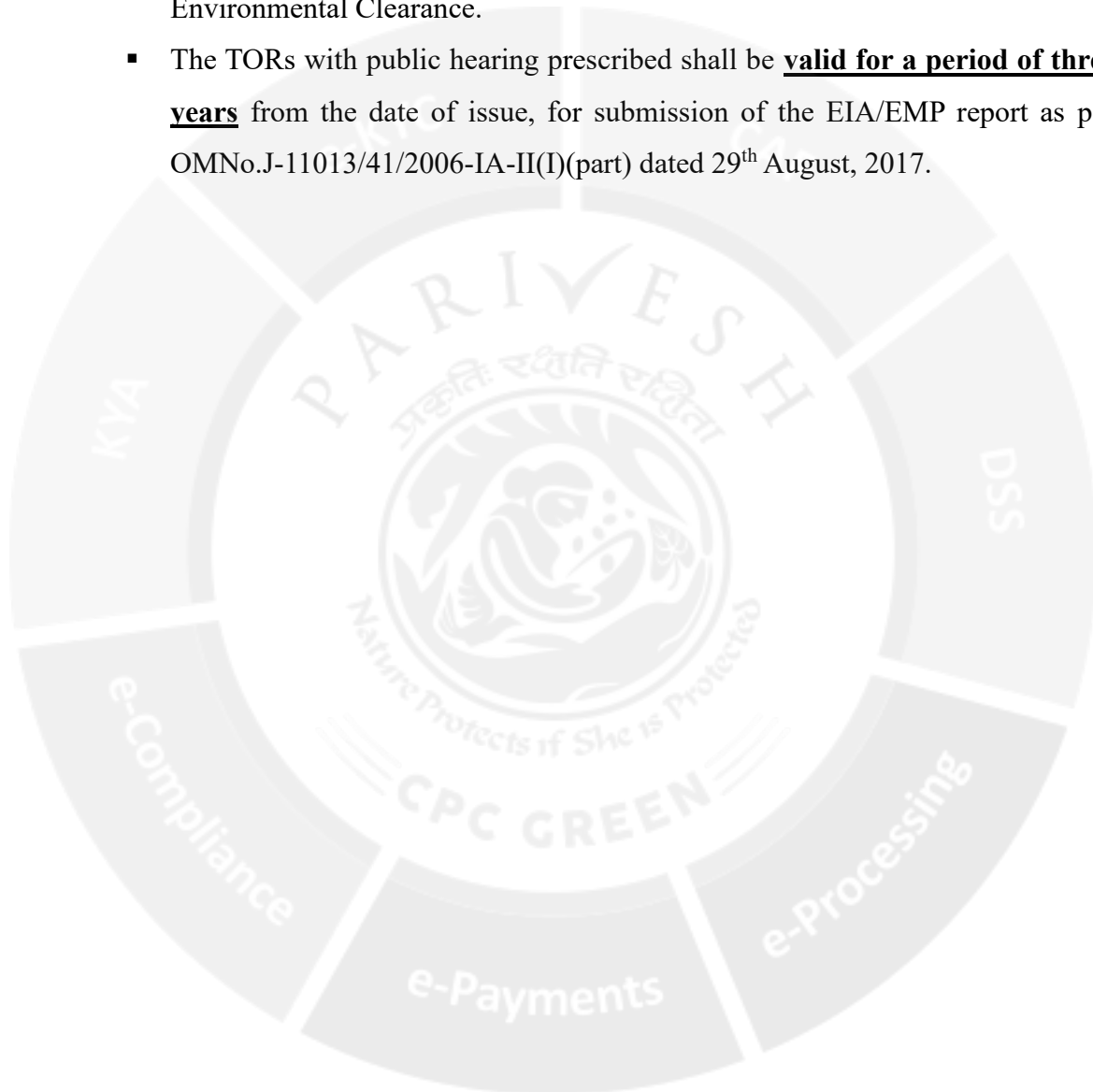
intuitions/NABET Accredited agencies.

27. A detailed report on the green belt development already undertaken is to be furnished and also submit the proposal for green belt activities.
28. The proponent shall propose the suitable control measure to control the fugitive emissions during the operations of the mines.
29. A specific study should include impact on flora & fauna, disturbance to migratory pattern of animals.
30. Reserve funds should be earmarked for proper closure plan.
31. A detailed plan on plastic waste management shall be furnished. Further, the proponent should strictly comply with, Tamil Nadu Government Order (Ms) No.84 Environment and forests (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. In this connection, the project proponent has to furnish the action plan.

**Besides the above, the below mentioned general points should also be followed:-**

- a. A note confirming compliance of the TOR, with cross referencing of the relevant sections / pages of the EIA report should be provided.
- b. All documents may be properly referenced with index, page numbers and continuous page numbering.
- c. Where data are presented in the report especially in tables, the period in which the data were collected and the sources should be indicated.
- d. While preparing the EIA report, the instructions for the proponents and instructions for the consultants issued by MoEF& CC vide O.M. No. J-11013/41/2006-IA.II (I) dated 4th August, 2009, which are available on the website of this Ministry should also be followed.
- e. The consultants involved in the preparation of EIA/EMP report after accreditation with Quality Council of India (QCI)/National Accreditation Board of Education and Training (NABET) would need to include a certificate in this regard in the EIA/EMP reports prepared by them and data provided by other organization/Laboratories including their status of approvals etc. In this regard circular no F. No.J -11013/77/2004-IA-II(I) dated 2<sup>nd</sup> December, 2009, 18<sup>th</sup> March 2010, 28<sup>th</sup> May 2010, 28<sup>th</sup> June 2010, 31<sup>st</sup> December 2010 & 30<sup>th</sup> September 2011 posted on the Ministry's website <http://www.moef.nic.in/> may be referred.

- After preparing the EIA (as per the generic structure prescribed in Appendix-III of the EIA Notification, 2006) covering the above-mentioned points, the proponent will take further necessary action for obtaining environmental clearance in accordance with the procedure prescribed under the EIA Notification, 2006.
- The final EIA report shall be submitted to the SEIAA, Tamil Nadu for obtaining Environmental Clearance.
- The TORs with public hearing prescribed shall be **valid for a period of three years** from the date of issue, for submission of the EIA/EMP report as per OMNo.J-11013/41/2006-IA-II(I)(part) dated 29<sup>th</sup> August, 2017.



**From**

Dr. P.Jayapal, M.Sc.,Ph.D.,  
Deputy Director,  
Dept. of Geology and Mining,  
Krishnagiri.

**To**

V.Venkatesulu,  
S/o. Venkatasamy,  
No.741, D.M.G Kotta,  
Chappadi Post, Shoolagiri Taluk,  
Krishnagiri District.

**Roc.No.19/2025/Mines****dated 27.03.2025****Sir,**

**Sub:** Mines and Minerals-Minor Mineral-Rough Stone-Krishnagiri District- Shoolagiri Taluk - Kamandoddi Village-Government Poromboke land - S.F.No. 754 & 760(P-6) - Over an extent of 4.00.0ha - e-Tender cum Auction conducted- Thiru. V.Venkatesulu offered Highest bid amount - Thiru. V.Venkatesulu declared as the successful bidder - Mining plan approved - Details of quarries situated within 500m radial distance requested - Quarry details furnished - Reg.

**Ref:**

1. Krishnagiri District Gazette (Extraordinary) No. 12 & 20, dated 16.11.2024.
2. The Deputy Director of Geology & Mining, Krishnagiri Rc.No.19/2025/Mines, dated 27.02.2025 (Precise area communication).
3. The Deputy Director of Geology & Mining, Krishnagiri letter No.206/2018/Mines, dated 23.05.2018 (Mining plan approval).
4. Representation of Thiru. V.Venkatesulu, dated 25.03.2025.

\*\*\*\*\*



Kind attention is invited to the references cited above.

2. e- Tender Cum Auction was conducted on 03.01.2025 for the grant of quarry lease to quarry rough stone in Government poramboke land in S.F.No.754 & 760(P-6) over an extent of 4.00.0 hectares in Kamandoddi Village, Shoolagiri Taluk, Krishnagiri District. Since Thiru. V.Venkatesulu had quoted the highest lease amount, the said tender was confirmed to him.

3. Subsequently, Thiru. V.Venkatesulu had been communicated precise area vide reference 2<sup>nd</sup> cited and directed to submit Mining plan and Environmental Clearance for grant of rough stone quarry lease over an extent of 4.00.0 hectares of Government poramboke land in S.F.No. 754 & 760(P-6) in Kamandoddi Village, Shoolagiri Taluk, Krishnagiri District for a period of 10 (Ten) years under the provisions of Rule 8 of Tamil Nadu Minor Mineral Concession Rules, 1959.

4. Accordingly, the applicant submitted Mining Plan and the same was approved by the Deputy Director of Geology & Mining vide the reference 3<sup>rd</sup> cited.

5. At this juncture, the applicant has requested the details of quarries situated within 500m radial distance from the lease applied area vide letter dated 25.03.2025. As requested by the applicant, the details of quarries situated within 500m radial distance from the subject area is furnished as follows:

V. Venkatesulu

## I. Details of Existing Quarries

| S. No. | Name of the Lessee                                                                                                                                                   | Village & Taluk                                      | S.F.No.                                                                  | Extent in ha | Proceedings Rc.No. & date                     | Lease period                   |
|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|--------------------------------------------------------------------------|--------------|-----------------------------------------------|--------------------------------|
| 1      | Thiru.G.Ashoka,<br>S/o.Gunнанappa,<br>No.31/5, 1 <sup>st</sup> Main<br>Road, 2 <sup>nd</sup> Cross, Nehru<br>Nagar, Hosur Taluk,<br>Krishnagiri District-<br>635109. | Kamandod<br>di Village<br>and<br>Shoolagiri<br>Taluk | 754 &<br>760<br>(P-3)                                                    | 3.66.0       | Rc.No.199/2018/<br>Mines, dated<br>09.03.2018 | 17.02.2022<br>to<br>16.02.2032 |
| 2      | Thiru.V.Karunanithi,<br>S/o. Vellaya Gounder,<br>D.No.127A,<br>Molaiyanur, Pappireddi<br>patty Taluk,<br>Dharmapuri district.                                        | Kamandod<br>di Village<br>and<br>Shoolagiri<br>Taluk | 754 &<br>760<br>(P-5)                                                    | 4.30.0       | Rc.No.201/2018/<br>Mines, dated<br>09.03.2018 | 24.06.2022<br>to<br>23.06.2032 |
| 3      | M/s.Royal Blue Metals,<br>R.No.207, Chinnammal<br>Building, 102-A,<br>Peramanur Main Road,<br>4 Roads, Salem.                                                        | Kamandod<br>di Village<br>and<br>Shoolagiri<br>Taluk | 1151,1<br>155,12<br>12 to<br>1219,1<br>222,12<br>25 &<br>1226/A<br>(P-1) | 2.70.0       | Rc.No.202/2018/<br>Mines, dated<br>09.03.2018 | 04.07.2024<br>to<br>03.07.2034 |
| 4      | M/s.Royal Blue Metals,<br>R.No.207, Chinnammal<br>Building, 102-A,<br>Peramanur Main Road,<br>4 Roads, Salem.                                                        | Kamandod<br>di Village<br>and<br>Shoolagiri<br>Taluk | 1151,1<br>155,12<br>12 to<br>1219,1<br>222,12<br>25 &<br>1226/A<br>(P-2) | 2.87.0       | Rc.No.203/2018/<br>Mines, dated<br>09.03.2018 | 24.06.2022<br>to<br>23.06.2032 |
| 5      | Thiru.K.Murugesha,<br>S/o. Krishnappa,<br>No.492, Kamandoddi<br>Village, Shoolagiri<br>Taluk, Krishnagiri<br>District.                                               | Kamandod<br>di Village<br>and<br>Shoolagiri<br>Taluk | 1151,1<br>155,12<br>12 to<br>1219,1<br>222,12<br>25 &<br>1226/A<br>(P-3) | 2.82.0       | Rc.No.204/2018/<br>Mines, dated<br>09.03.2018 | 30.03.2023<br>to<br>29.03.2033 |
| 6      | Thiru.C.Surendiran,<br>S/o. Chinnappa,<br>Pillaiyakolathur,<br>Hosur Taluk,<br>Krishnagiri District.                                                                 | Kamandod<br>di Village<br>and<br>Shoolagiri<br>Taluk | 1269/2<br>A                                                              | 1.66.5       | Rc.No.123/2016/<br>Mines, dated<br>06.10.2017 | 13.10.2017<br>to<br>12.10.2027 |
| 7      | Thiru.S.Madhu,<br>S/o.Srinivasan,<br>No.12, Eden Garden,<br>Thally Road, Hosur<br>Taluk,<br>Krishnagiri District-635<br>109.                                         | Kamandod<br>di Village<br>and<br>Shoolagiri<br>Taluk | 1151,1<br>155,12<br>12 to<br>1219,1<br>222,12<br>25 &<br>1226/A<br>(P-5) | 1.27.0       | Rc.No.206/2018/<br>Mines, dated<br>09.03.2018 | 06.12.2019<br>to<br>05.12.2029 |

V. V. V.

|              |                                                                                                                                  |                                                      |                             |                |                                               |                                |
|--------------|----------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|-----------------------------|----------------|-----------------------------------------------|--------------------------------|
| 8            | Thiru.R.Rajappa,<br>No.3/883,<br>Pillayakothor Village,<br>Koneripalli Post,<br>Hosur Taluk,<br>Krishnagiri District.            | Kamandod<br>di Village<br>and<br>Shoolagiri<br>Taluk | 1266                        | 4.04.5         | Rc.No.102/2016/<br>Mines, dated<br>13.10.2017 | 13.10.2017<br>to<br>12.10.2027 |
| 9            | Thiru.K.Govindappa,<br>S/o. Krishnappa,<br>No.79, SIPCOT,<br>Dharga, Hosur Taluk,<br>Krishnagiri District.                       | Kamandod<br>di Village<br>and<br>Shoolagiri<br>Taluk | 754&<br>760<br>(P-2)        | 2.10.0         | Rc.No.198/2018/<br>Mines, dated<br>25.03.2025 | 25.03.2025<br>to<br>24.03.2035 |
| 10           | P.Venkat Reddy,<br>S/o. Pilla Reddy,<br>Kukkalappalli Village,<br>Kamandoddi Post,<br>Shoolagiri Taluk,<br>Krishnagiri District. | Kamandod<br>di Village<br>and<br>Shoolagiri<br>Taluk | 1267/2<br>&<br>1268/2<br>&3 | 2.38.5         | Rc.No.721/2015/<br>Mines, dated<br>16.04.2021 | 10.11.2022<br>to<br>09.11.2027 |
| <b>Total</b> |                                                                                                                                  |                                                      |                             | <b>27.81.5</b> |                                               |                                |

## II. Details of Expired/Abandoned Quarries

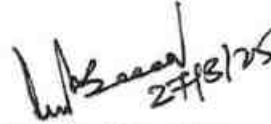
| S. No.       | Name of the Applicant/Lessee                                                                                                               | Village & Taluk                         | S.F.No. | Extent (ha)   | Proceeding Rc.No. & date                 | Lease period             |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|---------|---------------|------------------------------------------|--------------------------|
| 1            | Tmt.V.Renuka,<br>W/o.Venkatesh Reddy,<br>Kukkalappalli Village,<br>Kamandoddi Post,<br>Shoolagiri Taluk,<br>Krishnagiri District - 635109. | Kamandoddi Village and Shoolagiri Taluk | 1269/2B | 2.05.0        | Rc.No.736/2015/Mines-2, dated 11.07.2017 | 13.07.2017 to 12.07.2022 |
| <b>Total</b> |                                                                                                                                            |                                         |         | <b>2.05.0</b> |                                          |                          |

## III. Details of Proposed/applied quarries

| S. No. | Name of the Applicant/Lessee                                                                                                           | Village & Taluk                         | S.F.No.         | Extent (ha) | Proceeding Rc.No. & date               | Lease period     |
|--------|----------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-----------------|-------------|----------------------------------------|------------------|
| 1      | V.Venkatesulu,<br>S/o. Venkatasamy,<br>No.741, D.M.G Kotta, Chappadi Post, Shoolagiri Taluk, Krishnagiri District.                     | Kamandoddi Village and Shoolagiri Taluk | 754 & 760(P-6)  | 4.00.0      | ---                                    | Instant Proposal |
| 2      | Thiru.Mallikarjuna,<br>S/o.Y.Parthasarathy,<br>No.12,Naganayakk anahalli, Kasaba Hobli,Marsur Post, Anekkal Taluk, Bangalore District. | Kamandoddi Village and Shoolagiri Taluk | 754 & 760 (P-4) | 3.50.0      | Rc.No.200/2018/Mines, dated 09.03.2018 | Instant Proposal |

V. Venkatesulu

|              |                                                                                                                                       |                                                  |                                                                     |               |                                                  |                     |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|---------------------------------------------------------------------|---------------|--------------------------------------------------|---------------------|
| 3            | Thiru.<br>S.R.Sampangi,<br>S/o.Rajappa,<br>D.No.1/129,<br>Sanamavu Village<br>and Post, Shoolagiri<br>Taluk, Krishnagiri<br>District. | Kamandoddi<br>Village and<br>ShoolagiriTal<br>uk | 1151,115<br>5,1212<br>to<br>1219,122<br>2,1225 &<br>1226/A(<br>P-4) | 2.23.0        | Rc.No.205/20<br>18/Mines,<br>dated<br>09.03.2018 | Instant<br>Proposal |
| <b>Total</b> |                                                                                                                                       |                                                  |                                                                     | <b>9.73.0</b> |                                                  |                     |

  
**Deputy Director,**  
 Dept. of Geology and Mining,  
 Krishnagiri.  
  
 27.03.25

**Copy to:**

The Chairman, Tamil Nadu State Environment  
 Impact Assessment Authority, 3<sup>rd</sup> Floor, Panakal Maligai,  
 No. 1 Jeenes Road, Saidapet, Chennai -15.





**From**

Dr. P.Jayapal, M.Sc.,Ph.D.,  
Deputy Director,  
Dept of Geology and Mining,  
Krishnagiri.

**To**

V.Venkatesulu,  
S/o. Venkatasamy,  
No.741, D.M.G Kotta,  
Chappadi Post, Shoolagiri Taluk,  
Krishnagiri District.

**Roc.No.19/2025/Mines**

**dated 25.03.2025**

**Sir,**

**Sub:** Mines and Minerals-Minor Mineral-Rough Stone-Krishnagiri District- Shoolagiri Taluk - Kamandoddi Village - Government poramboke land in S.F.No.754 & 760(P-6) over an extent of 4.00.0 ha - e-Tender cum Auction conducted- Highest bid amount offered by Thiru. V.Venkatesulu- Thiru. V.Venkatesulu declared as the successful bidder-Precise area communicated- Draft mining plan submitted- Mining plan approved - Reg.

- Ref:**
1. Krishnagiri District Gazette (Extraordinary) No. 12 & 20, dated 16.11.2024.
  2. e-Auction(live) conducted on 03.01.2025
  3. Precise area Communication issued vide Rc.No.19/2025/Mines, dated 27.02.2025.
  4. Representation of Thiru. V.Venkatesulu, dated 25.03.2025.

\*\*\*\*\*

Kind attention is invited to the references cited above.

2.e- Tender Cum Auction was conducted on 03.01.2025 for the grant of quarry lease to quarry rough stone in Government poramboke land in S.F.No.754 & 760(P-6) over an extent of 4.00.0 hectares in



Kamandoddi Village, Shoolagiri Taluk, Krishnagiri District. Since Thiru. V.Venkatesulu had quoted the highest lease amount, the said tender was confirmed to him.

3.Subsequently, Thiru. V.Venkatesulu had been communicated precise area vide reference 3<sup>rd</sup> cited and directed to submit Mining plan and Environmental Clearance for grant of rough stone quarry lease over an extent of 4.00.0 hectares of Government poramboke land in S.F.No. 754 & 760(P-6) in Kamandoddi Village, Shoolagiri Taluk, Krishnagiri District for a period of 10 (Ten) years under the provisions of Rule 8 of Tamil Nadu Minor Mineral Concession Rules, 1959.

4.At this juncture, Thiru. V.Venkatesulu has submitted representation vide letter dated 25.03.2025 with a request to approve draft Mining Plan.

5.As per the draft Mining Plan, the year wise production for the 10 years including the first 5 year and second 5 year plan period is given as below:

**Yearwise production for the first 5 years**

| Year                 | ROM<br>(m <sup>3</sup> ) | Roughstone<br>(m <sup>3</sup> ) | Weathered<br>Rock<br>(m <sup>3</sup> ) | Topsoil<br>(m <sup>3</sup> ) |
|----------------------|--------------------------|---------------------------------|----------------------------------------|------------------------------|
| 1 <sup>st</sup> Year | 408135                   | 99325                           | 145530                                 | 163280                       |
| 2 <sup>nd</sup> Year | 99305                    | 99305                           | ---                                    | ---                          |
| 3 <sup>rd</sup> Year | 99340                    | 99340                           | ---                                    | ---                          |
| 4 <sup>th</sup> Year | 99365                    | 99365                           | ---                                    | ---                          |
| 5 <sup>th</sup> Year | 99065                    | 99065                           | ---                                    | ---                          |
| <b>Total</b>         | <b>805210</b>            | <b>496400</b>                   | <b>145530</b>                          | <b>163280</b>                |

V.Venkatesulu

**Yearwise production for the second 5 years**

| <b>Year</b>           | <b>ROM<br/>(m<sup>3</sup>)</b> | <b>Roughstone<br/>(m<sup>3</sup>)</b> | <b>Weathered<br/>Rock<br/>(m<sup>3</sup>)</b> | <b>Topsoil<br/>(m<sup>3</sup>)</b> |
|-----------------------|--------------------------------|---------------------------------------|-----------------------------------------------|------------------------------------|
| 6 <sup>th</sup> Year  | 36975                          | 36975                                 | ---                                           | ---                                |
| 7 <sup>th</sup> Year  | 34605                          | 34605                                 | ---                                           | ---                                |
| 8 <sup>th</sup> Year  | 37730                          | 37730                                 | ---                                           | ---                                |
| 9 <sup>th</sup> Year  | 39530                          | 39530                                 | ---                                           | ---                                |
| 10 <sup>th</sup> Year | 30780                          | 30780                                 | ---                                           | ---                                |
| <b>Total</b>          | <b>179620</b>                  | <b>179620</b>                         | ---                                           | ---                                |

6.Hence, the power delegated under Rule 41 of the Tamil Nadu Minor Mineral Concession Rules,1959 and as per the guidelines/instructions issued by the Commissioner of Geology and Mining, vide letter Rc.No.3868/LC/2012 dated 19.11.2012, the draft Mining Plan is hereby approved subject to the following conditions:

(i)The draft Mining Plan is approved without prejudice to any other law applicable to the quarry lease from time to time whether such laws are made by the Central Government, State Government or any other authority.

(ii)This approval of the draft Mining Plan does not in any way imply the approval of the Government in terms of any other provisions of Mines and Minerals (Development and Regulation) Act, 1957, or any other connected laws including Forest (Conservation) Act, 1957, or any other connected Laws, Forest (Conservation) Act, 1980, Forest Conservation Rules 1981, Environment protection Act, 1986, Indian Explosives Act, 1884 (Central Act IV of 1884), Metalliferous Mines Regulations,1961 and the rules made thereunder, Minor Mineral Conservation and Development Rules, 2017 and the Tamil Nadu Minor Mineral Concession Rules, 1959.

*V. V. K. S.*

(iii) The draft Mining Plan is approved without prejudice to any other order or directions from any court of competent jurisdiction.

(iv) All the conditions mentioned in the precise area communicated to the applicant shall be followed during quarry operation as per Act and Rules.

**Encl:** Approved Mining Plan

*[Signature]*  
25/03/25  
2/2

**Deputy Director,**

Dept. of Geology and Mining,  
Krishnagiri.

*[Signature]*  
25-03-25

**Copy to: -**

The Chairman, Tamil Nadu State Environment  
Impact Assessment Authority,  
3<sup>rd</sup> Floor, Panakal Maligai,  
No. 1, Jeenes Road, Saidapet,  
Chennai -15.

*[Signature]*

# MINING PLAN

FOR

## KAMANDODDI VILLAGE ROUGH STONE MINING LEASE PROGRESSIVE QUARRY CLOSURE PLAN

Govt Poramboke land / Open Cast-Semi-Mechanized mining/Non- Forest/Non-Captive Use

Lease period 10 Years from the date of lease execution

(Prepared under rule 41 of Tamil Nadu Minor Mineral Concession Rules, 1959)

### LOCATION OF THE LEASE AREA

STATE : TAMILNADU  
DISTRICT : KRISHNAGIRI  
TALUK : SHOOLAGIRI  
VILLAGE : KAMANDODDI  
S.F. No : 754 & 760 (Part-6)  
EXTENT : 4.00.0Hectares

### ADDRESS OF THE APPLICANT

**Mr.V.Venkatesulu,**

S/o. Venkatasamy,  
No.741, D.M.G Kotta,  
Chappadi Post,  
Shoolagiri Taluk,  
Krishnagiri District.

### PREPARED BY

**Dr.S. KARUPPANNAN, M.Sc., Ph.D.,**  
QUALIFIED PERSON

### **GEO TECHNICAL MINING SOLUTIONS**

(A NABET Accredited & ISO Certified Company)  
No: 1/213 -B, Ground Floor, Natesan Complex,  
Oddapatti, Collectorate Post office,  
Dharmapuri-636705, Tamil Nadu.  
Mob. : +91 9443937841, +917010076633,  
E-mail: [info.gtmsdpi@gmail.com](mailto:info.gtmsdpi@gmail.com),  
Website: [www.gtmsind.com](http://www.gtmsind.com)



*V. Venkatesulu*



## CONTENTS

| Sl. No. | Description                                          |     |
|---------|------------------------------------------------------|-----|
| -       | Certificates                                         | 5-8 |
| -       | Introductory notes                                   | 9   |
| 1.0     | General                                              | 11  |
| 2.0     | Location and Accessibility                           | 13  |
|         | <b><u>PART-A</u></b>                                 |     |
| 3.0     | Geology and Mineral reserves                         | 16  |
| 4.0     | Mining                                               | 20  |
| 5.0     | Blasting                                             | 25  |
| 6.0     | Mine Drainage                                        | 27  |
| 7.0     | Stacking of Mineral rejects and disposal of waste    | 28  |
| 8.0     | Uses of Mineral                                      | 28  |
| 9.0     | Others                                               | 29  |
| 10.0    | Mineral processing/Beneficiations                    | 29  |
|         | <b><u>PART-B</u></b>                                 |     |
| 11.0    | Environmental management plan                        | 31  |
| 12.0    | Progressive quarry closure plan                      | 36  |
| 13.0    | Financial assurance                                  | 38  |
| 14.0    | Certificates                                         | 38  |
| 15.0    | Plan and sections, etc                               | 38  |
| 16.0    | Any other details intend to furnish by the applicant | 38  |
| 17.0    | CSR Expenditure                                      | 39  |

*V. V. K. S.*

### ANNEXURES



| Sl. No. | Description                                  | Annexure No. |
|---------|----------------------------------------------|--------------|
| 1.      | Copy of District Tender Gazette Notification |              |
| 2.      | Copy of precise area communication letter    | II           |
| 3.      | Copy of <b>FMB</b> (Field Measurement book)  | III          |
| 4.      | Copy of Village map                          | IV           |
| 5.      | Copy of "A" register                         | V            |
| 6.      | Photo copy of the lease area                 | VI           |
| 7.      | Copy of ID Proof of the authorized signatory | VII          |
| 8.      | Copy of Qualified Person Certificate         | VIII         |

*V. V. K. S.*



### LIST OF PLATES

| Sl. No. | Description                                 | Plate No. | Scale                                      |
|---------|---------------------------------------------|-----------|--------------------------------------------|
| 1       | Key Map                                     | I         | Not to scale                               |
| 2       | Location Plan                               | I-A       | Not to scale                               |
| 3       | Toposheet Map                               | I-B       | 1:1,00,000                                 |
| 4       | Satellite Imagery Map                       | I-C       | 1: 5,000                                   |
| 5       | Environmental Plan                          | I-D       | 1: 5,000                                   |
| 6       | Mine Lease Plan                             | II        | 1:1000                                     |
| 7       | Surface, Geological Plan                    | III       | Plan 1:1000                                |
| 8       | Geological Sections                         | IIIA      | <b>Sections</b><br>Hor 1:1000<br>Ver 1:500 |
| 9       | Conceptual Plan                             | IV        | Plan 1:1000                                |
| 10      | Conceptual Sections                         | IVA       | <b>Sections</b><br>Hor 1:1000<br>Ver 1:500 |
| 11      | Mine Layout Plan and Land Use Pattern       | V         | Plan 1:1000                                |
| 12      | Year wise Development, Production Plan      | VI        | Plan 1:1000                                |
| 13      | Year wise Development & Production Sections | VIA       | <b>Sections</b><br>Hor 1:1000<br>Ver 1:500 |

V-Vik/2025



Mr.V.Venkatesulu,  
S/o.Venkatasamy,  
No.741, D.M.G Kotta,  
Chappadi Post,  
Shoolagiri Taluk,  
Krishnagiri District.



**CONSENT LETTER FROM THE APPLICANT**

The Mining Plan in respect of rough stone quarry lease in Government Poramboke land at S.F.No:754 & 760 (Part-6) over an extent of 4.00.0hectares of Kamandoddi Village, Shoolagiri Taluk, Krishnagiri District, Tamil Nadu State has been prepared by

**Dr. S. KARUPPANNAN. M.Sc., Ph.D. (QUALIFIED PERSON)**

I request "The Deputy Director", Department of Geology and Mining, Krishnagiri District to make further correspondence regarding modifications of the Mining Plan with the said Qualified Person on this following address,

**Dr. S. KARUPPANNAN. M.Sc., Ph.D.**  
(QUALIFIED PERSON)

**GEO TECHNICAL MINING SOLUTIONS**

(A NABET accredited & ISO certified Company)

No: 1/213-B, Natesan Complex,  
Oddapatti, Collectorate Post office, Dharmapuri-636705

Ph: +91 9443937841, +91 7010076633

E-mail: [info.gtmsdpi@gmail.com](mailto:info.gtmsdpi@gmail.com),

Website: [www.gtmsind.com](http://www.gtmsind.com)

I hereby undertake that all modifications so made in the Mining Plan by the Qualified Person may be deemed to have been made with my knowledge and consent and shall be acceptable to me and binding on me in all respects.

Place: Krishnagiri, TN.

Date:

  
Signature of the applicant  
(V.Venkatesulu)



Mr.V.Venkatesulu,  
S/o,Venkatasamy,  
No.741, D.M.G Kotta,  
Chappadi Post,  
Shoolagiri Taluk,  
Krishnagiri District.



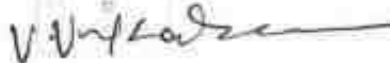
### DECLARATION

The Mining Plan in respect of rough stone quarry lease in in Government Poramboke land at S.F.No: 754 & 760(Part-6), over an extent of 4.00.0hectares of Kamandoddi Village, Shoolagiri Taluk, Krishnagiri District, Tamil Nadu State have been prepared with my consultation and I have understood the contents and agree to implement the same in accordance with the Mining Laws.

Place: Krishnagiri, TN.

Date:

  
Signature of the applicant  
(V.Venkatesulu)



Dr. S. KARUPPANNAN, M.Sc., Ph.D.

QUALIFIED PERSON

**GEO TECHNICAL MINING SOLUTIONS**

(A NABET accredited & ISO certified Company)

No: 1/213-B, Ground Floor, Natesan Complex,

Oddapatti, Collectorate Post office, Dharmapuri-636705

Ph: +91 9443937841, +91 7010076633

E-mail: [info.gtmsdpi@gmail.com](mailto:info.gtmsdpi@gmail.com),

Website: [www.gtmsind.com](http://www.gtmsind.com)



### CERTIFICATE

This is to certify that, the provisions of rule 8 of Tamil Nadu Minor Minerals Concession Rules, 1959 have been observed in the Mining Plan for the grant of rough stone quarry lease at S.F.No: 754 & 760 (Part-6), over an extent of 4.00.0 hectares of Kamandoddi Village, Shoolagiri Taluk, Krishnagiri District, Tamil Nadu State granted to **Mr.V.Venkatesulu**, S/o. Venkatasamy, Krishnagiri District.

Wherever specific permission / exemptions / relaxations or approvals are required, the applicant will approach the concerned authorities of State and Central governments for granting such permissions etc.

Place: Dharmapuri, TN

Date: 21/3/25

Signature of the Qualified Person

Dr.S.KARUPPANNAN, M.Sc, Ph.D.,  
Qualified Person  
GEO TECHNICAL MINING SOLUTIONS  
A NABET Accredited and ISO Certified Company  
1/213-B, Ground Floor, Natesan Complex,  
Collectorate Post Office, Oddapatti,  
Dharmapuri-636705, TamilNadu, India

Dr. S. KARUPPANNAN. M.Sc., Ph.D.

QUALIFIED PERSON

**GEO TECHNICAL MINING SOLUTIONS**

(A NABET accredited & ISO certified Company)

No: 1/213-B, Natesan Complex,

Oddapatti, Collectorate Post office, Dharmapuri-636705

Ph: +91 9443937841, +91 7010076633

E-mail: [info.gtmsdpi@gmail.com](mailto:info.gtmsdpi@gmail.com),

Website: [www.gtmsind.com](http://www.gtmsind.com)



### CERTIFICATE

I certify that, in preparation of Mining Plan for rough stone quarry lease at S.F.No: 754 & 760 (Part-6), over an extent of 4.00.0hectares of Kamandoddi Village, Shoolagiri Taluk, Krishnagiri District, Tamil Nadu State prepared to **Mr.V.Venkatesulu**, S/o.Venkatasamy, Krishnagiri District covers all the provisions of Mines Act, Rules, and Regulations etc., made there under and whenever specific permission are required, the applicant will approach the Director General of Mines Safety, Chennai. The standards prescribed by DGMS in respect of Mines Health will be strictly implemented.

