

**DRAFT OF ENVIRONMENTAL IMPACT ASSESSMENT
AND
ENVIRONMENT MANAGEMENT PLAN
FOR OBTAINING**

Environmental Clearance under EIA Notification – 2006

Schedule Sl. No. 1 (a) (i): Mining Project

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

CLUSTER EXTENT = 11.46.5 hectares

THIRU. P. DEVARAJ ROUGH STONE AND GRAVEL QUARRY

At

Kuppam Village, Pugalur Taluk,

Karur District, Tamil Nadu State

ToR letter No. SEIAA-TN/F.No.9653/ToR-1458/2023 Dated:15.05.2023.

NAME AND ADDRESS OF THE PROPOSED PROJECT PROPONENT

Name and Address	Extent & S.F.No
Thiru. P. Devaraj S/o. Pitchaimuthu, Pullaiyampalayam, Punnamchatram Post, Pugalur Taluk, Karur-639 136.	2.27.5 ha & 104/1, 104/2A(Part), 104/2B1(Part), 105/1A(Part) & 105/2

ENVIRONMENTAL CONSULTANT

GEO TECHNICAL MINING SOLUTIONS

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

Oddapatti, Collectorate Post office,

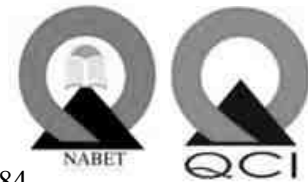
Dharmapuri-636705. Tamil Nadu.

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

Website: www.gtmsind.com

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

Valid till: Dec 31, 2023



ENVIRONMENTAL LAB

EXCELLENCE LABORATORY

No.23/93, Fifth Street, Ram Nagar,

S.S.Colony, Madurai-625 010.

Baseline Study Period – October-December, 2022

TERMS OF REFERENCE (ToR) COMPLIANCE

ToR issued vide Letter No. SEIAA-TN/F.No.9653/ToR-1458/2023 dated 15.05.2023 for

Thiru.P.Devaraj Rough Stone & Gravel Quarry

SPECIFIC CONDITIONS		
1	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 of adequate fencing, green belt along the periphery of the project area and the photographs showing nearby water bodies will be included in final EIA report.
2	The structures within the radius of (i) 50 m, (ii) 100 m, (iii) 200 m, (iv) 300 m, (v) 500 m shall be enumerated with details such as dwelling houses with number of occupants, whether it belongs to the owner or not, places of worship, industries, factories, sheds, etc with indicating the owner of the building nature of construction, age of the building, number of residents, their profession and income, etc.	The report about the structures within the radius of 50 m, 100 m, 200 m, 300 m, 500 m will be attached with final EIA report.
3	The PP shall submit a detailed hydrological report indicating the impact of proposed quarrying operations on the water bodies like lake, water tanks, etc are located within 1 km of the proposed quarry.	The details of hydrological study report will be included in final EIA report.
4	The proponent shall carry out Bio diversity study through reputed Institution and the same shall be included in EIA Report	The details of Bio diversity have been provided in Section 3.5 under Chapter III, pp.70-90.
5	In the case of proposed lease in an existing (or old) quarry where the benches are not formed (or) partially formed as per the approved Mining plan, the project proponent (PP) shall prepare and submit an	Slope stability report will be included in final EIA report.

	‘Slope Stability Action plan’ for carrying out the realignment of the benches in the proposed quarry lease after it is approved by the concerned Asst. Director and mining during the time of appraisal for obtaining the EC.	
6	During the EIA appraisal, the PP shall furnish the mining plan approved by the competent authority stating that the heavy blasting operation in the proposed quarry I not carried out and only hand-breaking operation is adopted for the extraction of dimension blocks using non-explosive techniques in the proposed quarrying operation.	The blasting operation is given in the Section 2.6 under Chapter II, pp.20-28.
7	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.	Photographic evidences showing mining activities of the project proponent will be attached with final EIA report.
8	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?	All the documents will be attached with final EIA report.
	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.	
9		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).	All corner coordinates of the mine lease area have been superimposed on a high-resolution Google Earth Image, as shown in Figure 2.4, p.13 under Chapter II.
10		The PP shall carry out Drone video survey covering the cluster, green belt, fencing etc.,	Drone video and photographs showing fencing and greenbelt development will be included in the final EIA report. The drone video will be submitted during the final EIA report appraisal.
11		The PP shall furnish the revised manpower including the statutory & competent persons as required under-the provisions of the MMR 1961 for the prosed quarry based on the volume of rock handled & area of excavation.	Details of manpower required for this project have been given in Table 2.14 under Chapter II, p.29.
12		The Project Proponent shall provide the details of mineral reserves and mineable reserves, planned production capacity,	The mineral reserves of the project have been discussed in Section 2.5 under Chapter II, pp.16-19. The anticipated

	proposed working methodology with justifications, the anticipated impacts of the mining operations on the surrounding environment and the remedial measures for the same.	impact of mining on land, air, noise, water, soil, biology, and socio economy is discussed under Chapter IV, pp.101-128.
13	The Project Proponent shall provide the Organization chart indicating the appointment of various statutory officials and other competent persons to be appointed as per the provisions of Mines Act, 1952 and the MMR, 1961 for carrying out the quarrying operations scientifically and systematically in order to ensure safety and to protect the environment.	Details of manpower required for this project have been given in Table 2.14 under Chapter II, p.29.
14	The Project Proponent shall conduct the hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) along with the collected water level data for both monsoon and non-monsoon seasons from the PWD/ TWAD so as to assess the impacts on the wells due to mining activity. 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.	Detailed hydrogeological study was carried out. The results have been discussed Section 3.2 under Chapter III, pp.42-54.
15	The proponent shall furnish the baseline data for the environmental and ecological parameters with regard to surface	The baseline data were collected for the environmental components including land, soil, water, air, noise, biology,

	water/ground water quality, air quality, soil quality & flora/fauna including traffic/vehicular movement study.	socio-economy, and traffic and the results have been discussed under Chapter III, pp. 30-100.
16	The Proponent shall carry out the Cumulative impact study due to mining operations carried out in the quarry specifically with reference to the specific environment in terms of soil health, biodiversity, air pollution, water pollution, climate change and flood control & health impacts. Accordingly, the Environment Management plan should be prepared keeping the concerned quarry and the surrounding habitations in the mind.	Results of cumulative impact study due to mining operations are given in Section 7.4 under Chapter VII, pp.142-145.
17	Rain water harvesting management with recharging details along with water balance (both monsoon & non-monsoon) be submitted.	The rainwater harvesting management plan will be submitted along with the final EIA report.
18	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.31-41 under Chapter III. The details of surrounding sensitive ecological features have been provided in Table 3.36 under Chapter III, p.97. Land use plan of the project area showing pre-operational, operational and post-operational phases are discussed in Table 2.8 under Chapter II, p.23.
19	Details of the land for storage of	This condition is not applicable to this

	Overburden/Waste Dumps (or) Rejects outside the mine lease. such as extent of land area, distance from mine lease' its land use, R&R issues. If any, should be provided.	project because no dumps have been proposed outside the lease area.
20	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.	This condition is not applicable to this project because this project is not located in proximity to the areas of areas declared as 'Critically Polluted' (or) the project areas which attracts the court restrictions for mining operations.
21	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.	Details about rainwater harvesting structures will be included in the final EIA report.
22	Impact on local transport infrastructure due to the Project should be indicated.	Details regarding the impact of the project on traffic are given in Section 3.7 under Chapter III, pp.94-96.
23	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.70-90.
24	A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific.	A progressive mine closure plan has been attached with the approved mining plan report in Annexure III, pp.215-298. The budget details for the progressive mine closure plan are shown in Table 2.9 under

		Chapter II, p.23.
25	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 comments made in public hearing meeting will be updated in the final EIA report after public hearing meeting.
26	The Public hearing advertisement shall be published in one major National daily and one most circulated vernacular daily.	Details of advertisement will be updated in the final EIA report.
27	The PP shall produce/display the EIA report, Executive summary and other related information with respect to public hearing in Tamil Language also.	The Tamil version of EIA report, executive summary and other related information will be incorporated in this report.
28	As a part of the study of flora and fauna around the vicinity of the proposed site, the EIA coordinator shall strive to educate the local students on the importance of preserving local flora and fauna by involving them in the study, wherever possible.	The EIA coordinator and the FAE for ecology and biodiversity visited the study area and educated the local students about the importance of protecting the biological environment.
29	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	A detailed greenbelt development plan has been provided in Section 4.6 under Chapter IV, pp.119-124.

	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.	
30	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/Horticulture 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.
31	A Disaster management plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.	A disaster management plan for the project has been provided in Section 7.3 under Chapter VII, pp.138-141.
32	A Risk Assessment and management plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.	A risk assessment plan for the project has been provided in Section 7.2 under Chapter VII, pp.135-137.
33	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	Occupational health impacts of the project and preventive measures have been discussed in detail in Section 4.8 under Chapter IV, pp.125 & 126.

	in the mining area may be detailed.	
34	Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.	No public health implications are anticipated due to this project. Details of CSR and CER activities have been discussed in Sections 8.6 and 8.7 under Chapter VIII, pp.150 & 151.
35	The Socio-economic studies should be carried out within a 5 km buffer zone from the mining activity. Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.	No negative impact on socio-economic environment of the study area is anticipated and this project shall benefit the socio-economic environment by offering employment for 14 people directly as discussed in Section 8.1 under Chapter VIII, p.149.
36	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.
37	Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.	Benefits of the project details have been given under Chapter VIII, pp.149-151.
38	If any quarrying operation were carried out in the proposed quarrying site for which now the EC is sought, the Project Proponent shall furnish the detailed compliance to EC conditions given in the previous EC with the site photographs which shall duly be certified by MoEF & CC, Regional Office, Chennai (or) the	CCR will be submitted during appraisal of final EIA.

	concerned DEE/TNPCB.	
39	The PP Shall prepare the EMP for the entire life/lease period of mine and also Furnish the sworn affidavit starting to Abide the EMP for the entire life of mine.	A detailed environment management plan has been prepared following the suggestion made by SEAC, as shown in Chapter X, pp.153-170. The sworn affidavit stating to abide the EMP for the entire life of mine will be submitted along with final EIA.
40	Concealing any factual information or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this Terms of Conditions besides attracting penal provisions in the Environment (Protection) Act' 1986.	The EIA report has been prepared keeping in mind the fact that concealing any factual information or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may lead to withdrawal of this terms of reference besides attracting penal provisions in the Environment (Protection) Act, 1986.
	The subject was placed in the 617 th authority meeting held on 15.05.2023. The authority noted that the subject was appraised in the 370 th SEAC meeting held on 25.04.2023. After detailed discussions, the Authority accepts the recommendation of SEAC and decided 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 following and the conditions mentioned in 'Annexure B' of this minute.	
i	The proponent shall take appropriate measures to comply all the non-compliance conditions mentioned in the Certified Compliance Report dated 28.12.2022 obtained from IRO of MoEF&CC for the EC issued earlier dated.23.04.2013	The details will be submitted in the final EIA report.
	Annexure 'B'	
1	Cluster Management Committee shall be	A cluster management committee

	framed which must include all the proponents in the cluster as members including the existing as well as proposed quarry.	including all the proponents of the rough stone quarrying projects within the cluster of 500 m radius will be constituted for the effective implementation of green belt development plan, water sprinkling, blasting, etc.
2	The members must coordinate among themselves for the effective implementation of EMP as committed including Green Belt Development Water sprinkling, tree plantation, blasting etc.,	The members of the cluster management committee will be instructed to carry out EMP in coordination.
3	The List of members of the committee formed shall be submitted to AD/Mines before the execution of mining lease and the same shall be updated every year to the AD/Mines.	The list of members of the committee formed will be submitted to AD/Mines before the execution of mining lease.
4	Detailed Operational Plan must be submitted which must include the blasting frequency with respect to the nearby quarry situated in the cluster, the usage of haul roads by the individual quarry in the form of route map and network.	All the information has been discussed in Section 2.6 & 2.7 under Chapter II, pp.20-29.
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	It will be advised to the cluster management committee to practice sustainable mining in a scientific and systematic manner in accordance with the

	law. The role played by the committee in implementing the environmental policy devised shall be given in detail.	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	The committee shall furnish an action plan to achieve sustainable development goals with reference to water, sanitation & safety.	A proper action plan with reference to water, sanitation & safety will be devised and submitted by the committee to the respective authority.
11	The committee shall furnish the fire safety and evacuation plan in the case of fire accidents.	The committee will submit the fire safety and evacuation plan as discussed in Section 7.3 under Chapter VII, pp.138-141.
Impact study of Mining		
12	Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area covering the entire mine lease period as per precise area communication order issued from reputed research institutions on the following	
	a) Soil health & soil biological, physical land chemical features.	The study is under process. The results will be updated in the final EIA report.
	b) Climate change leading to Droughts, Floods etc.	
	c) Pollution leading to release of Greenhouse gases (GHG), rise in Temperature, & Livelihood of the local	

	People.	
	d) Possibilities of water contamination and impact on aquatic ecosystem health.	
	e) Agriculture, Forestry, & Traditional practices.	
	f) Hydrothermal/Geothermal effect due to destruction in the Environment.	
	g) Bio-geochemical processes and its foot prints including environmental stress.	
	h) Sediment geochemistry in the surface streams.	
Agriculture & Agro-Biodiversity		
13	Impact on surrounding agricultural fields around the proposed mining area.	There shall be negligible air emissions or effluents from the project site. During loading the truck, dust generation will be likely. This shall be a temporary effect and not anticipated to affect the surrounding vegetation significantly, as shown in Section 4.6 under Chapter IV, pp.119-124.
14	Impact on soil flora & vegetation around the project site.	The details on flora have been provided in Section 3.5 under Chapter III, pp.70-90. There is no schedule I species of animals observed within study area as per Wildlife Protection Act, 1972 and no species falls in vulnerable, endangered or threatened category as per IUCN. There is no endangered red list species found in the study area.
15	Details of type of vegetations including no. of trees & shrubs within the proposed	Details of vegetation in the lease area have been provided in Section 3.5 under

	mining area shall be given and if so, transplantation of such vegetations all along the boundary of the proposed mining area shall committed mentioned in EMP.	Chapter III, pp.70-90. Details about transplantation of plants have been provided in Section 4.6 under Chapter IV, pp.119-124.
16	The Environmental Impact Assessment should study the biodiversity, the natural ecosystem, the soil micro flora, fauna and soil seed banks and suggest measures to maintain the natural Ecosystem.	The ecological details have been provided in Section 3.5 under Chapter III, pp.70-90 and measures have been provided in Section 4.6 under Chapter IV, pp.119-124.
17	Action should specifically suggest for sustainable management of the area and restoration of ecosystem for flow of goods and services.	All the essential environmental protective measures will be followed by the proponent to manage the surrounding environment and restore the ecosystem, as discussed in Chapter IV, pp.101-128.
18	The project proponent shall study and furnish the impact of project on plantations in adjoining patta lands, Horticulture, Agriculture and livestock.	The impact of project on the land environment has been discussed in Section 4.1 under Chapter IV, pp.101 & 102.
Forests		
19	The project proponent shall study on impact of mining on Reserve forests free ranging wildlife.	The project proponent shall do barbed wire fencing work and develop a green belt around the lease area to prevent wildlife from entering the site.
20	The Environmental Impact Assessment should study impact on forest, vegetation, endemic, vulnerable and endangered indigenous flora and fauna.	The impacts of the project on ecology and biodiversity have been discussed in Section 4.6 under Chapter IV, pp.119-124.
21	The Environmental Impact Assessment should study impact on standing trees and the existing trees should be numbered and action suggested for protection.	The impacts of the project on standing trees and the existing trees have been discussed in Section 4.6 under Chapter IV, pp.119-124.

