

**DRAFT OF 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 = 10.80.02 hectares

ROUGHSTONE AND GRAVEL QUARRY

At

Magaral-B Village, Walajabad Taluk, Kancheepuram District,

Tamil Nadu State

ToR letter No. SEIAA-TN/F.No. 9631/SEAC/ToR-1362/Dated 10.02.2023.

NAME AND ADDRESS OF THE PROPOSED PROJECT PROPONENT

| Name and Address | Extent & S.F.No. |
|---|------------------------------|
| Mr.D.Govindasamy, S/o. Desingu, No.288, Palla Street, Sitthalapakkam Village, Arasanipalaiyam Post, Vembakkam taluk, Tiruvannamalai District - 631702 Tamil Nadu | 2.90.50 ha & 699/2, 699/3 |

ENVIRONMENTAL CONSULTANT

GEO TECHNICAL MINING SOLUTIONS



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

Valid till: Dec 31, 2023



ENVIRONMENTAL LAB

EKDANT ENVIRO SERVICES(P) Ltd

R-7/1, AVK Towers, Ground Floor,

North main road, Anna Nagar West Extn,

Chennai – 600101.

Baseline Study Period – March through May 2023

TERMS OF REFERENCE (ToR) COMPLIANCE

ToR issued vide Lr No. SEIAA-TN/F.No.9631/SEAC/ToR-1362/2023 dated 10.02.2022

for Thiru.D. Govindasamy Rough stone & gravel Quarry

| REMARKS FROM SEAC | | |
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| 1 | The proponent is request to submit the valid registered lease document during the EIA. appraisal after the previous lease granted for the mining operations is legally surrendered (or) lapsed with the consent of the competent authority | It is a fresh quarry lease. Hence, it does not require the previous lease document from competent authority. |
| 2 | The proponent is requested to carry out a survey and enumerate on the structures including the crematory shed located within 100m,200m,300m from the boundary of the mine lease area. | The information on structures at 50 m, 100 m, 150 m, 200 m, 250 m, 300 m and 500 m will be added in final EIA report. |
| 3 | Since the proposed mining activity is abutting a huge water tank, the proponent shall conduct a detailed study regarding the implications of mining activity on the water tank and submit the mitigation measures along with the EIA Report. | The proponent shall conduct a detailed study regarding the implications of mining activity on the water tank will be attached in the final EIA report. |
| 4 | 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. | Photographs showing green belt, fencing and garland drain will be included in the final EIA report. |
| 5 | The Project Proponent shall conduct the hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies | Detailed hydrogeological study was carried out. The results have been discussed Section 3.2 under Chapter III, pp.39-51 |

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| | 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. | |
| 6 | The proponent shall submit the details regarding the nature of blasting activity which will be carried out. | This proposed project involves the open cast semi-mechanized mining method with bench height and width of 5m each. The open cast semi- mechanized method involved drilling and blasting is proposed to extract rough stone and gravel. |
| 7 | The PP shall furnish DFO letter stating that the proximity distance of Reserve Forests, protected Areas, sanctuaries, Tiger reserve etc., upto a radius of 25 km from the proposed site. | With respect to the suggestion made in the ToR, an application seeking details on distance of reserve forest & protected areas / Wild life sanctuaries & wild life corridors etc., within 25 km radius has been made to DFO at Kancheepuram. The document will be submitted along with the final EIA report. |
| 8 | The PP shall provide individual notice regarding the public Hearing to the nearby house owners located in the vicinity of the project site. | The individual notice regarding the Public Hearing to the nearby house owners located in the vicinity of the project site will be submitted in the final EIA report. |
| 9 | In the case of proposed lease in an existing (or old) quarry where the benches are non-existent (or) partially formed critical of the bench geometry | The action plan for realignment of benches for this proposed project will be submitted during presentation |

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| | approved in the Mining plan, the project proponent (PP) shall prepare and submit an 'Action plan' for carrying out the realignment of the 'highwall' benches to ensure slope stability in the proposed quarry lease which shall be vetted by the concerned Asst. Director of Geology and Mining, during the time of appraisal for obtaining the EC. | |
| 10 | The proponent shall submit a conceptual 'slope stability plan' for the proposed quarry indicating the proposed stabilizing measures during the appraisal while obtaining the EC, as the depth of the proposed working is extended beyond 30 m below ground level. | This project does not require the Slope Stability Plan because the SEAC has restricted the ultimate depth of mining to be 30 m BGL during the 5 year mining plan period. |
| 11 | If the blasting operation is to be carried out, the PP shall present a conceptual design for carrying out the NONEL initiation based controlled blasting operation involving line drilling & muffle blasting and simulation Model indicating the anticipated Blast – induced Ground vibration levels in the proposed quarry as stipulated by the DGMS circular No.7 of 1997, during the EIA proposal. | NONEL blasting is proposed for this project. A conceptual design of blasting has been given in Section 2.6 under Chapter II, pp.20-27. |
| 12 | Details of Green belt & fencing shall be included in the EIA Report. | Details of existing green belt and fencing will be provided in the final EIA report. |
| 13 | 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 document containing video and photographic evidences will be submitted at the time of presentation, if any. |

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| 14 | 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. | |
| | a. | What was the period of the operation and stoppage of the earlier mines with last work permit issued by the AD/DD mines? |
| | b. | Quantity of minerals mined out. |
| | c. | Highest production achieved in any one year |
| | d. | Detail of approved depth of mining. |
| | e. | Actual depth of the mining achieved earlier. |
| | f. | Name of the person already mined in that leases area. |
| | g. | If EC and CTO already obtained, the copy of the same shall be submitted. |
| | h. | Whether the mining was carried out as per the approved mine plan (or EC if issued) with stipulated benches. |
| | As the proposed project is a green field project, the conditions are not applicable to this project. | |
| 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). | |
| | All corner coordinates of the mine lease area have been superimposed on a high-resolution Google Earth Image, as shown in Figure 2.4, under Chapter II, p-13 | |

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| 16 | The PP shall carry out Drone video survey covering the cluster, green belt, fencing etc., | Drone video coverage will be submitted at the time of presentation. |
| 17 | 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 mineral reserves of the project have been discussed in Section 2.5 under Chapter II, pp.17-19 The anticipated impact of mining on land, air, noise, water, soil, biology, and socio economy is discussed under Chapter IV, pp.101-128. |
| 18 | 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 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. | Employment details of the proposed project are provided in Table 2.14 under Chapter II, p.28. |
| 19 | 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, pp. 29-100. |
| 20 | 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 | Results of cumulative impact study due to mining operations are given in Section 7.4 under Chapter VII, pp.146-147. |

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| | 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. | |
| 21 | Rain water harvesting management with recharging details along with water balance (both monsoon & non-monsoon) be submitted. | 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. |
| 22 | 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, pp.30-38 under Chapter III. The details of surrounding sensitive ecological features are provided in Table 3.42 under Chapter III, p.98 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. |
| 23 | 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. | Not Applicable. No dumps have been proposed outside the lease area. |

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| 24 | 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. | Not Applicable. This project area is involved in the production of rough stone and gravel materials as per the approved mine plan. |
| 25 | 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. | 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 | Impact on local transport infrastructure due to the Project should be indicated. | Impact on local traffic due to the project is within the permissible limit. Details are provided in Section 3.7, pp.95-97. |
| 27 | 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 3.5 under chapter-III, pp.66-90. |
| 28 | A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific. | Progressive mine closure plan has been prepared for this project and is given in Section 2.6 under Chapter II, pp.20-27. |
| 29 | Public Hearing points raised and commitments of the Project Proponent on | The project proponent addressed the concerns from the public during public |

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| | 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 and to be submitted to SEIAA/SEAC with regard to the Office Memorandum of MoEF & CC accordingly. | hearing will be submitted in the final EIA report. |
| 30 | The Public hearing advertisement shall be published in one major National daily and one most circulated vernacular daily. | The Public hearing advertisement will be updated in the final EIA report. |
| 31 | The PP shall produce/display the EIA report, Executive summary and other related information with respect to public hearing in Tamil Language also. | The Tamil version of EIA report, executive summary and other related information will be incorporated in this report. |
| 32 | 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. | The EIA coordinator and the FAE for ecology and biodiversity visited the study area and educated the local students about the importance of protecting the biological environment. |
| 33 | 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 and local school/college authorities. The plant species with dense/moderate canopy of | A detailed Greenbelt Development Plan dealing with carbon sequestration has been provided in Section 4.6 under Chapter IV, pp.119-125. |

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| | native origin should be chosen. Species of small/medium/tall trees alternating with shrubs should be planted in a mixed manner. | |
| 34 | Taller/one year old saplings raised in appropriate size of bags; preferably eco-friendly 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. Saplings used for greenbelt development have been shown in Section 4.6 under Chapter IV, pp.119-125. |
| 35 | 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. | The details about disaster management Plan have been provided in Section 7.2 under Chapter VII, pp.138-142. |
| 36 | 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. | The details about risk assessment and management plan have been provided in Section 7.2 under Chapter VII, pp.138-142. |
| 37 | 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, pp.126 & 127. |

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| 38 | 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.150 & 151. |
| 39 | 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 18 people directly and 10 people indirectly as discussed in Section 8.1 and 8.2 under Chapter VIII, p.149. |
| 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 | 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.149-151. |
| 42 | If any quarrying operation 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. | The certified compliance is attached with this report in Annexure. |

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| 43 | The PP shall prepare the EMP for entire life of mine and also furnish the sworn affidavit stating to abide the EMP for the entire life of mine. | A detailed EMP is provided in Table 10.9 under Chapter X, pp.163-168. |
| 44 | 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 |
| | The proposal was placed in the 591 th Authority meeting held on 10.02.2023. the proposal is placed in this 346 th SEAS Meeting held on 12.01.2023. Based on the presentation made by the proponent SEAC decided to recommend for grant of Terms of Reference (ToR) with public Hearing. After detailed deliberations, the Authority accepted the recommendations of SEAC and decided to grant Terms of Reference subject to the conditions as recommended by SEAC in addition to the following conditions and conditions stated therein vide Annexure 'B': | |
| Annexure 'B' | | |
| Cluster Management Committee | | |
| 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 | The list of members of the committee formed will be submitted to AD/Mines |

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| | before the execution of mining lease and the same shall be updated every year to the 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 individual quarry in the form of route map and network. | All the information has been discussed in Section 2.6 & 2.7 under Chapter II, pp.20-27. |
| 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. | The cluster management will be advised 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 furnish the Emergency Management plan within the cluster. | The committee will submit the emergency management plan to the respective authority in the stipulated time period. |
| 9 | The committee shall deliberate on the health of the workers/staff involved in | The information on the health of the workers and the local people will be |

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| | the mining as well as the health of the public. | updated periodically. |
| 10 | The committee shall furnish an action plan to achieve sustainable development goals with reference to water, sanitation & safety. | A proper action plan with reference to water, sanitation & safety will be devised and submitted by the committee to the respective authority. |
| 11 | The committee shall furnish the fire safety and evacuation plan in the case of fire accidents. | The committee will submit the fire safety and evacuation plan as discussed in Section 7.3 under Chapter VII, pp.142-146. |
| Impact Study of mining | | |
| 12 | Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area covering the entire mine lease period as per precise area communication order issued from reputed research institutions on the following | |
| | a) | Soil health & soil biological, physical land chemical features. |
| | b) | Climate change leading to Droughts, Floods etc. |
| | c) | Pollution leading to release of Greenhouse gases (GHG), rise in Temperature, & Livelihood of the local People. |
| | d) | Possibilities of water contamination and impact on aquatic ecosystem health. |
| | e) | Agriculture, Forestry, & Traditional practices. |
| | f) | Hydrothermal/Geothermal effect due to destruction in the Environment. |
| | g) | Bio-geochemical processes and its foot prints including environmental stress. |
| | | The Study is under process. The results will be updated in the final EIA report. |

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| | h) | Sediment geochemistry in the surface streams. | |
| Agriculture & Agro-Biodiversity | | | |
| 13 | Impact on surrounding agricultural fields around the proposed mining area. | | As the proposed lease area is dominantly surrounded by mining land, barren land, and fallow land, the impact on the surrounding agricultural fields if present will be low. With proper mitigation measures, the project will be carried out to reduce the impact further to the level of negligence. |
| 14 | Impact on soil flora & vegetation around the project site. | | Impact of the project on the ecology and biodiversity has been discussed in Section 4.2 and Section 4.6 under Chapter IV, pp.102-103 and pp.119 - 125 |
| 15 | Details of type of vegetations including no. of trees & shrubs within the proposed mining area shall be given 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 3.5 under chapter-III, pp.66-90. Details about transplantation of plants have been provided in Section 4.6 under Chapter IV, pp.102-103 |
| 16 | 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 3.5 under chapter-III, pp.66-90.and measures have been provided in Section 4.6 under Chapter IV, pp.102-103 |
| 17 | Action should specifically suggest for sustainable management of the area and restoration of ecosystem for flow of goods and services. | | The FAE of ecology and biodiversity has advised the project proponent that replantation work, particularly for the project area where plants of 4 years old exist should be carried out in the vacant areas available |

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| 18 | 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, pp.101 & 102. |
| Forests | | |
| 19 | The project proponent shall study on impact of mining on Reserve forests free ranging wildlife. | The impacts of the proposed project on the surrounding environment have discussed in Chapter IV, pp.101-128. |
| 20 | 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, pp.101-128. |
| 21 | 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, pp.102-103 |
| 22 | The Environmental Impact Assessment should study impact on protected areas, Reserve Forests, National parks, corridors and wildlife pathways, near project site. | There are no protected areas, National Parks, Corridors and Wildlife pathways near project site. The list of environmentally sensitive areas within 10 km radius has been provided in Table 3.42 under Chapter III, p.98 |
| Water Environment | | |
| 23 | 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) so as to assess the impacts on the nearby waterbodies due to mining activity. Based on actual | A detailed hydrogeological study was carried out. The results have been discussed in Section 3.2 under Chapter III, pp.39-51. |

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| | 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. | |
| 24 | 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, pp.103 & 104. |
| 25 | Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area on the nearby villages, waterbodies/rivers & any ecological fragile areas. | A detailed study was carried out regarding the impact of mining on the environment. The results have been included in Chapter IV, pp.101-128. |
| 26 | The project proponent shall study impact on fish habitats and the food WEB/food chain in the water body and Reservoir. | As there are no water bodies near to the proposed project site during study period, a study about the impact of mining on fish habitats was not conducted. |
| 27 | 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, pp.101-128. |
| 28 | 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 sits possible land form changes visual and aesthetic impacts. | The impact of the proposed project on aquatic plants and animals in water bodies has been discussed in Section 4.6 under Chapter IV, pp.102-103 |
| 29. | The Terms of Reference should specifically study impact on soil health, | The impact of mining on soil environment has been discussed in Section 4.2 under |

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| | soil erosion, the soil physical, chemical components. | Chapter IV, pp.102-103. |
| 30 | 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, pp.103 & 104. |
| Energy | | |
| 31 | 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, pp.101-128. |
| Climate Change | | |
| 32 | 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. | Greenbelt development plan as discussed in Section 4.6 under Chapter IV has been designed to reduce the impact of carbon emission on the environment, pp.119 - 125. |
| 33 | The Environmental Impact Assessment should study impact on climate change, temperature rise, pollution and above soil & below soil carbon stock. | The information will be included in the final EIA report. |
| Mine Closure Plan | | |
| 34 | 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 mine closure are shown in Table 2.9 under Chapter II, p.23. |
| EMP | | |
| 35 | Detailed Environment Management plan along with adaptation, mitigation & | A detailed Environment Management plan has been given under Chapter X, pp.153- |

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| | remedial strategies covering the entire mine lease period as per precise area communication order issued. | 169. |
| 36 | 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 10.10 & 10.11 under Chapter X, pp.163-169. |
| Risk Assessment | | |
| 37 | 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 7.1 under Chapter VII, pp.135-138. |
| Disaster Management Plan | | |
| 38 | 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. | A detailed Environment Management Plan has been given under Chapter X, pp.153-169 |
| Others | | |
| 39. | The project proponent shall furnish VAO certificate with reference to 300 m radius regard to approved habitations, schools, Archaeological sites, structures, railway lines, roads, water bodies such as streams, odai, vaari, canal, river, lake pond, tank etc. | The VAO certificate of 300 m radius will be attached with final EIA report. |

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| 40 | 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 response to comments will be given in final EIA report. |
| 41 | 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 matter on plastic waste management has been given in Section 7.5 under Chapter VII, pp.147 - 148 |
| 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 patta land. A copy of the ownership document has been enclosed along with the approved mining plan in Annexure.III |
| 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, | The following will approve mine plan, EIA and public hearing will submitted in the final EIA report. |

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| | 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/ 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 2.4, under Chapter II, p-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. | The baseline data sampling locations for all the environmental components are shown in Survey of India Toposheet under Chapter III, pp.29-101. |
| 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 applied 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 prescribed operating process/ procedures to bring into focus any infringement/ deviation/ violation of the environmental or forest | The proponent has framed Environmental Policy and the same has been discussed in Section 10.1 under Chapter X, pp.153 & 154. |

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| | <p>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 90⁰ 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>All the data contained in the EIA report such as waste generation etc., is for the life of the mine / lease period.</p> |
| 10. | <p>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</p> | <p>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.30-38.</p> |

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| | 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 plan of the project area showing pre-operational, operational and post-operational phases are discussed in Table 2.6, under Chapter II, p.22. |
| 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 | Not Applicable. There is no waste anticipated during this quarry operation. The entire quarried out rough stone will be transported to the need customers. Hence, no dumps are proposed outside the lease area. |
| 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. | Not Applicable. There is no forest land involved within the proposed project area and the proposed project area is a patta land. |
| 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) | Not Applicable. There are neither forests nor forest dwellers/forest dependent communities in the mine lease area. There is no forest impacted families (PF) or people (PP). |

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| | should be indicated. A copy of the forestry clearance should also be furnished. | Thus, the rights of Traditional Forest Dwellers will not be compromised on account of the project. |
| 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. 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. | Details about forest vegetation have been provided in Section 3.5 under chapter-III, pp.66-90. |
| 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. | A study was done on wildlife within the study area, as shown in Section 3.5 under chapter-III, pp.66-90. The impact on wild life has been discussed in Section 4.6 under Chapter IV, pp.119-125 |
| 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 | Information regarding the same has been given in Table 3.42 under Chapter III, p.98. |

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| | 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. | A detailed biological study was carried out in both core and buffer zones and the results have been discussed in Section 3.5 under chapter-III, pp.66-90. 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. |
| 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. Project area / Study area is not declared in 'Critically Polluted' Area and does not come under 'Aravalli Range. |

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| 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 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 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. | Not Applicable. There are no approved habitations within a radius of 300 meters. Therefore, R&R plan / compensation details for the Project Affected People (PAP) is not anticipated. |
| 22. | One season (non-monsoon) [i.e., March-May (Summer Season); October-December (post monsoon season); December-February (winter season)] | Baseline data were collected for the period of March 2023 - May 2023 as per CPCB notification and MoEF & CC Guidelines. Primary baseline data and the results have |

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| | <p>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.</p> | <p>been included in Sections 3.1-3.7 under Chapter III, pp. 30-97.</p> |
| 23. | <p>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. 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.</p> | <p>Air quality modelling for prediction of incremental GLCs of pollutants was carried out using AERMOD view. The model results have been given in Section 4.4 under the Chapter IV, pp.104-114.</p> |
| 24. | <p>The water requirement for the project, its</p> | <p>The water requirement for the project, its</p> |

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| | availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the project should be indicated. | availability and source have been provided in Table 2.11 under Chapter II, p.26. |
| 25. | Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the project should be provided. | Not Applicable. 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 will be 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 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 were conducted and the results have been discussed in Section 4.3, under the Chapter IV, pp. 103 & 104. |
| 28. | Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data | Not Applicable. The ground water table is found at the depth of 60 m below ground level. The ultimate |

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| | 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. | depth of quarry is 30 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 3.2 under Chapter III, pp.39-51. |
| 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. 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 71 m AMSL. Ultimate depth of the mine is 30 m BGL. Depth to the water level in the area is 30 m BGL. |
| 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 | A detailed Greenbelt Development Plan has been provided in Tables 4.14 and 4.15 in Section 4.6 under Chapter IV, pp.119-125. |

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| | 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. | Traffic density survey was carried out to analyse 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 3.7 under Chapter III, pp.95-97. |
| 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 2.6.6 under Chapter II, p.26. |
| 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 under Chapter II, pp.20-27. |

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| 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.126 & 127 |
| 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.150 & 151. |
| 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 18 people directly and 10 people indirectly, as discussed in Section 8.1 under Chapter VIII, p.149. |
| 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. | Detailed environment management plan for the project to mitigate the anticipated impacts has been provided under Chapter X, pp.153-169. |
| 39. | Public Hearing points raised and commitment of the Project Proponent on | The same will be updated in the final EIA report after public hearing meeting. |

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| | 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. | 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. 81,27,500/- In order to implement the environmental protection measures, an amount of Rs. 4976226 as capital cost and recurring cost as Rs. 2393437 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. 23276471, as shown in Tables 10.9 &10.10 under Chapter X, pp.163-169. |
| 42 | A Disaster management Plan shall be prepared and included in the EIA/EMP Report. | The details have been provided in Section 7.2 under Chapter VII, pp.138-142. |
| 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 have been discussed under Chapter VIII, pp.149-151. |
| 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. |

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| 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 during appraisal. |
| 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 enclosed along with final EIA/EMP 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 available on the website of this Ministry, should be followed. | Instructions issued by MoEF & CC O.M. No. J-11013/41/2006-IA. II (I) dated 4th August, 2009 have been followed while preparing the EIA report. |

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| 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. | The certified compliance report will be submitted in final EIA report. |
| 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 related to mining have been included along with the approved mining plan report in Annexure III |

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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 14th September 2006 and its subsequent amendments as per Gazette Notification S.O. 3977 (E) of 14th 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 obtained vide Letter No. SEIAA-TN/F.No.9631/ToR-1362/2023 Dated 10.02.2023 this EIA report has been prepared for the project proponent, Mr. D. Govindasamy applied for rough stone and gravel quarry lease in the Patta land falling in S.F.No.699/2 & 699/3 over an extent of 2.90.50 ha in Magaral-B Village, Walajabad Taluk, Kancheepuram District and Tamil Nadu. This EIA report takes into account the rough stone quarries within the cluster of 500 m radius from the periphery of the proposed project site. The cluster contains two proposed projects, known as P1, P2, Two Existing Quarries E1 and E2 and One Expired project, known as EX1. All the projects mentioned above have been taken for cluster extent calculation as per MoEF & CC Notification S.O. 2269 (E) Dated 1st July 2016. The total extent of all the quarries is **10.80.02** 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. D. Govindasamy | 699/2, 699/3 Magaral-B | 2.90.50 | Proposed Area |
| P2 | Sri Sai Infrastructures | 728/1(P), 728/2, 728/3, 728/4, 728/5, 728/6, 728/7, 728/8, 728/9, 728/10, 728/11, 728/12, 728/13, 728/14, 728/15, 728/16, 728/17, 728/18 Magaral-B | 2.75.02 | Applied Area |
| Existing Quarries | | | | |
| E1 | K. Samiyappan | 702/2 Magaral-B | 2.02.50 | 30.06.2018 to 29.06.2023 |
| E2 | S. Rathinavelu | 700/1(P), 700/2 Magaral-B | 2.34.50 | 23.01.2019 to 22.01.2024 |
| Expired Quarries | | | | |
| EX1 | R. Elumalai | 694/31, 694/3N, 694/3H & 694/3O Magaral-B | 0.77.5 | 02.03.2015 to 01.03.2020 |
| | Total Cluster Extent | | 10.80.02 | --- |

Source:

DD Letter - Rc.No.254/Q3/2022, Dated:18.11.2022.

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 report is to study baseline environmental conditions in and around the proposed project area for the period of **March-May 2023** 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/ 409141/2022, dated 03.12.2022) 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 08.12.2022.

Scoping

The proposal was placed in the 346th meeting of SEAC on 12.01.2023. 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 updated in the final EIA report for appraisal.

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.

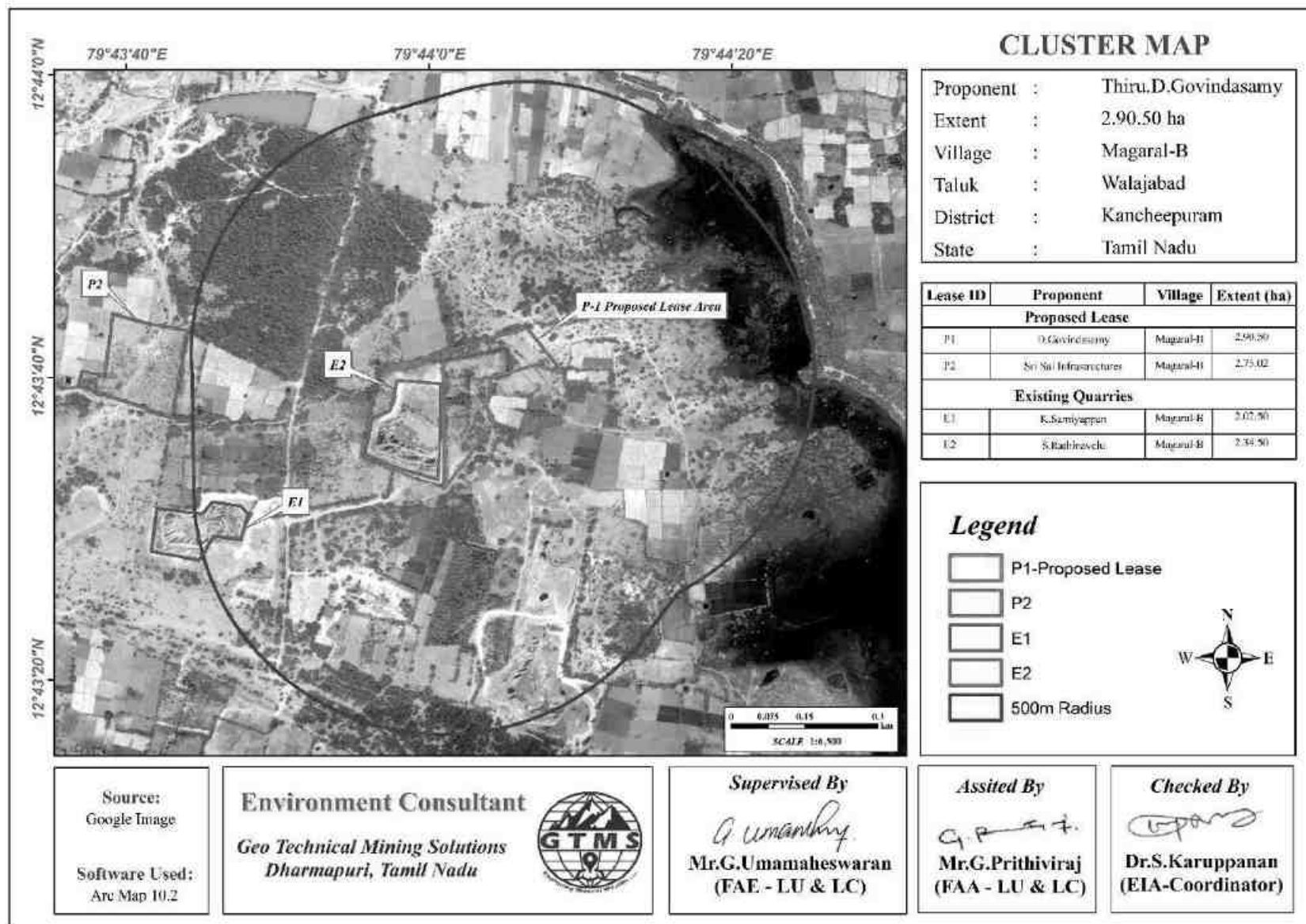


Figure 1.1 Location of the Proposed and Existing Rough Stone and Gravel Quarries in the Cluster of 500 m Radius

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 **LetterNo:SEIAA-TN/F.No.9631/ToR-1362/2023 Dated :10.02.2023** for the preparation of an EIA report.

1.4 POST ENVIRONMENT CLEARANCE MONITORING

For category B projects, irrespective of its clearance by MoEF/SEIAA, the project proponent shall prominently advertise in the newspapers indicating that the project has been accorded environmental clearance and the details of MoEF 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 1st June and 1st 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 GENERIC STRUCTURE OF EIA DOCUMENT

The overall contents of the EIA report follow the list of contents prescribed in the EIA Notification 2006 and the “Environmental Impact Assessment Guidance Manual for Mining of Minerals” published by MoEF & CC. The generic structure of the EIA document should be as under:

- ❖ Introduction
- ❖ Project Description
- ❖ Description of the Environment
- ❖ Anticipated Environmental Impact & Mitigation Measures
- ❖ Analysis of Alternatives (Technology & Site)
- ❖ Environmental Monitoring Program
- ❖ Additional Studies
- ❖ Project Benefits
- ❖ Environmental Cost Benefit Analysis
- ❖ Environmental Management Plan (EMP)
- ❖ Summary & Conclusion
- ❖ Disclosure of Consultants engaged.

1.7 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

| Name of the Project Proponent | Mr. D. Govindasamy |
|-------------------------------|---|
| Address | S/o. Mr. Desingu, No.288, Palla Street, Sitthalapakkam Village, Arasanipalaiyam Post, Vembakkam taluk, Tiruvannamalai District - 631702 Tamil Nadu |
| Status | Proprietor |

1.8 BRIEF DESCRIPTION OF THE PROJECT

The proposed project deals with excavation of rough stone and gravel which is primarily used in construction projects. The method adopted for rough stone and gravel excavation is open cast semi mechanized mining method involving formation of benches with 5 m height and 5 m width. The proposed project site is located in Magaral-B Village, Walajabad Taluk, Kancheepuram District, and Tamilnadu State. 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 | Mr. D. Govindasamy Rough Stone and Gravel Quarry | | |
| Toposheet No | 57-P/10 | | |
| Latitude | 12°43'32.65"N to 12°43'43.28"N | | |
| Longitude | 79°44'0.85"E to 79°44'8.88"E | | |
| Highest Elevation | 71 m AMSL | | |
| Proposed Depth as per ToR | 30 m BGL | | |
| Ultimate Pit Dimension | Length (m) | Width (m) | Depth (m) |
| | 186 | 77 | 30 |
| Geological Resources | Rough Stone in m ³ | Gravel in m ³ | |
| | 958452 | 58088 | |
| Mineable Reserves | Rough Stone in m ³ | Gravel in m ³ | |
| | 417131 | 45804 | |
| Proposed reserves for five years | Rough Stone in m ³ | Gravel in m ³ | |
| | 417131 | 45804 | |
| Method of Mining | Open-Cast Semi Mechanized Method | | |
| Topography | Flat Terrain | | |
| Machinery proposed | Jack Hammer | 4 | |

| | | |
|------------------------------|--|----|
| | Compressor | 1 |
| | Hydraulic Excavator | 1 |
| | Tippers | 10 |
| Blasting Method | Quarrying operation is done with conventional method using jack hammer drilling and blasting for shattering effect and loosen the rough stone. 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 drilling is proposed. | |
| Proposed Manpower Deployment | 18 Nos | |
| Project Cost | Rs.81,27,500 /- | |
| CER Cost | Rs. 5,00,000/- | |
| Proposed Water Requirement | 6.750 KLD | |

1.9 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 each individual lease. 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 **March-May 2023** for various environmental components such as land, soil, air, water, noise, ecology, etc. 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.

1.10 REFERENCES

The report has been prepared using the following references:

- ❖ Guidance Manual of Environmental Impact Assessment for Mining of Minerals, Ministry of Environment and Forests, February, 2010
- ❖ EIA Notification, 14th September, 2006
- ❖ Terms of Reference (ToR) issued by SEIAA.
- ❖ Approved Mining Plan of this Project.
- ❖ 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 DESCRIPTION OF THE PROJECT

The proponent Mr.D.Govindasamy 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 for quarry lease on 11.08.2020 to extract rough stone and gravel. The precise area communication letter was issued by Department of Geology and Mining, Kancheepuram vide Rc.No.254/Q3/2022, dated:27.10.2022. Based on the precise area communication letter, mining plan was prepared. The mining plan thus prepared was approved by Assistant Director Department of Geology and Mining, Kancheepuram Rc.No.254/Q3/2022, dated:18.11.2022. 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 Magaral-B Village, Walajabad Taluk, Kancheepuram District, as shown in Figure 2.2 & 2.3. The area lies between Latitudes from 12°43'32.65"N to 12°43'43.28"N and Longitudes from 79°44'0.85"E to 79°44'8.88"E. The maximum altitude of the project area is 71 m AMSL. Accessibility details to the proposed project site have been given in Table 2.1.

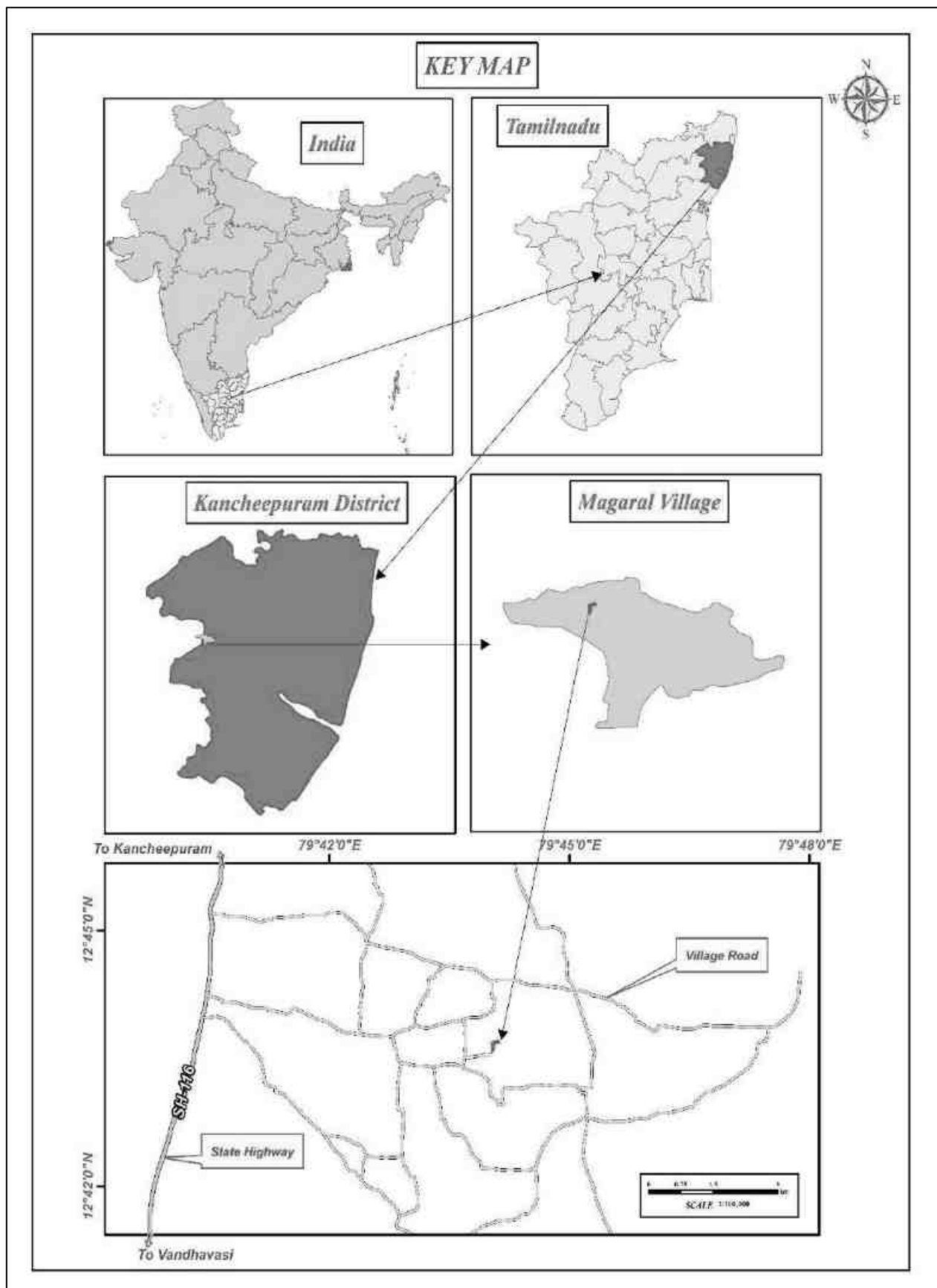


Figure 2.2 Key Map Showing Location of the Project Site

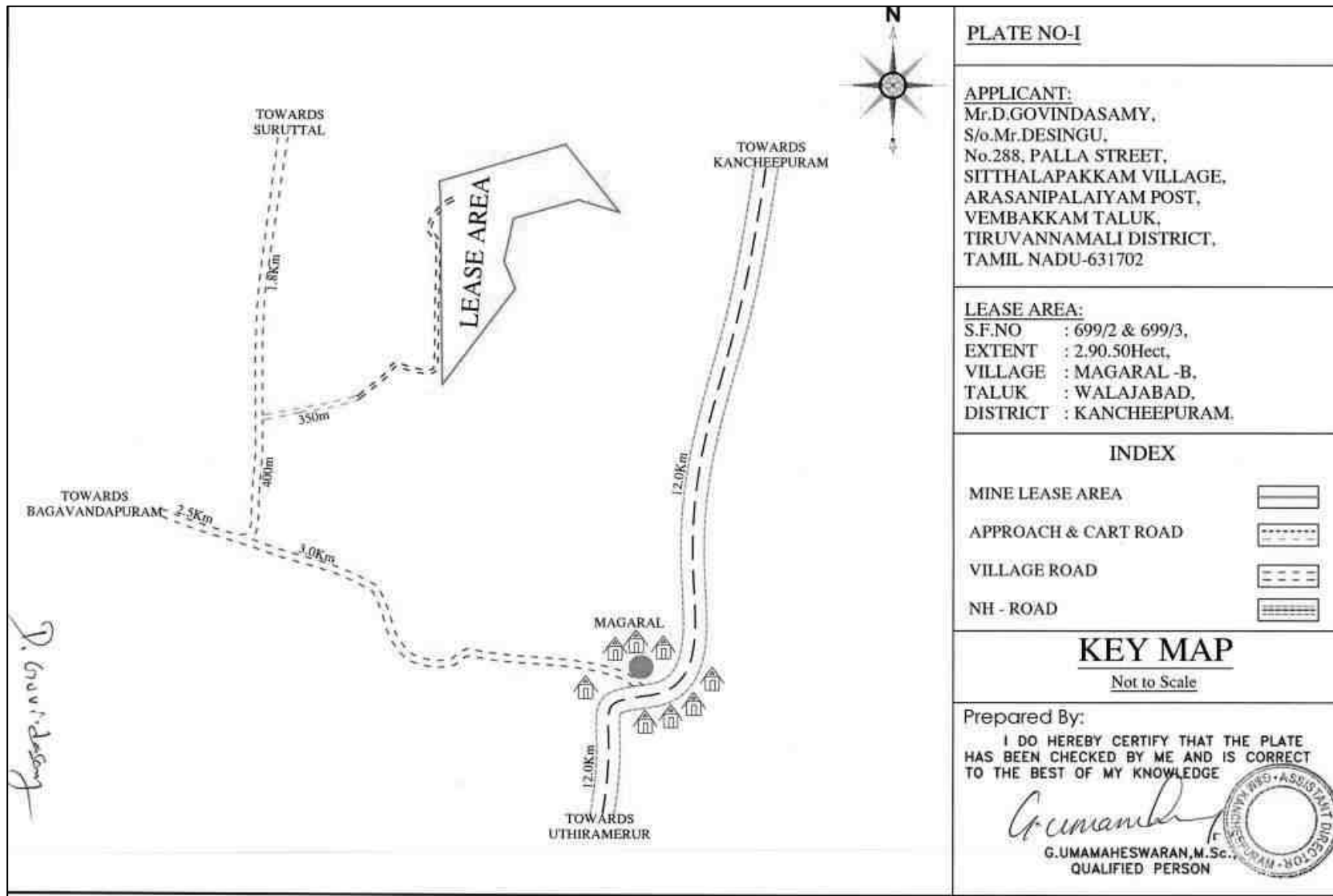


Figure 2.3 Site Connectivity to the Lease Area

Table 2.1 Site Connectivity to the Project Area

| | | |
|-------------------------|-------------------------------------|-------------|
| Nearest Roadways | SH-118A Uthirameru -Kancheepuram | 1.96 km E |
| Nearest Town | Magaral | 2.12 km E |
| Nearest Railway Station | Walajabad | 11.7 km N |
| Nearest Airport | Chennai | 55.92 km NE |
| Nearest Seaport | Chennai | 72.2 km NE |
| Nearest Village | Suruttal | 0.95 km N |
| | Sithalapakkam | 1.16 km S |
| | Magaral-A | 2.0 km SE |
| | Bagavandapuram | 2.54 km W |

2.3 LEASEHOLD AREA

- ❖ The extent of the proposed project site is 2.90.50 ha.
- ❖ 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 2.4.

Table 2.2 Corner Coordinates of Proposed Project

| Pillar ID | Latitude | Longitude |
|-----------|---------------|--------------|
| 1 | 12°43'43.28"N | 79°44'6.44"E |
| 2 | 12°43'40.26"N | 79°44'8.88"E |
| 3 | 12°43'40.82"N | 79°44'7.03"E |
| 4 | 12°43'40.01"N | 79°44'4.15"E |
| 5 | 12°43'38.10"N | 79°44'3.74"E |
| 6 | 12°43'36.90"N | 79°44'4.24"E |
| 7 | 12°43'32.65"N | 79°44'1.01"E |
| 8 | 12°43'41.04"N | 79°44'0.91"E |
| 9 | 12°43'41.64"N | 79°44'0.85"E |

2.4 GEOLOGY AND GEOMORPHOLOGY

The lease area is geologically composed of Charnockite, commercially known as Roughstone. In addition, the lease area geomorphologically occurs over Pediment Pediplain Complex, as shown in Figure 3.2.

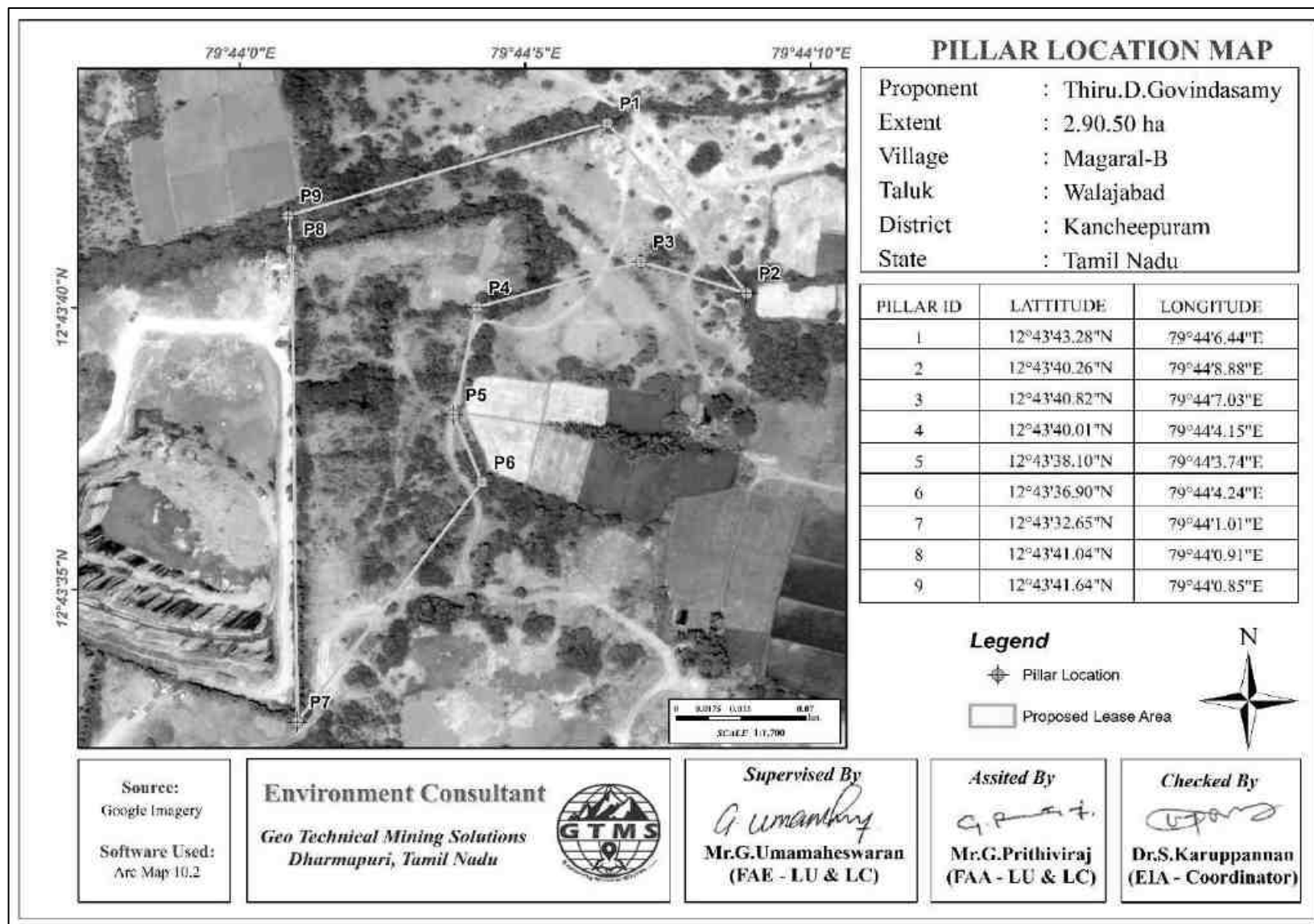


Figure 2.4 Google Earth Image Showing Lease Area with Pillars

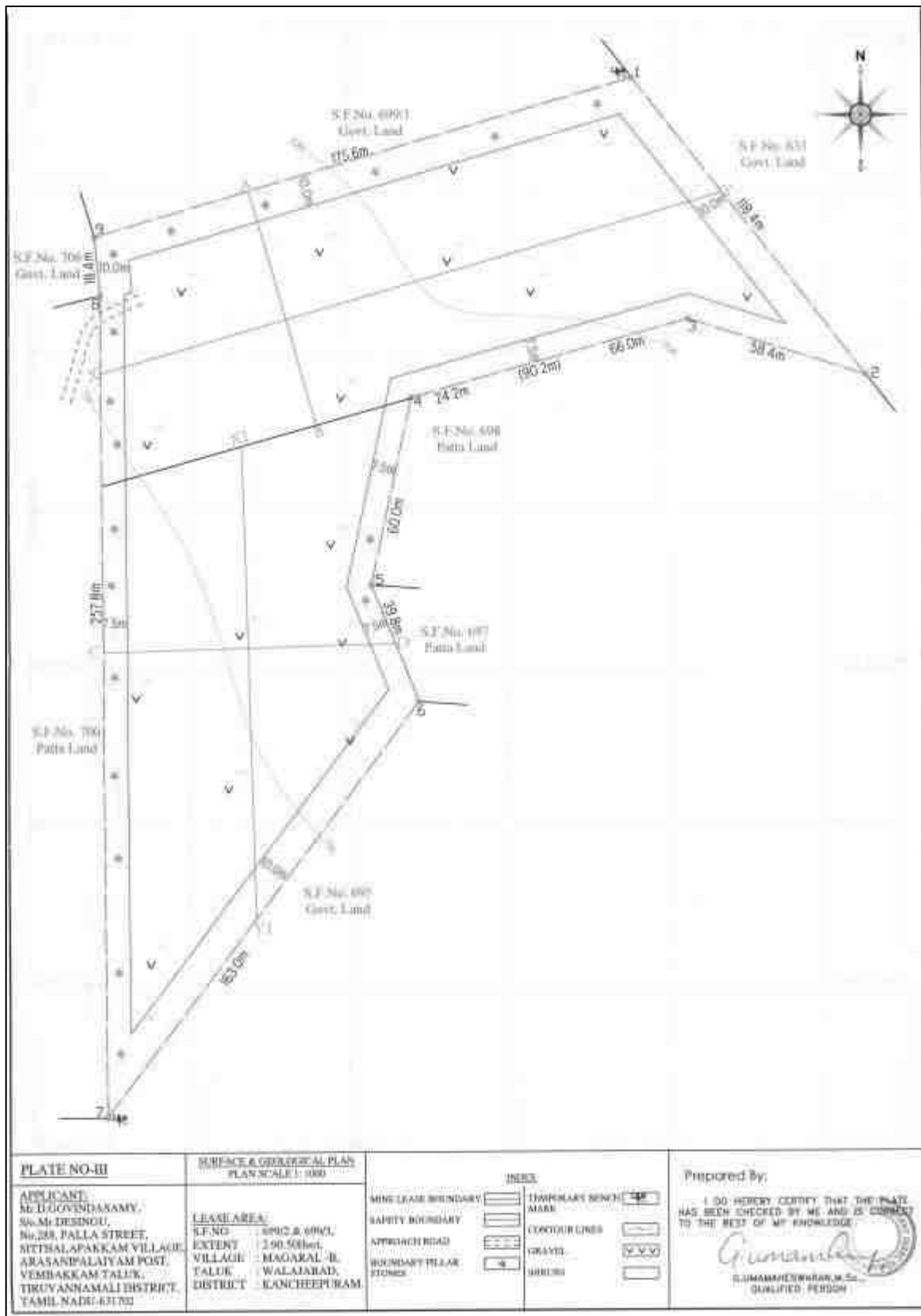


Figure 2.6 Surface and Geological Plan

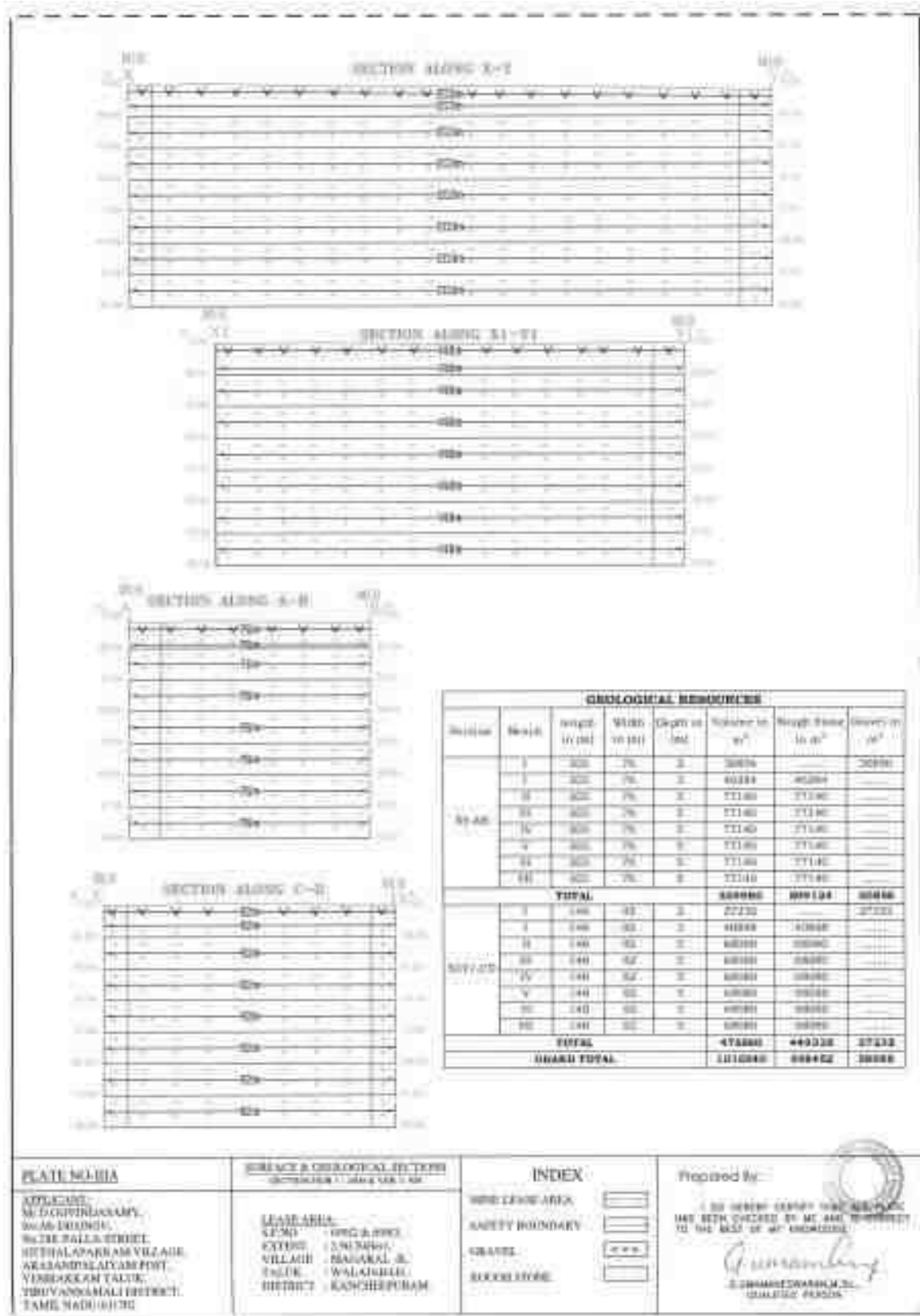


Figure 2.7 Geological Sections

2.5 QUANTITY OF RESERVES

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. 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 30 m 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 & 2.7 and results of geological resources and reserves have been shown in Table 2.3.

Table 2.3 Estimated Resources and Reserves of the Project

| Resource Type | Rough stone in m ³ | Gravel in m ³ |
|---|-------------------------------|--------------------------|
| Geological Resource in m ³ | 958452 | 58088 |
| Mineable Reserves as per ToR in m ³ | 417131 | 45804 |
| Proposed production as per ToR for 5 years m ³ | 417131 | 45804 |

Based on the year wise development and production plan and sections, the year wise production results have been given in Table 2.4 & Figure 2.8 and 2.8a.

Table 2.4 Year-Wise Production Details

| Year | Rough stone in (m ³) | Gravel in (m ³) |
|--------------|----------------------------------|-----------------------------|
| I | 90508 | 24552 |
| II | 76433 | 21252 |
| III | 82960 | -- |
| IV | 90515 | -- |
| V | 76715 | -- |
| Total | 417131 | 45804 |

Source: Approved Mining Plan & ToR

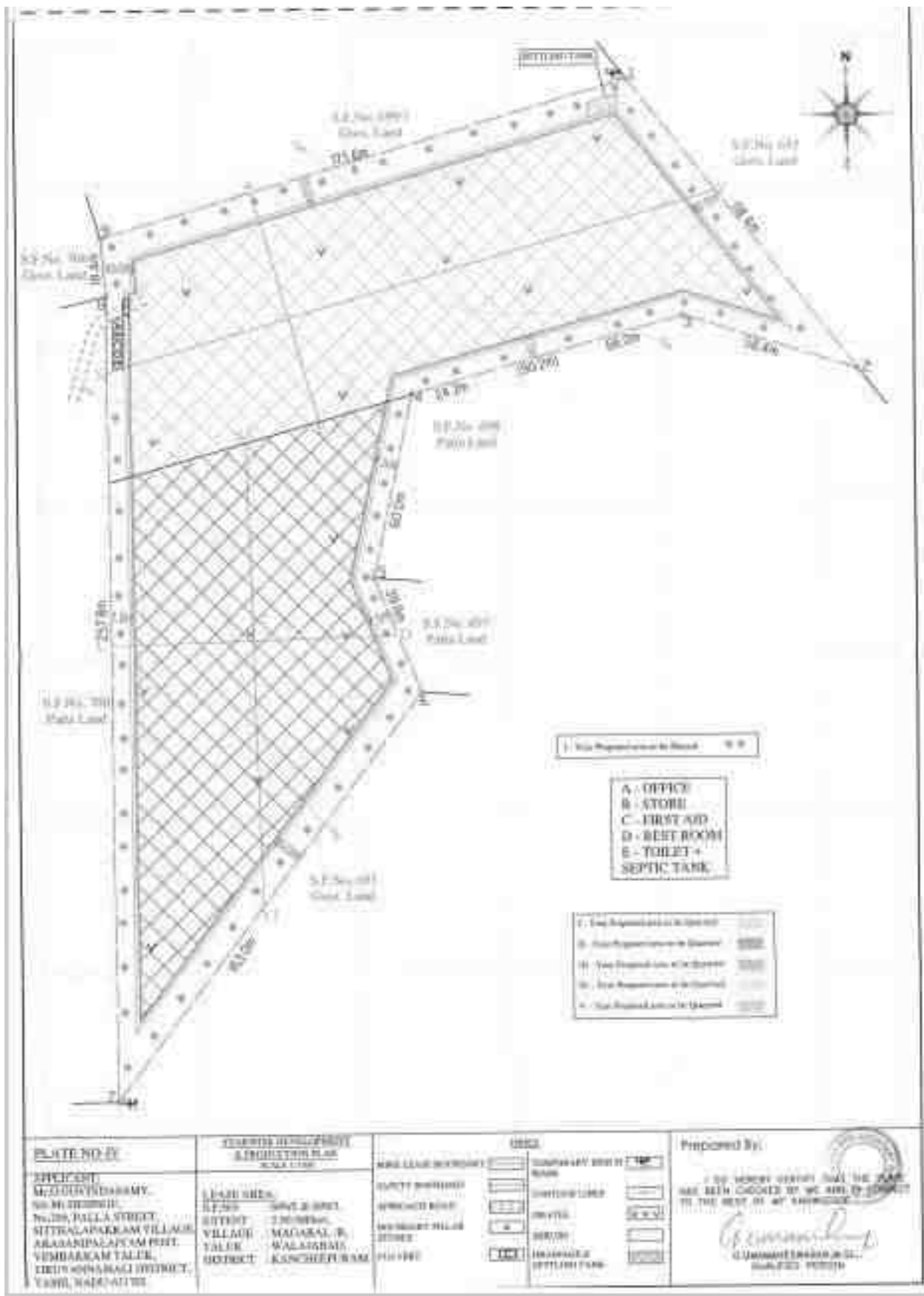


Figure 2.8 Yearwise Development & Production Plan

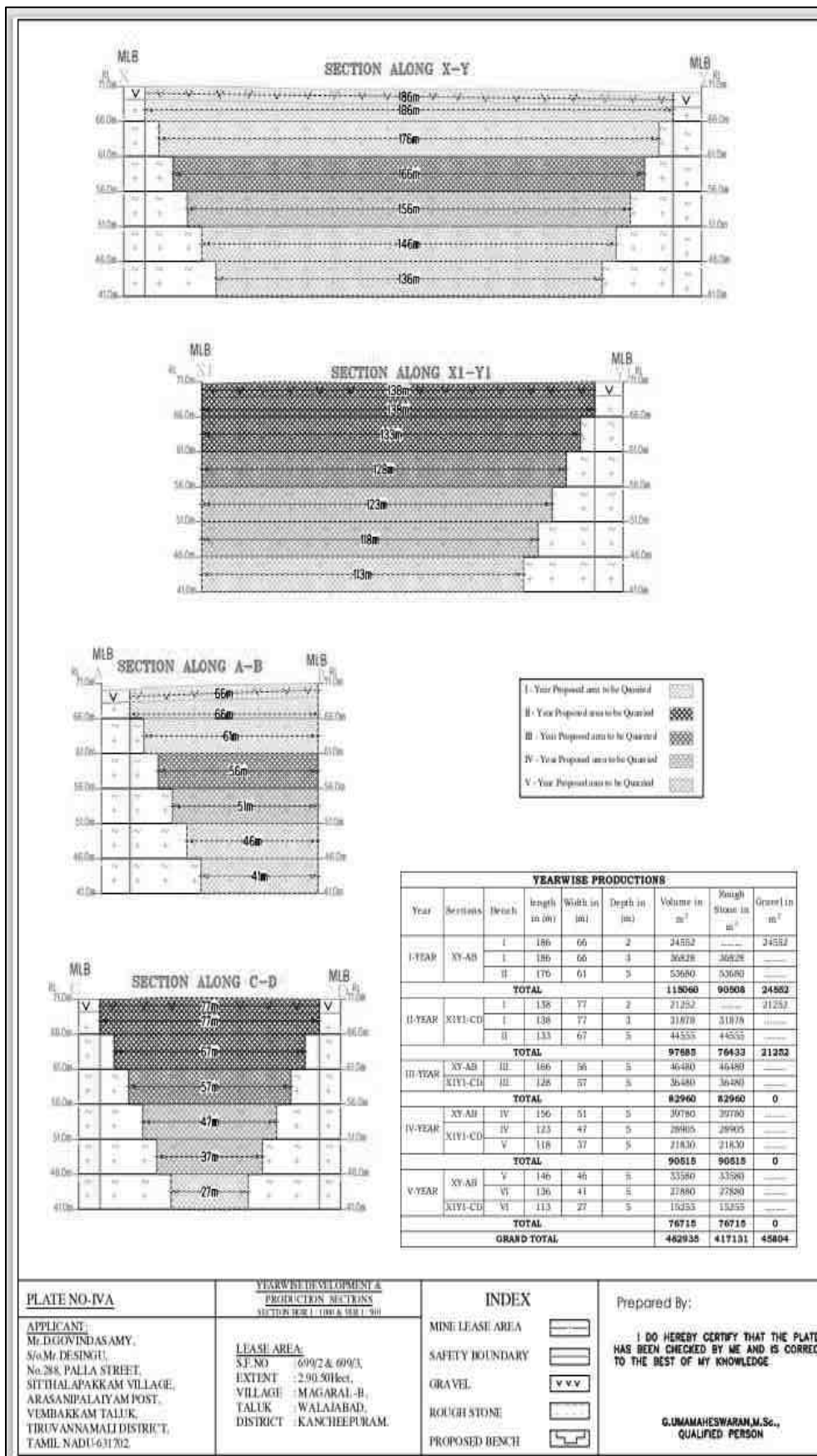


Figure 2.8a Yearwise Development & Production Section

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 5 m 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.

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

| | |
|---|-----------------------|
| Blast hole Diameter (D) in mm | 32 |
| Burden (B) in m | 1 |
| Spacing (S) in m | 0.97 |
| Sub drill in m | 0.3 |
| Charge length (C) in m | 0.64 |
| Stemming | 1 |
| Hole Length (L) in m | 1.9 |
| Bench Height (BH) in m | 1.6 |
| Mass of explosive/hole in g | 400 |
| Stemming material size in mm | 3.2 |
| Burden stiffness ratio | 1.64 |
| Blast volume/hole in m ³ | 1.59 |
| Production of rough stone/day in m ³ | 309 |
| Number of blast holes/day | 194 |
| Blast hole pattern | Staggered/Rectangular |

| | |
|------------------------------------|--------|
| Mass of explosive /day in kg | 78 |
| Powder factor in kg/m ³ | 0.25 |
| Loading density | 0.63 |
| Type of explosives | Slurry |
| Diameter of packaging in mm | 25 |
| Initiation system | NONEL |
| Fly rock distance in m | 23 |

2.6.1 Magnitude of Operation

Based on the results of estimated production for the 5 years, details about the size of operation have been provided in Table 2.6.

Table 2.6 Operational Details for Proposed Project

| | Rough Stone (For 5 years) | Gravel (For 2 years) |
|--------------------------------------|--------------------------------------|---------------------------------|
| Proposed production | 417131 | 45804 |
| Number of Working Days /Annum | 270 | 270 |
| Production of /Day (m ³) | 309 | 85 |
| No. of Lorry Loads | 51 | 14 |

2.6.2 Extent of Mechanization

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

Table 2.7 Machinery Details

| S. No. | Type | No of Unit | Capacity | Make | Motive Power |
|--|--------------|-----------------------|-----------------|-------------|---------------------|
| 1 | Jack Hammers | 4 | Hand held | - | Diesel Drive |
| 2 | Compressor | 1 | Air | - | Diesel Drive |
| 3 | Excavator | 1 | - | - | Diesel Drive |
| Haulage & Transport Equipment | | | | | |
| 4 | Tipper | 10 | 15MT | - | Diesel Drive |

2.6.3 Progressive Quarry Closure Plan

The progressive quarry closure plan (Figure 2.5) of the proposed project shows past, present, and future land use statistics. According to the land use results, as shown in Table 2.8 about 0.08.0ha of land is used for green belt; about 2.82.50 ha of land is unutilized. Whereas, at the end of the mine life, about 2.18.12 ha of land will have been quarried; about 0.06.24 ha of land will be used for unutilized; and the rest will be used for road and infrastructures.

Table 2.8 Land use Data at resent, during scheme of mining, and at the end of mine life

| Description | Present Area (ha) | Area at the end of life of quarry (ha) |
|--------------------------|--------------------------|---|
| Area under quarry | Nil | 2.18.12 |
| Infrastructure | Nil | 0.02.0 |
| Roads | Nil | 0.03.0 |
| Green Belt | 0.08.0 | 0.51.64 |
| Drainage & Settling Tank | Nil | 0.09.5 |
| Unutilized area | 2.82.50 | 0.06.24 |
| Total | 2.90.50 | 2.90.50 |

2.6.4 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

| Activity | Capital Cost | Recurring Cost/Annum |
|-----------------------------------|---------------------|-----------------------------|
| 581 plants inside the lease area | 116200 | 17430 |
| 872 plants outside the lease area | 261450 | 26145 |
| Wire Fencing | 581000 | 29050 |
| Renovation of Garland Drain | 29050 | 14525 |
| Total | 9,87,700 | 87,150 |

Source: Environment Management Plan

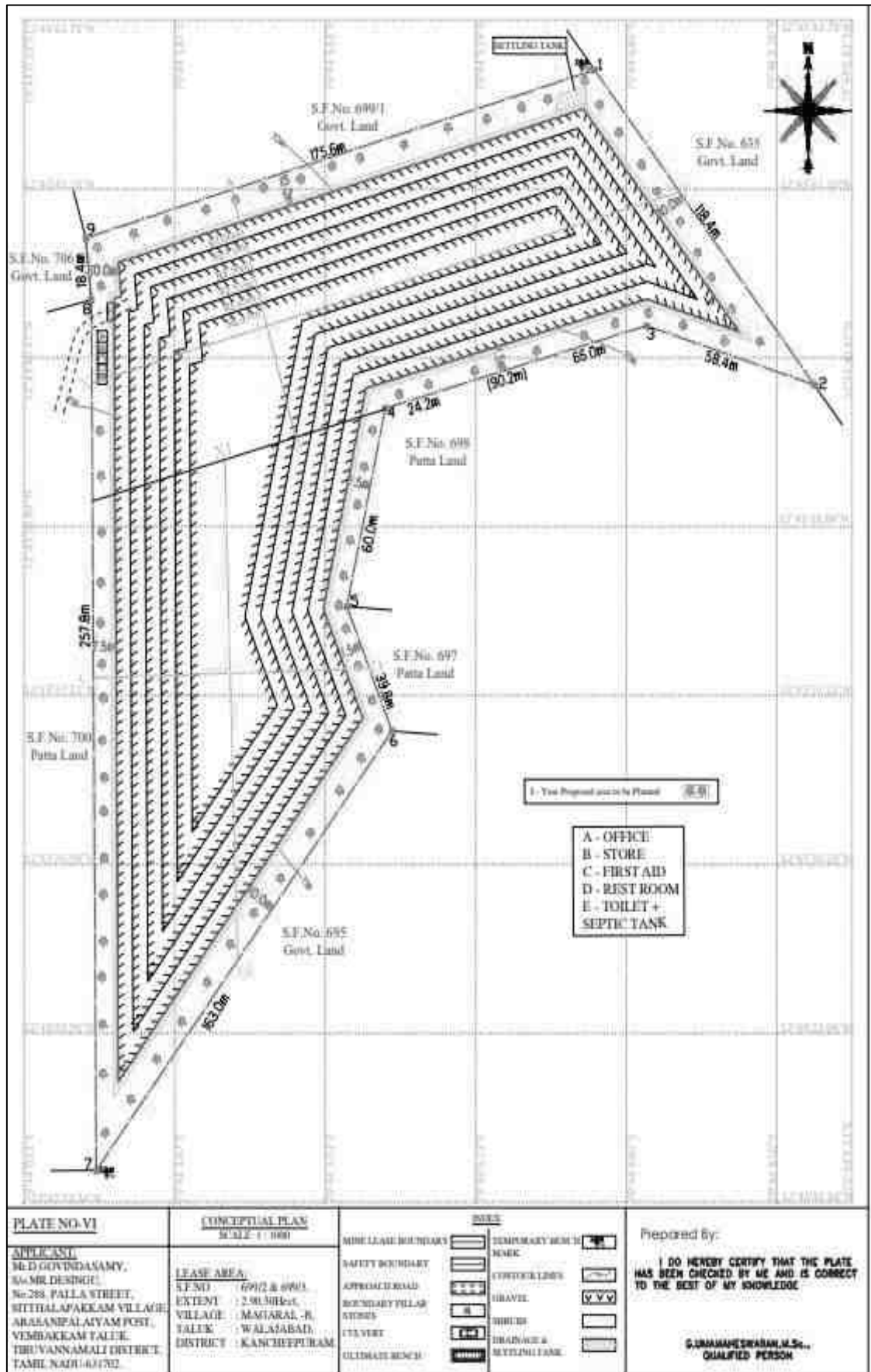


Figure 2.9 Conceptual Plan

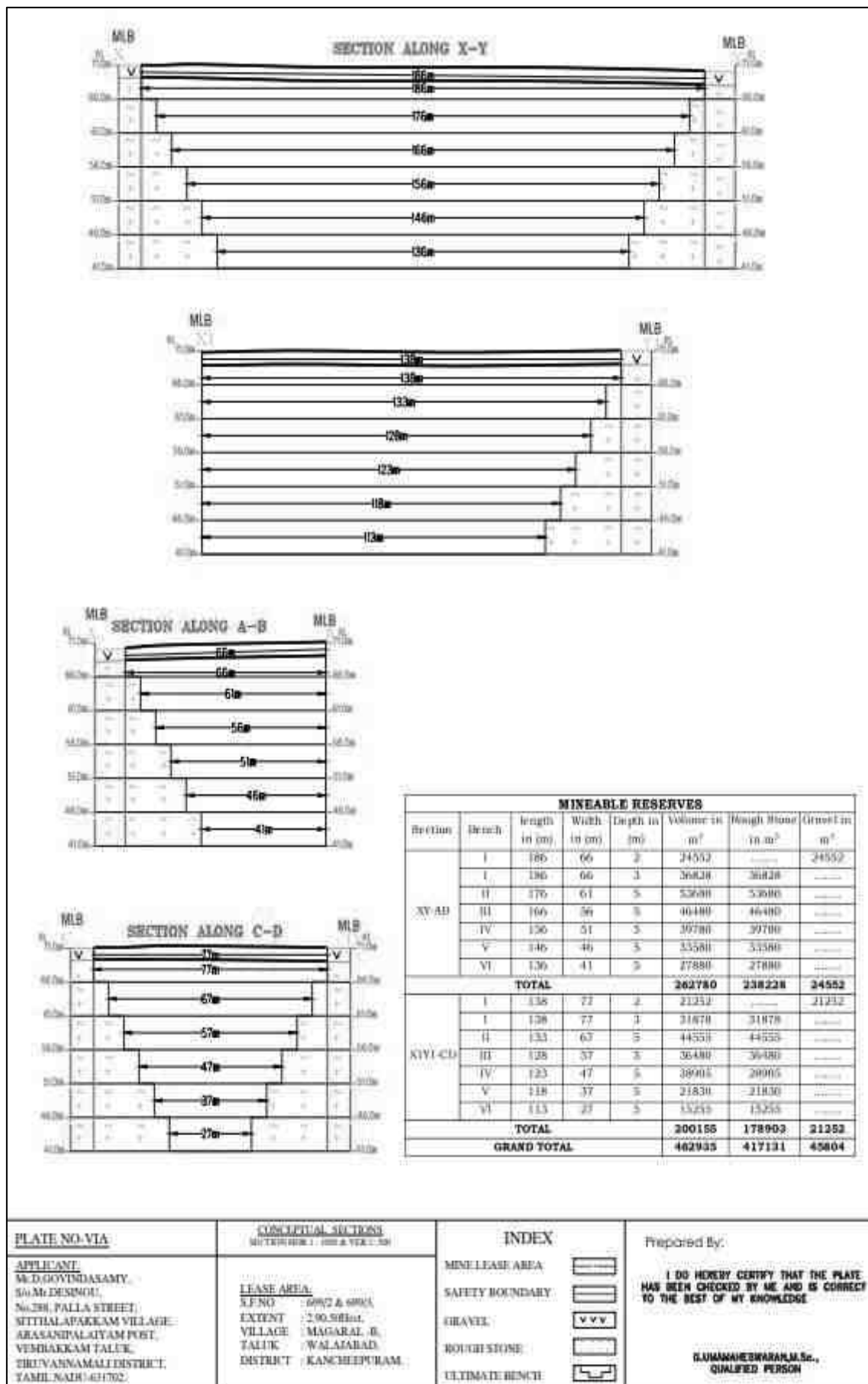


Figure 2.10 Conceptual Sections

2.6.5 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:2.9 and 2.10.

Table 2.10 Ultimate Pit Dimension

| Pit | Length (m) | Width (m) (Max) | Depth (m) |
|-----|------------|-----------------|-----------|
| I | 186 | 77 | 30 |

Source: Approved Mining Plan & ToR

2.6.6 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.

2.6.6.1 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.

2.6.7 Water Requirement

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

Table 2.11 Water Requirement for the Project

| Purpose | Quantity | Source |
|------------------------|-----------------|--|
| Dust Suppression | 2.0 KLD | Existing bore wells nearby the lease area |
| Green Belt development | 2.0 KLD | Existing bore wells nearby the lease area |
| Drinking & Domestic | 2.75 KLD | Existing bore wells and approved water vendors |
| Total | 6.75 KLD | |

Source: Prefeasibility Report

2.6.8 Energy Requirement

High speed Diesel (HSD) will be used for quarrying machineries. As per the data shown in Table 2.12, Around 19,89,215 litres of HSD will be used for rough stone and gravel extraction during this 5 years plan period. The diesel will be brought to the site from nearby diesel pumps.

Table 2.12 Fuel Requirement Details

| Fuel Requirement for Excavator | | | |
|---|--|---|---------------------------------|
| Details | Rough Stone (417131m³) | Gravel (45804 m³) | Total Diesel (litre) |
| Average Rate of Fuel Consumption (l/hr) | 16 | 10 | --- |
| Working Capacity (m ³ /hr) | 20 | 60 | --- |
| Time Required (hours) | 20857 | 763 | --- |
| Total Diesel Consumption for 5 years (litre) | 333705 | 7634 | 341339 |
| Fuel Requirement for Compressor | | | |
| Average Rate of Fuel Consumption/hole (litre) | 0.4 | --- | --- |
| Number of Drillholes/day | 194 | --- | --- |
| Total Diesel Consumption for 5 years (litre) | 104760 | --- | 104760 |
| Fuel Requirement for Tipper | | | |
| Average Rate of Fuel Consumption/Trip (litre) | 20 | 20 | --- |
| Carrying Capacity in m ³ | 6 | 6 | --- |
| Number of Trips / days | 51 | 6* | --- |
| Number of Trips / 5 years | 69522 | 7634 | --- |
| Total Diesel Consumption for 5 years (litre) | 1390437 | 152680 | 1543117 |
| Total Diesel Consumption by Excavator, Compressor and Tipper | | | 19,89,215 |

* Number of truck loads for gravel has been normalized for 5 years.

2.6.9 Capital Requirement

The project proponent will invest Rs. 81,27,500/- to the project. The breakup summary of the investment has been given in Table 2.13.

Table 2.13 Capital Requirement Details

| S. No. | Description | Cost (Rs.) |
|---------------------------|--------------------|---------------------|
| 1 | Fixed Asset Cost | 1980000 |
| 2 | Machinery cost | 3000000 |
| 3 | EMP Cost | 3147500 |
| Total Project Cost | | 81,27,500 /- |

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 | Mines Manager | 1 |
| | | Mine Engineer | 1 |
| | | Mine Geologist | 1 |
| | | Blaster | 1 |
| 2. | Unskilled | Musdoor/Labours | 14 |
| Total | | | 18 |

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 st | 2 nd | 3 rd | 4 th | 5 th | |
| 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 | | | | | | | |

Source: Anticipated based on Timelines framed in EIA Notification & CPCB Guidelines

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. Field monitoring studies to evaluate the base line status of the project site were carried out covering **March-May, 2023** with CPCB guidelines. Environmental baseline data were collected by an NABL accredited and MoEF notified Ekdant Enviro Services (p) limited 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 5 km radius from the periphery of the cluster, except for ecological study, which considers 10 km 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

| Attribute | Parameters | Frequency of Monitoring | No. of Locations | Protocol |
|-------------------------|--|---------------------------------|-------------------------------------|--|
| Land Use/ Land Cover | Land-use Pattern within 5 km radius of the study area | Once during the study period | Study Area | Satellite Imagery & Primary Survey |
| *Soil | Physico- Chemical characteristics | Once during the study period | 7 (1 core & 6 in buffer zone) | IS 2720 Agriculture Handbook - Indian Council of Agriculture Research, New Delhi |
| *Water Quality | Physical, Chemical and | Once during the study period | 8 (3 surface water & | IS 10500& CPCB Standards |

| | | | | |
|------------------------|---|--|-------------------------------|---|
| | Bacteriological Parameters | | 5ground water) | |
| Meteorology | Wind speed Wind direction Temperature Cloud cover Dry bulb temperature Rainfall | 1 hourly continuous mechanical/automatic weather station | 1 | Site specific primary data & secondary data from IMD Station |
| *Ambient Air Quality | PM ₁₀ PM _{2.5} SO ₂ NO _x Fugitive dust | 24 hours, twice a week | 7 (1 core & 6buffer) | IS 5182 Part 1-23 National Ambient Air Quality Standards, CPCB |
| *Noise Levels | Ambient noise | Hourly observation for 24 hours per location | 8 (1 core & 7 buffer zone) | IS 9989 As per CPCB Guidelines |
| Ecology | Existing flora and fauna | Through field visit during the study period | Study area | Primary Survey by Quadrate & Transect Study Secondary Data – Forest Working Plan |
| Socio Economic Aspects | Socio-economic characteristics, Population statistics and existing infrastructure in the study area | Site visit & Census Handbook, 2011 | Study area | Primary Survey, census handbook & need based assessments. |

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

3.1 LAND ENVIRONMENT

The main objective of this section is to provide a baseline status of the study area covering 5 km radius around the proposed mine site so that temporal changes in the LU/LC pattern due to the mining activities can be assessed in future.

3.1.1 Geology and Geomorphology

Study area is mainly composed of charnockite, fluvial deposit and upper gondwana rocks, as shown in Figure 3.1. Among the geomorphic units, pediment pediplain complex covers major part of the study area, as shown in Figure 3.2.

3.1.2 Land Use/ Land Cover

Land Use and Land Cover (LULC) map, as shown in Figure 3.3 was prepared using Sentinel II image for the study area of 5 km radius. Totally, 8 LULC were mapped. The areal extent of each LULC is provided in Table 3.2. Of the total area, mining area covers only 37.18 ha accounting for 0.48 %, of which cluster area of 10.80.02 ha contributes only about 0.0375 %. 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. | Classification | Area (ha) | Area (%) |
|--------------|--------------------------------|----------------|--------------|
| 1 | Crop land | 2232.18 | 28.88 |
| 2 | Dense Forest | 291.99 | 3.78 |
| 3 | Fallow land | 297.13 | 3.84 |
| 4 | Land with or without scrub | 409.89 | 5.30 |
| 5 | Mining / Industrial wastelands | 37.18 | 0.48 |
| 6 | Plantations | 3386.35 | 43.81 |
| 7 | Settlement | 156.93 | 2.03 |
| 8 | Water bodies | 917.22 | 11.87 |
| Total | | 7728.87 | 100.0 |

Source: Sentinel II Satellite Imagery

3.1.3 Topography

The proposed lease area is located in a flat terrain with an altitude range of 70-71 m AMSL, showing relief of 1 m.

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 a portion of dendritic drainage pattern indicating uniform lithology beneath the surface, as shown in Figure 3.4.

3.1.5 Seismic Sensitivity

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

3.1.6 Soil Environment

Soil is one of the important components of the land environment. Composite soil samples were collected from the study area and analysed for different parameters to determine the baseline soil characteristics of the study area.

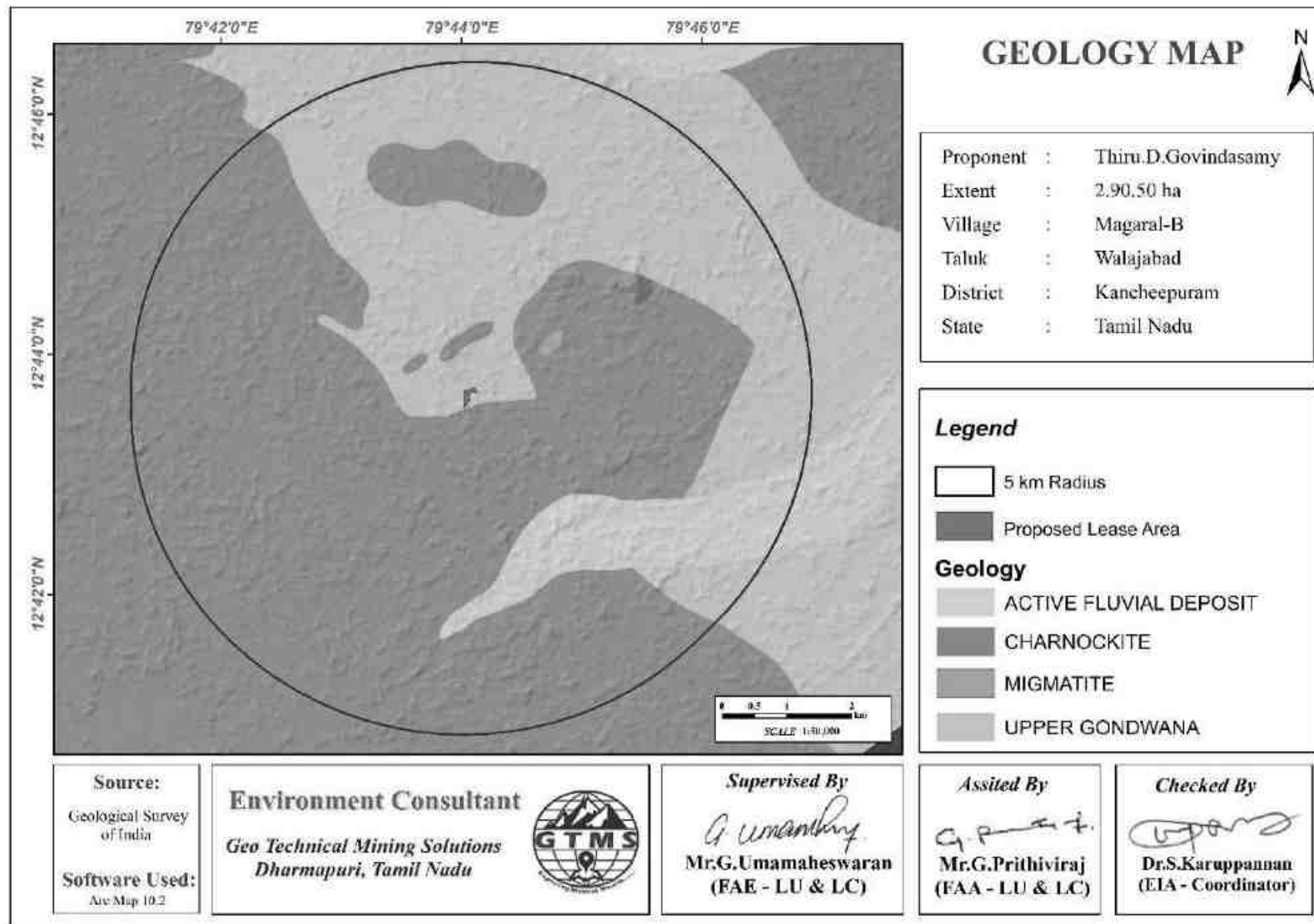


Figure 3.1 Geology Map of 5 km Radius from the Proposed Project Site

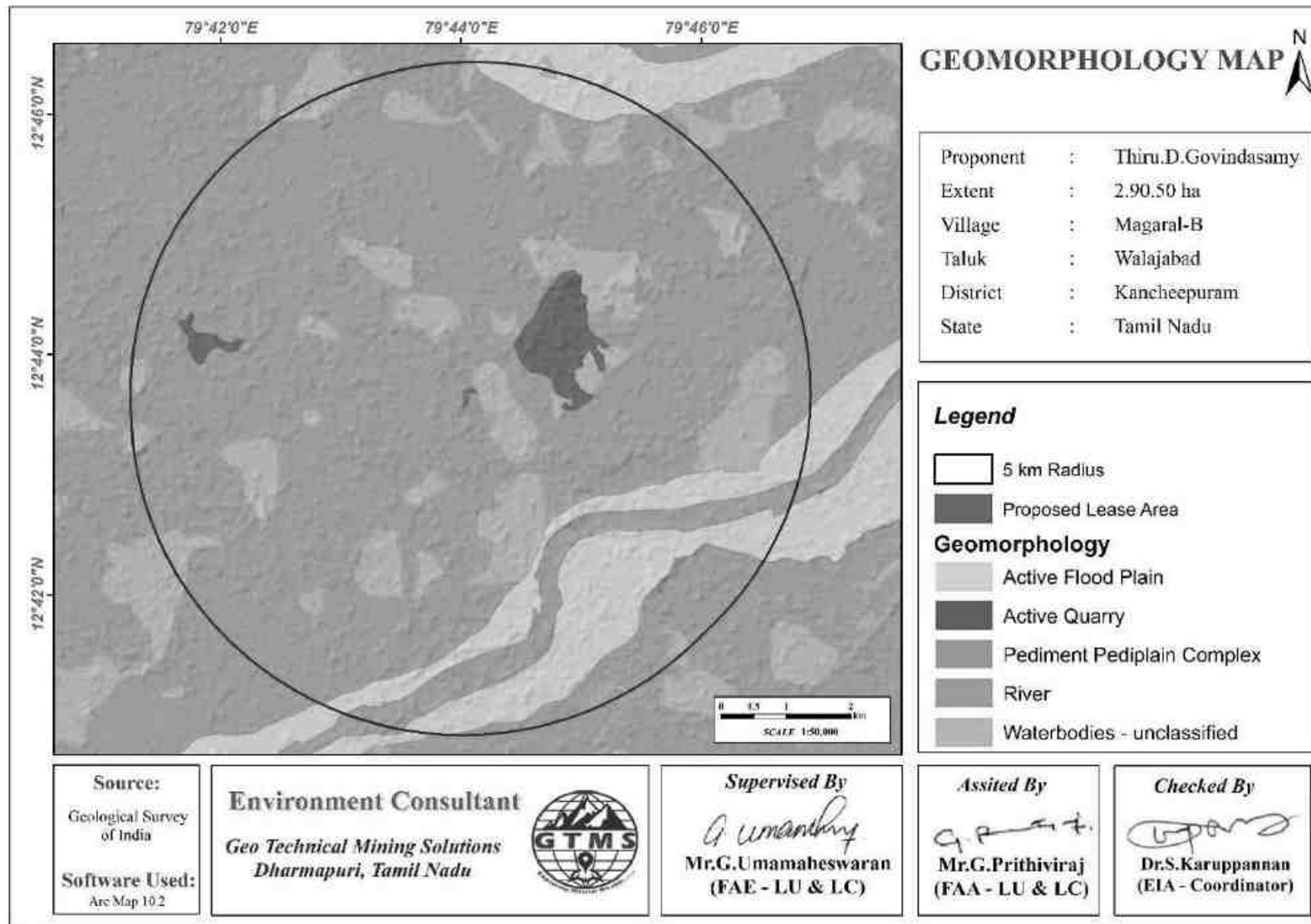


Figure 3.2 Geomorphology Map of 5 km Radius from the Proposed Project Site

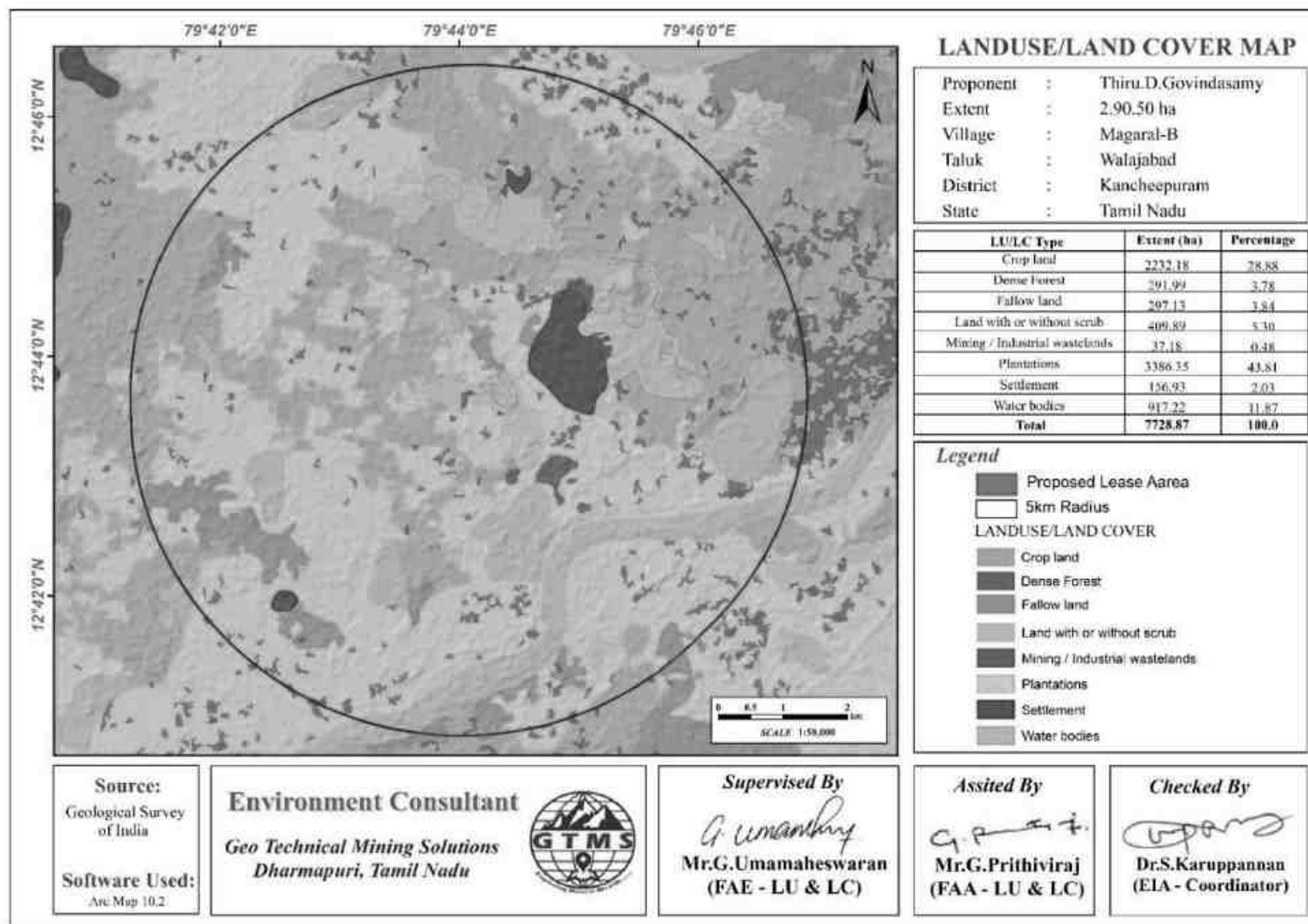


Figure 3.3 LULC Map of 5 km Radius from the Proposed Project Site

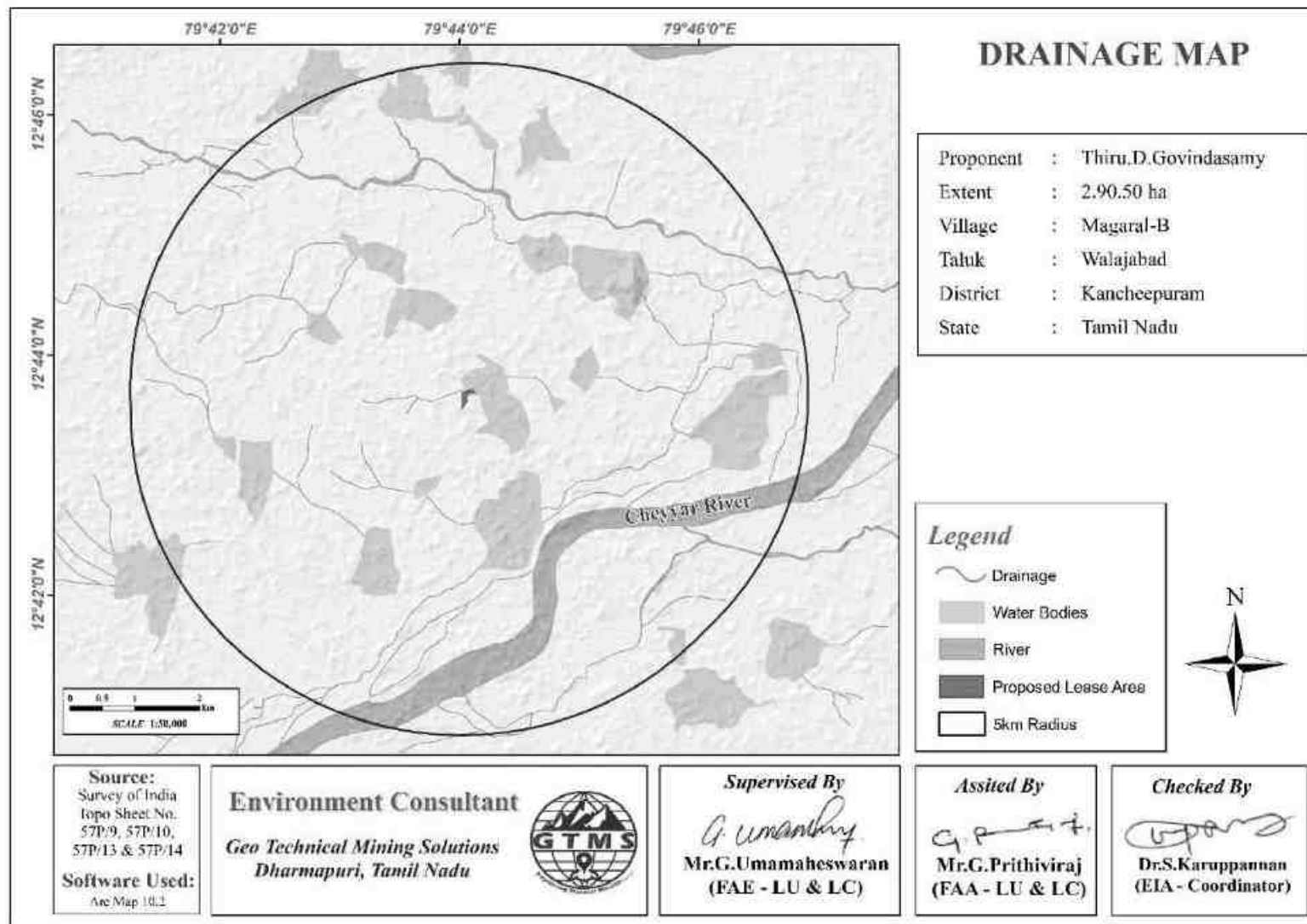


Figure 3.4 Drainage Map of 5 km Radius from the Proposed Project Site Showing a Portion of Dendritic Pattern

3.1.6.1 Methodology

Seven locations were selected for soil sampling based on soil types, vegetative cover, and industrial & residential activities including infrastructure facilities. Soil samples were collected up to 90 cm depth, filled in polythene bags, coded and sent to laboratory for analysis. 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 as per the standard methods prescribed in “Soil Chemical Analysis (M.L. Jackson, 1967) & Department of Agriculture, Cooperation & Farmers Welfare, Ministry of Agriculture & Farmers Welfare, Government of India”. The physical and chemical characteristic results of soil samples are provided in Table 3.4.