Place: Dharmapuri, TN

Date: 21/3/25

Signature of the Qualified Person

Dr.S.KARUPPANNAN,M.Sc,Ph.D.,  
Qualified Person  
GEO TECHNICAL MINING SOLUTIONS  
A NABET Accredited and ISO Certified Company  
1/213-B, Ground Floor, Natesan Complex,  
Collectorate Post Office, Oddapatti,  
Dharmapuri-636705, TamilNadu, India

# MINING PLAN

FOR KAMANDODDI VILLAGE ROUGH STONE QUARRY LEASE WITH  
PROGRESSIVE QUARRY CLOSURE PLAN

Govt Poramboke land / Open cast-Semi-Mechanized mining/Non-forest/Non-Captive

Lease period 10 Years from the date of lease execution

(Prepared under rule 41 of Tamil Nadu Minor Mineral Concession Rules, 1959)

25 MAR 2025

கிருஷ்ணகிரி

## INTRODUCTORY NOTES:

- a) **Introduction:** The Mining plan with progressive quarry closure plan is prepared for Mr.V.Venkatesulu S/o.Venkatasamy, residing at D.No.741, T M G Kotta, Chappadi post, Shoolagiri Taluk, Krishnagiri District, Tamilnadu State and got auction of quarry lease for rough stone in S.F.No. 754 & 760 (Part-6), over na extent of 4.00.0 hectares of Kamandoddi Village, Shoolagiri Taluk, Krishnagiri District, Tamil Nadu State. Special publication in Krishnagiri District Gazette Notification No. **Re.No.2023/2023/Mines, dated 15.11.2024** for eligible Govt Poramboke land quarry lease has issued notice inviting tender under Krishnagiri District Gazette (Extra-Ordinary) No.12 (English) & 20 (Tamil) dated 16.11.2024 and received applications through online from the interested bidders for conducting e-Tender cum auction. E-tender cum auction held on 03.01.2025, Since, Mr.V.Venkatesulu has quoted highest bid amount of Rs.8,30,50,000/-.

Therefore, Mr.V.Venkatesulu has been declared as successful bidder and granted rough stone quarry lease in government poramboke land for a period of 10 years in S.F.No: 754 & 760 (Part-6) over an extent of 4.00.0Hectare, Kamandoddi Village, Shollagiri Taluk, Krishnagiri District.

- b) **The Precise area communication letter:** The Deputy Director, Department of Geology and mining, Krishnagiri has directed to the applicant Mr.V.Venkatesulu, through his precise area communication letter vide Roc.No.19/2025/Mines Dated: 27.02.2025, for quarrying lease rough stone at Tamil Nadu State, Krishnagiri District, Shoolagiri Taluk, Kamandoddi Village in S.F.No: 754 & 760 (Part-6), over an extent of 4.00.0hectares has recommended as following conditions for a period of Ten (10) years under Rule 8 Tamil Nadu Minor Mineral concession rules, 1959.

- 1) A safety distance of 7.5 meters is to be maintained to the adjacent patta lands and a safety distance of 10m to be maintained to the adjacent Government lands and should not cause any hindarance to them while quarrying and transportation.

9 V Venkatesulu



- 2) All conditions stipulated in the District Gazette Extra ordinary notification No.12 (English) & 20 (Tamil) dated : 16.11.2024 should adhere by the bidder.
  - 3) Environment clearance should be obtained from the State Level Environmental Impact Assessment Authority before grant of quarry lease as per rule 42 of the Tamil Nadu Minor Mineral Concession Rules 1959.
  - 4) The bidder should fence the lease granted area with barbed wire before the execution of lease deed as follows:
    - o The pillar post shall be firmly rounded with concrete foundation of height not less than 2 meters with a distance between two pillars shall not be more than 3 meters.
    - o The applicant firm shall incorporate the DGPS readings for the entire boundary pillars of the area and the same should be clearly shown in the Mining plan.
    - o A Soft copy of digitalized map with DGPS readings should be submitted in the CD from to the Deputy/Assistant Director, Krishnagiri.
  - 5) As per Rule 12(V) of Minerals (other than Atomic & Hydrocarbon Energy Minerals) Concession Rules, 2016, the applicant firm shall at his own expenses erect, maintain and keep in repair all the boundary pillars for entire period of lease.
  - 6) The applicant should use mild explosives during quarrying.
  - 7) Child Labourers should not be engaged in the quarry works.
  - 8) If any violation is found during quarrying operation, the Rule 36(5)(h) and the penal provisions of the Tamil Nadu Minor Mineral Concession Rules, 1959 and connected Act and rules in force will attract.
- c) **Preparation and Submission of Mining Plan:** The Mining Plan with progressive quarry closure plan has been prepared under rule 41 and submitted under rule 42 of Tamil Nadu Minor Mineral Concession Rules, 1959 for mining lease as per conditions mentioned in the precise area communication letter **Roc.No.19/2025/Mines Dated: 27.02.2025.**
- *There is a waste Dump available in the lease area with average dimension (Area 3.65.0Hect x height 11.78m) = Total Volume of Dump is 429970m<sup>3</sup>*
- d) **Geological resources and Mineable reserves:** Geological resource of estimated as 2200110m<sup>3</sup> including the resources of safety zone, topsoil, Weathered rock etc. Of which, rough stone resources of about 1800090m<sup>3</sup>, topsoil is 200010m<sup>3</sup> and Weathered rock is 200010m<sup>3</sup> up to a depth of 55m below ground level. The total mineable reserve is estimated to be 984830m<sup>3</sup> by deducting the reserve safety zone,

10 V. V. L.



block in benches from the total Geological resources. of which, rough stone is about 676020m<sup>3</sup>, topsoil is 163280m<sup>3</sup> and Weathered rock is 145530m<sup>3</sup> up to a depth of 55m below ground level (Refer Plate No. III & IV).

- c) **Proposed Production Schedule:** Total proposed production of rough stone is 676020m<sup>3</sup>, topsoil is 163280m<sup>3</sup> and Weathered rock is 145530m<sup>3</sup> up to a depth of 55m below ground level for ten years plan period. (Refer Plate No. VI & VIA).

f) **Environmental Sensitivity of the proposed lease area: -**

- i). **Interstate boundary:** There is no interstate boundary around 10Km radius periphery of proposed lease area.
  - ii). **Wildlife Sanctuaries any:** There are no notified wildlife sanctuaries within the radius of 10km from the project site under the wildlife (Protection) Act, 1972.
  - iii). **Forest (conservation) Act, 1980:** No forest land granted for quarrying and there is no reserve forest within the radius of 60m.
  - iv). **CRZ Notification, 2019:** There is no Sea coastal zone found within radius of 10km and this project site doesn't attract CRZ Notification, 2019.
- h) **Environmental measures to be adopted during the ongoing activity period,**
- a. Usage of sharp drill bits while drilling which will help in reducing noise.
  - b. Secondary blasting will be totally avoided and hydraulic rock breaker will be used for breaking boulders.
  - c. Controlled blasting with proper spacing, burden, stemming and optimum charge/delay will be maintained.
  - d. Green Belt/Plantation will be developed around the project area and along the haul roads. The plantation minimizes propagation of noise.
  - e. Water will be sprinkled on haul roads twice a day to avoid dust generation during transportation.
  - f. Transportation of material will be carried out during day time and material will be covered with tarpaulin.
  - g. The speed of tippers plying on the haul road will be limited below 20 km/hr to avoid generation of dust.
  - h. And any other conditions as stipulated by the concerned authorities should be followed to protect the environment.

**1.0 GENERAL:**

|    |                       |   |                                                                                 |
|----|-----------------------|---|---------------------------------------------------------------------------------|
| a. | Name of the Applicant | : | Mr.V.Venktesulu                                                                 |
|    | Applicant address     | : | S/o.Venkatasamy,<br>No.741, D.M.G Kotta,<br>Chappadi Post,<br>Shoolagiri Taluk, |
|    | District              | : | Krishnagiri.                                                                    |

V. Venkatesulu



|                                                                                              |   |                                                                                                                                                                                                                  |
|----------------------------------------------------------------------------------------------|---|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| State                                                                                        | : | Tamilnadu                                                                                                                                                                                                        |
| Pin code                                                                                     | : | 635117                                                                                                                                                                                                           |
| Phone                                                                                        | : | Nil                                                                                                                                                                                                              |
| Fax                                                                                          | : | Nil                                                                                                                                                                                                              |
| Gram                                                                                         | : | Nil                                                                                                                                                                                                              |
| Telex                                                                                        | : | Nil                                                                                                                                                                                                              |
| E-mail                                                                                       | : | .....                                                                                                                                                                                                            |
| <b>b. Status of the Applicant</b>                                                            |   |                                                                                                                                                                                                                  |
| Private individual                                                                           | : | Individual                                                                                                                                                                                                       |
| Cooperative Association                                                                      | : | ---                                                                                                                                                                                                              |
| Private company                                                                              | : | ---                                                                                                                                                                                                              |
| Public Company                                                                               | : | ---                                                                                                                                                                                                              |
| Public Sector Undertaking                                                                    | : | ---                                                                                                                                                                                                              |
| Joint Sector Undertaking                                                                     | : | ---                                                                                                                                                                                                              |
| Other (pl. specify)                                                                          | : | ---                                                                                                                                                                                                              |
| <b>c. Mineral(s) Which are occurring in the area and which the applicant intends to mine</b> | : | Rough Stone                                                                                                                                                                                                      |
| <b>d. Period for which the mining lease granted /renewed/ proposed to be applied</b>         | : | The precise area has been communicated to the applicant for quarrying period of Ten (10) years.                                                                                                                  |
| Name of the QP preparing the Mining Plan                                                     | : | <b>Dr. S.KARUPPANNAN.M.Sc.,Ph.D.,</b>                                                                                                                                                                            |
| Address                                                                                      | : | <b>Geo Technical Mining Solutions</b><br>(A NABET Accredited & ISO certified Company)<br>No: 1/213-B, Natesan Complex,<br>Oddapatti, Collectorate Post office,<br>Dharmapuri-636705<br>Web site: www.gtmsind.com |
| Phone                                                                                        | : | +91 9443937841, 7010076633                                                                                                                                                                                       |
| Fax                                                                                          | : | Nil                                                                                                                                                                                                              |
| e-mail                                                                                       | : | info.gtmsdpi@gmail.com                                                                                                                                                                                           |
| Telex                                                                                        | : | Nil                                                                                                                                                                                                              |
| Registration number                                                                          | : | ---                                                                                                                                                                                                              |

12 V V/La



207

25 MAR 2025

|    |                                                                    |   |                                                                                                                                                                    |
|----|--------------------------------------------------------------------|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | Date of grant/renewal                                              | : | ---                                                                                                                                                                |
|    | Valid upto                                                         | : | ---                                                                                                                                                                |
| f. | Name of the prospecting agency                                     | : | <b>Geo Technical Mining Solutions</b><br>GSR 286(E) No:272, Ministry of Mines<br>Notification 7th April 2022.                                                      |
|    | Address                                                            | : | No: 1/213-B, Natesan Complex,<br>Oddapatti, Collectorate Post office,<br>Dharmapuri-636705<br>Web site: <a href="http://www.gtmsind.com">www.gtmsind.com</a>       |
|    | Phone                                                              | : | +91 9443937841, 7010076633                                                                                                                                         |
| g. | Reference No. and date of consent letter from the state government | : | The precise area communication letter issued by the Deputy Director, Department Geology and Mining, Krishnagiri vide <b>Roc.No.19/2025/Mines Dated: 27.02.2025</b> |

## 2.0 LOCATION AND ACCESSIBILITY:

| a.                  | Details of the Area:                                                                                                                                                                                                                                                                                                                                                                                                       | :                    | Refer plate no: IA & IB                                                                                                                                                                                                                                |                      |           |                      |           |        |        |     |                     |                     |  |               |               |  |  |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|-----------|----------------------|-----------|--------|--------|-----|---------------------|---------------------|--|---------------|---------------|--|--|
|                     | District & State                                                                                                                                                                                                                                                                                                                                                                                                           | :                    | Krishnagiri, Tamil Nadu                                                                                                                                                                                                                                |                      |           |                      |           |        |        |     |                     |                     |  |               |               |  |  |
|                     | Taluk                                                                                                                                                                                                                                                                                                                                                                                                                      | :                    | Shoolagiri                                                                                                                                                                                                                                             |                      |           |                      |           |        |        |     |                     |                     |  |               |               |  |  |
|                     | Village                                                                                                                                                                                                                                                                                                                                                                                                                    | :                    | Kamandoddi                                                                                                                                                                                                                                             |                      |           |                      |           |        |        |     |                     |                     |  |               |               |  |  |
|                     | Khasra No./ Plot No./ Block Range/ Felling Series etc.:                                                                                                                                                                                                                                                                                                                                                                    |                      |                                                                                                                                                                                                                                                        |                      |           |                      |           |        |        |     |                     |                     |  |               |               |  |  |
|                     | <table border="1"> <thead> <tr> <th>Survey No</th> <th>Sub Division</th> <th>Total Extent in Hect</th> <th>Patta No.</th> <th>Ownership /Occupancy</th> </tr> </thead> <tbody> <tr> <td>754 &amp; 760</td> <td>Part-6</td> <td>4.00.0</td> <td>---</td> <td>Govt Poramboke land</td> </tr> <tr> <td colspan="2"><b>Total Extent</b></td> <td><b>4.00.0</b></td> <td colspan="2"><b>4.00.0</b></td> </tr> </tbody> </table> | Survey No            | Sub Division                                                                                                                                                                                                                                           | Total Extent in Hect | Patta No. | Ownership /Occupancy | 754 & 760 | Part-6 | 4.00.0 | --- | Govt Poramboke land | <b>Total Extent</b> |  | <b>4.00.0</b> | <b>4.00.0</b> |  |  |
| Survey No           | Sub Division                                                                                                                                                                                                                                                                                                                                                                                                               | Total Extent in Hect | Patta No.                                                                                                                                                                                                                                              | Ownership /Occupancy |           |                      |           |        |        |     |                     |                     |  |               |               |  |  |
| 754 & 760           | Part-6                                                                                                                                                                                                                                                                                                                                                                                                                     | 4.00.0               | ---                                                                                                                                                                                                                                                    | Govt Poramboke land  |           |                      |           |        |        |     |                     |                     |  |               |               |  |  |
| <b>Total Extent</b> |                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>4.00.0</b>        | <b>4.00.0</b>                                                                                                                                                                                                                                          |                      |           |                      |           |        |        |     |                     |                     |  |               |               |  |  |
|                     | Lease area (hectares)                                                                                                                                                                                                                                                                                                                                                                                                      | :                    | 4.00.0 Hectares                                                                                                                                                                                                                                        |                      |           |                      |           |        |        |     |                     |                     |  |               |               |  |  |
|                     | Whether the area is recorded to be in forest (please specify whether protected, reserved, etc)                                                                                                                                                                                                                                                                                                                             | :                    | Government Promboke Land                                                                                                                                                                                                                               |                      |           |                      |           |        |        |     |                     |                     |  |               |               |  |  |
|                     | Ownership / Occupancy                                                                                                                                                                                                                                                                                                                                                                                                      | :                    | Government of Tamil Nadu                                                                                                                                                                                                                               |                      |           |                      |           |        |        |     |                     |                     |  |               |               |  |  |
|                     | Existence of Public Road / Railway line if any nearby and approximate distance                                                                                                                                                                                                                                                                                                                                             | :                    | <p>✓ Exploited quarry materials will be transported through the cart road is situated on the northern side of the lease area.</p> <p>✓ There is an NH-44 is situated on the northern side about 1.82km which is connecting Hosur-Krishnagiri Road.</p> |                      |           |                      |           |        |        |     |                     |                     |  |               |               |  |  |

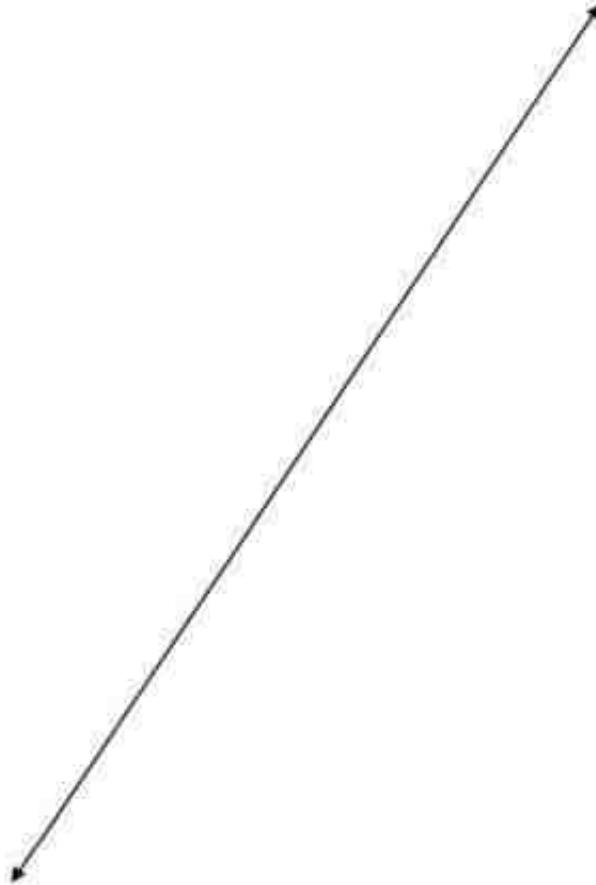


|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | ✓ There is no railway line is situated within 5km radius from the lease area.                                              |               |          |           |   |               |               |   |               |               |   |               |               |   |               |               |   |               |               |   |               |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|---------------|----------|-----------|---|---------------|---------------|---|---------------|---------------|---|---------------|---------------|---|---------------|---------------|---|---------------|---------------|---|---------------|---------------|
| Toposheet No. with latitude and longitude                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | : Toposheet No. 57 H/14<br>Latitude: From 12°39'26.30"N to 12°39'35.28"N<br>Longitude: From 77°57'37.60"E to 77°57'44.84"E |               |          |           |   |               |               |   |               |               |   |               |               |   |               |               |   |               |               |   |               |               |
| Geo-Coordinates of the lease boundary:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                            |               |          |           |   |               |               |   |               |               |   |               |               |   |               |               |   |               |               |   |               |               |
| <table border="1" style="margin: auto; border-collapse: collapse;"> <thead> <tr> <th style="padding: 5px;">PILLAR ID</th> <th style="padding: 5px;">LATITUDE</th> <th style="padding: 5px;">LONGITUDE</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">12°39'32.93"N</td> <td style="text-align: center;">77°57'44.84"E</td> </tr> <tr> <td style="text-align: center;">2</td> <td style="text-align: center;">12°39'26.30"N</td> <td style="text-align: center;">77°57'43.20"E</td> </tr> <tr> <td style="text-align: center;">3</td> <td style="text-align: center;">12°39'27.10"N</td> <td style="text-align: center;">77°57'38.30"E</td> </tr> <tr> <td style="text-align: center;">4</td> <td style="text-align: center;">12°39'30.28"N</td> <td style="text-align: center;">77°57'39.00"E</td> </tr> <tr> <td style="text-align: center;">5</td> <td style="text-align: center;">12°39'32.09"N</td> <td style="text-align: center;">77°57'37.60"E</td> </tr> <tr> <td style="text-align: center;">6</td> <td style="text-align: center;">12°39'35.28"N</td> <td style="text-align: center;">77°57'38.64"E</td> </tr> </tbody> </table> |                                                                                                                            | PILLAR ID     | LATITUDE | LONGITUDE | 1 | 12°39'32.93"N | 77°57'44.84"E | 2 | 12°39'26.30"N | 77°57'43.20"E | 3 | 12°39'27.10"N | 77°57'38.30"E | 4 | 12°39'30.28"N | 77°57'39.00"E | 5 | 12°39'32.09"N | 77°57'37.60"E | 6 | 12°39'35.28"N | 77°57'38.64"E |
| PILLAR ID                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | LATITUDE                                                                                                                   | LONGITUDE     |          |           |   |               |               |   |               |               |   |               |               |   |               |               |   |               |               |   |               |               |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 12°39'32.93"N                                                                                                              | 77°57'44.84"E |          |           |   |               |               |   |               |               |   |               |               |   |               |               |   |               |               |   |               |               |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 12°39'26.30"N                                                                                                              | 77°57'43.20"E |          |           |   |               |               |   |               |               |   |               |               |   |               |               |   |               |               |   |               |               |
| 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 12°39'27.10"N                                                                                                              | 77°57'38.30"E |          |           |   |               |               |   |               |               |   |               |               |   |               |               |   |               |               |   |               |               |
| 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 12°39'30.28"N                                                                                                              | 77°57'39.00"E |          |           |   |               |               |   |               |               |   |               |               |   |               |               |   |               |               |   |               |               |
| 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 12°39'32.09"N                                                                                                              | 77°57'37.60"E |          |           |   |               |               |   |               |               |   |               |               |   |               |               |   |               |               |   |               |               |
| 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 12°39'35.28"N                                                                                                              | 77°57'38.64"E |          |           |   |               |               |   |               |               |   |               |               |   |               |               |   |               |               |   |               |               |
| Land use pattern (Forest, Agricultural, Grazing, Barren etc.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | : It is an barren and Ryotwari land.                                                                                       |               |          |           |   |               |               |   |               |               |   |               |               |   |               |               |   |               |               |   |               |               |
| b. <i>Attach a general location and vicinity map showing area boundaries and existing and proposed access routs. It is preferred that the area to be marked on a survey of India topographical map or a cadastral map or forest map as the case may be. However if none of these are available, the area should be shown on an accurate sketch map on scale of 1 : 5000.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | : Refer plate no-IA & IB                                                                                                   |               |          |           |   |               |               |   |               |               |   |               |               |   |               |               |   |               |               |   |               |               |

34 *V. Velkase*

**i) INFRASTRUCTURE AND COMMUNICATION:**

| S.No | Description              | Place                | Distance | Direction |
|------|--------------------------|----------------------|----------|-----------|
| a.   | Nearest post office      | Sappadi              | 1.22Km   | East      |
| b.   | Nearest police station   | Shoolagiri           | 5.11km   | East      |
| c.   | Nearest fire station     | Hosur                | 20.4km   | West      |
| d.   | Nearest medical facility | Kamandoddi           | 3.98Km   | Northwest |
| e.   | Nearest school           | Addakurukki          | 3.07km   | North     |
| f.   | Nearest railway station  | Kelamangalam         | 11.4km   | Southwest |
| g.   | Nearest port facility    | Chennai              | 257km    | Northeast |
| h.   | Nearest airport          | Salem                | 97.0km   | South     |
| i.   | Nearest DSP office       | Krishnagiri          | 16.4km   | East      |
| j.   | Nearest villages         | Koneripalli          | 2.10km   | North     |
|      |                          | Sappadi              | 1.14km   | East      |
|      |                          | Kukkala Palli        | 1.79Km   | West      |
|      |                          | Tirumalaigovunikotta | 1.8km    | Southwest |



15 U. V. / 2020

-23-

**PART - A**

**3.0 GEOLOGY AND MINERAL RESERVES:**

(a) Briefly describe the topography and general geology and local/mine geology of the proposed mineral deposit including drainage pattern:

|      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                               |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (i)  | Topography                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | : The proposed lease area is elevated topography. The average elevation of 6m above ground level. The maximum elevation (776m) was observed eastern side and minimum elevation (770m) was observed western of the site. The slope is towards southern side and falls in Toposheet no. 57 H/14 |
| (ii) | <p><b>General Geology of the District:</b></p> <p>The geological formations of the district belong mainly to Archaean age along with rock of Proterozoic age. The former is represented by Khondalite Group of rocks, Charnockite Group of rocks, Migmatites Complex, Sathyamangalam Group of rocks, while the latter is represented by Alkaline rocks. The Khondalite Group includes garnet sillimanite gneiss and quartzite which occur as small patches. The migmatite complex includes garnetiferous quartz feldspathic gneiss and hornblends biotite gneiss, the former exposed on the western part of the district. The Sathyamangalam Group includes fuchsite quartzite, sillimanite mica schist and amphibolites. The Bhavani Group in this area includes fissile hornblende-biotite gneiss, granitoid gneiss and pink migmatite. Amphibolites with barbed ferruginous quartzite and associated quartzo-feldspathic rocks (Champion Gneiss) represent the Kolar group and are found west and southwest of Epiphaniically. Following this there are basic intrusions occurring as dykes.</p> <p>The Charnockite Group occupies a major part of the south-west portion of this district with small bands of garnetiferous quartzo-feldspathic gneiss, Granite gneiss and dolerite dykes. The North-East and Northern part of the district mainly consist of granite gneiss with small patches of Pink Migmatite, hornblende-biotite gneiss and dolerite dykes. The Eastern part of the district consists of Epidote-Hornblende Gneiss, Ultra Mafics, Syenite and Carbonatite.</p> <p><b>Order of superposition of the proposed lease area,</b></p> |                                                                                                                                                                                                                                                                                               |

16 V-V/La

|       | Age                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Group             | Rock Formation                                                                   |
|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|----------------------------------------------------------------------------------|
|       | Recent to Sub recent                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | ---               | Top Soil (2m Thick)                                                              |
|       | Archean to Lower Proterozoic                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Migmatite complex | Pegmatite and Quartz/veins<br>Dolerite dyke<br>Peninsular gneisses<br>Migmatites |
|       | Archean                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Charnockite Group | Charnockite, Garnetiferous<br>quartzo-feldspathic, Biotite<br>gneisses           |
| (iii) | <p>Local / Mine Geology of The Mineral Deposit:</p> <p><b>Topography of the proposed lease area:</b></p> <p>The applied lease area exhibits an almost elevated topography and the maximum elevation 776m was observed east side of the site, while the minimum elevation (770m) was observed west side of the site. The rocks exhibits layered, medium to coarse grained hornblende biotite, orthopyroxene charnockite gneiss.</p> <p>The Topsoil is obtained the average of 0-5.0m, Weathered rock is obtained the average of 5.0-10m and a rough stone starts from 10m to 55m (R.L.751-706m from the flat terrain. The Surface plan showing elevation, contour, accessibility road and Geological map was prepared the proposed lease area.</p> <p><b>Mode of origin:</b></p> <p>The Charnockite series originally was assumed to have developed by the fractional crystallization of silicate magma. Subsequent studies have shown, however, that many, if not all, of the rocks are metamorphic, formed by recrystallization at high pressures and moderately high temperatures.</p> <p><b>Physiography of the rocks:</b></p> <p>General characteristics of the rocks of this series has recorded that the rocks are in general bluish gray or darkish in colour and extremely fresh in appearance with an even grained granular structure.</p> <p><b>Chemical composition of rocks:</b></p> <p>The compositional characteristics of coexisting orthopyroxene, garnet and biotite have established several petrographic varieties within the Charnockites-Enderbites such as the granulite's and gneisses. Plagioclase feldspars, alkali feldspars and quartz are the salic minerals present in this series of rocks.</p> <p><b>Order of superposition of the proposed lease area,</b></p> |                   |                                                                                  |



|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Age                                                                                                                                                                                                                                                                                                                                                                              |   | Group                                                                                                                                                                 | Rock Formation |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Recent to Sub recent                                                                                                                                                                                                                                                                                                                                                             |   |                                                                                                                                                                       |                |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Archaean                                                                                                                                                                                                                                                                                                                                                                         |   |                                                                                                                                                                       |                |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                  |   | Charnockite Group                                                                                                                                                     | Charnockite    |
| (iv)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Drainage Pattern                                                                                                                                                                                                                                                                                                                                                                 | : | There is no major river or water bodies within 50m radius. The drainage in the area is sub-dendritic in nature.                                                       |                |
| (b)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <p><i>The topographic plan of the lease area prepared on a scale of 1 :1000 or 1 : 2000 with contour interval of 3 to 10m depending upon the topography of the area should be taken as the base plan for preparation of geological plan. The details of exploration already carried out including evidences of mineral existence should be shown on the geological plan:</i></p> |   |                                                                                                                                                                       |                |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | a. Present status:                                                                                                                                                                                                                                                                                                                                                               | : | The QP examined the surface features during survey. It is a fresh quarry lease.                                                                                       |                |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | b. Surface Plan                                                                                                                                                                                                                                                                                                                                                                  | : | Surface plan showing elevation contour and accessibility road was prepared at the scale of 1: 1000, as shown in Plate No. III.                                        |                |
| (c)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Geological sections should be prepared at suitable intervals on a scale of 1: 1000 / 1: 2000:                                                                                                                                                                                                                                                                                    | : | Longitudinal and transverse geological cross sections were prepared at the horizontal scale of 1: 1000 and at the vertical scale of 1:500, as shown in Plate No. IIIA |                |
| (d)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <p><i>Broadly indicate the Yearwise future programme of exploration, taking into consideration the future production programme planned in next five years as in table below:-</i></p> <p>No future programmed proposed in this area. Its massive homogeneous parent rock. Hence exploration proposal is not required to this mining project.</p>                                 |   |                                                                                                                                                                       |                |
| <p><i>(e) Indicate geological and recoverable reserves and grade, duly supported by standard method of estimation and calculations along with required sections (giving split up of various categories i.e. proved, probable, possible). Indicate cut-off grade. Availability of resources should also be indicated for the entire leasehold.</i></p> <p>The geological resources were computed by cross section method with respect to the boundaries of the lease area. In this method, the lease area was divided into one longitudinal and one transverse section to calculate the volume of material up to the depth of 55m below ground level for ten years plan period. (Refer Plate No. III &amp; IIIA). The one longitudinal and two transverse cross section were assigned XY-AB as respectively. Using the cross-sectional</p> |                                                                                                                                                                                                                                                                                                                                                                                  |   |                                                                                                                                                                       |                |

18 V. V. Lakshmi



method, total reserve is estimated to be 2200110m<sup>3</sup> including the resources of safety bank, and Topsoil, etc. Of which, rough stone resources of about 1800090m<sup>3</sup>, topsoil is 200010m<sup>3</sup> and Weathered rock is 200010m<sup>3</sup>.

| GEOLOGICAL RESOURCES |       |                  |                 |                 |                             |                                     |                                     |                              |
|----------------------|-------|------------------|-----------------|-----------------|-----------------------------|-------------------------------------|-------------------------------------|------------------------------|
| Section              | Bench | Length<br>in (m) | Width<br>in (m) | Depth<br>in (m) | Volume<br>In m <sup>3</sup> | Rough<br>Stone in<br>m <sup>3</sup> | Weathered<br>rock in m <sup>3</sup> | Topsoil<br>in m <sup>3</sup> |
| XY-AB                | I     | 226              | 177             | 5               | 200010                      | .....                               | .....                               | 200010                       |
|                      | II    | 226              | 177             | 5               | 200010                      | .....                               | 200010                              | .....                        |
|                      | III   | 226              | 177             | 5               | 200010                      | 200010                              | .....                               | .....                        |
|                      | IV    | 226              | 177             | 5               | 200010                      | 200010                              | .....                               | .....                        |
|                      | V     | 226              | 177             | 5               | 200010                      | 200010                              | .....                               | .....                        |
|                      | VI    | 226              | 177             | 5               | 200010                      | 200010                              | .....                               | .....                        |
|                      | VII   | 226              | 177             | 5               | 200010                      | 200010                              | .....                               | .....                        |
|                      | VIII  | 226              | 177             | 5               | 200010                      | 200010                              | .....                               | .....                        |
|                      | IX    | 226              | 177             | 5               | 200010                      | 200010                              | .....                               | .....                        |
|                      | X     | 226              | 177             | 5               | 200010                      | 200010                              | .....                               | .....                        |
|                      | XI    | 226              | 177             | 5               | 200010                      | 200010                              | .....                               | .....                        |
| TOTAL                |       |                  |                 | 55              | 2200110                     | 1800090                             | 200010                              | 200010                       |

The mineable reserve is estimated to be **984830m<sup>3</sup>** by deducting the reserve safety zone, block in benches from the total Geological resources up to a depth of 55m below ground level. Of which, rough stone is about **676020m<sup>3</sup>**, topsoil is **163280m<sup>3</sup>** and Weathered rock is **145530m<sup>3</sup>**. The commercially viable rough stone has been prepared on 1: 1000 scale and sections are prepared in a scale of 1:1000 in horizontal axis and 1:500 as vertical axis (Refer plate no's. IV & IVA).

#### 4.0 MINING:

- a) Briefly describe the existing / proposed method for developing / working the deposit with all design parameters.  
(Note: In case of pocket deposits, sequence of development/working may be indicated on the same plan)
- The mining operation is open cast, semi-mechanized method are adopted and on single shift basis only. Under the regulation 106 of the Metalliferous Mines Regulations, 1961 in all open cast workings in hard rock, the benches and sides should be properly benched and sloped. The bench height should not exceed 5m and the bench width should not less than the bench height. The slope of the benches should not exceed 45° from horizontal.