22	The Environmental Impact Assessment should study impact on protected areas, Reserve Forests, National parks, corridors and wildlife pathways, near project site.	There are no protected areas, National Parks, environmentally sensitive areas Corridors and Wildlife pathways near project site. The list of RF details within 10 km radius has been provided in Table 3.36 under Chapter III, pp.97.
Water Environment		
23	Hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) so as to assess the impacts on the nearby waterbodies due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided, covering the entire mine lease period.	Detailed hydrogeological study was carried out. The results have been discussed Section 3.2 under Chapter III, pp.42-54.
24	Erosion control measures.	Garland drainage structures will be constructed around the lease area to control the erosion, as discussed in Section 4.3 under Chapter IV, pp.103 & 104.
25	Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area on the nearby villages, waterbodies/rivers & any ecological fragile areas.	The matter has been discussed under Chapter IV, pp.101-128.
26	The project proponent shall study impact	An analysis for food chain in aquatic

	on fish habitats and the food WEB/food chain in the water body and Reservoir.	ecosystem has been discussed in Section 4.6 under Chapter IV, pp.119-124.
27	The project proponent shall study and furnish the details on potential fragmentation impact on natural environment, by the activities.	The impacts of the proposed project on the surrounding environment have discussed in Chapter IV, pp.101-128.
28	The project proponent shall study and furnish the impact on aquatic plants and animals in water bodies and possible scars on the landscape, damages to nearby caves, heritage site, and archaeological sits possible land form changes visual and aesthetic impacts.	The impact of the proposed project on aquatic plants and animals in water bodies has been discussed in Section 4.6 under Chapter IV, pp.119-124.
29.	The Terms of Reference should specifically study impact on soil health, soil erosion, the soil physical, chemical components.	The impact of mining on soil environment has been discussed in Section 4.2 under Chapter IV, pp.102 & 103.
30	The Environmental Impact Assessment should study on wetlands, water bodies, rivers streams, lakes and farmer sites.	The impacts on water bodies, streams, lakes have been discussed in Section 4.3 under Chapter IV, pp.103 & 104.
Energy		
31	The measures taken to control Noise, Air, water, Dust control and steps adopted to efficiently utilise the Energy shall be furnished.	The measures taken to control noise, air, water, and dust have been given under Chapter IV, pp.101-128.
Climate Change		
32	The Environmental Impact Assessment shall study in detail the carbon emission and also suggest the measures to mitigate carbon emission including development of carbon sinks and temperature reduction including control of other emission and	The carbon emission and the measures to mitigate carbon emission have been discussed in Section 4.6 under Chapter IV, pp.119-124.

	climate mitigation activities.	
33	The Environmental Impact Assessment should study impact on climate change, temperature rise, pollution and above soil & below soil carbon stock.	The information will be included in the final EIA report.
Mine Closure Plan		
34	Detailed Mine closure plan covering the entire mine lease period as per precise area communication order issued.	A progressive mine closure plan has been attached with the approved mining plan report in Annexure III. The budget details for the progressive mine closure plan are shown in Table 2.9 under Chapter II, p.23.
EMP		
35	Detailed Environment Management plan along with adaptation, mitigation & remedial strategies covering the entire mine lease period as per precise area communication order issued.	A detailed Environment Management plan has been given under Chapter X, pp.153-170.
36	The Environmental Impact Assessment should hold detailed study on EMP with budget for green belt development and mine closure plan including disaster management plan.	A detailed Environment Management plan has been given in Tables 10.9 & 10.10 under Chapter X, pp.164-170.
Risk Assessment		
37	To furnish risk assessment and management plan including anticipated vulnerabilities during operational and post operational phases of Mining.	The risk assessment and management plan for this project has been provided in Section 7.2 under Chapter VII, pp.135-137.
Disaster Management Plan		
38	To furnish disaster management plan and disaster mitigation measures in regard to all aspects to avoid/reduce vulnerability to	The disaster management plan for this project has been provided in Section 7.3 under Chapter VII, pp.138-141.

	hazards & to cope with disaster/untoward accidents in & around the proposed mine lease area due to the proposed method of mining activity & its related activities covering the entire mine lease period as per precise area communication order issued.	
Others		
39.	The project proponent shall furnish VAO certificate with reference to 300 m radius regard to approved habitations, schools, Archaeological sites, structures, railway lines, roads, water bodies such as streams, odai, vaari, canal, river, lake pond, tank etc.	The VAO certificate of 300 m radius is attached in the Annexure IV, p.299
40	As per the MoEF & CC office memorandum F.No.22-65/2017-IA.III dated: 30.09.2020 and 20.10.2020 the proponent shall address the concerns raised during the public consultation and all the activities proposed shall be part of the Environment Management plan.	The concerns raised during the public consultation and all the activities proposed will be updated in the final EIA report.
41	The project proponent shall study and furnish the possible pollution due to plastic and microplastic on the environment. The ecological risks and impacts of plastic & microplastics on aquatic environment and fresh water systems due to activities, contemplated during mining may be investigated and reported.	The matter on plastic waste management has been given in Section 7.5 under Chapter VII, p.146.
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	Not applicable. This is not a violation category project. This proposal falls under B1 category.

	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.	The proposed site for quarrying is a private land. A copy of the document showing that the proponent is the rightful lessee has been enclosed along with the approved mining plan in Annexure III.
3.	All documents including approved mine plan, EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, 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 the annexure part.
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, p.13 under Chapter II.
5.	Information should be provided in Survey of India Toposheet in 1:50,000 scale indicating geological map of the area, geomorphology of land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics.	Toposheets of Survey of India have been used for showing sampling locations of air, soil, water, and noise, as shown in Chapter III.

6.	Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority.	The lease area was inspected by the officers of Department of Geology along with revenue officials and found that the land is fit for quarrying under the policy of State Government.
7.	It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the 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, p.153 & 154.
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. The rough stone formation is a hard, compact and homogeneous body. The height and width of the bench will be maintained as 5m with 90 ⁰ bench angles. Quarrying activities will be carried out under the supervision of Competent Persons like Mines Manager, Mines

		Foreman and Mining Mate. Necessary permissions will be obtained from DGMS after obtaining Environmental Clearance.
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.	The study area considered for this study is of 5 km radius for air, soil, water, and noise level sample collections, while the study area is 10 km radius for ecology and biodiversity studies and all data contained in the EIA report such as waste generation 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, pp.31-41 under Chapter III. The details of surrounding sensitive ecological features have been provided in Table 3.36 under Chapter III, p.97. Land use plan of the project area showing pre-operational, operational and post-operational phases are discussed in Table 2.8 under Chapter II, p.23.
11.	Details of the land for any over burden dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given	It is not applicable as no dumps have been proposed outside the lease area. The entire quarried out rough stone will be transported to the needy customers.
12.	Certificate from the Competent Authority in the State Forest Department should be	It is not applicable as there is no forest land involved within the proposed project

	<p>provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.</p>	<p>area. The details have been discussed in Table 3.36 under Chapter III, p.97.</p>
13.	<p>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.</p>	<p>It is not applicable as the proposed project area does not involve any forest land.</p>
14.	<p>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.</p>	<p>Not Applicable.</p> <p>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.</p>
15.	<p>The vegetation in the RF / PF areas in the study area, with necessary details, should</p>	<p>No Reserve Forest is found within the study area. The matter has been discussed</p>

	be given.	Table 3.36 under Chapter III, pp.97.
16.	A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly, detailed mitigative measures required, should be worked out with cost implications and submitted.	There is no any wildlife/protected area within 10 km radius from the periphery of the project area. Information regarding the same has been given in Table 3.36 under Chapter III, p.97.
17.	Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves/(existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished	There are No National Parks, Biosphere Reserves, Wildlife Corridors, and Tiger/Elephant Reserves within 10 km radius from the periphery of the project area. Information regarding the same has been given in Table 3.36 under Chapter III, p.97.
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	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.70-90

	<p>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.</p>	
19.	<p>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.</p>	<p>Not Applicable. Project area / Study area is not declared in 'Critically Polluted' Area and does not come under 'Aravalli Range.</p>
20.	<p>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).</p>	<p>Not Applicable The project doesn't attract the C.R.Z. Notification, 2018.</p>
21.	<p>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</p>	<p>Not Applicable. There are no approved habitations of SCs/STs and other weaker sections in the lease area. Therefore, R&R Plan /</p>

	<p>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.</p>	<p>Compensation Plan for the Project Affected People (PAP) are not provided.</p>
22.	<p>One season (non-monsoon) [i.e., March-May (Summer Season); October-December (post monsoon season); December-February (winter season)] primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind</p>	<p>Baseline data were collected for the period of October 2022 - December 2022 as per CPCB notification and MoEF & CC Guidelines. Primary baseline data and the results have been included in Sections 3.1-3.8 under Chapter III, pp. 31-100.</p>

	direction. The mineralogical composition of PM10, particularly for free silica, should be given.	
23.	Air quality modelling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of mineral. 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.	Air quality modelling for prediction of incremental GLCs of pollutants was carried out using AERMOD view 11.2.0. The model results have been given in Section 4.4 under the Chapter IV, pp.104-114.
24.	The water requirement for the project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the project should be indicated.	The water requirement for the project, its availability and source have been provided in Table 2.11 under Chapter II, p.27.
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	Part of the working pit will be allowed to collect rain water during the spell of rain.

	should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.	The water thus collected will be used for greenbelt development and dust suppression. The mine closure plan has been prepared for converting the excavated pit into rain water harvesting structure and serve as water reservoir for the project village during draught season.
27.	Impact of the Project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided.	Impact studies and mitigation measures of water environment including surface water and ground water have been discussed in Section 4.3 under Chapter IV, pp. 103 & 104.
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.	Not Applicable. The ground water table is found at the depth of 50-60 m below ground level. The ultimate depth of quarry is 35 m BGL. Therefore, the mining activity will not intersect the ground water table. Data regarding the occurrence of groundwater table have been provided in Section 3.2 under Chapter III, pp.42-54.
29.	Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion proposed, if any, and the impact of the same on the hydrology should be brought out.	Not Applicable. There are no streams, seasonal or other water bodies passing within the project area. Therefore, no modification or diversion of water bodies is anticipated.

30.	Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and BGL. A schematic diagram may also be provided for the same.	The highest elevation of the project area is 176 m AMSL. Ultimate depth of the mine is 35 m BGL. Depth to the water level in the area is 50-60 m BGL.
31.	A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution.	Greenbelt development plan has been given in Section 4.6 under Chapter IV, pp.119-124.
32.	Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those outside the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as	Traffic density survey was carried out to analyse the impact of transportation in the study area as per IRC guidelines 1961 and it is inferred that there is no significant impact due to the proposed transportation from the project area. Details have been provided in Section 3.7 under Chapter III, pp.94 - 96.

	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.	Infrastructure & other facilities will be provided to the mine workers after the grant of quarry lease and the same has been discussed in Section 2.6.6 under Chapter II, p.27.
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 2.6.4 under Chapter II, p.23.
35.	Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.	Occupational health impacts of the project and preventive measures have been explained in detail in Section 4.8 under Chapter IV, pp.125 & 126.
36.	Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.	No public health implications are anticipated due to this project. Details of CSR and CER activities have been discussed in Sections 8.6 and 8.7 under Chapter VIII, pp.150 & 151.
37.	Measures of socio-economic significance and influence to the local community proposed to be provided by the Project	No negative impact on socio-economic environment of the study area is anticipated and this project shall benefit

	Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.	the socio-economic environment by offering employment for 14 people directly as discussed in Section 8.1 under Chapter VIII, p.149.
38.	Detailed environmental management plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project.	A detailed Environment Management Plan has been prepared and provided in Tables 10.9 & 10.10 under Chapter X, pp.164-170.
39.	Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project.	The outcome of public hearing will be updated in the final EIA/EMP report.
40.	Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.	No litigation is pending in any court against this project.
41	The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.	Project Cost is Rs. 28,86,700/- CER Cost is Rs. 5,00,000/- In order to implement the environmental protection measures, an amount of Rs.2699506 as capital cost and recurring cost as Rs.1455746 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.10820773, as shown in Tables 10.9 & 10.10 under Chapter X, pp.164-

		170.
42	A disaster management Plan shall be prepared and included in the EIA/EMP Report.	The disaster management plan for this project has been provided in Section 7.3 under Chapter VII, pp.138-141.
43.	Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.	Benefits of the project details have been given under Chapter VIII, pp.149-151.
44.	Besides the above, the below mentioned general points are also to be followed:	
a)	Executive Summary of the EIA/EMP Report	Executive summary has been enclosed as a separate booklet.
b)	All documents to be properly referenced with index and continuous page numbering.	All the documents have been properly referenced with index and continuous page numbering.
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 included in the final EIA report.
e)	Where the documents provided are in a language other than English, an English translation should be provided.	All the documents provided here are in English language.
f)	The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted.	The questionnaire will be enclosed along with final EIA/EMP report.
g)	While preparing the EIA report, the instructions for the Proponents and	Instructions issued by MoEF & CC O.M. No. J-11013/41/2006-IA. II (I) dated 4th

	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.	August, 2009 have been followed while preparing the EIA report.
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 report of the status of compliance of the conditions will be submitted along with final EIA report.
j)	The EIA report should also include (i) surface plan of the area indicating contours of main topographic features, drainage and mining area, (ii) geological maps and sections and (iii) sections of the mine pit and external dumps, if any, clearly showing the land features of the adjoining area.	All the plans including surface & geological plans, and progressive closure plan have been included in Annexure III, pp.215-298

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CHAPTER I

INTRODUCTION

1.0 PREAMBLE

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

In compliance with ToR obtained vide Letter No. **SEIAA-TN/F.No.9653/ToR-1458/2023 dated 15.05.2023**. this EIA report has been prepared for the project proponent, Thiru.P. Devaraj applied for rough stone and gravel quarry lease in the Patta land falling in S.F.No.104/1,104/2A(Part),104/2B1 (Part),105/1A(Part) and 105/2 over an extent of 2.27.5 ha in Kuppam Village, Pugalur Taluk, Karur District and Tamil Nadu. This EIA report takes into account the rough stone quarries within the cluster of 500 m radius from the periphery of the proposed project site. The cluster contains two proposed projects, known as P1 and P2 and one existing project known as E1 and two expired projects known as EX1 and EX2. All the projects mentioned above have been taken for cluster extent calculation as per MoEF & CC Notification S.O. 2269 (E) Dated 1st July 2016. The total extent of all the quarries is **11.46.5 ha**, also known as the cluster extent. The quarries involved in the calculation of cluster extent are shown in Figure 1.1.

Table 1.1 Details of Quarries within the cluster area of 500 m radius

Proposed Quarries				
Code	Name of the Owner	S.F. No/ Village	Extent (ha)	Status
P1	Thiru.P. Devaraj	104/1, 104/2A(Part), 104/2B1(Part), 105/1A(Part) & 105/2 Kuppam	2.27.5	Proposed Area
P2	Thiru.N. Sakthivel	105/1B(P), 112/1A(P), 112/2A(P) Kuppam	3.87.0	Applied Area
Existing Quarry				
E1	Thiru.M.Arunachalam	104/2B2, 104/2B3 Kuppam	1.37.5	21.02.2018 to 20.02.2023
Expired Quarries				
EX1	Tmt. T.Sathiya	1287/1, 1287/3 Kuppam	1.83.0	31.07.2017 To 30.07.2022
EX2	Thiru.P.Marappan	74, 75/3B Kuppam	2.11.5	14.10.2016 To 13.10.2021
Total Cluster Extent			11.46.5	---

Source:

DD Letter - Rc.No.743/Mines/2019, Dated:05.12.2022.

