

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

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

**CLUSTER EXTENT = 10.51.5 hectares**

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

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

NAME AND ADDRESS OF THE PROPOSED PROJECT PROPONENT

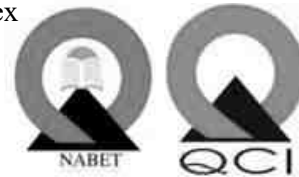
Name and Address	Extent & S.F.No.
<b>Mr.B.Venkatakrishnan No.25, 2nd Cross Street, Kurumbapet, Housing Board, Puducherry – 605009</b>	1.53.5 ha & 70/2, 70/3, 70/4 70/5A,71/3

**ENVIRONMENTAL CONSULTANT**

**GEO TECHNICAL MINING SOLUTIONS**



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



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

**ENVIRONMENTAL LAB**

**EKDANT ENVIRO SERVICES (P) LIMITED**

**NABL Accredited & Recognised Laboratory  
No.R7/1, AVK Tower, North Main Road, Anna Nagar, West Exten.Chennai-600 101**

Baseline Study Period – December 2022 - February, 2023

APRIL-2023

## TERMS OF REFERENCE (ToR) COMPLIANCE

**Thiru.B.Venkatakrishnan**

**“ToR issued vide Letter No. SEIAA-TN/F.No.9383/ToR-1279/2022 Dated 08.10.2022”**

SPECIFIC CONDITIONS		
1	The PP shall furnish DFO letter in regard to shortest distance of Reserve Forest & protected areas/Wildlife sanctuaries & wild life corridors etc.	DFO letter will be submitted along with final EIA report.
2	The PP is requested to submit the composition / component of the minerals proposed to be quarried which shall be tested in the Department of Civil Engineering laboratory, NIT, Trichy authorized by the Department of Geology & Mining, and further it shall be duly certified by the concerned AD (Geology & Mining)	A soil sample was collected from lease area. The was analysed by an NABL accredited EKDANT ENVIRO SERVICES (P) LTD LABORATORY. The soil results have been included in Section 3.1 under Chapter III, pp.24-33.
3	The proponent should produce a letter from the Department of Geology and Mining stating that the location of quarry sites does not lie adjoining to the rivers, streams, canals etc., and also does not come under any notified /declared protected zones.	The certificate will be submitted along with final EIA report.
4	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 project proponent has no history of quarry ownership.
5	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?	As the proposed project is a fresh project, the conditions are not applicable to this project.
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.	
6		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).	The mine lease area with corner coordinates has been superimposed on Google Earth Image, as shown in Figure 2.4, under Chapter II, p.13, geology and geomorphology of the lease area in Figures 3.1 and 3.2, respectively, under Chapter II, pp.26 and 27.
7		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.
8		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 fencing, green belt have been included in Section 4.6 under Chapter IV, pp.112-119.
9		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.14. The anticipated impact of mining on land, air, noise, water, soil, biology, and socio economy is discussed under Chapter IV, pp.98-122.
10		The Project Proponent shall provide the Organization chart indicating the appointment of various statutory of official and other competent persons to be	Employment details of the proposed project are provided in Table 2.13 under Chapter II, p.22.

	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.	
11	The Project Proponent shall indicate the provision of basic amenities such as Rest Room, First-Aid Room, Toilets, etc under the previous of Mines Rules 1955, in the EIA Report	The PP will provide the basic amenities such as Rest Room, First-Aid Room, Toilets, etc during operation.
12	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 I km (radius) along with the collected water level data for both monsoon and non-monsoon seasons from the PWD / TWAD.	Detailed hydrogeological study was carried out. The results have been discussed Section 3.2 under Chapter III, pp.34-46.
13	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. 23-97.
14	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 and its mitigation measures. Accordingly, the Environment Management plan should be prepared keeping the concerned quarry and the surrounding habitations in the mind.	Results of cumulative impact study due to mining operations are given in Section 7.3 under Chapter VII, pp.135-138.
15	Rain water harvesting management with recharging details along with water balance (both monsoon &	Water for dust suppression, greenbelt development and domestic use will be

	non-monsoon) be submitted.	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.
16	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.24 & 33 under Chapter III. The details of surrounding sensitive ecological features are provided in Table 3.42 under Chapter III, p.95. Land use plan of the project area showing pre-operational, operational and post-operational phases are discussed in Table 2.7 under Chapter II, p.19.
17	Proximity to Areas declared '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.
18	Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in	Water for dust suppression, greenbelt development and domestic use will be sourced from accumulated

	the Project, if any, should be provided.	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.
19	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.92 and 95.
20	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.61-85.
21	A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific.	The progressive mine closure plan has been included in the approved mining plan report attached in Annexure III.
22	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.	The response to comments will be enclosed along with the final EIA.
23	The Public hearing advertisement shall be published in one major National daily and one most circulated Tamil daily.	The public hearing advertisement details will be attached in final EIA report
24	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 draft EIA report and executive summary was submitted to TNPCB for public hearing.

25	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 instructed the local people about the importance of protecting the biological environment.
26	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 native origin should be chosen. Species of small/medium/tall trees alternating with shrubs should be planted in a mixed manner.	A detailed Greenbelt Development Plan dealing with carbon sequestration has been provided in Section 4.6 under Chapter IV, pp.112-119.
27	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/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.112-119.
28	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.131-134.
29	A Risk Assessment and management plan shall be prepared and included in the EIA/EMP Report for	The details about risk assessment and management plan have been provided in

	the complete life of the proposed quarry (or) till the end of the lease period.	Section 7.1 under Chapter VII, pp.129-131.
30	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.120 & 121.
31	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.142 & 143.
32	The Socio-economic studies should be carded 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 35 people directly and 17 people indirectly as discussed in Section 8.1 and 8.2 under Chapter VIII, p.141.
33	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.
34	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.141-143.
35	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	As it is a fresh project, the certified compliance is not required.



	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.	
36	The PP shall prepare the EMP for the entire life of mine and also furnish the sworn affidavit stating to abide the EMP for the entire life of mine.	A detailed EMP is provided in Table 10.8 under Chapter X, pp.155-161.
37	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.
<b>Annexure 'B'</b>		
1	Cluster Management Committee, which must include all the proponents in the cluster as members including the existing as well as proposed quarry.	Cluster Management Committee will be constituted in the near future.
2	The members must coordinate among themselves for the effective implementation of EMP as committee including Green Belt Development, Water sprinkling, Tree plantation, blasting etc.,	The information will be shared to the cluster management committee.
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 to the AD/Mines.	The list of members of the committee formed will be submitted to AD/Mines before the execution of mining lease.
4	Detailed Operational Plan must be submitted which must include the blasting frequency with respect to the nearby quarry situated in the cluster, the usage of haul roads by the individual quarry in the form of	This proposed project is a red earth mining project. It does not involve blasting during the operation. Hence, blasting certificate is not included.

	route map and network.	
5	The committee shall deliberate on risk management plan pertaining to the cluster in a holistic manner especially during natural calamities like intense rain and the mitigation measures considering the inundation of the cluster and evacuation plan.	It will be informed to the committee.
6	The Cluster Management Committee shall form Environmental Policy to practice sustainable mining in a scientific and systematic manner in accordance with the law. The role played by the committee in implementing the environmental policy devised shall be given in detail.	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 mining as well as the health of the public.	The information on the health of the workers and the local people will be updated periodically.
10	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 & bio-diversity.
		Soil health and biodiversity have been discussed in Sections 3.1 and 3.5 respectively under Chapter III, pp.24-33 & pp.61-85
	b	Climate change leading to Drought, Floods etc.
		Climatic condition of the proposed project area has been discussed in

		Section 3.3 under Chapter III, pp.46-57.
c	Pollution leading to release of Greenhouse gases (GHG), rise in Temperature & Livelihood of the local people.	The information about CO <sub>2</sub> emission has been added to Section 4.6 under Chapter IV, pp.112-119.
d	Possibilities of water contamination and impact on aquatic ecosystem health.	Possibilities of both surface and ground water contamination have been discussed in Section 4.3 under Chapter IV, pp.100 & 101. The impact on aquatic species has been discussed in Section 4.6 under Chapter IV, pp.112-119.
e	Agriculture, Forestry & Traditional practices.	Sorgum, millet, groundnut, and coconut are the primary crops that are cultivated in the study area.
f	Hydrothermal/Geothermal effect due to destruction in the Environment.	Data is not included.
g	Bio-geochemical processes and its foot prints including environmental stress.	Data is not included.
h	Sediment geochemistry in the surface streams.	As there are no water bodies within 5 km radius, stream sediments were not collected.
11	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.
12	The committee shall furnish the fire safety and evacuation plan in the case of fire accidents.	The fire safety and evacuation plan will be submitted by the committed to the corresponding authority.
13	The measures taken to control Noise, Air, Water Dust Control and steps adopted to efficiently utilise the Energy shall be furnished.	The measures to control water, air, and noise pollution due to dust have been provided in Sections 4.3, 4.4, and 4.5 under Chapter IV, pp.100-112.

14	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.	The vegetation details have been provided in Section 3.5, pp.61-85 under Chapter III. 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.
15	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.
16	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.100 and 101.
17	Impact on soil flora & vegetation around the project site.	Impact of the project on the ecology and biodiversity has been discussed in Section 4.6 under Chapter IV, pp.112-119.
18	Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area on the nearby Villages, Water-bodies/Rivers, & any ecological fragile areas.	The matter has been discussed under Chapter IV, pp.98-122.
19	The project proponent shall furnish VAO certificate with reference to 300m radius regard to approved habitations, schools, Archaeological sites, Structures,	The VAO certificate of 300 m radius has been enclosed in Annexure.

	Railway lines, Roads, Water bodies such as streams, odai, vaari, canal, channel, river, lake pond, tank etc.	
20	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 enclosed along with the final EIA.
21	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.112 - 119.
22	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.61-85. Details about the soil micro flora, fauna and soil seed banks will be included in final EIA report.
23	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.
24	The project proponent shall study impact on fish habitats and the food WEB/ food chain in the water body and Reservoir	An analysis for food chain in aquatic ecosystem is under process and report will be added to the final EIA report.
25	The Terms of Reference should specifically study impact on soil health, soil erosion, the soil physical, chemical components and microbial components	The impact of mining on soil environment has been discussed in Section 4.2 under Chapter IV, pp 99 and 100.

26	The Environmental Impact Assessment should study impact on forest, vegetation. endemic, vulnerable anal endangered indigenous flora and fauna	The impact on wildlife and mitigation measures are provided in Section 4.6 under Chapter IV, pp.112-119.
27	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.112-119.
28	The Environmental Impact Assessment should study on wetlands, water bodies, rivers streams, lake and former sites.	The impacts on water bodies, streams, lakes have been discussed in Sections 4.3 and 4.6 under Chapter IV, pp.100 & 101 and pp.112-119.
29	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 EMP is given in Table 10.8 under Chapter X, pp.155-161.
30	The Environmental Impact Assessment should study impact on climate change, temperature rise, pollution and above soil & below soil carbon stock	The study is going on. The report will be added in the final EIA report.
31	The Environmental Impact Assessment should study impact on protected areas Reserve Forests, National Parks, Corridors and Wildlife pathways near project site	The impact on Protected areas, Reserve Forests, National Parks, Corridors and Wildlife pathways and mitigation measures are provided in Section 4.6 under Chapter IV, pp.112-119.
32	The project proponent shall study and furnish the impact of project on plantations patta lands, Horticulture, Agriculture and livestock	The impact of project on the land environment has been discussed in Section 4.1 under Chapter IV, p.98 &99.
33	The project proponent shall study and furnish the details on potential fragmentation impact of natural environment, by the activities	The impacts of the proposed project on the surrounding environment have been discussed in Chapter IV, pp.98-99.
34	The project proponent shall study and furnish the impact on aquatic plants and animals in water bodies and possible scars on the landscape, damage to	The impact of the proposed project on aquatic plants and animals in water bodies has been discussed in Section 4.6

	nearby caves, heritage site, and archaeological sites possible land form changes visual and aesthetic impacts.	under Chapter IV, pp.112-119.
35	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 7.4 under Chapter VII, pp.138-139.
36	The project proponent shall detailed study on impact of mining on Reserve forests free ranging wildlife.	The project proponent shall do barbed wire fencing work and develop a green belt around the lease area to prevent wildlife from entering the site among other environmental protection measures.
37	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 I 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.	Detailed hydrogeological study was carried out. The results have been discussed in Section 3.2 under Chapter III, pp.34-46.
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	The disaster management plan for this project has been provided in Section 7.2 under Chapter VII, pp.131-134.

	area communication order issued.	
39	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.129 - 131.
40	Detailed Mine Closure plan covering the entire mine lease period as per precise area communication order issued.	A progressive mine closure plan is given in the approved mining plan report attached as an Annexure. The budget details for the mine closure plan are shown in Table 2.8 under Chapter II, p.19.
41	Detailed Environment Management plan along with adaptation, mitigation & remedial strategies covering the entire mine lease period as per precise area communication order issued	A detailed Environment Management plan has been discussed under Chapter X, pp.145-162.
<b>A. STANDARD TERMS OF REFERENCE</b>		
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.
3.	All documents including approved mine plan, EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee.	All the documents related to mining plan, EIA and public hearing are compatible to each other and have been provided in Annexure.



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-14
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
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 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.	The proponent has framed Environmental Policy and the same has been discussed in Section 10.1 under Chapter X, pp.145 & 146.

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.	It is an opencast quarrying operation proposed to operate in Manual method. 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.
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.	All the data contained in the EIA report such as waste generation etc., is for the life of the mine / lease period.
10.	Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.	Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features has been discussed in Section 3.1 under Chapter III, pp.24 & 33. Land use plan of the project area showing pre-operational, operational and post-operational phases are discussed in Table 2.7, under Chapter II, p.19.
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,	Not Applicable. There is no forest land involved within

	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.	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) should be indicated. A copy of the forestry clearance should also be furnished.	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). 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.61-85

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.61-85. The impact on wild life has been discussed in Section 4.6 under Chapter IV, pp.112-119.
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	Information regarding the same has been given in Table 3.42 under Chapter III, p.95.
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.61-85. 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.
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	Baseline data were collected for the

	<p>(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.</p>	<p>period of October 2022 - December 2022 as per CPCB notification and MoEF &amp; CC Guidelines. Primary baseline data and the results have been included in Sections 3.1-3.7 under Chapter III, pp. 24-95.</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.101-109.</p>
24.	<p>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.</p>	<p>The water requirement for the project, its availability and source have been provided in Table 2.10 under Chapter II, p.21.</p>

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. 100-101.
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	Not Applicable.  The ground water table is found at the depth of 60 m below ground level. The ultimate depth of quarry is 2 m BGL. Therefore, the mining activity will not intersect the ground water table. Data regarding the occurrence of groundwater

	<p>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.</p>	<p>table have been provided in Section 3.2 under Chapter III, pp.34-46</p>
29.	<p>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.</p>	<p>Not Applicable.</p> <p>There are no streams, seasonal or other water bodies passing within the project area. Therefore, no modification or diversion of water bodies is anticipated.</p>
30.	<p>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.</p>	<p>The highest elevation of the project area is 48 m AMSL. Ultimate depth of the mine is 2 m BGL. Depth to the water level in the area is 60 m BGL.</p>
31.	<p>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.</p>	<p>A detailed Greenbelt Development Plan has been provided in Tables 4.12 and 4.13 in Section 4.6 under Chapter IV, pp.114-115</p>
32.	<p>Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present</p>	<p>Traffic density survey was carried out to analyse the impact of transportation in the study area as per IRC guidelines</p>



	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.	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.92&95.
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, pp.19-21.
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.18-22.
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.120&121
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.142 & 143.
37.	Measures of socio-economic significance and influence to the local community proposed to be	No negative impact on socio-economic environment of the study area is

	provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.	anticipated and this project shall benefit the Socio-Economic environment by offering employment for 5 people directly and 10 people indirectly, as discussed in Section 8.1 under Chapter VIII, p.141.
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.145-162.
39.	Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project.	The same will be updated in the final EIA report after public hearing meeting.
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. 13,75,000/- In order to implement the environmental protection measures, an amount of Rs. 1654913 as capital cost and recurring cost as Rs. 1077340 as recurring cost/annum is proposed considering present market price considering present market scenario for the proposed project. After the adjustment of 5% inflation per year, the overall EMP cost for 5 years will be Rs. 7660087, as shown in Tables 10.9 &10.10

		under Chapter X, pp.155-162.
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.131-134.
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.141-143.
44.	Besides the above, the below mentioned general points are also to be followed:	
a)	Executive Summary of the EIA/EMP Report	Executive summary has been enclosed as a separate booklet.
b)	All documents to be properly referenced with index and continuous page numbering.	All the documents have been properly referenced with index and continuous page numbering.
c)	Where data are presented in the Report especially in Tables, the period in which the data were collected and the sources should be indicated.	List of tables and source of the data collected have been mentioned.
d)	Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF & CC/NABL accredited laboratories. All the original analysis/testing reports should be available during appraisal of the Project	Original Baseline monitoring reports will be submitted in the final EIA report 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 in the 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,	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.

	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	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 is provided in Annexure.
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.

## TABLE OF CONTENTS

S No.	TITLE	PAGE No.
<b>I</b>	<b>Introduction</b>	<b>1-7</b>
1.0	Preamble	1
1.1	Purpose of the report	2
1.2	Environmental clearance	2
1.3	Terms of reference (Tor)	5
1.4	Post environment Clearance Monitoring	5
1.5	Transferability of Environmental Clearance	5
1.6	Generic Structure of EIA Document	5
1.7	Identification of the project proponent	6
1.8	Brief description of the project	6
1.9	Scope of the study	7
1.10	References	7
<b>II</b>	<b>PROJECT DESCRIPTION</b>	<b>8-22</b>
2.0	General Introduction	8
2.1	Description of the project	8
2.2	Location and Accessibility	9
2.3	Leasehold area	12
2.4	Geology and Geomorphology	12
2.5	Quantity of Reserves	14
2.6	Mining Method	18
2.6.1	Magnitude of Operation	18
2.6.2	Extent of Mechanization	18
2.6.3	Progressive Quarry Closure Plan	18
2.6.4	Quarry Closure Budget	19
2.6.5	Conceptual Mining Plan	19
2.6.6	Infrastructures	19
2.6.7	Water Requirement	21
2.6.8	Energy Requirement	21
2.6.9	Capital Requirement	21
2.7	Manpower Requirement	22
2.8	Project Implementation Schedule	22
<b>III</b>	<b>DESCRIPTION OF THE ENVIRONMENT</b>	<b>23-97</b>
3.0	General	23
3.1	Land environment	23

3.1.1	Geology and Geomorphology	24
3.1.2	Land use/Land cover	24
3.1.3	Topography	25
3.1.4	Drainage pattern	25
3.1.5	Seismic sensitivity	25
3.1.6	Soil Environment	25
3.1.6.1	Methodology	30
3.1.6.2	Results and discussion	30
3.2	Water Environment	34
3.2.1	Surface Water Resources and Quality	34
3.2.2	Ground water Resources and Quality	34
3.2.3	Hydrogeological Studies	35
3.2.3.1	Groundwater level and flow direction	35
3.2.3.2	Electrical resistivity investigation	45
3.3	Air Environment	46
3.3.1	Meteorology	46
3.3.1.1	Climatic Variables	46
3.3.1.2	Wind Pattern	48
3.3.2	Ambient Air Quality Study	52
3.4	Noise Environment	58
3.5	Biological Environment	61
3.5.1	Flora	63
3.5.2	Fauna	81
3.6	Socio-Economic environment	85
3.6.1	Objectives of the Study	85
3.6.2	Scope of work	86
3.6.3	Socio-Economic status of Study area	86
3.6.4	Recommendation and Suggestion	92
3.6.5	Summary & conclusion	92
3.7	Traffic density	92
3.8	Site Specific Features	95
<b>IV</b>	<b>ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES</b>	<b>98-122</b>
4.0	General	98
4.1	Land Environment	98
4.1.1	Anticipated Impact	98

4.1.2	Common Mitigation Measures from Proposed Project	99
4.2	Soil Environment	99
4.2.1	Anticipated Impact	99
4.2.2	Common Mitigation Measures from Proposed Project	100
4.3	Water Environment	100
4.3.1	Anticipated Impact	100
4.3.2	Common Mitigation Measures from Proposed Project	100
4.4	Air Environment	101
4.4.1	Anticipated impact from Proposed Project	101
4.4.1.1	Emission Estimation	101
4.4.1.2	Frame work of Computation and Model Details	102
4.4.1.3	Modelling of Incremental Concentration	103
4.4.1.4	Model Results	103
4.4.2	Common Mitigation Measures	109
4.5	Noise Environment	110
4.5.1	Anticipated Impact	110
4.5.2	Common Mitigation Measures	112
4.6	Ecology And Biodiversity	112
4.6.1	Impact on Ecology and Biodiversity	112
4.6.2	Mitigation Measures on Flora	113
4.6.3	Anticipated Impact on Fauna	115
4.6.3.1	Measures for Protection and Conservation of Wildlife Species	116
4.6.3.2	Mitigation Measures	116
4.6.4	Impact on Aquatic Biodiversity	116
4.6.5	Impact Assessment on Biological Environment	116
4.7	Socio Economic Environment	119
4.7.1	Anticipated Impact from proposed and Existing Projects	119
4.7.2	Common Mitigation Measures for proposed project	119
4.8	Occupational Health and Safety	120
4.8.1	Respiratory Hazards	120
4.8.2	Noise	120
4.8.3	Physical Hazards	120
4.8.4	Occupational Health Survey	120
4.9	Mine Waste Management	121

4.10	Mine Closure	121
4.10.1	Mine Closure Criteria	121
4.10.1.1	Physical Stability	121
4.10.1.2	Chemical Stability	122
4.10.1.3	Biological Stability	122
<b>V</b>	<b>ANALYSIS OF ALTERNATIVES (TECHNOLOGY AND SITE)</b>	<b>123</b>
5.0	Introduction	123
5.1	Factors behind the Selection of Project Site	123
5.2	Analysis of Alternative Site	123
5.3	Factors behind Selection of Proposed Technology	123
5.4	Analysis of Alternative Technology	123
<b>VI</b>	<b>ENVIRONMENTAL MONITORING PROGRAM</b>	<b>124-128</b>
6.0	General	124
6.1	Methodology of Monitoring Mechanism	124
6.2	Implementation Schedule of Mitigation Measures	126
6.3	Monitoring Schedule and Frequency	126
6.4	Budgetary provision for Environment Monitoring Program	128
6.5	Reporting schedules of monitored data	128
<b>VII</b>	<b>ADDITIONAL STUDIES</b>	<b>129-140</b>
7.0	General	129
7.1	Risk Assessment for Proposed Project	129
7.2	Disaster Management Plan for Proposed Project	131
7.2.1	Roles and Responsibilities of Emergency Team	132
7.2.2	Emergency Control Procedure	133
7.2.3	Proposed Fire Extinguishers	134
7.2.4	Alarm System	134
7.3	Cumulative Impact Study	135
7.3.1	Air Environment	136
7.3.1.1	Cumulative Impact of Air Pollutants	136
7.3.2	Noise Environment	136
7.3.3	Socio Economic Environment	137
7.3.4	Ecological Environment	138
7.4	Plastic Waste management Plan for Proposed Project	138
7.4.1	Objective	138



7.5	Post Covid health management Plan for Proposed Project	139
7.5.1	Post-Covid follow-up Protocol	139
<b>VIII</b>	<b>PROJECTS BENEFITS</b>	<b>141-143</b>
8.0	General	141
8.1	Employment Potential	141
8.2	Socio-Economic Welfare Measures Proposed	141
8.3	Improvement in Physical Infrastructure	141
8.4	Improvement in Social Infrastructure	141
8.5	Other Tangible Benefits	142
8.6	Corporate Social Responsibility	142
8.7	Corporate Environment Responsibility	143
8.8	Summary of project benefits	143
<b>IX</b>	<b>ENVIRONMENTAL COST BENEFIT ANALYSIS</b>	<b>144</b>
<b>X</b>	<b>ENVIRONMENTAL MANAGEMENT PLAN</b>	<b>145-162</b>
10.0	General	145
10.1	Environmental Policy	145
10.1.1	Description of the Administration and Technical setup	145
10.2	Land Environment Management	146
10.3	Soil Management	147
10.4	Water Management	147
10.5	Air Quality Management	147
10.6	Noise Pollution Control	148
10.7	Biological Environment Management	149
10.7.1	Green Belt Development Plan	149
10.8	Occupational Safety & Health Management	150
10.8.1	Medical Surveillance and Examinations	150
10.8.2	Proposed Occupational Health and Safety Measures	151
10.8.3	Health and Safety Training Program	152
10.8.4	Budgetary Provision for Environmental Management	154
10.9	Conclusion	162
<b>XI</b>	<b>SUMMARY AND CONCLUSION</b>	<b>163-173</b>
11.0	Introduction	163
11.1	Project Description	163
11.2	Description of the Environment	164
11.2.1	Land Environment	164

11.2.2	Soil Characteristics	164
11.2.3	Water Environment	164
11.3	Air Environment	165
11.4	Noise Environment	165
11.5	Biological Environment	166
11.6	Socio-Economic Environment	166
11.7	Anticipated Environmental Impacts and Mitigation Measures for Proposed Project	166
11.8	Analysis of Alternatives	170
11.9	Environmental Monitoring Program	171
11.10	Additional Studies	171
11.11	Project Benefits for Proposed Project	172
11.12	Environment Management Plan	172
11.13	Conclusion	173
<b>XII</b>	<b>DISCLOSURE OF CONSULTANT</b>	<b>174-179</b>

### LIST OF TABLES

<b>TABLE No.</b>	<b>CONTENTS</b>	<b>PAGE No.</b>
1.1	Details of Quarries within the cluster area of 500 m Radius	2
1.2	Details of project proponent	6
1.3	Salient Features of the Proposed project	6
2.1	Site connectivity to the project area	9
2.2	Corner coordinates of proposed project	12
2.3	Estimated resources and reserves of the project	14
2.4	Year-wise production details	14
2.5	Operational Details for Proposed Project	18
2.6	Machinery Details	18
2.7	Land use data at present, during scheme of mining, and at the end of mine life	19
2.8	Mine closure budget	19
2.9	Ultimate Pit Dimension	19
2.10	Water requirement for the project	21
2.11	Fuel Requirement Details	21

2.12	Capital Requirement Details	22
2.13	Employment Potential for the Proposed Project	22
2.14	Expected Time Schedule	22
3.1	Monitoring attributes and frequency of monitoring	23
3.2	LULC statistics of the study area	25
3.3	Soil sampling locations	30
3.4	Soil quality of the study area	33
3.5	Water sampling locations	34
3.6	Surface Water Quality Result	37
3.7	Ground Water Quality Result	38
3.8	Pre-monsoon water level of Open wells within 2 km radius	39
3.9	Post-monsoon water level of Open wells within 2 km radius	39
3.10	Pre-monsoon water level of bore wells within 2 km radius	40
3.11	Post-monsoon water level of bore wells within 2 km radius	40
3.12	Vertical electrical sounding data	45
3.13	Onsite Meteorological Data	47
3.14	Methodology and instrument used for AAQ analysis	52
3.15	National ambient air quality standards	52
3.16	Ambient air quality (AAQ) monitoring locations	53
3.17	Summary of AAQ result	55
3.18	Noise Monitoring Locations	58
3.19	Ambient Noise Quality Result	58
3.20	Calculation of density, frequency (%), dominance, relative density, relative frequency, relative dominance & important value index	62
3.21	Calculation of Species Diversity by Shannon – Wiener Index, Evenness and Richness	62
3.22	Flora in Mine Lease Area	65
3.23	Flora in 300-m Radius	66
3.24	Flora in Mine Lease Area	68
3.25	Species Richness (Index) in Mine Lease Area	68
3.26	Calculation of Species Diversity in 300-meter radius	69

3.27	Species Richness (Index) in 300-meter radius	70
3.28	Flora in Buffer Zone	71
3.29	Calculation of Species Diversity in buffer Zone	74
3.30	Species Richness (Index) in Buffer Zone	76
3.31	Aquatic Vegetation	80
3.32	Fauna in Core Zone	82
3.33	Fauna in buffer zone	83
3.34	Kondalankuppam village Population Facts	86
3.35	Population and literacy data of study area	87
3.36	Educational Facilities & Water & Drainage Facilities Data of Study Area	88
3.37	Other Facilities in the Study Area	90
3.38	Traffic survey locations	93
3.39	Existing traffic volume	93
3.40	Red soil transportation requirement	93
3.41	Summary of traffic volume	93
3.42	Details of environmentally sensitive ecological features in the study area	95
4.1	Empirical formula for emission rate from overall mine	102
4.2	Estimated emission rate	102
4.3	Incremental & Resultant GLC of PM <sub>2.5</sub>	103
4.4	Incremental & Resultant GLC of PM <sub>10</sub>	108
4.5	Incremental & Resultant GLC of SO <sub>2</sub>	108
4.6	Incremental & Resultant GLC of NO <sub>x</sub>	108
4.7	Activity and noise level produced by machinery	111
4.8	Predicted Noise Incremental Values	111
4.9	Carbon Released During Five Years of Multi-Colour Granite Production	113
4.10	CO <sub>2</sub> Sequestration	113
4.11	Recommended Species for Greenbelt Development Plan	114
4.12	Greenbelt development plan	114
4.13	Budget for greenbelt development plan	115

4.14	Ecological Impact Assessments	117
4.15	Anticipated Impact of Ecology and Biodiversity	118
6.1	Implementation schedule for proposed project	126
6.2	Proposed monitoring schedule post EC for the proposed quarry	127
6.3	Environment monitoring budget	128
7.1	Risk assessment & control measures for proposed project	129
7.2	<b>Proposed teams for Emergency Situation</b>	132
7.3	Proposed Fire Extinguishers at Different Locations in P1	134
7.4	Salient Features of Proposed Project Site “P2”	135
7.5	Cumulative Production Load of Red Earth	136
7.6	Cumulative impact results from the 2 proposed projects	136
7.7	Cumulative Impact of Noise from 2 Proposed Quarries on Thollamur Habitation	137
7.8	Socio Economic Benefits from 2 Mines	137
7.9	Employment Benefits from 2 Mines	137
7.10	Greenbelt Development Benefits From 2 Mines	138
7.11	Action Plan to Manage Plastic Waste	138
8.1	CER – action plan	143
8.2	Project Benefits to the State Government	143
10.1	Proposed controls for land environment	146
10.2	Proposed controls for Water environment	147
10.3	Proposed controls for Air environment	148
10.4	Proposed controls for Noise Environment	148
10.5	Proposed greenbelt development plan	150
10.6	Medical examination schedule	151
10.7	List of periodical trainings proposed for employees	153
10.8	EMP budget for proposed project	155
10.9	Estimation of overall EMP budget after adjusting 5% annual inflation	162
11.1	Anticipated Impacts & Mitigation Measures	166

## LIST OF FIGURES

FIGURE NO.	TITLE	PAGE NO.
1.1	<b>Location of the Proposed and Existing Red Earth Quarry in the Cluster of 500m Radius.</b>	4
2.1	Overall view of proposed project site	9
2.2	Key map showing location of the project site	10
2.3	Route Map of the Project Site	11
2.4	Google Earth Showing Lease Area with Pillars	13
2.5	Mine Lease Plan	15
2.6	Surface and Geological Plan & Sections	16
2.7	Year wise Development Production Plan & Sections	17
2.8	Conceptual Plan & Sections	20
3.1	Geology Map of the Proposed Project Site	26
3.2	Geomorphology Map of the Proposed Project Site	27
3.3	LULC map of 5km radius from the proposed project site	28
3.4	Drainage map of 5 km radius from the proposed project site	29
3.5	Toposheet showing soil sampling location within 5 km radius around the proposed project site	31
3.6	Soil Erosion Map within 5 km Radius around the Proposed Project Site	32
3.7	Toposheet showing water sampling locations within 5 km radius around the proposed project site	36
3.8	Open well static groundwater elevation map showing the direction of groundwater flow during pre-monsoon season	41
3.9	Open well static groundwater elevation map showing the direction of groundwater flow during post-monsoon season	42
3.10	Borewell static groundwater elevation map showing the direction of groundwater flow during pre-monsoon season	43

3.11	Borewell static groundwater elevation map showing the direction of groundwater flow during post-monsoon season	44
3.12	<b>Graph showing occurrence of water bearing fracture zones at the depth range of 60 m below ground level in proposed project</b>	46
3.13	<b>Long-term monthly average rainfall vs monthly rainfall</b>	48
3.14	Windrose Diagram for 2018-2019 and 2019-2020 (December to February)	49
3.14 (A)	Windrose Diagram for 2020-2021 and 2021-2022 (December to February)	50
3.15	Onsite Wind Rose Diagram	51
3.16	Toposheet showing ambient air quality monitoring station locations around 5 km radius from the proposed project site	54
3.17	Bar chart showing maximum, minimum, and the average concentrations of PM <sub>2.5</sub> measured from the nine air quality monitoring stations within 5 km radius	55
3.18	Bar chart showing maximum, minimum, and the average concentrations of PM <sub>10</sub> measured from the nine air quality monitoring stations within 5km radius	56
3.19	Bar chart showing maximum, minimum, and the average concentrations of SO <sub>2</sub> measured from the nine air quality monitoring stations within 5 km radius	56
3.20	Bar chart showing maximum, minimum, and the average concentrations of NO <sub>2</sub> measured from the nine air quality monitoring stations within 5km radius	57
3.21	Bar chart showing maximum, minimum, and the average concentrations of pollutants in the atmosphere within 5km radius	57
3.22	Bar chart showing day time noise levels measured in core and buffer zones	59
3.23	Bar chart showing day time noise levels measured in core and buffer zones	59
3.24	Toposheet showing noise level monitoring station	60

	locations around 5 km radius from the proposed project site	
3.25	Quadrates sampling methods of flora	61
3.26	Agriculture Cropping Pattern in Vanur Taluk	64
3.27	Calculation of Species Diversity in mine lease area	68
3.28	Floral diversity species Richness (Index) in buffer zone and 300m radius	70
3.28	Field Photographs Showing Baseline Data Collection	70
3.29	Floral diversity species Richness (Index) in 10km radius buffer zone	76
3.30	Flora photos in core and buffer area	79
3.31	Traffic Density Map	94
3.32	Base Line study photographs	96
3.33	Socio Economic photographs	97
4.1	Predicted incremental concentration of PM <sub>2.5</sub>	104
4.2	Predicted incremental concentration of PM <sub>10</sub>	105
4.3	Predicted incremental concentration of SO <sub>2</sub>	106
4.4	Predicted incremental concentration of NO <sub>x</sub>	107
6.1	Proposed environmental monitoring chart	125
7.1	Disaster management team layout for proposed project	131
10.1	Personal protective equipment to the mine workers	152

### **LIST OF ANNEXURES**

<b>Annexure No.</b>	<b>Contents</b>	<b>Page No.</b>
I	Copy of ToR letter	180
II	Copy of 500 m radius letter	202
III	Approved mining plan along with mining plan AD/DD letter/original mining plan plates	205
IV	VAO 300m radius letter	294
V	NABET certificate of EIA consultant	295



# CHAPTER I

## INTRODUCTION

### 1.0 PREAMBLE

Environmental Impact Assessment (EIA) study is a process used to identify the environmental, social and economic impacts of a project prior to decision-making. EIA systematically examines both beneficial and adverse consequences of the proposed project and ensure that these impacts are considered during the project designing. According to the Ministry of Environment and Forests, Govt. of India, EIA notification S.O. 1533(E) of 14<sup>th</sup> September 2006 and its subsequent amendments as per Gazette Notification S.O. 3977 (E) of 14<sup>th</sup> August 2018, all the mining projects are broadly classified into two categories, i.e., category A and category B, based on the spatial extent of the projects. The category B projects are further divided into 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.9383/TOR-1279/2022 dated 08.10.2022. This EIA report has been prepared for the project proponent Mr. B.Venkatakrishnan applied for red earth quarry lease in the patta land falling in S.F.Nos.70/2, 70/3, 70/4, 70/5A & 71/3 over an extent of 1.53.5 ha in Kondalangkuppam Village, Vanur Taluk, Villuppuram District and Tamil Nadu. This EIA report takes into account the red earth quarry within the cluster of 500 m radius from the periphery of the proposed project site. The cluster contains two proposed projects, known as P1, P2 and three Expired Projects known as EX1, EX2 and EX3. All the projects mentioned above have been taken for cluster extent calculation as per MoEF & CC Notification S.O. 2269 (E) dated 1<sup>st</sup> July 2016. The total extent of all the quarries is 10.51.5 ha, also known as the cluster extent. The quarries involved in the calculation of cluster extent are shown in Figure 1.1.

**Table:1.1 Details of Quarries within the Cluster Area of 500 m Radius**

<b>Proposed Quarries</b>				
<b>Code</b>	<b>Name of the owner</b>	<b>S. F. No. and Village</b>	<b>Extent (ha)</b>	<b>Status</b>
P1	B. Venkatakrisnan	70/2, 70/3, 70/4 70/5A,71/3 Kondalangkuppam	1.53.5	Proposed Area
P2	S. Devamani	70/5B, 70/7B, 70/6, 88/2, 69/2, 70/8 Kondalangkuppam	3.05.5	Applied Area
<b>Expired Quarries</b>				
EX1	P. Senjivel	60/2 Kondalangkuppam	1.17.0	13.03.2018 to 12.03.2020
EX2	A. Arikrishanan	85/1, 85/2, 85/3, 85/5, 89/2, 91/1B, 91/2 Kondalangkuppam	3.54.0	23.03.2018 To 22.03.2020
EX3	Tmt. A. Gunaselvi	194/2B1, 194/2B2, 194/3B, 194/4A Kondalangkuppam	1.21.50	25.02.2020 to 24.02.2022
<b>Total Cluster Extent</b>			<b>10.51.5</b>	

**Source:**

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

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

**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 **December 2022 to February 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 given below:

- ❖ 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/79249/2022, dated 30.06.2022) 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 08.07.2022.

### ***Scoping***

The proposal was placed in the 312<sup>th</sup> meeting of SEAC on 16.09.2022. 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.

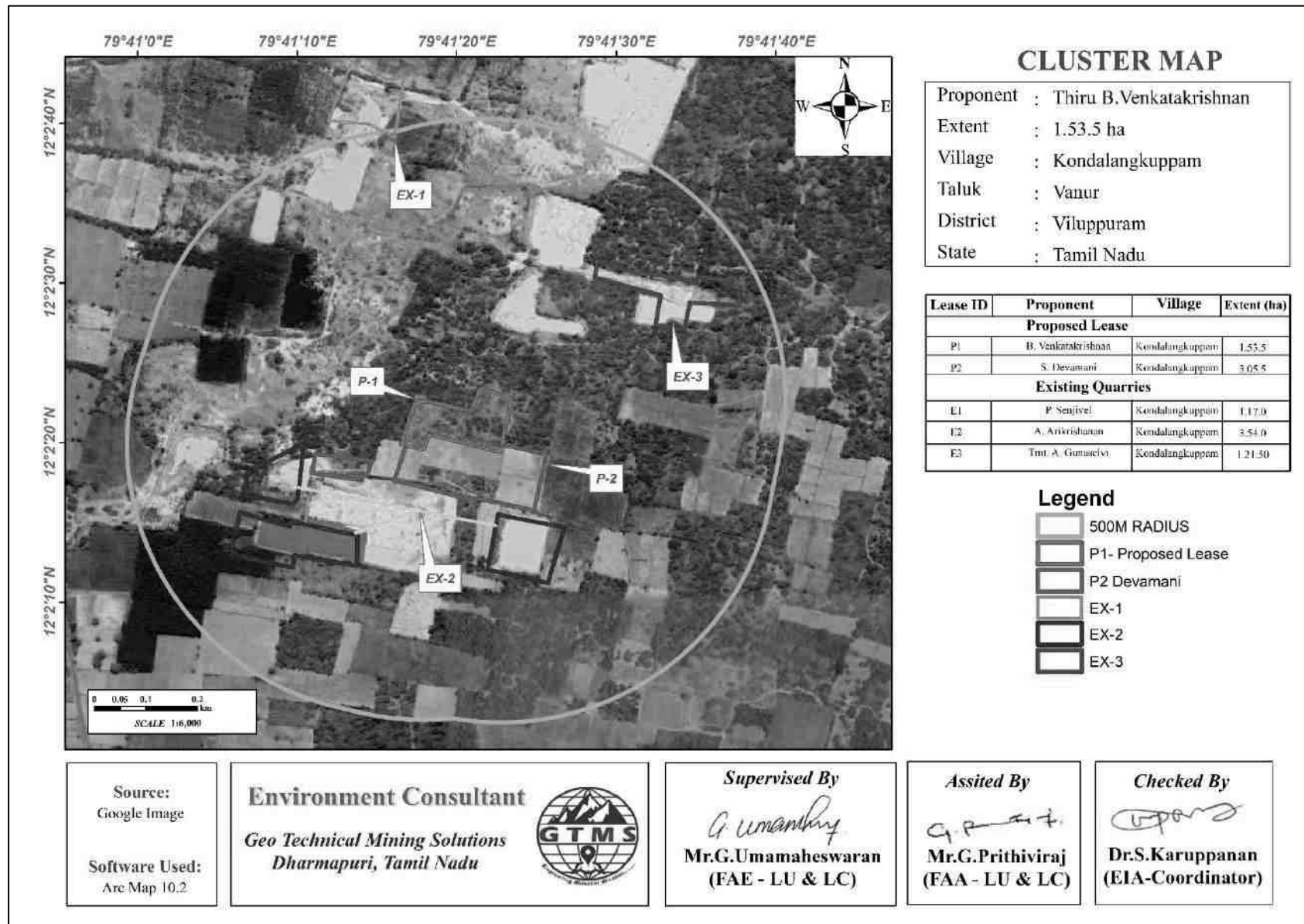


Figure 1.1 Location of the Proposed and Existing Red Earth Quarry in the Cluster of 500 m Radius.

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

- ❖ Compliance to TOR issued vide TOR Letter No: **SEIAA-TN/F.NO.9383/TOR-1279/2022**  
**Dated: 08.10.2022.**

### **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 1<sup>st</sup> June and 1<sup>st</sup> December of every year.

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

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

### **1.6 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.

### 1.2 Details of Project Proponent

<b>Name of the Project Proponent</b>	<b>Mr.B.Venkatakrishnan</b>
Address	S/o. Balaram No.25, 2 <sup>nd</sup> Cross Street, Kurumbapet, Housing Board, Puducherry – 605009
Status	Proprietor

## 1.8 BRIEF DESCRIPTION OF THE PROJECT

The proposed project deals with excavation of red earth quarry which is primarily used in construction projects. The method adopted for red earth quarry is open cast mechanized method. The proposed project site is located in Kondalangkuppam Village, Vanur Taluk, Villuppuram District, and Tamilnadu State. Some of the important features of the proposed project have been provided in Table 1.3.

### 1.3 Salient Features of the Proposed Project

Name of the Quarry	Mr. B. Venkatakrishnan		
Type of Land	Patta land		
Extent	1.53.5 ha		
S.F. No.	70/2, 70/3, 70/4 70/5A & 71/3		
Toposheet No.	57 P/12		
Maximum Elevation	48 m AMSL		
Latitude	12°02'19.41"N to 12°02'23.38"N		
Longitude	79°41'16.53"E to 79°41'23.40"E		
Ultimate Depth of Mining	2 m BGL		
Geological Resources	Red earth (m <sup>3</sup> )		
	30712		
Mineable Reserves	23004		
Proposed production for 2 years	23004		
Ultimate Pit Dimensions	Length (m)	Width (m)	Depth (m)

	67	92	2
Method of Mining	Open cast semi mechanized method		
Topography	Undulated Terrain		
	Excavator		1
	Tipper		3
Proposed Manpower Deployment	5 persons		
Project Cost	Rs.13,75,000/-		

### 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 **December 2022-February 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, 14<sup>th</sup> 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. B. Venkatakrisnan** 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 red earth quarry. Therefore, the proponent had applied for quarry lease on 22.11.2021 to extract red earth quarry. The precise area communication letter was issued by Department of Geology and Mining, Villuppuram vide Roc.No.B/G & M/09/2022 dated 06.06.2022. Based on the precise area communication letter, mining plan was prepared. The mining plan thus prepared was approved by Deputy Director Department of Geology and Mining, Villuppuram (Rc.No.A/G&M/442/2021 dated 13.06.2022). The overall view of the project site is shown in Figure 2.1.





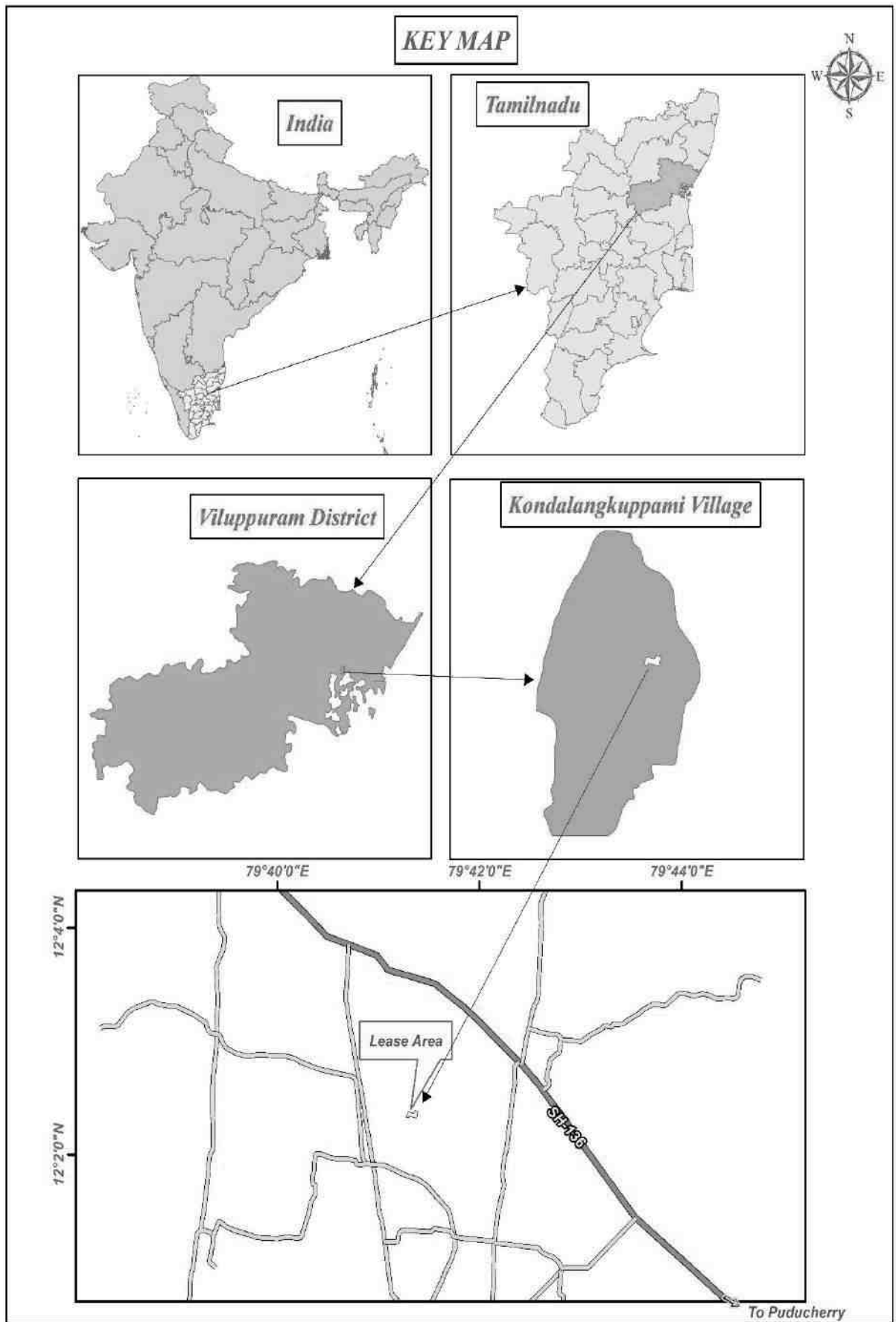
**Figure 2.1 Overall View of Proposed Project Site**

## **2.2 LOCATION AND ACCESSIBILITY**

The proposed quarry project is located in Kondalangkuppam Village, Vanur Taluk, Villuppuram District, as shown in Figure 2.2 & 2.3. The area lies between Latitudes from 12°02'19.41"N to 12°02'23.38"N and Longitudes from 79°41'16.53"E to 79°41'23.40"E. The maximum altitude of the project area is 48 m AMSL. Accessibility details to the proposed project site have been given in Table 2.1.

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

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



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

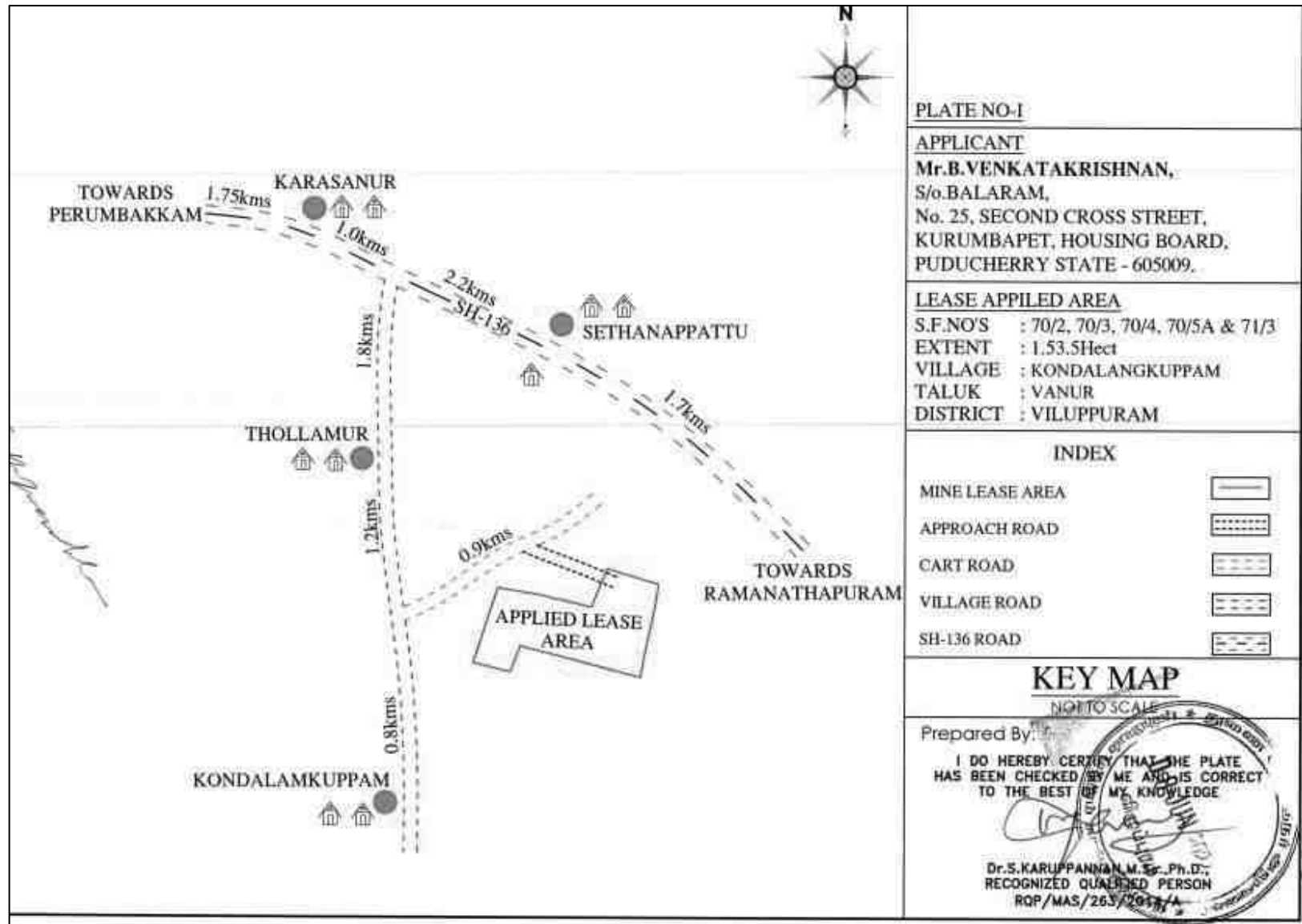


Figure 2.3 Route Map of the Project Site

## 2.3 LEASEHOLD AREA

- ❖ The extent of the proposed project site is 1.53.5 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.

### *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**

<b>Pillar ID</b>	<b>Latitude</b>	<b>Longitude</b>
1	12°2'22.83"N	79°41'23.40"E
2	12°2'20.05"N	79°41'22.87"E
3	12°2'19.41"N	79°41'22.76"E
4	12°2'20.53"N	79°41'18.29"E
5	12°2'19.58"N	79°41'17.93"E
6	12°2'19.90"N	79°41'16.53"E
7	12°2'22.67"N	79°41'17.43"E
8	12°2'22.42"N	79°41'18.97"E
9	12°2'21.98"N	79°41'20.91"E
10	12°2'23.38"N	79°41'21.49"E

## 2.4 GEOLOGY AND GEOMORPHOLOGY

This section discusses about the geology and geomorphology of the study area of 5 km radius, as given below.

### *Geology*

Study area is mainly composed of Panamparai Formation containing red earth, as shown in Figure 3.1.

### *Geomorphology*

The lease area is geomorphologically located in Pediment Pediplain Complex, as shown in Figure 3.2.

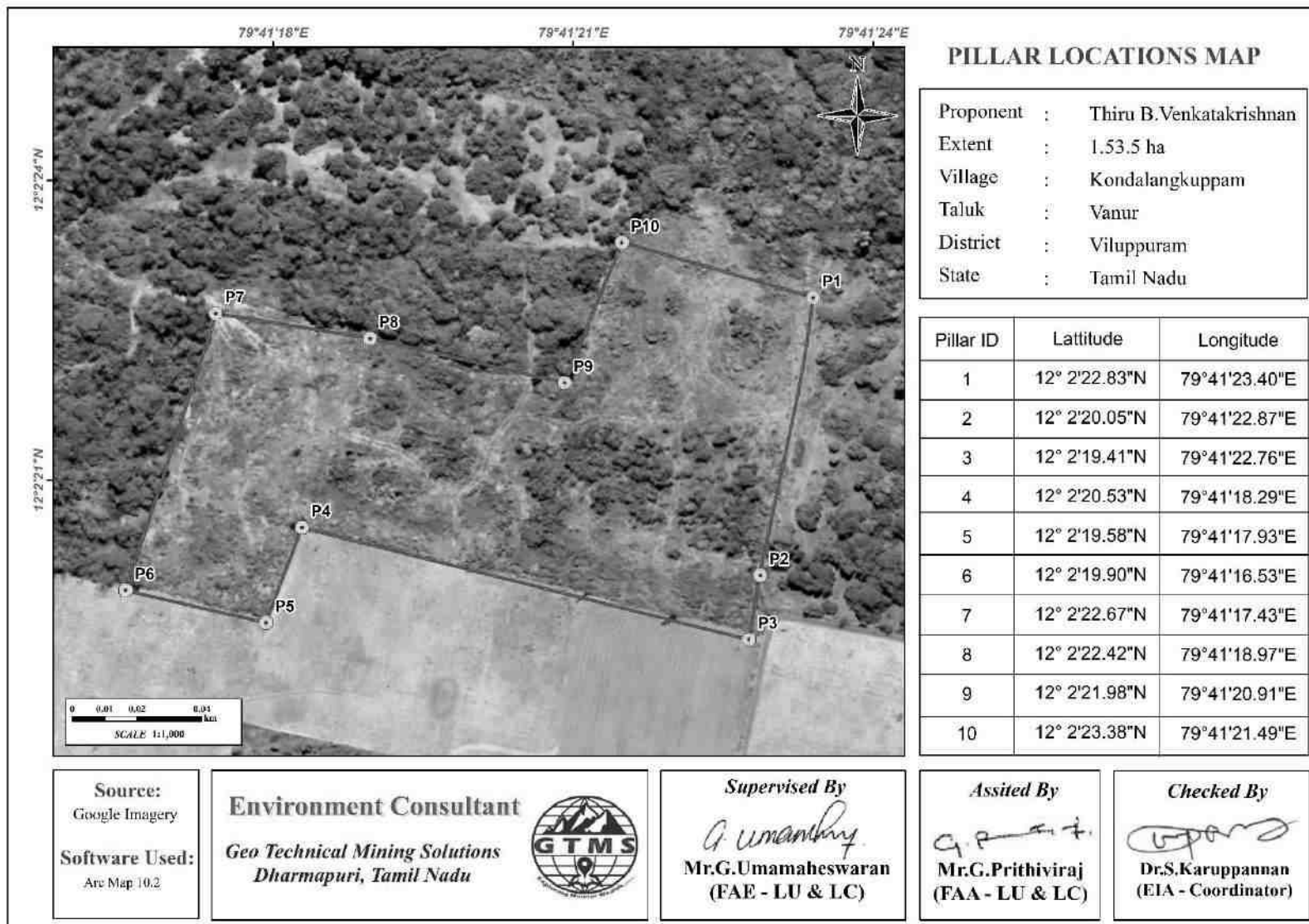


Figure 2.4 Google Earth Image Showing Lease Area with Pillars

## 2.5 QUANTITY OF RESERVES

The resources and reserves of red earth 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 margins, as shown in Figure 2.6 and deducting the locked-up reserves during bench formation (also called as Bench Loss). The mineable reserves are calculated up to the depth of 2 m BGL considering there is no waste / overburden / side burden (100% Recovery anticipated) for the proposed project. The results of geological resources and reserves have been shown in Table 2.3.

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

<b>Resource Type</b>	<b>Red Earth in m<sup>3</sup></b>
Geological Resource in m <sup>3</sup>	30712
Mineable Reserves in m <sup>3</sup>	23004
Proposed production for 2 years m <sup>3</sup>	23004

Based on the year wise development and production plan and sections, as exemplified in Figures 2.7, the year wise production results have been provided in Table 2.4.

**Table 2.4 Year-Wise Production Details**

<b>Year</b>	<b>Red Earth (m<sup>3</sup>)</b>
I	12148
II	10856
<b>Total</b>	<b>23004</b>

*Source: Approved Mining Plan & ToR*

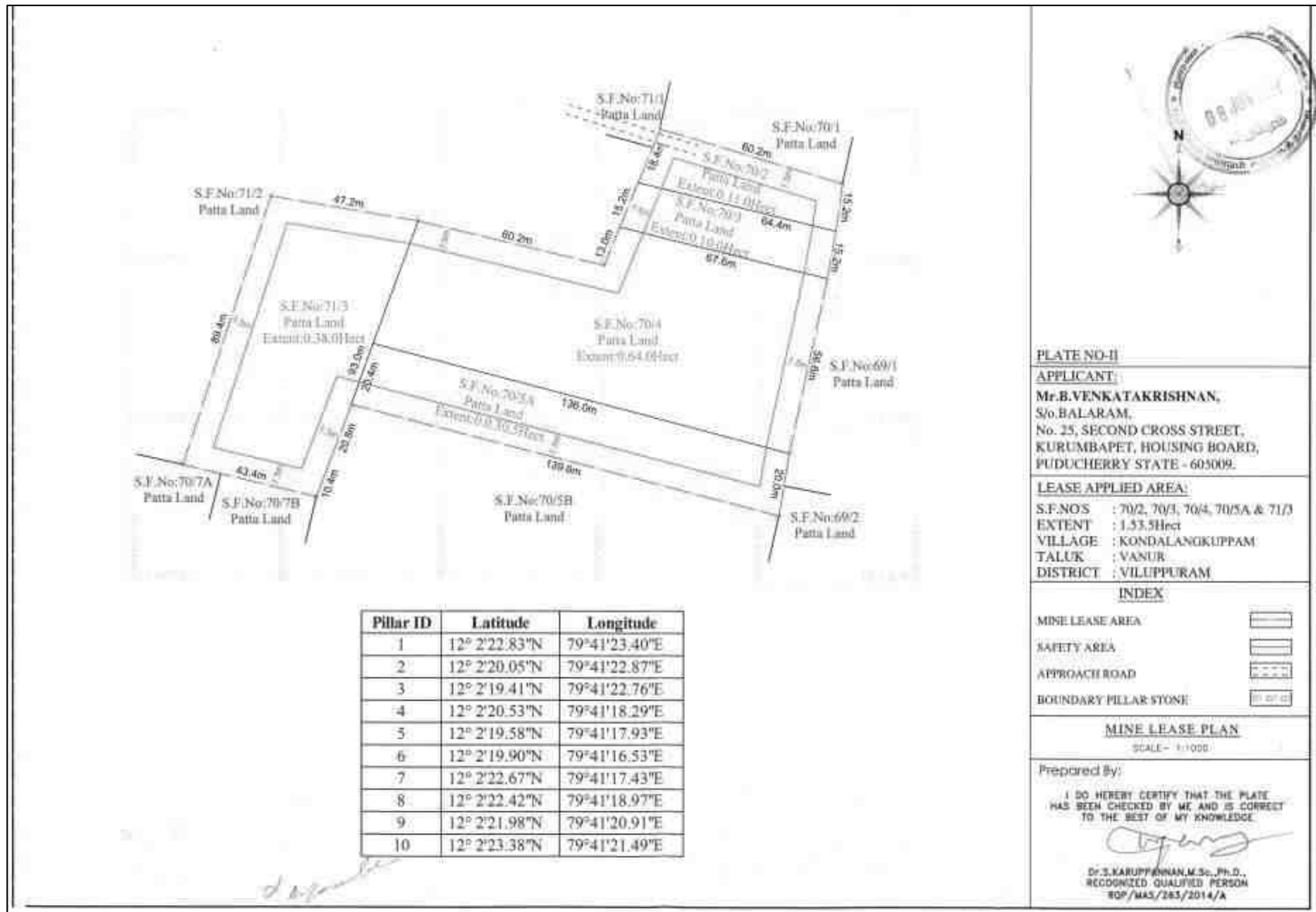


Figure 2.5 Mine Lease Plan

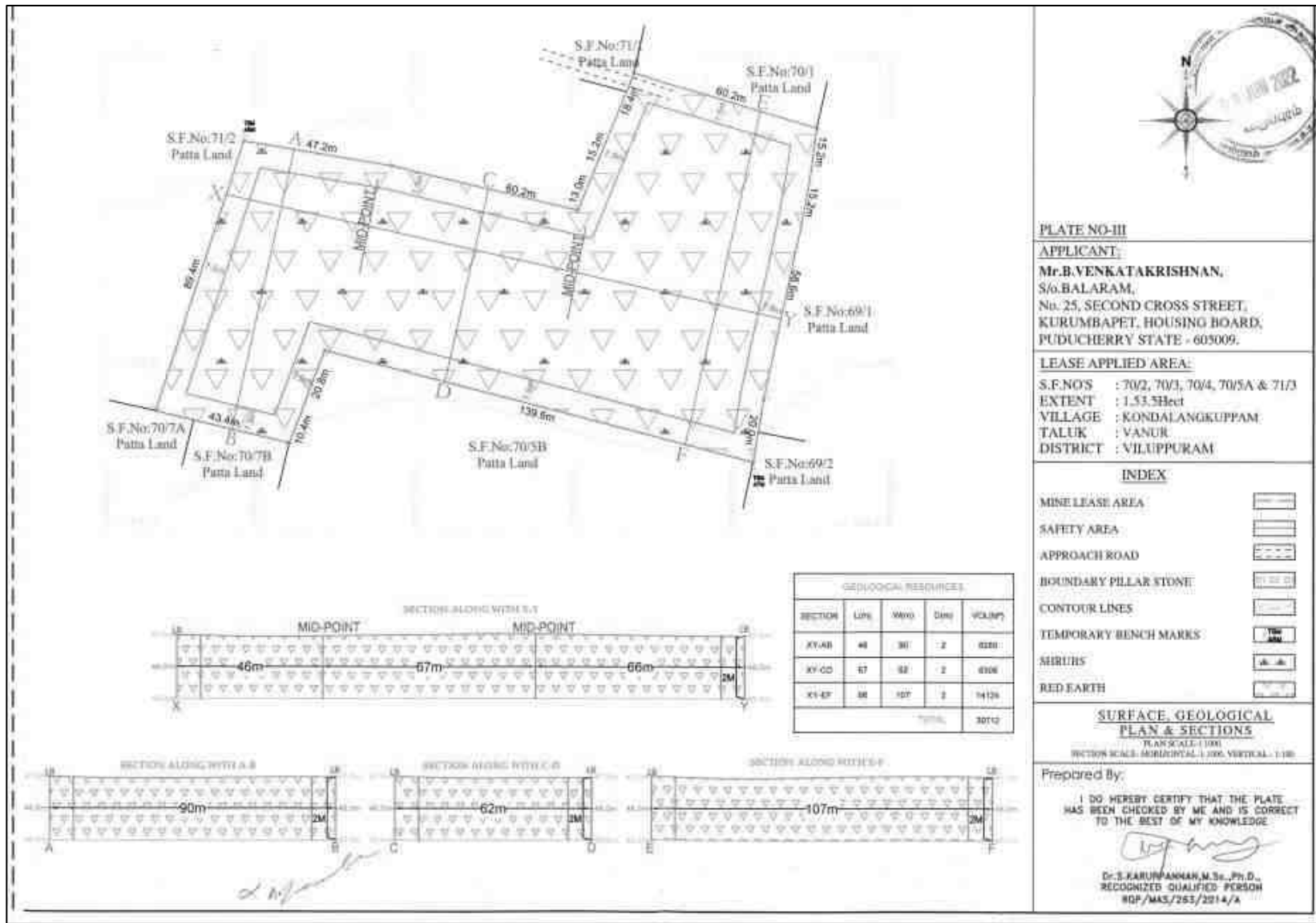


Figure 2.6 Surface Geological Plan and Sections



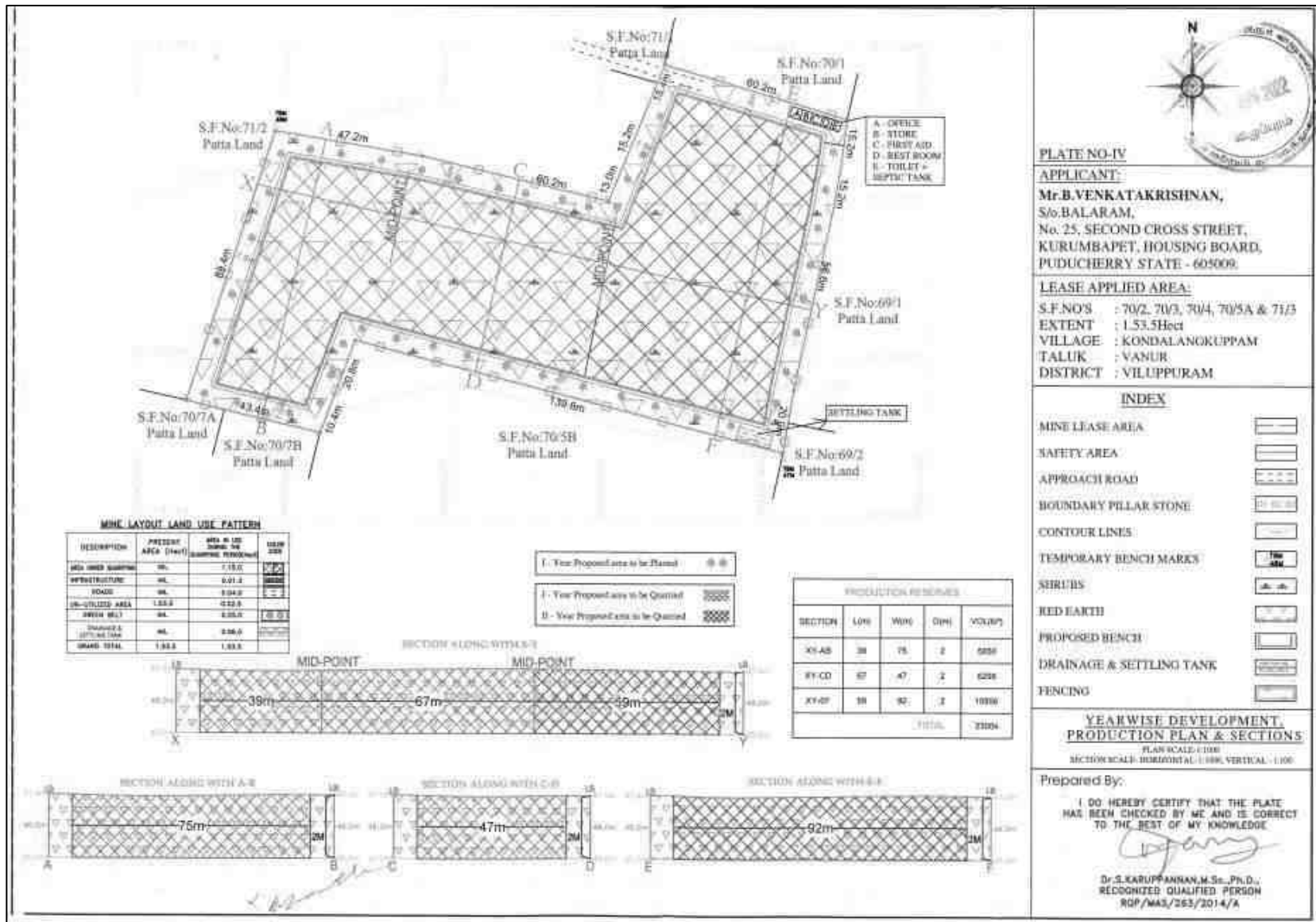


Figure 2.7 Development, Production Plan and Sections

## 2.6 MINING METHOD

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

### 2.6.1 Magnitude of Operation

Based on the results of estimated production for the 2 years, details about the size of operation have been provided in Table 2.5.

**Table 2.5 Operational Details for Proposed Project**

	<b>Red Earth / 2 years</b>
Proposed production	23004
Number of Working Days	270
Production /Day (m <sup>3</sup> )	43
No. of Lorry Loads	7.1

### 2.6.2 Extent of Mechanization

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

**Table 2.6 Machinery Details**

<b>S. No.</b>	<b>Type</b>	<b>No. of Unit</b>	<b>Capacity</b>	<b>Make</b>	<b>Motive Power</b>
1	Excavator	1	--	-	Diesel Drive
<b>Haulage &amp; Transport Equipment</b>					
2	Tipper	3	-	-	Diesel Drive

### 2.6.3 Progressive Quarry Closure Plan

The progressive quarry closure plan of the proposed project shows past, present, and future land use statistics, green belt development statistics, fencing and garland drains establishment details. According to the land use results, as shown in Table 2.7 and Figure 2.7, at present, about 1.53.5 ha of land is designated as unutilized area, whereas at the end of the mine life, about 1.15.0 ha of land would have been quarried; about 0.01.0 ha of land would have been used for establishing infrastructures; about 0.04.0 ha of land would have been used for road development; about 0.25.0 ha of land would have been used for green belt development; and about 0.02.5 ha of land would have been unutilized. During the greenbelt development phase, about 307 plants would be planted inside the lease area, whereas about 461 plants would be planted outside the mine lease area. The budget required for implementing the progressive mine closure plan has been discussed in the preceding section.