Table 3.3 Soil Sampling Locations

| S. No. | Sampling ID | Location | Distance (km) | Direction | Coordinates |
|--------|-------------|----------------|---------------|-----------|-----------------------------|
| 1 | S01 | Core | --- | --- | 12°43'39.07"N 79°44'2.80"E |
| 2 | S02 | Kanikilluppai | 2.20 | N | 12°44'40.52"N 79°43'55.46"E |
| 3 | S03 | Bagavandapuram | 2.74 | WNW | 12°43'28.59"N 79°42'12.66"E |
| 4 | S04 | Elacheri | 4.13 | SSW | 12°41'27.96"N 79°43'8.70"E |
| 5 | S05 | Pulivoy | 3.84 | SSE | 12°43'28.59"N 79°42'12.66"E |
| 6 | S06 | Magaral | 2.90 | E | 12°43'21.45"N 79°45'42.95"E |
| 7 | S07 | Kolathur | 3.65 | NE | 12°44'48.53"N 79°45'47.81"E |

Source: On-site monitoring/sampling by Ekdant Enviro Services (p) Limited, in association with GTMS.

3.1.6.2 Results and Discussion

Physical Characteristics

The soil samples in the study area show loamy textures varying between sandy loam, to sandy clay loam. pH of the soil varies from 6.63 to 7.26 indicating slightly acidic to slightly alkaline nature. Electrical conductivity of the soil varies from 168 to 210 $\mu\text{S}/\text{cm}$. Bulk density ranges between 0.88 and 1.53 g/cm^3 and water content ranges between 2.16 to 8.56 %.

Chemical Characteristics

Calcium ranges between 184 and 442 mg/kg. Magnesium ranges between 83 and 184 mg/kg. Sodium ranges between 165 and 219 mg/kg. Potassium ranges between 144.56 and 213.56 mg/kg. Organic matter content ranges between 0.94 and 1.78 mg/kg and Iron ranges between 21.51 and 47.45 mg/kg.

Soil Erosion

Soil erosion map shows that:

- ❖ Low to moderate soil erosion is in mine lease area. Soil Erosion Map Showing in Figure 3.6

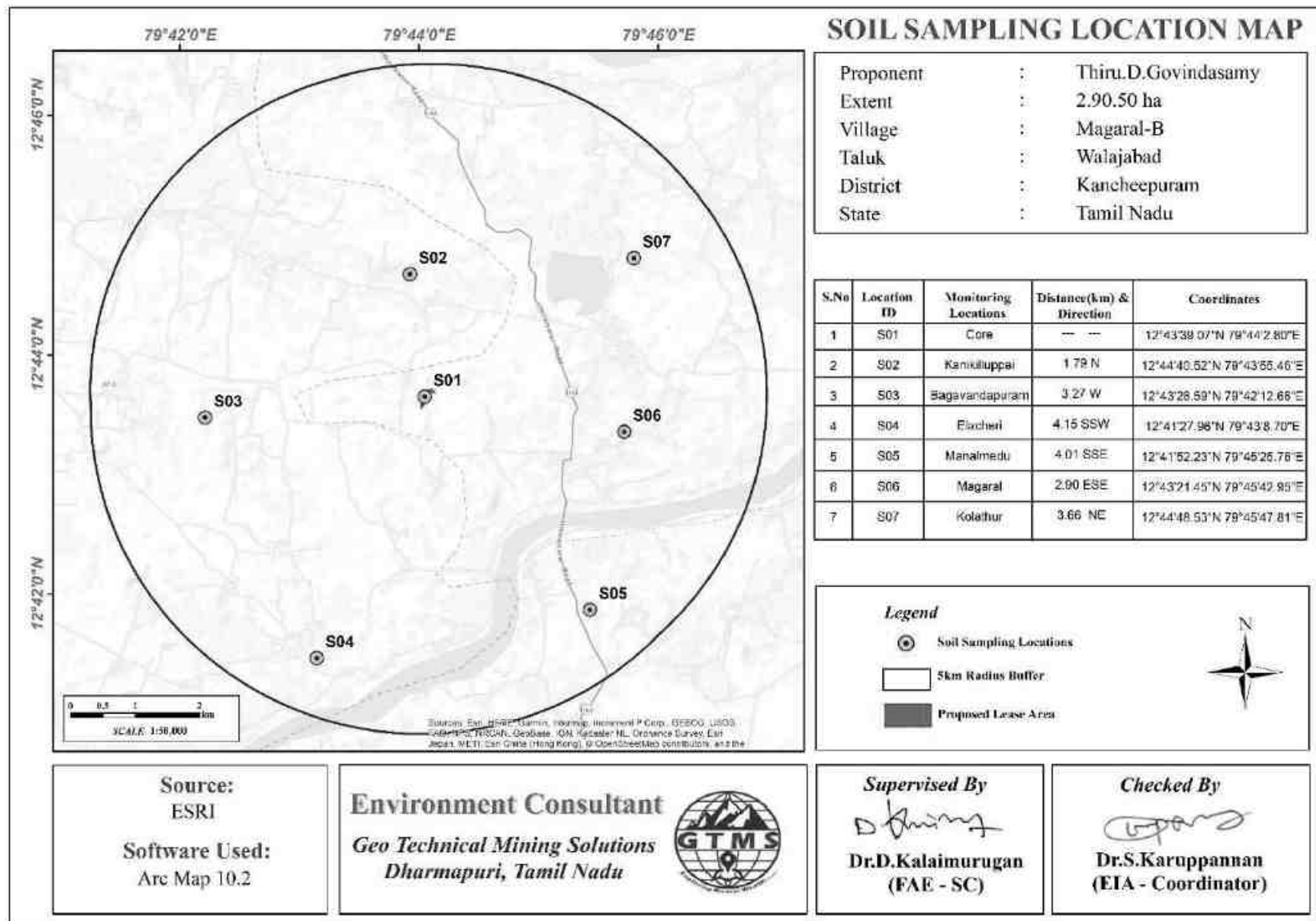


Figure 3.5 Toposheet Showing Soil Sampling Locations within 5 km Radius around the Proposed Project Site

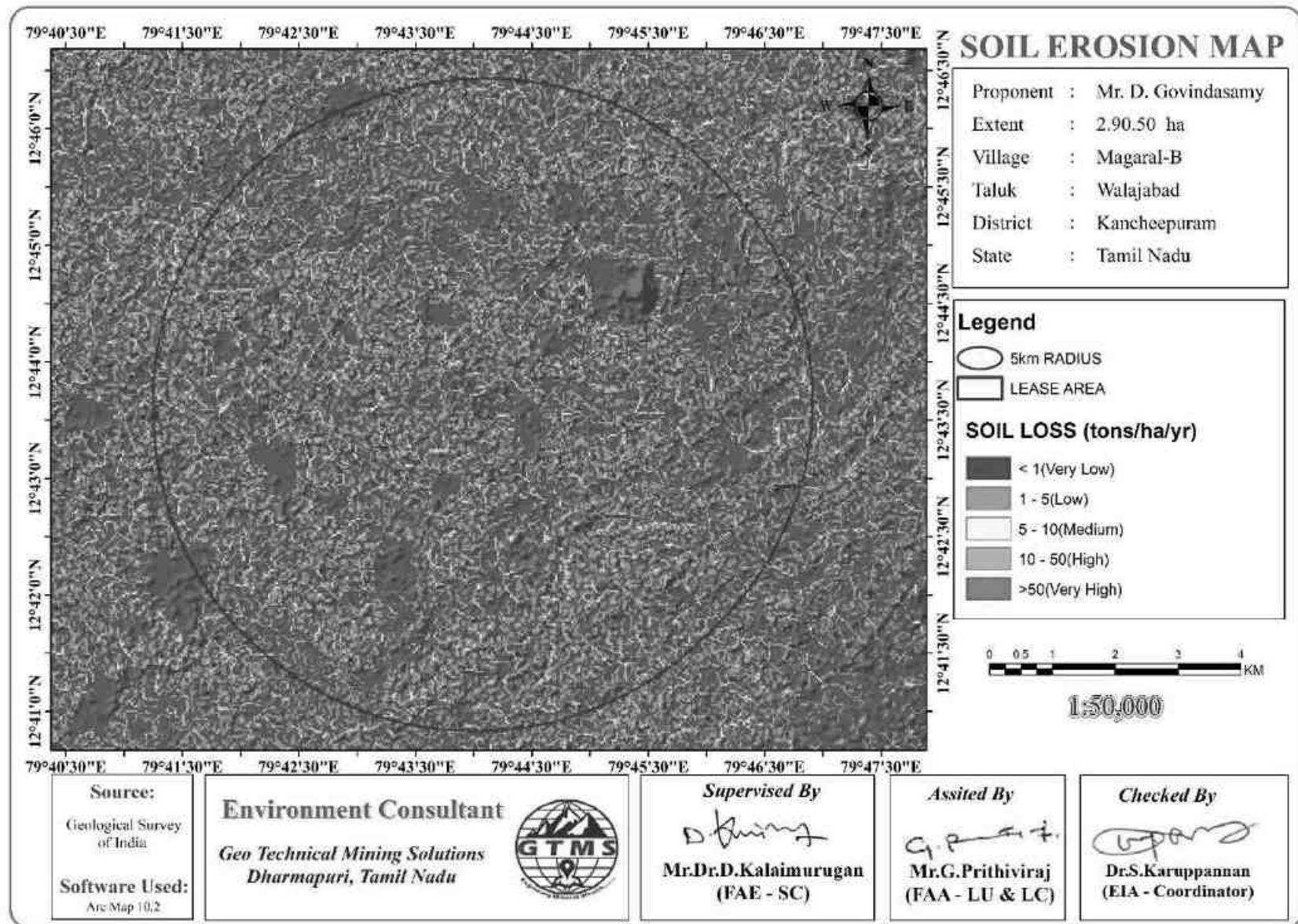


Figure 3.6 Soil erosion map within 5 km Radius around the Proposed Project Site

Table 3.4 Soil Quality of the Study Area

| S. No. | Parameters | Unit | Result in Core | Result in Buffer | | |
|--------|------------------------|--------|-------------------|-------------------------------|-------------------|-------------------|
| | | | | Minimum | Maximum | Average |
| 1 | pH value @ 25°C | - | 7.42 | 6.63 | 7.26 | 6.99 |
| 2 | EC @ 25°C | µS /cm | 213 | 168 | 210 | 183.83 |
| 3 | Texture | - | Sandy Loam | Sandy Loam to Sandy Clay Loam | | |
| 4 | Sand | % | 56.46 | 49.13 | 63.19 | 57.18 |
| 5 | Silt | % | 32.03 | 17.88 | 29.64 | 25.19 |
| 6 | Clay | % | 11.51 | 11.34 | 29.67 | 17.61 |
| 7 | Bulk Density | g/cc | 1.05 | 0.88 | 1.53 | 1.07 |
| 8 | Water Content | % | 2.54 | 2.16 | 8.56 | 4.63 |
| 9 | Organic Matter | % | 1.45 | 0.94 | 1.78 | 1.37 |
| 10 | Alkalinity | mg/kg | 84.56 | 42.56 | 86.45 | 61.82 |
| 11 | Potassium (K) | mg/kg | 186.90 | 144.56 | 213.56 | 183.20 |
| 12 | Water Holding Capacity | % | 39.79 | 32.76 | 59.45 | 42.49 |
| 13 | Calcium (Ca) | mg/kg | 256 | 184 | 442 | 326.83 |
| 14 | Magnesium (Mg) | mg/kg | 192 | 83 | 184 | 148 |
| 15 | Sodium (Na) | mg/kg | 212 | 165 | 219 | 195 |
| 16 | Iron (Fe) | mg/kg | 42.93 | 21.51 | 47.45 | 31.97 |
| 17 | Copper (Cu) | mg/kg | BLQ (LOQ=0.05) | BLQ (LOQ=0.05) | BLQ (LOQ=0.05) | BLQ (LOQ=0.05) |
| 18 | Chlorides (Cl) | mg/kg | 145 | 127 | 186 | 1449.33 |

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

3.2 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

| S. No | Sampling ID | Location | Distance (km) | Direction | Coordinates |
|-------|-------------|---------------------------|---------------|-----------|--------------------------------|
| 1 | SW01 | Cheyar river Arasanipalai | 2.47 | SSE | 12°42'29.61"N 79°44'52.03"E |
| 2 | SW02 | Arpakkam Lake | 2.94 | ENE | 12°44'30.46"N 79°45'31.46"E |
| 3 | SW03 | Sithalapakkam Lake | 2.12 | S | 12°42'24.04"N 79°44'5.28"E |
| 4 | OW01 | Elacheri | 0.13 | E | 12°43'34.50"N 79°44'7.71"E |
| 5 | OW02 | Bagavandapuram | 2.61 | WSW | 12°43'20.35"N 79°42'36.06"E |
| 6 | OW03 | Kilnaickenpalayam | 3.36 | NNW | 12°44'52.41"N 79°42'36.81"E |
| 7 | BW01 | Iyyanpattai | 3.54 | E | 12°43'35.10"N 79°46'5.01"E |
| 8 | BW02 | Kalakattur | 4.37 | N | 12°46'4.68"N 79°43'59.47"E |

Source: On-site monitoring/sampling by Ekdant Enviro Services (p) Limited, in association with GTMS.

3.2.1 Surface Water Resources and Quality

Cheyar River Arasanipalai, Arpakkam Lake and Sithalapakkam Lake are the three prominent surface water resources present in the study area. These are ephemeral in nature, which convey water only after rainfall events. The proposed project area is located 2.47 km SSE of Cheyyar River Arasanipalai, 2.94 ENE of Arpakkam Lake and 2.12 km S of Sithalapakkam Lake, as shown in Table 3.6 and Figure 3.7. Two surface water samples, known as SW1, SW2 and SW3 were collected from the three surface water bodies to assess the baseline water quality. Table 3.6 summarizes surface water quality data of the three samples. Results for surface water samples in the Table 3.6 indicate that the physical and chemical parameters are within permissible limits. Of the two biological parameters, Coliform bacteria are present in the three water samples, whereas E-Coli is absent in the samples.

3.2.2 Ground Water Resources and Quality

Groundwater in the study area occurs in the crystalline rocks of Archaean age and Recent alluvium. The movement of the groundwater is controlled by the intensity of weathering and fracturing of crystalline rocks. Dug wells and bore wells are the most common ground water abstraction structures in the area. However, in dry season, people in the study area heavily rely on bore wells for their domestic and agriculture purpose. Five groundwater samples, known as OW1, OW2, OW3, BW4 and BW5 were collected from open wells and bore wells to analysed for physico-chemical conditions, heavy metals and bacteriological contents in order to assess baseline quality of ground water. Ground water sampling locations and their distance and direction from the lease area are provided in Table 3.5 and the spatial occurrence of water sampling locations is shown in Figure 3.6. Table 3.7 summarizes ground water quality data of the five samples.

Results for ground water samples in the Table 3.7 indicate that the physical, chemical and biological parameters are within permissible limits in comparison with standards of IS10500:2012.

3.2.3 Hydrogeological Studies

The area within 2 km radius consists of numerous open wells and deep wells. Groundwater level data were collected both from open wells and bore wells for two monsoon seasons as discussed in the following section.

3.2.3.1 Groundwater Levels and Flow Direction

As the groundwater moves from the points of highest static groundwater elevation to the points of lowest static groundwater elevation under the influence of gravity, 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 9 bore wells at various locations within 2 km radius around the proposed project sites for the period from October through December, 2022 (Post Monsoon Season) and from March through May, 2023(Pre-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 5.5 to 8.8 m BGL in post monsoon and from 8.6 to 13.6 m BGL in pre monsoon. The bore well data thus collected onsite are provided in Tables 3.10 and 3.11. The average depths to static potentiometric surface in bore wells for the period of October through December 2022 (Post-Monsoon Season) vary from 40 to 56 m and from 44 to 59 m for the period of March through May, 2023 (Pre-Monsoon Season).

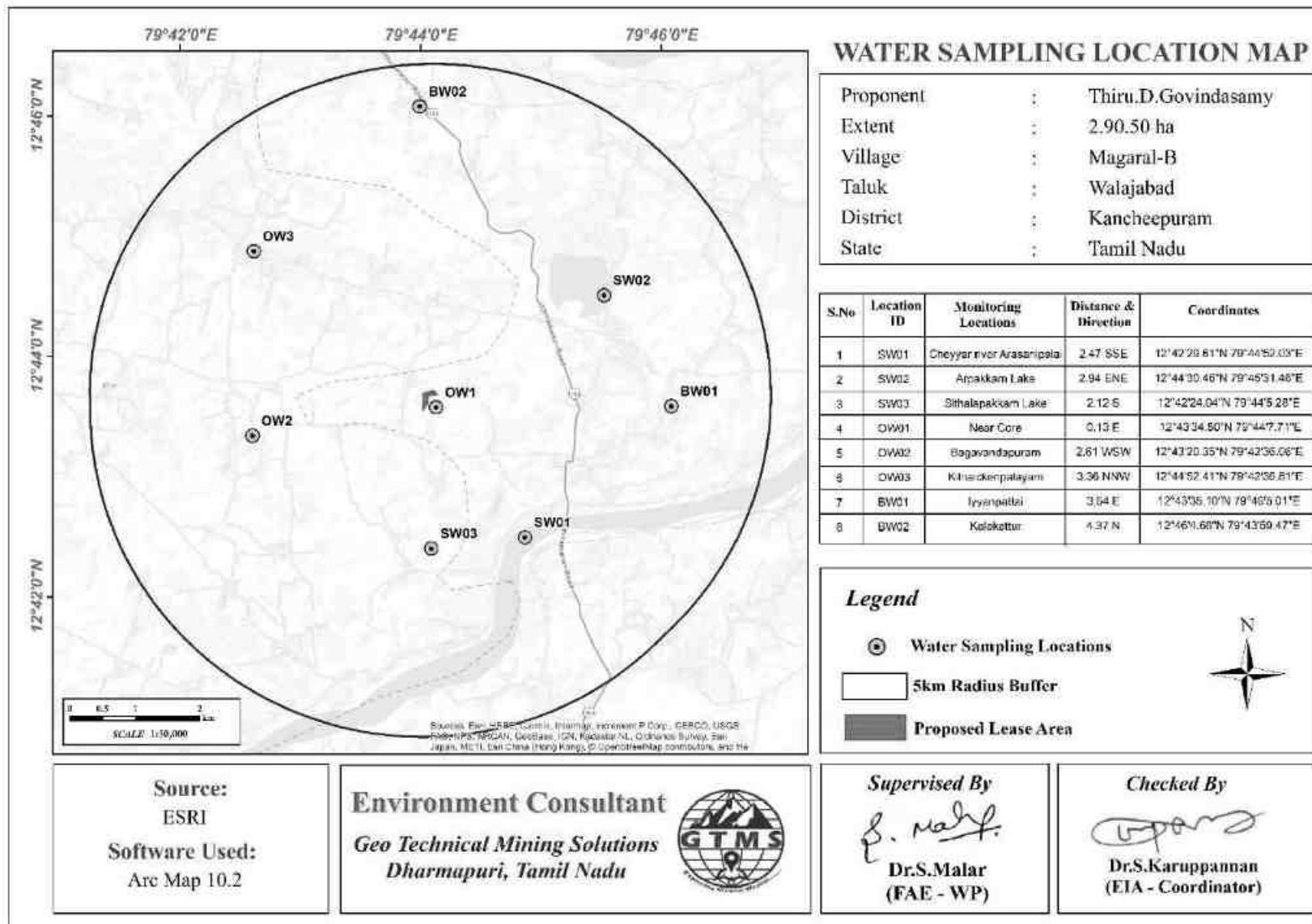


Figure 3.7 Toposheet Showing Water Sampling Locations within 5 km Radius around the Proposed Project Site

Table 3.6 Surface Water Quality Result

| S.No. | Parameters | Units | Result | | | CPCB Designated Best Use | IS:2296-1982 Standards For Class A |
|-------|--------------------------------|------------|----------------|----------------|----------------|---|---|
| | | | Minimum | Maximum | Average | | |
| 1 | pH@ 25°C | -- | 7 | 7.23 | 7.11 | 6.5 – 8.5 | 6.5 – 8.5 |
| 2 | Turbidity | NTU | BLQ (LOQ=0.1) | | | 5 | 15 |
| 3 | Electrical Conductivity @ 25°C | µs/cm | 473 | 543 | 504 | Not specified | Not specified |
| 4 | TSS | mg /l | BLQ (LOQ=1.0) | BLQ (LOQ=1.0) | BLQ (LOQ=1.0) | Not specified | Not specified |
| 5 | TDS | mg /l | 213 | 276 | 235 | 500 | 500 |
| 6 | Total Hardness | mg /l | 213 | 322 | 271.66 | 400 | 300 |
| 7 | Chloride (Cl) | mg /l | 58 | 85 | 70.66 | 400 | 250 |
| 8 | Sulphate (SO ₄) | mg /l | 12 | 36 | 24.66 | 200 | 400 |
| 9 | Iron (Fe) | mg /l | BLQ (LOQ=0.01) | BLQ (LOQ=0.01) | BLQ (LOQ=0.01) | Not specified | 0.3 |
| 10 | Silica (SiO ₂) | mg /l | -- | -- | -- | Not specified | Not specified |
| 11 | Total Coliform | MPN/ 100ml | Present | | | Shall not be detectable in any 100 ml water | Shall not be detectable in any 100 ml water |
| 12 | E-Coli | MPN/ 100ml | Absent | | | Shall not be detectable in any 100 ml water | Shall not be detectable in any 100 ml water |

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

Table 3.7 Ground Water Quality Result

| S.No. | Parameters | Units | Result in Core Zone | Result in Buffer Zone | | | Acceptable Limit | Permissible Limit |
|-------|-----------------------------|---------------|---------------------|-----------------------|---------|---------|---|---|
| | | | | Minimum | Maximum | Average | | |
| 1 | pH@ 25°C | -- | 7.25 | 6.92 | 7.28 | 7.13 | 6.5-8.5 | No relaxation |
| 2 | Turbidity | NTU | BLQ (LOQ=0.1) | BLQ(LOQ=0.1) | | | 1 | 5 |
| 3 | EC @ 25°C | µs/cm | 556 | 413 | 723 | 572.75 | Not specified | Not specified |
| 4 | TSS | mg /l | BLQ (LOQ=1.0) | BLQ(LOQ=1.0) | | | Not specified | Not specified |
| 5 | TDS | mg /l | 313 | 240 | 415 | 321.5 | 500 | 2000 |
| 6 | Total Hardness | mg /l | 217 | 216 | 436 | 345 | 200 | 600 |
| 7 | Chloride (Cl) | mg /l | 106 | 43 | 189 | 119 | 250 | 1000 |
| 8 | Sulphate (SO ₄) | mg /l | 56 | 31 | 61 | 45 | 200 | 400 |
| 9 | Iron (Fe) | mg /l | BLQ (LOQ=0.01) | BLQ(LOQ=0.01) | | | 0.3 | No relaxation |
| 10 | Silica (SiO ₂) | mg /l | - | - | - | - | | |
| 11 | Total Coliform | MPN/ 100ml | Absent | Absent | | | Shall not be detected any 100 ml sample | Shall not be detected any 100 ml sample |
| 12 | E-Coli | MPN/ 100ml | Absent | Absent | | | Shall not be detected any 100 ml sample | Shall not be detected any 100 ml sample |

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

Data on the depths to static water table and potentiometric surface were used to calculate static groundwater table and potentiometric surface elevations for open wells and borewells, respectively to draw contour lines connecting groundwater elevation (also known as equipotential hydraulic head) to determine the groundwater flow direction perpendicular to the contour lines. The maps thus produced are shown in Figures 3.8-3.9. From the maps of groundwater flow direction, it is understood that most of the open well groundwater for the post- and pre-monsoon seasons flows towards the open well number 1 and 8 located in NNE and SSW of the proposed project site respectively. The maps thus produced in bore wells are shown in Figures 3.10-3.11. From the groundwater flow map in fare that two monsoon seasons groundwater flows towards the bore well number 8 located in SE 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 Static Water Table BGL(m) | | | | Latitude | Longitude |
|------------|------------------------------------|----------|-----------|---------|---------------|---------------|
| | Mar-2023 | Apr-2023 | May- 2023 | Average | | |
| DW01 | 12.9 | 13.3 | 13.6 | 13.3 | 12°43'22.00"N | 79°43'38.79"E |
| DW02 | 12.5 | 12.8 | 13.2 | 12.8 | 12°43'33.61"N | 79°44'15.70"E |
| DW03 | 9.5 | 9.8 | 10.6 | 10.0 | 12°43'46.15"N | 79°43'20.29"E |
| DW04 | 8.6 | 8.9 | 9.6 | 9.0 | 12°42'56.26"N | 79°44'17.53"E |
| DW05 | 9.6 | 10.2 | 10.8 | 10.2 | 12°43'11.71"N | 79°43'18.42"E |
| DW06 | 10.1 | 10.6 | 11.0 | 10.6 | 12°44'9.34"N | 79°43'45.59"E |
| DW07 | 10.4 | 10.8 | 11.3 | 10.8 | 12°44'10.10"N | 79°44'26.10"E |
| DW08 | 11.1 | 11.8 | 12.3 | 11.7 | 12°43'57.38"N | 79°44'10.04"E |
| DW09 | 12.1 | 12.3 | 12.5 | 12.3 | 12°43'21.47"N | 79°44'49.07"E |

Source: Onsite monitoring data

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

| Station ID | Depth to Static Water Table BGL(m) | | | | Latitude | Longitude |
|------------|------------------------------------|----------|----------|---------|---------------|---------------|
| | Oct-2022 | Nov-2022 | Dec-2022 | Average | | |
| DW01 | 5.5 | 5.9 | 6.1 | 5.8 | 12°43'22.00"N | 79°43'38.79"E |
| DW02 | 5.8 | 6.2 | 6.6 | 6.2 | 12°43'33.61"N | 79°44'15.70"E |
| DW03 | 6.9 | 7.2 | 7.8 | 7.3 | 12°43'46.15"N | 79°43'20.29"E |
| DW04 | 7.1 | 7.5 | 7.9 | 7.5 | 12°42'56.26"N | 79°44'17.53"E |
| DW05 | 8.0 | 8.4 | 8.8 | 8.4 | 12°43'11.71"N | 79°43'18.42"E |
| DW06 | 7.6 | 7.9 | 8.4 | 8.0 | 12°44'9.34"N | 79°43'45.59"E |
| DW07 | 7.7 | 8.1 | 8.5 | 8.1 | 12°44'10.10"N | 79°44'26.10"E |
| DW08 | 6.1 | 6.6 | 6.8 | 6.5 | 12°43'57.38"N | 79°44'10.04"E |
| DW09 | 7.2 | 7.6 | 7.8 | 7.5 | 12°43'21.47"N | 79°44'49.07"E |

Source: Onsite monitoring data

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

| Station ID | Depth to Static Potentiometric Surface BGL(m) | | | | Latitude | Longitude |
|------------|---|----------|-----------|---------|---------------|---------------|
| | Mar-2023 | Apr-2023 | May- 2023 | Average | | |
| BW01 | 48 | 51 | 54 | 51.00 | 12°42'58.89"N | 79°44'10.69"E |
| BW02 | 50 | 54 | 58 | 54.00 | 12°43'28.93"N | 79°43'25.10"E |
| BW03 | 49 | 53 | 58 | 53.50 | 12°43'6.15"N | 79°42'51.31"E |
| BW04 | 51 | 55 | 59 | 55.00 | 12°43'31.82"N | 79°42'36.44"E |
| BW05 | 44 | 46 | 48 | 46.00 | 12°44'40.70"N | 79°43'42.89"E |
| BW06 | 44 | 48 | 52 | 48.00 | 12°44'14.79"N | 79°44'2.09"E |
| BW07 | 47 | 50 | 53 | 50.00 | 12°43'58.89"N | 79°44'37.18"E |
| BW08 | 46 | 49 | 51 | 48.67 | 12°43'11.37"N | 79°44'58.78"E |
| BW09 | 48 | 52 | 55 | 51.67 | 12°42'32.05"N | 79°43'44.51"E |

Source: Onsite monitoring data

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

| Station ID | Depth to Static Potentiometric Surface BGL(m) | | | | Latitude | Longitude |
|------------|---|----------|----------|---------|---------------|---------------|
| | Oct-2022 | Nov-2022 | Dec-2022 | Average | | |
| BW01 | 43 | 48 | 50 | 47.00 | 12°42'58.89"N | 79°44'10.69"E |
| BW02 | 45 | 50 | 53 | 49.33 | 12°43'28.93"N | 79°43'25.10"E |
| BW03 | 44 | 51 | 55 | 50.00 | 12°43'6.15"N | 79°42'51.31"E |
| BW04 | 47 | 52 | 56 | 51.67 | 12°43'31.82"N | 79°42'36.44"E |
| BW05 | 41 | 43 | 46 | 43.33 | 12°44'40.70"N | 79°43'42.89"E |
| BW06 | 40 | 44 | 48 | 44.00 | 12°44'14.79"N | 79°44'2.09"E |
| BW07 | 42 | 46 | 49 | 45.67 | 12°43'58.89"N | 79°44'37.18"E |
| BW08 | 41 | 45 | 48 | 44.67 | 12°43'11.37"N | 79°44'58.78"E |
| BW09 | 40 | 43 | 49 | 44.00 | 12°42'32.05"N | 79°43'44.51"E |

Source: Onsite monitoring data

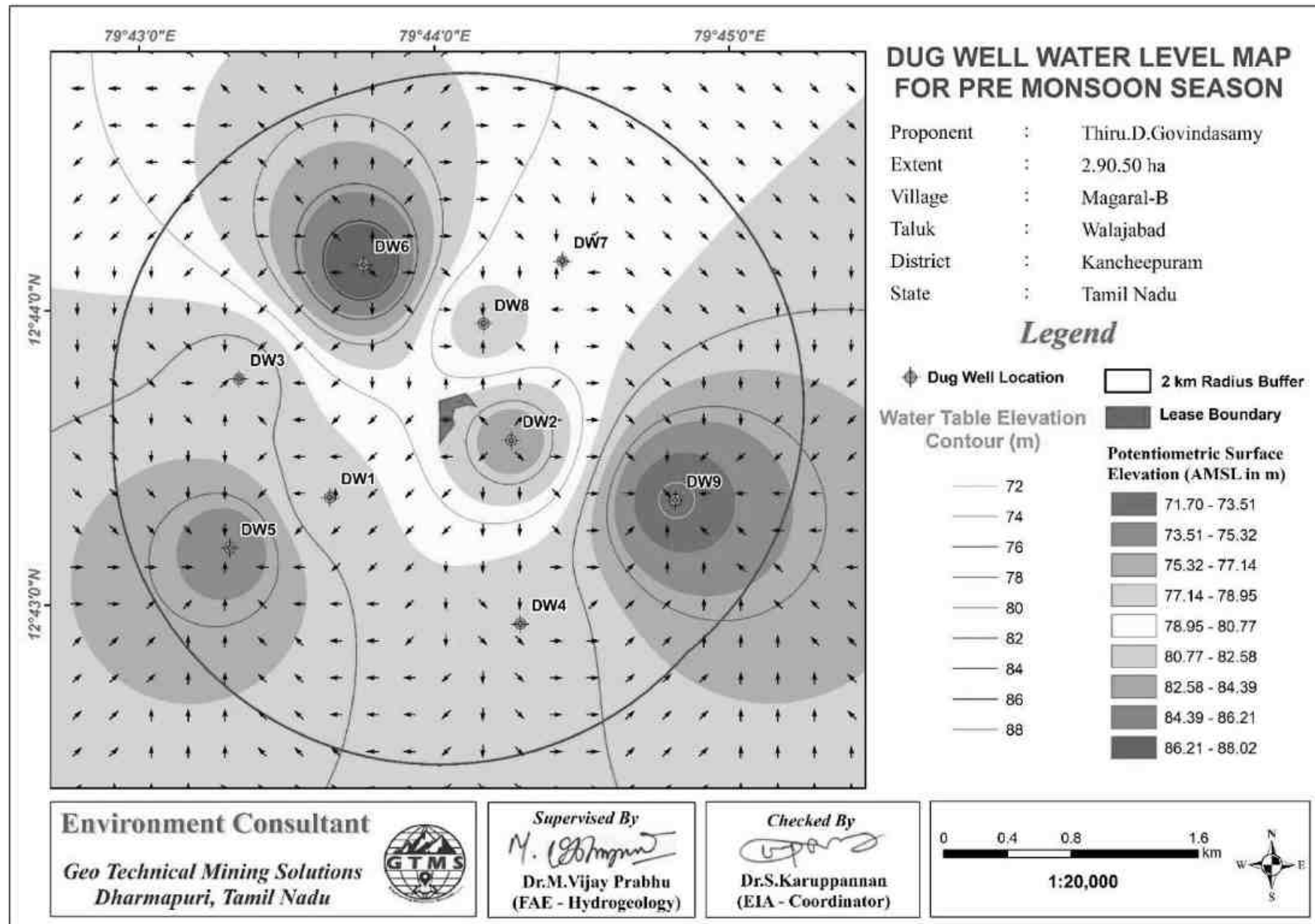


Figure 3.8 Open Well Static Groundwater Elevation Map Showing the Direction of Groundwater Flow during Pre-Monsoon Season

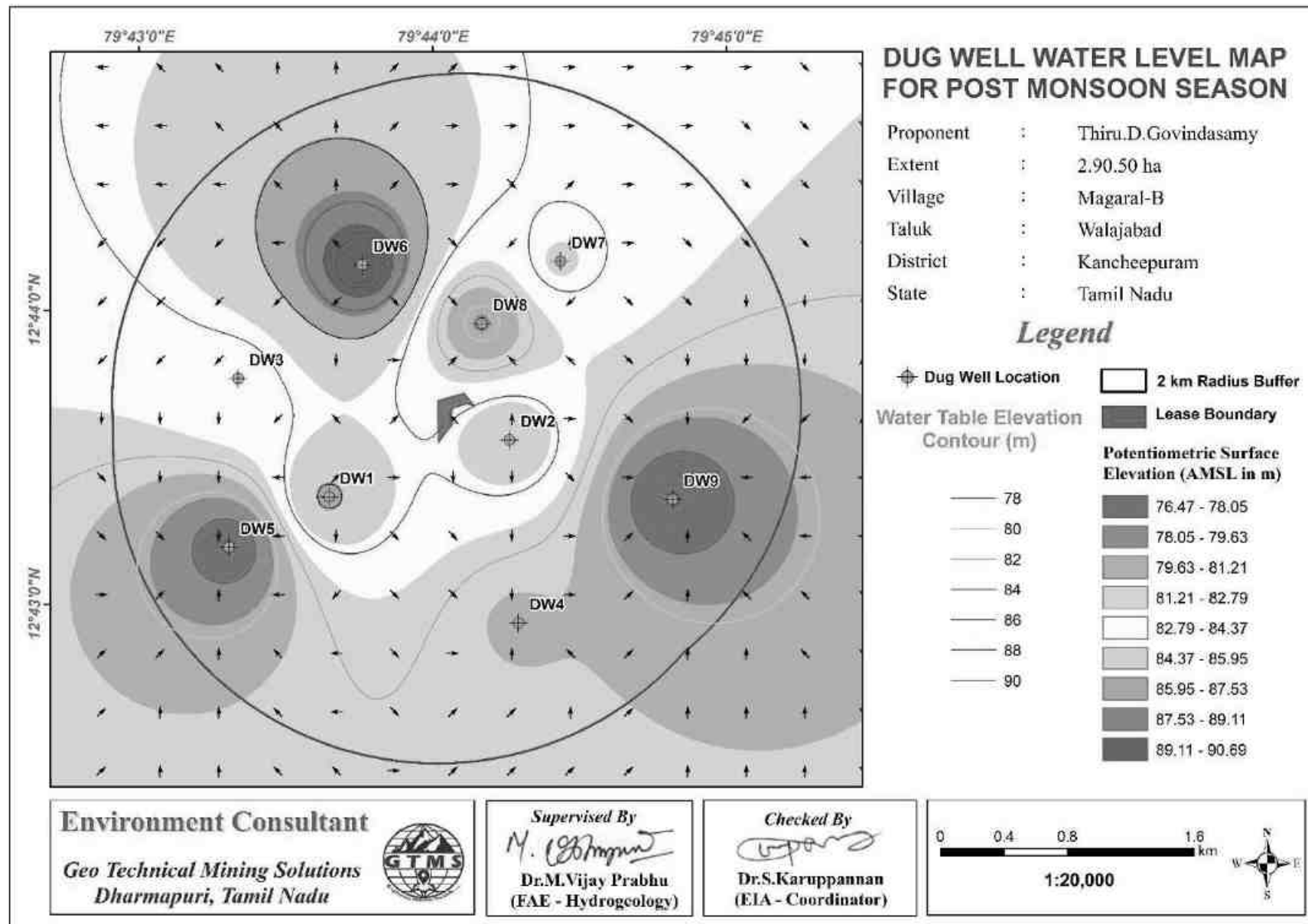


Figure 3.9 Open Well Static Groundwater Elevation Map Showing the Direction of Groundwater Flow during Post-Monsoon Season

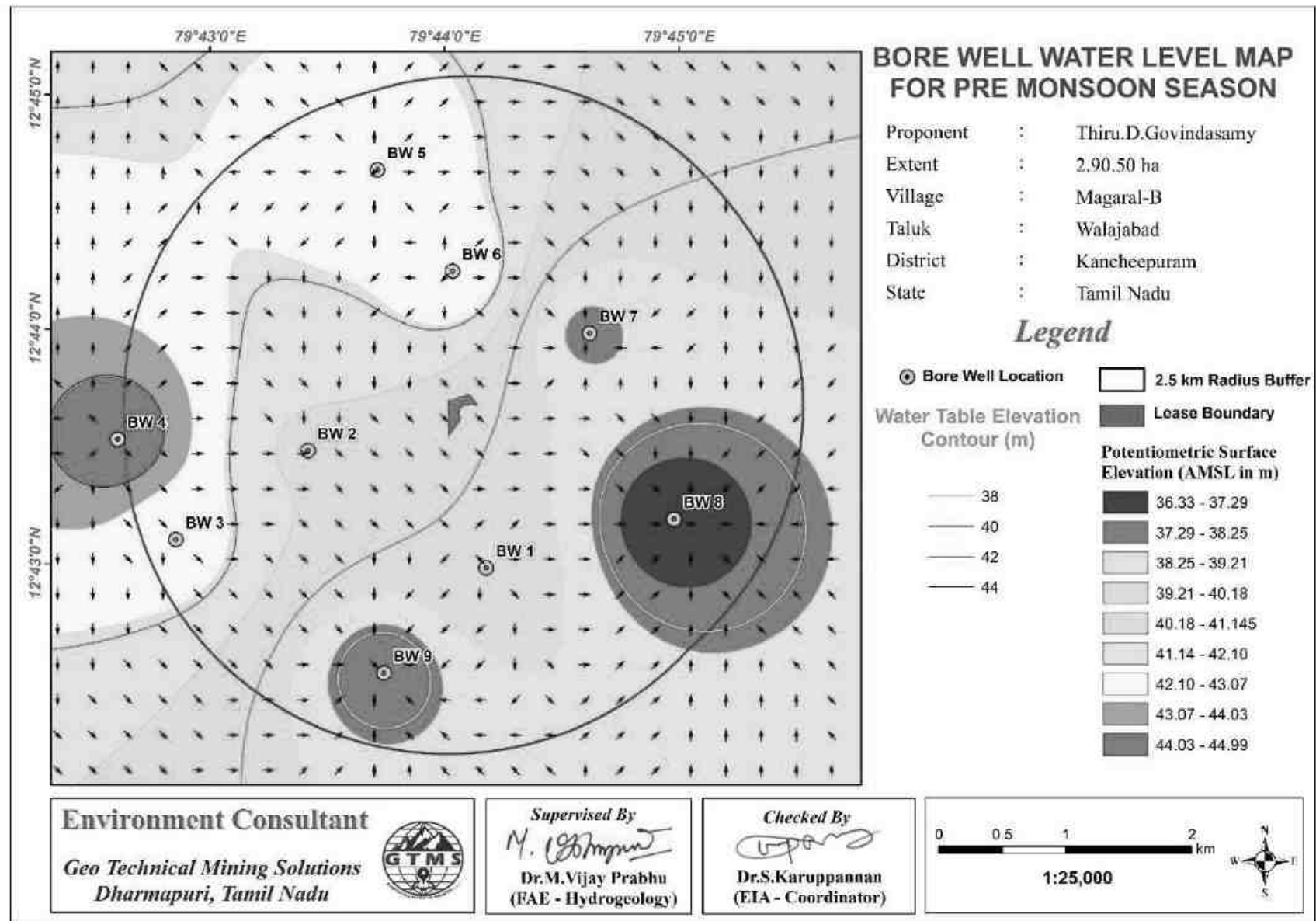


Figure 3.10 Borewell Static Groundwater Elevation Map Showing the Direction of Groundwater Flow during Pre-Monsoon Season

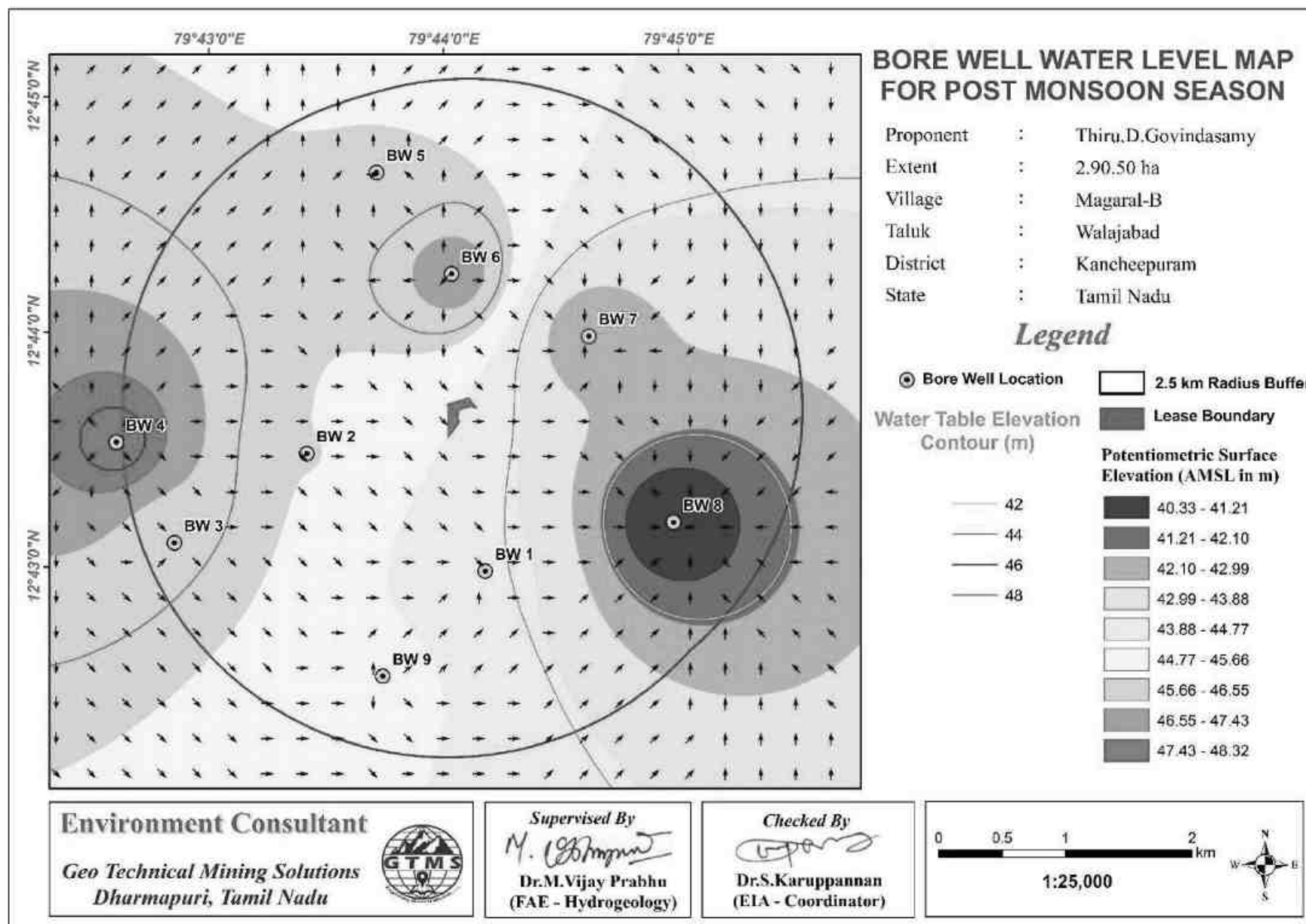


Figure 3.11 Borewell Static Groundwater Elevation Map Showing the Direction of Groundwater Flow during Post-Monsoon Season

3.2.3.2 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.

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 3.12.

Table 3.12 Vertical Electrical Sounding Data

| Location Coordinates – 10°56'50.52"N 77°58'12.02"E | | | | | |
|---|---------------------|---------------------|-----------------------------------|--|--|
| S. No. | AB/2 (m) | MN/2 (m) | Geometrical Factor (G) | Resistance in Ω | Apparent Resistivity in Ωm |
| 1 | 5 | 2 | 16.50 | 0.741 | 125.05 |
| 2 | 10 | 2 | 75.43 | 0.245 | 167.91 |
| 3 | 15 | 5 | 62.86 | 0.454 | 288.48 |
| 4 | 20 | 5 | 117.86 | 0.326 | 369.37 |
| 5 | 25 | 5 | 188.58 | 0.263 | 496.74 |
| 6 | 25 | 10 | 82.50 | 0.594 | 490.67 |
| 7 | 30 | 10 | 125.72 | 0.580 | 582.30 |
| 8 | 35 | 10 | 176.79 | 0.406 | 718.27 |
| 9 | 40 | 10 | 235.73 | 0.368 | 876.45 |
| 10 | 45 | 10 | 302.51 | 0.355 | 1073.17 |
| 11 | 50 | 20 | 165.01 | 0.278 | 1189.65 |
| 12 | 60 | 20 | 251.44 | 0.272 | 786.42 |
| 13 | 70 | 20 | 353.59 | 0.269 | 1239.90 |
| 14 | 80 | 20 | 471.45 | 0.262 | 1281.12 |
| 15 | 90 | 20 | 605.03 | 0.257 | 1546.68 |
| 16 | 100 | 20 | 754.32 | 0.251 | 1785.32 |

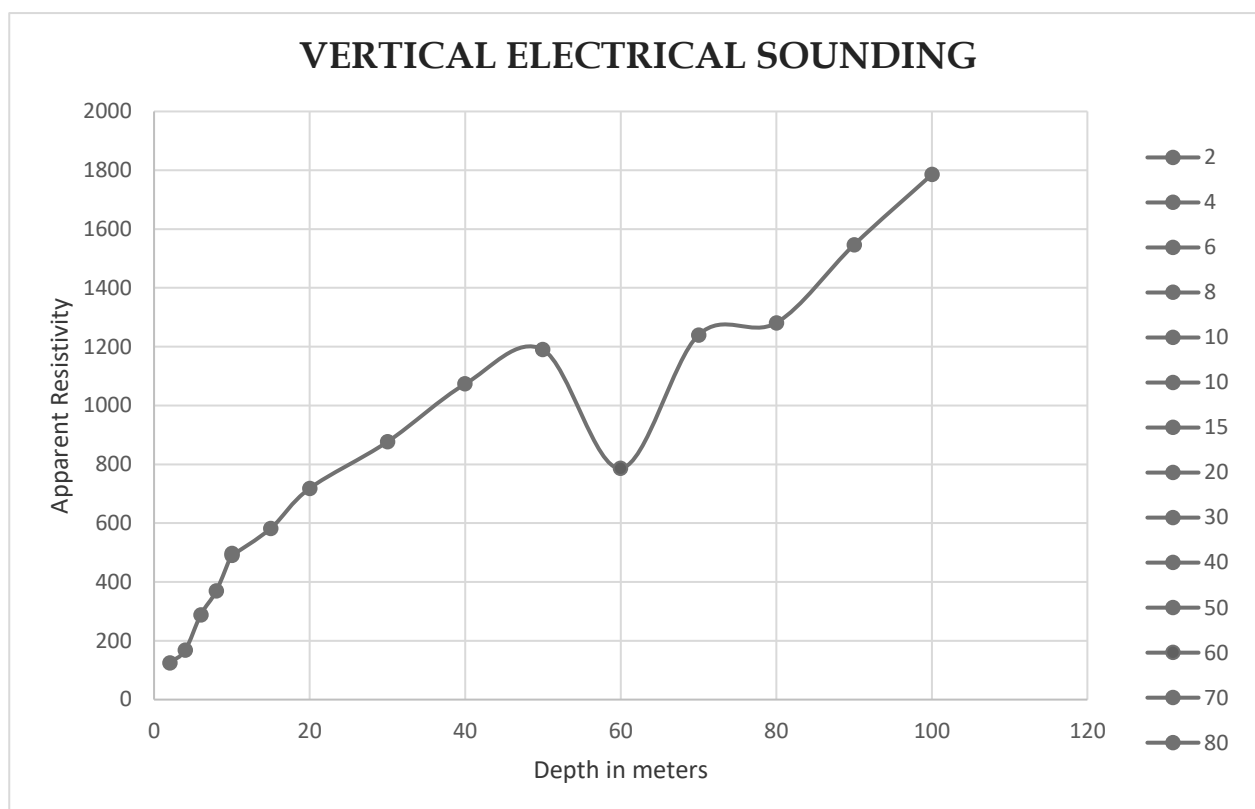


Figure 3.12 Graph Showing Occurrence of Water Bearing Fracture Zones at the Depth of 60 m below Ground Level in Proposed Project

The rock formation of low resistivity values indicates occurrence of water at the depth of about 60 m below ground level. The maximum depth proposed for the proposed project is 30 m below ground level. Therefore, the mining operation will not affect the aquifer throughout the entire mine life period.

3.3 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.

3.3.1 Meteorology

3.3.1.1 Climatic Variables

A temporary meteorological station was installed at the project sites by covering cluster quarries. The station was installed at a height of 3 m above the ground level as there are no obstructions facilitating flow of wind, wind speed, wind direction, humidity and temperature. Meteorological data obtained from the onsite monitoring station are provided in Table 3.13.

According to the onsite data, the temperature in March, 2022 varied from 22.19 to 35.52⁰C with the average of 28.08⁰C; in April, 2022 from 25.34 to 36.46⁰C with the average of 29.82⁰C; and in May, 2022 from 25.64 to 37.22⁰C with the average of 30.27⁰C. In March, 2022, relative humidity ranged from 30.44 to 95.19 % with the average of 71.17%; in April, 2022, from 36.56 to 92.19 % with the average of 72.22; and in May, 2022, from 36.19 to 93.19 % with the average of 72.29 %. The wind speed in March, 2022 varied from 0.035 to 8.80 m/s with the average of 3.96 m/s; in April, 2022 from 0.09 to 6.81 m/s with the average of 3.67 m/s; and in May, 2022 from 0.06 to 9.06 m/s with the average of 4.17 m/s. In March,2022, wind direction varied from 2.32 to 359.65⁰ with the average of 119.25⁰; in April, 2022, from 0.00 to 357.92⁰ with the average of 149.97⁰; and in May, 2022, from 2.09 to 358.03⁰ with the average of 207.43⁰. In March,2022, surface pressure varied from 99.94 to 101.17 kPa with the average of 100.56 kPa; in April, 2022, from 99.87 to 101.08 kPa with the average of 100.45 kPa; and in May, 2022, from 99.38 to 100.58 kPa with the average of 100.06 kPa

Table 3.13 Onsite Meteorological Data

| S. No. | Parameters | | March,2022 | April,2022 | May,2022 |
|--------|-------------------------------|-----|------------|------------|----------|
| 1 | Temperature (⁰ C) | Min | 22.19 | 25.34 | 25.64 |
| | | Max | 35.52 | 36.46 | 37.22 |
| | | Avg | 28.08 | 29.82 | 30.27 |
| 2 | Relative Humidity (%) | Min | 30.44 | 36.56 | 36.19 |
| | | Max | 95.19 | 92.19 | 93.19 |
| | | Avg | 71.17 | 72.22 | 72.29 |
| 3 | Wind Speed (m/s) | Min | 0.35 | 0.09 | 0.06 |
| | | Max | 8.80 | 6.81 | 9.06 |
| | | Avg | 3.96 | 3.67 | 4.17 |
| 4 | Wind Direction (degree) | Min | 2.32 | 0.00 | 2.09 |
| | | Max | 359.65 | 357.92 | 358.03 |
| | | Avg | 119.25 | 149.97 | 207.43 |
| 5 | Surface Pressure(kPa) | Min | 99.94 | 99.87 | 99.38 |
| | | Max | 101.17 | 101.08 | 100.58 |
| | | Avg | 100.56 | 100.45 | 100.06 |

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

Rainfall

Rainfall data for the study area were collected for the period of 1981-2021. Long term monthly average rainfall was estimated from the data of 1981-2021 and compared with the monthly rainfall for the year 2021, shown in Figure 3.12. The Figure 3.13 shows that rainfall is generally high in the months of September through November in every year. Particularly, rainfall in September through November of 2021 is higher than the previous years.

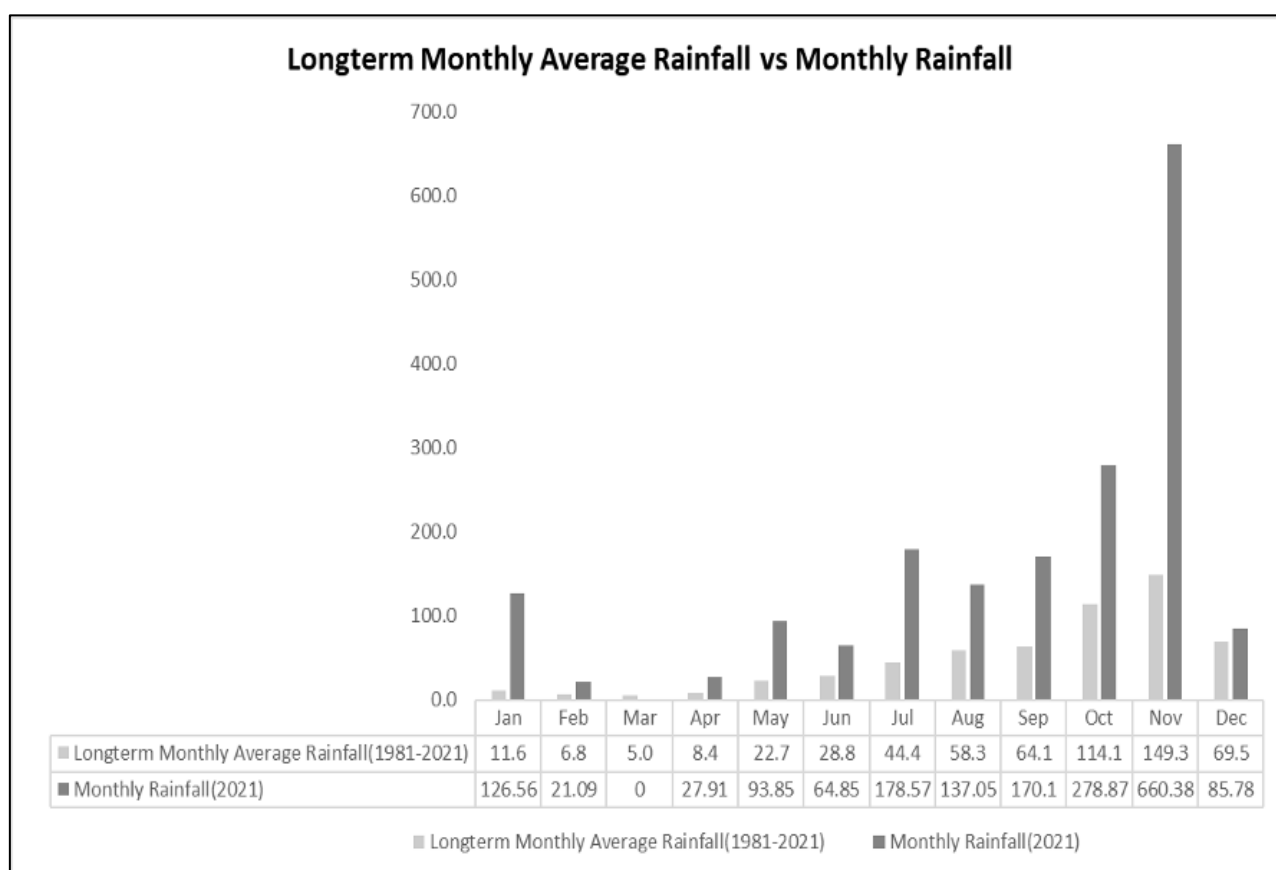


Figure 3.13 Long-Term Monthly Average Rainfall vs Monthly Rainfall

3.3.1.2 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. Two types of wind rose were generated: historical seasonal wind rose for the period of March through May of the years from 2019 to 2022 and the seasonal wind rose for the study period of March through May 2023. The wind rose diagrams thus produced are shown in Figures 3.14-3.14a. Figure 3.15 reveals that:

- ❖ The measured average wind velocity during the study period is 3.94m/s.
- ❖ Predominant wind was dominant in the directions ranging from Southeast to Northwest.

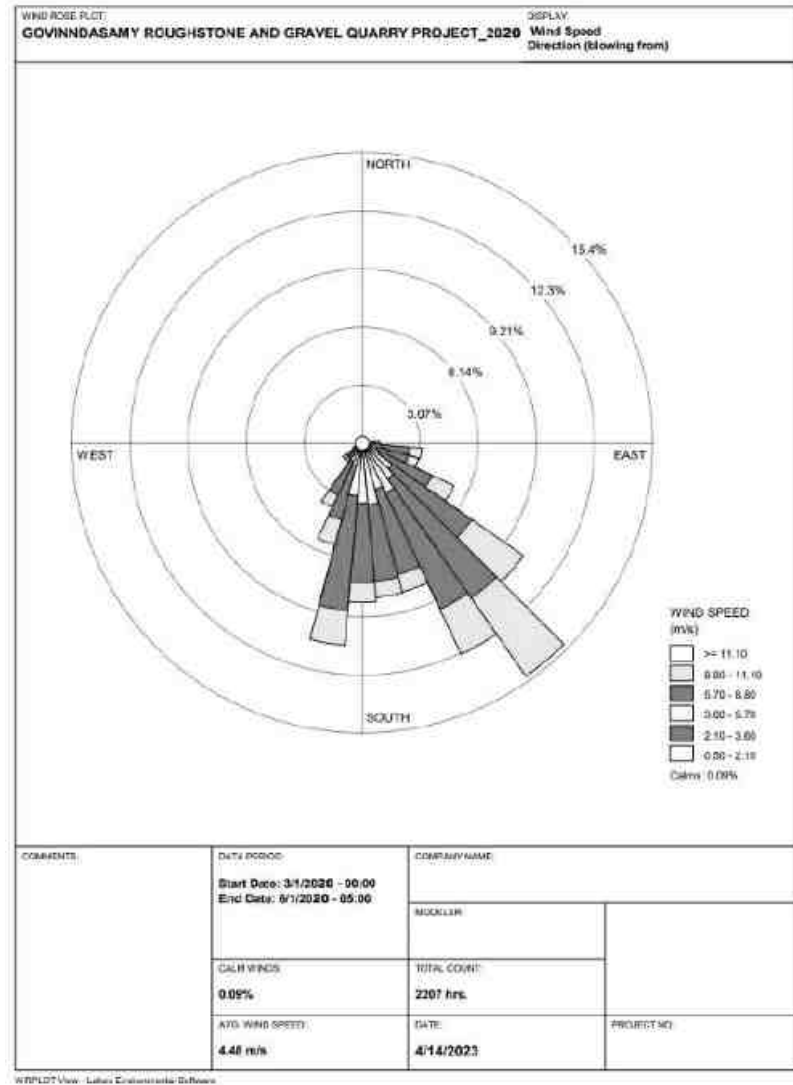
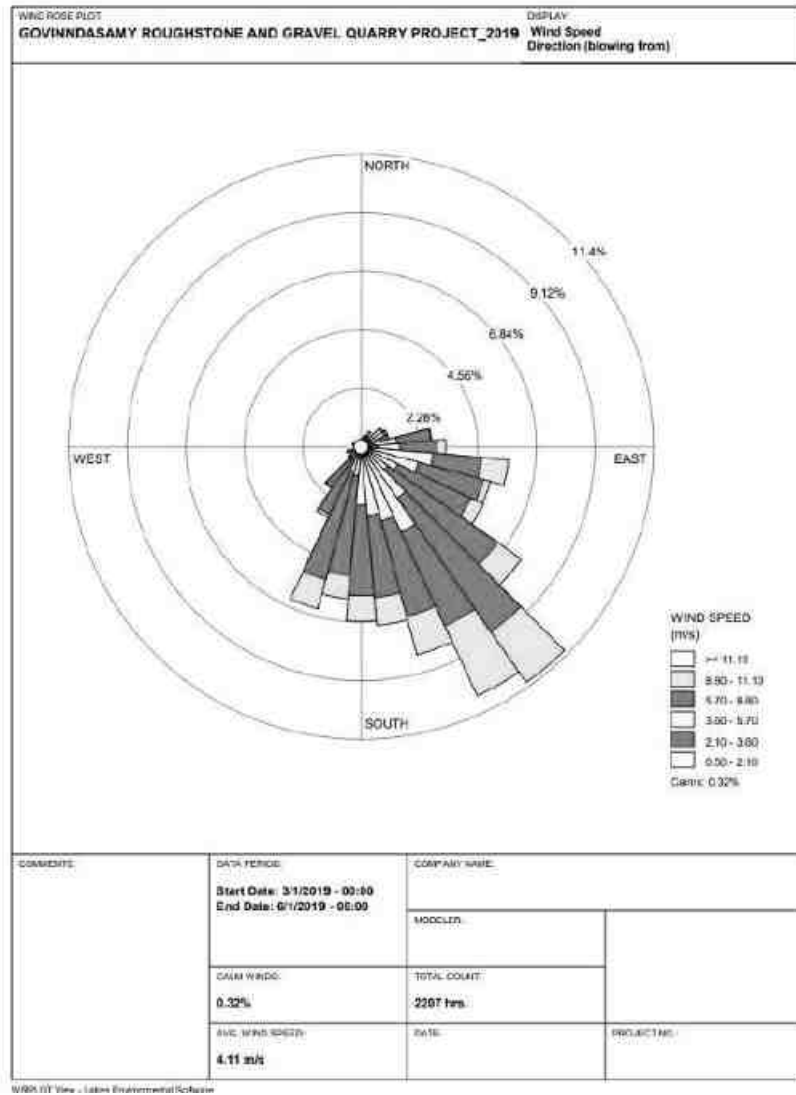


Figure 3.14 Windrose Diagram for 2018 and 2019 (March to May)

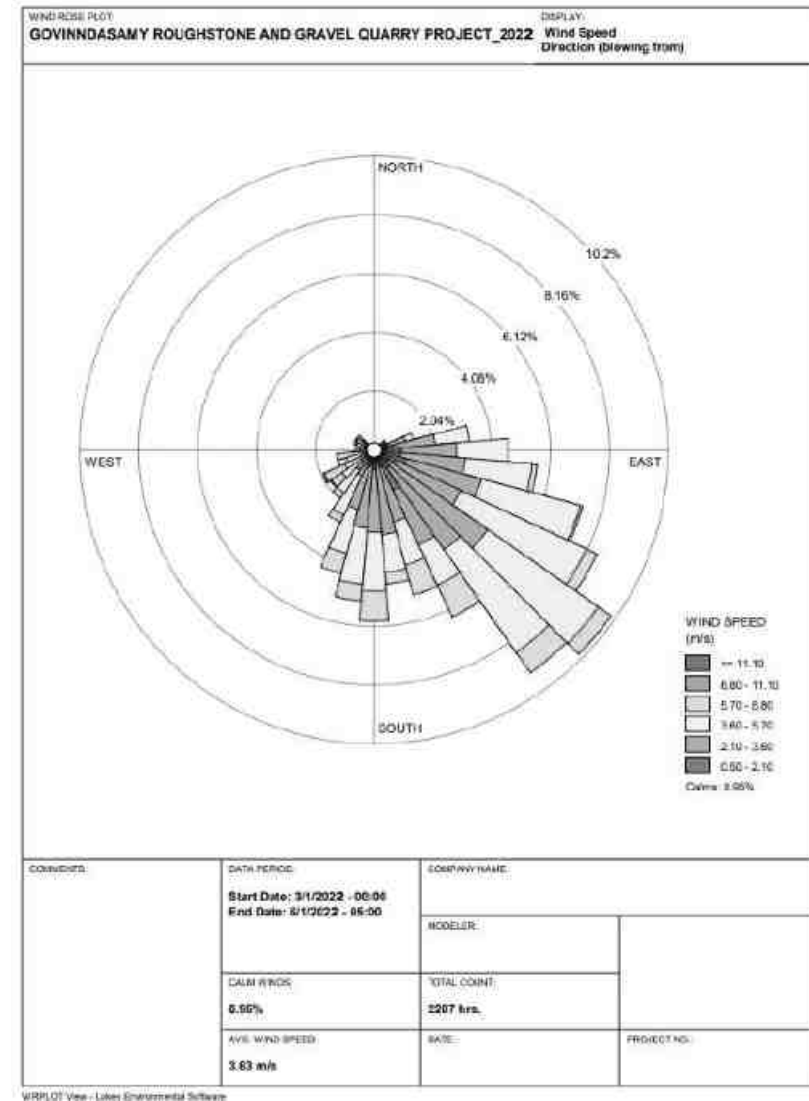
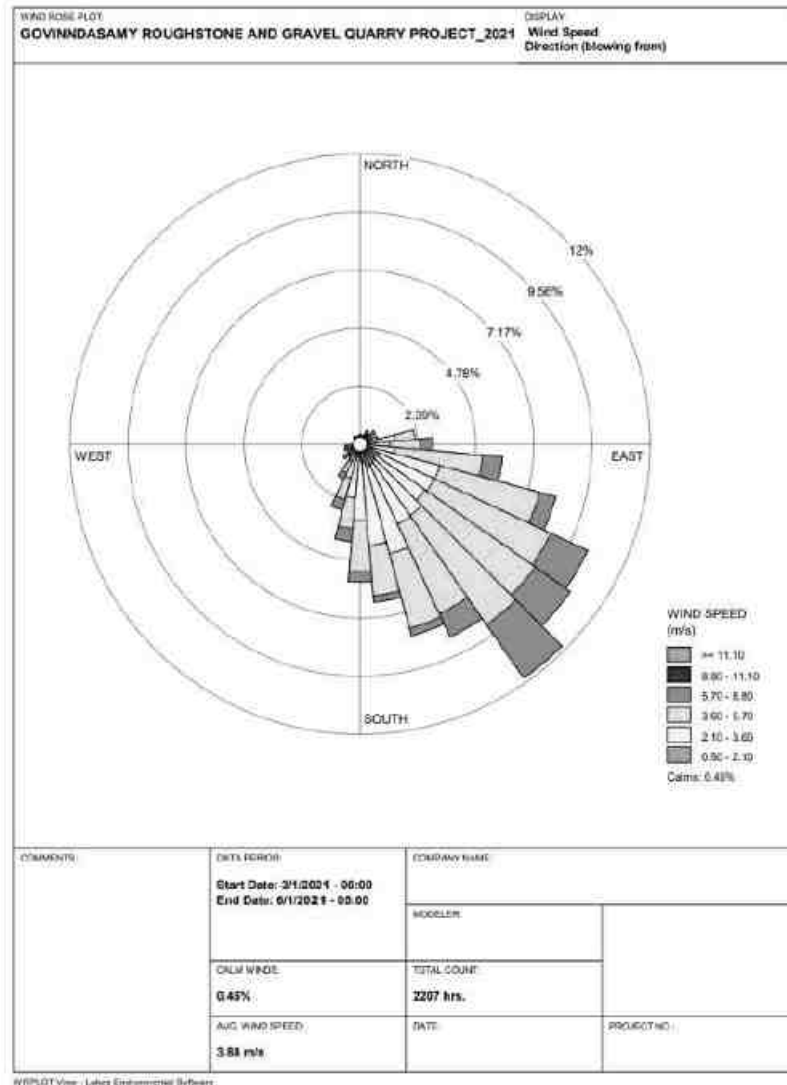
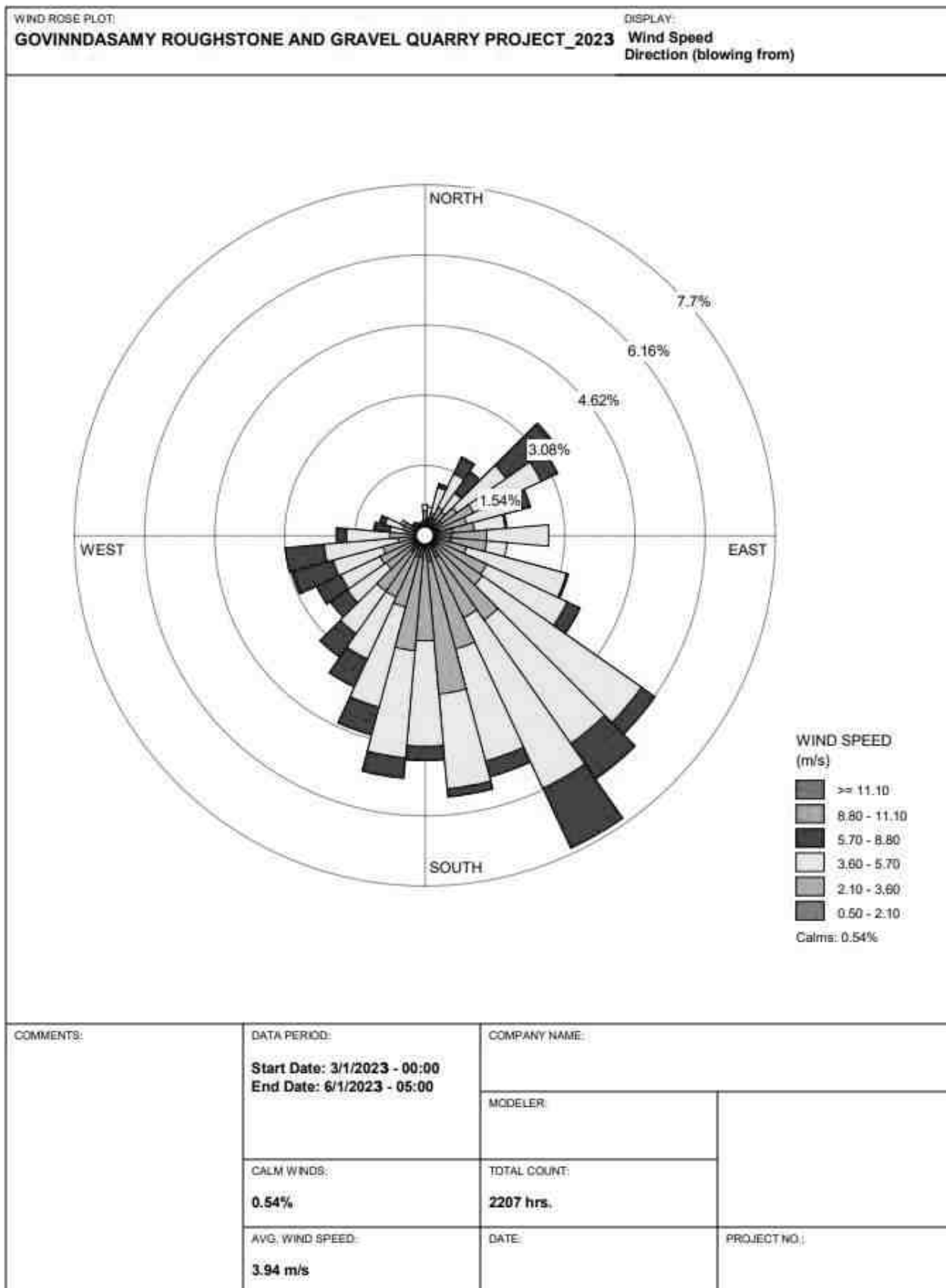


Figure 3.14(A) Windrose Diagram for 2020 and 2021 (March to May)



WRPLOT View - Lakes Environmental Software.

Figure 3.15 Onsite Wind Rose Diagram

3.3.2 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 3.14 Methodology and Instrument Used for AAQ Analysis

| Parameter | Method | Instrument |
|-------------------|--|---|
| PM _{2.5} | Gravimetric method | Fine Particulate Sampler |
| | Beta attenuation method | Make – Thermo Environmental Instruments – TEI 121 |
| PM ₁₀ | Gravimetric method | Respirable Dust Sampler |
| | Beta attenuation method | Make –Thermo Environmental Instruments – TEI 108 |
| SO ₂ | IS-5182 Part II (Improved West & Gaeke method) | Respirable Dust Sampler with gaseous attachment |
| NO _x | IS-5182 Part II (Jacob & Hoch heiser modified method) | Respirable Dust Sampler with gaseous attachment |
| Free Silica | NIOSH – 7601 | Visible Spectrophotometry |

Source: Sampling Methodology based on *Ekdant Enviro Services (p) Limited & CPCB Notification*

Table 3.15 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 ₂ (µg/m ³) | Annual Avg.* | 50.0 | 20.0 |
| | | 24 hours** | 80.0 | 80.0 |
| 2 | NO _x (µg/m ³) | Annual Avg. | 40.0 | 30.0 |
| | | 24 hours | 80.0 | 80.0 |
| 3 | PM ₁₀ (µg/m ³) | Annual Avg. | 60.0 | 60.0 |
| | | 24 hours | 100.0 | 100.0 |
| 4 | PM _{2.5} (µg/m ³) | Annual Avg. | 40.0 | 40.0 |
| | | 24 hours | 60.0 | 60.0 |

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

Methodology

Ambient air quality monitoring was carried out with a frequency of two samples per week at Seven (7) locations, adopting a continuous 24 hourly (3 shift of 8-hour) schedule for the period October-December, 2022 as per the CPCB, MoEF guidelines and notifications.

It was ensured that the equipment was placed preferably at a height of at least $3 \pm 0.5\text{m}$ 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 $\text{PM}_{2.5}$, PM_{10} , sulphur dioxide (SO_2) and nitrogen dioxide (NO_x). The sampling locations are shown in Figure 3.16 and average concentrations of air pollutants are summarized in Tables 3.15.

Table 3.16 Ambient Air Quality (AAQ) Monitoring Locations

| S. No | Location Code | Monitoring Locations | Distance (km) | Direction | Coordinates | |
|-------|---------------|----------------------|---------------|-----------|---------------|---------------|
| | | | | | Lat | Long |
| 1 | AAQ1 | Core | -- | -- | 12°43'35.98"N | 79°44'1.86"E |
| 2 | AAQ2 | Chinna Elacheri | 2.3 | SW | 12°43'0.88"N | 79°42'51.89"E |
| 3 | AAQ3 | Vadakalpakkam | 4.85 | NW | 12°45'4.77"N | 79°41'44.03"E |
| 4 | AAQ4 | Arpakkam | 1.98 | NE | 12°44'17.82"N | 79°45'2.10"E |
| 5 | AAQ5 | Kalakattur | 4.34 | N | 12°46'4.01"N | 79°43'56.45"E |
| 6 | AAQ6 | Magaral | 2.36 | ESE | 12°43'9.28"N | 79°45'15.50"E |
| 7 | AAQ7 | Girijapuram | 3.56 | NW | 12°44'51.44"N | 79°42'26.79"E |

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

Results

As per the monitoring data, $\text{PM}_{2.5}$ ranges from $14.7\mu\text{g}/\text{m}^3$ to $19.9\mu\text{g}/\text{m}^3$; PM_{10} from $34.1\mu\text{g}/\text{m}^3$ to $39.5\mu\text{g}/\text{m}^3$; SO_2 from $5.9\mu\text{g}/\text{m}^3$ to $9.6\mu\text{g}/\text{m}^3$; NO_x from $11.5\mu\text{g}/\text{m}^3$ to $18.8\mu\text{g}/\text{m}^3$. The concentration levels of the pollutants fall within the acceptable limits of NAAQS prescribed by CPCB.