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 **October-December, 2022** according to the provisions of MoEF & CC Office Memorandum dated 29.08.2017 and MoEF & CC Notification, S.O. 996 (E) dated 10.04.2015, to analyse impacts and provide mitigation measures.

1.2 ENVIRONMENTAL CLEARANCE

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

Screening

Screening is the first stage of the EIA process. In this stage, the State level Expert Appraisal Committee (SEAC) examined the application of EC made by the proponent in Form 1 through online (Proposal No. SIA/TN/ MIN/407980/2022, dated 12.12.2022) and decided that the project requires detailed environmental studies for the preparation of EIA report. Therefore, the proponent submitted application for Terms of Reference (ToR) on 20.12.2022.

Scoping

The proposal was placed in the 370th meeting of SEAC on 25.04.2023. Based on the presentation and documents furnished by the project proponent, SEAC decided to recommend the proposal for the grant of Terms of Reference (ToR) and the recommendation for ToR is subjected to the outcome of the Honourable NGT, Principal Bench, New Delhi (O.A No.186 of 2016 (M.A.No.350/2016) and O.A. No.200/2016 and O.A.No.580/2016 (M.A.No.1182/2016) and O.A.No.102/2017 and O.A.No.404/2016 (M.A.No. 758/2016, M.A.No.920/2016, M.A.No.1122/2016, M.A.No.12/2017 & M.A. No. 843/2017) and O.A.No.405/2016 and O.A.No.520 of 2016 (M.A.No. 981/2016, M.A.No.982/2016 & M.A.No.384/2017).

Public Consultation

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

Appraisal

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

1.3 TERMS OF REFERENCE (ToR)

The SEAC framed a comprehensive Terms of Reference (TOR) based on the information provided in the Form 1 and information collected from the proposed project site visit and issued TOR to the proponent vide **Letter No: SEIAA-TN/F.No.9653/ToR-1458/2023 Dated:15.05.2023 for the preparation of an EIA report.**

1.4 POST ENVIRONMENT CLEARANCE MONITORING

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

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

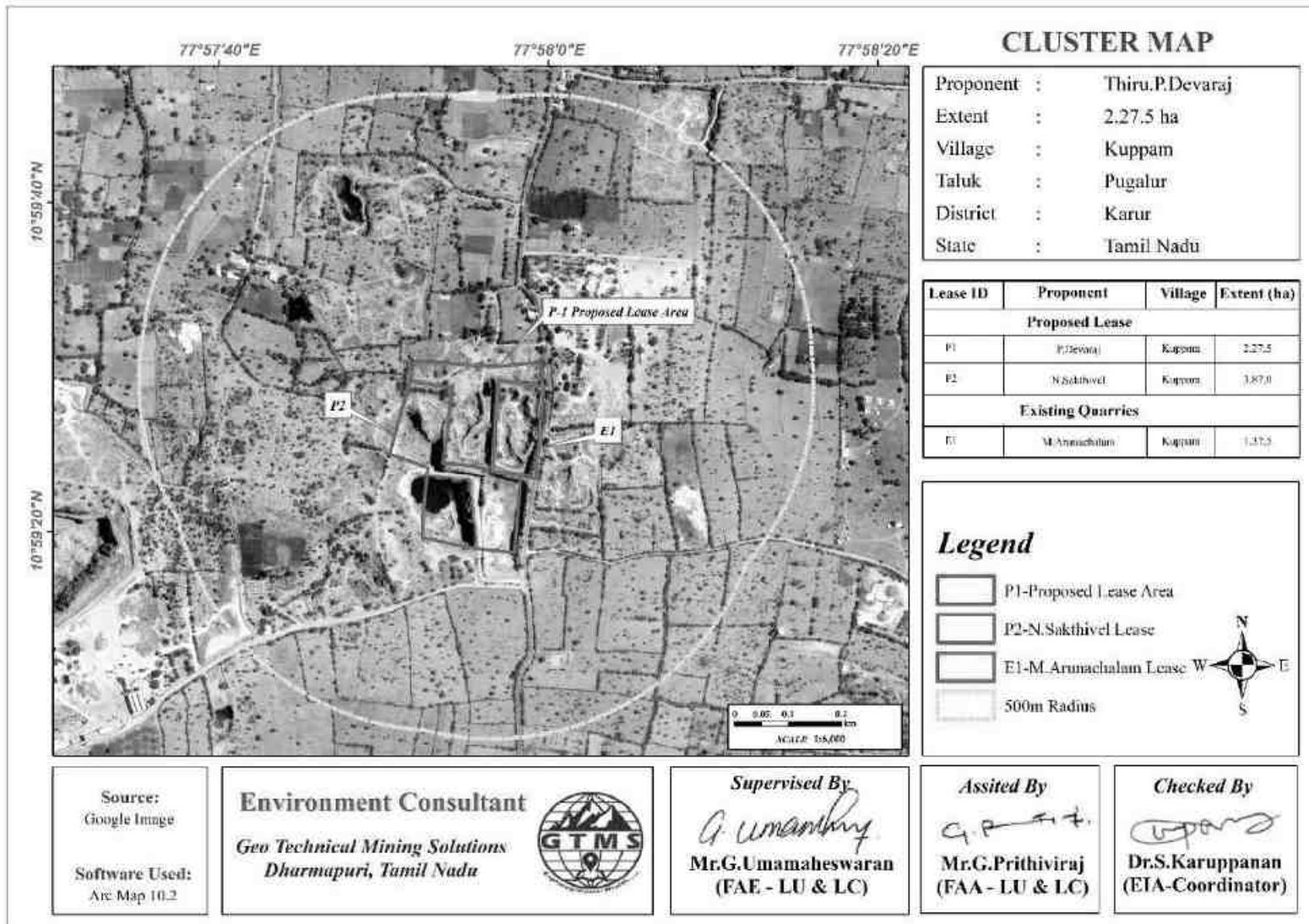


Figure 1.1 Location of the proposed and existing rough stone and gravel quarries in the cluster of 500 m radius

1.5 TRANSFERABILITY OF ENVIRONMENTAL CLEARANCE

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

1.6 GENERIC STRUCTURE OF EIA DOCUMENT

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

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

1.7 IDENTIFICATION OF THE PROJECT PROPONENT

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

Table 1.2 Details of Project Proponent

Name of the Project Proponent	Thiru. P. Devaraj
Address	S/o. Pitchaimuthu, Pullaiyampalayam, Punnamchatram Post, Pugalur Taluk, Karur-639 136.
Status	Proprietor

1.8 BRIEF DESCRIPTION OF THE PROJECT

The proposed project deals with excavation of rough stone and gravel which is primarily used in construction projects. The method adopted for rough stone and gravel excavation is open cast manual mining method involving formation of benches with 5 m height and 5 m width. The proposed project site is located in Kuppam Village, Pugalur Taluk, Karur District, and Tamilnadu State. Some of the important features of the proposed project have been provided in Table 1.3.

Table 1.3 Salient Features of the Proposed Project

Name of the Quarry	Thiru. P. Devaraj Rough Stone and Gravel Quarry			
Type of Land	Patta Land			
Extent	2.27.5 Ha			
S.F. No	104/1, 104/2A(Part), 104/2B1(Part), 105/1A(Part) & 105/2			
Toposheet No	58-F/13			
Latitude	10°59'23.69"N to 10°59'30.32"N			
Longitude	77°57'51.60"E to 77°57'59.63"E			
Highest Elevation	176 m AMSL			
Ultimate depth of Mining	35 m BGL			
Existing Pit Dimension	Pit Level	Length(m)	Width(m)	Depth(m)
	Level I	58	46	1
	Level II	90	14	5
	Level III	127	71	15
Geological Resources	Rough Stone in m ³		Gravel in m ³	
	586025		15550	
Mineable Reserves	Rough Stone in m ³		Gravel in m ³	
	106213		8136	
Proposed reserves for five years	Rough Stone in m ³		Gravel in m ³	
	106213		8136	
Method of Mining	Open cast manual mining			
Topography	Undulated Topography			
Machinery proposed	Jack Hammer		4	
	Compressor		2	
	Hydraulic Excavator		1	

Blasting Method	Controlled blasting method involving shot hole drilling and slurry explosives of 25 mm diameter is proposed for removal of rough stone.
Proposed Manpower Deployment	14
Project Cost	Rs.15,50,000
CER Cost	Rs. 5,00,000
Proposed Water Requirement	1.7 KLD

1.9 SCOPE OF THE STUDY

The main scope of the EIA study is to quantify the cumulative impact of the quarries in the cluster on the study area and formulate the effective mitigation measures for each individual lease. A detailed account of the emission sources, emissions control equipment, background air quality levels, meteorological measurements, dispersion model and all other aspects of pollution like effluent discharge, and dust generation has been provided in this report. The baseline monitoring study has been carried out during the period of **October-December, 2022** for various environmental components such as land, soil, air, water, noise, ecology, etc. to assess the anticipated impacts of the cluster quarry projects on the environment and suggest suitable mitigation measures for likely adverse impacts due to the proposed project. The sampling methodologies for the various environmental parameters required for the study, frequency of sampling, method of sample analysis, etc., are given in Table 3.1 in chapter III.

1.10 REFERENCES

The report has been prepared using the following references:

- ❖ Guidance Manual of Environmental Impact Assessment for Mining of Minerals, Ministry of Environment and Forests, February, 2010
- ❖ EIA Notification, 14th September, 2006
- ❖ Terms of Reference (ToR) issued by SEIAA.
- ❖ Approved Mining Plan of this Project.
- ❖ The Water (Prevention and Control of Pollution) Act, 1974
- ❖ The Air (Prevention and Control of Pollution) Act, 1981
- ❖ The Environment (Protection) Act, 1986
- ❖ The Forest (Conservation) Act, 1988
- ❖ The Wildlife (Protection) Act, 1972

CHAPTER II

PROJECT DESCRIPTION

2.0 GENERAL INTRODUCTION

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

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

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

2.1 DESCRIPTION OF THE PROJECT

The proponent, **Thiru. P. Devaraj** is involved in the undertaking of establishment, construction, development, and closure of opencast mines. He, through the exploration phase, identified the proposed project site as the one that has a great potential of producing an economically viable quantity of rough stone and gravel. Therefore, the proponent had applied for quarry lease on 10.12.2019 to extract rough stone. The precise area communication letter was issued by Department of Geology and Mining, Karur vide Rc.No.743/Mines/2019, dated:15.09.2022. 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, Karur Rc.No.743/Mines/2019, dated:16.11.2022. The overall view of the project site is shown in Figure 2.1.



Figure 2.1 Overall View of Proposed Project Site

2.2 LOCATION AND ACCESSIBILITY

The proposed quarry project is located in Kuppam Village, Pugalur Taluk, Karur District, as shown in Figure 2.2 & 2.3. The area lies between Latitudes from $10^{\circ}59'23.69''\text{N}$ to $10^{\circ}59'30.32''\text{N}$ and Longitudes from $77^{\circ}57'51.60''\text{E}$ to $77^{\circ}57'59.63''\text{E}$. The maximum altitude of the project area is 176 m AMSL. Accessibility details to the proposed project site have been given in Table 2.1.