**Table 2.7 Land Use Data at Present, during Scheme of Mining, and at the End of Mine Life**

Description	Present Area (ha)	Area at the end of life of quarry (ha)
Area under Mining	Nil	1.15.0
Infrastructure	Nil	0.01.0
Roads	Nil	0.04.0
Green Belt	Nil	0.25.0
Unutilized area	1.53.5	0.02.5
Drainage & Settling tank	Nil	0.06.0
<b>Total</b>	<b>1.53.5</b>	<b>1.53.5</b>

#### 2.6.4 Quarry Closure Budget

As the proposed project has the enormous potential for continuous operations even after the expiry of lease period, final mine closure plan is not proposed for now. Based on the environment management plan as discussed in Chapter X, the progressive mine closure cost is given in Table 2.8.

**Table 2.8 Mine Closure Budget**

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

*Source: Environment Management Plan*

#### 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. The ultimate pit dimension derived from Figure 2.8 is provided in Table 2.9.

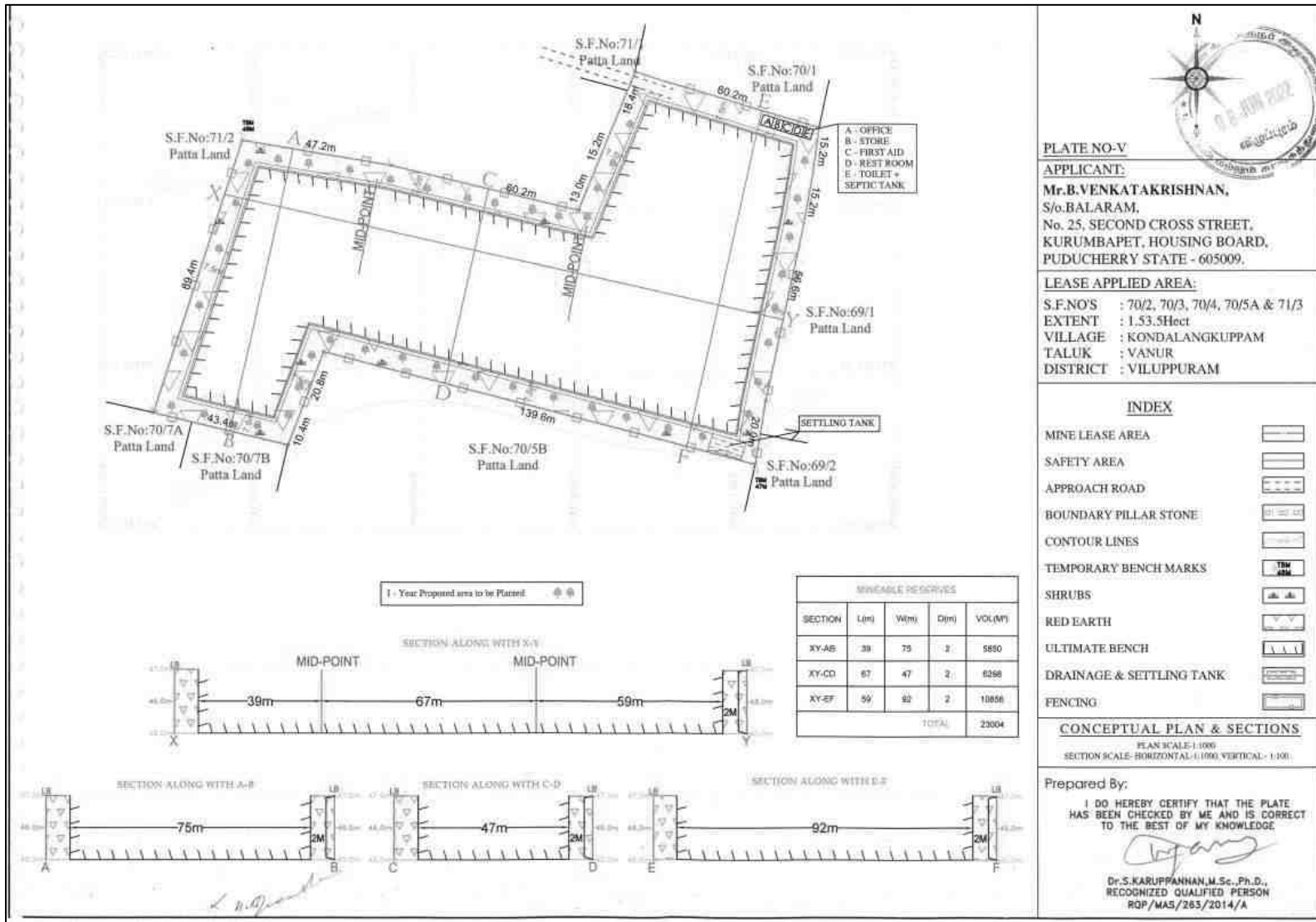
**Table 2.9 Ultimate Pit Dimension**

Pit	Length (m)	Width (m)	Depth (m)
I	67	92	2

*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.



**Figure 2.8 Conceptual Plan and Sections**

### **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**

Details of water requirement in KLD is given in Table 2.10.

**Table 2.10 Water Requirement for the Project**

<b>Purpose</b>	<b>Quantity</b>	<b>Source</b>
Dust Suppression	0.5 KLD	Existing bore wells nearby the lease area
Green Belt development	0.5 KLD	Existing bore wells nearby the lease area
Drinking & Domestic	1.0 KLD	Existing bore wells and approved water vendors
<b>Total</b>	<b>2.0 KLD</b>	

*Source: Prefeasibility Report*

### **2.6.8 Energy Requirement**

As per the data shown in Table 2.11, High Speed Diesel (HSD) will be used for quarrying machineries. Around 80514 litres of HSD will be used for red earth extraction during this 2 years plan period. The diesel will be brought to the site from nearby diesel pumps.

**Table 2.11 Fuel Requirement Details**

<b>Fuel Requirement for Excavator</b>		
<b>Details</b>	<b>Red Earth (23004 m<sup>3</sup>)</b>	<b>Total Diesel (litre)</b>
Average Rate of Fuel Consumption (l/hr)	10	---
Working Capacity (m <sup>3</sup> /hr)	60	---
Time Required (hours)	383	---
Total Diesel Consumption for 2 years (litre)	3834	3834
<b>Fuel Requirement for Tipper</b>		
Average Rate of Fuel Consumption/Trip (litre)	20	--
Carrying Capacity in m <sup>3</sup>	6	--
Number of Trips / days	7.1	--
Number of Trips / 2 years	3834	--
Total Diesel Consumption for 2 years (litre)	76680	76680
<b>Total Diesel Consumption by Excavator and Tipper</b>		<b>80514</b>

### **2.6.9 Capital Requirement**

The project proponent will invest Rs.13,75,000/- to the project. The breakup summary of the investment has been given in Table 2.12.

**Table 2.12 Capital Requirement Details**

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

Source: Approved Mining Plan

## 2.7 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 2.13.

**Table 2.13 Employment Potential for the Proposed Project**

S. No.	Category	Role	Nos.
1	Skilled	Excavator Operator	1
		Mechanic	--
		Blaster/Mat	--
2	Semi – Skilled	Driver	--
3	Unskilled	Musdoor/ Labours	2
		Cleaners	--
		Office Boy	--
4	Management & Supervisory Staff		2
<b>Total</b>			<b>5</b>

Source: Prefeasibility Report

## 2.8 PROJECT IMPLEMENTATION SCHEDULE

The commercial operation will commence after the grant of Environmental Clearance. CTO and CTE will be obtained from the Tamil Nadu State Pollution Control Board. The conditions imposed during the environmental clearance will be compiled before the start of mining operation. Expected time schedule for the quarrying operation is given Table 2.14.

**Table 2.14 Expected Time Schedule**

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

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 **December 2022 - February, 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 (2 surface water & 6	IS 10500& CPCB Standards

	Bacteriological Parameters		ground 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 <sub>10</sub> PM <sub>2.5</sub> SO <sub>2</sub> NO <sub>x</sub> Fugitive dust	24 hours, twice a week (February to April 2022.)	7 (1 core & 6 buffer)	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

#### 3.1.1 Geology and Geomorphology

Study area is mainly composed of Charnockite, Panamparai Formation, Fluvial Deposits, and rocks of Pondicherry Group, as shown in Figure 3.1. Among the geomorphic ussnuts, Pediment and Pediplain Complex and Flood Plain dominate 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, 9 LULCs were mapped. The areal extent of each LULC is provided in Table 3.2. Of the total area, mining area covers only 113.19 ha accounting for 1.49 %, of which lease area of 1.53.5 ha contributes only about 0.02%. 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**

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

*Source: Sentinel II Satellite Imagery*

### **3.1.3 Topography**

The proposed lease area is located in a flat terrain with an altitude range of 161-162 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 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 II, as defined by National Center for Seismology ([Official Website of National Centre of Seismology](#)). The Zone II is defined as the region where only minor damage is expected from seismic events. In this respect, the proposed lease area is located in a low earthquake hazard area.

### **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.

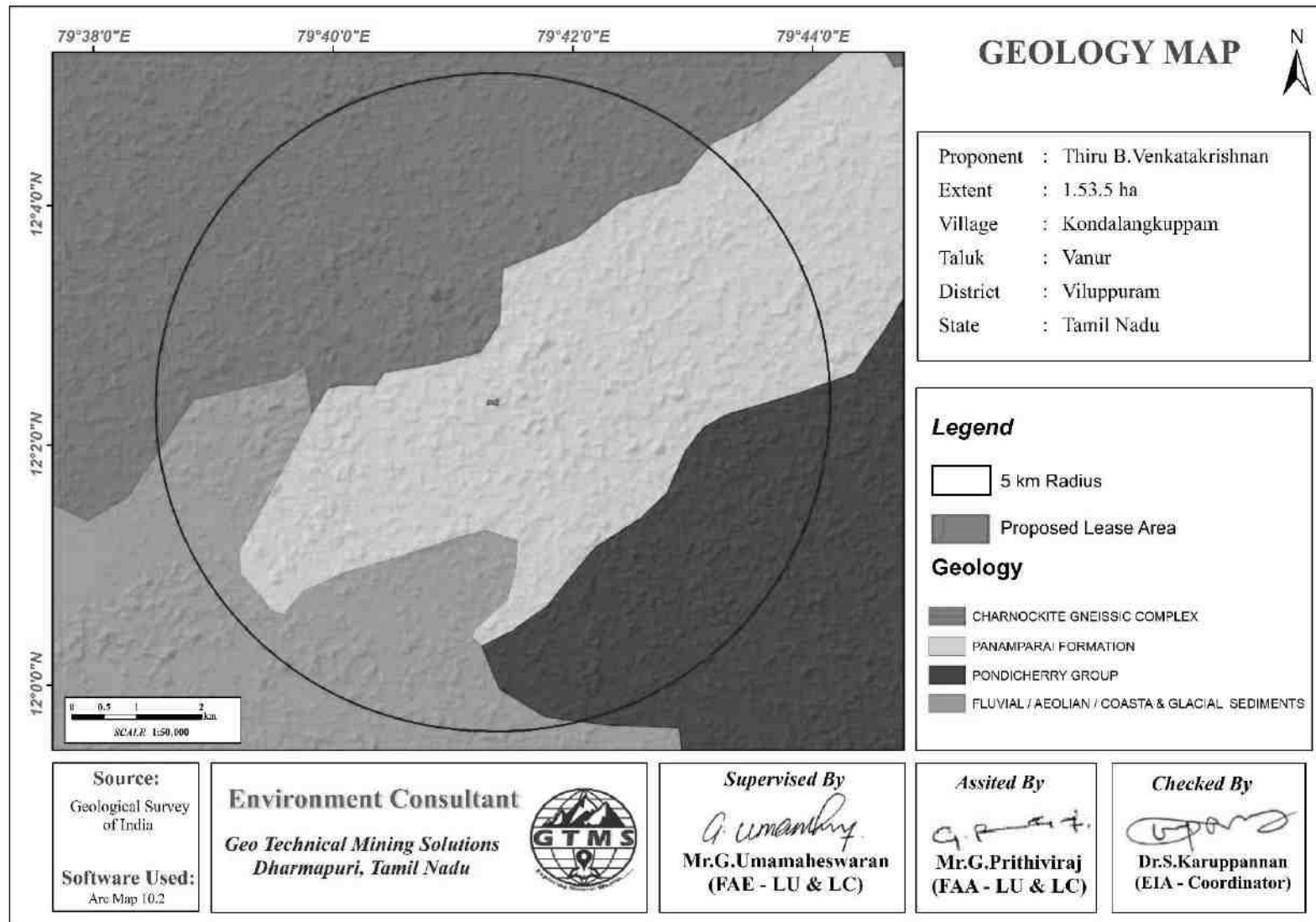


Figure 3.1 Geology Map of the Proposed Project Site

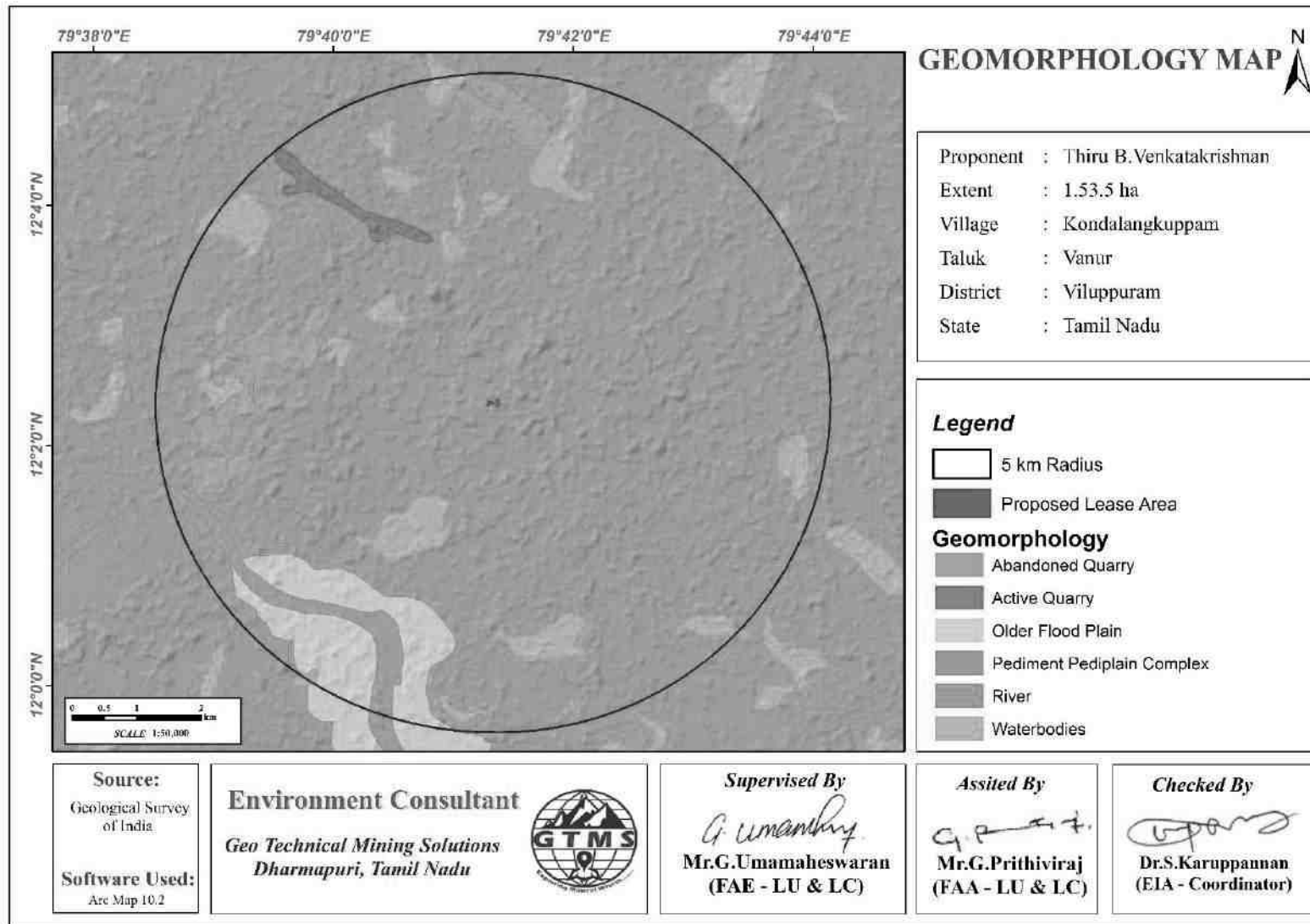
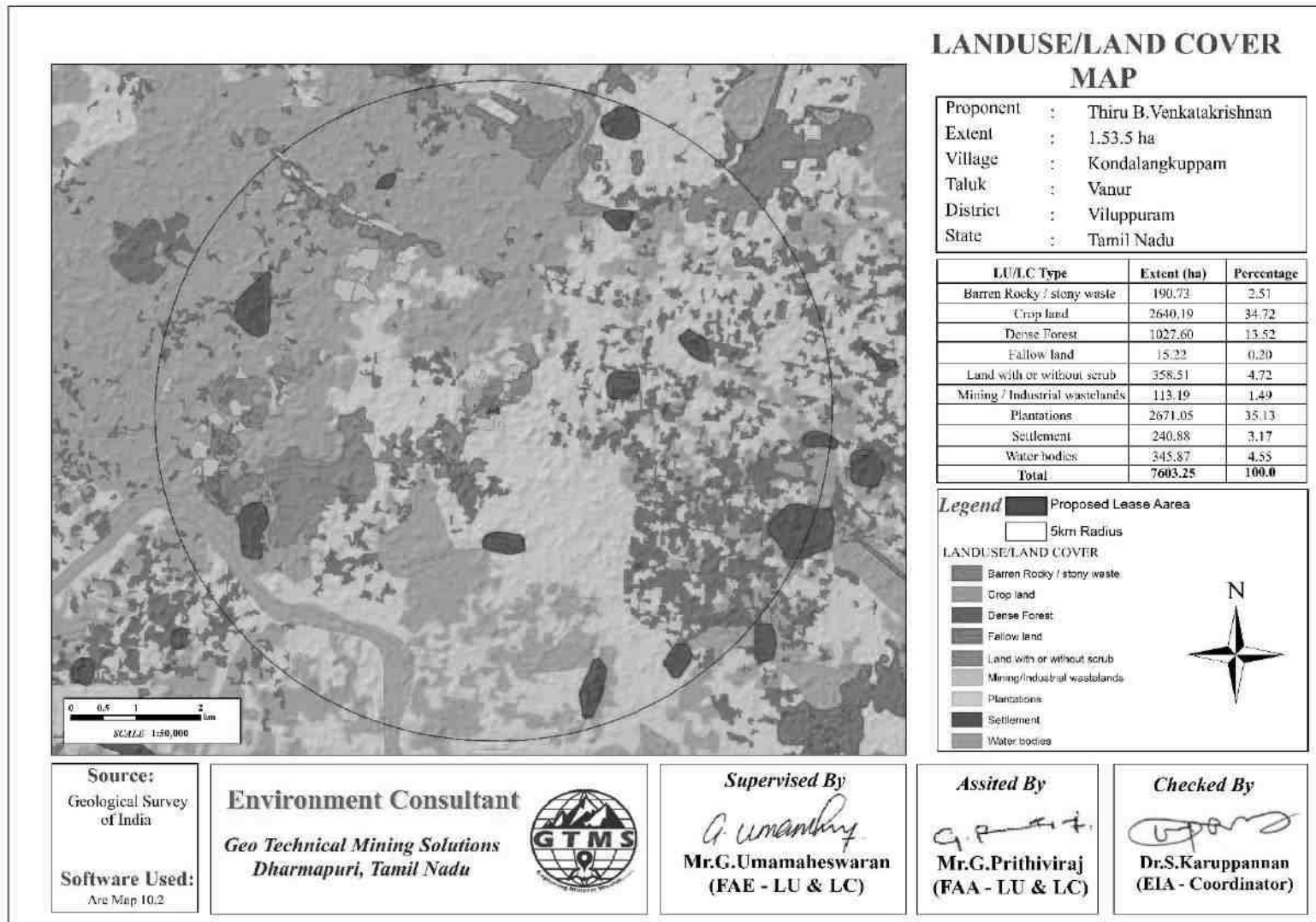
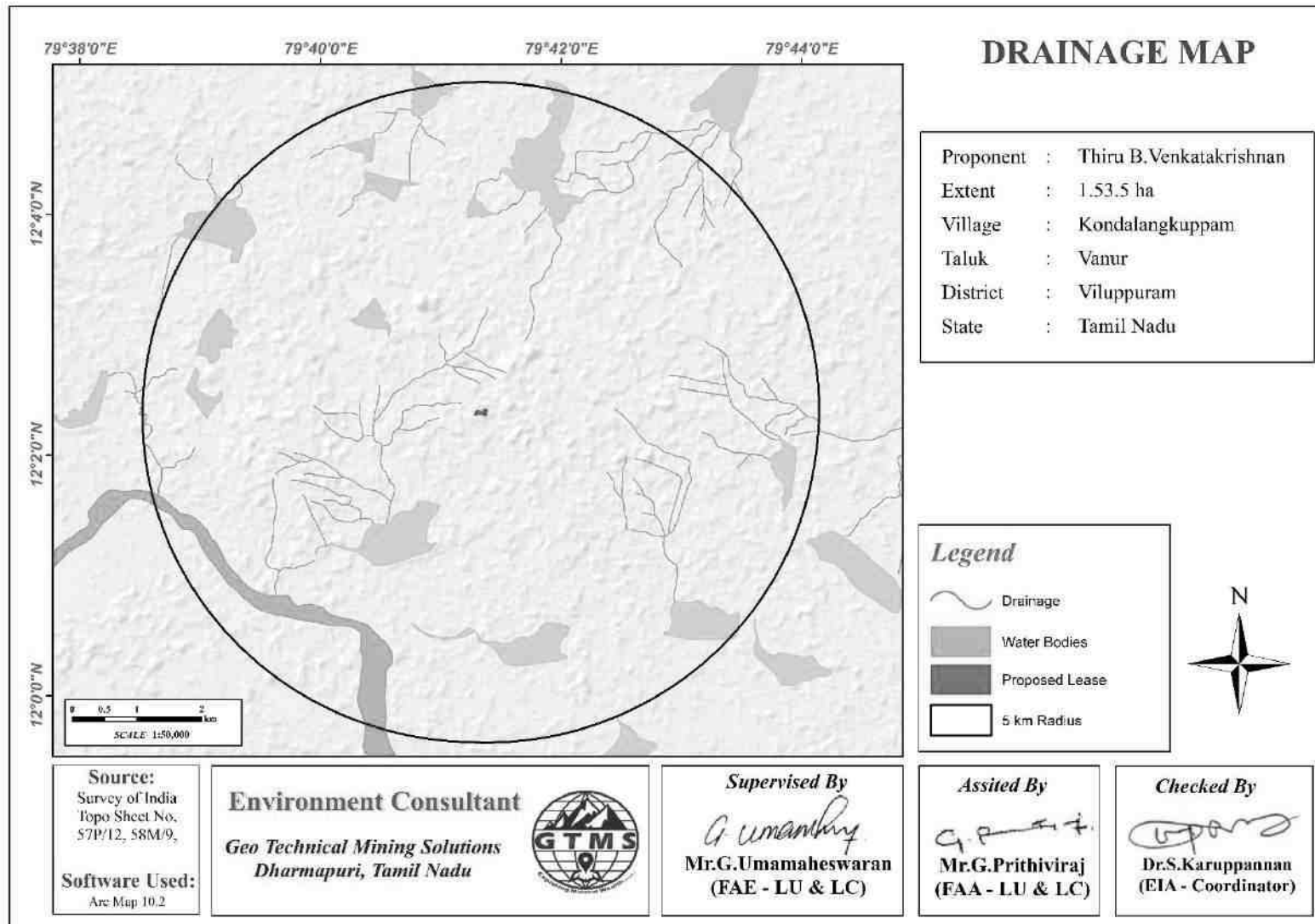


Figure 3.2 Geomorphology Map of the Proposed Project Site



**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° 2'21.09"N 79°41'20.22"E
2	S02	Thiruvakkarai	3.38	W	12° 2'7.49"N 79°39'25.64"E
3	S03	Vanur	4.48	E	12° 2'13.78"N 79°43'51.18"E
4	S04	Eraiyur	3.88	WNW	12° 3'40.88"N 79°39'37.78"E
5	S05	Ilvampattu	3.98	N	12° 4'29.97"N 79°41'39.05"E
6	S06	V. Pudupakkam	3.09	SSE	12° 1'3.68"N 79°42'30.37"E
7	S07	Katterikuppam	4.42	SSW	12° 0'1.40"N 79°40'36.71"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 silty clay loam, silty loam and sandy loam. pH of the soil varies from 7.1 to 7.5 indicating slightly acidic to slightly alkaline nature. Electrical conductivity of the soil varies from 217 to 287  $\mu\text{s}/\text{cm}$ . Bulk density ranges between 1.01 and 1.53  $\text{g}/\text{cm}^3$ .

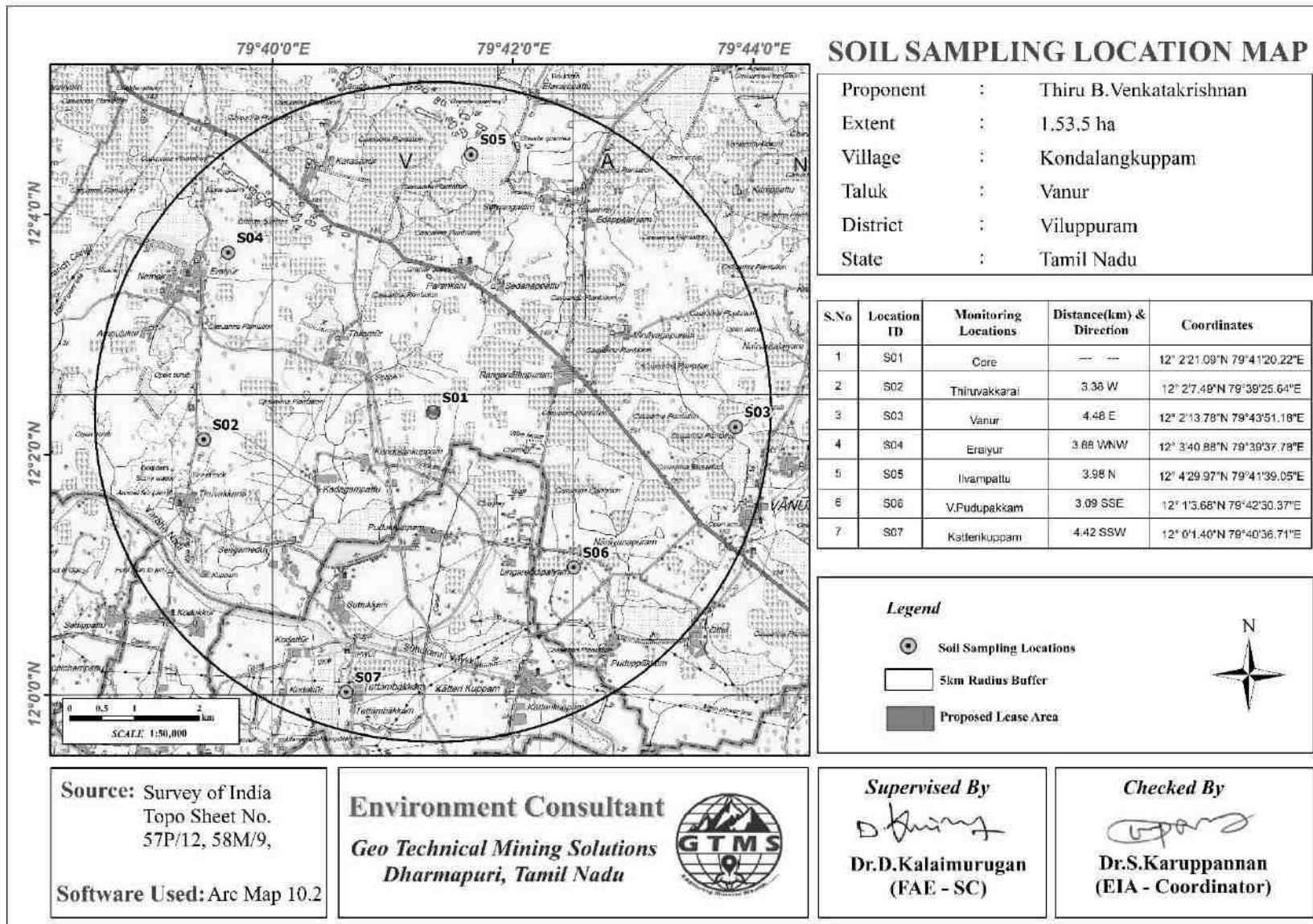
#### *Chemical Characteristics*

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

#### *Soil Erosion*

Soil erosion map shows that:

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

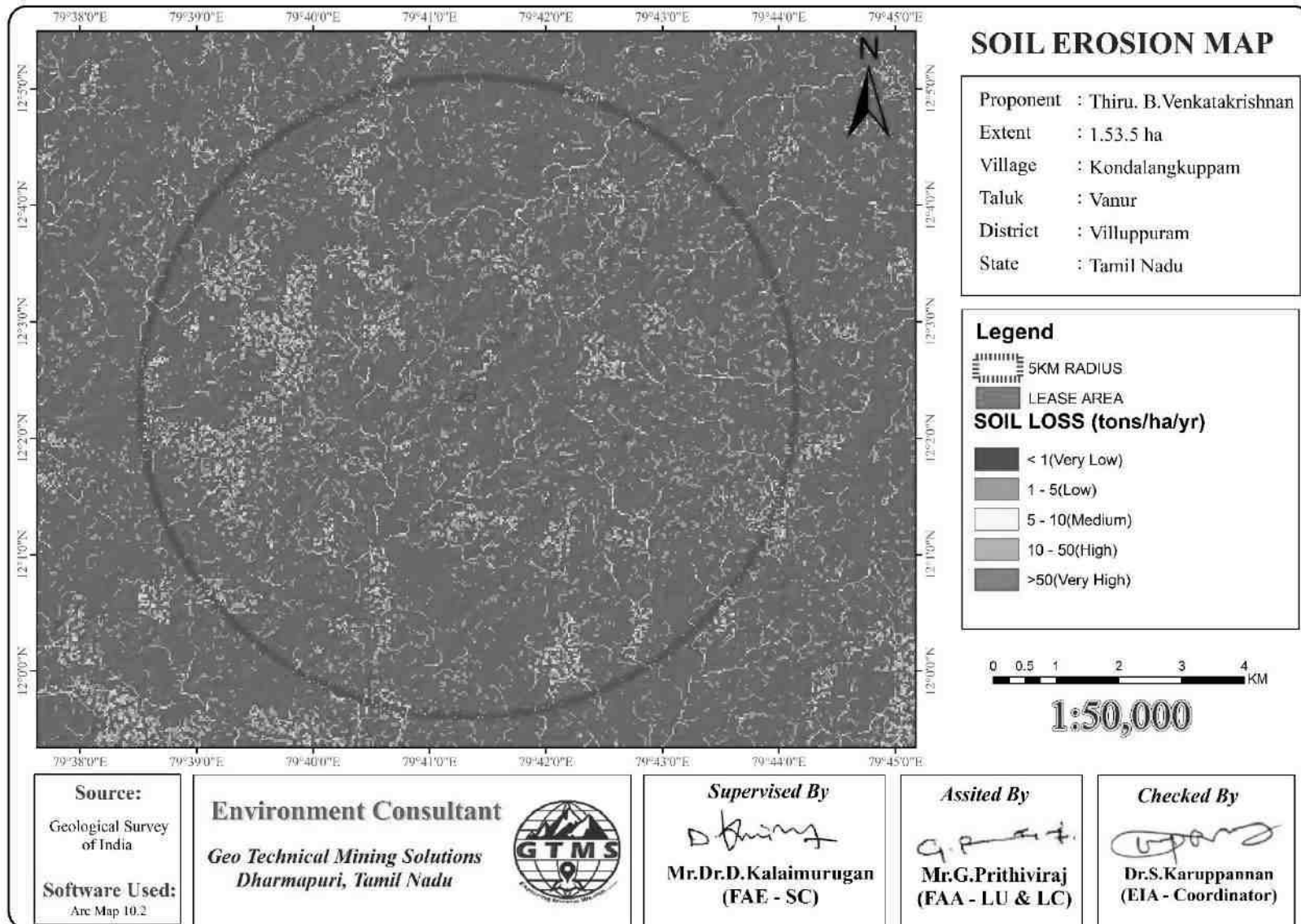


Figure 3.6 Soil Erosion Map within 5 km Radius around the Proposed Project Site



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

S. No.	Parameters	Units	Result		
			Minimum	Maximum	Average
1	pH value @ 25°C	-	7.1	7.5	7.3
2	EC @ 25°C	µS /cm	217.0	287.0	253.9
3	Texture	-	Loam, Clay Loam, Sandy Loam and Sandy Clay Loam		
4	Sand	%	38.0	65.0	50.9
5	Silt	%	5.0	54.0	33.0
6	Clay	%	8.0	30.0	16.1
7	Bulk Density	g/cc	1.0	1.5	1.2
8	Water Content	%	2.5	5.3	4.1
9	Organic Matter	%	1.0	1.4	1.2
10	Alkalinity	mg/kg	56.2	96.5	78.6
11	Potassium (K)	mg/kg	17.3	34.9	25.6
12	Water Holding Capacity	%	35.6	49.6	41.5
13	Calcium (Ca)	mg/kg	78.0	156.0	126.4
14	Magnesium (Mg)	mg/kg	18.8	29.2	23.6
15	Sodium (Na)	mg/kg	115.0	178.0	137.0
16	Iron (Fe)	mg/kg	78.7	172.4	118.6
17	Copper (Cu)	mg/kg	BLQ(LOQ=0.05)		
18	Chlorides (Cl)	mg/kg	112.0	147.0	131.4

*Source: Sampling Results by 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	Sampli ng ID	Location	Distance (km)	Direction	Coordinates
1	SW01	Sangarabarani River, Thiruvakkarai	4.63	WSW	12° 1'29.68"N 79°38'52.28"E
2	SW02	Sangarabarani River, Kaikilampattu	3.72	SW	12° 0'29.62"N 79°40'29.41"E
3	OW01	V. Parangani	3.38	NNE	12° 4'9.99"N 79°41'49.81"E
4	OW02	Thollamur	1.86	NW	12° 3'1.28"N 79°40'30.31"E
5	BW01	Katterikuppam	4.35	SSE	12° 0'2.54"N 79°42'0.92"E
6	BW02	Ranganathapuram	2.24	ENE	12° 2'40.76"N 79°42'34.78"E
7	BW03	Kadagampattu	1.35	SSW	12° 1'42.67"N 79°40'51.54"E
8	BW04	Vanur	4.70	ESE	12° 1'16.87"N 79°43'44.29"E

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

#### 3.2.1 Surface Water Resources and Quality

Sangarabarani River is the prominent surface water resources present in the study area. This river was ephemeral in nature, which convey water only after rainfall events. The proposed project area is located in 4.63 (Thiruvakkarai) km WSW of Sangarabarani River and 3.72 (Kaikilampattu) km SW of Sangarabarani River, as shown in Table 3.5 and Figure 3.7. Two surface water sample, known as SW01 and SW02 were collected from the Sangarabarani River in Thiruvakkarai (4.63 km) and Sangarabarani River in Kaikilampattu (3.72 km), to assess the baseline water quality. Table 3.6 summarizes surface water quality data of the collected sample.

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

#### 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.

Six groundwater samples, known as OW01, OW02, BW01, BW02, BW03 and BW04 collected from bore wells and open wells were analysed for physico-chemical conditions, heavy metals and bacteriological contents in order to assess baseline quality of ground water. 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 3.7. Table 3.7 summarizes ground water quality data of the nine samples.

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

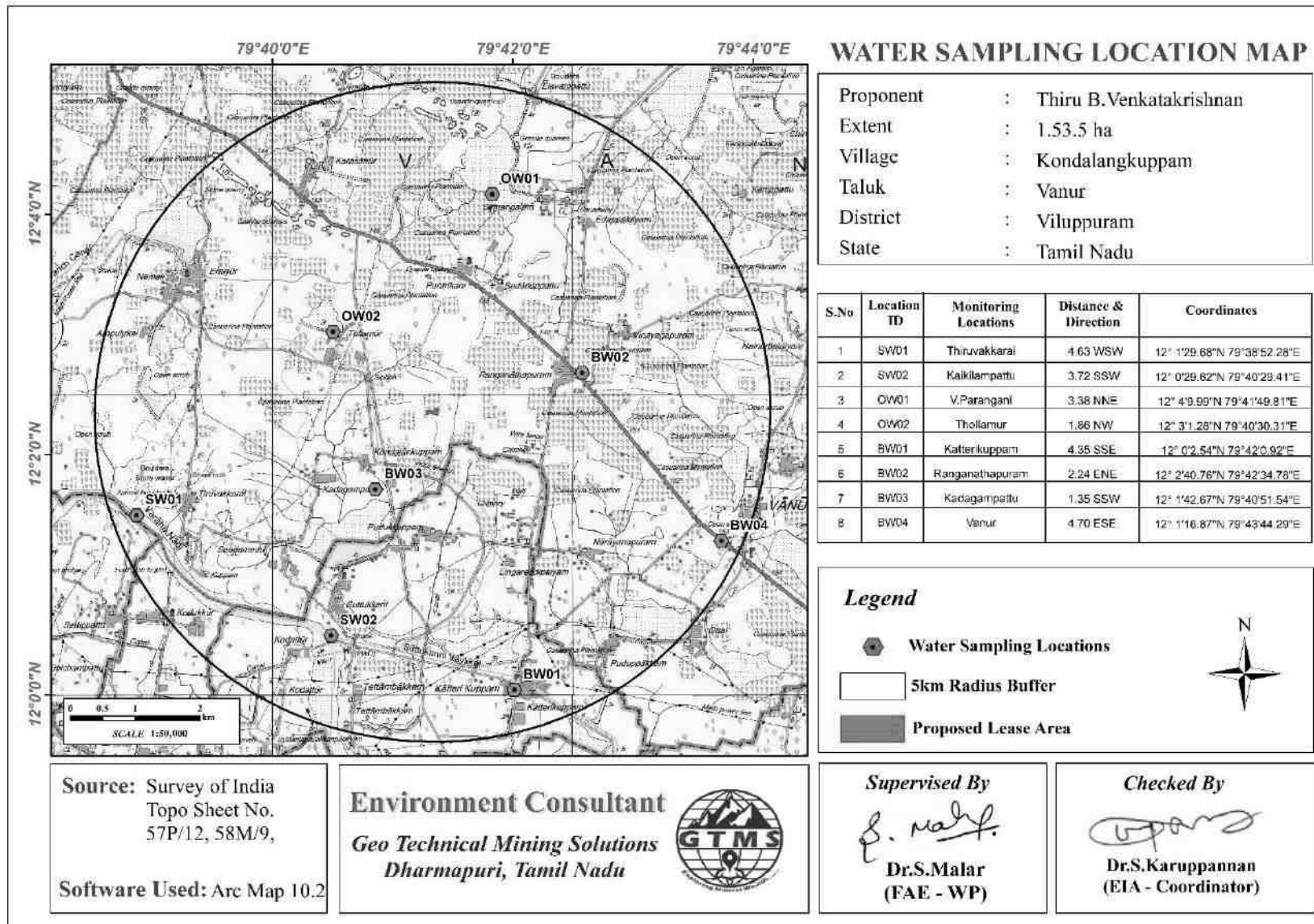
### **3.2.3 Hydrogeological Studies**

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**

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 March through May 2022 (Pre-Monsoon Season) and from December 2022 through February, 2023 (Post Monsoon Season).

The open well water level data thus collected onsite are provided in Tables 3.7 and 3.8. According to the data, average depths to the static water table in open wells range from 11.3 to 15.9 m BGL in pre monsoon and 6.5 to 10.5 m BGL in post monsoon. The bore well data thus collected onsite are provided in Tables 3.9 and 3.10. The average depths to static potentiometric surface in bore wells for the period of December 2022 through February, 2023 (Post Monsoon Season) vary from 55.10 to 60.0 m and from 60.2 to 70.0 m for the period of March through May, 2022 (Pre-Monsoon Season). Data on the depths to static water table and potentiometric surface were used to draw contour lines connecting groundwater elevation (also known as equipotential hydraulic head) to determine the groundwater flow direction perpendicular to the contour lines.



**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			Standards as Per IS 10500: 2012	
			Minimum Limit	Maximum Limit	Average	Acceptable Limit	Permissible Limit
1	pH@ 25°C	--	7.2	7.4	7.3	6.5-8.5	No relaxation
2	Turbidity	NTU	BLQ (LOQ=0.1)			1	5
3	Electrical Conductivity @ 25°C	µs/cm	429	445	437	Not specified	Not specified
4	TSS	mg /l	BLQ (LOQ=0.1)			Not specified	Not specified
5	TDS	mg /l	240	250	245	500	2000
6	Total Hardness	mg /l	103	116	109.5	200	600
7	Chloride (Cl)	mg /l	85	142	113.5	250	1000
8	Sulphate (SO <sub>4</sub> )	mg /l	9	46	27.5	200	400
9	Iron (Fe)	mg /l	BLQ (LOQ=0.1)			0.3	No relaxation
10	Silica (SiO <sub>2</sub> )	mg /l	-			Not specified	Not specified
11	Total Coliform	MPN/ 100ml	Absent			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 by *Ekdant Enviro Service (P) Limited*, in association with *GTMS*.

**Table 3.7 Ground Water Quality Result**

S. No.	Parameters	Units	RESULT			Standards as Per IS 10500: 2012	
			Minimum Limit	Maximum Limit	Average	Acceptable Limit	Permissible Limit
1	pH@ 25°C	--	7.1	7.6	7.3	6.5-8.5	No relaxation
2	Turbidity	NTU	BLQ (LOQ=0.1)			1	5
3	Electrical Conductivity @ 25°C	µs/cm	512	2112	939.2	Not specified	Not specified
4	TSS	mg /l	BLQ (LOQ=0.1)			Not specified	Not specified
5	TDS	mg /l	343	1225	573.7	500	2000
6	Total Hardness	mg /l	219	289	241.8	200	600
7	Chloride (Cl)	mg /l	89	142	144.3	250	1000
8	Sulphate (SO <sub>4</sub> )	mg /l	24	223	122.8	200	400
9	Iron (Fe)	mg /l	BLQ (LOQ=0.1)			0.3	No relaxation
10	Silica (SiO <sub>2</sub> )	mg /l	-			Not specified	Not specified
11	Total Coliform	MPN/ 100ml	Absent			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 by *Ekdant Enviro Service (P) Limited*, in association with *GTMS*.

From the maps of open well groundwater flow direction shown in Figures 3.8-3.9, it is understood that most of the open well groundwater for the post- and pre-monsoon seasons flows towards the open well number 1 located in western direction of the proposed project site. The groundwater flow maps in Figure 3.10-3.11 show that most of the bore well groundwater for the post- and pre-monsoon seasons flows towards the bore well number 3. It is located in South Southwest direction of the proposed project site. 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-2022	Apr-2022	May- 2022	Average		
DW01	11.4	12.9	15.2	13.17	12° 2'27.80"N	79°40'58.03"E
DW02	11.6	13.2	14.2	13.00	12° 2'29.75"N	79°40'26.08"E
DW03	11.5	12.5	14.9	12.97	12° 1'54.64"N	79°40'49.41"E
DW04	11.3	12.1	13.9	12.43	12° 1'24.92"N	79°41'6.83"E
DW05	11.4	13.4	15.4	13.40	12° 1'46.10"N	79°41'57.40"E
DW06	11.5	12.9	15.9	13.43	12° 2'21.40"N	79°42'6.23"E
DW07	11.4	13	15.7	13.37	12° 3'4.90"N	79°41'40.68"E
DW08	11.4	13.2	15.9	13.50	12° 3'27.72"N	79°41'20.87"E
DW09	11.9	12.8	14.7	13.13	12° 3'25.37"N	79°40'50.15"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
	Dec-22	Jan-23	Feb-23	Average		
DW01	6.8	8.1	10	8.30	12° 2'27.80"N	79°40'58.03"E
DW02	6.9	8.2	9.8	8.30	12° 2'29.75"N	79°40'26.08"E
DW03	6.8	7.9	9.7	8.13	12° 1'54.64"N	79°40'49.41"E
DW04	7	7.8	9.5	8.10	12° 1'24.92"N	79°41'6.83"E
DW05	6.9	8.5	10	8.47	12° 1'46.10"N	79°41'57.40"E
DW06	6.5	8.2	9.7	8.13	12° 2'21.40"N	79°42'6.23"E
DW07	6.9	8	9.9	8.27	12° 3'4.90"N	79°41'40.68"E
DW08	7.2	8.5	10.5	8.73	12° 3'27.72"N	79°41'20.87"E
DW09	7.1	8.6	9.5	8.40	12° 3'25.37"N	79°40'50.15"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-2022	Apr-2022	May- 2022	Average		
BW01	60.5	61.9	63.2	61.87	12° 2'10.94"N	79°40'55.66"E
BW02	60.7	63.4	66.5	63.53	12° 1'52.48"N	79°40'23.01"E
BW03	60.2	61.1	62.6	61.30	12° 1'42.67"N	79°40'51.54"E
BW04	62.3	65.3	69.2	65.60	12° 1'20.30"N	79°41'0.68"E
BW05	62.8	66.2	70	66.33	12° 1'34.38"N	79°41'44.27"E
BW06	63.9	66.8	69.3	66.67	12° 1'56.65"N	79°42'14.14"E
BW07	64.5	67.6	69.4	67.17	12° 2'17.81"N	79°41'54.61"E
BW08	64.2	67.2	69.8	67.07	12° 2'57.25"N	79°41'43.41"E
BW09	63.9	66.1	67.2	65.73	12° 2'47.48"N	79°40'47.98"E

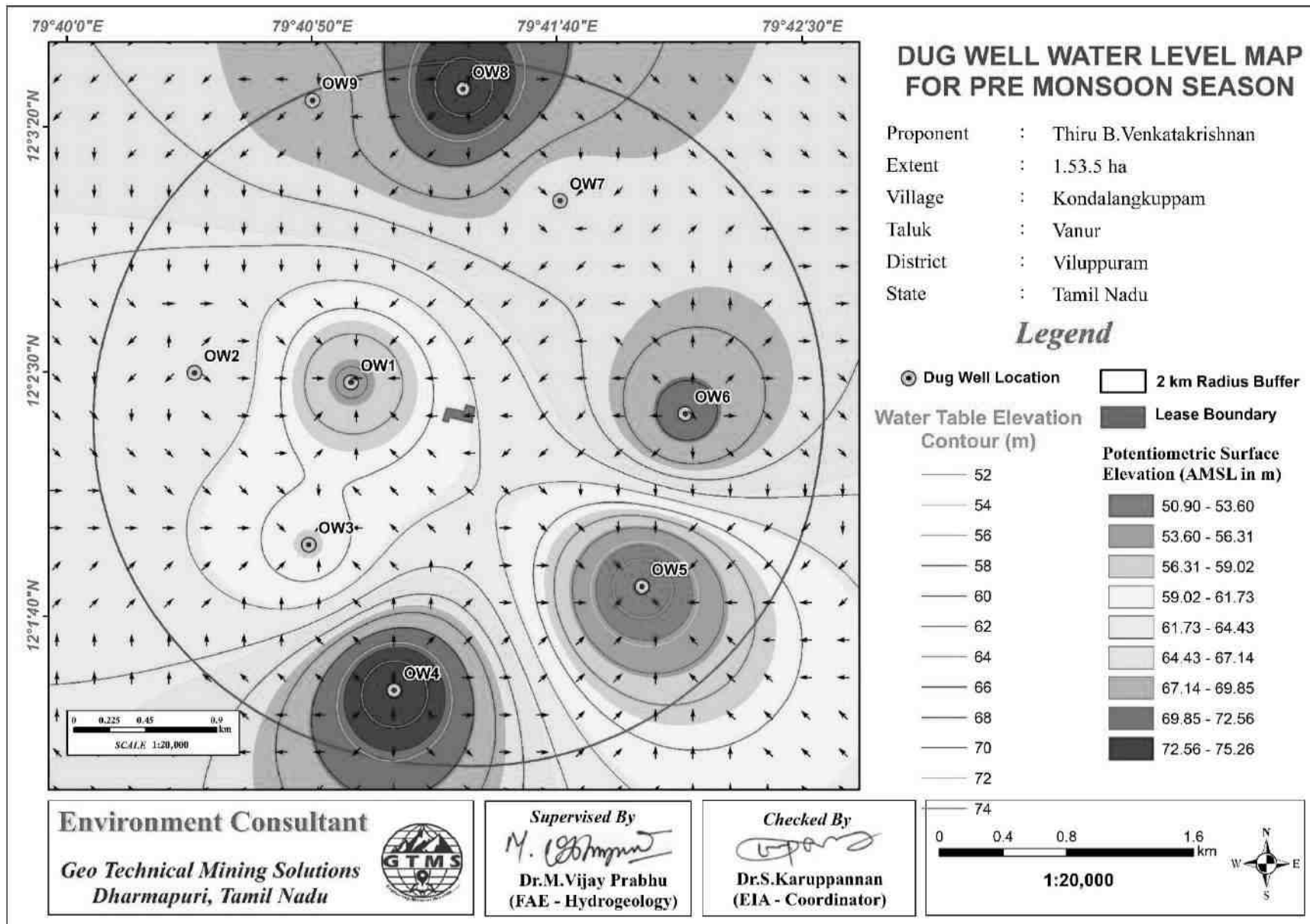
Source: Onsite monitoring data

**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
	Dec-22	Jan-23	Feb-23	Average		
BW01	55.10	55.8	56.4	55.77	12° 2'10.94"N	79°40'55.66"E
BW02	55.30	55.9	57.9	56.37	12° 1'52.48"N	79°40'23.01"E
BW03	56.00	56.6	58.5	57.03	12° 1'42.67"N	79°40'51.54"E
BW04	55.10	56.2	56.3	55.87	12° 1'20.30"N	79°41'0.68"E
BW05	55.80	56.6	59.6	57.33	12° 1'34.38"N	79°41'44.27"E
BW06	55.90	57.2	59.8	57.63	12° 1'56.65"N	79°42'14.14"E
BW07	56.10	57.6	59.9	57.87	12° 2'17.81"N	79°41'54.61"E
BW08	56.40	57.9	60	58.10	12° 2'57.25"N	79°41'43.41"E
BW09	57.00	58.2	59.4	58.20	12° 2'47.48"N	79°40'47.98"E

Source: Onsite monitoring data





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

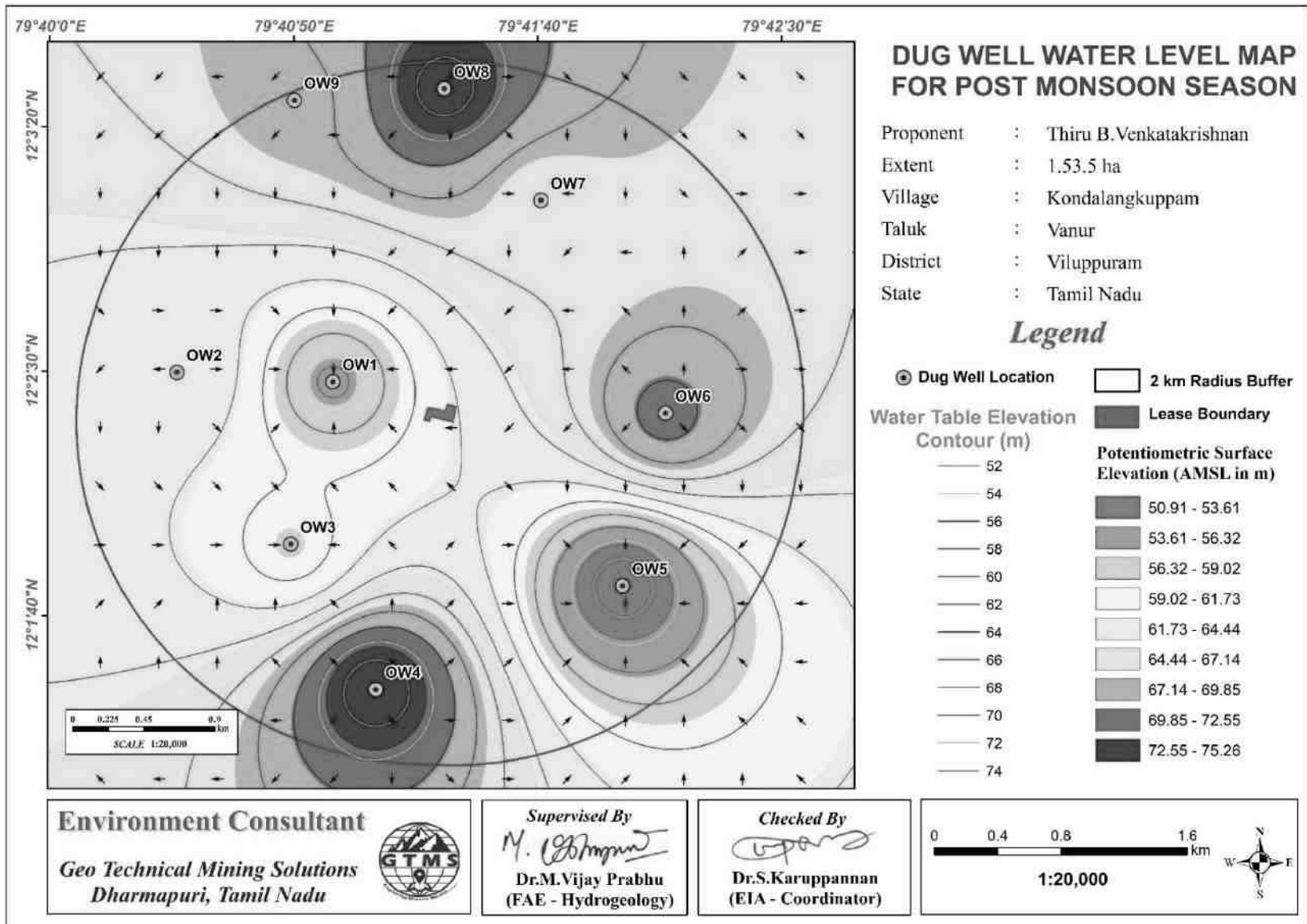


Figure 3.9 Open Well Static Groundwater Elevation Map Showing the Direction of Groundwater Flow During Post-Monsoon Season

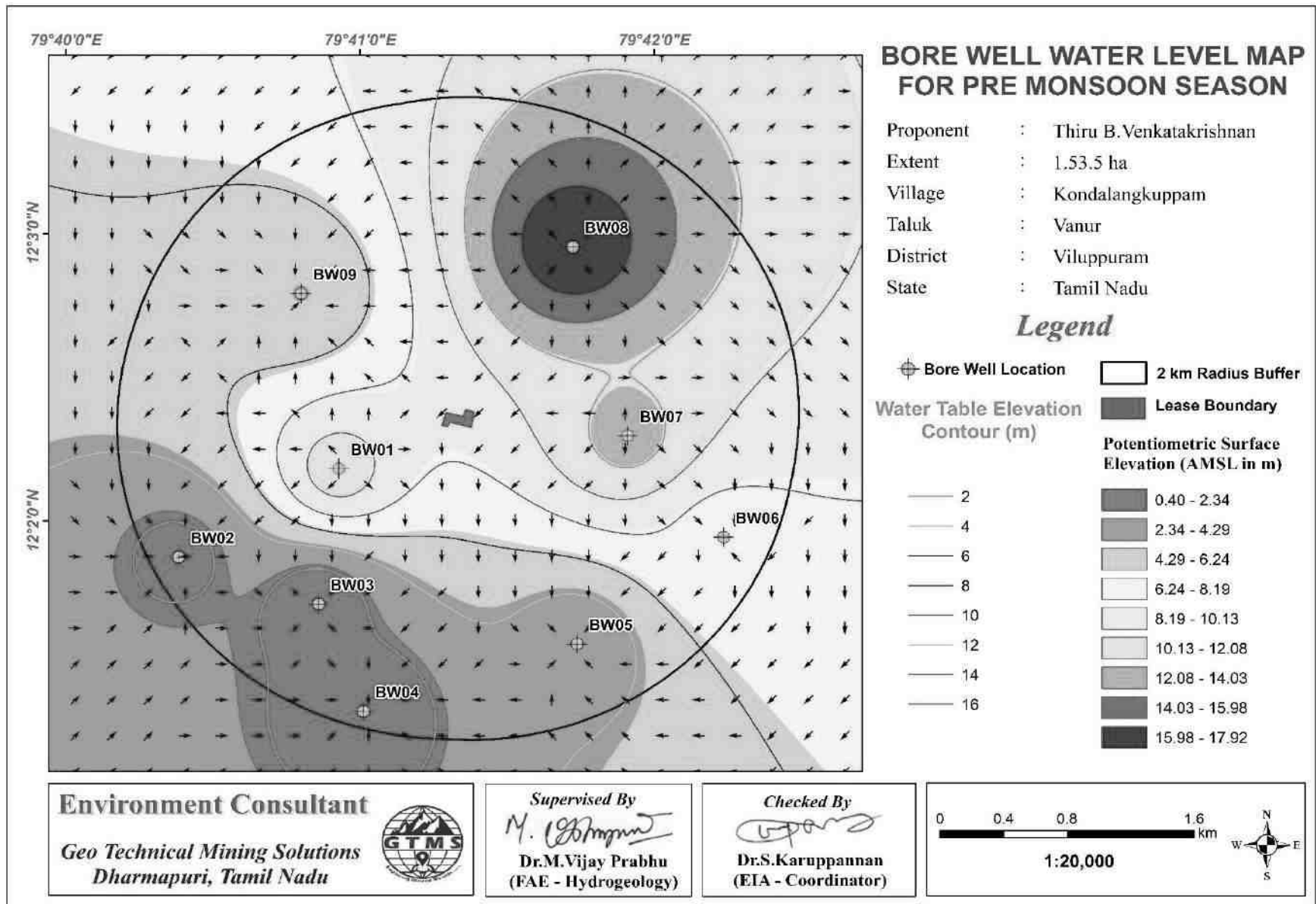


Figure 3.10 Borewell Static Groundwater Elevation Map Showing the Direction of Groundwater Flow During Pre-Monsoon Season

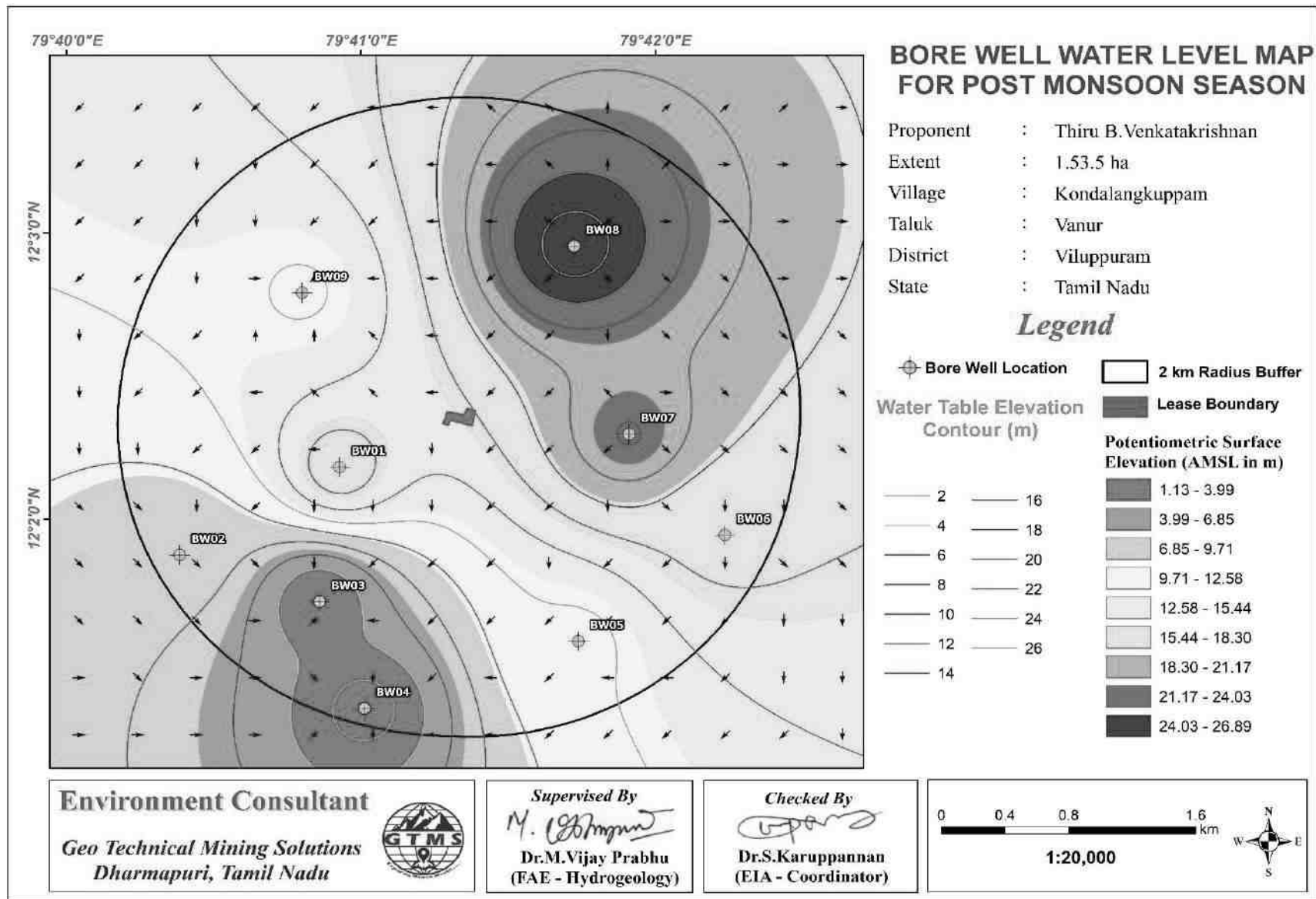


Figure 3.11 Borewell Static Groundwater Elevation Map Showing the Direction of Groundwater Flow During Post-Monsoon Season

### 3.2.3.2 Electrical Resistivity Investigation

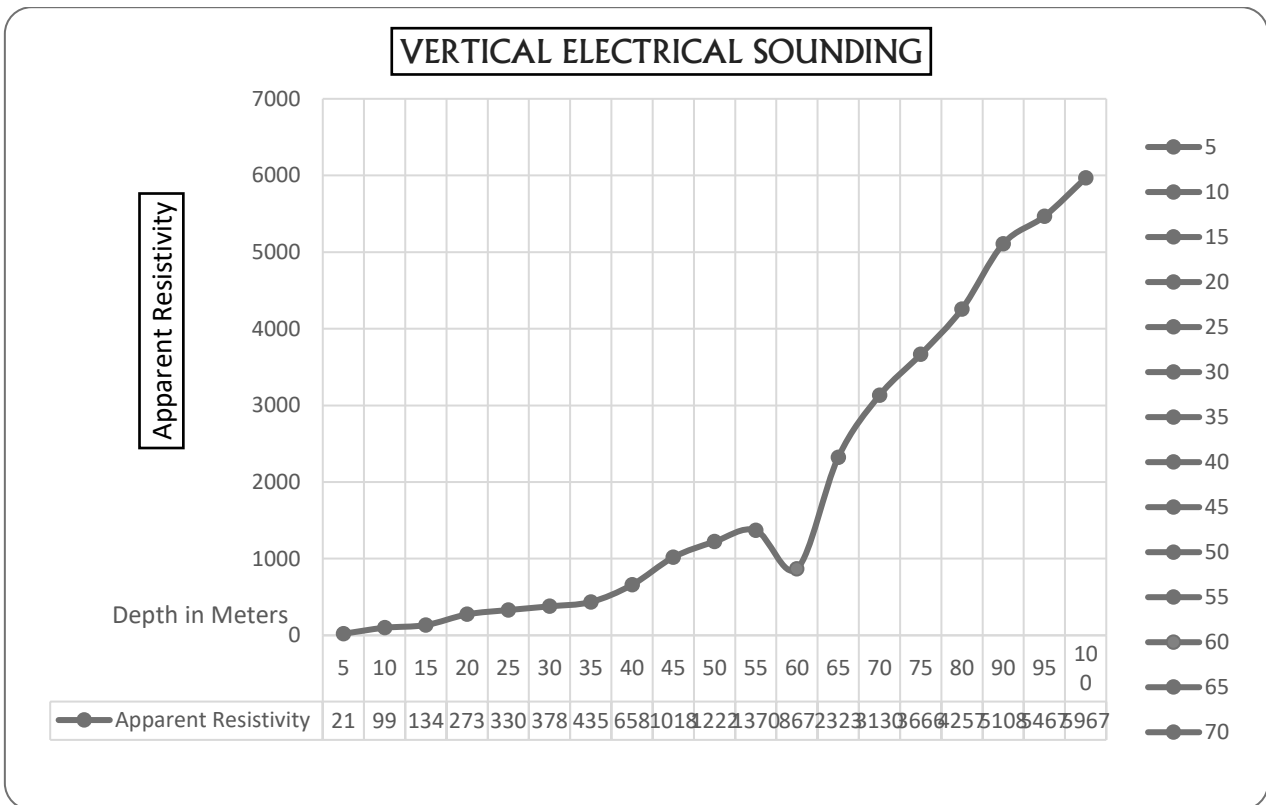
Electrical resistivity investigation is especially useful in the areas where there are no adequate exploratory well data about the aquifer conditions. The present study makes use of vertical electric sounding (VES) to delineate earth's subsurface layers. The electrical resistivity investigation uses 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 - 12° 2'19.10"N 79°41'20.09"E					
S. No.	AB/2 (m)	MN/2 (m)	Geometrical Factor (G)	Resistance in $\Omega$	Apparent Resistivity in $\Omega$ m
1	5	2	16.50	7.410	122.26
2	10	2	75.43	2.446	184.48
3	15	5	62.86	4.540	285.38
4	20	5	117.86	3.260	384.22
5	25	5	188.58	2.630	495.96
6	25	10	82.50	5.940	490.05
7	30	10	125.72	4.209	529.12
8	35	10	176.79	4.060	717.76
9	40	10	235.73	3.680	867.48
10	45	10	302.51	3.550	1073.91
11	50	20	165.01	7.210	1189.65
12	60	20	251.44	3.238	886.42
13	70	20	353.59	3.506	1239.9
14	80	20	471.45	2.712	1281.12
15	90	20	605.03	2.558	1544.68
16	100	20	754.32	2.367	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 Area**

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 2 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 December, 2022 varied from 22.24 to 28.97<sup>0</sup> C with the average of 25.88<sup>0</sup> C; in January, 2023 from 19.73 to 31.58<sup>0</sup> C with the average of 25.17<sup>0</sup> C;

and in February, 2023 from 22.85 to 29.72<sup>0</sup> C with the average of 25.83<sup>0</sup>C. In December, 2022, relative humidity ranged from 67.19 to 92.31 % with the average of 83.88%; in January, 2023, from 49.12 to 100 % with the average of 74.88 %; and in February, 2023, from 46.69 to 89.38 % with the average of 72.94 %. The wind speed in December, 2022 varied from 1.10 to 12.32 m/s with the average of 5.46 m/s; in January, 2023 from 1.49 to 8.12 m/s with the average of 4.69 m/s; and in February, 2023 from 0.56 to 8.07 m/s with the average of 3.95 m/s. In December,2022, wind direction varied from 0.0 to 359.24<sup>0</sup> with the average of 83.12<sup>0</sup>; in January, 2023, from 1.16 to 107.38<sup>0</sup> with the average of 51.82<sup>0</sup>; and in February, 2023, from 3.41 to 117.76<sup>0</sup> with the average of 70.34<sup>0</sup>. In December,2022, surface pressure varied from 100.08 to 101.73 kPa with the average of 100.89 kPa; in January, 2023, from 98.14 to 101.63 kPa with the average of 101.0 kPa; and in February, 2023, from 100.63 to 101.66 kPa with the average of 101.09 kPa.

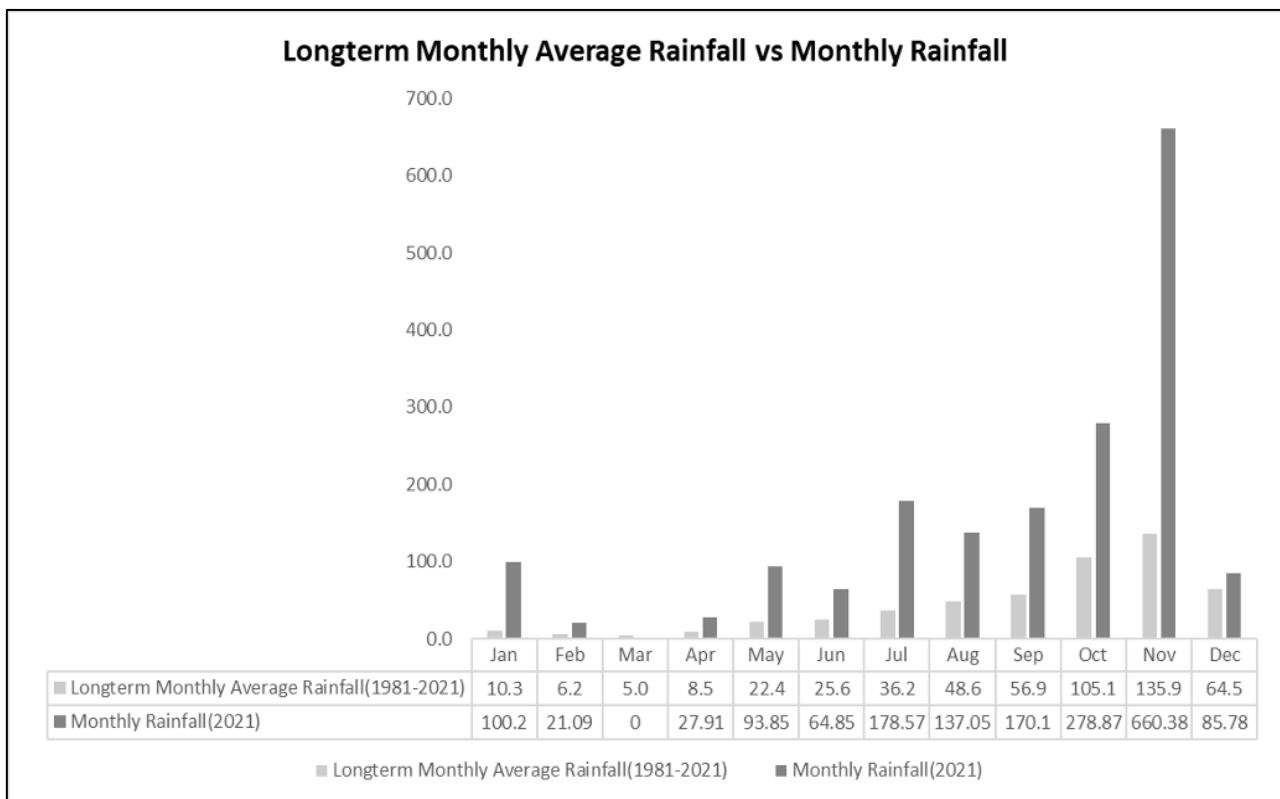
**Table 3.13 Onsite Meteorological Data**

S. No.	Parameters		DEC, 2022	JAN,2023	FEB,2023
1	Temperature ( <sup>0</sup> C)	Min	22.24	19.73	22.85
		Max	28.97	31.58	29.72
		Avg	25.88	25.17	25.83
2	Relative Humidity (%)	Min	67.19	49.12	46.69
		Max	92.31	100.00	89.38
		Avg	83.88	74.88	72.94
3	Wind Speed (m/s)	Min	1.10	1.49	0.56
		Max	12.32	8.12	8.07
		Avg	5.46	4.69	3.95
4	Wind Direction (degree)	Min	0.00	1.16	3.41
		Max	359.24	107.38	117.76
		Avg	83.12	51.82	70.34
5	Surface Pressure(kPa)	Min	100.08	98.14	100.63
		Max	101.73	101.63	101.66
		Avg	100.89	101.00	101.09

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

## Rainfall

Rainfall data for the study area were collected for the period of 1981-2021 (POWER | Data Access Viewer (nasa.gov)). Long term monthly average rainfall was estimated from the data of 1981-2021 and compared with the monthly rainfall for the year 2021. The Figure 3.13 shows that long-term monthly average rainfall shows an increasing trend from March through November during the period of 1981-2021 and is higher in November of every year. Particularly, monthly average rainfall shows an increasing trend in September through November of 2021 than the previous years and is higher in November 2021 when compared to monthly average of 30 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 December through February of the years from 2018 to 2021 and the seasonal wind rose for the study period of December through February 2022-2023. The wind rose diagrams thus produced are shown in Figures 3.14, 3.14a, 3.15 reveals that:

- ❖ The measured average wind velocity during the study period is 4.76 m/s.
- ❖ Predominant wind was dominant in the directions ranging from northeast to southwest.