- b) *Indicate quantum of development and tonnage and grade of production expected pit wise as in table below.*

Total proposed production for ten years of rough stone is about 676020m<sup>3</sup>, topsoil is 163280m<sup>3</sup> and Weathered rock is 145530m<sup>3</sup> up to a depth of 55m below ground level.(Refer Plate No's. VI & VIA).

| Year        | Plt No.(s) | Topsoil/Overburden (m <sup>3</sup> ) | ROM (m <sup>3</sup> ) | Saleable rough stone (m <sup>3</sup> ) @ 100% | Rough stone rejects(m <sup>3</sup> ) | Sub grade/Weathered rock (m <sup>3</sup> ) | Saleable Topsoil (m <sup>3</sup> ) | Rough stone to waste ratio |
|-------------|------------|--------------------------------------|-----------------------|-----------------------------------------------|--------------------------------------|--------------------------------------------|------------------------------------|----------------------------|
| I           | I          | ...                                  | 408135                | 99325                                         | ...                                  | 145530                                     | 163280                             | ...                        |
| II          | I          | ...                                  | 99305                 | 99305                                         | ...                                  | ...                                        | ...                                | ...                        |
| III         | I          | ...                                  | 99340                 | 99340                                         | ...                                  | ...                                        | ...                                | ...                        |
| IV          | I          | ...                                  | 99365                 | 99365                                         | ...                                  | ...                                        | ...                                | ...                        |
| V           | I          | ...                                  | 99065                 | 99065                                         | ...                                  | ...                                        | ...                                | ...                        |
| VI          | I          | ...                                  | 36975                 | 36975                                         | ...                                  | ...                                        | ...                                | ...                        |
| VII         | I          | ...                                  | 34605                 | 34605                                         | ...                                  | ...                                        | ...                                | ...                        |
| VIII        | I          | ...                                  | 37730                 | 37730                                         | ...                                  | ...                                        | ...                                | ...                        |
| IX          | I          | ...                                  | 39530                 | 39530                                         | ...                                  | ...                                        | ...                                | ...                        |
| X           | I          | ...                                  | 30780                 | 30780                                         | ...                                  | ...                                        | ...                                | ...                        |
| Grand Total |            |                                      | 984830                | 676020                                        | ...                                  | 145530                                     | 163280                             | ...                        |

- c) *Composite plans and Year wise sections (In case of 'A' class mines):*
- Not applicable. It is a "B" class quarry lease





| YEARWISE PRODUCTION RESERVES |                                                                                                                                                                                                                                    |       |               |              |              |                                                          |                               |                             |                           |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|---------------|--------------|--------------|----------------------------------------------------------|-------------------------------|-----------------------------|---------------------------|
| Section                      | Year                                                                                                                                                                                                                               | Bench | Length in (m) | Width in (m) | Depth in (m) | Volume in m <sup>3</sup>                                 | Rough Stone in m <sup>3</sup> | Weathered in m <sup>3</sup> | Topsoil in m <sup>3</sup> |
| XY-AB                        | I-YEAR                                                                                                                                                                                                                             | I     | 208           | 157          | 5            | 163280                                                   | .....                         | .....                       | 163280                    |
|                              |                                                                                                                                                                                                                                    | I     | 198           | 147          | 5            | 145530                                                   | .....                         | 145530                      | .....                     |
|                              |                                                                                                                                                                                                                                    | II    | 145           | 137          | 5            | 99325                                                    | 99325                         | .....                       | .....                     |
|                              | TOTAL                                                                                                                                                                                                                              |       |               |              |              | 408135                                                   | 99325                         | 145530                      | 163280                    |
|                              | II-YEAR                                                                                                                                                                                                                            | II    | 43            | 137          | 5            | 29455                                                    | 29455                         | .....                       | .....                     |
|                              |                                                                                                                                                                                                                                    | IV    | 110           | 127          | 5            | 69850                                                    | 69850                         | .....                       | .....                     |
|                              | TOTAL                                                                                                                                                                                                                              |       |               |              |              | 99305                                                    | 99305                         | 0                           | 0                         |
|                              | III-YEAR                                                                                                                                                                                                                           | IV    | 68            | 127          | 5            | 43180                                                    | 43180                         | .....                       | .....                     |
|                              |                                                                                                                                                                                                                                    | V     | 96            | 117          | 5            | 56160                                                    | 56160                         | .....                       | .....                     |
|                              | TOTAL                                                                                                                                                                                                                              |       |               |              |              | 99340                                                    | 99340                         | 0                           | 0                         |
|                              | IV-YEAR                                                                                                                                                                                                                            | V     | 72            | 117          | 5            | 42120                                                    | 42120                         | .....                       | .....                     |
|                              |                                                                                                                                                                                                                                    | VI    | 107           | 107          | 5            | 57245                                                    | 57245                         | .....                       | .....                     |
|                              | TOTAL                                                                                                                                                                                                                              |       |               |              |              | 99365                                                    | 99365                         | 0                           | 0                         |
|                              | V-YEAR                                                                                                                                                                                                                             | VI    | 51            | 107          | 5            | 27285                                                    | 27285                         | .....                       | .....                     |
|                              |                                                                                                                                                                                                                                    | VII   | 148           | 97           | 5            | 71780                                                    | 71780                         | .....                       | .....                     |
|                              | TOTAL                                                                                                                                                                                                                              |       |               |              |              | 99065                                                    | 99065                         | 0                           | 0                         |
|                              | VI-YEAR                                                                                                                                                                                                                            | VIII  | 85            | 87           | 5            | 36975                                                    | 36975                         | .....                       | .....                     |
|                              |                                                                                                                                                                                                                                    | TOTAL |               |              |              |                                                          | 36975                         | 36975                       | 0                         |
|                              | VII-YEAR                                                                                                                                                                                                                           | VIII  | 53            | 87           | 5            | 23055                                                    | 23055                         | .....                       | .....                     |
|                              |                                                                                                                                                                                                                                    | IX    | 30            | 77           | 5            | 11550                                                    | 11550                         | .....                       | .....                     |
|                              | TOTAL                                                                                                                                                                                                                              |       |               |              |              | 34605                                                    | 34605                         | 0                           | 0                         |
|                              | VIII-YEAR                                                                                                                                                                                                                          | IX    | 98            | 77           | 5            | 37730                                                    | 37730                         | .....                       | .....                     |
|                              |                                                                                                                                                                                                                                    | TOTAL |               |              |              |                                                          | 37730                         | 37730                       | 0                         |
|                              | IX-YEAR                                                                                                                                                                                                                            | X     | 118           | 67           | 5            | 39530                                                    | 39530                         | .....                       | .....                     |
|                              |                                                                                                                                                                                                                                    | TOTAL |               |              |              |                                                          | 39530                         | 39530                       | 0                         |
|                              | X-YEAR                                                                                                                                                                                                                             | XI    | 108           | 57           | 5            | 30780                                                    | 30780                         | .....                       | .....                     |
|                              |                                                                                                                                                                                                                                    | TOTAL |               |              |              |                                                          | 30780                         | 30780                       | 0                         |
|                              | GRAND TOTAL                                                                                                                                                                                                                        |       |               |              |              |                                                          | 984830                        | 676020                      | 145530                    |
| d)                           | Attach supporting composite plan and section showing pit layouts, dumps, stacks of sub-grade mineral, if any, etc.                                                                                                                 |       |               |              |              | Composite plan not prepared in this proposed lease area. |                               |                             |                           |
| e)                           | Indicate proposed rate of production when the mine is fully developed and the expected life of the mine and the year from which effected:<br>At this rate of production, the expected life of quarry is calculated as given below: |       |               |              |              |                                                          |                               |                             |                           |



|               | <b><u>Rough stone:</u></b><br>Mineable reserves of rough stone (10 Years) = 676020m <sup>3</sup><br>Annual Peak production = 99365m <sup>3</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                       |                    |            |          |  |  |  |       |        |                        |          |          |          |   |                             |         |     |     |   |    |             |     |     |   |     |     |     |   |    |     |     |   |   |     |     |   |    |     |     |   |     |     |    |   |      |     |    |   |    |     |    |   |   |     |    |   |    |     |    |   |  |  |  |                    |            |  |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|------------|----------|--|--|--|-------|--------|------------------------|----------|----------|----------|---|-----------------------------|---------|-----|-----|---|----|-------------|-----|-----|---|-----|-----|-----|---|----|-----|-----|---|---|-----|-----|---|----|-----|-----|---|-----|-----|----|---|------|-----|----|---|----|-----|----|---|---|-----|----|---|----|-----|----|---|--|--|--|--------------------|------------|--|
| f)            | Attach a note furnishing a conceptual mining plan for the entire lease period (for "B" category mines) and upto the life of the mine (for "A" category mines) based on the geological, mining and environments considerations:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                       |                    |            |          |  |  |  |       |        |                        |          |          |          |   |                             |         |     |     |   |    |             |     |     |   |     |     |     |   |    |     |     |   |   |     |     |   |    |     |     |   |     |     |    |   |      |     |    |   |    |     |    |   |   |     |    |   |    |     |    |   |  |  |  |                    |            |  |
| i)            | Time frame of completion of mineral exploration program in leasehold area: Give broad description identified potential areas to be covered in the given time frame:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | : Considering the indefinite depth persistence of the rough stone deposit is proved beyond the workable limits about up to a depth of 55m below ground level from the petrogenetic character of the charnockite rock as well as from the actual mining practice in the area and with the current trend of rough stone production the quarry may sustain for 10 years. |                    |            |          |  |  |  |       |        |                        |          |          |          |   |                             |         |     |     |   |    |             |     |     |   |     |     |     |   |    |     |     |   |   |     |     |   |    |     |     |   |     |     |    |   |      |     |    |   |    |     |    |   |   |     |    |   |    |     |    |   |  |  |  |                    |            |  |
| ii)           | Whether ultimate pit limit has been determined and demarcated on surface and geological plan :-<br>The ultimate pit limit has been determined and demarcated in the conceptual plan                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                       |                    |            |          |  |  |  |       |        |                        |          |          |          |   |                             |         |     |     |   |    |             |     |     |   |     |     |     |   |    |     |     |   |   |     |     |   |    |     |     |   |     |     |    |   |      |     |    |   |    |     |    |   |   |     |    |   |    |     |    |   |  |  |  |                    |            |  |
|               | <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th colspan="6">SECTION XY-AB</th> </tr> <tr> <th>Bench</th> <th>Period</th> <th>Overburden/<br/>Mineral</th> <th>L<br/>(m)</th> <th>W<br/>(m)</th> <th>D<br/>(m)</th> </tr> </thead> <tbody> <tr> <td>I</td> <td rowspan="11">Ten years<br/>Plan<br/>Period</td> <td>Topsoil</td> <td>208</td> <td>157</td> <td>5</td> </tr> <tr> <td>II</td> <td rowspan="10">Rough stone</td> <td>198</td> <td>147</td> <td>5</td> </tr> <tr> <td>III</td> <td>188</td> <td>137</td> <td>5</td> </tr> <tr> <td>IV</td> <td>178</td> <td>127</td> <td>5</td> </tr> <tr> <td>V</td> <td>168</td> <td>117</td> <td>5</td> </tr> <tr> <td>VI</td> <td>158</td> <td>107</td> <td>5</td> </tr> <tr> <td>VII</td> <td>148</td> <td>97</td> <td>5</td> </tr> <tr> <td>VIII</td> <td>138</td> <td>87</td> <td>5</td> </tr> <tr> <td>IX</td> <td>128</td> <td>77</td> <td>5</td> </tr> <tr> <td>X</td> <td>118</td> <td>67</td> <td>5</td> </tr> <tr> <td>XI</td> <td>108</td> <td>57</td> <td>5</td> </tr> <tr> <td colspan="3"></td> <td><b>Total Depth</b></td> <td><b>55m</b></td> <td></td> </tr> </tbody> </table> |                                                                                                                                                                                                                                                                                                                                                                       | SECTION XY-AB      |            |          |  |  |  | Bench | Period | Overburden/<br>Mineral | L<br>(m) | W<br>(m) | D<br>(m) | I | Ten years<br>Plan<br>Period | Topsoil | 208 | 157 | 5 | II | Rough stone | 198 | 147 | 5 | III | 188 | 137 | 5 | IV | 178 | 127 | 5 | V | 168 | 117 | 5 | VI | 158 | 107 | 5 | VII | 148 | 97 | 5 | VIII | 138 | 87 | 5 | IX | 128 | 77 | 5 | X | 118 | 67 | 5 | XI | 108 | 57 | 5 |  |  |  | <b>Total Depth</b> | <b>55m</b> |  |
| SECTION XY-AB |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                       |                    |            |          |  |  |  |       |        |                        |          |          |          |   |                             |         |     |     |   |    |             |     |     |   |     |     |     |   |    |     |     |   |   |     |     |   |    |     |     |   |     |     |    |   |      |     |    |   |    |     |    |   |   |     |    |   |    |     |    |   |  |  |  |                    |            |  |
| Bench         | Period                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Overburden/<br>Mineral                                                                                                                                                                                                                                                                                                                                                | L<br>(m)           | W<br>(m)   | D<br>(m) |  |  |  |       |        |                        |          |          |          |   |                             |         |     |     |   |    |             |     |     |   |     |     |     |   |    |     |     |   |   |     |     |   |    |     |     |   |     |     |    |   |      |     |    |   |    |     |    |   |   |     |    |   |    |     |    |   |  |  |  |                    |            |  |
| I             | Ten years<br>Plan<br>Period                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Topsoil                                                                                                                                                                                                                                                                                                                                                               | 208                | 157        | 5        |  |  |  |       |        |                        |          |          |          |   |                             |         |     |     |   |    |             |     |     |   |     |     |     |   |    |     |     |   |   |     |     |   |    |     |     |   |     |     |    |   |      |     |    |   |    |     |    |   |   |     |    |   |    |     |    |   |  |  |  |                    |            |  |
| II            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Rough stone                                                                                                                                                                                                                                                                                                                                                           | 198                | 147        | 5        |  |  |  |       |        |                        |          |          |          |   |                             |         |     |     |   |    |             |     |     |   |     |     |     |   |    |     |     |   |   |     |     |   |    |     |     |   |     |     |    |   |      |     |    |   |    |     |    |   |   |     |    |   |    |     |    |   |  |  |  |                    |            |  |
| III           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                       | 188                | 137        | 5        |  |  |  |       |        |                        |          |          |          |   |                             |         |     |     |   |    |             |     |     |   |     |     |     |   |    |     |     |   |   |     |     |   |    |     |     |   |     |     |    |   |      |     |    |   |    |     |    |   |   |     |    |   |    |     |    |   |  |  |  |                    |            |  |
| IV            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                       | 178                | 127        | 5        |  |  |  |       |        |                        |          |          |          |   |                             |         |     |     |   |    |             |     |     |   |     |     |     |   |    |     |     |   |   |     |     |   |    |     |     |   |     |     |    |   |      |     |    |   |    |     |    |   |   |     |    |   |    |     |    |   |  |  |  |                    |            |  |
| V             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                       | 168                | 117        | 5        |  |  |  |       |        |                        |          |          |          |   |                             |         |     |     |   |    |             |     |     |   |     |     |     |   |    |     |     |   |   |     |     |   |    |     |     |   |     |     |    |   |      |     |    |   |    |     |    |   |   |     |    |   |    |     |    |   |  |  |  |                    |            |  |
| VI            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                       | 158                | 107        | 5        |  |  |  |       |        |                        |          |          |          |   |                             |         |     |     |   |    |             |     |     |   |     |     |     |   |    |     |     |   |   |     |     |   |    |     |     |   |     |     |    |   |      |     |    |   |    |     |    |   |   |     |    |   |    |     |    |   |  |  |  |                    |            |  |
| VII           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                       | 148                | 97         | 5        |  |  |  |       |        |                        |          |          |          |   |                             |         |     |     |   |    |             |     |     |   |     |     |     |   |    |     |     |   |   |     |     |   |    |     |     |   |     |     |    |   |      |     |    |   |    |     |    |   |   |     |    |   |    |     |    |   |  |  |  |                    |            |  |
| VIII          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                       | 138                | 87         | 5        |  |  |  |       |        |                        |          |          |          |   |                             |         |     |     |   |    |             |     |     |   |     |     |     |   |    |     |     |   |   |     |     |   |    |     |     |   |     |     |    |   |      |     |    |   |    |     |    |   |   |     |    |   |    |     |    |   |  |  |  |                    |            |  |
| IX            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                       | 128                | 77         | 5        |  |  |  |       |        |                        |          |          |          |   |                             |         |     |     |   |    |             |     |     |   |     |     |     |   |    |     |     |   |   |     |     |   |    |     |     |   |     |     |    |   |      |     |    |   |    |     |    |   |   |     |    |   |    |     |    |   |  |  |  |                    |            |  |
| X             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                       | 118                | 67         | 5        |  |  |  |       |        |                        |          |          |          |   |                             |         |     |     |   |    |             |     |     |   |     |     |     |   |    |     |     |   |   |     |     |   |    |     |     |   |     |     |    |   |      |     |    |   |    |     |    |   |   |     |    |   |    |     |    |   |  |  |  |                    |            |  |
| XI            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                       | 108                | 57         | 5        |  |  |  |       |        |                        |          |          |          |   |                             |         |     |     |   |    |             |     |     |   |     |     |     |   |    |     |     |   |   |     |     |   |    |     |     |   |     |     |    |   |      |     |    |   |    |     |    |   |   |     |    |   |    |     |    |   |  |  |  |                    |            |  |
|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                       | <b>Total Depth</b> | <b>55m</b> |          |  |  |  |       |        |                        |          |          |          |   |                             |         |     |     |   |    |             |     |     |   |     |     |     |   |    |     |     |   |   |     |     |   |    |     |     |   |     |     |    |   |      |     |    |   |    |     |    |   |   |     |    |   |    |     |    |   |  |  |  |                    |            |  |
| iii)          | Whether the site for disposal of waste rock or an un-saleable material have/ has been examined for adequacy of land and suitability of long term use in the event of continuation of mining activity: -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | : The weathered rock is 145530m <sup>3</sup> will be removed and dump in the safety area.<br>Topsoil is 163280m <sup>3</sup> will be removed and stacked for earth bund in the the lease area to prevent inherent entry of cattle's and human as per rules 106, Metalliferous Mines Regulations, 1961.                                                                |                    |            |          |  |  |  |       |        |                        |          |          |          |   |                             |         |     |     |   |    |             |     |     |   |     |     |     |   |    |     |     |   |   |     |     |   |    |     |     |   |     |     |    |   |      |     |    |   |    |     |    |   |   |     |    |   |    |     |    |   |  |  |  |                    |            |  |

22 V. V. Lakshmi

|     |                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| iv) | Whether back filling of pits after recovery of mineral up to techno -economically feasible depth envisaged. If so, describe the broad features of the proposal: -                | : As the depth of persistence of the deposit may likely to continue for further depth, it is proposed not to backfilled the quarry pit.                                                                                                                                                                                                                                                                                                                                        |
| v)  | Whether post mining land use envisaged: -                                                                                                                                        | : At the end of mining activities over the quarry pit may be utilized for storage of rain water and may be converted in to dumping yards for solid waste by adopting suitable technologies.                                                                                                                                                                                                                                                                                    |
| g)  | Open cast mining                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| i)  | Describe briefly giving salient features of the mode of working (Mechanized, Semi-Mechanized, manual)                                                                            | : It is a fresh quarry lease. The mining operation is opencast, semi-mechanized methods are adopted and on single shift basis only. Under the regulation 106 of the Metalliferous Mines Regulations, 1961 in all opencast workings in hard rock, the benches and sides should be properly benched and sloped. The bench height should not exceed 5m and the bench width should not less than the bench height. The slope of the benches should not exceed 45° from horizontal. |
| ii) | Describe briefly the layout of mine workings, the layout of faces and sites for disposal of overburden/waste. A reference to the plans enclosed under 4(b) and 4(d) will suffice | : The rough stone is proposed to quarry at 5m bench height & width conventional opencast semi mechanized quarrying operation using shot hole drilling with the help of tractor mounted compressor attached with jack hammers, smooth blasting and waste and are removal using Hydraulic excavator and loaded directly to the tippers and transported to the needy customer.<br>Bench height = 5mts.<br>Bench width = 5mts.                                                     |
|     | a. Details of Topsoil/Overburden                                                                                                                                                 | : There is a topsoil of 163280m <sup>3</sup> will be removed and stacked for earth bund in the                                                                                                                                                                                                                                                                                                                                                                                 |

|                     |                                                                                                                                                                                                                                                                                                                                                                                                                                          | lease area.                                                                                                                             |                 |                  |                 |              |              |        |                     |    |                       |           |        |        |    |            |   |    |     |    |        |    |  |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|-----------------|------------------|-----------------|--------------|--------------|--------|---------------------|----|-----------------------|-----------|--------|--------|----|------------|---|----|-----|----|--------|----|--|
|                     | b. Rough Stone waste and side burden waste:-                                                                                                                                                                                                                                                                                                                                                                                             | The recovery of rough stone and side burden waste in this quarry is 100%. There is no rough stone waste or side burden will be removed. |                 |                  |                 |              |              |        |                     |    |                       |           |        |        |    |            |   |    |     |    |        |    |  |
| H                   | Underground Mining                                                                                                                                                                                                                                                                                                                                                                                                                       | Not applicable                                                                                                                          |                 |                  |                 |              |              |        |                     |    |                       |           |        |        |    |            |   |    |     |    |        |    |  |
| i)                  | <b>Extent of mechanization:</b><br>Describe briefly including the calculation for adequacy and type of machinery and equipment proposed to be used in different mining operations.                                                                                                                                                                                                                                                       |                                                                                                                                         |                 |                  |                 |              |              |        |                     |    |                       |           |        |        |    |            |   |    |     |    |        |    |  |
|                     | <b>(1) Drilling Machines:</b><br>Drilling of shot holes will be carried out using tractor mounted compressor and jack hammer. Details of drilling equipment's are given below.                                                                                                                                                                                                                                                           |                                                                                                                                         |                 |                  |                 |              |              |        |                     |    |                       |           |        |        |    |            |   |    |     |    |        |    |  |
|                     | <table border="1"> <thead> <tr> <th>Type</th> <th>Nos</th> <th>Dia of hole (mm)</th> <th>Size / Capacity</th> <th>Make</th> <th>Motive power</th> <th>H.P.</th> </tr> </thead> <tbody> <tr> <td>Jack Hammer</td> <td>4</td> <td>32 mm</td> <td>Hand held</td> <td>--</td> <td>Diesel</td> <td>--</td> </tr> <tr> <td>Compressor</td> <td>2</td> <td>--</td> <td>Air</td> <td>--</td> <td>Diesel</td> <td>--</td> </tr> </tbody> </table> | Type                                                                                                                                    | Nos             | Dia of hole (mm) | Size / Capacity | Make         | Motive power | H.P.   | Jack Hammer         | 4  | 32 mm                 | Hand held | --     | Diesel | -- | Compressor | 2 | -- | Air | -- | Diesel | -- |  |
| Type                | Nos                                                                                                                                                                                                                                                                                                                                                                                                                                      | Dia of hole (mm)                                                                                                                        | Size / Capacity | Make             | Motive power    | H.P.         |              |        |                     |    |                       |           |        |        |    |            |   |    |     |    |        |    |  |
| Jack Hammer         | 4                                                                                                                                                                                                                                                                                                                                                                                                                                        | 32 mm                                                                                                                                   | Hand held       | --               | Diesel          | --           |              |        |                     |    |                       |           |        |        |    |            |   |    |     |    |        |    |  |
| Compressor          | 2                                                                                                                                                                                                                                                                                                                                                                                                                                        | --                                                                                                                                      | Air             | --               | Diesel          | --           |              |        |                     |    |                       |           |        |        |    |            |   |    |     |    |        |    |  |
|                     | <b>(2) Loading Equipment:</b> <table border="1"> <thead> <tr> <th>Type</th> <th>Nos</th> <th>Size / Capacity</th> <th>Make</th> <th>Motive power</th> <th>H.P.</th> </tr> </thead> <tbody> <tr> <td>Hydraulic Excavator</td> <td>2</td> <td>2.9-4.5m<sup>3</sup></td> <td>--</td> <td>Diesel</td> <td>--</td> </tr> </tbody> </table>                                                                                                    |                                                                                                                                         | Type            | Nos              | Size / Capacity | Make         | Motive power | H.P.   | Hydraulic Excavator | 2  | 2.9-4.5m <sup>3</sup> | --        | Diesel | --     |    |            |   |    |     |    |        |    |  |
| Type                | Nos                                                                                                                                                                                                                                                                                                                                                                                                                                      | Size / Capacity                                                                                                                         | Make            | Motive power     | H.P.            |              |              |        |                     |    |                       |           |        |        |    |            |   |    |     |    |        |    |  |
| Hydraulic Excavator | 2                                                                                                                                                                                                                                                                                                                                                                                                                                        | 2.9-4.5m <sup>3</sup>                                                                                                                   | --              | Diesel           | --              |              |              |        |                     |    |                       |           |        |        |    |            |   |    |     |    |        |    |  |
|                     | <b>(3) Haulage and Transport Equipment</b><br>(a) Haulage within the mining leasehold:                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                         |                 |                  |                 |              |              |        |                     |    |                       |           |        |        |    |            |   |    |     |    |        |    |  |
|                     | <table border="1"> <thead> <tr> <th>Type</th> <th>Nos</th> <th>Size / Capacity</th> <th>Make</th> <th>Motive power</th> <th>H.P.</th> </tr> </thead> <tbody> <tr> <td>Tipper</td> <td>8</td> <td>--</td> <td>--</td> <td>Diesel</td> <td>--</td> </tr> </tbody> </table>                                                                                                                                                                 | Type                                                                                                                                    | Nos             | Size / Capacity  | Make            | Motive power | H.P.         | Tipper | 8                   | -- | --                    | Diesel    | --     |        |    |            |   |    |     |    |        |    |  |
| Type                | Nos                                                                                                                                                                                                                                                                                                                                                                                                                                      | Size / Capacity                                                                                                                         | Make            | Motive power     | H.P.            |              |              |        |                     |    |                       |           |        |        |    |            |   |    |     |    |        |    |  |
| Tipper              | 8                                                                                                                                                                                                                                                                                                                                                                                                                                        | --                                                                                                                                      | --              | Diesel           | --              |              |              |        |                     |    |                       |           |        |        |    |            |   |    |     |    |        |    |  |
|                     | <b>Whether the dumpers are fitted with exhaust conditioner should be indicated:</b><br>The dumpers not used in this quarry area, hence it's a small B category mine.                                                                                                                                                                                                                                                                     |                                                                                                                                         |                 |                  |                 |              |              |        |                     |    |                       |           |        |        |    |            |   |    |     |    |        |    |  |
| b)                  | Transport from mine head to the destination :                                                                                                                                                                                                                                                                                                                                                                                            | Tipper will be used for transport rough stone and topsoil from the mine head to needy customer.                                         |                 |                  |                 |              |              |        |                     |    |                       |           |        |        |    |            |   |    |     |    |        |    |  |
| c)                  | Describe briefly the transport system (please specify) :                                                                                                                                                                                                                                                                                                                                                                                 | Hydraulic excavator and tippers utilized for internal transport sizeable rough stone lumps and deliver to the customer's area.          |                 |                  |                 |              |              |        |                     |    |                       |           |        |        |    |            |   |    |     |    |        |    |  |
|                     | i) Ore transported by: own trucks / hired trucks :                                                                                                                                                                                                                                                                                                                                                                                       | Hired trucks for initially production purposes                                                                                          |                 |                  |                 |              |              |        |                     |    |                       |           |        |        |    |            |   |    |     |    |        |    |  |



|    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |                                                                                                                                                                       |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | ii) Main destination to which ore is transported (giving to and from distance)                                                                                                                                                                                                                                                                                                                                                                                                                     | :   | The excavated stone materials road metal will be supplied to the consumers for road laying, earth filling, building construction, etc                                 |
| a) | Details of hauling / transport equipment:                                                                                                                                                                                                                                                                                                                                                                                                                                                          |     |                                                                                                                                                                       |
|    | Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Nos | Size / Capacity                                                                                                                                                       |
|    | --                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | --  | --                                                                                                                                                                    |
|    | --                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | --  | --                                                                                                                                                                    |
| 4) | (4). Miscellaneous:<br>Describe briefly any allied operations and machineries related to the mining of the deposit not covered earlier.                                                                                                                                                                                                                                                                                                                                                            |     |                                                                                                                                                                       |
|    | (A) Operations                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | :   | The mining operation is open-cast, semi-mechanized methods are adopted and on single shift basis only.                                                                |
|    | (B) Machineries deployed                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | :   | Machineries like Tractor mounted compressor attached with Jack hammers is proposed to drilling and blasting. Hydraulic Excavators and tipper combination are adapted. |
| 5  | <b>BLASTING:</b><br><i>a) Broad blasting parameters like charge per hole, blasting pattern, charge per delay, maximum number of holes blasted in a round, manner and sequence of firing, etc.</i><br>Blasting pattern:<br>The quarrying operation is proposed to carried by open cast mining in conjunction with conventional method using jack hammer drilling and blasting for shattering effect and loosen the rough stone.<br>Rough stone production for 10 years = <b>676020m<sup>3</sup></b> |     |                                                                                                                                                                       |
|    | BLAST DESIGN                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     |                                                                                                                                                                       |
|    | Blasthole Diameter (D) in mm                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     | 32                                                                                                                                                                    |
|    | Burden (B) in m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     | 1.2                                                                                                                                                                   |
|    | Spacing (S) in m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     | 1.38                                                                                                                                                                  |
|    | Subdrill in m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |     | 0.5                                                                                                                                                                   |
|    | Charge length (C) in m                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     | 0.70                                                                                                                                                                  |
|    | Stemming                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |     | 0.5                                                                                                                                                                   |
|    | Hole Length (L) in m                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     | 1.2                                                                                                                                                                   |
|    | Bench Height (BH) in m                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     | 2.5                                                                                                                                                                   |

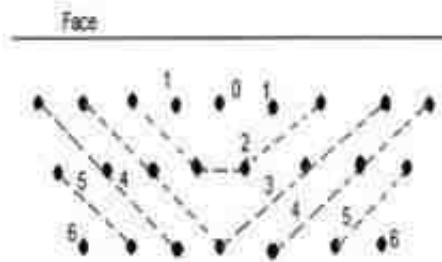


*V. V. Lakshmi*



|                                                 |           |
|-------------------------------------------------|-----------|
| Mass of explosive/hole in g                     | 4376      |
| Stemming material size in mm                    | 25        |
| Burden stiffness ratio                          | 2.0       |
| Blast volume/hole in m <sup>3</sup>             | 4.14      |
| Production of rough stone/day in m <sup>3</sup> | 241       |
| Number of blast holes/day                       | 58        |
| Number of blast round/day                       | 2         |
| Blasthole pattern                               | Staggered |
| Mass of explosive /day in kg                    | 25.51     |
| Powder factor in kg/m <sup>3</sup>              | 0.11      |
| Loading density                                 | 0.63      |
| Type of explosives                              | Slurry    |
| Diameter of packaging in mm                     | 25        |
| Initiation system                               | NONEL     |

Note: If >2kg of explosives per day use for blasting if proponent get the permission from the DGMS



Staggered method of mining

**b) Type of explosives used / to be used:**

Following explosives are recommended for efficient blasting with safe practice.

Small dia. 25mm slurry explosives are proposed to be used for shattering and heaving effect for removal and winning of rough stone. No deep hole drilling or primary blasting is proposed.

**c) Measures proposed to minimize ground vibration due to blasting:**

The control blasting measures is being adopted for minimizing ground vibration and fly rock.

Shallow depths jack hammer drilling and blasting is proposed to be carried out with minimum use of explosive mainly to give hearing effect in rough stone for easy excavation and to control fly rock.