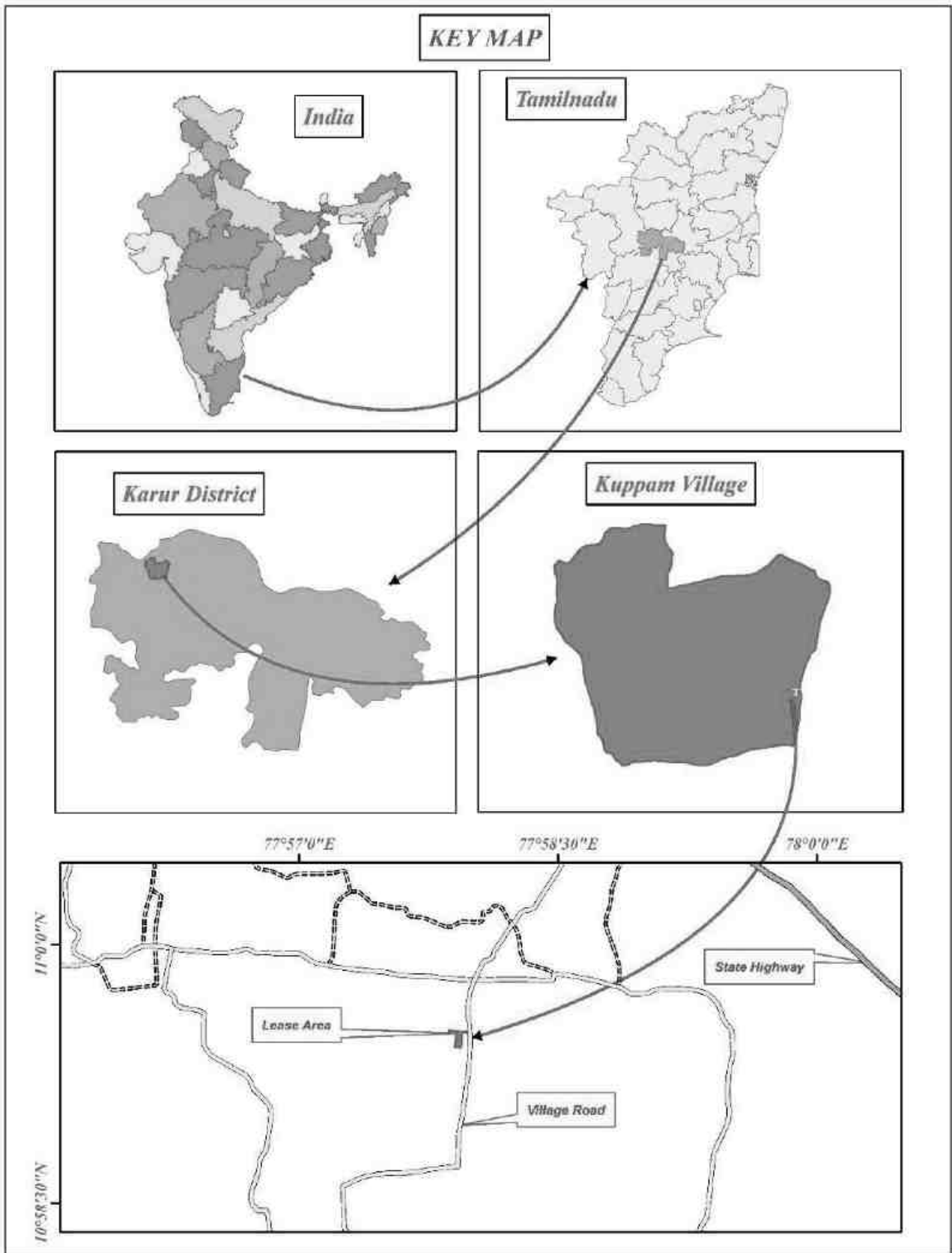


Figure 2.2 Key Map Showing Location of the Project Site

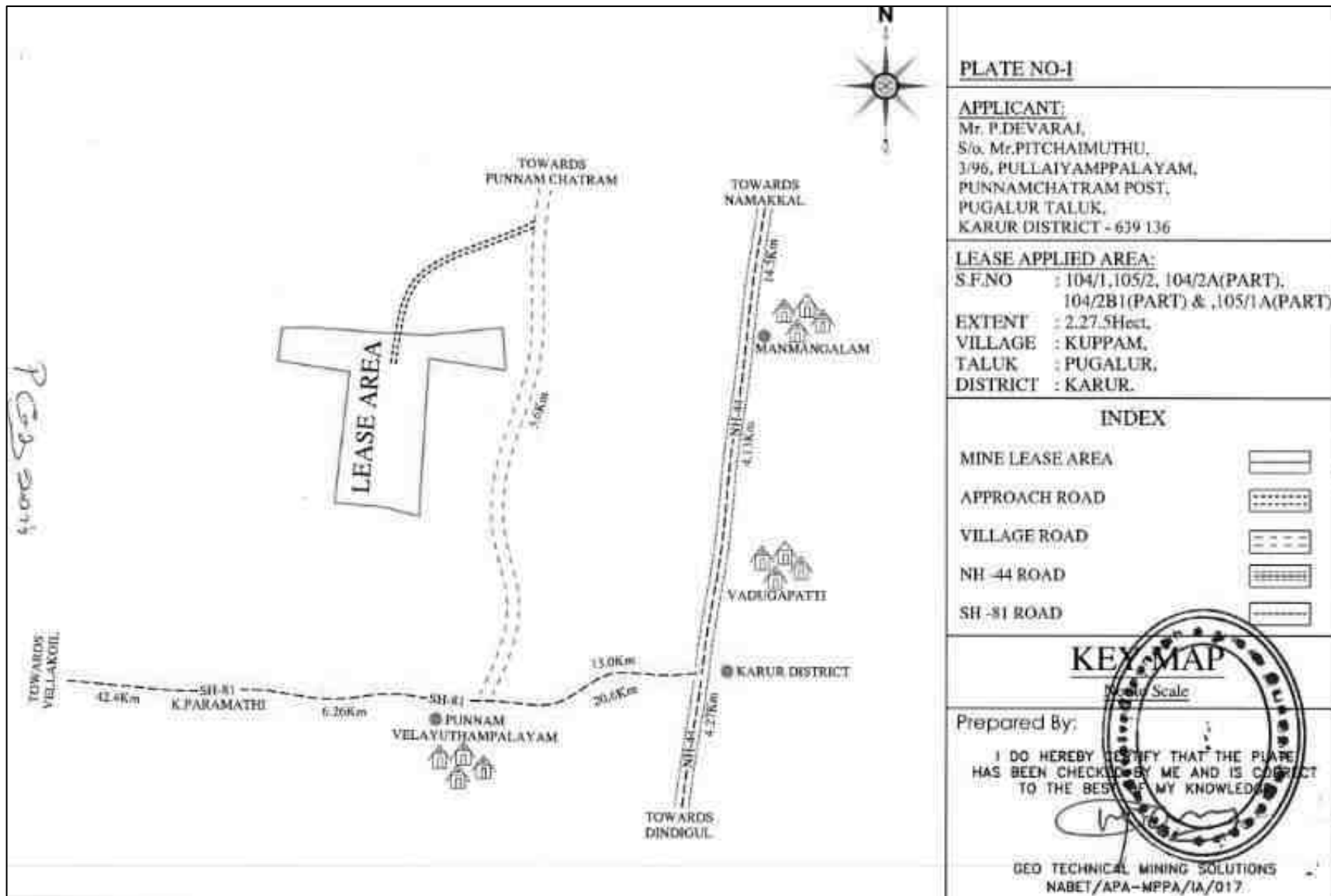


Figure 2.3 Site Connectivity Route of the Project Site

Table 2.1 Site Connectivity to the Project Area

Nearest Roadways	SH-84 Karur - Kodumudi	2.63 km N
	NH-81 Karur - Vellakoil	3.61 km S
Nearest Town	K.Paramathy	7.8 km SW
Nearest Railway Station	Pugalur	7.2km NE
Nearest Airport	Tiruchirappalli	85.0 km E
Nearest Seaport	Tuticorin	245.0 km S

2.3 LEASEHOLD AREA

- ❖ The extent of the proposed project site is 2.27.5 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.

2.3.1 Corner Coordinates

The boundary corner geographic coordinates are given in Table 2.2 and the proposed project site with boundary coordinates has been shown in Figure 2.4.

Table 2.2 Corner Coordinates of Proposed Project

Pillar ID	Latitude	Longitude	Pillar ID	Latitude	Longitude
1	10°59'30.32''N	77°57'59.54''E	7	10°59'28.54''N	77°57'54.12''E
2	10°59'28.82''N	77°57'59.63''E	8	10°59'28.76''N	77°57'54.15''E
3	10°59'29.23''N	77°57'56.94''E	9	10°59'29.15''N	77°57'51.60''E
4	10°59'23.69''N	77°57'56.59''E	10	10°59'30.31''N	77°57'51.76''E
5	10°59'24.01''N	77°57'55.31''E	11	10°59'30.32''N	77°57'52.90''E
6	10°59'24.16''N	77°57'53.61''E	12	10°59'30.09''N	77°57'55.80''E
			13	10°59'30.06''N	77°57'56.94''E

2.4 GEOLOGY

The lease area geologically occurs in Acid to Intermediate Charnockite. The Charnockite, commercially called as Roughstone occurs within the migmatite rock. Also, the lease area geomorphologically occurs over pediment pediplain complex.

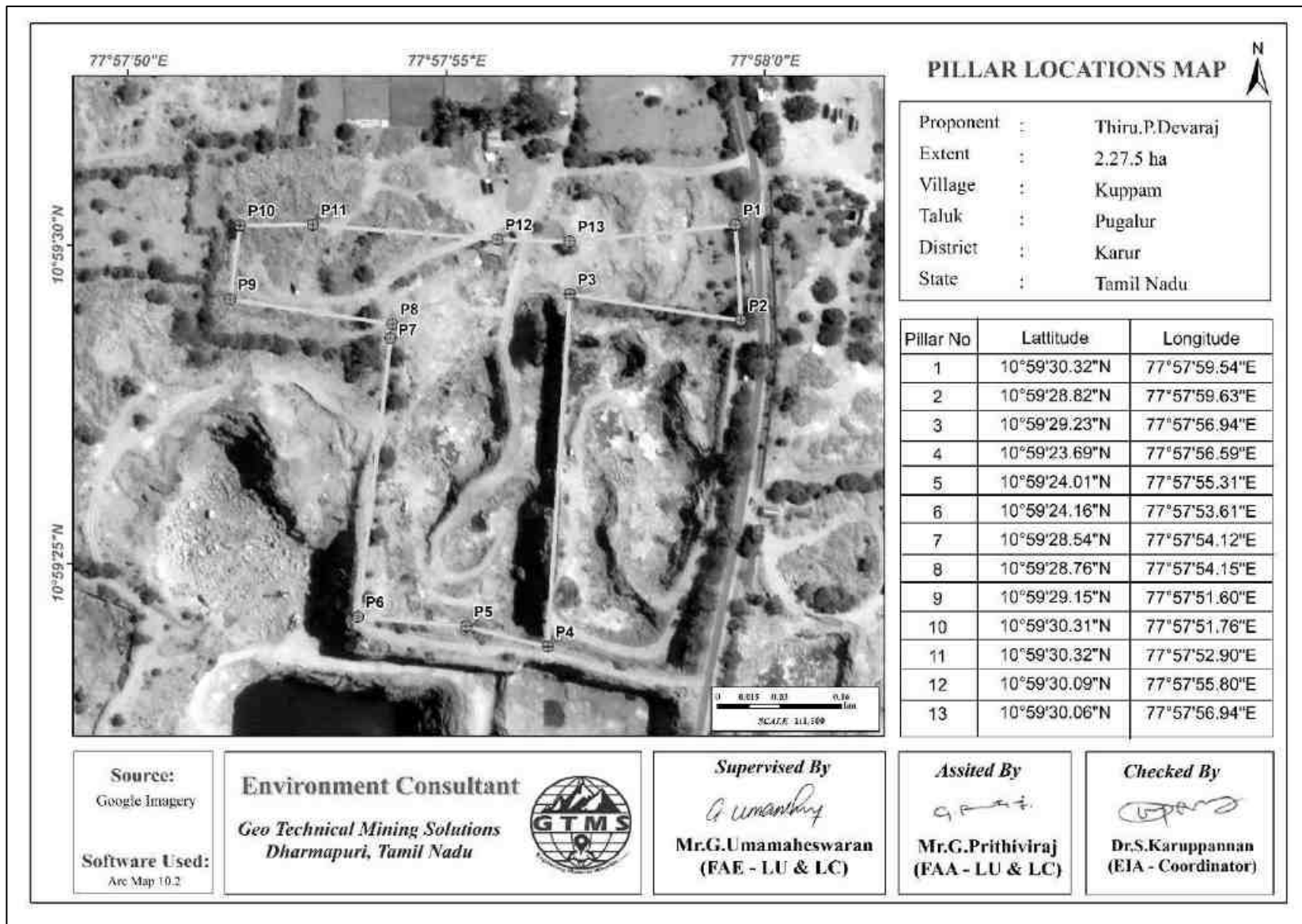


Figure 2.4 Google Earth Image Showing Lease Area with Pillars

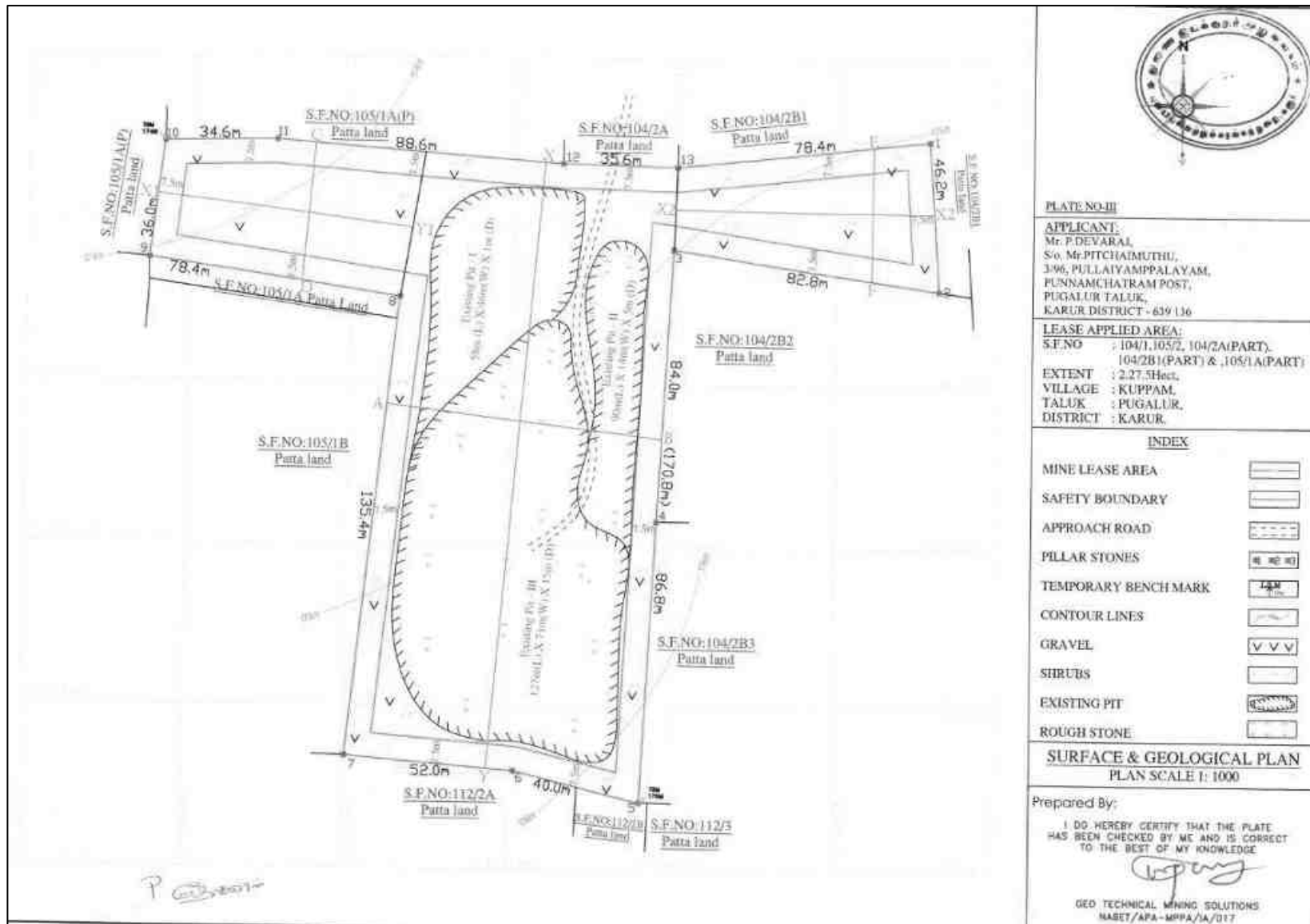


Figure 2.5 Surface and Geological Plan

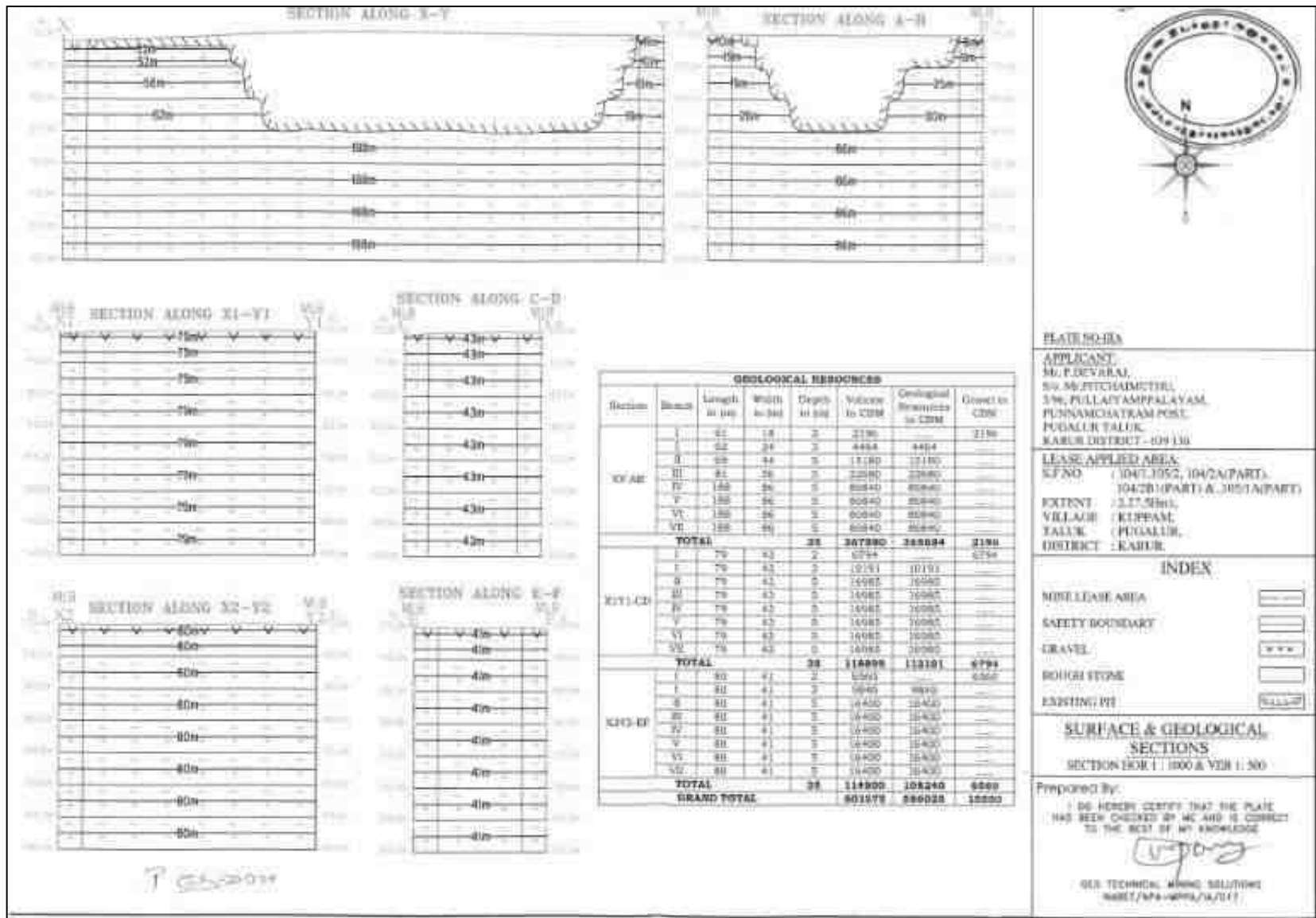


Figure 2.6 Surface and Geological Sections

2.5 QUANTITY OF RESERVES

The Resources and Reserves of Rough Stone were calculated based on cross-section method by plotting sections to cover the maximum lease area for the proposed project. Based on the availability of geological resources, the mineable reserves are calculated by considering excavation system of bench formation and leaving essential safety distance of 7.5 m and 10m safety distance as per precise area communication letter and deducting the locked-up reserves during bench formation (also called as Bench Loss). The mineable reserves are calculated up to the depth of 35 m considering there is no waste / overburden / side burden (100% Recovery anticipated) for the proposed project. The plate used for reserve estimation has been shown in Figure 2.5 and 2.6 and results of geological resources and reserves have been shown in Table 2.3