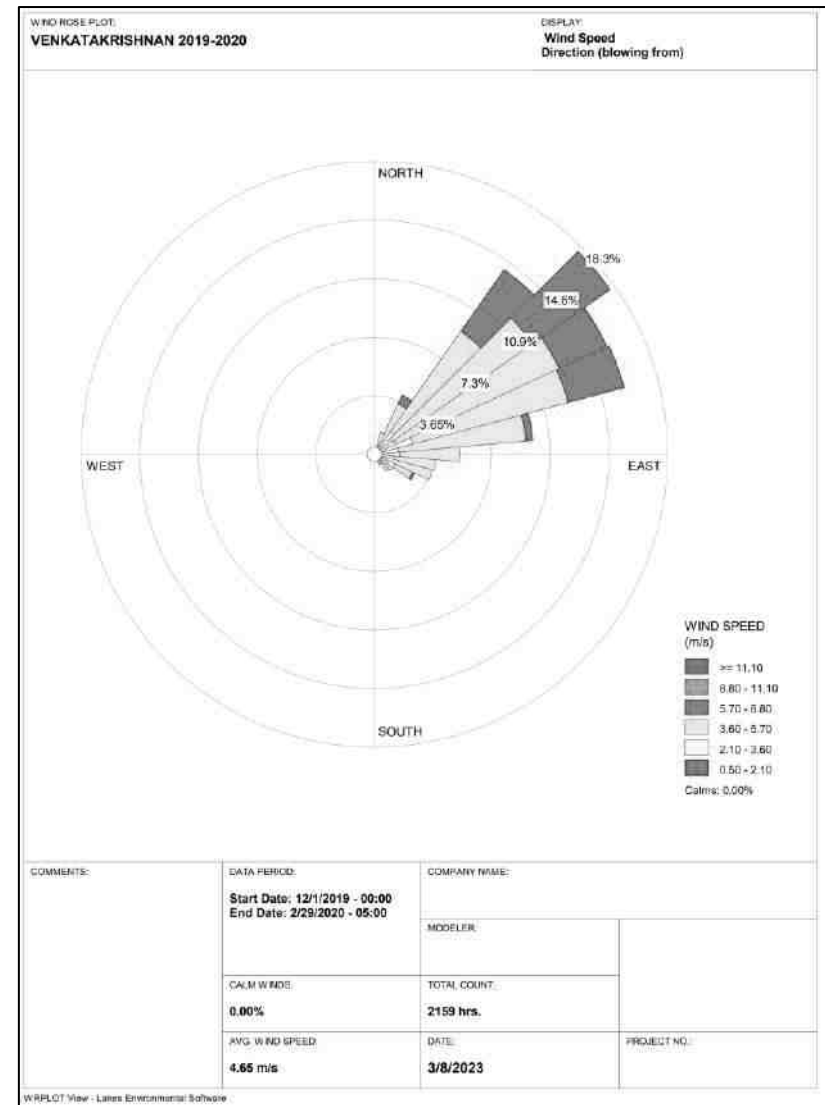
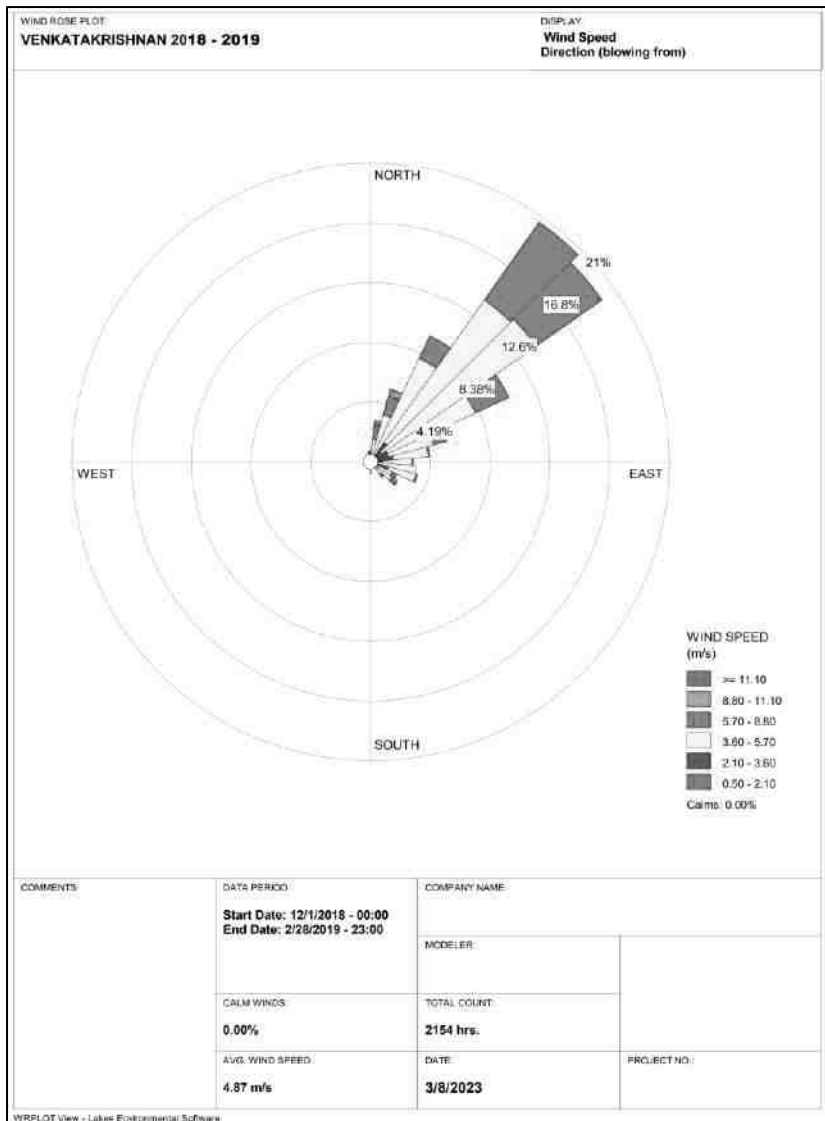
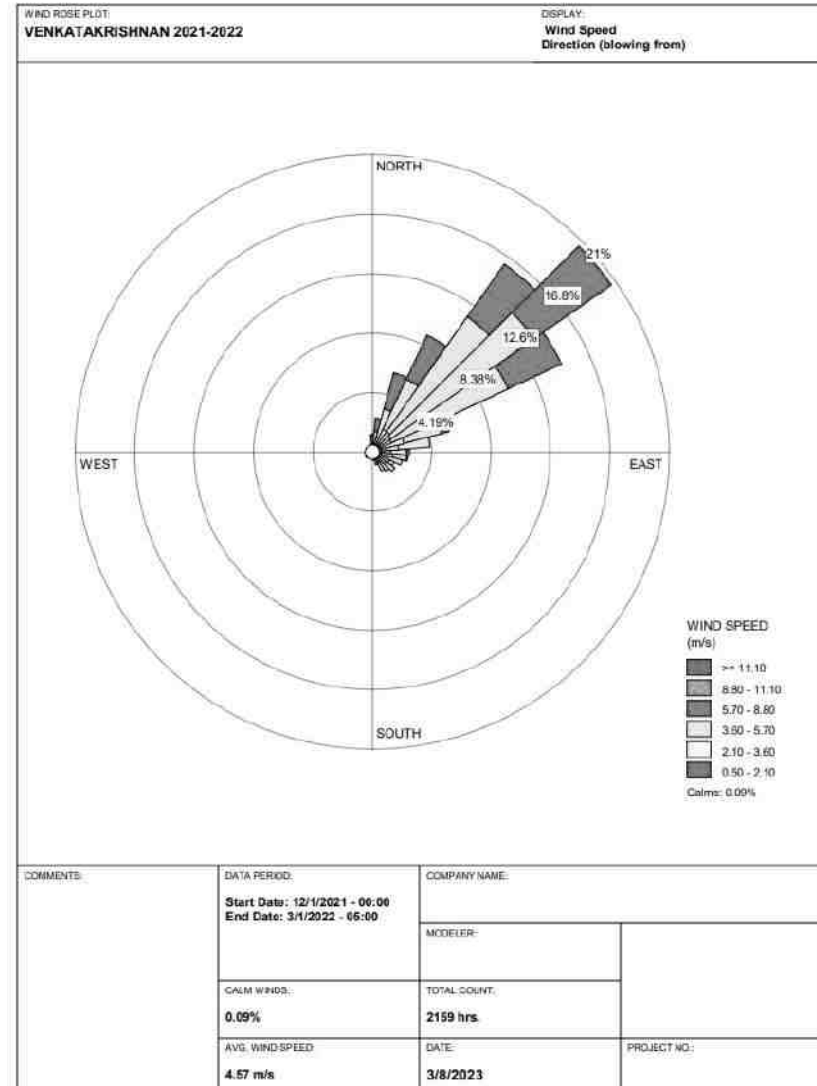
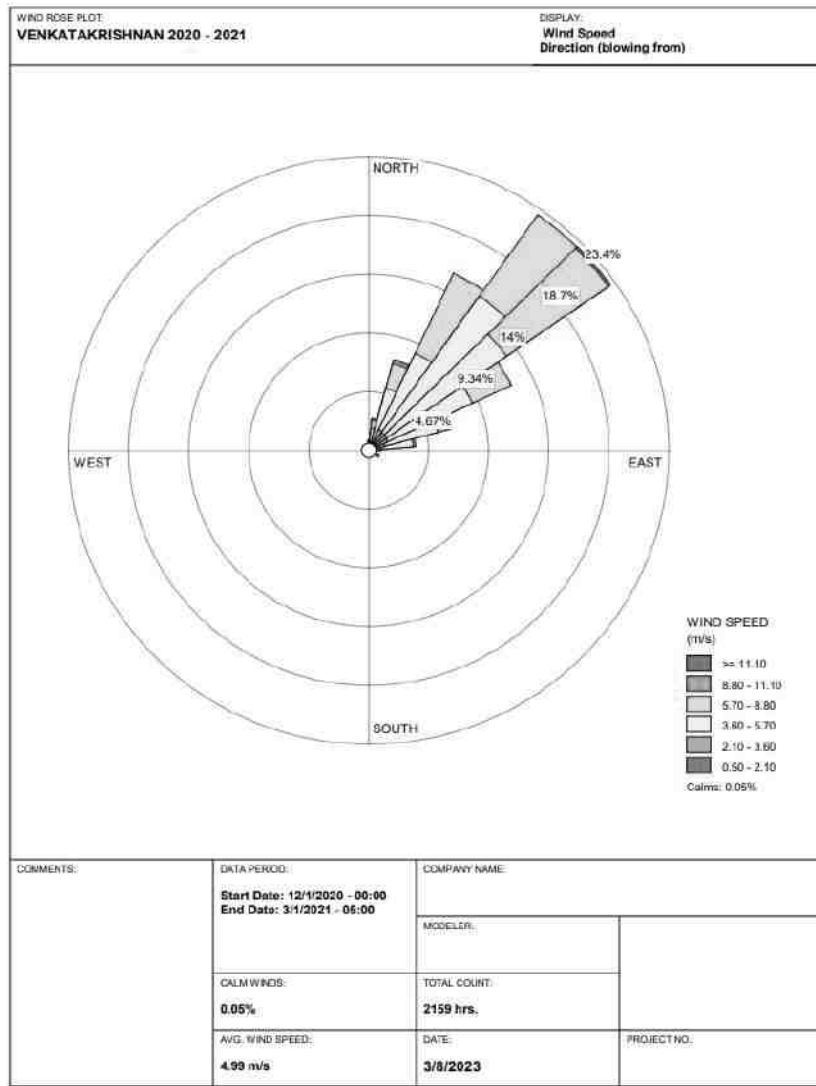
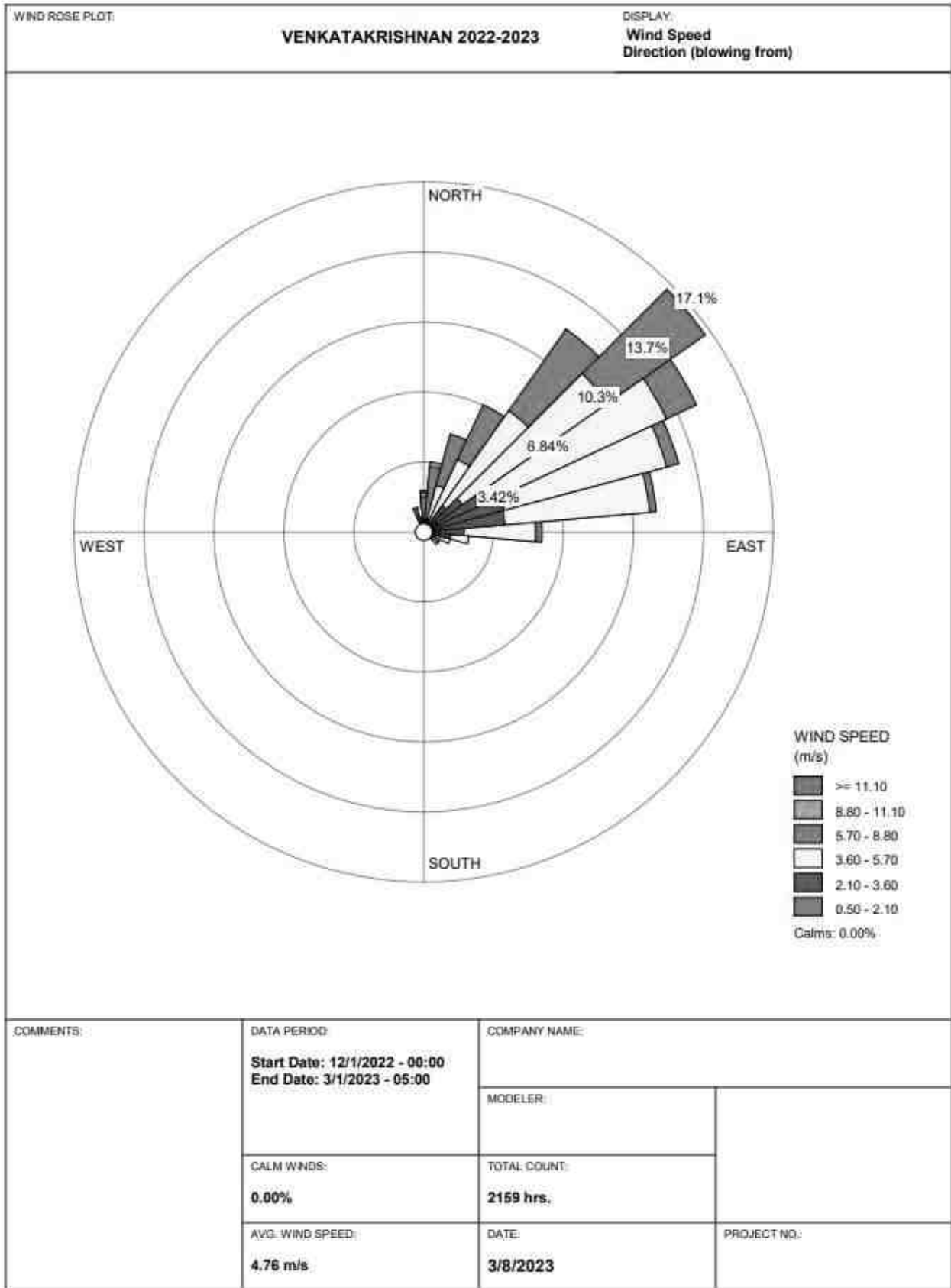


Figure 3.14 Windrose Diagram for 2018-2019 and 2019-2020 (December to February)



**Figure 3.14(A) Windrose Diagram for 2020-2021 and 2021-2022 (December to February)**



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 <sub>2.5</sub>	Gravimetric method	Fine Particulate Sampler
	Beta attenuation method	Make – Thermo Environmental Instruments – TEI 121
PM <sub>10</sub>	Gravimetric method	Respirable Dust Sampler
	Beta attenuation method	Make –Thermo Environmental Instruments – TEI 108
SO <sub>2</sub>	IS-5182 Part II (Improved West & Gaeke method)	Respirable Dust Sampler with gaseous attachment
NO <sub>x</sub>	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 Service (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 <sub>2</sub> (µg/m <sup>3</sup> )	Annual Avg.*	50.0	20.0
		24 hours**	80.0	80.0
2	NO <sub>2</sub> (µg/m <sup>3</sup> )	Annual Avg.	40.0	30.0
		24 hours	80.0	80.0
3	PM <sub>10</sub> (µg/m <sup>3</sup> )	Annual Avg.	60.0	60.0
		24 hours	10 <sup>o</sup> .0	10 <sup>o</sup> .0
4	PM <sub>2.5</sub> (µg/m <sup>3</sup> )	Annual Avg.	40.0	40.0
		24 hours	60.0	60.0

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

## Methodology

Ambient air quality monitoring was carried out with a frequency of two samples per week at Seven (7) locations, adopting a continuous 24 hourly (3 shift of 8-hour) schedule for the period **December 2022 to February 2023** as per the CPCB, MoEF guidelines and notifications.

It was ensured that the equipment was placed preferably at a height of at least  $3 \pm 0.5\text{m}$  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  $\text{PM}_{2.5}$ ,  $\text{PM}_{10}$ , sulphur dioxide ( $\text{SO}_2$ ) and nitrogen dioxide ( $\text{NO}_2$ ). The sampling locations are shown in Figure 3.16 and average concentrations of air pollutants are summarized in Tables 3.16.

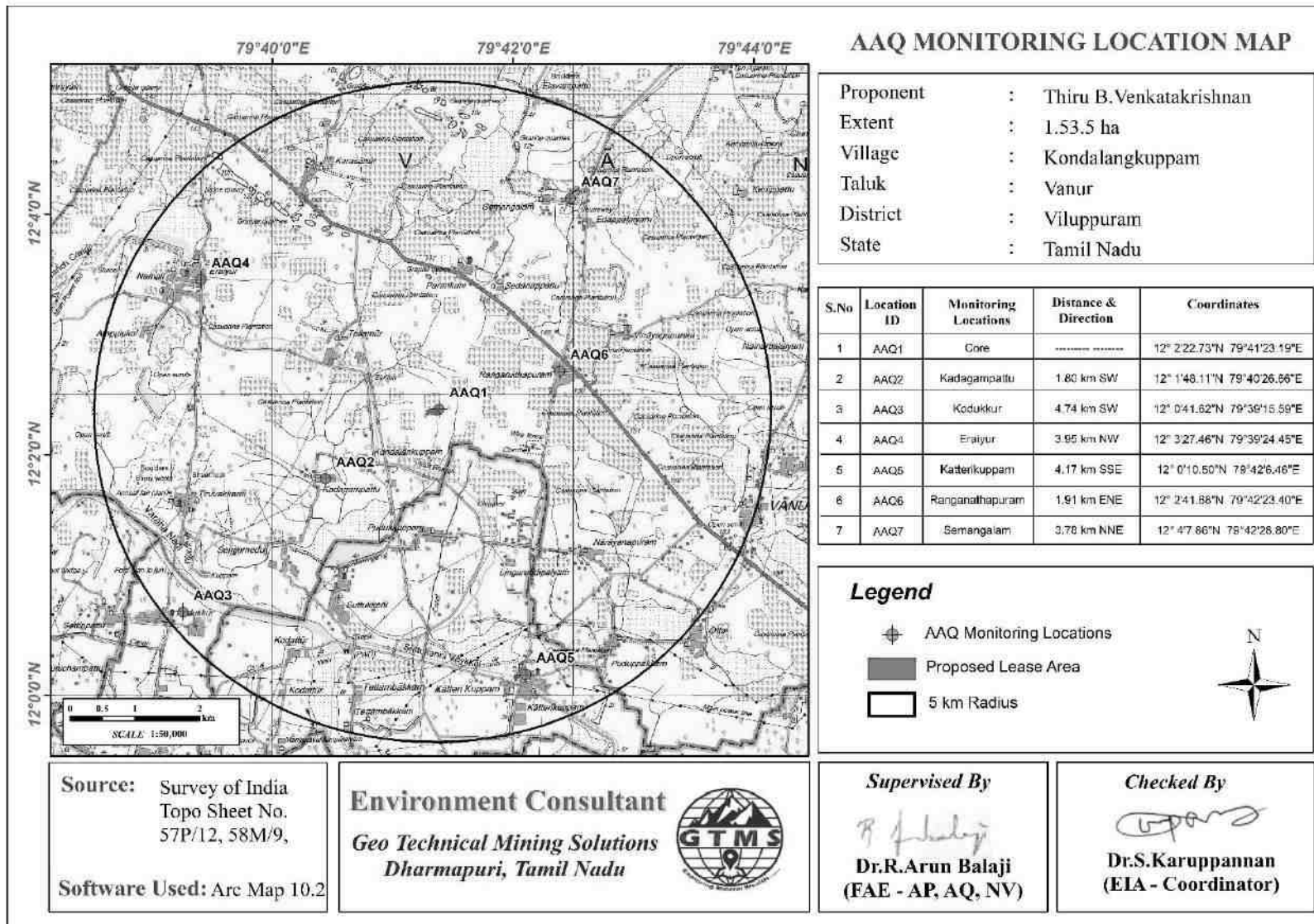
**Table 3.16 Ambient Air Quality (AAQ) Monitoring Locations**

S. No.	Sampling ID	Location	Distance	Coordinates
1	AAQ1	Core	---	12° 2'22.73"N,79°41'23.19"E
2	AAQ2	Kadagampattu	1.80km SW	12° 1'48.11"N,79°40'26.66"E
3	AAQ3	Kodukkur	4.74km SW	12° 0'41.62"N,79°39'15.59"E
4	AAQ4	Eraiyr	3.95km NW	12° 3'27.46"N,79°39'24.45"E
5	AAQ5	Katterikuppam	4.17km SSE	12° 0'10.50"N,79°42'6.46"E
6	AAQ6	Ranganathapuram	1.91km ENE	12° 2'41.68"N,79°42'23.40"E
7	AAQ7	Semangalam	3.78km NNE	12° 4'7.86"N,79°42'28.80"E

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

## Results

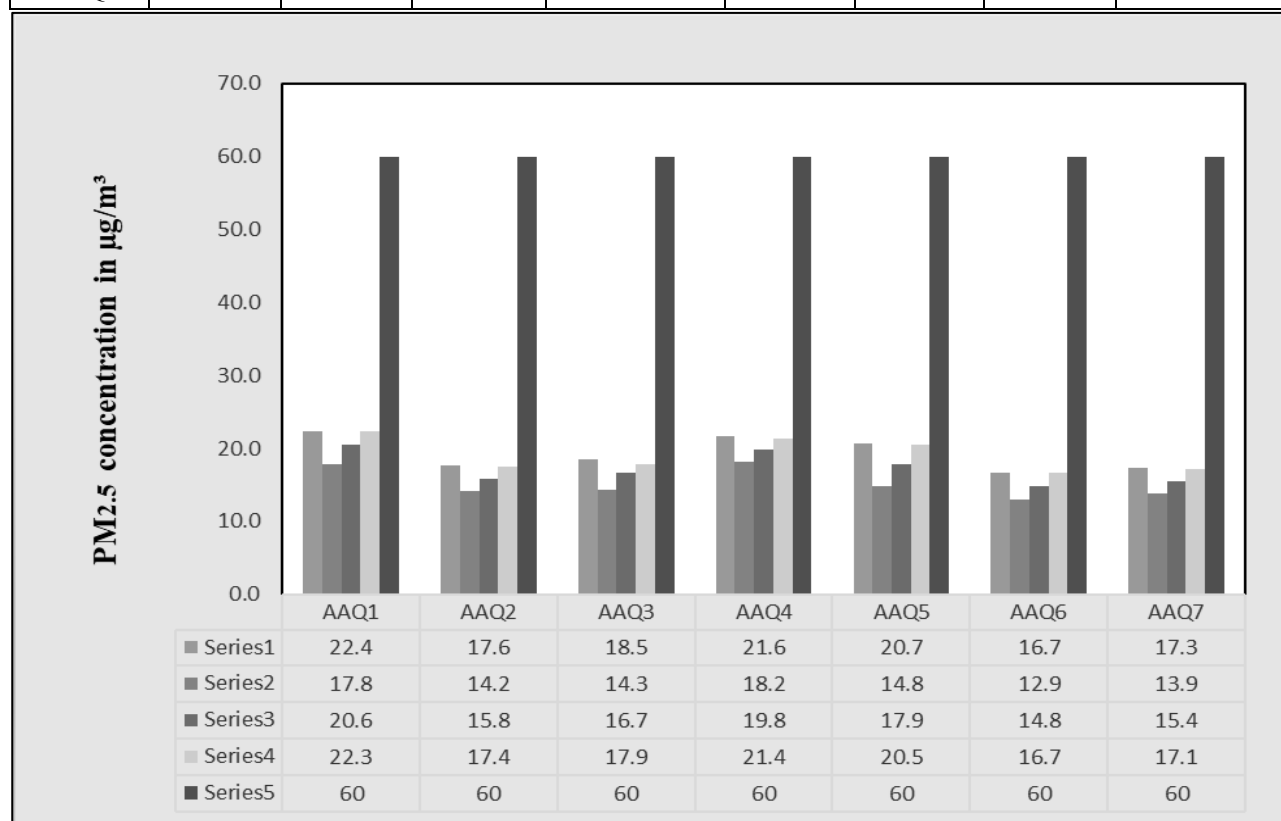
As per the monitoring data,  $\text{PM}_{2.5}$  ranges from  $15.2 \mu\text{g}/\text{m}^3$  to  $19.3 \mu\text{g}/\text{m}^3$ ;  $\text{PM}_{10}$  from  $32.3 \mu\text{g}/\text{m}^3$  to  $36.9 \mu\text{g}/\text{m}^3$ ;  $\text{SO}_2$  from  $6.9 \mu\text{g}/\text{m}^3$  to  $10.0 \mu\text{g}/\text{m}^3$ ;  $\text{NO}_x$  from  $13.0 \mu\text{g}/\text{m}^3$  to  $18.9 \text{g}/\text{m}^3$ . The concentration levels of the pollutants fall within the acceptable limits of NAAQS prescribed by CPCB.



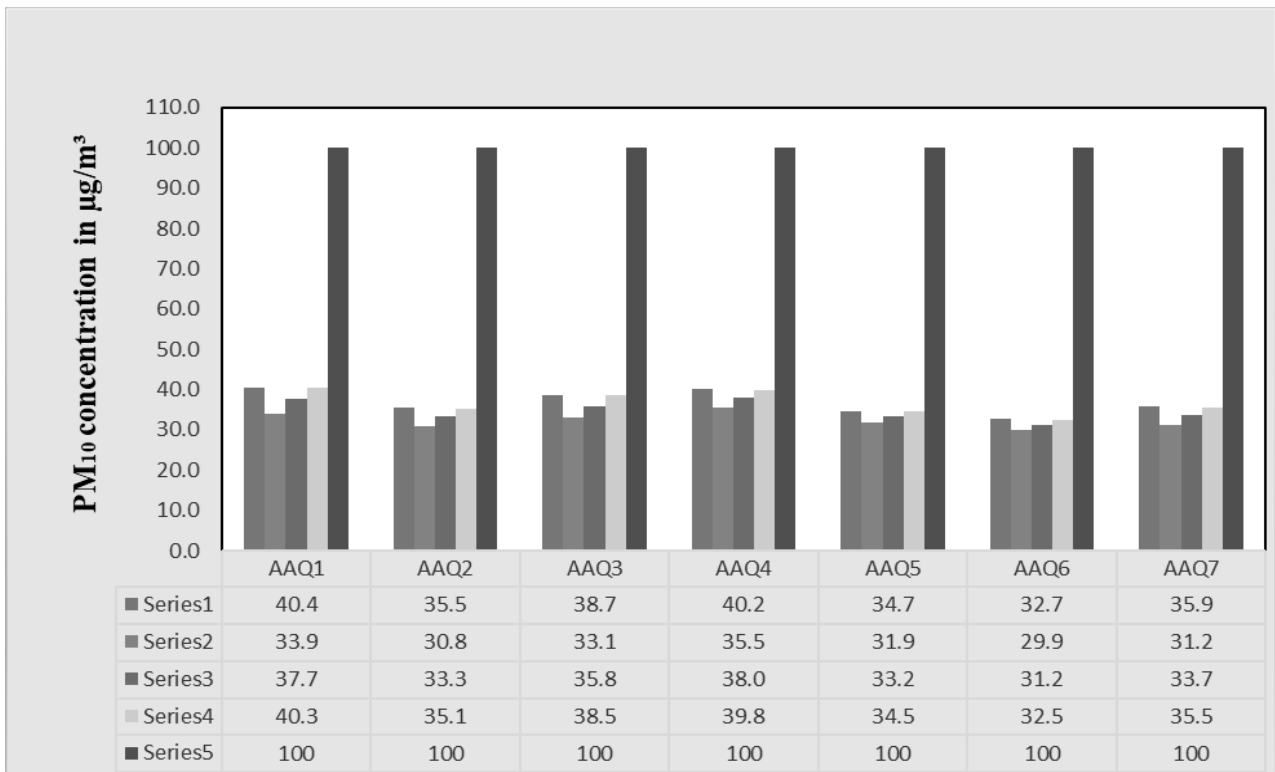
**Figure 3.16 Toposheet Showing Ambient Air Quality Monitoring Station Locations around 5 km Radius from the Proposed Project Site**

**Table 3.17 Summary of AAQ Result**

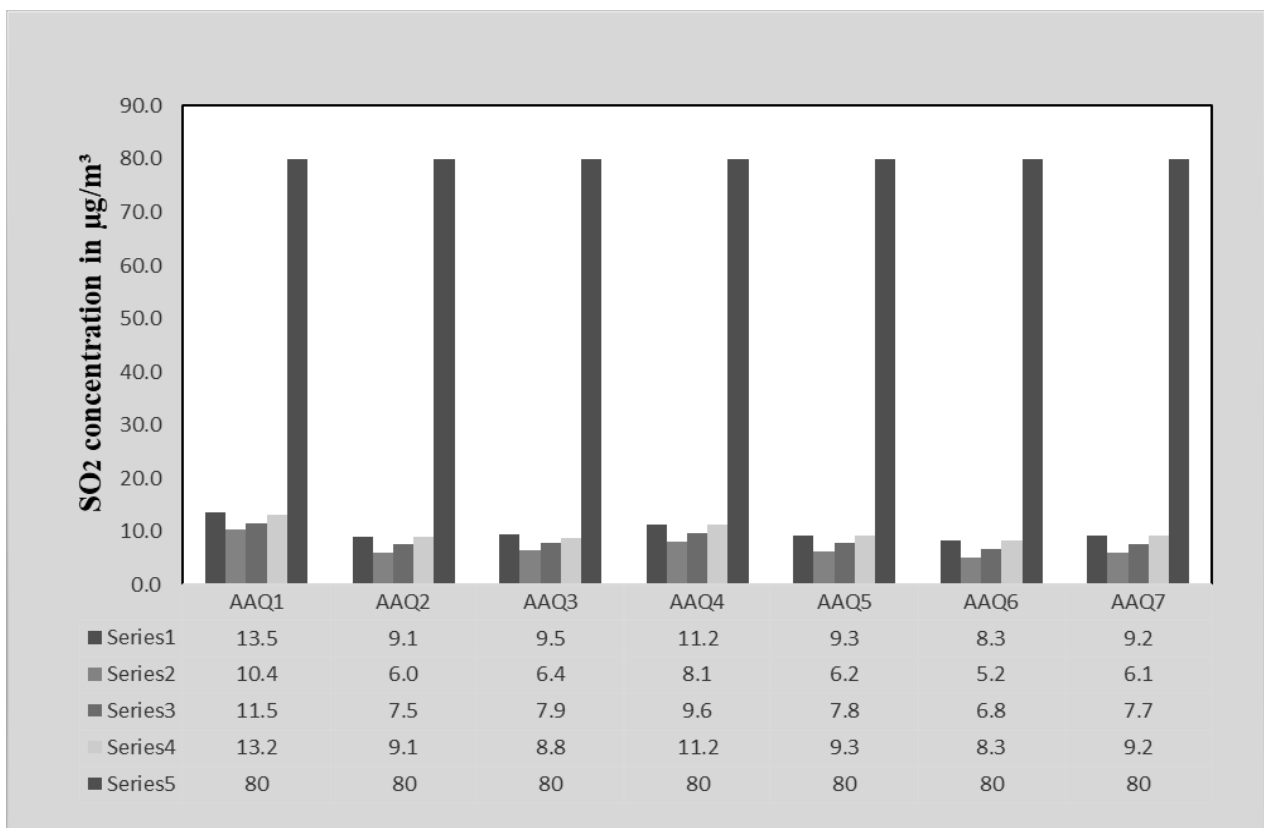
PM <sub>2.5</sub>					PM <sub>10</sub>			
Station ID	Max	Min	Mean	98 <sup>th</sup> Percentile	Max	Min	Mean	98 <sup>th</sup> Percentile
AAQ1	22.4	17.8	20.6	22.3	40.4	33.9	37.7	40.3
AAQ2	17.6	14.2	15.8	17.4	35.5	30.8	33.3	35.1
AAQ3	18.5	14.3	16.7	17.9	38.7	33.1	35.8	38.5
AAQ4	21.6	18.2	19.8	21.4	40.2	35.5	38.0	39.8
AAQ5	20.7	14.8	17.9	20.5	34.7	31.9	33.2	34.5
AAQ6	16.7	12.9	14.8	16.7	32.7	29.9	31.2	32.5
AAQ7	17.3	13.9	15.4	17.1	35.9	31.2	33.7	35.5
SO <sub>2</sub>					NO <sub>2</sub>			
AAQ1	13.5	10.4	11.5	13.2	21.9	17.7	19.5	21.9
AAQ2	9.1	6.0	7.5	9.1	18.6	12.7	15.8	18.4
AAQ3	9.5	6.4	7.9	8.8	19.8	8.6	16.8	19.6
AAQ4	11.2	8.1	9.6	11.2	20.7	14.8	17.9	20.5
AAQ5	9.3	6.2	7.8	9.3	17.7	14.1	16.0	17.5
AAQ6	8.3	5.2	6.8	8.3	15.9	12.3	14.2	15.7
AAQ7	9.2	6.1	7.7	9.2	17.9	11.0	15.0	17.3



**Figure 3.17 Bar chart showing maximum, minimum, and the average concentrations of PM<sub>2.5</sub> measured from the seven air quality monitoring stations within 5 km radius**

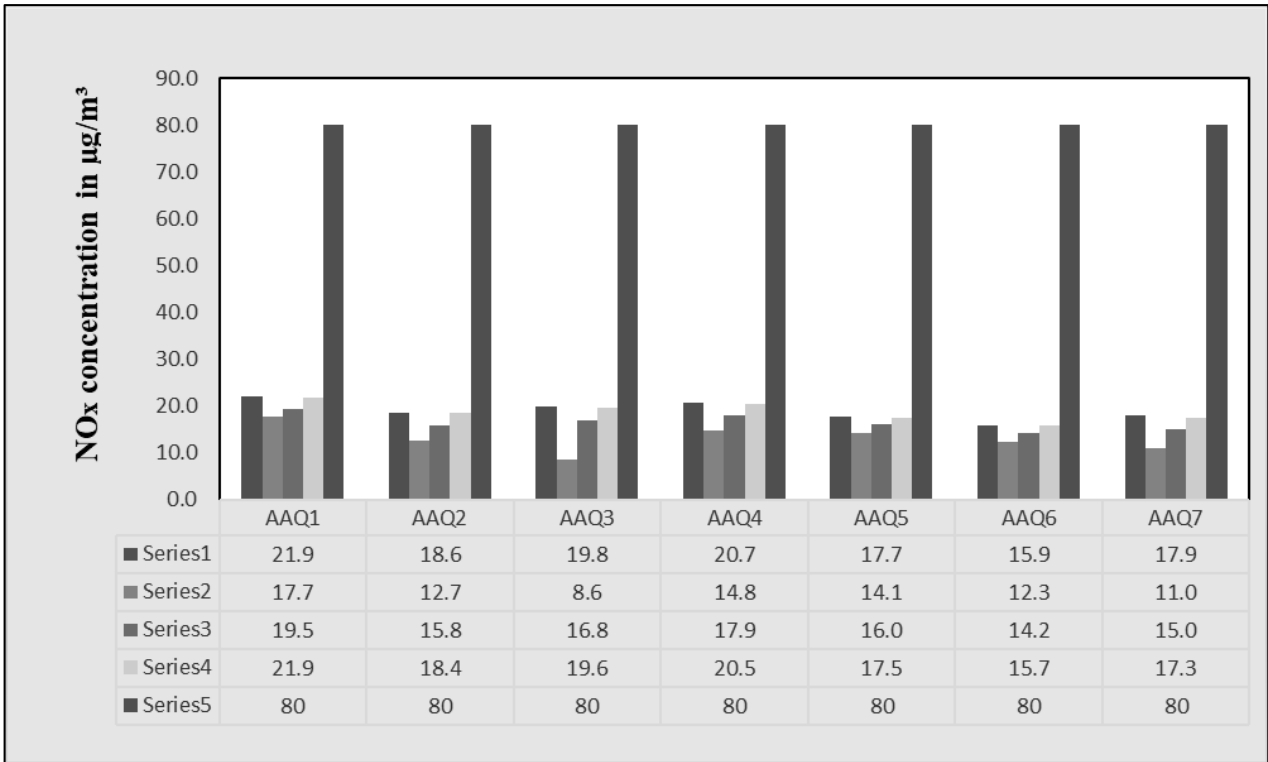


**Figure 3.18 Bar chart showing maximum, minimum, and the average concentrations of PM<sub>10</sub> measured from the seven air quality monitoring stations within 5 km radius**

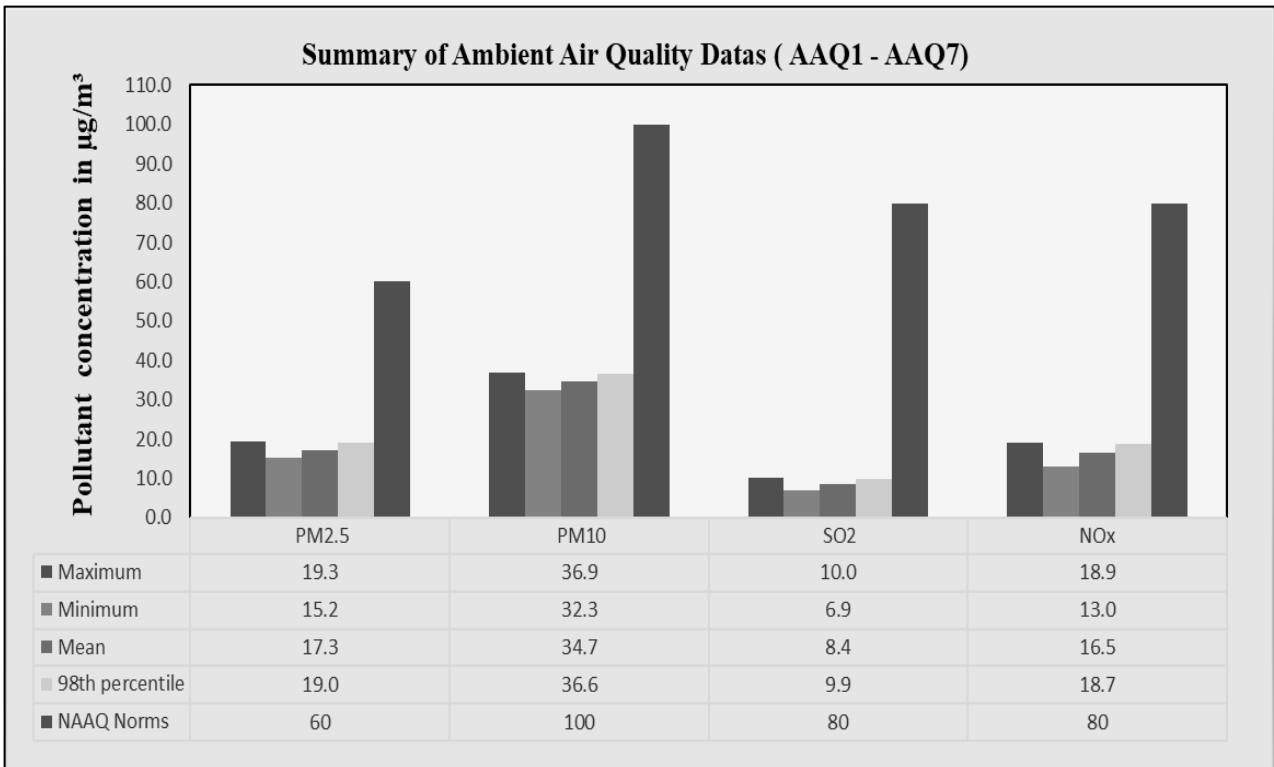


**Figure 3.19 Bar chart showing maximum, minimum, and the average concentrations of SO<sub>2</sub> measured from the seven air quality monitoring stations within 5 km radius**





**Figure 3.20** Bar chart showing maximum, minimum, and the average concentrations of NO<sub>x</sub> 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 3.24.

**Table 3.18 Noise Monitoring Locations**

S. No.	Sampling ID	Location	Distance	Coordinates
1	N1	Core	--	12° 2'22.73"N, 79°41'23.19"E
2	N2	Thollamur	1.69km NNW	12° 2'53.93"N, 79°40'31.53"E
3	N3	Kadagampattu	1.80km SW	12° 1'48.11"N, 79°40'26.66"E
4	N4	Kodukkur	4.74km SW	12° 0'41.62"N, 79°39'15.59"E
5	N5	Eraiyrur	3.95km NW	12° 3'27.46"N, 79°39'24.45"E
6	N6	Katterikuppam	4.17km SSE	12° 00'10.50"N, 79°42'23.46"E
7	N7	Ranganathapuram	1.91km ENE	12° 2'41.68"N, 79°42'23.40"E
8	N8	Semangalam	3.78km NNE	12° 4'7.86"N, 79°42'28.80"E

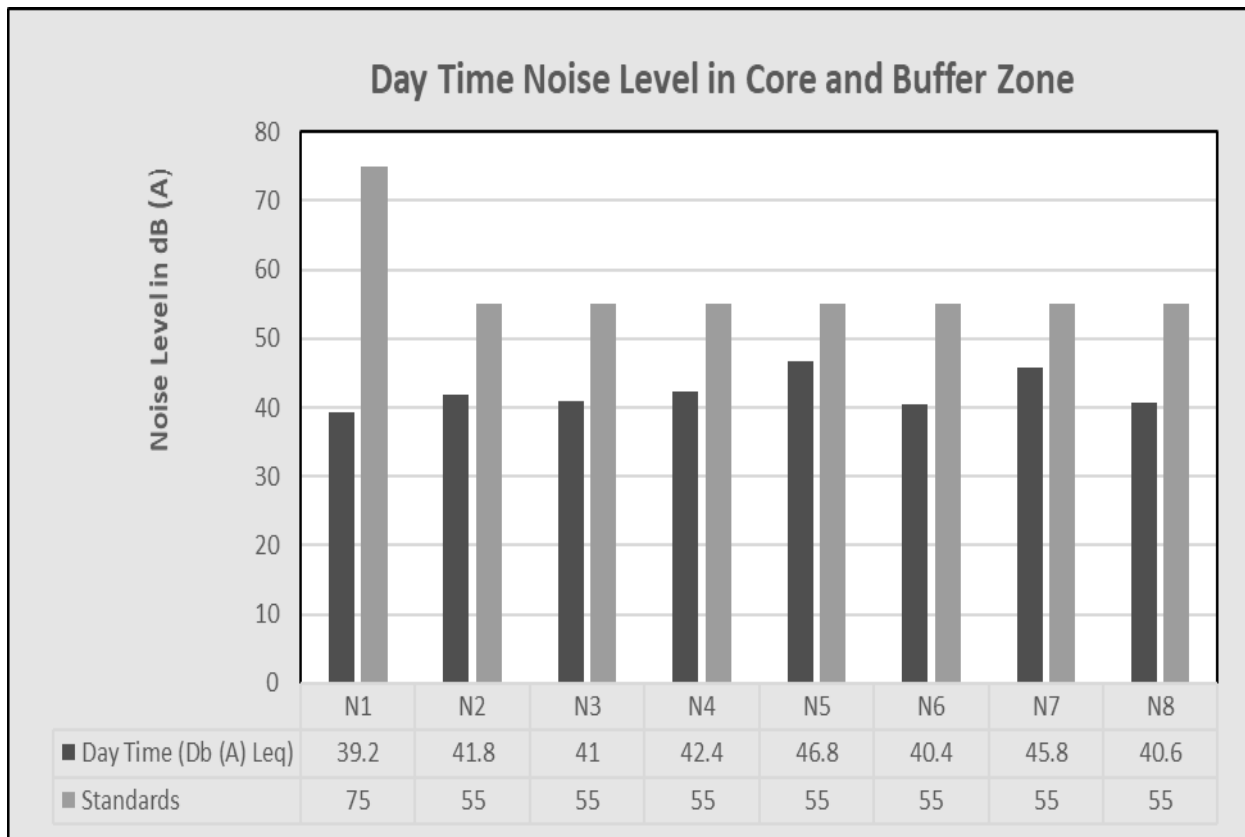
Source: On-site monitoring/sampling by *Ekdant Enviro Service (P) Limited* in association with GTMS

**Table 3.19 Ambient Noise Quality Result**

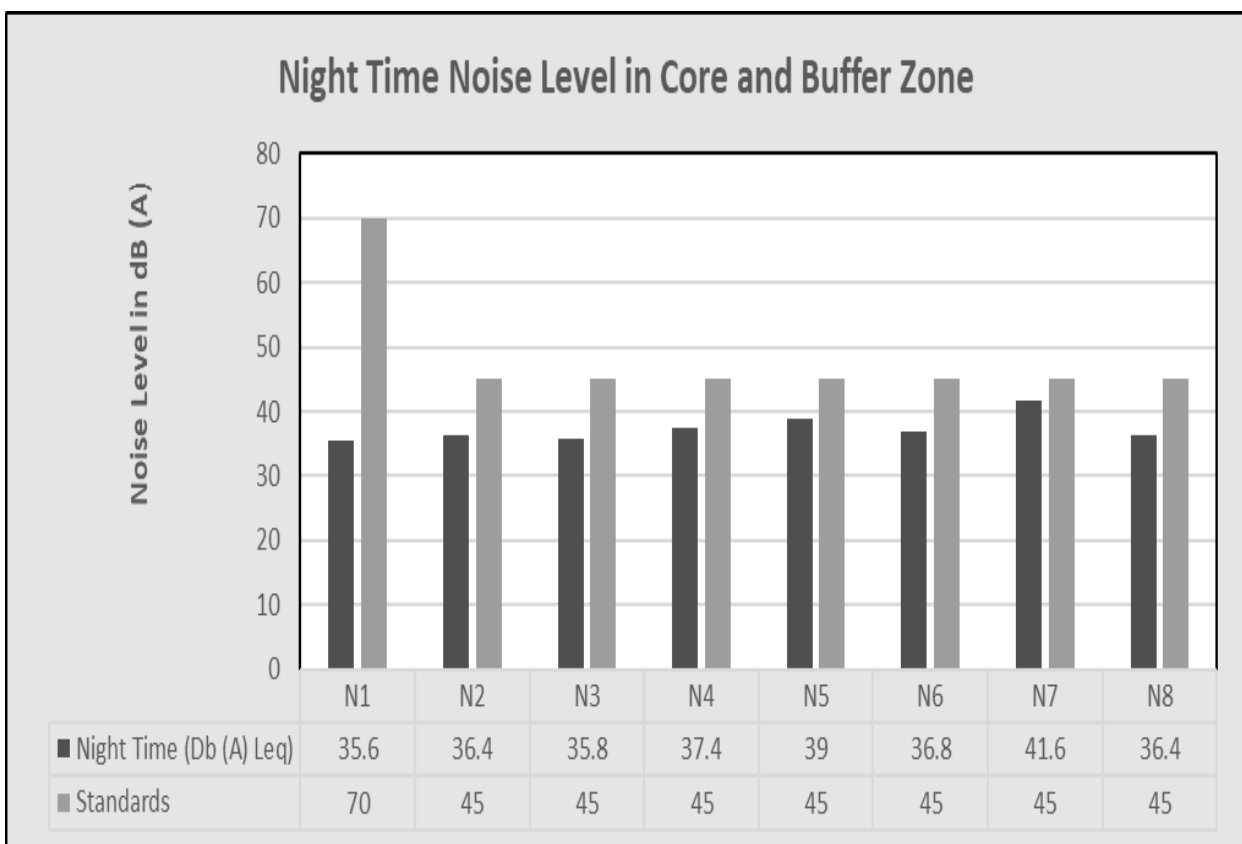
Station ID	Location	Environmental setting	Average day noise level (dB(A))	Average night noise level (dB(A))	Day time (6.00 AM – 10.00 PM)	Night time (10.00 PM – 6.00 AM)
					Standard (L <sub>eq</sub> in dB (A))	
N1	Core	Industrial area	39.2	35.6	75	70
N2	Thollamur	Residential area	41.8	36.4	55	50
N3	Kadagampattu	Residential area	41.0	35.8	55	50
N4	Kodukkur	Residential area	42.4	37.4	55	50
N5	Eraiyrur	Residential area	46.8	39.0	55	50
N6	Katterikuppam	Residential area	40.4	36.8	55	50
N7	Ranganathapuram	Residential area	45.8	41.6	55	50
N8	Semangalam	Residential area	40.6	36.4	55	50

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

The Table 3.18 shows that noise level in core zone was 39.2 dB (A) Leq during day time and 35.6 dB(A) Leq during night time. Noise levels recorded in buffer zone during day time varied from 40.4 to 46.8 dB (A) Leq and during night time from 35.8 to 41.6 dB (A) Leq. Thus, the noise level for industrial and residential area meets the requirements of CPCB. The results are also depicted below in Figures 3.22 and 3.23.



**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**

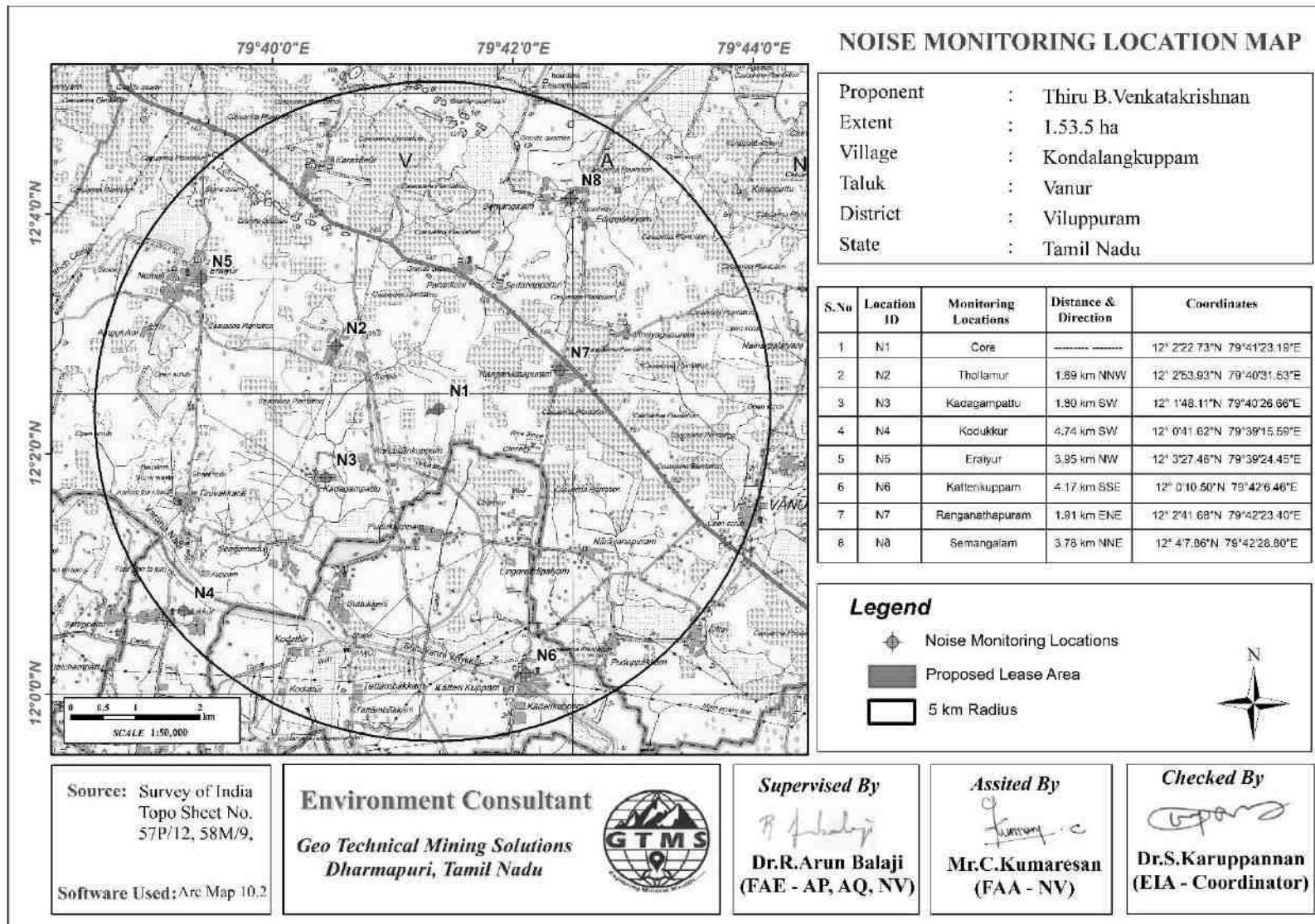


Figure 3.24 Toposheet showing noise level monitoring station locations around 5 km radius from the proposed project site

### 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	$H = -\sum [(p_i) * \ln(p_i)]$ 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 Vanur Taluk***

The major crops of the district are paddy, groundnut, oilseeds, sugarcane and banana. Kondalanguppam village and Vanur taluk are major paddy areas. A large amount of paddy is cultivated. Tree species of Casuarina and teak are cultivated. Showing in figure 3.26

#### ***Flora in mine lease area (core zone)***

Quarry leases have a large number of *Acacia holoseicea* plants whose seeds are wind-dispersed so that they are abundant both inside and outside the quarry leases area. It contains a total of 18 species belonging to 16 families have been recorded from the buffer zone. 3 Trees (16%), 6 Shrubs (33%) and 9 Herbs (50%) were identified. Details of flora with the scientific Name Details Mention in Table 3.22.

#### ***Flora within 300 m radius Zone***

A variety of plant species are found within a radius of 300 meters. It is an arid landscape. There is no agricultural land nearby. It contains a total of 36 species belonging to 22 families have been recorded from the buffer zone. 9 Trees (25%), 7 Shrubs (19%) and 23 Herbs and Climbers, Creeper, Grass & Cactus (69%) were identified. Details of flora with the scientific name details and of diversity species Rich ness index were mentioned in Table 3.25 and figure 3.27. There is no threat to the Flora species in 300-meter radius.

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

Similar type of environment also in buffer area but with more flora diversity compare than core zone area. It contains a total of species belonging to 40 families have been recorded from the buffer zone. The floral (81) varieties among them 35 Trees (38%), 15 Shrubs (18%) Herbs and Climbers, Creeper, Grass & Cactus, 31 (38%) were identified. Details of flora with the scientific name details of diversity species Rich ness index were mentioned in Table 3.30 and figure 3.28



**Figure 3.26 Agriculture Cropping Pattern in Vanur Taluk**



**Table 3.22 Flora in Mine Lease area**

S.No	Local Name	Scientific name	Family name	Total No. of species	Total of Quadrants with species	Total No. of Quadrants	Density	Frequency (%)	Abundance	Relative Density	Relative Frequency	IVI	IUCN Conservation Status
<b>Trees</b>													
1	Munderi maram	<i>Anacardium occidentale</i>	Anacardiaceae	2	2	5	0.4	40.0	1.0	28.6	33.3	61.9	Not Listed
2	Teak maram	<i>Tectona grandis</i>	Lamiaceae	1	1	5	0.2	20.0	1.0	14.3	16.7	31.0	Not Listed
3	Echamaram	<i>Arenga engleri Becc</i>	Arecaceae	4	3	5	0.8	60.0	1.3	57.1	50.0	107.1	Not Listed
<b>Shrubs</b>													
1	Erukku	<i>Calotropis gigantea</i>	Apocynaceae	6	5	8	0.8	62.5	1.2	11.8	14.7	26.5	Not Listed
2	Thuthi	<i>Abutilon indicum</i>	Meliaceae	6	6	8	0.8	75.0	1.0	11.8	17.6	29.4	Not Listed
3	Avarai	<i>Senna auriculata</i>	Fabaceae	5	5	8	0.6	62.5	1.0	9.8	14.7	24.5	Not Listed
4	Unichadi	<i>Lantana camara</i>	Verbenaceae	7	6	8	0.9	75.0	1.2	13.7	17.6	31.4	Not Listed
5	Suraimullu	<i>Zizyphus Oenoplia</i>	Rhamnaceae	5	4	8	0.6	50.0	1.3	9.8	11.8	21.6	Not Listed
6	Acacia	<i>Acacia holosecicea</i>	Fabaceae	22	8	8	2.8	100.0	2.8	43.1	23.5	66.7	Not Listed
<b>Herbs</b>													
1	Nayuruvi	<i>Achyranthes aspera</i>	Amaranthaceae	7	6	8	0.9	75.0	1.2	13.7	14.3	28.0	Not Listed
2	Nearunji mull	<i>Tribulus zeyheri Sond</i>	Zygophyllaceae	6	5	8	0.8	62.5	1.2	11.8	11.9	23.7	
3	pill	<i>Cenchrus ciliaris</i>	Poaceae	4	3	8	0.5	37.5	1.3	7.8	7.1	15.0	Not Listed
4	pulapoo	<i>Aerva lanata</i>	Amaranthaceae	6	4	8	0.8	50.0	1.5	11.8	9.5	21.3	Not Listed
5	Rail poondu	<i>Croton bonplandianus</i>	Euphorbiaceae	8	6	8	1.0	75.0	1.3	15.7	14.3	30.0	Not Listed
6	Perandai	<i>Cissus quadrangularis</i>	Vitaceae	3	3	8	0.4	37.5	1.0	5.9	7.1	13.0	Not Listed
7	Thumbai chadi	<i>Leucas aspera</i>	Lamiaceae	6	5	8	0.8	62.5	1.2	11.8	11.9	23.7	Not Listed
8	Kolunji	<i>Tephrosia purpurea</i>	Fabaceae	7	7	8	0.9	87.5	1.0	13.7	16.7	30.4	Not Listed
9	Sapathikalli	<i>Opuntia ficus-indica</i>	Cactaceae	4	3	8	0.5	37.5	1.3	7.8	7.1	15.0	Not Listed

**Table 3.23 Flora in 300-meter radius**

S.No	Local Name	Scientific name	Family name	Total No. of species	Total of Quadrants with species	Total No. of Quadrants	Density	Frequency (%)	Abundance	Relative Density	Relative Frequency	IVI	IUCN Conservation Status
<b>Trees</b>													
1	Karuvealan	<i>Prosopis juliflora</i>	Fabaceae	5	4	10	0.5	40.0	1.3	15.6	16.7	32.3	Not Listed
2	Palm tree	<i>Borassus flabellifer</i>	Fabaceae	4	3	10	0.4	30.0	1.3	12.5	12.5	25.0	Not Listed
3	Vembu	<i>Azadirachta indica</i>	Meliaceae	3	2	10	0.3	20.0	1.5	9.4	8.3	17.7	Not Listed
4	Unjai maram	<i>Albizia amara</i>	Fabaceae	4	3	10	0.4	30.0	1.3	12.5	12.5	25.0	Not Listed
5	Vetpalai	<i>Wrightia tinctoria</i>	Apocynaceae	3	2	10	0.3	20.0	1.5	9.4	8.3	17.7	Not Listed
6	Munderi maram	<i>Anacardium occidentale</i>	Anacardiaceae	4	3	10	0.4	30.0	1.3	12.5	12.5	25.0	Not Listed
7	Teak maram	<i>Tectona grandis</i>	Lamiaceae	5	4	10	0.5	40.0	1.3	15.6	16.7	32.3	Not Listed
8	Echamaram	<i>Arenga engleri Becc</i>	Arecaceae	4	3	10	0.4	30.0	1.3	12.5	12.5	25.0	Not Listed
<b>Shrubs</b>													
1	Erukku	<i>Calotropis gigantea</i>	Apocynaceae	6	5	15	0.4	33.3	1.2	11.8	11.4	23.1	Not Listed
2	Uumaththai	<i>Datura metel</i>	Solanaceae	7	6	15	0.5	40.0	1.2	13.7	13.6	27.4	Not Listed
3	Thuthi	<i>Abutilon indicum</i>	Meliaceae	8	7	15	0.5	46.7	1.1	15.7	15.9	31.6	Not Listed
4	Avarai	<i>Senna auriculata</i>	Fabaceae	9	8	15	0.6	53.3	1.1	17.6	18.2	35.8	Not Listed
5	Unichadi	<i>Lantana camara</i>	Verbenaceae	6	5	15	0.4	33.3	1.2	11.8	11.4	23.1	Not Listed
6	suraimullu	<i>Zizyphus Oenoplia</i>	Rhamnaceae	7	6	15	0.5	40.0	1.2	13.7	13.6	27.4	Not Listed
7	Acacia	<i>Acacia holosecicea</i>	Fabaceae	8	7	15	0.5	46.7	1.1	15.7	15.9	31.6	Not Listed
<b>Herbs</b>													
1	Nayuruv	<i>Achyranthes aspera</i>	Amaranthaceae	6	5	20	0.3	25.0	1.2	3.6	3.5	7.1	Not Listed

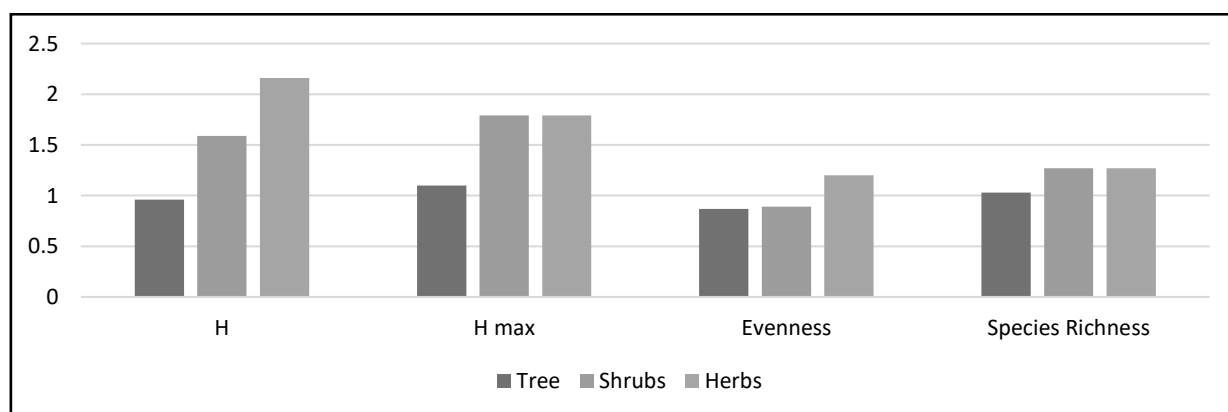
2	Nearunji mull	<i>Tribulus zeyheri</i>	Zygophyllaceae	7	6	20	0.4	30.0	1.2	4.2	4.2	8.4	
3	pill	<i>Cenchrus ciliaris</i>	Poaceae	8	7	20	0.4	35.0	1.1	4.8	4.9	9.7	Not Listed
4	pulapoo	<i>Aerva lanata</i>	Amaranthaceae	6	5	20	0.3	25.0	1.2	3.6	3.5	7.1	Not Listed
5	kapok bush	<i>Aerva javani</i>	Amaranthaceae	5	4	20	0.3	20.0	1.3	3.0	2.8	5.8	Not Listed
6	Rail poondu	<i>Croton bonplandianus</i>	Euphorbiaceae	8	7	20	0.4	35.0	1.1	4.8	4.9	9.7	Not Listed
7	Perandai	<i>Cissus quadrangularis</i>	Vitaceae	9	8	20	0.5	40.0	1.1	5.4	5.6	10.9	Not Listed
8	Thumbai chadi	<i>Leucas aspera</i>	Lamiaceae	6	5	20	0.3	25.0	1.2	3.6	3.5	7.1	Not Listed
9	Umathai	<i>Datura metel</i>	Solanaceae	8	7	20	0.4	35.0	1.1	4.8	4.9	9.7	Not Listed
10	Sethamutti	<i>Sida cordata</i>	Malvaceae	7	6	20	0.4	30.0	1.2	4.2	4.2	8.4	Not Listed
11	Kolunji	<i>Tephrosia purpurea</i>	Fabaceae	9	8	20	0.5	40.0	1.1	5.4	5.6	10.9	Not Listed
12	Nayuruvi	<i>Achyranthes aspera</i>	Amaranthaceae	7	6	20	0.4	30.0	1.2	4.2	4.2	8.4	Not Listed
13	Ishappukol Vitai	<i>Plantago coronopus</i>	Plantaginaceae	6	5	20	0.3	25.0	1.2	3.6	3.5	7.1	Not Listed
14	vealiparuthi	<i>Pergularia daemia</i>	Apocynaceae	7	6	20	0.4	30.0	1.2	4.2	4.2	8.4	Not Listed
15	Seppu nerinji	<i>Indigofera linnaei</i> Ali	Fabaceae	8	7	20	0.4	35.0	1.1	4.8	4.9	9.7	Not Listed
16	Sapathikalli	<i>Opuntia ficus-indica</i>	Cactaceae	9	8	20	0.5	40.0	1.1	5.4	5.6	10.9	Not Listed
17	Pal kodi	<i>Cynanchum viminalis</i>	Apocynaceae	6	5	20	0.3	25.0	1.2	3.6	3.5	7.1	Not Listed
18	Ila perandai	<i>Cissus rotundifolia</i>	Vitaceae	9	8	20	0.5	40.0	1.1	5.4	5.6	10.9	Not Listed
19	Katralai	<i>Aloe vera</i>	Asphodelaceae	7	6	20	0.4	30.0	1.2	4.2	4.2	8.4	Not Listed
20	Seammulli	<i>Barleria prionitis</i>	Acanthaceae	8	7	20	0.4	35.0	1.1	4.8	4.9	9.7	Not Listed
21	Kandakathri	<i>Solanum virginianum</i>	Solanaceae	6	5	20	0.3	25.0	1.2	3.6	3.5	7.1	Not Listed
22	Cerupatai	<i>Coldenia procumbens</i>	Boraginaceae	7	6	20	0.4	30.0	1.2	4.2	4.2	8.4	Not Listed
23	Karisalanganni	<i>Eclipta Prostrata</i>	Asteraceae	8	7	20	0.4	35.0	1.1	4.8	4.9	9.7	Not Listed

**Table 3.24 Flora in Mine Lease area**

S.No	Common name	Scientific name	No. of Species	Pi	In (Pi)	Pi x in (Pi)
<b>Trees</b>						
1	Muntheri maram	<i>Anacardium occidentale</i>	2	0.29	-1.25	-0.36
2	Thakku maram	<i>Tectona grandis</i>	1	0.14	-1.95	-0.28
3	Echamaram	<i>Arenga engleri Becc</i>	4	0.57	-0.56	-0.32
H (Shannon Diversity Index) =0.96						
<b>Shrubs</b>						
1	Erukku	<i>Calotropis gigantea</i>	6	0.12	-2.14	-0.25
2	Thuthi	<i>Abutilon indicum</i>	6	0.12	-2.14	-0.25
3	Avarai	<i>Senna auriculata</i>	5	0.10	-2.32	-0.23
4	Unichadi	<i>Lantana camara</i>	7	0.14	-1.99	-0.27
5	Suraimullu	<i>Zizyphus Oenopia</i>	5	0.10	-2.32	-0.23
6	Acacia	<i>Acacia holosecicea</i>	22	0.43	-0.84	-0.36
H (Shannon Diversity Index) =1.59						
<b>Herbs</b>						
1	Nayuruvi	<i>Achyranthes aspera</i>	7	0.14	-1.99	-0.27
2	Nearunji mull	<i>Tribulus zeyheri Sond</i>	6	0.12	-2.14	-0.25
3	Pill	<i>Cenchrus ciliaris</i>	4	0.08	-2.55	-0.20
4	Pulapoo	<i>Aerva lanata</i>	6	0.12	-2.14	-0.25
5	Rail poondu	<i>Croton bonplandianus</i>	8	0.16	-1.85	-0.29
6	Perandai	<i>Cissus quadrangularis</i>	3	0.06	-2.83	-0.17
7	Thumbai chadi	<i>Leucas aspera</i>	6	0.12	-2.14	-0.25
8	Kolunji	<i>Tephrosia purpurea</i>	7	0.14	-1.99	-0.27
9	Sapathikalli	<i>Opuntia ficus-indica</i>	4	0.08	-2.55	-0.20
H (Shannon Diversity Index) =2.16						