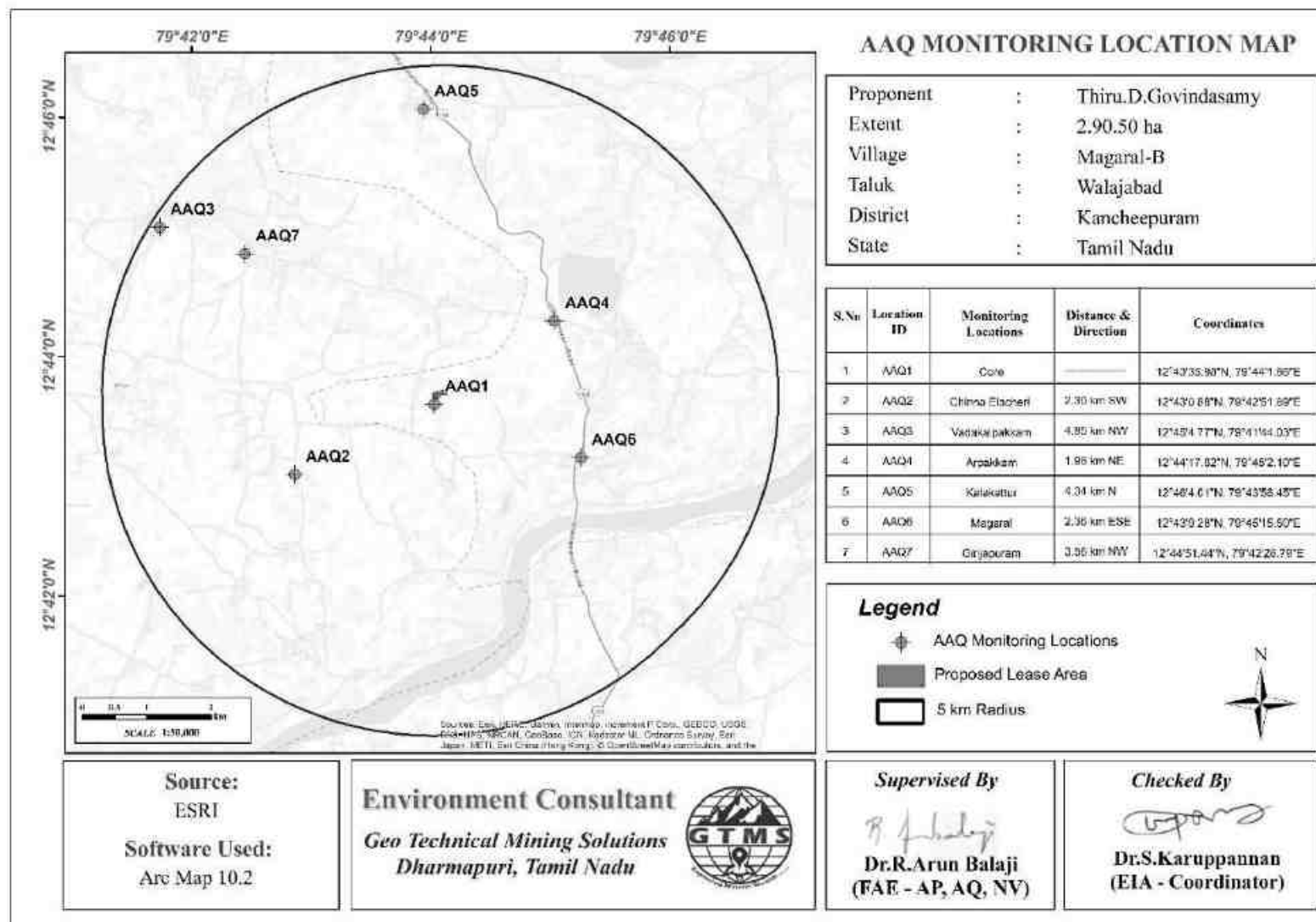


Figure 3.16 Toposheet Showing Ambient Air Quality Monitoring Station Locations Around 5 Km Radius from the Proposed Project Site

Table 3.17 Summary of AAQ Result

| PM _{2.5} | | | | | PM ₁₀ | | | |
|-------------------|------|------|------|-----------------------------|------------------|------|------|-----------------------------|
| Station ID | Max | Min | Mean | 98 th Percentile | Max | Min | Mean | 98 th Percentile |
| AAQ1 | 22.3 | 18.3 | 20.4 | 22.3 | 41.7 | 37.9 | 39.8 | 41.7 |
| AAQ2 | 19.1 | 12.3 | 16.0 | 19.1 | 39.5 | 34.3 | 37.0 | 39.5 |
| AAQ3 | 18.6 | 14.4 | 16.8 | 18.0 | 40.3 | 34.7 | 37.4 | 40.1 |
| AAQ4 | 17.6 | 14.2 | 15.8 | 17.4 | 36.4 | 31.7 | 34.2 | 36.0 |
| AAQ5 | 21.1 | 14.3 | 18.0 | 21.1 | 40.3 | 31.7 | 36.4 | 40.0 |
| AAQ6 | 23.4 | 15.5 | 19.5 | 23.1 | 42.2 | 37.0 | 39.7 | 42.2 |
| AAQ7 | 17.3 | 13.9 | 15.4 | 17.1 | 35.9 | 31.2 | 33.7 | 35.5 |
| SO ₂ | | | | | NO _x | | | |
| AAQ1 | 10.8 | 8.0 | 9.5 | 10.8 | 20.0 | 13.5 | 16.6 | 19.6 |
| AAQ2 | 9.6 | 5.2 | 7.0 | 9.4 | 15.1 | 8.6 | 11.0 | 14.4 |
| AAQ3 | 9.0 | 5.9 | 7.4 | 8.3 | 19.9 | 8.7 | 16.9 | 19.7 |
| AAQ4 | 8.2 | 5.1 | 6.6 | 8.2 | 18.6 | 12.7 | 15.8 | 18.4 |
| AAQ5 | 9.9 | 5.5 | 7.3 | 9.7 | 18.1 | 11.6 | 14.0 | 17.4 |
| AAQ6 | 12.0 | 6.8 | 9.6 | 11.9 | 22.1 | 14.3 | 18.5 | 22.0 |
| AAQ7 | 8.0 | 4.9 | 6.5 | 8.0 | 17.9 | 11.0 | 15.0 | 17.3 |

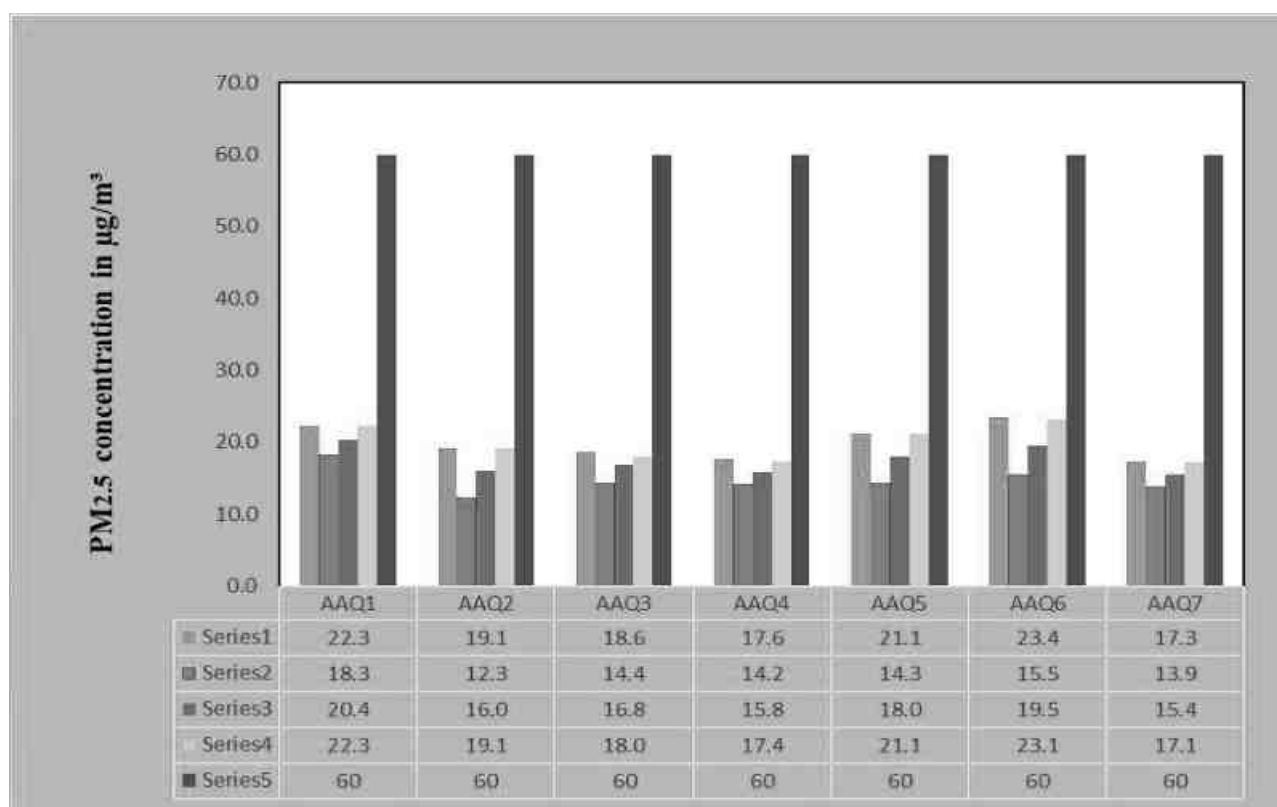


Figure 3.17 Bar Chart Showing Maximum, Minimum, and the Average Concentrations of PM_{2.5} Measured from the Seven Air Quality Monitoring Stations Within 5 km Radius

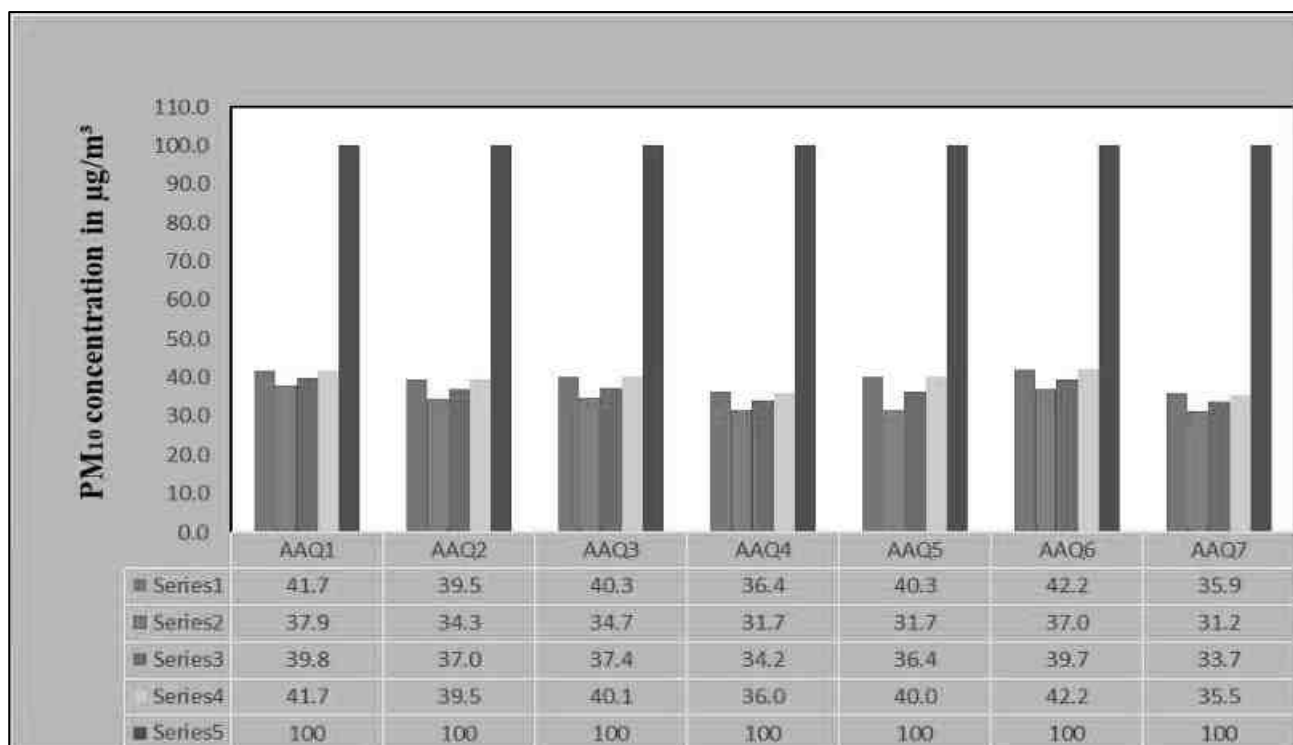


Figure 3.18 Bar Chart Showing Maximum, Minimum, and the Average Concentrations of PM₁₀ Measured from the Seven Air Quality Monitoring Stations Within 5km Radius

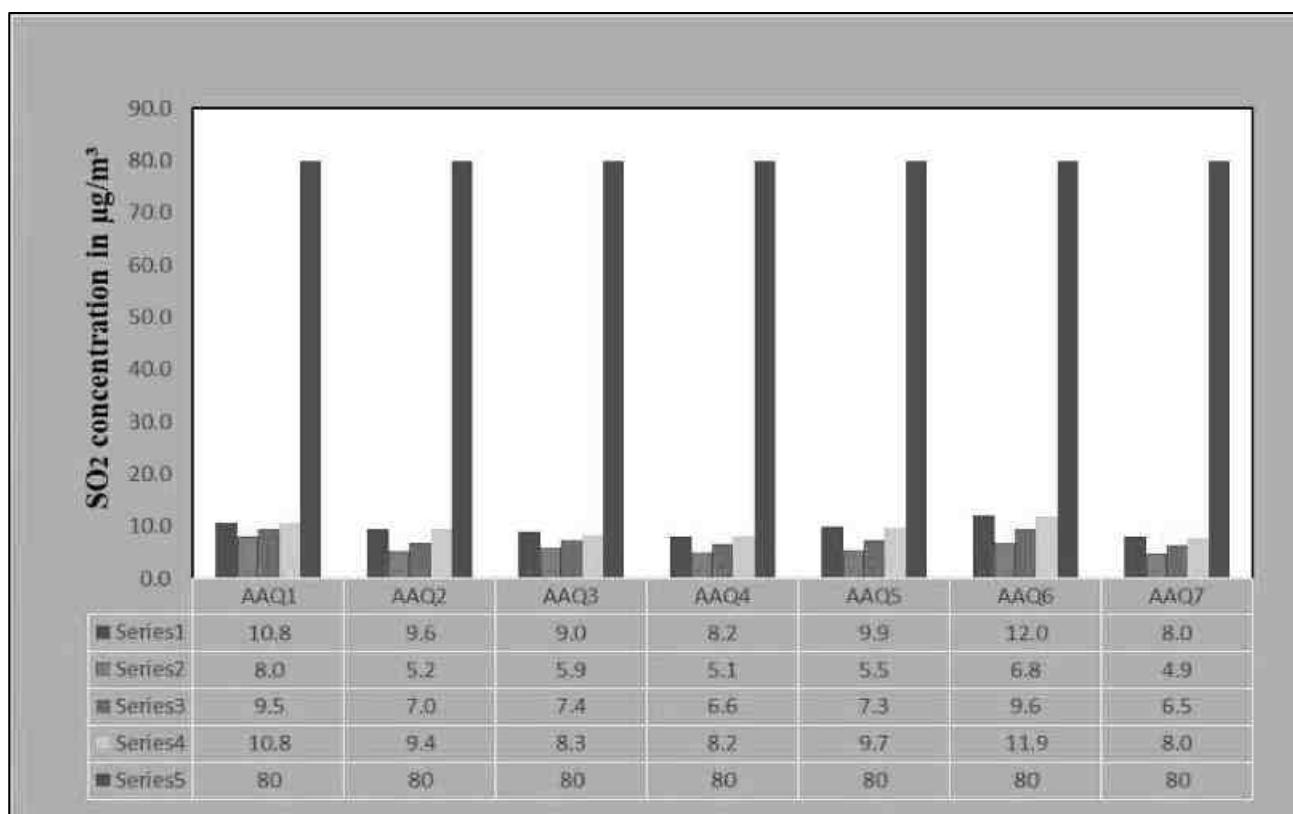


Figure 3.19 Bar Chart Showing Maximum, Minimum, and the Average Concentrations of SO₂ Measured from the Seven Air Quality Monitoring Stations Within 5 km Radius

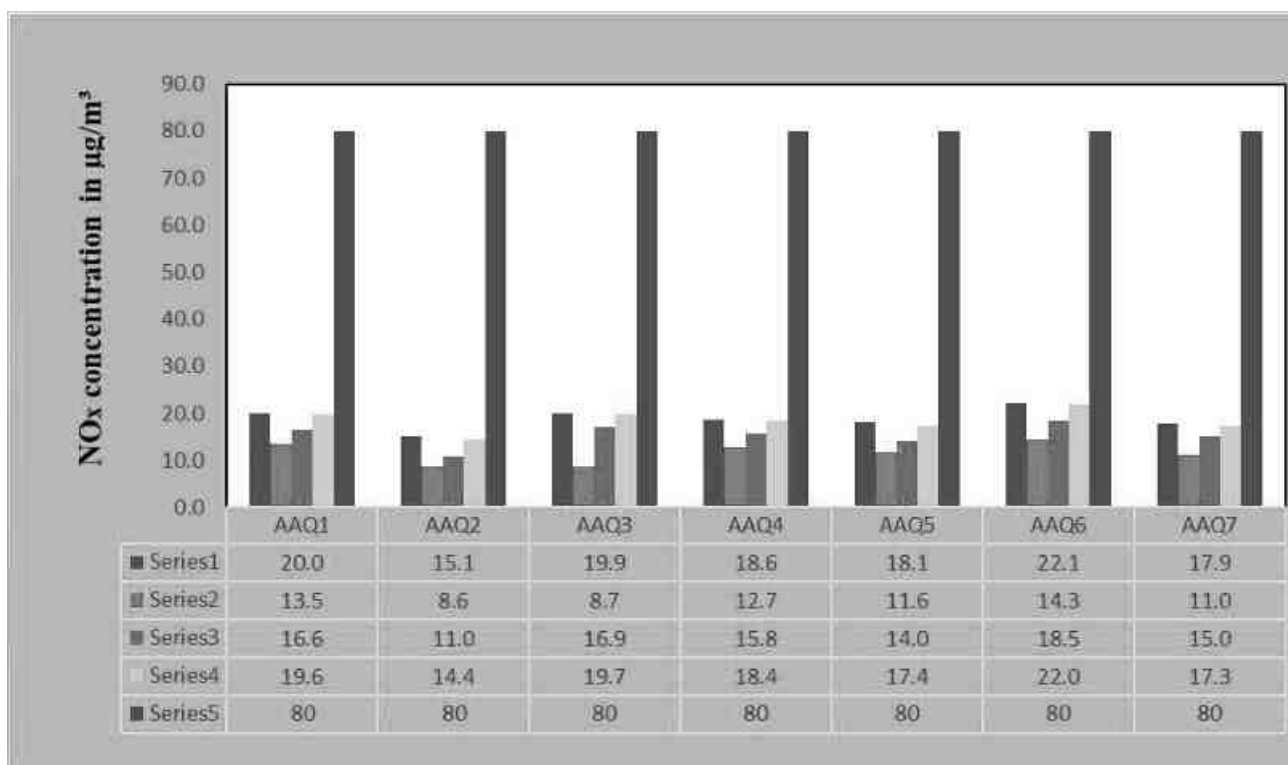


Figure 3.20 Bar Chart Showing Maximum, Minimum, and the Average Concentrations of NOx Measured from The Seven Air Quality Monitoring Stations Within 5km Radius

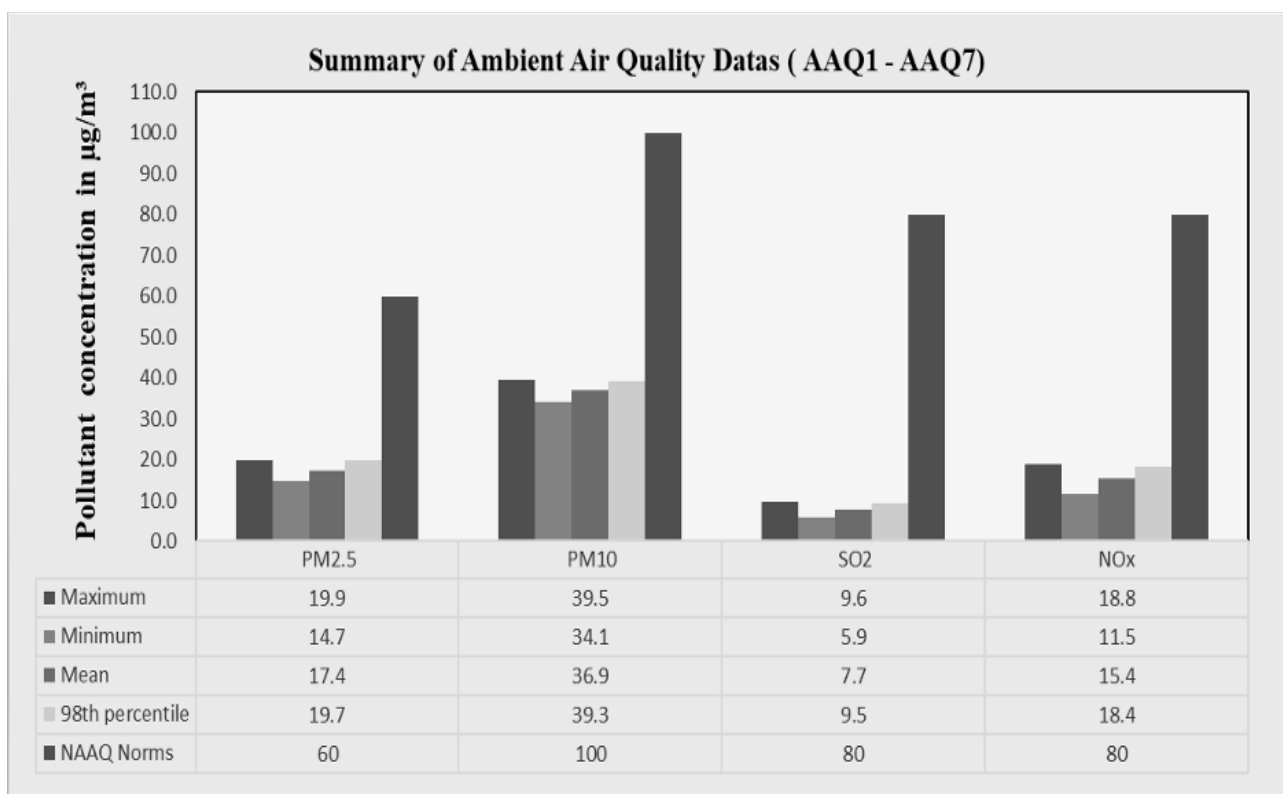


Figure 3.21 Bar Chart Showing Maximum, Minimum, and the Average Concentrations of Pollutants in the Atmosphere Within 5 km Radius

3.4 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 Eight (8) locations covering commercial, residential, rural areas within the radius of 5 km. Details of noise monitoring locations are provided in Table 3.18 and spatial occurrence of the locations are shown in Figure 3.21.

Table 3.18 Noise Monitoring Locations

| S. No | Location Code | Monitoring Locations | Distance (km) | Direction | Coordinates | |
|-------|---------------|----------------------|---------------|-----------|---------------|---------------|
| | | | | | Lat | Long |
| 1 | N1 | Core | -- | -- | 12°43'40.59"N | 79°44'0.14"E |
| 2 | N2 | Surutal | 0.92 | N | 12°44'12.91"N | 79°44'2.85"E |
| 3 | N3 | Chinna Elacheri | 2.28 | SW | 12°43'2.05"N | 79°42'52.15"E |
| 4 | N4 | Vadakalpakkam | 4.90 | NW | 12°45'10.05"N | 79°41'45.86"E |
| 5 | N5 | Arpakkam | 2.0 | NE | 12°44'17.09"N | 79°45'3.61"E |
| 6 | N6 | Kalakattur | 4.41 | N | 12°46'6.30"N | 79°43'55.99"E |
| 7 | N7 | Magaral | 2.38 | ESE | 12°43'8.88"N | 79°45'16.01"E |
| 8 | N8 | Girijapuram | 3.51 | NNW | 12°44'51.79"N | 79°42'29.06"E |

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

Table 3.19 Ambient Noise Quality Result

| Station ID | Location | Environmental setting | Average day noise level (dB(A)) | Average night noise level (dB(A)) | Day time (6.00 AM – 10.00 PM) | Night time (10.00 PM – 6.00 AM) |
|------------|-----------------|-----------------------|---------------------------------|-----------------------------------|-------------------------------|---------------------------------|
| | | | | | Standard (Leq in dB(A)) | |
| N1 | Core | Industrial area | 42.4 | 38.6 | 75 | 70 |
| N2 | Surutal | Residential area | 40.6 | 36.4 | 55 | 45 |
| N3 | Chinna Elacheri | Residential area | 38.4 | 33.2 | 55 | 45 |
| N4 | Vadakalpakkam | Residential area | 39.8 | 34.7 | 55 | 45 |
| N5 | Arpakkam | Residential area | 40.2 | 35.6 | 55 | 45 |
| N6 | Kalakattur | Residential area | 41.6 | 38.4 | 55 | 45 |
| N7 | Magaral | Residential area | 42.6 | 38.9 | 55 | 45 |
| N8 | Girijapuram | Residential area | 39.8 | 34.7 | 55 | 45 |

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

The Table 3.19 shows that noise level in core zone was 42.4 dB (A) Leq during day time and 38.6 dB (A) Leq during night time. Noise levels recorded in buffer zone during day time varied from 38.4 to 40.6dB (A) Leq and during night time from 33.2 to 38.9dB (A) Leq. Thus, the noise level for industrial and residential area meets the requirements of CPCB. The results are also depicted below in Figures 3.22 and 3.22.

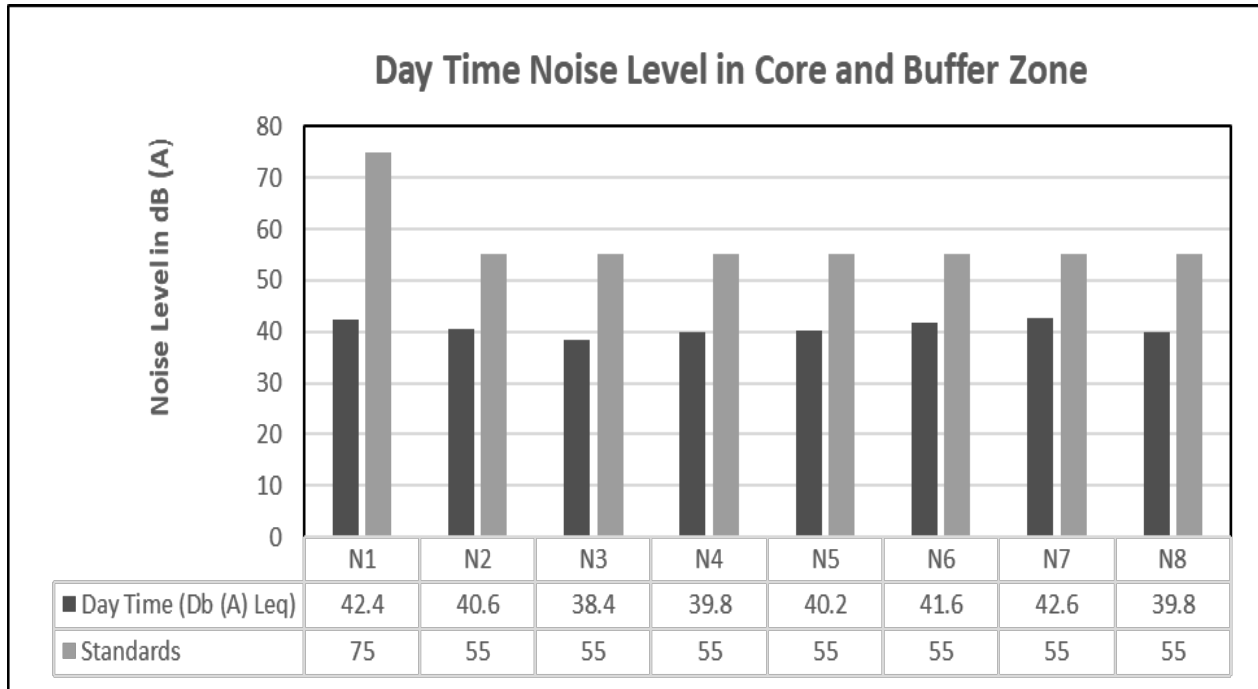


Figure 3.22 Bar Chart Showing Day Time Noise Levels Measured in Core and Buffer Zones

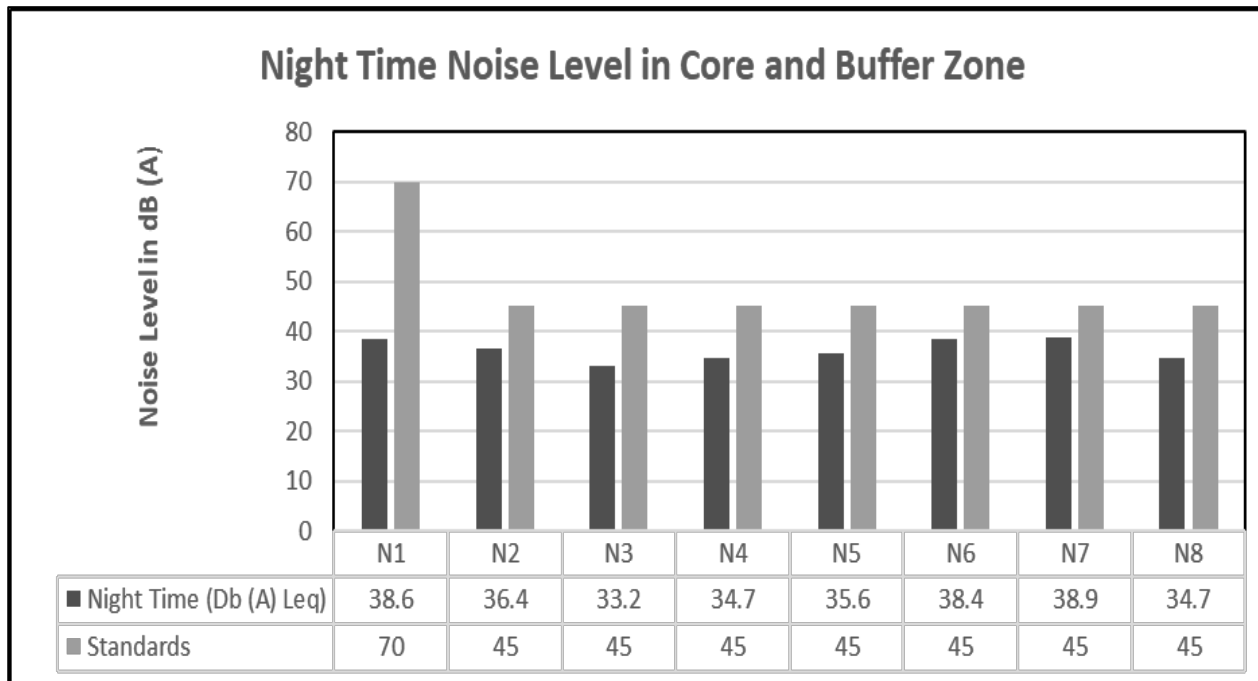


Figure 3.23 Bar Chart Showing Night Time Noise Levels Measured in Core and Buffer Zones

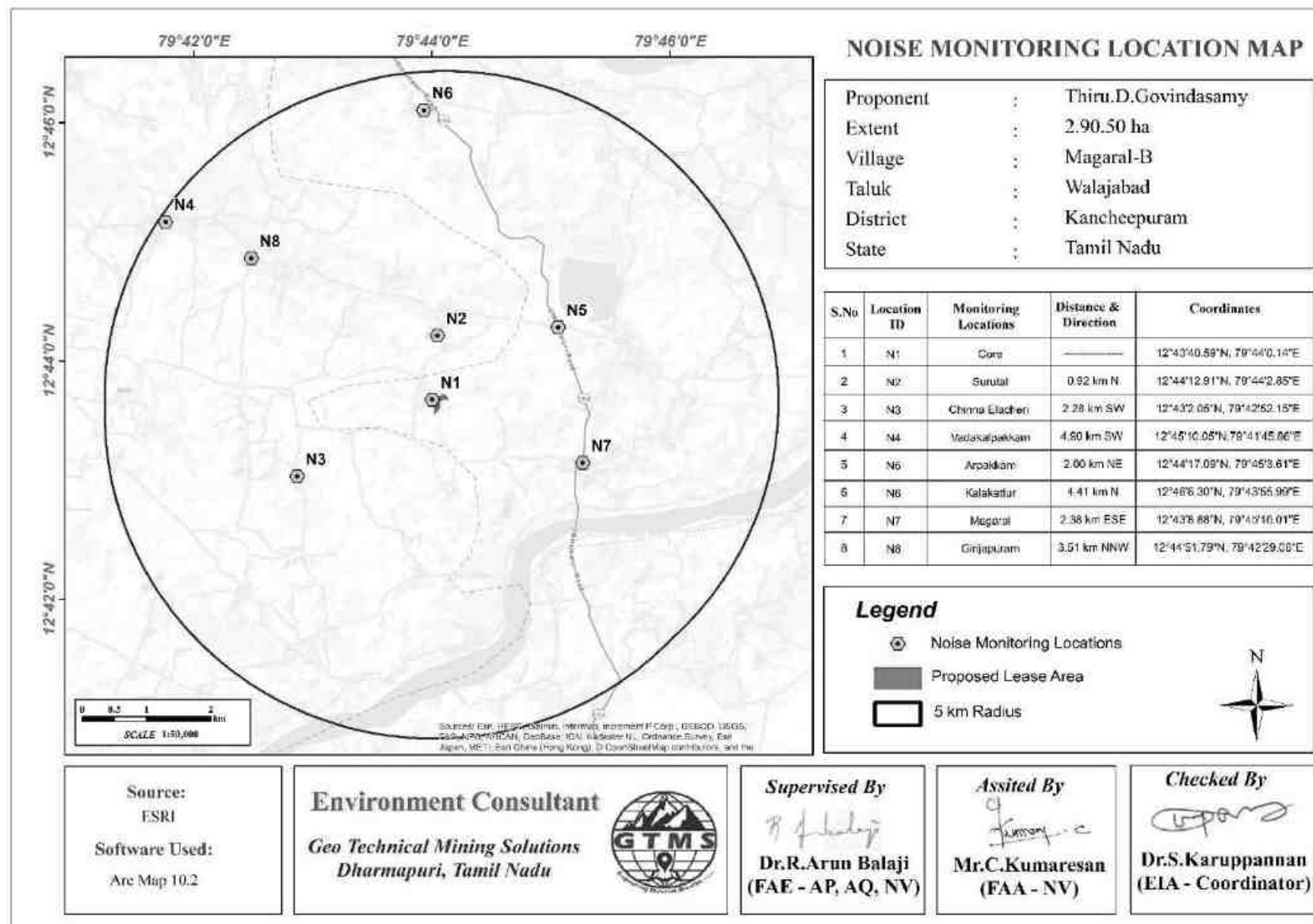


Figure 3.24 Toposheet Showing Noise Level Monitoring Station Locations Around 5 km Radius from the Proposed Project Site

3.5 BIOLOGICAL ENVIRONMENT

An ecological survey was conducted to collect the baseline data regarding flora and fauna in the study area of 10 km radius. Data were also collected from different sources, i.e., government departments such as District Forest Office, Government of Tamil Nadu. On the basis of onsite observations as well as forest department records the checklist of flora and fauna was prepared.

Methodology

Sampling locations were selected with reference to topography, land use, vegetation pattern, etc. In this study, quadrats of 25 m × 25 m were laid down to assess trees and quadrats of 10 m × 10 m were laid down for shrubs.



Figure 3.25 Quadrates Sampling Methods of Flora

Phyto-Sociological Studies

Phyto sociological parameters, such as *Density, Frequency, Abundance and Importance Value Index* of individual species were determined in randomly placed quadrat of different sizes in the study area, as shown in Table 3.20. Relative frequency, and relative density were calculated and the sum of these three represented Importance Value Index (IVI) for various species. For shrubs, herbs and grasses, *Density, Frequency, Relative Density & Relative Frequency were found*. Sample plots were selected in such a way to get maximum representation of different types of vegetation and plots were laid out in different part of the study area of 10 km radius. Analysis of the vegetation will help in determining the relative importance of each species in the study area and to reveal if any economically valuable species is threatened in the process.

Table 3.20 Calculation of Density, Frequency (%), Dominance, Relative Density, Relative Frequency, Relative Dominance & Important Value Index

| Parameters | Formula |
|-----------------------|---|
| Density | Total No. of individuals of species/ Total No. of Quadrats used in sampling |
| Frequency (%) | (Total No. of Quadrats in which species occur/ Total No. of Quadrats studied)100 |
| Abundance | Total No. of individuals of species/ No. of Quadrats in which they occur |
| Relative Density | (Total No. of individuals of species/Sum of all individuals of all species) * 100 |
| Relative Frequency | (Total No. of Quadrats in which species occur/ Total No. of Quadrats occupied by all species) * 100 |
| Important Value Index | Relative Density + Relative Frequency |

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 corresponding formulas are given in Table 3.21.

Table 3.21 Calculation of Species Diversity by Shannon – Wiener Index, Evenness and Richness

| Description | Formula |
|--|--|
| Species diversity – Shannon – Wien Index | $H = -E[(p_i) \cdot \ln(p_i)]$ Where p_i : Proportion of total sample represented by species i : number of individuals of species i / total number samples |
| Evenness | H/H_{\max} $H_{\max} = \ln(s)$ = maximum diversity possible S =No. of species |
| Species Richness by Margalef | $RI = S - 1/\ln N$ Where S = Total Number of species in the community N = Total Number of individuals of all species in the Community |

3.5.1 Flora

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.

Crop Patterns in Walajabad Taluk

A variety of fruits and vegetables are cultivated in Walajabad Taluk. The important crops of this district are Paddy, Maize, Ragi, Banana, Sugarcane, Cotton, Coconut. The land is very fertile and there is significant access to fresh water. In Magaral-B village, rice cultivation is more intensive as shown in figure 3.26.



Figure 3.26 Crop Patterns in Walajabad Taluk

Flora in core zone

The species in the lease area include herbs (7), trees (06), shrubs (05), climbers (02), creepers (01), grass (02). Quarry lease area has the highest abundance of *Prosopis juliflora* followed by *Azadirachta indica*, *Tectona grandis* and *Borassus flabellifer*. Trees are few and shrubs and herbs are more than trees. The names and family details of the plants are given in Table 3.22. Species Richness (margalef Index) in the study area it mentioned in Table 3.24 & 3.25 Moreover, no species are found as threatened category.

Flora in 300 m radius zone

Taxonomically, a total of 33 species belonging to 19 families have been recorded from the mining lease area. The species in the lease area include herbs (18), trees (08), shrubs (05), the 19 families, Fabaceae and Lamiaceae are the main dominating species in the study area, Species Richness (margalef Index) in the study area it mentioned in Table 3.26-3.27 Moreover, no species are found as threatened category.

Flora in 10 km radius zone

In the buffer zone, a total of 81 species belonging to 41 families were recorded. Amongthem are trees (32), shrubs (14), herbs (38), climbers (09), creepers (5), grasses (4), and cactus(1). Majority of the species belongs to the family of Fabaceae and Poaceae, as mentioned in Table 3.28. Species Richness (margalef Index) in the study area it mentioned in Table 3.29 & 3.30 Moreover, no species are found as threatened category.

Table 3.22 Flora in mine lease area

| S.No. | Local Name | Scientific name | Family name | Total No. of species | Total of Quadrants with | Total No. of Quadrants | Density | Frequency (%) | Abundance | Relative Density | Relative Frequency | IVI | IUCN Conservation Status |
|---|------------------|-----------------------------|---------------|----------------------|-------------------------|------------------------|---------|---------------|-----------|------------------|--------------------|------|--------------------------|
| Trees | | | | | | | | | | | | | |
| 1 | Velikathan maram | <i>Prosopis juliflora</i> | Fabaceae | 2 | 3 | 5 | 0.4 | 60.0 | 0.7 | 20.0 | 18.8 | 38.8 | Not Listed |
| 2 | Panai maram | <i>Borassus flabellifer</i> | Arecaceae | 2 | 3 | 5 | 0.4 | 60.0 | 0.7 | 20.0 | 18.8 | 38.8 | Not Listed |
| 3 | Nuna maram | <i>Morinda citrifolia</i> | Rubiaceae | 1 | 2 | 5 | 0.2 | 40.0 | 0.5 | 10.0 | 12.5 | 22.5 | Not Listed |
| 4 | Vembu | <i>Azadirachta indica</i> | Meliaceae | 2 | 3 | 5 | 0.4 | 60.0 | 0.7 | 20.0 | 18.8 | 38.8 | Not Listed |
| 5 | Eshamaram | <i>Phoenix Reclinata</i> | Arecaceae | 1 | 2 | 5 | 0.2 | 40.0 | 0.5 | 10.0 | 12.5 | 22.5 | Not Listed |
| 6 | Teaku | <i>Tectona grandis</i> | Lamiaceae | 2 | 3 | 5 | 0.4 | 60.0 | 0.7 | 20.0 | 18.8 | 38.8 | Not Listed |
| Shrubs | | | | | | | | | | | | | |
| 7 | Erukku | <i>Calotropis gigantea</i> | Apocynaceae | 4 | 5 | 10 | 0.4 | 50.0 | 0.8 | 19.0 | 27.8 | 46.8 | Not Listed |
| 8 | Avarai | <i>Senna auriculata</i> | Fabaceae | 5 | 4 | 10 | 0.5 | 40.0 | 1.3 | 23.8 | 22.2 | 46.0 | Not Listed |
| 9 | Arali | <i>Nerium indicum</i> | Apocynaceae | 3 | 2 | 10 | 0.3 | 20.0 | 1.5 | 14.3 | 11.1 | 25.4 | Not Listed |
| 10 | Sappathikalli | <i>Cereus pterogonus</i> | Cactaceae | 4 | 3 | 10 | 0.4 | 30.0 | 1.3 | 19.0 | 16.7 | 35.7 | Not Listed |
| 11 | Unichedi | <i>Lantana camara</i> | Verbenaceae | 5 | 4 | 10 | 0.5 | 40.0 | 1.3 | 23.8 | 22.2 | 46.0 | Not Listed |
| Herbs & Climbers & Grass | | | | | | | | | | | | | |
| 12 | Thumbai | <i>Leucas aspera</i> | Lamiaceae | 7 | 6 | 15 | 0.5 | 40.0 | 1.2 | 13.0 | 12.8 | 25.7 | Not Listed |
| 13 | Katang kathrikai | <i>Solanum virginianum</i> | Solanaceae | 8 | 7 | 15 | 0.5 | 46.7 | 1.1 | 14.8 | 14.9 | 29.7 | Not Listed |
| 14 | Arugampul | <i>Cynodon dactylon</i> | Poaceae | 9 | 8 | 15 | 0.6 | 53.3 | 1.1 | 16.7 | 17.0 | 33.7 | Not Listed |
| 15 | Poolai poondu | <i>Aerva lanata</i> | Amaranthaceae | 6 | 5 | 15 | 0.4 | 33.3 | 1.2 | 11.1 | 10.6 | 21.7 | Not Listed |
| 16 | Korai | <i>Cyperus rotundus</i> | Cyperaceae | 8 | 7 | 15 | 0.5 | 46.7 | 1.1 | 14.8 | 14.9 | 29.7 | Not Listed |
| 17 | nearunji | <i>Tribulus terrestris</i> | Zygophyllales | 9 | 8 | 15 | 0.6 | 53.3 | 1.1 | 16.7 | 17.0 | 33.7 | Not Listed |
| 18 | Nayuruv | <i>Achyranthes aspera</i> | Amaranthaceae | 7 | 6 | 15 | 0.5 | 40.0 | 1.2 | 13.0 | 12.8 | 25.7 | Not Listed |

Table 3.23 Flora in 300 m radius

| S.No. | Local Name | Scientific name | Family name | Total No. of species | Total of Quadrants with | Total No. of Quadrants | Density | Frequency (%) | Abundance | Relative Density | Relative Frequency | IVI | IUCN Conservation Status |
|---------------|------------------|-----------------------------|-------------|----------------------|-------------------------|------------------------|---------|---------------|-----------|------------------|--------------------|------|--------------------------|
| Trees | | | | | | | | | | | | | |
| 1 | Velikathan maram | <i>Prosopis juliflora</i> | Fabaceae | 6 | 5 | 10 | 0.6 | 50.0 | 1.2 | 12.8 | 12.8 | 25.6 | Not Listed |
| 2 | Panai maram | <i>Borassus flabellifer</i> | Arecaceae | 5 | 4 | 10 | 0.5 | 40.0 | 1.3 | 10.6 | 10.3 | 20.9 | Not Listed |
| 3 | Nuna maram | <i>Morinda citrifolia</i> | Rubiaceae | 7 | 6 | 10 | 0.7 | 60.0 | 1.2 | 14.9 | 15.4 | 30.3 | Not Listed |
| 4 | Vembu | <i>Azadirachta indica</i> | Meliaceae | 6 | 5 | 10 | 0.6 | 50.0 | 1.2 | 12.8 | 12.8 | 25.6 | Not Listed |
| 5 | Vagai | <i>albizia lebbek</i> | Fabaceae | 5 | 4 | 10 | 0.5 | 40.0 | 1.3 | 10.6 | 10.3 | 20.9 | Not Listed |
| 6 | Eshamaram | <i>Phoenix Reclinata</i> | Arecaceae | 7 | 6 | 10 | 0.7 | 60.0 | 1.2 | 14.9 | 15.4 | 30.3 | Not Listed |
| 7 | Teaku | <i>Tectona grandis</i> | Lamiaceae | 6 | 5 | 10 | 0.6 | 50.0 | 1.2 | 12.8 | 12.8 | 25.6 | Not Listed |
| 8 | Teanai Maram | <i>Cocos nucifera</i> | Arecaceae | 5 | 4 | 10 | 0.5 | 40.0 | 1.3 | 10.6 | 10.3 | 20.9 | Not Listed |
| Shrubs | | | | | | | | | | | | | |
| 9 | Erukku | <i>Calotropis gigantea</i> | Apocynaceae | 9 | 8 | 15 | 0.6 | 53.3 | 1.1 | 22.0 | 22.2 | 44.2 | Not Listed |
| 10 | Avarai | <i>Senna auriculata</i> | Fabaceae | 8 | 7 | 15 | 0.5 | 46.7 | 1.1 | 19.5 | 19.4 | 39.0 | Not Listed |
| 11 | Arali | <i>Nerium indicum</i> | Apocynaceae | 7 | 6 | 15 | 0.5 | 40.0 | 1.2 | 17.1 | 16.7 | 33.7 | Not Listed |
| 12 | Sappathikalli | <i>Cereus pterogonus</i> | Cactaceae | 9 | 8 | 15 | 0.6 | 53.3 | 1.1 | 22.0 | 22.2 | 44.2 | Not Listed |
| 13 | Unichedi | <i>Lantana camara</i> | Verbenaceae | 8 | 7 | 15 | 0.5 | 46.7 | 1.1 | 19.5 | 19.4 | 39.0 | Not Listed |

| <i>Herbs, Climbers & Grass</i> | | | | | | | | | | | | | |
|------------------------------------|-------------------|------------------------------|----------------|----|----|----|-----|------|-----|-----|-----|------|------------|
| 14 | Thumbai | <i>Leucas aspera</i> | Lamiaceae | 8 | 7 | 20 | 0.4 | 35.0 | 1.1 | 5.4 | 5.4 | 10.9 | Not Listed |
| 15 | Kantang kathrikai | <i>Solanum virginianum</i> | Solanaceae | 7 | 6 | 20 | 0.4 | 30.0 | 1.2 | 4.8 | 4.7 | 9.4 | Not Listed |
| 16 | Arugampul | <i>Cynodon dactylon</i> | Poaceae | 10 | 9 | 20 | 0.5 | 45.0 | 1.1 | 6.8 | 7.0 | 13.8 | Not Listed |
| 17 | Poolai poondu | <i>Aerva lanata</i> | Amaranthaceae | 8 | 7 | 20 | 0.4 | 35.0 | 1.1 | 5.4 | 5.4 | 10.9 | Not Listed |
| 18 | Korai | <i>Cyperus rotundus</i> | Cyperaceae | 6 | 5 | 20 | 0.3 | 25.0 | 1.2 | 4.1 | 3.9 | 8.0 | Not Listed |
| 19 | Nearunji | <i>Tribulus terrestris</i> | Zygophyllales | 8 | 7 | 20 | 0.4 | 35.0 | 1.1 | 5.4 | 5.4 | 10.9 | Not Listed |
| 20 | Nayuruv | <i>Achyranthes aspera</i> | Amaranthaceae | 7 | 6 | 20 | 0.4 | 30.0 | 1.2 | 4.8 | 4.7 | 9.4 | Not Listed |
| 21 | Vilaiti tulsi | <i>hyptis suaveolens</i> | Lamiaceae | 11 | 10 | 20 | 0.6 | 50.0 | 1.1 | 7.5 | 7.8 | 15.2 | Not Listed |
| 22 | Pink Blumea | <i>Blumea axillaris</i> | Asteraceae | 8 | 7 | 20 | 0.4 | 35.0 | 1.1 | 5.4 | 5.4 | 10.9 | Not Listed |
| 23 | Rail Pindu | <i>Croton bonplandianus</i> | Euphorbiaceae | 7 | 6 | 20 | 0.4 | 30.0 | 1.2 | 4.8 | 4.7 | 9.4 | Not Listed |
| 24 | Communist pacha | <i>Chromolaena odorata</i> | Asteraceae | 8 | 7 | 20 | 0.4 | 35.0 | 1.1 | 5.4 | 5.4 | 10.9 | Not Listed |
| 25 | Veattukayapundu | <i>Tridax Procumbens</i> | Asteraceae | 9 | 8 | 20 | 0.5 | 40.0 | 1.1 | 6.1 | 6.2 | 12.3 | Not Listed |
| 26 | Kundumani | <i>Abrus precatorius</i> | Fabaceae | 8 | 7 | 20 | 0.4 | 35.0 | 1.1 | 5.4 | 5.4 | 10.9 | Not Listed |
| 27 | Mosukkattan | <i>Passiflora foetida</i> | Passifloraceae | 7 | 6 | 20 | 0.4 | 30.0 | 1.2 | 4.8 | 4.7 | 9.4 | Not Listed |
| 28 | Perandai | <i>Cissus quadrangularis</i> | Vitaceae | 10 | 9 | 20 | 0.5 | 45.0 | 1.1 | 6.8 | 7.0 | 13.8 | Not Listed |
| 29 | Kandakathari | <i>Solanum xanthocarpum</i> | Solanaceae | 8 | 7 | 20 | 0.4 | 35.0 | 1.1 | 5.4 | 5.4 | 10.9 | Not Listed |
| 30 | Arugam Pill | <i>Cynodon dactylon</i> | Poaceae | 9 | 8 | 20 | 0.5 | 40.0 | 1.1 | 6.1 | 6.2 | 12.3 | Not Listed |
| 31 | paspalum | <i>Paspalum quadrifarium</i> | Poaceae | 8 | 7 | 20 | 0.4 | 35.0 | 1.1 | 5.4 | 5.4 | 10.9 | Not Listed |

Table 3.24 Calculation of Species Diversity in Mine Lease Area

| S.No | Common name | Scientific name | No. of Species | Pi | ln (Pi) | Pi x ln (Pi) |
|-----------------------------------|------------------|-----------------------------|----------------|------|---------|--------------|
| Trees | | | | | | |
| 1 | Velikathan maram | <i>Prosopis juliflora</i> | 2 | 0.20 | -1.61 | -0.32 |
| 2 | Panai maram | <i>Borassus flabellifer</i> | 2 | 0.20 | -1.61 | -0.32 |
| 3 | Nuna maram | <i>Morinda citrifolia</i> | 1 | 0.10 | -2.30 | -0.23 |
| 4 | Vembu | <i>Azadirachta indica</i> | 2 | 0.20 | -1.61 | -0.32 |
| 5 | Eshamaram | <i>Phoenix Reclinata</i> | 1 | 0.10 | -2.30 | -0.23 |
| 6 | Teaku | <i>Tectona grandis</i> | 2 | 0.20 | -1.61 | -0.32 |
| H (Shannon Diversity Index) =1.75 | | | | | | |
| Shrubs | | | | | | |
| 7 | Erukku | <i>Calotropis gigantea</i> | 4 | 0.19 | -1.66 | -0.32 |
| 8 | Avarai | <i>Senna auriculata</i> | 5 | 0.24 | -1.44 | -0.34 |
| 9 | Arali | <i>Nerium indicum</i> | 3 | 0.14 | -1.95 | -0.28 |
| 10 | Sappathikalli | <i>Cereus pterogonus</i> | 4 | 0.19 | -1.66 | -0.32 |
| 11 | Unichedi | <i>Lantana camara</i> | 5 | 0.24 | -1.44 | -0.34 |
| H (Shannon Diversity Index) =1.59 | | | | | | |
| Herbs | | | | | | |
| 12 | Thumbai | <i>Leucas aspera</i> | 7 | 0.13 | -2.04 | -0.26 |
| 13 | Katang kathrikai | <i>Solanum virginianum</i> | 8 | 0.15 | -1.91 | -0.28 |
| 14 | Arugampul | <i>Cynodon dactylon</i> | 9 | 0.17 | -1.79 | -0.30 |
| 15 | Poolai poondu | <i>Aerva lanata</i> | 6 | 0.11 | -2.20 | -0.24 |
| 16 | Korai | <i>Cyperus rotundus</i> | 8 | 0.15 | -1.91 | -0.28 |
| 17 | Nearunji | <i>Tribulus terrestris</i> | 9 | 0.17 | -1.79 | -0.30 |
| 18 | Nayuruv | <i>Achyranthes aspera</i> | 7 | 0.13 | -2.04 | -0.26 |
| H (Shannon Diversity Index) =1.94 | | | | | | |

Table 3.25 Species Richness (Index) in Mine Lease Area

| Details | H | H max | Evenness | Species Richness |
|---------------|------|-------|----------|------------------|
| Trees | 1.75 | 1.79 | 0.98 | 2.17 |
| Shrubs | 1.59 | 1.61 | 0.99 | 1.31 |
| Herbs | 1.94 | 1.95 | 1.00 | 1.50 |

Table 3.26 Calculation of Species Diversity in 300 m Radius

| S.No | Common name | Scientific name | No. of Species | Pi | In (Pi) | Pi x in (Pi) |
|-----------------------------------|------------------|------------------------------|----------------|------|---------|--------------|
| Tree | | | | | | |
| 1 | Velikathan maram | <i>Prosopis juliflora</i> | 6 | 0.13 | -2.06 | -0.26 |
| 2 | Panai maram | <i>Borassus flabellifer</i> | 5 | 0.11 | -2.24 | -0.24 |
| 3 | Nuna maram | <i>Morinda citrifolia</i> | 7 | 0.15 | -1.90 | -0.28 |
| 4 | Vembu | <i>Azadirachta indica</i> | 6 | 0.13 | -2.06 | -0.26 |
| 5 | vagai | <i>albizia lebbeck</i> | 5 | 0.11 | -2.24 | -0.24 |
| 6 | Eshamaram | <i>Phoenix Reclinata</i> | 7 | 0.15 | -1.90 | -0.28 |
| 7 | Teaku | <i>Tectona grandis</i> | 6 | 0.13 | -2.06 | -0.26 |
| 8 | Teanai Maram | <i>Cocos nucifera</i> | 5 | 0.11 | -2.24 | -0.24 |
| H (Shannon Diversity Index) =2.07 | | | | | | |
| Shrubs | | | | | | |
| 9 | Erukku | <i>Calotropis gigantea</i> | 9 | 0.22 | -1.52 | -0.33 |
| 10 | Avarai | <i>Senna auriculata</i> | 8 | 0.20 | -1.63 | -0.32 |
| 11 | Arali | <i>Nerium indicum</i> | 7 | 0.17 | -1.77 | -0.30 |
| 12 | Sappathikalli | <i>Cereus pterogonus</i> | 9 | 0.22 | -1.52 | -0.33 |
| 13 | Unichedi | <i>Lantana camara</i> | 8 | 0.20 | -1.63 | -0.32 |
| H (Shannon Diversity Index) =1.61 | | | | | | |
| herbs | | | | | | |
| 14 | Thumbai | <i>Leucas aspera</i> | 8 | 0.05 | -2.91 | -0.16 |
| 15 | Katang kathrikai | <i>Solanum virginianum</i> | 7 | 0.05 | -3.04 | -0.14 |
| 16 | Arugampul | <i>Cynodon dactylon</i> | 10 | 0.07 | -2.69 | -0.18 |
| 17 | Poolai poundu | <i>Aerva lanata</i> | 8 | 0.05 | -2.91 | -0.16 |
| 18 | Korai | <i>Cyperus rotundus</i> | 6 | 0.04 | -3.20 | -0.13 |
| 19 | Nerunji | <i>Tribulus terrestris</i> | 8 | 0.05 | -2.91 | -0.16 |
| 20 | Nayuruv | <i>Achyranthes aspera</i> | 7 | 0.05 | -3.04 | -0.14 |
| 21 | Vilaiti tulsi | <i>hyptis suaveolens</i> | 11 | 0.07 | -2.59 | -0.19 |
| 22 | Pink Blumea | <i>Blumea axillaris</i> | 8 | 0.05 | -2.91 | -0.16 |
| 23 | Rail Pindu | <i>Croton bonplandianus</i> | 7 | 0.05 | -3.04 | -0.14 |
| 24 | Communist pacha | <i>Chromolaena odorata</i> | 8 | 0.05 | -2.91 | -0.16 |
| 25 | veattukayapundu | <i>Tridax Procumbens</i> | 9 | 0.06 | -2.79 | -0.17 |
| 26 | Kundumani | <i>Abrus precatorius</i> | 8 | 0.05 | -2.91 | -0.16 |
| 27 | Mosukkattan | <i>Passiflora foetida</i> | 7 | 0.05 | -3.04 | -0.14 |
| 28 | Perandai | <i>Cissus quadrangularis</i> | 10 | 0.07 | -2.69 | -0.18 |
| 29 | Kandakathari | <i>Solanum xanthocarpum</i> | 8 | 0.05 | -2.91 | -0.16 |
| 30 | Arugam Pill | <i>Cynodon dactylon</i> | 9 | 0.06 | -2.79 | -0.17 |
| 31 | paspalum | <i>Paspalum quadrifarium</i> | 8 | 0.05 | -2.91 | -0.16 |
| H (Shannon Diversity Index) =2.88 | | | | | | |

Table 3.27 Species Richness (Index) in 300 m Radius

| Details | H | H max | Evenness | Species Richness |
|---------------|------|-------|----------|------------------|
| Tree | 2.07 | 2.08 | 1.00 | 1.82 |
| Shrubs | 1.61 | 1.61 | 1.00 | 1.08 |
| Herbs | 2.88 | 2.89 | 1.00 | 3.41 |

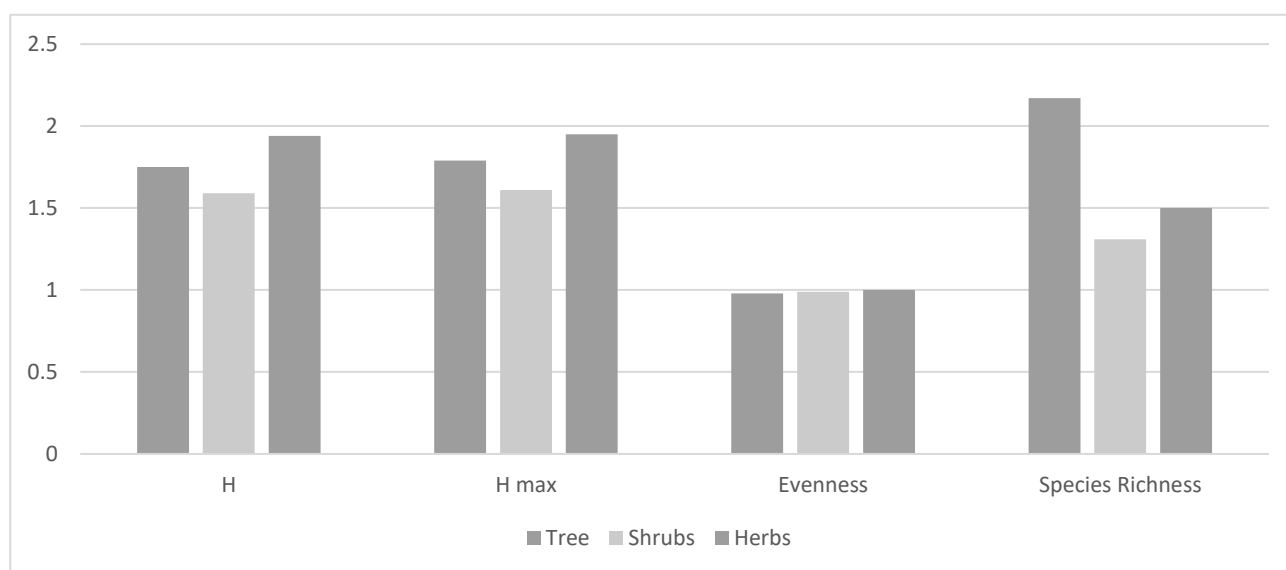


Figure 3.27 Floral Diversity Species Richness (Index) in Mine Lease Area

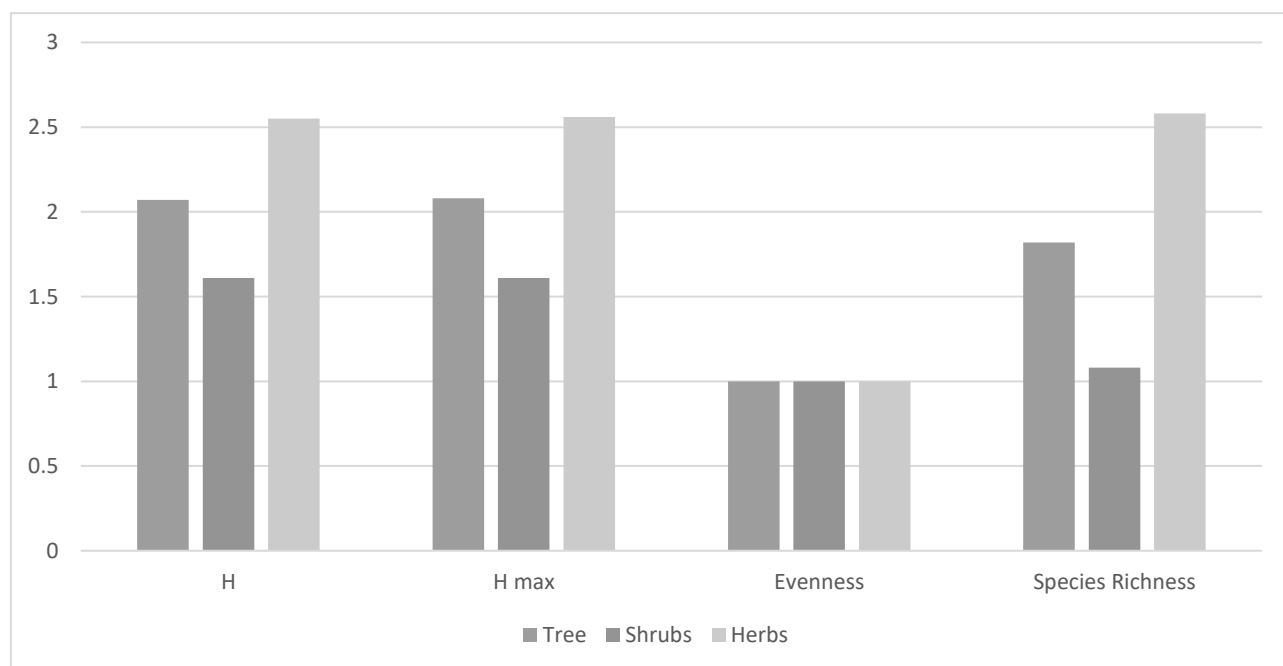


Figure 3.28 Floral Diversity Species Richness (Index) in 300 m Radius

Table 3.28 Flora in Buffer Zone

| S. N | 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 | Vembu | <i>Azadirachta indica</i> | Meliaceae | 5 | 4 | 10 | 0.5 | 40.0 | 1.3 | 2.9 | 2.9 | 5.8 | Not Listed |
| 2 | Pongam oiltree | <i>Pongamia pinnata</i> | Fabaceae | 4 | 3 | 10 | 0.4 | 30.0 | 1.3 | 2.3 | 2.2 | 4.5 | Not Listed |
| 3 | Karuvelam | <i>Acacia nilotica</i> | Mimosaceae | 5 | 4 | 10 | 0.5 | 40.0 | 1.3 | 2.9 | 2.9 | 5.8 | Not Listed |
| 4 | Thennai maram | <i>Cocos nucifera</i> | Arecaceae | 4 | 3 | 10 | 0.4 | 30.0 | 1.3 | 2.3 | 2.2 | 4.5 | Not Listed |
| 5 | Puliyamaram | <i>Tamarindus indica</i> | Legumes | 5 | 4 | 10 | 0.5 | 40.0 | 1.3 | 2.9 | 2.9 | 5.8 | Not Listed |
| 6 | Athi | <i>Ficus recemosa</i> | Moraceae | 6 | 5 | 10 | 0.6 | 50.0 | 1.2 | 3.5 | 3.6 | 7.1 | Not Listed |
| 7 | Vazhaimaram | <i>Musa</i> | Musaceae | 4 | 3 | 10 | 0.4 | 30.0 | 1.3 | 2.3 | 2.2 | 4.5 | Not Listed |
| 8 | Nettilinkam | <i>Polylathia longifolia</i> | Annonaceae | 6 | 5 | 10 | 0.6 | 50.0 | 1.2 | 3.5 | 3.6 | 7.1 | Not Listed |
| 9 | Amanakku | <i>Ricinus communis</i> | Euphorbiaceae | 5 | 4 | 10 | 0.5 | 40.0 | 1.3 | 2.9 | 2.9 | 5.8 | Not Listed |
| 10 | Perumungil | <i>Bambusa bambos</i> | Poaceae | 4 | 3 | 10 | 0.4 | 30.0 | 1.3 | 2.3 | 2.2 | 4.5 | Not Listed |
| 11 | Karungali | <i>Acacia sundra</i> | Legumes | 6 | 5 | 10 | 0.6 | 50.0 | 1.2 | 3.5 | 3.6 | 7.1 | Not Listed |
| 12 | Sapota | <i>Manilkara zapota</i> | Sapotaceae | 7 | 6 | 10 | 0.7 | 60.0 | 1.2 | 4.1 | 4.3 | 8.4 | Not Listed |
| 13 | Eucalyptus | <i>Eucalyptus globules</i> | Myrtaceae | 6 | 5 | 10 | 0.6 | 50.0 | 1.2 | 3.5 | 3.6 | 7.1 | Not Listed |
| 14 | Navalmaram | <i>Syzygium cumini</i> | Myrtaceae | 7 | 6 | 10 | 0.7 | 60.0 | 1.2 | 4.1 | 4.3 | 8.4 | Not Listed |
| 15 | Ezhumuchaipalam | <i>Citrus lemon</i> | Rutaceae | 8 | 7 | 10 | 0.8 | 70.0 | 1.1 | 4.7 | 5.0 | 9.7 | Not Listed |
| 16 | Alamaram | <i>Ficus benghalensis</i> | Moraceae | 3 | 2 | 10 | 0.3 | 20.0 | 1.5 | 1.8 | 1.4 | 3.2 | Not Listed |
| 17 | Panai maram | <i>Borassus flabellifer</i> | Arecaceae | 5 | 4 | 10 | 0.5 | 40.0 | 1.3 | 2.9 | 2.9 | 5.8 | Not Listed |
| 18 | Manga | <i>Mangifera indica</i> | Anacardiaceae | 7 | 6 | 10 | 0.7 | 60.0 | 1.2 | 4.1 | 4.3 | 8.4 | Not Listed |
| 19 | Thekku | <i>Tectona grandis</i> | Verbenaceae | 4 | 3 | 10 | 0.4 | 30.0 | 1.3 | 2.3 | 2.2 | 4.5 | Not Listed |
| 20 | Nelli | <i>Emblica officinalis</i> | Phyllanthaceae | 5 | 4 | 10 | 0.5 | 40.0 | 1.3 | 2.9 | 2.9 | 5.8 | Not Listed |
| 21 | Karuvelam maram | <i>Vachellia nilotica</i> | Fabaceae | 6 | 5 | 10 | 0.6 | 50.0 | 1.2 | 3.5 | 3.6 | 7.1 | Not Listed |
| 22 | Vadanarayani | <i>Delonix elata</i> | Fabaceae | 4 | 3 | 10 | 0.4 | 30.0 | 1.3 | 2.3 | 2.2 | 4.5 | Not Listed |
| 23 | Marudaani | <i>Lawsonia inermis</i> | Lythraceae | 7 | 6 | 10 | 0.7 | 60.0 | 1.2 | 4.1 | 4.3 | 8.4 | Not Listed |

| | | | | | | | | | | | | | |
|-----------------------------------|------------------|------------------------------|---------------|---|---|----|-----|------|-----|-----|-----|------|------------|
| 24 | Pappali maram | <i>Carica papaya L</i> | Caricaceae | 6 | 5 | 10 | 0.6 | 50.0 | 1.2 | 3.5 | 3.6 | 7.1 | Not Listed |
| 25 | Nochi | <i>Vitex negundo</i> | Verbenaceae | 5 | 4 | 10 | 0.5 | 40.0 | 1.3 | 2.9 | 2.9 | 5.8 | Not Listed |
| 26 | Vilvam | <i>Aegle marmelos</i> | Rutaceae | 4 | 3 | 10 | 0.4 | 30.0 | 1.3 | 2.3 | 2.2 | 4.5 | Not Listed |
| 27 | Nuna maram | <i>Morinda citrifolia</i> | Rubiaceae | 6 | 5 | 10 | 0.6 | 50.0 | 1.2 | 3.5 | 3.6 | 7.1 | Not Listed |
| 28 | Koyya | <i>Psidium guajava</i> | Myrtaceae | 7 | 6 | 10 | 0.7 | 60.0 | 1.2 | 4.1 | 4.3 | 8.4 | Not Listed |
| 29 | Seethapazham | <i>Annona reticulata</i> | Annonaceae | 6 | 5 | 10 | 0.6 | 50.0 | 1.2 | 3.5 | 3.6 | 7.1 | Not Listed |
| 30 | Vagai | <i>Albizia lebbeck</i> | Fabaceae | 5 | 4 | 10 | 0.5 | 40.0 | 1.3 | 2.9 | 2.9 | 5.8 | Not Listed |
| 31 | Teaku | <i>Tectona grandis</i> | Lamiaceae | 6 | 5 | 10 | 0.6 | 50.0 | 1.2 | 3.5 | 3.6 | 7.1 | Not Listed |
| 32 | Teanai Maram | <i>Cocos nucifera</i> | Arecaceae | 3 | 2 | 10 | 0.3 | 20.0 | 1.5 | 1.8 | 1.4 | 3.2 | Not Listed |
| Shrubs | | | | | | | | | | | | | |
| 33 | Avarai | <i>Senna auriculata</i> | Fabaceae | 8 | 7 | 15 | 0.5 | 46.7 | 1.1 | 7.6 | 7.7 | 15.3 | Not Listed |
| 34 | Sundaika | <i>Solanum torvum</i> | Solanaceae | 9 | 8 | 15 | 0.6 | 53.3 | 1.1 | 8.6 | 8.8 | 17.4 | Not Listed |
| 35 | Arali | <i>Nerium indicum</i> | Apocynaceae | 7 | 6 | 15 | 0.5 | 40.0 | 1.2 | 6.7 | 6.6 | 13.3 | Not Listed |
| 36 | Idlipoo | <i>Xoracoc cineia</i> | Rubiaceae | 6 | 5 | 15 | 0.4 | 33.3 | 1.2 | 5.7 | 5.5 | 11.2 | Not Listed |
| 37 | Neermulli | <i>Hydrophila auriculata</i> | Acanthaceae | 7 | 6 | 15 | 0.5 | 40.0 | 1.2 | 6.7 | 6.6 | 13.3 | Not Listed |
| 38 | Icham | <i>Phoenix pusilla</i> | Arecaceae | 8 | 7 | 15 | 0.5 | 46.7 | 1.1 | 7.6 | 7.7 | 15.3 | Not Listed |
| 39 | Chaturakalli | <i>Euphorbia antiquorum</i> | Euphorbiaceae | 6 | 5 | 15 | 0.4 | 33.3 | 1.2 | 5.7 | 5.5 | 11.2 | Not Listed |
| 40 | Kattamanakku | <i>Jatropha curcas</i> | Euphorbiaceae | 7 | 6 | 15 | 0.5 | 40.0 | 1.2 | 6.7 | 6.6 | 13.3 | Not Listed |
| 41 | Thuthi | <i>Abutilon indicum</i> | Meliaceae | 9 | 8 | 15 | 0.6 | 53.3 | 1.1 | 8.6 | 8.8 | 17.4 | Not Listed |
| 42 | Chemparuthi | <i>Hibiscu rosa-sinensis</i> | Malvaceae | 8 | 7 | 15 | 0.5 | 46.7 | 1.1 | 7.6 | 7.7 | 15.3 | Not Listed |
| 43 | Kundumani | <i>Abrus precatorius</i> | Fabaceae | 6 | 5 | 15 | 0.4 | 33.3 | 1.2 | 5.7 | 5.5 | 11.2 | Not Listed |
| 44 | Erukku | <i>Calotropis gigantea</i> | Apocynaceae | 8 | 7 | 15 | 0.5 | 46.7 | 1.1 | 7.6 | 7.7 | 15.3 | Not Listed |
| 45 | Bulangan | <i>Gmelina asiatica L.</i> | Lamiaceae | 9 | 8 | 15 | 0.6 | 53.3 | 1.1 | 8.6 | 8.8 | 17.4 | Not Listed |
| 46 | mottled spurge | <i>Euphorbia lactea</i> | Euphorbiaceae | 7 | 6 | 15 | 0.5 | 40.0 | 1.2 | 6.7 | 6.6 | 13.3 | Not Listed |
| Herbs, Climber, Creeper & Grasses | | | | | | | | | | | | | |
| 47 | Nayuruv | <i>Achyranthes aspera</i> | Amaranthaceae | 6 | 5 | 20 | 0.3 | 25.0 | 1.2 | 2.1 | 2.0 | 4.1 | Not Listed |
| 48 | Vetukaayapoondur | <i>Tridax procumbens</i> | Asteraceae | 7 | 6 | 20 | 0.4 | 30.0 | 1.2 | 2.5 | 2.4 | 4.9 | Not Listed |
| 49 | Koraikkilangu | <i>Cyperus articulatus</i> | Cyperaceae | 8 | 7 | 20 | 0.4 | 35.0 | 1.1 | 2.8 | 2.8 | 5.6 | Not Listed |
| 50 | Kuppaimeni | <i>Acalypha indica</i> | Euphorbiaceae | 9 | 8 | 20 | 0.5 | 40.0 | 1.1 | 3.2 | 3.2 | 6.4 | Not Listed |
| 51 | Manjal | <i>Curcuma longa</i> | Zingiberaceae | 7 | 6 | 20 | 0.4 | 30.0 | 1.2 | 2.5 | 2.4 | 4.9 | Not Listed |
| 52 | Chempu | <i>Colocasia indica</i> | Araceae | 8 | 7 | 20 | 0.4 | 35.0 | 1.1 | 2.8 | 2.8 | 5.6 | Not Listed |
| 53 | Karisilanganni | <i>Eclipta prostrata</i> | Asteraceae | 9 | 8 | 20 | 0.5 | 40.0 | 1.1 | 3.2 | 3.2 | 6.4 | Not Listed |
| 54 | Korai | <i>Cyperus rotundus</i> | Cyperaceae | 6 | 5 | 20 | 0.3 | 25.0 | 1.2 | 2.1 | 2.0 | 4.1 | Not Listed |
| 55 | Kunnakora | <i>Cyperus compressus</i> | Cyperaceae | 7 | 6 | 20 | 0.4 | 30.0 | 1.2 | 2.5 | 2.4 | 4.9 | Not Listed |

| | | | | | | | | | | | | | |
|----|------------------|----------------------------------|----------------|----|----|----|-----|------|-----|-----|-----|-----|------------|
| 56 | Milagai | <i>Capsicum frutescens</i> | Solanaceae | 6 | 5 | 20 | 0.3 | 25.0 | 1.2 | 2.1 | 2.0 | 4.1 | Not Listed |
| 57 | Kanamvazha | <i>Commelina benghalensis</i> | Commelinaceae | 7 | 6 | 20 | 0.4 | 30.0 | 1.2 | 2.5 | 2.4 | 4.9 | Not Listed |
| 58 | Nai kadugu | <i>Celome viscosa</i> | Capparidaceae | 8 | 7 | 20 | 0.4 | 35.0 | 1.1 | 2.8 | 2.8 | 5.6 | Not Listed |
| 59 | Thumbai | <i>Leucas aspera</i> | Lamiaceae | 9 | 8 | 20 | 0.5 | 40.0 | 1.1 | 3.2 | 3.2 | 6.4 | Not Listed |
| 60 | Partiniyam | <i>Parthenium hysterophorus</i> | Asteraceae | 6 | 5 | 20 | 0.3 | 25.0 | 1.2 | 2.1 | 2.0 | 4.1 | Not Listed |
| 61 | Mukurattai | <i>Boerhavia diffusa</i> | Nyctaginaceae | 7 | 6 | 20 | 0.4 | 30.0 | 1.2 | 2.5 | 2.4 | 4.9 | Not Listed |
| 62 | Thulasi | <i>Ocimum tenuiflorum</i> | Lamiaceae | 11 | 10 | 20 | 0.6 | 50.0 | 1.1 | 3.9 | 4.0 | 7.9 | Not Listed |
| 63 | Manathakkali | <i>Solanumnigrum</i> | Solanaceae | 7 | 8 | 20 | 0.4 | 40.0 | 0.9 | 2.5 | 3.2 | 5.7 | Not Listed |
| 64 | Kumipoondur | <i>Gomphrena celosioides</i> | Amaranthaceae | 6 | 5 | 20 | 0.3 | 25.0 | 1.2 | 2.1 | 2.0 | 4.1 | Not Listed |
| 65 | Kattuthulasi | <i>Ocimum sanctum</i> | Lamiaceae | 10 | 9 | 20 | 0.5 | 45.0 | 1.1 | 3.5 | 3.6 | 7.1 | Not Listed |
| 66 | Kovai | <i>Coccinia grandis</i> | Cucurbitaceae | 7 | 6 | 20 | 0.4 | 30.0 | 1.2 | 2.5 | 2.4 | 4.9 | Not Listed |
| 67 | Perandai | <i>Cissus quadrangularis</i> | Vitaceae | 9 | 8 | 20 | 0.5 | 40.0 | 1.1 | 3.2 | 3.2 | 6.4 | Not Listed |
| 68 | Mudakkotan | <i>Cardiospermum helicacabum</i> | Sapindaceae | 8 | 7 | 20 | 0.4 | 35.0 | 1.1 | 2.8 | 2.8 | 5.6 | Not Listed |
| 69 | Karkakartum | <i>Clitoria ternatea</i> | Fabaceae | 7 | 6 | 20 | 0.4 | 30.0 | 1.2 | 2.5 | 2.4 | 4.9 | Not Listed |
| 70 | Nannari | <i>Hemidesmus indicus</i> | Asclepiadaceae | 6 | 5 | 20 | 0.3 | 25.0 | 1.2 | 2.1 | 2.0 | 4.1 | Not Listed |
| 71 | Kovakkai | <i>Trichosanthes dioica</i> | Cucurbitaceae | 8 | 7 | 20 | 0.4 | 35.0 | 1.1 | 2.8 | 2.8 | 5.6 | Not Listed |
| 72 | Malli | <i>Jasminum augustifolium</i> | Oleaceae | 6 | 5 | 20 | 0.3 | 25.0 | 1.2 | 2.1 | 2.0 | 4.1 | Not Listed |
| 73 | Musumusukkai | <i>Mukia maderaspatana</i> | Cucurbitaceae | 7 | 6 | 20 | 0.4 | 30.0 | 1.2 | 2.5 | 2.4 | 4.9 | Not Listed |
| 74 | Mosukkattan | <i>Passiflora foetida</i> | Passifloraceae | 6 | 5 | 20 | 0.3 | 25.0 | 1.2 | 2.1 | 2.0 | 4.1 | Not Listed |
| 75 | Vallikeerai | <i>Ipomoea aquatica</i> | Convolvulaceae | 8 | 7 | 20 | 0.4 | 35.0 | 1.1 | 2.8 | 2.8 | 5.6 | Not Listed |
| 76 | Siru puladi | <i>Desmodium triflorum</i> | Fabaceae | 9 | 8 | 20 | 0.5 | 40.0 | 1.1 | 3.2 | 3.2 | 6.4 | Not Listed |
| 77 | Sithrapaalavi | <i>Euphorbia prostrata</i> | Euphorbiaceae | 8 | 7 | 20 | 0.4 | 35.0 | 1.1 | 2.8 | 2.8 | 5.6 | Not Listed |
| 78 | Korai | <i>Cyperus rotandus</i> | Poaceae | 6 | 5 | 20 | 0.3 | 25.0 | 1.2 | 2.1 | 2.0 | 4.1 | Not Listed |
| 79 | mookuthi poondur | <i>Wedelia trilobata</i> | Asteraceae | 7 | 6 | 20 | 0.4 | 30.0 | 1.2 | 2.5 | 2.4 | 4.9 | Not Listed |
| 80 | Nellu | <i>Oryza sativa</i> | Poaceae | 9 | 8 | 20 | 0.5 | 40.0 | 1.1 | 3.2 | 3.2 | 6.4 | Not Listed |
| 81 | Pullu | <i>Eragrostis ferruginea</i> | Poaceae | 12 | 11 | 20 | 0.6 | 55.0 | 1.1 | 4.2 | 4.4 | 8.6 | Not Listed |
| 82 | Chevvarakupul | <i>Chloris barbata</i> | Amaranthaceae | 8 | 7 | 20 | 0.4 | 35.0 | 1.1 | 2.8 | 2.8 | 5.6 | Not Listed |
| 83 | Arugampul | <i>Cynodon dactylon</i> | Poaceae | 13 | 12 | 20 | 0.7 | 60.0 | 1.1 | 4.6 | 4.8 | 9.4 | Not Listed |
| 84 | Sapathikalli | <i>Opuntia dillenii</i> | Cactaceae | 9 | 8 | 20 | 0.5 | 40.0 | 1.1 | 3.2 | 3.2 | 6.4 | Not Listed |

Table 3.29 Calculation of Species Diversity in buffer Zone

| S.No | Common name | Scientific name | No. of Species | Pi | In (Pi) | Pi x in (Pi) |
|-----------------------------------|-----------------|------------------------------|----------------|------|---------|--------------|
| Trees | | | | | | |
| 1 | Vembu | <i>Azadirachta indica</i> | 5 | 0.03 | -3.53 | -0.10 |
| 2 | Pongam oiltree | <i>Pongamia pinnata</i> | 4 | 0.02 | -3.76 | -0.09 |
| 3 | Karuvelam | <i>Acacia nilotica</i> | 5 | 0.03 | -3.53 | -0.10 |
| 4 | Thennai maram | <i>Cocos nucifera</i> | 4 | 0.02 | -3.76 | -0.09 |
| 5 | Puliya maram | <i>Tamarindus indica</i> | 5 | 0.03 | -3.53 | -0.10 |
| 6 | Athi | <i>Ficus recemosa</i> | 6 | 0.04 | -3.35 | -0.12 |
| 7 | Vazhai maram | <i>Musa</i> | 4 | 0.02 | -3.76 | -0.09 |
| 8 | Nettilinkam | <i>Polylathia longifolia</i> | 6 | 0.04 | -3.35 | -0.12 |
| 9 | Amanakku | <i>Ricinus communis</i> | 5 | 0.03 | -3.53 | -0.10 |
| 10 | Perumungil | <i>Bambusa bambos</i> | 4 | 0.02 | -3.76 | -0.09 |
| 11 | Karungali | <i>Acacia sundra</i> | 6 | 0.04 | -3.35 | -0.12 |
| 12 | Sapota | <i>Manilkara zapota</i> | 7 | 0.04 | -3.20 | -0.13 |
| 13 | Eucalyptus | <i>Eucalyptus globules</i> | 6 | 0.04 | -3.35 | -0.12 |
| 14 | Navalmaram | <i>Sygygium cumini</i> | 7 | 0.04 | -3.20 | -0.13 |
| 15 | Ezhumuchaipalam | <i>Citrus lemon</i> | 8 | 0.05 | -3.06 | -0.14 |
| 16 | Alamaram | <i>Ficus benghalensis</i> | 3 | 0.02 | -4.04 | -0.07 |
| 17 | Panai maram | <i>Borassus flabellifer</i> | 5 | 0.03 | -3.53 | -0.10 |
| 18 | Manga | <i>Mangifera indica</i> | 7 | 0.04 | -3.20 | -0.13 |
| 19 | Thekku | <i>Tectona grandis</i> | 4 | 0.02 | -3.76 | -0.09 |
| 20 | Nelli | <i>Emblica officinalis</i> | 5 | 0.03 | -3.53 | -0.10 |
| 21 | Karuvelam maram | <i>Vachellia nilotica</i> | 6 | 0.04 | -3.35 | -0.12 |
| 22 | Vadanarayani | <i>Delonix elata</i> | 4 | 0.02 | -3.76 | -0.09 |
| 23 | Marudaani | <i>Lawsonia inermis</i> | 7 | 0.04 | -3.20 | -0.13 |
| 24 | Pappali maram | <i>Carica papaya L</i> | 6 | 0.04 | -3.35 | -0.12 |
| 25 | Nochi | <i>Vitex negundo</i> | 5 | 0.03 | -3.53 | -0.10 |
| 26 | Vilvam | <i>Aegle marmelos</i> | 4 | 0.02 | -3.76 | -0.09 |
| 27 | Nuna maram | <i>Morinda citrifolia</i> | 6 | 0.04 | -3.35 | -0.12 |
| 28 | Koyya | <i>Psidium guajava</i> | 7 | 0.04 | -3.20 | -0.13 |
| 29 | Seethapazham | <i>Annona reticulata</i> | 6 | 0.04 | -3.35 | -0.12 |
| 30 | vagai | <i>albizia lebbeck</i> | 5 | 0.03 | -3.53 | -0.10 |
| 31 | Teaku | <i>Tectona grandis</i> | 6 | 0.04 | -3.35 | -0.12 |
| 32 | Teanai Maram | <i>Cocos nucifera</i> | 3 | 0.02 | -4.04 | -0.07 |
| H (Shannon Diversity Index) =3.44 | | | | | | |
| Shrubs | | | | | | |
| 33 | Avarai | <i>Senna auriculata</i> | 8 | 0.08 | -2.57 | -0.20 |
| 34 | Sundaika | <i>Solanum torvum</i> | 9 | 0.09 | -2.46 | -0.21 |
| 35 | Arali | <i>Nerium indicum</i> | 7 | 0.07 | -2.71 | -0.18 |
| 36 | Idlipoo | <i>xoracoc cineia</i> | 6 | 0.06 | -2.86 | -0.16 |
| 37 | Neermulli | <i>Hydrophila auriculata</i> | 7 | 0.07 | -2.71 | -0.18 |
| 38 | Icham | <i>Phoenix pusilla</i> | 8 | 0.08 | -2.57 | -0.20 |
| 39 | Chaturakalli | <i>Euphorbia antiquorum</i> | 6 | 0.06 | -2.86 | -0.16 |
| 40 | Kattamanakku | <i>Jatropha curcas</i> | 7 | 0.07 | -2.71 | -0.18 |
| 41 | Thuthi | <i>Abutilon indicum</i> | 9 | 0.09 | -2.46 | -0.21 |
| 42 | Chemparuthi | <i>Hibiscu rosa-sinensis</i> | 8 | 0.08 | -2.57 | -0.20 |
| 43 | Kundumani | <i>Abrus precatorius</i> | 6 | 0.06 | -2.86 | -0.16 |
| 44 | Erukku | <i>Calotropis gigantea</i> | 8 | 0.08 | -2.57 | -0.20 |
| 45 | Bulangan | <i>Gmelina asiatica L.</i> | 9 | 0.09 | -2.46 | -0.21 |
| 46 | mottled spurge | <i>Euphorbia lactea Haw.</i> | 7 | 0.07 | -2.71 | -0.18 |

| H (Shannon Diversity Index) =2.63 | | | | | | |
|-----------------------------------|------------------|----------------------------------|----|------|-------|-------|
| Herbs | | | | | | |
| 47 | Nayuruv | <i>Capsicum frutescens</i> | 6 | 0.02 | -3.90 | -0.08 |
| 48 | Vetukaayapoondur | <i>Commelina benghalensis</i> | 7 | 0.02 | -3.75 | -0.09 |
| 49 | Koraikkilangu | <i>Celome viscosa</i> | 8 | 0.03 | -3.61 | -0.10 |
| 50 | Kuppaimeni | <i>Leucas aspera</i> | 9 | 0.03 | -3.50 | -0.11 |
| 51 | Manjal | <i>Parthenium hysterophorus</i> | 7 | 0.02 | -3.75 | -0.09 |
| 52 | Chempu | <i>Boerhavia diffusa</i> | 8 | 0.03 | -3.61 | -0.10 |
| 53 | Karisilanganni | <i>Ocimum tenuiflorum</i> | 9 | 0.03 | -3.50 | -0.11 |
| 54 | Korai | <i>Solanum nigrum</i> | 6 | 0.02 | -3.90 | -0.08 |
| 55 | Kunnakora | <i>Gomphrena celosioides</i> | 7 | 0.02 | -3.75 | -0.09 |
| 56 | Milagai | <i>Ocimum sanctum</i> | 6 | 0.02 | -3.90 | -0.08 |
| 57 | Kanamvazha | <i>Coccinia grandis</i> | 7 | 0.02 | -3.75 | -0.09 |
| 58 | Nai kadugu | <i>Cissus quadrangularis</i> | 8 | 0.03 | -3.61 | -0.10 |
| 59 | Thumbai | <i>Cardiospermum helicacabum</i> | 9 | 0.03 | -3.50 | -0.11 |
| 60 | Partiniyam | <i>Clitoria ternatea</i> | 6 | 0.02 | -3.90 | -0.08 |
| 61 | Mukurattai | <i>Hemidesmus indicus</i> | 7 | 0.02 | -3.75 | -0.09 |
| 62 | Thulasi | <i>Trichosanthes dioica</i> | 11 | 0.04 | -3.30 | -0.12 |
| 63 | Manathakkali | <i>Jasminum augustifolium</i> | 7 | 0.02 | -3.75 | -0.09 |
| 64 | Kumipoondur | <i>Mukia maderaspatana</i> | 6 | 0.02 | -3.90 | -0.08 |
| 65 | Kattuthulasi | <i>Passiflora foetida</i> | 10 | 0.03 | -3.39 | -0.11 |
| 66 | Kovai | <i>Ipomoea aquatica</i> | 7 | 0.02 | -3.75 | -0.09 |
| 67 | Perandai | <i>Desmodium triflorum</i> | 9 | 0.03 | -3.50 | -0.11 |
| 68 | Mudakkotan | <i>Euphorbia prostrata</i> | 8 | 0.03 | -3.61 | -0.10 |
| 69 | Karkakartum | <i>Cyperus rotundus</i> | 7 | 0.02 | -3.75 | -0.09 |
| 70 | Nannari | <i>Wedelia trilobata</i> | 6 | 0.02 | -3.90 | -0.08 |
| 71 | Kovakkai | <i>Oryza sativa</i> | 8 | 0.03 | -3.61 | -0.10 |
| 72 | Malli | <i>Eragrostis ferruginea</i> | 6 | 0.02 | -3.90 | -0.08 |
| 73 | Musumusukkai | <i>Chloris barbata</i> | 7 | 0.02 | -3.75 | -0.09 |
| 74 | Mosukkattan | <i>Cynodon dactylon</i> | 6 | 0.02 | -3.90 | -0.08 |
| 75 | Vallikeerai | <i>Opuntia dillenii</i> | 8 | 0.03 | -3.61 | -0.10 |
| 76 | Siru puladi | <i>Capsicum frutescens</i> | 9 | 0.03 | -3.50 | -0.11 |
| 77 | Sithrapaalavi | <i>Commelina benghalensis</i> | 8 | 0.03 | -3.61 | -0.10 |
| 78 | Korai | <i>Celome viscosa</i> | 6 | 0.02 | -3.90 | -0.08 |
| 79 | mookuthi poondur | <i>Leucas aspera</i> | 7 | 0.02 | -3.75 | -0.09 |
| 80 | Nellu | <i>Parthenium hysterophorus</i> | 9 | 0.03 | -3.50 | -0.11 |
| 81 | Pullu | <i>Boerhavia diffusa</i> | 12 | 0.04 | -3.21 | -0.13 |
| 82 | Chevvarakupul | <i>Ocimum tenuiflorum</i> | 8 | 0.03 | -3.61 | -0.10 |
| 83 | Arugampul | <i>Solanum nigrum</i> | 13 | 0.04 | -3.13 | -0.14 |
| 84 | Sapathikalli | <i>Gomphrena celosioides</i> | 9 | 0.03 | -3.50 | -0.11 |
| H (Shannon Diversity Index) =3.62 | | | | | | |

Table 3.30 Species Richness (Index) in Buffer Zone

| Details | H | H max | Evenness | Species Richness |
|---------------|------|-------|----------|------------------|
| Trees | 3.44 | 3.47 | 0.99 | 6.03 |
| Shrubs | 2.63 | 2.64 | 1.00 | 2.79 |
| Herbs | 3.62 | 3.64 | 0.99 | 6.50 |

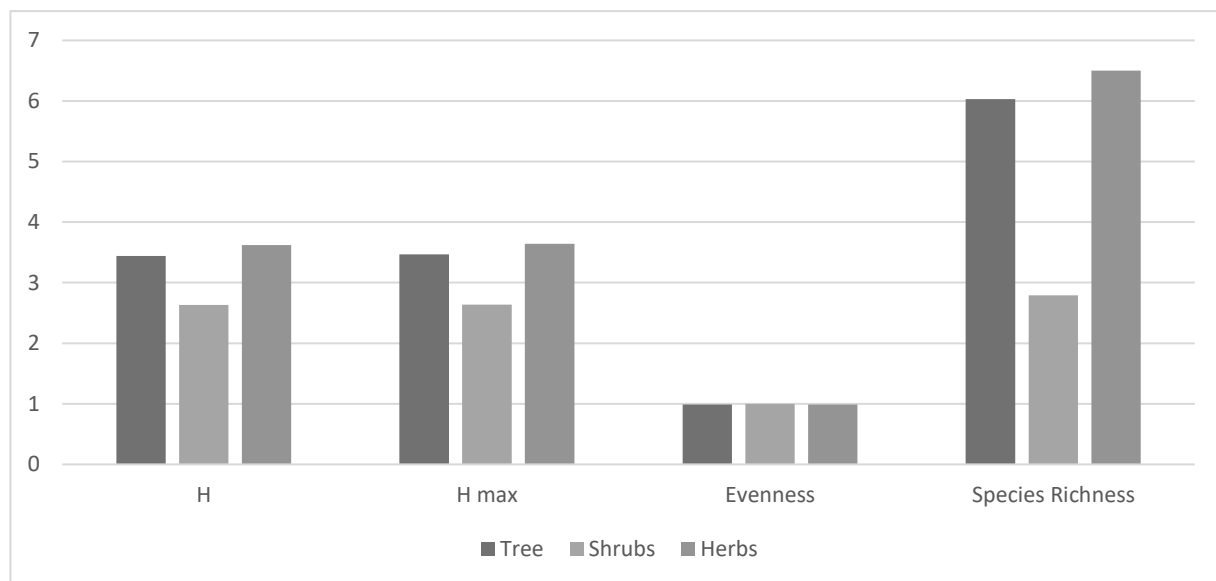


Figure 3.29 Floral Diversity Species Richness (Index) in Buffer Zone



Ipomoeacarnea



Borassus flabellifer



Blumea axillaris



Croton bonplandianus



Leucasaspera



Passiflora foetida L



Phoenix acaulis



Lantana camara



Cissus quadrangularis



Chromolaena odorata



Tridax Procumbens



Phoenix Reclinata



Opuntia guatemalensis



Ziziphus oenopolia (L.)