Delay detonators:

Delay blasting permits to divide the shot to smaller charges, which are detonated in a predetermined millisecond sequence at specific time intervals. The



*V. V. V. V.*





major advantages of delay blasting are:

- ❖ Reduction of ground vibration
- ❖ Reduction in air blast
- ❖ Reduction in over break
- ❖ Improved fragmentation
- ❖ Better control of fly rock

Blasting program for the production per day

|                           |                             |
|---------------------------|-----------------------------|
| No of holes               | : 58 holes                  |
| Yield                     | : 241m <sup>3</sup>         |
| Total explosive required  | : 25.51kg-Slurry explosives |
| Charge per hole           | : 0.5kg                     |
| Blasting at day time only | : 12.0p.m-1.0p.m            |

|    |                                                                           |   |                                                                                                                                                                                                                                                      |
|----|---------------------------------------------------------------------------|---|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| c) | Powder factor in ore and overburden / waste / development heading / stope | : | Powder factor is proposed as 0.11kg per hole of explosives                                                                                                                                                                                           |
| d) | Whether secondary blasting is needed, if so describe it briefly           | : | There is no secondary blasting involved.                                                                                                                                                                                                             |
| e) | Storage of explosives (like capacity and type of explosive magazine)      | : | 1. The applicant is advised to engage an authorized explosive agency to carry out blasting.<br>2. First Aid Box will be keeping ready at all the time.<br>3. Necessary precautionary announcement will be carried out before the blasting operation. |

**6. MINE DRAINAGE:**

|    |                                                                                       |   |                                                                                                                                                                              |
|----|---------------------------------------------------------------------------------------|---|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| a) | Likely depth of water table based on observations from nearby wells and water bodies. | : | The ground water table is reported as of 65m in summer and 60m in rainy season from the general ground level observed in the adjacent bore well.                             |
| b) | Workings expected to be _____ m. above / reach below water table by the year _____.   | : | Proposed mining depth is 55m below ground level. Now, the present Mining lease shall be proposed above the water table and hence, quarrying may not affect the ground water. |
| c) | Quantity and quality of water likely to be encountered, the                           | : | The ground water may not rise immediately in this type of mining. However, the rain                                                                                          |

21

V. V. V. V.



|                                                              |                                                                                                                                                                                        |   |                                                                                                                                                                                                                                                                                           |
|--------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                              | pumping arrangements and places where the mine water is finally proposed to be discharged                                                                                              |   | water percolation and collection of water from the seepage shaft less than 300 lpm and it shall be pumped periodically by a stand by diesel powered centrifugal pump motivated with 7.5 H.P. Motor. The quality of water is potable and it is not contaminated with any hazardous things. |
| <b>7. STACKING OF MINERAL REJECTS AND DISPOSAL OF WASTE:</b> |                                                                                                                                                                                        |   |                                                                                                                                                                                                                                                                                           |
| a).                                                          | Indicate briefly the nature and quantity of top soil, overburden / waste and mineral rejects likely to be generated during the years:<br>No other wastes are removed during years.     |   |                                                                                                                                                                                                                                                                                           |
| b).                                                          | Land chosen for disposal of waste with proposed justification                                                                                                                          | : | There is a topsoil of <b>163280m<sup>3</sup></b> will be removed and stacked for earth bund in the lease area.                                                                                                                                                                            |
| c).                                                          | Attach a note indicating the manner of disposal and configuration, sequence of buildup of dumps along with the proposals for the stacking of sub-grade ore, to be indicated Year wise. | : | The recovery of rough stone in this quarry is 100%. If rough stone may be unsold will be keep within the lease boundary.                                                                                                                                                                  |
| <b>8. USE OF MINERAL:</b>                                    |                                                                                                                                                                                        |   |                                                                                                                                                                                                                                                                                           |
| a).                                                          | Describe briefly the end-use of the mineral (sale to intermediary parties, captive consumption, export, industrial use)                                                                | : | The excavated stone materials will be supplied to the consumers like stone pillar, sized stone, etc. For instance, aggregates are mostly used for building, roads and footpaths, etc                                                                                                      |
| b).                                                          | Indicate physical and chemical specifications stipulated by buyers                                                                                                                     | : | Basically, the materials produced at this quarry are rough stone (charnockite) the same are used for building materials and road metal. So, there is no chemical specifications are specified. Only physical specifications are involved.                                                 |
| c).                                                          | Give details in case blending of different grades of ores is being practiced or is to be practiced at the mine to meet specifications stipulated by buyers.                            | : | Not blending process is involved, after blasting the rough stone will be directly loaded to the needy customer.                                                                                                                                                                           |



V. V. Lakshmi





|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |                                                                                                                                                                                                                                                                                                               |    |                |               |      |  |  |               |      |  |  |                |   |  |  |         |     |    |           |                   |         |  |  |  |                       |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----------------|---------------|------|--|--|---------------|------|--|--|----------------|---|--|--|---------|-----|----|-----------|-------------------|---------|--|--|--|-----------------------|
| 9.  | <b>OTHERS</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                   |                                                                                                                                                                                                                                                                                                               |    |                |               |      |  |  |               |      |  |  |                |   |  |  |         |     |    |           |                   |         |  |  |  |                       |
|     | Describe briefly the following<br>a) Site services                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | :                 | Infrastructure required for such mines like office, stores, canteen, first aid room, shelter latrine and bath room provided as per the Metalliferous Mines Regulations, 1961 as a welfare amenity for our quarry laborers.                                                                                    |    |                |               |      |  |  |               |      |  |  |                |   |  |  |         |     |    |           |                   |         |  |  |  |                       |
|     | <p>b) Employment potential:</p> <p>As per Mines safety under the provisions of Metalliferous Mines Rules, 1961 under the Mines Act, 1952, whenever the workers are employed more than 10, it is preferred to have a qualified Mining Mate to keep all the production workers directly under his control and supervision.</p> <p>The following man power is proposed for quarrying stone material during the ten years period the same manpower will be utilize for this mining plan period to achieve the proposed production and to comply the provisions of as per the MMR, 1961 norms.</p> <table border="1"> <tr> <td>1.</td> <td>Highly Skilled</td> <td>Mines Manager</td> <td>1No.</td> </tr> <tr> <td></td> <td></td> <td>Mine Engineer</td> <td>1No.</td> </tr> <tr> <td></td> <td></td> <td>Mine Geologist</td> <td>—</td> </tr> <tr> <td></td> <td></td> <td>Blaster</td> <td>1No</td> </tr> <tr> <td>2.</td> <td>Unskilled</td> <td>Musdoor / Labours</td> <td>20 No's</td> </tr> <tr> <td colspan="3"></td> <td><b>Total = 23No's</b></td> </tr> </table> |                   |                                                                                                                                                                                                                                                                                                               | 1. | Highly Skilled | Mines Manager | 1No. |  |  | Mine Engineer | 1No. |  |  | Mine Geologist | — |  |  | Blaster | 1No | 2. | Unskilled | Musdoor / Labours | 20 No's |  |  |  | <b>Total = 23No's</b> |
| 1.  | Highly Skilled                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Mines Manager     | 1No.                                                                                                                                                                                                                                                                                                          |    |                |               |      |  |  |               |      |  |  |                |   |  |  |         |     |    |           |                   |         |  |  |  |                       |
|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Mine Engineer     | 1No.                                                                                                                                                                                                                                                                                                          |    |                |               |      |  |  |               |      |  |  |                |   |  |  |         |     |    |           |                   |         |  |  |  |                       |
|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Mine Geologist    | —                                                                                                                                                                                                                                                                                                             |    |                |               |      |  |  |               |      |  |  |                |   |  |  |         |     |    |           |                   |         |  |  |  |                       |
|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Blaster           | 1No                                                                                                                                                                                                                                                                                                           |    |                |               |      |  |  |               |      |  |  |                |   |  |  |         |     |    |           |                   |         |  |  |  |                       |
| 2.  | Unskilled                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Musdoor / Labours | 20 No's                                                                                                                                                                                                                                                                                                       |    |                |               |      |  |  |               |      |  |  |                |   |  |  |         |     |    |           |                   |         |  |  |  |                       |
|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   | <b>Total = 23No's</b>                                                                                                                                                                                                                                                                                         |    |                |               |      |  |  |               |      |  |  |                |   |  |  |         |     |    |           |                   |         |  |  |  |                       |
| 10  | <b>MINERAL PROCESSING/BENEFICIATIONS:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                   |                                                                                                                                                                                                                                                                                                               |    |                |               |      |  |  |               |      |  |  |                |   |  |  |         |     |    |           |                   |         |  |  |  |                       |
| (a) | If processing / beneficiations of the ore or minerals mined is planned to be conducted on site or adjacent to the extraction area, briefly describe the nature of the processing /beneficiation. This should indicate size and grade of feed material and concentrate (finished marketable product), recovery rate.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | :                 | <p>Excavated rough stone minerals directly will be used by the applicant for required size ½, ¾ and 1½ inches Jelly which are mainly used in road and building construction purpose.</p> <p>The recovery of rough stone in this quarry is 100%.</p>                                                           |    |                |               |      |  |  |               |      |  |  |                |   |  |  |         |     |    |           |                   |         |  |  |  |                       |
| (b) | Explain the disposal method for tailings or waste from the processing plant (quantity and quality of tailings proposed to be discharged, size and capacity of tailing pond, toxic effect of such tailings, if any,                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | :                 | <p>No water shall be used for quarrying or any other processing except drinking water to be drawn from public sources. Some stagnation of rain water in the pit shall be used for drilling and spraying haul roads. Therefore, need for tailing dam doesn't arise. But tailing control of rain water flow</p> |    |                |               |      |  |  |               |      |  |  |                |   |  |  |         |     |    |           |                   |         |  |  |  |                       |



|     |                                                                                                                                                   |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-----|---------------------------------------------------------------------------------------------------------------------------------------------------|---|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     | with process adopted to neutralize any such effect before their disposal and dealing of excess water from the tailing dam).                       |   | during rainy season has to be decanting the SPM in a pond before passing the water in to natural system.                                                                                                                                                                                                                                                                                                                                                                            |
| (c) | A flow sheet or schematic diagram of the processing procedure should be attached.                                                                 | : | Not applicable.                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| (d) | Specify quantity and type of chemicals to be used in the processing plant.                                                                        | : | Not applicable                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| (e) | Specify quantity and type of chemicals to be stored on site / plant.                                                                              | : | Not applicable                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| (f) | Indicate quantity (cu.m. per day) of water required for mining and processing and sources of supply of water. Disposal of water and of recycling. | : | <p>Drinking is 0.2KLD, utilized water is 0.8KLD, Dust suppression is 1.0KLD and Green Belt is 1.0KLD. Minimum quantity of water 3.0KLD per day. It is proposed to make an authorized water vendors for drinking water, dust suppression. The workers utilized water will be used for green belt development.</p> <p>The sewage water to a tune of 0.9KLD generated from the mine office toilet and mine labour toilet will be diverted to the septic tank followed by soak pit.</p> |



30

V.V. Lakshmi

## PART – B

### 11.0 ENVIRONMENTAL MANAGEMENT PLAN:

a) Attach a note on the status of Baseline information with regard to the following:

11.1 Fresh lease land use pattern indicating the area already degraded due to quarrying /pitting, dumping, roads, processing plant, workshop, township etc in a tabular form. The present land use pattern is given as below.

| Sl. No.     | Land Use                 | Present area (Hect.) |
|-------------|--------------------------|----------------------|
| 1.          | Area under Mining        | Nil                  |
| 2           | Infrastructure           | Nil                  |
| 3           | Roads                    | Nil                  |
| 4           | Unutilized               | 0.32.5               |
| 5           | Green belt               | Nil                  |
| 6           | Settling Tank & Drainage | Nil                  |
| 7           | Dump                     | 3.67.50              |
| Grand Total |                          | 4.00.0               |

11.2 Water Regime : Water table in this area is noticed at a depth of 65m in summer and 60m in rainy season from the general ground level and presently the quarrying of rough stone is ultimate up to a depth of 55m below ground level. Hence, it will not affect the ground water depletion of this area. It is proposed to make an authorized water vendors for drinking water, dust suppression. The workers utilized water will be used for green belt development.

11.3 Flora and Fauna : There is no major flora observed in this area and except bushes, shrubs, no other valuable trees are noticed in the lease area. Further, neither flora of botanical interest nor fauna of zoological interest is noticed in this area.

11.4 Quality of air, ambient noise level and water : Air or dust expected to be generated from drilling process, hauling roads, places of excavation etc., will be suppressed by periodical wetting of land by water spraying. Quarrying of rough stone will be carried out by drilling and blasting by using low power explosives, and hence, noise will be very



|      |                                                                                                                                                                                                                                                                         |                        |                                                                                                                                                                                                                                                  |
|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      |                                                                                                                                                                                                                                                                         |                        | minimum. However, periodical noise monitoring will be carried out every six months around the quarry site.                                                                                                                                       |
| 11.5 | <b>Climatic conditions:</b><br><br>Krishnagiri, India weather forecasted for the maximum temperature of 29°C / 84°F. Min temperature will be 18°C/64°F. Most precipitation falling will be 8.20mm/0.32inch. Windiest day is expected to see wind of upto 17kmph/ 11mph. |                        |                                                                                                                                                                                                                                                  |
| 11.6 | <b>Human Settlement:</b><br><br>The nearest villages are found in the buffer zone with population as per 2011 census.                                                                                                                                                   |                        |                                                                                                                                                                                                                                                  |
|      | <b>S.No</b>                                                                                                                                                                                                                                                             | <b>Village</b>         | <b>Direction</b>                                                                                                                                                                                                                                 |
|      | 1                                                                                                                                                                                                                                                                       | Koneripalli            | North                                                                                                                                                                                                                                            |
|      | 2                                                                                                                                                                                                                                                                       | Sappadi                | East                                                                                                                                                                                                                                             |
|      | 3                                                                                                                                                                                                                                                                       | Kukkala Palli          | West                                                                                                                                                                                                                                             |
|      | 4                                                                                                                                                                                                                                                                       | Tirumalaigovunikotta   | Southwest                                                                                                                                                                                                                                        |
|      |                                                                                                                                                                                                                                                                         | <b>Distance in Kms</b> | <b>Population</b>                                                                                                                                                                                                                                |
|      |                                                                                                                                                                                                                                                                         | 2.10km                 | 865                                                                                                                                                                                                                                              |
|      |                                                                                                                                                                                                                                                                         | 1.14km                 | 662                                                                                                                                                                                                                                              |
|      |                                                                                                                                                                                                                                                                         | 1.79Km                 | 225                                                                                                                                                                                                                                              |
|      |                                                                                                                                                                                                                                                                         | 1.8km                  | 659                                                                                                                                                                                                                                              |
| 11.7 | Public buildings, places of worship and monuments                                                                                                                                                                                                                       | :                      | No infrastructure like residential building, are found within radius of 300m. The places of special interest like archeological monuments, Sanctuaries, etc., are found around 10km radius.                                                      |
| 11.8 | Attach plans showing the locations of sampling stations                                                                                                                                                                                                                 | :                      | The proposed Ambient air quality, Water quality Ambient noise level and vibration are periodically tested for every season (6 months once) around 5km radius as per the guidance of MoEF and EIA Notification 2006 and also covering DGMS norms. |
| 11.9 | Does area (partly or fully) fall under notified area under Water (Prevention & Control of Pollution), Act, 1974                                                                                                                                                         | :                      | The proposed area not fall under notified area under Water (Prevention & Control of Pollution), Act, 1974                                                                                                                                        |

b) Attach an Environmental Impact Assessment Statement describing the impact of Mining and beneficiation on environment on the following over the next five years (and upto conceptual plan period for 'A' category mines)



i) Land area indicating the area likely to be degraded due to quarrying pitting, dumping, roads, workshop, processing plant, township etc:

Due to quarrying and exploitation of the rough stone, there will impact in the form i.e. change in the ground profile, pits, and dumps. The details of the land use pattern, during the ensuing plan period and till lease period is shown in the tabular form:

| Sl. No.            | Land Use                 | Area in use during the quarrying period (Hect.) |
|--------------------|--------------------------|-------------------------------------------------|
| 1                  | Area under Mining        | 3.28.0                                          |
| 2                  | Infrastructure           | 0.02.0                                          |
| 3                  | Roads                    | 0.05.0                                          |
| 4                  | Green Belt               | 0.57.0                                          |
| 5                  | Un-Utilized Area         | Nil                                             |
| 6                  | Drainage & Settling Tank | 0.08.0                                          |
| <b>Grand Total</b> |                          | <b>4.00.0</b>                                   |

ii). Air Quality  
Air or dust expected to be generated from drilling process, hauling roads, places of excavation etc., will be suppressed by periodical wetting of land by water spraying.

iii). Water quality  
A water sample from the open/bore wells was tested to NABL approved lab to assess hardness, Salinity, colour, Specific gravity, etc.

iv). Noise levels  
Quarrying of rough stone will be carried out by drilling and blasting by using low power explosives, and hence, noise will be very minimum. However, periodical noise level monitoring will be carried out every six months around the quarry site.

v). Vibration levels (due to blasting)  
No deep hole blasting envisaged. Small dia shot holes are used for breaking boulders. The maximum peak particles velocity shall be recorded using mini seismograph devices as per the guidance of MoEF and EIA Notification 2006 and also covering DGMS norms.



|        |                           |                                                                                                                             |
|--------|---------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| vi).   | Water regime              | No major river or any water track are found around 500m radius.                                                             |
| vii).  | Socio-economics           | 1. To provide Employment opportunities of the nearby villagers.<br>2. For the cultural development of the nearby villagers. |
| viii). | Historical monuments etc. | There are no historical monuments, etc found around 500m radius.                                                            |

c) Attach an Environmental Management Plan (supported by appropriate plans and sections) defining the time bound action proposed to be taken with sequence & timing in the following areas (or diagrams should be used):

|       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                            |
|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| i).   | temporary storage and utilization of topsoil                                                                                                                                                                                                                                                                                                                                                                                                                                                              | : No separate of topsoil will be removed.                                                                                                                                                                                                                                                                                                                                  |
| ii).  | Yearwise proposal for reclamation of land affected by abandoned quarries and other mining activities during ten years (and upto conceptual plan period for 'A' category mines) clarifying the extent of back filling and re-contouring and / or alternative use of unfilled / partially filled excavations / road sides / slopes and mine. In case abandoned quarries/ pits are proposed to be used as reservoir, their size, water holding capacity and proposal for utilization of such water be given. | : The present mining is proposed to an average depth of 55m below ground level from the below ground level has been envisaged as workable depth for safe & economic mining during the lease period. The mined-out area will be fenced on top of working bench with S1 fencing. No immediate proposals for closure of pit as the rough stone persist still at deeper level. |
| iii). | <b>Programme of afforestation, Yearwise for the initial ten years (and upto conceptual plan period for 'A' category mines) indicating the number of plants with name of species to be afforested under different areas in hectares.</b><br><b>Green Belt Development:</b><br>Safety barrier, nearby school area and Nearest Panchayat approach Roads has been identified to be utilized for Greenbelt appropriate native species of                                                                       |                                                                                                                                                                                                                                                                                                                                                                            |





Neem, Pungan and other regional trees will be planted in a planned manner as described below

| Year   | Place                                 | Area in Sq.m | No.of Plants | Rate of survival | Rate                | Amount     |
|--------|---------------------------------------|--------------|--------------|------------------|---------------------|------------|
| First  | Lease Boundary                        | 5700         | 650          | 80%              | @100 Rs Per sapling | 30,000/-   |
| Second | Approach road and Nearby Village Road | --           | 300          | 80%              |                     | 30,000/-   |
| Third  | Schools                               | --           | 300          | 80%              |                     | 30,000/-   |
| Total  |                                       |              |              |                  |                     | 1,25,000/- |

|        |                                                                                                                                                              |   |                                                                                                                                                                                                             |
|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|---|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| iv).   | Stabilization and vegetation of dumps along with waste dump management Year wise for the ten years (and upto conceptual plan period for 'A' category mines). | : | No waste or rejects shall be proposed.                                                                                                                                                                      |
| v).    | Measures to control erosion / sedimentation of water courses.                                                                                                | : | Not applicable. There is no major dumps are stabilize in this quarry area.                                                                                                                                  |
| vi).   | Treatment and disposal of water from mine.                                                                                                                   | : | It will not be harmful and it does not require any treatment before discharging into the natural courses.                                                                                                   |
| vii).  | Measures for minimizing adverse effects on water regime.                                                                                                     | : | There is no water to be pumped out will be very pure and portable and therefore, it will not affect any water regime surrounding the quarry.                                                                |
| viii). | Protective measures for ground vibrations / air blast caused by blasting.                                                                                    | : | It is a small "B" category open cast, semi mechanized mining and no heavy machinery shall be used. The only smooth blasting is proposed, therefore no change for ground vibration or noise from the quarry. |
| ix).   | Measures for protecting historical monuments and for rehabilitation of human settlements likely to be disturbed due to mining activity.                      | : | No historical monuments and for rehabilitation of human settlements doesn't to be disturbed during mining activity.                                                                                         |
| x).    | Socioeconomic benefits                                                                                                                                       | : | The nearest villages are will get employment benefits.                                                                                                                                                      |

35

V. V. K. K.

d). *Monitoring schedules for different environmental components after the commencement of mining and other related activities. (for 'A' category mines only)*

Not applicable. It is B category quarry

**12.0 PROGRESSIVE QUARRY CLOSURE PLAN:**

|      |                                                                                                            |   |                                                                                                                                                                                                                                                                                                                                                                                                            |
|------|------------------------------------------------------------------------------------------------------------|---|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 12.1 | Steps proposed for phased restoration, reclamation of already mined out area.                              | : | Present mining is proposed to depth of 55m below ground level. The mined-out area will be fenced on top of working bench with S1 fencing to arrest the entry of cattle's and public in to the quarry site.                                                                                                                                                                                                 |
| 12.2 | Measures to be under taken on mine closure as per Act & Rules                                              | : | Measures will be taken as per the Acts and Rules. The quarried pit will be fenced by Barbed wire fencing. Green belt development at the rate of 650 trees will be proposed in the quarry area. No immediate proposals for closure of pit as the rough stone persist still at deeper level.                                                                                                                 |
| 12.3 | Mitigation measures to be undertaken for safety and restoration/ reclamation of the already mined out area | : | The quarry lease is a fresh mining lease, no mitigation measures observed.                                                                                                                                                                                                                                                                                                                                 |
| 12.4 | Mine closure activity                                                                                      | : | The mining plan is proposed to depth of 55m below ground level has been envisaged as workable depth for safe & economic mining during the lease period. The mined-out area will be fenced on top of open cast working with S1 fencing. No immediate proposals for closure of pit as the rough stone persist still at deeper level.                                                                         |
| 12.5 | Safety and security                                                                                        | : | Safety measures implement to the prevent access to surface opening excavations will be taken as Metalliferous mine regulations, 1961, it is a small open cast mining method adopted. Safety provisions like helmet, goggles, safety shoes, Dust mask, Ear muffs etc have to be provided as per the circulars and amendments made for Mine labours under the guidance of DGMS being a mechanized operation. |





-255-



|      |                                                                         |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|------|-------------------------------------------------------------------------|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 12.6 | Disaster management and Risk Assessment                                 | : | Open cast mining method is adopted in this quarry. If the benches are made with proposed height and with no slope will be there. Even then if any minor accident happens the quarry staffs having First aid facilities with first aid box with all necessary medicine and stretches etc., to give first aid treatment at the site and will arrange immediately the vehicle to reach nearest hospital, if any disaster happens the lessee is capable to meet such eventualities. At the time of any accident during mining activity, proposal of first aid facility at quarry and one vehicle always ready at quarry site. |
| 12.7 | Care and maintenance during temporary discontinuance                    | : | A board of discontinuance will be changed on the main entrance of the working place. One watch man will be kept on the quarry area for security purposes also look after the survival of the plants.                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 12.8 | Economic repercussions of closure of quarry and man power entrenchments | : | During the ten years mining period the employment potential will be generated, general financial status and socio-economic conditions of approx. 23 labors will be improved.                                                                                                                                                                                                                                                                                                                                                                                                                                              |

**12.9 Proposed Financial Estimate / Budget for (EMP) Environment Management:**

|          |                                                   |                                       |
|----------|---------------------------------------------------|---------------------------------------|
| <b>A</b> | <b>Fixed Asset Cost:</b>                          |                                       |
|          | 1. Land Cost                                      | : Rs. 8,30,50,000/-                   |
|          | 2. Labour Shed                                    | : Rs. 1,00,000/-                      |
|          | 3. Sanitary Facility                              | : Rs. 1,00,000/-                      |
|          | 4. Fencing                                        | : Rs. 2,50,000/-                      |
|          | 5. Other expenses (Security guard, dust bin, etc) | : Rs. 4,00,000/-                      |
|          | <b>Total</b>                                      | : <b>Rs. 8,39,00,000/-</b>            |
| <b>B</b> | <b>B. Machinery cost</b>                          | : <b>Rs. 20,00,000/- (Hire Basis)</b> |

-957-

|   |                                                              |                           |
|---|--------------------------------------------------------------|---------------------------|
| C | Total Expenditure of EMP cost (for ten years)                | Rs. 25,95,000/-           |
|   | 1. Drinking Water Facility                                   |                           |
|   | 2. Sanitary facility & Maintenance                           | Rs. 1,30,000/-            |
|   | 3. Permanent water sprinkler                                 | Rs. 2,00,000/-            |
|   | 4. Afforestation and its maintenance                         | Rs. 1,25,000/-            |
|   | 5. Safety Kits                                               | Rs. 50,000/-              |
|   | 6. Provision of tyre washing facility                        | Rs. 1,50,000/-            |
|   | 7. Blasting materials with blast mat cost                    | Rs. 10,00,000/-           |
|   | 8. Drainage & Settling Tank<br>(0.08.0Hect or 800Sq.m x 400) | Rs. 3,20,000/-            |
|   | 9. Environment monitoring                                    | Rs. 5,00,000/-            |
|   | <b>Total</b>                                                 | <b>Rs. 25,95,000/-</b>    |
| D | <b>Total Project Cost (A+B+C)</b>                            | <b>Rs. 8,84,95,000 /-</b> |

**13.0 FINANCIAL ASSURANCE:**

Not applicable, it is a small "B" rough stone quarry.

**14.0 CERTIFICATES:**

All required certificates are enclosed.

**15.0 PLAN AND SECTIONS, ETC:**

Plan and Sections are submitted along with mining plan.

**16.0 ANY OTHER DETAILS INTEND TO FURNISH BY THE APPLICANT**

- (i) Care and precautionary measures will be taken for the safety of workers as per Rules and Acts.
- (ii) The applicant will endeavor every attempt to quarry the rough stone economically without any wastage and to improve the environment and ecology.
- (iii) The Mining Plan is prepared by incorporating the conditions stipulated in the precise area communication issued by the Deputy Director, Department of Geology and Mining, Krishnagiri vide letter Roc.No.19/2025/Mines Dated 27.02.2025.
- (iv) Total proposed production rough stone is 676020m<sup>3</sup> and topsoil is 163280m<sup>3</sup> up to a depth of 55m below ground level for ten years plan period.



**17.0 CSR Expenditure:**

CSR (Corporate Social responsibility) shall provide by the applicant @ 2% of average net profit of the company for the last three financial years to the nearby village on the Ministry has notified the amendments in section 135 of the Act as well under CSR Rules on 22<sup>nd</sup> January 2021 as circular no. CSR-05/01/2021-CSR-MCA dated 25<sup>th</sup> August 2021.

Place: Dharmapuri, TN

Date: 21/3/25

Signature of the Qualified Person

Dr.S.KARUPPANNAN,M.Sc,Ph.D.,  
Qualified Person  
GEO TECHNICAL MINING SOLUTIONS  
A NABET Accredited and ISO Certified Company  
1/213-B, Ground Floor, Natesan Complex,  
Collectorate Post Office, Oddapatti,  
Dharmapuri-636705, TamilNadu, India

This Mining Plan is approved based on guidelines / instruction issued and in corporation of the particulars specified in the letter Roc. No. 19/2025 Dated 25.3.25 of the Deputy Director of Geology and Mining, Krishnagiri and subject to further fulfillment of the conditions laid down under Tamil Nadu Minor Mineral Concession Rules, 1959 and Minor Mineral Conservation and Development Rule 2010.

This Mining Plan is approved subject to the conditions / Stipulation indicated in the Mining Plan Approval

Letter Roc. No. 19/2025 Dated 25.3.25

**DEPUTY DIRECTOR**  
Geology and Mining,  
Collectorate, Krishnagiri.

M.P.  
25.03.25

தமிழ்நாடு அரசு  
2024



**கிருஷ்ணகிரி  
மாவட்ட அரசிதழ்  
சிறப்பு வெளியீடு  
ஆணையின்படி வெளியிடப்பட்டது**

கிருஷ்ணகிரி, நவம்பர் 16, 2024  
[ குரோதி, கார்த்திகை 1 - திருவள்ளுவர் ஆண்டு 2055 ] [ எண் 20 ]

**மாவட்ட ஆட்சியர் அறிவிக்கை**

[ ந.க.எண்.2023/2023/(கனிமம்), நாள் : 15.11.2024. ]

(மின்அஞ்சல் (mine.tnkgi@nic.in))

**ஒப்பந்தப்புள்ளி வரவேற்கும் அறிவிக்கை**

கிருஷ்ணகிரி மாவட்டத்தில் அரசு புறம்போக்கு நிலங்களில் அமைந்துள்ள சாதாரண வகை கற்குவாரிகளில் பொதுப் பயன்பாட்டிற்காக உடைகல் / சாதாரண வகை கற்கள் குவாரி கனிமக் குத்தகை தொடர்பான விண்ணப்பங்கள் வரவேற்கும் அறிவிக்கை

கனிமங்களும் குவாரிகளும் (மேம்படுத்தத்தல் மற்றும் ஒழுங்குபடுத்துதல்) சட்டம் 1957-ன் பிரிவு 15 மற்றும் அரசாணை (எம்.எஸ்) எண்.21 இயற்கை வளங்கள் (எம்.எம்.சி.1) துறை நாள்: 31.07.2024 மற்றும் தமிழ்நாடு சிறுகனிம சலுகை விதிகள் 1959-ன் விதி எண் 8-ன் படியும், அவ்வப்போது ஏற்படுத்தப்படும் அதன் திருத்தங்களின்படியும், கிருஷ்ணகிரி மாவட்ட நிர்வாகம் இவ்வறிக்கையின் இணைப்பில் கண்டுள்ளவாறு அரசுபுறம்போக்கு நிலங்களில் அமைந்துள்ள 20 இனங்களில் உள்ள உடைகல் / சாதாரண வகை கற்களை குவாரி செய்து பொதுப் பயன்பாட்டிற்கு, பயன்படுத்தும் பொருட்டு (e-auction) மின்னணு ஏலம் முறையில் கனிமக் குத்தகைக்கு அளிக்க ஒப்பந்தப் புள்ளிகள் வரவேற்கப்படுகின்றன.

மேற்படி கல்குவாரி குத்தகை மின்னணு ஏலத்தில் கலந்து கொள்ள உரிய படிவத்தில் ரூ.5000- (ரூபாய் ஐந்தாயிரம் மட்டும்) விண்ணப்பக் கட்டணத்துடன் அளிக்கப்படும் ஒப்பந்தப்புள்ளிகள் மூலம் தேர்ந்தெடுக்கப்படும் தகுதியான நபர்கள் தொழில்நுட்ப அடிப்படையிலான பரிசீலனை மூலம் உறுதிசெய்யப்பட்டு மின்னணு ஏலக்கேட்பில் கலந்துகொள்ள அனுமதிக்கப்படுவார்கள்.

V. V. L. S.



2 கிருஷ்ணகிரி மாவட்ட அரசிதழ் சிறப்பு வெளியீடு [நவம்பர்]

ஒப்பந்தப்புள்ளி ஆவணத்தில் (Tender Document) தகுதிகள் குறித்து விபரம் கொண்டுள்ளன. ஏலத்தில் கலந்து கொள்ள குறிக்கப்பட்டுள்ள நான் மற்றும் நேரம் ஆகியவற்றை கவனிக்கப்பட்டுள்ளன. விளக்கங்களுடன் ஒப்பந்தப்புள்ளி படிவம், மின்னணு ஏலம் தொடர்பான அறிவிக்கை, காலமுறை, முன்கொண்டிடுகள் மற்றும் நடைமுறைகள் ஆகியவற்றை வலைதள முகவரி website <https://tntenders.gov.in>-ல் இருந்து பதிவிறக்கம் செய்துகொள்ளலாம்.

மின்னணு ஏலம் கேட்பில் கலந்து கொள்ள ஆர்வமுள்ள மற்றும் தகுதியான நபர்கள் மேற்படி வலைதளத்தில் தாங்களாகவே பதிவு செய்து கொள்ள வேண்டும். அவ்வாறு பதிவு செய்துகொண்ட பின்னர் தகுதியான ஏலக் கேட்பு நபர்கள் உள்நுழைவு அடையாளக் குறியீடு (Login ID) மற்றும் கடவுச் சொல் (Password) ஆகியவற்றை பெற்ற பின்னர் மின்னணு ஏல நடவடிக்கைகளில் பங்குபெறலாம். ஒப்பந்தப்புள்ளி படிவ மாதிரி மற்றும் கனிமப் பகுதியில் சுருக்கமான விவரங்களை கட்டணம் ஏதுமின்றி website <https://tntenders.gov.in> என்ற வலைதளத்தில் பதிவிறக்கம் செய்துகொள்ளலாம். எண்ம கையொப்பம் சான்று (Digital Signature certificate) பெற்றிருக்க வேண்டும்.

இவ்வினத்தில் விருப்பமுள்ள ஏலக்கேட்பு நபர்கள் தேவையான விவரங்கள் மற்றும் தொடர்புடைய ஆவணங்கள் ஆகியவற்றை மின்னணு ஏலம் - டெண்டர் வழிகாட்டு முறை கையேட்டின் பிற்சேர்க்கை 2-ல் கண்டுள்ளவாறு சரியான குறியீடு மற்றும் கடவுச் சொல் பயன்படுத்தி சமர்ப்பிக்க வேண்டும். ஏலக்கேட்பு நபர்கள் ஏலக்கேட்பு கையேட்டை பார்வையிட்டு மின்னணு ஏலம் மற்றும் ஒப்பந்தப்புள்ளி ஆகியவற்றை இணைய வழி நுழைவாயில் (e-Portal) உரிய முறையில் சமர்ப்பிக்க வேண்டும்.

மின்னணு ஒப்பந்தப்புள்ளி, தொழில்நுட்ப மதிப்பீடு ஆகியவற்றிற்கு வழங்கப்படும் கால அளவு ஒப்பந்தப்புள்ளி வரவேற்கும் அறிவிக்கை வெளியிடப்பட்ட நாளிலிருந்து, தினசரி பத்திரிக்கைகளில் பிரசுரம் செய்தல் மற்றும் புனியியல் மற்றும் சரங்கத் துறை வலைதளத்தில் பதிவேற்றம் செய்யப்படும் நாளிலிருந்தும் கணக்கிடப்படும்.

மின்னணு பொது ஏலத்தில் கலந்து கொள்ளும் ஏலதாரர்கள் மற்றும் உயர்ந்தபட்ச ஏலதாரர்கள் ஆகியோருக்கு மாவட்ட ஆட்சியரின் ஏல ஆவண வழிகாட்டு நெறிமுறைகள் தொகுப்பு எண்.001/MM/2024-1 நாள். 15.11.2024-ன் படி தெரிவிக்கப்பட்டுள்ளது.

#### கால வரையறை

மின்னணு ஒப்பந்தப்புள்ளிக்கான காலவரையறை ஒப்பந்தப்புள்ளி தொடர்பான ஆவணத்தில் உள்ளவை.