**Table 3.25 Species Richness (Index) in Mine Lease Area**

Details	H	H max	Evenness	Species Richness
<b>Tree</b>	0.96	1.10	0.87	1.03
<b>Shrubs</b>	1.59	1.79	0.89	1.27
<b>Herbs</b>	2.16	1.79	1.20	1.27



**Figure 3.27 Calculation of Species Diversity in mine lease area**

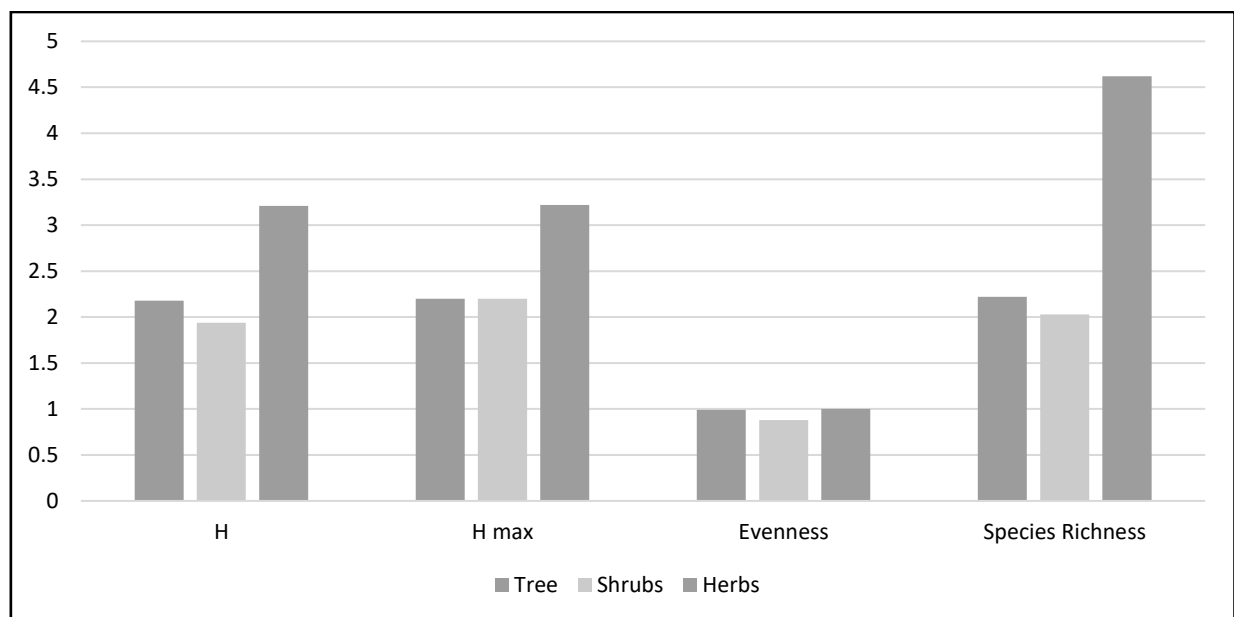
**Table 3.26 Calculation of Species Diversity in 300m radius**

S.No	Common name	Scientific name	No. of Species	Pi	In (Pi)	Pi x in (Pi)
<b>Trees</b>						
1	Karuvealam Maram	<i>Prosopis juliflora</i>	5	0.14	-2.00	-0.27
2	Palm tree	<i>Borassus flabellifer</i>	4	0.11	-2.22	-0.24
3	Vembu	<i>Azadirachta indica</i>	3	0.08	-2.51	-0.20
4	Unjai maram	<i>Albizia amara</i>	4	0.11	-2.22	-0.24
5	Vetpalai	<i>Wrightia tinctoria</i>	3	0.08	-2.51	-0.20
6	Munderi maram	<i>Anacardium occidentale</i>	4	0.11	-2.22	-0.24
7	Teak maram	<i>Tectona grandis</i>	5	0.14	-2.00	-0.27
8	Echamaram	<i>Arenga engleri Becc</i>	4	0.11	-2.22	-0.24
9	Karuvealan	<i>Prosopis juliflora</i>	5	0.14	-2.00	-0.27
H (Shannon Diversity Index) =2.18						
<b>Shrubs</b>						
1	Erukku	<i>Calotropis gigantea</i>	6	0.12	-2.14	-0.25
2	Umaththai	<i>Datura metel</i>	7	0.14	-1.99	-0.27
3	Thuthi	<i>Abutilon indicum</i>	8	0.16	-1.85	-0.29
4	Avarai	<i>Senna auriculata</i>	9	0.18	-1.73	-0.31
5	Unichadi	<i>Lantana camara</i>	6	0.12	-2.14	-0.25
6	Suraimullu	<i>Zizyphus Oenoplia</i>	7	0.14	-1.99	-0.27
7	Acacia	<i>Acacia holosecicea</i>	8	0.16	-1.85	-0.29
H (Shannon Diversity Index) =1.94						
<b>Herbs</b>						
1	Nayuruv	<i>Achyranthes aspera</i>	6	0.03	-3.40	-0.11
2	Nearunji mull	<i>Tribulus zeyheri Sond</i>	7	0.04	-3.25	-0.13
3	Pill	<i>Cenchrus ciliaris</i>	8	0.04	-3.11	-0.14
4	Pulapoo	<i>Aerva lanata</i>	6	0.03	-3.40	-0.11
5	Kapok bush	<i>Aerva javani</i>	5	0.03	-3.58	-0.10
6	Rail poondu	<i>Croton bonplandianus</i>	8	0.04	-3.11	-0.14
7	Mookuthi poondu	<i>pedalium murex</i>	9	0.05	-3.00	-0.15
8	Perandai	<i>Cissus quadrangularis</i>	6	0.03	-3.40	-0.11
9	Thumbai chadi	<i>Leucas aspera</i>	8	0.04	-3.11	-0.14
10	Umathai	<i>Datura metel</i>	7	0.04	-3.25	-0.13
11	Sethamutti	<i>Sida cordata</i>	9	0.05	-3.00	-0.15

12	Annam	<i>Iva annua</i>	7	0.04	-3.25	-0.13
13	Kolunji	<i>Tephrosia purpurea</i>	6	0.03	-3.40	-0.11
14	Nayuruvi	<i>Achyranthes aspera</i>	7	0.04	-3.25	-0.13
15	Ishappukol Vitai	<i>Plantago coronopus</i>	8	0.04	-3.11	-0.14
16	Vealiparuthi	<i>Pergularia daemia</i>	9	0.05	-3.00	-0.15
17	Seppu nerinji	<i>Indigofera linnaei Ali</i>	6	0.03	-3.40	-0.11
18	Sapathikalli	<i>Opuntia ficus-indica</i>	9	0.05	-3.00	-0.15
19	Pal kodi	<i>Cynanchum viminale</i>	7	0.04	-3.25	-0.13
20	Ila perandai	<i>Cissus rotundifolia</i>	8	0.04	-3.11	-0.14
21	Katralai	<i>Aloe vera</i>	6	0.03	-3.40	-0.11
22	Seammulli	<i>Barleria prionitis</i>	7	0.04	-3.25	-0.13
23	Kandakathri	<i>Solanum virginianum</i>	8	0.04	-3.11	-0.14
24	Ceruppaṭai	<i>Coldenia procumbens</i>	6	0.03	-3.40	-0.11
25	Karisalanganni	<i>Eclipta Prostata</i>	7	0.04	-3.25	-0.13
H (Shannon Diversity Index) =3.21						

**Table 3.27 Species Richness (Index) in 300-meter radius**

Details	H	H max	Evenness	Species Richness
<b>Tree</b>	2.18	2.20	0.99	2.22
<b>Shrubs</b>	1.94	2.20	0.88	2.03
<b>Herbs</b>	3.21	3.22	1.00	4.62



**Figure 3.28 Floral diversity species Richness (Index) in buffer zone and 300m radius**

**Table 3.28 Flora in Buffer Zone**

S.No	Local Name	Scientific name	Family name	Total No. of species	Total of Quadrants with species	Total No. of Quadrants	Density	Frequency (%)	Abundance	Relative Density	Relative Frequency	IVI	IUCN Conservation Status
<b>TREE</b>													
1	Vembu	<i>Azadirachta indica</i>	Meliaceae	5	4	10	0.5	40.0	1.3	3.1	3.1	6.2	Not Listed
2	Thekku	<i>Tectona grandis</i>	Verbenaceae	4	3	10	0.4	30.0	1.3	2.5	2.3	4.8	Not Listed
3	Pongam oiltree	<i>Pongamia pinnata</i>	Fabaceae	3	2	10	0.3	20.0	1.5	1.8	1.6	3.4	Not Listed
4	Thennai maram	<i>Cocos nucifera</i>	Arecaceae	4	3	10	0.4	30.0	1.3	2.5	2.3	4.8	Not Listed
5	Manga	<i>Mangifera indica</i>	Anacardiaceae	6	5	10	0.6	50.0	1.2	3.7	3.9	7.6	Not Listed
6	Puliyamaram	<i>Tamarindus indica</i>	Legumes	4	3	10	0.4	30.0	1.3	2.5	2.3	4.8	Not Listed
7	Vadanarayani	<i>Delonix elata</i>	Fabaceae	3	2	10	0.3	20.0	1.5	1.8	1.6	3.4	Not Listed
8	Thenpazham	<i>Muntingia calabura</i>	Tiliaceae	4	3	10	0.4	30.0	1.3	2.5	2.3	4.8	Not Listed
9	Punnai	<i>Calophyllum inophyllum</i>	Calophyllaceae	5	4	10	0.5	40.0	1.3	3.1	3.1	6.2	Not Listed
10	Ilanthai	<i>Ziziphus jujubha</i>	Rhamnaceae	3	2	10	0.3	20.0	1.5	1.8	1.6	3.4	Not Listed
11	Karuvellam	<i>Acacia nilotica</i>	Mimosaceae	6	5	10	0.6	50.0	1.2	3.7	3.9	7.6	Not Listed
12	Nettilinkam	<i>Polylathia longifolia</i>	Annonaceae	4	3	10	0.4	30.0	1.3	2.5	2.3	4.8	Not Listed
13	Arai nelli	<i>Phyllanthus acidus</i>	Euphorbiaceae	5	4	10	0.5	40.0	1.3	3.1	3.1	6.2	Not Listed
14	Panai maram	<i>Borassus flabellifer</i>	Arecaceae	4	3	10	0.4	30.0	1.3	2.5	2.3	4.8	Not Listed
15	Sapota	<i>Manilkara zapota</i>	Sapotaceae	6	5	10	0.6	50.0	1.2	3.7	3.9	7.6	Not Listed
16	Navalmaram	<i>Syzygium cumini</i>	Myrtaceae	7	6	10	0.7	60.0	1.2	4.3	4.7	9.0	Not Listed
17	Alamaram	<i>Ficus benghalensis</i>	Moraceae	3	2	10	0.3	20.0	1.5	1.8	1.6	3.4	Not Listed
18	Vazhaimaram	<i>Musa Paradisiyaca</i>	Musaceae	4	3	10	0.4	30.0	1.3	2.5	2.3	4.8	Not Listed
19	Karuvellam maram	<i>Vachellia nilotica</i>	Fabaceae	5	4	10	0.5	40.0	1.3	3.1	3.1	6.2	Not Listed
20	Nelli	<i>Emblia officinalis</i>	Phyllanthaceae	3	2	10	0.3	20.0	1.5	1.8	1.6	3.4	Not Listed
21	Eucalyptus	<i>Eucalyptus globules</i>	Myrtaceae	4	3	10	0.4	30.0	1.3	2.5	2.3	4.8	Not Listed
22	Maramalli	<i>Millingtonia hortensis</i>	Bignoniaceae	5	4	10	0.5	40.0	1.3	3.1	3.1	6.2	Not Listed

23	Koduka puli	<i>Pithecellobium dulce</i>	Mimosaceae	4	3	10	0.4	30.0	1.3	2.5	2.3	4.8	Not Listed
24	Karungali	<i>Acacia sundra</i>	Legumes	6	5	10	0.6	50.0	1.2	3.7	3.9	7.6	Not Listed
25	Nochi	<i>Vitex negundo</i>	Lamiaceae	4	3	10	0.4	30.0	1.3	2.5	2.3	4.8	Not Listed
26	Karimurungai	<i>Moringa oleifera</i>	Moraginaceae	5	4	10	0.5	40.0	1.3	3.1	3.1	6.2	Not Listed
27	Pappali maram	<i>Carica papaya L</i>	Caricaceae	7	6	10	0.7	60.0	1.2	4.3	4.7	9.0	Not Listed
28	Poovarasu	<i>Thespesia populnea</i>	Malvaceae	5	4	10	0.5	40.0	1.3	3.1	3.1	6.2	Not Listed
29	Arasanmaram	<i>Ficus religiosa</i>	Moraceae	3	2	10	0.3	20.0	1.5	1.8	1.6	3.4	Not Listed
30	Vilvam	<i>Aegle marmelos</i>	Rutaceae	5	4	10	0.5	40.0	1.3	3.1	3.1	6.2	Not Listed
31	Nuna maram	<i>Morinda citrifolia</i>	Rubiaceae	4	3	10	0.4	30.0	1.3	2.5	2.3	4.8	Not Listed
32	Nettilingam	<i>Polyalthia longifolia</i>	Annonaceae	5	4	10	0.5	40.0	1.3	3.1	3.1	6.2	Not Listed
33	Koyya	<i>Psidium guajava</i>	Myrtaceae	6	5	10	0.6	50.0	1.2	3.7	3.9	7.6	Not Listed
34	Seethapazham	<i>Annona reticulata</i>	Annonaceae	7	6	10	0.7	60.0	1.2	4.3	4.7	9.0	Not Listed
35	Savukku	<i>Casuarina L.</i>	Casuarinaceae	5	4	10	0.5	40.0	1.3	3.1	3.1	6.2	Not Listed
<b>SHRUBS</b>													
1	Avarai	<i>Senna auriculata</i>	Fabaceae	7	6	15	0.5	40.0	1.2	6.4	6.3	12.7	Not Listed
2	Sundaika	<i>Solanum torvum</i>	Solanaceae	8	7	15	0.5	46.7	1.1	7.3	7.4	14.6	Not Listed
3	Puramuttai	<i>Chrozophora rottleri</i>	Euphorbiaceae	6	5	15	0.4	33.3	1.2	5.5	5.3	10.7	Not Listed
4	Arali	<i>Nerium indicum</i>	Apocynaceae	9	8	15	0.6	53.3	1.1	8.2	8.4	16.6	Not Listed
5	Seemaiagaththi	<i>Cassia alata</i>	Caesalpinaceae	7	6	15	0.5	40.0	1.2	6.4	6.3	12.7	Not Listed
6	Chemparuthi	<i>Hibiscu rosa-sinensis</i>	Malvaceae	8	7	15	0.5	46.7	1.1	7.3	7.4	14.6	Not Listed
7	Kattamanakku	<i>Jatropha curcas</i>	Euphorbiaceae	6	5	15	0.4	33.3	1.2	5.5	5.3	10.7	Not Listed
8	Chaturakalli	<i>Euphorbia antiquorum</i>	Euphorbiaceae	8	7	15	0.5	46.7	1.1	7.3	7.4	14.6	Not Listed
9	Idlipoo	<i>xoracoc cineia</i>	Rubiaceae	9	8	15	0.6	53.3	1.1	8.2	8.4	16.6	Not Listed
10	Thuthi	<i>Abutilon indicum</i>	Meliaceae	6	5	15	0.4	33.3	1.2	5.5	5.3	10.7	Not Listed
11	Nithyakalyani	<i>Cathranthus roseus</i>	Apocynaceae	7	6	15	0.5	40.0	1.2	6.4	6.3	12.7	Not Listed
12	Uumaththai	<i>Datura metel</i>	Solanaceae	8	7	15	0.5	46.7	1.1	7.3	7.4	14.6	Not Listed
13	Kundumani	<i>Abrus precatorius</i>	Fabaceae	7	6	15	0.5	40.0	1.2	6.4	6.3	12.7	Not Listed
14	Erukku	<i>Calotropis gigantea</i>	Apocynaceae	8	7	15	0.5	46.7	1.1	7.3	7.4	14.6	Not Listed
15	Neermulli	<i>Hydrophila auriculata</i>	Acanthaceae	6	5	15	0.4	33.3	1.2	5.5	5.3	10.7	Not Listed
<b>Herbs, Climber, Creeper &amp; Grasses</b>													
1	Nayuruv	<i>Achyranthes aspera</i>	Amaranthaceae	6	5	20	0.3	25.0	1.2	2.6	2.5	5.2	Not Listed
2	Veetukaayapoondur	<i>Tridax procumbens</i>	Asteraceae	7	6	20	0.4	30.0	1.2	3.1	3.0	6.1	Not Listed



3	Mukkirattai	<i>Boerhaavia diffusa</i>	Nyctaginaceae	8	7	20	0.4	35.0	1.1	3.5	3.6	7.1	Not Listed
4	Kuppaimeni	<i>Acalypha indica</i>	Euphorbiaceae	9	8	20	0.5	40.0	1.1	4.0	4.1	8.0	Not Listed
5	Karisilanganni	<i>Eclipta prostrata</i>	Asteraceae	7	6	20	0.4	30.0	1.2	3.1	3.0	6.1	Not Listed
6	Korai	<i>Cyperus rotundus</i>	Cyperaceae	6	5	20	0.3	25.0	1.2	2.6	2.5	5.2	Not Listed
7	Thumbai	<i>Leucas aspera</i>	Lamiaceae	7	6	20	0.4	30.0	1.2	3.1	3.0	6.1	Not Listed
8	Nai kadugu	<i>Celome viscosa</i>	Capparidaceae	8	7	20	0.4	35.0	1.1	3.5	3.6	7.1	Not Listed
9	Parttiniyam	<i>Parthenium hysterophorus</i>	Asteraceae	7	6	20	0.4	30.0	1.2	3.1	3.0	6.1	Not Listed
10	Thulasi	<i>Ocimum tenuiflorum</i>	Lamiaceae	10	9	20	0.5	45.0	1.1	4.4	4.6	9.0	Not Listed
11	Arugampul	<i>Cynodon dactylon</i>	Poaceae	11	10	20	0.6	50.0	1.1	4.8	5.1	9.9	Not Listed
12	Thoiya keerai	<i>Digeria muricata</i>	Amarantheceae	7	6	20	0.4	30.0	1.2	3.1	3.0	6.1	Not Listed
13	Kovai	<i>Coccinia grandis</i>	Cucurbitaceae	8	7	20	0.4	35.0	1.1	3.5	3.6	7.1	Not Listed
14	Perandai	<i>Cissus quadrangularis</i>	Vitaceae	10	9	20	0.5	45.0	1.1	4.4	4.6	9.0	Not Listed
15	Mudakkotan	<i>Cardiospermum helicacabum</i>	Sapindaceae	6	5	20	0.3	25.0	1.2	2.6	2.5	5.2	Not Listed
16	Karkakartum	<i>Clitoria ternatea</i>	Fabaceae	7	6	20	0.4	30.0	1.2	3.1	3.0	6.1	Not Listed
17	Kovakkai	<i>Trichosanthes dioica</i>	Cucurbitaceae	6	5	20	0.3	25.0	1.2	2.6	2.5	5.2	Not Listed
18	Sangupoo	<i>Clitoriaternatia</i>	Fabaceae	8	7	20	0.4	35.0	1.1	3.5	3.6	7.1	Not Listed
19	Siru puladi	<i>Desmodium triflorum</i>	Fabaceae	9	8	20	0.5	40.0	1.1	4.0	4.1	8.0	Not Listed
20	Sithrapaalavi	<i>Euphorbia prostrata</i>	Euphorbiaceae	6	5	20	0.3	25.0	1.2	2.6	2.5	5.2	Not Listed
21	Thumattikai	<i>Cucumis callosus</i>	Cucurbitaceae	7	6	20	0.4	30.0	1.2	3.1	3.0	6.1	Not Listed
22	mookuthi poondu	<i>Wedelia trilobata</i>	Asteraceae	8	7	20	0.4	35.0	1.1	3.5	3.6	7.1	Not Listed
23	Kattu kanchippul	<i>Apluda mutica</i>	Poaceae	6	5	20	0.3	25.0	1.2	2.6	2.5	5.2	Not Listed
24	Musthakasu	<i>Kyllinga brevifolia</i>	Cyperaceae	7	6	20	0.4	30.0	1.2	3.1	3.0	6.1	Not Listed
25	Nagathali	<i>Opuntia dillenii</i>	Cactaceae	8	7	20	0.4	35.0	1.1	3.5	3.6	7.1	Not Listed
26	Peaiveratti	<i>Anisomeles malabarica</i>	Lamiaceae	6	5	20	0.3	25.0	1.2	2.6	2.5	5.2	Not Listed
28	Mosukkattan	<i>Passiflora foetida</i>	Passifloraceae	7	6	20	0.4	30.0	1.2	3.1	3.0	6.1	Not Listed
29	Etelepoo	<i>Ixora coccinea</i>	Rubiaceae	8	7	20	0.4	35.0	1.1	3.5	3.6	7.1	Not Listed
30	Kannadi kalli	<i>Euphorbia tithymaloides</i>	Euphorbiaceae	9	8	20	0.5	40.0	1.1	4.0	4.1	8.0	Not Listed
31	Kodi Rose	<i>Antigonon leptopus</i>	Polygonaceae	8	7	20	0.4	35.0	1.1	3.5	3.6	7.1	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)
<b>Trees</b>						
1	Vembu	<i>Azadirachta indica</i>	5	0.03	-3.51	-0.10
2	Thekku	<i>Tectona grandis</i>	4	0.02	-3.74	-0.09
3	Pongam oiltree	<i>Pongamia pinnata</i>	3	0.02	-4.03	-0.07
4	Thennai maram	<i>Cocos nucifera</i>	4	0.02	-3.74	-0.09
5	Manga	<i>Mangifera indica</i>	6	0.04	-3.33	-0.12
6	Puliyamaram	<i>Tamarindus indica</i>	4	0.02	-3.74	-0.09
7	Vadanarayani	<i>Delonix elata</i>	3	0.02	-4.03	-0.07
8	Thenpazham	<i>Muntingia calabura</i>	4	0.02	-3.74	-0.09
9	Punnai	<i>Calophyllu inophyllum</i>	5	0.03	-3.51	-0.10
10	Ilanthai	<i>Ziziphus jujubha</i>	3	0.02	-4.03	-0.07
11	Karuvelam	<i>Acacia nilotica</i>	6	0.04	-3.33	-0.12
12	Nettilinkam	<i>Polylathia longifolia</i>	4	0.02	-3.74	-0.09
13	Arai nelli	<i>Phyllanthus acidus</i>	5	0.03	-3.51	-0.10
14	Panai maram	<i>Borassus flabellifer</i>	4	0.02	-3.74	-0.09
15	Sapota	<i>Manilkara zapota</i>	6	0.04	-3.33	-0.12
16	Navalmaram	<i>Sygygium cumini</i>	7	0.04	-3.18	-0.13
17	Alamaram	<i>Ficus benghalensis</i>	3	0.02	-4.03	-0.07
18	Vazhaimaram	<i>Musa</i>	4	0.02	-3.74	-0.09
19	Karuvelam maram	<i>Vachellia nilotica</i>	5	0.03	-3.51	-0.10
20	Nelli	<i>Embllica officinalis</i>	3	0.02	-4.03	-0.07
21	Eucalyptus	<i>Eucalyptus globules</i>	4	0.02	-3.74	-0.09
22	Maramalli	<i>Millingtonia hortensis</i>	5	0.03	-3.51	-0.10
23	Kuduka puli	<i>Pithecellobium dulce</i>	4	0.02	-3.74	-0.09
24	Karungali	<i>Acacia sundra</i>	6	0.04	-3.33	-0.12
25	Nochi	<i>Vitex negundo</i>	4	0.02	-3.74	-0.09
26	Karimurungai	<i>Moringa olefera</i>	5	0.03	-3.51	-0.10
27	Pappali maram	<i>Carica papaya L</i>	7	0.04	-3.18	-0.13
28	Poovarasu	<i>Thespesia populnea</i>	5	0.03	-3.51	-0.10
29	Arasanmaram	<i>Ficus religiosa</i>	3	0.02	-4.03	-0.07
30	Vilvam	<i>Aegle marmelos</i>	5	0.03	-3.51	-0.10
31	Nuna maram	<i>Morinda citrifolia</i>	4	0.02	-3.74	-0.09
32	Nettilingam	<i>Polyalthia longifolia</i>	5	0.03	-3.51	-0.10
33	Koyya	<i>Psidium guajava</i>	6	0.04	-3.33	-0.12
34	Seethapazham	<i>Annona reticulata</i>	7	0.04	-3.18	-0.13
35	Savukku	<i>Casuarina L.</i>	5	0.03	-3.51	-0.10
			5	0.03	-3.51	-0.10
H (Shannon Diversity Index) =3.55						
<b>Shrubs</b>						
1	Avarai	<i>Senna auriculata</i>	7	0.06	-2.75	-0.18
2	Sundaika	<i>Solanum torvum</i>	8	0.07	-2.62	-0.19
3	Puramuttai	<i>Chrozophora rottleri</i>	6	0.05	-2.91	-0.16
4	Arali	<i>Nerium indicum</i>	9	0.08	-2.50	-0.20
5	Seemaiagaththi	<i>Cassia alata</i>	7	0.06	-2.75	-0.18
6	Chemparuthi	<i>Hibiscu rosa-sinensis</i>	8	0.07	-2.62	-0.19

7	Kattamanakku	<i>Jatropha curcas</i>	6	0.05	-2.91	-0.16
8	Chaturakalli	<i>Euphorbia antiquorum</i>	8	0.07	-2.62	-0.19
9	Idlipoo	<i>xoracoc cinea</i>	9	0.08	-2.50	-0.20
10	Thuthi	<i>Abutilon indicum</i>	6	0.05	-2.91	-0.16
11	Nithyakalyani	<i>Cathranthus roseus</i>	7	0.06	-2.75	-0.18
12	Uumaththai	<i>Datura metel</i>	8	0.07	-2.62	-0.19
13	Kundumani	<i>Abrus precatorius</i>	7	0.06	-2.75	-0.18
14	Erukku	<i>Calotropis gigantea</i>	8	0.07	-2.62	-0.19
15	Neermulli	<i>Hydrophila auriculata</i>	6	0.05	-2.91	-0.16
H (Shannon Diversity Index) =2.70						
<b>Herbs, Climber, Creeper &amp; Grasses</b>						
1	Nayuruv	<i>Achyranthes aspera</i>	6	0.03	-3.66	-0.09
2	Veetukaayapoond	<i>Tridax procumbens</i>	7	0.03	-3.51	-0.11
3	Mukkirattai	<i>Boerhaavia diffusa</i>	8	0.03	-3.37	-0.12
4	Kuppaimeni	<i>Acalypha indica</i>	9	0.04	-3.25	-0.13
5	Karisilanganni	<i>Eclipta prostata</i>	7	0.03	-3.51	-0.11
6	Korai	<i>Cyperus rotundus</i>	6	0.03	-3.66	-0.09
7	Thumbai	<i>Leucas aspera</i>	7	0.03	-3.51	-0.11
8	Nai kadugu	<i>Celome viscosa</i>	8	0.03	-3.37	-0.12
9	Parttiniyam	<i>Parthenium hysterophorus</i>	7	0.03	-3.51	-0.11
10	Thulasi	<i>Ocimum tenuiflorum</i>	10	0.04	-3.15	-0.14
11	Arugampul	<i>Cynodon dactylon</i>	11	0.05	-3.05	-0.14
12	Thoiya keerai	<i>Digeria muricata</i>	7	0.03	-3.51	-0.11
13	Kovai	<i>Coccinia grandis</i>	8	0.03	-3.37	-0.12
14	Perandai	<i>Cissus quadrangularis</i>	10	0.04	-3.15	-0.14
15	Mudakkotan	<i>Cardiospermum helicacabum</i>	6	0.03	-3.66	-0.09
16	Karkakartum	<i>Clitoria ternatea</i>	7	0.03	-3.51	-0.11
17	Kovakkai	<i>Trichosanthes dioica</i>	6	0.03	-3.66	-0.09
18	Sangupoo	<i>Clitoriaternatia</i>	8	0.03	-3.37	-0.12
19	Siru puladi	<i>Desmodium triflorum</i>	9	0.04	-3.25	-0.13
20	Sithrapaalavi	<i>Euphorbia prostrata</i>	6	0.03	-3.66	-0.09
21	Thumattikai	<i>Cucumis callosus</i>	7	0.03	-3.51	-0.11
22	mookuthi poond	<i>Wedelia trilobata</i>	8	0.03	-3.37	-0.12
23	Kattu kanchippul	<i>Apluda mutica</i>	6	0.03	-3.66	-0.09
24	Musthakasu	<i>Kyllinga brevifolia</i>	7	0.03	-3.51	-0.11
25	Nagathali	<i>Opuntia dillenii</i>	8	0.03	-3.37	-0.12
26	Peaiveratti	<i>Anisomeles malabarica</i>	6	0.03	-3.66	-0.09
27	Mosukkattan	<i>Passiflora foetida</i>	7	0.03	-3.51	-0.11
28	Etelepoo	<i>Ixora coccinea</i>	8	0.03	-3.37	-0.12
29	Kannadi kalli	<i>Euphorbia tithymaloides</i>	9	0.04	-3.25	-0.13
30	Kodi Rose	<i>Antigonon leptopus</i>	8	0.03	-3.37	-0.12
31	Kodi Rose	<i>Antigonon leptopus</i>	6	0.03	-3.66	-0.09
H (Shannon Diversity Index) =3.42						

**Table 3.30 Species Richness (Index) in Buffer Zone**

Details	H	H max	Evenness	Species Richness
Tree	3.55	3.56	1.00	6.64
Shrubs	2.70	1.00	2.71	2.98
Herbs	3.42	3.43	1.00	5.50



**Figure 3.29 Floral diversity species Richness (Index) in 10km radius buffer zone**



*Euphorbia hirta*



*Azolla*



*Cardiospermum halicacabum*



*Oryza sativa*



*Cocos nucifera*



*Vitex negundo*



*Gardenia jasminoides*



*Lantana camara*



*Casuarina equisetifolia*



*Anisomeles malabarica*



*Arenga engleri*



*Acacia holosericea*



*Xanthium strumarium*



*Cleome viscosa*



*Azadirachta indica*



*Passiflora foetida*



*Ixora coccinea*



*Calotropis gigantea*



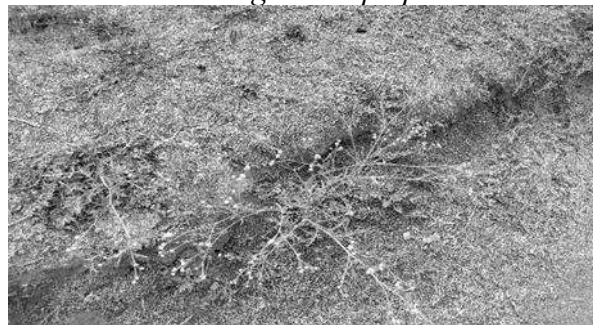
*Euphorbia tithymaloides*



*Antigonon leptopus*



*Ipomoea carnea*



*Parthenium hysterophorus*



*Phyllanthus acidus*



*Gomphrena celosioides*



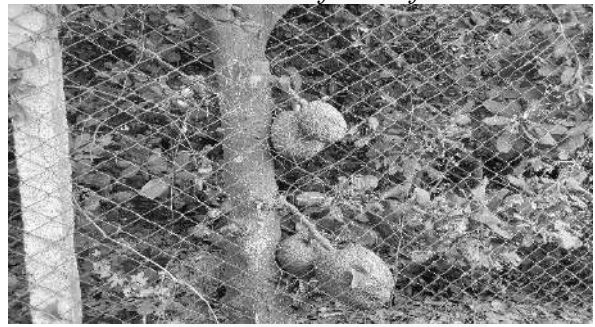
*Musa paradisiaca*



*Borassus flabellifer*



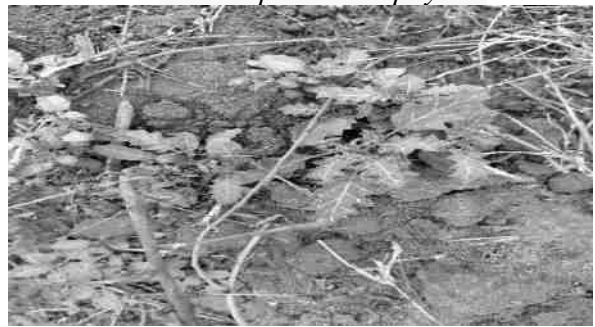
*Tectona grandis*



*Artocarpus heterophyllus*



*Anacardium occidentale*



*Solanum virginianum*



*Arenga engleri*



*Coldenia procumbens*



*Ziziphus oenoplia*



*Eclipta Prostrata*

**Figure 3.30 Flora photos 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**

<b>S. No.</b>	<b>Scientific Name</b>	<b>Common Name</b>	<b>Vernacular Name (Tamil)</b>	<b>IUCN Red List of Threatened Species</b>
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***

#### **Oussudu Lake Bird Sanctuary**

The century-old man-made Osudu Lake is located about 9.50 km southeast of the mining lease area and is recognized as one of the important wetlands of Asia by the International Union for Conservation of Nature. Resources (IUCN) and is the most important freshwater lake in the Pondicherry region. The structure of the lake is complex – consisting of water, swamp/swamp and mud flats; It serves as Puducherry's largest fresh water catchment. About 20,000 birds were recorded in the lake in 1995, which rose to 25,000 birds of 44 species in 1998 (BNHS, 2004). In addition to residents such as Little Cormorant and Common Coot, Cotton Teal, Spot Billed Pelican, Spoonbills, White Ibis; Migratory species such as the Eurasian Wigeon have been recorded in large numbers (up to 4600 individuals!). Diverse species of ducks, herons, cormorants, hawks, kites, darters, terns, kingfishers, lapwings, flycatchers abound.

Ousteri Lake has been designated as one of the important wetlands of Asia by the International Union for Conservation of Nature and Natural Resources (IUCN). Bombay Natural History Society has also nominated it as an Important Bird Area. The lake has also been declared as a bird sanctuary by Government of Pondicherry.



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

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

The 21 varieties of species observed in the core zone. Among them numbers of Insects 8 (41%), Reptiles 3 (14%), Mammals 1 (4%) and Avian 9 (41%). A total of 21 species belonging to 15 families have been recorded from the core mining lease area. Number of species decreases towards the mining area this might be due the lack of vegetation. None of these species are threatened or endemic. There is no Schedule I species and eight species are under schedule IV according to Indian wild life Act 1972. A total eight species of birds were sighted in the mining lease area. There are no critically endangered, endangered, vulnerable and endemic species were observed. Details of fauna in core zone with the scientific name were mentioned in Table. 3.32.

**Table 3.32 Fauna in Core Zone**

<b>SI. No</b>	<b>Common name/English Name</b>	<b>Family Name</b>	<b>Scientific Name</b>	<b>Schedule list wildlife Protection act 1972</b>	<b>IUCN Red List data</b>
<b>INSECTS</b>					
1	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	Striped tiger	Nymphalidae	<i>Danaus plexippus</i>	Schedule IV	LC
8	<i>Acraea violae</i>	Nymphalidae	<i>Acraea violae</i>	NL	LC
<b>REPTILES</b>					
1	Garden lizard	Agamidae	<i>Calotes versicolor</i>	NL	LC
2	Common house gecko	Gekkonidae	<i>Hemidactylus frenatus</i>	NL	LC
3	Fan-Throated Lizard	Agamidae	<i>Sitanaponticeriana</i>	NL	LC
<b>MAMMALS</b>					
1	Indian Field Mouse	Muridae	<i>Mus booduga</i>	Schedule IV	NL
<b>AVES</b>					
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**

A total of 47 species belonging to 34 families were recorded in the buffer zone. Based on habitat classification the majority of species were Birds 18 (40%), followed by Insects 15 (31%), Reptiles 7 (15%), 4 Mammals (8%) and amphibians 3 (6%). There are 4 schedule II species and 24 schedule IV species according to Indian wild life Act 1972. The Oussudu Lake Bird Sanctuary is located about 9.50 km southeast of the mining lease area. List of fauna in the buffer zone is provided in Table 3.33

**Table 3.33 Fauna in Buffer Zone**

S. No.	Common Name/English Name	Family Name	Scientific Name	Schedule List Wildlife Protection Act 1972	IUCN Red List Data
<b>INSECTS</b>					
1	Blue tiger	Nymphalidae	<i>Tirumala limniace</i>	Schedule IV	LC
2	Milkweed butterfly	Nymphalidae	<i>Danainae</i>	NL	LC
3	Tawny coster	Nymphalidae	<i>Danaus chrysippus</i>	Schedule IV	LC
4	Indian honey bee	Apidae	<i>Apis cerana</i>	Schedule IV	LC
5	Grasshopper	Acrididae	<i>Hieroglyphus sp</i>	NL	LC
6	Red-veined darter	Libellulidae	<i>Sympetrum fonscolombii</i>	NL	LC
7	Lime butterfly	Papilionidae	<i>Papilio demoleus</i>	Schedule IV	LC
8	Ant	Formicidae	<i>Camponotus Vicinus</i>	NL	NL
9	Dragonfly	Gomphidae	<i>Ceratogomphus pictus</i>	Schedule IV	LC
10	Common Tiger	Nymphalidae	<i>Danaus genutia</i>	Schedule IV	LC
11	Common Indian crow	Nymphalidae	<i>Euploea core</i>	Schedule IV	LC
12	Praying mantis	Mantidae	<i>mantis religiosa</i>	NL	NL
13	Striped tiger	Nymphalidae	<i>Danaus plexippus</i>	Schedule IV	LC
14	Lesser grass blue	Lycaenidae	<i>Zizina otis indica</i>	Schedule IV	LC
15	Jewel beetle	Buprestidae	<i>Eurythyrea austriaca</i>	Schedule IV	NA

REPTILES					
16	Garden lizard	Agamidae	<i>Calotes versicolor</i>	NL	LC
17	Common house gecko	Gekkonidae	<i>Hemidactylus frenatus</i>	NL	LC
18	Indian chameleon	Chamaeleonidae	<i>Chamaeleo zeylanicus</i>	Sch II (Part I)	LC
19	Olive keelback water snake	Natricidae	<i>Atretium schistosum</i>	Sch II (Part II)	LC
20	Brahminy skink	Scincidae	<i>Eutropis carinata</i>	NL	LC
21	Rat snake	Colubridae	<i>Ptyas mucosa</i>	Sch II (Part II)	LC
22	Common skink	Scincidae	<i>Mabuya carinatus</i>	NL	LC
MAMMALS					
23	Indian palm squirrel	Sciuridae	<i>Funambulus palmarum</i>	Schedule IV	LC
24	Indian hare	Leporidae	<i>Lepus nigricollis</i>	Schedule IV	LC
25	Indian Field Mouse	Muridae	<i>Mus booduga</i>	Schedule IV	LC
26	Asian Small Mongoose	Herpestidae	<i>Herpestes javanicus</i>	Schedule (Part II)	LC
AVES					
27	Indian pond heron	Ardeidae	<i>Ardeola grayii</i>	Schedule IV	LC
28	Black drongo	Dicruridae	<i>Dicrurus macrocercus</i>	Schedule IV	LC
29	Asian green bee-eater	Meropidae	<i>Meropsorientalis</i>	NL	LC
30	Red-breasted parakeet	Psittaculidae	<i>Psittacula alexandri</i>	NL	LC
31	Common Coot	Rallidae	<i>Fulica atra</i>	Schedule IV	LC
32	Common myna	Sturnidae	<i>Acridotheres tristis</i>	NL	LC
33	Shikra	Accipitridae	<i>Accipiter badius</i>	NL	LC
34	Koel	Cucalidae	<i>Eudynamys</i>	Schedule IV	LC
35	Common Quail	Phasianidae	<i>Coturnix coturnix</i>	Schedule IV	LC
36	Red-vented Bulbul	Pycnonotidae	<i>Pycnonotuscafer</i>	Schedule IV	LC
37	Brahminy starling	Sturnidae	<i>Sturnia pagodarum</i>	Schedule IV	LC
38	Indian golden oriole	Oriolidae	<i>Oriolus kundoo</i>	Schedule IV	LC
39	Rose-ringed parakeet	Psittaculidae	<i>Psittacula krameria</i>	NL	LC
40	Common quail	Phasianidae	<i>Coturnix coturnix</i>	Schedule IV	LC
41	White-breasted waterhen	Rallidae	<i>Amaurornis phoenicurus</i>	NL	LC

42	Two-tailed Sparrow	Dicruridae	<i>Dicrurus macrocercus</i>	Schedule IV	LC
43	Grey Francolin	Phasianidae	<i>Francolinus pondicerianus</i>	Schedule IV	LC
44	House crow	Corvidae	<i>Corvus splendens</i>	NL	LC
<b>AMPHIBIANS</b>					
45	Indian Burrowing frog	Dicroglossidae	<i>Sphaerotheca breviceps</i>	Schedule IV	LC
46	Green Pond Frog	Ranidae	<i>Rana hexadactyla</i>	Schedule IV	LC
47	Tiger Frog	Chordata	<i>Hoplobatrachus tigerinus (Rana tigerina)</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 ECONOMICS 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 analyse 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 27 villages including Agaram, Eyyakunnam, Ilvampattu, Semangalam, Kenippattu, Karasanur, Eraiyur, T.Parangani, Tollamur, Nemili(V), Vanur, Ambuzhukkai, Kondalamkuppam, Korakkeni, Tiruvaikkarai, V.Pudupakkam, Kadagampattu, Ottai, Sengamedu, Kodukkur, Chettipet, Kodathur, Suthukeny, Pudukuppam, Katteri, Kuppam, Thethampakkam, As Kondalangkuppam 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 Kondalangkuppam Village Population Facts**

Number of Households	96
Population	353
Male Population	175
Female Population	178
Children Population	31
Sex-ratio	1017
Literacy	83.85%
Male Literacy	90.57%
Female Literacy	77.30%
Scheduled Tribes (ST) %	0
Scheduled Caste (SC) %	97
Total Workers	184
Main Worker	177
Marginal Worker	7

**Table 3.35 Population and literacy data of study area**

<b>Village Name</b>	<b>Total Population Person</b>	<b>Total Population Male</b>	<b>Total Population Female</b>	<b>Population in the age group 0-6 Male</b>	<b>Population in the age group 0-6 Female</b>	<b>Scheduled Castes population Person</b>	<b>Scheduled Tribes population Person</b>	<b>Literates Population Person</b>	<b>Illiterate Persons</b>
Agaram (Then)	518	263	255	34	25	485	0	361	157
Eyyakunnam	1851	925	926	107	85	33	5	1049	802
Ilvampattu	743	384	359	39	50	522	1	476	267
Semangalam	3635	1859	1776	245	210	1361	52	2331	1304
Kenippattu	943	465	478	49	55	426	0	623	320
Karasanur	2862	1458	1404	169	172	539	32	1828	1034
Eraiyur	3257	1656	1601	502	547	950	0	6023	2803
T. Parangani	1277	638	639	80	74	301	94	690	587
Tollamur	1419	731	688	98	99	916	31	826	593
Nemili (V)	1238	627	611	73	56	544	0	835	403
Vanur	5161	2649	2512	306	274	2518	93	3705	1456
Ambuzhukkai	558	294	264	36	29	124	22	377	181
Kondalamkuppam	353	175	178	16	15	97	0	270	83
Korakkeni	906	489	417	51	32	361	0	594	312
Tiruvaikkarai	3220	1627	1593	212	205	911	90	1904	1316
V. Pudupakkam	2441	1208	1233	150	138	522	0	1710	731
Kadagampattu	601	315	286	35	23	0	0	462	139
Ottai	1704	862	842	117	103	746	20	1082	622

Sengamedu	1063	521	542	60	65	745	35	719	344
Kodukkur	2581	1272	1309	154	152	1533	0	1662	919
<b>Pondicherry</b>									
Chettipet	1822	942	880	113	91	333	0	1107	715
Kodathur	3605	1788	1817	216	199	1368	0	2528	1077
Suthukeny	2637	1311	1326	177	176	1950	0	1593	1044
Pudukuppam	2211	1098	1113	483	440	2	0	1619	592
Katteri	4292	2163	2129	216	205	69	0	3238	1054
Kuppam	2731	1320	1411	165	156	1195	0	1834	897
Thethampakkam	2109	1036	1073	130	110	817	0	696	1413

**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
Agaram (Then)	2	2	0	1	2	1	2	1	1	2	2	1
Eyyakunnam	1	2	0	1	2	1	1	1	1	1	2	1
Ilvampattu	1	2	0	2	1	2	2	1	1	1	2	1
Semangalam	1	2	0	1	2	1	2	1	1	1	2	1



Kenippattu	1	2	0	1	2	2	2	1	1	1	1	1
Karasanur	1	2	0	2	2	1	1	1	1	1	2	1
Eraiyur	1	2	0	1	2	1	1	1	1	1	2	1
T. Parangani	1	2	0	1	2	1	1	1	1	1	2	1
Tollamur	1	2	0	2	1	2	2	1	1	1	1	1
Nemili (V)	1	2	0	2	2	1	1	1	1	1	2	1
Vanur	1	2	0	2	1	1	1	1	1	1	1	1
Ambuzhukkai	1	2	0	2	2	2	2	1	1	2	2	1
Kondalamkuppam	1	2	0	1	2	1	1	1	1	2	2	1
Korakkeni	1	2	0	2	2	1	1	1	1	1	2	1
Tiruvaikkarai	1	2	0	1	2	1	1	1	1	1	2	1
V. Pudupakkam	1	2	0	2	2	2	2	1	1	1	2	1
Kadagampattu	1	2	0	2	2	2	2	1	1	1	2	1
Ottai	1	2	0	2	1	1	1	1	1	1	2	1
Sengamedu	1	2	0	2	2	2	2	1	1	1	2	1
Kodukkur	1	2	0	1	2	1	1	1	1	1	2	1
<b>Pondicherry</b>												
Chettipet	1	2	0	2	2	1	2	2	1	1	2	1
Kodathur	1	2	0	2	2	1	1	2	1	1	1	1
Suthukeny	1	2	0	2	2	1	2	2	1	1	1	1
Pudukuppam	1	2	0	2	2	1	1	2	1	1	1	1
Katteri	1	2	1	2	2	1	1	2	1	1	1	1
Kuppam	2	2	0	2	2	1	1	2	1	1	2	1
Thethampakkam	1	2	0	2	2	1	1	2	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 (First)	Handicrafts Commodities (First)	Forest Area (in Hectares)	Net Area Sown (in Hectares)
Agaram (Then)	2	2	1	2	2	1	2	1	2	2	1	2	PADDY	0	0	0	145.95
Eyyakunnam	2	2	1	2	2	2	2	1	2	2	1	1	PADDY	0	0	0	219.05
Ilvampattu	2	2	1	2	2	2	2	1	2	2	1	1	PADDY	0	0	0	43.09
Semangalam	2	2	1	2	2	2	2	1	2	2	1	1	PADDY	0	0	0	789
Kenippattu	2	2	1	2	2	2	2	1	2	2	1	2	PADDY	0	0	0	361.86
Karasanur	2	2	1	2	2	2	2	1	2	2	1	1	PADDY	0	0	0	399.6
Eraiyyur	2	2	1	2	2	1	2	1	2	2	1	2	PADDY	0	0	0	305.47
T. Parangani	2	2	1	2	2	2	2	1	2	2	1	2	PADDY	0	0	0	223.32
Tollamur	2	2	1	2	2	2	1	1	2	2	1	1	PADDY	0	0	0	339.85
Nemili (V)	2	2	1	2	2	2	2	1	2	2	1	2	PADDY	0	0	0	75.92
Vanur	2	2	1	2	2	1	1	1	2	2	1	1	CASUARINA	0	0	0	878.36
Ambuzhukkai	2	2	1	2	2	2	2	1	2	2	1	1	PADDY	0	0	0	63.13
Kondalamkuppam	2	2	1	2	2	2	2	1	2	2	1	2	SUGARCANE	0	0	0	302.52
Korakkeni	2	2	1	2	2	2	2	1	2	2	1	2	GROUND NUT	0	0	0	163

Tiruvaikkarai	2	2	1	2	2	2	2	1	2	2	1	1	SUGARCANE	0	0	0	137.18
V. Pudupakkam	2	2	1	2	2	2	2	1	2	2	1	2	SUGARCANE	0	0	0	540
Kadagampattu	2	2	1	2	2	2	2	1	2	2	1	2	SUGARCANE	0	0	0	120.48
Ottai	2	2	1	2	2	1	1	1	2	2	1	2	CASUARINA	0	0	0	300.92
Sengamedu	2	2	1	2	2	2	2	1	2	2	1	2	PADDY	0	0	0	77.42
Kodukkur	2	2	1	2	2	2	2	1	2	2	1	2	PADDY	0	0	0	213
Pondicherry																	
Chettipet	1	1	1	2	2	2	1	1	1	2	1	1	PADDY	0	0	0	135.86
Kodathur	1	1	1	2	2	1	1	1	1	2	1	1	PADDY	CORRUGATED BOX	0	0	228.95
Suthukeny	1	1	1	2	2	1	1	1	1	2	1	1	PADDY	PVC PIPES	0	0	250.21
Pudukuppam	1	1	1	2	2	2	1	1	1	2	1	1	SUGAR CANE	0	0	0	156.41
Katteri	1	1	1	2	1	1	1	1	1	2	1	1	PADDY	SUGAR	0	0	148.43
Kuppam	1	1	1	2	2	2	2	1	1	2	1	1	PADDY	0	0	0	158.51
Thethampakkam	1	1	1	2	2	2	2	1	1	2	1	1	PADDY	BLUE DROPS	0	0	74.66

Abbreviations: ATM - Automatic Teller Machine; PDS - Public Distribution System (Shop); CB - Commercial Bank; RM - Regular Market; COB - Co-operative Bank; AMS - Agricultural Market Society; ACS - Agricultural Credit Societies; NC - Nutritional Centres; SHG - Self Help Group; NC-AC - Nutritional Centres - Anganwadi Centre; DBRO - Birth & Death Registration Office; PS - Power Supply Note – 1 - Available within the village; 2 - Not available

### **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 Red Soil is proposed to be transported mainly through Village Road and mayilam-pondicherry (SH-136) as shown in Table 3.38 and in Figure 3.28. 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	0.96 Km-SW	Village Road
TS2	Mayilam-pondicherry	2.9 Km-NNW	Mayilam-pondicherry

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	42	42	69	35	182
TS2	98	294	51	51	102	51	396

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 Red Soil Transportation Requirement**

Transportation of Red Soil per day		
Capacity of trucks	No. of Trips per day	Volume in PCU
15 tonnes	7	21

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	182	21	203	1200
Mayilam-pondicherry	396	21	417	1200

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

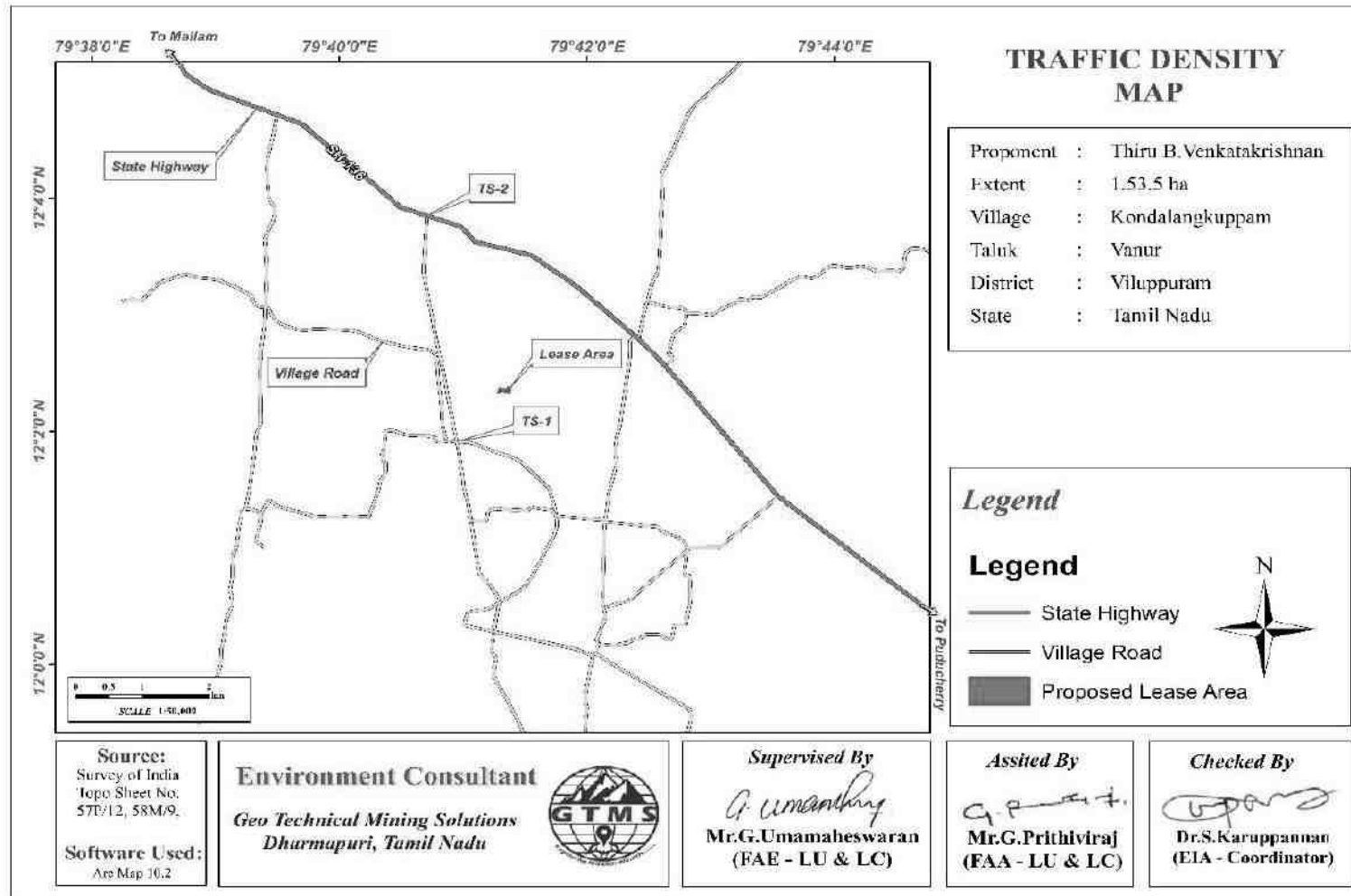


Figure 3.31 Traffic Density Map

- 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.

### 3.8 SITE SPECIFIC FEATURES

There are no Reserve Forest and National Park within the project areato10 km radius. There is no Protected and Reserved Forest 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**

S. No	Sensitive Ecological Features	Name	Areal Distance in km from cluster
1	National Park / Wild life Sanctuaries	None	Nil within 10 km radius
		None	Nil within 10 km radius
2	Reserve Forest	None	Nil within 10 km radius
3	Lakes/Reservoirs/ Dams/Streams/Rivers	Gingee River	3.62 km S
		Ossudu Lake	9.50 km SE
4	Tiger Reserve/Elephant Reserve/ Biosphere Reserve	Ossudu Bird Sanctuary	9.50 km SE
5	Critically Polluted Areas	None	Nil within 10 km radius
6	Mangroves	None	Nil within 10 km radius
7	Mountains/Hills	None	Nil within 10 km radius
8	Notified Archaeological Sites	None	Nil within 10 km radius
9	Industries/ Thermal Power Plants	None	Nil within 10 km radius
10	Defence Installation	None	Nil within 10 km radius

Source: Survey of India Toposheet



**Figure 3.32 Base Line study photographs**







**Figure 3.33 Socio Economic 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 impact on mineral resources due to removal of 23004 m<sup>3</sup> of Red Earth
- ❖ Permanent or temporary change on land use and land cover

- ❖ Change in topography of the mine lease area
- ❖ Problems to agricultural land and human habitations due to dust, and noise caused by movement of heavy vehicles
- ❖ Degradation of the aesthetic environment of the core zone due to quarrying
- ❖ Soil erosion and sediment deposition in the nearby water bodies due to earthworks during the rainy season
- ❖ Siltation of water course due to wash off from the exposed working area

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

## **4.2 SOIL ENVIRONMENT**

### **4.2.1 Anticipated Impact**

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

#### ***Soil Erosion***

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

#### **4.2.2 Common Mitigation Measures from Proposed Project**

- ❖ Soil erosion is very low in the proposed lease area. Therefore, the lease area will not cause soil erosion in any way. but Run-off diversion – Garland drains will be constructed around the project boundary to prevent surface flows from entering the quarry works areas and will be discharged into vegetated natural drainage lines, or as distributed flow across an area stabilised against erosion. Soil Erosion Map Showing in Figure 3.6
- ❖ Sedimentation ponds - Run-off from working areas will be routed towards sedimentation ponds. These trap sediment and reduce suspended sediment loads before runoff is discharged from the quarry site. Sedimentation ponds should be designed based on runoff, retention times, and soil characteristics. There may be a need to provide a series of sedimentation ponds to achieve the desired outcome.
- ❖ Retain vegetation – Retain existing or re-plant the vegetation at the site wherever possible.
- ❖ Monitoring and maintenance – Weekly monitoring and daily maintenance of erosion control systems so that they perform as specified specially during rainy season.

### **4.3 WATER ENVIRONMENT**

#### **4.3.1 Anticipated Impact**

- ❖ As the water required for the mining operations, as given in Table 2.10 is obtained from the approved water supplying agency, the project does not develop any abstraction structures in the lease area. Therefore, no impact responsible for the water table declination is anticipated.
- ❖ Surface and ground water resources may be contaminated due to mine pit water discharge, domestic sewage, waste water from vehicle washing, washouts from surface exposure or working areas, discharge of oil & grease, and suspended solids due to waste from washing of machineries. To address this impact, some of the important mitigation measures is provided as below.

#### **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.

- ❖ 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**

### **4.4.1 Anticipated Impact from Proposed Project**

- ❖ Emission of air pollutants such as particulate matter (PM), gases such as sulphur dioxide, oxides of nitrogen at various stages of activities such as excavation and transportation of materials. The rate of emission and the incremental concentration of pollutants is estimated in the following sections before providing mitigation measures.

#### **4.4.1.1 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, SO<sub>2</sub>, and NO<sub>x</sub> emission estimation have been given in Table 4.1.

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

	<b>Pollutant</b>	<b>Source Type</b>	<b>Empirical Equation</b>	<b>Parameters</b>
Overall Mine	SPM	Area	$E = [0.4a0.2\{9.7 + 0.01p + b/(4 + 0.3b)\}]$	u = Wind speed(m/s); p = Mineral production (Mt/yr); b = Overburden handling (Mm <sup>3</sup> /yr); a = Lease area(km <sup>2</sup> ); E = Emission rate(g/s).
Overall Mine	SO <sub>2</sub>	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 <sup>3</sup> /yr); a = Lease area(km <sup>2</sup> ); E = Emission rate(g/s).
Overall Mine	NO <sub>x</sub>	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 <sup>3</sup> /yr); a = Lease area(km <sup>2</sup> ); E = Emission rate(g/s).

The emission rate thus calculated using the empirical formula is used as one of the inputs in the AERMOD modelling. 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 PM<sub>10</sub> keeping in mind that proper control measures are followed. It is important to note that PM<sub>10</sub> emission rate is derived from the SPM estimation in the background that PM<sub>10</sub> constitutes 52% of SPM emission. The PM<sub>2.5</sub>, PM<sub>10</sub>, SO<sub>2</sub> and NO<sub>x</sub> emission results have been given in Table 4.2.

**Table 4.2 Estimated Emission Rate**

<b>Activity</b>	<b>Pollutant</b>	<b>Calculated Value (g/s)</b>	<b>Lease Area in m<sup>2</sup></b>	<b>Calculated Value (g/s/m<sup>2</sup>)</b>
Overall Mine	PM <sub>2.5</sub>	0.021564851	15350	1.40488E-06
Overall Mine	PM <sub>10</sub>	0.033740625	15350	2.19809E-06
Overall Mine	SO <sub>2</sub>	0.0184615587	15350	1.20271E-06
Overall Mine	NO <sub>x</sub>	0.010528954	15350	6.85925E-07

#### 4.4.1.2 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 model was used to predict the impact on the ambient air environment at each receptor at various localities within 5 km 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<sub>2.5</sub>, PM<sub>10</sub>, SO<sub>2</sub> and NO<sub>x</sub> dust close to the proposed project site due to low to moderate wind speeds.

#### 4.4.1.3 Modelling of Incremental Concentration

The air borne particulate matter such as PM<sub>10</sub> and PM<sub>2.5</sub> generated by quarrying operation, transportation, and wind erosion of the exposed areas and emissions of oxides of sulphur (SO<sub>2</sub>) and oxides of nitrogen (NO<sub>x</sub>) due to excavation and loading equipment 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 is predicted by 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.

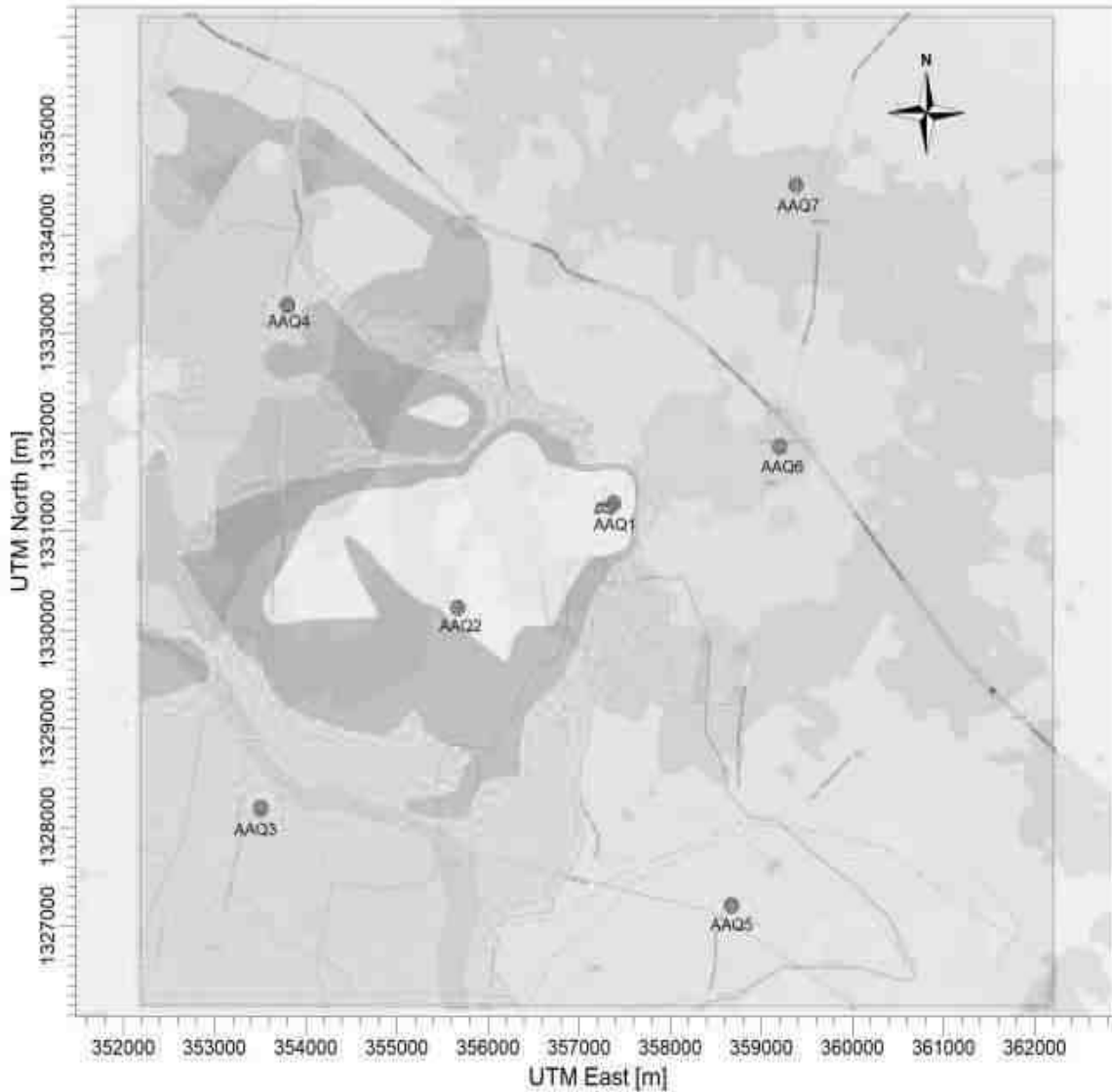
#### 4.4.1.4 Model Results

The post project resultant concentrations of PM<sub>2.5</sub>, PM<sub>10</sub>, SO<sub>2</sub> & NO<sub>x</sub> were given in Tables 4.3-4.6.