Table 2.3 Estimated Resources and Reserves of the Project

Resource Type	Rough stone in m ³	Gravel in m ³
Geological Resource in m ³	586025	15550
Mineable Reserves in m ³	106213	8136
Proposed production for 5 years m ³	106213	8136

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

Table 2.4 Year-Wise Production Details

Year	Rough Stone in (m ³)	Gravel in (m ³)
I	21943	8136
II	20500	--
III	24340	---
IV	20460	---
V	18970	---
Total	106213	8136

Source: Approved Mining Plan & ToR

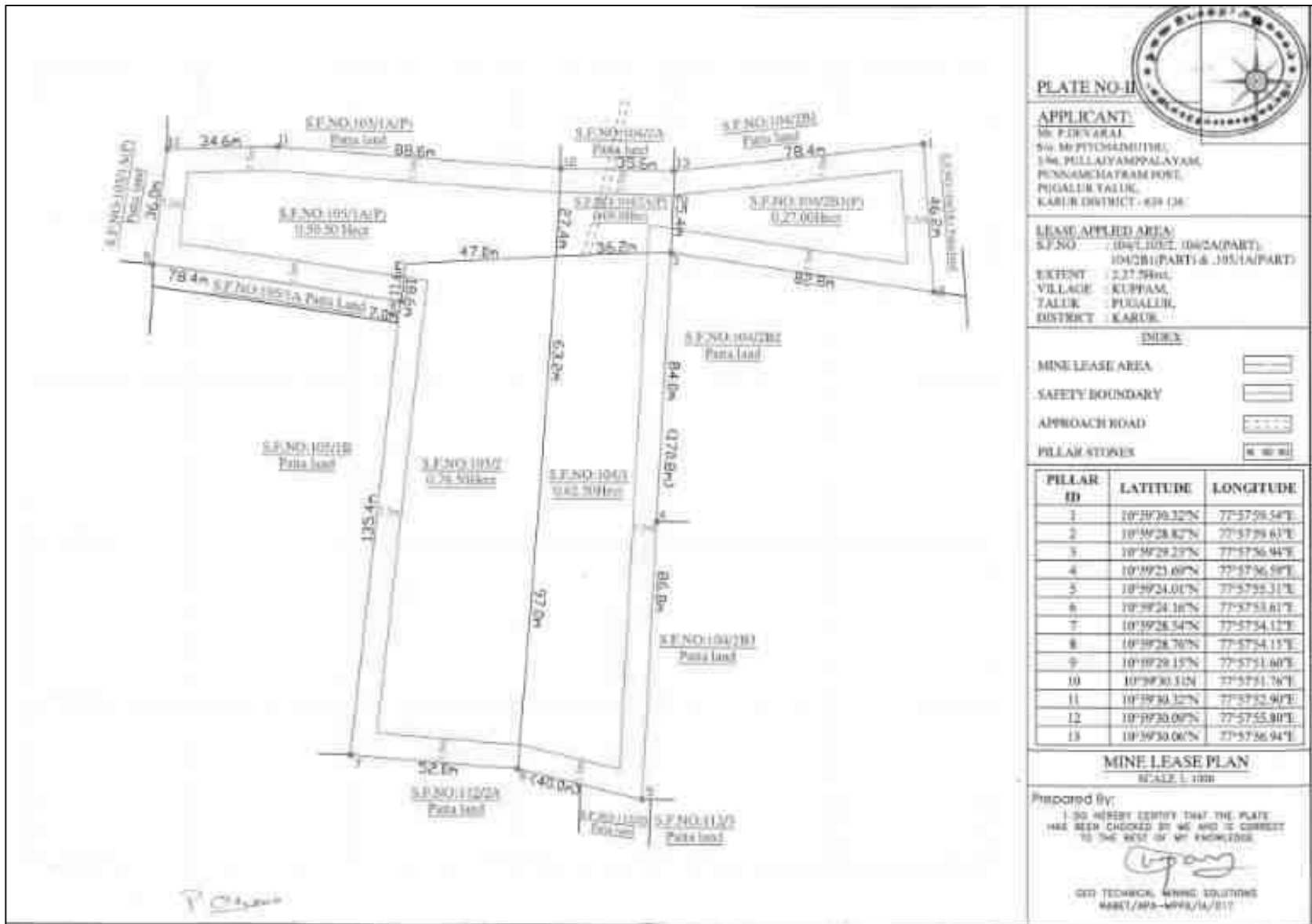


Figure 2.7 Mine Lease Plan

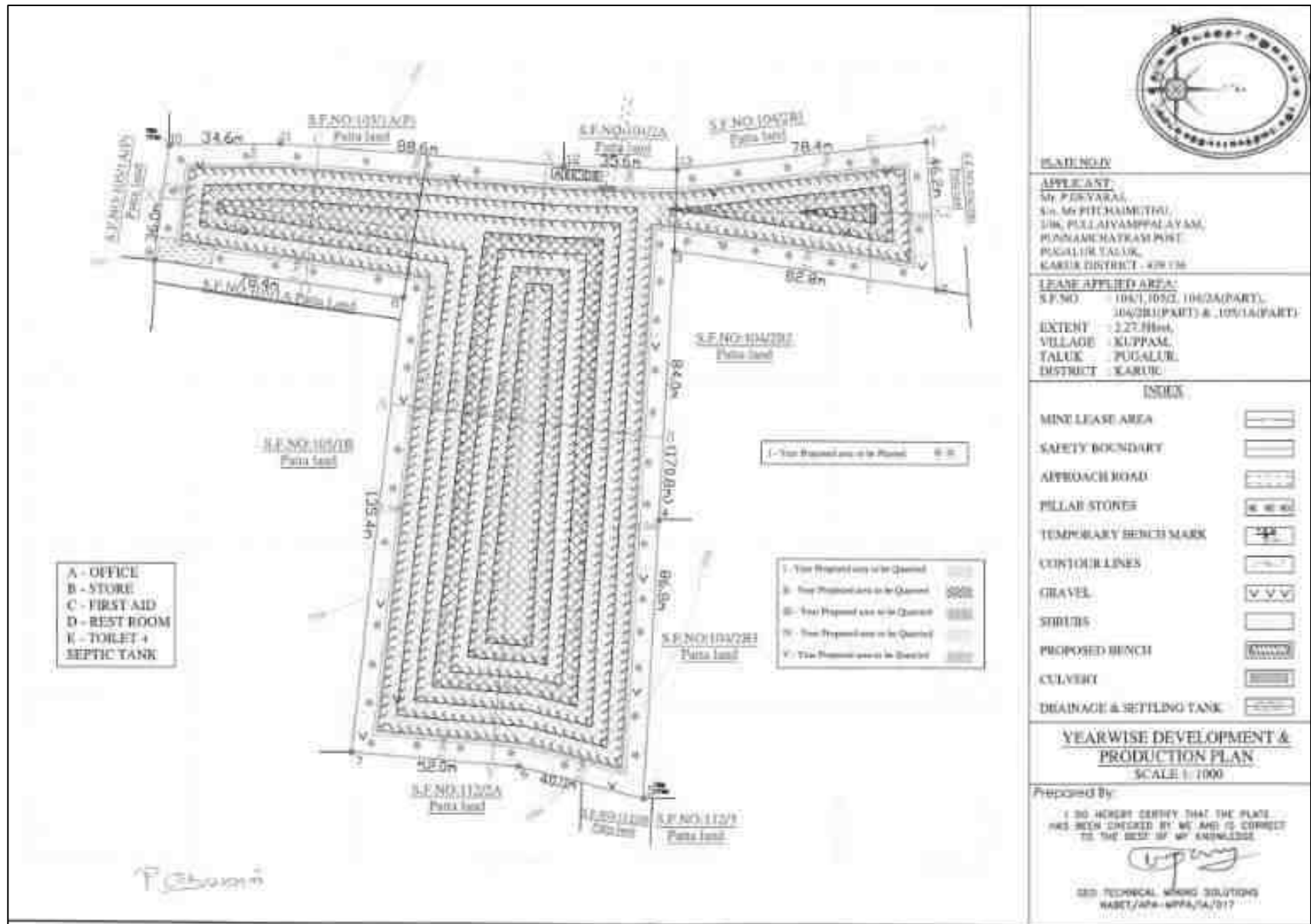


Figure 2.8 Yearwise Development and Production Plan

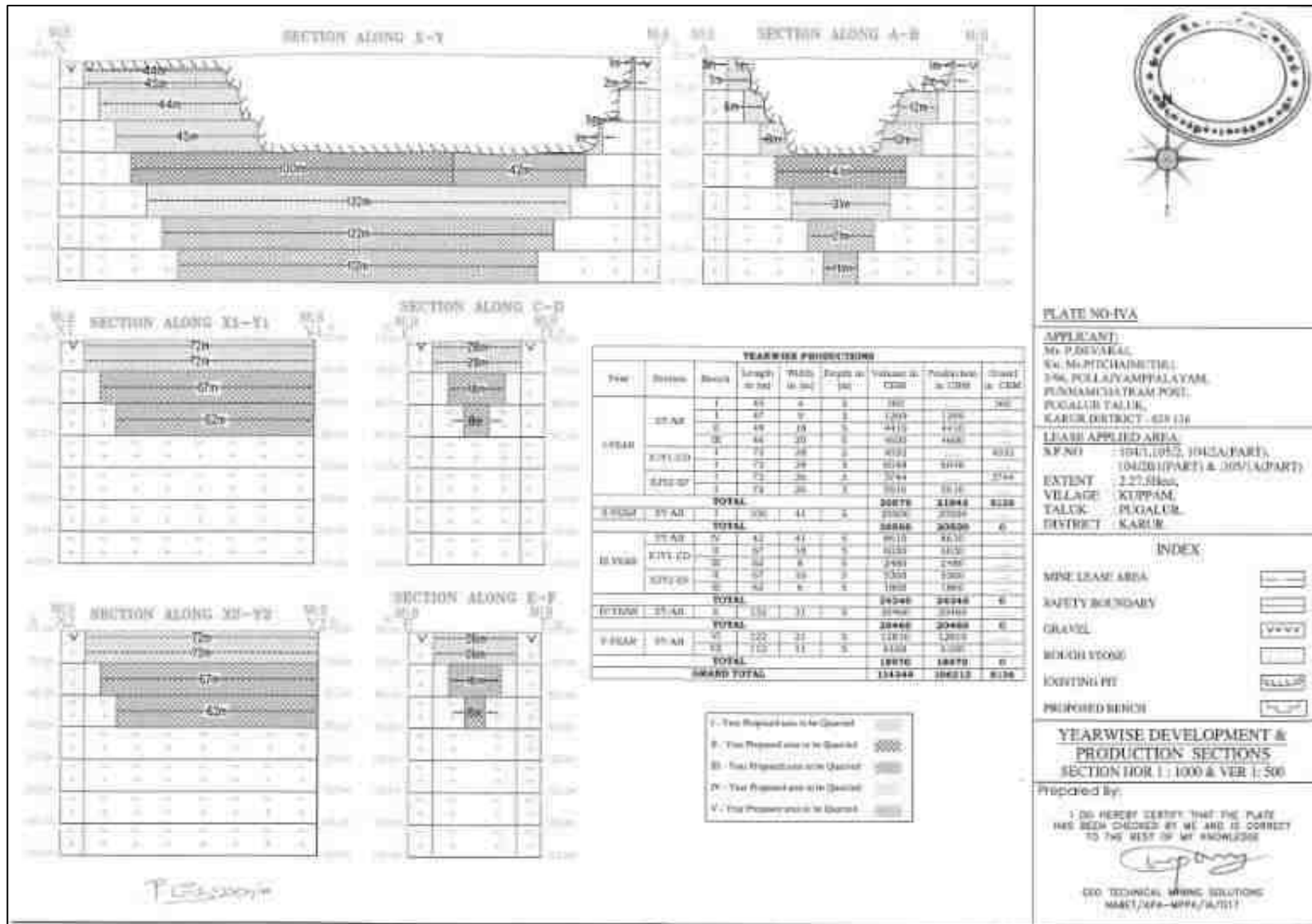


Figure 2.8a Year wise Development and Production Sections

2.6 MINING METHOD

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

Conceptual Blasting Design

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

Rules of Thumb for Blast Design

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

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

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

Rule 2: Generally, select the densest explosive possible.

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

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

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

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

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

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

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

Rule 6: Stemming should be equal to the burden.

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

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

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

Table 2.5 Conceptual Blasting Design

Blasthole Diameter (D) in mm	32
Burden (B) in m	2
Spacing (S) in m	1.45
Subdrill in m	0.6
Charge length (C) in m	0.30
Stemming	2
Hole Length (L) in m	2.9
Bench Height (BH) in m	2.3
Mass of explosive/hole in g	187.5
Stemming material size in mm	3.2
Burden stiffness ratio	1.15

Blast volume/hole in m3	6.67
Production of rough stone/day in m3	79
Number of blastholes/day	12
Blasthole pattern	Staggered
Mass of explosive /day in kg	2.21
Powder factor in kg/m3	0.03
Loading density	0.63
Type of explosives	Slurry
Diameter of packaging in mm	25
Initiation system	NONEL
Fly rock distance in m	18

2.6.1 Magnitude of Operation

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

Table 2.6 Operational Details for Proposed Project

	Rough Stone (5 years)	Gravel (1 year)
Proposed production for 5 years	106213	8136
Number of Working Days /Annum	270	270
Production of /Day (m ³)	79	30
No. of Lorry Loads	13	5

2.6.2 Extent of Mechanization

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

Table 2.7 Machinery Details

S. No.	Type	No of Unit	Capacity	Make	Motive Power
1	Jack Hammers	4	Hand held	-	Diesel Drive
2	Compressor	2	Air	-	Diesel Drive
3	Excavator	1	-	-	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. According to the land use results, as shown in Table 2.8 At Present about 1.08.5 ha of land is used for quarrying; about 1.08.0 ha of land is unutilized; about 0.08.0 of land is used for green belt and the rest will be used for roads and infrastructure.