Aerva lanata



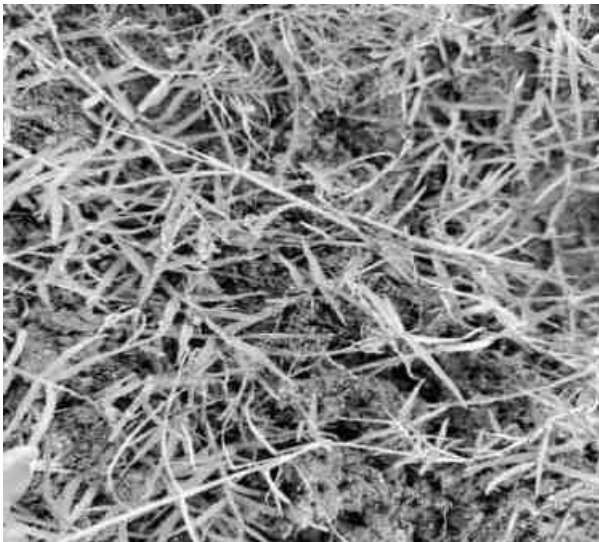
Paspalum quadrifarium



Ehretia rigida



Prosopis juliflora



Cynodactylon (L.)



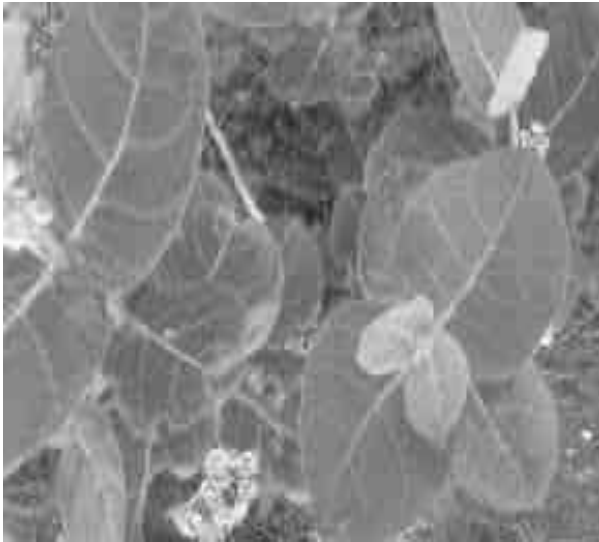
Nymphaea lotus L.



Albizia lebeck



Psidium guajava



Calotropis



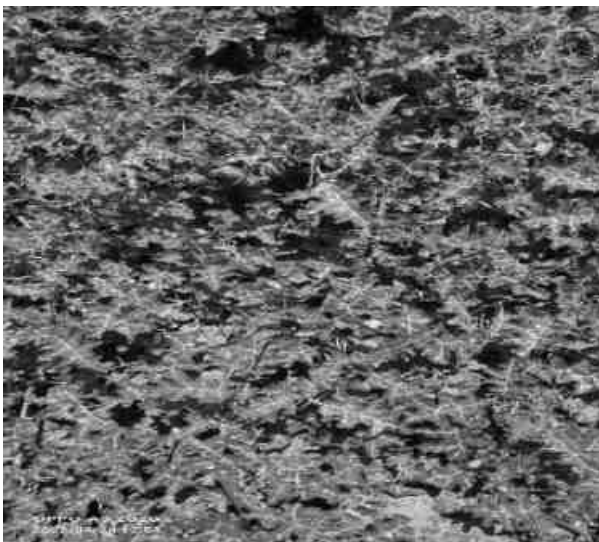
Azadirachta indica



Morinda citrifolia



Cleome viscosa L



Solanum xanthocarpum



Solanum trilobatum



Gomphrena celosioides



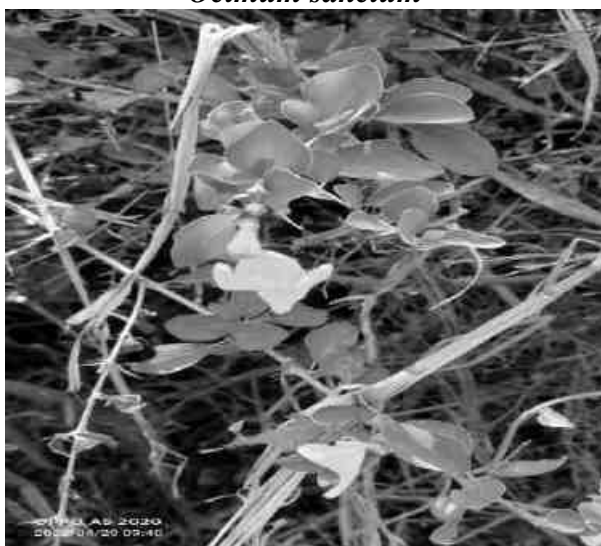
Parthenium hysterophorus



Ocimum sanctum



Moringa oleifera



Gmelina asiatica L.



Euphorbia lactea Haw.

Figure 3.30 Flora in Core and buffer Area

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 3.31.

Table 3.31 Aquatic Vegetation

| S. No. | Scientific Name | Common Name | Vernacular Name (Tamil) | IUCN Red List of Threatened Species |
|--------|---------------------------|---------------------|-------------------------|-------------------------------------|
| 1 | <i>Eichornia crassipe</i> | Water hyacinth | Agayatamarai | NA |
| 2 | <i>Aponogeton natans</i> | Floating lace plant | Kottikizhnagu | NA |
| 3 | <i>Nymphaea nouchali</i> | Blue water lily | Nellambal | LC |
| 4 | <i>Carex cruciata</i> | Cross Grass | Koraipullu | NA |
| 5 | <i>Cynodon dactylon</i> | Scutch grass | Arugampul | LC |
| 6 | <i>Cyperus exaltatus</i> | Tall Flat Sedge | Koraikizhangu | LC |

LC- Least Concern, NA-Not yet assessed

Forest Vegetation

There are no biosphere reserves or wildlife sanctuaries or National parks or Important Bird Areas (IBAs), or migratory routes of fauna. Marudam R. F is located about 7.03 km SE of core zone. It is a dense Scrub Forest Land, mostly containing *Calliea cinerea*, *Catunaregam spinosa*, *Carissa spinarum*, *Albizia amara*, *Buchanania lanzan*, and *Dodonaea viscosa*. Thus, the area under study (Mine lease area and the 10 Km buffer zone) is not ecologically sensitive.

Endangered and endemic species as per the IUCN Red List

There are no rare, endangered and endemic species found in the study area.

3.5.2 Fauna

The faunal survey was carried out for Mammals, Birds, Reptiles, Amphibians and Butterflies. There are no rare, endangered, threatened (RET) and endemic species present in core area.

Survey Methodology

The assessment of fauna was done on the basis of primary data collected from the lease area. The presence was also confirmed from the local inhabitants depending on the animal sightings and the frequency of their visits in the project area. In addition, officials, local people were another source of information for studying the fauna of the area. Field activities are physical/active search, covering rocks, burrows, hollow inspection and location of nesting sites and habitat assessment etc. Taxonomical identification was done by the field guide book and wildlife ENVIS data base ([wiienvis.nic.in/Database/Schedule Species Database](http://wiienvis.nic.in/Database/Schedule%20Species%20Database)) and Zoological Survey of India (ZSI). Detailed fauna is mentioned in the Table 3.28 and 3.29

Survey and Monitoring of Mammals

Intensive survey has been done by line transect methods (Walking and in vehicle) for all major habitats for surveying of mammals by direct and indirect evidence. Indirect methods such as faecal matter (i.e., scat) and pug mark by establishing 10 × 100 m linear transects depending on the habitat (i.e., existing wildlife game routes/forest trails used). Direct observation technique has been used for surveying large and medium sized mammals. But this technique is perfectly suitable for surveying of diurnal mammals; however, good photographs were also taken for species identification.

Survey and Monitoring of Birds

Birds are sampled by using point count methods, and opportunistic bird sightings. By the bird vocal sounds and photographs, the species were identified in consultation with village local people. Point count: in these methods, the observer will stand in a randomly chosen point and birds seen or heard in 50 m radius are recorded for 5 min. This observation is repeated in another point at least 30 m from the first point. We have enumerated 20-point counts in each quartile, which constitute a total of 80-point counts (20 x 4) within 10 km radius area. Opportunistic bird sightings: while traveling in study area, many bird species will be detected in survey time. Such species are recorded by their appearance or by their call.

Survey and monitoring of reptiles

Several survey techniques such as standard walk transect visual encounter survey methods were used to sampling reptiles in each and every habitat of the study area. While doing this survey, photographs were taken for identification of species. Species identification was done by using standard field guides in consultation with village people expert. The butterfly was enumerated by 2 linear transects of 10 × 100 m were laid within each quartile at minimum interval of 1 km. Further, amphibians and fishes documented in existing literature and secondary information in consultation with local people and wildlife experts.

Fauna in Core Zone

A total of 22 species belonging to 15 families were observed in the core zone (Table 3.32). Among them are 9 species of Insects, 3 species of Reptiles, 1 species of Mammals, and 9 species of Avian. None of these species are threatened or endemic in the study area and surroundings. There are no Schedule I species and 8 species are under schedule IV according to Indian wild life Act, 1972. There are no critically endangered, endangered, vulnerable and endemic species in the core zone.

Table 3.32 Fauna in Core Zone

| S. No. | Common name/English Name | Family Name | Scientific Name | Schedule List Wildlife Protection Act, 1972 | IUCN Red List data |
|-----------------|--------------------------|--------------|-------------------------------|---|--------------------|
| INSECTS | | | | | |
| 1 | Common Tiger | Nymphalidae | <i>Danaus genutia</i> | NL | NL |
| 2 | Red-veined darter | Libellulidae | <i>Sympetrum fonscolombii</i> | NL | LC |
| 3 | Grasshopper | Acrididae | <i>Hieroglyphus sp</i> | NL | LC |
| 4 | Blue tiger | Nymphalidae | <i>Tirumala limniace</i> | Schedule IV | LC |
| 5 | Stick insect | Lonchodidae | <i>carausius morosus</i> | NL | LC |
| 6 | Mottled emigrant | Peridae | <i>Catopsilia pyranthe</i> | NL | LC |
| 7 | Praying mantis | Mantidae | <i>mantis religiosa</i> | NL | NL |
| 8 | Striped tiger | Nymphalidae | <i>Danaus plexippus</i> | Schedule IV | LC |
| 9 | Acraea violae | Nymphalidae | <i>Acraea violae</i> | NL | LC |
| REPTILES | | | | | |
| 10 | Garden lizard | Agamidae | <i>Calotes versicolor</i> | NL | LC |
| 11 | Common house gecko | Gekkonidae | <i>Hemidactylus frenatus</i> | NL | LC |
| 12 | Fan-Throated Lizard | Agamidae | <i>Sitanaponticeriana</i> | NL | LC |
| MAMMALS | | | | | |
| 1 | Indian Field Mouse | Muridae | <i>Mus booduga</i> | Schedule IV | NL |
| AVES | | | | | |
| 1 | Asian green bee-eater | Meropidae | <i>Meropsorientalis</i> | NL | LC |
| 2 | Koel | Cuculidae | <i>Eudynamys</i> | Schedule IV | LC |
| 3 | Common myna | Sturnidae | <i>Acridotheres tristis</i> | NL | LC |
| 4 | Cattle egret | Ardeidae | <i>Bubulcus ibis</i> | NL | LC |
| 5 | House crow | Corvidae | <i>Corvus splendens</i> | NL | LC |
| 6 | Koel | Cuculidae | <i>Eudynamys scolopaceus</i> | Schedule IV | LC |
| 7 | Crow Pheasant | Cuculidae | <i>Centropus sinensis</i> | Schedule IV | LC |
| 8 | Indian pond heron | Ardeidae | <i>Ardeola grayii</i> | Schedule IV | LC |
| 9 | Grey drongo | Dicruridae | <i>Dicrurus leucophaeus</i> | Schedule IV | LC |

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

Fauna in Buffer Zone

Taxonomically, a total of 44 species belonging to 34 families were recorded from the buffer area. Among them were 20 species of Birds, 13 species of Insects, 5 species of Reptiles, 3 species of Mammals, and 3 species of Amphibians, as mentioned in Table.3.33. There are four species under Schedule II and twenty-six species under schedule IV according to Indian wild life Act 1972. And there are no critically endangered, vulnerable and endemic species in the buffer area. There is no schedule I Species in study area and there are no critically endangered, endangered, vulnerable and endemic species.

Table 3.33 Fauna in Buffer Zone

| S. No. | Common Name/EnglishName | Family Name | Scientific Name | Schedule List Wildlife Protection Act 1972 | IUCN Red List Data |
|-----------------|-------------------------|----------------|-------------------------------|--|--------------------|
| INSECTS | | | | | |
| 1 | Tawny costar | Nymphalidae | <i>Danaus chrysippus</i> | Schedule IV | LC |
| 2 | Milkweed butterfly | Nymphalidae | <i>Danainae</i> | NL | LC |
| 3 | Blue tiger | Nymphalidae | <i>Tirumala limniace</i> | Schedule IV | LC |
| 4 | Common Indian Crow | Nymphalidae | <i>Euploea core</i> | Schedule IV | LC |
| 5 | Green marsh hawk | Libellulidae | <i>Orthetrum sabina</i> | NL | LC |
| 6 | Mottled emigrant | Peridae | <i>Catopsilia pyranthe</i> | NL | LC |
| 7 | Striped tiger | Nymphalidae | <i>Danaus plexippus</i> | Schedule IV | LC |
| 8 | Ant | Formicidae | <i>Camponotus Vicinus</i> | NL | NL |
| 9 | Red-veined darter | Libellulidae | <i>Sympetrum fonscolombii</i> | NL | LC |
| 10 | Lesser grass blue | Lycaenidae | <i>Zizina Otis indica</i> | Schedule IV | LC |
| 11 | Praying mantis | Mantidae | <i>mantis religiosa</i> | NL | NL |
| 12 | Grasshopper | Acrididae | <i>Hieroglyphus sp</i> | NL | LC |
| 13 | Common Tiger | Nymphalidae | <i>Danaus genutia</i> | Schedule IV | LC |
| REPTILES | | | | | |
| 1 | Chameleon | Chamaeleonidae | <i>Chameleonzeylanicus</i> | Sch II (Part II) | LC |
| 2 | Garden lizard | Agamidae | <i>Calotes versicolor</i> | NL | LC |
| 3 | Green Vine snake | Colubridae | <i>Ahaetulla nasuta</i> | Schedule IV | LC |
| 4 | Common house gecko | Gekkonidae | <i>Hemidactylusfrenatus</i> | NL | LC |
| 5 | Rat snake | Colubridae | <i>Ptyas mucosa</i> | Sch II (Part II) | LC |
| MAMMALS | | | | | |
| 1 | palmsquirrel | Sciuridae | <i>Funambuluspalmarum</i> | Schedule IV | LC |
| 2 | Indian FieldMouse | Muridae | <i>Mus booduga</i> | Schedule IV | LC |
| 3 | Home mouse | Muridae | <i>Mus musculustytleri</i> | NL | LC |
| AVES | | | | | |
| 1 | House crow | Corvidae | <i>Corvussplendens</i> | NL | LC |
| 2 | Cattle egret | Ardeidae | <i>Bubulcus ibis</i> | NL | LC |
| 3 | Black drongo | Dicruridae | <i>Dicrurus macrocercus</i> | Schedule IV | LC |
| 4 | Red-vented Bulbul | Pycnonotidae | <i>Pycnonotuscafer</i> | Schedule IV | LC |
| 5 | Indian pond heron | Ardeidae | <i>Ardeola grayii</i> | Schedule IV | LC |
| 6 | green bee-eater | Meropidae | <i>Meropsorientalis</i> | NL | LC |
| 7 | Small Sunbird | Nectariniidae | <i>Nectarinia asiatica</i> | Schedule IV | LC |
| 8 | Common myna | Sturnidae | <i>Acridotheres tristis</i> | NL | LC |
| 9 | Blue Rock Pigeon | Columbidae | <i>Columba livia</i> | Schedule IV | LC |
| 10 | Common Coot | Rallidae | <i>Fulica atra</i> | Schedule IV | LC |
| 11 | Small Sunbird | Nectariniidae | <i>Nectarinia asiatica</i> | Schedule IV | LC |

*NL-Not listed, LC-Least concern, NT-Near threatened.

Results

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

3.6 SOCIO-ECONOMIC ENVIRONMENT

Socio-economic study is an essential part of environmental study. It is a measure of an individual's or family's or group of people's economic and social position based on education, income, health, and occupation. Socio-economic most important determinant of livelihoods as levels of knowledge, skill and income conditions which mean for their living. People from one income group to another consumption power is also differ among income groups of population This will help in visualizing and predicting the possible impact depending upon the nature and magnitude of the project It is expected that the socio-economic status of the area will substantially improve because of this proposed project. As the proposed project will provide direct and indirect employment and improve the infrastructural facilities in that area, thus leading to the improvement of their standard of living.

3.6.1 Objectives of the Study

The main objectives of the study are as follows:

- To study the demographic conditions by level of income of sample population in the study area.
- To analyses the level of education among different income groups of population.
- To investigate the housing situation by level of income of the sample population in the study unit

3.6.2 Scope of Work

- To study the Socio-economic Environment of the area from the secondary sources;
- Data Collection & Analysis
- Prediction of project impact
- Mitigation Measure

3.6.3 Socio-Economic Status of Study area

The study area covers 18 villages including Adavapakkam, Arpakkam, Kadukalur, Kannikulam, Karuveppampoondi, Kavanthandalam, Magaral, Nelveli, Ozhugarai, Perumanallur, Pulivoy, Puthali, Silambakkam, Sirunallur, Vedal, Vengacheri, Vengaram, Vitchanthangal. As Magaral-B is the village in which the proposed project site is located, the summary of population facts for the village is exclusively provided in Table 3.34 and for other 27 villages in Tables 3.35-3.37.

Table 3.34 Magaral-B Village Population Facts

| Magaral-B village | |
|--------------------------|--------|
| Number of Households | 709 |
| Population | 2834 |
| Male Population | 1399 |
| Female Population | 1435 |
| Children Population | 303 |
| Sex-ratio | 1026 |
| Literacy | 69.30% |
| Male Literacy | 75.50% |
| Female Literacy | 63.30% |
| Scheduled Tribes (ST) % | 36 |
| Scheduled Caste (SC) % | 1777 |
| Total Workers | 1501 |
| Main Workers | 427 |
| Marginal Workers | 1074 |

Source: <https://www.census2011.co.in/data/village/635497-karudayampalayam-tamil-nadu.html>

Table 3.35 Population and Literacy Data of Study Area

| Village Name | Total Population Person | Total Population Male | Total Population Female | Population in the age group 0-6 Male | Population in the age group 0-6 Female | Scheduled Castes population | Scheduled Tribes population Person | Literates Population Person | Illiterate Persons |
|---------------------|--|--------------------------------------|--|---|---|--|---|--|-------------------------------|
| Adavapakkam | 765 | 396 | 369 | 69 | 28 | 499 | 8 | 465 | 300 |
| Arpakkam | 2937 | 1475 | 1462 | 181 | 197 | 1626 | 320 | 1794 | 1143 |
| Kadukalur | 1204 | 587 | 617 | 81 | 77 | 850 | 8 | 691 | 513 |
| Kannikulam | 727 | 372 | 355 | 47 | 35 | 421 | 23 | 453 | 274 |
| Karuveppampoondi | 1652 | 846 | 806 | 96 | 89 | 844 | 19 | 1157 | 495 |
| Kavanthandalam | 1619 | 796 | 823 | 66 | 68 | 392 | 67 | 970 | 649 |
| Magaral | 2834 | 1399 | 1435 | 154 | 149 | 1777 | 36 | 1754 | 1080 |
| Nelveli | 667 | 322 | 345 | 38 | 50 | 577 | 0 | 403 | 264 |
| Ozhugarai | 1240 | 613 | 627 | 61 | 71 | 488 | 0 | 697 | 543 |
| Perumanallur | 438 | 203 | 235 | 16 | 28 | 12 | 18 | 277 | 161 |
| Pulivoy | 491 | 237 | 254 | 16 | 32 | 217 | 19 | 324 | 167 |
| Puthali | 1032 | 510 | 522 | 66 | 76 | 766 | 27 | 674 | 358 |
| Silambakkam | 461 | 244 | 217 | 24 | 23 | 0 | 11 | 270 | 191 |
| Sirunallur | 2163 | 1079 | 1084 | 101 | 92 | 791 | 10 | 1440 | 723 |
| Vedal | 2472 | 1221 | 1251 | 70 | 63 | 1016 | 54 | 825 | 295 |
| Vengacheri | 753 | 379 | 374 | 49 | 43 | 1 | 45 | 435 | 318 |
| Vengaram | 176 | 89 | 87 | 9 | 18 | 86 | 0 | 96 | 80 |
| Vitchanthangal | 1016 | 517 | 499 | 64 | 56 | 343 | 13 | 369 | 148 |

Table 3.36 Educational Facilities & Water & Drainage & Health Facilities Data of Study Area

| Village Name | Govt Primary School | Govt Vocational Training School/ITI | Primary Health Sub Centre (Numbers) | Tap Water Untreated | Is the Area Covered under Total Sanitation Campaign (TSC)? | Telephone (landlines) | Public Bus Service | Gravel (kuchha) Roads | Self - Help Group (SHG) | Nutritional Centres- Anganwadi Centre | Community Centre with/without TV | Power Supply for Domestic Use |
|---------------------|----------------------------|--|--|----------------------------|---|------------------------------|---------------------------|------------------------------|--------------------------------|--|---|--------------------------------------|
| Adavapakkam | 1 | 2 | 0 | 1 | 2 | 1 | 2 | 1 | 1 | 1 | 2 | 1 |
| Arpakkam | 1 | 2 | 0 | 1 | 2 | 1 | 1 | 1 | 2 | 1 | 2 | 1 |
| Kadukalur | 1 | 2 | 0 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 1 |
| Kannikulam | 1 | 2 | 0 | 2 | 2 | 1 | 2 | 1 | 1 | 1 | 2 | 1 |
| Karuveppampooni | 1 | 2 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Kavanthandalam | 1 | 2 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 |
| Magaral | 1 | 2 | 0 | 1 | 2 | 1 | 1 | 1 | 2 | 1 | 2 | 1 |
| Nelveli | 1 | 2 | 0 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 1 |
| Ozhugarai | 1 | 2 | 0 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 1 |
| Perumanallur | 1 | 2 | 0 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 |
| Pulivoy | 1 | 2 | 0 | 2 | 2 | 1 | 1 | 1 | 2 | 1 | 2 | 1 |
| Puthali | 1 | 2 | 0 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 1 |
| Silambakkam | 1 | 2 | 0 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 1 |
| Sirunallur | 1 | 2 | 0 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 1 |
| Vedal | 1 | 2 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 |
| Vengacheri | 1 | 2 | 0 | 1 | 2 | 1 | 2 | 1 | 1 | 1 | 2 | 1 |
| Vengaram | 2 | 2 | 0 | 1 | 2 | 2 | 1 | 1 | 1 | 2 | 2 | 1 |
| Vitchanthangal | 2 | 2 | 0 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 1 |

Table 3.37 Other Facilities in The Study Area

| Village Name | Tractors | Carts Driven by Animals | Black Topped (pucca) Road | ATM | Commercial Bank | Cooperative Bank | Agricultural Credit Societies | Public Distribution System | Mandis/Regular Market | Weekly Haat | Power Supply for Agriculture Use | Power Supply for Commercial Use | Agricultural Commodities (First) | Manufacturers Commodities | Handicrafts Commodities (First) | Forest Area (in Hectares) | Net Area Sown (in Hectares) |
|---------------------|-----------------|--------------------------------|----------------------------------|------------|------------------------|-------------------------|--------------------------------------|-----------------------------------|------------------------------|--------------------|---|--|---|----------------------------------|--|----------------------------------|------------------------------------|
| Adavapakkam | 2 | 2 | 1 | 2 | 1 | 2 | 2 | 1 | 2 | 2 | 1 | 2 | PADDY | -- | 0 | 2.15 | 58.23 |
| Arpakkam | 2 | 2 | 1 | 2 | 2 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | PADDY | HOLLOW BLOCKS | 0 | 0 | 272.18 |
| Kadukalur | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 2 | PADDY | -- | 0 | 9.85 | 600 |
| Kannikulam | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 1 | PADDY | -- | 0 | 1 | 58.98 |
| Karuveppampoondi | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 2 | PADDY | -- | 0 | 3 | 301.87 |
| Kavanthandalam | 2 | 2 | 1 | 2 | 2 | 1 | 1 | 1 | 2 | 2 | 1 | 2 | PADDY | -- | 0 | 0 | 211.69 |
| Magaral | 2 | 2 | 1 | 2 | 1 | 1 | 2 | 1 | 2 | 2 | 1 | 2 | PADDY | -- | 0 | 0 | 203.23 |
| Nelveli | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 2 | PADDY | -- | 0 | 0 | 71.63 |
| Ozhugarai | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 2 | PADDY | -- | 0 | 1 | 68.75 |
| Perumanallur | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 1 | | -- | 0 | 0 | 65.13 |
| Pulivoy | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | PADDY | -- | 0 | 0 | 97.19 |
| Puthali | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 2 | PADDY | -- | 0 | 112.2 | 117.29 |
| Silambakkam | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 2 | PADDY | -- | 0 | 50 | 59.63 |
| Sirunallur | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 1 | PADDY | -- | 0 | 0 | 150.57 |
| Vedal | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 1 | PADDY | -- | 0 | 0 | 500 |
| Vengacheri | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 2 | PADDY | -- | 0 | 19.19 | 118.47 |
| Vengaram | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 2 | PADDY | -- | 0 | 2 | 25.1 |
| Vitchanthangal | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 1 | -- | -- | 0 | 0 | 125.52 |

3.6.4 Recommendation and Suggestion

- ❖ Awareness program should be conducted to make the population aware of education and to get a better livelihood.
- ❖ Vocational training programme should be organized to make the people self - employed, particularly for women and unemployed youth.
- ❖ On the basis of qualification and skills local community may be preferred. Long term and short-term employments should be generated.
- ❖ Health care centre and ambulance facility should be provided to the population to get easy access to medical facilities. Apart from that, as these areas are prone to various diseases a hospital with modern facilities should be opened on a priority basis in a central place to provide better health facilities to the villagers around the project.
- ❖ 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.

3.6.5 Summary & Conclusion

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

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

3.7 TRAFFIC DENSITY

The traffic survey conducted based on the transportation route of material, the Rough and Gravel is proposed to be transported mainly through Village Road and Vanthavaasi– Kancheepuram (SH-116) as shown in Table 3.38 and in Figure 3.31. 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 3.38 Traffic Survey Locations

| Station Code | Road Name | Distance and Direction | Type of Road |
|--------------|------------------------------------|------------------------|------------------------------------|
| TS1 | Village Road | 0.7 Km-SW | Village Road |
| TS2 | Vanthavaasi– Kancheepuram (SH-116) | 6.5 Km-WNW | Vanthavaasi– Kancheepuram (SH-116) |

Source: On-site monitoring by GTMS FAE & TM

Table 3.39 Existing Traffic Volume

| Station code | HMV | | LMV | | 2/3 Wheelers | | Total PCU |
|--------------|-----|-----|-----|-----|--------------|-----|-----------|
| | No | PCU | No | PCU | No | PCU | |
| TS1 | 35 | 105 | 35 | 35 | 64 | 32 | 172 |
| TS2 | 95 | 285 | 50 | 50 | 90 | 45 | 380 |

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 3.40 Rough and Gravel Transportation Requirement

| Transportation of Rough and Gravel per day | | |
|--|----------------------|---------------|
| Capacity of trucks | No. of Trips per day | Volume in PCU |
| 15 tonnes | 65 | 195 |

Source: Approved Mining Plan

Table 3.41 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 | 172 | 195 | 367 | 1200 |
| Vanthavaasi– Kancheepuram (SH-116) | 380 | 195 | 575 | 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.

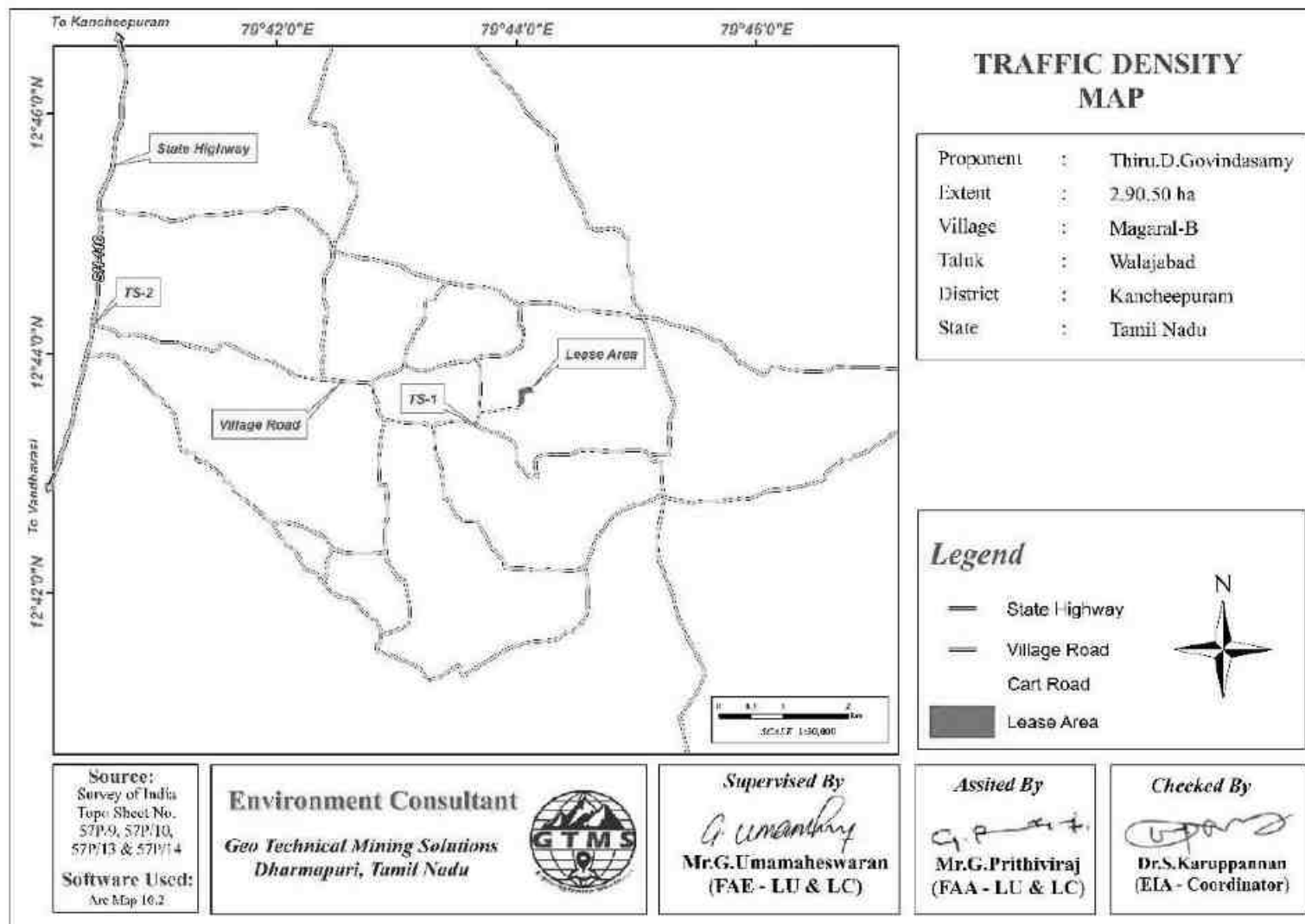


Figure 3.31 Traffic Density Map

3.8 SITE SPECIFIC FEATURES

There are no Wildlife Sanctuaries, National Park within the project area. There is no Protected area is found within 10 km radius from the proposed project area. Therefore, there will be no need of acquisition/diversion of forest land. The details related to the environment sensitivity around the proposed mine lease area i.e., 10 km radius and the nearby water bodies are given in the Table 3.42.

Table 3.42 Details of Environmentally Sensitive Ecological Features in the Study Area

| Sl. No | Sensitive Ecological Features | Name | Areal Distance in km from cluster |
|--------|---|---------------|-----------------------------------|
| 1 | National Park / Wild life Sanctuaries | None | Nil within 10 km radius |
| | | None | Nil within 10 km radius |
| 2 | Reserve Forest | Marutham R. F | 7.03 km SE |
| 3 | Lakes/Reservoirs/ Dams/Streams/Rivers | Cheyyar River | 2.30 km S |
| | | Paalar River | 5.7 km N |
| | | Mamandur | 7.7 km NW |
| | | Uthiramerur | 8.65 km S |
| 4 | Tiger Reserve/Elephant Reserve/ Biosphere Reserve | None | Nil within 10 km radius |
| 5 | Critically Polluted Areas | None | Nil within 10 km radius |
| 6 | Mangroves | None | Nil within 10 km radius |
| 7 | Mountains/Hills | None | Nil within 10 km radius |
| 8 | Notified Archaeological Sites | None | Nil within 10 km radius |
| 9 | Industries/ Thermal Power Plants | None | Nil within 10 km radius |
| 10 | Defence Installation | None | Nil within 10 km radius |

Source: Survey of India Toposheet





Figure 3.32 Field Study & Socio-Economic Study Photographs

CHAPTER IV

ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

4.0 GENERAL

Environmental impacts both direct and indirect on various environmental attributes due to proposed mining activity will be created in the surrounding environment, during the operational and post-operational phases. The occurrence of mineral deposits, being site specific, their exploitation, often, does not allow for any choice except adoption of eco-friendly operation. The methods are required to be selected in such a manner, so as to maintain environmental equilibrium ensuring sustainable development.

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.

Several scientific techniques and methodologies are available to predict impacts of physical environment. Mathematical models are the best tools to quantitatively describe the cause-and-effect relationships between sources of pollution and different components of environment. In cases where it is not possible to identify and validate a model for a particular situation, predictions have been arrived at based on logical reasoning / consultation / extrapolation.

The following parameters are of significance in the Environmental Impact Assessment and are being discussed in detail:

- ❖ Land environment
- ❖ Soil environment
- ❖ Water Environment
- ❖ Air Environment
- ❖ Noise Environment
- ❖ Socio economic environment
- ❖ Biological Environment

Based on the baseline environmental status at the project site, the environmental factors that are likely to be affected are identified, quantified and assessed.

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 Common 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., 7.5 m safety barrier and other safety provided) so as to help minimize dust emissions.
- ❖ Proper fencing will be carried out at the conceptual stage, Security will be posted round the clock, to prevent inherent entry of the public and cattle.

4.2 SOIL ENVIRONMENT

No top soil will be removed in this project. However, some of the common mitigation measures is discussed in the following sections.

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

Soil Erosion

- Low to moderate soil erosion is in mine lease area

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.
- ❖ Retention of Vegetation – Soil erosion is controlled by retaining or replanting existing vegetation where possible
- ❖ Monitoring and maintenance – Weekly monitoring and daily maintenance of erosion control systems so that they perform as for specified specially during rainy season.

4.3 WATER ENVIRONMENT

The total water requirement for this project will be 6.750 KLD. The water will be sourced initially from outside agencies. Later the rainwater collected in the mine pit sump will be used for this purpose. The domestic effluent to be generated from the project will be collected in septic tank with soak pits arrangements. There are no waste dumps in this quarry. Based on the available information and the geophysical investigations the study concluded that the project area is considered to have poor groundwater potential. Besides, the mining area consists of hard compact rock, no major water seepage within the mine is expected.

4.3.1 Anticipated Impact

The major sources of water pollution normally associated due to mining and allied operations are:

- ❖ Generation of waste water from vehicle washing.
- ❖ Washouts from surface exposure or working areas
- ❖ Domestic sewage
- ❖ Disturbance to drainage course in the project area
- ❖ Mine Pit water discharge
- ❖ Increase in sediment load during monsoon in downstream of lease area
- ❖ This being a mining project, there will be no process effluent. Waste from washing of machinery may result in discharge of oil & grease, suspended solids.
- ❖ The sewage from soak pit may percolate to the ground water table and contaminate it.
- ❖ Surface drainage may be affected due to Mining
- ❖ As the proposed project acquires 6.750 KLD of water from water vendors, it will not extract water by developing abstraction structures in the lease area. Therefore, the project will not deplete aquifer beneath the lease area.

4.3.2 Common Mitigation Measures for the Proposed Project

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

4.4 AIR ENVIRONMENT

The air borne particulate matter is the main air pollutant by opencast mining. The mining operation will be carried out by jack hammer drilling, excavation, loading and transportation.

4.4.1 Anticipated Impact from proposed project

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

4.4.2 Emission Estimation

Emission resulting from different mining activities is estimated using relevant empirical formulae developed by Chauhya et al.,2001. The equations used for SPM, SO₂, and NO_x 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 ³ /yr); a = Lease area(km ²); E = Emission rate(g/s). |
| Overall Mine | SO ₂ | Area | $E = a0.14\{u/(1.83 + 0.93u)\} [\{p/(0.48 + 0.57p)\} + \{b/(14.37 + 1.15b)\}]$ | u = Wind speed(m/s); p = Mineral production (Mt/yr); b = Overburden handling (Mm ³ /yr); a = Lease area(km ²); E = Emission rate(g/s). |
| Overall Mine | NO _x | Area | $E = a0.25\{u/(4.3 + 32.5u)\} [1.5p + \{b/(0.06 + 0.08b)\}]$ | u = Wind speed(m/s); p = Mineral production (Mt/yr); b = Overburden handling (Mm ³ /yr); a = Lease area(km ²); 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. As the SPM emission calculation for overall mine is not considering pollution control measures, one-third of the SPM value is taken for derivation of PM₁₀ keeping in mind that proper control measures are followed. It is important to note that PM₁₀ emission rate is derived from

the SPM estimation in the background that PM₁₀ constitutes 52% of SPM emission. The PM_{2.5}, PM₁₀, SO₂ and NO_x 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 ² | Calculated Value (g/s/m ²) |
|--------------|-------------------|------------------------|------------------------------|--|
| Overall Mine | PM _{2.5} | 0.0151451098 | 29050 | 5.21346E-07 |
| Overall Mine | PM ₁₀ | 0.0301451064 | 29050 | 1.0377E-06 |
| Overall Mine | SO ₂ | 0.0121451098 | 29050 | 4.18076E-07 |
| Overall Mine | NO _x | 0.0104350648 | 29050 | 3.5921E-07 |

4.4.2.1 Frame work of Computation and Model Details

By using the above-mentioned inputs, Ground Level Concentrations (GLC) due to the quarrying activities have been estimated to know the incremental concentration in ambient air quality and impact in the study area. The effect of air pollutants upon receptors are influenced by concentration of pollutants and their dispersion in the atmosphere.

Air quality modelling is an important tool for prediction, planning and evaluation of air pollution control activities besides identifying the requirements for emission control to meet the regulatory standards and to apply mitigation measures to reduce impact caused by quarrying activities. Suspended Particulate Matter (SPM) is the major pollutant occurred during quarrying activities. The prediction includes the impacts of excavation, drilling, loading and movement of vehicles during transportation and meteorological parameters such as wind speed, wind direction, temperature, rainfall, humidity and cloud cover.

The model was used to predict the impact on the ambient air environment at each receptor at various localities within 10km radius around the project site and the maximum incremental GLC at the project site. All the prediction models in Figures 4.1- 4.4 shows the maximum concentrations of PM_{2.5}, PM₁₀, SO₂ and NO_x close to the proposed project site due to low to moderate wind speeds.

4.4.2.2 Modelling of Incremental Concentration

The air borne particulate matter such as PM₁₀ and PM_{2.5} generated by quarrying operation, transportation, and wind erosion of the exposed areas and emissions of sulphur dioxide (SO₂) and oxides of nitrogen (NO_x) due to excavation and loading equipment's and vehicles plying on haul roads are the significant air pollutants arising from mining operation, leading to an adverse impact on the ambient air environment in and around the project area. 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 4.3-4.6.

4.4.2.3 Model Results

The post project resultant concentrations of PM₁₀, PM_{2.5}, SO₂ & NO_x (GLC) is given in Tables 4.3-4.6.

Table 4.3 Incremental & Resultant GLC of PM_{2.5}

| Station ID | Distance to core area (km) | Direction | PM _{2.5} concentrations(µg/m ³) | | | Comparison against air quality standard (60 µg/m ³) | Magnitude of change (%) | Significance |
|------------|----------------------------|-----------|--|-----------|-------|---|-------------------------|-----------------|
| | | | Base line | Predicted | Total | | | |
| AAQ1 | -- | -- | 20.4 | 6.49 | 26.89 | Below standard | 31.81 | Not significant |
| AAQ2 | 2.3 | SW | 16.0 | 1 | 17 | | 6.25 | |
| AAQ3 | 4.95 | NW | 16.8 | 0 | 16.8 | | 0.00 | |
| AAQ4 | 1.98 | NE | 15.8 | 0.5 | 16.3 | | 3.16 | |
| AAQ5 | 4.34 | N | 18.0 | 0 | 18 | | 0.00 | |
| AAQ6 | 2.36 | ESE | 19.5 | 0.5 | 20 | | 2.56 | |
| AAQ7 | 3.56 | NW | 15.4 | 0.5 | 15.9 | | 3.25 | |

Table 4.4 Incremental & Resultant GLC of PM₁₀

| Station ID | Distance to core area (km) | Direction | PM ₁₀ concentrations(µg/m ³) | | | Comparison against air quality standard (100 µg/m ³) | Magnitude of change (%) | Significance |
|------------|----------------------------|-----------|---|-----------|-------|--|-------------------------|-----------------|
| | | | Base line | Predicted | Total | | | |
| AAQ1 | -- | -- | 39.8 | 12.9 | 52.7 | Below standard | 32.41 | Not significant |
| AAQ2 | 2.3 | SW | 37.0 | 5 | 42 | | 13.51 | |
| AAQ3 | 4.95 | NW | 37.4 | 0 | 37.4 | | 0.00 | |
| AAQ4 | 1.98 | NE | 34.2 | 0.5 | 34.7 | | 1.46 | |
| AAQ5 | 4.34 | N | 36.4 | 0 | 36.4 | | 0.00 | |
| AAQ6 | 2.36 | ESE | 39.7 | 0.5 | 40.2 | | 1.26 | |
| AAQ7 | 3.56 | NW | 33.7 | 0.5 | 34.2 | | 1.48 | |

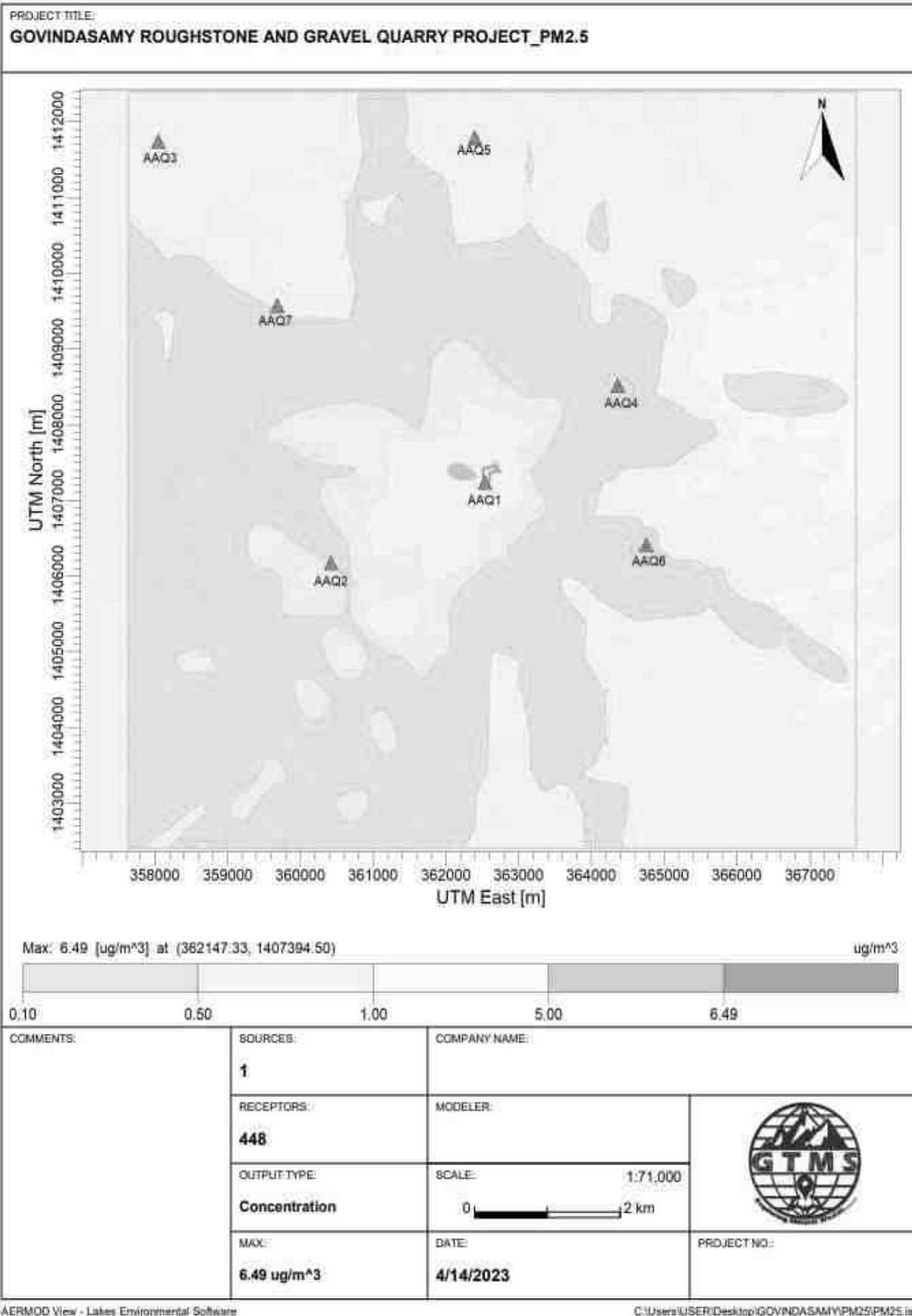
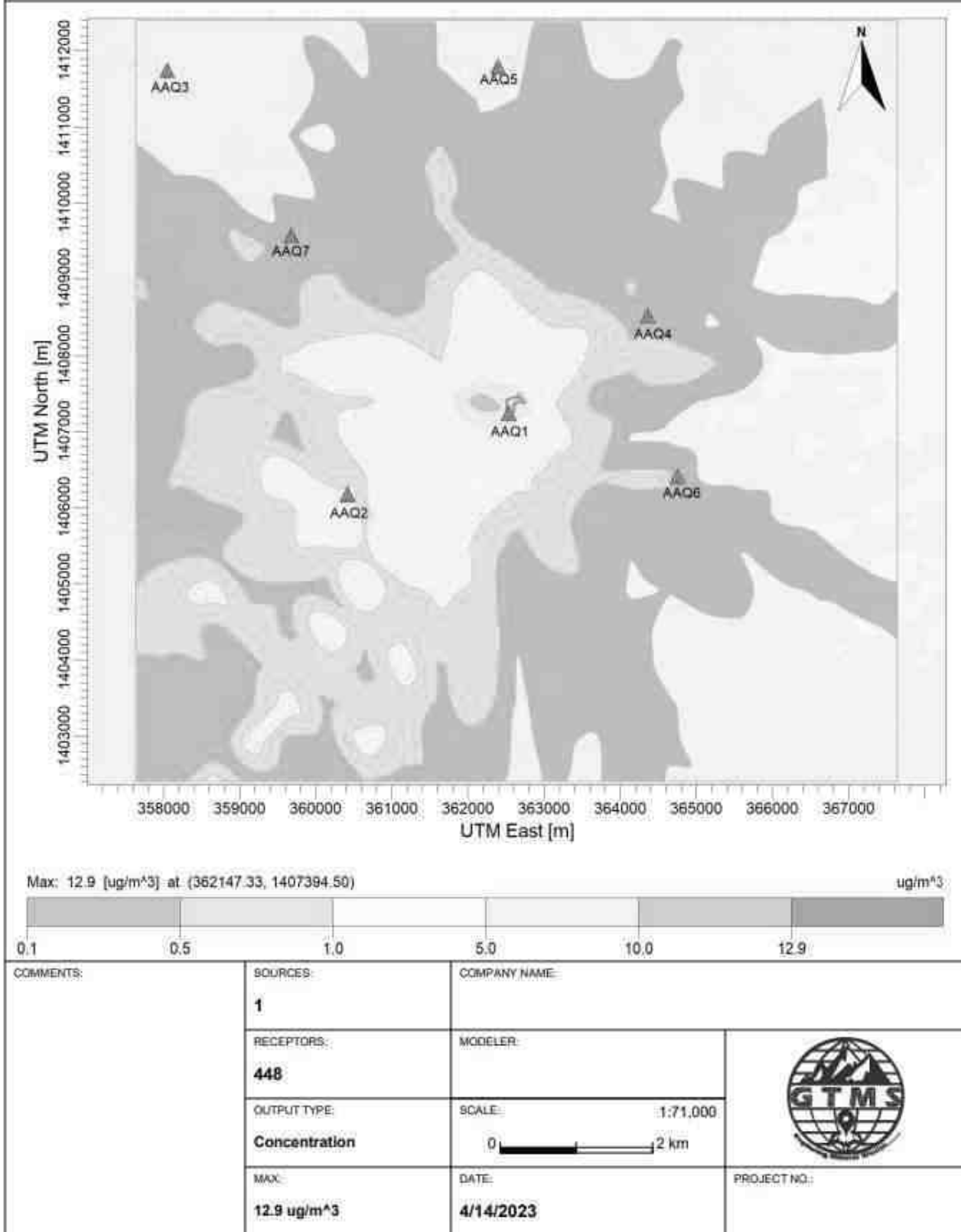


Figure 4.1 Predicted Incremental Concentration of PM_{2.5}

PROJECT TITLE:

GOVINDASAMY ROUGHSTONE AND GRAVEL QUARRY PROJECT_PM10



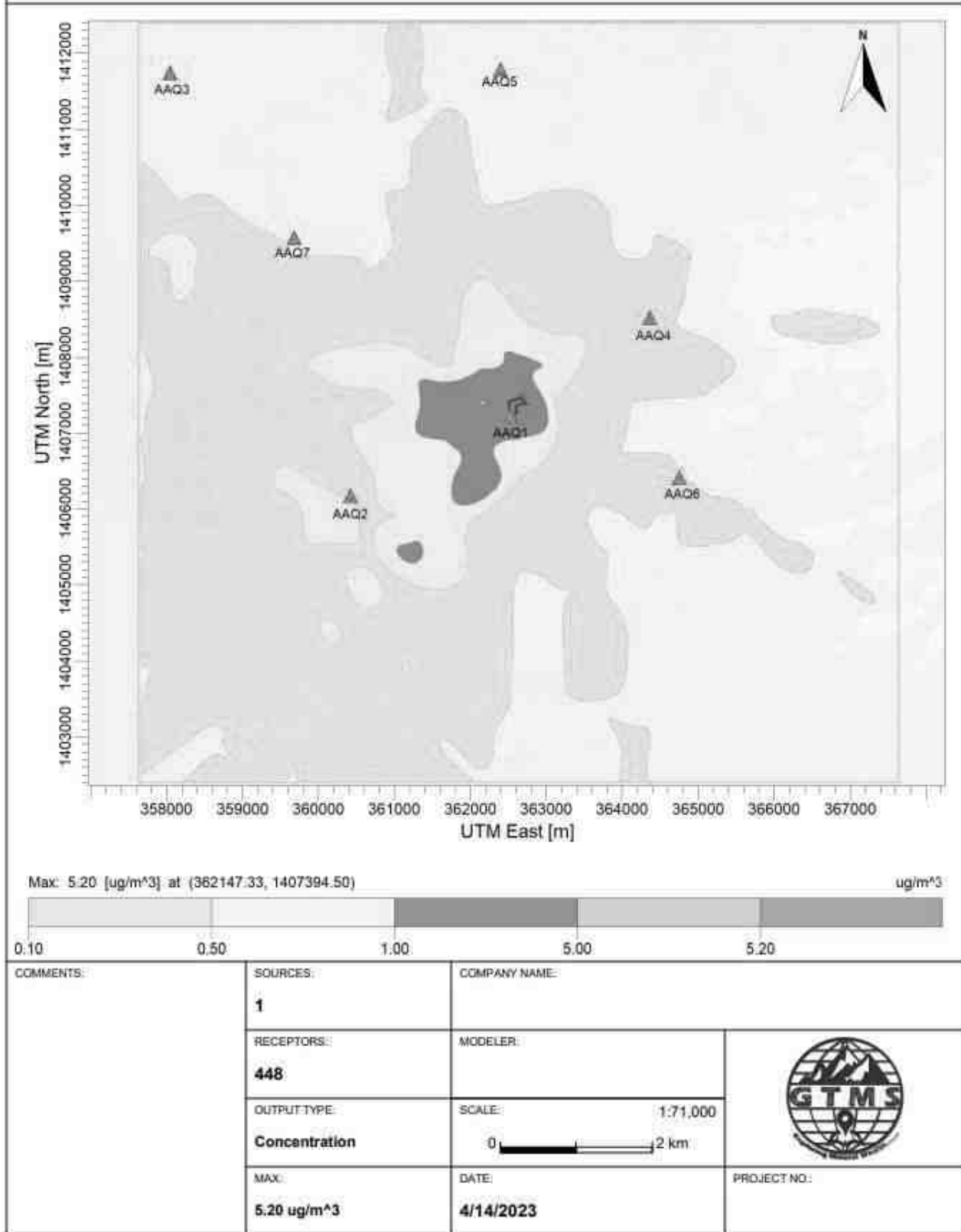
AERMOD View - Lakes Environmental Software

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Figure 4.2 Predicted Incremental Concentration of PM₁₀

PROJECT TITLE:

GOVINDASAMY ROUGHSTONE AND GRAVEL QUARRY PROJECT_SO2



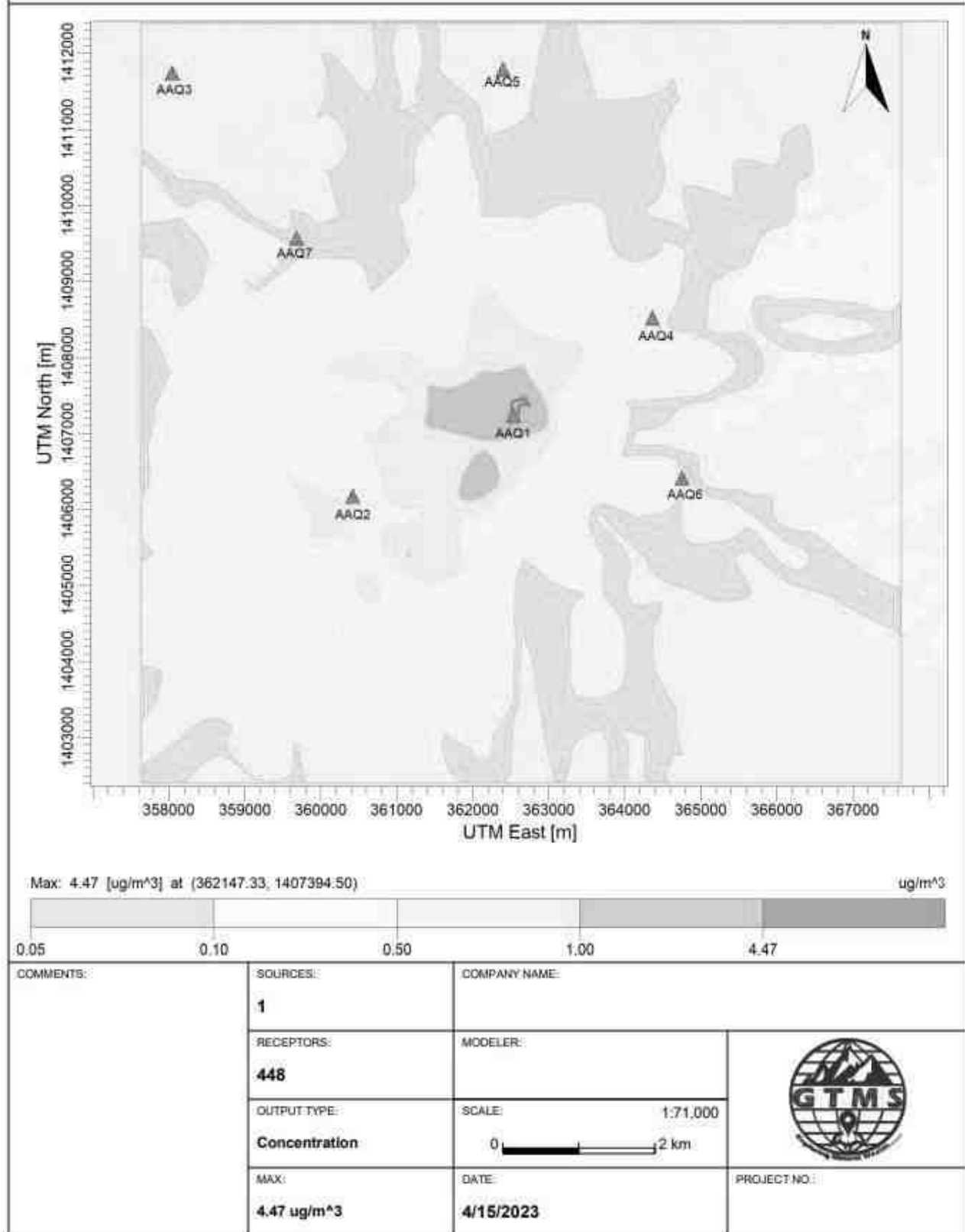
AERMOD View - Lakes Environmental Software

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Figure 4.3 Predicted Incremental Concentration of SO₂

PROJECT TITLE:

GOVINDASAMY ROUGHSTONE AND GRAVEL QUARRY PROJECT_NOx



AERMOD View - Lakes Environmental Software

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Figure 4.4 Predicted Incremental Concentration of NO_x

Table 4.5 Incremental & Resultant GLC of SO₂

| Station ID | Distance to core area (km) | Direction | SO ₂ concentrations($\mu\text{g}/\text{m}^3$) | | | Comparison against air quality standard ($80 \mu\text{g}/\text{m}^3$) | Magnitude of change (%) | Significance |
|------------|----------------------------|-----------|--|-----------|-------|---|-------------------------|-----------------|
| | | | Base line | Predicted | Total | | | |
| AAQ1 | -- | -- | 9.5 | 5.20 | 14.7 | Below standard | 54.74 | Not significant |
| AAQ2 | 2.3 | SW | 7.0 | 1 | 8 | | 14.29 | |
| AAQ3 | 4.95 | NW | 7.4 | 0 | 7.4 | | 0.00 | |
| AAQ4 | 1.98 | NE | 6.6 | 0.5 | 7.1 | | 7.58 | |
| AAQ5 | 4.34 | N | 7.3 | 0 | 7.3 | | 0.00 | |
| AAQ6 | 2.36 | ESE | 9.6 | 0.5 | 10.1 | | 5.21 | |
| AAQ7 | 3.56 | NW | 6.5 | 0 | 6.5 | | 0.00 | |

Table 4.6 Incremental & Resultant GLC of NO_x

| Station ID | Distance to core area (km) | Direction | NO _x concentrations($\mu\text{g}/\text{m}^3$) | | | Comparison against air quality standard ($80 \mu\text{g}/\text{m}^3$) | Magnitude of change (%) | Significance |
|------------|----------------------------|-----------|--|-----------|-------|---|-------------------------|-----------------|
| | | | Base line | Predicted | Total | | | |
| AAQ1 | -- | -- | 16.6 | 4.47 | 21.8 | Below standard | 31.33 | Not significant |
| AAQ2 | 2.3 | SW | 11.0 | 1 | 12 | | 9.09 | |
| AAQ3 | 4.95 | NW | 16.9 | 0 | 16.9 | | 0.00 | |
| AAQ4 | 1.98 | NE | 15.8 | 0.5 | 16.3 | | 3.16 | |
| AAQ5 | 4.34 | N | 14.0 | 0 | 14 | | 0.00 | |
| AAQ6 | 2.36 | ESE | 18.5 | 0.5 | 19 | | 2.70 | |
| AAQ7 | 3.56 | NW | 15.0 | 0 | 15 | | 0.00 | |

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

4.4.3 Common Mitigation Measures

Drilling

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

Advantages of Wet Drilling

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

Blasting

- ❖ Suitable time of blasting will be chosen according to the local conditions and water will be sprinkled on blasting face.
- ❖ Blasting will be avoided when temperature inversion is likely to occur and strong wind blows towards residential areas.
- ❖ Controlled blasting will be carried out using suitable explosive charge and short delay detonators, adequate stemming of holes at collar zone.
- ❖ Blasting will be restricted to a particular time of the day i.e., at the time of lunch hours.
- ❖ Before loading of material water will be sprayed on blasted material.
- ❖ Dust mask will be provided to the workers and their use will be strictly monitored.

Haul Road and Transportation

- ❖ Water will be sprinkled on haul roads twice a day to avoid dust generation during transportation
- ❖ Transportation of material will be carried out during day time and material will be covered with tarpaulin
- ❖ The speed of tippers plying on the haul road will be limited to < 20 km/hr to avoid generation of dust
- ❖ Water sprinkling on haul roads and loading points will be carried out twice a day
- ❖ Main source of gaseous pollution will be from vehicle used for transportation of mineral; therefore, weekly maintenance of machines improves combustion process and reduces pollution

- ❖ The un-metalled haul roads will be compacted weekly before being put into use
- ❖ Overloading of tippers will be avoided to prevent spillage
- ❖ It will be ensured that all transportation vehicles carry a valid PUC certificate
- ❖ Haul roads and service roads will be graded to clear accumulation of loose materials

Green Belt

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

Occupational Health

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

4.5 NOISE ENVIRONMENT

Noise pollution is mainly due to operation like drilling, plying of trucks & HEMM. These activities will not cause any problem to the inhabitants of this area because there is no human settlement in close proximity to the project area. Noise modelling has been carried out considering compressor operation (drilling) and transportation activities.

Predictions have been carried out to compute the noise level at various distances around the working pit due to these major noise-generating sources. 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.

$$Lp_2 = Lp_1 - 20 \log (r_2/r_1) - Ae_{1,2}$$

Where,

Lp_1 & Lp_2 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.

$$Lp_{total} = 10 \log \{10^{(Lp_1/10)} + 10^{(Lp_2/10)} + 10^{(Lp_3/10)} + \dots\}$$

4.5.1 Anticipated Impact

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
- 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 4.7.

Table 4.7 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 |
| Total | | | 95.8 |

*50 feet from source = 15.24 meters

Source: U.S. Department of Transportation (Federal Highway Administration) – Construction Noise Handbook

The total noise to be produced by mining activity is calculated to be 95.8 dB (A). Generally, most mining operations produce noise between 100-109 dB (A). We have considered equipment and operation noise levels (max) to be approx. 109 dB (A) for noise prediction modelling.

Table 4.8 Predicted Noise Incremental Values

| Noise Monitoring Location | Distance From Project Site(m) | Baseline Noise Level (dBA)m During Day Time | Predicted Noise Level (dBA) | Total (dBA) |
|---------------------------|--|---|-----------------------------|-------------|
| Core | 100 | 42.4 | 57.16 | 57.30 |
| Surutal | 920 | 40.6 | 37.88 | 42.46 |
| Chinna Elacheri | 2280 | 38.4 | 30.00 | 38.99 |
| Vadakalpakkam | 4900 | 39.8 | 23.36 | 39.90 |
| Arpakkam | 2000 | 40.2 | 31.14 | 40.71 |
| Kalakattur | 4410 | 41.6 | 24.27 | 41.68 |
| Magaral | 2380 | 42.6 | 29.63 | 42.81 |
| Girijapuram | 3510 | 39.8 | 26.25 | 39.99 |
| NAAQ Standards | Industrial Day Time - 75 dB (A) & Night Time- 70 dB (A) Residential Day Time -55 dB (A) & Night Time- 45 dB (A) | | | |

The incremental noise level is found to be 57.16 dB (A) in core zone and ranges between 23.36 and 37.88dB (A) in buffer zone. The noise level at different receptors in buffer zone is lower due to the distance involved and other topographical features adding to the noise attenuation. The resultant Noise level due to monitored values and calculated values at the receptors are based on the mathematical formula considering attenuation due to several factors including ground reflection, atmosphere, wind speed, temperature, trees, and buildings as 35.5 dB (A), the barrier effect. 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 (The Principal Rules were published in the Gazette of India, vide S.O.123(E), dated 14.2.2000 and subsequently amended vide S.O. 1046(E), dated 22.11.2000, S.O. 1088(E), dated 11.10.2002, S.O. 1569 (E), dated 19.09.2006 and S.O. 50 (E) dated 11.01.2010 under the Environment(Protection) Act, 1986.).

4.5.2 Common Mitigation Measures

The following noise mitigation measures are proposed for control of noise:

- ❖ Usage of sharp drill bits while drilling which will help in reducing noise
- ❖ Secondary blasting will be totally avoided and hydraulic rock breaker will be used for breaking boulders
- ❖ Controlled blasting with proper spacing, burden, stemming and optimum charge/delay will be maintained
- ❖ The blasting will be carried out during favourable atmospheric condition and less human activity timings by using nonelectrical initiation system

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

4.5.3 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 kuchha 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. Nearest habitation from the proposed project areas is listed in below table. 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 4.9 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 | 78 | 920 | 0.29 | 23 | 0.17 | 139 |

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

| Location ID | Maximum Charge in kgs | Radial Distance in m | PPV in mm/s | Fly rock distance in m | Air Blast | |
|-------------|-----------------------|----------------------|-------------|------------------------|----------------|------------------|
| | | | | | Pressure (kPa) | Sound Level (dB) |
| P1 | 78 | 100 | 10.29 | 23 | 2.44 | 162 |
| | | 200 | 3.39 | | 1.06 | 154 |
| | | 300 | 1.77 | | 0.65 | 150 |
| | | 400 | 1.12 | | 0.46 | 147 |
| | | 500 | 0.78 | | 0.35 | 145 |

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, 2nd Class Mines Manager/ 1st 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.

4.6 ECOLOGY AND BIODIVERSITY

4.6.1 Impact on Ecology and Biodiversity

- 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
- The species in the lease area include herbs (7), trees (06), shrubs (05), climbers (02), creepers (01), grass (02). Quarry lease area has the highest abundance of *Prosopis juliflora* followed by *Azadirachta indica*, *Tectona grandis* and *Borassus flabellifer*. Trees are few and shrubs and herbs are more than trees.
- Most of the land in the buffer area is undulating terrain with crop lands, grass patches and small shrubs. Hence, there will be no effect on flora of the region.
- Carbon released from quarrying machineries and tippers during quarrying would be 3949 kg per day, 1066219 kg per year and 5331097 kg over five years, as provided in Table 4.11.

Table 4.11 Carbon Released During Five Years of Rough Stone and Gravel Production

| | Per day | Per year | Per five years |
|----------------------------------|---------|----------|----------------|
| Fuel consumption of excavator | 253 | 68268 | 341339 |
| Fuel consumption of compressor | 78 | 20952 | 104760 |
| Fuel consumption of tipper | 1143 | 308623 | 1543117 |
| Total fuel consumption in liters | 1473 | 397843 | 1989215 |
| CO ₂ emission in kg | 3949 | 1066219 | 5331097 |

4.6.2 Mitigation Measures on Flora

- ❖ During conceptual stage, the top bench will be re-vegetated by planting local /native species and lower benches will be converted into rainwater harvesting structure following completion of mining activities, which will replace habitat resources for fauna species in this locality over a longer time.
- ❖ 20 *Borassus flabellifer* trees are protected in 7.5-meter Safety zone without any damage during quarrying. As the survival rate due to uprooting was only 30%, 20 seedlings were procured at 10 seedlings per tree. Seedlings are planted and protected in a 7.5- and 50-meter safety zone.
- ❖ Existing roads will be used; new roads will not be constructed to reduce impact on flora.

Carbon Sequestration

- ❖ To mitigate carbon emission due to mining activities, we recommend planting trees around the quarry to offset the carbon emission during quarrying. A tree can sequester 24 kg of carbon per year. Therefore, we recommend planting large number of trees around the quarry and near school campuses, government wasteland, roadsides etc.
- ❖ As per the greenbelt development plan as recommended by SEAC (Table 4.13), about 2183 trees will be planted within three months from the beginning of mining. These trees, when grown up would sequester carbon of about 129 kg of the total carbon, as provided in Table 4.12.

Table 4.12 CO₂ Sequestration

| | | | |
|--|-------|---------|---------|
| CO ₂ sequestration in kg | 129 | 34825 | 174126 |
| Remaining CO ₂ not sequestered in kg | 3820 | 1031394 | 5156972 |
| Trees required for environmental compensation | 42975 | | |
| Area required for environmental compensation in hectares | 86 | | |

Greenbelt Development

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. This habitat improvement program would ensure the faunal species to re-colonize and improve the abundance status in the core zone. Greenbelt development plan and budget required for green belt development plan are given in Tables 4.14-4.15. For greenbelt development, species are recommended, as shown in Table 4.12 on the basis of:

- ❖ Natural growth of existing species and survival rate of various species.
- ❖ Suitability of a particular plant species for a particular type of area.
- ❖ Creating of biodiversity.
- ❖ Fast growing, thick canopy copy, perennial and evergreen large leaf area.
- ❖ Efficient in absorbing pollutants without major effects of natural growth.

Table 4.13 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 Well distinct in Palisade & Spongy parenchyma. 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 | Nettilingam | Tree | |
| 4 | <i>Albizia lebbek</i> | Fabaceae | Vagai | Tree | |
| 5 | <i>Delonix regia</i> | Fabaceae | Cemmayir-konrai | Tree | |
| 6 | <i>Bauhinia racemosa</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 4.14 Greenbelt Development Plan

| | No. of trees proposed for plantation | No. of trees expected to survive @ 80% | Area to be covered(m ²) |
|---|--|--|-------------------------------------|
| Plantation in the construction phase (3 months) | Number of plants inside the mine lease area | | |
| | 581 | 465 | 5229 |
| | Number of plants outside the mine lease area | | |
| | 872 | 697 | 7844 |
| Total | 1453 | 1162 | 13073 |

Table 4.15 Budget for Greenbelt Development Plan

| Activity | Plantation in the construction phase(3Months) | Cost | Capital Cost (Rs.) | Recurring Cost-per annum |
|---|---|--|--------------------|--------------------------|
| Plantation inside the mine lease area (in safety margins) | 581 | Site clearance, preparation of land, digging of pits / trenches, soil amendments, transplantation of saplings @ 200 per plant (capital) for plantation | 116200 | 17430 |

| | | | | |
|-----------------------------|-----|--|--------|-------|
| | | inside the lease area and @ 30 per plant maintenance (recurring))" | | |
| Plantation outside the area | 872 | Avenue Plantation @ 300 per plant (capital) for plantation outside the lease area and @ 30 per plant maintenance (recurring) | 261450 | 26145 |
| Total | | | 377650 | 43575 |

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. Anticipated Impact on Fauna

- ❖ There is no Wildlife Sanctuary and Biosphere Reserve within 10 km radius of the project site.
- ❖ No rare, endemic & endangered species are reported in the buffer zone. However, during the course of mining, the management will practice scientific method of mining with proper Environmental Management Plan including pollution control measures especially for air and noise, to avoid any adverse impact on the surrounding wildlife.
- ❖ Fencing around all the proposed mine lease areas will be constructed to restrict the entry of stray animals
- ❖ Green belt development will be carried out which will help in minimizing adverse impact on the flora found in the area.

4.6.4 Measures for Protection and Conservation of Wildlife Species

- ❖ All the preventive measures will be taken for growth & development of fauna.
- ❖ Creating and development awareness for nature and wildlife in the adjoin villages.
- ❖ The workers shall be trained to not harm any wildlife, should it come near the project site. No work shall be carried out after 6.00 pm.
- ❖ Undertaking mitigation measures for conducive environment to the flora and fauna in consultation with Forest Department.
- ❖ Dust suppression system will be installed within mine and periphery of mine for proposed project
- ❖ Plantation around mine area will help in creating habitats for small faunal species and to
- ❖ create better environment for various fauna. Creating and developing awareness for nature and wildlife in the adjoining villages.

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.

Table 4.16 Ecological Impact Assessments

| S. No | Attributes | Assessment |
|--------------|---|--|
| 1 | Activities of the project affects the breeding/nesting sites of birds and animals | No breeding and nesting sites were identified in the lease area. |
| 2 | Located near an area populated by rare or endangered species | No endangered, critically endangered, vulnerable species were sighted in core area. |
| 3 | Proximity to national park/wildlife sanctuary/reserve forest /mangroves/ coastline/estuary/sea | Marutham reserve forest is located in 7.03km southeast. There are no national parks or eco-sensitive zones around 10 km radius. |
| 4 | Proposed project restricts access to waterholes for wildlife | No. The proposed project does not restrict access to water holes for wildlife. |
| 5 | Proposed mining project impact surface water quality that also provide water to wildlife | No scheduled or threatened wildlife animal were sighted in core area. |
| 6 | Proposed mining project increase siltation that would affect nearby biodiversity area. | Surface runoff management system will be developed properly. So, there will be no siltation in nearby mining area. |
| 7 | Risk of fall/slip or cause death to wild animals due to project activities | Barbed wire fencing will be installed around the lease area. Therefore, wild animals will not fall into the quarry pit. |
| 8 | The project release effluents into a water body that also supplies water to a wildlife | No water bodies were found close to core zone so chances of water becoming polluted will be low. |
| 9 | Mining project effect the forest-based livelihood/ any specific forest product on which local livelihood depended | No. The proposed project does not involve any forestland. Therefore, it will not affect the livelihood of people depending the forest product. |
| 10 | Project likely to affect migration routes | No migration routes were found crossing the lease area. |
| 11 | Project likely to affect flora of an area, which have medicinal value | No flora with medicinal values were found in the study area. |
| 12 | Forestland is to be diverted, has carbon high sequestration | As the proposed project does not involve any forestland, there will be no need for diversion. |
| 13 | The project likely to affect wetlands, fish breeding grounds, marine ecology | Wetland was not present in and around mining lease area. No fish breeding grounds were present in core area. |

Table 4.17 Anticipated Impact of Ecology and Biodiversity

| S. No | Aspect Description | Likely Impacts on Ecology and Biodiversity (EB) | Impact Consequence - Probability Description / Justification | Significance | Mitigation Measures |
|------------------|---|---|---|--------------|--|
| Pre-Mining Phase | | | | | |
| 1 | Uprooting of vegetation of lease area | Site specific loss of common floral diversity (Direct impact) | Site possesses common floral (not trees) species. Clearance of these species will not result in loss of flora | Less severe | No immediate action required. However, Greenbelt /plantation will be developed in project site and in periphery of the project boundary, which will improve flora and fauna diversity of the project area. |
| | | Site specific loss of associated faunal diversity (Partial impact) | Site supports only common species, which use wide variety of habitats of the buffer zone reserve forest area. So, there is no threat of faunal diversity. | | |
| | | -Loss of Habitat (Direct impact) | Site does not form Unique / critical habitat structure for unique flora or fauna. | | |
| Mining Phase | | | | | |
| 2 | Excavation of mineral using machine and labours, Transportation activities will generate noise. | Site-specific disturbance to normal faunal movements at the site due to noise. (Partial impact) | Site does not form unique / critical habitat structure for unique flora or fauna. | Less severe | Mining activity should not be operated after 5PM. Excavation of dump and transportation work should stop before 7PM. |

| | | | | | |
|---|--|--|---|-------------|--|
| 3 | Vehicular Movement for transportation of materials will result in generation of dust (SPM) due to haul roads and emission of SO ₂ , NO ₂ , CO etc. | Impact on surrounding agriculture and associated fauna due to deposition of dust and Emission of CO. (Indirect impact) | Impact is less as the agricultural land far from core area. | Less severe | All vehicles will be certified for appropriate Emission levels. More plantation has been suggested. Upgrade the vehicles with alternative fuel such as biodiesel, methanol and biofuel around the mining 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
- ❖ Increase in Employment opportunities both direct and indirect thereby increasing economic status of people of the region.

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

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 discharge 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 III, there is no major history of landslides, earthquake, and subsidence etc., recorded in the 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 Semi Mechanized mining method with secondary blasting will be applied to extract rough stone 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 / trippers 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 Semi 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.

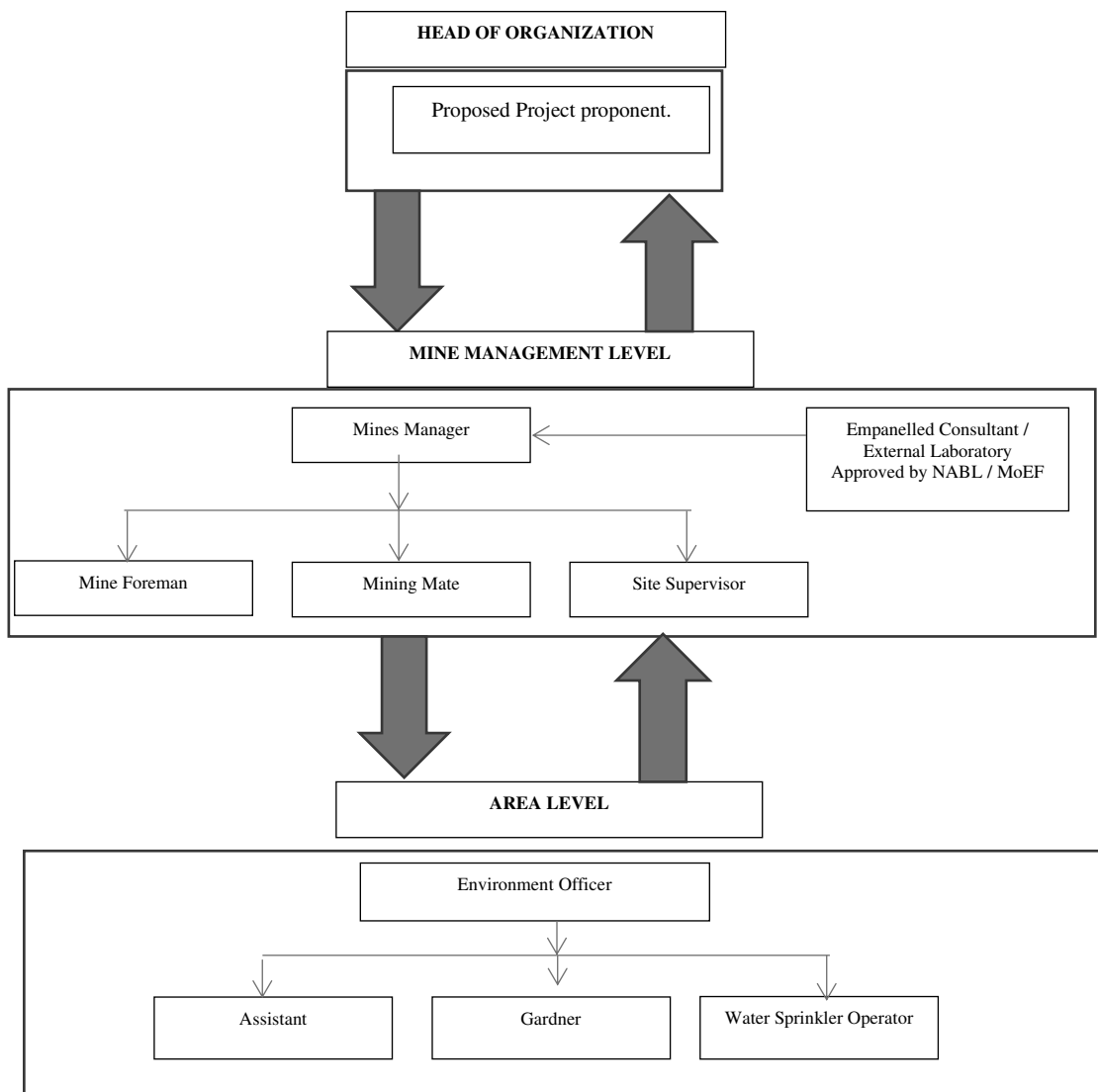


Figure 6.1 Proposed Environmental Monitoring Chart

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 _{2.5} , PM ₁₀ , SO ₂ and NO _x . |
| 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/- |
| Total | | - | Rs 2,95,000 /- |

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:

- ❖ Risk Assessment
- ❖ Disaster Management Plan
- ❖ Cumulative Impact Study
- ❖ Plastic Waste Management
- ❖ Post-COVID Health Management Plan

7.1 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 31st 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 | 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; |

| | | | |
|---|----------|--|--|
| | | | <p>Workers will be sent to the Training in the nearby Group Vocational Training Centre Entry of unauthorized persons will be prohibited;</p> <p>Fire-fighting and first-aid provisions in the mine office complex and mining area;</p> <p>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</p> <p>Working of quarry, as per approved plans and regularly updating the mine plans;</p> <p>Cleaning of mine faces on daily basis shall be daily done in order to avoid any overhang or undercut;</p> <p>Handling of explosives, charging and firing shall be carried out by competent persons only under the supervision of a Mine Manager;</p> <p>Maintenance and testing of all mining equipment as per manufacturer's guidelines.</p> |
| 2 | Drilling | <p>Improper and unsafe practices</p> <p>Due to high pressure of compressed air, hoses may burst</p> <p>Drill Rod may break</p> | <p>Safe operating procedure established for drilling (SOP) will be strictly followed.</p> <p>Only trained operators will be deployed.</p> <p>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,</p> <p>Drilling shall not be carried on simultaneously on the benches at places directly one above the other.</p> <p>Periodical preventive maintenance and replacement of worn-out accessories in the compressor and drill equipment as per operator manual.</p> <p>All drills unit shall be provided with wet drilling shall be maintained in efficient working in condition.</p> <p>Operator shall regularly use all the personal protective equipment.</p> |

| | | | |
|---|----------------|---|---|
| 4 | Blasting | <p>Fly rock, ground vibration, Noise and dust.</p> <p>Improper charging, stemming & Blasting/fining of blast holes</p> <p>Vibration due to movement of vehicles</p> | <p>Restrict maximum charge per delay as per regulations and by optimum blast hole pattern, vibrations will be controlled within the permissible limit and blasting can be conducted safely.</p> <p>SOP for Charging, Stemming & Blasting/Firing of Blast Holes will be followed by blasting crew during initial stage of operation</p> <p>Shots are fired during daytime only.</p> <p>All holes charged on any one day shall be fired on the same day.</p> <p>The danger zone will be distinctly demarcated (by means of red flags)</p> |
| 5 | Transportation | <p>Potential hazards and unsafe workings contributing to accident and injuries</p> <p>Overloading of material</p> <p>While reversal & overtaking of vehicle</p> | <p>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.</p> <p>Not allow any unauthorized person to ride on the vehicle nor allow any unauthorized person to operate the vehicle.</p> <p>Concave mirrors should be kept at all corners</p> <p>All vehicles should be fitted with reverse horn with one spotter at every tipping point</p> <p>Loading according to the vehicle capacity</p> <p>Periodical maintenance of vehicles as per operator manual</p> |

| | | | |
|---|---------------------------------------|--|--|
| | | Operator of truck leaving his cabin when it is loaded. | |
| 6 | Natural Calamities | Unexpected happenings | Escape Routes will be provided to prevent inundation of storm water Fire Extinguishers & Sand Buckets |
| 7 | Failure of mine benches and pit slope | Slope geometry, Geological structure | Ultimate or over all pit slope shall be below 60° and each bench height shall be 5m height. |

Source: Analysed and Proposed by FAE & EC

7.2 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 III. 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.

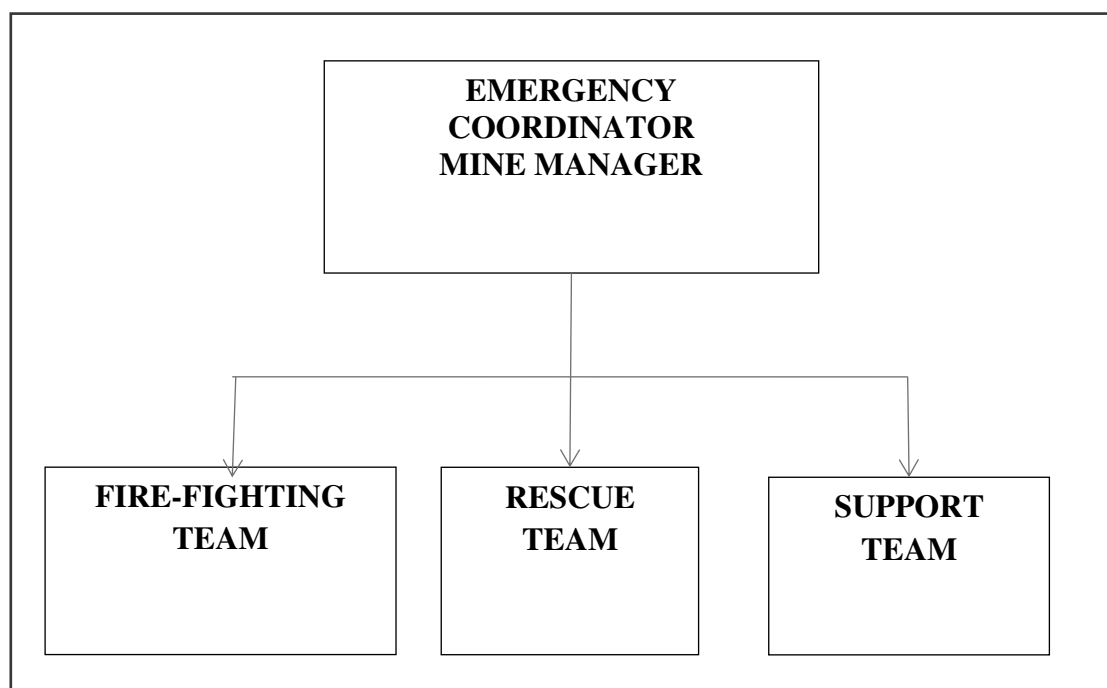


Figure 7.1 Disaster management team layout for proposed project

The emergency organization shall be headed by emergency coordinator who will be qualified competent mines manager. In his absence senior most people available at the mine shall be emergency coordinator till arrival of mines manager. There would be three teams for taking care of emergency situations – Fire-Fighting Team, Rescue Team and Support Team. The proposed composition of the teams is given in Table 7.2.

Table 7.2 Proposed Teams for Emergency Situation

| DESIGNATION | QUALIFICATION |
|---|---------------------|
| FIRE-FIGHTING TEAM | |
| Team Leader/ Emergency Coordinator (EC) | Mines Manager |
| Team Member | Mines Foreman |
| Team Member | Mining Mate |
| RESCUE TEAM | |
| Team Leader/ Emergency Coordinator (EC) | Mines Manager |
| Team Member/ Incident Controller (IC) | Environment Officer |
| Team Member | Mining Foreman |

| SUPPORT TEAM | |
|---|---------------------|
| Team Leader/ Emergency Coordinator (EC) | Mines Manager |
| Assistant Team Leader | Environment Officer |
| Team Member | Mining Mate |
| Security Team Leader/ Emergency Security Controller | Mines Foreman |

Once the mine becomes operational, the above table along with names of personnel will be prepared and made easily available to workers for respective proposed quarries. A mobile communication network and wireless shall connect Mine Emergency Control Room (MECR) to control various departments of the mine, fire station and neighbouring industrial units/mines.

7.2.1 Roles and Responsibilities of Emergency Team

(a) Emergency coordinator (EC)

The emergency coordinator shall assume absolute control of site and shall be located at MECR.

(b) Incident controller (IC)

Incident controller shall be a person who shall go to the scene of emergency and supervise the action plan to overcome or contain the emergency. Shift supervisor or Environmental Officer shall assume the charge of IC.

(c) Communication and advisory team

The advisory and communication team shall consist of heads of Mining Departments i.e., Mines Manager

(d) Roll call coordinator

The Mine Foreman shall be Roll Call Coordinator. The roll call coordinator will conduct the roll call and will evacuate the mine personnel to assembly point. His prime function shall be to account for all personnel on duty.

(e) Search and rescue team

There shall be a group of people trained and equipped to carryout rescue operation of trapped personnel. The people trained in first aid and fire-fighting shall be included in search and rescue team.

(f) Emergency security controller

Emergency Security Controller shall be senior most security person located at main gate office and directing the outside agencies e.g., fire brigade, police, doctor and media men etc.,

7.2.2 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

7.2.3 Proposed Fire Extinguishers

The following type of fire extinguishers has been proposed at strategic locations within the mine, as shown in Table 7.3.

Table 7.3 Proposed Fire Extinguishers at Different Locations in P1

| Location | Type of Fire Extinguishers |
|----------------------|--|
| Electrical Equipment | CO ₂ type, foam type, dry chemical powder type |
| Fuel Storage Area | CO ₂ type, foam type, dry chemical powder type, Sand bucket |
| Office Area | Dry chemical type, foam type |

7.2.4 Alarm System

On receiving the message of disaster from Site Controller, fire-fighting team, the mine control room attendant will sound siren wailing for 5 minutes. Incident controller will arrange to broadcast disaster message through public address system. On receiving the message of "Emergency Over" from Incident Controller the emergency control room attendant will give "All Clear Signal", by sounding alarm straight for 2 minutes.

The features of alarm system will be explained to one and all to avoid panic or misunderstanding during disaster. In order to prevent or take care of hazard / disasters if any the following control measures have been adopted.

- ❖ Fire-fighting and first-aid provisions in the mines office complex and mining area are provided.
- ❖ Provisions of all the safety appliances such as safety boot, helmets, goggles, dust masks, ear plugs and ear muffs etc. are made available to the employees and the use of same is strictly adhered to through regular monitoring.
- ❖ Training and refresher courses for all the employees working in hazardous premises.
- ❖ Working of mine, as per approved plans and regularly updating the mine plans.
- ❖ Cleaning of mine faces is regularly done.
- ❖ Handling of explosives, charging and blasting are carried out only by qualified persons following SOP.
- ❖ Checking and regular maintenance of garland drains and earthen bunds to avoid any inflow of surface water in the mine pit.
- ❖ Provision of high-capacity standby pumps with generator sets with enough quantity of diesel for emergency pumping especially during monsoon.
- ❖ A blasting SIREN is used at the time of blasting for audio signal.
- ❖ Before blasting and after blasting, red and green flags are displayed as visual signals.
- ❖ Warning notice boards indicating the time of blasting and NOT TO TRESPASS are displayed at prominent places.
- ❖ Regular maintenance and testing of all mining equipment were carried out as per manufacturer's guidelines.