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

Station ID	Distance to core area (km)	Direction	PM <sub>2.5</sub> concentrations(µg/m <sup>3</sup> )			Comparison against air quality standard (60 µg/m <sup>3</sup> )	Magnitude of change (%)	Significance
			Baseline	Predicted	Total			
AAQ1	--	--	20.6	5.87	26.47	Below Standard	28.50	Not Significant
AAQ2	1.80	SW	15.8	5	20.8		31.65	
AAQ3	4.74	SW	16.7	0.5	17.2		2.99	
AAQ4	3.95	NW	19.8	0.5	20.3		2.53	
AAQ5	4.17	SSE	17.9	0	17.9		0.00	
AAQ6	1.91	ENE	14.8	0	14.8		0.00	
AAQ7	3.78	NNE	15.4	0	15.4		0.00	

PROJECT TITLE:  
**B.VENKATAKRISHNAN RED EARTH QUARRY \_PM2.5**



Max: 5.87 [ug/m<sup>3</sup>] at (357239.29, 1331242.18) ug/m<sup>3</sup>



COMMENTS:	SOURCES:	COMPANY NAME:	
	1		
	RECEPTORS:	MODELER:	
	448		
OUTPUT TYPE:	SCALE:	1:72,015	
Concentration			
MAX:	DATE:	PROJECT NO.:	
5.87 ug/m <sup>3</sup>	3/31/2023		

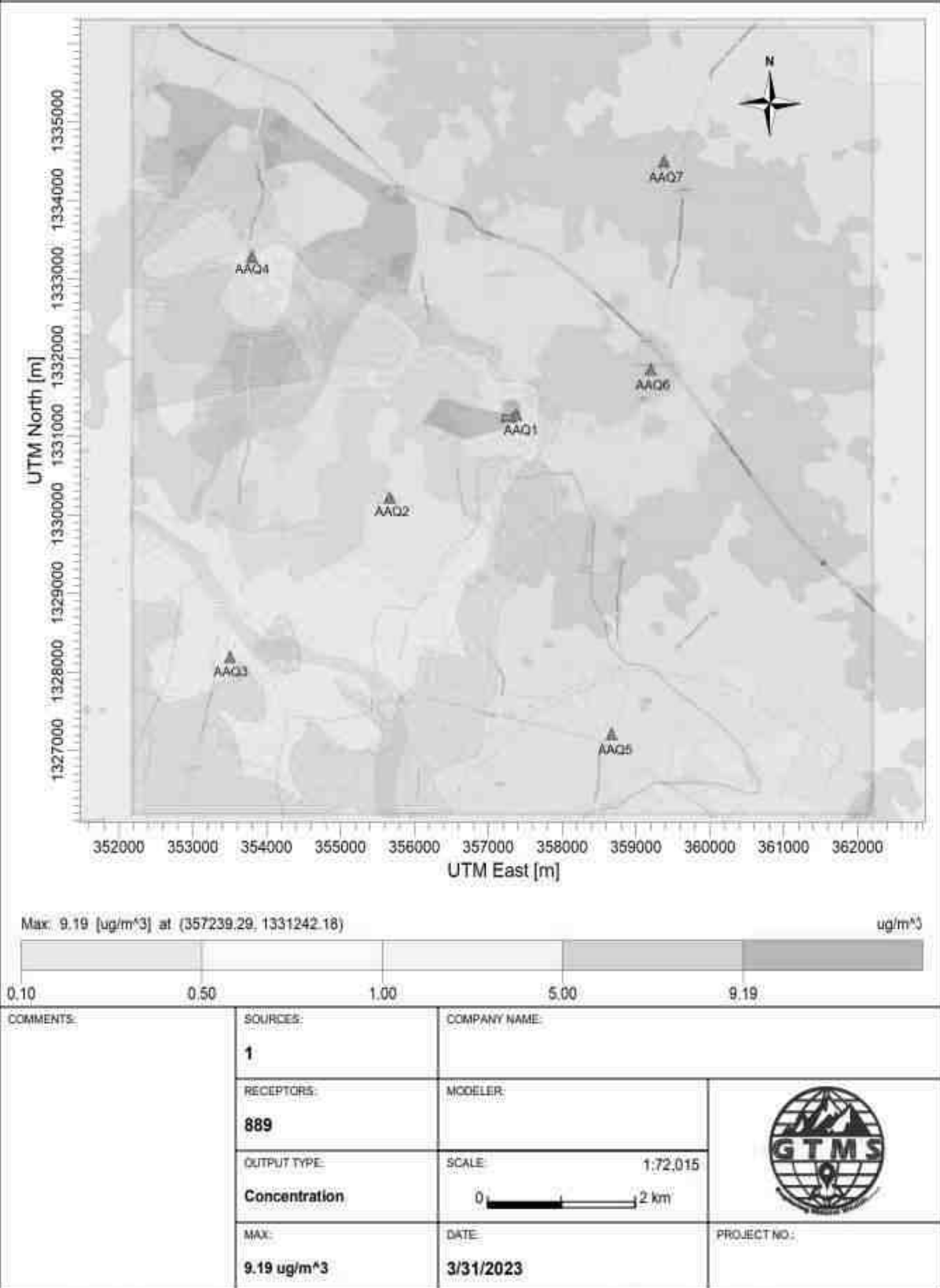
AERMOD View - Lakes Environmental Software

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



PROJECT TITLE:  
**B.VENKATAKRISHNAN RED EARTH QUARRY \_PM10**

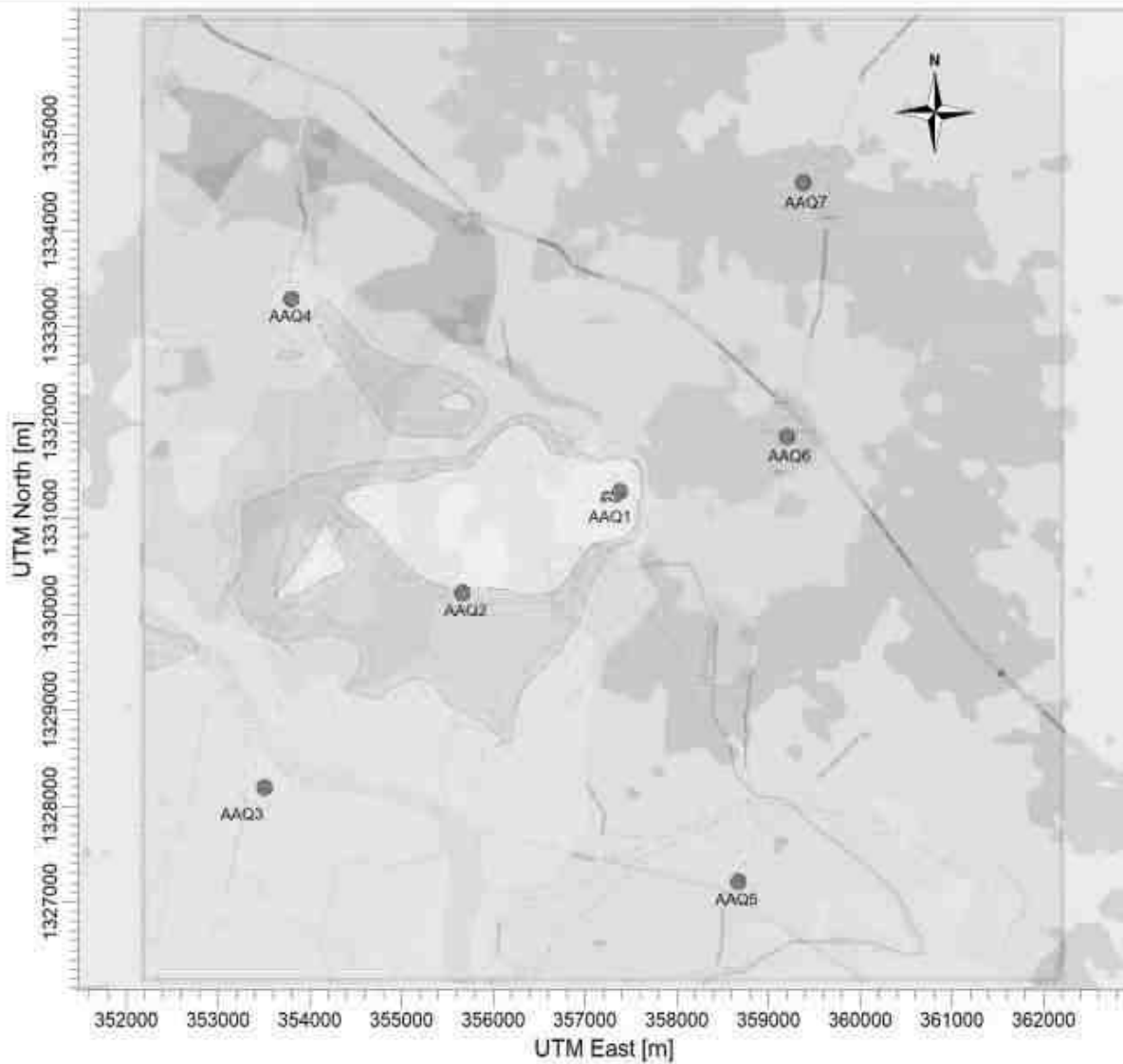


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**Figure 4.2 Predicted Incremental Concentration of PM<sub>10</sub>**

PROJECT TITLE:  
**B.VENKATAKRISHNAN RED EARTH QUARRY \_SO2**



Max: 5.03 [ug/m<sup>3</sup>] at (357239.29, 1331242.18)

ug/m<sup>3</sup>



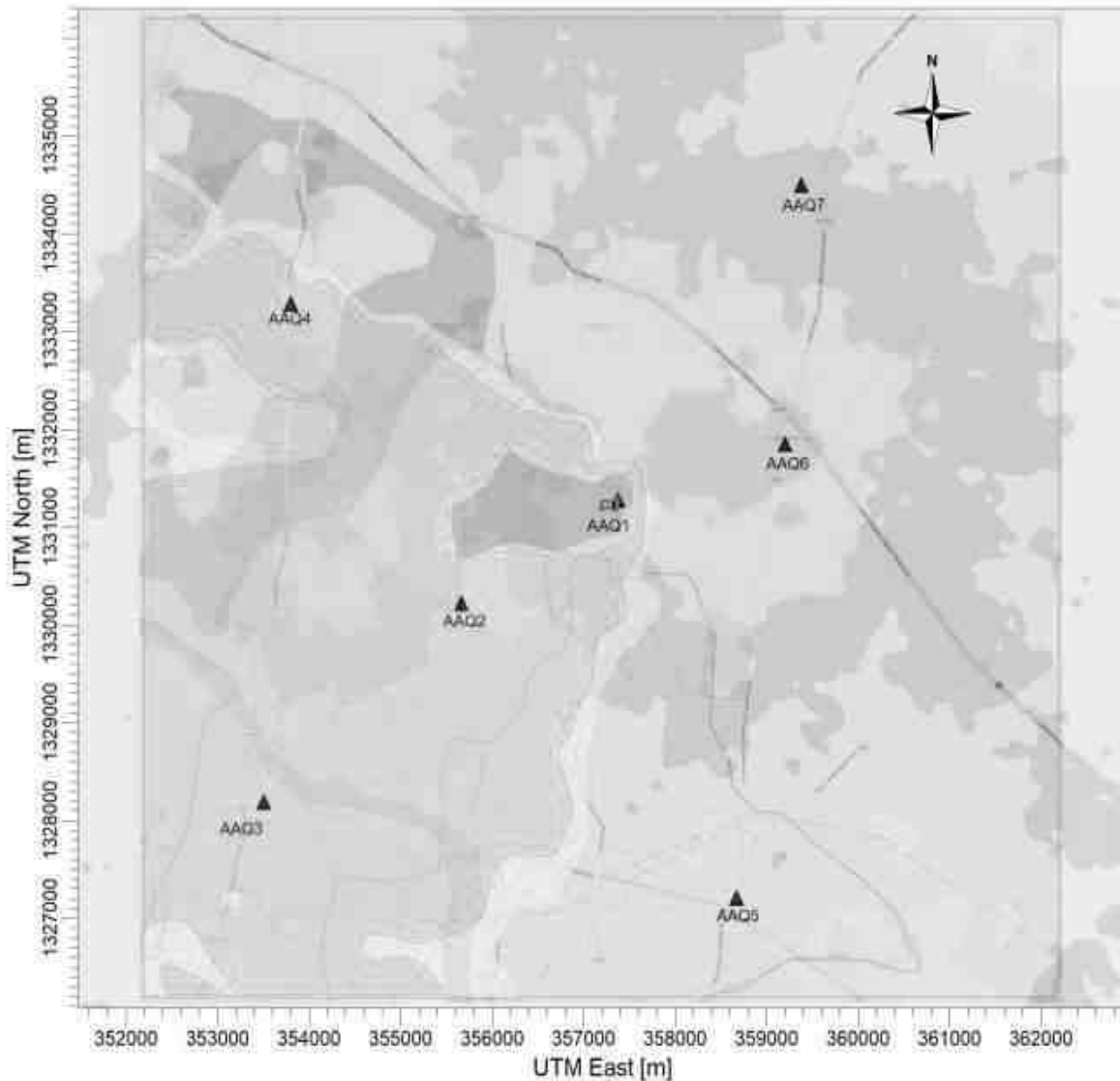
COMMENTS:	SOURCES:	COMPANY NAME:	
	RECEPTORS:	MODELER:	
	OUTPUT TYPE:	SCALE:	1:72,015
	MAX:	DATE:	PROJECT NO.:
	1		
	448		
	Concentration	0  2 km	
	5.03 ug/m <sup>3</sup>	3/31/2023	

AERMOD View - Lakes Environmental Software

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**Figure 4.3 Predicted Incremental Concentration of SO<sub>2</sub>**

PROJECT TITLE:  
**B.VENKATAKRISHNAN RED EARTH QUARRY \_NOx**



COMMENTS:	SOURCES:	COMPANY NAME:	
	1		
	RECEPTORS:	MODELER:	
	448		
OUTPUT TYPE:	SCALE:	1:72,015	
Concentration			
MAX:	DATE:	PROJECT NO.:	
2.87 ug/m <sup>3</sup>	3/31/2023		



**Figure 4.4 Predicted Incremental Concentration of NO<sub>x</sub>**

**Table 4.4 Incremental & Resultant GLC of PM<sub>10</sub>**

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

**Table 4.5 Incremental & Resultant GLC of SO<sub>2</sub>**

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

**Table 4.6 Incremental & Resultant GLC of NO<sub>x</sub>**

Station ID	Distance to core area (km)	Direction	NO <sub>x</sub> concentrations(µg/m <sup>3</sup> )			Comparison against air quality standard (80 µg/m <sup>3</sup> )	Magnitude of change (%)	Significance
			Baseline	Predicted	Total			
AAQ1	--	--	19.5	2.87	22.37	Below Standard	14.72	Not Significant
AAQ2	1.80	SW	15.8	1	16.8		6.33	
AAQ3	4.74	SW	16.8	0.5	17.3		2.98	
AAQ4	3.95	NW	17.9	0.5	18.4		2.79	
AAQ5	4.17	SSE	16.0	0	16		0.00	
AAQ6	1.91	ENE	14.2	0	14.2		0.00	
AAQ7	3.78	NNE	15.0	0	15		0.00	

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

#### **4.4.2 Common Mitigation Measures**

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

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

##### ***Green Belt***

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

##### ***Occupational Health***

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

## 4.5 NOISE ENVIRONMENT

Noise pollution is mainly due to operation like playing 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 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.

$$L_{p2} = L_{p1} - 20 \log (r_2/r_1) - A_{e1,2}$$

Where,

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

$A_{e1,2}$  is the excess attenuation due to environmental conditions.

Combined effect of all sources can be determined at various locations by logarithmic addition.

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

### 4.5.1 Anticipated Impact

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	Excavator	Yes	85
2	Tipper	Yes	84
<b>Total Noise Produced</b>			<b>87.54</b>

\*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 87.54 dB (A). Therefore, we have considered equipment and operation noise levels (max) to be approx. 87.54 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	39.2	35.70	40.80
Thollamur	1690	41.8	11.14	41.80
Kadagampattu	1800	41.0	10.59	41.00
Kodukkur	4740	42.4	2.18	42.40
Eraiur	3950	46.8	3.77	46.80
Katterikuppam	4170	40.4	3.30	40.40
Ranganathapuram	1910	45.8	10.08	45.80
Semangalam	3780	40.6	4.15	40.60
NAAQ Standards	Industrial Day Time - 75 dB (A) & Night Time- 70 dB (A) Residential Day Time -55 dB (A) & Night Time- 45 dB (A)			

The incremental noise level is found to be 35.70 dB (A) in core zone and ranges between 2.18 and 11.14 dB (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:

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

### **4.6 ECOLOGY AND BIODIVERSITY**

#### **4.6.1 Impact on Ecology and Biodiversity**

- Quarry leases have a large number of Acacia holoseicea plants whose seeds are wind-dispersed so that they are abundant both inside and outside the quarry leases area. It contains a total of 18 species belonging to 16 families have been recorded from the buffer zone. 3 Trees (16%), 6 Shrubs (33%) and 9 Herbs (50%) were identified in mine lease area.
- There shall be negligible air emissions or effluents from the project site. During loading the truck, dust generation will be likely. This shall be a temporary effect and not anticipated to affect the surrounding vegetation significantly
- Most of the land in the buffer zone is undulating terrain with croplands, patches of grass and small shrubs. Therefore, excavation of the soil will also affect the vegetation of the croplands, grass patches and small shrubs in the area.
- Carbon released from quarrying machineries and tippers during quarrying would be 400 kg per day, 107889 kg per year and 215778 kg for two years, as provided in Table 4.9.



**Table 4.9 Carbon Released During Two Years of Red Earth Production**

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

**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.
- ❖ Existing roads will be used; new roads will not be constructed to reduce impact on flora.
- ❖ None of the plants in the lease area will be cut during operational phase of the mine. We recommend uprooting and planting 3 trees in the 7.5-meter safety zone to prevent general damage during quarrying. As the survival rate due to uprooting was only 30%, 90 seedlings were procured at the rate of 10 seedlings per tree. Seedlings are planted and protected in 7.5-meter safety zone.

**Carbon Sequestration**

- ❖ To mitigate carbon emission due to mining activities, we recommend planting trees around the quarry to offset the carbon emission during quarrying. A tree can sequester 24 kg of carbon per year. Therefore, we recommend planting large number of trees around the quarry and near school campuses, government wasteland, roadsides etc.
- ❖ As per the greenbelt development plan as recommended by SEAC (Table 4.11), about 768 trees will be planted within three months from the beginning of mining. These trees, when grown up would sequester carbon of 68 about kg of the total carbon, as provided in Table 4.10.

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

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

**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 4.11-4.12. For greenbelt development, species are recommended, as shown in Table 4.11 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 4.11 Recommended Species for Greenbelt Development Plan**

S. No	Botanical Name of the Plant	Family Name	Common Name	Category	Dust Capturing Efficiency Features
1	<i>Azadirachta indica</i>	Meliaceae	Vembu	Tree	Well distinct thick at both the layer 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 4.12 Greenbelt Development Plan**

	No. of trees proposed for plantation	No. of trees expected to survive @ 80%	Area to be covered(m <sup>2</sup> )
Plantation in the construction phase (3 months)	Number of plants inside the mine lease area		
	307	246	2763
	Number of plants outside the mine lease area		
	461	368	4145
<b>Total</b>	<b>768</b>	<b>614</b>	<b>6908</b>

**Table 4.13 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)	307	Site clearance, preparation of land, digging of pits /trenches, soil amendments, transplantation of saplings @ 200 per plant (capital) for plantation inside the lease area and @ 30 per plant maintenance (recurring))"	61400	9210
Plantation outside the area	461	Avenue Plantation @ 300 per plant (capital) for plantation outside the lease area and @ 30 per plant maintenance (recurring)	138150	13815
<b>Total</b>			<b>199550</b>	<b>23025</b>

Source: EMP budget

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

#### 4.6.3 Anticipated Impact on Fauna

- ❖ Osudu Lake Bird Sanctuary is located 9.50 km south-east of the mining lease area. Birds have access to the quarry at a distance of 9.50 km where the dust generated during the quarrying may affect the birds.
- ❖ No rare, endemic & endangered species are reported in mine lease area. 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.

#### **4.6.3.1 Measures for Protection and Conservation of Wildlife Species**

- ❖ Undertaking mitigative 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.

#### **4.6.3.2 Mitigation Measures**

- ❖ 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.

#### ***Artificial Nest or Man-made Nest***

Since the area is also declared as IBA (Important Bird and Biodiversity Area), it is important to have habit management for birds. Man-made nests should be installed on near water bodies, railway cabin and villages that provide suitable conditions for the existence and reproduction of birds and at the same time. Many species of birds find their homes in artificial nests mostly Common Kestrels, Black kite, Owls, parakeets, sparrows etc. By accepting the offered artificial nesting opportunities, these birds make it possible for ornithologists to study their lives and behaviour. Apart from this to cope up with the habitat loss due to clearance of vegetation in the project site, artificial nest should be put up on big trees for other birds for nesting. Artificial nest can also be put up in the houses in the villages around the project site. Awareness and training programme will be organised for birds and installation of nest in their houses for conservation of avifauna as mitigation measures.

#### **4.6.4 Impact on Aquatic Biodiversity**

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

#### **4.6.5 Impact Assessment on Biological Environment**

A detail of impact and assessments was mentioned in Table 4.14.

**Table 4.14 Ecological Impact Assessments**

<b>SI. No</b>	<b>Attributes</b>	<b>Assessment</b>
1	Activities of the project affects the breeding/nesting sites of birds and animals	No breeding and nesting site was identified in mining lease site. The fauna sighted mostly migrated from buffer area.
2	Located near an area populated by rare or endangered species	No endangered, critically endangered, vulnerable species sighted in core mining lease area.
3	Proximity to national park/wildlife sanctuary/reserve forest /mangroves/ coastline/estuary/sea	Osudu Lake Bird Sanctuary is located 9.50 km south-east side.
4	Proposed project restricts access to waterholes for wildlife	No
5	Proposed mining project impact surface water quality that also provide water to wildlife	No scheduled or threatened wildlife animal sighted regularly core in core area.
6	Proposed mining project increase siltation that would affect nearby biodiversity area.	Surface runoff management such as drains is constructed properly so there will be no siltation affect in nearby mining area.
7	Risk of fall/slip or cause death to wild animals due to project activities	No
8	The project release effluents into a water body that also supplies water to a wildlife	No water body near to core zone so chances of water become polluted is low.
9	Mining project effect the forest-based livelihood/ any specific forest product on which local livelihood depended	No
10	Project likely to affect migration routes	No migration route observed during monitoring period.
11	Project likely to affect flora of an area, which have medicinal value	No
12	Forestland is to be diverted, has carbon high sequestration	There was no forest land diverted.
13	The project likely to affect wetlands, Fish breeding grounds, marine ecology	Wetland was not present in near core Mining lease area. No breeding and nesting ground present in core mining area.

**Table 4.15 Anticipated Impact of Ecology and Biodiversity**

<b>S. No</b>	<b>Aspect Description</b>	<b>Likely Impacts on Ecology and Biodiversity (EB)</b>	<b>Impact Consequence - Probability Description / Justification</b>	<b>Significance</b>	<b>Mitigation Measures</b>
<b>Pre-Mining Phase</b>					
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.		
<b>Mining Phase</b>					
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 5 PM. Excavation of dump and transportation work should stop before 7 PM.

3	Vehicular Movement for transportation of materials will result in generation of dust (SPM) due to haul roads and emission of SO <sub>2</sub> , NO <sub>2</sub> , 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 biodiesel, methanol and biofuel around the mining area.
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## 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.
- ❖ Work site assessment will be done by rock scaling of each surface exposed to workers to prevent accidental rock falling and / or landslide.
- ❖ 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, Spirometry tests
- ❖ Periodic medical examination – yearly
- ❖ Lung function test – yearly, those who are exposed to dust
- ❖ Eye test

Essential medicines will be provided at the site. The medicines and other test facilities will be provided at free of cost. The first aid box will be made available at the mine for immediate treatment.

First aid training will be imparted to the selected employees regularly. The lists of first aid trained members shall be displayed at strategic places.

#### **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 II, there is no major history of landslides, earthquake, subsidence etc., recorded in the past history.

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

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

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

The proposed mining lease areas have following advantages:

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

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

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

## CHAPTER VI

### ENVIRONMENTAL MONITORING PROGRAMME

#### 6.0 GENERAL

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

#### 6.1 METHODOLOGY OF MONITORING MECHANISM

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

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

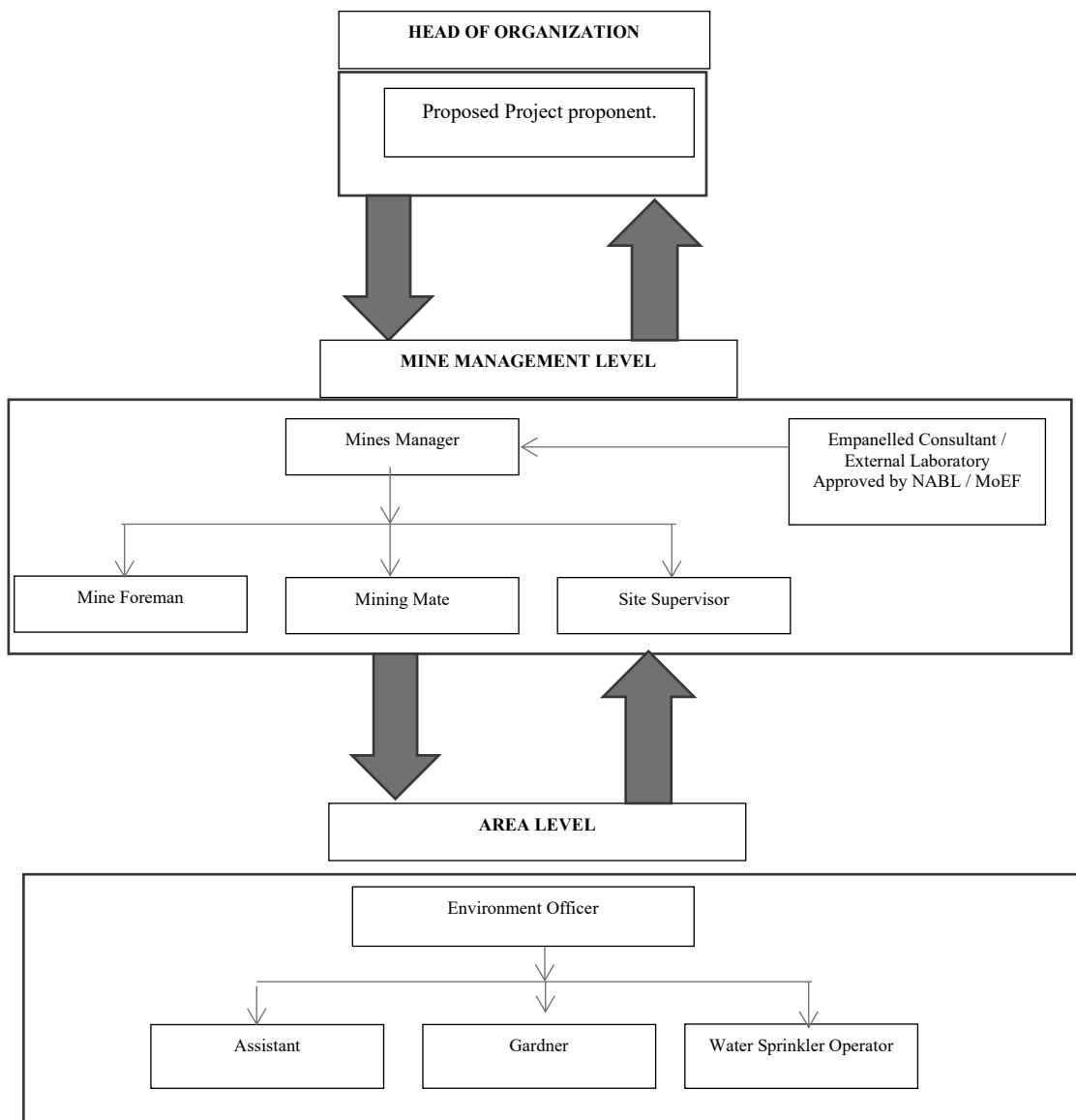
The responsibilities of this cell will be:

- ❖ Implementation of pollution control measures
- ❖ Monitoring programme implementation
- ❖ Post-plantation care
- ❖ To check the efficiency of pollution control measures taken
- ❖ Any other activity as may be related to environment
- ❖ Seeking expert's advice when needed.

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

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

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



**Figure 6.1 Proposed Environmental Monitoring Chart**

## 6.2 IMPLEMENTATION SCHEDULE OF MITIGATION MEASURES

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

**Table 6.1 Implementation Schedule for Proposed Project**

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

## 6.3 MONITORING SCHEDULE AND FREQUENCY

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

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

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

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

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

S. No.	Environment Attributes	Location	Monitoring		Parameters
			Duration	Frequency	
1	Air Quality	2 Locations (1 Core & 1 Buffer)	24 hours	Once in 6 months	Fugitive Dust, PM <sub>2.5</sub> , PM <sub>10</sub> , SO <sub>2</sub> and NO <sub>x</sub> .
2	Meteorology	At mine site before start of Air Quality Monitoring & IMD Secondary Data	Hourly / Daily	Continuous online monitoring	Wind speed, Wind direction, Temperature, Relative humidity and Rainfall
3	Water Quality Monitoring	2 Locations (1SW & 1 GW)	-	Once in 6 months	Parameters specified under IS:10500, 1993 & CPCB Norms
4	Hydrology	Water level in open wells in buffer zone around 1 km at specific wells	-	Once in 6 months	Depth in m BGL
5	Noise	2 Locations (1 Core & 1 Buffer)	Hourly – 1 Day	Once in 6 months	Leq, Lmax, Lmin, Leq Day & Leq Night
6	Soil	2 Locations (1 Core & 1 Buffer)	-	Once in six months	Physical and chemical characteristics
7	Greenbelt	Within the project area	Daily	Monthly	Maintenance

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

#### 6.4 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 1,45,000 /- 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/-
8	Greenbelt	-	Rs 10,000/-
<b>Total</b>		-	<b>Rs 1,45,000 /-</b>

*Source: Field Data*

#### 6.5 REPORTING SCHEDULES OF MONITORED DATA

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

Periodical reports to be submitted to:

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

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

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



## CHAPTER VII

### ADDITIONAL STUDIES

#### 7.0 GENERAL

Additional studies deal with:

- ❖ 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 31<sup>st</sup> December, 2002. The DGMS risk assessment process is intended to identify existing and probable hazards in the work environment and all operations and assess the risk levels of those hazards in order to prioritize those that need immediate attention. Further, mechanisms responsible for these hazards are identified and their control measures, set to timetable are recorded along with pinpointed responsibilities. The whole quarry operation will be carried out under the direction of a Qualified Competent Mine Manager holding certificate of competency to manage a metalliferous mine granted by the DGMS, Dhanbad for proposed project.

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

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

S. No.	Risk factors	Causes of risk	Control measures
1	Accidents due to explosives and heavy mining machineries.	Improper handling and unsafe working practice	<ul style="list-style-type: none"> <li>✓ All safety precautions and provisions of Mine Act, 1952, Metalliferous Mines Regulation, 1961 and Mines Rules, 1955 will be strictly followed during all mining operations.</li> <li>✓ Workers will be sent to the Training in the nearby Group Vocational Training Centre Entry of unauthorized persons will be prohibited.</li> </ul>

			<ul style="list-style-type: none"> <li>✓ Fire-fighting and first-aid provisions in the mine office complex and mining area.</li> <li>✓ Provisions of all the safety appliances such as safety boot, helmets, goggles etc. will be made available to the employees and regular check for their use.</li> <li>✓ Working of quarry, as per approved plans and regularly updating the mine plans.</li> <li>✓ Cleaning of mine faces on daily basis shall be daily done in order to avoid any overhang or undercut.</li> <li>✓ Handling of explosives, charging and firing shall be carried out by competent persons only under the supervision of a Mine Manager.</li> <li>✓ Maintenance and testing of all mining equipment as per manufacturer's guidelines.</li> </ul>
3	Transportation	<p>Potential hazards and unsafe workings contributing to accident and injuries</p> <p>Overloading of material</p> <p>While reversal &amp; overtaking of vehicle</p> <p>Operator of truck leaving his cabin when it is loaded.</p>	<ul style="list-style-type: none"> <li>✓ Before commencing work, drivers personally check the truck/tipper for oil(s), fuel and water levels, tyre inflation, general cleanliness and inspect the brakes, steering system, warning devices including automatically operated audio-visual reversing alarm, rear view mirrors, side indicator lights etc., are in good condition.</li> <li>✓ Not allow any unauthorized person to ride on the vehicle nor allow any unauthorized person to operate the vehicle.</li> <li>✓ Concave mirrors should be kept at all corners</li> <li>✓ All vehicles should be fitted with reverse horn with one spotter at every tipping point</li> <li>✓ Loading according to the vehicle capacity</li> <li>✓ Periodical maintenance of vehicles as per operator manual</li> </ul>

4	Natural calamities	Unexpected happenings	✓ Escape Routes will be provided to prevent inundation of storm water ✓ Fire Extinguishers & Sand buckets
5	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.

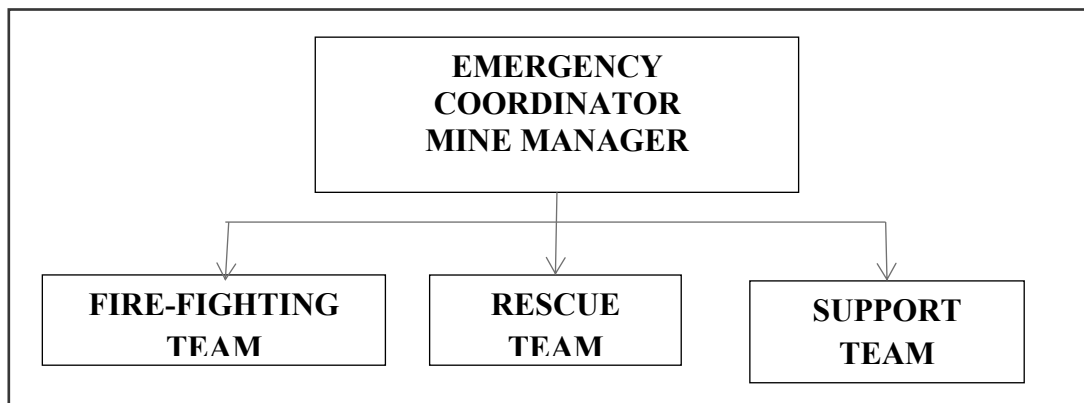
*Source: Analysed and Proposed by FAE & EC*

## 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 II. The area is far away from the sea. Hence, the disaster due to heavy floods and tsunamis are not anticipated. The Disaster Management Plan is aimed to ensure safety of life, protection of environment, protection of installation, restoration of production and salvage operations in this same order of priorities. The objective of the Disaster Management Plan is to make use of the combined resources of the mine and the outside services to achieve the following:

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

In case a disaster takes place, despite preventive actions, disaster management will have to be done in line with the descriptions below. There is an organization proposed for dealing with the emergency. 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**

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

<b>Location</b>	<b>Type of Fire Extinguishers</b>
Electrical Equipment	CO <sub>2</sub> type, foam type, dry chemical powder type
Fuel Storage Area	CO <sub>2</sub> 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.
- ❖ 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.
- ❖ 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 excavation and transportation activities in all the quarries within the cluster and major impact anticipated is on air and noise environment. For this cumulative study, 2 proposed projects, known as P1, P2 are taken into consideration. The details of P1 have been given in Table 1.2 and the details of P2 is given in Table 7.4.

**Table 7.4 Salient Features of Proposed Project Site “P2”**

Name of the Quarry	<b>Thiru.S.Devamani</b>	
Extent	3.05.5 ha	
Toposheet No	57-P/2	
Latitude between	12°02'15.85"N to 12°02'20.80"N	
Longitude between	79°41'10.94"E to 79°41'25.61"E	
Highest Elevation	55 m AMSL	
Proposed Depth of Mining	2 m BGL	
Geological Resources	Red Soil in m <sup>3</sup>	
	61100	
Mineable Reserves	Red Soil in m <sup>3</sup>	
	47470	
Proposed production for 3 years	Red Soil in m <sup>3</sup>	
	47470	
Ultimate Pit Dimension (Proposed)	249 m (L) x 94 m (W) x 2 m (D)	
Method of Mining	Opencast Semi mechanized mining	
Topography	Flat terrain	
Machines Required	Hydraulic Excavator	1
	Tippers	3
Proposed Manpower Required	9	
Project Cost	Rs.23,68,900	
CER Cost	Rs. 5,00,000	
Proposed Water Requirement	4.8 KLD	

Source: Approved Mining Plan

### 7.3.1 Air Environment

As the production of red earth plays a vital role in affecting the air environment. The data on the cumulative production resulting from the two proposed projects have been given in Table 7.5.

**Table 7.5 Cumulative Production Load of Red Earth**

Quarry	For 2 Years in m <sup>3</sup>	Per Day in m <sup>3</sup>	Number of Lorry Load Per Day
P1	23004	43	7
P2	47470	59	10
<b>Grand Total</b>	<b>70474</b>	<b>102</b>	<b>17</b>

The cumulative study shows that the overall production of red soil from the two quarries is 102 m<sup>3</sup> per day with a capacity of 17 trips of red soil per day.

#### 7.3.1.1 Cumulative Impact of Air Pollutants

The results on the cumulative impact of the 2 proposed projects on air environment of the cluster have been provided in Table 7.6. The cumulative values resulting from the 2 projects for each pollutant do not exceed the permissible limits set by CPCB.

**Table 7.6 Cumulative impact results from the 2 proposed projects**

Pollutants	Baseline Data (µg/m <sup>3</sup> )	Incremental Values (µg/m <sup>3</sup> )		Cumulative Value (µg/m <sup>3</sup> )
		P1	P2	
PM <sub>2.5</sub>	20.6	5.87	8.93	37.7
PM <sub>10</sub>	37.7	9.18	13.97	11.5
SO <sub>2</sub>	11.5	5.03	7.65	19.5
NO <sub>2</sub>	19.5	2.87	4.37	20.6

### 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 7.7 Cumulative Impact of Noise from 2 Proposed Quarries on Thollamur Habitation**

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	1690 m	NNW	41.8	11.14	41.80	55
Habitation Near P2	1700 m	NNW	41.8	10.79	41.80	
<b>Cumulative Noise (dB (A))</b>					<b>44.80</b>	

Source: Lab Monitoring Data

The cumulative analysis of noise due to 2 proposed projects shows that habitation of Thollamur will receive about 44.80 dB (A), respectively. The cumulative results for all the villages in consideration do not exceed the limit set by CPCB for residential areas for daytime.

### 7.3.3 Socio Economic Environment

Socio Economic benefits of the 2 proposed projects were calculated and the results have been shown in Table 7.8 the 2 projects together will contribute Rs.10,00,000 towards CER fund.

**Table 7.8 Socio Economic Benefits from 2 Mines**

Location ID	Project Cost	CER @ 2%
P1	13,75,000	Rs. 5,00,000
P2	23,68,900	Rs. 5,00,000
<b>Grand Total</b>	<b>37,43,900</b>	<b>Rs. 10,00,000</b>

**Table 7.9 Employment Benefits from 2 Mines**

Location ID	Employment
P1	5
P2	9
<b>Grand Total</b>	<b>14</b>

A total of 14 people will get employment due to 2 proposed mines in cluster

### 7.3.4 Ecological Environment

**Table 7.10 Greenbelt Development Benefits From 2 Mines**

Code	Number of Trees proposed	Area to be covered (m <sup>2</sup> )	No. of Trees expected to be grown @ 80% survival rate	Species recommended
P1	768	6908	614	<i>Azadirachta indica, Albizia lebbeck, Delonix regia, Tectona grandis, etc.,</i>
P2	1528	13748	1222	
<b>Total</b>	<b>2296</b>	<b>20656</b>	<b>1836</b>	

Cumulative studies show that the 2 proposed projects will plant about 2296 native tree species like *Azadirachta indica, Albizia lebbeck, Delonix regia, Tectona grandis*, etc inside and outside the lease area. It is expected that 80 % of trees, i.e., 1836 trees will survive in this green belt development program.

### 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 7.11.

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

S. No.	Activity	Responsibility
1	Framing of Layout Design by incorporating provision of the Rules, user fee to be charged from waste generators for plastic waste management, penalties/fines for littering, burning plastic waste or committing any other acts of public nuisance.	Mines Manager
2	Enforcing waste generators to practice segregation of bio-degradable, recyclable and domestic hazardous waste.	Mines Manager

3	Collection of plastic waste.	Mines Foreman
4	Setting up of Material Recovery Facilities.	Mines Manager
5	Segregation of Recyclable and Non-Recyclable plastic waste at Material Recovery Facilities.	Mines Foreman
6	Channelization of Recyclable Plastic Waste to registered recyclers.	Mines Foreman
7	Channelization of Non-Recyclable Plastic Waste for use either in Cement kilns, in Road Construction.	Mines Foreman
8	Creating awareness among all the stakeholders about their responsibility.	Mines Manager
9	Surprise checking's of littering, open burning of plastic waste or committing any other acts of public nuisance.	Mine Owner

Source: Proposed by FAEs and EC

## 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 O<sub>2</sub> < 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 Kondalangkuppam Village aims to produce **23004 m<sup>3</sup>** of red earth over a period of 2 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 5 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 in the form of contractual jobs, business opportunities, and service facilities etc. Because of this, the economic status of the local people will improve.

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

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

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

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

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

#### **8.4 IMPROVEMENT IN SOCIAL INFRASTRUCTURE**

Employment is expected during civil construction period, in trade, garbage lifting, sanitation and other ancillary services, Employment in these sectors will be primarily temporary or contractual and involvement of unskilled labour will be more. A major part of the labour force will be mainly

from local villagers who are expected to engage themselves both in agriculture and mining activities. This will enhance their income and lead to overall economic growth of the area.

### **8.5 OTHER TANGIBLE BENEFITS**

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

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

### **8.6 CORPORATE SOCIAL RESPONSIBILITY**

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

Under this programme, the project proponents will take-up following programmes for social and economic development of villages within 10 km of the project site. For this purpose, separate budget will be provided every year. For finalization of these schemes, proponent will interact with LSG. The schemes will be selected from the following broad areas –

- ❖ Health Services
- ❖ Social Development
- ❖ Infrastructure Development
- ❖ Education & Sports
- ❖ Self-Employment
- ❖ CSR Cost Estimation
- ❖ CSR activities mainly contributing to education, health, training of women self-help groups and infrastructure etc., will be taken up in the Kondalangkuppam Village. 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  $\leq$  100 crores, the proposed project shall contribute 2% of capital investment towards CER as per directions of EAC/SEAC. However, the SEAC has suggested to allocate CER fund on the basis of the extent of the project. Therefore, Rs. 5,00,000 is allocated for CER. The proposed utilization of the budget of CER activities is given in Table 8.1.

**Table 8.1 CER Action Plan**

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

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

## 8.8 SUMMARY OF PROJECT BENEFITS

The project would pay about **Rs. 14,10,958** to the state government through various ways, as provided in Table 8.2.

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

Particulars	Budget (Rs.) for red earth
CER	500000
Seigniorage @ Rs.33/m <sup>3</sup> of red earth	7,59,132
District Mineral Foundation Tax @ 10% of Seigniorage	75,913
Green Tax @ 10% of Seigniorage	75,913
<b>Total</b>	<b>14,10,958</b>

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

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



## **CHAPTER X**

### **ENVIRONMENTAL MANAGEMENT PLAN**

#### **10.0 GENERAL**

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

#### **10.1 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. B. Venkatakrisnan 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**

<b>Control</b>	<b>Responsibility</b>
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 and stored 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 2 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**

<b>Control</b>	<b>Responsibility</b>
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
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**

<b>Control</b>	<b>Responsibility</b>
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
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, and truck-loading 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**

<b>Control</b>	<b>Responsibility</b>
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
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
Change the burden and spacing by altering the drilling pattern and/or delay layout, or altering the hole inclination	Mines Manager
Undertake noise monitoring	Mines Manager

*Source: Proposed by FAEs & EIA Coordinator*

## 10.7 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.

### 10.7.1 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 10.5.

**Table 10.5 Proposed Greenbelt Development Plan**

	<b>No. of trees proposed for plantation</b>	<b>No. of trees expected to survive @ 80%</b>	<b>Area to be covered(m<sup>2</sup>)</b>
Plantation in the construction phase (3 months)	Number of plants inside the mine lease area		
	307	246	2763
	Number of plants outside the mine lease area		
	461	368	4145
<b>Total</b>	<b>768</b>	<b>614</b>	<b>6908</b>

Source: Proposed by FAEs & EIA Coordinator

About 768 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.

## **10.8 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.

### **10.8.1 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 10.6) keep upgrading the database of medical history of the employees.

**Table 10.6 Medical Examination Schedule**

S. No.	Activities	1 <sup>st</sup> Year	2 <sup>nd</sup> Year	3 <sup>rd</sup> Year	4 <sup>th</sup> Year	5 <sup>th</sup> 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:						
<b>Age Group</b>		<b>PME as per Mines Rules 1955</b>		<b>Special Examination</b>		
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.						

### 10.8.2 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**

### **10.8.3 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 10.7.



**Table 10.7 List of Periodical Trainings Proposed for Employees**

<b>Course</b>	<b>Personnel</b>	<b>Frequency</b>	<b>Duration</b>	<b>Instruction</b>
New-Employee Training	All new employees exposed to mine hazards	Once	One week	<ul style="list-style-type: none"> <li>✓ Employee rights,</li> <li>✓ Supervisor responsibilities</li> <li>✓ Self-rescue</li> <li>✓ Respiratory devices</li> <li>✓ Transportation controls</li> <li>✓ Communication systems</li> <li>✓ Escape and emergency evacuation</li> <li>✓ Ground control hazards</li> <li>✓ Occupational health hazards</li> <li>✓ Electrical hazards and First aid Explosives</li> </ul>
Task Training on Safety, Slope Stability, Dewatering, Haul Road Maintenance.	Employees assigned to new work tasks	Before new assignments	Variable	<ul style="list-style-type: none"> <li>✓ Task-specific health &amp; safety procedures and SOP for various mining activity</li> <li>✓ Supervised practice in assigned work tasks.</li> </ul>
Refresher Training	All employees who received new-hire training	Yearly	One week	<ul style="list-style-type: none"> <li>✓ Required health and safety standards</li> </ul>

				<ul style="list-style-type: none"> <li>✓ Transportation controls</li> <li>✓ Communication systems</li> <li>✓ Escape ways, emergency evacuations</li> <li>✓ Fire warning</li> <li>✓ Ground control hazards</li> <li>✓ First aid on electrical hazards</li> <li>✓ Accident prevention</li> <li>✓ Explosives</li> <li>✓ Respirator devices</li> </ul>
Hazard Training	All employees exposed to mine hazards	Once	Variable	<ul style="list-style-type: none"> <li>✓ Hazard recognition and avoidance</li> <li>✓ Emergency evacuation procedures</li> <li>✓ Health standards</li> <li>✓ Safety rules</li> <li>✓ Respiratory devices</li> </ul>

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

#### **10.8.4 Budgetary Provision for Environmental Management**

Adequate budgetary provision has been made by the company for execution of Environmental Management Plan. The Table 10.8 gives overall investment on the environmental safeguards and recurring expenditure for successful monitoring and implementation of control measures.

**Table 10.8 EMP Budget for Proposed Project**

<b>Attribute</b>	<b>Mitigation measures</b>	<b>Provision for Implementation</b>	<b>Capital Cost (Rs.)</b>	<b>Recurring Cost/annum (Rs.)</b>
<b>Air Environment</b>	Compaction, gradation and drainage on both sides	Rental Dozer & drainage construction on haul road @ Rs. 10,000/- per hectare and yearly maintenance @ Rs. 10,000/- per hectare	15350	15350
	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	0	0
	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	15000	0
	Regular monitoring of exhaust fumes as per RTO norms	Monitoring of exhaust fumes	0	3750
	Regular sweeping and maintenance of roads for at least about 200 m from quarry entrance	Provision for 2 labours @ Rs.10,000/labour (Contractual)	0	30700
	Installing wheel wash system near exit gate of quarry	Installation + Maintenance + Supervision	50000	20000
<b>Noise Environment</b>	Source of noise will be transportation vehicles, and HEMM. For this, proper	Provision made in Operating Cost	0	0

	maintenance will be done at regular intervals.			
	Oiling & greasing of Transport vehicles and HEMM at regular interval will be done.	Provision made in Operating Cost	0	0
	Adequate silencers will be provided in all the diesel engines of vehicles.	Provision made in Operating Cost	0	0
	It will be ensured that all transportation vehicles carry a fitness certificate.	Provision made in Operating Cost	0	0
	Safety tools and implementations that are required will be kept adequately near blasting site at the time of charging.	Provision made in OHS part	0	0
	Line Drilling all along the boundary to reduce the PPV from blasting activity and implementing controlled blasting.	Provision made in Operating Cost	0	0
	Proper warning system before blasting will be adopted and clearance of the area before blasting will be ensured.	Blowing Whistle by Mining Mate / Blaster / Competent Person	0	0

	Provision for portable blaster shed	Installation of portable blasting shelter	0	0
	NONEL Blasting will be practiced to control Ground vibration and fly rocks	Rs. 30/- per 6 tons of blasted material	0	0
<b>Water Environment</b>	Water Management	Provision for garland drain @ Rs. 10,000/- per hectare with maintenance of Rs. 5,000/- per annum	15350	7675
<b>Waste Management</b>	Waste management (Spent Oil, Grease etc.,)	Provision for domestic waste collection and disposal through authorized agency (capital cost, recurring cost for collection /disposal).	25000	20000
		Installation of dust bins	5000	2000
	Bio toilets will be made available outside mine lease on the land of owner itself	Provision made in Operating Cost	0	0

<b>Implementation of EC, Mining Plan &amp; DGMS Condition Occupational Health and Safety</b>	Size 6' X 5' with blue background and white letters as mentioned in MoM Appendix II by the SEAC TN	Fixed display board at the quarry entrance as permanent structure	10000	1000
	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)	20000	5000
	Health checkup for workers will be provisioned	IME & PME Health checkup @ Rs. 1000/- per employee	0	5000
	First aid facility will be provided	Provision of 2 Kits per Hectare @ Rs. 2000/-	0	6140
	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	307000	15350

	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	76750	15350
	Installation of CCTV cameras in the mines and mine entrance	Camera 4 Nos, DVR, Monitor with internet facility	30000	5000
	Implementation as per Mining Plan and ensure safe quarry working	Mines Manager (1 <sup>st</sup> Class / 2 <sup>nd</sup> Class / Mine Foreman) under regulation 34 / 34 (6) of MMR, 1961 and Mining Mate under regulation 116 of MMR, 1961 @ 40,000/- for Manager & @ 25,000/- for Foreman / Mate	0	780000
<b>Development of Green Belt</b>	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	61400	9210



		and @ 30 per plant maintenance (recurring))"		
		Avenue plantation @ 300 per plant (capital) for plantation outside the lease area and @ 30 per plant maintenance (recurring)	138150	13815
<b>Mine Closure Activity</b>	Closure includes 10% of the ammount 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	52190
<b>Green fund</b>	G.O.(Ms). No.23, Dated: 28.09.2021	Section IVA of TNMMCR 1959 (@10% of Seigniorage Fee) (Seigniorage Fee for Roughstone = Rs.59 and for Gravel= Rs.33)	75913	
<b>Total EMP Budget</b>			<b>1654913</b>	<b>1077340</b> (Excl. Mine Closure)

**Table 10.9 Estimation of Overall EMP Budget after Adjusting 5% Annual Inflation**

<b>I<sup>st</sup> Year</b>	<b>II<sup>nd</sup> Year</b>	<b>III<sup>rd</sup> Year</b>	<b>IV<sup>th</sup> Year</b>	<b>V<sup>th</sup> Year Including Mine Closure Cost</b>	<b>Total</b>
2732253	1131207	1187767	1247156	1361704	<b>7660087</b>

In order to implement the environmental protection measures, an amount of Rs. 1654913 as capital cost and recurring cost as Rs. 1077340 as recurring cost/annum is proposed considering present market price considering present market scenario for the proposed project. After the adjustment of 5% inflation per year, the overall EMP cost for 2 years will be Rs. 7660087 as shown in Table 10.9.

### **10.9 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 Lr.No: SEIAA-TN/F.NO.9383/TOR-1279/2022 dated 08.10.2022 by considering 2 proposed quarries and 3 Expired Projects in a cluster with the total extent of 10.51.5ha Kondalangkuppam Village, Vanur Taluk, Villuppuram District and Tamil Nadu State. Cluster area was calculated as per MoEF & CC Notification S.O. 2269(E) Dated 1<sup>st</sup> July 2016. Baseline Monitoring studies were carried out during the period of December 2022- February 2023.

### 11.1 PROJECT DESCRIPTION

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

According to the approved mining plan, about 23004<sup>m<sup>3</sup></sup> red earth will be mined out up to the depth of 2 m BGL for two years. To achieve the estimated production, 1 excavator with bucket/rock breaker, and 3 tippers will be deployed. To operate the machineries and taking red soil about 5 persons will be employed. At the end of the quarry life, the dimension of the ultimate pit will be 67 m X 92 m X 2 m and about 1.15.0 ha of land would have been quarried. According to the land use results, at present about 1.53.5 ha of land is designated as unutilized area, whereas at the end of the mine life, about 1.15.0 ha of land would have been quarried; about 0.01.0 ha of land would have been used for establishing infrastructures; about 0.04.0 ha of land would have been used for road development; about 0.25.0 ha of land would have been used for green belt development; and about 0.02.5 ha of land would have been unutilized. The final mine closure plan shows that about **Rs. 521900** with the annual recurring cost of **Rs. 46050** will be spent towards mine closure.

## **11.2 DESCRIPTION OF THE ENVIRONMENT**

The baseline monitoring studies were carried out during December 2022- February 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, air, noise, ecology, socio-economy, and traffic.

### **11.2.1 Land Environment**

Land Use and Land Cover (LULC) map was prepared using Sentinel II image for the study area of 5 km radius. Totally, 9 LULCs were mapped. The areal extent of each LULC is provided in Table 3.2. Of the total area, mining area covers only 113.19 ha accounting for 1.49 %, of which lease area of 1.53.5 ha contributes only about 0.02%. This small percentage of mining activities shall not have any significant impact on the land environment.

### **11.2.2 Soil Characteristics**

#### ***Physical Characteristics***

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

#### ***Chemical Characteristics***

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

### **11.2.3 Water Environment**

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

Sangarabarani River is the prominent surface water resources present in the study area. Two surface water sample, known as SW01 and SW02 were collected from the Sangarabarani River in Thiruvakkarai (4.63 km) and Sangarabarani River in Kaikilampattu (3.72 km) in, to assess the baseline water quality. Result for surface water sample in the Table 3.6 indicate that the physical, chemical and biological parameters, and heavy metals are within permissible limits in comparison with standards of IS10500:2012.

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

Six groundwater samples, known as OW01, OW02, BW01, BW02, BW03 and BW04 collected from bore wells and open wells were analysed for physico-chemical conditions, heavy metals and

bacteriological contents in order to assess baseline quality of ground water and analyzed for physico-chemical conditions, heavy metals and bacteriological contents in order to assess baseline quality of ground water. Results for ground water samples indicate that the physical, chemical and biological parameters, and heavy metals are within permissible limits in comparison with standards of IS10500:2012.

### **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 December, 2022 varied from 22.24 to 28.97<sup>0</sup> C with the average of 25.88<sup>0</sup> C; in January, 2023 from 19.73 to 31.58<sup>0</sup> C with the average of 25.17<sup>0</sup> C; and in February, 2023 from 22.85 to 29.72<sup>0</sup> C with the average of 25.83<sup>0</sup>C. In December, 2022, relative humidity ranged from 67.19 to 92.31 % with the average of 83.88%; in January, 2023, from 49.12 to 100 % with the average of 74.88 %; and in February, 2023, from 46.69 to 89.38 % with the average of 72.94 %. The wind speed in December, 2022 varied from 1.10 to 12.32 m/s with the average of 5.46 m/s; in January, 2023 from 1.49 to 8.12 m/s with the average of 4.69 m/s; and in February, 2023 from 0.56 to 8.07 m/s with the average of 3.95 m/s. In December,2022, wind direction varied from 0.0 to 359.24<sup>0</sup> with the average of 83.12<sup>0</sup>; in January, 2023, from 1.16 to 107.38<sup>0</sup> with the average of 51.82<sup>0</sup>; and in February, 2023, from 3.41 to 117.76<sup>0</sup> with the average of 70.34<sup>0</sup>. In December,2022, surface pressure varied from 100.08 to 101.73 kPa with the average of 100.89 kPa; in January, 2023, from 98.14 to 101.63 kPa with the average of 101.0 kPa; and in February, 2023, from 100.63 to 101.66 kPa with the average of 101.09 kPa.

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

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

### **11.4 NOISE ENVIRONMENT**

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

## 11.5 BIOLOGICAL ENVIRONMENT

There is no schedule I species of animals observed within study area as per Wildlife Protection Act 1972 as well as no species is in vulnerable, endangered or threatened category as per IUCN. There is no endangered red list species found in the study area. 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

An attempt has been made to assess the impact of the proposed mining project on Socio-economic aspect of the study area. The various attributes that have been taken into account are population composition, employment generation, occupational shift, household income and consumption pattern. Implementation of the Proposed Mine Project will generate both direct and indirect employment. Besides, mining operation will be legally valid and it will bring income to the state exchequer. At present seasonal agriculture is the main occupation of the people as more than half of the population depends on it. With the implementation of the proposed mining project the occupational pattern of the people in the area will change making more people engaged in mining-based activities rather in seasonal agriculture.

## 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**

<b>Impact</b>	<b>Mitigation Measure</b>
<b>Land Environment</b>	
<ul style="list-style-type: none"><li>❖ Destruction of natural landscapes</li><li>❖ Changes in soil characteristics</li><li>❖ Soil erosion and slope instability</li></ul>	<ul style="list-style-type: none"><li>❖ Mining will be carried out as per approved mine plan in scientific and systematic way</li><li>❖ Safety Zone or Buffer area will be maintained and will not be mined and instead plantation will be carried out in the safety zone</li><li>❖ Barbed wire fencing will be provided all along the proposed mine boundary</li><li>❖ At conceptual stage, the land use pattern of the quarry will be changed into Greenbelt area and temporary reservoir</li><li>❖ Construction of garland</li></ul>

	<ul style="list-style-type: none"> <li>❖ 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</li> </ul>
<b>Water Environment</b>	
<ul style="list-style-type: none"> <li>❖ Decrease in aquifer recharge and increase in surface runoff;</li> <li>❖ Disturbance to land drainage, overload and erosion of watercourses;</li> <li>❖ Changes to the surface over which water flows;</li> <li>❖ Changes to surface and groundwater resources quantity and quality due to stream blockage and contamination by particulate matter or waste;</li> <li>❖ Contamination of aquifers due to removal of the natural filter medium.</li> </ul>	<ul style="list-style-type: none"> <li>❖ 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</li> <li>❖ 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</li> <li>❖ Domestic sewage from site office &amp; urinals/latrines provided in project area will be discharged through septic tank followed by soak pit system.</li> <li>❖ Tippers &amp; 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 &amp; grease trap, only clear water will be reused for greenbelt development.</li> </ul>
<b>Air Environment</b>	
<ul style="list-style-type: none"> <li>❖ Generation of Fugitive Dust</li> <li>❖ Dust will be generated mainly during excavation, loading &amp; unloading activities.</li> </ul>	<ul style="list-style-type: none"> <li>❖ Haul roads will be well maintained by sprinkling water twice a day</li> <li>❖ The access road will be cleaned and brushed to ensure that mud and dust deposits do not accumulate.</li> </ul>

<ul style="list-style-type: none"> <li>❖ Gaseous pollutants will be generated mostly by the traffic.</li> <li>❖ Reduction in visibility due to dust plumes.</li> <li>❖ Coating of surfaces leading to annoyance and loss of amenity.</li> <li>❖ Physical and/or chemical contamination and corrosion.</li> <li>❖ Increase in the concentration of suspended particles in runoff water.</li> <li>❖ Coating of vegetation leading to reduced photosynthesis,</li> <li>❖ Inhibited growth, destroying of foliage, degradation of crops;</li> <li>❖ Increase in health hazards due to inhalation of dust.</li> </ul>	<ul style="list-style-type: none"> <li>❖ 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</li> <li>❖ Speed restrictions will be imposed to avoid spillage of loaded materials upon the road and to reduce wear and tear of the road.</li> <li>❖ 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.</li> <li>❖ 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.</li> <li>❖ Personal Protective Equipment's will be provided to all workers</li> <li>❖ 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.</li> <li>❖ A site speed limit of 20 km/h will be set to minimise the potential for dust generation</li> <li>❖ Weekly maintenance programme to identify machinery due for maintenance, based on the number of hours it has been in operation.</li> <li>❖ Air filters are renewed after every 1000 hours of use, unless otherwise indicated by an on-board computer system.</li> <li>❖ All site machineries &amp; tippers will be serviced and maintained 6 months once and drivers will report</li> </ul>
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	any defects immediately to the site manager to enable repairs to be carried out promptly.
<b>Noise &amp; Vibration</b>	
<ul style="list-style-type: none"> <li>❖ Annoyance and deterioration of the quality of life;</li> </ul>	<ul style="list-style-type: none"> <li>❖ Proper maintenance, oiling and greasing of machines will be done every week to reduce generation of noise;</li> <li>❖ Provision of sound insulated chambers for the workers working on machines (HEMM) producing higher levels of noise;</li> <li>❖ Silencers / mufflers will be installed in all machineries;</li> <li>❖ Green Belt/Plantation will be developed around the project area and along the haul roads. The plantation minimizes propagation of noise;</li> <li>❖ 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.</li> </ul>
<b>Biological Environment</b>	
<ul style="list-style-type: none"> <li>❖ Direct impacts include land clearance and excavation causing destruction of flora and fauna and loss of habitats;</li> <li>❖ Indirect impacts include habitat degradation due to noise, dust, and human activity.</li> </ul>	<ul style="list-style-type: none"> <li>❖ Only some common herbs, shrubs and grass will be cleared. So, there will be no impact on the biodiversity.</li> <li>❖ Green belt development with suitable species will enhance the biodiversity of the project area.</li> <li>❖ The core zone or buffer zone does not encompass any threatened flora or fauna species.</li> </ul>
<b>Socio-Economic Environment</b>	
<ul style="list-style-type: none"> <li>❖ Health and safety of workers and the general public;</li> <li>❖ Increase in traffic volumes and sizes of road vehicles;</li> </ul>	<ul style="list-style-type: none"> <li>❖ The mining activity puts negligible change in the socio-economic profile.</li> <li>❖ Around 5 local workers will get employment opportunities along with periodical training to generate local skills.</li> </ul>

<ul style="list-style-type: none"> <li>❖ Economic issues, including the increase in employment opportunities;</li> </ul>	<ul style="list-style-type: none"> <li>❖ New patterns of indirect employment/ income will generate.</li> <li>❖ Regular health check-up camp.</li> <li>❖ Assistance to schools and scholarship to children will be provided.</li> </ul>
<b>Occupational Health &amp; Safety</b>	
<ul style="list-style-type: none"> <li>❖ Exposure to Dust</li> <li>❖ Noise Exposure</li> <li>❖ Physical Hazards</li> <li>❖ Respiratory hazards due to Dust exposure</li> </ul>	<ul style="list-style-type: none"> <li>❖ Provision of rest shelters for mine workers with amenities like drinking water etc.</li> <li>❖ All safety measures like use of safety appliances, such as dust masks, helmets, shoes, safety awareness programs, awards, posters, slogans related to safety etc.</li> <li>❖ Training of employees for use of safety appliances and first aid in vocational training centre.</li> <li>❖ Weekly maintenance and testing of all equipment as per manufacturers' guidelines.</li> <li>❖ Pre placement and Yearly Medical Examination of all workers by a medical Officer</li> <li>❖ First Aid facility will be provided at the mine site.</li> <li>❖ 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.</li> <li>❖ Working of mine as per approved mining plan and environmental plans</li> </ul>

## 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 1,45,000 /- 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***

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 31<sup>st</sup> 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 Impact Studies***

- The results on the cumulative impact of the four proposed projects on air environment of the cluster do not exceed the permissible limits set by CPCB for air pollutants.
- The cumulative results of noise for the habitation in consideration do not exceed the limit set by CPCB for residential areas for day time.
- 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 about 14 local people.
- The two proposed projects will plant about 2296 saplings in and around the lease area.
- The two proposed projects will add 51 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 5 local people
- ❖ Rain water harvesting structures to augment the water availability for irrigation and plantation and ground water recharge
- ❖ Creation of community assets (infrastructure) like school buildings, village roads/ linked roads, dispensary & health Centre, community Centre, market place etc.,
- ❖ Strengthening of existing community facilities through the Community Development 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 Kondalangkuppam 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. 1654913 as capital cost and recurring cost as Rs. 1077340 as recurring cost/annum is proposed considering present market price considering present market scenario for the proposed project. After the adjustment of 5% inflation per year, the overall EMP cost for 2 years will be Rs. 7660087.

### **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.B.Venkatakrishnan has engaged **Geo Technical Mining Solutions**, a NABET accredited consultancy for carrying out the EIA study as per the ToR issued.

**Address of the consultancy:**

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

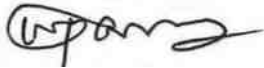
The accredited experts and associated members who were engaged in this EIA study are given below:

S.No.	Name of the expert	In house/ Empanelled	Sector	Functional Area	Category
<b>Approved Functional Area Experts &amp; EC</b>					
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
<b>Approved Functional Area Associates</b>					
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
<b>Abbreviations</b>					
EC	EIA Coordinator	NV	Noise and Vibration		
FAE	Functional Area Expert	SE	Socio Economics		
FAA	Functional Area Associates	HG	Hydrology, ground water and water conservation		
TM	Team Member	SC	Soil conservation		
GEO	Geology	RH	Risk assessment and hazard management		
WP	Water pollution monitoring, prevention and control	SHW	Solid and hazardous wastes		
AP	Air pollution monitoring, prevention and control	MSW	Municipal Solid Wastes		
LU	Land Use	ISW	Industrial Solid Wastes		
AQ	Meteorology, air quality modelling, and prediction	HW	Hazardous Wastes		
EB	Ecology and bio-diversity	GIS	Geographical Information System		

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

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

Signature : 

Date : 04.04.2023

Name : **Dr. S. Karuppannan**






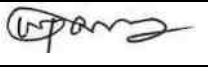



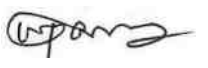

Designation : EIA Coordinator

Name of the EIA Consultant Organization : Geo Technical Mining Solutions



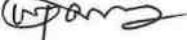





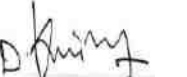
Period of Involvement : Till date


We, the FAEs and FAAs hereby declare that information furnished in this EIA/EMP report for Mr. B. Venkatakrisnan red earth project with the extent of 1.53.5 ha situated in the cluster with the extent of 10.51.5 ha in Kondalangkuppam Village, Vanur Taluk, Villuppuram District of Tamil Nadu is true and correct to the best of our knowledge.

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







<b>S. No.</b>	<b>Functional Area</b>	<b>Involvement</b>	<b>Name of the Experts</b>	<b>Signature</b>
1	AP	○ Identification of different sources of air pollution due to the proposed mine activity	J.N. Manikandan	
		○ Prediction of air pollution and propose mitigation measures / control measures	P.Venkatesh	
2	WP	○ 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	○ 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	○ 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	○ 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"> <li>○ Collection of Baseline data of Flora and Fauna.</li> <li>○ Identification of species labelled as Rare, Endangered and threatened as per IUCN list.</li> <li>○ Impact of the project on flora and fauna.</li> <li>○ Suggesting species for greenbelt development.</li> </ul>	Dr.J. Rajarajeshwari	
7	RH	<ul style="list-style-type: none"> <li>○ Identification of hazards and hazardous substances</li> <li>○ Risks and consequences analysis</li> <li>○ Vulnerability assessment</li> <li>○ Preparation of Emergency Preparedness Plan</li> <li>○ Management plan for safety.</li> </ul>	J.N. Manikandan	
8	LU	<ul style="list-style-type: none"> <li>○ Construction of Land use Map</li> <li>○ Impact of project on surrounding land use</li> <li>○ Suggesting post closure sustainable land use and mitigative measures.</li> </ul>	Dr.S. Karuppannan	
			G.Uma Maheswaran	
			Dr.M. Vijay Prabhu	
9	NV	<ul style="list-style-type: none"> <li>○ Identify impacts due to noise and vibrations</li> <li>○ Suggesting appropriate mitigation measures for EMP.</li> </ul>	Dr.R. Arun Balaji	
10	AQ	<ul style="list-style-type: none"> <li>○ Identifying different source of emissions and propose predictions of incremental GLC using AERMOD.</li> <li>○ Recommending mitigations measures for EMP</li> </ul>	Dr.R. Arun Balaji	
11	SC	<ul style="list-style-type: none"> <li>○ Assessing the impact on soil environment and proposed mitigation measures for soil conservation</li> </ul>	Dr.J. Rajarajeshwari	
			Dr. D.Kalaimurugan	


12	SHW	<ul style="list-style-type: none"> <li>○ Identify source of generation of non-hazardous solid waste and hazardous waste.</li> <li>○ Suggesting measures for minimization of generation of waste and how it can be reused or recycled.</li> </ul>	J.N. Manikandan	
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**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"> <li>○ Site visit with FAE</li> <li>○ Provide inputs &amp; Assisting FAE for LU and HG</li> </ul>	
2	C. Kumaresan	NV	<ul style="list-style-type: none"> <li>○ Assistance to FAE in both primary and secondary data collection</li> <li>○ Assistance in noise prediction modelling</li> </ul>	
3	P. Vellaiyan	HG & GEO	<ul style="list-style-type: none"> <li>○ Field visits along with FAE</li> <li>○ Assistance to FAE in both primary and secondary data collection</li> </ul>	
4	S.Vasugi	AQ	<ul style="list-style-type: none"> <li>○ Field visits along with FAE</li> <li>○ Assistance to FAE in both primary and secondary data collection</li> </ul>	
5	P. Dhatchayini	AQ	<ul style="list-style-type: none"> <li>○ Site visit with FAE</li> <li>○ Assistance to FAE in collection of both primary and secondary data</li> </ul>	
6	V. Malavika	NV, SHW	<ul style="list-style-type: none"> <li>○ Site visit along with FAE</li> <li>○ Assistance in report preparation</li> </ul>	

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

I, **Dr. S. KARUPPANNAN**, Managing Partner, **Geo Technical Mining Solutions**, hereby, confirm that the above-mentioned functional area experts and team members prepared the EIA/EMP report for Mr. B.Venkatakrishnan Red earth project with the extent of 1.53.5 ha located within the cluster of 10.51.5 ha in Kondalangkuppam Village, Vanur Taluk, Villupuram Distri of Tamil Nadu is true and correct to the best of my knowledge.

Signature : 

Date : 04.04.2023

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 : Till 31.12.2023



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

STATE LEVEL ENVIRONMENT IMPACT  
ASSESSMENT AUTHORITY-TAMILNADU  
3<sup>rd</sup>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.9383/ToR-1279/2022 Dated:08.10.2022.**

To

Thiru. B. Venkatakrishnan  
S/o. Balaram  
No. 25, 2nd Cross Street  
Kurumbapet  
Housing Board  
Pondicherry - 605009

Sir / Madam,

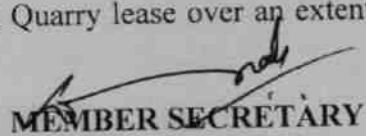
**Sub:** SEIAA, Tamil Nadu – Terms of Reference with public Hearing (ToR) for the Proposed Red Earth Quarry lease over an extent of 1.53.5 Ha at S.F.No. 70/2, 70/3, 70/4, 70/5A & 71/3 in Kondalangkuppam Village, Vanur Taluk, Viluppuram District, Tamil nadu by Mr.B.Venkatakrishnan- under project category – “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/79249/2022 dated 30.06.2022
  2. Your application submitted for Terms of Reference dated:08.07.2022.
  3. Minutes of the 312<sup>th</sup> meeting of SEAC held on 16.09.2022.
  4. Minutes of the 557<sup>th</sup> SEIAA meeting held on 08.10.2022.

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

The proponent, Mr.B.Venkatakrishnanhas submitted application for Terms of Reference (ToR) in Form-I, Pre- Feasibility report for the Proposed Red Earth Quarry lease over an extent of

180

  
MEMBER SECRETARY  
SEIAA-TN

1.53.5 Ha at S.F.No. 70/2, 70/3, 70/4, 70/5A & 71/3 in Kondalangkuppam Village, Vanur Taluk, Viluppuram District, Tamilnadu

**Discussion by SEAC and the Remarks:-**

The proposal was placed in 312<sup>th</sup> meeting of SEAC held on 16.09.2022. The details of the project are available in the website (parivesh.nic.in).

**The SEAC noted the following:**


1. The project proponent, Mr.B.Venkatakrishnan has applied for Terms of Reference for the proposed red earth quarry lease over an extent of 1.53.5 Ha at S.F.Nos. 70/2, 70/3, 70/4, 70/5A & 71/3 in Kondalangkuppam Village, Vanur Taluk, Viluppuram District, Tamilnadu.
2. The project/activity is covered under Category "B1" of Item 1(a) "Mining of Minerals Projects" of the Schedule to the EIA Notification, 2006.
3. As per the mining plan, the lease period is for 2 years. The mining plan is for 2 years. The production for 2 years not to exceed **23,004 cu.m of red earth** with an ultimate depth of 2m below ground level.

Based on the presentation made by the proponent, SEAC recommended to 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 PP shall furnish DFO letter in regard to shortest distance of Reserve Forest & protected areas/Wildlife sanctuaries & wild life corridors etc.
2. The PP is requested to submit the composition/component of the minerals proposed to be quarried which shall be tested in the Department of Civil Engineering laboratory, NIT, Trichy authorized by the Dept of Geology & Mining, and further it shall be duly certified by the concerned AD (Geology & Mining).
3. The proponent should produce a letter from the Department of Geology and Mining stating that the location of quarry site does not lie adjoining to the rivers, streams, canals etc., and also does not come under any notified/declared protected zones.

  
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SEIAA-TN

4. 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.
5. 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.
6. 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).
7. The PP shall carry out Drone video survey covering the cluster, Green belt, fencing etc.,
8. 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.
9. 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.
10. 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

  
MEMBER SECRETARY  
SEIAA-TN

- scientifically and systematically in order to ensure safety and to protect the environment.
11. The Project Proponent shall indicate the provision of basic amenities such as Rest Room, First-Aid Room, Toilets, etc under the provisions of Mines Rules 1955, in the EIA Report.
  12. The Project Proponent shall study the hydro-geological impacts due to mining activities 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 500 m (radius) along with the collected water level data for both monsoon and non-monsoon seasons from the PWD / TWAD.
  13. 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.
  14. 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.
  15. Rain water harvesting management with recharging details along with water balance (both monsoon & non-monsoon) shall be submitted.
  16. 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.
  17. 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.
  18. 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.
  19. Impact on local transport infrastructure due to the Project should be indicated.

20. 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.
21. A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific.
22. 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.
23. The Public hearing advertisement shall be published in one major National daily and one most circulated Tamil daily.
24. The PP shall produce/display the EIA report, Executive summary and other related information with respect to public hearing in Tamil Language also.
25. 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.
26. 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 native origin should be chosen. Species of small/medium/tall trees alternating with shrubs should be planted in a mixed manner.
27. 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
28. 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.

  
MEMBER SECRETARY  
SEIAA-TN





29. 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.
30. Occupational Health impacts of the Project should be anticipated and the proposed preventive measures should be 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.
31. 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.
32. 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.
33. Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.
34. 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.
35. If any quarrying operations were carried out in the proposed quarrying site for which now the EC is sought, the Project Proponent shall furnish the detailed compliance to EC conditions given in the previous EC with the site photographs which shall duly be certified by MoEF&CC, Regional Office, Chennai (or) the concerned DEE/TNPCB.
36. 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.
37. 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.