மின்னணு ஒப்பந்தப்புள்ளி விண்ணப்பம் சமர்ப்பிக்க இறுதி நாள் - 06.12.2024

விண்ணப்பங்களை (தொழில்நுட்ப கேட்புகளுக்காக திறக்கும் நாள் - 09.12.2024

மின்னணு ஏல நாள் - பின்னர் அறிவிக்கப்படும்

இணைப்பு - மின்னணு ஒப்பந்தப்புள்ளி மற்றும் மின்னணு ஏலத்தின் மூலம் கக்குவாரி கனிமக் குத்தகை அளிக்கப்படக் கூடிய குவாரிகளின் விவரம்.

V. V. Lakshmi



2024]

கிருஷ்ணகிரி மாவட்ட அரசிதழ் சிறப்பு வெளியீடு

25 MAR 2025

அட்டவணை - சாதாரண கற்குவாரி பட்டியல்

கிருஷ்ணகிரி

## 1. கிருஷ்ணகிரி வருவாய் கோட்டம்

## கிருஷ்ணகிரி வட்டம்

| வ. எண். | கிராமம்       | புல எண்       | மொத்த பரப்பு      | குவாரி குத்தகை வழங்கும் பரப்பு | வகைப்பாடு    | குத்தகை உரிமம் காலம் |
|---------|---------------|---------------|-------------------|--------------------------------|--------------|----------------------|
| (1)     | (2)           | (3)           | (4)<br>(ஹெக்டேர்) | (5)<br>(ஹெக்டேர்)              | (6)          | (7)<br>(வருடங்கள்)   |
| 1       | கல்லுகுறுக்கி | 354 (பகுதி-1) | 46.61.0           | 1.00.0                         | தீ.ஏ.த (மலை) | 10                   |
| 2       | கல்லுகுறுக்கி | 354 (பகுதி-2) | 46.61.0           | 1.00.0                         | தீ.ஏ.த (மலை) | 10                   |
| 3       | கல்லுகுறுக்கி | 354 (பகுதி-3) | 46.61.0           | 1.00.0                         | தீ.ஏ.த (மலை) | 10                   |
| 4       | கல்லுகுறுக்கி | 354 (பகுதி-4) | 46.61.0           | 1.00.0                         | தீ.ஏ.த (மலை) | 10                   |

## 2. ஓசூர் வருவாய் கோட்டம்

## ஓசூர் வட்டம்

|   |                  |                                                 |        |        |               |    |
|---|------------------|-------------------------------------------------|--------|--------|---------------|----|
| 5 | அச்செட்டிப்பள்ளி | 886, 887 (பகுதி),<br>896 மற்றும்<br>895 (பகுதி) | 8.78.5 | 4.00.0 | கல்லாங்குத்து | 10 |
|---|------------------|-------------------------------------------------|--------|--------|---------------|----|

## குளகிரி வட்டம்

|    |               |                              |          |        |               |    |
|----|---------------|------------------------------|----------|--------|---------------|----|
| 6  | பேரிகை        | 305/4 (பகுதி)                | 1.89.0   | 1.15.0 | தீ.ஏ.த (பாறை) | 10 |
| 7  | உல்லட்டி      | 122 (பகுதி-1)                | 4.31.0   | 1.00.0 | தீ.ஏ.த (பாறை) | 10 |
| 8  | காமன்தொட்டி   | 653 (பகுதி-1)                | 7.56.0   | 3.35.0 | தீ.ஏ.த (தரிக) | 5  |
| 9  | காமன்தொட்டி   | 754 மற்றும்<br>760 (பகுதி-6) | 36.46.50 | 4.00.0 | தீ.ஏ.த (மலை)  | 10 |
| 10 | மாணாடப்பள்ளி  | 71/2                         | 1.15.0   | 1.15.0 | தீ.ஏ.த (பாறை) | 10 |
| 11 | வெங்கடேசபுரம் | 132 (பகுதி-1)                | 3.90.0   | 1.55.0 | தீ.ஏ.த (பாறை) | 10 |
| 12 | வெங்கடேசபுரம் | 132 (பகுதி-2)                | 3.90.0   | 1.45.0 | தீ.ஏ.த (பாறை) | 10 |
| 13 | வெங்கடேசபுரம் | 135 (பகுதி)                  | 42.34.0  | 1.70.0 | தீ.ஏ.த (கரடு) | 10 |

V.V. Lakshmi



4

கிருஷ்ணகிரி மாவட்ட அரசிதழ் சிறப்பு வெளியீடு

| (1)                    | (2)                 | (3)            | (4)        | (5)        |               |    |
|------------------------|---------------------|----------------|------------|------------|---------------|----|
|                        |                     |                | (ஹெக்டேர்) | (ஹெக்டேர்) |               |    |
| 14                     | வெங்கடேசபுரம்       | 294 (பகுதி-1)  | 18.36.5    | 3.00.0     | தீ.ஏ.த (காடு) | 10 |
| 15                     | மதிநாபக்கன் பாளைபம் | 53 (பகுதி-1)   | 86.01.5    | 1.70.0     | தீ.ஏ.த (காடு) | 10 |
| 16                     | மதிநாபக்கன் பாளைபம் | 53 (பகுதி-2)   | 86.01.5    | 2.00.0     | தீ.ஏ.த (காடு) | 10 |
| 17                     | வெங்கடேசபுரம்       | 136 (பகுதி-10) | 69.36.0    | 2.00.0     | தீ.ஏ.த (காடு) | 5  |
| தேன்கணிக்கோட்டை வட்டம் |                     |                |            |            |               |    |
| 18                     | ஒசபுரம்             | 359 (பகுதி)    | 3.03.5     | 1.50.0     | தீ.ஏ.த (தரிக) | 10 |
| 19                     | தண்டரை              | 738 (பகுதி-2)  | 61.78.0    | 2.00.0     | தீ.ஏ.த (மலை)  | 10 |
| 20                     | தண்டரை              | 738 (பகுதி-3)  | 61.78.0    | 1.50.0     | தீ.ஏ.த (மலை)  | 10 |

கிருஷ்ணகிரி,  
15.11.2024.

கே.எம். சரயு.  
மாவட்ட ஆட்சியர்,  
கிருஷ்ணகிரி மாவட்டம்.

தமிழ்நாடு எழுதுபொருள் மற்றும் அச்சத்துறை ஆணையரால் சேலம் அரசினர் கிளை அச்சகத்தில் அச்சிடப்பட்டு மாவட்ட ஆட்சியரால் வெளியிடப்பட்டது.

V. V. K.

Government of Tamil Nadu  
2024



**KRISHNAGIRI  
DISTRICT GAZETTE  
EXTRAORDINARY  
PUBLISHED BY AUTHORITY**

No. 12 ]

KRISHNAGIRI, NOVEMBER 16, 2024  
( Krodhi, Karthigai 1 – Thiruvalluvar Aandu 2055 )

**NOTIFICATION BY THE COLLECTOR**

[ Rc.No.2023/2023/(Mines), Dated : 15.11.2024 ]

E-mail : (mine.tnkgi@nic.in)

**Notice Inviting Tender (NIT)**

**"Inviting Application for Grant of Rough Stone Quarry Leases in Government Lands"**

In exercise of the power conferred by Section 15 of Mines and Mineral (Development & Regulation) Act, 1957 and in accordance with the Rule 8 of the Tamil Nadu Minor Mineral Concession Rules, 1959 read with G.O. Ms. No.21, Natural Resources (MMC.1), 31<sup>st</sup> July 2024 as amended from time to time notified there under, the District Administration of Krishnagiri District, Tamil Nadu has identified 20 areas in Krishnagiri District for grant of leases through electronic auction (e-auction) to quarry Rough Stone and hereby invites tender for the said purpose.

Accordingly, technical bids for grant of quarry lease are invited in the format of "FORM XXXXX" to the Tamil Nadu Minor Mineral Concession Rules, 1959, in digital format from eligible bidders.

138C/11 (K) Ex.No.12

*V. V. Lakshmi*





Eligible condition, date and time for participating in the electronic auction are provided in Tender Document. Detailed Tender Document along with the timeline, notification, updates and other details for the e-auction process for the quarries are available in electronic form only and can be downloaded from the website <https://tntenders.gov.in>.

Interested and eligible bidders can register themselves on the above website. On successful registration, Eligible bidders will obtain login ID and password necessary for participation in the e-auction process. Model Tender Document and Mineral Block Summary are available free of cost on the website <https://tntenders.gov.in>.

The intending bidders should submit necessary details and relevant mandatory documents in "ANNEXURE-II", by using valid login User ID and password. The bidders should refer to the 'Bidder's Manual' for successful submission of "FORM XXXXX" for participating in the tenders, which is available in the e-Auction portal. The period given to the bidder for submission of e-tenders for Technical Evaluation, is counted from the date on which the notice inviting tender (e-NIT) including e-tender is actually published in newspaper(s) and the website of the Department of Geology and Mining (<https://tnmines.tn.gov.in>).

The Guidelines stipulated in the Tender document by the District Collector vide Tender No.001/MM/2024-1 Dated: 15.11.2024 are binding on the participating bidders and successful bidders.

#### Time schedule:

The detail time schedule is available in the tender document.

|                                                  |   |                                                                  |
|--------------------------------------------------|---|------------------------------------------------------------------|
| Technical bid submission end date of application | : | 06.12.2024                                                       |
| Technical bid opening date                       | : | 09.12.2024                                                       |
| Financial bid opening and live e-auction date    | : | Will be intimated later on through<br>Tamil Nadu e-Tender portal |

*V. V. K. S.*

List of Areas identified in Government Lands in Krishnagiri District of Tamil Nadu for Grant of Rough stone Quarry Leases through

## e-Auction

## 1. Krishnagiri – Revenue Division

## Krishnagiri Taluk

| Sl. No | Village      | SF. No.         | Total Extent in Hectare | Proposed Extent in Hectare | Classification of land | Period of lease to be granted |
|--------|--------------|-----------------|-------------------------|----------------------------|------------------------|-------------------------------|
| (1)    | (2)          | (4)             | (5)                     | (6)                        | (7)                    | (8)<br>(In number of years)   |
| 1      | Kallukurukki | 354<br>(Part-1) | 46.61.0                 | 1.00.0                     | UAW (Malai)            | 10                            |
| 2      | Kallukurukki | 354<br>(Part-2) | 46.61.0                 | 1.00.0                     | UAW (Malai)            | 10                            |
| 3      | Kallukurukki | 354<br>(Part-3) | 46.61.0                 | 1.00.0                     | UAW (Malai)            | 10                            |
| 4      | Kallukurukki | 354<br>(Part-4) | 46.61.0                 | 1.00.0                     | UAW (Malai)            | 10                            |

## 2. Hosur – Revenue Division

## Hosur Taluk

|   |              |                                            |         |        |              |    |
|---|--------------|--------------------------------------------|---------|--------|--------------|----|
| 5 | Achettipalli | 886,<br>887 (Part),<br>896 &<br>895 (Part) | 8.78.50 | 4.00.0 | (Kalankuthu) | 10 |
|---|--------------|--------------------------------------------|---------|--------|--------------|----|

## Shoolagiri Taluk

|    |                |                       |          |        |               |    |
|----|----------------|-----------------------|----------|--------|---------------|----|
| 6  | Berigai        | 305/4 (Part)          | 1.89.0   | 1.15.0 | UAW (Parai)   | 10 |
| 7  | Ulkatti        | 122 (Part-1)          | 4.31.0   | 1.00.0 | UAW (Parai)   | 10 |
| 8  | Kamandoddi     | 653(Part-1)           | 7.56.00  | 3.35.0 | UAW (Therisu) | 5  |
| 9  | Kamandoddi     | 754 & 760<br>(Part-6) | 36.46.50 | 4.00.0 | UAW (Malai)   | 10 |
| 10 | Marandapalli   | 71/2                  | 1.15.0   | 1.15.0 | UAW (Parai)   | 10 |
| 11 | Venkatesapuram | 132 (Part-1)          | 3.90.0   | 1.55.0 | UAW (Parai)   | 10 |
| 12 | Venkatesapuram | 132 (Part-2)          | 3.90.0   | 1.45.0 | UAW (Parai)   | 10 |
| 13 | Venkatesapuram | 135 (Part)            | 42.34.0  | 1.70.0 | UAW (Karadu)  | 10 |

V. Venkatesh



4

KRISHNAGIRI DISTRICT GAZETTE EXTRAORDINARY

| (1)                 | (2)                 | (3)          | (4)     | (5)    |               |    |
|---------------------|---------------------|--------------|---------|--------|---------------|----|
| 14                  | Venkatesapuram      | 294 (Part-1) | 18.36.5 | 3.00.0 | UAW (Karadu)  | 10 |
| 15                  | Mathinayakanpalayam | 53 (Part-1)  | 86.01.5 | 1.70.0 | UAW (Karadu)  | 10 |
| 16                  | Mathinayakanpalayam | 53 (Part-2)  | 86.01.5 | 2.00.0 | UAW (Karadu)  | 10 |
| 17                  | Venkatesa puram     | 136(Part-10) | 69.36.0 | 2.00.0 | UAW (Karadu)  | 5  |
| Denkanikottai Taluk |                     |              |         |        |               |    |
| 18                  | Hosapuram           | 359(Part)    | 3.03.5  | 1.50.0 | UAW (Tharisu) | 10 |
| 19                  | Thandarai           | 738(Part-2)  | 61.78.0 | 2.00.0 | UAW (Malai)   | 10 |
| 20                  | Thandarai           | 738(Part-3)  | 61.78.0 | 1.50.0 | UAW (Malai)   | 10 |

Krishnagiri,  
15.11.2024.

K.M. SARAYU,  
District Collector,  
Krishnagiri District.

*V. V. K.*



# KRISHNAGIRI DISTRICT GAZETTE

EXTRAORDINARY

PUBLISHED BY AUTHORITY

No. 14 ]

KRISHNAGIRI, NOVEMBER 27, 2024  
( Krodhi, Karthigai 12 - Thiruvalluvar Aandu 2055 )

## NOTIFICATION BY THE COLLECTOR

[ Roc.No.2023/2023/(Mines). Date : 26.11.2024 ]

[ Amendment Notice Inviting Tender Applications for the Grant of Quarry Lease for Rough Stone situated in Government lands in Krishnagiri District through e-Tender cum auction system as per Rule 8 of the Tamil Nadu Minor Mineral Concession Rules, 1959 ].

For and on behalf of the Government of Tamil Nadu Tender applications were invited by the District Collector, Krishnagiri through online vide Krishnagiri District Gazette Extraordinary Notification No.20 (Tamil) and 12 (English) dated:16.11.2024 for grant of rough stone quarry leases in Government lands situated in Krishnagiri District, wherein the last date for submission of tender applications through online was mentioned as 06.12.2024 upto 4.00 PM and Technical Biding opening date was mentioned as 09.12.2024 at 10.00 AM.

For administrative reasons, the following amendment is hereby made to the Gazette notification No.20 and 12 dated:16.11.2024.

|                                   |   |                                                       |
|-----------------------------------|---|-------------------------------------------------------|
| Technical bid submission end date | : | 16.12.2024 upto 5.00 PM                               |
| Technical bid opening date        | : | 17.12.2024 at 10.00 AM                                |
| Date of e-auction date            | : | Will be intimated later in Tamil Nadu e-Tender portal |

Krishnagiri,  
26.11.2024.

K.M. SARAYU,  
District Collector,  
Krishnagiri District.



**THE DISTRICT COLLECTOR, KRISHNAGIRI DISTRICT**

**(Tender Document)**

**TENDER No.001/Mines/2024-1, Dated: 26.11.2024.**

**e-Tender with forward bidding for grant of Rough Stone quarry  
leases in Krishnagiri District.**

*V. V. K. S.*



OFFICE OF THE DISTRICT COLLECTOR, KRISHNAGIRI

Phone No. 04343-239301, 239302, 239303 Fax No: 91-4343-239304

E-Mail: [mune.tnkgi@nic.in](mailto:mune.tnkgi@nic.in)

Tender No.001/Mines/2024-1

Dated : 26.11.2024.

**NOTICE INVITING e-TENDER with FORWARD BIDDING**  
**INFORMATION AND GUIDELINES TO TENDERERS**  
**(Tender Document)**

E-tender with forward bidding is invited through the e-tendering portal by the District Collector, Krishnagiri for grant of Rough Stone quarry leases in Krishnagiri District as indicated in the Annexure I of this tender, document.

The tendering process is online at e-portal URL (Universal Resources Locator) address <https://tntenders.gov.in>. Aspiring bidders may download and go through the tender document. The URL for online bid submission in e-tender is <https://tntenders.gov.in/nicgep/app>

Intending tenderers are advised to get themselves registered at Tamil Nadu tender portal, obtain 'login ID' & 'password' and go through the instructions available in the Home page after log in to the Tamil Nadu Tender Portal <https://tntenders.gov.in>. They should also obtain Digital Signature Certificate (DSC) in parallel which is essentially required for submission of their application.

**1. A) Eligibility to participate:**

- a) The applicant shall be an Indian National or a Company as defined in clause (20) of section 2 of the Companies

*V. V. K. S.*



Act 2013 (Central Act 18 of 2013) and domestic Tamil Nadu having business and corporate office in Tamil Nadu.

- b) In case of a firm or other Association of persons, only if all the members of the firm or members of the Association shall be citizens of India; in case of an individual, only if he / she shall be a citizen of India.
- c) In case of a firm or other association of persons, only if all the members of the firm or members of the Association shall reside or doing business with an established office or corporate office in Tamil Nadu for a minimum period of 05 years (five years).
- d) In case of an individual, only if he / she shall reside or doing business with an established office in Tamil Nadu for a minimum period of 05 years (five years).
- e) The Applicant shall not have any dues, namely, mining dues, income tax dues, Goods and service Tax dues etc., to be paid to the Government.
- f) The applicant shall obtain a valid mining dues clearance certificate from the Assistant Director of geology and Mining where the quarrying or mining lease area is situated, in the form prescribed in Appendix-VIII of the Tamil Nadu Minor Mineral Concession Rules 1959.
- g) The applicant shall satisfy such other conditions as specified in this tender document.

**2. e-TENDER WITH FORWARD BIDDING:**

- a) The details of the areas offered under the e-Tender with forward bidding for grant of Rough Stone quarry lease is given in the Annexure -I.

*V. V. Katar*





- b) The e-auction shall be an ascending forward online electronic auction and shall comprise the following rounds namely, a technical bid (1<sup>st</sup> round of e-auction) and offering of bid amount with forward bidding greater than the floor price (2<sup>nd</sup> round of e-auction).
- c) The bidders shall first submit their e-tenders and then take part in the forward bidding when the live Forward bidding is opened during the stipulated date & time as in the critical data sheet Annexure-V.
- d) The date & time period of live Forward bidding will be intimated through the Tamil Nadu e-Tender portal / email after evaluation of the Technical and Financial bid.
- e) Only the bidders shall become eligible in accordance with the terms and conditions of eligibility specified in the Gazette published and this tender document.
- f) Only those bidders whose initial tender price offered is greater than the reserved price shall be considered as the Technically qualified bidders eligible to participate in the further round of e-auction.
- g) Whenever the number of Technically qualified bidders are more than ten, the 1<sup>st</sup> 10 highest bidders shall be eligible for participating in the second round of e-auction, and if the number is less than 10, all the technically qualified bidders will be eligible for participating in the 2<sup>nd</sup> round of e-auction.
- h) If the number of bidders qualified to participate in the 2<sup>nd</sup> round is less than three, e-auction process shall be annulled.

V. V. V. V.





- i) The highest initial bid price offered amongst the qualified bidders quoted over and above the reserve price shall be the floor price for the 2<sup>nd</sup> round of e-auction.
- j) The qualified bidder who offers the highest final price in the forward bidding shall be declared as the successful bidder immediately on conclusion of the e-auction.
- k) The e-auction process shall be annulled if none of the technically qualified bidders offer a final price or a price higher than the floor price on the online e-auction platform.
- l) If there are any clarifications, the same may be obtained online through the e-Portal or through the contact details given in the tender document. Bidder should take into account of the corrigendum addendum published, if any, before submitting the bids through online.
- m) Tender inviting authority will not be held responsible for any sort of delay or the difficulties faced during the submission of bids online by the bidders due to any technical issues.
- n) The time that is displayed from the server clock at the top of the tender portal, will be valid for all actions of requesting bid submission, bid opening, forward bidding etc.,
- o) E-tender /Forward bidding cannot be accessed after the due date and time for bid submission.
- p) The bidder shall submit the bid documents and bid in forward bidding online mode only, through <https://tntenders.gov.in> portal.

V. V. K. S.



- q) All notices and correspondence to the bidders will be sent by email only, during the process till finalization of tender with forward bidding. Hence the bidders are required to ensure that their email address provided at the time of registration is valid and updated. Bidders are also requested to ensure validity of their DSC.
- r) Bidders are advised to see the website regularly to remain updated with latest information to ensure that they do not miss out any corrigendum / addendum uploaded against the said e-Tender with forward bidding. The responsibility of downloading the related corrigendum, if any, will be that of the bidders.
- s) All electronic bids submitted during the e-Tender with forward bidding process shall be legally binding on the bidder. Any bid will be considered as the valid bid offered by that bidder and acceptance of the same by the Tender inviting authority will form a binding contract between TIA and the Bidder.
- t) It is mandatory that all the bids are submitted with digital signature certificate otherwise the same will not be accepted by the system.
- u) Tender Inviting Authority reserves the right to cancel or reject or accept or withdraw or extend the tender with forward bidding in full or in part as the case may be without assigning any reason thereof.
- v) The server time shall be treated as final and binding. Bids recorded in the server before the bid closing time will only be treated as valid bid. Bidders are, therefore,

V. V. L.



advised to submit their bids well before the closing time of e-tender cum auction. If any bid reaches the server after the bid closing time as per server time, the same will not be recorded and no complaint in this regard shall be entertained.

- w) Bidders are advised to exercise caution in quoting their bids in e-Tender with forward bidding to avoid any mistake. Bids once submitted can't be recalled after bid closing time.
- x) Tenders shall be subject to all the conditions stipulated in the Tender specification. Any other conditions of counter offers stipulated by the bidders in their tender will not be accepted.

### 3. PAYMENTS:

- a. Any person interested to participate in the e-auction shall pay through online a non-refundable application fee of Rs.5,000/- (Rupees five thousand only).
- b. Every bidder shall, while applying for bidding, pay online, as bid security amount equal to 1% of the value of the estimated resources or Rs.10,00,000/- (Rupees ten lakhs only) for fresh rough stone quarries and Rs.5,00,000/- (Rupees five lakhs only) for other quarries, whichever is higher.
- c. On declaration of the name of the successful bidder, the successful bidder shall pay 10% of the bid amount as initial payment through electronic clearance service (ECS), within 24 hours of such declaration. If the 24

V. V. / 402



hours limit happens to the bank holiday, the payment shall be made on the immediate next working day of the bank.

- d. If the declared successful bidder fails to pay the 10% of the bid amount within 24 hours, his/ her bid shall be rejected and the bid security amount paid by him / her shall be forfeited to the Government within two days. The remaining 90% of the bid amount, deducting the bid security amount already paid, shall be paid by the successful bidder through electronic clearance service (ECS), within one month from the date of declaration. If the bidder fails to do so, the 10% of the bid amount already paid by the successful bidder along with the bid security amount shall be forfeited to the Government within one week.
- e. TIA will not be responsible for any sort of difficulties or delay faced by the bidder during the online payment.
- f. Any other mode of payment other than ECS (Electronic Clearance Services) shall not be accepted.
- g. In case of unsuccessful bidders, on conclusion of the e-auction process, the bid security amount paid by the persons other than the successful bidders shall be refunded automatically to bidders through "Pooling Account" of the State Government only. Tender Inviting Authority is no way responsible for refund of bid security amount to the unsuccessful bidders.

V. V. Lakshmi



#### 4. SUBMISSION OF e-TENDER:

Bidder has to select the payment option as "pay online" to pay the Tender Application fee and bid security amount. Only after payment of Tender Application fee and bid security amount, bidder will be able to encrypt/upload their bids. In order to avoid last minute lapses, it is recommended to make payment and submit the bid as early as possible.

##### **Cover-1 named "Technical bid":**

The bidder shall upload the scanned copies of the following:

- ✓ Annexure II duly filled & signed (Tenderer name, Full Postal address & contact details to be filled legibly without fail).
- ✓ Annexure III dully filled and signed.
- ✓ Scanned copy of Aadhar card.
- ✓ Scanned copy of GST Registration Certificate.
- ✓ Scanned copy of PAN Card.
- ✓ Scanned copy of Certificate of Registration.
- ✓ Affidavit for no mining dues / no mining due clearance certificate obtained from competent authority.

##### **Cover -2 named "Financial bid":**

The bidder shall download the BOQ (Bill of Quantities) template available under "Details of price quoted" and fill up the name of the bidder & the rates offered for each area in relevant column. After filling the details, the bidder should save it and upload without changing the file name.

**Note:** The rates quoted shall be exclusive of Seigniorage fee,

V.V. / 2025



DMFT, Green fund, GST and other taxes and levies imposed on the Government then and there. The same will have to be paid additionally by successful bidder.

#### **5. FORCE MAJEURE:**

In case, the terms contained herein or in the order cannot be performed either by the bidder or TIA for any reason arising out of the laws/regulations / restrictions governing mining industry, natural calamities, war/hostility, military operation of any character, civil commotions, sabotage, Pandemic, riots, quarantine restriction, acts of Government embargoes, the Successful Bidder shall not be entitled for any compensation.

#### **6. NON ASSIGNABILITY:**

The letter of confirmation issued to successful bidder is not transferable or assignable in whatsoever manner. Tender inviting Authority will not entertain any third party nominee/ assignee in whatsoever manner on behalf of the Successful Bidder.

#### **7. TRACK THE WEBSITE:**

Intending bidders are advised to visit <https://tntenders.gov.in> regularly till closing date of e-auction for any corrigendum / addendum / amendment.

#### **8. DISCRETION:**

- a) The tender accepting authority, reserves the right of rejection / cancellation of all or any of the tenders without assigning any reason thereof or split up the tender as deemed fit.

*V. V. Lakshmi*



- b) The tender accepting authority, reserves the right to cancel the bid even after acceptance or during performance of the contract.
- c) The tender accepting authority reserves the right to alter/modify any of the above tender conditions before the award of the tender.

*[Signature]*  
**DISTRICT COLLECTOR,**  
**KRISHNAGIRI** 12/17

*[Signature]*

For any technical assistance with regard to e-tendering, the bidders may contact the following official on all working days:-

The Deputy Director,  
Department of Geology  
and Mining,  
Collectorate, Krishnagiri.

Phone No: 04343-239200 Fax No. 04343-239300 & Mobile: 94990 02247

*[Signature]*



## ANNEXURE -I

Tender No.001/Mines/2024-1

Dated: 26.12.2024



### THE DETAILS OF THE AREAS FOR GRANT OF ROUGH STONE QUARRY LEASES IN KRISHNAGIRI DISTRICT THROUGH e-Tender WITH FORWARD BIDDING

#### 1. Krishnagiri – Revenue Division

##### Krishnagiri Taluk

| Sl. No | Taluk       | Village      | SF. No.      | Total Extent in Ha | Proposed Extent in Ha | Classification of land | Period of lease to be granted (in number of years) |
|--------|-------------|--------------|--------------|--------------------|-----------------------|------------------------|----------------------------------------------------|
| 1      | Krishnagiri | Kallukurukki | 354 (Part-1) | 46.61.0            | 1.00.0                | UAW (Malai)            | 10                                                 |
| 2      | Krishnagiri | Kallukurukki | 354 (Part-2) | 46.61.0            | 1.00.0                | UAW (Malai)            | 10                                                 |
| 3      | Krishnagiri | Kallukurukki | 354 (Part-3) | 46.61.0            | 1.00.0                | UAW (Malai)            | 10                                                 |
| 4      | Krishnagiri | Kallukurukki | 354 (Part-4) | 46.61.0            | 1.00.0                | UAW (Malai)            | 10                                                 |

#### 2. Hosur – Revenue Division

##### Hosur Taluk

| Sl. No | Taluk | Village      | SF. No.                         | Total Extent in Ha | Proposed Extent in Ha | Classification of land | Period of lease to be granted (in number of years) |
|--------|-------|--------------|---------------------------------|--------------------|-----------------------|------------------------|----------------------------------------------------|
| 5      | Hosur | Achettipalli | 886, 887(Part), 896 & 895(Part) | 8.78.50            | 4.00.0                | UAW (Kalankuthu)       | 10                                                 |

##### Shoolagiri Taluk

| Sl. No | Taluk      | Village | SF. No.      | Total Extent in Ha | Proposed Extent in Ha | Classification of land | Period of lease to be granted (in number of years) |
|--------|------------|---------|--------------|--------------------|-----------------------|------------------------|----------------------------------------------------|
| 6      | Shoolagiri | Berigai | 305/4 (Part) | 1.89.0             | 1.15.0                | UAW (Parai)            | 10                                                 |
| 7      | Shoolagiri | Ullatti | 122 (Part-1) | 4.31.0             | 1.00.0                | UAW (Parai)            | 10                                                 |

*V. V. Lakshmi*





|    |            |                      |                    |          |        |               |    |
|----|------------|----------------------|--------------------|----------|--------|---------------|----|
| 8  | Shoolagiri | Kamandoddi           | 653(Part-1)        | 7.56.00  | 3.35.0 | UAW (Tharisu) | 5  |
| 9  | Shoolagiri | Kamandoddi           | 754 & 760 (Part-6) | 36.46.50 | 4.00.0 | UAW (Malai)   | 10 |
| 10 | Shoolagiri | Marandapalli         | 71/2               | 1.15.0   | 1.15.0 | UAW (Parai)   | 10 |
| 11 | Shoolagiri | Venkatesa puram      | 132 (Part-1)       | 3.90.0   | 1.55.0 | UAW (Parai)   | 10 |
| 12 | Shoolagiri | Venkatesa puram      | 132 (Part-2)       | 3.90.0   | 1.45.0 | UAW (Parai)   | 10 |
| 13 | Shoolagiri | Venkatesa puram      | 135 (Part)         | 42.34.0  | 1.70.0 | UAW (Karadu)  | 10 |
| 14 | Shoolagiri | Venkatesa puram      | 294 (Part-1)       | 18.36.5  | 3.00.0 | UAW (Karadu)  | 10 |
| 15 | Shoolagiri | Mathinayaka npalayam | 53 (Part-1)        | 86.01.5  | 1.70.0 | UAW (Karadu)  | 10 |
| 16 | Shoolagiri | Mathinayaka npalayam | 53 (Part-2)        | 86.01.5  | 2.00.0 | UAW (Karadu)  | 10 |
| 17 | Shoolagiri | Venkatesa puram      | 136(Part-10)       | 69.36.0  | 2.00.0 | UAW (Karadu)  | 5  |

**Denkanikottai Taluk**

| Sl. No | Taluk          | Village   | SF. No.     | Total Extent in Ha | Propose d Extent in Ha | Classifi cation of land | Period of lease to be granted (in number of years) |
|--------|----------------|-----------|-------------|--------------------|------------------------|-------------------------|----------------------------------------------------|
| 18     | Denkani kottai | Hosapuram | 359(Part)   | 3.03.5             | 1.50.0                 | UAW (Tharisu)           | 10                                                 |
| 19     | Denkani kottai | Thandarai | 738(Part-2) | 61.78.0            | 2.00.0                 | UAW (Malai)             | 10                                                 |
| 20     | Denkani kottai | Thandarai | 738(Part-3) | 61.78.0            | 1.50.0                 | UAW (Malai)             | 10                                                 |

*[Signature]*  
District Collector,  
Krishnagiri. 13/17

26/11/24

*[Signature]*



**ANNEXURE - II**

**Tender No. 001/Mines/2024-1**

**Dated: 26.11.2024**

**Back ground details of Bidder**

|    |                                                                                                                           |   |  |
|----|---------------------------------------------------------------------------------------------------------------------------|---|--|
| 1  | Name and address of the Individual / firm/company (with full postal address)                                              | : |  |
| 2  | Telephone/ Mobile number                                                                                                  | : |  |
| 3  | Contact Person                                                                                                            | : |  |
| 4  | Email Address                                                                                                             | : |  |
| 5  | Status of the firm Proprietorship/Partnership Company (Certificate of Registration to be enclosed)                        | : |  |
| 6  | Aadhar card number                                                                                                        | : |  |
| 7  | PAN Number.                                                                                                               | : |  |
| 8  | GST Number                                                                                                                | : |  |
| 9  | Audited P/L & Balance sheet of last two years.                                                                            | : |  |
| 10 | No Mining dues affidavit - with notional attestation whether enclosed.                                                    | : |  |
| 11 | Mining due clearance certificate obtained from the competent authority - whether enclosed.                                | : |  |
| 12 | Affidavit for quarry leases already held, applied, yet to be granted and simultaneously applied with notarial attestation | : |  |
| 13 | Any other relevant particulars                                                                                            | : |  |

I / We hereby declare that the particulars furnished above are correct and I/ We are ready to furnish any other detail or details as may be required by the DISTRICT COLLECTOR, KRISHNAGIRI.

**SIGNATURE OF THE TENDERER  
WITH OFFICE SEAL (if any)**

- Encl: The scanned copy of the followings have been uploaded
- 1.Aadhar Card
  - 2.GST Registration
  - 3.PAN card.
  - 4.Certificate of Registration

*[Signature]*  
District Collector  
Krishnagiri.

16/17

*[Signature]*



ANNEXURE - III

TENDER DECLARATION FORM

Tender No. 001/Mines/2024-1

Dated: 26.11.2024

1. I/we have gone through the tender notice and all the instructions to the bidder and agree to abide by all the conditions and terms mentioned therein.
2. I /We hereby quote the price for the rough stone quarry lease specified in the Annexure I. The quotations furnished in the schedule are subject to the conditions set-forth in the tender form.
3. I/We hereby certify that myself / our firm has not been banned or black listed by the Government on account of unfair business dealings with any Government Departments and Government undertaking.