7.3 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, 2 proposed projects, known as P1 and P2 are taken into consideration. The details of P1 have been given in Table 1.2 and the details of P2 given in Table 7.4.

Table 7.4 Salient Features of Proposed Project Site “P2”

| | | |
|---|---|--------------------------|
| Name of the Quarry | Sri Sai Infrastructures - Rough stone and Gravel quarry | |
| Toposheet No. | 57-P/ 10 | |
| Geographic Coordinates of Project Site Centre | Latitude: 12°43'41.06"N, Longitude: 79°43'40.69"E | |
| Highest Elevation | 72 m AMSL | |
| Proposed Depth of Mining | 20 m BGL (2 m gravel + 18 m rough stone) for the first 5 years | |
| Geological Resources | Rough Stone in m ³ | Gravel in m ³ |
| | 11,36,275 | 52,850 |
| Mineable Reserves for 10 years | Rough Stone in m ³ | Gravel in m ³ |
| | 4,84,640 | 42,160 |
| Production for 5 years | 2,99,140 | |
| Existing Pit Dimension | Nil | |
| Ultimate Pit Dimension | 155 m (L) x 136 m (W) x 45 m (D) | |
| Method of Mining | Opencast mining involving drilling and blasting | |
| Topography | Flat terrain with the average elevation of 72 m AMSL. | |
| Machinery proposed | Jack Hammer | 3 Nos |
| | Compressor | 1 Nos |
| | Hydraulic excavator with rock breaker | 1 No |
| | Tippers | 2 Nos |
| Blasting Method | Controlled blasting method using shot drill holes of 25 mm diameter and slurry explosives will be adopted for shattering rough stone and gravel. No deep hole drilling is proposed. | |
| Proposed Manpower | 28 Nos | |
| Project Cost | Rs.68,65,050/- | |
| CER cost @ 2% of project cost | Rs. 1,37,301/- | |
| Water Requirement | 4.3 KLD | |

The cumulative impact is mainly anticipated due to drilling & blasting and excavation and transportation activities in all the quarries (proposed and existing) within the cluster and major impact anticipated is on Air & Noise Environment and Ground vibrations due to blasting.

7.3.1 Air Environment

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

Table 7.5 Cumulative Production Load of Rough Stone

| Proposed Production Details | | | | |
|------------------------------------|---------------------------------|----------------------------------|---------------------------------|-------------------------------------|
| Quarry | 5 Years in m³ | Per Year in m³ | Per Day in m³ | Number of Lorry Load Per Day |
| P1 | 417131 | 83426 | 309 | 51 |
| P2 | 299140 | 59828 | 222 | 37 |
| Grand Total | 716271 | 143254 | 531 | 88 |

Table 7.6 Cumulative Production Load of Gravel

| Proposed Production Details | | | | |
|------------------------------------|---------------------------------|----------------------------------|---------------------------------|-------------------------------------|
| Quarry | 2 Years in m³ | Per Year in m³ | Per Day in m³ | Number of Lorry Load Per Day |
| P1 | 45804 | 22902 | 85 | 14 |
| P2 | 42160 | 14053 | 52 | 9 |
| Grand Total | 87964 | 36955 | 137 | 23 |

The cumulative study shows that the overall production of rough stone from the 2 quarry is 531 m³ per day with a capacity of 88 trips per day, gravel from the 2 quarry is 137 m³ per day with a capacity of 23 trips per day.

7.3.1.1 Cumulative Impact of Air Pollutants

The results on the cumulative impact of the two proposed project on air environment of the cluster have been provided in Table 7.7. The cumulative values resulting from the two projects for each pollutant do not exceed the permissible limits set by CPCB.

Table 7.7 Cumulative impact results from the two proposed project

| Pollutants | Baseline Data (µg/m³) | Incremental Values (µg/m³) | | Cumulative Value (µg/m³) |
|-------------------|---|--|-----------|--|
| | | P1 | P2 | |
| PM _{2.5} | 20.4 | 6.49 | 4.65 | 31.54 |
| PM ₁₀ | 39.8 | 12.9 | 9.25 | 61.95 |
| SO ₂ | 9.5 | 5.20 | 3.73 | 18.43 |
| NO ₂ | 16.6 | 4.47 | 3.21 | 24.28 |

7.3.2 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 7.8 Predicted Noise Incremental Values from Cluster

| 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 | 920 | N | 39.8 | 37.88 | 41.96 | 55 |
| Habitation Near P2 | 1060 | N | 39.8 | 36.65 | 41.52 | |
| Cumulative Noise (dB(A)) | | | | | 44.57 | |

Source: Lab Monitoring Data

The cumulative analysis of noise due to 2 proposed project shows that habitation near P1 and P2 will receive about 44.57 dB (A), as shown in Table 7.8. The cumulative results for the habitation in consideration do not exceed the limit set by CPCB for residential areas for day time.

7.3.3 Ground Vibrations

Cumulative results of ground vibrations due to mining activities in the all the 4 mines have been shown in Table 7.9.

Table 7.9 Ground Vibrations at 4 Mines

| Location ID | Maximum Charge in kgs | Nearest Habitation in m | PPV in mm/s |
|--------------|-----------------------|-------------------------|-------------|
| P1 | 78 | 920 | 0.29 |
| P2 | 56 | 1060 | 0.18 |
| E1 | 84 | 1000 | 0.27 |
| E2 | 40 | 1300 | 0.09 |
| Total | | | 0.83 |

Source: Blasting Calculations

From the above table, the charge per blast is considered as maximum in each mine and the resultant cumulative PPV 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.

7.3.4 Socio Economic Environment

Socio economic benefits of the two proposed projects were calculated and the results are shown in Tables 7.10. The one project will contribute Rs. 5,00,000 towards CER fund.

Table 7.10 Socio Economic Benefits from two Mines

| Location ID | Project Cost (Rs.) | CER as per SEAC Suggestion (Rs.) |
|--------------------|--------------------|----------------------------------|
| P1 | 8127500 | 5,00,000 |
| P2 | 68,65,050 | 5,00,000 |
| Grand Total | 14992550 | 10,00,000 |

Table 7.11 Employment Benefits from two Mines

| Location ID | Employment |
|--------------------|------------|
| P1 | 18 |
| P2 | 28 |
| Grand Total | 46 |

A total of 46 people will get employment due to 2 proposed mine in cluster.

7.3.5 Ecological Environment

Table 7.12 Greenbelt Development Benefits From 2 Mines

| ID | No of Trees proposed to be planted | Area to be Covered(m ²) | Name of the Species | No. of Trees expected to be grown @ 80% survival rate |
|--------------|------------------------------------|-------------------------------------|-------------------------|---|
| P1 | 1453 | 13073 | Neem, Pongamia, Teak | 1162 |
| P2 | 330 | 2975 | | 264 |
| Total | 1783 | 16048 | | 1426 |

Cumulative studies show that the two proposed projects will plant about 1783 native tree species like Neem, Teak, etc both inside and outside the lease area. It is expected that 80 % of trees, i.e., 1426 trees will survive in this green belt development program.

7.3.6 Traffic Density

Table 7.4 shows that the two proposed projects will add 111 truck load per day, accounting for addition of 333 PCUs to the nearby roads.

7.4 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.

7.4.1 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 7.13.

Table 7.13 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

7.5 POST COVID HEALTH MANAGEMENT PLAN FOR PROPOSED PROJECT

COVID – 19 diseases caused by SARS-CoV-2 Coronavirus is relatively a new disease, with fresh information being known on a dynamic basis about the natural history of the disease, especially in terms of post-recovery events.

After acute COVID-19 illness, recovered patients may continue to report wide variety of signs and symptoms including fatigue, body ache, cough, sore throat, difficulty in breathing, etc. As of now there is limited evidence of post-COVID sequelae and further research is required and is being actively pursued. A holistic approach is required for follow up care and well-being of all post COVID recovering patients.

7.5.1 Post-COVID Follow up Protocol

- ❖ Continue COVID appropriate behaviour (use of mask, hand & respiratory hygiene, physical distancing).
- ❖ Drink adequate amount of warm water (if not contra-indicated).
- ❖ Make sure your workplaces are clean and hygienic
- ❖ Surfaces (e.g., desks and tables) and objects (e.g., telephones, helmet) need to be wiped with disinfectant regularly

- ❖ Put sanitizing hand rub dispensers in prominent places around the workplace. Make sure these dispensers are regularly refilled
- ❖ Display posters promoting hand-washing
- ❖ Make sure that staff, contractors and customers have access to places where they can wash their hands with soap and water
- ❖ Display posters promoting respiratory hygiene.
- ❖ Brief your employees, contractors and customers that if COVID-19 starts spreading in your community anyone with even a mild cough or low-grade fever (37.3°C or more) need to stay at home. They should also stay home (or work from home) if they have had to take simple medications, such as paracetamol/acetaminophen, ibuprofen or aspirin, which may mask symptoms of infection
- ❖ Keep communicating and promoting the message that people need to stay at home even if they have just mild symptoms of COVID-19.
- ❖ Consider whether a face-to-face meeting or event is needed. Could it be replaced by a teleconference or online event?
- ❖ Could the meeting or event be scaled down so that fewer people attend?
- ❖ Pre-order sufficient supplies and materials, including tissues and hand sanitizer for all employees. Have surgical masks available to offer anyone who develops respiratory symptoms.
- ❖ It is also suggested by the Ministry of AYUSH that the use of Chyawanprash in the morning (1 teaspoonful) with Luke warm water/milk is highly recommended (under the direction of Registered Ayurveda physician) as in the clinical practice Chyawanprash is believed to be effective in post-recovery period.
- ❖ If there is persistent dry cough / sore throat, do saline gargles and take steam inhalation. The addition of herbs/spices for gargling/steam inhalation. Cough medications, should be taken on advice of medical doctor or qualified practitioner of Ayush.
- ❖ Look for early warning signs like high grade fever, breathlessness, Sp O₂ < 95%, unexplained chest pain, new onset of confusion, focal weakness.
- ❖ Avoid smoking and consumption of alcohol.
- ❖ Communicate to your employees and contractors about the plan and make sure they are aware of what they need to do – or not do – under the plan. Emphasize key points such as the importance of staying away from work even if they have only mild symptoms or have had to take simple medications (e.g., paracetamol, ibuprofen) which may mask the symptoms

The plan should address how to keep your business running even if a significant number of employees, contractors and suppliers cannot come to your place of business - either due to local restrictions on travel or due to illness.

CHAPTER VIII

PROJECT BENEFITS

8.0 GENERAL

The proposed project at Magaral-B Village aims to produce **417131 m³** of rough stone and **45804 m³** of gravel 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 18 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 10 persons in the form of contractual jobs, business opportunities, service facilities etc. the economic status of the local people will be enhanced due to mining project.

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 is located in Magaral-B Village, Walajabad Taluk and Kancheepuram District is well established. The following physical infrastructure facilities will further improve due to proposed mine.

- ❖ 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 will be taken up in the Magaral-B village mainly contributing to education, health, training of women self-help groups and contribution to infrastructure etc., CSR budget is allocated as 2.5% of the profit.

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 ≤ 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 with reference to 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 |
| | Total | Rs.5, 00,000 |

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

8.8 SUMMARY OF PROJECT BENEFITS

The project would pay about **Rs. 3,18,46,871** 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.) | Budget for Gravel (Rs.) |
|---|------------------------------|-------------------------|
| CER | 5,00,000 | ----- |
| Seigniorage @ Rs.59/m ³ of rough stone Rs.33/m ³ of Gravel | 2,46,10,729 | 15,11,664 |
| District Mineral Foundation Tax @ 10% of Seigniorage | 24,61,073 | 1,51,166 |
| Green Tax @ 10% of Seigniorage | 24,61,073 | 1,51,166 |
| Total | 3,00,32,875 | 18,13,996 |

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 ENVIRONMENTAL POLICY

The project proponent is committed to conduct all its operations and activities in an environmentally responsible manner and to continually improve environmental performance.

The Proponent, **Mr. D. Govindasamy**, will:

- ❖ Meet the requirements of all laws, acts, regulations, and standards relevant to its operations and activities.
- ❖ Implement a program to train employees in general environmental issues and individual workplace environmental responsibilities.
- ❖ Allocate necessary resources to ensure the implementation of the environmental policy.
- ❖ Ensure that an effective closure strategy is in place at all stages of project development and that progressive reclamation is undertaken as early as possible to reduce potential long-term environmental and community impacts.
- ❖ Implement monitoring programs to provide early warning of any deficiency or unanticipated performance in environmental safeguards.
- ❖ Conduct periodic reviews to verify environmental performance and to continuously strive towards improvement.

10.1.1 Description of the Administration and Technical Setup

The environment monitoring cell discussed under chapter VI will ensure effective implementation of environment management plan and to ensure compliance of environmental statutory guidelines through mine management level of each proposed quarry. The said team will be responsible for:

- ❖ Monitoring of the water/ waste water quality, air quality and solid waste generated.
- ❖ Analysis of the water and air samples collected through external laboratory.

- ❖ Implementation and monitoring of the pollution control and protective measures/ devices which shall include financial estimation, ordering, installation of air pollution control equipment, waste water treatment plant, etc.
- ❖ Co-ordination of the environment related activities within the project as well as with outside agencies.
- ❖ Collection of health statistics of the workers and population of the surrounding villages.
- ❖ Green belt development.
- ❖ Monitoring the progress of implementation of the environmental monitoring program.
- ❖ Compliance to statutory provisions, norms of State Pollution Control Board, Ministry of Environment and Forests and the conditions of the environmental clearance as well as the consents to establish and consents to operate.

10.2 LAND ENVIRONMENT MANAGEMENT

Landscape of the area will be changed due to the quarrying operation, restoration of the land by converting the quarry pit into temporary reservoir and the remaining part of the area (unutilized areas, infrastructure, haul roads) will be utilized for greenbelt development. Aesthetic of the environment will not be affected. There is no major vegetation in the project area. During the course of quarrying operation and after completion of the quarrying operation thick plantation will be developed under greenbelt development program. A detailed land environment management plan has been provided in Table 10.1.

Table 10.1 Proposed Controls for Land Environment

| Control | Responsibility |
|---|----------------------------|
| Design vehicle wash-down areas so that all runoff water is captured and passed through oil water separators and sediment catchment devices. | Mines Manager |
| Refueling to be undertaken in a safe location away from vehicle movement pathways & 100m away of any watercourse. Refueling activity to be under visual observation at all times. Drainage of refueling areas to sumps with oil/water separation. | Mine Foreman & Mining Mate |
| Soil and groundwater testing as required following up a particular incident of contamination. | Mines Manager |
| At conceptual stage, the mining pits will be converted into Rain Water Harvesting. Remaining area will be converted into greenbelt area. | Mines Manager |
| No external dumping i.e., outside the project area. | Mine Foreman |
| Garland drains with catch pits / settlement traps to be provided all around the project area to prevent run off affecting the surrounding lands. | Mines Manager |
| The periphery of Project area will be planted with thick plantation to arrest the fugitive dust, which will also act as acoustic barrier. | Mines Manager |

Source: Proposed by FAEs & EIA Coordinator

10.3 SOIL MANAGEMENT

No top soil will be removed during the mining operation. Therefore, topsoil management plan is not provided here.

10.4 WATER MANAGEMENT

In the proposed quarrying project, no process is involved for the effluent generation, only oil & grease from the machinery wash and domestic sewage from mines office is anticipated. The quarrying operation is proposed up to a depth of 30 m. The water table in the area is at 60 m below ground level. Hence, the proposed project will not intersect the ground water table during entire quarry period. A detailed water environment management plan has been provided in Table 10.2.

Table 10.2 Proposed Controls for Water Environment

| Control | Responsibility |
|---|-----------------------|
| To maximize the reuse of pit water for water supply | Mines Foreman |
| Temporary and permanent garland drain will be constructed to contain the catchments of the mining area and to divert runoff from undisturbed areas through the mining areas | Mines Manager |
| Natural drains/nallahs/brooklets outside the project area should not be disturbed at any point of mining operations | Mines Manager |
| Ensure there is no process effluent generation or discharge from the project area into water bodies | Mines Foreman |
| Domestic sewage generated from the project area will be disposed in septic tank and soak pit system | Mines Foreman |
| Monthly or after rainfall, inspection for performance of water management structures and systems | Mines Manager |
| Conduct ground water and surface water monitoring for parameters specified by CPCB | Manager Mines |

Source: Proposed by FAEs & EIA Coordinator

10.5 AIR QUALITY MANAGEMENT

The proposed quarrying activity would result in the increase of particulate matter concentrations in the ambient air. Daily water sprinkling on the haul roads, approach roads in the vicinity will be undertaken and will be continued as there is possibility for dust generation due to truck mobility. It will be ensured that vehicles are properly maintained to comply with exhaust emission requirements. A detailed ambient air environment management plan is provided in Table 10.3.

Table 10.3 Proposed Controls for Air Environment

| Control | Responsibility |
|---|-----------------------|
| Generation of dust during excavation is minimized by daily (twice) water sprinkling on working face and daily (twice) water sprinkling on haul road | Mines Manager |
| Wet drilling procedure /drills with dust extractor system to control dust generation during drilling at source itself is implemented | Mines Manager |
| Maintenance as per operator manual of the equipment and machinery in the mines to minimizing air pollution | Mines Manager |
| Ambient air quality Monitoring carried out in the project area and in surrounding villages to assess the impact due to the mining activities and the efficacy of the adopted air pollution control measures | Mines Manager |
| Provision of dust mask to all workers | Mines Manager |
| Greenbelt development all along the periphery of the project area | Mines Manager |

Source: Proposed by FAEs & EIA Coordinator

10.6 NOISE POLLUTION CONTROL

There will be intermittent noise levels due to vehicular movement, trucks loading, drilling and blasting and cutting activities. No mining activities are planned during night time. A detailed noise environment management plan has been provided in Table 10.4.

Table 10.4 Proposed Controls for Noise Environment

| Control | Responsibility |
|--|-----------------------|
| Development of thick greenbelt all along the buffer zone (7.5 meters) of the project area to attenuate the noise and the same will be maintained | Mines Manager |
| Preventive maintenance of mining machinery and replacement of worn-out accessories to control noise generation | Mines Foreman |
| Deployment of mining equipment with an inbuilt mechanism to reduce noise | Mines Manager |
| Provision of earmuff / ear plugs to workers working in noise prone zones in the mines | Mining Mate |
| Provision of effective silencers for mining machinery and transport vehicles | Mines Manager |
| Provision of sound proof AC operator cabins to HEMM | Mines Manager |
| Sharp drill bits are used to minimize noise from drilling | Mines Foreman |
| Controlled blasting technologies are adopted by using delay detonators to minimize noise from blasting | Mines Manager |
| Annual ambient noise level monitoring is carried out in the project area and in surrounding villages to assess the impact due to the mining activities and the efficacy of the adopted noise control measures. Additional noise control measures will be adopted if required as per the observations during monitoring | Mines Manager |

| | |
|--|---------------|
| Reduce maximum instantaneous charge using delays while blasting | Mining Mate |
| Change the burden and spacing by altering the drilling pattern and/or delay layout, or altering the hole inclination | Mines Manager |
| Undertake noise or vibration monitoring | Mines Manager |

Source: Proposed by FAEs & EIA Coordinator

10.7 GROUND VIBRATION AND FLY ROCK CONTROL

The rough stone quarry operation creates vibration due to the blasting and movement of heavy earth moving machineries, fly rocks due to the blasting. A detailed ground vibration management plan has been provided in Table 10.5.

Table 10.5 Proposed Controls for Ground Vibrations & Fly Rock

| Control | Responsibility |
|---|----------------|
| Controlled blasting using delay detonators will be carried out to maintain the PPV value (below 8Hz) well within the prescribed standards of DGMS | Mines Manager |
| Drilling and blasting will be carried under the supervision of qualified persons | Mines Manager |
| Proper stemming of holes should be carried out with statutory competent qualified blaster under the supervision of statutory mines manager to avoid any anomalies during blasting | Mines Manager |
| Suitable spacing and burden will be maintained to avoid misfire / fly rocks | Manager Mines |
| Number of blast holes will be restricted to control ground vibrations | Manager Mines |
| Blasting will be carried out only during noon time | Mining Mate |
| Undertake noise or vibration monitoring | Mines Manager |
| ensure blast holes are adequately stemmed for the depth of the hole and stemmed with suitable angular material | Mines Foreman |

Source: Proposed by FAEs & EIA Coordinator

10.8 BIOLOGICAL ENVIRONMENT MANAGEMENT

The proponent will take all necessary steps to avoid the impact on the ecology of the area by adopting suitable management measures in the planning and implementation stage. During mining, thick plantation will be carried out around the project periphery, on safety barrier zone, on top benches of quarried out area etc. Following control measures are proposed for its management and will be the responsibility of the mines manager.

- ❖ Greenbelt development all along the safety barrier of the project area.
- ❖ It is also proposed to implement the greenbelt development program and post plantation status will be regularly checked for every season.
- ❖ The main attributes that retard the survival of sapling is fugitive dust, this fugitive dust can be controlled by water sprinkling on the haul roads and installing a sprinkler unit near the newly planted area.

- ❖ Year wise greenbelt development will be recorded and monitored based on the area of plantation, period of plantation, type of plantation, spacing between the plants, type of manuring and fertilizers and its periods, lopping period, interval of watering, survival rate and density of plantation.
- ❖ The ultimate reclamation planned leaves a congenial environment for development of flora & immigration of small fauna through green belt and water reservoir. The green belt and water reservoir developed within the Project at the end of mine life will attract the birds and animals towards the project area in the post mining period.

10.8.1 Green Belt Development Plan

The main objectives of the greenbelt development plan are to:

- ❖ Combat the dispersal of dust in the adjoining areas.
- ❖ Protect the erosion of the soil and conserve moisture of the soil.
- ❖ Increase the rate of recharge of ground water.
- ❖ Restore the ecology of the area, restore aesthetic beauty of the locality and meet the requirement of fodder, fuel and timber of the local community. The proposed green belt development plan is given in Table 10.6.

Table 10.6 Proposed Greenbelt Development Plan

| | No. of trees proposed for plantation | No. of trees expected to survive @ 80% | Area to be covered(m²) |
|---|---|---|--|
| Plantation in the construction phase (3 months) | Number of plants inside the mine lease area | | |
| | 581 | 465 | 5229 |
| | Number of plants outside the mine lease area | | |
| | 872 | 697 | 7844 |
| Total | 1453 | 1162 | 13073 |

Source: Proposed by FAEs & EIA Coordinator

About 1453 saplings will be planted in and around the lease area with the survival rate of 80%. A well-planned green belt of trees with long canopy leaves shall be developed with dense plantations around the boundary and along the haul roads to prevent air, dust noise propagation to undesired places and efforts will be taken for the enhancement of survival rate.

10.9 OCCUPATIONAL SAFETY & HEALTH MANAGEMENT

Occupational safety and health are very closely related to productivity and good employer-employee relationship. The main factors of occupational health impact in quarries are fugitive dust and noise. Safety of employees during quarrying operation and maintenance of mining equipment

will be taken care as per Mines Act 1952 and Rule 29 of Mines Rules 1955. To avoid any adverse effect on the health of workers due to dust, noise and vibration sufficient measures have been provided.

10.9.1 Medical Surveillance and Examinations

- ❖ Identifying workers with conditions that may be aggravated by exposure to dust & noise and establishing baseline measures for determining changes in health.
- ❖ Evaluating the effect of noise on workers.
- ❖ Enabling corrective actions to be taken when necessary.
- ❖ Providing health education.

The health status of workers in the mine shall be regularly monitored under an occupational surveillance program. Under this program, all the employees are subjected to a detail medical examination at the time of employment. The medical examination covers the following tests under mines act 1952.

- ❖ General Physical Examination and Blood Pressure.
- ❖ X-ray Chest and ECG.
- ❖ Sputum Test, Sperm Count Test.
- ❖ Detailed Routine Blood and Urine Examination.

The medical histories of all employees will be maintained in a standard format annually. Thereafter, the employees will be subject to medical examination annually. The below tests (Table 10.7) keep upgrading the database of medical history of the employees.

Table 10.7 Medical Examination Schedule

| S. No. | Activities | 1 st Year | 2 nd Year | 3 rd Year | 4 th Year | 5 th Year |
|--------|---|----------------------|----------------------|----------------------|----------------------|----------------------|
| 1 | Initial Medical Examination (Mine Workers) | | | | | |
| A | Physical Check-up | | | | | |
| B | Psychological Test | | | | | |
| C | Audiometric Test | | | | | |
| D | Respiratory Test | | | | | |
| 2 | Periodical Medical Examination (Mine Workers) | | | | | |
| A | Physical Check – up | | | | | |
| B | Audiometric Test | | | | | |
| C | Eye Check – up | | | | | |
| D | Respiratory Test | | | | | |

| | | | | | | |
|--|--|-----------------------------|--|------------------------|--|--|
| 3 | Medical Camp (Mine Workers & Nearby Villagers) | | | | | |
| 4 | Training (Mine Workers) | | | | | |
| Medical Follow ups: Work force will be divided into three targeted groups age wise as follows: | | | | | | |
| Age Group | | PME as per Mines Rules 1955 | | Special Examination | | |
| Less than 25 years | | Once in a Three Years | | In case of emergencies | | |
| Between 25 to 40 Years | | Once in a Three Years | | In case of emergencies | | |
| Above 40 Years | | Once in a Three Years | | In case of emergencies | | |
| Medical help on top priority immediately after diagnosis/ accident is the essence of preventive aspects. | | | | | | |

10.9.2 Proposed Occupational Health and Safety Measures

- ❖ The mine site will have adequate drinking water supply so that workers do not get dehydrated.
- ❖ Lightweight and loose-fitting clothes having light color will be preferred to wear.
- ❖ Noise exposure measurements will be taken to determine the need for noise control strategies.
- ❖ The personal protective equipment will be provided for mine workers.
- ❖ Supervisor will be instructed for reporting any problems with hearing protectors or noise control equipment.
- ❖ At noisy working activity, exposure time will be minimized.
- ❖ Dust generating sources will be identified and proper control measure will be adopted.
- ❖ Periodic medical examinations will be provided for all workers.
- ❖ Strict observance of the provisions of DGMS Acts, Rules and Regulations in respect of safety both by management and the workers.
- ❖ The width of road will be maintained more than thrice the width of the vehicle. A code of traffic rules will be implemented.
- ❖ In respect of contract work, safety code for contractors and workers will be implemented. They will be allowed to work under strict supervision of statutory person/officials only after they will impart training at vocational training centers. All personal protective equipment's will be provided to them.
- ❖ A safety committee meeting every month will be organized to discuss the safety of the mines and the persons employed.
- ❖ Celebration of annual mines safety week and environmental week in order to develop safety awareness and harmony amongst employees and co quarry owners.



Figure 10.1 Personal Protective Equipment to the Mine Workers

10.9.3 Health and Safety Training Program

The Proponents will provide special induction program along with machinery manufacturers for the operators and co-operators to run and maintain the machinery effectively and efficiently. The training program for the supervisors and office staffs will be arranged in the Group Vocational Training Centers in the State and engage Environmental Consultants to provide periodical training to all the employees to carry out the mining operation in and eco-friendly manner, as shown in Table 10.8.

Table 10.8 List of Periodical Trainings Proposed for Employees

| Course | Personnel | Frequency | Duration | Instruction |
|-----------------------|---|-----------|----------|--|
| New-Employee Training | All new employees exposed to mine hazards | Once | One week | <ul style="list-style-type: none"> ✓ Employee rights, ✓ Supervisor responsibilities ✓ Self-rescue ✓ Respiratory devices ✓ Transportation controls ✓ Communication systems ✓ Escape and emergency evacuation ✓ Ground control hazards |

| | | | | |
|--|--|------------------------|----------|--|
| | | | | <ul style="list-style-type: none"> ✓ Occupational health hazards ✓ Electrical hazards and First aid Explosives |
| Task Training Like Drilling, Blasting, Stemming, safety, Slope stability, Dewatering, Haul Road maintenance. | Employees assigned to new work tasks | Before new Assignments | Variable | <ul style="list-style-type: none"> ✓ Task-specific health & safety procedures and SOP for various mining activity ✓ Supervised practice in assigned work tasks. |
| Refresher Training | All employees who received new-hire training | Yearly | One week | <ul style="list-style-type: none"> ✓ Required health and safety standards ✓ Transportation controls ✓ Communication systems ✓ Escape ways, emergency evacuations ✓ Fire warning ✓ Ground control hazards ✓ First aid on electrical hazards ✓ Accident prevention ✓ Explosives ✓ Respirator devices |
| Hazard Training | All employees exposed to mine hazards | Once | Variable | <ul style="list-style-type: none"> ✓ Hazard recognition and avoidance ✓ Emergency evacuation procedures ✓ Health standards ✓ Safety rules ✓ Respiratory devices |

Source: Proposed by FAEs & EIA Coordinator as per DGMS Norms

10.9.4 Budgetary Provision for Environmental Management

Adequate budgetary provision has been made by the Company for execution of Environmental Management Plan. The Table 10.9 gives overall investment on the environmental safeguards and recurring expenditure for successful monitoring and implementation of control measures.

Table 10.9 EMP Budget for Proposed Project

| Attribute | Mitigation measures | Provision for Implementation | Capital Cost | Recurring Cost/annum |
|------------------------|---|--|--------------|----------------------|
| | | | (Rs.) | (Rs.) |
| Air Environment | 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 | 29050 | 29050 |
| | 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 | 50000 | 0 |
| | Regular monitoring of exhaust fumes as per RTO norms | Monitoring of Exhaust Fumes | 0 | 12500 |

| | | | | |
|--------------------------|--|--|-------|-------|
| | 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 | 58100 |
| | Installing wheel wash system near exit gate of quarry | Installation + Maintenance + Supervision | 50000 | 20000 |
| Noise Environment | Source of noise will be transportation vehicles, and HEMM. For this, proper maintenance will be done at regular intervals. | Provision made in Operating Cost | 0 | 0 |
| | 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 Ground vibration and fly rocks | Rs. 30/- per 6 tons of blasted material | 0 | 1167967 |
| Water Environment | Water Management | Provision for garland drain @ Rs. 10,000/- per hectare with maintenance of Rs. 5,000/- per annum | 29050 | 14525 |
| Waste Management | 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 |
| Implementation of EC, Mining Plan & DGMS Condition | 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 |
| Occupational Health | Workers will be provided with Personal Protective Equipment | Provision of PPE @ Rs. 4000/- per employee with recurring based on wear and tear (say, @ Rs. 1000/- per employee) | 72000 | 18000 |

| | | | | |
|----------------------------------|--|--|--------|--------|
| and Safety | Health checkup for workers will be provisioned | IME & PME Health checkup @ Rs. 1000/- per employee | 0 | 18000 |
| | First aid facility will be provided | Provision of 2 Kits per Hectare @ Rs. 2000/- | 0 | 11620 |
| | 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 | 581000 | 29050 |
| | 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 | 145250 | 29050 |
| | 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 st Class / 2 nd 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 |
| Development of Green Belt | Green belt development - 500 trees per hectare (200 Inside Lease Area & 300 Outside Lease Area) | Site clearance, preparation of land, digging of pits /trenches, soil amendments, transplantation of saplings @ 200 per plant (capital) for plantation inside the lease area | 116200 | 17430 |

| | | | | |
|---------------------|---|--|----------------|--|
| | | and @ 30 per plant maintenance (recurring))" | | |
| | | Avenue Plantation @ 300 per plant (capital) for plantation outside the lease area and @ 30 per plant maintenance (recurring) | 261450 | 26145 |
| Mine Closure | Closure includes 10% of the amount allotted for Greenbelt development, wire fencing, and garland drainage (Rule 27 in MCDR 2017 for Cat B mines will pay 2 lakhs per hectare or minimum amount of financial assurance of 5 lakhs) | | 0 | 98770 |
| Green fund | G.O.(Ms).No.23, Dated: 28.09.2021 | Section IVA of TNMMCR 1959 (@10% of Seigniorage Fee) (Seigniorage Fee for Rough stone = Rs.59 and for Gravel= Rs.33) | 2612226 | 0 |
| TOTAL | | | 4976226 | 2393437 (Excl. Mine Closure Cost) |

Table 10.10 Estimation of Overall EMP Budget after Adjusting 5% Annual Inflation

| Ist Year | IInd Year | IIIrd Year | IVth Year | Vth Year (Including Mine Closure Cost) | Total Recurring Cost | Total EMP Cost (Capital Cost + Total Recurring Cost) |
|----------------------------|-----------------------------|------------------------------|-----------------------------|--|-------------------------------------|--|
| 7369663 | 2513109 | 2638764 | 2770702 | 3008007 | 18300245 | 23276471 |

In order to implement the environmental protection measures, an amount of Rs. **4976226** as capital cost and recurring cost as Rs. **2393437** 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 total recurring cost over 5 years is Rs. **18300245** and the overall EMP cost for 5 years will be Rs. **23276471** as shown in Table 10.10.

10.10 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

11.0 INTRODUCTION

This EIA report was prepared in compliance with ToR obtained vide Letter No. SEIAA-TN/F.No.9631/ToR-1362/Dated 10.02.2023 by considering 2 proposed quarry, 2 existing quarry, and 1 expired quarry in a cluster with the total extent of **10.80.02** ha in Magaral-B Village, Walajabad Taluk, Kancheepuram District and Tamil Nadu State. Cluster area was calculated as per MoEF & CC Notification S.O. 2269 (E) Dated 1st July 2016. Baseline Monitoring studies were carried out during the period of March-May, 2023.

11.1 PROJECT DESCRIPTION

The proposed project deals with excavation of rough stone and gravel, which is primarily used, in construction projects. The method adopted for rough stone and gravel excavation is a manual open cast mining method involving formation of benches with 5 m height and 5 m width and secondary blasting. The proposed project area is located between latitudes from 12°43'32.65"N to 12°43'43.28"N and from longitudes from 79°44'0.85"E to 79°44'8.88"E in Magaral-B Village, Walajabad Taluk, Kancheepuram District. The project site is a Patta land with the extent of 2.90.50 ha leased for the project proponent, Mr.D.Govindasamy. The proponent had applied for quarry lease on 03.12.2022 to extract rough stone and gravel obtained the precise area communication letter issued by Department of Geology and Mining, Kancheepuram vide Rc.No.254/Q3/2022, dated:27.10.2022. Based on the precise area communication letter, mining plan was prepared. The mining plan thus prepared was approved by Deputy Director of Geology and Mining, Kancheepuram (Rc.No.254/Q3/2022, dated:18.11.2022).

According to the approved mining plan, about 417131 m³ of rough stone and 45808 m³ gravel will be mined up to the depth of 30 m BGL in five years. To achieve the estimated production, 4 Jack Hammers, 1 compressor, 1 excavator with bucket/rock breaker, and 10 tippers will be deployed. To operate the machineries and to break the rough stone to preferred dimension, about 18 persons will be employed. At the end of the quarry life, the dimension of the ultimate pit will be 186 m*77 m*30 m and about 0.09.5 ha of land is unutilized. Whereas, at the end of the mine life, about 2.18.12 ha of land will have been quarried; about 0.06.24 ha of land will be used for green belt development and the rest will be used for road and infrastructures.

The final mine closure plan shows that about Rs. **987700** capital cost with the annual recurring cost of Rs. **87150** will be spent towards mine closure.

11.2 DESCRIPTION OF THE ENVIRONMENT

The baseline monitoring studies were carried out during March-May, 2023 to assess the existing environmental conditions in the study area. For the purpose of the EIA studies, project area was considered as the core zone and area outside the project area up to 5 km radius from the periphery of the project site was considered as buffer zone. Baseline Environmental data has been collected for land, water, noise, ecology, socio-economy, and traffic.

11.2.1 Land Environment

Land Use and Land Cover (LULC) map, as shown in Figure 3.3 was prepared using Sentinel II image for the study area of 5 km radius. Totally, 8 LULC were mapped. The areal extent of each LULC is provided in Table 3.2. Of the total area, mining area covers only 37.18 ha accounting for 0.48 %, of which cluster area of 10.80.02 ha contributes only about 0.0375 %. This small percentage of mining activities shall not have any significant impact on the land environment.

11.2.2 Soil Characteristics

Physical Characteristics

The soil samples in the study area show loamy textures varying between sandy loam, to sandy clay loam. pH of the soil varies from 6.63 to 7.26 indicating slightly acidic to slightly alkaline nature. Electrical conductivity of the soil varies from 168 to 210 $\mu\text{S}/\text{cm}$. Bulk density ranges between 0.88 and 1.53 g/cm^3 and water content ranges between 2.16 to 8.56 %.

Chemical Characteristics

Calcium ranges between 184 and 442 mg/kg. Magnesium ranges between 83 and 184 mg/kg. Sodium ranges between 165 and 219 mg/kg. Potassium ranges between 144.56 and 213.56 mg/kg. Organic matter content ranges between 0.94 and 1.78 mg/kg and Iron ranges between 21.51 and 47.45 mg/kg.

11.2.3 Water Environment

Surface Water

Cheyyar River Arasanipalai, Arpakkam Lake and Sithalapakkam Lake are the three prominent surface water resources present in the study area. These are ephemeral in nature, which convey water only after rainfall events. The proposed project area is located 2.47 km SSE of Cheyyar River Arasanipalai, 2.94 ENE of Arpakkam Lake and 2.12 km S of Sithalapakkam Lake, as shown in Table 3.5 and Figure 3.6. Two surface water samples, known as SW1, SW2 and SW3 were collected from the three surface water bodies to assess the baseline water quality. Table 3.6 summarizes surface water quality data of the three samples.

Results for surface water samples in the Table 3.6 indicate that the physical and chemical parameters are within permissible limits. Of the two biological parameters, Coliform bacteria are present in the three water samples, whereas E-Coli is absent in the samples.

Ground Water

Groundwater in the study area occurs in the crystalline rocks of Archaean age and Recent alluvium. The movement of the groundwater is controlled by the intensity of weathering and fracturing of crystalline rocks. Dug wells and bore wells are the most common ground water abstraction structures in the area. However, in dry season, people in the study area heavily rely on bore wells for their domestic and agriculture purpose. Five groundwater samples, known as OW1, OW2, OW3, BW4 and BW5 were collected from open wells and bore wells to analyzed for physico-chemical conditions, heavy metals and bacteriological contents in order to assess baseline quality of ground water. Ground water sampling locations and their distance and direction from the lease area are provided in Table 3.5 and the spatial occurrence of water sampling locations is shown in Figure 3.6. Table 3.7 summarizes ground water quality data of the five samples.

Results for ground water samples in the Table 3.7 indicate that the physical, chemical and biological parameters are within permissible limits in comparison with standards of IS10500:2012.

11.3 AIR ENVIRONMENT

Site Specific Meteorology

Site specific meteorology during the study period was recorded by an automated weather station. According to the onsite data, the temperature in March, 2022 varied from 22.19 to 35.52⁰C with the average of 28.08⁰C; in April, 2022 from 25.34 to 36.46⁰C with the average of 29.82⁰C; and in May, 2022 from 25.64to 37.22⁰C with the average of 23.14⁰C. In March, 2022, relative humidity ranged from 30.44 to 95.19 % with the average of 71.17%; in April, 2022, from 36.56 to 92.19 % with the average of 72.22; and in May, 2022, from 36.19 to 93.19 % with the average of 72.29 %. The wind speed in March, 2022 varied from 0.035 to 8.80 m/s with the average of 3.96 m/s; in April, 2022 from 0.09 to 6.81 m/s with the average of 3.67 m/s; and in May, 2022 from 0.06 to 9.06 m/s with the average of 4.17 m/s. In March, 2022, wind direction varied from 2.32 to 359.65⁰ with the average of 119.25⁰; in April, 2022, from 0.00 to 357.92⁰ with the average of 149.97⁰; and in May, 2022, from 2.09 to 358.03⁰ with the average of 207.43⁰. In March, 2022, surface pressure varied from 99.94 to 101.17 kPa with the average of 100.56 kPa; in April, 2022, from 99.87 to 101.08 kPa with the average of 100.45 kPa; and in May, 2022, from 99.38 to 100.58 kPa with the average of 100.06 kPa.

Ambient Air Quality Results

As per the monitoring data, PM_{2.5} ranges from 14.7 µg/m³ to 19.9 µg/m³; PM₁₀ from 34.1 µg/m³ to 39.5 µg/m³; SO₂ from 5.9 µg/m³ to 9.6 µg/m³; NO_x from 11.5 µg/m³ to 18.8 µg/m³. The concentration levels of the pollutants fall within the acceptable limits of NAAQS prescribed by CPCB.

11.4 NOISE ENVIRONMENT

Ambient noise levels were measured at 8 locations around the proposed project area. The Table 3.18 shows that noise level in core zone was 42.4 dB (A) Leq during day time and 38.6 dB (A) Leq during night time. Noise levels recorded in buffer zone during day time varied from 38.4 to 40.6 dB (A) Leq and during night time from 33.2 to 38.9 dB (A) Leq. Thus, the noise level for industrial and residential area meets the requirements of CPCB.

11.5 BIOLOGICAL ENVIRONMENT

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

11.6 SOCIO-ECONOMIC ENVIRONMENT

The socio-economic study in the study area gives a clear picture of its population, average household size, literacy rate and sex ratio etc. It is also found that a part of population is suffering from a lack of permanent job to run their day-to-day life. Their expectation is to earn some income for their sustainability on a long-term basis. The proposed project will aim to provide preferential employment to the local people there by improving the employment opportunity in the area and in turn, the social standards will improve.

11.7 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES FOR PROPOSED PROJECT

The summary of anticipated adverse environmental impacts due to the proposed project and mitigation measures are given below:

Table 11.1 Anticipated Impacts & Mitigation Measures

| Impact | Mitigation Measure |
|---|--|
| Land Environment | |
| <ul style="list-style-type: none"> ❖ Destruction of natural landscapes ❖ Changes in soil characteristics ❖ Soil erosion and slope instability | <ul style="list-style-type: none"> ❖ Mining will be carried out as per approved mine plan in scientific and systematic way ❖ Safety Zone or Buffer area will be maintained and will not be mined and instead plantation will be carried out in the safety zone ❖ Barbed wire fencing will be provided all along the proposed mine boundary ❖ At conceptual stage, the land use pattern of the quarry will be changed into Greenbelt area and temporary reservoir ❖ Construction of garland ❖ Construction of garland drains all around the quarry pit and construction of settling traps at strategic location in lower elevations to prevent soil erosion due to surface runoff during rainfall and also to collect the storm water for various uses within the proposed area |
| Water Environment | |
| <ul style="list-style-type: none"> ❖ Decrease in aquifer recharge and increase in surface runoff; ❖ Disturbance to land drainage, overload and erosion of watercourses; ❖ Changes to the surface over which water flows; ❖ Changes to surface and groundwater resources quantity and quality due to stream blockage and contamination by particulate matter or waste; | <ul style="list-style-type: none"> ❖ Construction of garland drains all around the quarry pit and construction of settling traps at strategic location in lower elevations to prevent soil erosion due to surface runoff during rainfall and also to collect the storm water for various uses within the proposed area ❖ De-silting will be carried out before and immediately after the monsoon season and the settling tank and drains will be cleaned weekly, especially during monsoons ❖ Domestic sewage from site office & urinals/latrines provided in project area will be discharged through septic tank followed by soak pit system. |

| | |
|---|---|
| ❖ Contamination of aquifers due to removal of the natural filter medium. | ❖ Tippers & HEMM will be washed in a designated area and the washed water will be routed through drains to a settling tank, which has an oil & grease trap, only clear water will be reused for greenbelt development. |
| Air Environment | |
| <ul style="list-style-type: none"> ❖ Generation of Fugitive Dust ❖ Dust will be generated mainly during excavation, loading & unloading activities. ❖ Gaseous pollutants will be generated mostly by the traffic. ❖ Reduction in visibility due to dust plumes. ❖ Coating of surfaces leading to annoyance and loss of amenity. ❖ Physical and/or chemical contamination and corrosion. ❖ Increase in the concentration of suspended particles in runoff water. ❖ Coating of vegetation leading to reduced photosynthesis, ❖ Inhibited growth, destroying of foliage, degradation of crops; ❖ Increase in health hazards due to inhalation of dust. | <ul style="list-style-type: none"> ❖ Haul roads will be well maintained by sprinkling water twice a day ❖ The access road will be cleaned and brushed to ensure that mud and dust deposits do not accumulate. ❖ To ensure that dust and debris is minimised on the access road, all the tipper drivers will be instructed to use water spray system on all the tyres and spray water on the loaded material that is provided at the compound area before leaving the site ❖ Speed restrictions will be imposed to avoid spillage of loaded materials upon the road and to reduce wear and tear of the road. ❖ Weekly inspections of the condition of the access road by competent person employed, and immediate action will be taken to address any potholes or damage to the road surface. ❖ Dust wetting agents can be mixed with the water applied to haul roads during hot, dry weather conditions to increase the duration that the road surface remains damp. ❖ Personal Protective Equipment's will be provided to all workers ❖ All drilling rods used will have dust suppression systems fitted which injects water into the hole. ❖ Wet gunny bags will be used as a cover while drilling. ❖ The blast zone will be kept damp by the application of water from the rain gun fitted to the water tanker prior |

| | |
|---|---|
| | <p>to each blast to control any fugitive dust emissions that could arise from the surface during detonation.</p> <ul style="list-style-type: none"> ❖ A daily visual inspection shall be conducted by the site manager who will keep a daily log of all process operations and site activities and note any malfunctions, which could lead to abnormal emissions from the quarry operations. ❖ A site speed limit of 20 km/h will be set to minimise the potential for dust generation ❖ Weekly maintenance programme to identify machinery due for maintenance, based on the number of hours it has been in operation. ❖ Air filters are renewed after every 1000 hours of use, unless otherwise indicated by an on-board computer system. ❖ All site machineries & tippers will be serviced and maintained 6 months once and drivers will report any defects immediately to the site manager to enable repairs to be carried out promptly. |
| Noise & Vibration | |
| <ul style="list-style-type: none"> ❖ Annoyance and deterioration of the quality of life; ❖ Propelling of rocks fragments by blasting. ❖ Shaking of buildings and people due to blasting; | <ul style="list-style-type: none"> ❖ Usage of sharp drill bits while drilling which will help in reducing noise; ❖ Secondary blasting will be totally avoided and hydraulic rock breaker will be used for breaking boulders; ❖ Controlled blasting with proper spacing, burden, stemming and optimum charge/delay will be maintained; ❖ The blasting will be carried out during favourable atmospheric condition and less human activity timings by using nonelectrical initiation system; |

| | |
|---|--|
| | <ul style="list-style-type: none"> ❖ Proper maintenance, oiling and greasing of machines will be done every week to reduce generation of noise; ❖ Provision of sound insulated chambers for the workers working on machines (HEMM) producing higher levels of noise; ❖ Silencers / mufflers will be installed in all machineries; ❖ Green Belt/Plantation will be developed around the project area and along the haul roads. The plantation minimizes propagation of noise; ❖ Personal Protective Equipment (PPE) like ear muffs/ear plugs will be provided to the operators of HEMM and persons working near HEMM and their use will be ensured through training and awareness. |
| Biological Environment | |
| <ul style="list-style-type: none"> ❖ Direct impacts include land clearance and excavation causing destruction of flora and fauna and loss of habitats; ❖ Indirect impacts include habitat degradation due to noise, dust, and human activity. | <ul style="list-style-type: none"> ❖ Only some common herbs, shrubs and grass will be cleared. Therefore, there will be no impact on the biodiversity. ❖ Green belt development with suitable species will enhance the biodiversity of the project area. ❖ The core zone or buffer zone does not encompass any threatened flora or fauna species. |
| Socio-Economic Environment | |
| <ul style="list-style-type: none"> ❖ Health and safety of workers and the general public; ❖ Increase in traffic volumes and sizes of road vehicles; ❖ Economic issues, including the increase in employment opportunities; | <ul style="list-style-type: none"> ❖ The mining activity puts negligible change in the socio-economic profile. ❖ Around 88 local workers will get employment opportunities along with periodical training to generate local skills. ❖ New patterns of indirect employment/ income will generate. ❖ Regular health check-up camp. |

| | |
|--|--|
| | ❖ Assistance to schools and scholarship to children will be provided. |
| Occupational Health & Safety | |
| <ul style="list-style-type: none"> ❖ Exposure to Dust ❖ Noise and Vibration Exposure ❖ Physical Hazards ❖ Respiratory hazards due to Dust exposure | <ul style="list-style-type: none"> ❖ Provision of rest shelters for mine workers with amenities like drinking water etc. ❖ All safety measures like use of safety appliances, such as dust masks, helmets, shoes, safety awareness programs, awards, posters, slogans related to safety etc. ❖ Training of employees for use of safety appliances and first aid in vocational training centre. ❖ Weekly maintenance and testing of all equipment as per manufacturers' guidelines. ❖ Pre placement and Yearly Medical Examination of all workers by a medical Officer ❖ First Aid facility will be provided at the mine site. ❖ Close surveillance of the factors in working environment and work practices which may affect environment and worker's health by the mine's manager employed. ❖ Working of mine as per approved mining plan and environmental plans |

11.8 ANALYSIS OF ALTERNATIVES

There are no alternatives suggested as the proposed mining area has the following advantages:

- ❖ The mineral deposit occurs in a non-forest area.
- ❖ There is no habitation within the applied lease area; hence, no R & R issues exist.
- ❖ There is no river, stream, nallas and water bodies in the or passing through the applied mine lease areas.
- ❖ 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 accessible.

- ❖ Mine connectivity through road and rail is good.
- ❖ The proposed mining operations do not intersect the ground water level. Hence, no impact on ground water environment.

11.9 ENVIRONMENTAL MONITORING PROGRAM

Environmental Monitoring program will be conducted for various environmental components such as air quality, meteorology, water quality, water level monitoring, soil quality, noise level, vibration, and greenbelt as per conditions stipulated in Environmental Clearance Letter issued by SEIAA & Consent to Operate issued by TNPCB. For this environmental monitoring program, Rs **2,95,000** /- per annum will spent by the project proponent. 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 and 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.

11.10 ADDITIONAL STUDIES

Risk Analysis & Disaster Management Plan for proposed project

The methodology for the risk assessment has been based on the specific risk assessment guidance issued by the Directorate General of Mine Safety (DGMS), Dhanbad, vide Circular No.13 of 2002, dated 31st December, and 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 time table are recorded along with pinpointed responsibilities.

In the unlikely event that a consequence has occurred, disaster management kicks in. This includes instituting procedures pertaining to a number of issues such as communication, rescue, and rehabilitation. These are addressed in the disaster management plan. Both, the RA and DMP, are living documents and need to be updated whenever there are changes in operations, equipment, or procedures Assessment is all about preventing accidents and taking necessary steps to prevent it from happening.

The Disaster Management Plan (DMP) is a guide, giving general considerations, directions, and procedures for handling emergencies likely to arise from planned operations. The DMP has been prepared on the basis of the Risk Assessment and related findings covered in the report.

Cumulative Studies

- The results on the cumulative impact of the three proposed projects on air environment of the cluster do not exceed the permissible limits set by CPCB for air pollutants.
- The cumulative results of noise for the habitation in consideration do not exceed the limit set by CPCB for residential areas for day time.
- PPV resulting from two proposed projects is well below the permissible limit of Peak Particle Velocity of 8 mm/s.
- The two proposed projects will allocate Rs. 10,00,000/- towards CER as recommended by SEAC.
- The two proposed projects will directly provide jobs to 46 local people, in addition to indirect jobs.
- The two proposed project will plant 1783 about trees in and around the lease area.
- The two proposed projects will add 333 PCU per day to the nearby roads.

11.11 PROJECT BENEFITS FOR PROPOSED PROJECT

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

- ❖ Direct employment to 18 local people and indirect employment to the people
- ❖ Rain water harvesting structures to augment the water availability for irrigation and plantation and ground water recharge
- ❖ Creation of community assets (infrastructure) like school buildings, village roads/ linked roads, dispensary & health Centre, community Centre, market place etc.,
- ❖ Strengthening of existing community facilities through the Community Development Programme
- ❖ Skill development & capacity building like vocational training
- ❖ Awareness program and community activities, like health camps, medical aids, sports & cultural activities, plantation etc.,
- ❖ CSR activities mainly contributing to education, health, training of women self-help groups and infrastructure etc., will be taken up in the Magaral-B Village. CSR budget is allocated as 2.5% of the profit.
- ❖ Rs. 5,00,000 will be allocated for CER.

11.12 ENVIRONMENT MANAGEMENT PLAN

In order to implement the environmental protection measures, an amount of Rs. **4976226** as capital cost and recurring cost as Rs. **2393437** 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 total recurring cost over 5 years is Rs. **18300245** and the overall EMP cost for 5 years will be Rs. **23276471**.

11.13 CONCLUSION

EIA study was performed as per the approved ToR. Various environmental attributes were studied relating with aspects of mining activities. The related impacts were identified and evaluated. Considering all the possible ways to mitigate the environmental concerns Environmental Management Plan was prepared and accordingly fund was allocated. The EMP has been dynamic, flexible and subject to periodic review. CER activities were identified and for its time bound implementation, fund has been allocated.

The project will increase the revenue of the State Govt. as well as it will help in the social upliftment of the local community. The green belt development programme will help in increasing the green cover in the area. Thus, the proposed project is not likely to affect the environment or adjacent ecosystem in an adverse way.

The Mines Management will be responsible for the project 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 XII

DISCLOSURES OF CONSULTANT

The Project Proponent, **Mr. D. Govindasamy** 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
Web: www.gtmsind.com
Phone: 04342 232777.

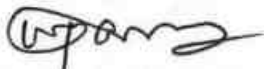
The accredited experts and associated members who were engaged in this EIA study are given below:

| S.No. | Name of the expert | In house/ Empanelled | Sector | Functional Area | Category |
|--|----------------------|-------------------------------------|---------|-----------------|----------|
| Approved Functional Area Experts & EC | | | | | |
| 1. | Dr. S. Karuppannan | EIA Coordinator (EC) In-house | 1(a)(i) | Mining | B |
| 2. | Dr. M. Vijayprabhu | In-house FAE | 1(a)(i) | HG, LU, GEO | B |
| 3. | Dr. J. Rajarajeswari | In-house, FAE | 1(a)(i) | EB, SC | B |
| 4. | Dr. G. Prabakaran | In-house, FAE | 1(a)(i) | SE | B |
| 5. | Dr. R. Arunbalaji | In-house, FAE | 1(a)(i) | AP, AQ, NV | B |
| 6. | 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. | S. Gopalakrishnan | In-house, FAE | 1(a)(i) | HG, GEO | B |
| 10. | P. Venkatesh | In-house, FAE | 1(a)(i) | AP | B |
| 11. | Dr. D.Kalaimurugan | In-house, FAE | 1(a)(i) | SC | B |
| Approved Functional Area Associates | | | | | |
| 12. | G. Prithiviraj | FAA | 1(a)(i) | LU, HG | B |
| 13. | C. Kumaresan | FAA | 1(a)(i) | NV | B |
| 14. | P. Vellaiyan | FAA | 1(a)(i) | HG, GEO | B |

| | | | | | |
|----------------------|--|-----|--|---------|---|
| 15. | S.Vasugi | FAA | 1(a)(i) | AQ | B |
| 16. | P. Dhatchayini | FAA | 1(a)(i) | AQ | B |
| 17. | V. Malavika | FAA | 1(a)(i) | NV, SHW | B |
| Abbreviations | | | | | |
| 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 modeling, and prediction | HW | Hazardous Wastes | | |
| EB | Ecology and bio-diversity | GIS | Geographical Information System | | |

ECLARATION 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 : 12.06.2023

Name : **Dr. S. Karuppannan**



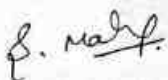





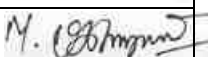
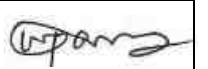


Designation : EIA Coordinator


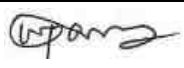





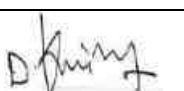

Name of the EIA Consultant Organization : Geo Technical Mining Solutions

Period of Involvement : Till date


We, the FAEs and FAAs hereby declare that information furnished in this EIA/EMP report for **Mr. D. Govindasamy** rough stone and gravel quarry project with the extent of 2.90.5 ha situated in the cluster with the extent of **10.80.02** ha in Magaral-B Village of Walajabad Taluk, Kancheepuram 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 | <ul style="list-style-type: none"> Identification of different sources of air pollution due to the proposed mine activity Prediction of air pollution and propose mitigation measures / control measures | J. N. Manikandan |  |
| | | | P. Venkatesh |  |
| 2 | WP | <ul style="list-style-type: none"> Suggesting water treatment systems, drainage facilities Evaluating probable impacts of effluent/waste water discharges into the receiving environment/water bodies and suggesting control measures. | Dr. S. Malar |  |
| 3 | HG | <ul style="list-style-type: none"> Interpretation of ground water table and predict impact and propose mitigation measures. Analysis and description of aquifer Characteristics | Dr. M. Vijay Prabhu |  |
| | | | G. Uma Maheswaran |  |
| | | | Dr. S. Karuppannan |  |
| 4 | GEO | <ul style="list-style-type: none"> Field Survey for assessing the regional and local geology of the area. Preparation of mineral and geological maps. Geology and Geo morphological analysis/description and Stratigraphy/Lithology. | G. Gopala Krishnan |  |
| | | | G. Uma Maheswaran |  |
| | | | Dr. M. Vijay Prabhu |  |
| | | | Dr. S. Karuppannan |  |
| 5 | SE | <ul style="list-style-type: none"> Revision in secondary data as per Census of India, 2011. Impact Assessment & Preventive Management Plan Corporate Environment Responsibility. | Dr. G. Prabhakaran |  |
| 6 | EB | <ul style="list-style-type: none"> Collection of Baseline data of Flora and Fauna. Identification of species labelled as Rare, Endangered and threatened as per IUCN list. Impact of the project on flora and fauna. Suggesting species for greenbelt | Dr. J. Rajarajeshwari |  |

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

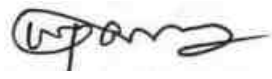
List of Functional Area Associate Engaged in this Project

| S.No. | Name | Functional Area | Involvement | Signature |
|-------|----------------|-----------------|---|---|
| 1 | G. Prithiviraj | LU, HG | <ul style="list-style-type: none"> ○ Site visit with FAE ○ Provide inputs & Assisting FAE for LU and HG |  |

| | | | | |
|---|---------------|----------|---|---|
| 2 | C. Kumaresan | NV | <ul style="list-style-type: none"> ○ Assistance to FAE in both primary and secondary data collection ○ Assistance in noise prediction modelling |  |
| 3 | P. Vellaiyan | HG & GEO | <ul style="list-style-type: none"> ○ Field visits along with FAE ○ Assistance to FAE in both primary and secondary data collection |  |
| 4 | S.Vasugi | AQ | <ul style="list-style-type: none"> ○ Field visits along with FAE ○ Assistance to FAE in both primary and secondary data collection |  |
| 5 | P.Dhatchayini | AQ | <ul style="list-style-type: none"> ○ Site visit with FAE ○ Assistance to FAE in collection of both primary and secondary data |  |
| 6 | V.Malavika | NV, SHW | <ul style="list-style-type: none"> ○ Site visit along with FAE ○ Assistance in report preparation |  |

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 **Mr. D. Govindasamy** rough stone and gravel quarry project with the extent of 2.90.50 ha located within the cluster of **10.80.02** ha in Magaral-B Villages of Walajabad Taluk, Kancheepuram District of Tamil Nadu is true and correct to the best of my knowledge.

Signature : 

Date : 12.06.2023

Name : **Dr. S. Karuppannan**

Designation : Managing Partner

Name of the EIA Consultant Organization : Geo Technical Mining Solutions

NABET Certificate No & Issue Date : NABET/EIA/2124/SA 0184

Validity : Valid till 31.12.2023



**THIRU.DEEPAK S. BILGI, I.F.S.
MEMBER SECRETARY**

**STATE LEVEL ENVIRONMENT IMPACT
ASSESSMENT AUTHORITY-TAMILNADU**
3rd Floor, Panagal Maaligai,
No.1, Jeenis Road, Saidapet,
Chennai - 600 015.
Phone No. 044-24359973
Fax No. 044-24359975

TERMS OF REFERENCE (ToR)

Lr No.SEIAA-TN/F.No.9631/ToR- 1362/2023 Dated: 10.02.2023.

To

Thiru.D.Govindasamy,
S/o. Desingu,
No.288, Palla Street,
Sitthalapakkam Village,
Arasanipalaiyam Post,
Vembakkam Taluk,
Tiruvannamalai District- 631702.

Sir / Madam,

Sub: SEIAA, Tamil Nadu – Terms of Reference with public Hearing (ToR) for the proposed Rough stone & gravel over an extent of 2.90.50 Ha at S.F.Nos.699/2 & 699/3 of Magaral-B Village, Walajabad Taluk, Kancheepuram District, Tamil Nadu by Thiru.D.Govindasamy - 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/ 409141 /2022, dated: 03.12.2022.
2. Your application submitted for Terms of Reference dated: 08.12.2022.
3. Minutes of the 346th SEAC meeting held on 12.01.2023.
4. Minutes of the 591st Authority meeting held on 10.02.2023.

Kindly refer to your proposal submitted to the State Level Impact Assessment Authority for Terms of Reference.


**MEMBER SECRETARY
SEIAA-TN**

The proponent, Thiru.D.Govindasamy has submitted application for Terms of Reference (ToR), for the proposed Rough stone & gravel over an extent of 2.90.50 Ha at S.F.Nos.699/2 & 699/3 of Magaral-B Village, Walajabad Taluk, Kancheepuram District, Tamil Nadu.

SEAC Remarks:-

The proposal was placed in 346th SEAC meeting held on 12.01.2023. The details of the project furnished by the proponent are given in the website (parivesh.nic.in).

The SEAC noted the following:

1. The Project Proponent Thiru. D. Govindasamy has applied for Terms of Reference for the Proposed Rough stone & gravel over an extent of 2.90.50 Ha at S.F.Nos. 699/2 & 699/3 of Magaral-B Village, Walajabad Taluk, Kancheepuram District, Tamil Nadu.
2. The project/activity is covered under Category "B1" of Item 1(a) "Mining Projects" of the Schedule to the EIA Notification, 2006.
3. The Production for the five years states that the total quantity should not exceed 4,48,991 m³ of rough stone, 45,804m³ of Gravel for an ultimate depth of mining up to 35m (2m Gravel + 33m Rough Stone) with annual peak production of 1,08,575 m³ for rough stone (5th Year), 24,552m³ for gravel (1st Year).

Based on the presentation made by the proponent SEAC recommended grant of Terms of Reference (TOR) with Public Hearing, subject to the following TORs, in addition to the standard terms of reference for EIA study for non-coal mining projects and details issued by the MOEF & CC to be included in EIA/EMP Report:

1. The proponent is requested to submit the valid registered lease document during the EIA appraisal after the previous lease granted for the mining operations is legally surrendered (or) lapsed with the consent of the competent authority.
2. The proponent is requested to carry out a survey and enumerate on the structures including the crematory shed located within 100m, 200m, 300m from the boundary of the mine lease area.
3. Since the proposed mining activity is **abutting a huge water tank**, the proponent shall conduct a detailed study regarding the implications of mining activity on the water tank and submit the mitigation measures along with the EIA Report.
4. 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.
5. The Project Proponent shall conduct the 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) 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. Necessary data and documentation in this regard may be provided.
 6. The proponent shall submit the details regarding the nature of blasting activity which will be carried out.
 7. The PP shall furnish DFO letter stating that the proximity distance of Reserve Forests, Protected Areas, Sanctuaries, Tiger reserve etc., upto a radius of 25 km from the proposed site.
 8. The PP shall provide individual notice regarding the Public Hearing to the nearby house owners located in the vicinity of the project site.
 9. In the case of proposed lease in an existing (or old) quarry where the benches are non-existent (or) partially formed critical of the bench geometry approved in the Mining Plan, the Project Proponent (PP) shall prepare and submit an 'Action Plan' for carrying out the realignment of the 'highwall' benches to ensure slope stability in the proposed quarry lease which shall be vetted by the concerned Asst. Director of Geology and Mining, during the time of appraisal for obtaining the EC.
 10. The Proponent shall submit a conceptual 'Slope Stability Plan' for the proposed quarry indicating the proposed stabilizing measures during the appraisal while obtaining the EC, as the depth of the proposed working is extended beyond 30 m below ground level.
 11. If the blasting operation is to be carried out, the PP shall present a conceptual design for carrying out the NONEL initiation based controlled blasting operation involving line drilling & muffle blasting and Simulation Model indicating the anticipated Blast-induced Ground Vibration levels in the proposed quarry as stipulated by the DGMS Circular No.7 of 1997, during the EIA Proposal.
 12. Details of Green belt & fencing shall be included in the EIA Report.

13. 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.
14. 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,
- What was the period of the operation and stoppage of the earlier mines with last work permit issued by the AD/DD mines?
 - Quantity of minerals mined out.
 - Highest production achieved in any one year
 - Detail of approved depth of mining.
 - Actual depth of the mining achieved earlier.
 - Name of the person already mined in that leases area.
 - If EC and CTO already obtained, the copy of the same shall be submitted.
 - Whether the mining was carried out as per the approved mine plan (or EC if issued) with stipulated benches.
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).
16. The PP shall carry out Drone video survey covering the cluster, Green belt, fencing etc.,
17. 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.
18. 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 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.

19. 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.
20. 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.
21. Rain water harvesting management with recharging details along with water balance (both monsoon & non-monsoon) be submitted.
22. 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.
23. 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.
24. 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.
25. 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.
26. Impact on local transport infrastructure due to the Project should be indicated.
27. 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.

28. A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific.
29. Public Hearing points raised and commitments 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 and to be submitted to SEIAA/SEAC with regard to the Office Memorandum of MoEF& CC accordingly.
30. The Public hearing advertisement shall be published in one major National daily and one most circulated vernacular daily.
31. The PP shall produce/display the EIA report, Executive summary and other related information with respect to public hearing in Tamil Language also.
32. 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.
33. 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.
34. Taller/one year old Saplings raised in appropriate size of bags, preferably eco-friendly 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
35. 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.
36. 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.

37. 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.
38. 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.
39. 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.
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. 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.
42. 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/TNPNB.
43. 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.
44. 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.

SEIAA Remarks:-

The proposal was placed in the 591st Authority meeting held on 10.02.2023. The proposal is placed in this 346th SEAC Meeting held on 12.01.2023.

Based on the presentation made by the proponent SEAC decided to recommend for grant of Terms of Reference (TOR) with Public Hearing. After detailed deliberations, the Authority accepted the recommendations of SEAC and decided to grant Terms of Reference subject to the conditions as recommended by SEAC in addition to the following conditions and conditions stated therein vide Annexure 'B':

1. The Depth is restricted to 30m (2m – Gravel & 28m – Rough Stone) considering the hydrogeological regime and the quantity of rough stone shall not exceed 4,17,131 m³.

Annexure 'B'

Cluster Management Committee

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.
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.,
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.
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.
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.
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.
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.
8. The committee shall furnish the Emergency Management plan within the cluster.
9. The committee shall deliberate on the health of the workers/staff involved in the mining as well as the health of the public.

10. The committee shall furnish an action plan to achieve sustainable development goals with reference to water, sanitation & safety.
11. The committee shall furnish the fire safety and evacuation plan in the case of fire accidents.

Impact study of mining

12. Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area covering the entire mine lease period as per precise area communication order issued from reputed research institutions on the following
 - a) Soil health & soil biological, physical land chemical features.
 - b) Climate change leading to Droughts, Floods etc.
 - c) Pollution leading to release of Greenhouse gases (GHG), rise in Temperature, & Livelihood of the local people.
 - d) Possibilities of water contamination and impact on aquatic ecosystem health.
 - e) Agriculture, Forestry & Traditional practices.
 - f) Hydrothermal/Geothermal effect due to destruction in the Environment.
 - g) Bio-geochemical processes and its foot prints including environmental stress.
 - h) Sediment geochemistry in the surface streams.

Agriculture & Agro-Biodiversity

13. Impact on surrounding agricultural fields around the proposed mining Area.
14. Impact on soil flora & vegetation around the project site.
15. 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.
16. 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.
17. Action should specifically suggest for sustainable management of the area and restoration of ecosystem for flow of goods and services.
18. The project proponent shall study and furnish the impact of project on plantations in adjoining patta lands, Horticulture, Agriculture and livestock.

Forests

19. The project proponent shall detailed study on impact of mining on Reserve forests free ranging wildlife.
20. The Environmental Impact Assessment should study impact on forest, vegetation, endemic, vulnerable and endangered indigenous flora and fauna.
21. The Environmental Impact Assessment should study impact on standing trees and the existing trees should be numbered and action suggested for protection.
22. The Environmental Impact Assessment should study impact on protected areas, Reserve Forests, National Parks, Corridors and Wildlife pathways, near project site.

Water Environment

23. 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) 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.
24. Erosion Control measures.
25. 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.
26. The project proponent shall study impact on fish habitats and the food WEB/ food chain in the water body and Reservoir.
27. The project proponent shall study and furnish the details on potential fragmentation impact on natural environment, by the activities.
28. 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.
29. The Terms of Reference should specifically study impact on soil health, soil erosion, the soil physical, chemical components and microbial components.
30. The Environmental Impact Assessment should study on wetlands, water bodies, rivers streams, lakes and farmer sites.

Energy

31. The measures taken to control Noise, Air, Water, Dust Control and steps adopted to efficiently utilise the Energy shall be furnished.

Climate Change

32. 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.
33. The Environmental Impact Assessment should study impact on climate change, temperature rise, pollution and above soil & below soil carbon stock.

Mine Closure Plan

34. Detailed Mine Closure Plan covering the entire mine lease period as per precise area communication order issued.

EMP

35. Detailed Environment Management Plan along with adaptation, mitigation & remedial strategies covering the entire mine lease period as per precise area communication order issued.
36. The Environmental Impact Assessment should hold detailed study on EMP with budget for Green belt development and mine closure plan including disaster management plan.

Risk Assessment

37. To furnish risk assessment and management plan including anticipated vulnerabilities during operational and post operational phases of Mining.

Disaster Management Plan

38. To furnish disaster management plan and disaster mitigation measures in regard to all aspects to avoid/reduce vulnerability to hazards & to cope with disaster/untoward 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.

Others

39. 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.

40. 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.
41. 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.

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 PM10, 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 is acquisition, nearby (in 2-3 km.) water body, population, with in 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 2nd December, 2009, 18th March 2010, 28th May 2010, 28th June 2010, 31st December 2010 & 30th 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 29th August, 2017.


MEMBER SECRETARY
SEIAA-TN

Copy to:

1. The Additional Chief Secretary to Government, Environment & Forests Department, Govt. of Tamil Nadu, Fort St. George, Chennai - 9
2. The Chairman, Central Pollution Control Board, Parivesh Bhavan, CBD Cum-Office Complex, East Arjun Nagar, New Delhi 110032.
3. The Member Secretary, Tamil Nadu Pollution Control Board, 76, Mount Salai, Guindy, Chennai-600 032.
4. The APCCF (C), Regional Office, MoEF & CC (SZ), 34, HEPC Building, 1st & 2nd Floor, Cathedral Garden Road, Nungambakkam, Chennai -34.
5. Monitoring Cell, IA Division, Ministry of Environment, Forests & CC, Paryavaran Bhavan, CGO Complex, New Delhi 110003
6. The District Collector, Kancheepuram District.
7. Stock File.

From
A.Arumuganainar, M.Sc.,
Assistant Director (i/c),
Dept. of Geology and Mining,
Kancheepuram.

To
Thiru. D. Govindasamy,
S/o. Desingu,
No.288, Palla Street,
Sitthalapakkam Village,
Arasanipalaiyam Post,
Vembakkam Taluk,
Tiruvannamalai District- 631 702.

Rc.No.254/Q3/2022, Dated.18.11.2022

Sir,

Sub: Mines & Minerals – Minor Mineral – Rough stone -
Kancheepuram District – Walajabad Taluk –
Magaral B Village - S.F. Nos. 699/2 & 699/3 - over
an extent of 2.90.50 Hectares of patta lands –
Quarry lease application preferred by
Thiru. D. Govindasamy S/o. Desingu – Details of
quarries situated within 500 meter radial distance –
furnished - reg.

- Ref: 1. Precise are notice issued by the Assistant
Director, Geology and Mining, Kancheepuram
in Rc.No.254/Q3/2022, dated.27.10.2022.
2. Representation of Thiru. D. Govindasamy S/o.
Desingu dated.09.11.2022.

With reference to your letter in the reference 2nd cited, the details
of existing, proposed and abandoned quarries located within 500 meter
radius from the proposed Rough Stone quarry, over an extent of
2.90.50 Hectares of patta lands in S.F.Nos. 699/2 (2.02.50) and 699/3
(0.88.00) of Magaral B Village, Walajabad Taluk, Kancheepuram
District are as follows.

1. Existing quarries:

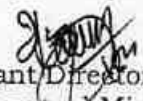
| Sl. No. | Name of the lessee / permit holder | Name of the Mineral | Village & Taluk | S.F. Nos. | Extent (in hecets) | Lease period |
|---------|---|------------------------|-------------------------|--------------------|--------------------|--------------------------------|
| 1 | K.Samiyappan, S/o Kandasamy, No.11, 3rd East Street, Poonga Nagar, Sothupakkam, Cheyyur Taluk, Kancheepuram District- 603319 | Roughstone & Gravel | Walajabad, Magaral B | 702/2 | 2.02.50 | 30.06.2018 To 29.06.2023 |
| 2 | S. Rathinavelu, S/o.R. Sivaswamy, Old No. 44, New No.2/33, Bhuvaneswari Nagar, Ist street, Gowrivaikkam, Chennai - 73. | Roughstone & Gravel | Walajabad, Magaral B | 700/1(P), 700/2 | 2.34.50 | 23.01.2019 To 22.01.2024 |

II. Proposed Quarries :

| Sl. No. | Name of the lessee / permit holder | Name of the Mineral | Village & Taluk | S.F. Nos. | Extent (in hecets) | Remarks |
|---------|--|------------------------|-------------------------|--|--------------------|---|
| 1. | Thiru. D. Govindasamy, S/o. Desingu, No.288, Palla Street, Sithalapakkam Village, Arasanipalaiyam Post, Vembakkam Taluk, Tiruvannamalai District- 631 702 | Roughstone & Gravel | Walajabad, Magaral B | 699/2 & 699/3 | 2.90.50 | Under Processing (Present Application) |
| 2. | Sri Sai Infrastructures, No.18 G, 4-Back mark Place, 15- cross street, New Colony, Chrompet, Chennai-44. | Roughstone & Gravel | Walajabad, Magaral | 728/1 (P), 728/2, 728/3, 728/4, 728/5, 728/6, 728/7, 728/8, 728/9, 728/10, 728/11, 728/12, 728/13, 728/14, 728/15, 728/16, 728/17 & 728/18 | 2.75.02 | Under Processing |

III. Abandoned quarries :

| Sl. No. | Name of the lessee / permit holder | Name of the Mineral | Village & Taluk | S.F. Nos. | Extent (in hecets) | Lease period |
|---------|---|------------------------|---------------------------|--------------------------------------|--------------------|--------------------------------|
| 1 | P. Janakiraman No.2A, Govindhapillai Street, Walajabad, Kancheepuram | Roughstone & Gravel | Kancheepuram, Magaral. | 683, 684/1.2 | 1.84.0 | 26.01.2005 To 25.01.2010 |
| 2 | P. Janakiraman S/o. Parthasarathy Arumugapettai Walajabad, Kancheepuram | Roughstone & Gravel | Kancheepuram, Magaral. | 682/1, 2, 3, 683/1 & 684/1, 2 | 3.14.5 | 12.05.2010 To 11.05.2015 |
| 3 | R.Elumalai, S/o. Sri Raghava Pillai, Sankarapuram Village, Palayaseevara Madura Puliambakkam Post, Kanchipuram Taluk | Roughstone & Gravel | Walajabad, Magaral. | 694/3I, 694/3N, 694/3H, & 694/3O. | 0.77.5 | 02.03.2015 To 01.03.2020 |


 Assistant Director(i/c),
 Geology and Mining,
 Kancheepuram.



MINING PLAN

FOR

MAGARAL-B VILLAGE ROUGH STONE AND GRAVEL MINE LEASE &
PROGRESSIVE QUARRY CLOSURE PLAN

Patta- Ryotwari land/ Non-Forest/Non-Captive Use "B2" Category
Lease period 5 Years from the date of lease execution

(For the ensuring mining plan prepared for the period of five years)

(Prepared under rule 41 of Tamil Nadu Minor Mineral Concession Rules, 1959)

LOCATION OF THE LEASE AREA

STATE : TAMILNADU
DISTRICT : KANCHEEPURAM
TALUK : WALAJABAD
VILLAGE : MAGARAL-B
S.F.No's : 699/2 & 699/3
EXTENT : 2.90.50Hectares

ADDRESS OF THE APPLICANT

Mr.D.GOVINDASAMY,
S/o.Mr.Desingu,
No.288, Palla Street,
Sitthalapakkam Village,
Arasanipalaiyam Post,
Vembakkam Taluk,
Tiruvannamali District,
Tamil Nadu-631702

PREPARED BY

G.UMAMAHESWARAN, M.Sc.,
Qualified person

4-101, Sengattur, Muthampatti – (PO),
Tholasampatti, Mettur Taluk,
Salem – 636503, Tamilnadu
Ph.No: +91 9790462882



ANNEXURES

| Sl. No. | Description | Annexure No. |
|----------------|---|---------------------|
| 1. | Copy of precise area communication letter | I |
| 2. | Copy of FMB (Field Measurement book) | II |
| 3. | Copy of Village Map | III |
| 4. | Copy of A-register | IV |
| 5. | Copy of Patta, adangal and land documents | V |
| 6. | Copy of consent registered documents | VI |
| 7. | Photo copy of the applied lease area | VII |
| 8. | Copy of explosive willing letter, agreement from explosive license holder & explosive license | VIII |
| 9. | Copy of ID Proof of the authorized signatory | IX |
| 10. | Copy of QP Certificate | X |



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 | 1:1000 |
| 8 | Geological sections | IIIA | Sections HOR 1:1000 VER 1:500 |
| 9 | Year wise Development & Production plan | IV | 1:1000 |
| 10 | Year wise development & Production sections | IVA | Sections HOR 1:1000 VER 1:500 |
| 11 | Mine layout plan and Land use pattern | V | 1:1000 |
| 12 | Progressive mine closure plan | VI | 1:1000 |
| 13 | Progressive mine closure sections | VIA | Sections HOR 1:1000 VER 1:500 |
| 14 | Conceptual plan | VII | 1:1000 |
| 15 | Conceptual sections | VIIA | Sections HOR 1:1000 VER 1:500 |



Mr.D.Govindasamy,
S/o.Mr.Desingu,
No.288, Palla Street,
Sitthalapakkam Village, Arasanipalaiyam Post,
Vembakkam Taluk,
Tiruvannamali District,
Tamil Nadu-631702.

CONSENT LETTER FROM THE APPLICANT

The Mining Plan in respect of rough stone and gravel quarry lease in S.F.No's: 699/2 & 699/3 over an extent of 2.90.50.hectares of Magaral-B Village, Walajabad Taluk, Kancheepuram District, Tamil Nādu State has been prepared by

G. UMAMAHESWARAN, M.Sc., (Qualified person)

I request "The Assistant Director (i/c)", Department of Geology and Mining, Kancheepuram District to make further correspondence regarding modifications of the Mining Plan with the said Recognized Qualified Person on this following address,

G.UMAMAHESWARAN, M.Sc.,
Qualified person
4-101, Sengattur, Muthampatti – (PO),
Tholasampatti, Mettur Taluk,
Salem – 636503, Tamilnadu
Ph.No: +91 9790462882

I hereby undertake that all modifications so made in the Mining Plan by the Recognized 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: Kancheepuram, TN.

Date:

D. Govindasamy
Signature of the applicant
(D. GOVINDASAMY)



Mr.D.Govindasamy,
S/o.Mr.Desingu,
No.288, Palla Street,
Sitthalapakkam Village, Arasanipalaiyam Post,
Vembakkam Taluk,
Tiruvannamali District,
Tamil Nadu-631702.

DECLARATION

The Mining Plan in respect of rough stone and gravel quarry lease S.F.No's: 699/2 & 699/3 over an extent of 2.90.50hectares of Magaral-B Village, Walajabad Taluk, Kancheepuram District, Tamilnadu 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: Kancheepuram, TN.

Date:

D. Govindasamy
Signature of the applicant
(D. GOVINDASAMY)



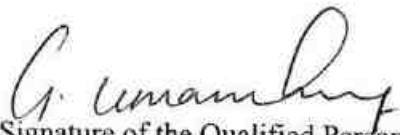
CERTIFICATE

I, G.Umamaheswaran, Dharmapuri had the qualified person to prepare mining plan have an office at **GEO TECHNICAL MINING SOLUTIONS** (A NABET accredited & ISO certified Company) No: 1/213-B, Natesan Complex, Oddapatti, Collectorate Post office, Dharmapuri-636705, Tamil Nadu.

I, G.Umamaheswaran prepared this Mining plan and Progressive Quarry Closure plan in respect of rough stone and gravel quarry lease in S.F.No: 699/2 & 699/3, over an extent of 2.90.5Hect Magaral - B village, Walajabad Taluk, Kancheepuram District, Tamil Nadu State. The mining plan prepare under rule 41 of Tamil Nadu Minor Mineral Concession Rules, 1959.

Place: Dharmapuri, TN

Date: 4/11/2022.


Signature of the Qualified Person

G.Umamaheswaran, M.Sc.,
Qualified Person
4-101, Sengattur, Muthampatti – (PO),
Tholasampatti, Mettur Taluk,
Salem – 636503, Tamilnadu
Ph.No: +91 9790462882

G.UMAMAHESWARAN, M.Sc.,

Qualified person

4-101, Sengattur, Muthampatti – (PO),

Tholasampatti, Mettur Taluk,

Salem – 636503, Tamilnadu

Ph.No: +91 9790462882



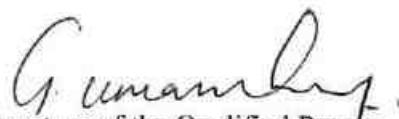
CERTIFICATE

This is to certify that, the provisions of 19(1) Tamil Nadu Minor Minerals Concession Rules, 1959 have been observed in the Mining Plan for the grant of rough stone and gravel quarry lease in S.F.No's: 699/2 & 699/3 over an extent of 2.90.50hectares of Magaral-B Village, Walajabad Taluk, Kancheepuram District, Tamilnadu State applied to **Mr. D.GOVINDASAMY**, Kancheepuram.

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: 4/11/2022



Signature of the Qualified Person

G.Umaheswaran, M.Sc.,

Qualified Person

4-101, Sengattur, Muthampatti – (PO),

Tholasampatti, Mettur Taluk,

Salem – 636503, Tamilnadu

Ph.No: +91 9790462882



G.UMAMAHESWARAN, M.Sc.,

Qualified person

4-101, Sengattur, Muthampatti – (PO),

Tholasampatti, Mettur Taluk,

Salem – 636503, Tamilnadu

Ph.No: +91 9790462882

CERTIFICATE

I certified that in preparation of Mining Plan for rough stone and gravel quarry lease in S.F.No's: 699/2 & 699/3 in an extent of 2.90.50hectares of Magaral-B Village, Walajabad Taluk, Kancheepuram District, Tamil Nadu State prepared to **Mr. D.GOVINDASAMY** Kancheepuram 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: 4/11/2022.


Signature of the Qualified Person

G.Umamaheswaran, M.Sc.,
Qualified Person
4-101, Sengattur, Muthampatti – (PO),
Tholasampatti, Mettur Taluk,
Salem – 636503, Tamilnadu
Ph.No: +91 9790462882



MINING PLAN

FOR MAGARAL-A- VILLAGE ROUGH STONE AND GRAVEL MINING LEASE WITH
PROGRESSIVE QUARRY CLOSURE PLAN

Patta- Ryotwari land/ Open cast-Semi-Mechanized mining /Non-forest/ Non-Captive Use – “B2” Category

Lease period 5 Years from the date of lease execution

(For the ensuring mining plan prepared for the period of five years)

(Prepared under rule 41 of Tamil Nadu Minor Mineral Concession Rules, 1959)

INTRODUCTORY NOTES:

- a) **Introduction:** The applicant **Mr.D.GOVINDASAMY**, S/o. Mr. Desingu, No.288, Palla Street, Sithalapakkam Village, Arasanipalaiyam Post, Vembakkam Taluk, Tiruvannamali District, Tamil Nadu-631702, filed an application for new proposals has submitted to the Assistant Director (i/c)”, Department of Geology and Mining, Kancheepuram dated 14.10.2022 had requested to grant the quarry lease for rough stone and gravel in S.F.No’s: 699/2 & 699/3 over an extent of 2.90.50hectares of Magaral-B Village, Walajabad Taluk, Kancheepuram District, Tamil Nadu State.
- b) **The Precise area communication letter:** The Assistant Director (i/c), Department of Geology and Mining, Kancheepuram has directed to the applicant **Mr D.GOVINDASAMY**, through his precise area communication letter **Roc. No. 254/Q3/2022** Dated: 27.10.2022, before execution of lease deed should submit the mining plan for approval and obtain environmental clearance from the competent authority of State Level Environment Impact Assessment Authority- TamilNadu (SEIAA) per EIA notification S.O.1533(E) dated 14th September 2006 and its subsequent amendments S.O.3977(E), dated 14th August 2018, MoEF & CC office memorandum letter F.No.22-1/2019 -IA.III [E116917] dated 15th December, 2021 for quarrying lease rough stone and gravel at Tamil Nadu State, Kancheepuram District, Walajabad Taluk, Magaral-B Village in S.F.Nos: 699/2 & 699/3 over an extent of 2.90.50hectares has recommended as following conditions for a period of ten (10) years under Rule 19(1) of Tamil Nadu Minor Mineral Concession Rules, 1959.
1. A safety distance of 7.5 meter should be provided to the adjacent patta lands and a safety of 10m should be provided to the adjacent government lands.
 2. Mining operations should be carried out in a safe manner without causing any damage to public or public property.