Appendix -I  
List of Native Trees Suggested for Planting

No	Scientific Name	Tamil Name	Tamil Name
1	<i>Aegle marmelos</i>	Vilvam	விவம்
2	<i>Adenanthera pavonina</i>	Marijadi	மஞ்சள், ஆனந்தகுன்றிமணி
3	<i>Albizia lebbek</i>	Vaagai	வாகை
4	<i>Albizia amara</i>	Usil	உசில்
5	<i>Bauhinia purpurea</i>	Mantharai	மந்தாரை
6	<i>Bauhinia racemosa</i>	Aathu	ஆத்து
7	<i>Bauhinia tomentosa</i>	Iruvathi	இருவாத்தி
8	<i>Buchanania axillaris</i>	Kattuna	காட்டுமர
9	<i>Borassus flabellifer</i>	Parai	பனை
10	<i>Butea monosperma</i>	Murukkamaram	முருக்கமரம்
11	<i>Bobax ceiba</i>	Ilavu, Sevvilavu	இலவு
12	<i>Calophyllum inophyllum</i>	Punnai	புனை
13	<i>Cassia fistula</i>	Sarakondrai	சரக்கொன்றை
14	<i>Cassia roxburghii</i>	Sengondrai	செங்கொன்றை
15	<i>Chloroxylon swietenia</i>	Purasamaram	புரசு மரம்
16	<i>Cochlospermum religiosum</i>	Kongu, Mariyallavu	கோங்கு, மஞ்சள் இலவு
17	<i>Cordia dichotoma</i>	Naruvu	நடுவளி
18	<i>Creteva adansonii</i>	Mavalingum	மாவலிங்கம்
19	<i>Dillenia indica</i>	Uva, Uzha	உவா
20	<i>Dillenia pentagyna</i>	SiruUva, Sitruzha	சீறு உவா
21	<i>Diospyros seboum</i>	Karungali	கருங்காளி
22	<i>Diospyros schloroxylon</i>	Vaganai	வாகனை
23	<i>Ficus amplissima</i>	Kaltchi	கல் இச்சி
24	<i>Hibiscus tiliaceus</i>	Aatrupoovarasu	ஆற்றுப்பூசை
25	<i>Hardwickia binata</i>	Aacha	ஆச்சா
26	<i>Holoptelia integrifolia</i>	Aayili	ஆயில் மரம், ஆயில்
27	<i>Larrea coromandlica</i>	Othuan	ஒதுவம்
28	<i>Lagerstroemia speciosa</i>	Poo Marudhu	பூ மருது
29	<i>Lepisanthus tetraphylla</i>	Neikottaimaram	நெய் கெட்டை மரம்
30	<i>Limonia acidissima</i>	Vila maram	வில்லா மரம்
31	<i>Litsea glutinos</i>	Pisinpattai	பிளிப்பாட்டை
32	<i>Madhuca longifolia</i>	Iluppai	இலுப்பை
33	<i>Mankara hexandra</i>	UlakkaiPaalai	உலக்கை பாலை
34	<i>Mimusops elengi</i>	Magazhamaram	மகழமரம்
35	<i>Mitragyna parvifolia</i>	Kadambu	கடம்பு
36	<i>Morinda pubescens</i>	Nuna	நுனா
37	<i>Morinda citrifolia</i>	Vellai Nuna	வெள்ளை நுனா
38	<i>Phoenix sylvestre</i>	Eachai	ஈச்சமரம்
39	<i>Pongamia pinnat</i>	Pungam	புங்கம்

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SEIAA-TN

40	<i>Premna mollissima</i>	Munnai	முள்ளை
41	<i>Premna serratifolia</i>	Narammunai	நறு முள்ளை
42	<i>Premna tomentosa</i>	Malaipoovarasu	மலை பூவரசு
43	<i>Prosopis cinerea</i>	Vanni maram	வண்ணீ மரம்
44	<i>Pterocarpus marsupium</i>	Vengai	வேங்கை
45	<i>Pterospermium canescens</i>	Verunangu, Tada	வேண்ணாங்கு
46	<i>Pterospermium xylocarpum</i>	Polavu	பலவு
47	<i>Puthanjiva roxburghii</i>	Karipala	கறிபாலா
48	<i>Salvadora persica</i>	Ugaa Maram	ஊகா மரம்
49	<i>Sapindus amarginatus</i>	Manipungan, Soapukai	மண்பயங்கன் சோப்புகாய்
50	<i>Saraca asoca</i>	Asoca	அசோகா
51	<i>Strobilus asper</i>	Piray maram	பிராய் மரம்
52	<i>Strychnos nuxvomica</i>	Yetti	எட்டி
53	<i>Strychnos potatorum</i>	Therthang Kottai	தேத்தான் கோட்டை
54	<i>Syzygium cumini</i>	Naval	நாவல்
55	<i>Terminalia belleric</i>	Thandri	தாந்திரி
56	<i>Terminalia arjuna</i>	Ven marudhu	வேண மருது
57	<i>Toona ciliata</i>	Sandhana vembu	சந்தன வேம்பு
58	<i>Thespesia populnea</i>	Puvarasu	பூவரசு
59	<i>Walsuratrifoliata</i>	valsura	வால்சுரா
60	<i>Wrightia tinctoria</i>	Veppalai	வேப்பநிலை
61	<i>Pithecolobium dulce</i>	Kodukkapuli	கொடுக்காப்பூசி

#### Discussion by SEIAA and the Remarks:-

The subject was placed in 557<sup>th</sup> authority meeting held on 08.10.2022. The authority noted that the subject was appraised in 312<sup>th</sup> SEAC meeting held on 16.09.2022.

The authority carefully examined the recommendations of SEAC to grant ToR for the proposal and the request made by the proponent to Member Secretary, SEIAA-TN to appraise the proposal under B2 category vide letter dated.22.09.2022. The authority noted that as per the MOEF Notification No: S.O. 2269(E), dated. 01.07.2016 and 500m cluster letter issued by Deputy Director, Viluppuram district vide Rc.No.A/G&M/442/2021 dated.13.06.2022, the proposal falls under 'B1' category of Item 1(a) "Mining of Minerals Projects" of the Schedule to the EIA Notification, 2006.

Therefore, the Authority, after detailed discussions, decided to accept the recommendations of SEAC to grant **Terms of Reference (ToR) along with Public Hearing** under cluster for undertaking the combined Environment Impact Assessment Study and preparation of separate Environment Management Plan subject to the conditions as recommended by SEAC & normal conditions in addition to the conditions in 'Annexure B' of this minutes.

  
MEMBER SECRETARY  
SEIAA-TN

Annexure 'B'

1. Cluster Management Committee, 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. 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 & bio-diversity.
  - 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.


  
MEMBER SECRETARY  
SEIAA-TN

- 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.
11. The committee shall furnish an action plan to achieve sustainable development goals with reference to water, sanitation & safety.
12. The committee shall furnish the fire safety and evacuation plan in the case of fire accidents.
13. The measures taken to control Noise, Air, Water, Dust Control and steps adopted to efficiently utilise the Energy shall be furnished.
14. 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.
15. Impact on surrounding agricultural fields around the proposed mining Area.
16. Erosion Control measures.
17. Impact on soil flora & vegetation around the project site.
18. 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.
19. 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.
20. 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.
21. 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.
22. 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.
23. Action should specifically suggest for sustainable management of the area and restoration of ecosystem for flow of goods and services.

  
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24. The project proponent shall study impact on fish habitats and the food WEB/ food chain in the water body and Reservoir.
25. The Terms of Reference should specifically study impact on soil health, soil erosion, the soil physical, chemical components and microbial components.
26. The Environmental Impact Assessment should study impact on forest, vegetation, endemic, vulnerable and endangered indigenous flora and fauna.
27. The Environmental Impact Assessment should study impact on standing trees and the existing trees should be numbered and action suggested for protection.
28. The Environmental Impact Assessment should study on wetlands, water bodies, rivers streams, lakes and farmer sites.
29. The Environmental Impact Assessment should hold detailed study on EMP with budget for Green belt development and mine closure plan including disaster management plan.
30. The Environmental Impact Assessment should study impact on climate change, temperature rise, pollution and above soil & below soil carbon stock.
31. The Environmental Impact Assessment should study impact on protected areas, Reserve Forests, National Parks, Corridors and Wildlife pathways, near project site.
32. The project proponent shall study and furnish the impact of project on plantations in adjoining patta lands, Horticulture, Agriculture and livestock.
33. The project proponent shall study and furnish the details on potential fragmentation impact of natural environment, by the activities.
34. 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.
35. 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.
36. The project proponent shall detailed study on impact of mining on Reserve forests free ranging wildlife.
37. 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,

  
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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.

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.
39. To furnish risk assessment and management plan including anticipated vulnerabilities during operational and post operational phases of Mining.
40. Detailed Mine Closure Plan covering the entire mine lease period as per precise area communication order issued.
41. Detailed Environment Management Plan along with adaptation, mitigation & remedial strategies covering the entire mine lease period as per precise area communication order issued.


#### **A. STANDARD TERMS OF REFERENCE**

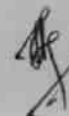
- 1) Year-wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification 1994 came into force, w.r.t. the highest production 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

  
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SEIAA-TN

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

  
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SEIAA-TN





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

  
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SEIAA-TN

the effect that the proposed mining activities could be considered.

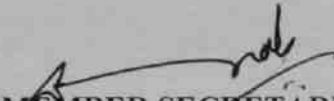
- 20) Similarly, for Coastal Projects, a CRZ map duly authenticated by one of the authorized agencies demarcating LTL, HTL, CRZ area, location of the mine lease with respect to CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also 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

  
MEMBER SECRETARY  
SEIAA-TN



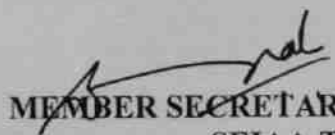
map.

- 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

  
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SEIAA-TN

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.

  
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- 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

  
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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 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


  
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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.

  
MEMBER SECRETARY  
SEIAA-TN



- c. Where data are presented in the report especially in tables, the period in which the data were collected and the sources should be indicated.
- d. While preparing the EIA report, the instructions for the proponents and instructions for the consultants issued by MoEF & CC vide O.M. No. J-11013/41/2006-IA.II (I) dated 4th August, 2009, which are available on the website of this Ministry should also be followed.
- e. The consultants involved in the preparation of EIA/EMP report after accreditation with Quality Council of India (QCI)/National Accreditation Board of Education and Training (NABET) would need to include a certificate in this regard in the EIA/EMP reports prepared by them and data provided by other organization/Laboratories including their status of approvals etc. In this regard circular no F. No.J -11013/77/2004-IA-II(I) dated 2<sup>nd</sup> December, 2009, 18<sup>th</sup> March 2010, 28<sup>th</sup> May 2010, 28<sup>th</sup> June 2010, 31<sup>st</sup> December 2010 & 30<sup>th</sup> September 2011 posted on the Ministry's website <http://www.moef.nic.in/> may be referred.
- After preparing the EIA (as per the generic structure prescribed in Appendix-III of the EIA Notification, 2006) covering the above mentioned points, the proponent will take further necessary action for obtaining environmental clearance in accordance with the procedure prescribed under the EIA Notification, 2006.
  - The final EIA report shall be submitted to the SEIAA, Tamil Nadu for obtaining Environmental Clearance.
  - The TORs with public hearing prescribed shall be **valid for a period of three years** from the date of issue, for submission of the EIA/EMP report as per OMNo.J-11013/41/2006-IA-II(I)(part) dated 29<sup>th</sup> August, 2017.

  
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**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, 1<sup>st</sup>& 2<sup>nd</sup> 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, Viluppuram District.
7. The EO/BDO, Thuppuganapalli & Agaram Agraharam Village, Shoolagiri Taluk, Krishnagiri District
8. Stock File.



From  
Tmt. N.Vijayalakshmi, M.Sc.,  
Deputy Director,  
Dept. of Geology and Mining,  
Viluppuram.

To  
Thiru B. Venkatakrisnan,  
S/o.Balaraman,  
No.25, 2<sup>nd</sup> Cross Street,  
Kurumbapet,  
Housing Board,  
Puducherry - 605009.

**Rc.No.A/G&M/442/2021 Dated .06.2022**

Sub: Mines & Minerals - Minor Mineral - Red Earth -  
Viluppuram District - Vanur Taluk -  
Kondalankuppam Village - over an extent of  
1.53.50 hectares of patta lands - S.F.Nos.70/2  
(0.11.0 hecets.), 70/3 (0.10.0 hecets.), 70/4 (0.64.0  
hecets.), 70/5A (0.30.50 hecets.) and 71/3 (0.38.0  
hecets.) - Quarry lease application preferred by  
Thiru B.Venkatakrisnan - Precise area  
communicated - Details of quarries situated within  
500 meter radial distance - furnished - reg.

- Ref: 1. Deputy Director, Geology and Mining,  
Viluppuram Letter Rc.No.A/G&M/442/2022  
Dated 06.06.2022.
2. Representation from Thiru B.Venkatakrisnan,  
S/o.Balaraman Dated 08.06.2022.

\*\*\*\*\*

With reference to your letter in the reference 2<sup>nd</sup> cited, the details of existing, proposed and abandoned quarries located within 500 mts. radial distance from the periphery of the proposed Red Earth quarry over an extent of 1.53.5 hectares of patta lands in S.F.Nos.70/2 (0.11.0 hecets.), 70/3 (0.10.0 hecets.), 70/4 (0.64.0 hecets.), 70/5A (0.30.5 hecets.) and 71/3 (0.38.0 hecets.) of Kondalankuppam Village, Vanur Taluk, Villupuram District are as follows.

**Existing quarries:**

Sl. No.	Name of the lessee / permit holder	Name of the Mineral	Taluk & Village	S.F. Nos.	Extent (in hecets)	Lease period	Remarks
NIL							

**II. Proposed quarries:**

Sl. No.	Name of the lessee / permit holder	Name of the Mineral	Taluk & Village	S.F. Nos.	Extent (in hecets)	Remarks
1.	B.Venkatakrishnan, S/o.Balaraman, No.25, 2 <sup>nd</sup> Cross Street, Kurumbapet, Housing Board, Puducherry - 605009	Red Earth	Vanur Kondalan- kuppam	70/2 70/3 70/4 70/5A 71/3	0.11.0 0.10.0 0.64.0 0.30.5 <u>0.38.0</u> <b>1.53.5</b>	Precise area communicated vide this office letter Rc.No.A/G&M/ 442/2022 Dated 06.06.2022.
2.	S.Devamani, S/o.Subramani, No.207/68, Mariyamman Kovil Street, Kadagampattu Village, Vanur Taluk	Red Earth	Vanur Kondalan- kuppam	70/5B 70/7B 70/6 88/2 69/2 70/8	0.28.5 0.23.0 0.55.0 0.39.0 0.95.0 <u>0.65.0</u> <b>3.05.5</b>	Mining Plan vide this office letter Rc.No.A/G&M/ 541/2019 Dated 03.06.2020.

**III. Abandoned quarries :**

Sl. No.	Name of the lessee / permit holder	Name of the Mineral	Taluk & Village	S.F. Nos.	Extent (in hecets)	Lease period	Remarks
1.	P.Sukumaran, S/o.Perumal, Thiruvalluvar Street, Mutrampattu Village, V.Nerkunam Post, Viluppuram.	Red Earth	Vanur Kondalan- kuppam	84/1	1.73.0	13.06.2014 to 12.12.2015	-
2.	M.Rajesh, S/o. Murugan, V. Nerkunam, Vikravandi Taluk.	Red Earth	Vanur Kondalan- kuppam	66/2A 67/2A	1.07.0 <u>0.19.5</u> <u>1.26.5</u>	24.09.2017 to 23.09.2019	-

3.	P. Senjivel S/o. Palanivel, No. 696, Main road, Uthangal & Post, Vridhachalam Tk, Cuddalore District.	Red Earth	Vanur Kondalan- kuppam	60/2	1.17.0	13.03.2018 to 12.03.2020	-
4.	A.Arikrishanan, S/o. Arumugam, V.Nergunam & Post, Vikiravandi Tk, Villupuram District.	Red Earth	Vanur Kondalan- kuppam	85/1 85/2 85/3 85/5 89/2 91/1B 91/2	0.21.0 0.20.0 0.27.5 0.76.0 0.76.0 0.67.5 <u>0.66.0</u> 3.54.0	23.03.2018 to 22.03.2020	-
5.	A.Sakthivel, S/o.Ayyanar, Mutrampattu, V.Nerkunam Village, Vikravandi Taluk.	Red Earth	Vanur V.Parangani	193/7	1.84.0	13.11.2015 to 12.11.2017	-
6.	Tmt.A.Gunaselvi, W/o. Ayyanar, V.Nerkunam & Post, Vikravandi Taluk, Viluppuram District	Red Earth	Vanur V.Parangani	194/2B1 194/2B2 194/3B 194/4A	0.24.75 0.24.75 0.40.50 <u>0.31.50</u> <b>1.21.50</b>	25.02.2020 to 24.02.2022	-

*[Signature]*  
Deputy Director,  
Geology and Mining,  
Viluppuram.

*[Signature]*  
13/6/20  
*[Signature]*  
13/10/20

# MINING PLAN

FOR

KONDALANGKUPPAM VILLAGE RED EARTH QUARRY LEASE WITH  
QUARRY CLOSURE PLAN

Patta- Ryotwari Land/Open Cast-Semi-Mechanized mining/Non- Forest/Non-Captive use/"B2" Category

Lease period of Two years

(Prepared under rule 19(1) and 41(3) (i) of Tamil Nadu Minor Mineral Concession Rules, 1959)

## LOCATION OF THE LEASE AREA

STATE : TAMILNADU  
DISTRICT : VILUPPURAM  
TALUK : VANUR  
VILLAGE : KONDALANGKUPPAM  
S.F. NO'S : 70/2, 70/3, 70/4, 70/5A & 71/3  
EXTENT : 1.53.5HECTARES

## ADDRESS OF THE APPLICANT

**Mr. B.VENKATAKRISHNAN,**  
S/o.Balaram,  
No. 25, Second Cross street,  
Kurumbapet, Housing Board,  
Puducherry State – 605009.

## PREPARED BY

**Dr.S.KARUPPANNAN.M.Sc., Ph.D.,**

RQP/MAS/263/2014/A

## **GEO TECHNICAL MINING SOLUTIONS**

(A NABET Accredited & ISO Certified Company)

No: 1/213 -B, Ground Floor, Natesan Complex,

Oddapatti, Collectorate Post office,

Dharmapuri -636705. Tamil Nadu.

Mob. : +91 9443937841, +917010076633,

E-mail: [info.gtmsdpi@gmail.com](mailto:info.gtmsdpi@gmail.com),

Website: [www.gtmsind.com](http://www.gtmsind.com)





**ANNEXURES**

Sl. No.	Description	Annexure No.
1.	Copy of precise area communication letter	I
2.	Copy of <b>FMB</b> (Field Measurement book)	II
3.	Copy of Village Map	III
4.	Copy of "A" Register	IV
5.	Copy of chitta, Adangal	V
6.	Copy of Consent land Documents	VI
7.	Copy of Soil test report	VII
8.	Photo copy of the applied lease area	VIII
9.	Copy of ID Proof of the authorized signatory	IX
10.	Copy of RQP certificate	X



**CONTENTS**

Sl. No.	Description	
-	Certificates	5-8
-	Introductory notes	9
1.0	General	11
2.0	Location and Accessibility	12
<b><u>PART-A</u></b>		
3.0	Geology and Mineral reserves	15
4.0	Mining	18
5.0	Blasting	22
6.0	Mine drainage	22
7.0	Stacking of mineral rejects and disposal of waste	23
8.0	Uses of Mineral	23
9.0	Others	23
10.0	Mineral processing/Beneficiations	24
<b><u>PART-B</u></b>		
11.0	Environment management plan	26
12.0	Final quarry closure plan	30
13.0	Financial assurance	32
14.0	Certificates	32
15.0	Plan and sections, etc	32
16.0	Any other details intend to furnish by the applicant	33
17.0	CSR Expenditure	33

207

*[Handwritten Signature]*



### LIST OF PLATES

Sl. No.	Description	Plate No.	
1	Key Map	I	Not to scale
2	Location Plan	I-A	Not to scale
3	Topo Sheet 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 and Sections	III	PLAN 1:1000 SECTION HOR 1:1000 VER 1: 100
8	Year wise development, Production plan and sections	IV	PLAN 1:1000 SECTION HOR 1:1000 VER 1: 100
9	Conceptual plan and Sections	V	PLAN 1:1000 SECTION HOR 1:1000 VER 1: 100





**B.Venkatakrishnan**  
S/o.Balaram,  
No. 25, Second Cross street,  
Kurumbapet, Housing Board,  
Puducherry State – 605009.

**CONSENT LETTER FROM THE APPLICANT**

The Mining Plan in respect of red earth quarry lease in S.F.No's: 70/2, 70/3, 70/4, 70/5A & 71/3, over an extent of 1.53.5hectares, Patta land of Kondalangkuppam Village, Vanur Taluk, Viluppuram District, Tamil Nadu State has been prepared by

**Dr. S. KARUPPANNAN.M.Sc., Ph.D., - Regn. No. RQP/MAS/263/2014/A**

I request the Deputy Director, Department of Geology and Mining, Viluppuram District to make further correspondence regarding modifications of the Mining Plan with the said Recognized Qualified Person on this following address.

**Dr. S.KARUPPANNAN.M.Sc.,Ph.D.,**  
RQP/MAS/263/2014/A  
**GEO TECHNICAL MINING SOLUTIONS**  
(A NABET accredited & ISO certified Company)  
No: 1/213-B, Ground Floor, Natesan Complex,  
Oddapatti, Collectorate Post office, Dharmapuri-636705  
Ph: +91 9443937841, +91 7010076633  
E-mail: [info.gtmsdpi@gmail.com](mailto:info.gtmsdpi@gmail.com),  
Website: [www.gtmsind.com](http://www.gtmsind.com)

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: Viluppuram, TN  
Date: 8.6.2022

  
Signature of the applicant  
**(B.VENKATAKRISHNAN)**

**B.Venkatakrishnan**

S/o.Balaram,

No. 25, Second Cross street,

Kurumbapet, Housing Board,

Puducherry State – 605009.



**DECLARATION**

The Mining Plan in respect of red earth quarry lease in S.F.No's: 70/2, 70/3, 70/4, 70/5A & 71/3, over an extent of 1.53.5hectares, patta land of Kondalanguppam Village, Vanur Taluk, Viluppuram District, Tamil Nadu State has been prepared with my consultation and I have understood the contents and agree to implement the same in accordance with the Mining Laws.

**Place:** Viluppuram, TN

**Date:** 2.6.2022

*(Handwritten Signature)*  
 Signature of the applicant  
**(B.VENKATAKRISHNAN)**



**Dr. S.KARUPPANNAN.M.Sc., Ph.D.,**  
 RQP/MAS/263/2014/A  
**GEO TECHNICAL MINING SOLUTIONS**  
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 E-mail: [info.gtmsdpi@gmail.com](mailto:info.gtmsdpi@gmail.com),  
 Website: [www.gtmsind.com](http://www.gtmsind.com)

**CERTIFICATE**

This is to certify that, the provisions of under rule 19 of Tamil Nadu Minor Mineral Concession Rules, 1959 have been observed in the Mining Plan for the grant of red earth quarry lease in S.F.No's: 70/2, 70/3, 70/4, 70/5A & 71/3, over an extent of 1.53.5hectares, Patta land of Kondalangkuppam Village, Vanur Taluk, Viluppuram District, Tamil Nadu State applied by **Mr. B.Venkatakrishnan**, Puducherry -605009.

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:** 06.06.2022

Signature of the Recognized Qualified Person

**Dr. S. KARUPPANNAN, M.Sc., Ph.D.,**  
 RQP/MAS/263/2014/A  
**GEO TECHNICAL MINING SOLUTIONS**  
 1/213-B, Ground Floor, Natesan Complex,  
 Oddapatti, Collectorate Post Office,  
 Dharmapuri - 636 705. Tamil Nadu, India.  
 E-mail : [info.gtmsdpi@gmail.com](mailto:info.gtmsdpi@gmail.com)  
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Dr. S.KARUPPANNAN.M.Sc., Ph.D.,

RQP/MAS/263/2014/A

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E-mail: info.gtmsdpi@gmail.com,

Website: [www.gtmsind.com](http://www.gtmsind.com)



### CERTIFICATE

Certified that, in preparation of Mining Plan for red earth quarry lease in S.F.No's: 70/2, 70/3, 70/4, 70/5A & 71/3, over an extent of 1.53.5hectares, patta land of Kondalangkuppam Village, Vanur Taluk, Viluppuram District, Tamil Nadu State for **Mr. B.Venkatakrishnan, Puducherry-605009**, 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:** 06.06.2022.

Signature of the Recognized Qualified Person

**Dr. S. KARUPPANNAN, M.Sc., Ph.D.,**  
RQP/MAS/263/2014/A  
**GEO TECHNICAL MINING SOLUTIONS**  
1/213-B, Ground Floor, Natesan Complex,  
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Dharmapuri - 636 705. Tamil Nadu, India.  
E-mail : info.gtmsdpi@gmail.com  
website : [www.gtmsind.com](http://www.gtmsind.com)

# MINING PLAN

FOR

KONDALANGKUPPAM VILLAGE RED EARTH QUARRY LEASE WITH FINAL QUARRY CLOSURE PLAN

Patta-Ryotwari land /Open Cast-Semi-Mechanized mining/Non- Forest/Non-Captive use/'B2' Category

Lease period of Two years

(Prepared under rule 19(1) and 41 (3) (i) of Tamil Nadu Minor Mineral Concession Rules, 1959)

## INTRODUCTORY NOTES:

- a) **Introduction:** The applicant Mr.B.Venkatakrishan, S/o.Balaram, No.25, Second Cross street, Kurumbapet, Housing Board, Puducherry state – 605009 and field with application for new proposals has submitted to the Deputy Director, Department of Geology and Mining, Viluppuram grant of quarry lease red earth for under rule 19 of Tamil Nadu Minor Mineral Concession Rules, 1959 for in S.F.No's: 70/2, 70/3, 70/4, 70/5A & 71/3, over an extent of 1.53.5hectares of Kondalangkuppam Village, Vanur Taluk, Viluppuram District, Tamil Nadu State within a period of two years.
- b) **The Precise area communication letter:** The Deputy Director, Department of Geology and Mining, Viluppuram has directed to the applicant Mr.B.Venkatakrishan through his precise area communication letter **Roc.No. B/G & M/09/2022 dated 06.06.2022**, 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) as per EIA Notification 2006 and S.O.3977 (E), dated 14<sup>th</sup> August 2018 and MoEF & CC office memorandum vide F.No.22-1/2019-IA.III [E116917] dated 15<sup>th</sup> December, 2021 for quarrying lease red earth at Tamil Nadu State, Viluppuram District, Vanur Taluk, Kondalangkuppam Village in S.F.No's: 70/2, 70/3, 70/4, 70/5A & 71/3, over an extent of 1.53.5hectares for a period of Two (2) year under Rule 19 of Tamil Nadu Minor Mineral Concession Rules, 1959 subject to the following special conditions,
- i. A safety distance of 7.5 meter and 10 meter should be provided for the adjacent patta lands and government land. From applied area should be provided 10 meter safety distance for nearest village road.





- ii. The applicant should fence the area with barbed wire and submit the DGPS survey report before execution of lease deed.
- iii. Necessary Environmental clearance should be obtained from the Competent Authority as required under rule 42 of TNMMCR, 1959.
- c) **Preparation and Submission of Mining Plan:** The Mining Plan with final quarry closure plan has been prepared under rule 19 and 41 (3) (i) and submission under rule 42 of Tamil Nadu Minor Mineral Concession Rules, 1959 as per precise area communication letter **Roc.No. B/G&M/09/2022, Dated 06.06.2022.**
- d) **Geological resources and Mineable reserves:** Geological resource of red earth are estimated as **30712m<sup>3</sup>** up to depth of 2.0m. Mineable reserves of red earth are estimated about **23004m<sup>3</sup>** up to depth of 2.0meter.
- e) **Proposed Production Schedule:** Total Proposed production of red earth are **23004m<sup>3</sup>** up to a depth of 2.0m.
- f) **Environmental Sensitivity of the proposed lease area: -**
  - a). **Interstate boundary:** There is no interstate boundary found within radius of 10Km.
  - b). **Wildlife Protection Act, 1972:** There is Ossudu lake bird sanctuary within 9.5Km radius from the project site area under the wildlife (Protection) Act, 1972.
  - c). **Indian Reserve Forest Act, 1980:** There is no reserve forest found within radius of 1km. The nearest reserve forest is Melkondai R.F situated about 15.45km away on the western side, Kumalampattu R.F. is situated about 15.6km away on the NE side.
  - d). **CRZ Notification, 2019:** There is no Sea coastal zone found within 10km radius and this project site doesn't attract CRZ Notification,2019.
- g) **Environmental measures to be adopted shall be during the ongoing activity period,**
  - i) Dust suppression at loading point and transport haul roads,
  - ii) Emission test of vehicles should be in stack to maintain minimum emission level of flue gases.
  - iii) Noise level should not exceed 58db and the vehicles should use only permitted Air Horn while on road near residential areas.
  - iv) And any other conditions as stipulated by the concerned authorities should be followed to protect the environment.



1.0 GENERAL:	
a.	<b>Name of the Applicant</b> : Mr. B.Venkatakrisnan
	<b>Applicant address</b> : S/o.Balaram, No. 25, Second Cross street, Kurumbapet, Housing Board, Puducherry State – 605009.
	<b>District</b> : Puducherry
	<b>State</b> : Puducherry
	<b>Pin code</b> : 605009
	<b>Phone</b> : ---
	<b>Fax</b> : Nil
	<b>Gram</b> : Nil
	<b>Telex</b> : Nil
	<b>E-mail</b> : Nil
b.	<b>Status of the Applicant</b>
	<b>Private individual</b> : ---
	<b>Cooperative Association</b> : ---
	<b>Private company</b> : Private company
	<b>Public Company</b> : ---
	<b>Public Sector Undertaking</b> : ---
	<b>Joint Sector Undertaking</b> : ---
	<b>Other (pl. specify)</b> : ---
c.	<b>Mineral(s) Which are occurring in the area and which the applicant intends to mine</b> : Red earth quarry lease
d.	<b>Period for which the mining lease granted /renewed/ proposed to be applied</b> : Permission for excavation of red earth lease request for the period of two (2) years to the Deputy Director, Department of Geology and Mining, Viluppuram.
e.	<b>Name of the RQP/NABET accredited company preparing the Mining Plan</b> : Dr. S.KARUPPANNAN.M.Sc.,Ph.D.,
	<b>Address</b> : <b>Geo Technical Mining Solutions</b> (A NABET accredited & ISO certified Company) No: 1/213-B, Ground Floor, Natesan Complex, Oddapatti, Collectorate Post office, Dharmapuri-636705 Web site: <a href="http://www.gtmsind.com">www.gtmsind.com</a>
	<b>Phone</b> : +91 9443937841
	<b>Fax</b> : Nil

215



e-mail	:	info.gtmsdpi@gmail.com
Telex	:	Nil
Registration Number	:	RQP/MAS/263/2014/A
Date of grant/renewal	:	16.12.2014
Valid upto	:	15.12.2024
f. Name of the prospecting agency	:	<b>Geo Technical Mining Solutions</b> GSR 286(E) No:272, Ministry of Mines Notification 7th April 2022. (Annexure XI)
Address	:	No: 1/213-B, Ground Floor, Natesan Complex, Oddapatti, Collectorate Post office, Dharmapuri-636705 Web site: <a href="http://www.gtmsind.com">www.gtmsind.com</a>
Phone	:	----
g. Reference No. and date of consent letter from the state government	:	The precise area communication letter issued by the Deputy Director, Department of Geology and Mining, Viluppuram vide <b>Roc.No. B/G &amp; M/09/2022</b> dated <b>06.06.2022</b> .

**2.0 LOCATION AND ACCESSIBILITY:**

a.	<b>Details of the Area</b>	:	Refer plate no: I, IA & IB,																																									
	<b>District &amp; State</b>	:	Viluppuram, Tamil Nadu																																									
	<b>Taluk</b>	:	Vanur																																									
	<b>Village</b>	:	Kondalangkuppam																																									
	<b>Khasra No./ Plot No./ Block Range / Felling Series etc.:</b>																																											
	<table border="1"> <thead> <tr> <th>Survey No.</th> <th>Sub division</th> <th>Total Extent in hect.</th> <th>Patta No.</th> <th>Village and Name of the land owner</th> <th>Mine lease Applied S.F. No.</th> <th>Mine lease Applied Area out of total area in hect.</th> </tr> </thead> <tbody> <tr> <td>70</td> <td>2</td> <td>0.11.0</td> <td rowspan="5">462</td> <td rowspan="5">Mr.Boobalan S/o. Mayavan</td> <td>70/2</td> <td>0.11.0</td> </tr> <tr> <td>70</td> <td>3</td> <td>0.10.0</td> <td>70/3</td> <td>0.10.0</td> </tr> <tr> <td>70</td> <td>4</td> <td>0.64.0</td> <td>70/4</td> <td>0.64.0</td> </tr> <tr> <td>70</td> <td>5A</td> <td>0.30.5</td> <td>70/5A</td> <td>0.30.5</td> </tr> <tr> <td>71</td> <td>3</td> <td>0.38.0</td> <td>71/3</td> <td>0.38.0</td> </tr> <tr> <td colspan="2"><b>Total Extent</b></td> <td><b>1.53.5</b></td> <td></td> <td><b>Applied lease area extent</b></td> <td><b>1.53.5</b></td> <td></td> </tr> </tbody> </table>	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.	70	2	0.11.0	462	Mr.Boobalan S/o. Mayavan	70/2	0.11.0	70	3	0.10.0	70/3	0.10.0	70	4	0.64.0	70/4	0.64.0	70	5A	0.30.5	70/5A	0.30.5	71	3	0.38.0	71/3	0.38.0	<b>Total Extent</b>		<b>1.53.5</b>		<b>Applied lease area extent</b>	<b>1.53.5</b>			
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70	4	0.64.0			70/4	0.64.0																																						
70	5A	0.30.5			70/5A	0.30.5																																						
71	3	0.38.0			71/3	0.38.0																																						
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	<b>Lease area (hectares)</b>	:	1.53.5 hectares																																									
	<b>Whether the area is recorded to be in forest (please specify whether protected, reserved etc.)</b>	:	The proposed lease area is recorded as patta land (Ref. Annexure No: V)																																									





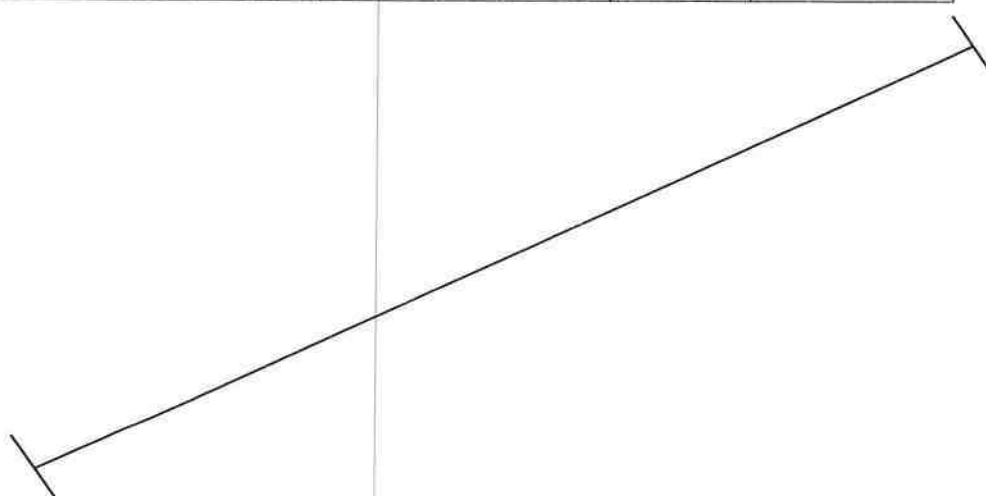
<b>Ownership / Occupancy</b>	: This is a Patta land of S.F.No's: 70/2, 70/3, 70/4, 70/5A & 71/3 registered in the name of Mr.M.Boobalan, S/o. Mayavan patta No. 462. The pattadhar gave consent register to the applicant. Hence the applicant has got surface rights over to the area. (Ref. Annex. No:VI).																																	
<b>Existence of Public Road /Railway line if any nearby and approximate distance</b>	: <ul style="list-style-type: none"> <li>➤ Exploited red earth materials will be transported through the consent registered land road is situated on the northwestern side from the site and connecting through village road.</li> <li>➤ The SH-136 road is situated about 1.86km away on eastern side.</li> <li>➤ No NH road is situated around 5km radius.</li> </ul>																																	
<p><b>Toposheet No. with latitude and longitude:</b> Toposheet No. 57 P/12</p> <p><b>Geo-Coordinates of the lease boundary pillar:</b></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° 2'22.83"N</td><td>79°41'23.40"E</td></tr> <tr><td>2</td><td>12° 2'20.05"N</td><td>79°41'22.87"E</td></tr> <tr><td>3</td><td>12° 2'19.41"N</td><td>79°41'22.76"E</td></tr> <tr><td>4</td><td>12° 2'20.53"N</td><td>79°41'18.29"E</td></tr> <tr><td>5</td><td>12° 2'19.58"N</td><td>79°41'17.93"E</td></tr> <tr><td>6</td><td>12° 2'19.90"N</td><td>79°41'16.53"E</td></tr> <tr><td>7</td><td>12° 2'22.67"N</td><td>79°41'17.43"E</td></tr> <tr><td>8</td><td>12° 2'22.42"N</td><td>79°41'18.97"E</td></tr> <tr><td>9</td><td>12° 2'21.98"N</td><td>79°41'20.91"E</td></tr> <tr><td>10</td><td>12° 2'23.38"N</td><td>79°41'21.49"E</td></tr> </tbody> </table>		Pillar ID	Latitude	Longitude	1	12° 2'22.83"N	79°41'23.40"E	2	12° 2'20.05"N	79°41'22.87"E	3	12° 2'19.41"N	79°41'22.76"E	4	12° 2'20.53"N	79°41'18.29"E	5	12° 2'19.58"N	79°41'17.93"E	6	12° 2'19.90"N	79°41'16.53"E	7	12° 2'22.67"N	79°41'17.43"E	8	12° 2'22.42"N	79°41'18.97"E	9	12° 2'21.98"N	79°41'20.91"E	10	12° 2'23.38"N	79°41'21.49"E
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9	12° 2'21.98"N	79°41'20.91"E																																
10	12° 2'23.38"N	79°41'21.49"E																																
<b>Land use pattern (Forest, Agricultural, Grazing, Barren etc.)</b>	: It is a vrin land																																	
b). <i>Attach a general location and vicinity map showing area boundaries and existing and proposed access routes. It is preferred that the area to be</i>	: Refer plate no-IA & IB																																	



*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) INFRASTRUCTURE AND COMMUNICATION:**

S.No	Description	Place	Distance	Direction
a.	Nearest post office	Thiruvakkarai	3.8Km	Southwest
b.	Nearest police station	Katterikuppam	4.0Km	SE
c.	Nearest fire station	Vanur	4.15km	SE
d.	Nearest Medical facility	Vanur	4.3Km	SE
e.	Nearest school	Sethanappattu	2.2Km	North
f.	Nearest Railway station	Perani	16.4km	East
g.	Nearest port facility	Chennai	141.5km	NE
h.	Nearest Airport	Cuddalore	36.0km	NE
i.	Nearest DSP office	Tindivanam	21.2km	NE
j.	Nearest Villages	Parankani	1.19km	North
		Kondalamkuppam	1.12km	Southwest
		Ranganathapuram	1.80km	East
		Thollamur	2.0km	Northwest



## 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 almost flat topography and shows the relief of 1m; the maximum elevation (48.0m AMSL) was observed in northwest side of the site, while the minimum elevation (47.0m AMSL) was observed southern side of the site and falls in Toposheet no. 57 P/12.
(ii)	<b>a) Geology of the District:</b> The greater part of the district is covered by rocks belonging to Archaean age comprising the charnockite group, the Migmatite complex, Sathyamangalam group and the Bhavani group and the alkali complex of proterozoic age. West of kallakurichi (southwestern part of the district), the area comprises the charnockite group of rocks viz. Charnockite, pyroxene granulite and garnetiferous gabbro. West of Tirukoilur (central part of the district), and east of the Charnockite terrain (i.e., kallakurichi area) the Migmatite complex is made up of Hornblende-biotite gneiss. Pink augen gneiss and pink migmatite with younger intrusions of Tindivanam and Gingee Granites (2250 Ma) and basic dykes (Proterozoic). The Migmatite Complex forms the major country rock of the area covering more than sixty percent and extending towards east upto Vikravandi, south of Gingee. Epidote-hornblende gneiss (Proterozoic age) occurs as small isolated outcrops. Dolerite dykes form the youngest basic intrusive traversing both Charnockite as well as the migmatite country equally. Overlying the Archaeans are the marine fossiliferous Upper, Cretaceous and Palaeogene Formations occurring in two separate sub-basins separated by thick cover of alluvial sediments deposited by Gadilam and Pennaiyar rivers. The two sub-basins are recognized as Vridhachalam subbasin and Pondicherry sub-basin. In Vridhachalam sub-basin, the marine Upper Cretaceous sediments are divisible into four formations viz., Parur formation, Patti Formation, Mattur Formation and Alladi Formation. The Parur Formation is not exposed in the district. The Patti Formation comprises fossiliferous sandy limestone and	





calcareous shale. Mattur Formation and shales with pockets of fossiliferous limestone. The Pondicherry Sub-basin is partly exposed in the eastern part of Viluppuram district and the Upper Cretaceous sediments are divisible into vanur Formation, comprising argillaceous sandstone with hard bands of siltstone and bands of shell limestone. **The general geological sequence of formation is given below:**

Age	Group	Lithology
Quaternary	--	Sands, gravelly sands, clays and clayey sands
Tertiary		Silty clay stones, argillaceous Lime stone.
Cretaceous	---	Epidote-hornblende gneiss
Archaean	Charnockite group	Charnockites, Migmatite, Dolerites and Pegmatite

(iii) **i) Regional Geology of the proposed area:**

**i) Topography of the proposed lease area:**

The proposed lease area almost flat topography and shows the relief of 1m; the maximum elevation (48.0m AMSL) was observed in northwest side of the site, while the minimum elevation (47.0m AMSL) was observed southern side of the site

Red soil combination of Sand & fines properties are obviously dominated by those respective fractions. For example, red soils (generally more than 75.51 percent red soil) are often poorly drained. The Surface plan showing contour, accessibility road and Geological map was prepared the proposed lease area.

**ii) Mode of origin:**

Red soil combination of sand & fines deposited by patta land. Thus, the parent material of these soils is of erosion, transportation, deposition with help of water and containing a fine to coarse grain soil mixture. **Order of superposition of the proposed lease area,**

Age	Group	Rock Formation
Recent to Sub recent	----	Red Soil (1-3m thick)
Archaean	Charnockite Group	Charnockite.

(iv) Drainage Pattern : There is a patta land. The drainage pattern of the area is sub-dendritic in nature.



- (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   | : | No exploration carried out. It is a patta land with covered with red soil deposit. Hence, the RQP personally examined during mining survey.                          |
| b. Surface Plan   | : | Surface plan showing 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 1:100, as shown in Plate No.III. |

(d) *Broadly indicate the Yearwise future programme of exploration, taking into consideration the future production programme planned in next year's as in table below:-*

Year	No. of boreholes	Total meterage	No. of Pits and Dimensions	No. of Trenches and Dimensions
2 year	N.A	---	---	N.A

No future exploration programmed is proposed in this area. It's a loose soil 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 are calculated by cross sectional method.**

The Geological resources is estimated as cross sectional method are following

GEOLOGICAL RESOURCES					
Section	Pit	length in (m)	Width in (m)	Depth in (m)	Volume in (m <sup>3</sup> )
XY-AB	I	46	90	2.0	8280
XY-CD		67	62	2.0	8308
XY-EF		66	107	2.0	14124
<b>TOTAL</b>					<b>30712</b>



(f) Indicate mineable reserves by slice plan / level plan method, as applicable, as per the proposed mining parameters.

The mineable reserves of red earth estimated as 23004m<sup>3</sup> up to depth of 2.0m from surface and the commercially viable red earth has been prepared on 1: 1000 Scale. Sections are prepared as scale of 1:1000 in horizontal axis and 1:100 as vertical axis (Plate No's. V).

MINEABLE RESERVES					
Section	Pit	length in (m)	Width in (m)	Depth in (m)	Volume in (m <sup>3</sup> )
XY-AB	I	39	75	2.0	5850
XY-CD		67	47	2.0	6298
XY-EF		59	92	2.0	10856
<b>TOTAL</b>					<b>23004</b>

**4.0 MINING:**

a. Briefly describe the existing/ proposed method for developing / working the deposit with all design parameters.

It is a fresh quarry lease. The mining operation is open-cast, semi-mechanized methods are adopted and on single shift basis only. It is being loose in nature. No drilling or blasting is proposed for this type of red earth quarry lease; it is an eco-friendly quarrying operation.

Machineries like hired tippers and excavator combination will be adapted for transportation to the customer.

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

Period	Pit No.(s)	Topsoil/ Overburden (m <sup>3</sup> )	ROM (m <sup>3</sup> )	Saleable Red earth (m <sup>3</sup> )	Sub grade/ Weathered rock in (m <sup>3</sup> )	Rejects (m <sup>3</sup> )	Ore to Waste ratio
I <sup>st</sup> Year	I	---	12148	12148	---	---	---
II <sup>nd</sup> Year	I	---	10856	10856	---	---	---
<b>Total</b>	---	---	<b>23004</b>	<b>23004</b>	---	---	---

c. i) Composite plans and Yearwise sections (In case of 'A' class mines):  
Not applicable

ii) Composite plans and Yearwise sections (In case of 'B' class mines):  
The average proposed rate of production of red earth as under.

PRODUCTION																								
Period	Section	Length in (m)	Width in (m)	Depth in (m)	Volume In (m <sup>3</sup> )	Production for Red earth in (m <sup>3</sup> )																		
Two years	XY-AB	39	75	2.0	5850	5850																		
	XY-CD	67	47	2.0	6298	6298																		
	XY-EF	59	92	2.0	10856	10856																		
<b>TOTAL</b>					<b>23004</b>	<b>23004</b>																		
d.	Attach supporting composite plan and section showing pit layouts, dumps, stacks of sub-grade mineral, if any, etc.		:	It is fresh quarry lease (Refer Plate No: III)																				
e.	<p><i>Indicate proposed rate of production when the mine is fully developed and the expected life of the mine and the year from which effected:</i></p> <p>At this rate of production, the expected life of quarry is calculated as given below:</p> <p style="text-align: center;">Mineable reserves of red earth = <b>23004m<sup>3</sup></b></p>																							
f.	<i>Attach a note furnishing a conceptual mining plan for the entire lease period (for "B" category mines) and upto the life of the mine (for "A" category mines) based on the geological, mining and environments considerations:</i>																							
(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 red soil deposit is proved beyond the workable limits about 2.0m depth below ground level.																				
(ii)	Whether ultimate pit limit has been determined and demarcated on surface and geological plan:-		:	The ultimate pit limit has been determined & demarcated in the conceptual plan																				
				<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Pit</th> <th>Overburden/ Mineral</th> <th>Length (m)</th> <th>Width (m)</th> <th>Depth (m)</th> </tr> </thead> <tbody> <tr> <td rowspan="3" style="text-align: center;">I</td> <td>Red earth</td> <td style="text-align: center;">39</td> <td style="text-align: center;">75</td> <td style="text-align: center;">2.0</td> </tr> <tr> <td>Red earth</td> <td style="text-align: center;">67</td> <td style="text-align: center;">47</td> <td style="text-align: center;">2.0</td> </tr> <tr> <td>Red earth</td> <td style="text-align: center;">59</td> <td style="text-align: center;">92</td> <td style="text-align: center;">2.0</td> </tr> </tbody> </table>			Pit	Overburden/ Mineral	Length (m)	Width (m)	Depth (m)	I	Red earth	39	75	2.0	Red earth	67	47	2.0	Red earth	59	92	2.0
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	Red earth	67	47	2.0																				
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(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: -		:	There is no waste will be proposed in this lease area.																				

223



(iv)	Whether back filling of pits after recovery of mineral upto techno-economically feasible depth envisaged. If so, describe the broad features of the proposal:-	: May not continue for further quarrying depth and do not backfill the quarry pit. At the end of mining activities over the quarrying area will be leveled utilize for agricultural purposes.
(v)	Whether post mining land use envisaged: -	: At the end of mining activities over the quarrying area. At the end of mining activities over the quarrying area after will be leveled may utilize for agricultural purposes.
<b>g. Open cast Mines:</b>		
(i)	Describe briefly giving salient features of the mode of working (Mechanized, Semi-Mechanized, manual)	: The mining operation is open-cast, semi-Mechanized methods are adopted and on single shift basis only. It is being loose in nature no drilling or blasting is proposed for this type of red earth quarry lease; it is an eco-friendly quarrying operation. Machineries like tippers and excavator combination will be adapted for transportation to the needy destination for construction purpose in and around the district.
(ii)	Describe briefly the layout of mine workings, the layout of faces and sites for disposal of overburden/ waste. A reference to the plans enclosed under 4(b) and 4(d) will suffice	: The red earth is proposed to quarry at 2.0m depth below ground level opencast semi-mechanized method.
	a. Details of Topsoil / Overburden	: No separate top soil will be removed red earth will be quarry right from surface level itself.
	b. Gravel waste and side burden waste: -	: It is red earth lease quarry. There is no waste or side burden removed.
h.	<b>Underground Mines:</b>	: It is a simple open cast, eco-friendly quarry operation only.

224





i. **(a) Extent of mechanization:**  
Describe briefly including the calculation for adequacy and type of machinery and equipment proposed to be used lease area

**(1) Drilling Machines:**  
It is being loose in nature no drilling is proposed for this type of red earth quarrying; it is an eco-friendly quarrying operation.

**(2) Loading Equipment:**  
Excavator (0.60m<sup>3</sup> capacity, Diesel Drive) and tippers utilized for transport and deliver to road making area.

**(3) Haulage and Transport Equipment**  
(a) Haulage within the mining lease hold:

Type	Nos	Size / Capacity	Make	Motive power	H.P.
Tipper	3	--	---	Diesel	--

**Whether the dumpers are fitted with exhaust conditioner should be indicated:**  
The dumpers are not used in this quarry; hence it's a small B2 category of red earth quarry.

b) Transport from mine head to the destination : The red earth will be loaded directly to the tippers for transportation to the customer.

c. Describe briefly the transport system (please specify) : The hired tipper and excavator will be used for carrying out day to day mining activities on the day basis or hourly basis as per market scenario.

d. Ore transported by: own trucks / hired trucks : Hired excavator and tippers

e. Main destination to which ore is transported (giving to and from distance) : The excavated red earth materials will be used to transport to the customer.

f. Details of hauling / transport equipment:  
Not applicable

**(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 excavator (0.60m<sup>3</sup> capacity, Diesel Drive) and tipper

225



		combination are adapted.
5.	<b>BLASTING:</b>	
	<i>a) Broad blasting parameters like charge per hole, blasting pattern, charge per delay, maximum number of holes blasted in a round, manner and sequence of firing, etc.</i>	
	It is being loose in nature no blasting is proposed for this type of red earth quarrying; it is an eco-friendly quarrying operation.	
	<i>b) Type of explosives used / to be used:</i>	
	Not applicable	
	c) Powder factor in ore and overburden / waste / development heading / stope	: Not applicable
	d) Whether secondary blasting is needed, if so describe it briefly	: Not applicable
	e) Storage of explosives (like capacity and type of explosive magazine)	: There is no stock dumped along lease area.
6.	<b>MINE DRAINAGE</b>	
	a) Likely depth of water table based on observations from nearby wells and water bodies	: The ground water table is reported as of 25m in summer and 20m in rainy season from the general ground level in the adjacent open wells of the area.
	b) Workings expected to be _____ m. above / reach below water table by the year _____.	: Proposed mining depth is 2.0m below from the general 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.



<b>7. STACKING OF MINERAL REJECTS AND DISPOSAL OF WASTE:</b>	
a) Indicate briefly the nature and quantity of top soil, overburden / waste and mineral rejects likely to be generated during the plan periods:  There is no separate of topsoil or overburden are removed.	
b) Land chosen for disposal of waste with proposed justification	: There is no any waste will be disposed from this lease area.
c) Attach a note indicating the manner of disposal and configuration, sequence of buildup of dumps along with the proposals for the stacking of sub-grade ore, to be indicated Yearwise.	: No stacked mineral or sub grade mineral dumps proposed.
<b>8. USE OF MINERAL:</b>	
a) Describe briefly the end-use of the mineral (sale to intermediary parties, captive consumption, export, industrial use)	: The excavated red earth materials will be used transport to the customer.
b) Indicate physical and chemical specifications stipulated by buyers	: No mineral, Sub-grade, Rejects are process are involved.
c) Give details in case blending of different grades of ores is being practiced or is to be practiced at the mine to meet specifications stipulated by buyers.	: Not blending process is involved, after exploited the red earth will be directly loaded to the customer.
<b>9. OTHERS</b>	
<b>Describe briefly the following</b> a) Site services	: Infrastructure required for such mines like semi sanitary facilities and first aid station, have been provide as per the Metalliferous Mines Regulations Act, 2021 as a welfare amenity for quarry laborers.  All the quarry workers will be provided with safety helmets, ear muffs, Dust mask, reflector jackets and Safety Shoes

227

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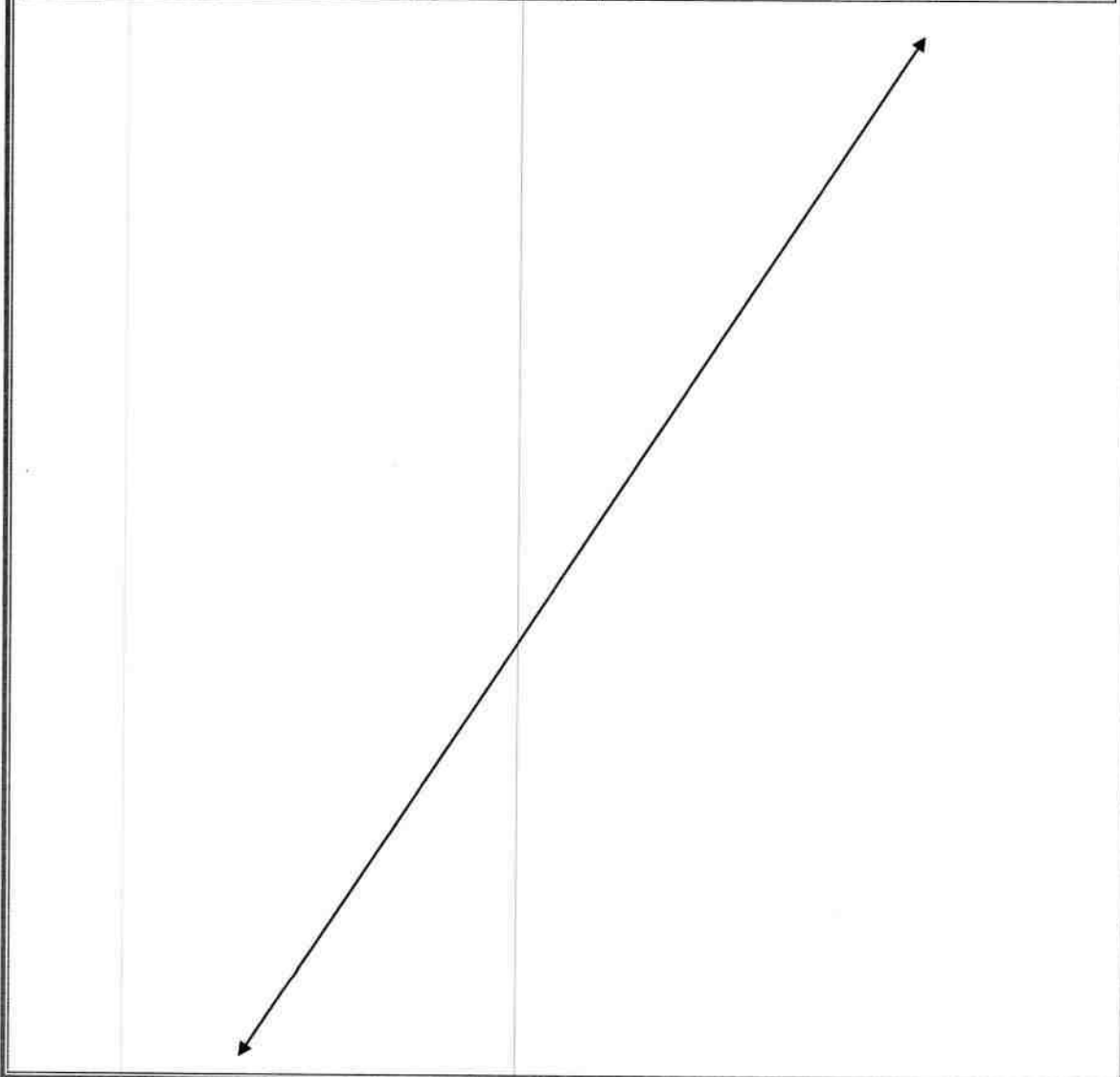
		as personal protective device as per the specification of Director of Mines Safety																																				
<p>b) Employment potential: The following man power is proposed for the red earth quarrying to carry out the day-to-day quarrying activities, aimed at the proposed production target and also to comply with the statutory provisions of the Government norms.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>1.</td> <td>Skilled</td> <td>Excavator operator</td> <td>1 No.</td> </tr> <tr> <td></td> <td></td> <td>Mechanic</td> <td>---</td> </tr> <tr> <td></td> <td></td> <td>Blaster/Mat</td> <td>---</td> </tr> <tr> <td>2.</td> <td>Semi – skilled</td> <td>Driver</td> <td>---</td> </tr> <tr> <td>3.</td> <td>Unskilled</td> <td>Musdoor / Labours</td> <td>2Nos</td> </tr> <tr> <td></td> <td></td> <td>Cleaners</td> <td>---</td> </tr> <tr> <td></td> <td></td> <td>Office Boy</td> <td>---</td> </tr> <tr> <td>4.</td> <td>Management &amp; Supervisory staff</td> <td></td> <td>2Nos</td> </tr> <tr> <td colspan="3" style="text-align: right;"><b>Total =</b></td> <td><b>5 Nos</b></td> </tr> </table>			1.	Skilled	Excavator operator	1 No.			Mechanic	---			Blaster/Mat	---	2.	Semi – skilled	Driver	---	3.	Unskilled	Musdoor / Labours	2Nos			Cleaners	---			Office Boy	---	4.	Management & Supervisory staff		2Nos	<b>Total =</b>			<b>5 Nos</b>
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<b>10 MINERAL PROCESSING/BENEFICIATIONS:</b>																																						
a) If processing / beneficiations of the ore or minerals mined is planned to be conducted on site or adjacent to the extraction area, briefly describe the nature of the processing /beneficiation. This should indicate size and grade of feed material and concentrate (finished marketable product), recovery rate.	:	No processing/ beneficiations of the ore or minerals mined. The excavated red earth materials will be used for transport to the customer.																																				
b) Explain the disposal method for tailings or waste from the processing plant (quantity and quality of tailings proposed to be discharged, size and capacity of tailing pond, toxic effect of such tailings, if any, with process adopted to neutralize any such effect before their disposal and dealing of excess water from the tailing dam).	:	No Waste shall be proposed.																																				
c) A flow sheet or schematic diagram of the processing procedure should be attached.	:	Not applicable																																				

228

*[Handwritten Signature]*



d) Specify quantity and type of chemicals to be used in the processing plant.	: Not applicable
e) Specify quantity and type of chemicals to be stored on site / plant.	: Not applicable
f) Indicate quantity (cu.m. per day) of water required for mining and processing and sources of supply of water. Disposal of water and extent of recycling.	: Drinking & utilized water is 1.0 KLD, Dust suppression is 0.5KLD and Green Belt is 0.5KLD. Minimum quantity of water 2.0KLD per day has to be maintained. Drinking water will be brought from the authorized water suppliers and dust suppression, Green belt has got water tank.



229



## PART – B

### 11.0 ENVIRONMENTAL MANAGEMENT PLAN :

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

11.1	It's a barren and with covered with clayey soil formation, does not sustain any type of vegetation. The present and proposed land use pattern is given as under																									
<table border="1" style="width: 100%;"> <thead> <tr> <th style="width: 10%;">S. No</th> <th style="width: 40%;">Land Use</th> <th style="width: 50%;">Present Area (Hect)</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>Under quarrying area</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 area</td> <td>1.53.5</td> </tr> <tr> <td>5.</td> <td>Green belt</td> <td>Nil</td> </tr> <tr> <td>6.</td> <td>Drainage &amp; settling tank</td> <td>Nil</td> </tr> <tr> <td colspan="2" style="text-align: right;"><b>Total</b></td> <td><b>1.53.5</b></td> </tr> </tbody> </table>			S. No	Land Use	Present Area (Hect)	1.	Under quarrying area	Nil	2.	Infrastructure	Nil	3.	Roads	Nil	4.	Unutilized area	1.53.5	5.	Green belt	Nil	6.	Drainage & settling tank	Nil	<b>Total</b>		<b>1.53.5</b>
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11.2	Water Regime	: Water table in this area is noticed at a depth of 25m in summer and 20m in rainy season from general ground level. Drinking water will be brought from the authorized water suppliers and dust suppression, Green belt has got water tank.																								
11.3	Flora and Fauna	: There is no major flora found in this area. 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	: This eco-friendly quarrying operation does not involve any blasting and drilling methods; hence noise will be minimal and this is only due to the movement of excavator and tippers combination.																								
11.5	Climatic conditions	: The area enjoys humid and tropical climate with hot summers, significant to slight winters and sensible to heavy rainfall. The normal annual rainfall over the area is 1230 mm. Temperature ranges between																								



		40.6 to 19.3° C with piercing fall in night temperatures during monsoon season.																				
11.6	Human Settlement:  The nearest villages are found in the buffer zone with population as per 2011 census.																					
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11.7	Public buildings, places of worship and monuments	: No infrastructure like residential building, places of special interest like archeological monuments, etc., are found around 10km radius.																				
11.8	Attach plans showing the locations of sampling stations	: The proposed Ambient air quality, Water quality Ambient noise level is periodically tested for one season around 1km 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 years (and upto conceptual plan period for 'A' category mines)**

i)	<p><b>Land area indicating the area likely to be degraded due to quarrying / pitting, dumping, roads, workshop, processing plant, township etc:</b></p> <p>The details of the land use pattern, during the ensuing plan period and till lease period is shown in the tabular form:</p> <table border="1"> <thead> <tr> <th>S. No</th> <th>Land Use</th> <th>Area in use during the quarrying period (Hect)</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>Under quarrying area</td> <td>1.15.0</td> </tr> <tr> <td>2.</td> <td>Infrastructure</td> <td>0.01.0</td> </tr> <tr> <td>3.</td> <td>Roads</td> <td>0.04.0</td> </tr> </tbody> </table>	S. No	Land Use	Area in use during the quarrying period (Hect)	1.	Under quarrying area	1.15.0	2.	Infrastructure	0.01.0	3.	Roads	0.04.0
S. No	Land Use	Area in use during the quarrying period (Hect)											
1.	Under quarrying area	1.15.0											
2.	Infrastructure	0.01.0											
3.	Roads	0.04.0											

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		4. Un-utilized	0.02.5
		5. Green belt	0.25.0
		Drainage & Settling Tank	0.06.0
		<b>Total</b>	<b>1.53.5</b>
ii).	Air Quality	In this eco-friendly quarrying operation only, Excavator are proposed without drilling and blasting, hence the air quality will not affect due to the quarrying operation, water will be sprinkled in the haul roads periodically to suppress dust Ambient Air Quality monitoring will be carried out to check the Quality of Air in and around the quarry. During transportation the red earth will be fully covered by Tarpaulin to prevent dust and spillage.	
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	This eco-friendly quarrying operation does not involve any blasting and drilling methods; hence noise will be minimal and this is only due to the movement of excavator and tippers combination.	
v).	Vibration levels (due to blasting)	The maximum peak particles velocity shall be recoded using mini seismograph devises as per the guidance of MoEF and EIA Notification 2006 and also covering DGMS norms.	
vi).	Water regime	It's a patta land. Drinking water will be brought from the authorized water suppliers and dust suppression, green belt has got water tank.	
vii).	Socio-economics	<ol style="list-style-type: none"> <li>1. To provide Employment opportunities of the nearby villagers.</li> <li>2. For the cultural development of the nearby villagers.</li> </ol>	

232





viii).	Historical monuments etc.	There are no historical monuments, etc found around 10km radius.
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**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 removed and red earth will be quarry right from surface level itself.
ii).	Yearwise proposal for reclamation of land affected by abandoned quarries and other mining activities during first five years (and up to 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 is given.	: The present mining is proposed to an average depth of 2.0m bgl has been envisaged as workable depth for safe & economic mining during the lease period. After completion of red earth quarrying area will be leveled after using agricultural purposes.

**iii). Programmed of afforestation, Year wise for the initial 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.**

Safety barrier, school and nearest panchayat roads has been identified to be utilized for Greenbelt appropriate native species of Neem, Pungan, Coconut 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	4462	500	80%	@100 Rs Per sapling	50,000/-
	Nearby Village Road	--	100	80%		10,000/-
	Schools	--	100	80%		10,000/-
<b>Total</b>						<b>70,000/-</b>



iv).	Stabilization and vegetation of dumps along with waste dump management Year wise for the first five years (and up to conceptual plan period for 'A' category mines).	:	There is no other quarry waste removed. To remove red earth only.
v).	Measures to control erosion / sedimentation of water courses.	:	There is no major dump are proposed.
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.
viii)	Protective measures for ground vibrations / air blast caused by blasting,	:	In this Eco-friendly quarrying operation only, Excavator are proposed without drilling and blasting, hence the air quality will not affect due to the quarrying operation, water will be sprinkled in the haul roads periodically to suppress dust.
ix).	Measures for protecting historical monuments and for rehabilitation of human settlements likely to be disturbed due to mining activity.	:	No historical monuments and for rehabilitation of human settlements doesn't to be disturbed during mining activity.
x).	Socioeconomic benefits arising out of mining.	:	The nearest villages are will get employment benefits.

*d). Monitoring schedules for different environmental components after the commencement of mining and other related activities. (For 'A' category mines only)*

Not applicable. It is B2 category quarry

**12.0 FINAL QUARRY CLOSURE PLAN:**

12.1	Steps proposed for phased restoration, reclamation of already mined out area.	:	The present mining is proposed to an average depth of 2.0m from the below ground level. After completion of red earth quarrying area will be utilized agricultural purposes.
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234



12.2	Measures to be under taken on mine closure as per Act & Rules	: Measures will be taken as per the Acts and Rules. Green belt development at the rate of 500 trees will be proposed.
12.3	Mitigation measures to be undertaken for safety and restoration/ reclamation of the already mined out area	: It is a patta land and loose soil. No mitigation measures to be undertaken.
12.4	Mine closure activity	: The present mining is proposed to a depth of 2.0m bgl. After completion of red earth quarrying area will be utilized agricultural purposes.
12.5	Safety and security	: Safety like helmet, safety shoes, Dust mask, 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. Even then if any minor or major accident happens the quarry staffs having First aid facilities with first aid box with all necessary medicine, etc., to give first aid treatment at the site and will arrange immediately.
12.7	Care and maintenance during temporary discontinuance	: During temporary discontinuance the working place will be fenced completely and a board of discontinuance will be changed on the main entrance of the working place.
12.8	Economic repercussions of closure of quarry and man power entrenchments	: The employment potential will be generated, general financial status and socio-economic conditions of approx. 5 labors will be improved.

235

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

<b>A. Fixed Asset Cost/Investment:</b>		
1. Capital Cost	:	Rs. 3,00,000/-
2. Infrastructure (Temporary Shed)	:	Rs. 15,000/-
3. Sanitary Facility	:	Rs. 15,000/-
4. Fencing	:	3,00,000
5. Others	:	Rs 10,000/-
<b>Total</b>	:	<b>Rs 6,40,000/-</b>
<b>B. Operational cost</b>		
Machinery's	:	<b>Rs 5,00,000/-</b> (Hire basis)
<b>C. EMP Cost: per year (Minimum 1 station * 1 season):</b>		
1. Air quality test	:	Rs 40,000/-
2. Water quality sampling	:	Rs 30,000/-
3. Noise test	:	Rs 30,000/-
4. Soil analysis	:	Rs 25,000/-
<b>Total cost</b>	:	<b>Rs.1,25,000/-</b>
<b>D. Expenditure cost</b>		
1. Drinking Water Facility	:	Rs. 10,000/-
2. Sanitary Maintenance	:	Nil
3. Water Sprinkling	:	Rs. 20,000/-
4. Afforestation and maintenance	:	Rs. 70,000/-
5. Safety Kits	:	Rs. 10,000/-
<b>Total</b>	:	<b>Rs. 1,10,000/-</b>
<b>E. Total Project Cost(A+B+C+D)</b>	:	<b>Rs. 13,75,000/-</b>

**13.0 FINANCIAL ASSURANCE:**

Not applicable, it is a small B2 red earth 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**

1. Care and precautionary measures will be taken for the safety of workers as per Rules and Acts.
2. Permission will be obtained from the District Mines Office to extract the red-earth only.
3. The Mining Plan is prepared by incorporating the conditions stipulated in the precise area communication issued on letter **Roc.No. No. B/G & M/442/21** dated **06.06.2022**.
4. The proposed quantity of red earth is **23004m<sup>3</sup>** up to a depth of **2.0m** for two years period.

**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 22<sup>nd</sup> January 2021 as circular no. CSR-05/01/2021-CSR-MCA dated 25<sup>th</sup> August 2021.

Place: Dharmapuri, TN

Date: 06.06.2022

Signature of the Recognized Qualified Person

Dr. S. KARUPPANNAN, M.Sc., Ph.D.,  
RQP/MAS/263/2014/A  
**GEO TECHNICAL MINING SOLUTIONS**  
1/213-B, Ground Floor, Natesan Complex,  
Oddapatti, Collectorate Post Office,  
Dharmapuri - 636 705. Tamil Nadu, India.  
E-mail : info.gtmsdpi@gmail.com  
website : www.gtmsind.com

This mining plan is approved based on the instructions and guidelines issued by the Commissioner of Geology and Mining, Chennai vide letter Rc.No. 3858/LC/2012, dated: 19-11-2012 and based on incorporation of the conditions laid by the Deputy Director of Geology and Mining, Viluppuram in precise area communication letter Rc. No. B/49m/442/2021 dated: 06.06.2022

*[Signature]*  
Deputy Director,  
Geology and Mining,  
Viluppuram.

Date : 13.6.22

*[Handwritten notes]*  
13/6/22

13/6/22

237

ந.க.எண்.ஆ/புவி (ம) து/442/2021  
நாள்: 06.06.2022

துணை இயக்குநர்,  
புவியியல் மற்றும் சுரங்கத்துறை அலுவலகம்  
விழுப்புரம்.