SIGNATURE OF THE TENDERER.  
WITH OFFICE SEAL (if any)

*[Signature]*  
District Collector  
Krishnagiri.

15/12

*[Signature]*  
14/11/24

*[Signature]*

ANNEXURE-IV

Details of price quoted



Tender No. 001/Mines/2024-1 Dated: 26.11.2024

BOQ

V. V. S. S.



Annexure - V

Tender No.001/Mines/2024-1,

Dated: 26.11.2024

**CRITICAL DATA SHEET**

(As per amended Gazette No.14 dated:26.11.2024)

|                                     |                                                       |
|-------------------------------------|-------------------------------------------------------|
| Publishing date                     |                                                       |
| Bid document download starting date | 29.11.2024 from 1000 hrs                              |
| Bid submission starting date        | 29.11.2024 from 1000 hrs                              |
| Bid Submission ending date          | 16.12.2024 upto 1700 hrs                              |
| Technical bid opening date          | 17.12.2024 at 1000 hrs                                |
| Date of e-Auction                   | Will be intimated later in Tamil Nadu e-Tender portal |
| Tender fee / Application fee        | Rs.5,000/- (Non-refundable)                           |
| Bid Security Amount                 | As per Annexure VI of the Tender Document             |

*[Signature]*  
DISTRICT COLLECTOR,  
KRISHNAGIRI

*[Signature]*  
26/11/24

*[Signature]*  
V.V/La

# ANNEXTURE - VI

## Details of EMD and Tender fee / Application Fee



| Sl. No. | Taluk         | Village             | S.F                     | Extent in Hects. | Proposed Lease Period in years | EMD fixed As per No. 21 dt. 31.07.2012 4(in Rs.) | Tender fee Application Fee (in Rs.) |
|---------|---------------|---------------------|-------------------------|------------------|--------------------------------|--------------------------------------------------|-------------------------------------|
| 1       | Krishnagiri   | Kallukurukki        | 354(Part-1)             | 1.00.0           | 10                             | 11,19,836                                        | 5000                                |
| 2       | Krishnagiri   | Kallukurukki        | 354(Part-2)             | 1.00.0           | 10                             | 11,12,241                                        | 5000                                |
| 3       | Krishnagiri   | Kallukurukki        | 354(Part-3)             | 1.00.0           | 10                             | 11,28,173                                        | 5000                                |
| 4       | Krishnagiri   | Kallukurukki        | 354(Part-4)             | 1.00.0           | 10                             | 11,60,777                                        | 5000                                |
| 5       | Hosur         | Achettipalli        | 886,887(P),896 & 895(P) | 4.00.0           | 10                             | 60,19,588                                        | 5000                                |
| 6       | Shoolagiri    | Berigai             | 305/4(Part)             | 1.15.0           | 10                             | 12,53,461                                        | 5000                                |
| 7       | Shoolagiri    | Ullatti             | 122(Part-1)             | 1.00.0           | 10                             | 10,00,000                                        | 5000                                |
| 8       | Shoolagiri    | Kamandoddi          | 653(Part-1)             | 3.35.0           | 5                              | 24,92,576                                        | 5000                                |
| 9       | Shoolagiri    | Kamandoddi          | 754&760(Part-6)         | 4.00.0           | 10                             | 50,09,308                                        | 5000                                |
| 10      | Shoolagiri    | Marandapalli        | 71/2                    | 1.15.0           | 10                             | 15,59,731                                        | 5000                                |
| 11      | Shoolagiri    | Venkatesapuram      | 132(Part-1)             | 1.55.0           | 10                             | 13,95,155                                        | 5000                                |
| 12      | Shoolagiri    | Venkatesapuram      | 132(Part-2)             | 1.45.0           | 10                             | 13,43,292                                        | 5000                                |
| 13      | Shoolagiri    | Venkatesapuram      | 135(Part)               | 1.70.0           | 10                             | 19,12,484                                        | 5000                                |
| 14      | Shoolagiri    | Venkatesapuram      | 294(Part-1)             | 3.00.0           | 10                             | 36,05,395                                        | 5000                                |
| 15      | Shoolagiri    | Mathinayakanpalayam | 53(Part-1)              | 1.70.0           | 10                             | 14,96,857                                        | 5000                                |
| 16      | Shoolagiri    | Mathinayakanpalayam | 53(Part-2)              | 2.00.0           | 10                             | 22,60,702                                        | 5000                                |
| 17      | Shoolagiri    | Venkatesapuram      | 136(Part-10)            | 2.00.0           | 5                              | 31,15,364                                        | 5000                                |
| 18      | Denkanikottai | Hosapuram           | 359(Part)               | 1.50.0           | 10                             | 14,53,731                                        | 5000                                |
| 19      | Denkanikottai | Thandarai           | 738(Part-2)             | 2.00.0           | 10                             | 21,76,317                                        | 5000                                |
| 20      | Denkanikottai | Thandarai           | 738(Part-3)             | 1.50.0           | 10                             | 13,39,135                                        | 5000                                |

**Note :** The Bidders shall pay respective EMD for each proposed areas for which they want to apply. For other non-interested areas for which they don't want to apply, the Bidder shall click "EMD Exemption" option available in the website during online application and shall upload "self - declaration" statement with signature by stating the reason why EMD Exemption is availed.

Signature Not Verified

Digitally signed by EASWARAN  
Date: 2024.12.02 09:00:00 IST  
Location: Tamil Nadu, TN

V. V. K. S.



Rc.No.19/2025/Mines dated: 27.02.2025

O/o. Deputy District Collector,  
Geology & Mining,  
Krishnagiri District



### Precise Area Communication

Sub : Mines and Minerals - Minor Mineral - Rough Stone - Krishnagiri District - Shoolagiri Taluk - Kamandoddi Village - SF.No.754&760(Part-6) - over an extent of 4.00.0 hectare of Government poramboke land - e-Tender cum Auction conducted - Highest bid amount offered by Thiru.V.Venkatesulu - successful bidder declared - entire bid amount remitted - Precise area communicated -Reg.

Ref : 1. Krishnagiri District Gazette (Extra-ordinary) No.12 & 20 dated: 16.11.2024.  
2. e-auction (live) conducted on 03.01.2025.  
3. Notice Rc.No.19/2025/Mines dated: 07.01.2025 and 09.01.2025  
4. Connected Records.

\*\*\*\*\*

Yours attention is invited to the reference cited.

2) Based on the recommendations of the Special Committee report dated: 13.11.2024, the District Collector, Krishnagiri has issued notice inviting tender under District Gazette No.12(English) & 20(Tamil) dated: 16.11.2024 and received applications through online from the interested bidders for conducting e-Tender cum auction.

3) Subsequently, after due processes envisaged in G.O(Ms)No.21 Natural Resources (MMC1) Department dated: 31.07.2024, e-Tender cum auction has been conducted on 03.01.2025. Since, Thiru.V.Venkatesulu has quoted highest bid amount of Rs.8,30,50,000/- (Rupees eight crores thirty lakhs fifty thousand only) for the proposed lease area in Government poramboke land over an extent of 4.00.0 hectares in SF.No.754 &

*V. Venkatesulu*



considered as qualified area for grant of lease for the period of 10 years, this precise area under Rule 41(4) of TNMMCR 1959 is hereby communicated to the successful bidder Thiru.V.Venkatesh. They are hereby directed to submit a draft mining plan within a period of 90 days from the date of receipt of this communication as required under rule 41 of TNMMCR 1959 for approval of the Deputy Director of Geology and Mining, Krishnagiri and further directed to obtain prior environment clearance from the State Level Environment Impact Assessment Authority, (SEIAA) Chennai as required under rule 42 of TNMMCR 1959 for further process to grant of lease in the proposed lease area subject to the following conditions:-

- 1) A safety distance of 7.5 meters is to be maintained to the adjacent patta lands and a safety distance of 10 meters to be maintained to the adjacent Government lands and should not cause any hindrance to them while quarrying and transportation.
- 2) All conditions stipulated in the District Gazette Extra ordinary notification No.12 (English) & 20 (Tamil) dated: 16.11.2024 should be adhered by the bidder.
- 3) Environment clearance should be obtained from the State Level Environmental Impact Assessment Authority before grant of quarry lease as per rule 42 of the Tamil Nadu Minor Mineral Concession Rules 1959.
- 4) The bidder should fence the lease granted area with barbed wire before the execution of lease deed as follows:
  - The pillar post shall be firmly grounded with concrete foundation of height not less than 2 meters with a distance between two pillars shall not be more than 3 meters.
  - The applicant firm shall incorporate the DGPS readings for the entire boundary pillars of the area

V.Venkatesh





760(Part-6), Kamandoddi Village, Shoolagiri Taluk,  
District, Thiru.V.Venkatesulu after careful scrutinization  
declared as the successful bidder.

4) In this regard, the highest bidder Thiru.V.Venkatesulu vide reference 3<sup>rd</sup> cited has been directed to remit the quoted highest bid amount to the proper head of Government Account. Accordingly, the Thiru.V.Venkatesulu has remitted the entire bid amount of Rs.8,30,50,000/- (Rupees eight crores thirty lakhs fifty thousand only) as detailed below;

| Challan Date                                   | E-challan No.  | Bank             | Category          | Amount in Rs.      |
|------------------------------------------------|----------------|------------------|-------------------|--------------------|
| EMD remitted during application through online |                |                  | EMD               | 5009308            |
| 08.01.2025                                     | 20250108013951 | SBI, Krishnagiri | 10% of Bid amount | 8305000            |
| 31.01.2025                                     | 20250130007162 | SBI, Krishnagiri | 90% of Bid amount | 5000000            |
| 31.01.2025                                     | 20250130007078 | SBI, Krishnagiri |                   | 7235692            |
| 03.02.2025                                     | 20250128004434 | SBI, Krishnagiri |                   | 7500000            |
| 01.02.2025                                     | 20250128004347 | SBI, Krishnagiri |                   | 7500000            |
| 01.02.2025                                     | 20250128004133 | SBI, Krishnagiri |                   | 7500000            |
| 01.02.2025                                     | 20250128003943 | SBI, Krishnagiri |                   | 7500000            |
| 21.01.2025                                     | 20250120002911 | SBI, Krishnagiri |                   | 7500000            |
| 21.01.2025                                     | 20250120002824 | SBI, Krishnagiri |                   | 7500000            |
| 21.01.2025                                     | 20250120002729 | SBI, Krishnagiri |                   | 7500000            |
| 06.02.2025                                     | 20250204010738 | SBI, Krishnagiri |                   | 5000000            |
|                                                |                |                  | <b>Total</b>      | <b>8,30,50,000</b> |

5) Since the subject area in SF.No.754 & 760(Part-6) over an extent of 4.00.0 hecets of Government poramboke land situated in Kamandoddi Village, Shoolagiri Taluk, Krishnagiri District has been

*V.V. Venkatesulu*

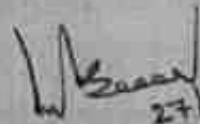


and the same should be clearly shown in the Mining Plan

- A soft copy of digitalized map with DGPS readings should be submitted in the CD form to the Deputy / Assistant Director, Krishnagiri.

- 5) As per Rule 12 (V) of Minerals (other than Atomic & Hydrocarbon Energy Minerals) Concession Rules, 2016, the applicant firm shall at his own expenses erect, maintain and keep in repair all the boundary pillars for entire period of lease.
- 6) The applicant should use mild explosives during quarrying.
- 7) Child labourers should not be engaged in the quarry works.
- 8) If any violation is found during quarrying operation, the Rule 36(5)(h) and the penal provisions of the Tamil Nadu Minor Mineral Concession Rules, 1959 and connected Act and rules in force will attract.

**Encl:** Demarcated Map showing the proposed lease area.

  
27/02/25

**Deputy Director,  
Dept. of Geology & Mining,  
Krishnagiri.**

  
27/2/25

**To,**

Thiru.V.Venkatesulu,  
S/o. Venkatasamy,  
No.741 D, M.G.Kotta, Seppatti Post,  
Shoolagiri Taluk,  
Krishnagiri District.





25 MAR 2025

மிகுப் பேரறிஞர்

மற்றும்

105

SED 129 RAD

OM

No. 126  
KAMANDHODI  
HOLUR TALLU  
DUDURUPU DISTRICT

1151, 1155, 1213 to 1219  
1222, 1225 to 1228

288





| 1   | 2   | 3        | 4 | 5   | 6   | 7   | 8   | 9    | 10      |      |                                                 |
|-----|-----|----------|---|-----|-----|-----|-----|------|---------|------|-------------------------------------------------|
| 753 | 3   | 753-பா   | ப | 4   | ... | 8-4 | 10  | 1 00 | 0 26.7  | 0 25 | 204 ச. கெம்பம் மாள்.                            |
|     |     |          |   |     |     |     |     |      | 0 83.5  | 0 88 |                                                 |
| 754 | ... | 754      | அ | 8-4 | ... | ... | ... | ...  | 80 46.5 | ...  |                                                 |
| 755 | ... | 755      | ப | 4   | ... | 8-4 | 10  | 1 00 | 0 22.5  | 0 25 | 204 ச. கெம்பம் மாள்.                            |
| 756 | ... | 756      | ப | 4   | ... | 8-2 | 7   | 2 37 | 0 52.0  | 1 44 | 815 ம. முனிசாமி.                                |
| 757 | 1   | 757-பா   | ப | 4   | ... | 8-2 | 7   | 2 77 | 0 75.5  | 1 44 | 888 ரா. சின்ன ராஜவப்பா.                         |
|     | 2   | ...      | ப | 4   | ... | 8-2 | 7   | 2 77 | 0 51.5  | 2 18 | 889 வெ. ராஜ வப்பா.                              |
|     |     |          |   |     |     |     |     |      | 1 30.0  | 3 62 |                                                 |
| 758 | ... | 758      | ப | 4   | ... | 8-2 | 7   | 2 70 | 0 59.5  | 1 69 | 1105 ரா. ராஜம் மாள்.                            |
| 759 | ... | 759      | ப | 4   | ... | 8-3 | 8   | 2 15 | 0 28.5  | 4 84 | 888 ரா. சின்ன ராஜவப்பா.                         |
| 760 | ... | 760      | ப | 4   | ... | 8-5 | 12  | 0 62 | 1 28.0  | 0 78 | 130 மு. சிஞ்சு வப்பா.                           |
| 761 | 1A  | 761-1 பா | ப | 4   | ... | 8-5 | 12  | 0 62 | 0 20.0  | 0 12 | 509 தே. சீரப்பா.                                |
|     | 1B  | -1 பா    | ப | 4   | ... | 8-5 | 12  | 0 62 | 0 55.0  | 0 34 | 93 தே. கரியப்பா.                                |
|     | 1C  | -1 பா    | ப | 4   | ... | 8-5 | 12  | 0 62 | 0 06.0  | 0 06 | 509 தே. சீரப்பா.                                |
|     | 1D  | -1 பா    | ப | 4   | ... | 8-5 | 12  | 0 62 | 0 06.0  | 0 06 | 1426 தே. சீரப்பா வும் மற்றும் திரண்டு போ களும். |
|     | 1E  | -1 பா    | ப | 4   | ... | 8-5 | 12  | 0 62 | 0 96.0  | 0 60 | 350 வெ. வெங்க டே. சூர்.                         |
|     | 2   | -2       | அ | 4   | ... | 8-5 | 12  | 0 62 | 0 04.5  | 0 06 |                                                 |
|     | 3   | -3       | ப | 4   | ... | 8-5 | 12  | 0 62 | 0 92.5  | 0 56 | 1014 தி. ராஜப்பா.                               |
|     | 4   | -4       | ப | 4   | ... | 8-5 | 12  | 0 62 | 0 99.0  | 0 60 | 1129 து. ஸ்ரீமம் மாள்.                          |
|     | 5   | -5       | ப | 4   | ... | 8-5 | 12  | 0 62 | 0 45.0  | 0 28 | 406 கே. ரத்தினம் மாள்.                          |
|     | 6   | -6       | அ | 4   | ... | 8-5 | 12  | 0 62 | 0 11.0  | 0 08 |                                                 |

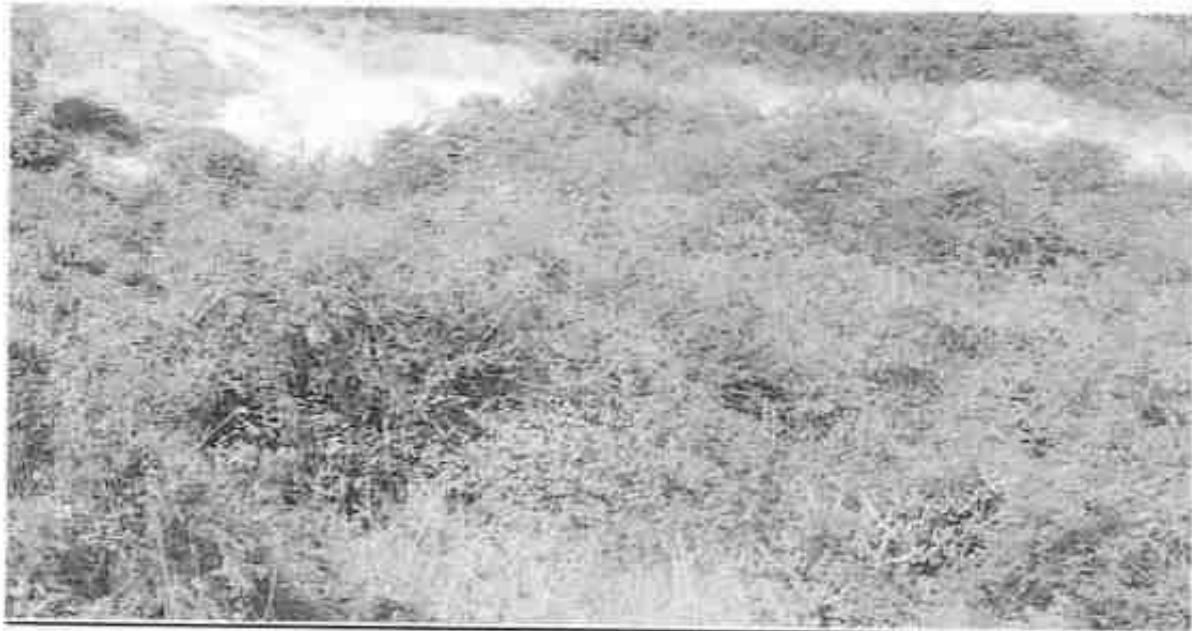
\* விவரப்பட்டியலைப் பார்க்கவும்.

V.V. K.

PHOTOCOPY OF THE LEASE AREA

Site photos in respect of rough stone quarry lease in S.F.No. 354 & 700 - Govt.  
Poramboke Land - over an extent of 4.00.0 hectares - Kallakudi  
Shoolagiri Taluk - Krishnagiri District, Tamil Nadu State

Mr.V.Venktesulu



VV/Lar

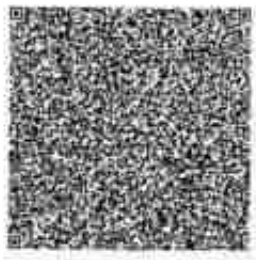


இந்திய அரசாங்கம்  
Government of India

இந்திய தனிப்பட்ட அடையாள ஆணையு அமைதி  
Unique Identification Authority of India

பதிவேட்டு எண்/ Enrolment No.: 0000/00331/13740

To:  
Geyarukellegu Gey  
Venkatesulu V  
S/O: Venkatasami,  
d no 741,  
I M G KOTTA,  
CHEPPADI POST,  
VTC: Shoolagiri,  
PO: Chappadi,  
Sub District: Hosur,  
District: Krishnagiri,  
State: Tamil Nadu,  
PIN Code: 635117,  
Mobile: 9444549008



உங்கள் ஆதார் எண் / Your Aadhaar No. :

8021 7759 1943  
VID : 9106 4188 4853 3721

எனது ஆதார், எனது அடையாளம்



இந்திய அரசாங்கம்  
Government of India



யெங்குடெல்லு யெ  
Venkatesulu V  
பிறந்த நாள்/DOB: 08/07/1954  
ஆண்/ MALE

ஆதார் என்பது அடையாளத்திற்கான சான்றாகும். குடியரிமை அல்லது பிறந்த தேதிக்கான சான்றாக இது அல்ல. இது உறுதிப்படுத்தப்பட்ட பதிவேட்டில் உள்ளது. ஆதாரை அடையாளம் காணும் போது, ​​அதன் செயல்பாடு மூலமாக ஆதார் உறுதிப்படுத்தப்படும்.  
Aadhaar is proof of identity, not of citizenship or date of birth. It should be used with verification (online authentication, or scanning of QR code / offline XML).

8021 7759 1943

எனது ஆதார், எனது அடையாளம்



தகவல் / INFORMATION

- ஆதார் என்பது அடையாளத்திற்கான சான்றாகும். குடியரிமை அல்லது பிறந்த தேதிக்கான சான்றாக இது அல்ல. இது உறுதிப்படுத்தப்பட்ட பதிவேட்டில் உள்ளது. ஆதாரை அடையாளம் காணும் போது, ​​அதன் செயல்பாடு மூலமாக ஆதார் உறுதிப்படுத்தப்படும்.
- இந்த ஆதார் கடிதத்தை UIDAI நிர்வாகி அங்கீகரிக்கப்பட்ட நிறுவனத்தால் அல்லது அங்கீகரிக்கப்பட்ட ஆபீஸ்களால் கிடைக்கும். இது ஆதார் அல்லது ஆதார் QR குறியீடு மூலமாக உறுதிப்படுத்தப்படும். இது கிடைக்கும் பதிவேட்டில் உள்ளது. இது உறுதிப்படுத்தப்பட்ட பதிவேட்டில் உள்ளது.
- ஆதார் தனித்துவமானது மற்றும் பாதுகாப்பானது.
- ஆதார் பதிவு செய்யப்பட்ட நாளிலிருந்து ஒவ்வொரு 10 வருடங்களுக்கும் பிறகும் ஆதாரில் அடையாளம் மற்றும் முகவரிக்கான ஆவணங்கள் புதுப்பிக்கப்பட வேண்டும்.
- பல்வேறு அரசு மற்றும் அரசு அல்லாத அமைப்புகள் / சேவைகளைப் பெற ஆதார் உறுதிப்படுத்தப்படும்.
- உங்கள் மொனிடர் எண் மற்றும் மின்னஞ்சல் முகவரி ஆதாரில் புதுப்பிக்கப்படும்.
- ஆதார் சேவைகளைப் பெற mAadhaar செயலியைப் பதிவிறக்கவும்.
- ஆதார்போடும் உறுதிப்படுத்தப்படும் பதிவேட்டில் உள்ளது. பாதுகாப்பான உறுதிப்பாடு ஆதார்போடும் உறுதிப்படுத்தப்படும்.
- ஆதார் கோரும் நிறுவனங்கள் ஒப்புதலைப் பெற வேண்டிய உடனடி உறுதிப்பாடு.
- Aadhaar is proof of identity, not of citizenship or date of birth (DOB). DOB is based on information supported by proof of DOB document specified in regulations, submitted by Aadhaar number holder.
- This Aadhaar letter should be verified through either online authentication by UIDAI-appointed authentication agency or QR code scanning using mAadhaar or Aadhaar QR Scanner app available in app stores or using secure QR code reader app available on www.uidai.gov.in.
- Aadhaar is unique and secure.
- Documents to support identity and address should be updated in Aadhaar after every 10 years from date of enrolment for Aadhaar.
- Aadhaar helps you avail of various Government and Non-Government benefits/services.
- Keep your mobile number and email id updated in Aadhaar.
- Download mAadhaar app to avail of Aadhaar services.
- Use the feature of Lock/Unlock Aadhaar/biometrics to ensure security when not using Aadhaar/biometrics.
- Entities seeking Aadhaar are obligated to seek consent.

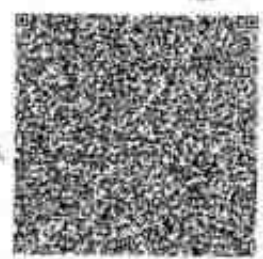


இந்திய அரசாங்கம்  
Unique Identification Authority of India



முகவரி:  
S/O: Geyarukellegu Gey, d no 741, I M G KOTTA,  
CHEPPADI POST, Shoolagiri,  
PO: Chappadi,  
Sub District: Hosur,  
District: Krishnagiri,  
Tamil Nadu - 635117

Address:  
S/O: Venkatasami, d no 741, I M G KOTTA,  
CHEPPADI POST, Shoolagiri, PO: Chappadi,  
DIST: Krishnagiri,  
Tamil Nadu - 635117



8021 7759 1943  
VID : 9106 4188 4853 3721

1943 | Help@uidai.gov.in | www.uidai.gov.in

V. Venkatesulu



V. Venkattasamy



Reg. No. 03HHH1007  
Col Code 013 / 106



பெரியார் பல்கலைக்கழக ஆட்சிக்குழு 2005 ஆம் ஆண்டு ஏப்ரல் மாதம் நடந்த பயன்பாட்டு புவியமைப்பியல் தேர்வில் S கருப்பண்ணன் என்பவர் தனிச்சிறப்புடன் முதல் வகுப்பில் தேர்ச்சி பெற்றார் என்று தக்க தேர்வாளர்கள் சான்றளித்தபடி அறிவியல் நிறைஞர் என்னும் பட்டத்தை அவருக்குப் பல்கலைக்கழக இலச்சினையுடன் வழங்குகிறது.

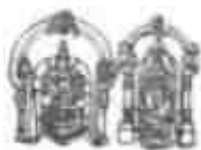
*The Syndicate of the Periyar University hereby makes known that*  
**KARUPPANNAN S** *has been*  
*admitted to the* **DEGREE OF MASTER OF SCIENCE in**  
**APPLIED GEOLOGY**  
*he/she having been certified by duly appointed Examiners to be qualified to receive the same and was placed in the* **FIRST CLASS WITH DISTINCTION**  
*at the Examination held in* **APR-2005**



Given under the seal of this university

*[Signature]*  
V. V. L. S.

IAC No. 142 / INGST. No. 2702141  
CST. No. 704829 / SLM / Dt. 7-4-99



**BALAJI MINES**

Proprietor: E. SANTHARAMAN  
PURITY LIME STONE SUPPLIERS  
5/88, CHINNAGOLLAPATTI, KANNANKURICHI P.O.  
SALEM-636 008. Tamil Nadu.



Mines : Devar Malai Village, Kulithalai Tk., KARUR Dt. (Via) Karur to Palayam.

Date | 5-6-2010

### EXPERIENCE CERTIFICATE

I E.SANTHARAMAN being the Managing Director of BALAJI MINES do hereby certify that Thiru. S.KARUPPANNAN, son of T.SUNDARAM (Whose signature is appended) worked as a Geologist in Balaji Mine, Devar malai village, kulithalai Taluk, Karur District, from 01.06.2005 to 10.10.2010. During his term of work aforesaid, he has obtained practical experience as detailed overleaf. The duties connected with his work have involved his continuous attendance at the mine, and have been efficiently performed by him.

I believe him to be of good character and a fit and proper person to be examined for Certificate of Competency.

  
(Signature with date and official Seal)

TIN No: 33852702141

CST No: 704829 / 7-4-99

**BALAJI MINES**

5/88, Chinnagollapatty,  
Kannankurichi (P.O), SALEM-8.

  
(Signature of Candidate)





SRI RAMAJAYAM  
Cell 94876 33355

**SRI RAMAJAYAM  
GRANITES**

731, Khatinagri Main Road, Opp. E B Office, MATHUR - 625 203.  
email: sramajayamgranites@gmail.com



Date: 13/10/2011

### EXPERIENCE CERTIFICATE

This is to certify that Mr. Karuppannan Sundaram has been worked as a "Senior Geologist" in our company from 11<sup>th</sup> October 2010 to 11<sup>th</sup> October 2011. During this period, he has been involved in the Quality Control for Granite block extraction from quarry. Involvement of his work is highly appreciated and have been efficiently worked in our company. The duties connected with his work have been continuous attendance at the quarry.

I wish him all the best in all his future endeavors.

for SRI RAMAJEYAM GRANITES

*[Signature]*  
Proprietor

13/10/2011

*[Signature]*  
13/10/2011

**DEPUTY DIRECTOR  
DEPARTMENT OF GEOLOGY AND MINING  
DHARMAPURI**

*V. V. K.*

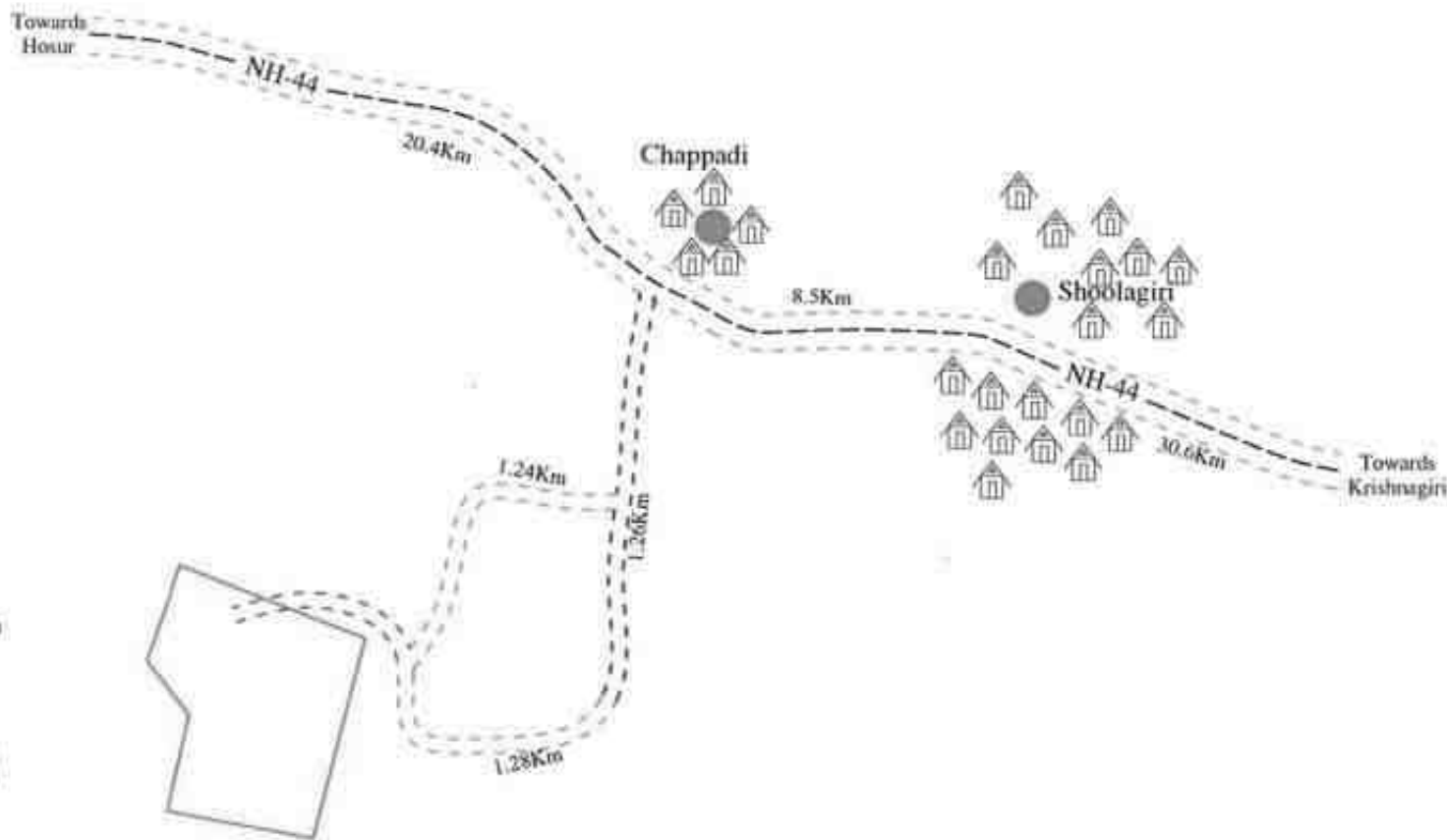


PLATE No-I

APPLIED BY  
Mr. V. VENKATESULU

S/o. VENKAT  
No. 741, D.M.G KOTTA,  
CHAPPADI POST,  
SHOOLAGIRI TALUK,  
KRISHNAGIRI DISTRICT.