Whereas, at the end of the mine life, about 1.60.0 ha of land is used for quarrying; about 0.01.38 ha of land is unutilized; about 0.51.64 ha of land is used for green belt and 0.03.0 will be used for roads and 0.02.0 is used for infrastructure

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

Description	Present Area (ha)	Area at the end of life of quarry (ha)
Area under quarry	1.08.5	1.60.0
Infrastructure	0.01.0	0.02.0
Roads	0.02.0	0.03.0
Green Belt	0.08.0	0.51.64
Drainage & Settling Tank	Nil	0.09.48
Unutilized area	1.08.0	0.01.38
Total	2.27.5	2.27.5

2.6.4 Quarry Closure Budget

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

Table 2.9 Mine Closure Budget

Activity	Capital Cost	Recurring Cost/Annum
455 plants inside the lease area	91000	13650
683 plants outside the lease area	204750	20475
Wire Fencing (2.27.5 ha)	455000	22750
Renovation of Garland Drain (2.27.5 ha)	22750	11375
Total	773500	68250

Source: Environment Management Plan

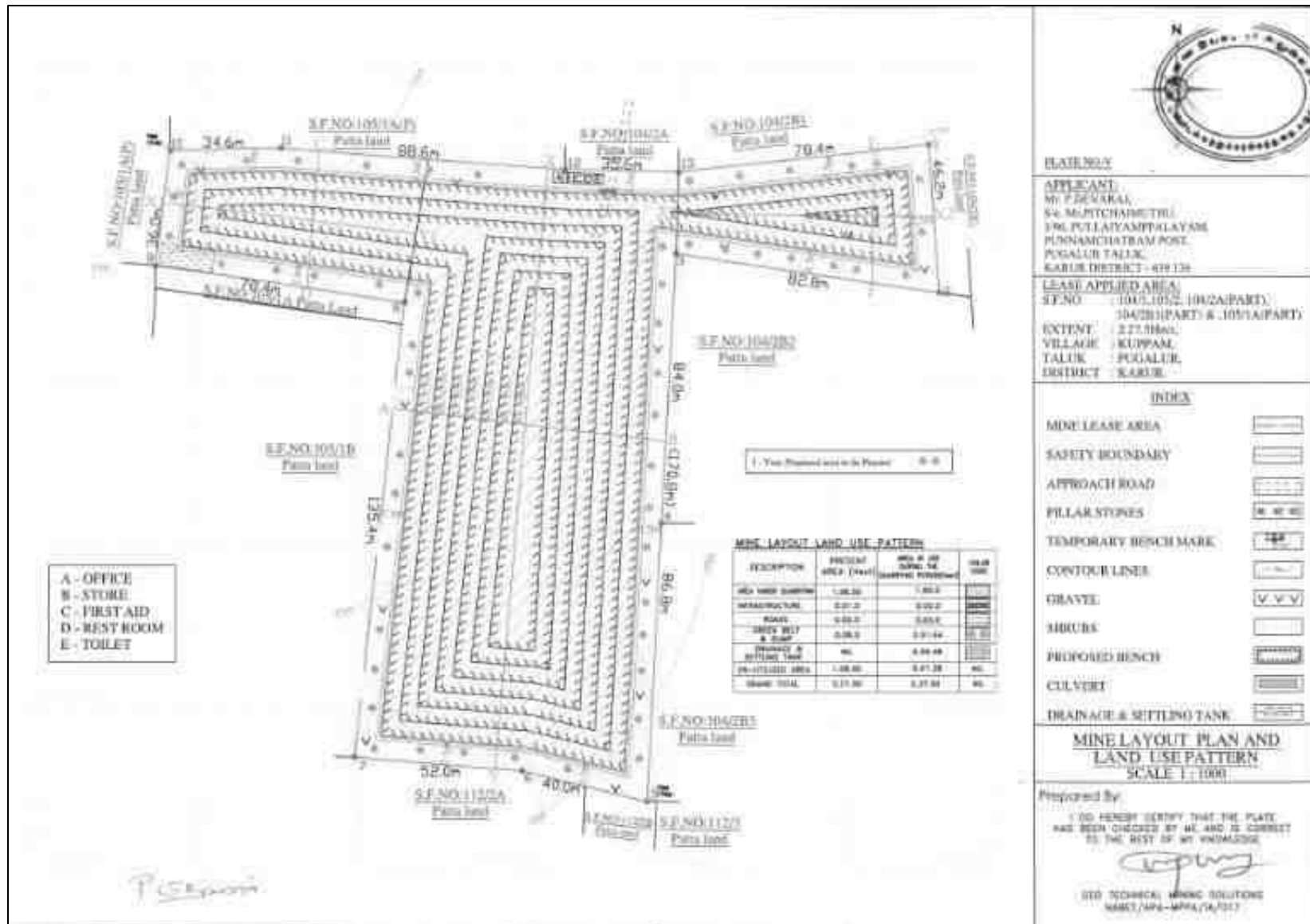


Figure 2.9 Mine Layout Plan and Land Use Pattern

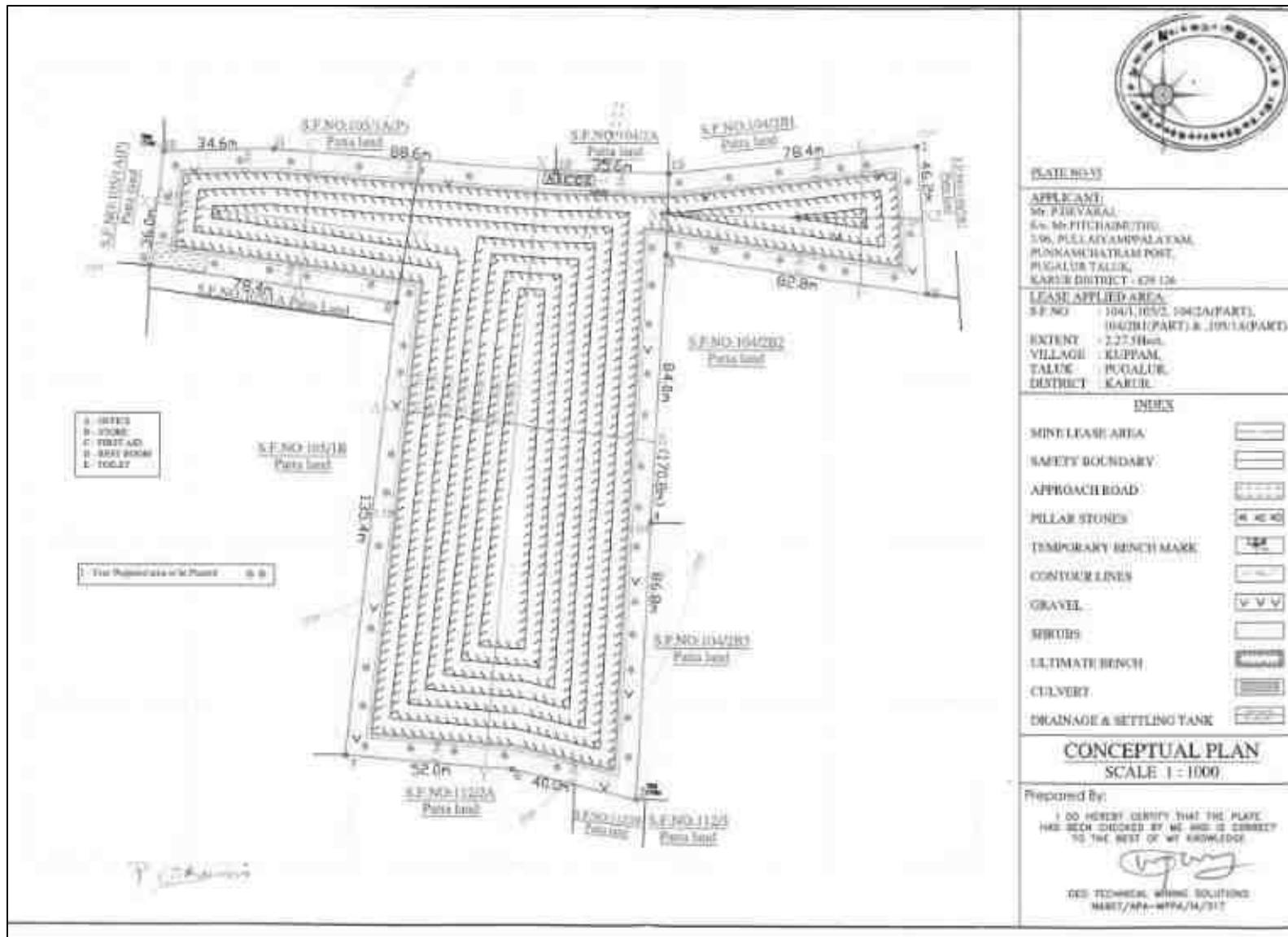


Figure 2.10 Conceptual Plan

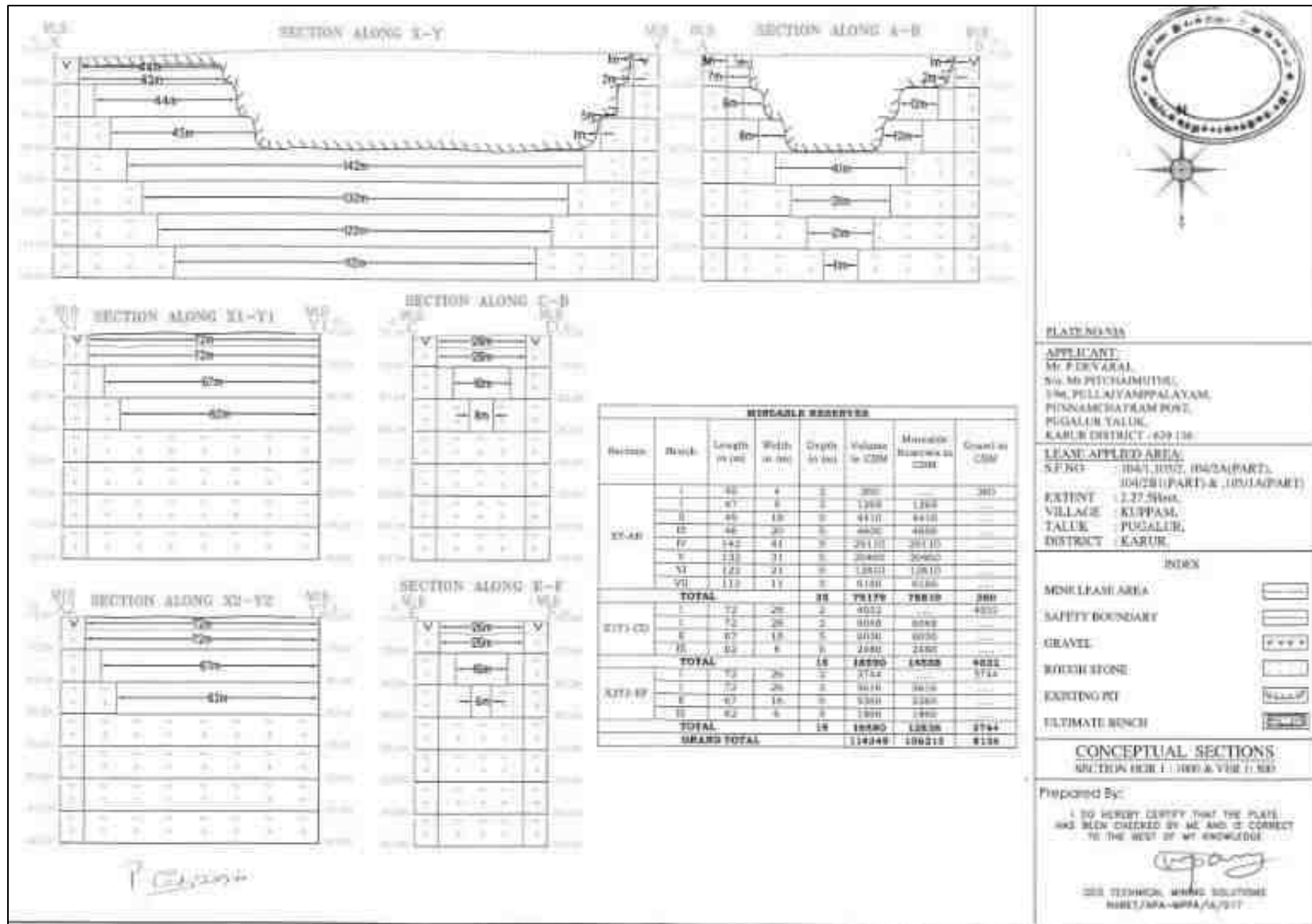


Figure 2.10a Conceptual Sections

2.6.5 Conceptual Mining Plan

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

Table 2.10 Ultimate Pit Dimension

Pit	Length (m)	Width (m)	Depth (m)
I	142	41	35

Source: Approved Mining Plan & ToR

2.6.6 Infrastructures

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

2.6.6.1 Other Infrastructure Requirement

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

2.6.7 Water Requirement

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

Table 2.11 Water Requirement for the Project

Purpose	Quantity	Source
Dust Suppression	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	0.7 KLD	Existing bore wells and approved water vendors
Total	1.7 KLD	

Source: Feasibility Report

2.6.8 Energy Requirement

High speed Diesel (HSD) will be used for quarrying machineries. As per the data shown in Table 2.12, Around 477750 litres of HSD will be used for rough stone and gravel extraction during this 5 years plan period. The diesel will be brought to the site from nearby diesel pumps.

Table 2.12 Fuel Requirement Details

Fuel Requirement for Excavator			
Details	Rough Stone (106213m³)	Gravel (8136 m³)	Total Diesel (litre)
Average Rate of Fuel Consumption (l/hr)	16	10	---
Working Capacity (m ³ /hr)	20	60	---
Time Required (hours)	5311	136	---
Total Diesel Consumption for 5 years (litre)	84970	1356	86326
Fuel Requirement for Compressor			
Average Rate of Fuel Consumption/hole (litre)	0.4	---	---
Number of Drillholes/day	12	---	---
Total Diesel Consumption for 5 years (litre)	6480	---	6480
Fuel Requirement for Tipper			
Average Rate of Fuel Consumption/Trip (litre)	20	20	---
Carrying Capacity in m ³	6	6	---
Number of Trips / days	13	1*	---
Number of Trips / 5 years	17702	1356	---
Total Diesel Consumption for 5 years (litre)	354043	27120	381163
Total Diesel Consumption by Excavator, Compressor and Tipper			473970

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

2.6.9 Capital Requirement

The project proponent will invest Rs.28,86,700/- to the project. The breakup summary of the investment has been given in Table 2.13.