ANNEXURE

-163-

08 JUN 2022

விழுப்புரம்

குறிப்பாணை:

**பொருள்:** கனிமங்களும் குவாரிகளும் - விழுப்புரம் மாவட்டம், வானூர் வட்டம், கொண்டாலங்குப்பம் கிராமம், புன்செய் புல எண்கள். 70/2 (0.11.0), 70/3 (0.10.0), 70/4(0.64.0), 70/5A(0.30.50) மற்றும் 71/3(0.38.0 மொத்தபரப்பு 1.53.50 ஹெக்டேர் பட்டா நிலம் - செம்மண் குவாரி குத்தகை உரிமம் வேண்டி திரு.ப.வெங்கடகிருஷ்ணன் த/பெ.பலராமன் நம்பர்.25, 2-வது குருக்குத்தெரு, குருவம்பேட்டை, ஹவுசிங் போர்ட், புதுச்சேரி மாநிலம், என்பவர் விண்ணப்பம் செய்தது - உரிமம் வழங்க பரிந்துரை செய்யப்பட்டது - தகுதியான நிலப்பரப்பாக கருதி ஏற்பளிக்கப்பட்ட சுரங்க திட்டம் மற்றும் சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணைய இசைவினை பெற்று சமர்ப்பிக்கக் கோருதல் - தொடர்பாக.

**பார்வை:** 1. திரு.ப.வெங்கடகிருஷ்ணன் த/பெ.பலராமன் நம்பர்.25, 2-வது குருக்குத்தெரு, குருவம்பேட்டை, ஹவுசிங் போர்ட், புதுச்சேரி மாநிலம், என்பவரின் விண்ணப்ப நாள். 22.11.2021.  
2. வருவாய் கோட்டாட்சியரின் கடித எண். ந.க.எண். அ4/1042/2022 நாள்: 11.04.2022  
3. விழுப்புரம், புவியியல் மற்றும் சுரங்கத்துறை துணை இயக்குநர் அலுவலகம், உதவி புவியியலாளரின் புலத்தணிக்கை அறிக்கை நாள்: 31.05.2022.

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விழுப்புரம் மாவட்டம், வானூர் வட்டம், கொண்டாலங்குப்பம் கிராமம், புன்செய் புல எண்கள். 70/2 (0.11.0), 70/3 (0.10.0), 70/4(0.64.0), 70/5A(0.30.50) மற்றும் 71/3(0.38.0 - ஆகியவற்றின் மொத்தபரப்பு 1.53.50 ஹெக்டேர் நிலத்தில் செம்மண் வெட்டியெடுக்க திரு.ப.வெங்கடகிருஷ்ணன் த/பெ.பலராமன் நம்பர்.25, 2-வது குருக்குத்தெரு, குருவம்பேட்டை, ஹவுசிங் போர்ட், புதுச்சேரி மாநிலம், என்பவர் பார்வை 1-ல் கண்ட விண்ணப்பத்தில் உரிய ஆவணங்களுடன் விண்ணப்பம் அளித்துள்ளார்.

மேற்படி விண்ணப்பம் தொடர்பாக, வருவாய் கோட்டாட்சியர் விழுப்புரம் மற்றும் உதவிப் புவியியலாளர், துணை இயக்குநர் அலுவலகம் புவியியல் மற்றும் சுரங்கம், விழுப்புரம் ஆகியோர் 238 புலத்தணிக்கை மேற்கொண்டு விழுப்புரம்

*[Handwritten Signature]*

மாவட்டம், வானூர் வட்டம், கொண்டாலங்குப்பம் கிராமம், புன்செய் புல எண்கள் 70/2 (0.11.0), 70/3 (0.10.0), 70/4(0.64.0), 70/5A(0.30.50) மற்றும் 71/3(0.38.0 - ஆகியவற்றின் மொத்தபரப்பு 1.53.50 ஹெக்டேர் பட்டா நிலத்தில் திரு.ப.வெங்கடகிருஷ்ணன் த/பெ.பலராமன் என்பவருக்கு செம்மண் குவாரி உரிமம் வழங்க கீழ்க்கண்ட நிபந்தனைகளுக்குட்பட்டு அனுமதி வழங்கலாம் என பரிந்துரை செய்துள்ளனர்.



- i. விண்ணப்ப புலங்களின் அருகிலுள்ள பட்டா நிலங்களுக்கு முறையே 7.5 மீட்டர் பாதுகாப்பு இடைவெளிவிட்டு குவாரி பணி செய்ய வேண்டும்.
- ii. குவாரி குத்தகை வழங்கும் முன்பு விண்ணப்பித்துள்ள இடத்தினை சுற்றி கம்பி வேலி அமைத்து DGPS சர்வே பணி மேற்கொண்டு அதன் அறிக்கையை சமர்ப்பிக்க வேண்டும்.
- iii. தமிழ்நாடு சிறுகனிம சலுகை விதிகள் 1959 விதி-42ன் படி மாநில சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையத்திடமிருந்து சுற்றுச்சூழல் சான்று பெற்று சமர்ப்பிக்கப்படவேண்டும்.

எனவே, வருவாய் கோட்டாட்சியர் விழுப்புரம் மற்றும் விழுப்புரம், புவியியல் மற்றும் சுரங்கத்துறை, துணை இயக்குநர் அலுவலக உதவிப் புவியியலாளர் ஆகியோரின் பரிந்துரை மற்றும் நிபந்தனைகளின் அடிப்படையில், விழுப்புரம் மாவட்டம், வானூர் வட்டம், கொண்டாலங்குப்பம் கிராமம், புன்செய் புல எண்கள். 70/2 (0.11.0), 70/3 (0.10.0), 70/4(0.64.0), 70/5A(0.30.50) மற்றும் 71/3(0.38.0 - ஆகியவற்றின் மொத்தபரப்பு 1.53.50 பரப்பில் 1959-ம் வருட தமிழ்நாடு சிறுகனிம விதிகள், விதி எண்.19-ன் படி மேற்கண்ட நிபந்தனைகளுக்குட்பட்டு 2 (இரண்டு) வருட காலத்திற்கு திரு. திரு.ப.வெங்கடகிருஷ்ணன் த/பெ.பலராமன் என்பவருக்கு செம்மண் குவாரி உரிமம் வழங்குவதற்குரிய தகுதியான நிலப்பரப்பாக கருதப்படுகிறது.

அதன் அடிப்படையில், தமிழ்நாடு சிறுகனிம சலுகை விதிகள்-1959 விதி எண். 41-ன்படி குவாரிப்பணி மேற்கொள்வது தொடர்பாக வரைவு சுரங்க திட்டத்தினை அங்கீகரிக்கப்பட்ட தகுதிவாய்ந்த நபர் (RQP) மூலமாக கீழ்க்கண்ட நிபந்தனைகளுக்குட்பட்டு தயாரித்து அதனை 90 தினங்களுக்குள் துணை இயக்குநர் புவியியல் மற்றும் சுரங்கத்துறை அவர்களின் பரிசீலனைக்கு சமர்ப்பிக்குமாறு விண்ணப்பதாரரை கேட்டுக்கொள்ளப்படுகிறது. மேலும் ஏற்பளிக்கப்பட்ட சுரங்கத்திட்டத்தின் தொடர்ச்சியாக 1959ம் வருடத்திய தமிழ்நாடு சிறுகனிம சலுகை விதிகள்-1959 விதி எண்.42-ன் படி சுற்றுச்சூழல் தாக்க

23

மதிப்பீட்டு ஆணையத்தின் இசைவினைப் பெற்று சமர்ப்பிக்கும் பட்சத்தில் மட்டுமே குவாரி உரிமம் வழங்கப்படும் என இதன் மூலம் தெரிவிக்கப்படுகிறது.

- i. விண்ணப்ப புலங்களின் அருகிலுள்ள பட்டா மற்றும் அரசு புறம்போக்கு நிலங்களுக்கு முறையே 7.5 மீட்டர் மற்றும் 10 மீட்டர் பாதுகாப்பு இடைவெளிவிட்டு குவாரி பணி செய்ய வேண்டும். விண்ணப்பித்துள்ள புலத்திற்கு அருகில் செல்லும் பாதைகளுக்கு, கிராம சாலைகளுக்கு 10 மீட்டர் பாதுகாப்பு இடைவெளி விடவேண்டும்.
- ii. குவாரி குத்தகை வழங்கும் முன்பு விண்ணப்பித்துள்ள இடத்தினை சுற்றி கம்பி வேலி அமைத்து DGPS சர்வே பணி மேற்கொண்டு அதன் அறிக்கையை சமர்ப்பிக்க வேண்டும்.
- iii. சுரங்கத்திட்டத்தின்படி மனுதாரர் அறிவியல் மற்றும் பாதுகாப்பு முறைப்படி குவாரிப்பணி செய்யவேண்டும்.
- iv. தமிழ்நாடு சிறுகனிம சலுகை விதிகள் 1959 விதி-42ன் படி மாநில சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையத்திடமிருந்து சுற்றுச்சூழல் சான்று பெற்று சமர்ப்பிக்கப்படவேண்டும்.

துணை இயக்குநர்,  
புவியியல் மற்றும் சுரங்கத்துறை,  
விழுப்புரம்.

பெறுநர்

திரு.ப.வெங்கடகிருஷ்ணன்,  
த/பெ.பலராமன் நம்பர்.25,  
2-வது குருக்குத்தெரு, குருவம்பேட்டை,  
ஹவுசிங் போர்ட், புதுச்சேரி மாநிலம்,

நகல்:-

1. மாநில சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையம், சென்னை.
2. இயக்குநர், புவியியல் மற்றும் சுரங்கத்துறை, கிண்டி, சென்னை.

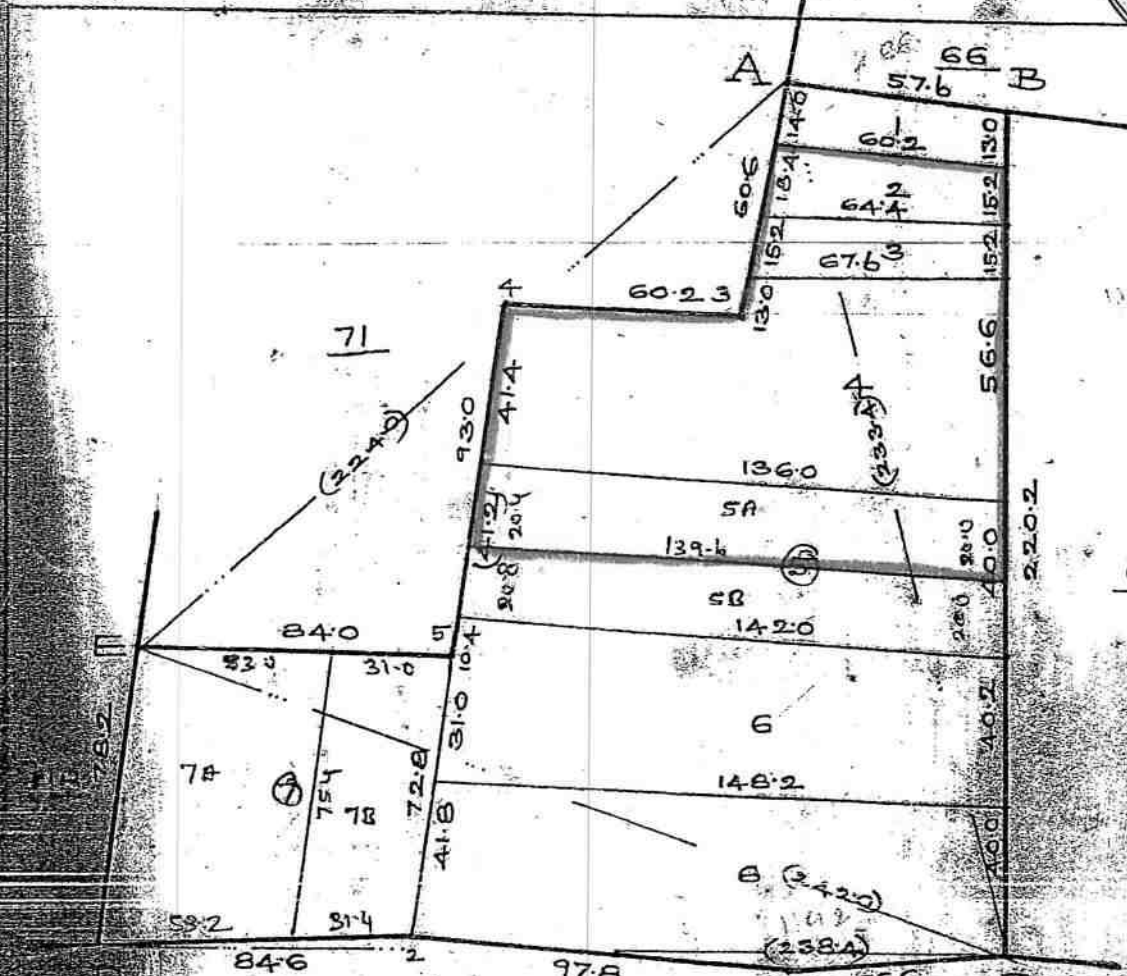


மாண்புமிகு. தொழில்நுட்ப அமைச்சர்

வட்டம். திருச்சி வட்டம்.

புல எண். 70

புறப்பு : வெங்கடேர்



// 2007-08 வருஷ //

ச. வே. அ. அ. அ.

Village Administrative Officer  
65, Kondalankuppam Villaga,  
Vanur Tk, Villupuram Dt.

LEASE APPLIED AREA



		E	
		(2240)	
5	566	1630	
		91.4	2.6
3	38	47.0	
		A	
		D	
		(2384)	
		154.0	3.0 2
1	38	566	
		C.	

241

ச. வே. அ. அ. அ.  
31-12-86

அளவு. 10/10 = 2000 sq ft

Comparison

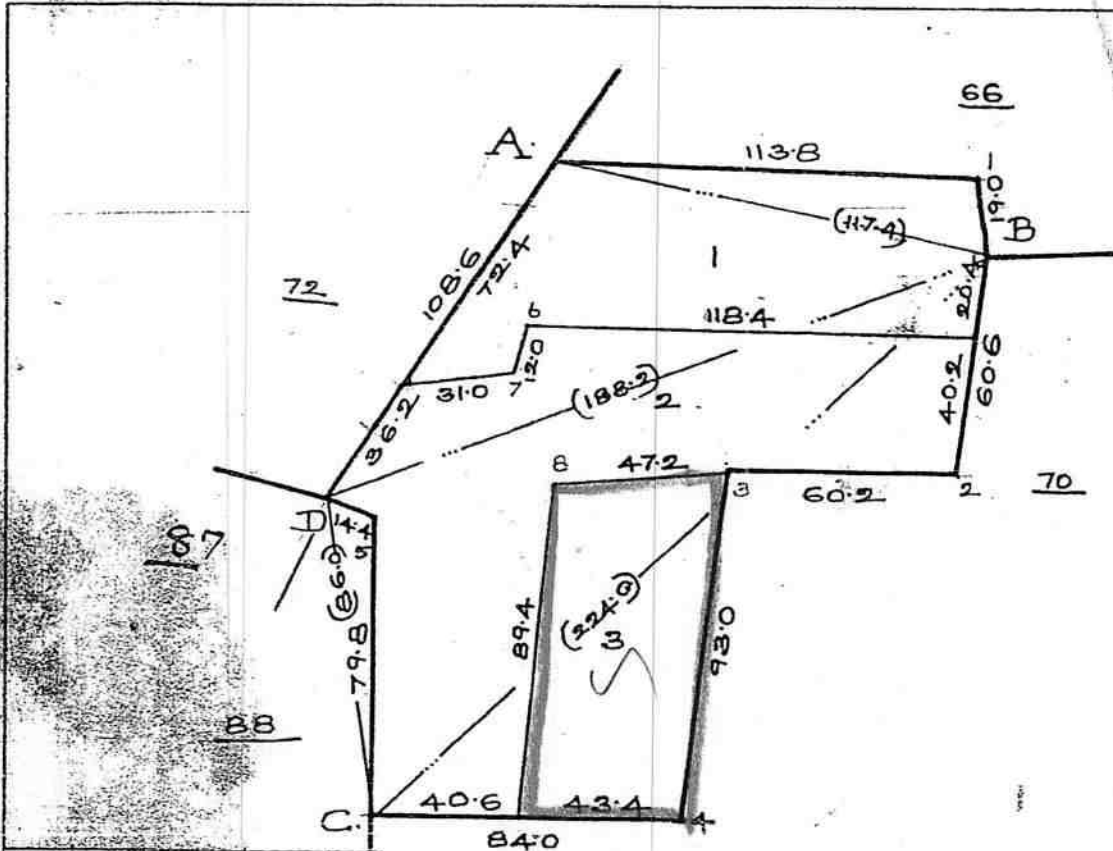
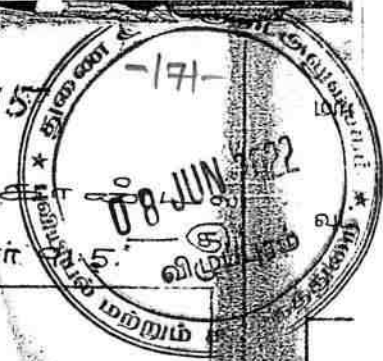
மாவட்டம். சூதன் ஆங்காடு.

வட்டம் சின்னடி வட்டம்.

புல எண். 71

கிராமம் {  
எண். 295  
பெயர். கோட்டை

பரப்பு : ஹெக்டேர். 1 ஏர்



		D	
		(188.2)	
8	54	131.0	
		284	13.8 7
		121.8	23.6 6
		B	
		C	
		(86.0)	
5	12.6	70	
		D	
		C	
		(224.0)	
4	56.6	163.0	
		91.4	2.6 3
2	38.8	47.0	
		B	
		A	
		(117.4)	
		5.0	18.4 1
		B	

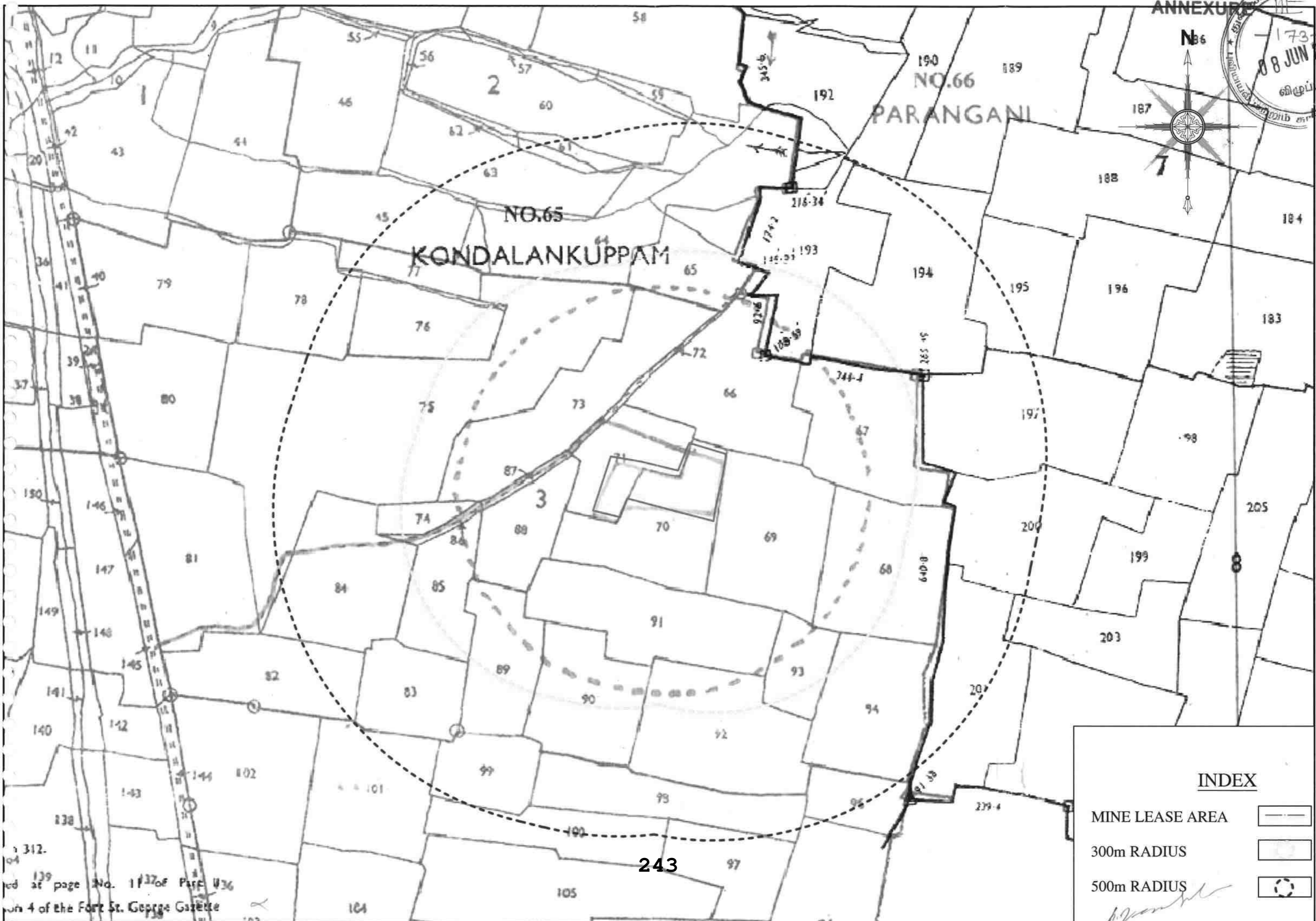
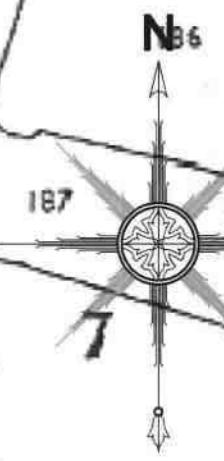
LEASE APPLIED AREA

|| 2007-08 ||

சி. பேரன் ச. நா. அ.  
Village Administrative Officer,  
65, Kondalankuppam Village,  
Vanur Tk. Villupuram Dt.

*(Handwritten signature)*

சுயநிர்வகம் - 242 = 2000 மீட்டர். *(Handwritten notes and signatures)*



**INDEX**

- MINE LEASE AREA
- 300m RADIUS
- 500m RADIUS

*[Signature]*

312.  
 139  
 ed at page No. 1137 of Part U36  
 n 4 of the Fort St. George Gazette

243



1	2	3	4	5	6	7	8	9	10		
66	2	66-2	ர	4	...	8-5	8	2 00	3 44.0	6 88	203 வே. பெருமாள்.
									3 76.0	7 52	
67	1	67-2எ -2டி	ர	4	...	8-5	8	2 00	0 88.0	1 76	178 ர. நாராயண - சாமி உடையார்.
	2	-1	ர	4	...	8-5	8	2 00	1 62.0	3 24	203 வே. பெருமாள்.
	3	-3எ	ர	4	...	8-5	8	2 00	0 10.0	0 20	234 ந. முருகேசக் கவுண்டர்.
	4	3-டி	ர	4	...	8-5	8	2 00	0 11.0	0 22	203 வே. பெருமாள்.
	5	-4	ர	4	...	8-5	8	2 00	0 68.0	1 36	83 ஜெ. கோவிந்த சரிமி.
									3 39.0	6 78	
68	1	68-3	ர	4	...	8-5	8	2 00	0 43.0	0 86	246 ரெ. ரங்கசாமி.
	2	-4	ர	4	...	8-5	8	2 00	0 16.0	0 32	228 து. மாணிக்கக் கவுண்டர்.
	3	-5எ -5டி	ர	4	...	8-5	8	2 00	0 50.0	1 00	235 சு. முனுசாமி.
	4	-1	ர	4	...	8-5	8	2 00	0 80.0	1 60	123 உ. சீனுவாசன்.
	5	-2எ -2டி	ர	4	...	8-5	8	2 00	0 57.5	1 15	132 உ. சுப்பிரமணி யன்.
	6	68-7	ர	4	...	8-5	8	2 00	0 58.0	1 16	199 த. பூரணி அம்பலாண்டி
	7	-6	ர	4	...	8-5	8	2 00	0 62.0	1 24	19. குடும்பத் 213 மு. மஞ்சினி
									3 66.5	7 33	8. ஆ. ஜெ. கி. சி.
69	1	69-1	ர	4	...	8-5	8	2 00	1 00.0	2 00	84 ஜெ. கோவிந்தராஜ் உடையார்.
	2	-2	ர	4	...	8-5	8	2 00	0 95.0	1 90	11 நா. அம்பையப்ப உடையார்.
	3	-3	ர	4	...	8-5	8	2 00	1 82.0	3 64	146. ராமசுந்தர் 258 து. ராமசுந்தர்
									3 77.0	7 54	// உண்பை ரகசீ // சி. ஜெ. கி. சி.
70	1	70-5	ர	4	...	8-5	8	2 00	0 09.0	0 18	Village Administrative Office 65. Kondalankuppam Village Vanur Tk. Villupuram Dt.
	2	-6	ர	4	...	8-5	8	2 00	0 11.0	0 22	229 கு. மாயவன்.
	3	-7	ர	4	...	8-5	8	2 00	0 10.0	0 20	84 ஜெ. கோவிந்த ராசு உடையார்.
	4	-8	ர	4	...	8-5	8	2 00	0 64.0	1 28	132 உ. சுப்பிரமணி யன்.



1	2	3	4	5	6	7	8	9	10	11	
							கு.பை.	ஹெ. ஏர்ஸ்	கு.பை.		
70	5	70-2எ 2பி, 2சி	ர	4	...	8-5	8	2 00	0 59.0	1 18	156 மு. தனம்மாள்.
	6	70-3	ர	4	...	8-5	8	2 00	0 55.0	1 10	68-சி. ராமகவுண்டர் (1), மு. முத்து லெட்சுமி அம்மாள் (2).
	7	-1எ 1பி, 1சி -1டி -1இ	ர	4	...	8-5	8	2 00	0 62.0	1 24	33 வே. ஜனார்த்த னன் இன்னும் நான்கு பேர்களும். *
	8	70-4	ர	4	...	8-5	8	2 00	0 65.0	1 30	229 கு. மாயவன்.
									3 35.0	6 70	
	1	71-1	ர	4	...	8-5	8	2 00	0 60.0	1 20	157 ந. தனலெட்சுமி.
	2	-2	ர	4	...	8-5	8	2 00	0 93.5	1 87	146 ஏ. செல்லம்மாள்.
	3	-3	ர	4	...	8-5	8	2 00	0 38.0	0 76	157 ந. தனலெட்சுமி.
									1 91.5	3 83	
72	...	72	அ	4ற	...	...	...	...	0 24.0	...	...
											வண்டிப் பாதை.
73	1	73-1எ	ர	4	...	8-5	8	2 00	0 58.0	1 16	164 கோ. தாண்டவ ராயன்.
	2	-1பி	ர	4	...	8-5	8	2 00	0 90.0	1 80	118 ந. சிங்காரம்.
	3	73-2	ர	4	...	8-5	8	2 00	2 61.0	5 22	358. சி. வினாயகன் உடையார் 35 மு. ஜெயலட்சுமி.
									4 09.0	8 18	
74	1	85-1	ர	4	...	8-5	8	2 00	0 13.5	0 27	213 மு. மஞ்சினி.
	2	-2	ர	4	...	8-5	8	2 00	0 51.0	1 02	215 க. மங்களாம் மாள்.
									0 64.5	1 29	1. உணர்வை தகவல்
75	...	74	அ	4ற	...	...	...	...	12 32.0	...	...
											சு. சேஷ... காதல் Village Administration Office 55, Kondalankuppam Village 10, Vanni Thiruppuram Di உடையார்.
76	...	75-1 2, 3	ர	4	...	8-5	8	2 00	2 37.0	4 74	164 கோ. தாண்டவ ராயன்.
77	...	76-1	ர	4	...	8-5	8	2 00	1 01.0	2 02	164 கோ. தாண்டவ ராயன்.
78	1	-2	ர	4	...	8-5	8	2 00	1 88.0	3 76	101 ரா. சத்திரசேகர உடையார்.
	2	-3எ	ர	4	...	8-5	8	2 00	0 52.0	1 04	51 கு. கலாவதி (1), ரா. சின்னையன் (2).

*[Handwritten signature]*



தமிழக அரசு

வருவாய்த் துறை

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

மாவட்டம் : விழுப்புரம்

வட்டம் : வானூர்

வருவாய் கிராமம் : கொண்டாலங்குப்பம்

பட்டா எண் : 462

உரிமையாளர்கள் பெயர்

1. மாயவன்

தந்தை

பூபாலன்

புல எண்	உட்பிரிவு	புன்செய்		நன்செய்		மற்றவை		குறிப்புரைகள்
		பரப்பு	தீர்வை	பரப்பு	தீர்வை	பரப்பு	தீர்வை	
		ஹெக் - ஏர்	ரூ - பை	ஹெக் - ஏர்	ரூ - பை	ஹெக் - ஏர்	ரூ - பை	
70	3	0 - 10.00	0.20	--	--	--	--	2019/0103 /07/185933--- -- 16-08-2019
70	4	0 - 64.00	1.28	--	--	--	--	2019/0103 /07/157214--- -- 24-04-2019
70	5A	0 - 30.50	0.60	--	--	--	--	2019/0103 /07/185935--- -- 16-08-2019
71	3	0 - 38.00	0.76	--	--	--	--	2019/0103 /07/157214--- -- 24-04-2019
70	2	0 - 11.00	0.22	--	--	--	--	2019/0103 /07/185933--- -- 16-08-2019
		1 - 53.50	3.06					

குறிப்பு2 :



1. மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் <https://eservices.tn.gov.in> என்ற இணைய தளத்தில் 07/02/065/00462/50542 என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.
2. இத் தகவல்கள் 21-09-2021 அன்று 11:28:39 AM நேரத்தில் அச்சடிக்கப்பட்டது.
3. கைப்பேசி கேமராவின் 2D barcode படிப்பான் மூலம் படித்து 3G/GPRS வழி இணையதளத்தில் சரிபார்க்கவும்

*(Handwritten signature)*



14/1070\*4726/2021

6685/20 ANNEXURE-VI

-183-



தமிழ்நாடு தமிழ்நாடு TAMIL NADU

ரூ 20/- குமாரசன்  
கொண்டலாங்குப்பம்

99AB 533110  
இரா. கருணாநந்தம்  
டி.தா.சி. களியனூர்  
உரியம் எண். 2809/ 81/2008  
கூடிய நாடு.

3477  
18.11.2021

**குத்தகை சுவணம்**

2021-ஆம் ஆண்டு நவம்பர் மாதம் 19-ஆம் தேதி (19-11-2021) தமிழ்நாடு மாநிலம், விழுப்புரம் மாவட்டம், வானூர் வட்டம், கொண்டலாங்குப்பம், டேங்க் தெரு, நெ.7 என்கிற முகவரியில் வசிக்கும் திரு.மாயவன் அவர்களின் குமாரர் திரு.M.யூலான் (இந்திய ஆதார் அட்டை எண். 8965 3617 6005, செல் நெ.8870828670)- 1வது பார்ட்டி;

புதுச்சேரி மாநிலம், புதுச்சேரி-605 009, குரும்பாபேட், ஹவுசிங் போர்டு, 2வது குறுக்கு வீதி, நெ.25 என்கிற முகவரியில் வசிக்கும் திரு.பலராம் அவர்களின் குமாரர் திரு.B.வெங்கடகிருஷ்ணன் (இந்திய ஆதார் அட்டை எண்.4562 2420 7035, செல் நெ.9787678770).1,

தமிழ்நாடு மாநிலம், விழுப்புரம் மாவட்டம், கலிஞ்சகுப்பம், பிள்ளையார்கோயில் தெரு, நெ.129எ என்கிற முகவரியில் வசிக்கும் திரு.முனுசாமி அவர்களின் குமாரர் திரு.M.பாலகிருஷ்ணன் (இந்திய ஆதார் அட்டை எண்.8887 4734 3158, செல் நெ.9363075787).2,

1வது பார்ட்டி

2வது பார்ட்டிகள்

m. B. பந்தம் 2021 வந்திய 6085 ஆலான்

248

N-309



சுற்றுலா அலுவலகம்  
-185-  
18.11.2022



தமிழ்நாடு தமில்நாடு TAMIL NADU

9B 20/- குமாரசன்  
கொண்டலாங்குட்டு

அ/ய உ 99AB 533111

ஆரா. கருணாநந்தம்  
ப.நா.சி. கீரியனூர்  
உ.நம்ப.பன்.2809/ B1/2008  
தமிழ் நாடு.

3478  
18.11.2022

-2-

புதுச்சேரி மாநிலம், புதுச்சேரி-605 009, குரும்பாபேட், கோபாலன் கடை ரோடு, முதல் குறுக்கு தெரு, நெ.5 என்கிற முகவரியில் வசிக்கும் திரு.நக்கீரன் அவர்களின் மனைவி திருமதி.N.சுகந்தி (இந்திய ஆதார் அட்டை எண்.7542 3462 2250, செல் நெ.9443646458).3, ஆகியோர்கள் 2வது பார்ட்டி, ஆகிய நாங்கள் இரு பார்ட்டிகளும் எழுதிக்கொண்ட குத்தகை ஆவணம்.

என்னவென்றால், இதனடியில் சொத்து விபரத்தில் கண்ட சொத்தைப் பொறுத்து, நம்மில் 1வது பார்ட்டி 15.04.2013 தேதியில் சுயமாய் கிரையம் பெற்று மேற்படி ஆவணம் வானூர் சார்பதிவகத்தில் மேற்படி ஆவணம் 1புத்தகம், 2013-ஆம் வருடத்திய 1974-ஆம் நெம்பராகப் பதிவாகி உள்ளது.

1வது பார்ட்டி

2வது பார்ட்டிகள்

m. B

M. D. T.

புத்தகம் 2024, நாள் 16, பக்கம் 6685, ஆவணம்  
தாள்களைக் கொண்டது  
2 வது தாளில்  
249

N. 509



தமிழ்நாடு வமிலநாடு TAMIL NADU, அபி  
இரா. கருணாநந்தம் 99AB 533112  
சுயநா. சி. களியனார்  
செ. 2809/ B1/2008  
தமிழ் நாடு

3479  
78.11 2021

-3-

மேலும், இதனடியில் சொத்து விபரத்தில் கண்ட சொத்தைப் பொறுத்து, நம்மில் 1வது பார்ட்டி 15.10.2018 தேதியில் சுயமாய் கிரையம் பெற்று மேற்படி ஆவணம் வானூர் சார்பதிவகத்தில் மேற்படி ஆவணம் 1புத்தகம், 2018-ஆம் வருடத்திய 4866-ஆம் நெம்பராகப் பதிவாகி உள்ளது.

மேலும், இதனடியில் சொத்து விபரத்தில் கண்ட சொத்தைப் பொறுத்து, நம்மில் 1வது பார்ட்டி 31.07.2019 தேதியில் சுயமாய் கிரையம் பெற்று மேற்படி ஆவணம் வானூர் சார்பதிவகத்தில் மேற்படி ஆவணம் 1புத்தகம், 2019-ஆம் வருடத்திய 3733-ம் நெம்பராகப் பதிவாகி உள்ளது.

1வது பார்ட்டி

m. Bl

2வது பார்ட்டிகள்

N. S. S.

1 புத்தகம் வந்தது 6685 ஆவணம்  
..... 16..... தாள்களைக் கொண்டது  
..... 3..... வது தாள்.  
பதிவு சிலைவாண்.  
250

Handwritten signature and scribbles at the bottom of the stamp area.

சுற்றுலா அலுவலகம்  
-189-  
JUN 2022  
விழுப்புரம்



தமிழ்நாடு தமில்நாடு TAMIL NADU

99AB 533113

ரூ 20/-  
காணடொந்தும்

சுற்றுலா அலுவலகம்  
மு.தா.வி. கீளியனார்  
உயிர்ப்பம் எண். 2809/ B1/2008  
தமிழ் நாடு.

3480  
18.11.2022

- 4 -

மேற்கூறிய ஆவணங்களின்படி நம்மில் 1வது பார்ட்டிக்கு சொந்தமான சொத்தினை, குத்தகைக்கு விடுவதாகவும், 2-வது பார்ட்டிகள் ஐந்து (5)வருடத்திற்கு, குத்தகைக்கு பெற்றுக் கொள்வதாகவும் ஒப்புக் கொண்டு, நாம் நமக்குள் மேற்படி 5வருடத்திற்கு மட்டும் மொத்தமாக குத்தகை கரார் தீர்த்துக் கொண்ட தொகை ரூபாய்.3,00,000/- (ரூபாய் மூன்று இலட்சம் மட்டும்). இவ்விதமாக 5வருடங்களுக்கு 2-வது பார்ட்டிகள் செம்மண் வெட்டி எடுத்துக்கொள்ள 1வது பார்ட்டி சம்மதிக்கிறார்.

மேற்படி குத்தகை காலம் முடியும் வரை கீழ்க்கண்ட சொத்தினில் அரசு நிர்ணயிக்கும் ஆழத்திற்கு செம்மண் வெட்டி எடுத்து தன் சொந்த செலவில் வெளியேற்றிக் கொள்ள நம்மில் 2வது பார்ட்டிகள் ஒப்புக் கொள்கிறார்கள். கீழ்க்கண்ட சொத்திற்குண்டான வரியை 1வது பார்ட்டியே செலுத்திக் கொள்ள வேண்டியது. இதற்கு முன் பணம் தொகை இல்லை. இதற்கு மாத வாடகை இல்லை. இந்தப்படி நாங்கள் இரு பார்ட்டிகளும் எழுதிக் கொண்ட குத்தகை ஆவணம்.

1வது பார்ட்டி	2வது பார்ட்டிகள்
M. B. I.	N. S. S.
புத்தகம் 16	புத்தகம் 16
4	4
251	251



தமிழ்நாடு தமில்நாடு TAMIL NADU

99AB 533114

ரூ 20/-

புன்சை

சுரா. கருணாநந்தம்  
பட்டினா. கிளியனார்  
பிளாய் எண். 2809/ B1/2998  
தமிழ் நாடு.

சுண்ணாலை மீட்டர்

348/  
18.11.2011

-5-

சொத்து விபரம்

சீண்டிவனம் பதிவு மாவட்டம், வானூர் சார் பதிவு அலுவலகம், கடகம்பட்டு ஊராட்சி எல்லைக்குட்பட்ட கொண்டலாங்குரம் கிராமத்தில், அயன் புன்சை புதிய சர்வே எண். 71/3, பழைய சர்வே எண். 71/3 -ஏக்கர் 1.02 செண்டு, சக்குபந்தி: சங்கர் புன்சைக்கு மேற்கு, முருகானந்தம் புன்சைக்கு வடக்கு, பிருந்தா புன்சைக்கு கிழக்கு, தெற்கு, இதற்குட்பட்டது.

ஆயன் புன்சை புதிய சர்வே எண். 70/5-0.59.0 ஏர்ஸில், தற்போதைய உட்பிரிவுபடி புதிய சர்வே எண். 70/5A), பழைய சர்வே எண். 70/2 -ஏக்கர் 1.40 செண்டில், சங்கர் புன்சைக்கு தெற்கு, முருகானந்தம் புன்சைக்கு வடக்கு, மேற்கு, ஜானகி அம்மாள் புன்சைக்கு கிழக்கு, இதன் மத்தியில் ஏக்கர் 0.46½ செண்டு, ஆக ஏக்கர் 1.48½ செண்டு.

1வது பார்ட்டி

2வது பார்ட்டிகள்

m. B. L. புன்சை  
 16  
 5  
 252  
 சார்களைக் கொண்டது  
 வசூ தான்  
 சி  
 சி

N. S. S.

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தமிழ்நாடு தமில்நாடு TAMIL NADU

ரூ 20/- சமரண  
சுதந்திர சிங்கம்

99AB 533115  
சுரா. கருணாநந்தம்  
பு.நா. சா. கிளியனார்  
பு.நா. எண். 2809/ B1/2008  
தமிழ் நாடு.

3482  
8.11.2021

- 6 -

அயன் புன்சை புதிய சர்வே எண்.70/4-0.64.0 ஏர்ஸ் பூரா, பழைய சர்வே எண்.70/8 -ஏக்கர் 1.58 செண்டு பூரா, சக்குபந்தி: கிருஷ்ணன் புஞ்சைக்கு மேற்கு, தங்கள்(பூபாலன்) புஞ்சைக்கு தெற்கு, வடக்கு, கிழக்கு, இதற்குட்பட்டது.

அயன் புன்சை புதிய சர்வே எண்.70/2, பழைய சர்வே எண்.70/6 -ஏக்கர் 0.27 செண்டு, அயன் புன்சை புதிய சர்வே எண்.70/3, பழைய சர்வே எண்.70/7 -ஏக்கர் 0.25 செண்டு, ஆக ஏக்கர் 0.52 செண்டு, சக்குபந்தி: பள்ளிக்கூடத்தான் நிலத்திற்கு தெற்கு, தங்கள் (பூபாலன்) நிலத்திற்கு வடக்கு, லட்சுமணன் நிலத்திற்கு மேற்கு, ராஜவேலு நிலத்திற்கு கிழக்கு, இதற்குட்பட்டது.

1வது பார்ட்டி

M.B.L

2வது பார்ட்டிகள்

M.B.L

N. Sog

பத்திரம் 16 எண். 253 ஆக  
தங்கள் கொண்டு  
6 வது தபால்  
253  
சுரா. கருணாநந்தம்  
பு.நா. சா. கிளியனார்



தமிழ்நாடு தமில்நாடு TAMIL NADU

99AB 533116

அரசா. கருணாநந்தம்  
பட்டா.என். களியனார்  
உள்ளம் எண். 2809/ B1/2008  
தமிழ் நாடு.

3483  
18.11.2009

சுமரன்  
கண்ணலமைத்துப்பர்

-7-

ஆக மொத்தம் ஆவணப்படி ஏக்கர் 3.58½ செண்டு, பட்டா எண்.462-ன்படி ஏக்கர் 3.79 செண்டு மட்டும் இந்த குத்தகை ஆவணத்திற்குட்பட்டது.

1வது பார்ட்டி

2வது பார்ட்டிகள்

*[Handwritten signature]*

*[Handwritten signature]*  
N. Sog

சாட்சிகள்:

1. *[Handwritten signature]* நக்கீரன், த.பெ. ராஜவேல், நெ.5, கோபாலன் கடை வீதி, குரும்பாபேட், புதுச்சேரி-605 009. (இந்திய ஆதார் அட்டை எண்.2317 5320 0296)

2. *[Handwritten signature]* தமிழ்ச்செல்வன், த.பெ. கேசவப்பிள்ளை, நெ.2/141A, பச்சைவாழியமமன் கோயில் தெரு, வானூர், வானூர் ஈட்டம் விழுப்புரம் மாவட்டம்-605109 (ஆதார் அட்டை எண்.603197449463)

ஆவணப் புள்ளி கிழிவு வகைய செறிவுகள் : T.மாணிக்கம், மாநில ஆவண எழுத்தர் உரிமம் எண்.அ.791/திவம்/1991, வானூர்.

புத்தகம் எண். 15  
7 வது பார்ட்டி  
*[Handwritten signature]*  
புதுச்சேரி

254

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R/வானூர்/புத்தகம்-1/6685/2021

1899ம் ஆண்டு இந்திய முத்திரைச் சட்டம் 42வது பிரிவின் கீழான சார்பதிவாளர்



2021ம் ஆண்டு வரிசை எண் 5162

7டேங்க் தெரு கொண்டலாங்குப்பம் வானூர், விழுப்புரம், தமிழ்நாடு, இந்தியா, 605502-ல் வசிக்கும் விழுப்புரம் அன்பவரிடமிருந்து ₹ 2,860/- (ரூபாய் இரண்டாயிரத்து எண்ணூற்று அறுபது மட்டும்) இந்த ஆண்டுகட்காக இந்திய முத்திரைச் சட்டம் 41வது பிரிவின் படி குறைவாயிருந்த முத்திரைக் கட்டணம் வசூலிக்கப்பட்டது என நான் இதன் மூலம் சான்றளிக்கிறேன்.

சார்பதிவாளர் : வானூர்  
நாள்: 19/11/2021

*[Handwritten Signature]*  
சார்பதிவாளர்  
இந்திய முத்திரைச் சட்டம் பிரிவு  
41ன் படி

2021 ஆம் ஆண்டு நவம்பர் மாதம் 19ம் தேதி பி.ப. 03:31 மணியளவில் வானூர் சார்பதிவாளர் அலுவலகத்தில் தாக்கல் செய்து கட்டணம் ₹ 3,275/- செலுத்தியவர்.

இடது பெருவிரல்



*m. BL*

கூடுதல் விவரங்கள் ஆவண வாசகத்தில் உள்ளபடி

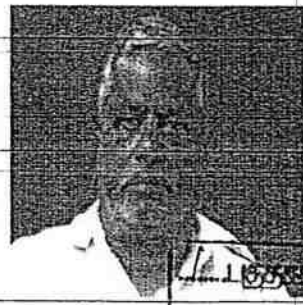
எழுதிக் கொடுத்ததாக ஒப்புக் கொண்டவர்  
இடது பெருவிரல்



*m. BL*

கூடுதல் விவரங்கள் ஆவண வாசகத்தில் உள்ளபடி

எழுதி வாங்கியதாக ஒப்புக் கொண்டவர்  
இடது பெருவிரல்



*[Handwritten Signature]*

கூடுதல் விவரங்கள் ஆவண வாசகத்தில் உள்ளபடி

16  
.....  
8 255  
.....  
*[Handwritten Signature]*  
.....

R/வானூர்/புத்தகம்-1/6685/2021

எழுதி வாங்கியதாக ஒப்புக் கொண்டவர்  
இடது பெருவிரல்



M-D



கூடுதல் விவரங்கள் ஆவண வாசகத்தில் உள்ளபடி

எழுதி வாங்கியதாக ஒப்புக் கொண்டவர்  
இடது பெருவிரல்



N. Sugu

கூடுதல் விவரங்கள் ஆவண வாசகத்தில் உள்ளபடி

இன்னாரென்று நிரூபித்தவர்கள்

1. *Rajavel*

திரு நக்கீரன் தபெ rajavel 5 gopalan shop street gurumbapet, புதுச்சேரி, இந்தியா, 605109

2. *K. S. S.*

திரு tamilselvan தபெ kesavapillai pachivazhiamman koil street vanur, விழுப்புரம், தமிழ்நாடு, இந்தியா, 605109

2021 ஆம் ஆண்டு நவம்பர் மாதம். 19ம் நாள்

*[Signature]*

மணிகண்டன் சீ  
சார்பதிவாளர்  
வானூர்

R/வானூர்/புத்தகம்-1/6685/2021 எண்ணாகப் பதிவு செய்யப்பட்டது.

நாள்: 19/11/2021

வானூர்



*[Signature]*

மணிகண்டன் சீ  
சார்பதிவாளர்

புத்தகம் 2021 வானூர் தபெ 6685 ஆவணம்  
16 தாள்களைக் கொண்டது  
9 வது தாள்.  
பதிவு சி.லு.வலர்.  
வானூர்.

256

*[Handwritten signature]*





இந்திய அரசாங்கம்

Government of India



பூபாலன் மாயவன்  
Boobalan Mayavan

பிறந்த நாள்/DOB: 03/05/1981  
ஆண்பால் / Male



8965 3617 6005



ஆதார்  
முகவரி: S/O மாயவன், 7  
டேங்கு தெரு, கொண்டாம்பக்கம்  
கந்தக்கேணி, விழுப்புரம்  
தமிழ்நாடு, 605502

Unique Identification Authority of India

Address: S/O: Mayavan, 7,  
TANK STREET,  
Kondalambakkam,  
Suthukeni, Viluppuram, Tamil  
Nadu - 605502

8965 3617 6005

ஆதார் - சாதாரண மனிதனின் அதிகாரம்

1947  
1800 300 1947

help@uidai.gov.in

www.uidai.gov.in

m. BL

பத்தாம் வருத்தியல் 16 ஆணம்  
16 தாள்களைக் கொண்டது  
10 வது தாள்.  
பதிவு அலுவலர்.  
வானூர்.



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இந்திய அரசாங்கம்  
Unique Identification Authority of India  
Government of India

பதிவு அடையாளம் / Enrolment No.: 1111/00040/42944

To  
வெங்கடகிருஷ்ணன்  
Venkatakrisnhan  
S/O Balaram  
MIG 25 Second Cross Street  
Housing Board Kurumbapet  
Thattanchavady Pondicherry  
Pondicherry 605009



உங்கள் ஆதார் எண் / Your Aadhaar No. :

**4562 2420 7035**

ஆதார் - சாதாரண மனிதனின் அதிகாரம்

மாண்புமிகு அரசாங்கம்  
GOVERNMENT OF INDIA

வெங்கடகிருஷ்ணன்  
Venkatakrisnhan  
பிறந்தவருடம் / Year of Birth : 1957  
ஆண்பால் / Male

4562 2420 7035

ஆதார் - சாதாரண மனிதனின் அதிகாரம்

புத்தகம் 10...  
11...  
பதிவு அலுவலர்  
258

*Handwritten signature*

*Handwritten signature*



இந்திய அரசாங்கம்  
Unique Identification Authority of India  
Government of India

பதிவு அடையாளம் / Enrollment No.: 1190/09001/07945

To  
பாலகிருஷ்ணன்  
Balakrishnan  
S/O: Munusamy  
129A Pilliyar Koil street  
KALINJUKUPPAM  
Melpattambakkam  
Viluppuram Viluppuram  
Tamil Nadu 607104  
9443113727

19/08/2014  
162528583



ML625285835FT



உங்கள் ஆதார் எண் / Your Aadhaar No. :

**8887 4734 3158**



ஆதார் - சாதாரண மனிதனின் அதிகாரம்

இந்திய அரசாங்கம்  
Government of India

பாலகிருஷ்ணன்  
Balakrishnan  
பிறந்த நாள் / DOB : 05/04/1958  
ஆண்பால் / Male

8887 4734 3158

ஆதார் - சாதாரண மனிதனின் அதிகாரம்

Handwritten signature

புத்தகம் 2222222222 ஆவணம்  
தாள்களைக் கொண்டது  
12 வது தாள்.  
பதிவு அலுவலர்.  
259



இந்திய அரசாங்கம்  
Unique Identification Authority of India  
Government of India

பதிவு அடையாளம் / Enrolment No.: 1111/00135/40372

To  
சுகந்தி  
Suganthi  
W/O Narkiran  
5 Gopalan Kadai Street  
Kurumbapet  
Thattanchavady Pondicherry  
Pondicherry 605009  
9443646458

1941448



UGO19414485IN



உங்கள் ஆதார் எண் / Your Aadhaar No. :

**7542 3462 2250**

ஆதார் - சாதாரண மனிதனின் அதிகாரம்



~~भारत सरकार~~  
~~GOVERNMENT OF INDIA~~



சுகந்தி  
Suganthi  
பிறந்தலகுடம் / Year of Birth : 1990  
பெண்பால் / Female



7542 3462 2250

ஆதார் - சாதாரண மனிதனின் அதிகாரம்

1. பத்தகதியை... வருத்தியுள்ள ஆவணம்  
2. ...தாள்களைக் கொண்டது  
3. ...வது தூள்.  
பதிவு அலுவலர்.  
வாணார்.

260

N. S. S.

Handwritten signature and stamp



**இந்திய அரசாங்கம்**  
**Unique Identification Authority of India**  
**Government of India**

பதிவு அடையாளம் / Enrolment No.: 1111/00135/40377

To  
 நக்கீரன்  
 Narkiran  
 S/O Rajavel  
 5 Gopalan Kadai Street  
 Kurumbapet  
 Thattanchavady Pondicherry  
 Pondicherry 605009  
 9443646458

1942154



UG019421549IN



உங்கள் ஆதார் எண் / Your Aadhaar No. :

**2317 5320 0296**

ஆதார் - சாதாரண மனிதனின் அதிகாரம்

இந்திய அரசாங்கம்  
 GOVERNMENT OF INDIA

நக்கீரன்  
 Narkiran  
 பிறந்தவருடம் / Year of Birth : 1980  
 ஆண்பால் / Male

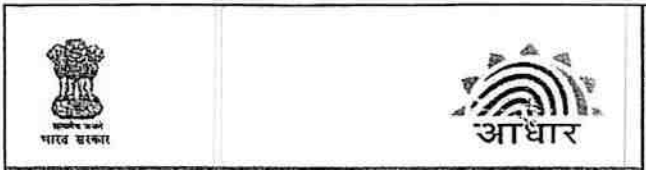
2317 5320 0296

ஆதார் - சாதாரண மனிதனின் அதிகாரம்

*[Handwritten signature]*

பத்திரம் 2022/06/08/0296  
 இது...  
 15...வது தரள்.  
 பதிவு அலுவலர்,  
 விழுப்புரம்.





இந்திய அரசாங்கம்  
Government of India

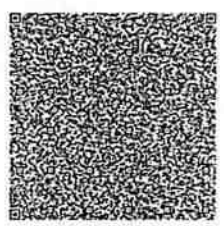
இந்திய தனிப்பட்ட அடையாள ஆணைய அமைப்பு  
Unique Identification Authority of India

பதிவேட்டு எண் / Enrolment No.: 2193/13124/06196

To  
தமிழ்செல்வன் கே  
Tamilselvan K  
C/O Kesavapillai  
2/141 A  
Pachaivazhiamman Koil Street  
Vanur  
Villupuram Tamil Nadu - 605109  
9791652515

Download Date: 08/11/2021  
Issue Date: 03/11/2021

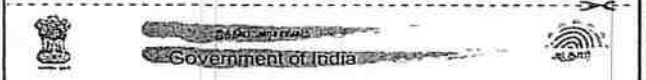
Signature  
Valid  
AUTHENTICATION  
DATE: 2021-06-21 08:28



உங்கள் ஆதார் எண் / Your Aadhaar No. :

6031 9744 9463  
VID : 9149 4012 9359 3475

எனது ஆதார். எனது அடையாளம்



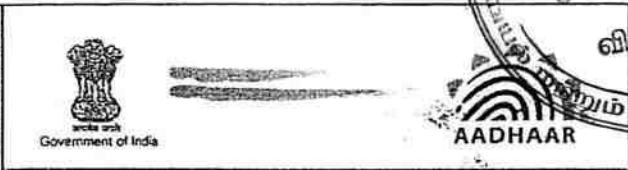
தமிழ்செல்வன் கே  
Tamilselvan K  
பிறந்த நாள்/DOB: 30/12/1996  
ஆண்/ MALE

Download Date: 08/11/2021

Issue Date: 03/11/2021

6031 9744 9463  
VID : 9149 4012 9359 3475

எனது ஆதார். எனது அடையாளம்



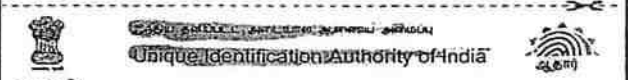
தகவல்

- ஆதார் அடையாளத்திற்கான சான்று குடியறிமைக்கு அல்ல.
- பாதுகாப்பான QR குறியீடு ஆப்லைன் XML / ஆன்லைன் அங்கீகாரத்தைப் பயன்படுத்தி அடையாளத்தை சரிபார்க்கவும்
- இது எலக்ட்ரானிக் செயல்முறை மூலம் தயாரிக்கப்பட்ட கடிதமாகும்.

INFORMATION

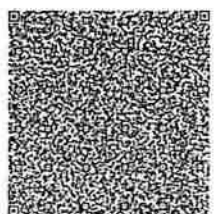
- Aadhaar is a proof of identity, not of citizenship.
- Verify identity using Secure QR Code/ Offline XML/ Online Authentication.
- This is electronically generated letter.

- ஆதார் நாடு முழுவதிலும் செல்லுபடியாகும்.
- பல்வேறு அரசு மற்றும் அரசு சாரா சேவைகளை எளிதில் பெற ஆதார் உதவுகிறது.
- உங்கள் மொபைல் எண் மற்றும் மின்னஞ்சல் ஐடியை ஆதாரில் புதுப்பிக்கவும்
- mAadhaar செயலியைப் பயன்படுத்தி உங்கள் எம்என்ஆர் போனில் ஆதாரை எடுத்துச் செல்லுங்கள்
- Aadhaar is valid throughout the country.
- Aadhaar helps you avail various Government and non-Government services easily.
- Keep your mobile number & email ID updated in Aadhaar.
- Carry Aadhaar in your smart phone – use mAadhaar App.



முகவரி:  
C/O கேசவப்பிள்ளை, 2/141 ஏ,  
பச்சைவழியம்மன் கோவில் தெரு, வானூர்,  
விழுப்புரம்,  
தமிழ்நாடு - 605109

Address:  
C/O Kesavapillai, 2/141 A,  
Pachaivazhiamman Koil Street, Vanur,  
Villupuram,  
Tamil Nadu - 605109



6031 9744 9463  
VID : 9149 4012 9359 3475

1947 | help@uidai.gov.in | www.uidai.gov.in

புத்தகம் 2021 வருட நியமன ஆணை  
16... சாதிக்கரைக் கொண்டது  
15...  
பதிவு செய்த  
262

K. T. L. K.  
262



தமிழக அரசு

வருவாய்த் துறை

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



மாவட்டம் : விழுப்புரம்

வட்டம் : வானூர்

வருவாய் கிராமம் : கொண்டாலங்குப்பம்

பட்டா எண் : 462

உரிமையாளர்கள் பெயர்

புல எண்	உட்பிரிவு	மாயவன்		தந்தை		பூபாலன்		குறிப்புரைகள்
		புன்செய்	நன்செய்	புன்செய்	நன்செய்	மற்றவை	மற்றவை	
		பரப்பு	தீர்வை	பரப்பு	தீர்வை	பரப்பு	தீர்வை	
		ஹெக் - ஏர்	ரூ - பை	ஹெக் - ஏர்	ரூ - பை	ஹெக் - ஏர்	ரூ - பை	
70	3	0 - 10.00	0.20	--	--	--	--	2019/0103 /07/185933--- -- 16-08-2019
70	4	0 - 64.00	1.28	--	--	--	--	2019/0103 /07/157214--- -- 24-04-2019
70	5A	0 - 30.50	0.60	--	--	--	--	2019/0103 /07/185935--- -- 16-08-2019
71	3	0 - 38.00	0.76	--	--	--	--	2019/0103 /07/157214--- -- 24-04-2019
70	2	0 - 11.00	0.22	--	--	--	--	2019/0103 /07/185933--- -- 16-08-2019
		1 - 53.50	3.06					

குறிப்பு 2 :



1. மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் <https://eservices.tn.gov.in> என்ற இணைய தளத்தில் 07/02/065/00462 /50542 என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.
2. இத் தகவல்கள் 19-11-2021 அன்று 03:04:19 PM நேரத்தில் அச்சடிக்கப்பட்டது.
3. கைப்பேசி கேமராவின் 2D barcode படிப்பான் மூலம் படித்து 3G/GPRS வழி இணையதளத்தில் சரிபார்க்கவும்.

புத்தம் 2021 வருத்திய 6685 ஆவணம்  
 16... தாள்களைக் கொண்டது  
 16... வரு துள்.  
 பதிவு அலுவலர்.  
 வானூர்.

263



தமிழ்நாடு தமிழ்நாடு TAMIL NADU

₹ 20/- மணி  
ரங்கநாதபுரம்

99AB 533109  
ஞா. கருணாநந்தம்  
ம.தா.சா. அலியனார்  
உ.ப.ப. எண். 2809/ B1/2008  
தமிழ்நாடு

3476  
18.11.2021

வழி நடை பாத்தியதை உடன் படிக்கைப் பத்திரம்

2021-ஆம் ஆண்டு நவம்பர் மாதம் 19-ஆம் தேதி (19-11-2021) தமிழ்நாடு மாநிலம், விழுப்புரம் மாவட்டம், வானூர் வட்டம், ரங்கநாதபுரம், பிள்ளையார்கோயில் தெரு, என்கிற முகவரியில் வசிக்கும் திரு.ராமசாமி அவர்களின் குமாரர் திரு.மணி (இந்திய ஆதார் அட்டை எண்.434380863493)-1, மேற்படி மணி அவர்களின் குமாரர் திரு.முருகன் (இந்திய ஆதார் அட்டை எண்.876438610285 செல் நெ.7010762227)-2, ஆகியோர் - 1வது பார்ட்டி,

புதுச்சேரி மாநிலம், புதுச்சேரி-605 009, குரும்பாபேட், ஹவுசிங் போர்டு, 2வது குறுக்கு வீதி, நெ.25 என்கிற முகவரியில் வசிக்கும் திரு.பலராம் அவர்களின் குமாரர் திரு. B.வெங்கடகிருஷ்ணன் (இந்திய ஆதார் அட்டை எண்.4562 2420 7035, செல் நெ.9787678770)-1,

1-வது பார்ட்டி

2-வது பார்ட்டிகள்

புதுச்சேரி 2021 வருத்திய 18 ஆவணம்  
10/11/21 13... நள்ளக்கரைக் கொண்டது  
பதிவு அலுவலர்.  
வானூர்.

N.S





தமிழ்நாடு மாநிலம், விழுப்புரம் மாவட்டம், கலிஞ்சகுப்பம், பிள்ளையார்கோயில் தெரு, நெ.129எ என்கிற முகவரியில் வசிக்கும் திரு.முனுசாமி அவர்களின் குமாரர் திரு.M.பாலகிருஷ்ணன் (இந்திய ஆதார் அட்டை எண்.8887 4734 3158, செல் நெ.9363075787).2,

புதுச்சேரி மாநிலம், புதுச்சேரி-605 009, குரும்பாபேட், கோபாலன் கடை வீதி, நெ.5 என்கிற முகவரியில் வசிக்கும் திரு.நக்கீரன் அவர்களின் மனைவி திருமதி.N.சுகநதி (இந்திய ஆதார் அட்டை எண்.7542 3462 2250, செல் நெ.9443646458).3, -ஆகியோர்கள் 2வது பார்ட்டிகள், ஆகிய நாங்கள் இரு பார்ட்டிகளும் சம்மதித்து எழுதிக் கொண்ட வழி நடைபாத்தியதை உடன்படிக்கைப் பத்திரம்.

என்னவென்றால், இதனடியில் சொத்து விபரத்தில் கண்ட சொத்தைப் பொறுத்து, நம்மில் 1வது பார்ட்டியில் 1-வது நபர் மணி அவர்கள் 10.07.1996 தேதியில் சுயமாய் கிரையம் பெற்று, மேற்படி ஆவணம் வானூர் சார்பதிவகத்தில் 1புத்தகம், 1249தொகுதி, 13 முதல் 15 வரை பக்கங்களில், 1996-ஆம் வருடத்திய 1676-ஆம் நெம்பராகப் பதிவாகி உள்ளது.

மேலும், இதனடியில் சொத்து விபரத்தில் கண்ட சொத்தைப் பொறுத்து, நம்மில் 1வது பார்ட்டியில் 2-வது நபர் முருகன் அவர்களுக்கு 23.09.2021 தேதியில் தான செட்டில்மெண்ட் ஆவணம் மூலம் கிடைக்கப் பெற்று, மேற்படி ஆவணம் வானூர் சார்பதிவகத்தில் 1புத்தகம், 2021-ஆம் வருடத்திய 5501-ஆம் நெம்பராகப் பதிவாகி உள்ளது.

மேற்கூறிய ஆவணங்களின்படி நம்மில் 1வது பார்ட்டிகளுக்கு உரிமையான சொத்தில் நம்மில் 2வது பார்ட்டிகள் வழிக்காக கேட்டுக் கொண்டதின் பேரில், நம்மில் 1வது பார்ட்டியும் வழிக்காக உபயோகப்படுத்த, 2வது பார்ட்டிகளிடம் பேசி நிச்சியித்துக் கொண்ட தொகை ரூபாய்.5,000/- (ரூபாய் ஐந்தாயிரம் மட்டும்). இந்த ரூபாய் ஐந்தாயிரமும் 1வது பார்ட்டி; 2வது பார்ட்டிகளிடம் இன்று தேதியில் ரொக்கமாக பெற்றுக் கொண்டு விட்டபடியால், கீழ்கண்ட சொத்தை 2வது பார்ட்டிகள் வழியாக உபயோகப்படுத்திக் கொள்ள 1வது பார்ட்டிகள் சம்மதிக்கிறார்கள். இன்று முதல் கீழ்கண்ட சொத்து விபரத்தில் கண்ட சொத்தை நம்மில் 1வது பார்ட்டியும், 2வது பார்ட்டிகளும் வழியாக உபயோகப்படுத்திக் கொள்ள வேண்டியது (இந்தி உடன்படிக்கை மட்டுமே சிலர் உடன்படிக்கை பாக்தியாகி நடைபாத்தியில் கிடைக்க.)

மணி  
M. Mani

2-வது பார்ட்டிகள்  
N. Sug

புத்தகம் 2024 வருடத்திய 1676 ஆவணம்  
13..... தாள்களைக் கொண்டது  
2..... வது தாளில்  
பதிவு சிஸ்டீமன்.  
வானூர்.

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இன்று முதல் 1வது பார்ட்டி கீழ்க்கண்ட சொத்தை எவ்வித பராதீனமும் செய்வதில்லை என்று உறுதி கூறுகிறார். இந்தப்படி நாமிரு பார்ட்டிகளும் சம்மதித்து கீழ்க்கண்ட சாட்சிகள் முன்னிலையில் எழுதிக் கொண்ட வழி நடைபாத்தியதை உடன்படிக்கை பத்திரம்



**சொத்து விபரம்**

திண்டிவனம் பதிவு மாவட்டம், வானூர் சார்பதிவு அலுவலகம், கடகம்பட்டு ஊராட்சி அலுவலகத்துக்குட்பட்ட **கொண்டலாங்குப்பம்** கிராமத்தில், அயன் புன்செய் புதிய சர்வே எண்.73/1,2, 66/1, (தற்போதைய உட்பிரிவுபடி புதிய சர்வே எண்.73/2A, 66/1A) பழைய சர்வே எண்.73/1-ஏக்கர் 3.65 செண்டு, 66/1-ஏக்கர் 0.78 செண்டு, ஆக மொத்தம் ஏக்கர் 4.43 செண்டில், 0.73½ செண்டில், ஏக்கர் 0.08 செண்டு, பொதுப்பாதைக்கு கிழக்கு, மேற்கு, சுப்புரமணி புஞ்சைக்கு வடக்கு, இருசன் புஞ்சைக்கு தெற்கு, இதற்கு உட்பட்டது.

அயன் புன்செய் புதிய சர்வே எண். 71/1-0.60.0, பழைய சர்வே எண்.71/1-ஏக்கர் 1.48 செண்டில், ஏக்கர் 0.20 செண்டு, சக்குபந்தி: பூபாலன் புஞ்சைக்கு மேற்கு, ராஜவேணு புஞ்சைக்கு வடக்கு, பெருமாள் புஞ்சைக்கு தெற்கு, பொது பாதைக்கு கிழக்கு, இதற்குட்பட்டது. இதை நாம் இருபார்ட்டிகளும் பொது வழிநடையாக பயன் படுத்திக் கொள்ள வேண்டியது. மதிப்பு ரூபாய்.20,000/-

1-வது பார்ட்டி

*Handwritten signature and name of the first party.*

2-வது பார்ட்டிகள்

*Handwritten signatures and names of the second party.*

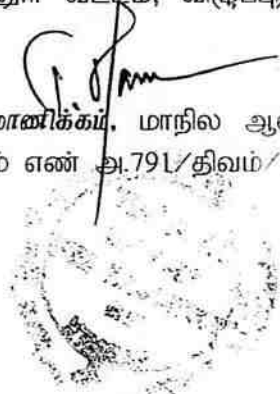
புத்தகம் 2024 வருத்திப்பட்டு ஆவணம்  
13.....  
3.....  
பதிவு அலுவலர்.  
வானூர்.

சாட்சிகள் :

1. *Handwritten name* நக்கீரன், த.பெ. ராஜவேல், நெ.5, கோபாலன் கடை வீதி, குரும்பாபேட், புதுச்சேரி-605 009. (இந்திய ஆதார் அட்டை எண்.231753200296)

2. *Handwritten name* தமிழ்ச்செல்வன், த.பெ. கேசவப்பிள்ளை, நெ.2/141A, பச்சைவாழியம்மன் கோயில் தெரு, வானூர், வானூர் வட்டம், விழுப்புரம் மாவட்டம்-605109 (ஆதார் அட்டை எண்.603197449463)

ஆவணம் தயார் செய்து வரைவு செய்தவர் : T.மாணிக்கம், மாநில ஆவண எழுத்தர் உரிமம் எண் அ.791/திவம்/1991, வானூர்.



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R/வானூர்/புத்தகம்-1/6686/2021



202: ஆம் ஆண்டு நவம்பர் மாதம் 19ம் தேதி பி.பி 0337 மணியளவில் வானூர் சார்பதிவாளர் அலுவலகத்தில் காக்கல் செய்து கட்டணம் ₹ 250/- செலுத்தியவர்.

இடது பெருவிரல்



சுரு

சுருதல் விவரங்கள் ஆவண வாசகத்தில் உள்ளபடி

எழுதிக் கொடுத்ததாக ஒப்புக் கொண்டவர்  
இடது பெருவிரல்



சுரு

சுருதல் விவரங்கள் ஆவண வாசகத்தில் உள்ளபடி

எழுதிக் கொடுத்ததாக ஒப்புக் கொண்டவர்  
இடது பெருவிரல்



M. J.

சுருதல் விவரங்கள் ஆவண வாசகத்தில் உள்ளபடி

எழுதி வாங்கியதாக ஒப்புக் கொண்டவர்  
இடது பெருவிரல்



M. J.

சுருதல் விவரங்கள் ஆவண வாசகத்தில் உள்ளபடி

புத்தகம் 1/6686/2021 ஆவணம்  
பி.பி 0337 மணியளவில் கொண்டு  
4 வது தளம்.  
பதிவு அலுவலர்.  
வானூர்.



M. J.



M.D. 71

எழுதி வாங்கியதாக ஒப்புக் கொண்டவர்  
இடது பெருவிரல்



கூடுதல் விவரங்கள் ஆவண வாசகத்தில் உள்ளபடி

எழுதி வாங்கியதாக ஒப்புக் கொண்டவர்  
இடது பெருவிரல்



கூடுதல் விவரங்கள் ஆவண வாசகத்தில் உள்ளபடி

N. S. 04

இன்னாரென்று நிரூபித்தவர்கள்

1.

திரு நக்கீரன் தபெ ராஜவேல் 5, கோபாலன் கடை விதி, குரும்பாபேட், புதுச்சேரி, புதுச்சேரி, இந்தியா, 605009

2.

திரு தமிழ்செல்வன் தபெ கேசவன் 2/141எ, பச்சைவாழியம்மன் நகர், வானூர், வானூர், விழுப்புரம், தமிழ்நாடு, இந்தியா, 605109

2021 ஆம் ஆண்டு நவம்பர் மாதம் 19ம் நாள்

மணிகண்டன் சி  
சார்பதிவாளர்  
வானூர்

R/வானூர்/புத்தகம்-1/6686/2021 எண்ணாகப் பதிவு செய்யப்பட்டது.

நாள்: 19/11/2021  
வானூர்



மணிகண்டன் சி  
சார்பதிவாளர்

புத்தகம் 2021 வருஷம் 13 ஆண்டில்  
பதிவு செய்து கொண்டு  
5 வருஷம்  
பதிவு சிவசுவலர்.  
வானூர்.