LEASE APPLIED AREA:

S.F.No : 754 & 760 (Part-6)

EXTENT : 4.00.0Hect

VILLAGE : KAMANDODDI

TALUK : SHOOLAGIRI

DISTRICT : KRISHNAGIRI

INDEX

MINE LEASE AREA



APPROACH ROAD



CART ROAD



VILLAGE ROAD



NH-44 ROAD



KEY MAP

Not to Scale

Prepared By:

I DO HEREBY CERTIFY THAT THE PLATE HAS  
BEEN CHECKED BY ME AND IS CORRECT  
TO THE BEST OF MY KNOWLEDGE

Dr. S. KARUPPANNAN, M.Sc., Ph.D.  
QUALIFIED PERSON

12°39'35.28"N

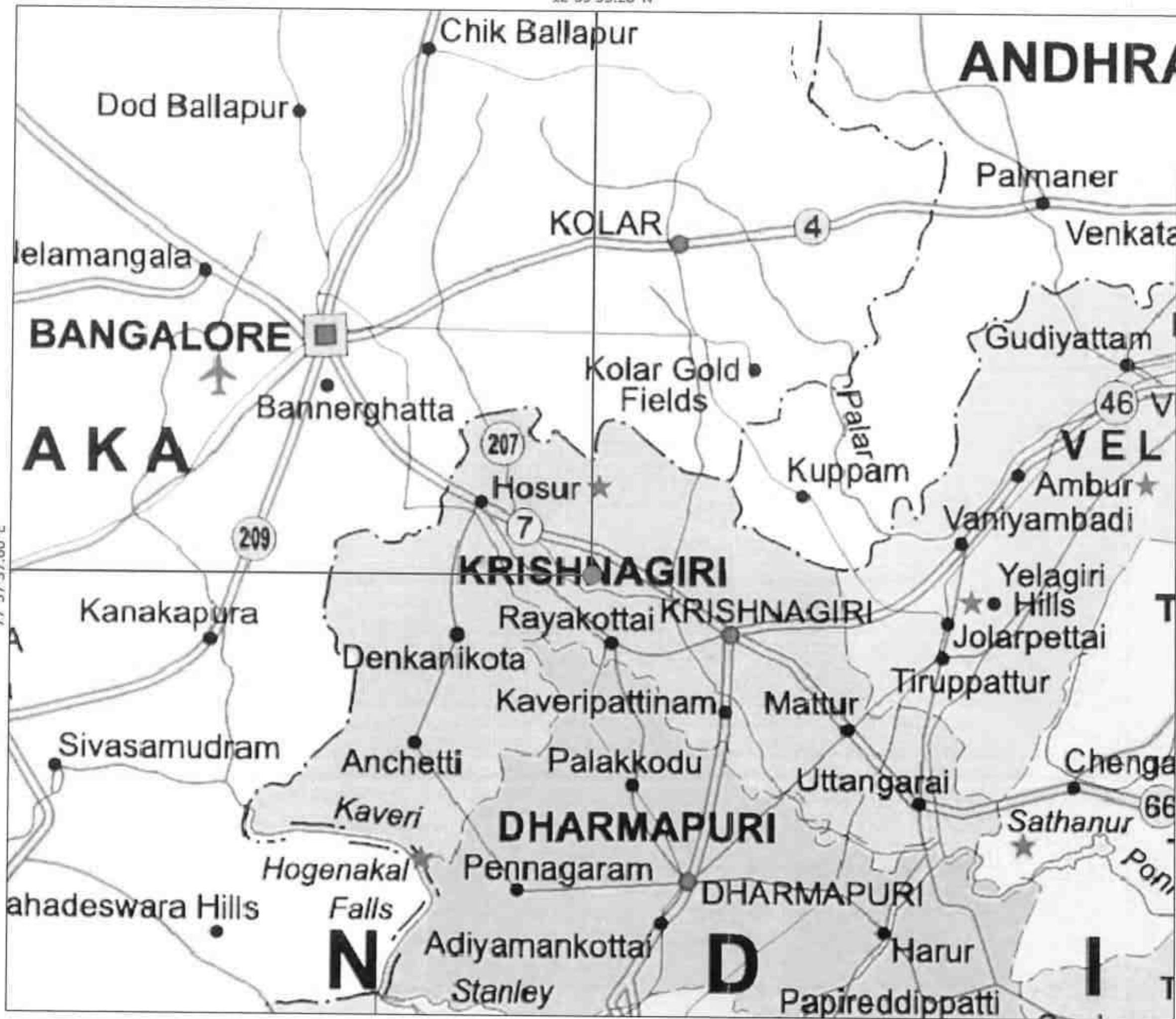


PLATE NO-IA

APPLICANT:

Mr.V.VENKATESULU,  
S/o.VENKATASAMY,  
No.741, D.M.G KOTTA,  
CHAPPADI POST,  
SHOOLAGIRI TALUK,  
KRISHNAGIRI DISTRICT.

LEASE APPLIED AREA:

S.F.No : 754 & 760 (Part-6)  
EXTENT : 4.00.0Hect  
VILLAGE : KAMANDODDI  
TALUK : SHOOLAGIRI  
DISTRICT : KRISHNAGIRI

INDEX

MINE LEASE AREA: ●

TOPO SHEET NO : 57-H/14

LATITUDE : 12°39'26.30"N to 12°39'35.28"N

LONGITUDE : 77°57'37.60"E to 77°57'44.84"E

LOCATION PLAN

NOT TO SCALE

Prepared By:

I DO HEREBY CERTIFY THAT THE PLATE HAS  
BEEN CHECKED BY ME AND IS CORRECT  
TO THE BEST OF MY KNOWLEDGE

Dr.S.KARUPPANNAN,M.Sc.,Ph.D.  
QUALIFIED PERSON







12°39'35.28"N



77°57'37.60"E

Towards  
Chappadi

Towards  
Agaram Agraharam



PLATE No. 16

**APPLICANT:**  
Mr.V.VENKATESULU,  
S/o.VENKATASAMY,  
No.741, D.M.G KOTTA,  
CHAPPADI POST,  
SHOOLAGIRI TALUK,  
KRISHNAGIRI DISTRICT.

**LEASE APPLIED AREA:**  
S.F.No : 754 & 760 (Part-6)  
EXTENT : 4.00.0Hect  
VILLAGE : KAMANDODDI  
TALUK : SHOOLAGIRI  
DISTRICT : KRISHNAGIRI

# INDEX

|                 |  |
|-----------------|--|
| MINE LEASE AREA |  |
| APPROACH ROAD   |  |
| CART ROAD       |  |
| VILLAGE ROAD    |  |
| 100m RADIUS     |  |
| 200m RADIUS     |  |
| 300m RADIUS     |  |
| 400m RADIUS     |  |
| 500m RADIUS     |  |
| EXISTING PIT    |  |

TOPO SHEET NO : 57-H/14

LATITUDE : 12°39'26.30"N to 12°39'35.28"N

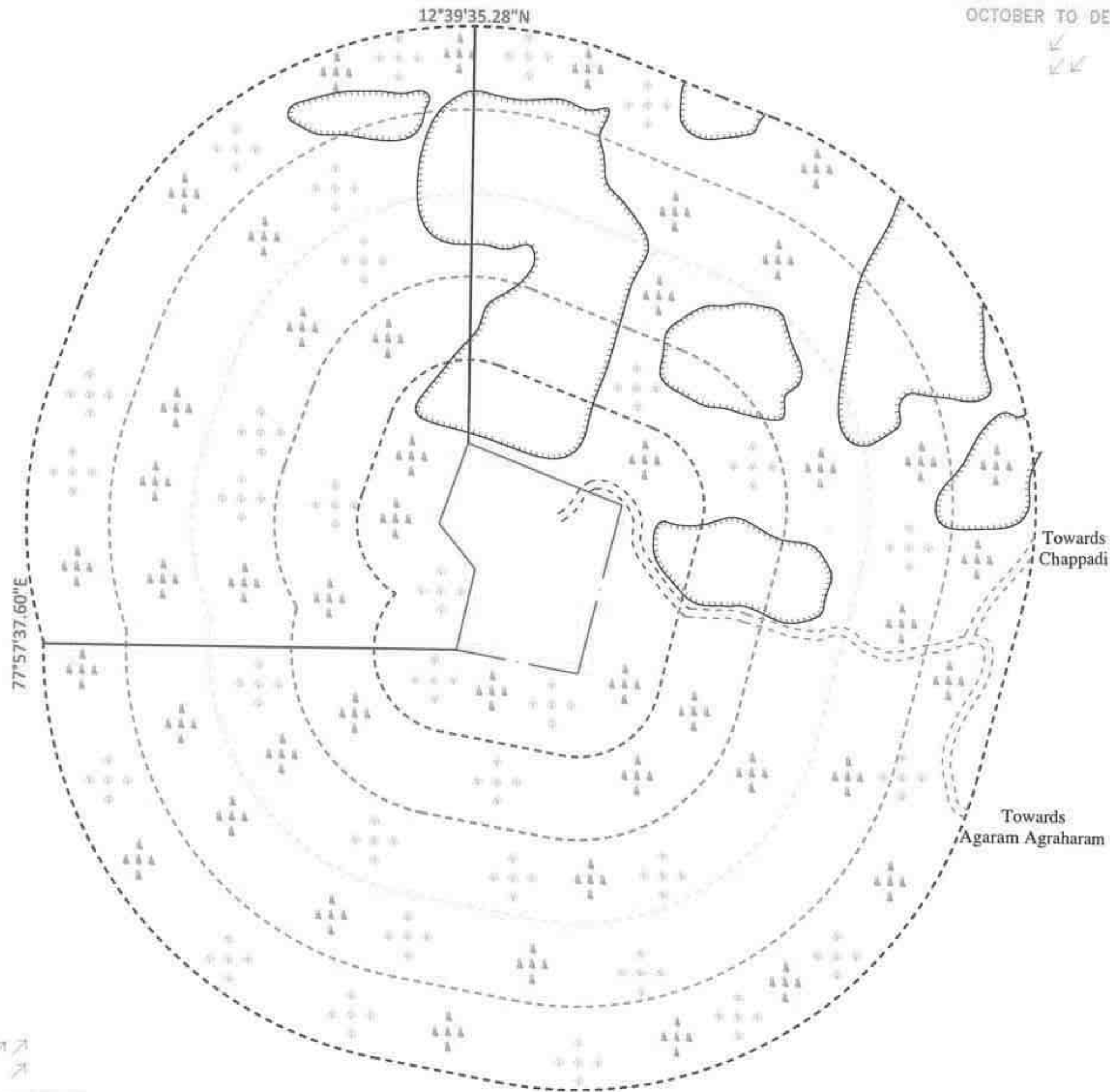
LONGITUDE : 77°57'37.60"E to 77°57'44.84"E

SATELITE IMAGERY MAP  
SCALE- 1:5000

Prepared By:

I DO HEREBY CERTIFY THAT THE PLATE HAS  
BEEN CHECKED BY ME AND IS CORRECT  
TO THE BEST OF MY KNOWLEDGE

Dr.S.KARUPPANNAN,M.Sc.,Ph.D.  
QUALIFIED PERSON



OCTOBER TO DECEMBER



**APPLICANT:**

Mr.V.VENKATESULU,  
S/o.VENKATASAMY,  
No.741, D.M.G KOTTA,  
CHAPPADI POST,  
SHOOLAGIRI TALUK,  
KRISHNAGIRI DISTRICT.

**LEASE APPLIED AREA:**

S.F.No : 754 & 760 (Part-6)  
EXTENT : 4.00.0Hect  
VILLAGE : KAMANDODDI  
TALUK : SHOOLAGIRI  
DISTRICT : KRISHNAGIRI

**INDEX**

MINE LEASE AREA



APPROACH ROAD



CART ROAD



100m RADIUS



200m RADIUS



300m RADIUS



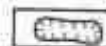
400m RADIUS



500m RADIUS



EXISTING PIT



SHRUBS & TREES



WIND DIRECTION



TOPO SHEET NO : 57-H/14

LATITUDE : 12°39'26.30"N to 12°39'35.28"N

LONGITUDE : 77°57'37.60"E to 77°57'44.84"E

**ENVIRONMENTAL PLAN**

SCALE - 1:5000

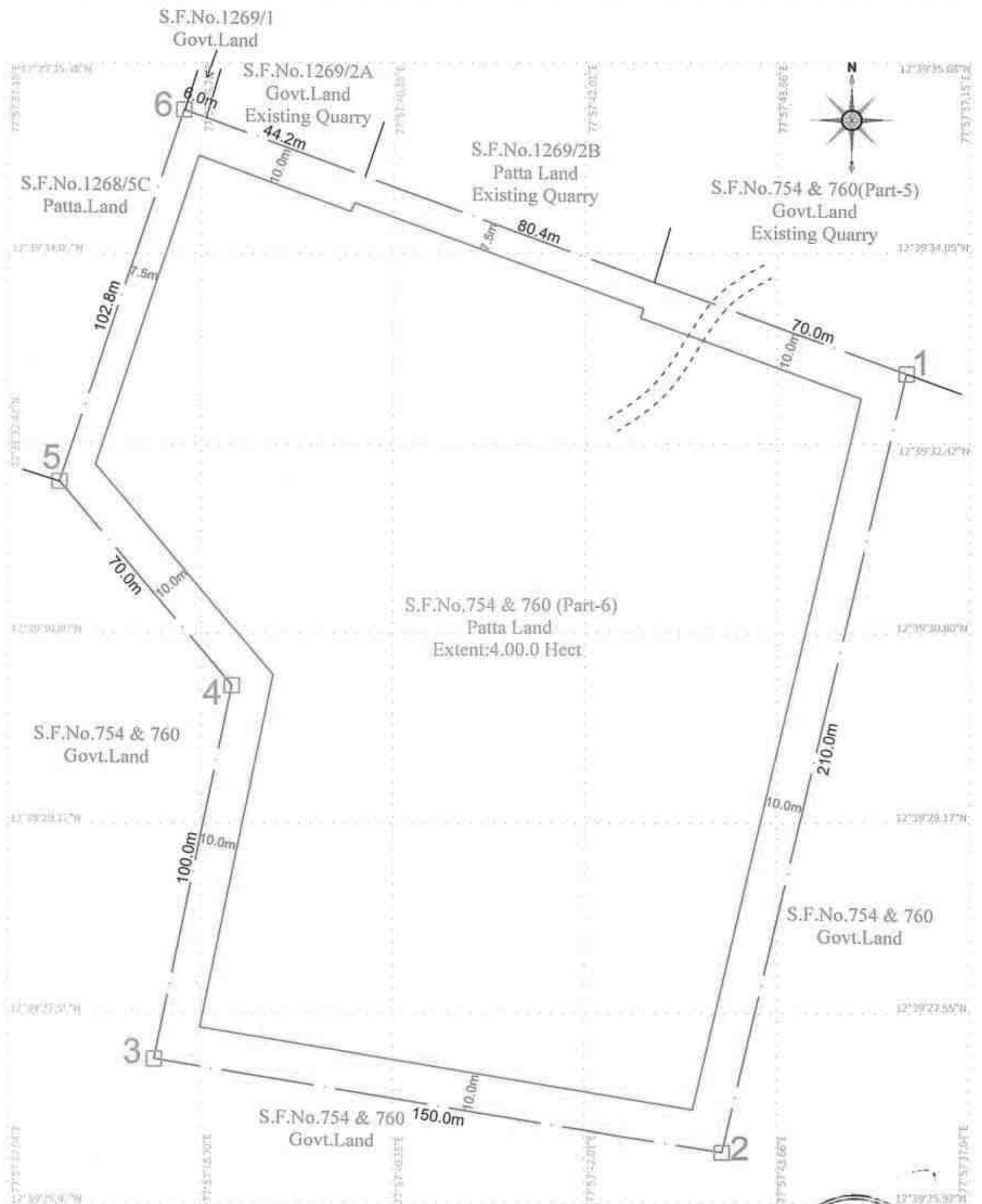
Prepared By:

I DO HEREBY CERTIFY THAT THE PLATE HAS  
BEEN CHECKED BY ME AND IS CORRECT  
TO THE BEST OF MY KNOWLEDGE

Dr.S.KARUPPANNAN,M.Sc.,Ph.D.  
QUALIFIED PERSON

JULY TO SEPTEMBER

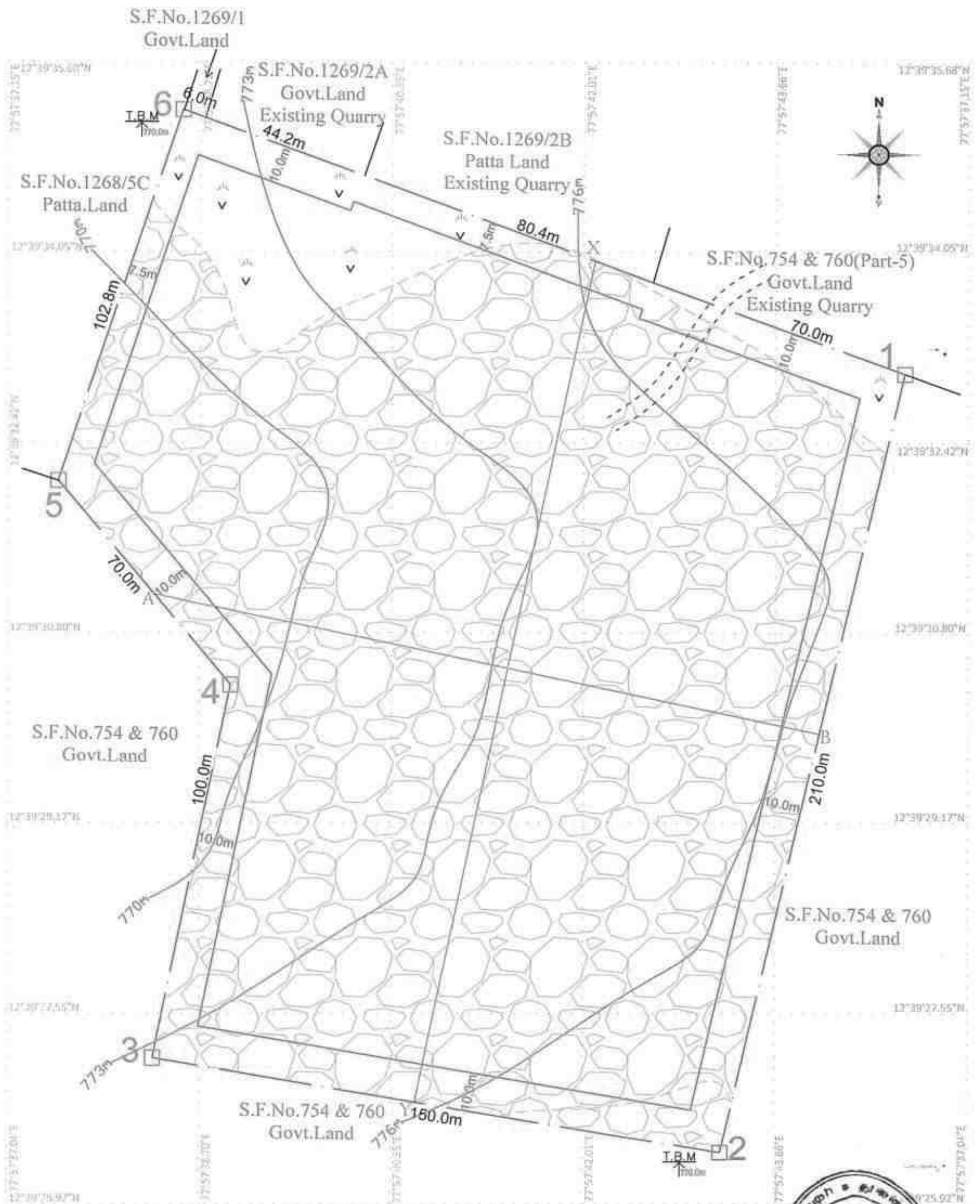




| PILLAR ID | LATITUDE      | LONGITUDE     |
|-----------|---------------|---------------|
| 1         | 12°39'32.93"N | 77°57'44.84"E |
| 2         | 12°39'26.30"N | 77°57'43.20"E |
| 3         | 12°39'27.10"N | 77°57'38.30"E |
| 4         | 12°39'30.28"N | 77°57'39.00"E |
| 5         | 12°39'32.09"N | 77°57'37.60"E |
| 6         | 12°39'35.28"N | 77°57'38.64"E |



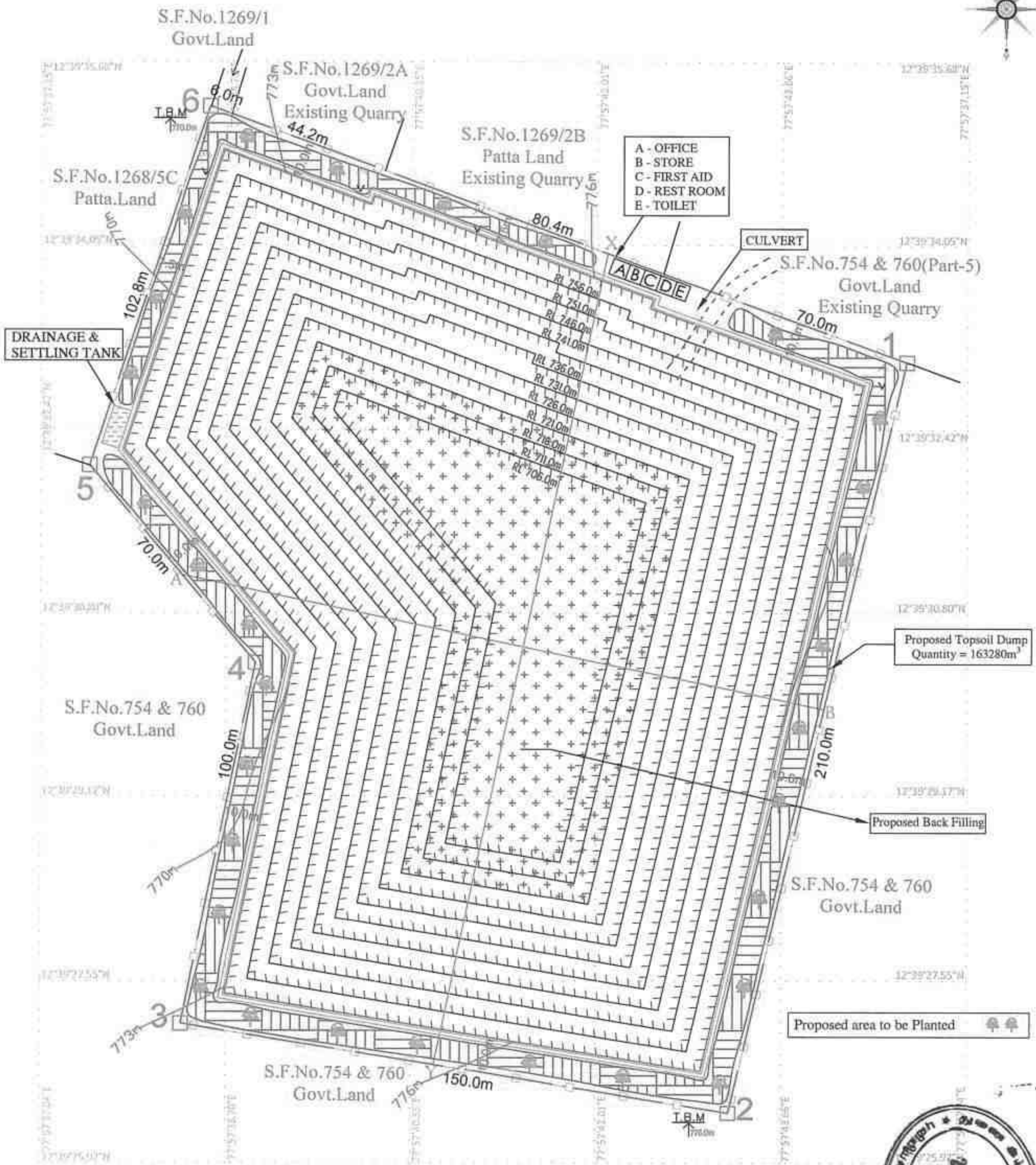
| PLATE No-II                                                                                                                                                                                  | MINE LEASE PLAN<br>SCALE 1 : 1000                                                                                                                                                               | INDEX                                                                                                         | Prepared By:                                                                                                                                                                      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>APPLICANT:</b><br><b>Mr.V.VENKATESULU,</b><br><b>S/o.VENKATASAMY,</b><br><b>No.741, D.M.G KOTTA,</b><br><b>CHAPPADI POST,</b><br><b>SHOOLAGIRI TALUK,</b><br><b>KRISHNAGIRI DISTRICT.</b> | <b>LEASE APPLIED AREA:</b><br><b>S.F.No : 754 &amp; 760 (Part-6)</b><br><b>EXTENT : 4.00.0Hect</b><br><b>VILLAGE : KAMANDODDI</b><br><b>TALUK : SHOOLAGIRI</b><br><b>DISTRICT : KRISHNAGIRI</b> | <b>MINE LEASE BOUNDARY</b><br><b>SAFETY DISTANCE</b><br><b>APPROACH ROAD</b><br><b>BOUNDARY PILLAR STONES</b> | <b>I DO HEREBY CERTIFY THAT THE PLATE HAS BEEN CHECKED BY ME AND IS CORRECT TO THE BEST OF MY KNOWLEDGE</b><br><br><b>Dr.S.KARUPPANNAN,M.Sc.,Ph.D.</b><br><b>QUALIFIED PERSON</b> |



|                                                                                                                                                                                                        |                                                                                                                                                                                                          |                                                                                                                                                                                                                                                        |  |                                                                                                                                                                                                                                                                  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <div>SURFACE &amp; GEOLOGICAL PLAN</div> <div>PLAN SCALE 1: 1000</div>                                                                                                                                 |                                                                                                                                                                                                          | <div>INDEX</div> <div>MINE LEASE BOUNDARY</div> <div>SAFETY DISTANCE</div> <div>APPROACH ROAD</div> <div>BOUNDARY PILLAR STONES</div> <div>CONTOUR LINES</div> <div>GRAVEL &amp; SHRUBS</div> <div>EXISTING DUMP</div> <div>TEMPORARY BENCH MARK</div> |  | <div><div>PLATE No-III</div><div>Prepared By:</div><div>I DO HEREBY CERTIFY THAT THE PLATE HAS BEEN CHECKED BY ME AND IS CORRECT TO THE BEST OF MY KNOWLEDGE</div><div><div></div><div>Dr.S.KARUPPANNAN,M.Sc.,Ph.D.</div><div>QUALIFIED PERSON</div></div></div> |
| <div>APPLICANT:</div> <div>Mr.V.VENKATESULU,</div> <div>S/o.VENKATASAMY,</div> <div>No.741, D.M.G KOTTA,</div> <div>CHAPPADI POST,</div> <div>SHOOLAGIRI TALUK,</div> <div>KRISHNAGIRI DISTRICT.</div> | <div>LEASE APPLIED AREA:</div> <div>S.F.No : 754 &amp; 760 (Part-6)</div> <div>EXTENT : 4.00.0Hect</div> <div>VILLAGE : KAMANDODDI</div> <div>TALUK : SHOOLAGIRI</div> <div>DISTRICT : KRISHNAGIRI</div> |                                                                                                                                                                                                                                                        |  |                                                                                                                                                                                                                                                                  |







**APPLICANT:**  
**Mr.V.VENKATESULU,**  
S/o.VENKATASAMY,  
No.741, D.M.G KOTTA,  
CHAPPADI POST,  
SHOOLAGIRI TALUK,  
KRISHNAGIRI DISTRICT.

**LEASE APPLIED AREA:**  
S.F.No : 754 & 760 (Part-6)  
EXTENT : 4.00.0Hect  
VILLAGE : KAMANDODDI  
TALUK : SHOOLAGIRI  
DISTRICT : KRISHNAGIRI

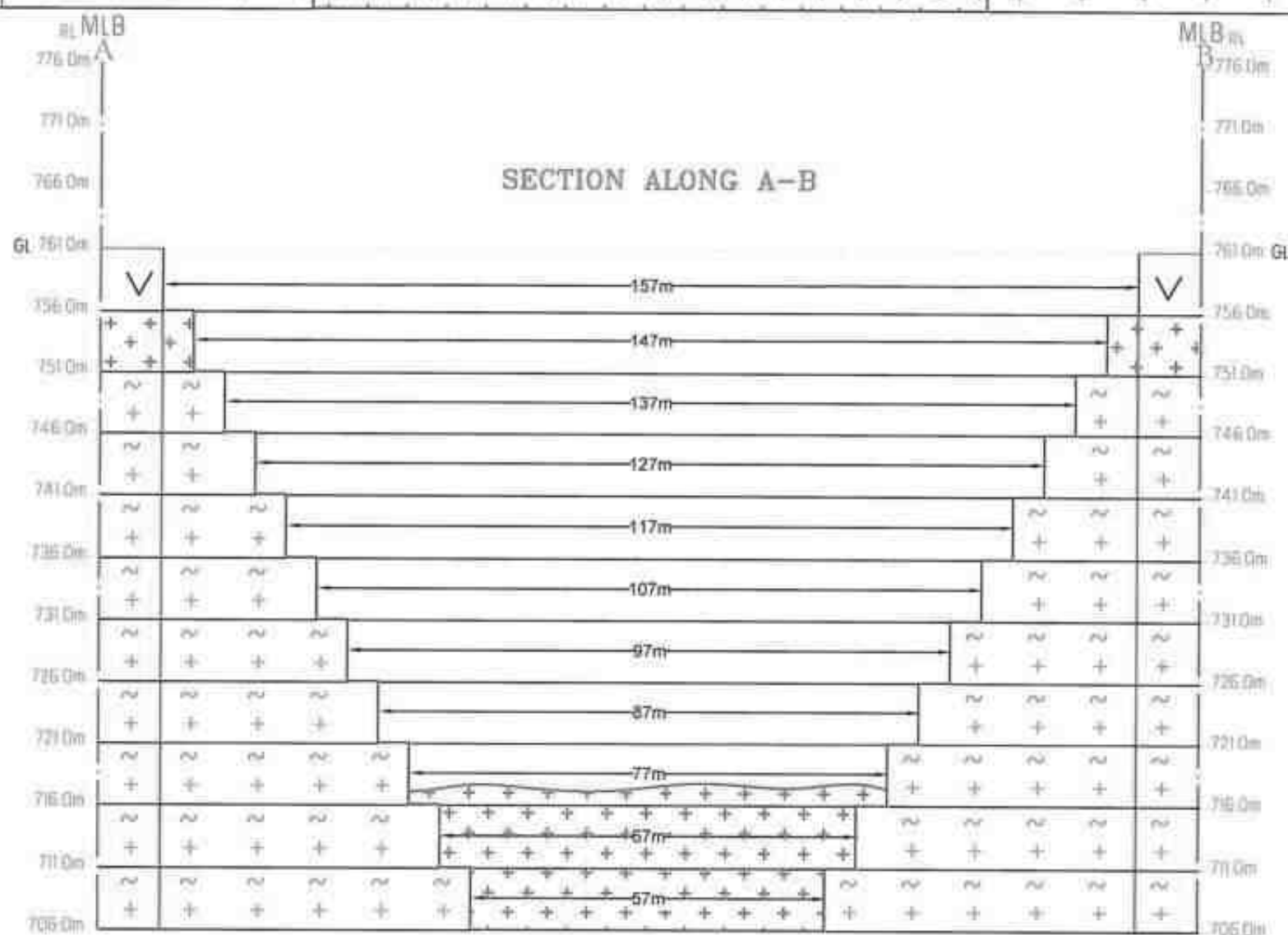
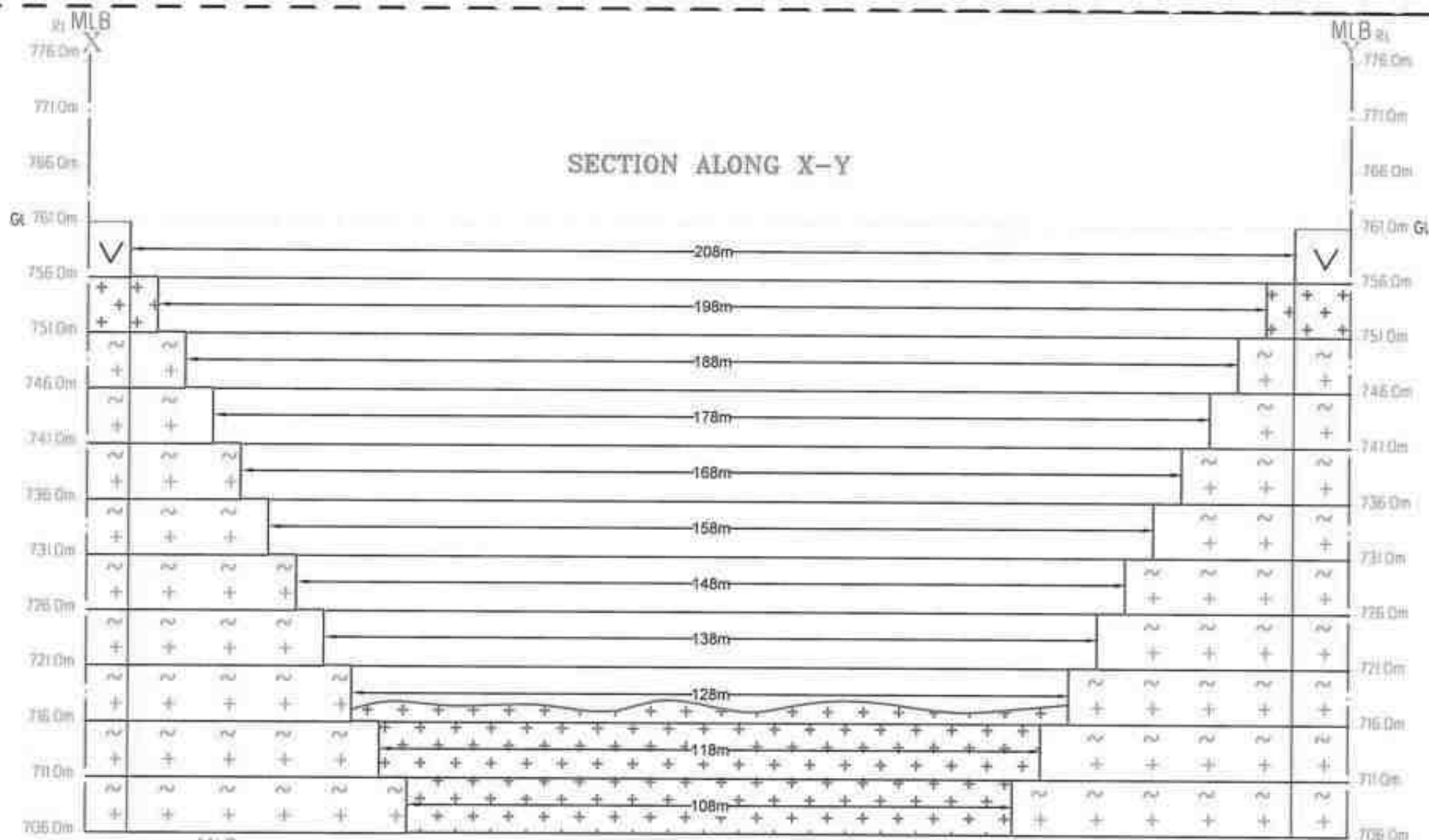
**CONCEPTUAL PLAN**  
PLAN SCALE 1:1000