3. The village hall is closed to the north of the application area. The village road should be excavated leaving a safety distance of 10 meters.
 4. As it is stated that the house situated to the north-east of the application notices belongs to the petitioner, the relevant documents and more village map should be submitted.
 5. As per the rule 41 of Tamil Nadu Minor Mineral Concession Rules, 1959, mining plan should be submitted for approval to the Assistant Director (i/c), Geology and Mining.
 6. Environment Clearance shall be obtained from the State Level Environment Impact Assessment Authority as per rule 42 of Tamilnadu Minor Mineral Concession Rules, 1959.
- c) **Preparation and Submission of Mining Plan:** The Mining Plan with progressive quarry closure plan has been prepared under rule 41 (3) (i) and submitted under rule 41 (8) (i) of Tamil Nadu Minor Mineral Concession Rules, 1959 for mining lease as per conditions mentioned in the precise area communication letter **Roc. No. 254/Q3/2022 Dated: 27.10.2022.**
- d) **Geological resources and Mineable reserves:** Geological resource of estimated as **1016540m³** including the resources of safety zone, and gravel, etc. of which, rough stone resources of about **958452m³**, Gravel is **58088m³**. The total mineable reserve is estimated to be **494795m³** by deducting the reserve safety zone, block in benches from the total Geological resources. of which, rough stone is about **448991m³**, and gravel is **45804m³** up to a depth of 35m below the ground level (R.L.71m to 36m) (Refer Plate No. VI & VIA).
- e) **Proposed Production Schedule** Total proposed production of **494795m³** of which, rough stone is about **448991m³** and gravel is about **45804m³** up to a depth of 35m below the ground level (R.L.71m to 36m) for first five years plan period. Average production is **89798m³** of rough stone per year and gravel is **15268m³** per year (Refer Plate No. IV & IVA).
- f) **Environmental Sensitivity of the proposed lease area: -**
- i). **Interstate boundary:** No interstate boundary around 10Km radius periphery of proposed lease area.



ii). **Wildlife Protection Act, 1972:** There is no wild life animal sanctuary within radius of 10Km from the project site area under the Wildlife (Protection) Act, 1972.

iii). **Indian Reserve Forest Act, 1980:** There is no reserve forest within the radius of 1.0km. The Nearest Reserve Forest is Marudham R.F – 7.3Km – Southeast Side. The Nearest Reserve Forest is Edamachi R.F – 14.20Km – Southeast Side.

iv). **CRZ Notification, 2019:** The Bay of Bengal is situated about 52.4km away on the Eastern side and this project site doesn't attract CRZ Notification, 2019.

g) Environmental measures to be adopted during the ongoing activity period,

- Usage of sharp drill bits while drilling which will help in reducing noise.
- Secondary blasting will be totally avoided and hydraulic rock breaker will be used for breaking boulders.
- Controlled blasting with proper spacing, burden, stemming and optimum charge/delay will be maintained.
- Green Belt/ Plantation will be developed around the project area and along the haul roads. The plantation minimizes propagation of noise.
- Water will be sprinkled on haul roads twice a day to avoid dust generation during transportation.
- Transportation of material will be carried out during day time and material will be covered with tarpaulin.
- The speed of tippers plying on the haul road will be limited below 20 km/hr to avoid generation of dust.
- 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. D. GOVINDASAMY, |
| | Applicant address | : | D. GOVINDASAMY, S/o. Mr. Desingu, No.288, Palla Street, Sitthalapakkam Village, Arasanipalaiyam Post, Vembakkam Taluk, Tiruvannamali District, Tamil Nadu- 631702. |
| | District | : | Tiruvannamali |
| | State | : | Tamilnadu |
| | Pin code | : | 631702 |
| | Phone | : | --- |



| | | | |
|----|--|---|--|
| | Fax | : | Nil |
| | Gram | : | Nil |
| | Telex | : | Nil |
| | E-mail | : | ..... |
| b. | Status of the Applicant | | |
| | Private individual | : | Individual |
| | Cooperative Association | : | --- |
| | Private company | : | --- |
| | Public Company | : | --- |
| | Public Sector Undertaking | : | --- |
| | Joint Sector Undertaking | : | --- |
| | Other (pl. specify) | : | --- |
| c. | Mineral(s) Which are occurring in the area and which the applicant intends to mine | : | Rough stone and gravel quarry lease |
| d. | Period for which the mining lease granted /renewed/ proposed to be applied | : | The precise area has been communicated to the applicant for quarrying period of ten years. |
| e. | Name of the Qualified Person | : | G. Umamaheswarn, M.Sc., |
| | Address | : | 4-101, Sengattur, Muthampatti – (PO), Tholasampatti, Mettur Taluk, Salem – 636503, Tamilnadu |
| | Phone | : | +91 9790462882 |
| | Fax | : | Nil |
| | e-mail | : | maheswaran.gk@gmail.com |
| | Telex | : | Nil |
| | Registration Number | : | Nil |
| | Date of grant/renewal | : | Nil |
| | Valid upto | : | Nil |
| | Phone | : | --- |
| f. | Reference No. and date of consent letter from the state government | : | The precise area communication letter issued by the Assistant Director (i/c), Department Geology and Mining, Kancheepuram was received vide Roc. No. 254/Q3/2022 Dated: 27.10.2022, |



2.0 LOCATION AND ACCESSIBILITY:

| | | | | | | |
|--|----------------------|----------------------|-----------|--|--|--|
| a. | Details of the Area: | | : | Refer plate no: IA & IB | | |
| | District & State | | : | Kancheepuram, Tamil Nadu | | |
| | Taluk | | : | Walajabad | | |
| | Village | | : | Magaral-B | | |
| Khasra No./ Plot No./ Block Range/ Felling Series etc.: | | | | | | |
| Survey No. | Sub division | Total Extent in Hect | Patta No. | Village and Name of the Land Owner | Mine lease Applied S.F. No. | Mine lease Applied Area out of total area in hect. |
| 699 | 2 | 2.02.5 | 551 | M/S.PJR Blue metals Private limited and Janagiraman S/o. Parthasarathi (Managing Director) | 699/2 | 2.02.5 |
| 699 | 3 | 0.88.0 | 626 | PJR Blue metals Private limited | 699/3 | 0.88.0 |
| Total Extent | | 2.90.50 | ... | Applied lease area extent | | 2.90.50 |
| Lease area (hectares) | | | | : | 2.90.50hectares | |
| Whether the area is recorded to be in forest (please specify whether protected, reserved, etc) | | | | : | It is a patta land | |
| Ownership / Occupancy | | | | : | This is a patta land S.F.No. 699/2 is registered on the name of M/S. PJR blue metals private limited and Janagiraman S/o. Parthasarathi (Managing Director) vide patta no. 551, S.F.No. 699/3 is registered on the name of M/S.PJR blue metals private limited vide patta no. 626 (Ref. Annex. No: V). | |
| Existence of Public Road / Railway line if any nearby and approximate distance | | | | : | ✓ Exploited quarry materials will be transported to through the patta land and connect village road is situated on the western side. ✓ There is a SH-118A road situated on the Eastern side about 1.96km which is connecting Uthirameru – | |



| | | <p>Kancheepuram.</p> <p>✓ There is no NH-road around 5kms radius of the periphery of the site.</p> <p>✓ There is railway situated about 12.2km radius away on the Northern side to the applied lease area.</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---------------|--|-----------|----------|-----------|---|---------------|--------------|---|---------------|--------------|---|---------------|--------------|---|---------------|--------------|---|---------------|--------------|---|---------------|--------------|---|---------------|--------------|---|---------------|--------------|---|---------------|--------------|
| Toposheet No. with latitude and longitude: | | <p>SOI Toposheet No. 57-P/10</p> <p>Latitude : From 12°43'32.65"N to 12°43'43.28"N</p> <p>Longitude : From 79°44'0.85"E to 79°44'8.88"E</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>Geo-Coordinates of the lease boundary:</p> <table border="1"> <thead> <tr> <th>PILLAR ID</th><th>Latitude</th><th>Longitude</th></tr> </thead> <tbody> <tr><td>1</td><td>12°43'43.28"N</td><td>79°44'6.44"E</td></tr> <tr><td>2</td><td>12°43'40.26"N</td><td>79°44'8.88"E</td></tr> <tr><td>3</td><td>12°43'40.82"N</td><td>79°44'7.03"E</td></tr> <tr><td>4</td><td>12°43'40.01"N</td><td>79°44'4.15"E</td></tr> <tr><td>5</td><td>12°43'38.10"N</td><td>79°44'3.74"E</td></tr> <tr><td>6</td><td>12°43'36.90"N</td><td>79°44'4.24"E</td></tr> <tr><td>7</td><td>12°43'32.65"N</td><td>79°44'1.01"E</td></tr> <tr><td>8</td><td>12°43'41.04"N</td><td>79°44'0.91"E</td></tr> <tr><td>9</td><td>12°43'41.64"N</td><td>79°44'0.85"E</td></tr> </tbody> </table> | | | PILLAR ID | Latitude | Longitude | 1 | 12°43'43.28"N | 79°44'6.44"E | 2 | 12°43'40.26"N | 79°44'8.88"E | 3 | 12°43'40.82"N | 79°44'7.03"E | 4 | 12°43'40.01"N | 79°44'4.15"E | 5 | 12°43'38.10"N | 79°44'3.74"E | 6 | 12°43'36.90"N | 79°44'4.24"E | 7 | 12°43'32.65"N | 79°44'1.01"E | 8 | 12°43'41.04"N | 79°44'0.91"E | 9 | 12°43'41.64"N | 79°44'0.85"E |
| PILLAR ID | Latitude | Longitude | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 12°43'43.28"N | 79°44'6.44"E | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | 12°43'40.26"N | 79°44'8.88"E | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | 12°43'40.82"N | 79°44'7.03"E | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | 12°43'40.01"N | 79°44'4.15"E | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | 12°43'38.10"N | 79°44'3.74"E | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | 12°43'36.90"N | 79°44'4.24"E | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | 12°43'32.65"N | 79°44'1.01"E | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | 12°43'41.04"N | 79°44'0.91"E | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | 12°43'41.64"N | 79°44'0.85"E | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Land use pattern (Forest, Agricultural, Grazing, Barren etc.) | : | It is an barren and virgin land | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| b). | : | <p><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></p> <p>Refer plate no-IA & IB</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |



i) INFRASTRUCTURE AND COMMUNICATION:

| S.No | Description | Place | Distance | Direction |
|------|--------------------------|----------------|----------|-----------|
| a. | Nearest post office | Magaral B | 2.3Km | SE |
| b. | Nearest police station | Magaral | 2.12Km | East |
| c. | Nearest fire station | Uthiramerur | 13.5km | SE |
| d. | Nearest medical facility | Elacheri | 3.1Km | SW |
| e. | Nearest school | Arpakkam | 2.8Km | NE |
| f. | Nearest railway station | Walajabad | 11.7km | North |
| g. | Nearest port facility | Chennai | 72.2km | NE |
| h. | Nearest airport | Chennai | 55.92km | NE |
| i. | Nearest DSP office | Kancheepuram | 13.3km | North |
| j. | Nearest villages | Suruttal | 0.95Km | North |
| | | Sithalapakkam | 1.16Km | South |
| | | Magaral-A | 2.0Km | SE |
| | | Bagavandapuram | 2.54km | West |

PART – A

3.0 GEOLOGY AND MINERAL RESERVES:

(a) Briefly describe the topography and general geology and local/mine geology of the mineral deposit including drainage pattern:

| | | |
|------|---|---|
| (i) | Topography | : The proposed lease area exhibits flat topography which is an average altitude of about 70.5m AMSL. The proposed site shows the relief of 1m; the maximum elevation (71m) was observed in South side, and the minimum elevation (70m) was observed North side of the site. The slope is towards South side and falls in Toposheet no. 57-P/10. |
| (ii) | General Geology of the district: a) Geomorphology: <p>The Kancheepuram area is endowed with a complex geological set up with crystalline rocks occurring in the southern part of the area and the northern part of the area the crystalline rocks occur at depths covered by sedimentary formations ranging from gondwana to recent. The depth at which the crystalline rocks occur progressively increase towards north. The eastern part comprises unconsolidated sediments of fluvio-marine and marine origin. The precambrian crystalline rocks are represented by charnockites and contain several enclave's mafic granulite. Garnetiferous and biotite gneisses are also encountered as linear bands.</p> b) Soils: <p>The analysis of the soil type reveals that the proposed lease area is predominantly covered by river alluvium is transported and is seen in coastal area</p> c) Lineaments: <p>he general trend of the gneiss is NE-SW direction and the regional trend observed is NNE-SSW to NW-SE direction. The deposition of gondwana rocks, the sedimentary rocks, in faulted troughs and in the rugged topography of crystalline rocks took place during jurassic period. The insitu soils laterites and alluvial deposits were deposited along the palar and cheyyar rivers during the quaternary period. The data have been checked by field studies and survey of India topographical maps at the 1: 50,000 scales.</p> | |



Order of superposition of the proposed lease area,

| Age | Group | Rock Formation |
|------------------------------|--------------------------|---|
| Recent | Alluvium and beach sands | Sand, gravel, silt and clay |
| Pleistocene | Laterite, soils, talus | Laterites, sandy clay, silt |
| -----Unconformity----- | | |
| Lower Cretaceous to Jurassic | Sandstones & Shales | Fine to medium grained sand stone with clay intercalations of greenish soft shale |
| -----Unconformity----- | | |
| Archaean | Crystalline formations | Charnockites, granites and associated basic and ultra-basic intrusive |

(iii) Local / Mine Geology of The Mineral Deposit:

Topography of the proposed lease area:

The proposed lease area is flat terrain with elevated about 1 meters and altitude of 71m maximum and minimum 70m above MSL. The area is sloping towards south side and charnockite composed mainly of quartz, perthite or antiperthite and orthopyroxene (usually hypersthene) formed at high temperature and pressure, commonly found in granulite facies metamorphic regions, as an end-member of the charnockite series. charnockite is extensively quarried for rough stone productivity / which is used as blue metals for construction of building.

b). Mode of origin:

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.

c). Physiography of the rocks:

Dark colour and clouding of the feldspars are typical features of these rocks as bluish in quartz.

d). Chemical composition of rocks:

Charnockite, any member of a series of metamorphic rocks with variable chemical composition, the term is often limited to the characteristic ortho pyroxene granite of the series. The alkali feldspar may be intermediate between microcline and orthoclase, the fine micro perthitic texture being common.

Order of superposition of the proposed lease area,



| | | Age | Group | Rock Formation |
|------|------------------|----------------------|--|------------------------------------|
| | | Recent to sub recent | --- | Fine to medium grained clayey soil |
| | | Archaean | Charnockite group | Charnockite. |
| (iv) | Drainage Pattern | : | The Ponneri lake is situated on Eastern side. There is no major river around 1km radius. | |

(b) *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:*

a. Present status: : The QP examined the surface features during survey. It is a fresh quarry lease covered with clayey soil in this lease area. No exploration carried out.

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) *Broadly indicate the Yearwise future programme of exploration, taking into consideration the future production programme planned in next five years as in table below :-*

| Year | No.of boreholes | Total meterage | No.of Pits and Dimensions | No.of Trenches and Dimensions |
|------|-----------------|----------------|---------------------------|-------------------------------|
| I | N.A | --- | --- | N.A |
| II | N.A | --- | --- | N.A |
| III | N.A | --- | --- | N.A |
| IV | N.A | --- | --- | N.A |
| V | N.A | --- | --- | N.A |

No future programmed proposed in this area. Its massive homogeneous parent rock. Hence exploration proposal is not required to this mining project.

(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.

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 three sections (longitudinal and transverse) to calculate the volume of material up to the depth of 35m below ground level. The longitudinal and transverse cross sections were assigned (XY-AB) & (XIY1-CD) as respectively. Using the cross-sectional method, total reserve is estimated to be **1016540m³** including the resources of safety zone, and gravel, etc. Of which, rough stone resources of about **958452m³**, and gravel is **58088m³**.

Gravel is obtained about 0-2m (R.L.71 to 69m) and from the surface level and a rough stone starts from 2 to 35m (R.L.69 to 36m) from the below the ground level. (Refer plate no's. III & IIIA).

| GEOLOGICAL RESOURCES | | | | | | | |
|----------------------|-------|---------------|--------------|--------------|--------------------------|-------------------------------|--------------------------|
| Section | Bench | length in (m) | Width in (m) | Depth in (m) | Volume In m ³ | Rough stone in m ³ | Gravel in m ³ |
| XY-AB | I | 203 | 76 | 2 | 30856 | ..... | 30856 |
| | I | 203 | 76 | 3 | 46284 | 46284 | ..... |
| | II | 203 | 76 | 5 | 77140 | 77140 | ..... |
| | III | 203 | 76 | 5 | 77140 | 77140 | ..... |
| | IV | 203 | 76 | 5 | 77140 | 77140 | ..... |
| | V | 203 | 76 | 5 | 77140 | 77140 | ..... |
| | VI | 203 | 76 | 5 | 77140 | 77140 | ..... |
| | VII | 203 | 76 | 5 | 77140 | 77140 | ..... |
| TOTAL | | | | | 539980 | 509124 | 30856 |
| XIY1-CD | I | 148 | 92 | 2 | 27232 | ..... | 27232 |
| | I | 148 | 92 | 3 | 40848 | 40848 | ..... |
| | II | 148 | 92 | 5 | 68080 | 68080 | ..... |
| | III | 148 | 92 | 5 | 68080 | 68080 | ..... |
| | IV | 148 | 92 | 5 | 68080 | 68080 | ..... |
| | V | 148 | 92 | 5 | 68080 | 68080 | ..... |
| | VI | 148 | 92 | 5 | 68080 | 68080 | ..... |
| | VII | 148 | 92 | 5 | 68080 | 68080 | ..... |
| TOTAL | | | | | 476560 | 449328 | 27232 |
| GRAND TOTAL | | | | | 1016540 | 958452 | 58088 |

(f) Indicate mineable reserves by slice plan / level plan method, as applicable, as per the proposed mining parameter: -

The total mineable reserve is estimated to be **494795m³** by deducting the reserve safety zone, block in benches from the total Geological resources up to a depth of 35m

(R.L.71 to 36m) below ground level. Of which, rough stone is about **448991m³** and gravel is **45804m³**. 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. VI & VIA).



| MINEABLE RESERVES | | | | | | | |
|-------------------|-------|------------------|-----------------|-----------------|-----------------------------|----------------------------------|-----------------------------|
| Section | Bench | length in (m) | Width in (m) | Depth in (m) | Volume In m ³ | Rough stone in m ³ | Gravel in m ³ |
| XY-AB | I | 186 | 66 | 2 | 24552 | ..... | 24552 |
| | I | 186 | 66 | 3 | 36828 | 36828 | ..... |
| | II | 176 | 61 | 5 | 53680 | 53680 | ..... |
| | III | 166 | 56 | 5 | 46480 | 46480 | ..... |
| | IV | 156 | 51 | 5 | 39780 | 39780 | ..... |
| | V | 146 | 46 | 5 | 33580 | 33580 | ..... |
| | VI | 136 | 41 | 5 | 27880 | 27880 | ..... |
| | VII | 126 | 36 | 5 | 22680 | 22680 | ..... |
| TOTAL | | | | | 285460 | 260908 | 24552 |
| XIYI- CD | I | 138 | 77 | 2 | 21252 | ..... | 21252 |
| | I | 138 | 77 | 3 | 31878 | 31878 | ..... |
| | II | 133 | 67 | 5 | 44555 | 44555 | ..... |
| | III | 128 | 57 | 5 | 36480 | 36480 | ..... |
| | IV | 123 | 47 | 5 | 28905 | 28905 | ..... |
| | V | 118 | 37 | 5 | 21830 | 21830 | ..... |
| | VI | 113 | 27 | 5 | 15255 | 15255 | ..... |
| | VII | 108 | 17 | 5 | 9180 | 9180 | ..... |
| TOTAL | | | | | 209335 | 188083 | 21252 |
| GRAND TOTAL | | | | | 494795 | 448991 | 45804 |

4.0 MINING:

| | | | |
|----|--|---|---|
| a. | <p>Briefly describe the existing / proposed method for developing / working the deposit with all design parameters.</p> <p>(Note: In case of pocket deposits, sequence of development/working may be indicated on the same plan)</p> | : | <p>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.</p> |
|----|--|---|---|



- b. *Indicate quantum of development and tonnage and grade of production expected pit wise as in table below.*

Total proposed production of **494795m³** of which, rough stone is about **448991m³** and gravel is **45804m³** up to a depth of 35m below the ground level (R.L.71 to 36m) from the below ground level for five years plan period. Average production is **89798m³** of rough stone per year and gravel is **15268m³** in a year (Refer Plate No's. IV & IVA).

| Year | Pit No.(s) | ROM (m ³) | Saleable rough stone (m ³) @ 100% | Rough stone rejects(m ³) | Saleable Gravel (m ³) | Rough stone to waste ratio |
|--------------|------------|-----------------------|---|--------------------------------------|-----------------------------------|----------------------------|
| First | I | 115060 | 90508 | ... | 24552 | .... |
| Second | I | 97685 | 76433 | ... | 21252 | .... |
| Third | I | 82960 | 82960 | ... | .... | .... |
| Fourth | I | 90515 | 90515 | ... | .... | .... |
| Fifth | I | 108575 | 108575 | ... | .... | .... |
| Total | --- | 494795 | 448991 | ... | 45804 | .... |

- c. *Composite plans and Year wise sections (In case of 'A' class mines):* : Not applicable. It is a "B" class mine

| YEARWISE PRODUCTIONS FIRST FIVE YEARS | | | | | | | | |
|---------------------------------------|-------------|-------|------------------|-----------------|-----------------|-----------------------------|----------------------------------|-----------------------------|
| Year | Section | Bench | Length in (m) | Width in (m) | Depth in (m) | Volume in m ³ | Rough Stone in m ³ | Gravel in m ³ |
| I-YEAR | XY-AB | I | 186 | 66 | 2 | 24552 | ..... | 24552 |
| | | I | 186 | 66 | 3 | 36828 | 36828 | ..... |
| | | II | 176 | 61 | 5 | 53680 | 53680 | ..... |
| TOTAL | | | | | | 115060 | 90508 | 24552 |
| II-YEAR | XIYI- CD | I | 138 | 77 | 2 | 21252 | ..... | 21252 |
| | | I | 138 | 77 | 3 | 31878 | 31878 | ..... |
| | | II | 133 | 67 | 5 | 44555 | 44555 | ..... |
| TOTAL | | | | | | 97685 | 76433 | 21252 |
| III- YEAR | XY-AB | III | 166 | 56 | 5 | 46480 | 46480 | ..... |
| | XIYI- CD | III | 128 | 57 | 5 | 36480 | 36480 | ..... |
| TOTAL | | | | | | 82960 | 82960 | 0 |
| IV- YEAR | XY-AB | IV | 156 | 51 | 5 | 39780 | 39780 | ..... |
| | XIYI- CD | IV | 123 | 47 | 5 | 28905 | 28905 | ..... |
| | | V | 118 | 37 | 5 | 21830 | 21830 | ..... |
| TOTAL | | | | | | 90515 | 90515 | 0 |
| V-YEAR | XY-AB | V | 146 | 46 | 5 | 33580 | 33580 | ..... |
| | | VI | 136 | 41 | 5 | 27880 | 27880 | ..... |
| | | VII | 126 | 36 | 5 | 22680 | 22680 | ..... |
| | XIYI- CD | VI | 113 | 27 | 5 | 15255 | 15255 | ..... |
| | | VII | 108 | 17 | 5 | 9180 | 9180 | ..... |
| TOTAL | | | | | | 108575 | 108575 | 0 |
| GRAND TOTAL | | | | | | 494795 | 448991 | 45804 |



| | | | |
|-----|---|---|---|
| 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. | <p>Indicate proposed rate of production when the mine is fully developed and the expected life of the mine and the year from which effected:</p> <p>At this rate of production, the expected life of quarry is calculated as given below:</p> <p><u>Rough stone:</u></p> <p>Mineable reserves of rough stone = 448991m³</p> <p>Production per year = 89798m³</p> <p>Monthly production of rough stone = 7483m³</p> <p><u>Gravel</u></p> <p>Mineable reserves of gravel = 45804m³</p> <p>Monthly production of gravel = 1272m³</p> <p>The regular working of the quarry and its production depends upon the demand from the market. The market is always fluctuating and flexible one. Accordingly, there is a possibility to increase or decrease the production. The year wise production, anticipated life of quarry etc., are only a tentative figure.</p> | | |
| f. | <p>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:</p> | | |
| 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 35m below ground level (R.L.71m to 36m) 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 5 years. |
| ii) | <p>Whether ultimate pit limit has been determined and demarcated on surface and geological plan:-</p> <p>The ultimate pit limit has been determined and demarcated in the conceptual plan</p> | | |



| ULTIMATE PIT LIMIT-(XY-AB) | | | | | | |
|----------------------------|---------------|----------------------|------------------------|----------|----------|----------|
| Bench | Bench R.L | Period | Overburden/ Mineral | L (m) | W (m) | D (m) |
| I | R.L.71 to 69m | Five years Period | Gravel | 186 | 66 | 2 |
| I | R.L.69 to 66m | | Rough stone | 186 | 66 | 3 |
| II | R.L.66 to 61m | | Rough stone | 176 | 61 | 5 |
| III | R.L.61 to 56m | | Rough stone | 166 | 56 | 5 |
| IV | R.L.56 to 51m | | Rough stone | 156 | 51 | 5 |
| V | R.L.51 to 46m | | Rough stone | 146 | 46 | 5 |
| VI | R.L.46 to 41m | | Rough stone | 136 | 41 | 5 |
| VII | R.L.41 to 36m | | Rough stone | 126 | 36 | 5 |
| Total | | | | | | 35m |

| ULTIMATE PIT LIMIT-(XIYI-CD) | | | | | | |
|------------------------------|---------------|----------------------|------------------------|----------|----------|----------|
| Bench | Bench R.L | Period | Overburden/ Mineral | L (m) | W (m) | D (m) |
| I | R.L.71 to 69m | Five years Period | Gravel | 138 | 77 | 2 |
| I | R.L.69 to 66m | | Rough stone | 138 | 77 | 3 |
| II | R.L.66 to 61m | | Rough stone | 133 | 67 | 5 |
| III | R.L.61 to 56m | | Rough stone | 128 | 57 | 5 |
| IV | R.L.56 to 51m | | Rough stone | 123 | 47 | 5 |
| V | R.L.51 to 46m | | Rough stone | 118 | 37 | 5 |
| VI | R.L.46 to 41m | | Rough stone | 113 | 27 | 5 |
| VII | R.L.41 to 36m | | Rough stone | 108 | 17 | 5 |
| Total | | | | | | 35m |

| | | | |
|------|---|---|---|
| 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 recovery of rough stone in this quarry is 100%. If rough stone may be unsold will be keep within the lease boundary. |
| 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 fish culture or storage of rain water reservoir used for irrigation purposes. |

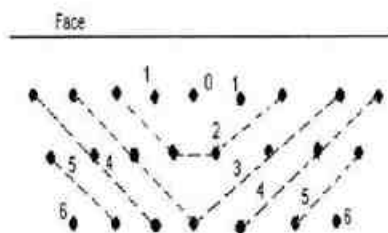


| | | |
|-----|--|--|
| g. | Open cast Mines: | |
| i | Describe briefly giving salient features of the mode of working (Mechanized, Semi-Mechanized, manual) | <p>The mining operation is open-cast, semi-mechanized methods are adopted and on single shift basis only. Under the regulation 106 of the Metalliferous 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.</p> <p>Machineries like Tractor mounted compressor attached with Jack hammers is proposed to drilling and blasting. Hydraulic Excavators and tipper combination are adapted.</p> |
| 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 | <p>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.</p> <p>Bench height = 5mts. Bench width = 5mts.</p> |
| | a. Details of Topsoil/ Overburden | No separate of topsoil will be removed. |
| | b. Rough Stone waste and side burden waste:- | The recovery of rough stone in this quarry is 100%. There is no mineral |



| | | | waste will be proposed in this lease area | | | | | | | | | | | | | | | | | | | | | |
|-------------|---|------------------|--|--------------|--------------|------------------|-----------------|--------------|--------------|--------|-------------|------|-------|-----------|----|--------|----|------------|---|-----|-----|----|--------|----|
| h. | Underground Mines: | : | Not applicable | | | | | | | | | | | | | | | | | | | | | |
| i. | Extent of mechanization: Describe briefly including the calculation for adequacy and type of machinery and equipment proposed to be used in different mining operations. | | | | | | | | | | | | | | | | | | | | | | | |
| | (1) Drilling Machines: Drilling of shot holes will be carried out using tractor mounted compressor and jack hammer. Depth of holes shall be 1.5m bench height and spacing will be 1.2m and burden will be 1m from the preface. 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>1</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 | 1 | --- | Air | -- | Diesel | -- |
| Type | Nos | Dia of hole (mm) | Size / Capacity | Make | Motive power | H.P. | | | | | | | | | | | | | | | | | | |
| Jack Hammer | 4 | 32 mm | Hand held | -- | Diesel | -- | | | | | | | | | | | | | | | | | | |
| Compressor | 1 | --- | Air | -- | Diesel | -- | | | | | | | | | | | | | | | | | | |
| | (2) Loading Equipment: Hydraulic excavator with attached rock breaker and tippers combination utilized for internal transport sizeable rough stone lumps and deliver to the consumer area. | | | | | | | | | | | | | | | | | | | | | | | |
| | (3) Haulage and Transport Equipment (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>10</td> <td>15MT</td> <td>--</td> <td>Diesel</td> <td>--</td> </tr> </tbody> </table> | | | Type | Nos | Size / Capacity | Make | Motive power | H.P. | Tipper | 10 | 15MT | -- | Diesel | -- | | | | | | | | | |
| Type | Nos | Size / Capacity | Make | Motive power | H.P. | | | | | | | | | | | | | | | | | | | |
| Tipper | 10 | 15MT | -- | Diesel | -- | | | | | | | | | | | | | | | | | | | |
| | Whether the dumpers are fitted with exhaust conditioner should be indicated: The dumpers not used in this quarry area, hence it's a small B2 category mine. | | | | | | | | | | | | | | | | | | | | | | | |
| | (b) Transport from mine head to the destination | : | Tipper will be used for transport rough stone 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. | | | | | | | | | | | | | | | | | | | | | |
| | d. Ore transported by: own trucks / hired trucks | : | Hired trucks for initially production purposes. | | | | | | | | | | | | | | | | | | | | | |
| | e. Main destination to which ore is | : | The excavated stone materials road | | | | | | | | | | | | | | | | | | | | | |

| transported (giving to and from distance) | metal will be supplied to the consumers like road laying, earth filling, building construction, etc | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|----------------------|-----------------|--------------|----------------------|------|----|-----------------|------|----|--------------------|------|---|---|------|---|---|--------|---|--|---------|---|--|------|---|--|------------|----|--|-----------|----|-----------------|-------|----|--|------|----|--|----|--|
| f. Details of hauling / transport equipment: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <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>--</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> </tr> </tbody> </table> | Type | Nos | Size / Capacity | Make | Motive power | H.P. | -- | -- | -- | -- | -- | -- | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Type | Nos | Size / Capacity | Make | Motive power | H.P. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| -- | -- | -- | -- | -- | -- | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (4).Miscellaneous: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 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. BLASTING: 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. Blasting pattern: 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. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1"> <tbody> <tr> <td>1</td> <td>Diameter of the hole</td> <td>32 mm</td> </tr> <tr> <td>2</td> <td>Spacing between hole</td> <td>1.2m</td> </tr> <tr> <td>3</td> <td>Burden for hole</td> <td>1.0m</td> </tr> <tr> <td>4</td> <td>Depth of each hole</td> <td>1.5m</td> </tr> <tr> <td>5</td> <td>Output per hole = Spacing × Burden × depth $1.2 \times 1.0 \times 1.5 = 1.8$</td> <td>1.8m</td> </tr> <tr> <td>6</td> <td>Output per hole = $1.8 \times 2.8 = 5.04$ T</td> <td>5.04 T</td> </tr> <tr> <td>7</td> <td>Production per annum $89798m^3 \times 2.8 = 251435T$</td> <td>251435T</td> </tr> <tr> <td>8</td> <td>Total handling per day (300 working day)</td> <td>838T</td> </tr> <tr> <td>9</td> <td>Nos. of holes per day $838/5.04 = 166$</td> <td>166 holes.</td> </tr> <tr> <td>10</td> <td>Meterage required per day ($166 \times 5.5 = 913$)</td> <td>913meters</td> </tr> <tr> <td>11</td> <td>Charge per hole</td> <td>0.5kg</td> </tr> <tr> <td>12</td> <td>Powder factor $166 \times 0.5 \text{ kg} = 83$</td> <td>83kg</td> </tr> <tr> <td>13</td> <td>Sequence of blasting = Cord relay with electric detonators / Nonel</td> <td>--</td> </tr> </tbody> </table> | 1 | Diameter of the hole | 32 mm | 2 | Spacing between hole | 1.2m | 3 | Burden for hole | 1.0m | 4 | Depth of each hole | 1.5m | 5 | Output per hole = Spacing × Burden × depth $1.2 \times 1.0 \times 1.5 = 1.8$ | 1.8m | 6 | Output per hole = $1.8 \times 2.8 = 5.04$ T | 5.04 T | 7 | Production per annum $89798m^3 \times 2.8 = 251435T$ | 251435T | 8 | Total handling per day (300 working day) | 838T | 9 | Nos. of holes per day $838/5.04 = 166$ | 166 holes. | 10 | Meterage required per day ($166 \times 5.5 = 913$) | 913meters | 11 | Charge per hole | 0.5kg | 12 | Powder factor $166 \times 0.5 \text{ kg} = 83$ | 83kg | 13 | Sequence of blasting = Cord relay with electric detonators / Nonel | -- | |
| 1 | Diameter of the hole | 32 mm | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Spacing between hole | 1.2m | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Burden for hole | 1.0m | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Depth of each hole | 1.5m | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Output per hole = Spacing × Burden × depth $1.2 \times 1.0 \times 1.5 = 1.8$ | 1.8m | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | Output per hole = $1.8 \times 2.8 = 5.04$ T | 5.04 T | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | Production per annum $89798m^3 \times 2.8 = 251435T$ | 251435T | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | Total handling per day (300 working day) | 838T | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | Nos. of holes per day $838/5.04 = 166$ | 166 holes. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | Meterage required per day ($166 \times 5.5 = 913$) | 913meters | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | Charge per hole | 0.5kg | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | Powder factor $166 \times 0.5 \text{ kg} = 83$ | 83kg | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | Sequence of blasting = Cord relay with electric detonators / Nonel | -- | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |



Blastholes/Initiation patterns for shot fired to an open face

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 jackhammer 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 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 | : | 166holes |
| Yield | : | 838tons |
| Powder factor | : | 0.5kg per hole of explosives |
| Total explosive required | : | 83kg- nonel explosives |
| Blasting at day time only | : | 12.00p.m-1.00p.m |

| | | |
|--|---|---|
| c) Powder factor in ore and overburden / waste / development heading / stope | : | Powder factor is proposed as 0.5kg per hole of explosives |
|--|---|---|



| | | | |
|----|---|---|--|
| | d) Whether secondary blasting is needed, if so describe it briefly | : | Irrespective of the method of primary blasting employed, it may be necessary to re-blast a proportion of the rock on the quarry floor so as to reduce it to a size suitable for handling by the excavators and crushers. |
| | 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. 2. First Aid Box will be keeping ready at all the time. |
| 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 55m in summer and 50m 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 35m 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 pumping arrangements and places where the mine water is finally proposed to be discharged | : | The ground water may not rise immediately in this type of mining. However, the rain water percolation and collection of water from the seepage shall be less than 300 Lpm and it shall be pumped out 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. |



| | | | |
|-----|---|---|---|
| 7. | STACKING OF MINERAL REJECTS AND DISPOSAL OF WASTE: | | |
| a). | <p>Indicate briefly the nature and quantity of top soil, overburden / waste and mineral rejects likely to be generated during the next five years:</p> <p>No separate of topsoil will be removed and any other waste or side burden dumps are doesn't proposed.</p> | | |
| b). | Land chosen for disposal of waste with proposed justification | : | There is no waste are proposed. |
| 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. | : | There is no waste or any other mineral dumps are proposed. If rough stone may be unsold will be keep within the lease boundary. |
| 8. | USE OF MINERAL: | | |
| a). | Describe briefly the end-use of the mineral (sale to intermediary parties, captive consumption, export, industrial use) | : | <p>The Charnockite is quarried as rough stone / blue metal and used for road material and construction purpose, used as raw material to produce M-Sand, P-Sand, etc.</p> <p>Charnockite is a hard Black with Blue tinges bearing rock; hence it is called as "Blue Metal". It is mainly used in Stone crushing units and size reduced in to ½, ¾ and 1½ inches Jelly which are mainly used in road and building construction purpose.</p> |
| b). | Indicate physical and chemical specifications stipulated by buyers | : | Basically, the materials produced at this quarry are rough stone (charnockite) and 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 | : | Not blending process is involved, after blasting the rough stone will be directly loaded to the needy customer. |



| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----|---|---|----------------|----------------|--------------|------|--|--|----------------|------|--|--|----------------|------|--|--|---------|------|----|-----------|-------------------|---------|--|--|----------------|----------------|
| | by buyers. | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9. | OTHERS | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <p>Describe briefly the following</p> <p>a) Site services</p> | <p>: Infrastructure required for such mines like office, stores, canteen, first aid station, shelter latrine and bath rooms have been provided as per the Metalliferous Mines Regulations, 1961, as a welfare amenity for quarry laborers. No manual mining shall be proposed. Approach road is available from nearby the site.</p> | | | | | | | | | | | | | | | | | | | | | | | | |
| | <p>b) Employment potential:</p> <p>As per Mines safety under the provisions of Metalliferous Mines Regulations, 1961 and 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 rough stone during the five years period the same manpower will be utilize for this Mining Plan period to achieve the proposed production and to comply the provisions of the DGMS norms.</p> <table border="1"> <tr> <td>1.</td> <td>Highly Skilled</td> <td>Mines Manger</td> <td>1No.</td> </tr> <tr> <td></td> <td></td> <td>Mines Engineer</td> <td>1No.</td> </tr> <tr> <td></td> <td></td> <td>Mine Geologist</td> <td>1No.</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>14 No's</td> </tr> <tr> <td></td> <td></td> <td>Total =</td> <td>18 No's</td> </tr> </table> | | 1. | Highly Skilled | Mines Manger | 1No. | | | Mines Engineer | 1No. | | | Mine Geologist | 1No. | | | Blaster | 1No. | 2. | Unskilled | Musdoor / Labours | 14 No's | | | Total = | 18 No's |
| 1. | Highly Skilled | Mines Manger | 1No. | | | | | | | | | | | | | | | | | | | | | | | |
| | | Mines Engineer | 1No. | | | | | | | | | | | | | | | | | | | | | | | |
| | | Mine Geologist | 1No. | | | | | | | | | | | | | | | | | | | | | | | |
| | | Blaster | 1No. | | | | | | | | | | | | | | | | | | | | | | | |
| 2. | Unskilled | Musdoor / Labours | 14 No's | | | | | | | | | | | | | | | | | | | | | | | |
| | | Total = | 18 No's | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | MINERAL PROCESSING/BENEFICIATIONS: | | | | | | | | | | | | | | | | | | | | | | | | | |
| (a) | <p>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> | <p>: Excavated rough stone minerals directly will be used by the applicant in his own crusher for required size (i.e 1/4", 1/2", 1/3" and 1")</p> <p>The recovery of rough stone in this quarry is 100%.</p> | | | | | | | | | | | | | | | | | | | | | | | | |
| (b) | <p>Explain the disposal method for tailings or waste from the processing</p> | <p>: No water shall be used for quarrying or any other processing except drinking</p> | | | | | | | | | | | | | | | | | | | | | | | | |



| | | | |
|-----|--|---|--|
| | plant (quantity and quality of tailings proposed to be discharged, size and capacity of tailing pond, toxic effect of such tailings, if any, with process adopted to neutralize any such effect before their disposal and dealing of excess water from the tailing dam). | | 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 during rainy season has to be done by decanting the SPM in a pit before passing the water in to natural system. |
| (c) | A flow sheet or schematic diagram of the processing procedure should be attached. | : | --- |
| (d) | Specify quantity and type of chemicals to be used in the processing plant. | : | --- |
| (e) | Specify quantity and type of chemicals to be stored on site / plant. | : | --- |
| (f) | Indicate quantity (cu.m. per day) of water required for mining and processing and sources of supply of water. Disposal of water and extent of recycling. | : | <p>Drinking is 0.750KLD, utilized water is 2.0KLD, Dust suppression is 2.0KLD and Green Belt is 2.0KLD. Minimum quantity of water 6.750KLD per day has to be maintained as per the Mines Rules, 1952. It is proposed to make an own borewell for providing uninterrupted supply of RO drinking water, dust suppression and Greenbelt development.</p> <p>The sewage water to a tune of 2.0KLD generated from the mine office toilet and mine labour toilet will be diverted to the septic tank followed by soak pit.</p> |



PART – B

11.0 ENVIRONMENTAL MANAGEMENT PLAN:

a) Attach a note on the status of Baseline information with regard to the following :

| 11.1 | Existing 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. | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------|--|---|----------|----------------------|----|-------------------|-----|---|----------------|-----|---|-------|-----|---|------------|--------|---|------------|--------|---|--------------------------|-----|--|--------------------|---------------|--|
| | <table border="1"> <thead> <tr> <th>Sl. No.</th><th>Land Use</th><th>Present area (Hect.)</th></tr> </thead> <tbody> <tr> <td>1.</td><td>Area under Mining</td><td>Nil</td></tr> <tr> <td>2</td><td>Infrastructure</td><td>Nil</td></tr> <tr> <td>3</td><td>Roads</td><td>Nil</td></tr> <tr> <td>4</td><td>Unutilized</td><td>2.82.5</td></tr> <tr> <td>5</td><td>Green belt</td><td>0.08.0</td></tr> <tr> <td>6</td><td>Drainage & Settling tank</td><td>Nil</td></tr> <tr> <td></td><td>Grand Total</td><td>2.82.5</td></tr> </tbody> </table> | Sl. No. | Land Use | Present area (Hect.) | 1. | Area under Mining | Nil | 2 | Infrastructure | Nil | 3 | Roads | Nil | 4 | Unutilized | 2.82.5 | 5 | Green belt | 0.08.0 | 6 | Drainage & Settling tank | Nil | | Grand Total | 2.82.5 | |
| Sl. No. | Land Use | Present area (Hect.) | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. | Area under Mining | Nil | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Infrastructure | Nil | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Roads | Nil | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Unutilized | 2.82.5 | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Green belt | 0.08.0 | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | Drainage & Settling tank | Nil | | | | | | | | | | | | | | | | | | | | | | | | |
| | Grand Total | 2.82.5 | | | | | | | | | | | | | | | | | | | | | | | | |
| 11.2 | Water Regime | : Water table in this area is noticed at a depth of 55m in summer and 50m in rainy season from the general ground level and presently the quarrying of rough stone is proposed up to a depth of 35m bgl. Hence, it will not affect the ground water depletion of this area. It is made own borewell for providing uninterrupted supply of RO drinking water, dust suppression and 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 level monitoring will be carried out every six months around the quarry site. | | | | | | | | | | | | | | | | | | | | | | | | |



11.5 Climatic conditions:
Rainfall: - The district receives rainfall Rainfall of this area is southwest monsoon, with an onset in June and lasting up to September, brings rainfall of 517.1 mm, with September being the rainiest month.
Climatic Conditions: - The temperature ranges from a maximum of 37 °C to a minimum of 25°C. Like the rest of the state, April to June is the hottest months and December to January are the coldest

11.6 Human Settlement:
 The nearest villages are found in the buffer zone with population as per 2011 census.

| S.No | Village | Direction | Distance in Kms | Population |
|------|----------------|-----------|-----------------|------------|
| 1 | Suruttal | North | 0.95Km | 1266 |
| 2 | Sithalapakkam | South | 1.16Km | 631 |
| 3 | Magaral-A | East | 2.0Km | 2834 |
| 4 | Bagavandapuram | West | 2.84km | 1085 |

11.7 Public buildings, places of worship and monuments : No infrastructure like residential building situated within radius of 300m and places of special interest like archeological monuments, Sanctuaries, etc., are found around 10km radius.

11.8 Attach plans showing the locations of sampling stations : It is fresh quarry lease. 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 | 2.18.12 |
| 2 | Infrastructure | 0.02.0 |
| 3 | Roads | 0.03.0 |
| 4 | Green belt | 0.51.64 |
| 5 | Drainage & Settling tank | 0.09.5 |
| 6 | Un-utilized area | 0.06.24 |
| Grand Total | | 2.90.5 |

| | | | |
|-------|---------------------------------------|---|--|
| 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 devises as per the guidance of MoEF and EIA Notification 2006 and also covering DGMS norms. |



| | | | |
|--------|---------------------------|---|---|
| vi). | Water regime | : | Ponneri is situated eastern side and there is no major river within the 1km radius. |
| vii). | Socio-economics | : | 1. To provide Employment opportunities of the nearby villagers. 2. For the cultural development of the nearby villagers. |
| viii). | Historical monuments etc. | : | There are no historical monuments, etc found around 10km 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 first five 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 35m bgl (R.L.71 to 36m) 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. |



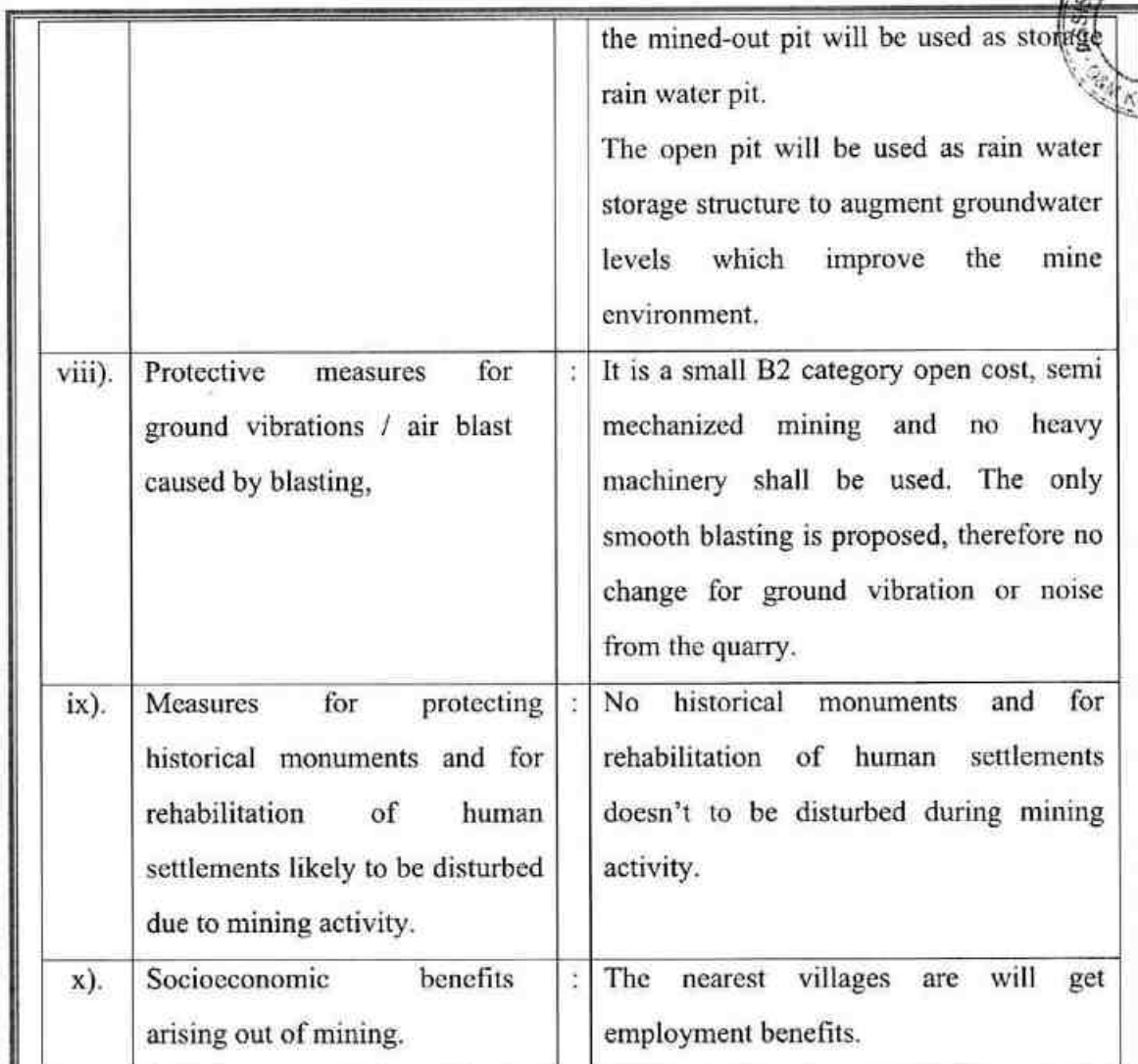
- iii). *Programme of afforestation, Yearwise for the initial five years (and upto conceptual plan period for 'A' category mines) indicating the number of plants with name of species to be afforested under different areas in hectares.*

Green Belt Development:

Safety barrier, school and nearest panchayat roads has been identified to be utilized for Greenbelt appropriate native species of Neem, Pungan and other regional trees will be planted in a phased manner as described below

| Year | Place | Area in Sq.m | No.of Plants | Rate of survival | Rate | Amount in Rs |
|--------|---------------------------------------|--------------|--------------|------------------|---------------------|--------------|
| First | Lease Boundary | 5164 | 575 | 80% | @100 Rs Per sapling | 57500/- |
| Second | Approach road and Nearby Village Road | -- | 300 | 80% | | 30000/- |
| Third | Schools | -- | 300 | 80% | | 30000/- |
| Total | | | | | | 1,17,500/- |

- | | | | |
|-------|---|---|--|
| iv). | Stabilization and vegetation of dumps along with waste dump management Year wise for the first five years (and upto conceptual plan period for 'A' category mines). | : | No waste or rejects removed in this lease area. |
| 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. The worked-out pit will be protected with barbed wire and |



Not applicable. It is B2 category quarry

| | | | |
|------|---|---|--|
| 12.1 | Steps proposed for phased restoration, reclamation of already mined out area. | : | The Ultimate mining is proposed to an average depth of 35 bgl (R.L.71 to 36m). 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 575 trees will be proposed in the lease 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 adopted. |
| 12.4 | Mine closure activity | : The present mining plan is proposed to depth of 35m bgl 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 Mines 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. |
| 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 risk will be there. Even then if any minor or major 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 five years mining period the employment potential will be generated, general financial status and socio-economic conditions of approx. 18 labors will be improved. |
| 12.9 | Reclamation and Rehabilitation | : | Land degradation is one of the major adverse impacts of open-cast mining activities and any effort to control adverse impacts would be incomplete without appropriate land reclamation strategy. After the exhaustion of entire mineable rough stone, mined out pit will be converted in fish culture or storage of rain water reservoir purposes. |

12.9 Proposed Financial Estimate / Budget for (EMP) Environment Management:

| | | | |
|----------|---|---|-------------------------------------|
| A | Fixed Asset Cost: | | |
| | 1. Land Cost (Consent Land) | : | Rs. 8,40,000/- |
| | 2. Labour Shed | | Rs. 1,50,000/- |
| | 3. Sanitary Facility | : | Rs. 1,50,000/- |
| | 4. Fencing | : | Rs. 3,00,000/- |
| | 5. Other expenses (Security guard, dust bin, etc) | : | Rs. 5,40,000/- |
| | Total | : | Rs. 19,80,050/- |
| B | B. Machinery cost | : | Rs. 30,00,000/- (Hire Basis) |
| C | Total Expenditure of EMP cost (for five years) | | |
| | 1. Drinking Water Facility | : | Rs. 2,00,000/- |
| | 2. Sanitary facility & Maintenance | : | Rs. 1,50,000/- |



| | | | |
|---|---|---|--------------------------|
| | 3. Permanent water sprinkler | : | Rs. 1,00,000/- |
| | 4. Afforestation and its maintenance | : | Rs. 1,17,500/- |
| | 5. Safety Kits | : | Rs. 1,00,000/- |
| | 6. Provision of tyre washing facility | : | Rs. 1,00,000/- |
| | 7. Surface runoff management structures like garland drain, settling pond & Bund (0.09.5Hect or 950Sq.m X 400 | : | Rs. 3,80,000/- |
| | 8. Blasting materials with blast mat cost | : | Rs. 15,00,000/- |
| | 9. Environment monitoring | : | Rs. 5, 00,000/- |
| | Total | : | Rs. 30,90,000/- |
| D | Total Project Cost (A+B+C) | : | Rs. 1,47,73,450/- |

13.0 FINANCIAL ASSURANCE:

Not applicable, it is a small B2 rough stone and gravel 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 and gravel 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 Assistant Director (i/c), Department of Geology and Mining, Kancheepuram vide letter **Roc. No. 254/Q3/2022 Dated: 27.10.2022,**
- (iv) Total proposed production **494795m³**. Of which, rough stone is **448991m³** and gravel is **45804m³** up to a depth of 35m below the ground level (R.L.71m to 36m) for five years plan period. Average production is **89798m³** of rough stone per year and the gravel is **15268m³** in a year.

17.0 CSR Expenditure:

CSR (Corporate Social responsibility) shall provide by the applicant @ 2.0% 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 in the CSR Rules on 22nd January 2021 as circular no. CSR-05/01/2021-CSR-MCA dated 25th August 2021.

Place: Dharmapuri, TN

Date: 4/11/2022



Signature of the Qualified Person

G.Umamaheswaran, M.Sc.,
Qualified Person

4-101, Sengattur, Muthampatti – (PO),
Tholasampatti, Mettur Taluk,
Salem – 636503, Tamilnadu
Ph.No: +91 9790462882

This Mining Plan is approved subject
to the conditions / stipulations
indicated in the Mining Plan approval
Letter No. 254 / 63/2022
Dated, 18.11.2022

This Mining Plan is approved as per the
powers conferred Under Rule 41 (2) of
Tamil Nadu Minor Mineral Concession
Rules, 1959


Assistant Director of Geology and Mining,
Kancheepuram District.

18.11.2022



நக.எண். 254/க்யூ3/2022
நாள். 27.10.2022

உதவி இயக்குநர் அலுவலகம்,
புவியியல் மற்றும் கரங்கத்துறை,
காஞ்சிபுரம்.

அறிவிக்கை

பொருள் : கனிமங்களும் குவாரிகளும் - சாதாரண கற்கள் மற்றும் கிராவல் மண் - காஞ்சிபுரம் மாவட்டம் - வாலாஜாபாத் வட்டம் - மாகரல் ஆ கிராமம் - புல எண்கள். 699/2 மற்றும் 699/3 -ன் மொத்த பரப்பு 2.90.50 ஹெக்டேர் பட்டா நிலம் சாதாரண கற்கள் மற்றும் கிராவல் மண் வெட்டியெடுக்க ஐந்து ஆண்டுகளுக்கு குவாரி குத்தகை உரிமம் கோரி - திரு. D. கோவிந்தசாமி த/பெ. தேசிங்கு என்பவர் தமிழ்நாடு சிறுகனிம சலுகை விதிகள் 1959 விதி எண்.19(1) - ன்கீழ் மனு செய்தது - தகுதி வாய்ந்த நிலப்பரப்பாக தெரிவித்தல் - தொடர்பாக.

- பார்வை :
1. திரு. D. கோவிந்தசாமி த/பெ. தேசிங்கு, எண்.288, பள்ளத் தெரு, சித்தாலப்பாக்கம் கிராமம், அரசாணிப்பாளையம் அஞ்சல், வெம்பாக்கம் வட்டம், திருவண்ணாமலை மாவட்டம் என்பவரிடமிருந்து விண்ணப்பம் பெறப்பட்ட நாள்.11.08.2020.
 2. காஞ்சிபுரம் வருவாய் கோட்டாட்சியர் அவர்களின் அறிக்கை நக. எண். 2605/2022/அ1, நாள்.14.10.2022.
 3. காஞ்சிபுரம், புவியியல் மற்றும் கரங்கத்துறை உதவி புவியியலாளர் மற்றும் தனிவருவாய் ஆய்வாளர் அவர்களின் புலத்தணிக்கை அறிக்கை, நாள்: 21.10.2022.
 4. மற்றும் தொடர்புடைய ஆவணங்கள்

காஞ்சிபுரம் மாவட்டம், வாலாஜாபாத் வட்டம், மாகரல் ஆ கிராமம், புல எண்கள். 699/2 மற்றும் 699/3 -ன் மொத்த பரப்பு 2.90.50 ஹெக்டேர் பரப்பில் சாதாரண கற்கள் மற்றும் கிராவல்மண் வெட்டியெடுக்க திரு. D. கோவிந்தசாமி த/பெ. தேசிங்கு என்பவர் குவாரி குத்தகை உரிமம் கோரி விண்ணப்பித்துள்ளார்.

மேற்படி விண்ணப்பம் தொடர்பாக காஞ்சிபுரம் வருவாய் கோட்டாட்சியர், காஞ்சிபுரம் புவியியல் மற்றும் கரங்கத்துறை உதவி புவியியலாளர் மற்றும் தனி வருவாய் ஆய்வாளர் ஆகியோர் மேற்காணும் விண்ணப்ப புலத்தில் தணிக்கை மேற்கொண்டு, காஞ்சிபுரம் மாவட்டம், வாலாஜாபாத் வட்டம், மாகரல் ஆ கிராம விண்ணப்பப் புல எண்கள். 699/2 (2.02.50), 699/3 (0.88.00) -ல் மொத்த பரப்பு 2.90.50 ஹெக்டேர் பரப்பளவில் குவாரி அனுமதி வழங்க கீழ்க்கண்ட நிபந்தனைகளுக்குட்பட்டு பரிந்துரை செய்துள்ளனர்.

1. விண்ணப்பப் புலங்களுக்கு அருகிலுள்ள அரசு புறம்போக்கு மற்றும் பட்டா நிலங்களுக்கு முறையே 10 மீட்டர் மற்றும் 7.5 மீட்டர் பாதுகாப்பு இடைவெளிவிட்டு குவாரிப்பணி செய்யப்பட வேண்டும்.
2. பொதுமக்களுக்கோ, பொது சொத்துக்களுக்கோ யாதொரு சேதமும் இன்றி பாதுகாப்பான முறையில் குவாரிப்பணி செய்ய வேண்டும்.

3. விண்ணப்பப் புலங்களை ஒட்டி வடக்கே கிராமசாலை அமைந்துள்ளது. கிராம சாலைக்கு 10 மீட்டர் பாதுகாப்பு இடைவெளிவிட்டு குவாரிப்பணி செய்ய வேண்டும்.
4. விண்ணப்பப் புலங்களுக்கு வடகிழக்கே அமைந்துள்ள வீடு மனுதாரருக்கு சொந்தமானது என தெரிவித்துள்ளதால் அதற்குண்டான ஆவணங்களையும், மேலும் கிராம வரைபடத்தையும் சமர்ப்பிக்கப்பட வேண்டும்.
5. தமிழ்நாடு சிறுகனிம சலுகை விதிகள் 1959 விதி எண்.41-ன்படி விண்ணப்ப புலங்களுக்கு வரைவு சுரங்கத்திட்டம் (Mining Plan) ஒப்புதல் பெற சமர்ப்பிக்கப்பட வேண்டும்.
6. தமிழ்நாடு சிறுகனிம சலுகை விதிகள் 1959 விதி எண்.42-ன்படி விண்ணப்ப புலத்திற்கு மாநில அளவிலான சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையத்தின் சுற்றுச்சூழல் ஒப்புதல் (Environment Clearance) பெற்று சமர்ப்பிக்கப்பட வேண்டும்.

எனவே காஞ்சிபுரம் வருவாய் கோட்டாட்சியர், காஞ்சிபுரம் புவியியல் மற்றும் சுரங்கத்துறை, உதவி புவியியலாளர் மற்றும் தனிவருவாய் ஆய்வாளர் ஆகியோரின் பரிந்துரையின் அடிப்படையில் காஞ்சிபுரம் மாவட்டம், வாலாஜாபாத் வட்டம், மாசரல் ஆ கிராம விண்ணப்பப் புல எண்கள். 699/2 (2.02.50), 699/3 (0.88.00) -ல் மொத்த பரப்பு 2.90.50 ஹெக்டேர் பரப்பளவில் சாதாரண கற்கள் மற்றும் கிராவல்மண் வெட்டியெடுக்க ஐந்து வருட காலத்திற்கு குத்தகை உரிமம் வழங்க தகுதி வாய்ந்த நிலப்பரப்பாக திரு. D. கோவிந்தசாமி த/பெ. தேசிங்கு என்பவருக்கு தெரிவிக்கப்படுகிறது. மேலும் குவாரி அனுமதி வழங்குவது தொடர்பாக வரைவு சுரங்கத் திட்டத்தை (Mining Plan) மூன்று மாத காலத்திற்குள் உதவி இயக்குநர் முன்பு சமர்ப்பித்து ஒப்புதல் பெறவும் குவாரி உரிமம் பெறுவது தொடர்பாக மாநில சுற்றுச் சூழல் தாக்க மதிப்பீட்டு ஆணையத்தின் (SEIAA) இசைவினை பெற்று சமர்ப்பிக்கவும் அறிவுறுத்தப்படுகிறது.

உதவி இயக்குநர் (பொ),
புவியியல் மற்றும் சுரங்கத்துறை,
செங்கல்பட்டு.

பெறுநர்
திரு. D. கோவிந்தசாமி த/பெ. தேசிங்கு,
எண்.288, பள்ளத் தெரு,
சித்தாலப்பாக்கம் கிராமம்,
அரசாணிப்பாளையம் அஞ்சல்,
வெம்பாக்கம் வட்டம்,
திருவண்ணாமலை மாவட்டம்.

நகல்:-

- 1) தலைவர், மாநில சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையம், சென்னை.
- 2) ஆணையர், புவியியல் மற்றும் சுரங்கத்துறை, கிண்டி, சென்னை 600 032.



சுற்றுலாத்துறை கட்டிடம் 23

பகுதி 1 க.ந.உ.ப.ப.ப.

பகுதி 2 க.ந.உ.ப.ப.ப.

43

அளவளவல்

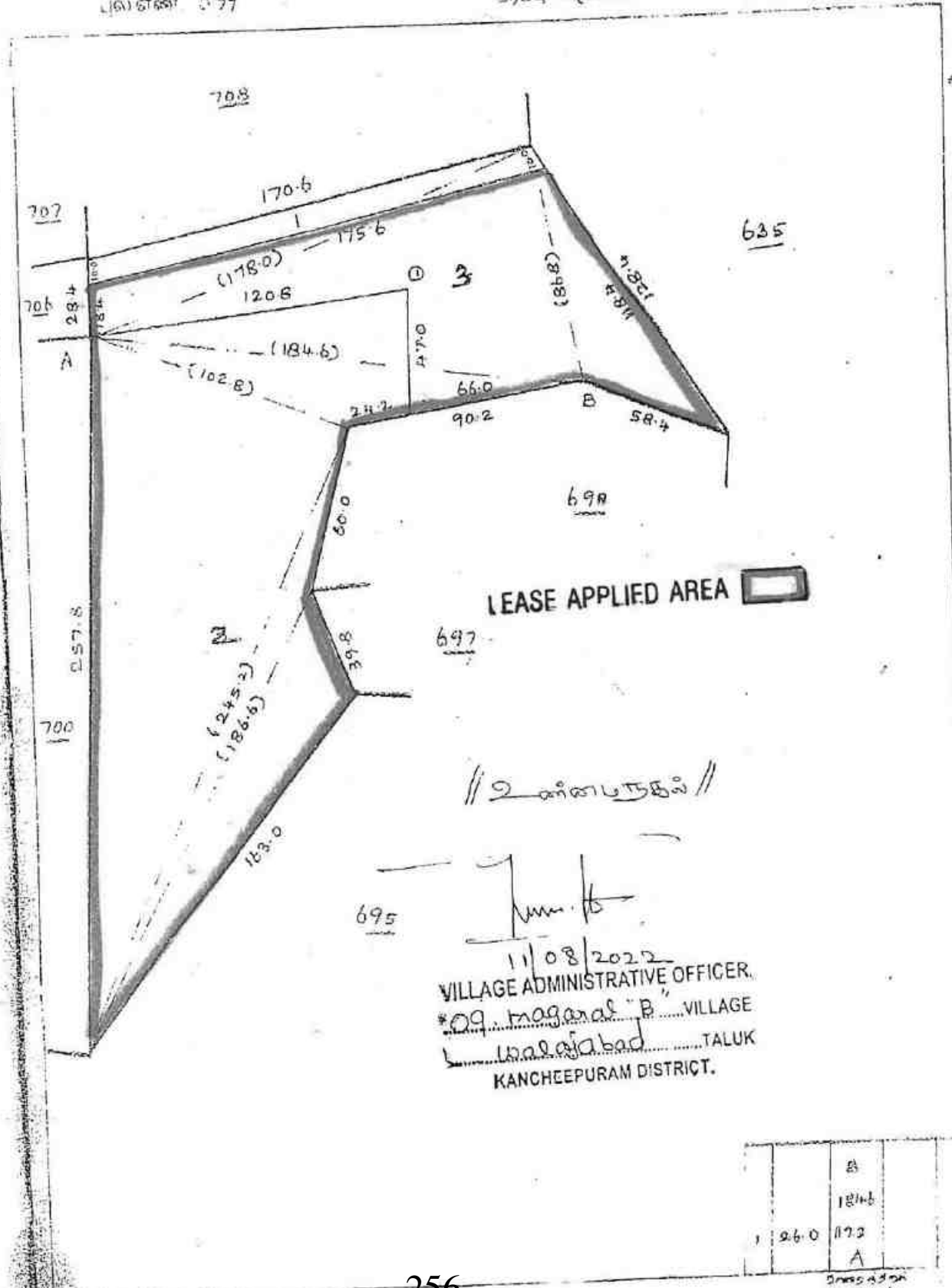
கட்டிடம்

பெரிய கட்டிடம்

பகுதி 3 க.ந.உ.ப.ப.ப.

பகுதி 4 க.ந.உ.ப.ப.ப.

3. ஏர் 08.0



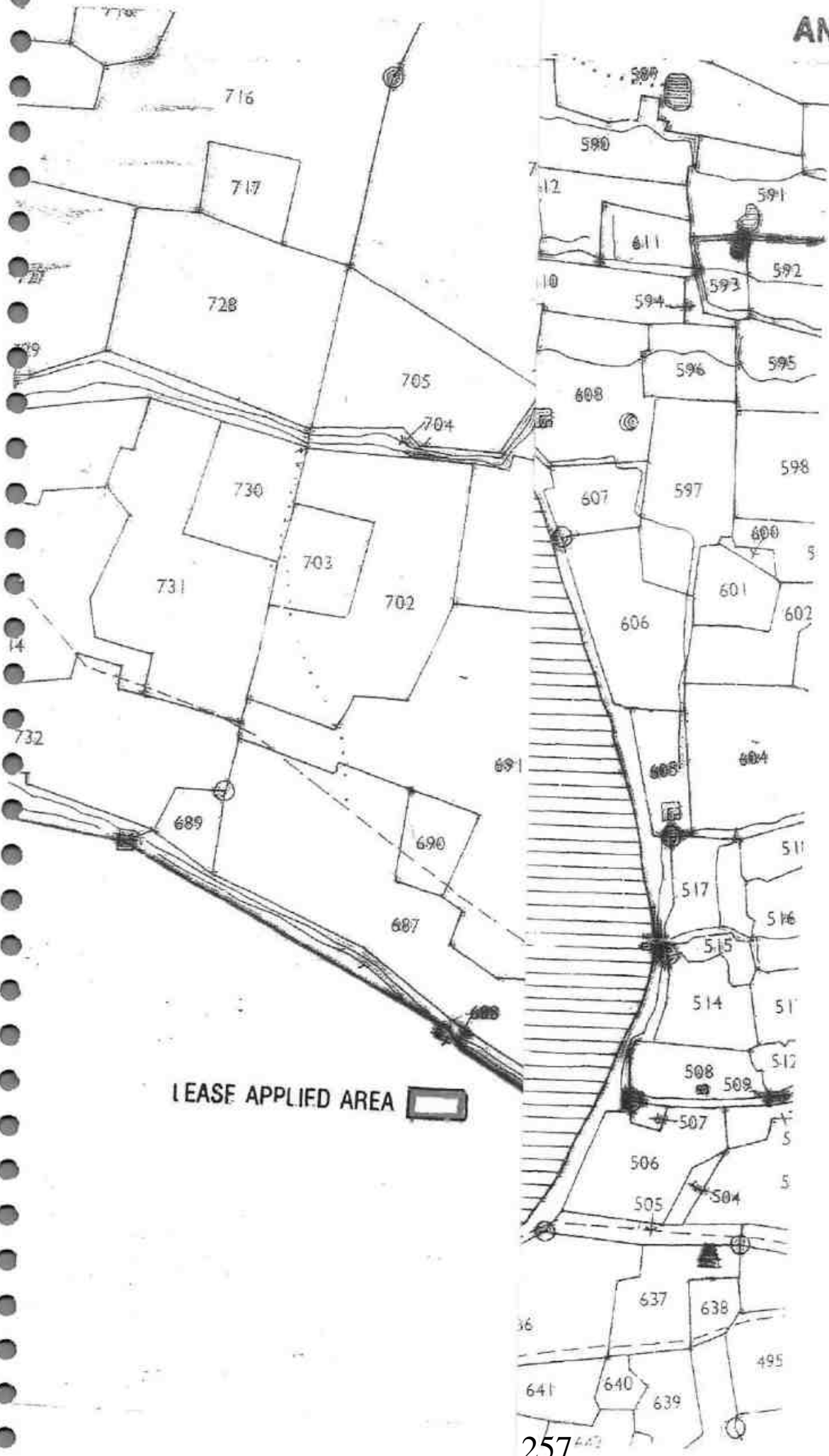
LEASE APPLIED AREA

// 2 கட்டிடங்கள் //

695

11/08/2022
VILLAGE ADMINISTRATIVE OFFICER,
*09. maganai "B" VILLAGE
Wadajabad TALUK
KANCHEEPURAM DISTRICT.

| | | | |
|---|------|-------|--|
| | | B | |
| | | 18/16 | |
| 1 | 26.0 | 1172 | |
| | | A | |





128

44

தி. ஏ. எஸ். 189. மாகரல்.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|-----|---------|---|---|-----|-----|---|---------|-----------|---------|---|
| | | | | | | | நு. பை. | தொ. ஏர்ஸ் | நு. பை. | |
| 696 | 696 | ர | 4 | ... | 8-5 | 8 | 0 89 | 2 57.5 | 2 63 | 328 க. பெருமாள் (1), க. குண சேகரன் (2), இளவர் நாயக்கர் (3). |
| 697 | 697 | \|\| | 4 | ... | 8-5 | 8 | 0 89 | 0 53.0 | 0 48 | 101 பெ. சுந்தர பண்டிதர். |
| 698 | 1 698-1 | ர | 4 | ... | 8-5 | 8 | 0 89 | 0 85.5 | 0 75 | 93 பெ. சின்னக் கண்ணு. |
| | 2 -2 | ர | 4 | ... | 8-5 | 8 | 0 89 | 0 34.5 | 0 32 | 101 பெ. சுந்தர பண்டிதர். |
| | | | | | | | | 1 20.0 | 1 10 | |
| 699 | 1 699-1 | அ | 4 | ... | 8-3 | 6 | 1 85 | 0 17.5 | 0 32 | ... |
| | 2 -2 | ர | 4 | ... | 8-3 | 6 | 1 85 | 2 02.5 | 8 75 | 21 ஸ். ஆண்டியப்ப நாயக்கர். |
| | 3 -3 | ர | 4 | ... | 8-3 | 6 | 1 85 | 0 88.0 | 1 64 | 140 நா. திருவேங்கட முதலியார். |
| | | | | | | | | 3 08.0 | 5 71 | |
| 700 | 1 700-1 | ர | 4 | ... | 8-2 | 5 | 3 09 | 2 18.5 | 6 74 | 220 வ. முனியம் மாள். |
| | 2 -2 | \|\| | 4 | ... | 8-2 | 5 | 3 09 | 1 05.5 | 3 26 | 57 கிஷ்டப்ப நாயக்கர். |
| | | | | | | | | 3 24.0 | 10 00 | |
| 701 | 701 | ர | 4 | ... | 8-2 | 5 | 3 09 | 4 21.0 | 13 00 | 182 அ. பின்பாராணி அம்மாள். |
| 702 | 1 702-1 | ர | 4 | ... | 8-3 | 5 | 3 09 | 1 91.0 | 5 90 | 185 கா. பெருமாள் நாயக்கர். |
| | 2 -2 | ர | 4 | ... | 8-3 | 5 | 3 09 | 2 02.5 | 6 25 | 182 அ. பின்பாராணி அம்மாள். |
| | | | | | | | | 3 93.5 | 12 15 | |
| 703 | 703 | \|\| | 4 | ... | 8-2 | 5 | 3 09 | 0 87.5 | 2 70 | 185 கா. பெருமாள் நாயக்கர். |
| 704 | 704 | அ | | | | | | 54.0 | ... | ... |
| 705 | 705-1 | ர | 4 | ... | | | | 95.0 | 3 62 | 171 தி. பழனி நாயக்கர். |



Tamil Nadu Govt

Department of Revenue

Land ownership details: e. No. 10(1) Sec

District : Kanchipuram

Circle : Walajabad

Revenue Village : Magaral - A

Patta No : 551

Owners' name

1. - ... PJR Blue Metals Chennai Pvt
2. Parthasarathi son Janakiraman (Managing Director)



| Survey Number | subdivision | Punsel | | do well | | Others | | Notes |
|---------------|-------------|-----------------|----------|------------|----------|------------|----------|---|
| | | Spread | solution | Spread | solution | Spread | solution | |
| | | Heck - air | Rs - Pi | Heck - air | Rs - Pi | Heck - air | Rs - Pi | |
| 692 | 3B | 0 - 17.40 | 0.55 | -- | -- | -- | -- | 2018/0103/03/115741-1888/1419 -- 19-10-2018 |
| 693 | 2 | 1 - 63.00 | 5.05 | -- | -- | -- | -- | 2018/0103/03/115741- -- -- 19-10-2018 |
| 694 | 2 | 1 - 8.00 p.m | 0.98 | -- | -- | -- | -- | 2018/0103/03/115741- -- -- 19-10-2018 |
| 694 | 3A | 0 - 12.00 | 0.11 | -- | -- | -- | -- | 2018/0103/03/066930- -- -- 01-06-2018 |
| 694 | 3D | 0 - 9.00 | 0.07 | -- | -- | -- | -- | 2018/0103/03/066930- -- -- 01-06-2018 |
| 694 | 3G | 0 - 15.50 | 0.14 | -- | -- | -- | -- | 2018/0103/03/066930- -- -- 01-06-2018 |
| 694 | 3L | 0 - 16.00 | 0.14 | -- | -- | -- | -- | 2018/0103/03/066930- -- -- 01-06-2018 |
| 699 | 2 | 2 - 2.50 | 3.75 | -- | -- | -- | -- | 2018/0103/03/099406- -- -- 18-08-2018 |
| | | 5 - 43.40 | 10.79 | | | | | |

Note 2 :



1. The above information / certificate copy details are obtained from E-Registry. Confirm these by entering reference number 03/12/204/00551/80431 at <https://eservices.tn.gov.in> .
2. This information was printed on 05-11-2022 at 10:32:54 AM.
3. Scan with 2D barcode reader of mobile phone camera and check on website via 3G/GPRS



Tamil Nadu Govt

Department of Revenue

Land ownership details: e. No. 10(1) Sec

District : Kanchipuram

Circle : Walajabad

Revenue Village : Magaral - A

Patta No : 626

Owners' name

1. -- ... PJR Blue Metals Private Limited Chennai-600045



| Survey Number | subdivision | Punsei | | do well | | Others | | Notes |
|---------------|-------------|------------|----------|------------|----------|------------|----------|---|
| | | Spread | solution | Spread | solution | Spread | solution | |
| | | Heck - air | Rs - Pi | Heck - air | Rs - Pi | Heck - air | Rs - Pi | |
| 692 | 2C | 0 - 56.20 | 1.72 | -- | -- | -- | -- | 2022/0103/03/248684- -2021/03/12/000014SD -- 28-05-2022 |
| 699 | 3 | 0 - 88.00 | 1.64 | -- | -- | -- | -- | 2021/0103/03/223612- -- -- 20-08-2021 |
| | | 1 - 44.20 | 3.36 | | | | | |

Note 2 :



1. The above information / certificate copy details are obtained from E-Registry. Confirm these by entering reference number **03/12/204/00626/90484** at **<https://eservices.tn.gov.in>** .
2. This information was printed on 05-11-2022 at 10:36:19 AM.
3. Scan with 2D barcode reader of mobile phone camera and check on website via 3G/GPRS



39

கிராமக் கணம்

ஆம் பச்சலியில்

மாஸ்டர்

வட்டம்

| தலை வரித் திட்டத்தின்படி புலன்களின் விபரம். | | | | | கைப்பற்று தாரகுடைய பெயரும் என்னும் அல்லது அனுபோக தாரகுடைய பெயர். | தாரகுடைய பெயர். | | முதல் கொகம். | | | |
|---|----------------|---------|---------|--------------------------------|--|--|---|---------------------------|---------------------------|------------------------------|-----------------------------|
| நில அளவை எண். | உட்பிரிவு எண். | பரப்பு. | தீர்வை. | ஒரு கோகம் அல்லது இரண்டு கோகம். | | நிலத்தின் எந்த பகுதி யாவது தாரகுடையாளர் யிடப்பட்டுள்ளது. | எந்த மாதத்தில் பயிர் செய்யப்பட்டது எந்த மாதத்தில் அறுவடை செய்யப்பட்டது. | பயிரின் பெயர். | பயிரை அறுவடை யான பரப்பு. | உன்னையாளர் பிழைச்சல் ஆதாரம். | விவசாயச் சல அளவு எடுக்காடு. |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| 699 | 2 | 2.025 | 3.75 | 551 | பி.பி.ஆர். ஆர். பஞ் பெயர் | பி.பி.ஆர். ஆர். பஞ் பெயர் | பி.பி.ஆர். ஆர். பஞ் பெயர் | பி.பி.ஆர். ஆர். பஞ் பெயர் | பி.பி.ஆர். ஆர். பஞ் பெயர் | பி.பி.ஆர். ஆர். பஞ் பெயர் | பி.பி.ஆர். ஆர். பஞ் பெயர் |
| 699 | 3 | 0.880 | 4.64 | 626 | பி.பி.ஆர். ஆர். பஞ் பெயர் | பி.பி.ஆர். ஆர். பஞ் பெயர் | பி.பி.ஆர். ஆர். பஞ் பெயர் | பி.பி.ஆர். ஆர். பஞ் பெயர் | பி.பி.ஆர். ஆர். பஞ் பெயர் | பி.பி.ஆர். ஆர். பஞ் பெயர் | பி.பி.ஆர். ஆர். பஞ் பெயர் |
| // 2 கைப்பற்று தாரகுடைய பெயர் // | | | | | | | | | | | |
| 19/08/2022 | | | | | | | | | | | |
| VILLAGE ADMINISTRATIVE OFFICER, | | | | | | | | | | | |
| No. 09 - MAGARAL 'B' VILLAGE, | | | | | | | | | | | |
| WALAJABAD TALUK. | | | | | | | | | | | |
| KANCHIPURAM DISTRICT. | | | | | | | | | | | |

104398338/21

97

3831/2021



தமிழ்நாடு தமிழ்நாடு TAMILNADU

AV 247195

PJR BLUE METALS
(CHENNAI)

PVE Ltd,
West Tambaram.

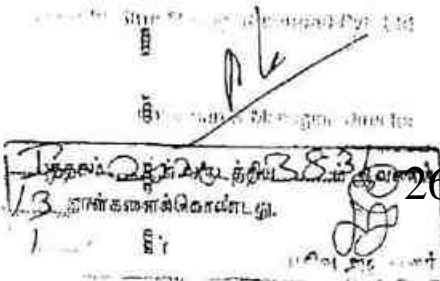
P. வண்டலாங்குழலி
உரிமம் எண் : 3202/D1/97
பெரிய காஞ்சிபுரம்.
பெண் : 9943157949
தேதி: 13.12.2021



ரூ.13,14,540/- க்கு புஞ்சை நிலம் சுத்த விக்சிரையப் பத்திரம்

2021 ஆம் ஆண்டு ஆகஸ்ட் மாதம் 16 ஆம் தேதி, சென்னை 600 045, மேற்கு தாமிரம், சிவசண்முகம் சாலை, கதவு எண்.8B கொண்ட கட்டிடத்தில் இயங்கிவரும் PJR Blue Metals (Chennai) Private Ltd., (PAN: AAFCP2235E) என்கிற நிறுவனத்திற்கு, மேற்படி நிறுவனத்திற்காக மேற்படி நிறுவனத்தின் மேனேஜிங் டைரக்டரும், திரு.E.பார்த்தசாரதி அவர்களின் குமாரருமான திரு.P.ஜானகிராமன் ஆகிய உங்கள் மூலம் மேற்படி PJR Blue Metals (Chennai) Private Ltd.,(PAN: AAFCP2235E)-க்கு,

காஞ்சிபுரம் மாவட்டம், காஞ்சிபுரம் வட்டம், காஞ்சிபுரம்,நெ.62,கோனேரிக்குப்பம் கிராமம்,இலுப்பை தோப்பு தெரு, கதவு எண்.368/248, கொண்ட இல்லத்தில் வசிக்கும் திரு.A.கருணாகரன் அவர்களின் மனைவி 45 வயதுள்ள திருமதி.K.சுமித்ரா (Voter



R. Srinivasan



262



2

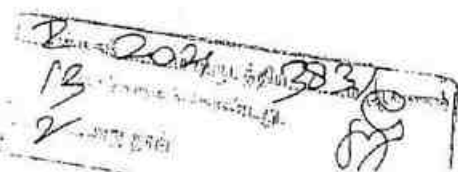
No.FJM4223970) ஆகிய நான் மனப்பூர்வமாய் சம்மதித்து எழுதிக்கொடுத்த புஞ்சை நிலம் சுத்த விகிதையப்பத்திரம் என்னவென்றால்,

இதனடியில் சொத்துவிவரத்தில் கண்டுள்ள நிலமானது காஞ்சிபுரம் மாவட்டம், வாலாஜாபாத் வட்டம், மாகரல்-ஆ கிராமத்தில் பட்டா எண்.444, அடங்கியுள்ள புஞ்சை சர்வே எண்.699/3 பூரா விஸ்தீரணம் ஹெக்டேர் 0.88.0 ஏர்ஸ்க்கு ஏக்கர் 2.18 செண்ட் கொண்ட நிலம் எனது சொந்தமாகும்.

இதனடியில்கண்ட சொத்தினத்தை முதன்முதலில் என் கணவர் திரு.A.கருணாகரன் அவர்கள் தன் சொந்த பணவரவைக் கொண்டு கபந்த 20-11-2006 தேதியில் சென்னை-112, சூளை, பேகர்ஸ் தெரு, கதவு எண்.50 கொண்ட இல்லத்தில் வசிக்கும் திருவேங்கட முதலியார் அவர்களின் குமாரர் A.T.வெங்கடராமன்-1, சென்னை-43, பல்லாவரம் ராஜாஜி நகர்,கதவு எண்.6/14 கொண்ட இல்லத்தில் வசிக்கும் திருவேங்கட முதலியார் அவர்களின் குமாரர் T.ஜனார்த்தனம்-2, காஞ்சிபுரம் வட்டம், பொடவூர் P.மலர்கொடி-3 ஆகியவர்களின் பவர்ஏஜெண்டான சென்னை-73 சேலையூர் ரங்கநாதன் நகர் 3வது தெரு பிளாட் எண்.27 கொண்ட இல்லத்தில் வசிக்கும் திரு.வி.சோமசுந்தரம் அவர்களின் குமாரர் எஸ்.சிவகுமார் அவர்களிடமிருந்து என் கணவர் திரு.A.கருணாகரன் சுத்த கிரையம் பெற்று அப்பத்திரமானது காஞ்சிபுரம் 2ந் இணைசார் பதிவகத்தில் 1வது புத்தகத்தில் 2006 ஆம் ஆண்டின் 6463 எண்ணாக பதிவு செய்யப்பட்ட கிரைய ஆவணப்படிக்கு என் கணவர் திரு.A.கருணாகரன் அவர்களுக்கு பாத்தியப்பட்டு ஆண்டனுபவித்து வந்ததில் தவறுதலாக மேற்படி கிரைய ஆவணத்தில் P.மலர்கொடி என்ற நபர் தவறுதலாக சேர்க்கப்பட்டு கிரையம் அளிக்கப்பட்டதை அறிந்தும் மேற்படி நபரை நீக்க வேண்டியும் மற்றும் மற்றொரு பிரின்சிபலான சென்னை-41, திருவான்மியூர், திருவள்ளூர் நகர், கதவு எண்.383, கொண்ட இல்லத்தில் வசிக்கும் மேற்படி திருவேங்கட முதலியார் குமாரத்தி T.தனலட்சுமி என்பவரை சேர்க்காமல் விடுபட்டதை அறிந்து மேற்படி அதற்காக ஒரு பிழைத்திருத்தல் பத்திரம் மேற்படி பவர்ஏஜெண்டான எஸ்.சிவக்குமார் அவர்களால் கபந்த 16-07-2007 தேதியில் என் கணவர் திரு.A.கருணாகரன் அவர்களுக்கு எழுதிக்கொடுத்து அப்பத்திரமானது மேற்படி

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காஞ்சிபுரம் 2நீ இணைசார் பதிவாளர் அலுவலகத்தில் புத்தகம் 2008 ஆம் ஆண்டின் 1141 எண்ணாக பதிவு செய்யப்பட்ட பிழைத்திருத்தல் ஆவணப்படிக்கு என் கணவர் திரு. A. கருணாகரன் அவர்களுக்கு மட்டும் பூரணமாய் பாத்தியப்பட்டு அவரது கைப்பற்றியும் சுவாதீன அனுபவத்திலும் வைத்துக் கொண்டு சர்வ சுதந்திரங்களுடன் ஆண்டனுபவித்து வந்த சொத்தினத்தை கடந்த 22-10-2010 தேதியில் எனக்கு பூரண தான செட்டில்மெண்ட் செய்து அப்பத்திரமானது காஞ்சிபுரம் 2நீ இணைசார் பதிவாளர் அலுவலகத்தில் 1வது புத்தகத்தில் 2010 ஆண்டின் 6091 எண்ணாக பதிவு செய்யப்பட்ட தான செட்டில்மெண்ட் ஆவணப்படிக்கு இதனடியிற்கண்ட சொத்தினம் எனக்கு மட்டும் பூரணமாய் பாத்தியப்பட்டு அதுமுதல் என் கைப்பற்றியும் சுவாதீன அனுபவத்திலும் என் பேரில் மாகரல் ஆ கிராம வருவாய் கணக்கில் 444 எண் பட்டாவாய் தாக்கலாகி நான் சர்வ சுதந்திரங்களுடன் ஆண்டனுபவித்து வரும் இதனடியில்கண்ட சொத்தினத்தை என் அவசிய தேவைகளுக்காகவும் வேண்டியும், மற்றும் நான் இச்சொத்தினத்தை கடந்த 20-06-2013 தேதியில் Mahendar.A.Challani அவர்களிடம் நான் ஈடுகாட்டி அதன்பேரில் பெற்ற அடமான கடனை பைசல் செய்ய வேண்டி விற்பதாக தீர்மானித்து தங்களை அணுகியதில் தாங்களும் தங்களின் மேற்படி நிறுவனத்தின் வியாபார தேவைகளுக்கு வேண்டி சுத்தகிரையம் பெறுவதாக கூறியதின் பேரில் இன்று இதனடியிற் கண்ட நிலத்துக்கு சுத்த கிரையம் நிச்சயித்த தொகை ரூ.13,14,540/- (எழுத்தால் ரூபாய்.பதிமூன்று லட்சத்து பதினான்காயிரத்து ஐந்நூற்று நாற்பது மட்டும்) மேற்படி கிரைய தொகைக்கு தங்கள் நிறுவனத்திற்கு நான் சுத்த கிரையம் செய்து கிரையத் தொகையை பெற்றுக் கொண்ட விவரம் பின்வருமாறு:-

நான் தங்களிடம் கடந்த 11-08-2021 தேதியில் காஞ்சிபுரம் கிளை சிட்டி யூனியன் வங்கியின் உங்களது நிறுவனத்தின் கணக்கிலிருந்து என் சார்பாக திரு. Mahendar.A.Challani-க்கு டிமாண்ட் டிராப்ட் எண்.110295 மூலம் தாங்கள் அளித்த வகையில் எனக்கு சேர்ந்த கிரைய தொகை ரூபாய்.11,82,000/- (எழுத்தால் ரூபாய்.பதினோறு லட்சத்து எண்பத்தி இரண்டாயிரம் மட்டும் மற்றும்

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தங்களின், காஞ்சிபுரம் கிளை, சிட்டி யூனியன் வங்கியின் டிமாண்ட் டிராப்ட் எண்.110294, நாள்.11-08-2021 மூலம் நான் தங்களின் நிறுவனத்தின் சார்பாக பெற்றுக் கொண்ட கிரைய தொகை ரூ.1,32,540/- (எழுத்தால் ரூபாய்.ஒரு லட்சத்து முப்பத்திரண்டாயிரத்து ஐநூற்று நாற்பது மட்டும்)

ஆக மேற்கண்ட இருவகையில் கிரைய தொகை ரூ.13,14,540/- (எழுத்தால் ரூபாய்.பதிமூன்று லட்சத்து பதினான்காயிரத்து ஐநூற்று நாற்பது மட்டும்) கீழ்க்கண்ட ஷெடியூல் நிலத்திற்குண்டான கிரைய முழு தொகையும் மேற்கண்டவாறு நான் தங்கள் நிறுவனத்திடமிருந்து மேற்கண்ட வகையில் பெற்றுக் கொண்டு விட்டேன் ஆகையால் இன்றே இதனடியிற்கண்ட நிலத்தை தங்களது நிறுவனத்திற்கு நான் சுத்த கிரையம் செய்து மேற்படி நிறுவனத்திற்காக தங்களின் பூரண சுவாதீனத்தில் ஒப்படைத்து விட்டேன்.

இனி நீரே தங்களின் நிறுவனத்திற்காக வேண்டி இதனடியில்கண்ட ஷெடியூல் நிலத்தை கைப்பற்றிக் கொண்டு சர்க்கார் வரியினத்தையும் பட்டா இவைகளை தங்களது மேற்படி நிறுவனத்தின் பெயரில் மாற்றிக் கொண்டு சர்வ சுதந்திரங்களுடன் பாரம்பரியமாய் தானாதி வினுமய விக்சிரையங்களுக்கு யோக்கியமாய் ஆண்டனுப வித்துக் கொள்ள வேண்டியது.

கீழ்க்கண்ட ஷெடியூல் கண்ட நிலத்துக்கு நாளது கிரைய தேதி வரைக்கும் உண்டான அனைத்து சர்க்கார் மற்றும் பிற உள்ளாட்சி அமைப்புகளுக்கான அனைத்து வரி மற்றும் இதர கட்டணங்கள் ஏதும் பாக்கி இல்லை. அப்படி ஏதேனும் பின்னிட்டு தெரிய வந்தால் அவைகளை நானே அதனை என் சொந்த செலவில் தீர்த்து கொடுக்கின்றேன்.

நாளது கிரைய தேதியில் ஷெடியூலில் கண்ட நிலத்தை தங்களது PJR Blue Metals (Chennai) Private Ltd. நிறுவனத்தின் பூரண சுவாதீனத்திற்கு நான் ஒப்படைத்து விட்டபடியால் அச்சொத்தினங்களில் இன்று முதல் எனக்கோ, எனது பின்னிட்ட வாரிசுகளுக்கோ, எந்த கோரிக்கையும் உரிமையும் கிடையாது.

இக்கிரைய ஆவணத்தின் பொருட்டு, கீழ்க்கண்ட ஷெடியூல் சொத்திற்கு தங்கள் நிறுவனத்திற்கு உண்டான உரிமையை உறுதி செய்யும் பொருட்டு பின் எந்த காலத்திலும் தங்கள் நிறுவனத்திற்கு தேவைபடும் எந்த ஒரு தஸ்தாவேஜிகளையும் தேவைபடும் கையொப்பங்களையும் தங்கள் அழைப்பின் பேரில் உடன்இருந்து ஏற்படுத்தி தருகின்றேன்.