Table 2.13 Capital Requirement Details

S. No.	Description	Cost (Rs.)
1	Fixed Asset Cost	15,50,000/-
2	Machinery cost	--
3	EMP Cost	13,36,700/-
Total Project Cost		28,86,700/-

Source: Approved Mining Plan

2.7 MANPOWER REQUIREMENT

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

Table 2.14 Employment Potential for the proposed project

S. No.	Category	Role	Nos.
1.	Highly Skilled	Mines Manager	1
		Mine Engineer	1
		Mine Geologist	1
		Blaster	--
2.	Unskilled	Musdoor/Labours	11
Total			14

Source: Prefeasibility Report

2.8 PROJECT IMPLEMENTATION SCHEDULE

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

Table 2.15 Expected Time Schedule

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

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

CHAPTER III

DESCRIPTION OF THE ENVIRONMENT

3.0 GENERAL

This chapter presents a regional background to the baseline data at the very onset, which will help in better appreciation of micro-level field data, generated on several environmental and ecological attributes of the study area. The baseline status of the project environment is described section wise for better understanding of the broad-spectrum conditions. The baseline environment quality represents the background environmental scenario of various environmental components such as land, water, air, noise, biological and socio-economic status of the study area. Field monitoring studies to evaluate the base line status of the project site were carried out covering **October-December, 2022** with CPCB guidelines. Environmental baseline data were collected by an NABL accredited and MoEF notified **Excellence Laboratory**, ISO 9001: 2015 and ISO/IEC:17025:2017 certified & MoEF notified laboratory 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	8 (1 core & 7 buffer zone)	IS 2720 Agriculture Handbook - Indian Council of Agriculture Research, New Delhi
*Water Quality	Physical, Chemical and Bacteriological Parameters	Once during the study period	8 (Ground water)	IS 10500& CPCB Standards

Meteorology	Wind speed Wind direction Temperature Cloud cover Dry bulb temperature Rainfall	1 hourly continuous mechanical/automatic weather station	1	Site specific primary data & secondary data from IMD Station
*Ambient Air Quality	PM ₁₀ PM _{2.5} SO ₂ NO _x	24 hours, twice a week (October – December 2022)	8 (1 core & 7 buffer)	IS 5182 Part 1-23 National Ambient Air Quality Standards, CPCB
*Noise Levels	Ambient noise	Hourly observation for 24 hours per location	9 (1 core & 8 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.

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

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

3.1 LAND ENVIRONMENT

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

3.1.1 Geology and Geomorphology

Study area is mainly composed of by Migmatite, as shown in Figure 3.1. Among the geomorphic unit's pediment pediplain complex covers major part of the study area, as shown in Figure 3.2.

3.1.2 Topography

The proposed project area is situated over a terrain of undulated nature.

3.1.3 Drainage Pattern of the Area

The project site falls within the area showing dendritic pattern, as shown in Figure 3.4.

3.1.4 Land Use/ Land Cover

Land use pattern of the study area was studied using Sentinel II image. Six LULC types are given in both Figure 3.3 and Table 3.2.

Table 3.2 LULC Statistics of the Study Area

S. No.	Classification	Area (Hectare)	Area (%)
1	Crop Land	7022.03	90.68
2	Dense Forest	71.98	0.92
3	Fallow Land	190.05	2.45
4	Mining/Industrial lands	219.58	2.83
5	Plantations	234.49	3.02
6	Settlements	5.29	0.07
Total		7743.44	100.0

Source: Sentinel II Satellite Imagery

From the land use/land cover analysis, it is known that the majority of the land in the study area is crop land covering 90.68% of the total land area, followed by plantations (3.02%), dense forest (0.92%), fallow land (2.45%) and settlement (0.07%). The total mining area within the study area is 219.58 ha (2.83%) among other LULC types. The Extend of the quarry is 2.27.5 ha contributes only 0.0285 % to the study area. This small percentage of mining activities shall not have any significant impact on the environment.

3.1.5 Seismic Sensitivity

The proposed project site falls in the seismic zone II, low damage risk zone as per BMTPC, as shown in vulnerability atlas of seismic zone of India IS: 1893 – 2002 as the project area falls in the hard rock terrain on the peninsular shield of south India which is highly stable (Source: https://moes.gov.in/writereaddata/files/LS_EN_20032020_385.pdf).

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.

3.1.6.1 Methodology

Eight 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.