**INDEX**

|                        |  |                           |  |
|------------------------|--|---------------------------|--|
| MINE LEASE BOUNDARY    |  | TEMPORARY BENCH MARK      |  |
| SAFETY DISTANCE        |  | FENCING                   |  |
| APPROACH ROAD          |  | ULTIMATE BENCH            |  |
| BOUNDARY PILLAR STONES |  | EARTH BUND(REFILLING)     |  |
| CONTOUR LINES          |  | WEATHERED ROCK(REFILLING) |  |
| GRAVEL & SHRUBS        |  | DRAINAGE & SETTLING TANK  |  |



Prepared By:  
I DO HEREBY CERTIFY THAT THE PLATE HAS  
BEEN CHECKED BY ME AND IS CORRECT  
TO THE BEST OF MY KNOWLEDGE  
  
**Dr.S.KARUPPANNAN,M.Sc.,Ph.D.**  
QUALIFIED PERSON



| MINEABLE RESERVES |       |               |              |              |                          |                               |                                  |                           |
|-------------------|-------|---------------|--------------|--------------|--------------------------|-------------------------------|----------------------------------|---------------------------|
| Section           | Bench | Length in (m) | Width in (m) | Depth in (m) | Volume in m <sup>3</sup> | Rough Stone in m <sup>3</sup> | Weathered Rock in m <sup>3</sup> | Topsoil in m <sup>3</sup> |
| XY-AB             | I     | 308           | 157          | 5            | 163280                   | ---                           | ---                              | 163280                    |
|                   | II    | 198           | 147          | 5            | 145530                   | ---                           | 145530                           | ---                       |
|                   | III   | 188           | 137          | 5            | 128780                   | 128780                        | ---                              | ---                       |
|                   | IV    | 178           | 127          | 5            | 113030                   | 113030                        | ---                              | ---                       |
|                   | V     | 168           | 117          | 5            | 98280                    | 98280                         | ---                              | ---                       |
|                   | VI    | 158           | 107          | 5            | 84530                    | 84530                         | ---                              | ---                       |
|                   | VII   | 148           | 97           | 5            | 71780                    | 71780                         | ---                              | ---                       |
|                   | VIII  | 138           | 87           | 5            | 60030                    | 60030                         | ---                              | ---                       |
|                   | IX    | 128           | 77           | 5            | 49280                    | 49280                         | ---                              | ---                       |
|                   | X     | 118           | 67           | 5            | 39530                    | 39530                         | ---                              | ---                       |
|                   | XI    | 108           | 57           | 5            | 30780                    | 30780                         | ---                              | ---                       |
| TOTAL             |       |               |              | 55           | 984830                   | 676020                        | 145530                           | 163280                    |

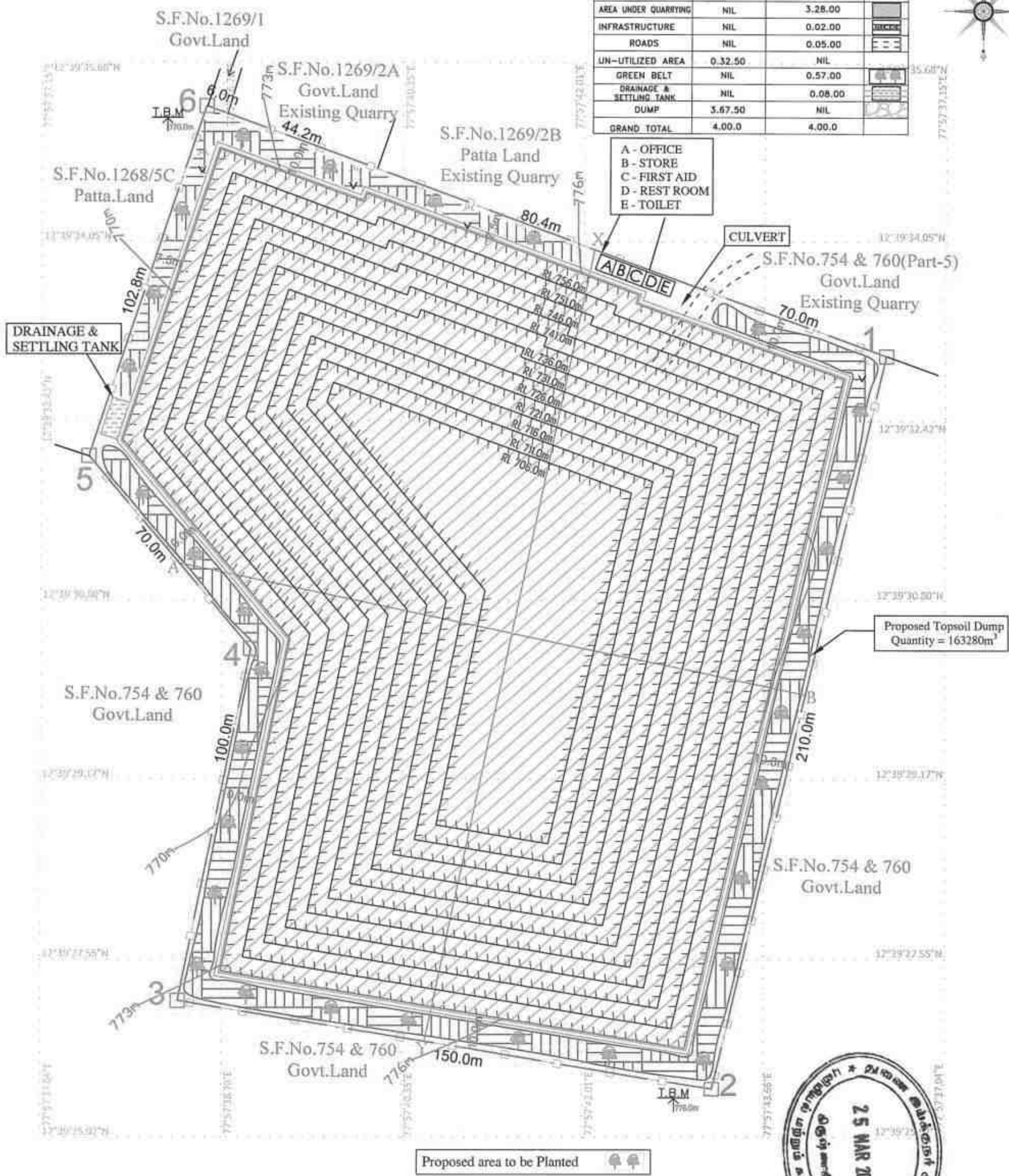
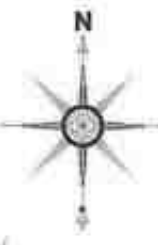
GL-GROUND LEVEL



|                                                                                                                                                    |                                                                                                                                                          |                                                                                                                    |  |                                                                                                                                                                                                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>CONCEPTUAL SECTIONS</b><br>SECTION HOR 1 : 1000 & VER 1 : 500                                                                                   |                                                                                                                                                          | <b>INDEX</b><br>MINE LEASE BOUNDARY<br>SAFETY DISTANCE<br>ROUGH STONE<br>TOPSOIL<br>BACK FILLING<br>ULTIMATE BENCH |  | <b>PLATE No-IVA</b><br>Prepared By:<br>I DO HEREBY CERTIFY THAT THE PLATE HAS BEEN CHECKED BY ME AND IS CORRECT TO THE BEST OF MY KNOWLEDGE<br><br>Dr.S.KARUPPANNAN, M.Sc., Ph.D.<br>QUALIFIED PERSON |
| <b>APPLICANT:</b><br>Mr.V.VENKATESULU,<br>S/o.VENKATASAMY,<br>No.741, D.M.G KOTTA,<br>CHAPPADI POST,<br>SHOOLAGIRI TALUK,<br>KRISHNAGIRI DISTRICT. | <b>LEASE APPLIED AREA:</b><br>S.F.No : 754 & 760 (Part-6)<br>EXTENT : 4.00.0Hect<br>VILLAGE : KAMANDODDI<br>TALUK : SHOOLAGIRI<br>DISTRICT : KRISHNAGIRI |                                                                                                                    |  |                                                                                                                                                                                                       |



| DESCRIPTION              | PRESENT AREA (Hect) | AREA IN USE DURING THE QUARRYING PERIOD (Hect) | COLOR CODE |
|--------------------------|---------------------|------------------------------------------------|------------|
| AREA UNDER QUARRYING     | NIL                 | 3.28.00                                        |            |
| INFRASTRUCTURE           | NIL                 | 0.02.00                                        |            |
| ROADS                    | NIL                 | 0.05.00                                        |            |
| UN-UTILIZED AREA         | 0.32.50             | NIL                                            |            |
| GREEN BELT               | NIL                 | 0.57.00                                        |            |
| DRAINAGE & SETTLING TANK | NIL                 | 0.08.00                                        |            |
| DUMP                     | 3.67.50             | NIL                                            |            |
| GRAND TOTAL              | 4.00.0              | 4.00.0                                         |            |



**APPLICANT:**  
**Mr.V.VENKATESULU,**  
 S/o.VENKATASAMY,  
 No.741, D.M.G KOTTA,  
 CHAPPADI POST,  
 SHOOLAGIRI TALUK,  
 KRISHNAGIRI DISTRICT.

**LEASE APPLIED AREA:**  
 S.F.No : 754 & 760 (Part-6)  
 EXTENT : 4.00.0Hect  
 VILLAGE : KAMANDODDI  
 TALUK : SHOOLAGIRI  
 DISTRICT : KRISHNAGIRI

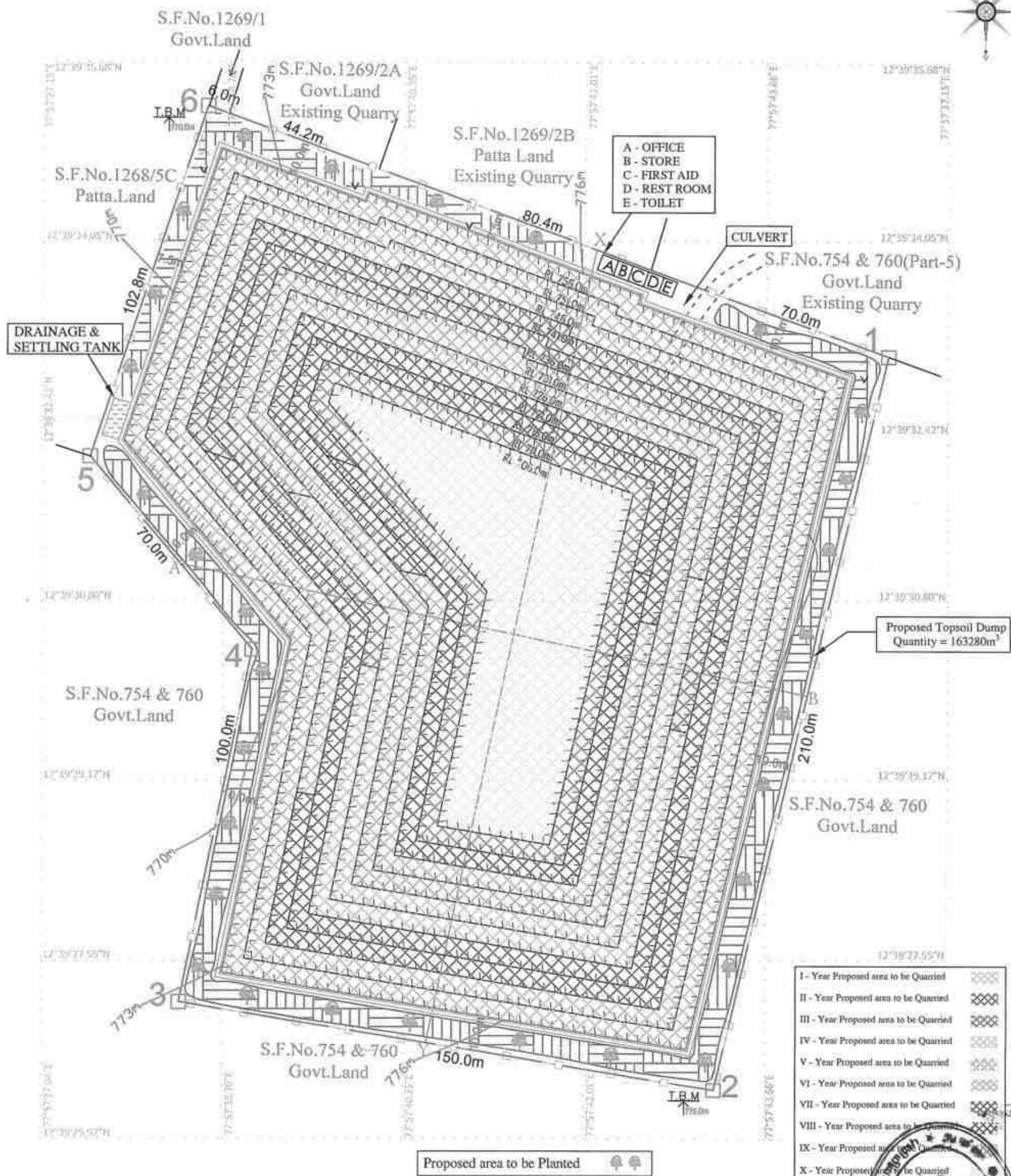
| MINE LAYOUT PLAN & LANDUSE PATTERN |  |                          |  |
|------------------------------------|--|--------------------------|--|
| PLAN SCALE 1 : 1000                |  |                          |  |
| INDEX                              |  |                          |  |
| MINE LEASE BOUNDARY                |  | EXISTING DUMP            |  |
| SAFETY DISTANCE                    |  | TEMPORARY BENCH MARK     |  |
| APPROACH ROAD                      |  | FENCING                  |  |
| BOUNDARY PILLAR STONES             |  | PROPOSED BENCH           |  |
| CONTOUR LINES                      |  | DRAINAGE & SETTLING TANK |  |
| GRAVEL & SHRUBS                    |  |                          |  |

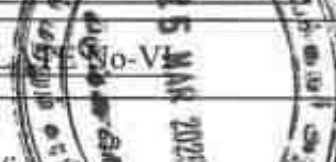


Prepared By:  
 I DO HEREBY CERTIFY THAT THE PLATE HAS BEEN CHECKED BY ME AND IS CORRECT TO THE BEST OF MY KNOWLEDGE

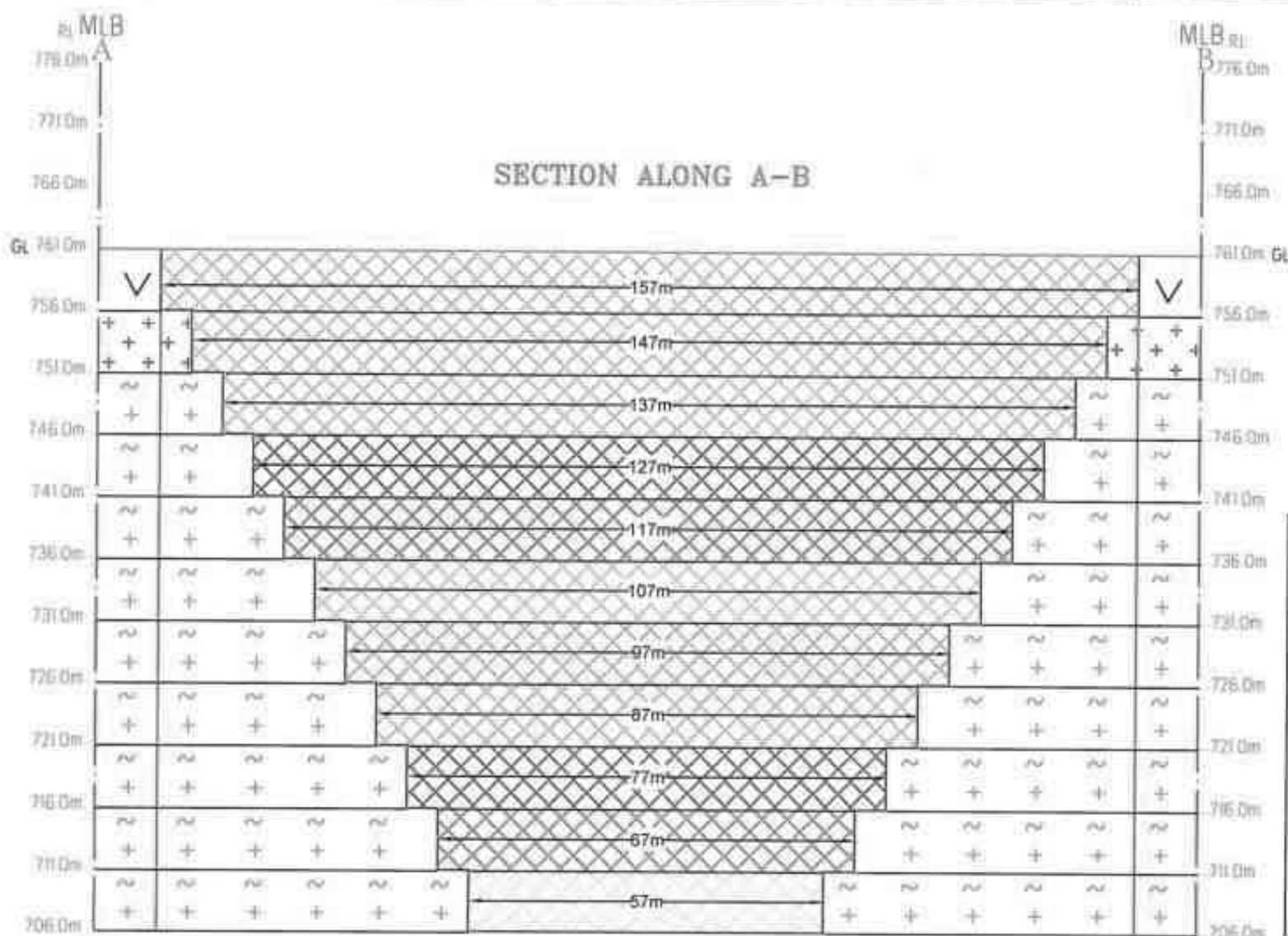
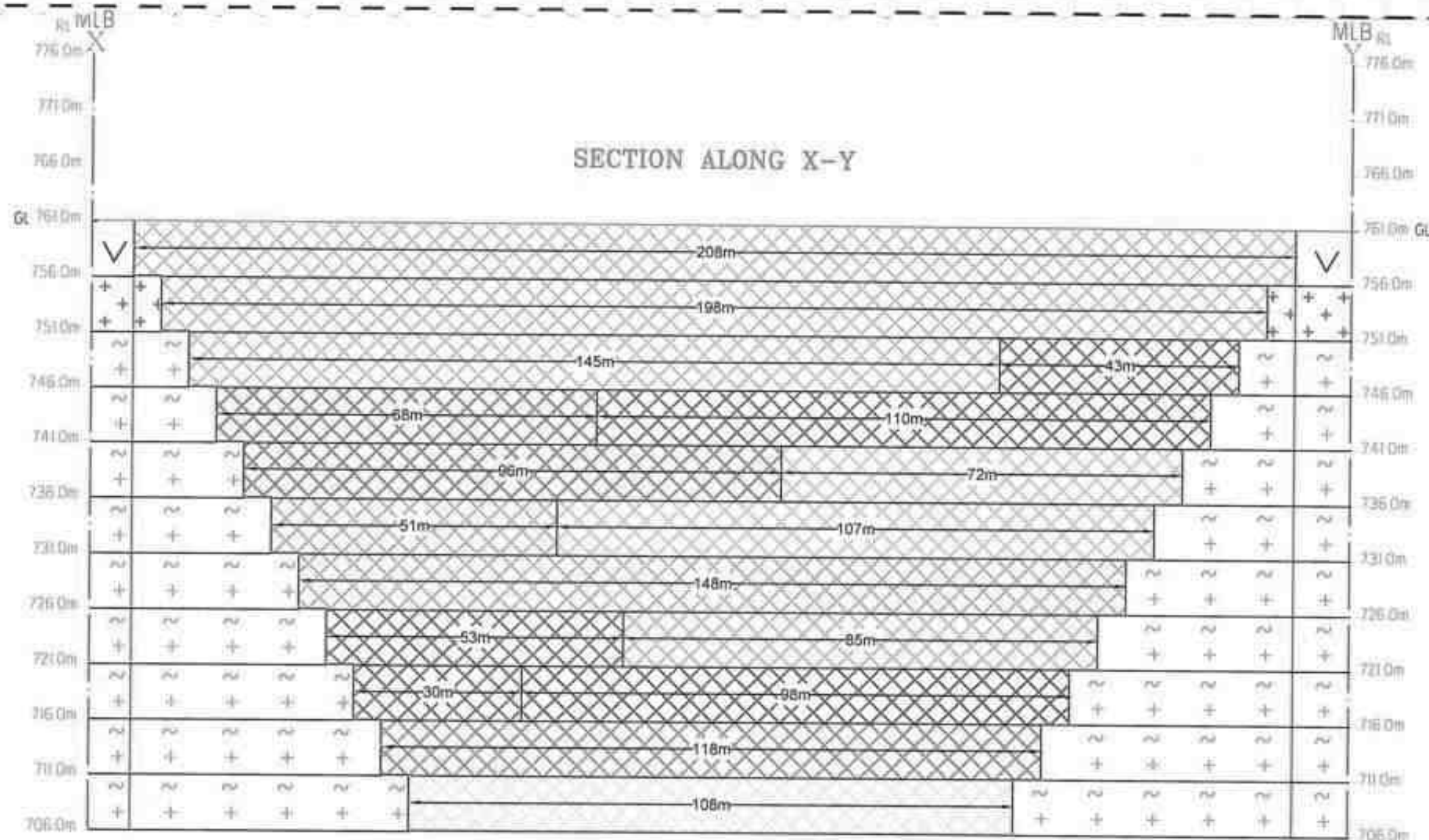
Dr.S.KARUPPANNAN,M.Sc.,Ph.D.  
 QUALIFIED PERSON





|                                                                                                                                                                                              |                                                                                                                       |                                                                                                                        |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| <b>APPLICANT:</b><br><b>Mr.V.VENKATESULU,</b><br><b>S/o.VENKATASAMY,</b><br><b>No.741, D.M.G KOTTA,</b><br><b>CHAPPADI POST,</b><br><b>SHOOLAGIRI TALUK,</b><br><b>KRISHNAGIRI DISTRICT.</b> | <b><u>YEARWISE DEVELOPMENT &amp; PRODUCTION PLAN</u></b><br><b>PLAN SCALE : 1 : 1000</b>                              | <div>PLATE No-V</div> <div></div> |
|                                                                                                                                                                                              | <b><u>INDEX</u></b>                                                                                                   | Prepared By:                                                                                                           |
|                                                                                                                                                                                              | <div>MINE LEASE BOUNDARY</div>    | <div>I DO HEREBY CERTIFY THAT THE PLAN HAS BEEN CHECKED BY ME AND IS CORRECT TO THE BEST OF MY KNOWLEDGE.</div>        |
|                                                                                                                                                                                              | <div>SAFETY DISTANCE</div>        | <div></div>                       |
|                                                                                                                                                                                              | <div>APPROACH ROAD</div>          | <div>Dr.S.KARUPPANNAN, M.Sc., Ph.D.</div>                                                                              |
|                                                                                                                                                                                              | <div>BOUNDARY PILLAR STONES</div> | <div>QUALIFIED PERSON</div>                                                                                            |
|                                                                                                                                                                                              | <div>CONTOUR LINES</div>          |                                                                                                                        |
|                                                                                                                                                                                              | <div>GRAVEL &amp; SHRUBS</div>    |                                                                                                                        |
| <b><u>LEASE APPLIED AREA:</u></b><br>S.F.No : 754 & 760 (Part-6)<br>EXTENT : 4.00 Hect<br>VILLAGE : KAMANDODDI<br>TALUK : SHOOLAGIRI<br>DISTRICT : KRISHNAGIRI                               |                                                                                                                       |                                                                                                                        |





GL-GROUND LEVEL

- I - Year Proposed area to be Quarried
- II - Year Proposed area to be Quarried
- III - Year Proposed area to be Quarried
- IV - Year Proposed area to be Quarried
- V - Year Proposed area to be Quarried
- VI - Year Proposed area to be Quarried
- VII - Year Proposed area to be Quarried
- VIII - Year Proposed area to be Quarried
- IX - Year Proposed area to be Quarried
- X - Year Proposed area to be Quarried

| YEARWISE PRODUCTION RESERVES |           |             |                  |                 |                 |                             |                                     |                                     |                              |        |        |
|------------------------------|-----------|-------------|------------------|-----------------|-----------------|-----------------------------|-------------------------------------|-------------------------------------|------------------------------|--------|--------|
| Section                      | Year      | Depth       | Length<br>in (m) | Width<br>in (m) | Depth in<br>(m) | Volume<br>in m <sup>3</sup> | Rough<br>Stone in<br>m <sup>3</sup> | Weathered<br>Rock in m <sup>3</sup> | Topsoil in<br>m <sup>3</sup> |        |        |
| XY-AB                        | I-YEAR    | I           | 208              | 157             | 5               | 163280                      | ---                                 | ---                                 | 163280                       |        |        |
|                              |           | II          | 198              | 147             | 5               | 145530                      | ---                                 | 145530                              | ---                          |        |        |
|                              |           | III         | 145              | 137             | 5               | 99335                       | 99335                               | ---                                 | ---                          |        |        |
| TOTAL                        |           |             |                  |                 |                 | 408135                      | 99335                               | 145530                              | 163280                       |        |        |
| XY-AB                        | II-YEAR   | IV          | 43               | 137             | 5               | 29455                       | 29455                               | ---                                 | ---                          |        |        |
|                              |           | V           | 110              | 127             | 5               | 69850                       | 69850                               | ---                                 | ---                          |        |        |
|                              |           | TOTAL       |                  |                 |                 |                             |                                     | 99305                               | 99305                        | 0      | 0      |
| XY-AB                        | III-YEAR  | VI          | 68               | 127             | 5               | 43180                       | 43180                               | ---                                 | ---                          |        |        |
|                              |           | V           | 96               | 117             | 5               | 56160                       | 56160                               | ---                                 | ---                          |        |        |
|                              |           | TOTAL       |                  |                 |                 |                             |                                     | 99340                               | 99340                        | 0      | 0      |
| XY-AB                        | IV-YEAR   | V           | 72               | 117             | 5               | 42120                       | 42120                               | ---                                 | ---                          |        |        |
|                              |           | VI          | 107              | 107             | 5               | 57245                       | 57245                               | ---                                 | ---                          |        |        |
|                              |           | TOTAL       |                  |                 |                 |                             |                                     | 99365                               | 99365                        | 0      | 0      |
| XY-AB                        | V-YEAR    | VI          | 51               | 107             | 5               | 27265                       | 27265                               | ---                                 | ---                          |        |        |
|                              |           | VII         | 148              | 97              | 5               | 71780                       | 71780                               | ---                                 | ---                          |        |        |
|                              |           | TOTAL       |                  |                 |                 |                             |                                     | 99045                               | 99045                        | 0      | 0      |
| XY-AB                        | VI-YEAR   | VIII        | 85               | 87              | 5               | 36975                       | 36975                               | ---                                 | ---                          |        |        |
|                              |           | TOTAL       |                  |                 |                 |                             |                                     | 36975                               | 36975                        | 0      | 0      |
|                              |           | XY-AB       | VII-YEAR         | VIII            | 53              | 87                          | 5                                   | 23055                               | 23055                        | ---    | ---    |
| IX                           | 30        |             |                  | 77              | 5               | 11550                       | 11550                               | ---                                 | ---                          |        |        |
| TOTAL                        |           |             |                  |                 |                 | 34605                       | 34605                               | 0                                   | 0                            |        |        |
| XY-AB                        | VIII-YEAR | IX          | 98               | 77              | 5               | 37730                       | 37730                               | ---                                 | ---                          |        |        |
|                              |           | TOTAL       |                  |                 |                 |                             |                                     | 37730                               | 37730                        | 0      | 0      |
|                              |           | XY-AB       | IX-YEAR          | X               | 118             | 67                          | 5                                   | 39530                               | 39530                        | ---    | ---    |
| TOTAL                        |           |             |                  |                 |                 | 39530                       | 39530                               | 0                                   | 0                            |        |        |
| XY-AB                        | X-YEAR    |             |                  | XI              | 108             | 57                          | 5                                   | 30780                               | 30780                        | ---    | ---    |
|                              |           | TOTAL       |                  |                 |                 |                             |                                     | 30780                               | 30780                        | 0      | 0      |
|                              |           | GRAND TOTAL |                  |                 |                 |                             |                                     | 984830                              | 676020                       | 145530 | 163280 |

## PLATE No-VIA

YEARWISE DEVELOPMENT & PRODUCTION SECTIONS  
SECTION HOR 1 : 1000 & VER 1 : 500

### APPLICANT:

Mr.V.VENKATESULU,  
S/o.VENKATASAMY,  
No.741, D.M.G KOTTA,  
CHAPPADI POST,  
SHOOLAGIRI TALUK,  
KRISHNAGIRI DISTRICT.

### LEASE APPLIED AREA:

S.F.No : 754 & 760 (Part-6)  
EXTENT : 4.00.0Hect  
VILLAGE : KAMANDODDI  
TALUK : SHOOLAGIRI  
DISTRICT : KRISHNAGIRI

## INDEX

- MINE LEASE BOUNDARY
- SAFETY DISTANCE
- ROUGH STONE
- TOPSOIL
- WEATHERED ROCK
- PROPOSED BENCH

Prepared By:

I DO HEREBY CERTIFY THAT THE PLATE HAS BEEN CHECKED BY ME AND IS CORRECT TO THE BEST OF MY KNOWLEDGE

Dr.S.KARUPPANNAN,M.Sc.,Ph.D.  
QUALIFIED PERSON



விடுவன்குடி ஸ்தலம், சூலாபுரம், உத்தரபுரம்  
 உள் ஸ்தலம் கமண்டோடி ஹஸ்த 754 to 760 உள்  
 கமண்டோடி ஹஸ்த 754 to 760 உள்  
 754 to 760 Part-6 ஸ்தல 4.00.0 Ha உள்  
 கமண்டோடி ஹஸ்த V. உத்தரபுரம் Rough Stone  
 கமண்டோடி கமண்டோடி 300 ஸ்தல கமண்டோடி  
 கமண்டோடி, 450 கமண்டோடி கமண்டோடி, கமண்டோடி  
 கமண்டோடி, கமண்டோடி கமண்டோடி கமண்டோடி  
 கமண்டோடி கமண்டோடி கமண்டோடி கமண்டோடி  
 கமண்டோடி கமண்டோடி கமண்டோடி கமண்டோடி

Village Administrative Officer  
 126, Kamandoddi.  
 Uddanapalli Firka, Shoolagiri Taluk,  
 Krishnagiri Dist.

V. V. / ca

PHOTOCOPY OF THE APPLIED LEASE AREA

Site photos in respect of rough stone quarry lease in S.F.No's. 754 & 760 (Part-6), Govt Poramboke land - Over an extent of 4.00.0 hectares - Kamandoddi Village - Shoolagiri Taluk - Krishnagiri District, Tamil Nadu State in belongs to Mr.V.Venkatesulu.



  
Village Administrative Officer  
126, Kamandoddi,  
Uddanapalli Firka, Shoolagiri Taluk,  
Krishnagiri Dist.





## National Accreditation Board for Education and Training

### Certificate of Accreditation

#### Geo Technical Mining Solutions, Dharmapuri

5/1485-3, Salem Main Road, Elakkiyampatty, Dharmapuri, Tamil Nadu

The organization is accredited as **Category-A** under the QCI-NABET Scheme for Accreditation of EIA Consultant Organization, Version 3: for preparing EIA/EMP reports in the following Sectors.

| S. No | Sector Description                                             | Sector (as per) |           | Cat. |
|-------|----------------------------------------------------------------|-----------------|-----------|------|
|       |                                                                | NABET           | MoEFCC    |      |
| 1.    | Mining of minerals - including opencast and underground mining | 1               | 1 (a) (i) | A    |

**Note:** Names of approved EIA Coordinators and Functional Area Experts are mentioned in RAAC minutes dated January 24, 2024, posted on QCI-NABET website.

The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in QCI-NABET's letter of accreditation bearing no QCI/NABET/ENV/ACO/24/3142 dated Feb 19, 2024. The accreditation needs to be renewed before the expiry date by Geo Technical Mining Solutions, Dharmapuri following due process of assessment.

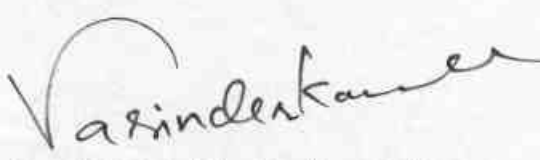
Issue Date  
Feb 19, 2024

Valid up to  
Dec 31, 2026



  
Mr. Ajay Kumar Jha  
Sr. Director, NABET

Certificate No.  
NABET/EIA/23-26/RA 0319

  
Prof (Dr) Varinder S Kanwar  
(CEO NABET)

For the updated List of Accredited EIA Consultant Organizations with approved Sectors please refer to QCI-NABET website.