தமிழக அரசு

வருவாய்த் துறை

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



மாவட்டம் : விழுப்புரம்

வட்டம் : வானூர்

வருவாய் கிராமம் : கொண்டாலங்குப்பம்

பட்டா எண் : 261

உரிமையாளர்கள் பெயர்

- |    |            |       |          |   |
|----|------------|-------|----------|---|
| 1. | துரைசாமி   | தந்தை | இருசன்   | - |
| 2. | பூங்காவனம் | தந்தை | ஆறுமுகம் | - |

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	
66	1A	0 - 14.00	0.30	--	--	--	--	05-05-2003
73	2A	0 - 46.00	0.95	--	--	--	--	05-05-2003
83	3	0 - 21.00	0.42	--	--	--	--	13-02-2003
		0 - 81.00	1.67					

குறிப்பு 2 :



- மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் <https://eservices.tn.gov.in> என்ற இணைய தளத்தில் 07/02/065/00261 /30539 என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.
- இத் தகவல்கள் 19-11-2021 அன்று 10:04:13 AM நேரத்தில் அச்சடிக்கப்பட்டது.
- கைப்பேசி கேமராவின் 2D barcode படிப்பான் மூலம் படித்து 3G/GPRS வழி இணையதளத்தில் சரிபார்க்கவும்

ம. சூ

புத்தம் 212 வருத்திபட்டு ஆவணம்  
 13 துணைகளைக் கொண்டது  
 வது தூள்.  
 பதிவு அலுவலர்.  
 வானூர்.

M. S. S. N. S. S.



11/19/2021, 10:05 AM

*(Handwritten signature)*



இந்திய அரசாங்கம்  
 Government of India  
 மணி ராமசாமி  
 Mani Ramasamy  
 தந்தை ராமசாமி  
 Father: RAMASAMY  
 பிறந்த நாள் / DOB : 10/10/1965  
 ஆண்பால் / Male



4343 8086 3493

ஆதார் - சாதாரண மனிதனின் அதிகாரம்



Unique Identification Authority of India

முகவரி  
 S/O ராமசாமி, கதவுண்ணை 160  
 பின்னையார் கோவில் தெரு  
 ரங்கநாதபுரம், வானூர் வட்டம்  
 வானூர், வானூர், விழுப்புரம்  
 தமிழ்நாடு, 605109

Address  
 S/O Ramasamy, 160, PUSAYAR  
 KOVIL STREET,  
 RANGANATHAPURAM, VANUR  
 TALUKA, Vanur, Vanur,  
 Viluppuram, Tamil Nadu, 605109

4343 8086 3493

1947 1800 300 1947

help@uidai.gov.in

www.uidai.gov.in

மணி

பத்தாம் 24 வது திபி 6886 ஆவணம்  
 13 தாள்களைக் கொண்டது  
 7 வது தளர்.  
 பதிவு அலுவலர்.  
 வானூர்.



*Handwritten signature*



இந்திய அரசாங்கம்  
Government of India



முருகன்  
Murugan  
தந்தை: மணி ராமசாமி  
Father: MANI RAMASAMY  
பிறந்த நாள் / DOB: 19/06/1983  
ஆண்பால் / Male



8764 3861 0285

ஆதார் - சாதாரண மனிதனின் அதிகாரம்

*M. Murugan*



இந்திய அரசு  
Unique Identification Authority of India

முகவரி  
S/O மணி, எண் 1/173,  
பிள்ளையார் கோவில் தெரு  
ரங்கநாதபுரம், வானூர்வட்டம்  
வானூர், வானூர், விழுப்புரம்,  
தமிழ்நாடு, 605109

Address:  
S/O Mani, 1/173, PILLAIYAR  
KOVIL STREET,  
RANGANATHAPURAM  
VANUR-TALUK, Vanur, Vanur,  
Viluppuram, Tamil Nadu, 605109

8764 3861 0285

1947  
1800 300 1947

1947  
1800 300 1947

1947  
1800 300 1947

1 புத்தம்பாளையம், விழுப்புரம், ஆவணம்  
.....13..... தாள்களைக் கொண்டது  
.....*R*..... வறு துள்ளி.  
பதிவு அலுவலர்.  
வானூர்.



*M. Murugan*



**இந்திய அரசாங்கம்**  
**Unique Identification Authority of India**  
**Government of India**

பதிவு அடையாளம் / Enrolment No.: 1111/00040/42944

To  
 வெங்கடகிருஷ்ணன்  
 Venkatakrishnan  
 S/O Balaram  
 MIG 25 Second Cross Street  
 Housing Board Kurumbapel  
 Thattanchavady Pondicherry  
 Pondicherry 605009



உங்கள் ஆதார் எண் / Your Aadhaar No. :

**4562 2420 7035**

ஆதார் - சாதாரண மனிதனின் அதிகாரம்

भारत सरकार  
 GOVERNMENT OF INDIA

வெங்கடகிருஷ்ணன்  
 Venkatakrishnan  
 பிறந்த வருடம் / Year of Birth : 1957  
 ஆண்பால் / Male

4562 2420 7035

ஆதார் - சாதாரண மனிதனின் அதிகாரம்

புத்தகம் 2024 வாங்கும் 6886 ஆவணம்  
 தாள்களைக் கொண்டு  
 9 வருட தள்ளி.  
 பதிவு அலுவலர்.  
 வாணார்.





இந்திய அரசாங்கம்  
Unique Identification Authority of India  
Government of India

பதிவு அடையாளம் / Enrollment No.: 1190/09001/07945

To  
பாலகிருஷ்ணன்  
Balakrishnan  
S/O: Munusamy  
129A Pilliyar Koil street  
KALINJUKUPPAM  
Melpattambakkam  
Viluppuram Viluppuram  
Tamil Nadu 607104  
9443113727

19/08/2014  
162528583



ML625285835FT



உங்கள் ஆதார் எண் / Your Aadhaar No. :

**8887 4734 3158**

ஆதார் - சாதாரண மனிதனின் அதிகாரம்

இந்திய அரசாங்கம்  
Government of India

பாலகிருஷ்ணன்  
Balakrishnan  
பிறந்த நாள் / DOB : 05/04/1958  
ஆண்பால் / Male

8887 4734 3158

ஆதார் - சாதாரண மனிதனின் அதிகாரம்



M.P.C

1 புத்தம் 22 வருத்தி 1686 ஆணம்  
13 சான்றகளைக் கொண்டது  
10 வது தளம்.  
பதிவு அலுவலர்.  
வானூர்.



*Handwritten signature*



இந்திய அரசாங்கம்  
 Unique Identification Authority of India  
 Government of India

பதிவு அடையாளம் / Enrolment No.: 1111/00135/40372

To  
 சுகந்தி  
 Suganthi  
 W/O Narkiran  
 5 Gopalan Kadai Street  
 Kurumbapet  
 Thattanchavady Pondicherry  
 Pondicherry 605009  
 9443646458



உங்கள் ஆதார் எண் / Your Aadhaar No. :

**7542 3462 2250**

ஆதார் - சாதாரண மனிதனின் அதிகாரம்

भारत सरकार  
 GOVERNMENT OF INDIA

சுகந்தி  
 Suganthi  
 பிறந்ததலதம் / Year of Birth : 1990  
 பெண்பால் / Female

7542 3462 2250




ஆதார் - சாதாரண மனிதனின் அதிகாரம்

N. S. S.

பத்தகம் 2021 வாழ்த்துப்பலக ஆவணம்  
 13 சாஸ்களைக் கொண்டது  
 11 வது தாளம்.

98  
 பதிவு அலுவலர்.  
 வானூர்.



இந்திய அரசாங்கம்  
Unique Identification Authority of India  
Government of India

பதிவு அடையாளம் / Enrolment No.: 1111/00135/40377

To  
நக்கீரன்  
Narkiran  
S/O Rajavel  
5 Gopalan Kadai Street  
Kurumbapet  
Thattanchavady Pondicherry  
Pondicherry 605009  
9443646458



உங்கள் ஆதார் எண் / Your Aadhaar No. :

**2317 5320 0296**

ஆதார் - சாதாரண மனிதனின் அதிகாரம்



भारत सरकार  
GOVERNMENT OF INDIA



நக்கீரன்  
Narkiran  
பிறந்தவருடம் / Year of Birth : 1980  
ஆண்பால் / Male



2317 5320 0296

ஆதார் - சாதாரண மனிதனின் அதிகாரம்  
பதிவு அலுவலர்  
வாணர்.  
13  
12 வது தூள்.

*Handwritten signature*



**இந்திய அரசாங்கம்**  
**Government of India**

---


**இந்திய தனிப்பட்ட அடையாள ஆணைய அமைப்பு**  
**Unique Identification Authority of India**

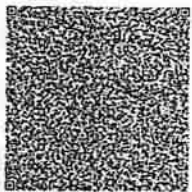
பதிவேட்டு எண் / Enrolment No.: 2193/13124/06196

Download Date: 08/11/2021

To  
தமிழ்செல்வன் கே  
Tamilselvan K  
C/O Kesavapillai  
2/141 A  
Pachavazhiamman Koil Street  
Vanur  
Vanur  
Villupuram Tamil Nadu - 605109  
9791652515

Issue Date: 03/11/2021

Signature  




**உங்கள் ஆதார் எண் / Your Aadhaar No. :**  
**6031 9744 9463**  
VID : 9149 4012 9359 3475

எனது ஆதார், எனது அடையாளம்

**தகவல்**

- ஆதார் அடையாளத்திற்கான சான்று குடியறிமைக்கு அல்ல.
- பாதுகாப்பான OR குறியீடு ஆப்ஸைன் XML - ஆன்லைன் அங்கீகாரத்தைப் பயன்படுத்தி அடையாளத்தை சரிபார்க்கவும்
- இது எலக்ட்ரானிக் செயல்முறை மூலம் தயாரிக்கப்பட்ட கடிதமாகும்.

**INFORMATION**

- Aadhaar is a proof of identity, not of citizenship.
- Verify identity using Secure QR Code/ Offline XML/ Online Authentication.
- This is electronically generated letter.

- ஆதார் நாடு முழுவதிலும் செல்லுபடியாகும்
- பல்வேறு அரசு மற்றும் அரசு சாரா சேவைகளை எளிதில் பெற ஆதார் உதவுகிறது
- உங்கள் மொபைல் எண் மற்றும் மின்னஞ்சல் ஐடியை ஆதாரில் புதுப்பிக்கவும்
- Aadhaar செயலியைப் பயன்படுத்தி உங்கள் சமார்ட் போனில் ஆதாரை எடுத்துச் செல்லுங்கள்

- Aadhaar is valid throughout the country.
- Aadhaar helps you avail various Government and non-Government services easily.
- Keep your mobile number & email ID updated in Aadhaar.
- Carry Aadhaar in your smart phone – use mAadhaar App.

**இந்திய அரசாங்கம்**  
**Government of India**

---

**இந்திய தனிப்பட்ட அடையாள ஆணைய அமைப்பு**  
**Unique Identification Authority of India**

Download Date: 08/11/2021



தமிழ்செல்வன் கே  
Tamilselvan K  
பிறந்த நாள்/DOB: 30/12/1996  
ஆண்/ MALE

Issue Date: 03/11/2021

**6031 9744 9463**  
VID : 9149 4012 9359 3475

எனது ஆதார், எனது அடையாளம்

**இந்திய அரசாங்கம்**  
**Government of India**

---

**இந்திய தனிப்பட்ட அடையாள ஆணைய அமைப்பு**  
**Unique Identification Authority of India**

Download Date: 08/11/2021

முகவரி:  
C/O கேசவப்பிள்ளை, 2/141 ஏ,  
பச்சாவழியம்மாள் கோவில் தெரு, வாணூர்,  
விழுப்புரம்,  
தமிழ்நாடு - 605109

Address:  
C/O Kesavapillai, 2/141 A,  
Pachavazhiamman Koil Street, Vanur,  
Villupuram,  
Tamil Nadu - 605109



**6031 9744 9463**  
VID : 9149 4012 9359 3475

1947 | help@uidai.gov.in | www.uidai.gov.in

K. Zhd

புத்தகம் 2021 ரெட்டி 6686 ஆவணம்  
13 சாஸ்கலைக் கொண்டது  
13 வது தாள்.  
பதிவு அலுவலர்.  
வாணூர்.



DEPARTMENT OF TECHNICAL EDUCATION, TAMIL NADU  
GOVERNMENT COLLEGE OF ENGINEERING, DHARMAPURI- 636 704

From  
The Principal,  
Government College of Engineering,  
Dharmapuri - 636 704.

To  
Tmt.N.Vijayalakshmi, M.SC.,  
Assistant Director (i/c).  
Geology and Mining,  
Kallakuruchi.

Lr. No.: GCE / DPI / CIVIL / SOIL / 2022/ C - 070                      Dated: 02.06.2022

Sir,

Sub.: Sieve analysis and Shear strength properties of the soil sample- Report forwarded -  
Regarding.

Ref.: Letter No.: B/G&M/442/2022    Dated: 24.05.2022

-----0000000-----

With reference to the letter cited above, the laboratory tests were carried out on the given soil sample and the test report is enclosed for the kind perusal.

*m. G...*  
02/06/22

*Son L. G. R. G.*  
27/06/22  
for Principal  
Head of the Department  
Department of Civil Engineering  
GCE, Dharmapuri-636 704.

Enclosure: Soil Test Report (2 pages)



*[Handwritten signature]*



DEPARTMENT OF TECHNICAL EDUCATION - TAMIL NADU  
GOVERNMENT COLLEGE OF ENGINEERING - DHARMAPURI  
DEPARTMENT OF CIVIL ENGINEERING  
SOIL MECHANICS LABORATORY



CONSULTANCY REPORT

Lr. No. : GCE / DPI / CIVIL / SOIL / 2022 / C - 070

Dated: 02.06.2022

Nature of test : Sieve analysis and Shear strength properties of the soil sample and fitness of the soil.  
Details of soil sample received : Two soil sample (Sample No.:01 and 02) collected from Survey Field No.70/2, 70/3, 70/4 and 70/5A of Kondalankuppam Village, Vanur Taluk, Viluppuram District.

----- ooo -----

Test Results

S.No	Description of Sample	Sieve Analysis			Atterberg's Limits		Shear Strength parameters	
		Gravel (%)	Sand (%)	Fines (%)	Plastic Limit (%)	Liquid Limit (%)	Cohesion, C (kN/m <sup>2</sup> )	Angle of internal friction, $\phi$ (°)
1	Sample No.: 01	0.00	24.49	75.51	25	31	14	18

IS classification of the soil as per IS 1498 (1970): Low Compressible Silt (ML)



Kindly Note: Any correction in the certificate not attested by the concerned authority shall invalidate this certificate

278  
*[Signature]*



S.No	Description of Sample	Sieve Analysis			Atterberg's Limits		Shear Strength parameters	
		Gravel (%)	Sand (%)	Fines (%)	Plastic Limit (%)	Liquid Limit (%)	Cohesion, C (kN/m <sup>2</sup> )	Angle of internal friction, φ
1	Sample No.: 02	0.00	23.90	76.10	24	32	14	18

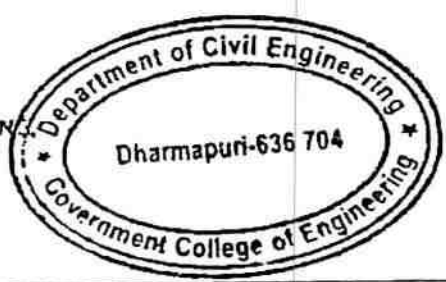
IS classification of the soil as per IS 1498 (1970): Low Compressible Silt (ML)

**Inference:**

As per the above laboratory test results obtained for the given two soil samples (Sample No.:01 & 02) from Survey Field No.70/2, 70/3, 70/4 and 70/5A of Kondalankuppam Village, Vanur Taluk, Viluppuram District, it is inferred that the soil samples are Low Compressible Silt (ML) and it is recommended that the soil samples with proper compaction can be used for filling in road works and embankment

*m. Gowthaman*  
02/06/22

**M. GOWTHAMAN**  
ASSISTANT PROFESSOR,  
CIVIL ENGINEERING DEPARTMENT,  
GOVERNMENT COLLEGE OF ENGINEERING,  
DHARMAPURI - 636 704.



*for*  
*B. Lakshmi*  
02/06/2022  
Professor and Head of the Department  
Head of the Department  
Department of Civil Engineering  
GCE, Dharmapuri-636 704.

Kindly Note: Any correction in the certificate not attested by the concerned authority shall invalidate this certificate

## PHOTOCOPY OF THE APPLIED LEASE AREA

Field photos in respect of red earth in patta land lease area belongs to **Mr. B.Venkatakrishnan**, at Tamil Nadu State, Viluppuram District, Vanur Taluk, Kondalangkuppam Village in S.F.No's: 70/2, 70/3, 70/4, 70/5A & 71/3, over an extent of 1.53.5hectares





भारत सरकार  
GOVERNMENT OF INDIA

வெங்கடகிருஷ்ணன்  
Venkatakrishnan  
பிறந்தவகுப்பு / Year of Birth : 1957  
ஆண்பால் / Male



4562 2420 7035

ஆதார் - சாதாரண மனிதனின் அதிகாரம்



இந்திய தனிப்பட்ட அடையாள ஆணையமைப்பு  
UNIQUE IDENTIFICATION AUTHORITY OF INDIA

முகவரி:  
S/O பலராம், எண் 25,  
இரண்டாவது குறுக்கு வீதி,  
குறம்பபேட்டை, பாண்டிச்சேரி,  
பாண்டிச்சேரி, 605009

Address:  
S/O Balaram, MIG 25, Second  
Cross Street, Housing Board,  
Kurumbapet, Thattanchavady,  
Pondicherry, Pondicherry,  
605009

1947  
1800 180 1947

help@uidai.gov.in

www.uidai.gov.in

P.O. Box No.1947,  
Bengaluru-560 001

*Handwritten signature*



*[Handwritten Signature]*

अर्हता प्राप्त व्यक्ति के रूप में मान्यता प्रमाण पत्र  
(खनिज रियायत नियमावली, 1960 के नियम 22सी के तहत)  
**CERTIFICATE OF RECOGNITION AS QUALIFIED PERSON**  
(Under Rule 22C of Mineral Concession Rules, 1960)

श्री एस. करुपण्ण, मॉगनीकाडू, मुत्तमंपट्टी पोस्ट, बोम्मीडी वर्यो, ओमलूर तालुक, सेलम डीस्टीक्ट, तमिलनाडू - 635 301, जिनका फोटो और हस्ताक्षर ऊपर दिया हुआ है, तथा जिनहोंने अपनी अर्हता और अनुभव का संतोष जनक साक्ष्य दिया है, को खनन योजना तैयार करने हेतु खनिज रियायत नियमावली 1960 के नियम 22सी के तहत अर्हता प्राप्त व्यक्ति के रूप में मान्यता प्रदान की जाती है।

Shri S. Karuppannan, Manganikadu, Muthampatty (Post), Bommidi (Via), Omalur Taluk, Salem District, Tamilnadu - 635 301, whose **Photograph and signature** is affixed herein above, having given satisfactory evidence of his qualifications & experience hereby **RECOGNISED** under Rule 22C of the Mineral Concession Rule, 1960 as a Qualified Person to prepare Mining Plans.

उनकीपंजीयन संख्या है  
His registration number is

RQP /MAS/263/2014/A

यह मान्यता 10 वर्षों की अवधि के लिए मान्यता है जो दिनांक 15.12.2024 को समाप्त होगी।  
This recognition is valid for a period of 10 years ending on 15.12.2024.

उनके द्वारा प्रस्तुत खनन योजना में गलत जानकारी / दस्तावेज पाए जाने की स्थिति में यह प्रमाण पत्र वापस लिया जाएगा / निरस्त किया जाएगा।

This certificate will liable to be withdrawn / cancelled in the event of furnishing the wrong information / documents in the Mining Plan submitted by him.

स्थान/ Place : Chennai  
दिनांक/ Date : 16.12.2014.

क्षेत्रीय खाननियंत्रक / Regional Controller of Mines  
भारतीय खानब्यूरो / Indian Bureau of Mines  
चेन्नई क्षेत्र / Chennai Region

282

*[Handwritten Signature]*

PLATE NO-I






APPLICANT

**Mr. B. VENKATAKRISHNAN,**  
S/o. BALARAM,  
No. 25, SECOND CROSS STREET,  
KURUMBAPET, HOUSING BOARD,  
PUDUCHERRY STATE - 605009.

LEASE APPLIED AREA

S.F.NO'S : 70/2, 70/3, 70/4, 70/5A & 71/3  
EXTENT : 1.53.5 Hect  
VILLAGE : KONDALANGKUPPAM  
TALUK : VANUR  
DISTRICT : VILUPPURAM

INDEX

- MINE LEASE AREA 
- APPROACH ROAD 
- CART ROAD 
- VILLAGE ROAD 
- SH-136 ROAD 

KEY MAP

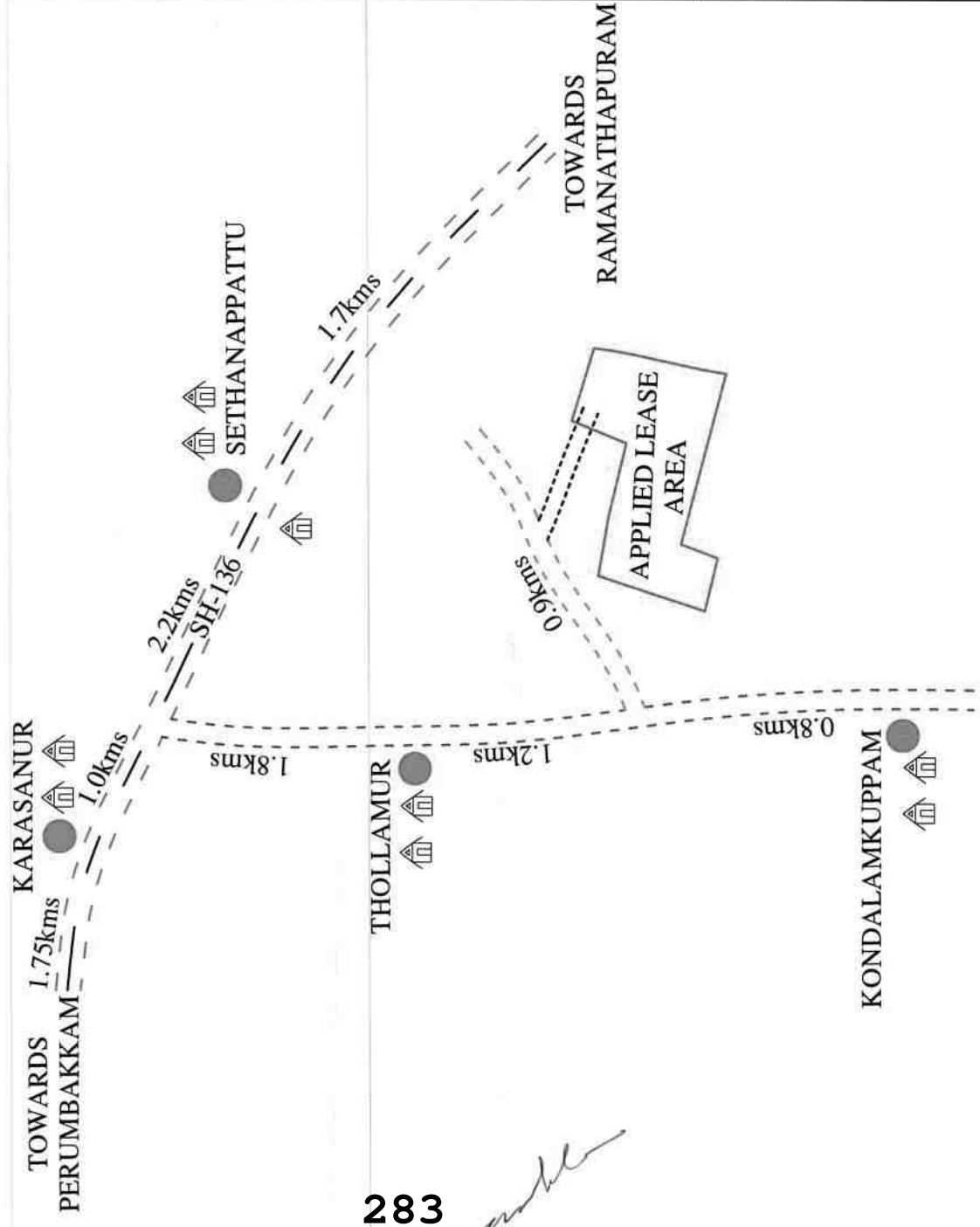
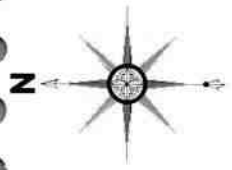
NOT TO SCALE

Prepared By: 

I DO HEREBY CERTIFY THAT THE PLATE HAS BEEN CHECKED BY ME AND IS CORRECT TO THE BEST OF MY KNOWLEDGE



Dr. S. KARUPPANNAN, M.Sc., Ph.D.,  
RECOGNIZED QUALIFIED PERSON  
RQP/MAS/263/2014/A





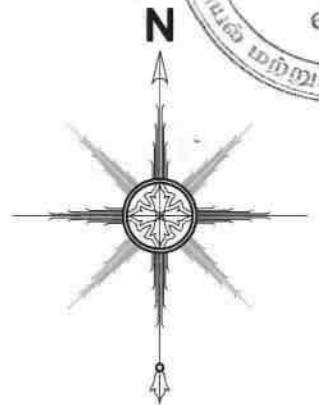


PLATE NO-IA

APPLICANT

**Mr.B.VENKATAKRISHNAN,**  
 S/o.BALARAM,  
 No. 25, SECOND CROSS STREET,  
 KURUMBAPET, HOUSING BOARD,  
 PUDUCHERRY STATE - 605009.

LEASE APPLIED AREA

S.F.NO'S : 70/2, 70/3, 70/4, 70/5A & 71/3  
 EXTENT : 1.53.5Hect  
 VILLAGE : KONDALANGKUPPAM  
 TALUK : VANUR  
 DISTRICT : VILUPPURAM

INDEX

MINE LEASE AREA: ●  
 TOPO SHEET NO : 57-P/12  
 LATITUDE : 12°2'19.41"N to 12°2'23.38"N  
 LONGITUDE : 79°41'16.53"E to 79°41'23.40"E

**LOCATION PLAN**  
 NOT TO SCALE

Prepared By:

I DO HEREBY CERTIFY THAT THE PLATE  
 HAS BEEN CHECKED BY ME AND IS CORRECT  
 TO THE BEST OF MY KNOWLEDGE

**Dr.S.KARUPPANNAN, M.Sc., Ph.D.,**  
 RECOGNIZED QUALIFIED PERSON  
 RQP/MAS/263/2014/A



12°2'23.38"N

79°41'16.53"E

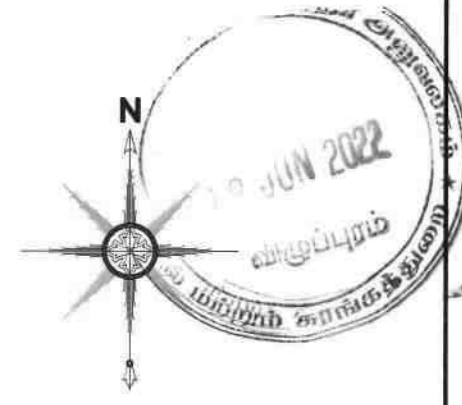


PLATE NO-IC

**APPLICANT:**  
**Mr.B.VENKATAKRISHNAN,**  
 S/o.BALARAM,  
 No. 25, SECOND CROSS STREET,  
 KURUMBAPET, HOUSING BOARD,  
 PUDUCHERRY STATE - 605009.

**LEASE APPLIED AREA:**  
 S.F.NO'S : 70/2, 70/3, 70/4, 70/5A & 71/3  
 EXTENT : 1.53.5Hect  
 VILLAGE : KONDALANGKUPPAM  
 TALUK : VANUR  
 DISTRICT : VILUPPURAM

**INDEX**

MINE LEASE AREA	
APPROACH ROAD	
CART ROAD	
ODAI	
300m RADIUS	
500m RADIUS	

TOPO SHEET NO : 57-P/12  
 LATITUDE : 12°2'19.41"N to 12°2'23.38"N  
 LONGITUDE : 79°41'16.53"E to 79°41'23.40"E

**ENVIRONMENTAL PLAN**

SCALE- 1:5000

Prepared By:  
 I DO HEREBY CERTIFY THAT THE PLATE  
 HAS BEEN CHECKED BY ME AND IS CORRECT  
 TO THE BEST OF MY KNOWLEDGE

Dr.S.KARUPPANNAN,M.Sc.,Ph.D.,  
 RECOGNIZED QUALIFIED PERSON  
 RQP/MAS/263/2014/A

286

OCTOBER TO DECEMBER

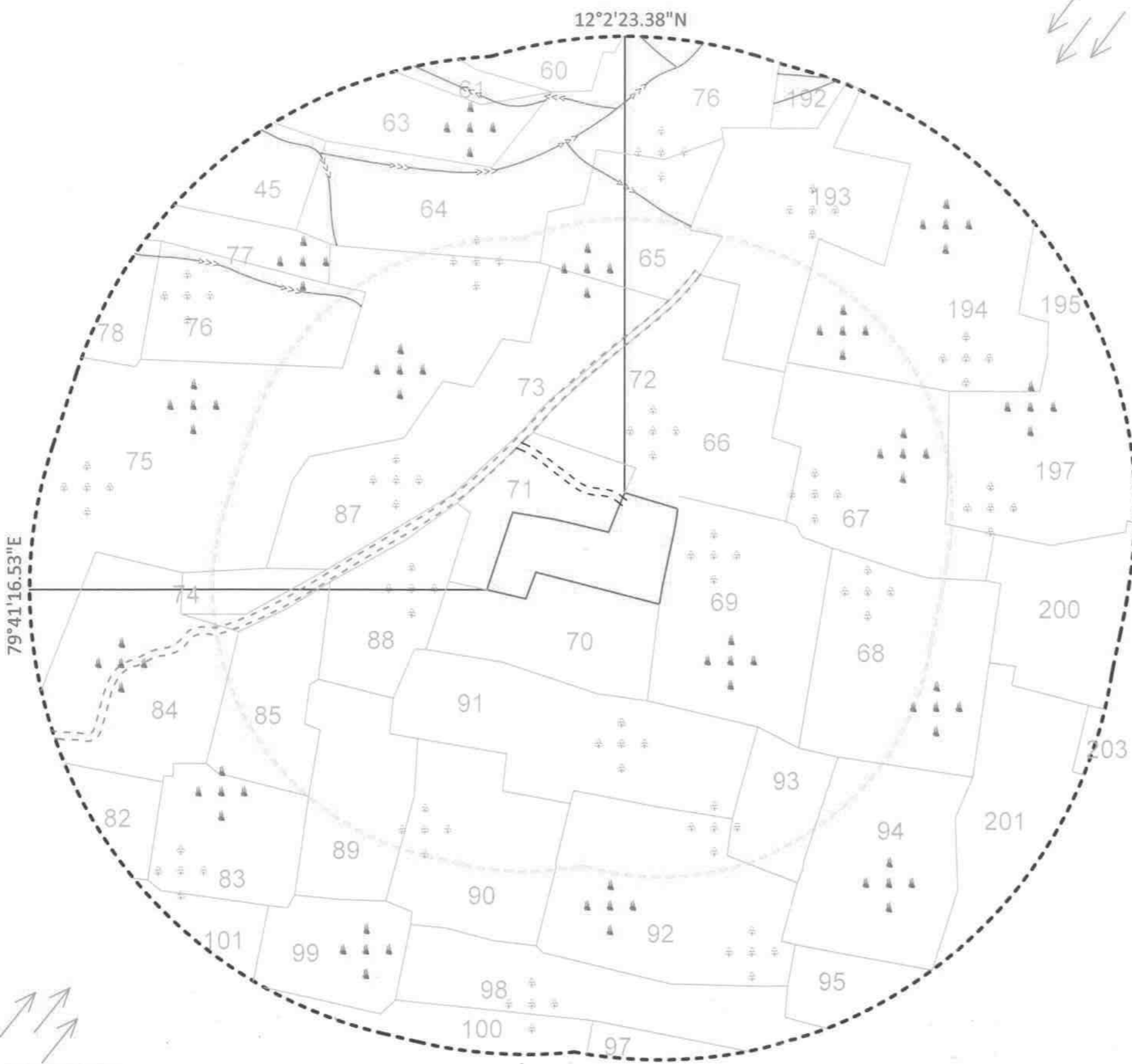
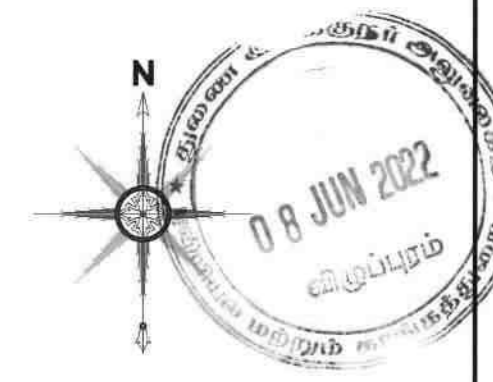


PLATE NO-ID

APPLICANT:

Mr.B.VENKATAKRISHNAN,  
S/o.BALARAM,  
No. 25, SECOND CROSS STREET,  
KURUMBAPET, HOUSING BOARD,  
PUDUCHERRY STATE - 605009.

LEASE APPLIED AREA:

S.F.NO'S : 70/2, 70/3, 70/4, 70/5A & 71/3  
EXTENT : 1.53.5Hect  
VILLAGE : KONDALANGKUPPAM  
TALUK : VANUR  
DISTRICT : VILUPPURAM

INDEX

MINE LEASE AREA	
APPROACH ROAD	
CART ROAD	
ODAI	
300m RADIUS	
500m RADIUS	
SHRUBS	
TREES	

TOPO SHEET NO : 57-P/12

LATITUDE : 12°2'19.41"N to 12°2'23.38"N

LONGITUDE : 79°41'16.53"E to 79°41'23.40"E

ENVIRONMENTAL PLAN

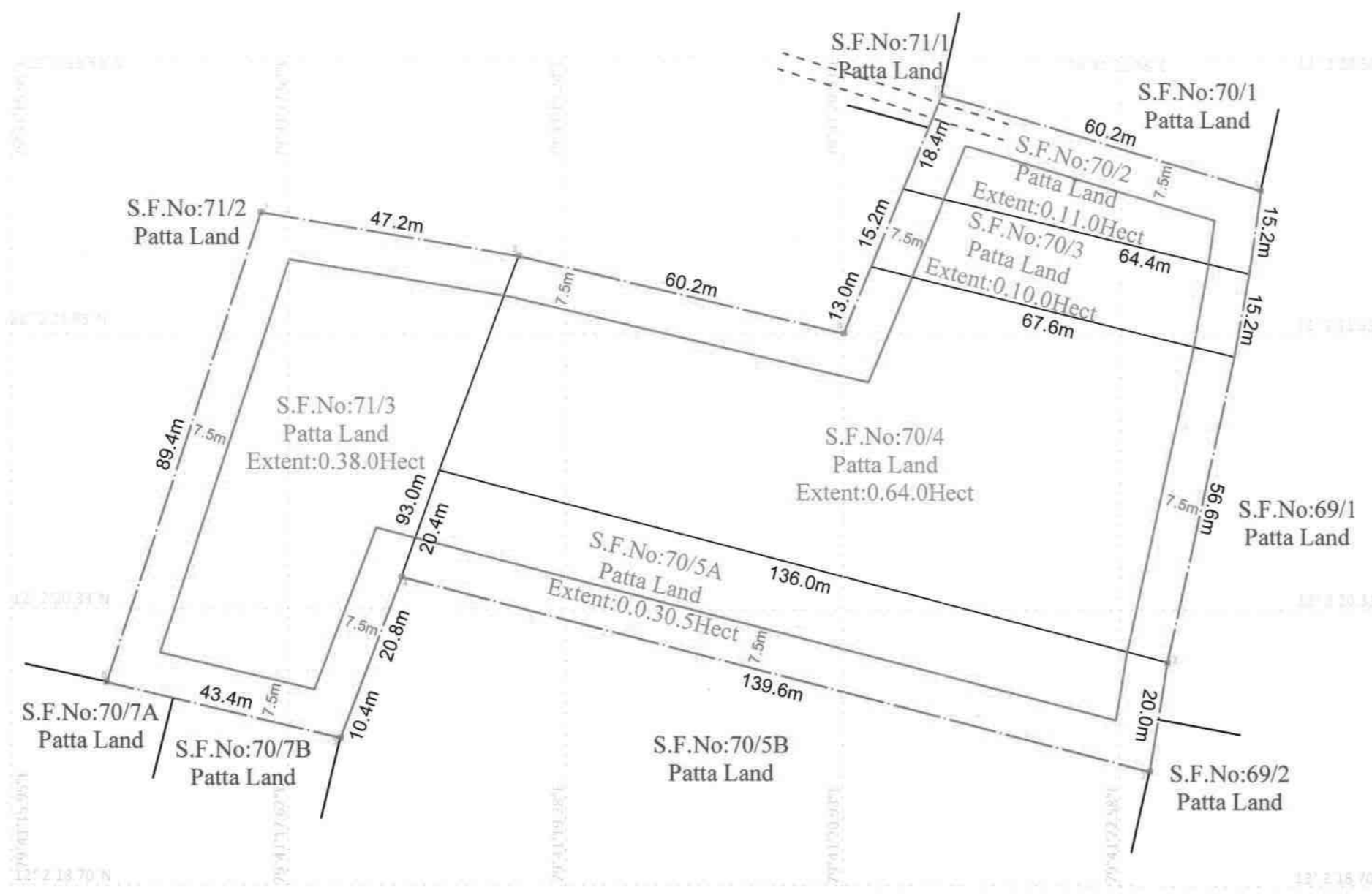
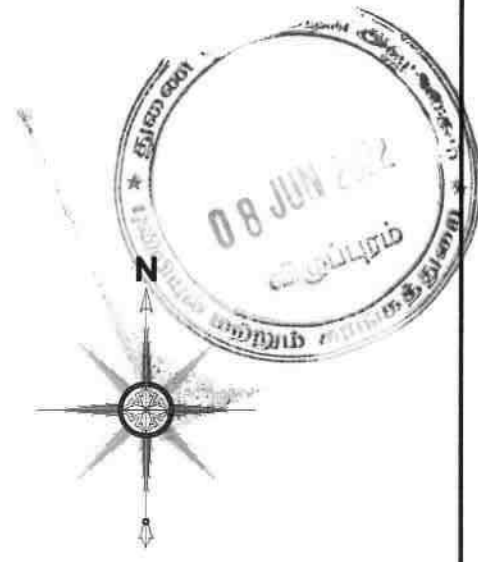
SCALE- 1:5000

Prepared By:

I DO HEREBY CERTIFY THAT THE PLATE  
HAS BEEN CHECKED BY ME AND IS CORRECT  
TO THE BEST OF MY KNOWLEDGE

Dr.S.KARUPPANNAN,M.Sc.,Ph.D.,  
RECOGNIZED QUALIFIED PERSON  
RQP/MAS/263/2014/A

JULY TO SEPTEMBER



**PLATE NO-II**

**APPLICANT:**  
**Mr.B.VENKATAKRISHNAN,**  
 S/o.BALARAM,  
 No. 25, SECOND CROSS STREET,  
 KURUMBAPET, HOUSING BOARD,  
 PUDUCHERRY STATE - 605009.

**LEASE APPLIED AREA:**  
 S.F.NO'S : 70/2, 70/3, 70/4, 70/5A & 71/3  
 EXTENT : 1.53.5Hect  
 VILLAGE : KONDALANGKUPPAM  
 TALUK : VANUR  
 DISTRICT : VILUPPURAM

**INDEX**

MINE LEASE AREA	
SAFETY AREA	
APPROACH ROAD	
BOUNDARY PILLAR STONE	

**MINE LEASE PLAN**

SCALE- 1:1000

Prepared By:

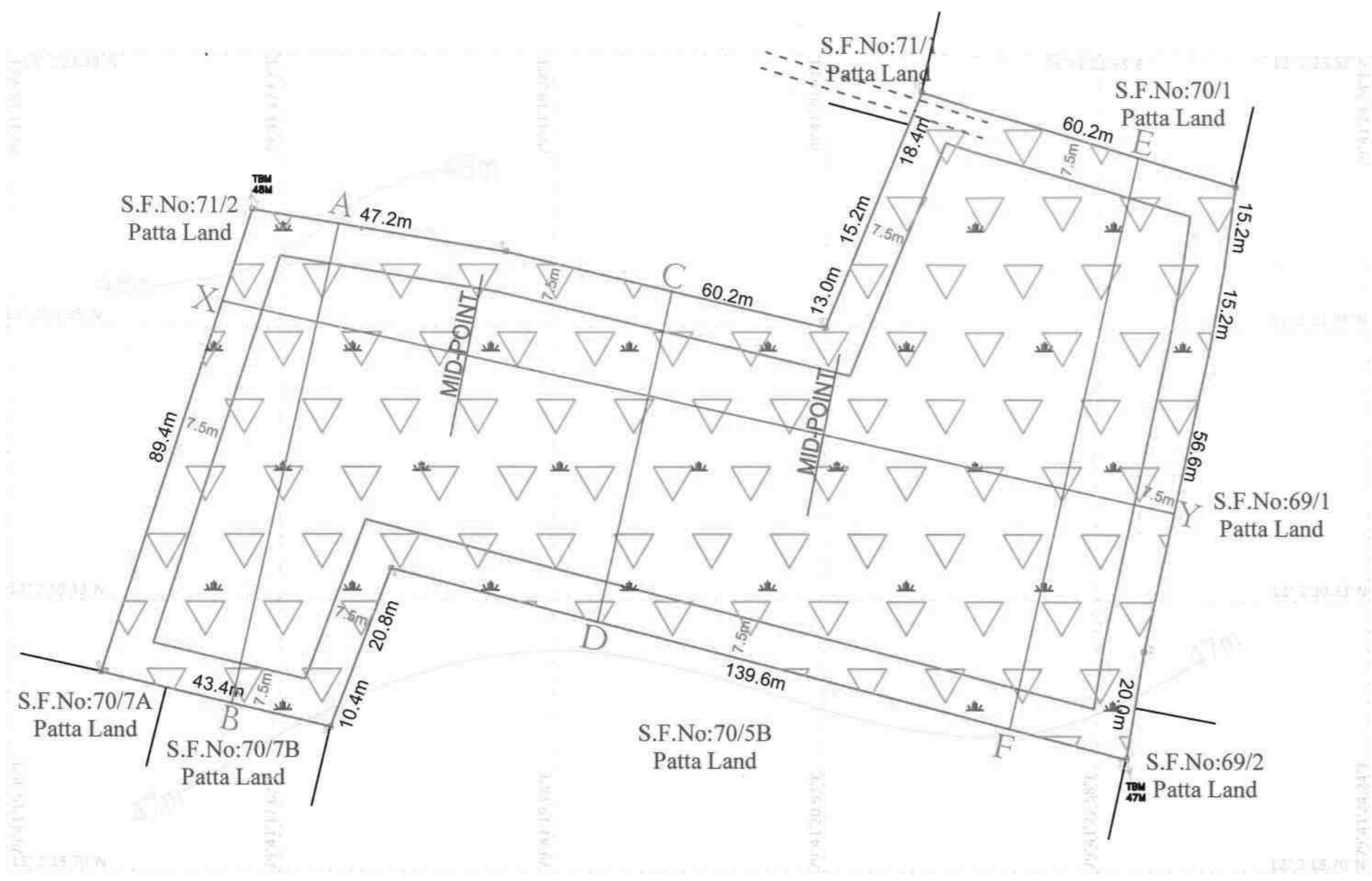
I DO HEREBY CERTIFY THAT THE PLATE HAS BEEN CHECKED BY ME AND IS CORRECT TO THE BEST OF MY KNOWLEDGE

**Dr.S.KARUPPANNAN,M.Sc.,Ph.D.,**  
 RECOGNIZED QUALIFIED PERSON  
 RQP/MAS/263/2014/A

Pillar ID	Latitude	Longitude
1	12° 2'22.83"N	79°41'23.40"E
2	12° 2'20.05"N	79°41'22.87"E
3	12° 2'19.41"N	79°41'22.76"E
4	12° 2'20.53"N	79°41'18.29"E
5	12° 2'19.58"N	79°41'17.93"E
6	12° 2'19.90"N	79°41'16.53"E
7	12° 2'22.67"N	79°41'17.43"E
8	12° 2'22.42"N	79°41'18.97"E
9	12° 2'21.98"N	79°41'20.91"E
10	12° 2'23.38"N	79°41'21.40"E

*Handwritten signature*





**PLATE NO-III**

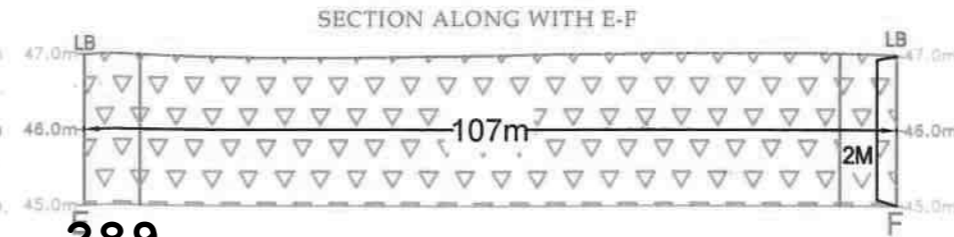
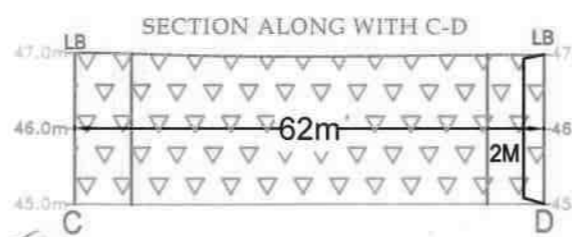
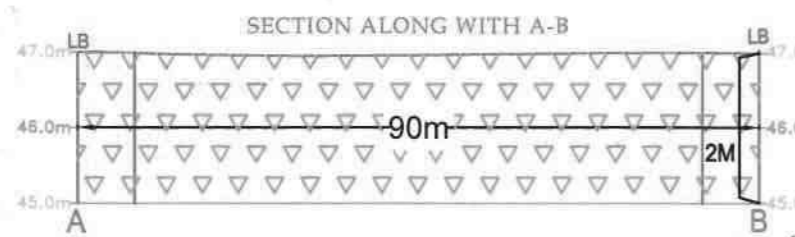
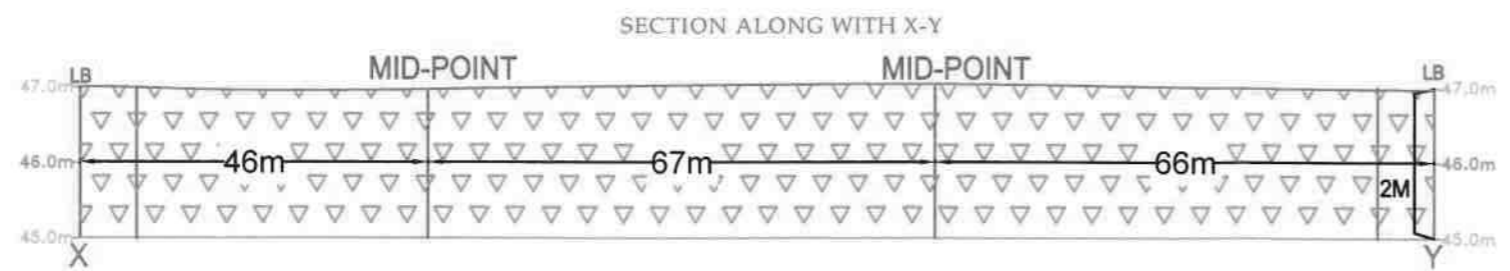
**APPLICANT:**  
**Mr.B.VENKATAKRISHNAN,**  
 S/o.BALARAM,  
 No. 25, SECOND CROSS STREET,  
 KURUMBAPET, HOUSING BOARD,  
 PUDUCHERRY STATE - 605009.

**LEASE APPLIED AREA:**  
 S.F.NO'S : 70/2, 70/3, 70/4, 70/5A & 71/3  
 EXTENT : 1.53.5Hect  
 VILLAGE : KONDALANGKUPPAM  
 TALUK : VANUR  
 DISTRICT : VILUPPURAM

**INDEX**

- MINE LEASE AREA
- SAFETY AREA
- APPROACH ROAD
- BOUNDARY PILLAR STONE
- CONTOUR LINES
- TEMPORARY BENCH MARKS
- SHRUBS
- RED EARTH

GEOLOGICAL RESOURCES				
SECTION	L(m)	W(m)	D(m)	VOL(M <sup>3</sup> )
XY-AB	46	90	2	8280
XY-CD	67	62	2	8308
XY-EF	66	107	2	14124
TOTAL				30712



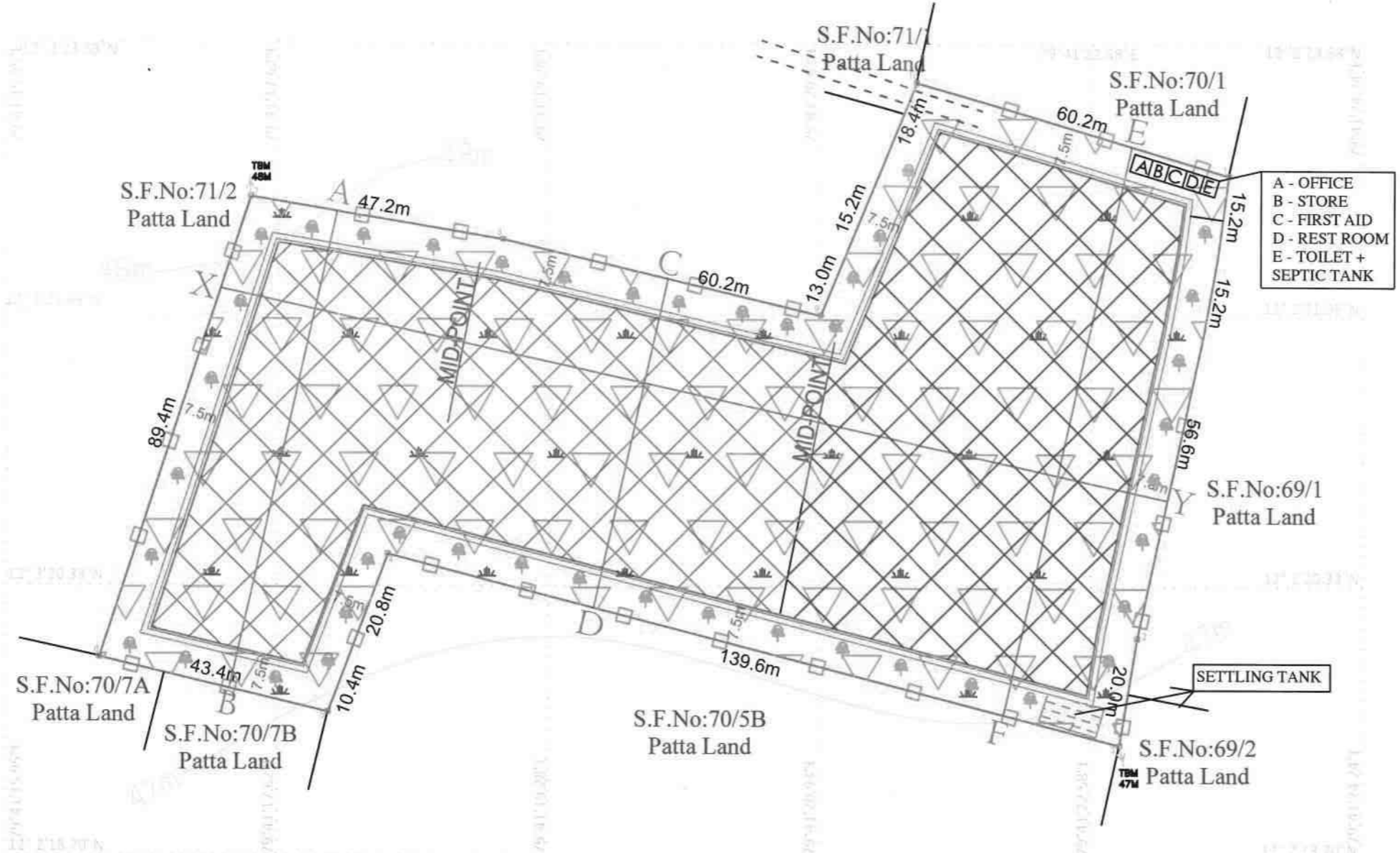
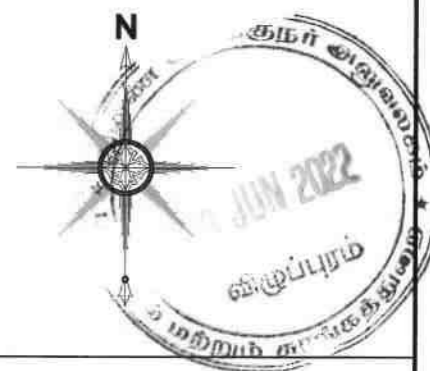
*Handwritten signature*

Prepared By:

I DO HEREBY CERTIFY THAT THE PLATE HAS BEEN CHECKED BY ME AND IS CORRECT TO THE BEST OF MY KNOWLEDGE

*Handwritten signature*

**Dr.S.KARUPPANNAN,M.Sc.,Ph.D.,**  
 RECOGNIZED QUALIFIED PERSON  
 RQP/MAS/263/2014/A



- A - OFFICE
- B - STORE
- C - FIRST AID
- D - REST ROOM
- E - TOILET + SEPTIC TANK

**PLATE NO-IV**

**APPLICANT:**  
**Mr.B.VENKATAKRISHNAN,**  
 S/o.BALARAM,  
 No. 25, SECOND CROSS STREET,  
 KURUMBAPET, HOUSING BOARD,  
 PUDUCHERRY STATE - 605009.

**LEASE APPLIED AREA:**  
 S.F.NO'S : 70/2, 70/3, 70/4, 70/5A & 71/3  
 EXTENT : 1.53.5Hect  
 VILLAGE : KONDALANGKUPPAM  
 TALUK : VANUR  
 DISTRICT : VILUPPURAM

**INDEX**

- MINE LEASE AREA
- SAFETY AREA
- APPROACH ROAD
- BOUNDARY PILLAR STONE
- CONTOUR LINES
- TEMPORARY BENCH MARKS
- SHRUBS
- RED EARTH
- PROPOSED BENCH
- DRAINAGE & SETTLING TANK
- FENCING

**YEARWISE DEVELOPMENT, PRODUCTION PLAN & SECTIONS**

PLAN SCALE-1:1000  
 SECTION SCALE- HORIZONTAL-1:1000, VERTICAL - 1:100

Prepared By:  
 I DO HEREBY CERTIFY THAT THE PLATE HAS BEEN CHECKED BY ME AND IS CORRECT TO THE BEST OF MY KNOWLEDGE  
  
 Dr.S.KARUPPANNAN,M.Sc.,Ph.D.,  
 RECOGNIZED QUALIFIED PERSON  
 RQP/MAS/263/2014/A

**MINE LAYOUT LAND USE PATTERN**

DESCRIPTION	PRESENT AREA (Hect)	AREA IN USE DURING THE QUARRYING PERIOD(Hect)	COLOR CODE
AREA UNDER QUARRYING	NIL	1.15.0	[Cross-hatch pattern]
INFRASTRUCTURE	NIL	0.01.0	[Dotted pattern]
ROADS	NIL	0.04.0	[Dashed line pattern]
UN-UTILIZED AREA	1.53.5	0.02.5	[White]
GREEN BELT	NIL	0.25.0	[Tree symbols]
DRAINAGE & SETTLING TANK	NIL	0.06.0	[Rectangular symbols]
<b>GRAND TOTAL</b>	<b>1.53.5</b>	<b>1.53.5</b>	

I - Year Proposed area to be Planted [Tree symbols]

I - Year Proposed area to be Quarried [Cross-hatch pattern]

II - Year Proposed area to be Quarried [Cross-hatch pattern]

PRODUCTION RESERVES				
SECTION	L(m)	W(m)	D(m)	VOL(M <sup>3</sup> )
XY-AB	39	75	2	5850
XY-CD	67	47	2	6298
XY-EF	59	92	2	10856
<b>TOTAL</b>				<b>23004</b>

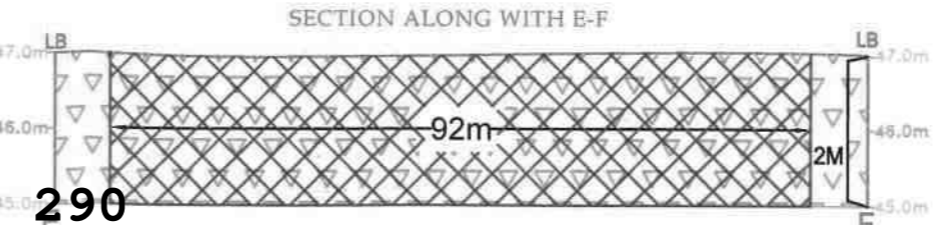
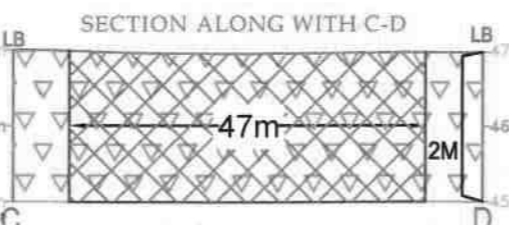
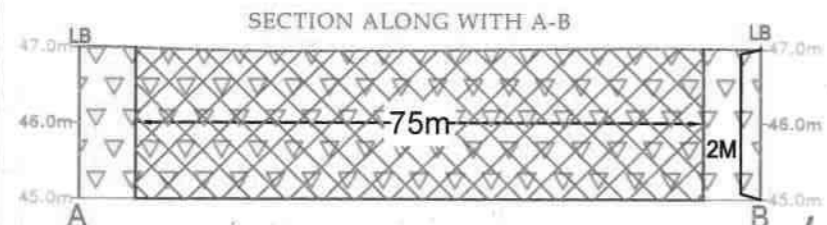
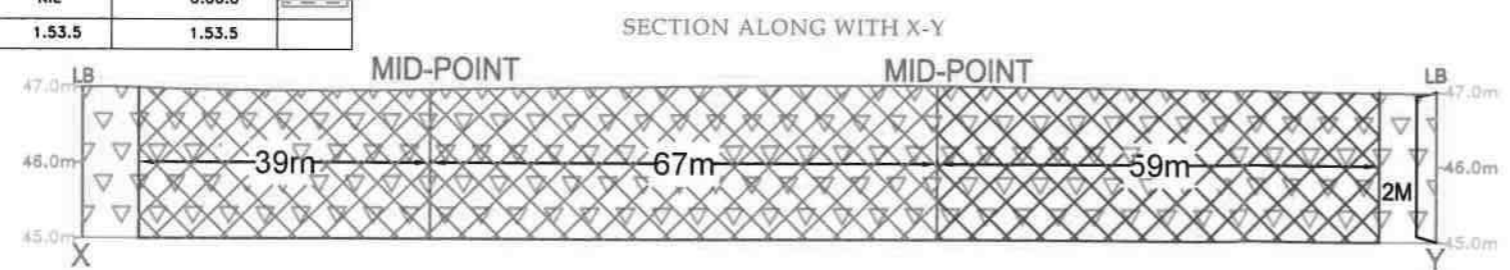
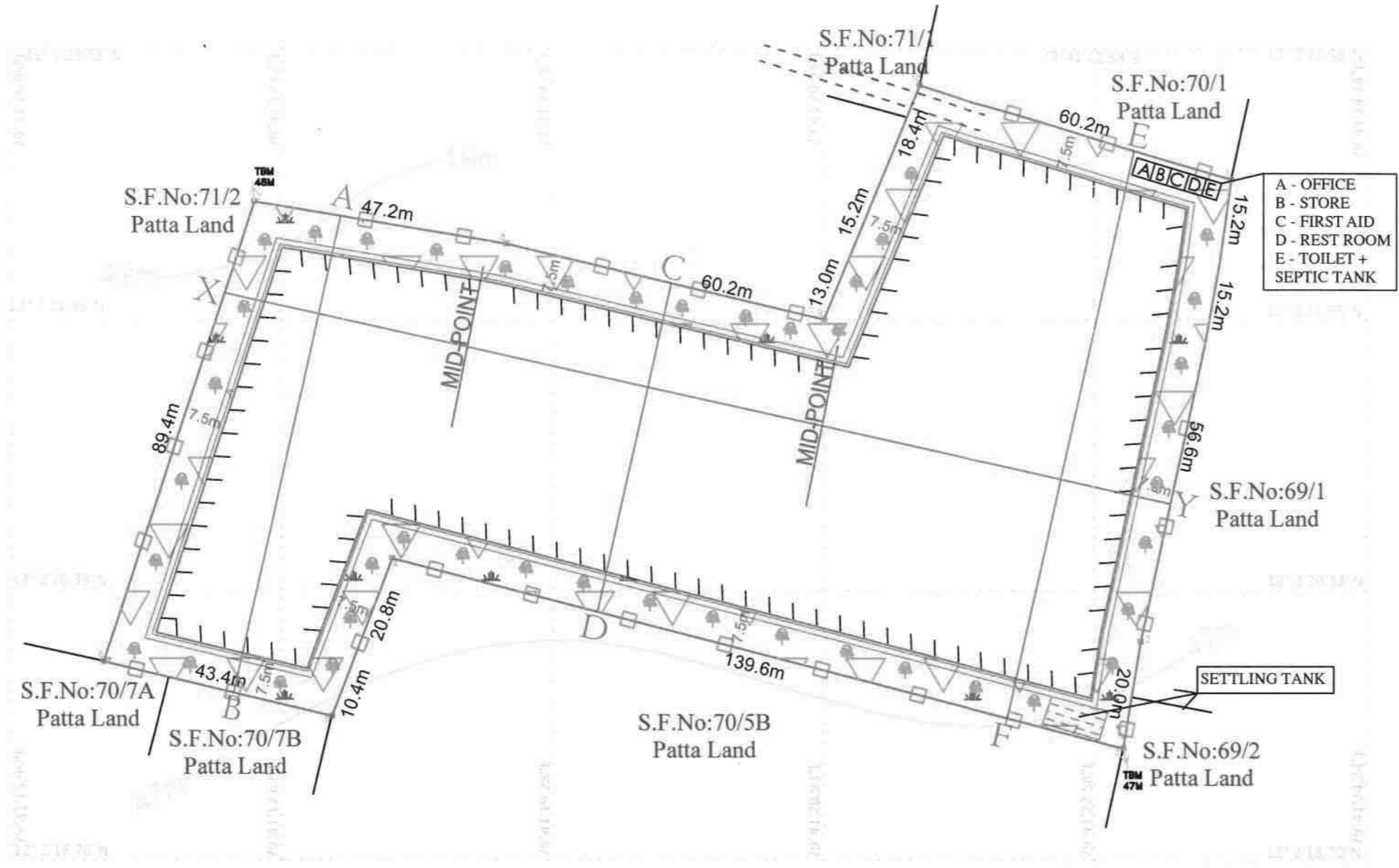




PLATE NO-V

**APPLICANT:**  
**Mr.B.VENKATAKRISHNAN,**  
 S/o.BALARAM,  
 No. 25, SECOND CROSS STREET,  
 KURUMBAPET, HOUSING BOARD,  
 PUDUCHERRY STATE - 605009.

**LEASE APPLIED AREA:**  
 S.F.NO'S : 70/2, 70/3, 70/4, 70/5A & 71/3  
 EXTENT : 1.53.5Hect  
 VILLAGE : KONDALANGKUPPAM  
 TALUK : VANUR  
 DISTRICT : VILUPPURAM

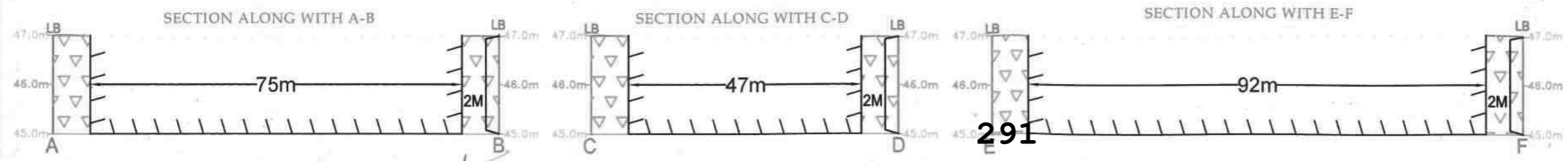
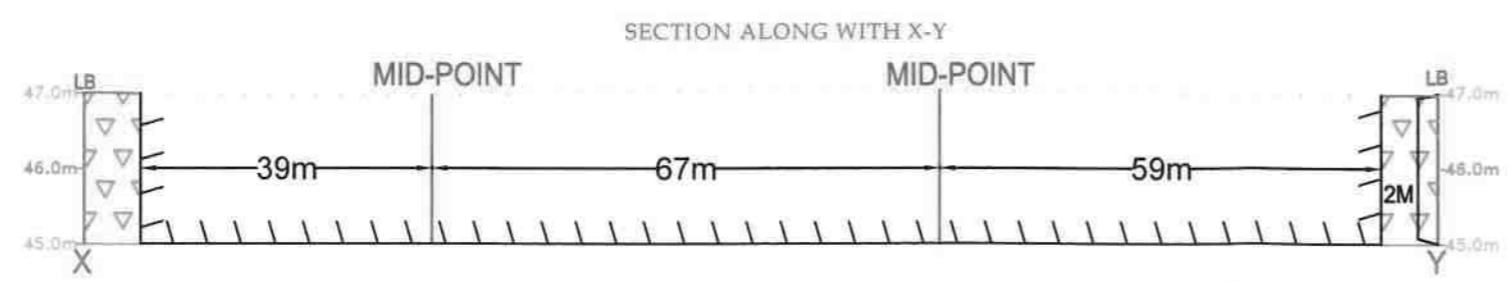


**INDEX**

MINE LEASE AREA	
SAFETY AREA	
APPROACH ROAD	
BOUNDARY PILLAR STONE	
CONTOUR LINES	
TEMPORARY BENCH MARKS	
SHRUBS	
RED EARTH	
ULTIMATE BENCH	
DRAINAGE & SETTLING TANK	
FENCING	

I - Year Proposed area to be Planted

MINEABLE RESERVES				
SECTION	L(m)	W(m)	D(m)	VOL(M <sup>3</sup> )
XY-AB	39	75	2	5850
XY-CD	67	47	2	6298
XY-EF	59	92	2	10856
TOTAL				23004



**CONCEPTUAL PLAN & SECTIONS**

PLAN SCALE-1:1000  
 SECTION SCALE- HORIZONTAL-1:1000, VERTICAL - 1:100.

Prepared By:  
 I DO HEREBY CERTIFY THAT THE PLATE HAS BEEN CHECKED BY ME AND IS CORRECT TO THE BEST OF MY KNOWLEDGE  
  
**Dr.S.KARUPPANNAN, M.Sc., Ph.D.,**  
 RECOGNIZED QUALIFIED PERSON  
 RQP/MAS/263/2014/A

From  
Tmt.N.Vijayalakshmi, M.Sc.,  
Deputy Director,  
Dept. of Geology and Mining,  
Viluppuram.

To  
Thiru B. Venkatakrishnan,  
S/o.Balaraman,  
No.25, 2<sup>nd</sup> Cross Street,  
Kurumbapet,  
Housing Board,  
Puducherry - 605009.

**Rc.No.A/G&M/442/2021 Dated 13.06.2022**

Sub: Mines & Minerals - Minor Mineral - Red Earth -  
Viluppuram District - Vanur Taluk -  
Kondalankuppam Village - over an extent of 1.53.50  
hectares of patta lands - S.F.Nos.70/2 (0.11.0  
hects.), 70/3 (0.10.0 hects.), 70/4 (0.64.0 hects.),  
70/5A (0.30.50 hects.) and 71/3 (0.38.0 hects.) -  
Quarry lease application preferred by Thiru  
B.Venkatakrishnan - Precise area communicated -  
Submission of mining plan for approval - Approved  
- Regarding.

- Ref:
1. Quarry lease application dated 22.11.2021 preferred by Thiru B.Venkatakrishnan, S/o.Balaraman, No.25, 2<sup>nd</sup> Cross Street, Kurumbapet, Housing Board, Puducherry.
  2. Deputy Director, Geology and Mining, Viluppuram Letter Rc.No.A/G&M/442/2021 Dated 06.06.2022.
  3. Mining Plan submitted by Thiru B.Venkatakrishnan, S/o.Balaraman Dated 08.06.2022.
  4. G.O.Ms.No.79, Industries (MMC-1) Department dated 06.04.2015.
  5. G.O.(Ms).No.169, Ind. (MMC.1) Dept. dated 04.08.2020.

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In response to the precise area communicated vide the reference 2<sup>nd</sup> cited, the applicant viz., Thiru B.Venkatakrishnan, S/o.Balaraman vide reference 3<sup>rd</sup> cited has submitted four copies of mining plan for the area applied seeking grant of quarry lease for Red Earth over an extent of 1.53.50 hectares of patta lands in S.F.Nos.70/2 (0.11.0 hects.), 70/3 (0.10.0 hects.), 70/4 (0.64.0 hects.), 70/5A (0.30.50 hects.) and 71/3 (0.38.0 hects.) of Kondalankuppam Village, Vanur Taluk, Viluppuram District with a request to approve the same.

2. The mining plan so submitted has been verified in detail.

3. As per the guidelines / instructions issued by the Commissioner of Geology and Mining, Chennai vide letter Rc.No.3868/LC/2012, dated 19.11.2012, the mining plan is hereby approved subject to the following conditions:

- (i) The mining plan is approved without prejudice to any other Law applicable to the quarry lease from time to time whether such laws are made by the Central Government, State Government or any other authority.
- (ii) This approval of the mining plan does not in any way imply the approval of the Government in terms or any other provisions of the Mines and Minerals (Development and Regulation) Amended Act, 2015, or any other connected laws including Forest (Conservation) Act, 1980, Forest Conservation Rules, 1981, Environment Protection Act, 1980, Explosives Act, 1884 (Central Act IV of 1884) and the Rules made there under and 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) As per the Deputy Director, Geology and Mining, Viluppuram letter Rc.No.A/G&M/442/2021 Dated 06.06.2022, the following conditions have been incorporated in the Mining Plan.
- a. A safety distance of 7.5 meter should be provided to the adjacent patta lands.
- (v) Quarrying shall be strictly done as per the approved Mining Plan.

Encl: Two copies of Approved Mining Plan.

  
Deputy Director,  
Dept. of Geology and Mining,  
Viluppuram.

Copy to:

The Director of Geology and Mining, Chennai-32.

  
w/d/2





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.