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இதுமையில்கண்ட ஷெடியூல் நிலமானது எனக்கு மட்டும் சொந்தமாய் பாத்தியப்பட்டதென்றும் மற்றபடி இதன்பேரில் வேறு யாருக்கும் எவ்வித பாத்தியதையும் அக்கு பின்தொடர்ச்சி ஒரு சிறிதும் கிடையாதென்றும் இதன்பேரில் எவ்வித முன் கிரைய உடன்படிக்கை, கிரையம், தானம், உயில், பரிவர்த்தனை, அடமானம், போக்கியம், தாவா, கோர்ட் அட்டாச்ச்மெண்ட் போன்ற எவ்வித வில்லங்க கலன்கள், டைட்டில் தகராறுகள் ஒரு சிறிதும் கிடையாது என்றும் தங்கள் நிறுவனம் PJR Blue Metals (Chennai) Private Ltd. அனுபவிக்குமளவில் இக்கிரைய தேதிக்குட்பட்ட காலத்திற்குள் ஏதேனும் மேற்கண்ட கலன்கள் இருப்பதாக தெரியவந்து அதன் பொருட்டு தங்களின் நிறுவன ஷெடியூலில் கண்ட கிரைய நிலத்துக்கு நஷ்டம் உண்டானால் அவைகளை நானே முன்னின்று தங்கள் நிறுவனத்திடம் எவ்வித பிரதிபலன் தொகையும் கோராமல் என் சொந்த பணச்செலவினாலும், என் இதர சொத்துக்களால் சட்டப்படி தீர்த்து அளிக்கிறேன் என்று உண்மையாகவும் உறுதியாகவும் கூறுகிறோம்.

இதற்கு ஆதரவான எனது செட்டில்மெண்ட் பத்திரம் மற்றும் பட்டா நகலை மட்டும் நான் தங்கள் வசம் வழங்கியுள்ளேன்.

இந்தப்படிக்கு நான் மனப்பூர்வமாய் சம்மதித்து ஏகோபித்து எழுதிக்கொடுத்த புஞ்சை நிலம் சுத்த விக்கிரைய பத்திரம்.


கிரைய சொத்து விவரம்

காஞ்சிபுரம் மாவட்டம், காஞ்சிபுரம் பதிவு மாவட்டம், காஞ்சிபுரம் 2ந் இணைசார் பதிவுக பதிவுத்துணை மாவட்டம், வாலாஜாபாத் வட்டம், மாகரல்-ஆ கிராமத்தில் பட்டா எண்.444 அடங்கியுள்ள புஞ்சை சர்வே எண்.699/3 பூரா விஸ்தீரணம் ஹெக்டேர் 0.88.00 ஏர்ஸ்க்கு ஏக்கர் 2.18 செண்ட் கொண்ட நிலம் கிரையமாகும். மொத்த மதிப்பு ரூபாய்.13,14,540/-

For Blue Metals (Chennai) Pvt. Ltd

Managing Director

சாட்சிகள்.

1. 
S/o சண்முகம்
34A/12 S.V.N. Road
காஞ்சிபுரம்

2. S. Anand
S/o சிபுசுமணி

11. மாண்புமிகு கிராமிய மேயர் சண்முகம்
சென்னை 600 015

2024.04.23/266
3

K. D. M.

Written by



D. ARUMUDAM
STATE DOCUMENT WRITER
L. NO: A6AKN/91
104B/1 S.V.N STREET
KANCHIPURAM-631502
Mobile no: 9443481239



ட்டாட்சியர் அலுவலக இணைய சேவை - நில ...

https://eservices.tn.gov.in/eservicesnew/land/chittaExtract_1a.htm



102

தமிழக அரசு

வருவாய்த் துறை

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

மாவட்டம் : காஞ்சிபுரம்

வட்டம் : வாலாஜாபாத்

வருவாய் கிராமம் : மாகரல் - ஆ

பட்டா எண் : 444

உரிமையாளர்கள் பெயர்

1. கருணாதரன்

மனைவி

கே. சுமத்ரா

| புல எண் | உட்பிரிவு | புன்செய் | | நன்செய் | | மற்றவை | | குறிப்புகள் |
|---------|-----------|---------------|---------|---------------|---------|---------------|---------|-------------|
| | | பரப்பு | தீர்வை | பரப்பு | தீர்வை | பரப்பு | தீர்வை | |
| | | ஹெக்டர் - ஏர் | ரூ - பை | ஹெக்டர் - ஏர் | ரூ - பை | ஹெக்டர் - ஏர் | ரூ - பை | |
| 699 | 3 | 0 - 88.00 | 1.64 | -- | -- | -- | -- | ----- |
| | | 0 - 88.00 | 1.64 | | | | | 07-09-2004 |

குறிப்பு2 :



1. மேற்கண்ட தகவல் / சான்றிதழ் தகவல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் <https://eservices.tn.gov.in> என்ற இணைய தளத்தில் 03/12/204/00444 /70462 என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.
2. இத் தகவல்கள் 29-07-2021 அன்று 02:16:06 PM நேரத்தில் அச்சடிக்கப்பட்டது.
3. கைப்பேசி கேமராவின் 2D barcode படிப்பான் மூலம் படித்து 3G/GPRS வழி இணையதளத்தில் சரிபார்க்கவும்

ple

Kidini

2021 0823/136



R/2 எண் இணை சார்பதிவாளர் காஞ்சிபுரம்/புத்தகம்-1/3831/2021

103

1893ம் ஆண்டு இந்திய முத்திரைச் சட்டம் 42வது பிரிவின் கீழான சான்று

2021ம் ஆண்டு வரிசை எண் 1918

8பி சிவசண்முகம் சாலை மேற்கு தாம்பரம், சென்னை, தமிழ்நாடு, இந்தியா, 600045-ல் வசிக்கும் திரு பி ஜானகிராமன் என்பவரிடமிருந்து ₹ 91,021/- (ரூபாய் தொண்ணூற்றொன்றாயிரத்து இருபத்தொன்று மட்டும்) இந்த ஆவணத்திற்காக இந்திய முத்திரைச் சட்டம் 41வது பிரிவின் படி குறைவாயிருந்த முத்திரைக் கட்டணம் வசூலிக்கப்பட்டது என நான் இதன் மூலம் சான்றுளிக்கிறேன்.

சார்பதிவாளர் : 2 எண் இணை சார்பதிவாளர் காஞ்சிபுரம்
நாள்: 16/08/2021

சார்பதிவாளர் : மன்றம் இந்திய முத்திரைச் சட்டம் பிரிவு
41ன் படி காஞ்சிபுரம்
Joint Sub Registrar
Kanchipuram.

2021 ஆம் ஆண்டு ஆகஸ்ட் மாதம் 16ம் தேதி மு.ப. 11:54 மணிக்குள் 2 எண் இணை சார்பதிவாளர் காஞ்சிபுரம் சார்பதிவாளர் அலுவலகத்தில் தாக்கல் செய்து கட்டணம் ₹ 52,834/- செலுத்தியவர்.

இடது பெருவிரல்



For P.J.R Blue Metals (Chennai) Pvt. Ltd

[Signature]

Chairman & Managing Director

கூடுதல் விவரங்கள் ஆவண வாசகத்தில் உள்ளபடி.

எழுதிக் கொடுத்ததாக ஒப்புக் கொண்டவர்
இடது பெருவிரல்



[Signature]

கூடுதல் விவரங்கள் ஆவண வாசகத்தில் உள்ளபடி.

எழுதி வாங்கியதாக ஒப்புக் கொண்டவர்
இடது பெருவிரல்



For P.J.R Blue Metals (Chennai) Pvt. Ltd

[Signature]

Chairman & Managing Director

கூடுதல் விவரங்கள் ஆவண வாசகத்தில் உள்ளபடி.

புத்தகம் 2021 வருடத்திய 3831 ஆவணம்
13 தாள்களைக் கொண்டது.
உறுதி நான்
பதிவு அளவன்

268

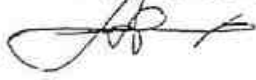




R/2 எண் இணை சார்பதிவாளர் காஞ்சிபுரம்/புத்தகம்-1/3831/2021

104

இன்னொருபுறம் இருபித்தவர்கள்

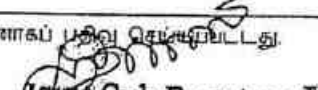
1.  திரு எஸ் குமரவேல் த/பெ சண்முகம் 34ஏ.12 சங்கீதவித்வான் நயினா தெரு காஞ்சிபுரம், காஞ்சிபுரம், தமிழ்நாடு, இந்தியா, 631502
2. S. Anand திரு எஸ் ஆனந்தன் த/பெ சுப்பிரமணி 11 பாண்டவ பெருமாள் கோயில் சன்னதி தெரு காஞ்சிபுரம், காஞ்சிபுரம், தமிழ்நாடு, இந்தியா, 631502

2021 ஆம் ஆண்டு ஆகஸ்ட் மாதம் 16ம் நாள்


Joint Sub Registrar-II
Kanchipuram
விரமணி பெருமாள்
சார்பதிவாளர்
2 எண் இணை சார்பதிவாளர் காஞ்சிபுரம்

R/2 எண் இணை சார்பதிவாளர் காஞ்சிபுரம்/புத்தகம்-1/3831/2021 எண்ணாகப் பதிவு செய்யப்பட்டது.

நாள்: 16/08/2021
2 எண் இணை சார்பதிவாளர் காஞ்சிபுரம்


Joint Sub Registrar-II
Kanchipuram
விரமணி பெருமாள்
சார்பதிவாளர்



புத்தகம் 2021/08/16... 3831/2021
1.3...
8...
269





सरकार
GOVERNMENT OF INDIA



जनकमन पार्थसारथी
Janakman Parthasarathy
Uppa no: DOB: 22/05/1953
Sex: MALE



6461 0941 0206

சமீபத்தில் சமீபத்தில் அனல் மின்னியல்

For P.B. (for) Meral (Chennai) Pvt. Ltd

plc
Chairman, Meral (Chennai) Pvt. Ltd

पोस्टीय विनिष्पन्न प्रधिकार
POSTAL INVESTMENT AUTHORITY

முகவரி:
கனம் தலைவர்
புத்தூர், ஏம். சி. ஏம்.
பி. பி. பி.
ஆதிகாரம்
மேலாடி கருணாமணி
கிழக்கு - 631805

Address:
SU Parthasarathy M. d. M.
STREET ARUMUGAPETTAI
Vellajedai Karunamuni,
Tamil Nadu - 631805

6461 0941 0206

MEERA AADHAAR, MERI PEHACHAN

K. L. M.

சமீபத்தில் 2024-25-ம் ஆண்டு 383-வது வாரம்
13-ஆம் திகதி வெளியிடப்பட்டது.
பி. பி. பி.
புதிதான அமைப்பு





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பிரைவட் லிமிடெட்
OFFICE AND DEPARTMENT
FOR BLUE METALS (CHENNAI)
PRIVATE LIMITED
GOVT. OFFICE
AAFCF2215E

For Blue Metals (Chennai) Pvt. Ltd
Chairman & Managing Director

pk

k. d. m.

புத்தகம் 202x வகுத்தியம் 383
1.3. தான் பவனங்கொண்டது.
1.0. கல் துறை
பதிவு பதிவுவரை

524



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இந்திய அரசாங்கம்
Government of India

குமரவேல் சண்முகம்
Kumaravel Shanmugam
தந்தை சண்முகம்
Father : Shanmugam
பிறந்த நாள் / DOB : 04/06/1973
ஆண்பால் / Male



6275 4726 4903

சாதாரண மனிதனின் அதிகாரம்

Unique Identification Authority of India

முகவரி:
த/பி. சண்முகம், 34A/12, எஸ்
பி என் பிள்ளை தெரு,
காஞ்சிபுரம், காஞ்சிபுரம், பெரிய
காஞ்சிபுரம், தமிழ் நாடு, 601502

Address:
S/O: Shanmugam, 34A/12, S.V
PILLAI STREET,
KANCHEEPURAM,
Kancheepuram, Big Kanchipuram
Tamil Nadu, 631502

6275 4726 4903

1847
1847 320 1847

www.uidai.gov.in

www.uidai.gov.in

[Signature]

[Signature]

பிறந்தநாள் 22/06/2023
13/06/2023
பதிவு செய்யப்பட்டது
பதிவு அலுவலர்



109

சாத்தாரண மனிதனின்
Government of India

சுமதிரா கருணாகரன்
Sumithira Karunakaran
தந்தை : சாத்தாரணன்
Father : Sathyanarayanan

பிறந்த ஆண்டு/Year of Birth: 1978
பாலினம் / Female

8732 2045 5099

ஆதார் - சாதாரண மனிதனின் அதிகாரம்

சாத்தாரண மனிதனின்
Unique Identification Authority of India

முகவரி: W/O: கருணாகரன், 356/240
இலுப்பைத்தோப்பு தெரு,
காஞ்சேபுரம், தி.கா. எந்திரப்பம்
காஞ்சேபுரம், தமிழ் நாடு, 631502

Address: W/O: Karunakaran,
356/240, ELUPPAITHOPPU
STREET, Konerikuppam,
Kancheepuram, Big
Kanchipuram, Tamil Nadu,
631502

8732 2045 5099

1847
1800 200 1847

help@uidai.gov.in

www.uidai.gov.in

K. d. n.

2022-23
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38316
சுமதிரா கருணாகரன்
சாத்தாரண மனிதனின் அதிகாரம்



58

3353/2018



தமிழ்நாடு தமிழ்நாடு TAMILNADU



SERIAL No. 5180
DATE 11.1 JUL 2018
Rs. 1000

PJR Blue Metals Chennai Private Ltd
Chennai.

S. EKAMBARAM, (S.V)
AP 337110
L.No. 3202/D1/97 Dt.30-09-9
105-B, PUTHERI STREET,
KANCHIPURAM-2.



ரூ.40,71,000/-க்கு புஞ்சை நிலம் சுத்த விக்சிரையப் பத்திரம்

2018 ஆம் ஆண்டு ஜூலை மாதம் 12 ஆம் தேதி, சென்னை 600 045, மேற்கு தாம்பரம், சிவசண்முகம் சாலை, 8B எண் கொண்ட கட்டிடத்தில் இயங்கிவரும் PJR Blue Metals (Chennai) Private Ltd., (PAN: AAFCP2235E) என்கிற நிறுவனத்திற்கு

1 A ஆனந்தன்
100 ரூபாய்
11 A மனசுண்டன்
12
13

1 A. சிவசண்முகம்
2 A. சிவசண்முகம்
3 A. சிவசண்முகம்
4 E. சிவசண்முகம்

5 A. சிவசண்முகம்
6 சென்னை
7 சென்னை
8 சென்னை
9 சென்னை
10 சென்னை

PJR Blue Metals (Chennai) Pvt Ltd

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மேற்படி நிறுவனத்திற்காக மேற்படி நிறுவனத்தின் மேனேஜிங் டைரக்டரும், திரு. E. பார்த்தசாரதி அவர்களின் குமாரருமான திரு. P. ஜானகிராமன் ஆகிய உங்கள் மூலம் மேற்படி PJR Blue Metals (Chennai) Private Ltd., -க்கு,

காஞ்சிபுரம் மாவட்டம், வாலாஜாபாத் வட்டம், மாகரல் கிராமம், மேட்டுத் தெரு, கதவு எண். 189 கொண்ட இல்லத்தில் வசிக்கும் காலஞ்சென்ற அண்ணாமலை நாயகர் அவர்களின் மனைவி திருமதி. கிருஷ்ணவேணி-1 (Aadhaar No. 781607736845),

மேற்படி கிராமத்தில் வசிக்கும் காலஞ்சென்ற அண்ணாமலை நாயகர் அவர்களின் குமாரர்கள் திரு. அ. திருமாதரல்-2 (Aadhaar No. 701589881614), அ. குட்டி-3 (Aadhaar No. 845138471650),

காஞ்சிபுரம் மாவட்டம், காஞ்சிபுரம் வட்டம், ஓரிக்கை கிராமம், வசந்தன் நகர், கதவு எண். 8 கொண்ட இல்லத்தில் வசிக்கும் காலஞ்சென்ற அண்ணாமலை நாயகர் அவர்களின் குமாரத்தியும் திரு. இளங்கோவன் அவர்களின் மனைவியுமான திருமதி. இலட்சுமி-4 (Aadhaar No. 543214457322)

காஞ்சிபுரம் மாவட்டம், வாலாஜாபாத் வட்டம், மாகரல் கிராமம், மேட்டு தெரு, கதவு எண். 17-7 கொண்ட இல்லத்தில் வசிக்கும் காலஞ்சென்ற அண்ணாமலை நாயகர் அவர்களின் குமாரத்தியும் திரு. அண்ணாமலை அவர்களின் மனைவியுமான திருமதி. சரஸ்வதி-5 (Aadhaar No. 474752544710)

காஞ்சிபுரம் மாவட்டம், காஞ்சிபுரம் வட்டம், காஞ்சிபுரம், சதாவரம், காந்தி நகர், கதவு எண். 57, கொண்ட இல்லத்தில் வசிக்கும் காலஞ்சென்ற கண்ணன் அவர்களின் மனைவி திருமதி. தெய்வானை-6 (Aadhaar No. 697331848698)

சென்னை-33, மேற்கு மாம்பலம், நாகாத்தம்மா கோவில் தெரு, கதவு எண். 2, கொண்ட இல்லத்தில் வசிக்கும் காலஞ்சென்ற கண்ணன் அவர்களின் குமாரத்தி திருமதி. முனியம்மாள்-7 (Aadhaar No. 867611502574)

அ. ஜனநீதன்
அ. ஜனகி
A. மனசுண்டன்

1594
உயர்வு
உயர்வு
A. திருமதி
A. குட்டி
E. லட்சுமி
A. கல்யாணி
தெய்வானை
ம. சிவசுந்தரி
K. கந்தசுந்தரி
K. குமாரன்
K. கந்தசுந்தரி

PJR Blue Metals (Chennai) Pvt. Ltd.

Managing Director

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காஞ்சிபுரம் மாவட்டம், காஞ்சிபுரம் வட்டம், காஞ்சிபுரம், சதாவரம், காந்தி நகர், கதவு எண்.57, கொண்ட இல்லத்தில் வசிக்கும் காலஞ்சென்ற கண்ணன் அவர்களின் குமாரர்கள் க.வடிவேல் என்கிற க.கந்தசாமி-8 (Aadhaar No.843276387991) க.குமரவேல்-9 (Aadhaar No.434458966637) க.தனசேகரன்-10 (Aadhaar No.982555159792)

காஞ்சிபுரம் மாவட்டம், வாலாஜாபாத் வட்டம், மாகரல் கிராமம், மேட்டு தெரு, கதவு எண்.16, கொண்ட இல்லத்தில் வசிக்கும் காலஞ்சென்ற ஆண்டியப்பன் நாயகர் அவர்களின் குமாரர் திரு.ஆ.ஆனந்தன்-11 (Aadhaar No.655736379624)

காஞ்சிபுரம் மாவட்டம், வாலாஜாபாத் வட்டம், மாகரல் கிராமம், மேட்டு தெரு, கதவு எண்.16, கொண்ட இல்லத்தில் வசிக்கும் திரு.ஆ.ஆனந்தன் அவர்களின் குமாரர்கள் திரு.ஆ.தினகரன்-12 (Aadhaar No.579980141639) திரு.ஆ.மணிகண்டன்-13 (Aadhaar No.583095325357)

ஆகிய நாங்கள் அனைவரும் சேர்ந்து மனப்பூர்வமாய் சம்மதித்து எழுதிக்கொடுத்த புஞ்சை நிலம் சுத்த விக்சிரையப்பத்திரம் என்னவென்றால்,

இதனடியில் சொத்துவிவரத்தில் கண்டுள்ள நிலமானது வாலாஜாபாத் வட்டம், மாகரல்-ஆ கிராமத்தில் பட்டா எண்.21, அடங்கியுள்ள புஞ்சை சர்வே எண்.

சர்வே எண்.699/2 புரா விஸ்தீரணம் ஹெக்டேர் 2.02.50 ஏர்ஸ்க்கு ஏக்கர் 5.00 கொண்ட நிலமானது எங்கள் அனைவரின் பிதுரர்ஜித சொந்தமாகும்.

අනුපාතික
වෙනස
A. 1000 වැනි

1. சி. சி. சி.
 2. சி. சி. சி.
 3. சி. சி. சி.
 4. சி. சி. சி.
 5. சி. சி. சி.
 6. சி. சி. சி.
 7. சி. சி. சி.
 8. சி. சி. சி.
 9. சி. சி. சி.
 10. சி. சி. சி.

For PJI Blue Metals (Chennai) Pvt. Ltd

Chairman & Managing Director

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எங்களில் 11-வது நபருக்கு தந்தையாரும், 1வது நபர், 6வது நபர்களுக்கு மாமனாரும் மற்ற நபர்களுக்கு பாட்டனாருமான காலஞ்சென்ற ஆனந்தன்நாயக்கர் மகன் ஆ.ஆண்டியப்ப நாயக்கர் அவர்களுக்கு தமிழ்நாடு அரசின் தனி வட்டாட்சியர் நில உடைமைப் பதிவு மேம்பாட்டுத் திட்டம் காஞ்சிபுரம் அலகு-2 அவர்களால் கடந்த 25-6-1981 தேதியில் ஆ.ஆண்டியப்ப நாயக்கர் அவர்களுக்கு மாகரல் கிராமத்தில் பட்டா எண்.21-ன்படி இதனடியிற் கண்ட சொத்தினம் பட்டா அளிக்கப்பட்டு அதுமுதல் அவரது கைப்பற்றிலும் சுவாதீன அனுபவத்திலும் வைத்துக் கொண்டு அவர் சர்வ சுதந்திரங்களுடன் ஆண்டனுபவித்து வந்து கடந்த 16/09/1987 தேதியில் இன்டஸ்டேடாக காலமாகி விட்டார்.மேற்படியார் காலாந்திரத்திற்கு பிறகு அவரின் அடுத்த வாரிசு ஆன மனைவி திருமதி.தனலட்சுமி அம்மாள் அவர்களும் கடந்த 18/02/1988 தேதியில் இன்டஸ்டேடாக காலமாகி விட்டார்.

மேற்படி ஆ.ஆண்டியப்ப நாயக்கர் - தனலட்சுமி தம்பதியர் காலம்பின்னர் மேற்படியார்களின் அடுத்த நேரடி வாரிசுகளான ஆ.அண்ணாமலை நாயக்கர்-1, ஆ.கண்ணன்-2, ஆ.ஆனந்தன்-3 ஆகிய மூவர்களுக்கு மட்டும் இதனடியிற்கண்ட ஏகதேசமாயும் பொதுவாய் பாத்தியப்பட்டு பொதுவாய் ஆண்டனுபவித்து வந்தார்கள்.

மேற்படி மூவரும் பொதுவாய் ஆண்டனுபவித்து வந்த சொத்தினத்தை கடந்த 25-05-1989 தேதியில் ஒரு பாகப்பிரிவினை கூர்ச்சீட்டு முன்னிலையில் குமாரர்கள் மூவரும் சேர்ந்து பாகம் பிரிவினை செய்துக் கொண்டு அவரவர் கைப்பற்றிலும் சுவாதீன அனுபவத்திலும் வைத்துக் கொண்டு சர்வ சுதந்திரங்களுடன் ஆண்டனுபவித்து வந்தார்கள்.

இதனடியிற்கண்ட சொத்தினத்தை பாகப்பிரிவினை கூர்ச்சீட்டு முன்னிலைக்கு அவரவர் பாகத்தை ஆண்டனுபவித்து வந்ததில் ஆ.அண்ணாமலை நாயக்கர் அவர்கள் கடந்த 12/10/2004 தேதியில் இன்டஸ்டேடாக காலமாகி விட்டார். காலஞ்சென்ற ஆ.அண்ணாமலை நாயக்கர் காலாந்திரம் முன்பே ஆ.அண்ணாமலை நாயக்கர் மகன் விஜயன் என்பவர் கடந்த 13-12-2002 தேதியில் காலமாகி விட்டார்.

A. ஆனந்தன்
A. தினகரன்
A. லக்ஷ்மணன்

L.T. 94
உய்ய
சென்னை
A. Thinnar
A. இரா
E. வட்டா
A. இராசு
தனலட்சுமி
மாணவன்
K. இராசு
K. இராசு
K. இராசு

For P.J.R. Blue Metals (Chennai) Pvt. Ltd

Chairman & Managing Director

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மேற்படி காலஞ்சென்ற ஆ.அண்ணாமலை நாயக்கர் அவர்களின் அடுத்த வாரிசுகளான மனைவி எங்களில் 1வது நபர் சிருஷ்ணவேணி, மற்றும் மக்கள் முறையே எங்களில் 2வது நபர் அ.திருமாகறல், 3வது நபர் அ.குட்டி, 4வதுநபர் லட்சுமி, 5வது நபர் சரஸ்வதி ஆகியவர்களுக்கு பொதுவாய் பாத்தியப்படும் மற்றும்,

ஆ.ஆண்டியப்ப நாயக்கர் மற்றொரு குமாரர் ஆ.கண்ணன் அவர்கள் கடந்த 23/03/1993 தேதியில் இன்டஸ்டீடாக காலமாகி விட்டார். காலஞ்சென்ற ஆ.கண்ணன் நாயக்கர் அவர்களின் அடுத்த வாரிசுகளான மனைவி எங்களில் 6வது நபர் தெய்வானை மற்றும் மக்கள் முறையே எங்களில் 7வது நபர் முனியம்மாள், 8வது நபர் க.வடிவேல் என்கிற கந்தசாமி, 9வது நபர் க.குமரவேல், 10வது நபர் க.தனசேகரன், ஆகியவர்களுக்கு பொதுவாய் பாத்தியப்படும் மற்றும்,

காலஞ்சென்ற ஆ.ஆண்டியப்ப நாயக்கர் அவர்களின் மூன்றாவது குமாரர் எங்களில் 11வது நபர் ஆ.ஆனந்தன் மற்றும் அவரது குமாரர்கள் 12வது நபர் ஆ.தினகரன், 13வது நபர் ஆ.மணிகண்டன் வாரிசுகள் சேர்ந்தும்

எங்கள் அனைவருக்கும் பொதுவாய் பாத்தியப்பட்டு எங்கள் கைப்பற்றிலும் சுவாதீன அனுபவத்திலும் நாங்கள் சகல சுதந்திரங்களுடன் பொதுவாய் ஆண்டனுபவித்து வரும் இதன்கீழ் ஷெடியூல் கண்ட நிலத்தை எங்கள் அனைவரின் குடும்ப தேவைகளுக்காக வேண்டி விற்பதாக தீர்மானித்து தங்களை அனுகியதில் தாங்களும் தங்களின் மேற்படி நிறுவனத்தின் வியாபார தேவைகளுக்கு வேண்டி சுத்தகிரையம் பெறுவதாக கூறியதின் பேரில் இன்று இதனடியிற் கண்ட நிலத்துக்கு சுத்த கிரையம் நிச்சயித்த தொகை ரூ.40,71,000/- (எழுத்தால் ரூபாய்,நாற்பது லட்சத்து எழுபத்தி ஓராயிரம் மட்டும்) மேற்படி கிரைய தொகைக்கு தங்கள் நிறுவனத்திற்கு நாங்கள் சுத்த கிரையம் செய்து கிரையத்தொகையை பெற்றுக்கொண்ட விவரம் பின்வருமாறு;

A.ஆனந்தன்
A.தினகரன்
A.மணிகண்டன்

11-9-98
A.தினகரன்
A.தினகரன்
E.லட்சுமி
A.சுவாமிநாதன்
சுமதி
K.சுமதி
K.சுமதி
K.சுமதி

P. R. Blue Metals (Chennai) Pvt. Ltd.

Managing Director

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தங்களின் காஞ்சிபுரம் கிளை சிட்டி யூனியன் வங்கியின் டிமாண்ட டிரப்ட் எண்.158722 / நாள்.10-07-2018 மூலம் எங்களில் 1வது நபர் சிருஷ்ணவேணி அவர்கள் பெற்றுக் கொண்ட கிரைய தொகை ரூ.257,000/- (எழுத்தால் ரூபாய்.இரண்டு லட்சத்து ஐம்பத்தி ஏழாயிரம் மட்டும்) மற்றும்

தங்களின் காஞ்சிபுரம் கிளை சிட்டி யூனியன் வங்கியின் டிமாண்ட டிரப்ட் எண்.158723 / நாள்.10-07-2018 மூலம் எங்களில் 2வது நபர் அ.திருமாதகல் அவர்கள் பெற்றுக் கொண்ட கிரைய தொகை ரூ.450,000/- (எழுத்தால் ரூபாய்.நான்கு லட்சத்து ஐம்பதாயிரம் மட்டும்) மற்றும்

தங்களின் காஞ்சிபுரம் கிளை சிட்டி யூனியன் வங்கியின் டிமாண்ட டிரப்ட் எண்.158724 / நாள்.10-07-2018 மூலம் எங்களில் 3வது நபர் அ.குட்டி அவர்கள் பெற்றுக் கொண்ட கிரைய தொகை ரூ.450,000/- (எழுத்தால் ரூபாய்.நான்கு லட்சத்து ஐம்பதாயிரம் மட்டும்) மற்றும்

தங்களின் காஞ்சிபுரம் கிளை சிட்டி யூனியன் வங்கியின் டிமாண்ட டிரப்ட் எண்.158725 / நாள்.10-07-2018 மூலம் எங்களில் 4வது நபர் லட்சுமி அவர்கள் பெற்றுக் கொண்ட கிரைய தொகை ரூ.100,000/- (எழுத்தால் ரூபாய்.ஒரு லட்சம் மட்டும்) மற்றும்

தங்களின் காஞ்சிபுரம் கிளை சிட்டி யூனியன் வங்கியின் டிமாண்ட டிரப்ட் எண்.158726 / நாள்.10-07-2018 மூலம் எங்களில் 5வது நபர் சரஸ்வதி அவர்கள் பெற்றுக் கொண்ட கிரைய தொகை ரூ.100,000/- (எழுத்தால் ரூபாய்.ஒரு லட்சம் மட்டும்) மற்றும்

தங்களின் காஞ்சிபுரம் கிளை சிட்டி யூனியன் வங்கியின் டிமாண்ட டிரப்ட் எண்.158727 / நாள்.10-07-2018 மூலம் எங்களில் 6வது நபர் தெய்வானை அவர்கள் பெற்றுக் கொண்ட கிரைய தொகை ரூ.357,000/- (எழுத்தால் ரூபாய்.மூன்று லட்சத்து ஐம்பத்தி ஏழாயிரம் மட்டும்) மற்றும்

அ.சுனந்தன்
செனிகரன்
A.சுனந்தன்

15.8.2018
A.திருமாதகல்
A.குட்டி
E.லட்சுமி
A.சுனந்தன்
தெய்வானை
முனியாசாமி
A.சுனந்தன்
A.சுனந்தன்
K.சுனந்தன்

1. PIR Blue Metals (Chennai) Puttelon Chennai கருத்தியுடையது

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தங்களின் காஞ்சிபுரம் கிளை சிட்டி யூனியன் வங்கியின் டிமாண்ட் டிரப்ட் எண்.158728 / நாள்.10-07-2018 மூலம் எங்களில் 7வது நபர் முனியம்மாள் அவர்கள் பெற்றுக் கொண்ட கிரைய தொகை ரூ.100,000/- (எழுத்தால் ரூபாய்.ஒரு லட்சம் மட்டும்) மற்றும்

தங்களின் காஞ்சிபுரம் கிளை சிட்டி யூனியன் வங்கியின் டிமாண்ட் டிரப்ட் எண்.158729 / நாள்.10-07-2018 மூலம் எங்களில் 8வது நபர் க.வடிவேல் என்கிற கந்தசாமி அவர்கள் பெற்றுக் கொண்ட கிரைய தொகை ரூ.300,000/- (எழுத்தால் ரூபாய்.மூன்று லட்சம் மட்டும்) மற்றும்

தங்களின் காஞ்சிபுரம் கிளை சிட்டி யூனியன் வங்கியின் டிமாண்ட் டிரப்ட் எண்.158730 / நாள்.10-07-2018 மூலம் எங்களில் 9வது நபர் க.குமரவேல் அவர்கள் பெற்றுக் கொண்ட கிரைய தொகை ரூ.300,000/- (எழுத்தால் ரூபாய்.மூன்று லட்சம் மட்டும்) மற்றும்

தங்களின் காஞ்சிபுரம் கிளை சிட்டி யூனியன் வங்கியின் டிமாண்ட் டிரப்ட் எண்.158731 / நாள்.10-07-2018 மூலம் எங்களில் 10வது நபர் க.தனசேகரன் அவர்கள் பெற்றுக் கொண்ட கிரைய தொகை ரூ.300,000/- (எழுத்தால் ரூபாய்.மூன்று லட்சம் மட்டும்) மற்றும்

தங்களின் காஞ்சிபுரம் கிளை சிட்டி யூனியன் வங்கியின் டிமாண்ட் டிரப்ட் எண்.158732 / நாள்.10-07-2018 மூலம் எங்களில் 11வது நபர் ஆ.ஆனந்தன் அவர்கள் பெற்றுக் கொண்ட கிரைய தொகை ரூ.457,000/- (எழுத்தால் ரூபாய்.நான்கு லட்சத்து ஐம்பத்தி ஏழாயிரம் மட்டும்) மற்றும்

தங்களின் காஞ்சிபுரம் கிளை சிட்டி யூனியன் வங்கியின் டிமாண்ட் டிரப்ட் எண்.158733 / நாள்.10-07-2018 மூலம் எங்களில் 12வது நபர் ஆ.தினகரன் அவர்கள் பெற்றுக் கொண்ட கிரைய தொகை ரூ.450,000/- (எழுத்தால் ரூபாய்.நான்கு லட்சத்து ஐம்பதாயிரம் மட்டும்) மற்றும்

அ.சு.நெடுஞ்
அதினகரன்
A.சு.நெடுஞ்

பி.சி.சி
ஆனந்தன்
அதினகரன்
A.சு.நெடுஞ்
E.லட்சுமி
A.சு.நெடுஞ்
செயல்பாடு
முனியம்மாள்
K.சு.நெடுஞ்
K.சு.நெடுஞ்
K.சு.நெடுஞ்

For PJR Blue Metals (Chennai) Pvt. Ltd

Chairman & Managing Director

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தங்களின் காஞ்சிபுரம் கிளை சிட்டி யூனியன் வங்கியின் டிமாண்ட் டிரப்ட் எண்.158721 / நாள்.10-07-2018 மூலம் எங்களில் 13வது நபர் ஆ.மணிகண்டன் அவர்கள் பெற்றுக் கொண்ட கிரைய தொகை ரூ.450,000/- (எழுத்தால் ரூபாய்.நான்கு லட்சத்து ஐம்பதாயிரம் மட்டும்)

ஆக கீழ்க்கண்ட வெட்பயில் கண்ட நிலத்திற்குண்டான தொகை ரூ.40,71,000/- (எழுத்தால் ரூபாய்.நாற்பது லட்சத்து எழுபத்தி ஓராயிரம் மட்டும்) கிரைய முழு தொகையும் மேற்கண்டவாறு நாங்கள் தங்கள் நிறுவனத்திடமிருந்து பெற்றுக்கொண்டு விட்டோம் ஆகையால் இன்றே இதனடியிற்கண்ட நிலத்தை தங்களது நிறுவனத்திற்கு நாங்கள் சுத்த கிரையம் செய்து மேற்படி நிறுவனத்திற்காக தங்களின் பூரண சுவாதீனத்தில் ஒப்படைத்துவிட்டோம்.

இனி நீரே தங்களின் நிறுவனத்திற்காக வேண்டி இதனடியில்சுண்ட ஷெட்யூல் நிலத்தை கைப்பற்றிக் கொண்டு சர்க்கார் வரியினத்தையும் பட்டா இவைகளை தங்களது மேற்படி நிறுவனத்தின் பெயரில் மாற்றிக்கொண்டு சர்வ சுதந்திரங்களுடன் பாரம்பரியமாய் தானாதி வினுமய விக்கிரையங்களுக்கு யோக்கியமாய் ஆண்டனுப வித்துக் கொள்ள வேண்டியது.

கீழ்க்கண்ட வெடிகளால் கண்ட நிலத்துக்கு நாளது கிரைய தேதி வரைக்கும் உண்டான அனைத்து சர்க்கார் மற்றும் பிற உள்ளாட்சி அமைப்புகளுக்கான அனைத்து வரி மற்றும் இதர கட்டணங்கள் ஏதும் பாக்கி இல்லை. அப்படி ஏதேனும் பின்னிட்டு தெரியவந்தால் அவைகளை நாங்களே அதனை எங்கள் சொந்த செலவில் தீர்த்து கொடுக்கின்றோம்.

நாள்து கிரைய தேதியில் ஷெடியூலில் கண்ட நிலங்களை தங்களது PJR Blue Metals (Chennai) Private Ltd. நிறுவனத்தின் பூரண சுவாதீனத்திற்கு நாங்கள் ஒப்படைத்து விட்டபடியால் அச்சொத்தினாங்களில் இன்று முதல் எங்களுக்குகோ, எங்களது பின்னிட்ட வாரிசுகளுக்குகோ, எந்த கோரிக்கையும் உரிமையும் கிடையாது.

A சமுதாயம்
அ சிறந்த
A லட்சியம்

[illegible]

For PJB Blue Metals (Chennai) Pvt. Ltd.

Chairman & Managing Director

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இக்கிரைய ஆவணத்தின் பொருட்டு, கீழ்க்கண்ட ஷெடியூல் நில சொத்திற்கு தங்கள் நிறுவனத்திற்கு உண்டான உரிமையை உறுதி செய்யும் பொருட்டு பின் எந்த காலத்திலும் தங்கள் நிறுவனத்திற்கு தேவைப்படும் எந்த ஒரு தஸ்தாவேஜிகளையும் தேவைப்படும் கையொப்பங்களையும் தங்கள் அழைப்பின் பேரில் உடனிருந்து ஏற்படுத்தி தருகின்றோம்.

இதனடியில்கண்ட ஷெடியூல் நிலமானது எங்கள் அனைவருக்கும் சொந்தமாய் பாத்தியப்பட்டதென்றும் மற்றபடி இதன்பேரில் வேறு யாருக்கும் எவ்வித பாத்தியதையும் அக்கு பின்தொடர்ச்சி ஒரு சிறிதும் கிடையாதென்றும் இதன்பேரில் எவ்வித முன் கிரைய உடன்படிக்கை, கிரையம், தானம், உயில், பரிவர்த்தனை, அடமானம், போக்கியம், தாவா, கோர்ட் அட்டாச்ச்மெண்ட் போன்ற எவ்வித வில்லங்க கலன்கள், டைட்டில் தகராறுகள் ஒரு சிறிதும் கிடையாது என்றும் தங்கள் நிறுவனம் PJR Blue Metals (Chennai) Private Ltd. அனுபவிக்குமளவில் இக்கிரைய தேதிக்குட்பட்ட காலத்திற்குள் ஏதேனும் மேற்கண்ட கலன்கள் இருப்பதாக தெரியவந்து அதன் பொருட்டு தங்களின் நிறுவன ஷெடியூலில் கண்ட கிரைய நிலத்திற்கு நஷ்டம் உண்டானால் அவைகளை நாங்களே முன்னின்று தங்கள் நிறுவனத்திடம் எவ்வித பிரதிபலன் தொகையும் கோராமல் எங்கள் சொந்த பணச்செலவினாலும், எங்கள் இதர சொத்துக்களால் சட்டப்படி தீர்த்து அளிக்கிறோம் என்று உண்மையாகவும் உறுதியாகவும் கூறுகிறோம்.

15.5.7
சென்னை
அ. சிவசுப்பிரமணியன்
A. சிவசுப்பிரமணியன்
E. லட்சுமி
A. சிவசுப்பிரமணியன்
சென்னை
முன்மொட்டை
K. சிவசுப்பிரமணியன்
K. சிவசுப்பிரமணியன்
K. சிவசுப்பிரமணியன்
K. சிவசுப்பிரமணியன்
A. சிவசுப்பிரமணியன்
சென்னை
A. சிவசுப்பிரமணியன்

For PJR Blue Metals (Chennai) Pvt. Ltd

Chairman & Managing Director



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இதற்கு ஆதரவான பட்டா நகலை மட்டும் நாங்கள் தங்கள் வசம் வழங்கியுள்ளோம்.
இந்தப்படிக்கு நாங்கள் மனப்பூர்வமாய் சம்மதித்து ஏகோபித்து எழுதிக்கொடுத்த புஞ்சை
நிலம் சுத்த விக்சிரைய பத்திரம்.

கிரைய சொத்து விவரம்

காஞ்சிபுரம் மாவட்டம், காஞ்சிபுரம் பதிவு மாவட்டம், காஞ்சிபுரம் 2ந் இணைசார் பதிவுக
பதிவுத்துணை மாவட்டம், வாலாஜாபாத் வட்டம், மாகரல்-ஆ கிராமத்தில் பட்டா எண்.21
அடங்கியுள்ள புஞ்சை சர்வே எண்.699/2 பூரா விஸ்தீரணம் ஹெக்டேர் 2.02.50 ஏர்ஸ்க்கு
ஏக்கர் 5.00 கொண்ட நிலமும் இந்த நிலத்தில் அமைந்துள்ள கலனான கிணறு 3எச்.பி
மின்திறன் கொண்ட மின்சார சர்வீஸ் கணைக்கஷன் அதன் டிபாசிட உள்பட ஷெட் கட்டிடம்
இல்லை

எழுதி வாங்குபவர்

மதிப்பு ரூபாய்.40,71,000/-

எழுதிக்கொடுப்பவர்கள்

For RJR Blue Metals (Chennai) Pvt. Ltd

Chairman & Managing Director

சாட்சிகள்.

1. D. Suresh
A. சரசு
3/0. சரசு
104B/1 SVNSI-
காஞ்சிபுரம்.

2. D. Suresh

ச. சரசு
3/0. சரசு
104B/1 SVNSI-
காஞ்சிபுரம்.

D. Suresh

D. Suresh

State Document-writer

For RJR Blue Metals (Chennai) Pvt. Ltd

104B/1 SVNSI-3

(Chennai) 10

284

10.9.2018
காஞ்சிபுரம்
D. Suresh
A. சரசு
3/0. சரசு
104B/1 SVNSI-
காஞ்சிபுரம்.
D. Suresh
A. சரசு
3/0. சரசு
104B/1 SVNSI-
காஞ்சிபுரம்.
D. Suresh
A. சரசு
3/0. சரசு
104B/1 SVNSI-
காஞ்சிபுரம்.



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1968 ஆம் ஆண்டின் இந்திய முத்திரைச் சட்டம் பத்திரங்களை குறைத்து எழுதலை தடுக்கும் விதி 3/1 கீழ் எழுதிக் கொடுப்பவரால் கொடுக்கப்படும் வாக்குமூலம்

நெ. மாகறல்-ஆ கிராமம்

| வரிசை எண் | சர்வே எண் | உட்பிரிவு | விஸ்தீரணம் | | கு.பை | |
|-----------|-----------|-----------|---|--------------------|-------|----------------|
| | | | ஹெக்டேர் ஏர்ஸ் | ஏக்கர் செண்ட் | | |
| 1. | 699 | 2 | 2.02.50 | 5.00 | பஞ்சை | 40,20,000/- |
| 2. | 699 | 2 | கலனான கிணறு | | | 25,000/- |
| 3. | 699 | 2 | 3எஸ்பி மின்திறன் கொண்ட மின்சார சர்வீஸ் டிபாசிட் | | | 26,000/- |
| மொத்தம் | | | | ஏக்கர் 5.00 செண்ட் | | ரூ.40,71,000/- |

For P.J.R Blue Metals (Chennai) Pvt. Ltd.

Chairman & Managing Director

17.9.78
உயர்
கனம்
A. இராஜசுந்தரன்
A.D. 24
E. லட்சுமி
A. சுவாமிநாதன்
ஜெயலட்சுமி
முனியசாமி
K. கந்தசாமி
K. குமாரசாமி
K. தனசேகரன்
A. சுவாமிநாதன்
அதிபதி
A. சுவாமிநாதன்

17.9.78
39
11
பதிவு
பதிவு



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தமிழக அரசு

வருவாய்த் துறை

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

மாவட்டம் : காஞ்சிபுரம்

வட்டம் : வாலாஜாபாத்

வருவாய் கிராமம் : மாகரல் - ஆ

பட்டா எண் : 21

உரிமையாளர்கள் பெயர்

| ஆனந்தநாயக்கர் | | மகன் | | ஆண்டியப்பநாயக்கர் | |
|---------------|-----------|------------|---------|-------------------|---------|
| நன்செய் | | புன்செய் | | மற்றவை | |
| பரப்பு | தீர்வை | பரப்பு | தீர்வை | பரப்பு | தீர்வை |
| புல எண் | உட்பிரிவு | ஹெக் - ஏர் | ரூ - பை | ஹெக் - ஏர் | ரூ - பை |
| 699 | 2 | -- | -- | 2 - 2.50 | 3.75 |
| | | | | 2 - 2.50 | 3.75 |

குறிப்பு2 :



1. மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் <http://eservices.tn.gov.in> என்ற இணைய தளத்தில் 03/12/204/00021/50433 என்ற குறிப்பு எண்ணை உள்ளிடு செய்து உறுதி செய்துகொள்ளவும்.
2. இத் தகவல்கள் 20-06-2018 அன்று 01:32:58 PM நேரத்தில் அச்சடிக்கப்பட்டது.
3. கைப்பேசி கேமராவின் 2D barcode படிப்பான் மூலம் படித்து 3G/GPRS வழி இணையதளத்தில் சரிபார்க்கவும்

அ. ச. ச. ச. ச. ச.
அ. ச. ச. ச. ச. ச.
அ. ச. ச. ச. ச. ச.

அ. ச. ச. ச. ச. ச.
அ. ச. ச. ச. ச. ச.
அ. ச. ச. ச. ச. ச.
அ. ச. ச. ச. ச. ச.
அ. ச. ச. ச. ச. ச.
அ. ச. ச. ச. ச. ச.
அ. ச. ச. ச. ச. ச.
அ. ச. ச. ச. ச. ச.

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12



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R/2 எண் இணை சார்பதிவாளர் காஞ்சிபுரம்/புத்தகம்-1/3353/2018

1899ம் ஆண்டு இந்திய முத்திரைச் சட்டம் 42வது பிரிவின் கீழான சான்று

2018ம் ஆண்டு வரிசை எண் 1225

871 சிவசண்முகம் சாலை மேற்கு தாம்பரம் சென்னை, சென்னை, தமிழ்நாடு. இந்தியா: 600045-ல் வசிக்கும் திரு பி ஜானகிராமன் என்பவரிடமிருந்து ₹ 2,83,450/- ரூபாய் இரண்டு இலட்சத்து எண்பத்து மூன்றாயிரத்து நானூற்று ஐம்பது மட்டும்) இந்த ஆவணத்திற்காக இந்திய முத்திரைச் சட்டம் 41வது பிரிவின் படி குறைவாயிருந்த முத்திரைக் கட்டணம் வசூலிக்கப்பட்டது என நான் இதன் மூலம் சான்றளிக்கிறேன்.

சார்பதிவாளர் : 2 எண் இணை சார்பதிவாளர் காஞ்சிபுரம்
நாள்: 12/07/2018

சார்பதிவாளர் : 2 எண் இணை சார்பதிவாளர் காஞ்சிபுரம் முத்திரைச் சட்டம் பிரிவு
41ன் படி, 42

Joint Sub Registrar,
Kanacheepuram.

2018 ஆம் ஆண்டு ஜூலை மாதம் 12ம் தேதி மு.ப. 11:39 மணிக்கு 2 எண் இணை சார்பதிவாளர் காஞ்சிபுரம் சார்பதிவாளர் அலுவலகத்தில் தாக்கல் செய்து கட்டுணம் ₹ 1,63,365/- செலுத்தியவர்.

இடது பெருவிரல்



For PJR Blue Metals (Chennai) Pvt. Ltd

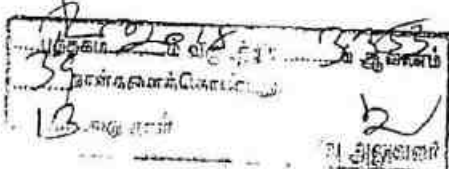
சுடுதல் விவரங்கள் ஆவண வாசகத்தில் உள்ளபடி

எழுதிக் கொடுத்ததாக ஒப்புக் கொண்டவர்
இடது பெருவிரல்

சுடுதல் விவரங்கள் ஆவண வாசகத்தில் உள்ளபடி













எழுதிக் கொடுத்ததாக ஒப்புக் கொண்டவர்
இடது பெருவிரல்

சுடுதல் விவரங்கள் ஆவண வாசகத்தில் உள்ளபடி



287

R/2 எண் இணை சார்பதிவாளர் காஞ்சிபுரம்/புத்தகம்-1/3353/2018

| | |
|---|--|
| <p>எழுதிக் கொடுத்ததாக ஒப்புக் கொண்டவர் இடது பெருவிரல்</p>   | <p>A. சூர்யா</p> <p>கூடுதல் விவரங்கள் ஆவண வாசகத்தில் உள்ளபடி</p> |
| <p>எழுதிக் கொடுத்ததாக ஒப்புக் கொண்டவர் இடது பெருவிரல்</p>   | <p>E. ஸுதா</p> <p>கூடுதல் விவரங்கள் ஆவண வாசகத்தில் உள்ளபடி</p> |
| <p>எழுதிக் கொடுத்ததாக ஒப்புக் கொண்டவர் இடது பெருவிரல்</p>   | <p>A. சூர்யா</p> <p>கூடுதல் விவரங்கள் ஆவண வாசகத்தில் உள்ளபடி</p> |
| <p>எழுதிக் கொடுத்ததாக ஒப்புக் கொண்டவர் இடது பெருவிரல்</p>   | <p>செய்லா</p> <p>கூடுதல் விவரங்கள் ஆவண வாசகத்தில் உள்ளபடி</p> |
| <p>எழுதிக் கொடுத்ததாக ஒப்புக் கொண்டவர் இடது பெருவிரல்</p>   | <p>முனியாட்சு</p> <p>கூடுதல் விவரங்கள் ஆவண வாசகத்தில் உள்ளபடி</p> |
| <p>எழுதிக் கொடுத்ததாக ஒப்புக் கொண்டவர் இடது பெருவிரல்</p>   | <p>K. கந்தசாமி</p> <p>கூடுதல் விவரங்கள் ஆவண வாசகத்தில் உள்ளபடி</p> |

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R/2













1/3353/2018

1/3353/2018

1/3353/2018

1/3353/2018

1/3353/2018

| | | |
|---|---|---|
| எழுதிக் கொடுத்ததாக ஒப்புக் கொண்டவர் இடது பெருவிரல் |   | சுருதுல் விவரங்கள் ஆவண வாசகத்தில் உள்ளபடி |
| எழுதிக் கொடுத்ததாக ஒப்புக் கொண்டவர் இடது பெருவிரல் |   | சுருதுல் விவரங்கள் ஆவண வாசகத்தில் உள்ளபடி |
| எழுதிக் கொடுத்ததாக ஒப்புக் கொண்டவர் இடது பெருவிரல் |   | சுருதுல் விவரங்கள் ஆவண வாசகத்தில் உள்ளபடி |
| எழுதிக் கொடுத்ததாக ஒப்புக் கொண்டவர் இடது பெருவிரல் |   | சுருதுல் விவரங்கள் ஆவண வாசகத்தில் உள்ளபடி |
| எழுதிக் கொடுத்ததாக ஒப்புக் கொண்டவர் இடது பெருவிரல் |   | சுருதுல் விவரங்கள் ஆவண வாசகத்தில் உள்ளபடி |
| எழுதி வாங்கியதாக ஒப்புக் கொண்டவர் இடது பெருவிரல் |   | For PJR Blue Metals (Chennai) Pvt. Ltd Chairman & Managing Director சுருதுல் விவரங்கள் ஆவண வாசகத்தில் உள்ளபடி |

73



R/2 10/07/2018 1/3353/2018

இன்னொரு நிருபித்தவர்கள்

1. A. S. S. S.

திருமதி சரசு கபெ டி.ஆறுமுகம் 104பி/1 சங்கீத வித்வான் நயினா தெரு காஞ்சிபுரம், காஞ்சிபுரம், தமிழ்நாடு, இந்தியா, 631502

2. S. S. S. S.

திரு ச. வெங்கடேசன் தபெ சண்முகம் 3பி/1 நடுத்தெரு காஞ்சிபுரம், காஞ்சிபுரம், தமிழ்நாடு, இந்தியா, 631501

2018 ஆம் ஆண்டு ஜூலை மாதம் 12ம் நாள்

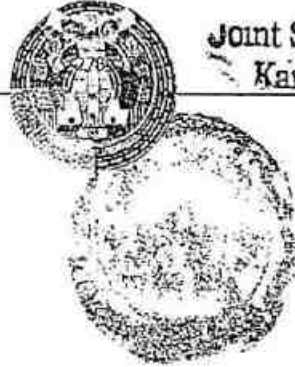
Joint Sub Registrar
Kancheepuram
2 எண் இணை சார்பதிவாளர் காஞ்சிபுரம்

R/2 எண் இணை சார்பதிவாளர் காஞ்சிபுரம்/புத்தகம்-1/3353/2018 எண்ணாகப் பதிவு செய்யப்பட்டது.

நாள்: 12/07/2018

2 எண் இணை சார்பதிவாளர் காஞ்சிபுரம்

Joint Sub Registrar
Kancheepuram
க.சேஷ கணேசன்
சார்பதிவாளர்



திருமதி சரசு கபெ டி.ஆறுமுகம்
104பி/1 சங்கீத வித்வான்
நயினா தெரு
காஞ்சிபுரம், காஞ்சிபுரம், தமிழ்நாடு, இந்தியா, 631502



74

46



भारत सरकार
GOVERNMENT OF INDIA

जनकीराम पन्थासराय
Janakiraman Parthasarathy
DOB: 22/05/1953
अप / MALE

5461 0941 0206

எனது ஆதார், எனது அடையாளம்.

भारतीय विशिष्ट पहचान प्राधिकरण
INDIAN IDENTIFICATION AUTHORITY OF INDIA

Address:
S/O. Parthasarathy, NO 9, N H
STREET, ARUMUDAPETTAI,
WELAJAHAD, KANCHESAPURAM,
Tamil Nadu - 631605

5461 0941 0206

मेरा आदधार, मेरी पहचान

For PJR Blue Metals (Chennai) Pvt. Ltd

plc

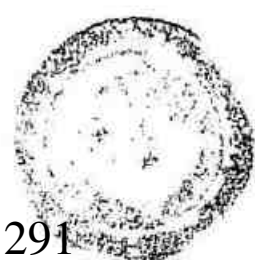
4.1.208
செய்ய
கம்பி

A. Thirumangay
அதிர்வு

E. வடகுடி
A. சிவசுந்தரி
செய்வாரி
சுவிசர்
கச்சிதம்பி

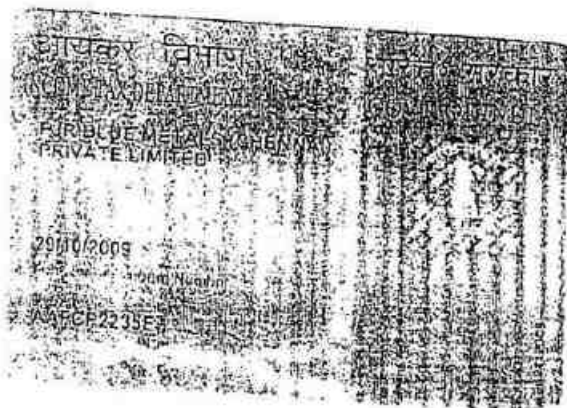
A. சிவசுந்தரி
அதிர்வு
A. சிவசுந்தரி
A. சிவசுந்தரி
A. சிவசுந்தரி
A. சிவசுந்தரி

புதிதாக
35
17





75



R Blue Metals (Chennai) Pvt. Ltd

Chairman & Managing Director

L.T. 948

ഭയം
കുറയ്ക്കുക

A. H. H. H. H.

A 5229

உவந்தது

9550 21

1.5.6.6

[illegible]

A. சூனாடுதல்

அதிகாரம்

Pr. Leonora de la Cruz

கருமேஸ்வரன்

K. தனசேகரன்

1. இவ்வாறு சான்றிதழ் வழங்குவதற்கு உரியவர்கள்
 2. இவ்வாறு சான்றிதழ் வழங்குவதற்கு உரியவர்கள்



746

சாதாரண மனிதனின் அடையாள அட்டை
General Human Identification Card



கிருஷ்ணவேணி அண்ணாமலை
 Krishnaveni Annamalai
 தாய் தாய்
 Father: THULASI

பிறந்த ஆண்டு/Year of Birth: 1955
 பாலினம் / Female

7816 0773 6845

சாதாரண மனிதனின் அடையாள அட்டை

பரிந்துரை அமைதி அமைதி அமைதி அமைதி
Identification Authority of India



மேலே உள்ள அடையாள அட்டை
 Card No. 7816 0773 6845
 கருவியின் தகவல் கருவியின் தகவல்

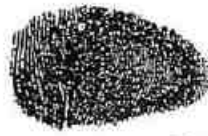
Address: W/O Annamalai,
 NO 17, METTU STREET,
 Magaral, Magaral,
 Kanchiapurem, Tamil Nadu,
 631603

7816 0773 6845

 1947
 1920 300 1947

 help@idai.gov.in

 www.idai.gov.in



19.9.98 (சென்னை)

18.9.98
 39
 19

சாதாரண மனிதனின் அடையாள அட்டை






77

4


இந்திய அரசாங்கம்
Government of India
பெயர்: திருமலை அண்ணாமலை
Thirumalai Annamalai
பெயர்: திருமலை அண்ணாமலை
Father: ANNAMALAI
பிறந்த தேதி: 1963
ஆண் / Male

7015 8988 1614

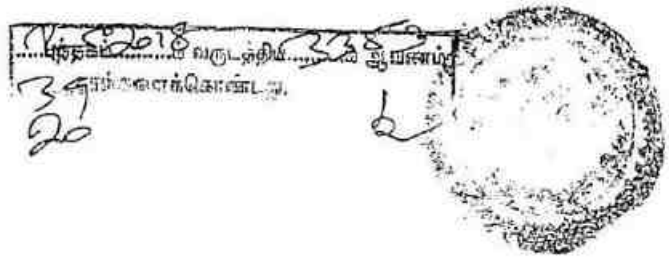

பெயர்: திருமலை அண்ணாமலை அம்மா
Unique Identification Authority of India
முகவரி: 17 அண்ணாமலை தெரு
மேட்டி தெரு, மகாரை, மகாரை
கங்கேபுரம், தமிழ்நாடு, 631603
Address: S/O Annamalai, NO
17, METTU STREET
Magarai, Magarai,
Kancheepuram, Tamil Nadu,
631603

ஆதார் - சாதாரண அணிதலின் அதிகாரம்

7015 8988 1614

1847 1847 1847
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www.uidai.gov.in

A-Thirumalai





78

இந்திய சர்க்கார்
Government of India
குட்டி அண்ணாமலை
Kully Annamalai
தந்தை அண்ணாமலை
Father: ANNAMALAI
பிறந்த நாள் / DOB: 04/07/1966
ஆள்பாலை / Male

8451 3847 1650

ஆதார் - சாதாரண மனிதனின் அதிகாரம்

இந்திய சர்க்கார்
Unique Identification Authority of India
ஆதார்
(முதலி)
S/O அண்ணாமலை, எண் 17,
மேட்டு தெரு, மாகரல்,
மாகரல், மாகரல், கங்கேபுரம்,
தமிழ்நாடு. 631603

Address:
S/O Annamalai, NO 17, METTU
STREET, MAGARAI, Magarai,
Magarai, Kancheepuram, Tamil
Nadu, 631603

8451 3847 1650

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1800 200 1947

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12/20/18 3302
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78




இந்திய அரசாங்கம்
Government of India
லக்ஷ்மி எலங்கோவன்
Lakshmi Elangovan
தந்தை: அன்னமலையார்
Father: ANNAMALAI
பிறந்த தேதி - Year of Birth: 1975
பாலினம் - Female

5432 1445 7322

சாதாரண மனிதனின் அதிகாரம்

Unique Identification Authority of India
முகவரி: W/O: Elangovan, S.
வாஸந்தன் நகர், கங்கேப்பூர், கரிகால், தமிழ்நாடு 631502
Address: W/O: Elangovan, S.
VASANTHAN NAGAR,
Orikkai, Kancheepuram,
Orikkai, Tamil Nadu: 631502

5432 1445 7322

1947
1800 302 1947

help@uidai.gov.in

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E.லட்சுமி

39





80

இந்திய அரசாங்கம்
Government of India
 சரசுவதி அண்ணாமலை
 Saraswathi Annamalai
 பிறந்த நாள் / DOB : 06/05/1991
 பெண் / Female



4747 5254 4710

சாதாரண மனிதனின் அதிகாரம்

Unique Identification Authority of India

முகவரி
 கூடுதல் அண்ணாமலை, 1772
 செட்டி தெரு மாகரல், மாகரல்,
 மாகரல் கங்குலிபுரம், கங்குலிபுரம்
 தமிழ் நாடு 631603

Address:
 W/O: Annamalai, 1772, METTU
 STREET, MAGARAL, Magaral,
 Magaral, Kanchapuram,
 Kanchapuram, Tamil Nadu,
 631603

4747 5254 4710

1600 150 1500

help@uidai.gov.in

www.uidai.gov.in

A. சாஸ்திரி

பிறந்தநாள்... மருத்துவ...
 சர்க்கரைக்கொண்டது.
 பிறந்த நாள்...
 பதிவு அலுவலர்





81

இந்திய அரசாங்கம்
Government of India

உயர்மன்ற கார்ட்
Dheivanai Kannan

பெண்
Father: Thulasi

DOB: 20/10/1957
Gender: Female

6973 3184 8698

ஆதார் - சாதாரண மனிதனின் அதிகாரம்

இந்திய அடையாள அமைப்பு
Unique Identification Authority of India

Address: W/O: Kannan, 57,
GANDHI NAGAR,
SADHAMIRAM,
Kanchipuram,
Tamil Nadu,
631501

6973 3184 8698

1800 303 1947
help@uidai.gov.in
www.uidai.gov.in

செயல்பாடு

33
24





82



भारतीय विशिष्ट पहचान प्राधिकरण
भारत सरकार
Unique Identification Authority of India
Government of India



E-Aadhaar Letter

பதிவேட்டு எண்/Enrolment No.: 2040/80368/02696

K. Muniamma (க. முனியம்மா)
D/O: Kannan, NO 2, NAGATHAMMAN KOIL STREET,
West Mambalam, Chennai,
Tamil Nadu - 600033

இந்த அடையாளத்திற்கான சான்று, குடியரிமைக்கு அல்ல.
இ அடையாள சான்ற ஆன்லைன் ஆதரவுகேள்விகள் மூலமாகப் பெறவும்.
இ இது எலக்ட்ரானிக் செயல்முறை மூலம் தயாரிக்கப்பட்ட கடிதமாகும்.

உங்கள் Your Aadhaar No.:

8676 1150 2574



இ Aadhaar is a proof of identity, not of citizenship.
இ To establish identity, authenticate online.
இ This is electronically generated letter.



Validity unknown
Digitally signed by UIDAI
IDENTIFICATION AUTHORITY OF INDIA
Date: 2016.01.21 12:27:47 IST

நாடு முழுதிலும் செல்லுபடியாகும்.
ஆதார் பெறுவதற்கு ஒரே ஒரு முறை மட்டுமே தேவைகள்
விண்ணப்பத்தை பூர்த்தி செய்து பதிவு செய்ய வேண்டிய
அடையாளம் ஏற்படும்.
தயவுசெய்து உங்களின் சமீபத்தைய பதிய பெண்பயல் தம்பல்
மற்றும் உ-மெயில் முகவரியை பதிவு செய்யவும். இதனால்
உங்களுக்கு பல்வேறு வசதிகளை பெற்றுக் கொள்ளும்
செலுகரியம் கிடைக்கும்.

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இ You need to enroll only once for Aadhaar.
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will help you to avail various services in future.

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GOVERNMENT OF INDIA



भारतीय विशिष्ट पहचान प्राधिकरण
UNIQUE IDENTIFICATION AUTHORITY OF INDIA



க. முனியம்மா
K. Muniamma
பிறந்த நாள்/ DOB: 10/01/1975
பெண் / FEMALE

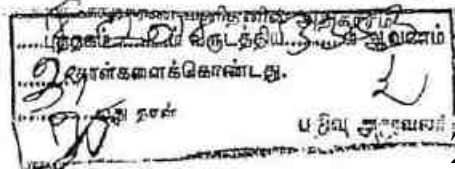


முகவரி:
தந்தை / தாய் பெண்:
கண்ணன், எண் 2,
நாகாத்தம்மா கோயில்
செரு. மேற்கு மம்பலம்,
சென்னை,
தமிழ்நாடு 600033

Address:
D/O: Kannan, NO 2,
NAGATHAMMAN KOIL STREET,
West Mambalam, Chennai,
Tamil Nadu - 600033

8676 1150 2574

8676 1150 2574



-Aam Admi ka Adhikar
முனியம்மா





83


भारत सरकार
GOVERNMENT OF INDIA


கந்தசாமி கண்ணன்
Kandhasamy Kannan
பிறந்த திகதி / DOB : 19/05/1980
ஆண் / MALE

8432 7638 7991




पहचान प्रमाणिकरण
IDENTIFICATION CARD

Address:
S/O: கண்ணன், 57, காந்தி
நகர், சாதிவேளம், கங்கேபுரம்,
கங்கேபுரம், தமிழ் நாடு,
631501

S/O: KANNAN, 57, GANDHI
NAGAR, Sathiveeram,
Kancheepuram, Kancheepuram,
Tamil Nadu, 631501

தகவல் மயிதழின் அதிகாரம்

Kandhasamy

1947
1950-2000-1947


http://pudai.gov.in


www.pudai.gov.in

P.O. Box No 1042,
Kancheepuram-631 001

கந்தசாமி கண்ணன்
பிறந்த திகதி / DOB : 19/05/1980
ஆண் / MALE





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இந்திய அரசாங்கம்
Government of India

குமரவேல் கண்ணன்

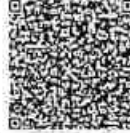
Kumaravel Kannan

தந்தை கண்ணன்

Father KANNAN

பிறந்த வருடம் / Year of Birth : 1954

ஆண்பால் / Male



4344 5896 6637

சாதாரண மனிதனின் அதிகாரம்



முதலாம்

50: கண்ணன், 57, காந்தி நகர்

சதாவரம், தேனம்பாக்கம்

காஞ்சிபுரம், காஞ்சிபுரம், தமிழ்

நாடு, 631501

உதவி இலாகா இயக்குநர், கீழ்க்கண்ட இலாகா
Union Information Authority of India

Address:

S/O: Kannan, 57, GANDHI

NAGAR SADAVARAM,

THENAMBAKKAM,

Kancheepuram, Kanchipuram,

Tamil Nadu, 631501

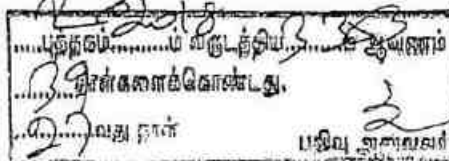
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கருணா





SS



இந்திய அரசாங்கம்

Government of India

தனசேகரன் கண்ணன்

Dhanasekaran Kannan

பிறந்ததல்குடும்பம் / Year of Birth: 1988

ஆண்பால் / Male



9825 5515 9792

ஆதார் - சாதாரண மனிதனின் அதிகாரம்



Unique Identification Authority of India

ஆதார்

முதலாளி

S/O கண்ணன், 57, காந்தி நகர்,

சதாவரம், காஞ்சிபுரம்,

காஞ்சிபுரம், தமிழ் நாடு, 631501

Address:

S/O: Kannan, 57, GANDHI

NAGAR, SHATHAVARAM,

Kancheepuram, Kanchipuram,

Tamil Nadu, 631501

9825 5515 9792

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1800 300 1847

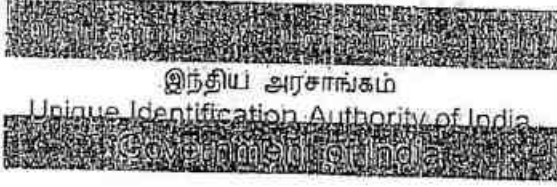
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1/1. தனசேகரன்

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ஆவணம்





புதிது அடையாளம் / Enrollment No. : 2007/26046/01492

To
Anandhan Andiyapan
ஆனந்தன் ஆண்டியப்பன்
S/O Andiyapan
NO 15
METTU STREET
MAGARAL
Magaral, Kancheepuram
Tamil Nadu - 631603
9789381587



KL231577607FT

23157760



உங்கள் ஆதார் எண் / Your Aadhaar No. :

6557 3637 9624

ஆதார் - சாதாரண மனிதனின் அதிகாரம்



இந்திய அரசாங்கம்
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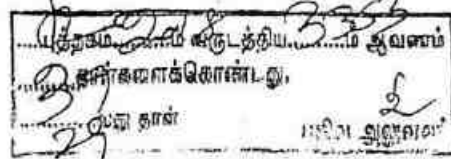
ஆனந்தன் ஆண்டியப்பன்
Anandhan Andiyapan
தந்தை : ஆண்டியப்ப நாயக்கர்
Father : ANDIYAPA NAYAKKAR

பிறப்பு ஆண்டு / Year of Birth: 1945
ஆண் / Male

6557 3637 9624



ஆதார் - சாதாரண மனிதனின் அதிகாரம்



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Government of India



AADHAAR

தகவல்

- ஆதார் அடையாளத்திற்கான சான்று குடியுரிமைக்கு அல்ல.
- அடையாள சான்றை இணையதளம் மூலம் உறுதிப்படுத்திக் கொள்ளவும்.

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முகவரி : 15 ஆண்டியப்பன், எண் 15
மெட்டு தெரு, மகாரல், மகாரல்
மகாரல், கங்கேபுரம், தமிழ்நாடு
631603

Address: S/O Andiyapan, NO
15, METTU STREET,
MAGARAL, Magaral,
Magaral, Kancheepuram,
Tamil Nadu, 631603

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73A அனநிர்
சுதந்திரம்





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இந்திய அரசாங்கம்
Government of India
சுவாமிநாதன் அனந்தன்
Srinagaran Anandhan
அவர் தந்தை இராமச்சந்திரன் நாவர்க்கன்
Father: AMANCHAN ANANDHAN NAYARKAN
பிறந்த தேதி/Year of Birth: 1969
பாலினம்: Male




5799 8014 1639

Unique Identification Authority of India

அவரது தந்தை அவர் 15
மெட்டு தெரு. மகாரல் மகாரல்
மகாரல் அந்தஸ்து. கனம்

Address: SVO Anandhan, No.
15, METTU STREET,
Magaral, Magaral,
Kanchenguram, Tamil Nadu.
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5799 8014 1639

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சாதாரண மனிதனின் அதிகாரம்

49தினம்

பிறந்த தேதி/Year of Birth: 1969
பாலினம்: Male
30





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சாதிக்கப்பட்டவர்
GOVERNMENT OF INDIA
மனிகண்டன் ஆனந்தன்
Manikandan Anandhan
தந்தை : ஆனந்தன்
Father : ANANDHAN
பிறந்த நாள் / DOB : 17/02/1996
ஆண்பால் / Male

5830 9532 5357

ஆதார் - சாதாரண மனிதனின் அதிகாரம்

இந்திய தனித்துவம் அமைதி அமைதி
Unique Identification Authority of India
முகவரி
50 ஆனந்தன், எண் 15, சமீட்டு
நெடு, மாகரல், மாகரல்.
மாகரல், கங்கேபுரம், தமிழ்நாடு.
631603

Address:
S/O Anandhan, NO 15, METTU
STREET, MAGARAL, Magaral,
Magaral, Kancheeppuram, Tamil
Nadu, 631603

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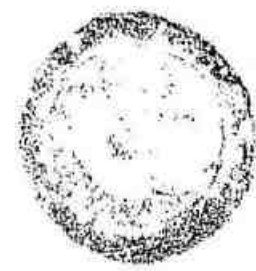
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22 A. Anandhan

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சாதிக்கப்பட்டவர்
சாதிக்கப்பட்டவர்
சாதிக்கப்பட்டவர்





தமிழ்நாடு தமிழ்நாடு TAMILNADU

AZ 560247



D. Gnanapavan
சென்னை மாவட்டம்

P. வன்டலாங்குழலி
உரிமம் எண் : 3202/D/19/
பெரிய காஞ்சிபுரம்.
செல் : 9943157949
தேதி: 18-8-2022

குத்தகை ஆவணம்

மாத, வாடகை ரூபாய்.10,000/-,கெடுவு காலம் 7 வருடங்கள்,

முன்பணம் ரூபாய்.200,000/-

2022 ஆம் ஆண்டு ஆகஸ்ட் மாதம் 4 ஆம் தேதி, சென்னை 600 045, மேற்கு தாம்பரம், சிவசண்முகம் சாலை, 8B எண் கொண்ட கட்டிடத்தில் இயங்கிவரும் PJR BLUEMETALS (CHENNAI) PRIVATE LIMITED., (PAN: AAFCP2235E) என்கிற நிறுவனத்திற்காக மேற்படி நிறுவனத்தின் சேர்மன் மற்றும் மேனேஜிங் டைரக்டரும் திரு.E.பார்த்தசாரதி அவர்களின் குமாரருமான திரு.P.ஜானகிராமன் (PAN AAJPJ 1327J / Cell No.9444005022) 1வது பார்ட்டியாகவும்,

திருவண்ணாமலை மாவட்டம், வெம்பாக்கம் வட்டம், பின்கோடு 631702 அரசாணிப்பாளையம் அஞ்சல், சித்தாலப்பாக்கம் கிராமம், பள்ள தெரு, கதவு எண்.288, கொண்ட இல்லத்தில் வசிக்கும் திரு.தேசிங்கு அவர்களின் குமாரர் திரு.D.கோவிந்தசாமி (Aadhaar No.6841 2905 5852) 2வது பார்ட்டியாகவும்

D. Gnanapavan

Managing Director

13-08-2022
தமிழ்நாடு அரசு
வசு கள்

46

ஆக நாமிரு பார்ட்டிகளும் சேர்ந்து சம்மதித்து ஏற்படுத்திக் கொண்ட புஞ்சை நிலங்கள் குத்தகை ஆவணம் என்னவென்றால்,

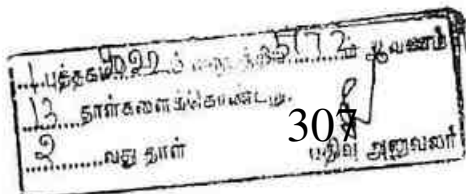
இதனடியிற் சொத்துவிவரத்தில் கண்டுள்ள சொத்துகளானது நம்மில் 1வது பார்ட்டியின் நிறுவனத்தின் சுயார்ஜிதம் சொந்தமாகும். அதாவது 1வது பார்ட்டியானவர் காஞ்சிபுரம் மாவட்டம், வாலாஜாபாத் வட்டம், மாகரல் ஆ கிராமத்தில் புஞ்சை சர்வே எண்.699/2 ஹெக்டேர் 2.02.50 ஏக்கர் 5.00 செண்ட் கொண்ட நிலம் கொண்டதை கடந்த 12-07-2018 தேதியில் திருமதி.கிருஷ்ணவேணி, திருமாகறல், குட்டி, லட்சுமி, சூஸ்வதி, தெய்வானை, முனியம்மாள், கந்தசாமி, குமரவேல், தனசேகரன், ஆனந்தன், தினகரன், மணிகண்டன் ஆகியவர்களிடமிருந்து 1வது பார்ட்டியானவர் தனது PJR BLUE METALS (CHENNAI) PRIVATE LIMITED.,(PAN:AAFCEP2235E) என்கிற நிறுவனத்திற்காக வேண்டி நம்மில் 1வது பார்ட்டி P.ஜானகிராமன் அவர்கள் சுத்த கிரையம் பெற்று அப்பத்திரமானது காஞ்சிபுரம் 2ந் இணைசார் பதிவாளர் அலுவலகத்தில் 1-வது புத்தகத்தில் 2018 ஆம் ஆண்டின் 3353 எண்ணாக பதிவுச்செய்யப்பட்ட கிரைய ஆவணபடிக்கு 1வது பார்ட்டியின் நிறுவனத்திற்கு பாத்தியப்படும் மற்றும்

காஞ்சிபுரம் மாவட்டம், வாலாஜாபாத் வட்டம், மாகரல் ஆ கிராமத்தில் புஞ்சை சர்வே எண்.699/3 ஹெக்டேர் 0.88.0 ஏக்கர் 2.18 செண்ட் கொண்ட நிலம் கொண்டதை கடந்த 16-08-2021 தேதியில் திருமதி.கே.சுமித்ரா அவர்களிடமிருந்து 1வது பார்ட்டியானவர் தனது PJR BLUE METALS (CHENNAI) PRIVATE LIMITED.,(PAN:AAFCEP2235E) என்கிற நிறுவனத்திற்காக வேண்டி நம்மில் 1வது பார்ட்டி P.ஜானகிராமன் அவர்கள் சுத்த கிரையம் பெற்று அப்பத்திரமானது காஞ்சிபுரம் 2ந் இணைசார் பதிவாளர் அலுவலகத்தில் 1-வது புத்தகத்தில் 2021 ஆம் ஆண்டின் 3831 எண்ணாக பதிவுச்செய்யப்பட்ட கிரைய ஆவணபடிக்கு 1வது பார்ட்டியின் நிறுவனத்திற்கு பாத்தியப்படும் 1வது பார்ட்டியின் நிறுவனத்தின் கைப்பற்றிலும் சுவாதீன அனுபவத்திலும் சர்வ சுதந்திரங்களுடன் ஆண்டனுபவித்து வரும் சொத்தினங்கள் ஆகும்.

For PJR Blue Metals (Chennai) Pvt. Ltd

Chairman & Managing Director

D. Govindasamy



47

மேற்படி வகையில் 1வது பார்ட்டியின் நிறுவனத்தின் கைப்பற்றிலும் சுவாதீன அனுபவத்திலும் சர்வ சுதந்திரங்களுடன் ஆண்டனுபவித்து வரும் சொத்தை 2வதுபார்ட்டியானவர் குத்தகை கேட்டதற்கிணங்க அதற்கு 1வது பார்ட்டியின் நிறுவனத்தின் சார்பாக திரு.P.ஜானகிராமன் அவர்கள் நம்மில் 2வது பார்ட்டி திரு.D.கோவிந்தசாமி அவர்களுக்கு 7 வருடத்திற்கு அதாவது 04-08-2022 முதல் 04-08-2029 வரையில் 7 வருடங்களுக்கு மட்டும் கல்குவாரி நடத்த குத்தகை ஆவணம் ஏற்படுத்திக் கொண்டும் மற்றும் இனி நாம் இருபார்ட்டிகளும் அதாவது கீழ்க்கண்ட கண்டிஷன்களின்படி குத்தகை ஒப்பந்தம் ஷரத்துக்கள் செய்துக் கொள்கிறோம்.

அதாவது கீழ்க்கண்ட நிலத்தில் உள்ள நிலத்திற்கு 2வது பார்ட்டியானவர் மாதம் பிரதி மாதம் ரூபாய்.10,000/-மட்டும் (எழுத்தால் ரூபாய்.பத்தாயிரம் மட்டும்) 1வது பார்ட்டிக்கு கொடுத்து விட வேண்டியது. வாடகை தொகையை ஒவ்வொரு மாதமும் 1ம் தேதிக்குள் 2வது பார்ட்டியானவர் 1வது பார்ட்டியின் நிறுவனத்திற்கு செலுத்த வேண்டியது. மற்றும் இதற்கு முன்பணமாக 2வது பார்ட்டியானவர் 1வது பார்ட்டியின் நிறுவனத்திற்கு ரூபாய்.200,000/- இரண்டு லட்சம் மட்டும் செலுத்தியுள்ளார்.

2வது பார்ட்டிக்கு கல்குவாரி சென்று வர அனுசூலு பாதை குவாரி நடத்த அரசாங்க ஒப்புதல் பெற விண்ணப்பிக்கவும், குவாரி உரிமம் அரசு விதிகளுக்குட்பட்டு பெறவும் மற்றும் மாசு கட்டுப்பாட்டு வாரியத்தின் விதிகளுக்கு உட்பட்டும், அரசின் அனுமதி பெற்றும், ஒப்புக்கை சீட்டு (பாஸ்) பெற்றுக் கொள்ளவும் மற்றும் அரசின் இதர நடிவடிக்கை உட்பட்டு நடந்துக் கொள்ள 2வது பார்ட்டிக்கு அனுமதி அளிக்கப்படுகிறது.

கீழ்க்கண்ட சொத்தில் 2வது பார்ட்டி செய்யும் தொழிலின் அனைத்து செலவுகளும் நம்மில் 2வது பார்ட்டியையே சாரும் 2வது பார்ட்டி மேற்படி சொத்தை வேறு நபர்களுக்கு குத்தகைக்கு வழங்கலடாது மேற்படி அனைத்து அரசாங்க கட்டணங்களையும் 2வது பார்ட்டியே செலுத்த வேண்டியது.

D. Govindasamy

For PJR Blue Metals (Chennai) Pvt. Ltd

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செயற்கைத் துணைப்பதிவு

| | |
|-----------------------|---------------|
| பத்தகம் 0.22-வகை-3 | 5112 |
| 13 தாள்களைக் கொண்டது. | |
| 3 வது தாள் | பதிவு அலுவலர் |

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2வது பார்ட்டியானவர் குத்தகை நிலங்களை காலிசெய்யும் போது குத்தகை காலத்திற்குள் அரசுக்கு செலுத்த வேண்டிய முழுதொகையும் பாக்கி எதுவும் இல்லாமல் 2வது பார்ட்டியானவர் செலுத்த வேண்டியது. குத்தகை காலம் முடிந்த பின்பு குத்தகை காலத்திற்குட்பட்ட காலத்தில் அரசுக்கு செலுத்த வேண்டிய வரிவகையறாக்கள் ஏதேனும் நிலுவையில் இருப்பது பின்னர் தெரியவருமேயானால் அதற்கு 2வது பார்ட்டியே பொறுப்பாகும். 1வதுபார்ட்டியின் நிறுவனத்திற்கு எந்த வகையிலும் பொறுப்பு கிடையாது.

கீழ்க்கண்ட சொத்தை காலிசெய்யும் சமயத்தில் அரசுக்கு செலுத்த வேண்டிய வரி வகையறாக்களை நிலுவை ஏதுமின்றி 2வது பார்ட்டியானவர் செலுத்திய பிறகு 1வது பார்ட்டி வசம் ஒப்படைக்க வேண்டியது. குத்தகை காலம் முடிந்த பின்பு குத்தகை காலத்திற்கு உட்பட்ட காலத்தில் அரசுக்கு செலுத்த வேண்டிய வரி வகையறாக்கள் ஏதேனும் நிலுவையில் இருப்பது தெரியவருமேயானால் 2வது பார்ட்டியே அதற்கு பொறுப்பாகும். 1வது பார்ட்டியின் நிறுவனமானது எந்த வகையிலும் அதற்கு பொறுப்பேற்க வேண்டியதில்லை பொறுப்பும் கிடையாது என இருபார்ட்டிகளும் ஒப்புக் கொள்கிறார்கள்.

குவாரி செய்யும் காலத்தில் அரசாங்க விதிகளுக்கு உட்பட்டும் மற்றும் கனிமவள துறையின் ஈட்டப்படியும் அதன் விதிகளின்படியும் தொழில் செய்யவேண்டும் அதை மீறினால் அரசாங்கம் கோரும் அபராதம் மற்றும் கனிமவள துறையின் விதிகளுக்குட்பட்ட அபராதம் மற்றும் தண்டனை, குற்றபுரிவுக்குண்டான தண்டனை அனைத்தும் 2வது பார்ட்டியே சார்ந்தாகும்.

குவாரியில் நடக்கும் அசாம்பவிதங்கள் வெடி விபத்துகள் அதனால் ஏற்படும் காயங்கள் மற்றும் உயிரிழப்புகளுக்கு உண்டான நஷ்ட ஈடு தொகைகளை மற்றும் குற்ற நடவடிக்கைகளுக்குண்டான தண்டனைகள் அனைத்தும் 2வது பார்ட்டியே சார்ந்ததாகும்.

குவாரியில் கல் உடைக்க வெடி வைத்து உடைக்கும்போது மின்னொயர்கள் மற்றும் ஏதேனும் இதர வகையில் நஷ்டம் உண்டானால் அதனை 2வது பார்ட்டியே சொந்த செலவில் சரிசெய்து கொடுக்க வேண்டியது.

D. Govindasamy

For P.J.R. Blue Metals (Chennai) Pvt. Ltd

Chairman & Managing Director

| | | |
|---------------|--------------------|------|
| புத்தகம் 22 | வருமானம் 172 | தவணை |
| 13 | தள்ளுபடிக்கொண்டது. | |
| 4 | வது தள்ளு | |
| பதிவு அலுவலர் | | |

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1வது பார்ட்டியின் நிறுவனமானது நிலங்களை மட்டும் தான் 2வது பார்ட்டிக்கு குத்தகை கொடுத்துள்ளார். இந்த நிலங்களில் 2வது பார்ட்டியானவர் செய்யும் தொழிலுக்கும் மற்ற நடவடிக்கைக்கும் 1வது பார்ட்டியின் நிறுவனத்திற்கு எவ்வித சம்மந்தமும் சிடையாது. இதனை 2வது பார்ட்டி ஒப்புக் கொள்கிறார்.

மேற்கூறிய ஒப்பந்த காலத்தில் 2வது பார்ட்டியானவர் 1வது பார்ட்டிக்கு கொடுக்க வேண்டிய மாத வாடகையை கொடுக்க தவறினாலும் இன்னும் பிற காரணங் களுக்காகவும் இந்த குத்தகையை 1வது பார்ட்டியின் நிறுவனமானது எப்பொழுது வேண்டுமானாலும் ரத்து செய்ய 1வது பார்ட்டியின் நிறுவனத்திற்கு முழு உரிமையுண்டு.

மேலும் குத்தகை காலம் முடிவதற்கு முன்னதாகவே 2வது பார்ட்டியானவர் காலி செய்ய விருப்பப்பட்டால் 2 மாதம் முன்னதாக எழுத்து மூலம் முன்னறிவிப்பு கொடுக்க வேண்டியது. மேற்படி சொத்தில் சட்ட சிக்கல்கள் இருந்தால் 1வது பார்ட்டியின் நிறுவனம் அதை தீர்த்து வைக்கவேண்டும் மற்றும் காலம் நீடிக்க வேண்டும் என்றால் இருபார்ட்டிகளும் வேறு புதிய உடன்படிக்கை ஆவணம் மூலம் நீடிக்கவும் செய்யலாம்.

எதிர்காலத்தில் குத்தகை எடுத்துக் கொண்ட இதனடியிற்கண்ட நிலங்களில் குவாரி செய்யும்போது கல் உடைக்கும்போதும் மற்றும் தோண்டி எடுக்கும்போதும் ஏற்படும் அதனால் ஏற்படும் பள்ளங்கள் ஒழுங்கற்ற நில அமைப்புகளுக்கு வருங்காலத்தில் அரசால் எடுக்கும் குற்ற நடவடிக்கைகளுக்கும் மற்றும் அபராதம் கட்டணங்களையும் இதர கட்டணங்களை 2வது பார்ட்டியே பொறுப்பு. உடையவர் ஆவார் அதனை 2வது பார்ட்டியே தன்னுடைய சொந்த செலவில் செலுத்த வேண்டியது.

மேற்கண்ட குத்தகை ஆவண சரத்துகளையாவும் 2வது பார்ட்டி படித்து பார்த்து அனைத்து சரத்துகள் அறிந்த பின்னர்தான் இந்த குத்தகை ஒப்பந்த பத்திரத்தில் கையொப்பம் செய்துள்ளார்.

இந்தப்படிக்கு நாம் இருபார்ட்டிகளும் சேர்ந்து மனப்பூர்வமாய் சம்மதித்து எழுதிக் கொண்ட புஞ்சை நிலங்கள் குத்தகை ஒப்பந்தப் பத்திரம்.

For PJB Blue Metals (Chennai) Pvt. Ltd

D. Govindasamy

Chairman & Managing Director

| | |
|------------|-----|
| புத்தகம் | 577 |
| 12 தாள்கள் | |
| 5 வது தாள் | |
| பதி 310 | |



குத்தகை சொத்து விவரம்

காஞ்சிபுரம் மாவட்டம், காஞ்சிபுரம் பதிவு மாவட்டம், காஞ்சிபுரம் 2^{ந்} இணைசார் சார்பதிவுகம் சேர்ந்த வாலாஜாபாத் வட்டம், மாகரல் ஆ கிராமத்தில் இருக்கும் புஞ்சை சர்வே எண்.699/2 பூரா விஸ்தீரணம் ஹெக்டேர் 2.02.50 ஏர்ஸ்க்கு ஏக்கர் 5.00 கொண்ட நிலம்,
புஞ்சை சர்வே எண்.699/3 பூரா விஸ்தீரணம் ஹெக்டேர் 0.88.00 ஏர்ஸ்க்கு ஏக்கர் 2.18 கொண்ட நிலம்,
ஆக மொத்த விஸ்தீரணம் ஏக்கர் 7.18 ஏக்கர் கொண்ட புஞ்சை நிலங்கள் மற்றும் இதில் உள்ள மின்சார சர்வீஸ் கணைக்ஷன் உள்பட இந்த குத்தகை ஆவணத்திற்கு உட்பட்டதாகும்.

2வது பார்ட்டி

1வது பார்ட்டி

D. Govindasamy

For PJB Blue Metals (Chennai) Pvt. Ltd

Chairman & Managing Director

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12/11/2019



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Mobile no: 9443483739

பத்திரம் 2-ம் வகுத்தியில் பதிவு செய்யப்பட்டது.
தாள்களைக் கொண்டது.
...வது தாள்
பதிவு அலுவலர்



23

51

சென்னை மாநகராட்சி
சென்னை மாநகராட்சி

கோவிந்தசாமி தே
Govindasamy D
பிறந்த நாள்/DOB: 17/05/1995
ஆண்/ MALE

6841 2905 5852
VO: 833 2785 63M 4180

எனது ஆதார், எனது அடையாளம்

சென்னை மாநகராட்சி
சென்னை மாநகராட்சி

Address:
S/O: Desingu, 288, PALLA STREET
SITTHALAKKAM, ARASANIPALAI POST,
Chithalapakkam, Tiruvr
Tamil Nadu - 631702

6841 2905 5852

1847
1800 308 1847
help@cidai.gov.in
www.cidai.gov.in
P.O. Box No. 1847,
Bengaluru-480 001

D. Govindasamy

பத்திரிகை... வகுத்த... ஆவணம்
13 தாள்களைக் கொண்டது.
7 வது தாள் பதிவு அலுவலர்

52

24



आयकर विभाग भारत सरकार
INCOMETAX DEPARTMENT GOVT OF INDIA
JANAKIRAMAN
PARTHASARATHI PILLAI
22/05/1953
PAN/ANR/1327J
Signature

For PJR Blue Metals (Chennai) Pvt. Ltd

Chairman & Managing Director

13 தாள் எண்ணிக்கை
8 வது தாள்
பதிவு அலுவலர்





53

25

आयकर विभाग
INCOME TAX DEPARTMENT

PJR-BLUE METALS CHENNAI
PRIVATE LIMITED

गो.सू.सू.सू.सू.
GOVT. OF INDIA

29/10/2009

AXFDP2215

For PJR Blue Metals (Chennai) Pvt. Ltd

Chairman & Managing Director

| | |
|-----------------------|---------------|
| 1. பத்திரம் 2215 | 5172 |
| 13. தாள்களைக் கொண்டு. | |
| 9. வது தாள் | பதிவு அலுவலர் |



26

54

- 15 -

भारतीय विशिष्ट पहचान प्राधिकरण

भारतीय विशिष्ट पहचान प्राधिकरण

भारत सरकार
GOVERNMENT OF INDIA

முகவரி:

S/O: பாலசுப்பிரமணியன்,
274, ராஜாஜிதி,
வாலாஜாபாத், காஞ்சிபுரம்,
தமிழ்நாடு - 631605

Address:

S/O: Balasubramaniam, 274, RAJA
STREET, Walajabad, Kancheepuram,
Tamil Nadu - 631605

சதானந்தம் பாலசுப்பிரமணியன்

Sadhanandam

Balasubbramaniam

பிறந்த தாள்/ DOB: 14/06/1971

ஆண் / MALE



3284 9908 2626

3284 9908 2626

Balanandam
Balasubramaniam

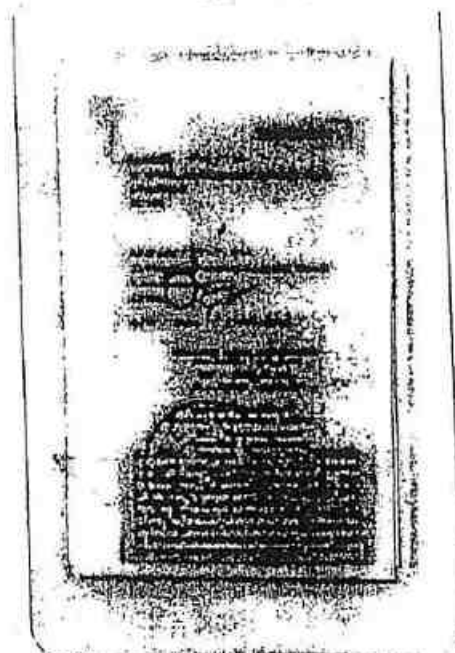
Q-36 0111-967

| | |
|--|------------------------------------|
| பிறந்த தாள்/ DOB: 14/06/1971 | பெயர்/ Name: S/O: பாலசுப்பிரமணியன் |
| 12 தார்க்கணம்/ Address: 274, ராஜாஜிதி, வாலாஜாபாத், காஞ்சிபுரம், தமிழ்நாடு - 631605 | பெயர்/ Name: S/O: பாலசுப்பிரமணியன் |
| 10 வது தாள்/ Signature: [Signature] | பெயர்/ Name: S/O: பாலசுப்பிரமணியன் |



27

55



S. Andar

[Handwritten signature]

| | |
|----------------------|--------------------------------|
| புத்தல் 2223-வது தலை | 5720 வுண் |
| 13 தாங்கரைக்கொண்டது. | <i>[Handwritten signature]</i> |
| 01 வது தாள் | புதிது அதுவரை |





56 28

R/2 எண் இணை சார்பதிவாளர் காஞ்சிபுரம்/புத்தகம்-1/5172/2022

1896ம் ஆண்டு இந்திய முத்திரைச் சட்டம் 42வது பிரிவின் கீழான சான்று

2022ம் ஆண்டு வரிசை எண் 2745

8பி சிவசண்முகம் சாலை மேற்கு தாம்பரம் சென்னை, செங்கல்பட்டு, தமிழ்நாடு, இந்தியா, 600045-ல் வசிக்கும் திரு பி ஜானகிராமன் என்பவரிடமிருந்து ₹ 9,400/- (ரூபாய் ஒன்பதாயிரத்து நானூறு மட்டும்) இந்த ஆவணத்திற்காக இந்திய முத்திரைச் சட்டம் 41வது பிரிவின் படி குறைவாயிருந்த முத்திரைக் கட்டணம் வசூலிக்கப்பட்டது என நான் இதன் மூலம் சான்றளிக்கிறேன்.

சார்பதிவாளர் : 2 எண் இணை சார்பதிவாளர் காஞ்சிபுரம்
நாள்: 04/08/2022

சார்பதிவாளர் மற்றும் இந்திய முத்திரைச் சட்டம் பிரிவு
41ன் படி ஆட்சியர்

2022 ஆம் ஆண்டு ஆகஸ்ட் மாதம் 04ம் தேதி பி.ப. 05:56 மணியளவில் 2 எண் இணை சார்பதிவாளர் காஞ்சிபுரம் சார்பதிவாளர் அலுவலகத்தில் தாக்கல் செய்து கட்டணம் ₹ 10,660/- செலுத்தியவர்

இடது பெருவிரல்



For PJR Blue Metals (Chennai) Pvt. Ltd

Chairman & Managing Director

கூடுதல் விவரங்கள் ஆவண வாசகத்தில் உள்ளபடி

புத்தகம் 2 கட்டி வருடத்தின் 720 ஆவணம்
3 தாள்களைக் கொண்டது.

12 வது தாள்

பதிவு அளவன்

எழுதிக் கொடுத்ததாக ஒப்புக் கொண்டவர்
இடது பெருவிரல்



For PJR Blue Metals (Chennai) Pvt. Ltd

Chairman & Managing Director

"சம்மதத்துடன் கூடிய ஆதார் அங்கீகாரம்" என்ற வழி இந்த நபரின் அடையாளம் விரல் ரேகை மூலம் ஆதார் ஆணையத்துடன் சரிபார்க்கப்பட்டது. ஒப்பீட்டு எண் UKC:950456ad91c7ea241e4168ac49c104c051b8c4 (Details from UIDAI : Janakiraman Parthasarathy S/O: Parthasarathy, 22-05-1953, xxxxxxxx0206)

எழுதி வாங்கியதாக ஒப்புக் கொண்டவர்
இடது பெருவிரல்



D. Govindasamy

"சம்மதத்துடன் கூடிய ஆதார் அங்கீகாரம்" என்ற வழி இந்த நபரின் அடையாளம் விரல் ரேகை மூலம் ஆதார் ஆணையத்துடன் சரிபார்க்கப்பட்டது. ஒப்பீட்டு எண் UKC:745250479c64fc4c1641059b32805e0f1c4ad3 (Details from UIDAI : Govindasamy D S/O: Desingu, 17-



R/2 எண் இணை சார்பதிவாளர் காஞ்சிபுரம்/புத்தகம்-1/5172/2022

| |
|------------------------|
| 05-1995, xxxxxxxx5852) |
|------------------------|

2022 ஆம் ஆண்டு ஆகஸ்ட் மாதம் 4ம் நாள்



RAMESHKUMAR E
2 எண் இணை சார்பதிவாளர்
காஞ்சிபுரம்

R/2 எண் இணை சார்பதிவாளர் காஞ்சிபுரம்/புத்தகம்-1/5172/2022 எண்ணாகப் பதிவு செய்யப்பட்டது.

நாள்: 04/08/2022

2 எண் இணை சார்பதிவாளர் காஞ்சிபுரம்



RAMESHKUMAR E
சார்பதிவாளர்
2 எண் இணை சார்பதிவாளர்
காஞ்சிபுரம்.

| | |
|-----------------------|---------------|
| புத்தகம் 1/5172 | வருவனம் |
| 13 தாள்களைக் கொண்டது. | |
| 13 வது தாள் | பதிவு அலுவலர் |





PHOTOCOPY OF THE APPLIED LEASE AREA

Site photos in respect of Rough stone and gravel quarry lease in S.F.No's:
699/2 & 699/3 over an extent of 2.90.50 Hectares of Magaral - A Village,
Walajabad Taluk, Kancheepuram District, Tamil Nadu State in belonging to
Mr.D.GOVINDASAMY.






भारत सरकार
 GOVERNMENT OF INDIA
 गोविंदसामी डी
 Govindasamy D
 பிறந்த நாள்/DOB: 17/05/1995
 பாலு / MALE
 6841 2905 5852
 NO: 9155 2195 6394 4189



எனது ஆதார், எனது அடையாளம்

34

ANNEXURE
 भारतीय विशिष्ट पहचान अधिकरण
 UNIQUE IDENTIFICATION AUTHORITY OF INDIA
 ASSISTANT DIRECTOR

முகவரி:
 S/O: Desingu, 288, PALLA STREET
 சித்தலாக்கம், அரண்பாளி போஸ்ட்
 SITTHALAPAKKAM, ARASANIPALAI POST
 சிதலாக்கம், திருவ. - 631702
 தமிழ் நாடு - 631702

Address:
 S/O: Desingu, 288, PALLA STREET
 SITTHALAPAKKAM, ARASANIPALAI POST
 Chithalapakkam, Tiruv.
 Tamil Nadu - 631702

6841 2905 5852
 NO: 9155 2195 6394 4189

 1947
 1800 300 1947
 help@uidai.gov.in
 www.uidai.gov.in
 P.O. Box No. 1947,
 Bengaluru-560 061

आयकर विभाग
 INCOME TAX DEPARTMENT
 भारत सरकार
 GOVT. OF INDIA

स्थायी लेखा संख्या कार्ड
 Permanent Account Number Card
 CLOPG56790

नाम/Name
 GOVINDASAMY D
 पिता/पति का नाम/Father's Name
 DESINGU
 दिनांक/Date
 17/05/1995

85

ASSISTANT DIRECTOR
 INCOME TAX DEPARTMENT
 GOVT. OF INDIA

This card is lost. Kindly inform return to
 Income Tax PAN Service Unit, IT-1
 Plot No. 1, Sector 11, CBD, New Delhi
 New Delhi - 110 014

आयकर विभाग
 INCOME TAX DEPARTMENT
 भारत सरकार
 GOVT. OF INDIA

स्थायी लेखा संख्या कार्ड
 Permanent Account Number Card
 CLOPG56790

Reg. No. 07PGL23011
Col Code 106

No. 2KI 00



அறிவியல் புலம்
FACULTY OF SCIENCE

பெரியார் பல்கலைக்கழக ஆட்சிக்குழு 2009 ஆம் ஆண்டு ஏப்ரல் மாதம்
நடந்த பயன்பாட்டுப்புவியமைப்பியல் தேர்வில்
அரசு கலைக் கல்லூரி, சேலம் - 636 007 (தன்னாட்சி) பயின்ற
G உமாமகேஸ்வரன் 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 **UMAMAHESWARAN G** *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-2009** *through*
GOVERNMENT ARTS COLLEGE, SALEM - 636 007 (AUTONOMOUS)



Given under the seal of this university

பதிவு
Dated: 16/04/2010
சேலம் 636011, தமிழ்நாடு, இந்தியா.
Salem 636011, Tamil Nadu, India.

322

பதிவாளர்
Registrar

மாணவகேந்தர்
Vice-Chancellor



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 _____

EXPERIENCE CERTIFICATE

I E.SANTHARAMAN being the Managing Director of BALAJI MINES do hereby certify that Thiru. G.UMAMAHESWARAN, son of P.GOPAL (Whose signature is appended) worked as a Geologist in the above mine from 01.08.2011 to 31.10.2016. 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.

E. Santharaman

(Signature with date and official Seal)

TIN No: 33852702141

CST No: 704829 / 7-4-99

BALAJI MINES

5/88, Chinnagollapatti,
Kannankurichi (P.O), SALEM-8.

G. Umamaheswaran
(Signature of Candidate)



BALAJI MINES

Proprietor: E. SANTHARAMAN,
PURITY LIME STONE SUPPLIERS,

5/88, CHINNAGOLLAPATTI, KANNANKURICHI P.O.,
SALEM-636 008. Tamil Nadu.



Mines : Devar Malai Village, Kullthalai Tk., KARUR Dt. (Via) Karur to Palayam.

Date _____

| Particular of Practical experience | Place of experience | Period of Practical Experience | | Total experience | | |
|---|---------------------|--------------------------------|------------|------------------|--------|------|
| (a) | (b) | (c) | | (e) | | |
| | | From | To | Year | Months | Days |
| Worked as Geologist and it Include Mine Workings, Exploration, Surveying, Drilling & Sampling Quality Control | Open cast Workings | 01.08.2011 | 31.10.2016 | 05 | 02 | 30 |
| Grand Total | | | | 05 | 02 | 30 |

AVERAGE MONTHLY OUTPUT (D) / AVERAGE DAILY EMPLOYMENT (e) DURING THE ABOVE PERIOD IS GIVEN BELOW:

| In below ground working | In open - cast working | In all |
|-------------------------|------------------------|--------|
| NIL | 30 | 30 |

E. Santharaman

(Signature of Managing Director with date and official Seal)

TIN No: 33852702141

CST No: 704829 / Dt. 7-4-99

BALAJI MINES

5/88, Chinnagollapatti,
Kannankurichi (P.O), SALEM.

G. Umamaheswari
(Signature of Candidate)

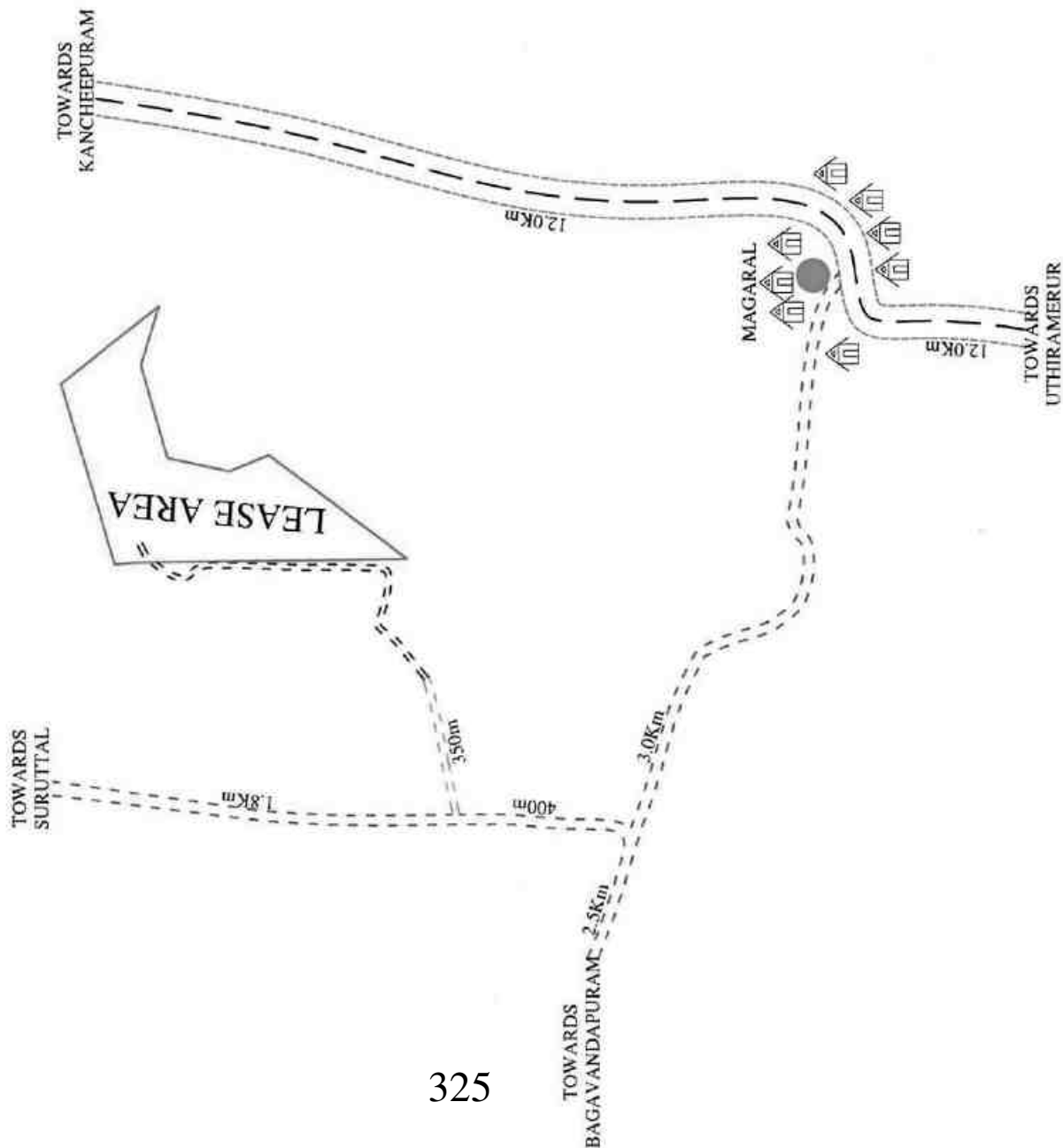
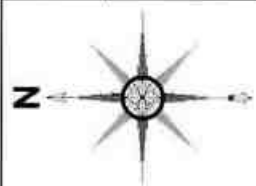


PLATE NO-I

APPLICANT:

Mr.D.GOVINDASAMY,
S/o.Mr.DESINGU,
No.288, PALLA STREET,
SITTHALAPAKKAM VILLAGE,
ARASANIPALAIYAM POST,
VEMBAKKAM TALUK,
TIRUVANNAMALI DISTRICT,
TAMIL NADU-631702

LEASE AREA:

S.F.NO : 699/2 & 699/3,
EXTENT : 2.90.50Hect,
VILLAGE : MAGARAL -B,
TALUK : WALAJABAD,
DISTRICT : KANCHEEPURAM.

INDEX

MINE LEASE AREA

APPROACH & CART ROAD

VILLAGE ROAD

NH - 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

G. Umamaheswaran

G.UMAMAHESWARAN,M.Sc.,
QUALIFIED PERSON



12° 43'43.28"N

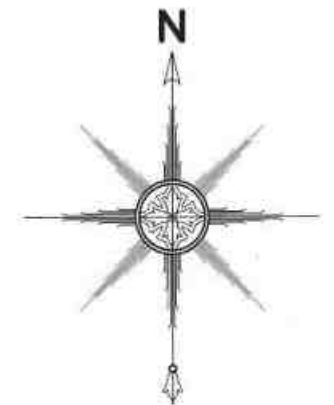


PLATE NO-IA

APPLICANT:
Mr.D.GOVINDASAMY,
S/o.Mr.DESINGU,
No.288, PALLA STREET,
SIITHALAPAKKAM VILLAGE,
ARASANIPALAIYAM POST,
VEMBAKKAM TALUK,
TIRUVANNAMALI DISTRICT,
TAMIL NADU-631702

LEASE AREA:
S.F.NO : 699/2 & 699/3,
EXTENT : 2.90.50Hect,
VILLAGE : MAGARAL -B,
TALUK : WALAJABAD,
DISTRICT : KANCHEEPURAM.

INDEX

MINE LEASE AREA: ●
TOPO SHEET NO : 57-P/10
LATITUDE : 12°43'32.65"N to 12°43'43.28"N
LONGITUDE: 79°44'0.85"E to 79°44'8.88"E

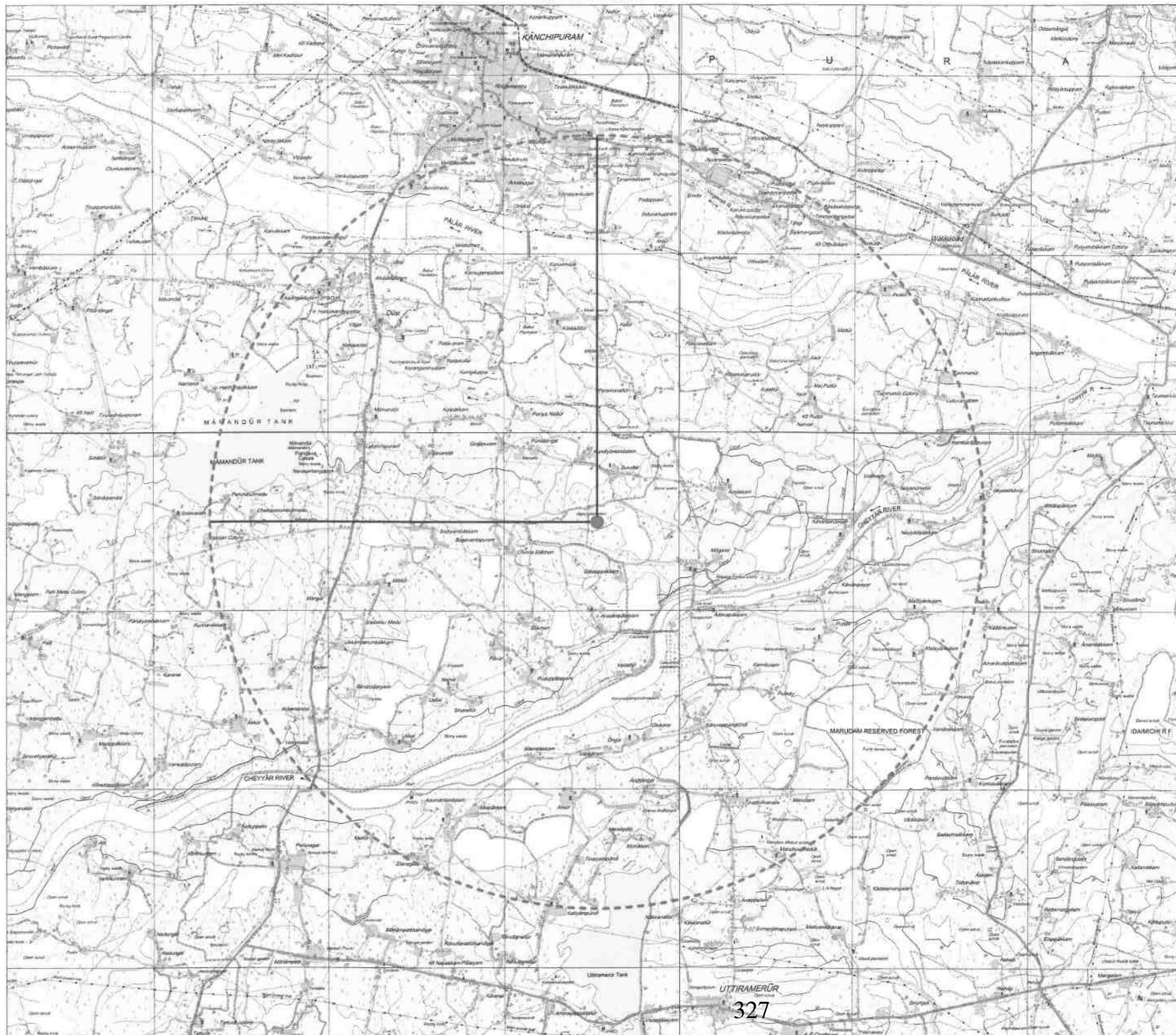
LOCATION PLAN NOT TO SCALE

Prepared By:

I DO HEREBY CERTIFY THAT THE PLATE
HAS BEEN CHECKED BY ME AND IS CORRECT
TO THE BEST OF MY KNOWLEDGE

G. Umamaheswaran
G.UMAMAHESWARAN,M.Sc.,
QUALIFIED PERSON

79°44'0.85"N



| | |
|--------------------|------------------|
| LEASE AREA: | |
| S.F.NO | : 699/2 & 699/3, |
| EXTENT | : 2.90.50Hect, |
| VILLAGE | : MAGARAL -B, |
| TALUK | : WALAJABAD, |
| DISTRICT | : KANCHEEPURAM. |

LATITUDE : 12°43'32.65"N to 12°43'43.28"N

LONGITUDE: 79°44'0.85"E to 79°44'8.88"N

[illegible]

SCALE— 1:1,00,000

I DO HEREBY CERTIFY THAT THE PLATE
HAS BEEN CHECKED BY ME AND IS CORRECT
TO THE BEST OF MY KNOWLEDGE

G. Umamaheswaran, M.Sc.,
QUALIFIED PERSON

TOWARDS
SURUTTAL

12° 43'43.28"N

79°44'0.85"N

TOWARDS
BAGAVANDAPURAM

TOWARDS
CHITHALAPAKKAM

328



PLATE NO-IC

APPLICANT:
Mr.D.GOVINDASAMY,
S/o.Mr.DESINGU,
No.288, PALLA STREET,
SITTHALAPAKKAM VILLAGE,
ARASANIPALAIYAM POST,
VEMBAKKAM TALUK,
TIRUVANNAMALI DISTRICT,
TAMIL NADU-631702

LEASE AREA:
S.F.NO : 699/2 & 699/3,
EXTENT : 2.90.50Hect,
VILLAGE : MAGARAL -B,
TALUK : WALAJABAD,
DISTRICT : KANCHEEPURAM.

INDEX

| | |
|---------------------|--|
| MINE LEASE AREA | |
| SAFETY DISTANCE | |
| APPROACH ROAD | |
| CART ROAD | |
| VILLAGE ROAD | |
| 300m RADIUS | |
| 500m RADIUS | |
| EXISTING QUARRY PIT | |

TOPO SHEET NO : 57-P/10

LATITUDE : 12°43'32.65"N to 12°43'43.28"N

LONGITUDE: 79°44'0.85"E to 79°44'8.88"N

SATELLITE 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

G.UMAMAHESWARAN,M.Sc.,
QUALIFIED PERSON

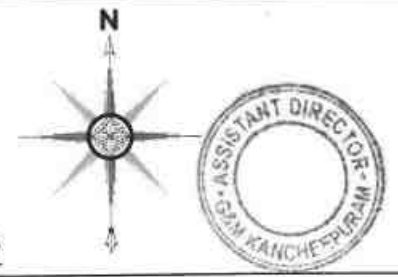


PLATE NO-ID

APPLICANT:
Mr.D.GOVINDASAMY,
S/o.Mr.DESINGU,
No.288, PALLA STREET,
SITTHALAPAKKAM VILLAGE,
ARASANIPALAIYAM POST,
VEMBAKKAM TALUK,
TIRUVANNAMALI DISTRICT,
TAMIL NADU-631702

LEASE AREA:
S.F.NO : 699/2 & 699/3,
EXTENT : 2.90.50Hect,
VILLAGE : MAGARAL -B,
TALUK : WALAJABAD,
DISTRICT : KANCHEEPURAM.

INDEX

| | |
|----------------------|--|
| MINE LEASE AREA | |
| SAFETY DISTANCE | |
| APPROACH ROAD | |
| CART ROAD | |
| VILLAGE ROAD | |
| 300m RADIUS | |
| 500m RADIUS | |
| EXISTING QUARRY PIT. | |
| TREES | |
| SHRUB | |
| WIND DIRECTION | |

TOPO SHEET NO : 57-P/10
LATITUDE : 12°43'32.65"N to 12°43'43.28"N
LONGITUDE: 79°44'0.85"E to 79°44'8.88"N

ENVIRONMENTAL PLAN

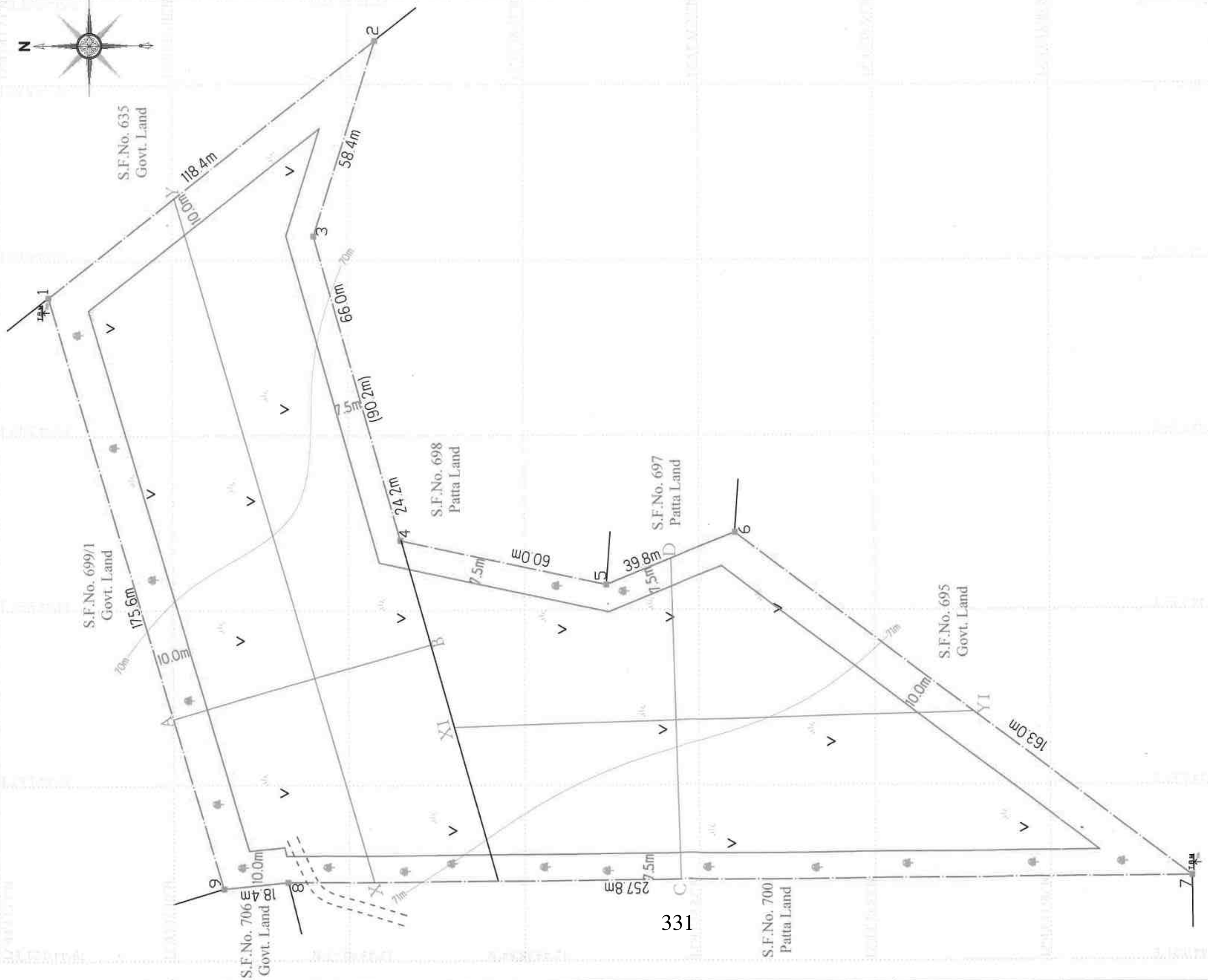
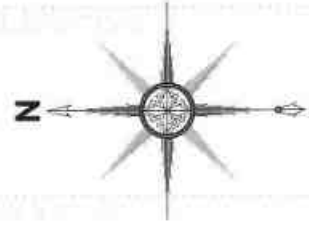
SCALE- 1:5000

Prepared By:


I DO HEREBY CERTIFY THAT THE PLATE
HAS BEEN CHECKED BY ME AND IS CORRECT
TO THE BEST OF MY KNOWLEDGE

G.UMAMAHESWARAN,M.Sc.,
QUALIFIED PERSON

JULY TO SEPTEMBER



331

| | | | |
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| <u>PLATE NO-III</u> | | <u>SURFACE & GEOLOGICAL PLAN</u> PLAN SCALE 1: 1000 | |
| <u>APPLICANT:</u> MR.D GOVINDASAMY, S/o.Mr.DESINGU, No.288, PALLA STREET, SITTHALAPAKKAM VILLAGE, ARASANIPALAIYAM POST, VEMBAKKAM TALUK, TIRUVANNAMALI DISTRICT, TAMIL NADU-631702 | | <u>LEASE AREA:</u> S.F.NO : 699/2 & 699/3, EXTENT : 2.90.50Hect, VILLAGE : MAGARAL -B, TALUK : WALAJABAD, DISTRICT : KANCHEEPURAM. | |
| | | <u>INDEX</u> | |
| | | Prepared By: | |
| | | I DO HEREBY CERTIFY THAT THE PLATE HAS BEEN CHECKED BY ME AND IS CORRECT TO THE BEST OF MY KNOWLEDGE | |
| | | G.UMAMAHESWARAN,M.Sc., QUALIFIED PERSON | |
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| SECTION ALONG C-D | | | | | | | | | |
|--------------------|---|---|---|---|-----|---|---|---|---------------------------------|
| MLB RL 21.0m | V | V | V | V | 92m | V | V | V | MLB D ^{RL} 71.0m |
| 66.0m | + | + | + | + | 92m | + | + | + | 66.0m |
| 61.0m | ~ | ~ | ~ | ~ | 92m | ~ | ~ | ~ | 61.0m |
| 56.0m | + | + | + | + | 92m | + | + | + | 56.0m |
| 51.0m | ~ | ~ | ~ | ~ | 92m | ~ | ~ | ~ | 51.0m |
| 46.0m | + | + | + | + | 92m | + | + | + | 46.0m |
| 41.0m | ~ | ~ | ~ | ~ | 92m | ~ | ~ | ~ | 41.0m |
| 36.0m | + | + | + | + | 92m | + | + | + | 36.0m |

| GEOLOGICAL RESOURCES | | | | | | | |
|----------------------|-------|------------------|-----------------|-----------------|-----------------------------|----------------------------------|-----------------------------|
| Section | Bench | length in (m) | Width in (m) | Depth in (m) | Volume in m ³ | Rough Stone in m ³ | Gravel in m ³ |
| XV-AB | I | 203 | 76 | 2 | 30856 | | 30856 |
| | I | 203 | 76 | 3 | 46284 | 46284 | |
| | II | 203 | 76 | 5 | 77140 | 77140 | |
| | III | 203 | 76 | 5 | 77140 | 77140 | |
| | IV | 203 | 76 | 5 | 77140 | 77140 | |
| | V | 203 | 76 | 5 | 77140 | 77140 | |
| | VI | 203 | 76 | 5 | 77140 | 77140 | |
| VII | 203 | 76 | 5 | 77140 | 77140 | | |
| TOTAL | | | | | 539980 | 509124 | 30856 |
| X1Y1-CD | I | 148 | 92 | 2 | 27232 | | 27232 |
| | I | 148 | 92 | 3 | 40848 | 40848 | |
| | II | 148 | 92 | 5 | 68080 | 68080 | |
| | III | 148 | 92 | 5 | 68080 | 68080 | |
| | IV | 148 | 92 | 5 | 68080 | 68080 | |
| | V | 148 | 92 | 5 | 68080 | 68080 | |
| | VI | 148 | 92 | 5 | 68080 | 68080 | |
| VII | 148 | 92 | 5 | 68080 | 68080 | | |
| TOTAL | | | | | 476560 | 449328 | 27232 |
| GRAND TOTAL | | | | | 1016540 | 958452 | 58088 |

SURFACE & GEOLOGICAL SECTIONS
SECTION HOR 1 : 1000 & VER 1 : 500

LEASE AREA:
S.F.NO : 699/2 & 699/3,
EXTENT : 2.90.50Hect,
VILLAGE : MAGARAL -B,
TALUK : WALAJABAD,
DISTRICT : KANCHEEPURAM.

MINE LEASE AREA

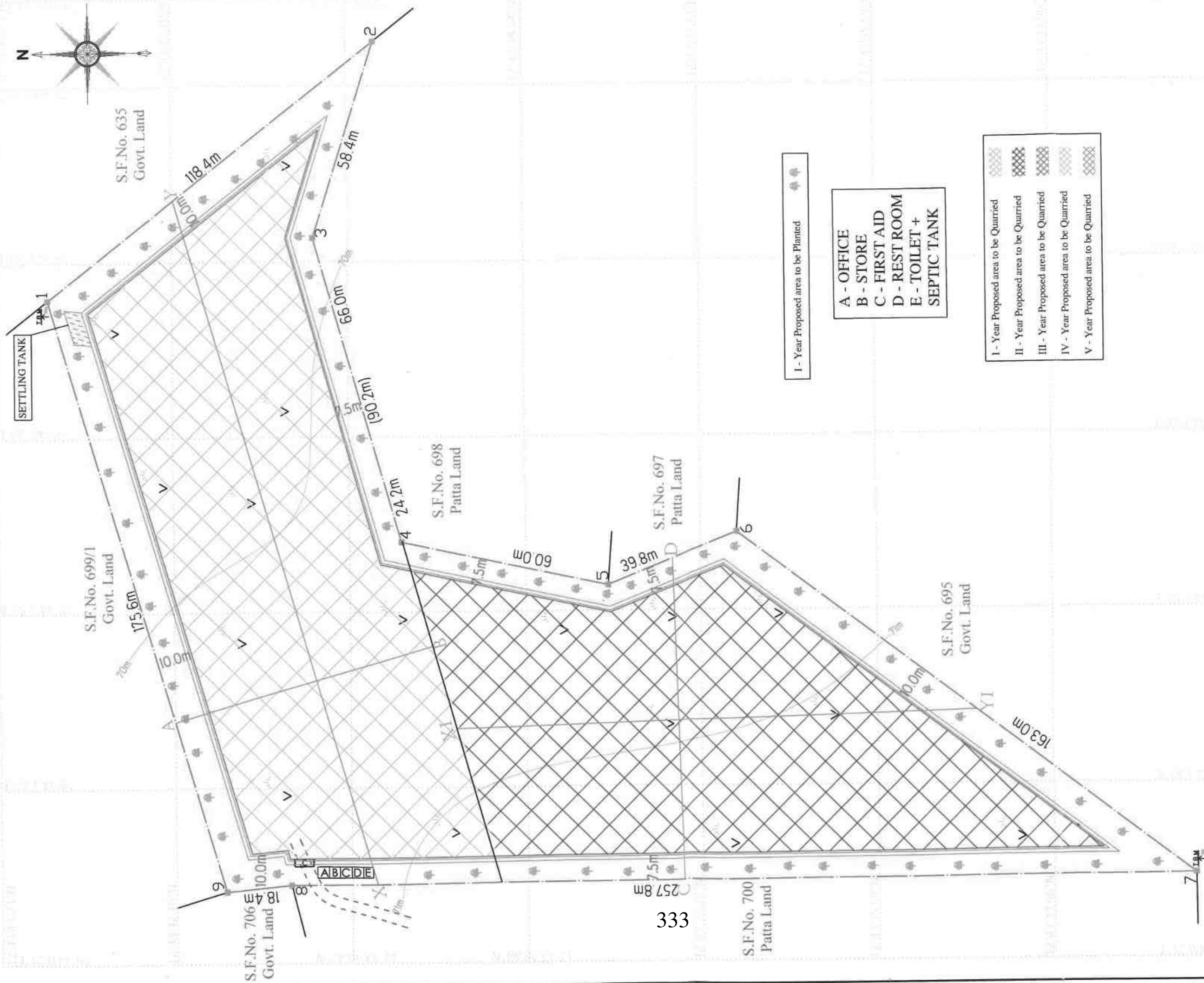
SAFETY BOUNDARY

GRAVEL

ROUGH STONE

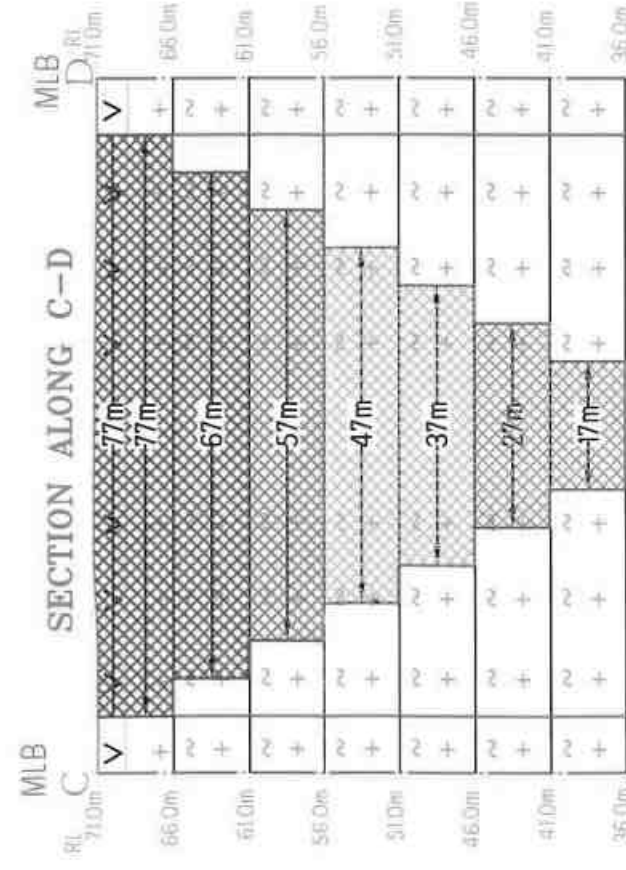
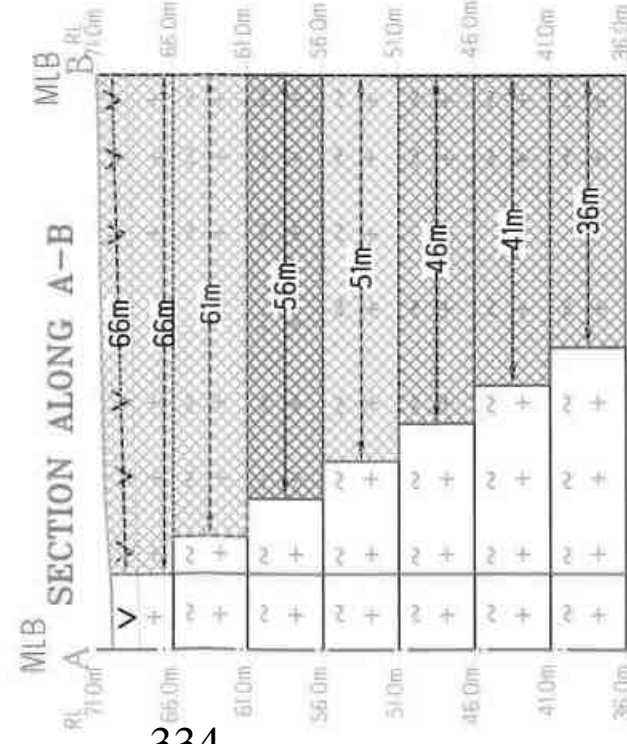
I DO HEREBY CERTIFY THAT THE PLATE
HAS BEEN CHECKED BY ME AND IS CORRECT
TO THE BEST OF MY KNOWLEDGE






G. Umamaheswaran,
G.UMAMAHESWARAN,M.Sc.,
QUALIFIED PERSON








| PLATE NO-IV | YEARWISE DEVELOPMENT & PRODUCTION PLAN SCALE 1: 1000 | INDEX | Prepared By: |
|---|---|---|---|
| APPLICANT: Mr.D.GOVINDASAMY, S/o.Mr.DESINGU, No.288, PALLA STREET, SITHALAPAKKAM VILLAGE, ARASANIPALAYAM POST, VEMBAKKAM TALUK, TIRUVANNAMALI DISTRICT, TAMIL NADU-631702. | LEASE AREA: S.F.NO : 699/2 & 699/3, EXTENT : 2.90.50Hect, VILLAGE : MAGARAL -B, TALUK : WALAJABAD, DISTRICT : KANCHEEPURAM. | INDEX MINE LEASE BOUNDARY SAFETY BOUNDARY APPROACH ROAD BOUNDARY PILLAR STONES CULVERT TEMPORARY BENCH MARK CONTOUR LINES 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 G.UMAMAHESWARAN.M.Sc., QUALIFIED PERSON |

| SECTION ALONG X-Y | | MLB | |
|-------------------|---|-----|--------------------|
| RL | X | Y | Y _{71.0m} |
| 65.0m | + | + | + |
| 65.0m | 2 | 2 | 2 |
| 61.0m | 2 | 2 | 2 |
| 56.0m | 2 | 2 | 2 |
| 51.0m | 2 | 2 | 2 |
| 46.0m | 2 | 2 | 2 |
| 41.0m | 2 | 2 | 2 |
| 36.0m | 2 | 2 | 2 |



| | |
|---|---|
| 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 |  |

| INDEX | |
|-----------------|---|
| MINE LEASE AREA |  |
| SAFETY BOUNDARY |  |
| GRAVEL |  |
| ROUGH STONE |  |
| PROPOSED BENCH |  |

I DO HEREBY CERTIFY THAT THE PLATE
HAS BEEN CHECKED BY ME AND IS CORRECT
TO THE BEST OF MY KNOWLEDGE

Gemanaly
G.UMAMAHESWARAN,M.Sc.,
QUALIFIED PERSON

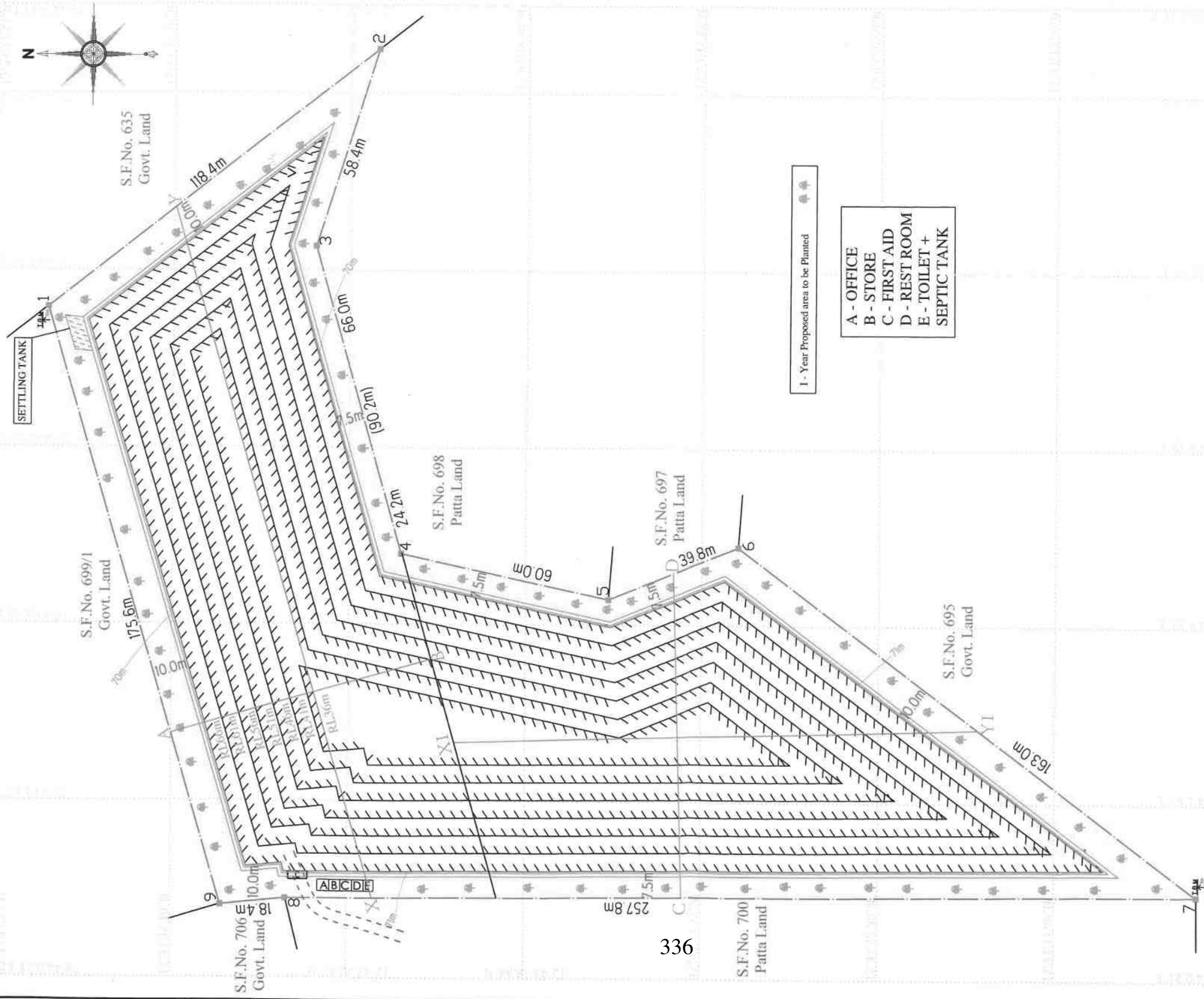


PLATE NO-VI

APPLICANT:
 Mr.D.GOVINDASAMY,
 S/o.MR.DESINGU,
 No.288, PALLA STREET,
 SITTHALAPAKKAM VILLAGE,
 ARASANIPALAYAM POST,
 VEMBAKKAM TALUK,
 TIRUVANNAMALI DISTRICT,
 TAMIL NADU-631702.

CONCEPTUAL PLAN
 SCALE 1 : 1000

LEASE AREA:
 S.F.No : 699/2 & 699/3,
 EXTENT : 2.90.50Hect,
 VILLAGE : MAGARAL-B,
 TALUK : WALAJABAD,
 DISTRICT : KANCHEEPURAM.

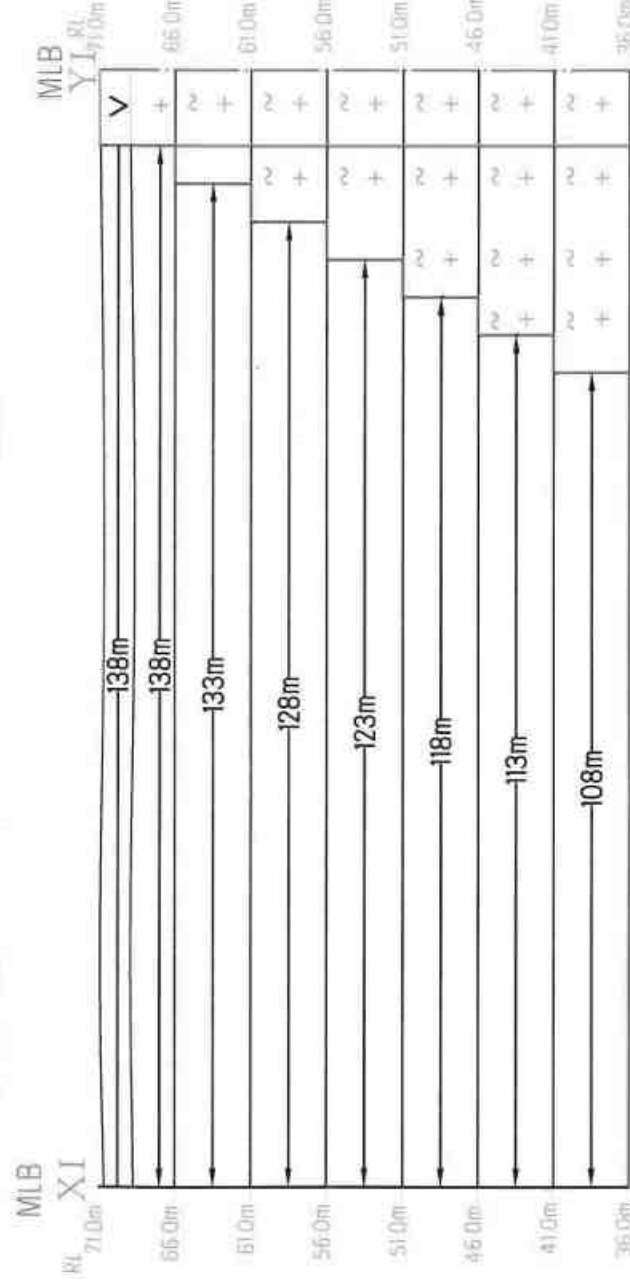
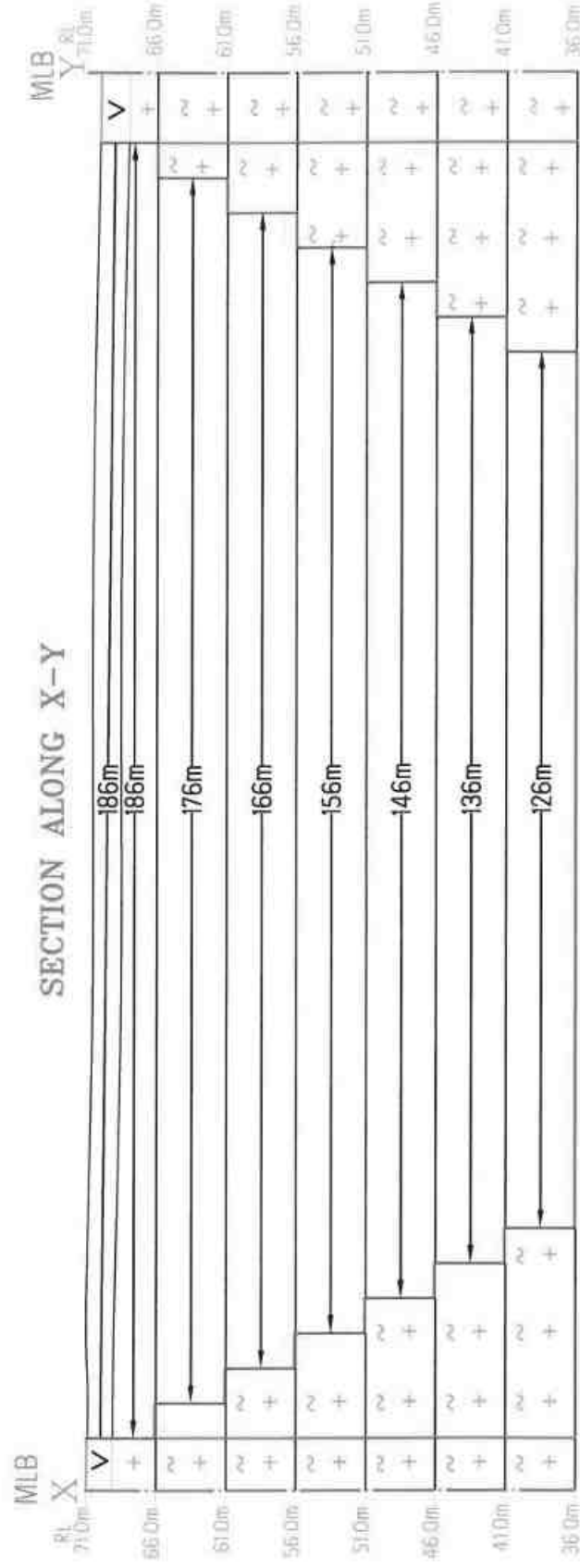
| | |
|------------------------|--------------------------|
| MINE LEASE BOUNDARY | TEMPORARY BENCH MARK |
| SAFETY BOUNDARY | CONTOUR LINES |
| APPROACH ROAD | GRAVEL |
| BOUNDARY PILLAR STONES | SHRUBS |
| CULVERT | DRAINAGE & SETTLING TANK |
| ULTIMATE BENCH | |

Prepared By:

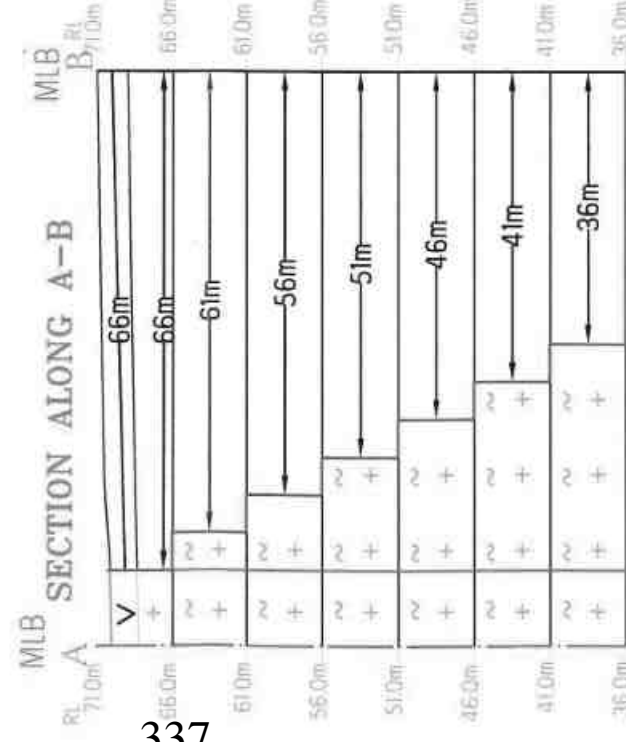
I DO HEREBY CERTIFY THAT THE PLATE HAS BEEN CHECKED BY ME AND IS CORRECT TO THE BEST OF MY KNOWLEDGE

G. Umamaheswaran
 G.UMAMAHESWARAN,M.Sc.,
 QUALIFIED PERSON

SECTION ALONG X-Y

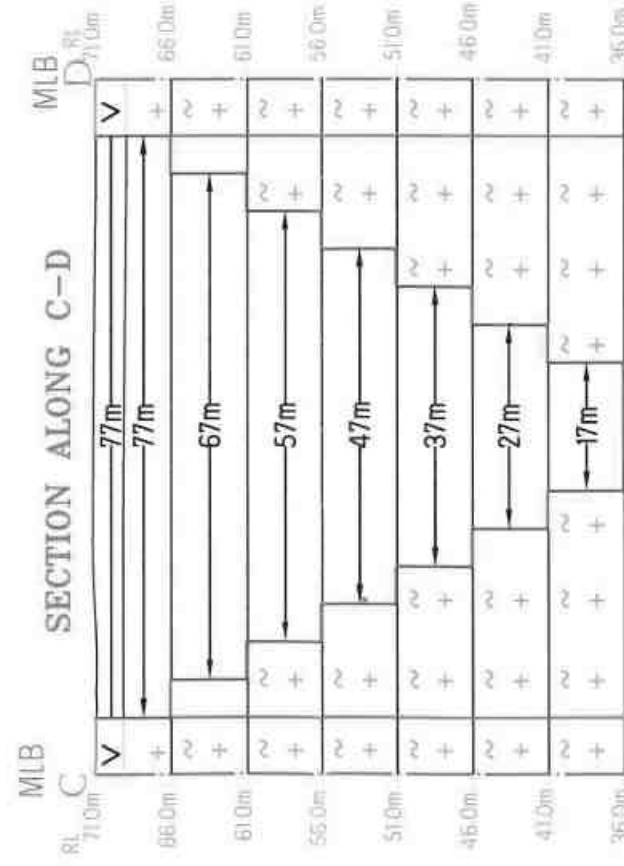


SECTION ALONG A-B



337

SECTION ALONG C-D



| MINEABLE RESERVES | | | | | | |
|-------------------|-------|---------------|--------------|--------------|--------------|--------------|
| Section | Bench | length in (m) | Width in (m) | Depth in (m) | Volume in m³ | Gravel in m³ |
| XY-AB | I | 186 | 66 | 2 | 24552 | 24552 |
| | I | 186 | 66 | 3 | 36828 | 36828 |
| | II | 176 | 61 | 5 | 53680 | 53680 |
| | III | 166 | 56 | 5 | 46480 | 46480 |
| | IV | 156 | 51 | 5 | 39780 | 39780 |
| | V | 146 | 46 | 5 | 33580 | 33580 |
| | VI | 136 | 41 | 5 | 27880 | 27880 |
| | VII | 126 | 36 | 5 | 22680 | 22680 |
| TOTAL | | | | | 285460 | 260908 |
| XIV1-CD | I | 138 | 77 | 2 | 21252 | 21252 |
| | I | 138 | 77 | 3 | 31878 | 31878 |
| | II | 133 | 67 | 5 | 44555 | 44555 |
| | III | 128 | 57 | 5 | 36480 | 36480 |
| | IV | 123 | 47 | 5 | 28905 | 28905 |
| | V | 118 | 37 | 5 | 21830 | 21830 |
| | VI | 113 | 27 | 5 | 15255 | 15255 |
| | VII | 108 | 17 | 5 | 9180 | 9180 |
| TOTAL | | | | | 209335 | 188083 |
| GRAND TOTAL | | | | | 494795 | 45804 |

PLATE NO-VIA

APPLICANT:
Mr.D.GOVINDASAMY,
S/o.Mr.DESINGU,
No.288, PALLA STREET,
SITTHALAPAKKAM VILLAGE,
ARASANIPALAIYAM POST,
VEMBAKKAM TALUK,
TIRUVANNAMALI DISTRICT,
TAMIL NADU-631702.

CONCEPTUAL SECTIONS
SECTION HOR 1 : 1000 & VER 1: 500

LEASE AREA:
S.F.NO : 699/2 & 699/3,
EXTENT : 2.90.50Hect,
VILLAGE : MAGARAL -B,
TALUK : WALAJABAD,
DISTRICT : KANCHEEPURAM.

INDEX

MINE LEASE AREA
SAFETY BOUNDARY
GRAVEL
ROUGH STONE
ULTIMATE BENCH

Prepared By:

I DO HEREBY CERTIFY THAT THE PLATE
HAS BEEN CHECKED BY ME AND IS CORRECT
TO THE BEST OF MY KNOWLEDGE

G. Umamaheswaran,
G.UMAMAHESWARAN,M.Sc.,
QUALIFIED PERSON

From

To

A.Arumuganainar, M.Sc.,
Assistant Director (i/c),
Dept. of Geology and Mining,
Kancheepuram.

Thiru. D. Govindasamy,
S/o. Desingu,
No.288, Palla Street,
Sitthalapakkam Village,
Arasanipalaiyam Post,
Vembakkam Taluk,
Tiruvannamalai District- 631 702.

Rc.No.254/Q3/2022, Dated.18.11.2022

Sir,

Sub: Mines and Quarries - Kancheepuram District -
Walajabad Taluk - Magaral B Village - S.F. Nos.
699/2 & 699/3 - over an extent of 2.90.50 Hectares
of patta lands - permission requested for Quarrying
Rough stone and Gravel under rule 19(1) of Tamil
Nadu Minor Mineral Concession Rules 1959 -
applied by Thiru. D. Govindasamy - Mining Plan
submitted for approval - **Mining Plan approved for
Five years** - directed to obtain Environmental
clearance from State Level Environment Impact
Assessment Authority, Tamil Nadu -Reg.

- Ref:**
1. Application of Thiru. D. Govindasamy S/o.
Desingu, No.288, Palla Street, Sitthalapakkam
Village, Arasanipalaiyam Post, Vembakkam
Taluk, Tiruvannamalai District- 631 702
dated.11.08.2022.
 2. Precise are notice issued by the Assistant
Director, Geology and Mining, Kancheepuram in
Rc.No.254/Q3/2022, dated.27.10.2022.
 3. Representation of Thiru. D. Govindasamy S/o.
Desingu dated.09.11.2022.


In the reference 1st cited, one Thiru. D. Govindasamy S/o.
Desingu, No.288, Palla Street, Sitthalapakkam Village,
Arasanipalaiyam Post, Vembakkam Taluk, Tiruvannamalai District-
631 702 has applied for quarrying Rough stone and gravel from S.F.
Nos. 699/2 (2.02.50) and 699/3 (0.88.00)- over an extent of 2.90.50
hectares of Magaral B Village, Walajabad Taluk, Kancheepuram
District under Rule 19(1) of Tamil Nadu Minor Mineral Concession
Rules, 1959.

In this regard, based on the recommendations of the Revenue Divisional Officer, Kancheepuram and Inspection report submitted by the Assistant Geologist and Revenue Inspector, Dept. of Geology and Mining, Kancheepuram the above application was considered for quarrying Rough stone and Gravel from the above area under rule 19(1) of Tamil Nadu Minor Mineral Concession Rules, 1959 for a period of **Five years** subject to certain conditions and precise area has been communicated to the applicant vide reference 2nd cited.

In exercise of the power delegated under Rule 42 of Tamil Nadu Minor Mineral Concession Rules, 1959, I hereby approve the mining plan submitted by Thiru. D. Govindasamy S/o. Desingu for the grant of lease to quarry Rough Stone and Gravel over an extent of 2.90.50 Hectares in S.F. Nos. 699/2 (2.02.50) and 699/3 (0.88.00)-Patta lands of Magaral B Village, Walajabad Taluk, Kancheepuram District the mineable reserves of Rough stone & Gravel after leaving safety distance is arrived as 4,48,991 M³ of Rough stone, 45,804 M³ of Gravel for **Five years** upto a depth of 35 meter (BGL). This approval is subject to the following conditions:-

- i) That the Mining Plan is approved without prejudice to any other Law applicable to quarrying Rough stone and Gravel from time to time whether such laws are made by the Central Government/State Government or any other authority.
- ii) The approval of the Mining Plan does not in any way imply the approval of the Government in terms of any other provisions of the Mines and Minerals(Development and Regulation) Act, 1957 or any other connected laws including Forest (Conservation) Act, 1980 Forest Conservation Rules 1981, Environment Protection Act, 1980, Indian Explosives Act, 1884 (Central Act IV of 1884) and the rules made there under the Tamil Nadu Minor Mineral Concession Rules, 1959.
- iii) The Mining Plan is approved without prejudice to any other order or direction from any Court of competent jurisdiction.
- iv) The applicant is directed to submit the application in Form -I as prescribed by the MoEF along with the approved Mining Plan.

Encl: Approved Mining Plan


Assistant Director(i/c),
Geology and Mining,
Kancheepuram.

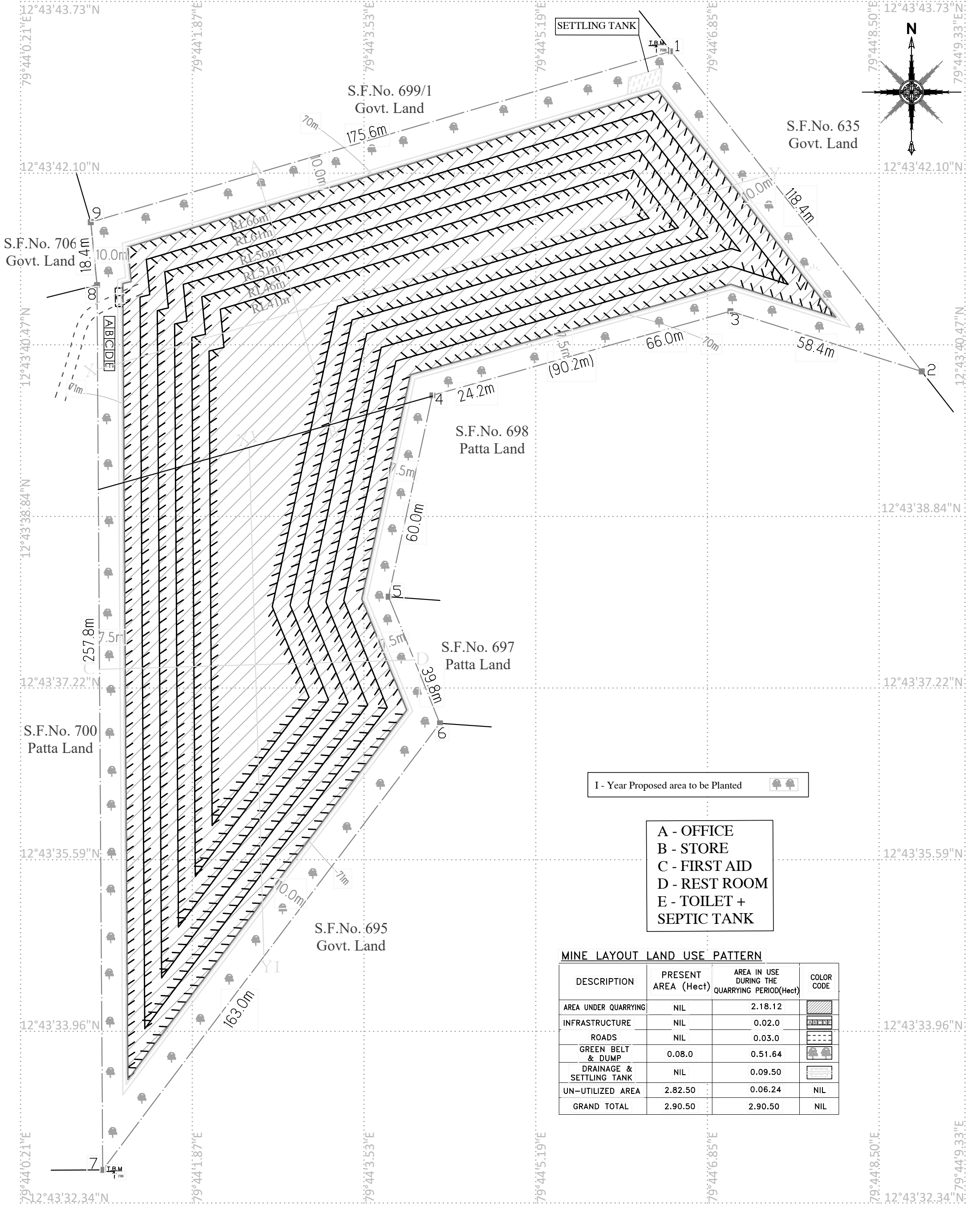


PLATE NO-V

APPLICANT:
Mr.D.GOVINDASAMY,
S/o.Mr.DESINGU,
No.288, PALLA STREET,
SITTHALAPAKKAM VILLAGE,
ARASANIPALAIYAM POST,
VEMBAKKAM TALUK,
TIRUVANNAMALI DISTRICT,
TAMIL NADU-631702.

LEASE AREA:
S.F.NO : 699/2 & 699/3,
EXTENT : 2.90.50Hect,
VILLAGE : MAGARAL -B,
TALUK : WALAJABAD,
DISTRICT : KANCHEEPURAM.

MINE LAYOUT PLAN AND
LAND USE PATTERN
SCALE 1 : 1000

INDEX

MINE LEASE BOUNDARY

SAFETY BOUNDARY

APPROACH ROAD

BOUNDARY PILLAR STONES

CULVERT

PROPOSED BENCH

TEMPORARY BENCH MARK

CONTOUR LINES

GRAVEL

SHRUBS

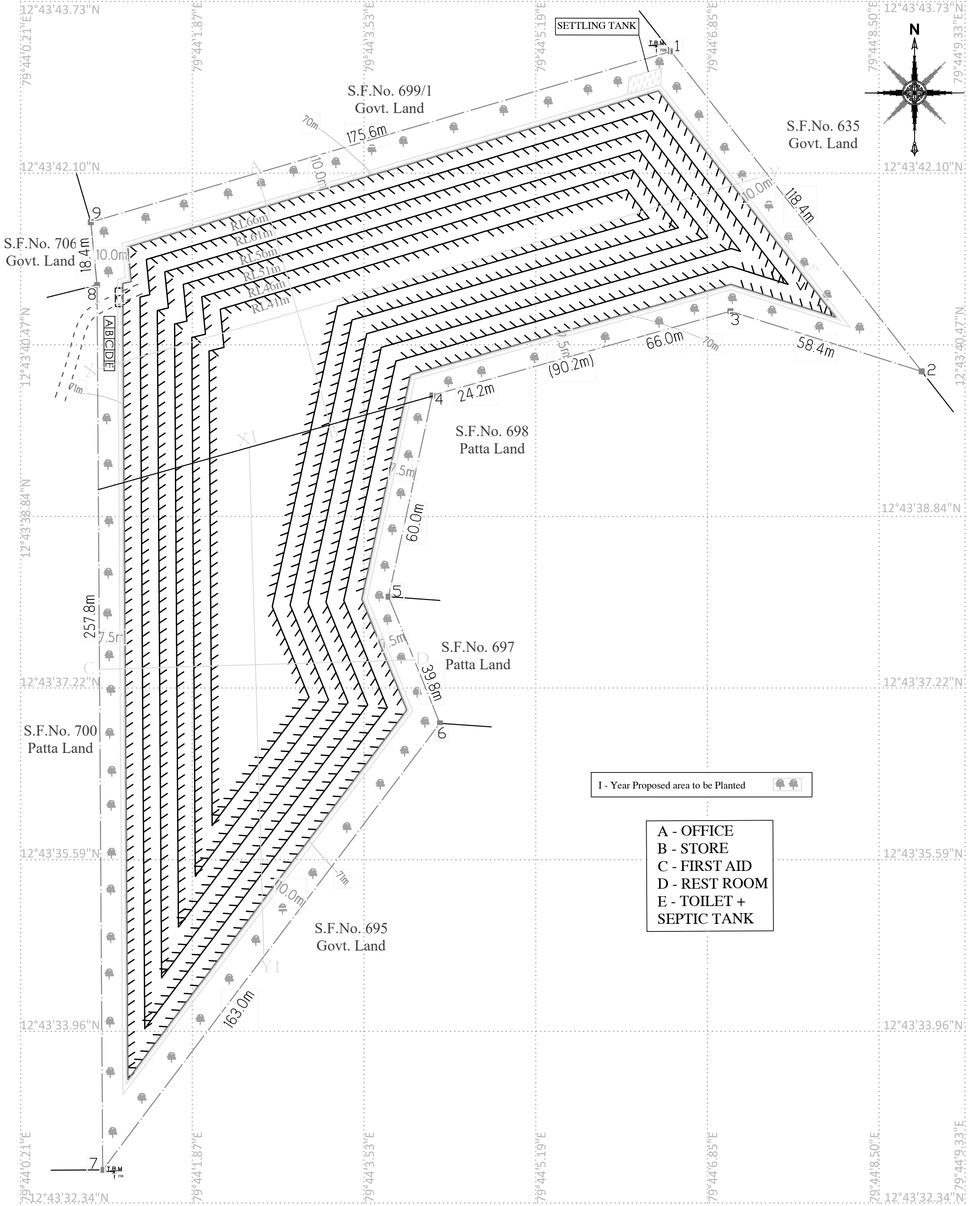
DRAINAGE & SETTLING TANK

Prepared By:

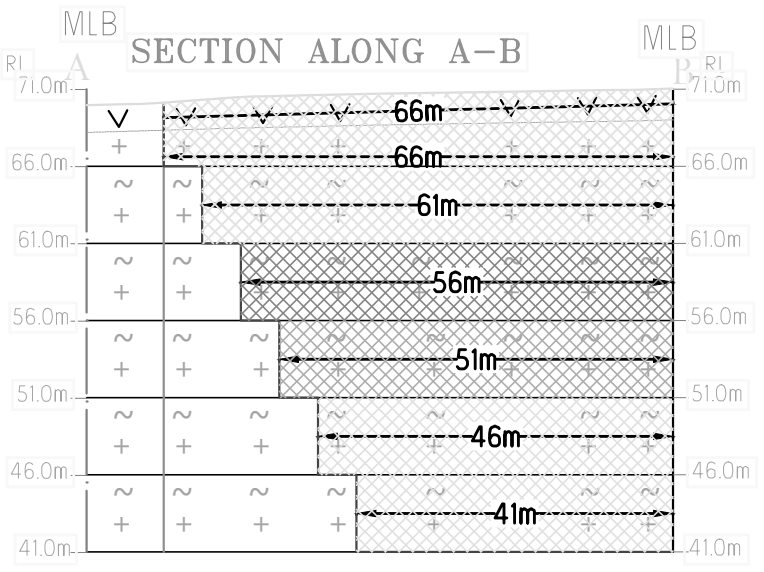
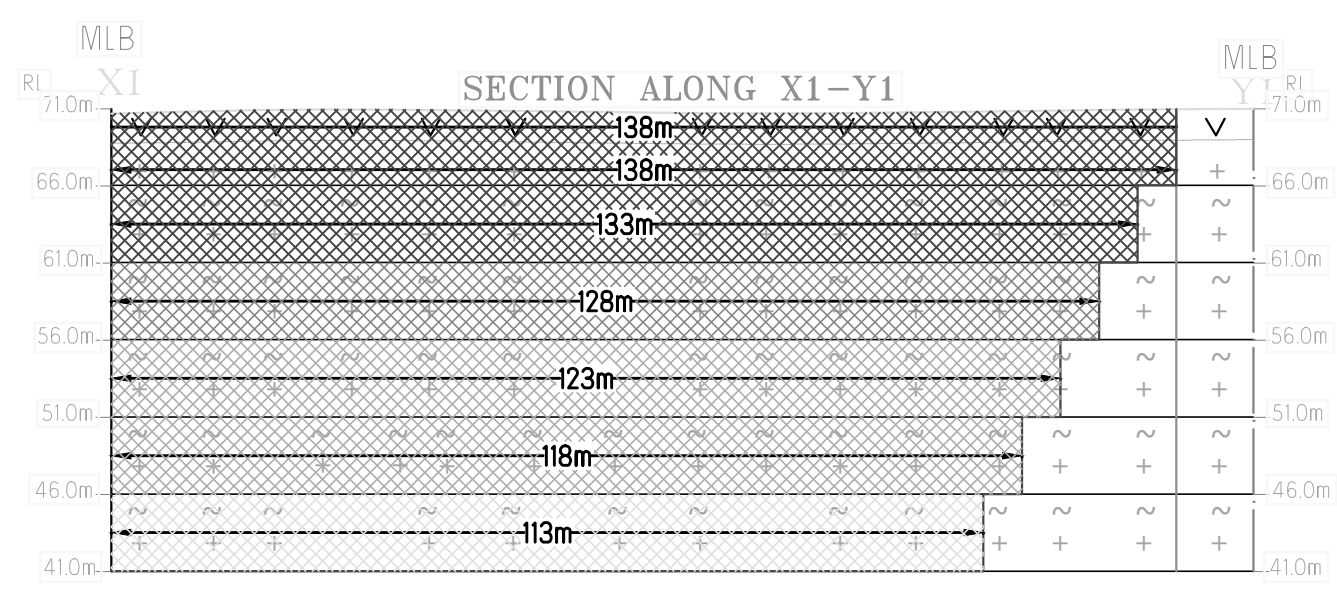
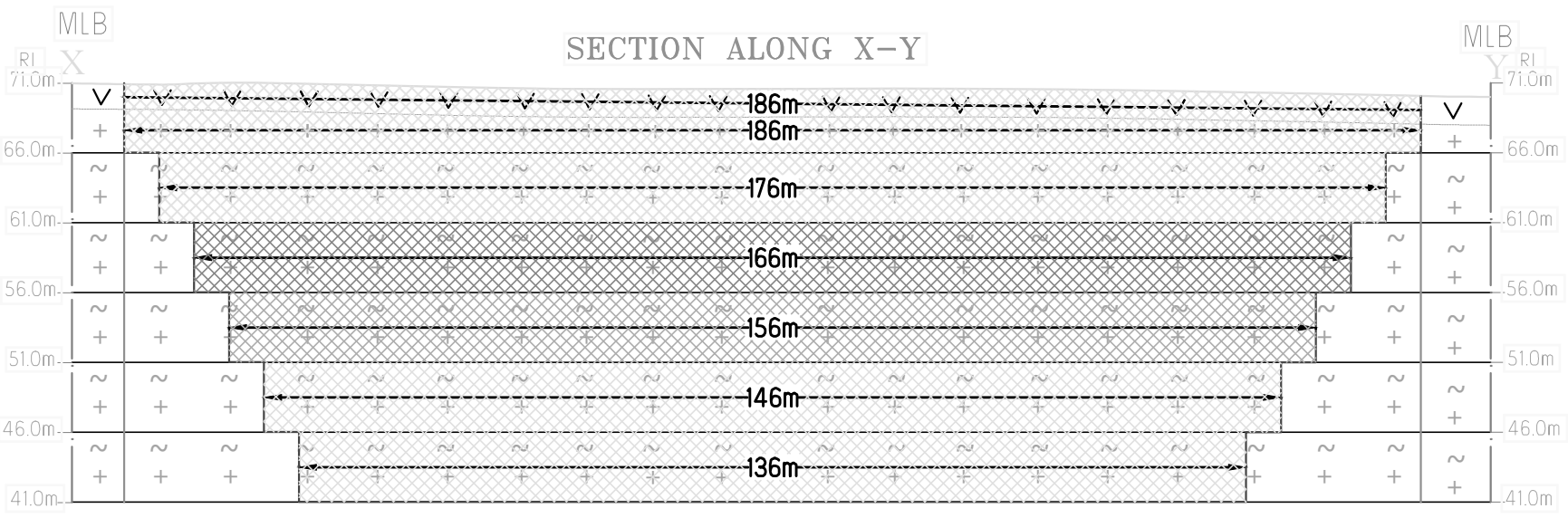
I DO HEREBY CERTIFY THAT THE PLATE HAS BEEN CHECKED BY ME AND IS CORRECT TO THE BEST OF MY KNOWLEDGE

G. Umamaheswaran

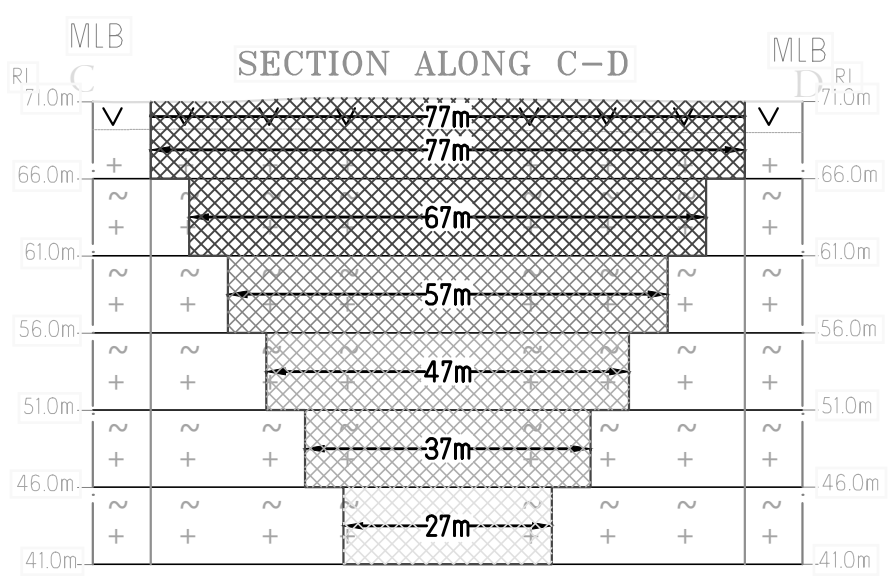
G.UMAMAHESWARAN,M.Sc.,
QUALIFIED PERSON



| | | | | |
|--|--|------------------------|--------------------------|--|
| PLATE NO-VI | CONCEPTUAL PLAN SCALE 1 : 1000 | INDEX | | Prepared By: |
| APPLICANT: Mr.D.GOVINDASAMY, S/o.MR.DESINGU, No.288, PALLA STREET, SITTHALAPAKKAM VILLAGE, ARASANIPALAIYAM POST, VEMBAKKAM TALUK, TIRUVANNAMALI DISTRICT, TAMIL NADU-631702. | LEASE AREA: S.F.NO : 699/2 & 699/3, EXTENT : 2.90.50Hect, VILLAGE : MAGARAL -B, TALUK : WALAJABAD, DISTRICT : KANCHEEPURAM. | MINE LEASE BOUNDARY | TEMPORARY BENCH MARK | I DO HEREBY CERTIFY THAT THE PLATE HAS BEEN CHECKED BY ME AND IS CORRECT TO THE BEST OF MY KNOWLEDGE G. Umamaheswaran G.UMAMAHESWARAN,M.Sc., QUALIFIED PERSON |
| | | SAFETY BOUNDARY | CONTOUR LINES | |
| | | APPROACH ROAD | GRAVEL | |
| | | BOUNDARY PILLAR STONES | SHRUBS | |
| | | CULVERT | DRAINAGE & SETTLING TANK | |
| | | ULTIMATE BENCH | | |



- 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



| YEARWISE PRODUCTIONS | | | | | | | | |
|----------------------|----------|-------|------------------|-----------------|-----------------|-----------------------------|-------------------------------------|-----------------------------|
| Year | Sections | Bench | length in (m) | Width in (m) | Depth in (m) | Volume in m ³ | Rough Stone in m ³ | Gravel in m ³ |
| I-YEAR | XY-AB | I | 186 | 66 | 2 | 24552 | ..... | 24552 |
| | | I | 186 | 66 | 3 | 36828 | 36828 | ..... |
| | | II | 176 | 61 | 5 | 53680 | 53680 | ..... |
| TOTAL | | | | | | 115060 | 90508 | 24552 |
| II-YEAR | X1Y1-CD | I | 138 | 77 | 2 | 21252 | ..... | 21252 |
| | | I | 138 | 77 | 3 | 31878 | 31878 | ..... |
| | | II | 133 | 67 | 5 | 44555 | 44555 | ..... |
| TOTAL | | | | | | 97685 | 76433 | 21252 |
| III-YEAR | XY-AB | III | 166 | 56 | 5 | 46480 | 46480 | ..... |
| | X1Y1-CD | III | 128 | 57 | 5 | 36480 | 36480 | ..... |
| TOTAL | | | | | | 82960 | 82960 | 0 |
| IV-YEAR | XY-AB | IV | 156 | 51 | 5 | 39780 | 39780 | ..... |
| | X1Y1-CD | IV | 123 | 47 | 5 | 28905 | 28905 | ..... |
| | | V | 118 | 37 | 5 | 21830 | 21830 | ..... |
| TOTAL | | | | | | 90515 | 90515 | 0 |
| V-YEAR | XY-AB | V | 146 | 46 | 5 | 33580 | 33580 | ..... |
| | X1Y1-CD | VI | 136 | 41 | 5 | 27880 | 27880 | ..... |
| | | VI | 113 | 27 | 5 | 15255 | 15255 | ..... |
| TOTAL | | | | | | 76715 | 76715 | 0 |
| GRAND TOTAL | | | | | | 462935 | 417131 | 45804 |

PLATE NO-IVA

APPLICANT:
Mr.D.GOVINDASAMY,
S/o.Mr.DESINGU,
No.288, PALLA STREET,
SITTHALAPAKKAM VILLAGE,
ARASANIPALAIYAM POST,
VEMBAKKAM TALUK,
TIRUVANNAMALI DISTRICT,
TAMIL NADU-631702.

YEARWISE DEVELOPMENT & PRODUCTION SECTIONS
SECTION HOR 1 : 1000 & VER 1 : 500

LEASE AREA:
S.F.NO : 699/2 & 699/3,
EXTENT : 2.90.50Hect,
VILLAGE : MAGARAL -B,
TALUK : WALAJABAD,
DISTRICT : KANCHEEPURAM.

INDEX

MINE LEASE AREA
SAFETY BOUNDARY
GRAVEL
ROUGH STONE
PROPOSED BENCH

Prepared By:

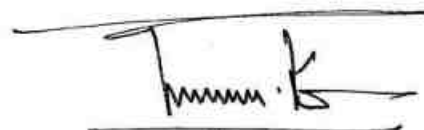
I DO HEREBY CERTIFY THAT THE PLATE HAS BEEN CHECKED BY ME AND IS CORRECT TO THE BEST OF MY KNOWLEDGE
G.UMAMAHESWARAN,M.Sc.,
QUALIFIED PERSON

காஜீதிபுரம் மாவட்டம், வாலாஜாபாடு வட்டம், 09.
 மாகரல் "ஆ" கிராமம், பட்டா எண்: 626 படி
 4ன்ரெதம் 4லஎண்கள்:- 699/2 - 2.02.5, 699/3 - 0.88.1
 என மொத்தம் 2.90.5 ஹெக்டேர் நிலத்தில்
 பரப்பு பி.ஜே.ஆர் 4லுமெட்டன்ஸ் மிஸ்ட்ரவெட்
 லிமிடெட் நிறுவனத்திற்கு சொந்தம் எனவும்,
 மேற்படி 4ன்ரெதம் 4லஎண்கள்: 699/2 - 2.02.5,
 699/3 - 0.88.0 ஹெக்டேர் நிலங்களை சுற்று
 300 மீட்டர் (முன்னாள் மீட்டர்) சுற்றளவில், 4ராசு
 சின்னங்கள், காப்பு காடுகள், வளைவிலங்கு
 சரணாலயங்கள், உயர்அகத்த மின்கம்பங்கள்
 போன்றவை இன்னை என கிராம கமிசரி
 -னாவின் அடிப்படையில் குறிப்பிடப்பட்டுள்ளது.

(பொது சுகவசுக்கு மட்டும், கித்தான்ன வசுந்த
 -ப்படுகிறது)

09. மாகரல் "ஆ"

22.11.2022



22/11/2022

VILLAGE ADMINISTRATIVE OFFICER,
 No. 09 - MAGARAL 'B' VILLAGE,
 WALAJABAD TALUK,
 KANCHIPURAM DISTRICT.

D. Govinda Semy



**QUALITY COUNCIL
OF INDIA**
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National Accreditation Board for Education and Training



Certificate of Accreditation

Geo Technical Mining Solutions

1/213B, Natesan Complex, Dharmapuri Salem Main Road, Oddapatti, Collectorate post office,
Dharmapuri, Tamil Nadu-636705

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/ underground mining. | 1 | 1 (a) (i) | B |

Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in SAAC minutes dated September 13, 2022 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/23/2641 dated January 19, 2023. The accreditation needs to be renewed before the expiry date by Geo Technical Mining Solutions following due process of assessment.

Sr. Director, NABET
Dated: January 19, 2023

Certificate No.
NABET/EIA/2124/SA 0184

Valid up to
Dec 31, 2023

For the updated List of Accredited EIA Consultant Organizations with approved Sectors please refer to QCI-NABET website.