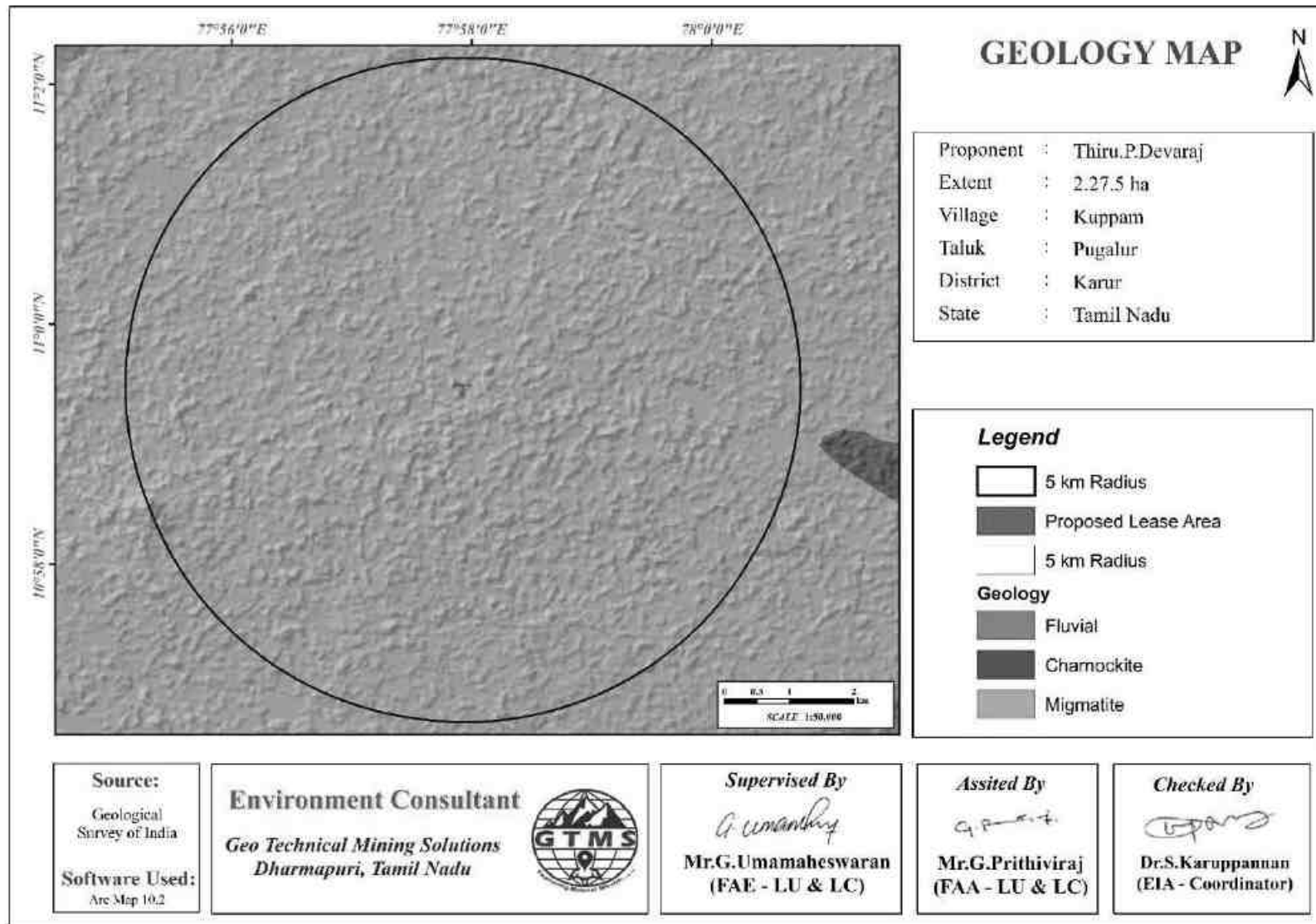


Figure 3.1 Geology Map of 5 km Radius from the Proposed Project Site

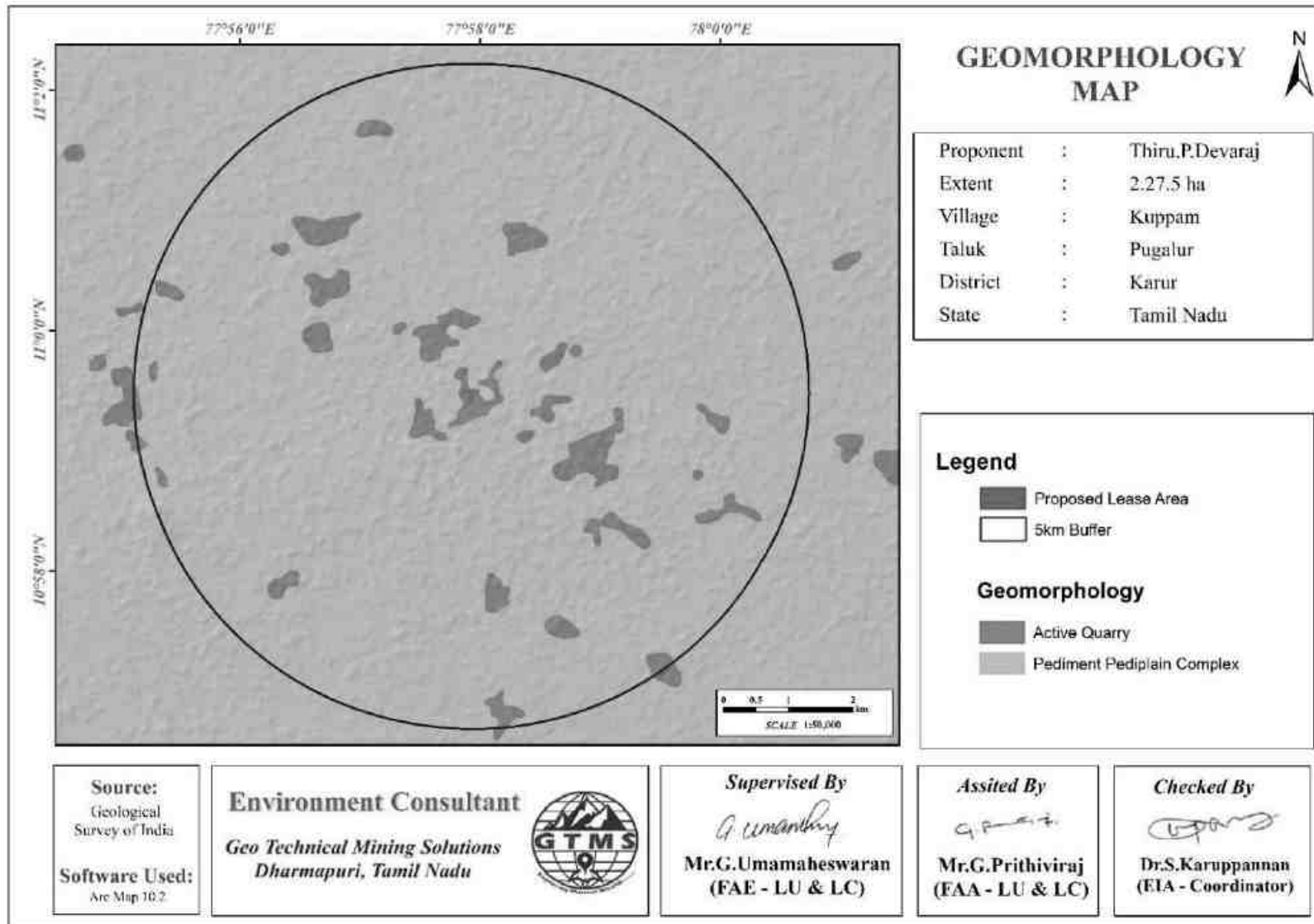


Figure 3.2 Geomorphology Map of 5 km Radius from the Proposed Project Site

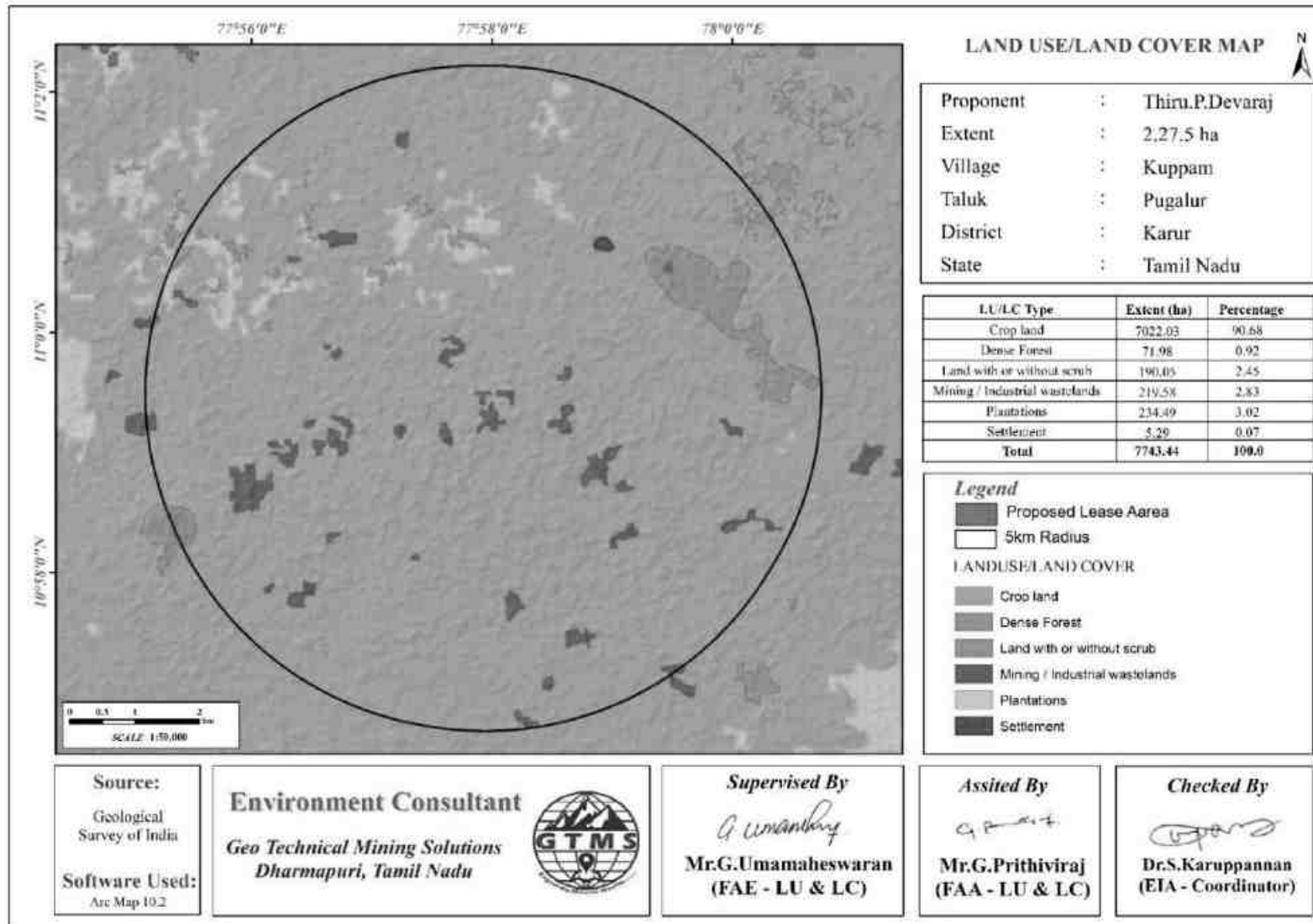


Figure 3.3 LULC Map of 5 km Radius from the Proposed Project Site

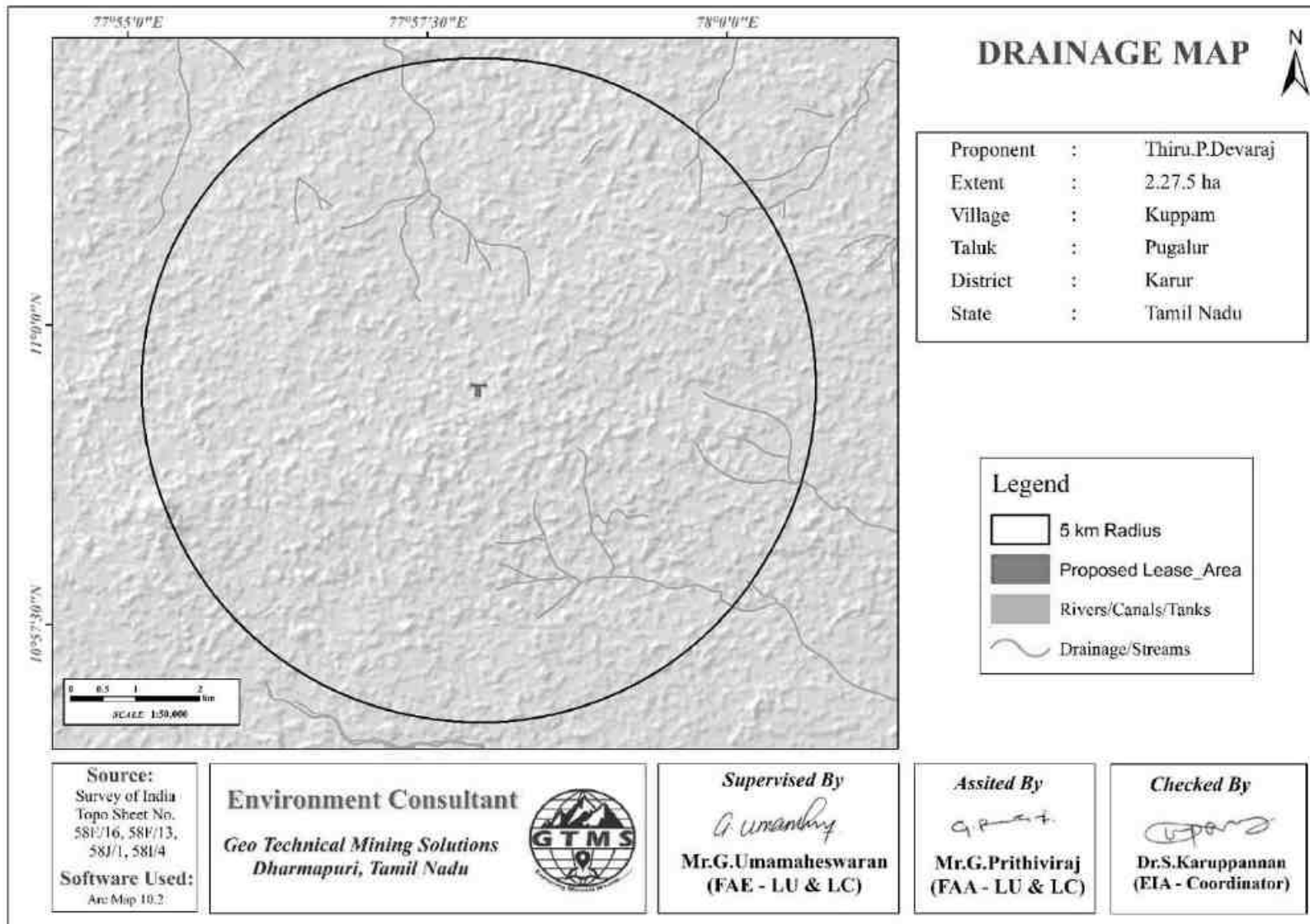


Figure 3.4 Drainage Map of 5 km Radius from the Proposed Project Site

Table 3.3 Soil Sampling Locations

S. No.	Sampling ID	Location	Distance (km)	Direction	Coordinates
1	S01	Core	---	---	10°59'29.11"N,77°57'55.95"E
2	S02	Vetamangalam	5.00	NNW	11°2'4.11"N 77°56'57.26"E
3	S03	Uppupalayam	2.15	N	11°0'40.39"N,77°57'52.96"E
4	S04	Valipuram	4.27	WSW	10° 59'7.30"N, 77°55'33.98"E
5	S05	Karudayampalayam	3.41	SSW	10°57'46.96"N 77°56'59.21"E
6	S06	Punnam	3.45	SE	10°59'14.77"N 77°59'46.45"E
7	S07	Punnam	4.01	NE	11°00'51.87"N 77°59'42.66"E
8	S08	Pavithram	4.60	SE	10°57'25.20"N 77°59'29.09"E

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

3.1.6.2 Results and Discussion

Physical Characteristics

The soil samples in the study area show loamy textures varying between sandy loam, to silty clay loam. pH of the soil varies from 6.5 to 7.7 indicating slightly acidic to slightly alkaline nature. Electrical conductivity of the soil varies from 161 to 338 $\mu\text{s}/\text{cm}$. Bulk density ranges between 1.4 and 9.2 g/cm^3 and organic matter ranges between to 4.2 %.

Chemical Characteristics

Calcium ranges between 301 and 513 mg/kg . Magnesium ranges between 110 and 180 mg/kg . Sulphate ranges between 0.15 and 0.73 %. Potassium ranges between 0.12 and 0.16 %. Organic matter content ranges between 0.25 and 4.2 % and Iron ranges between 7845 and 37397 mg/kg .

Soil Erosion

Soil erosion map shows that:

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

Soil Quality Assessment

Soil quality is the foundation of sustainable crop production. Soil quality assessment helps to understand soil conditions and adopt suitable production practices. It can be done using physical, chemical, and biological properties of soil. For this assessment, four soil quality parameters including PH, EC, OM, CEC and BD were taken into account. The soil quality score for each sample has been provided in Table 3.4a.

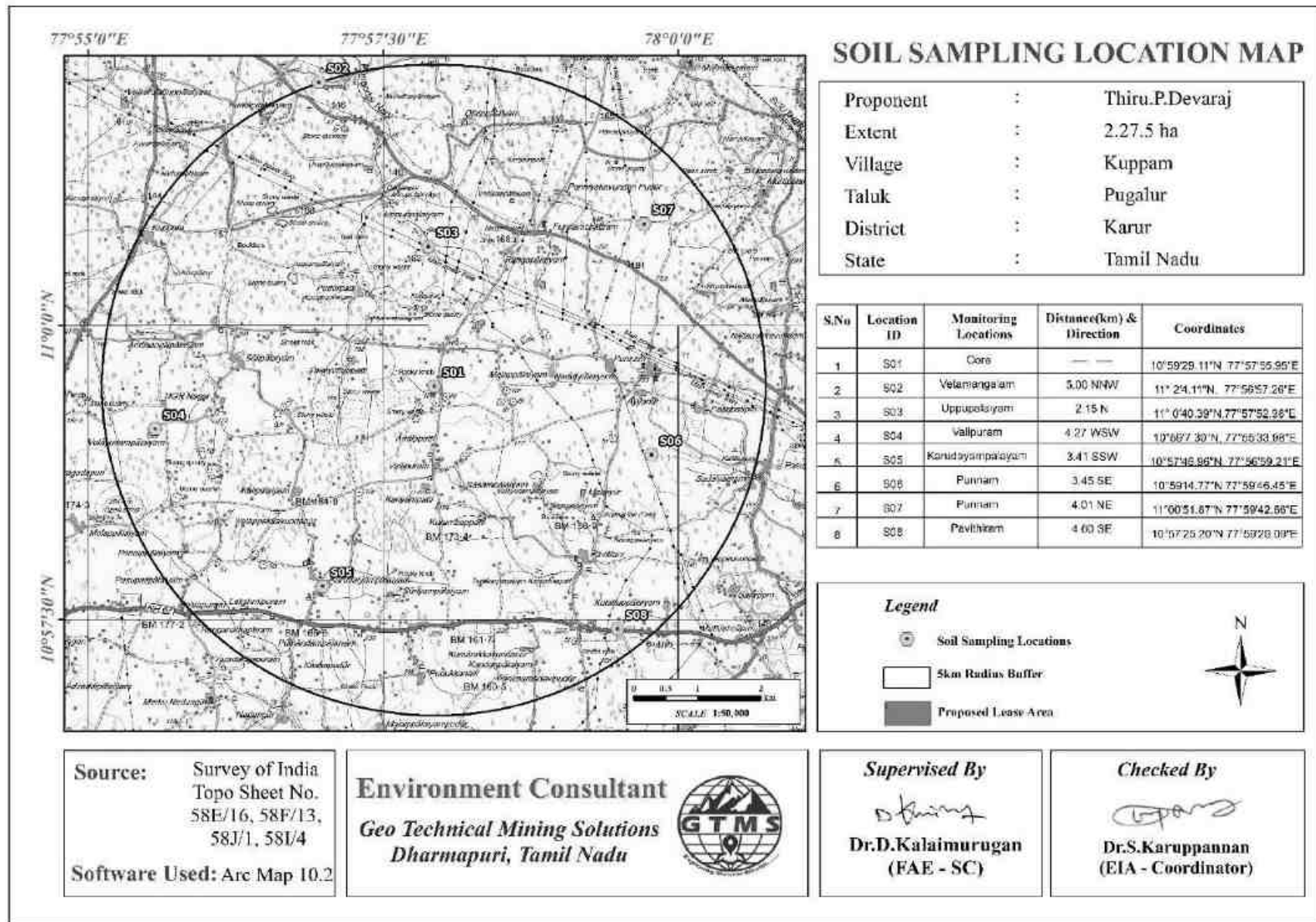


Figure 3.5 Toposheet Showing Soil Sampling Locations within 5 km Radius around the Proposed Project Site

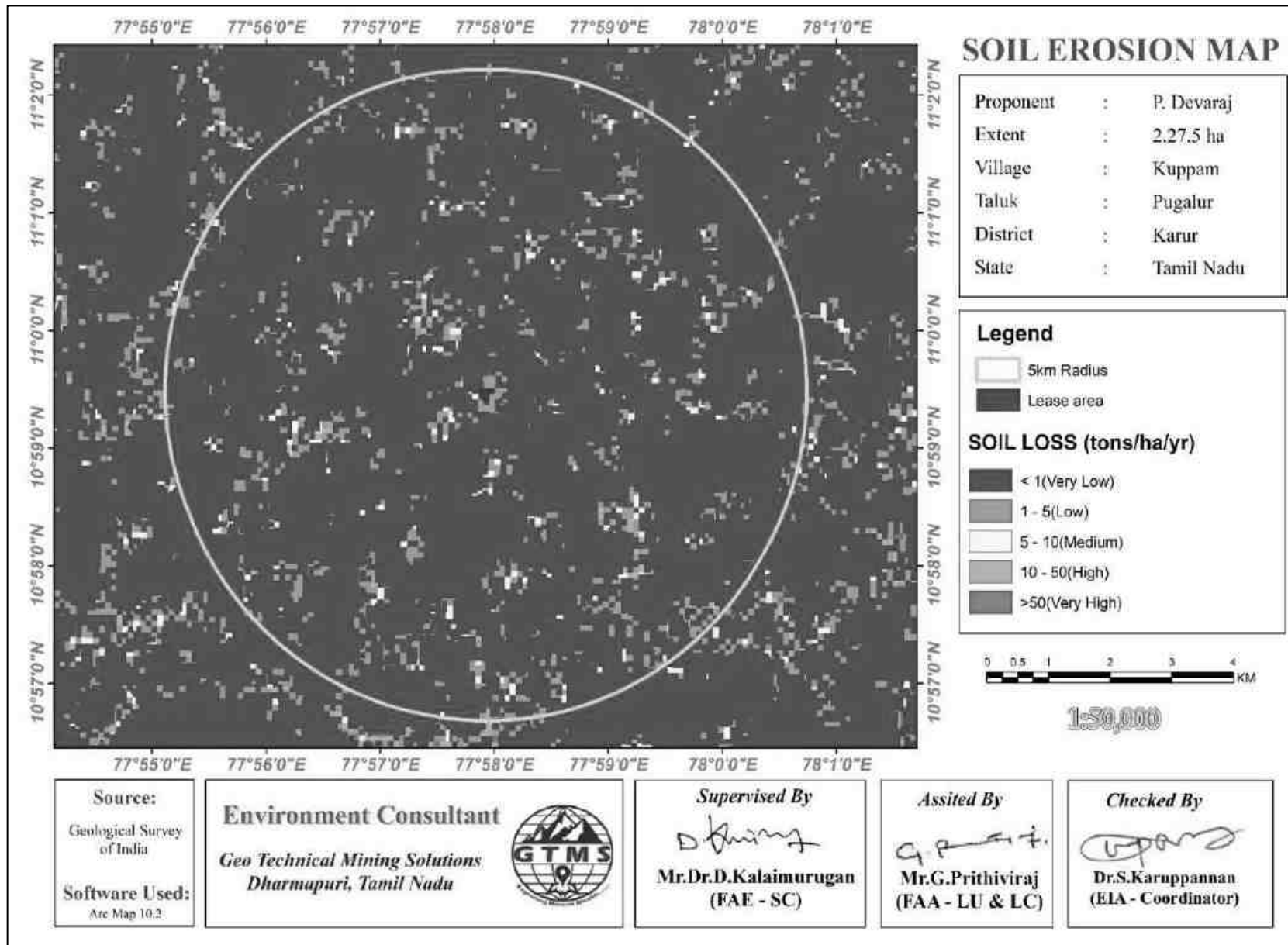


Figure 3.6 Soil Erosion Map of 5 km Radius from the Proposed Project Site

Table 3.4 Soil Quality of the Study Area

S. No.	Parameters	Unit	Result in Core	Result in Buffer		
				Minimum	Maximum	Average
1	Bulk Density	g/cm ³	1.2	1.4	9.2	3.95
2	Cadmium (Cd)	mg/kg	<1.0	<1.0	<1.0	<1.0
3	CEC	meq%	17.8	14.8	24	20.21
4	Chromium (Cr)	mg/kg	<1.0	<1.0	<1.0	<1.0
5	Copper (Cu)	mg/kg	1.6	1.8	10	3.90
6	Iron (Fe)	mg/kg	6432	7845	37397	19374
7	Lead (Pb)	mg/kg	<1.0	<1.0	<1.0	<1.0
8	Manganese (Mn)	mg/kg	1.86	1.5	114	34.87
9	Nitrogen (N)	%	1.23	0.04	2.05	1.15
10	Organic Matter @ 155°C	%	0.78	0.25	4.2	1.74
11	pH value @ 25°C	--	7.3	6.5	7.7	7.14
12	Phosphate (P)	%	2.9	0.16	2.17	1.36
13	Potassium (K)	%	0.27	0.12	0.16	0.13
14	EC @ 25°C	µS/cm	163	161	338	241.55
15	Total Carbon	%	2.4	2	17.4	7.02
16	Sulphates (SO ₄)	%	0.47	0.15	0.73	0.39
17	Zinc (Zn)	mg/kg	19	17	31	23.55
18	Boron (B)	mg/kg	0.82	0.32	0.84	0.55

19	Calcium (Ca)	mg/kg	323	301	513	392.77
20	Chlorides (Cl)	mg/kg	217	160	318	235.11
21	Magnesium (Mg)	mg/kg	140	110	180	153.55
22	Texture	-	Sandy Loam	Sandy loam- Silty Clay Loam		
23	Sand	%	55.45	16.23	53.45	32.25
24	Silt	%	29.88	29.1	58.58	46.28
25	Clay	%	14.67	12.34	37.43	22.24

Source: Sampling Results by Excellence Laboratory.

Table 3.4a Assigning Scores to Soil Quality Indicators

Soil Quality Score							
S. No.	OM	BD	PH	CEC	EC	Total Score	Recommendation
S01	30	12	12	6	10	70	The soil requires major and immediate treatment
S02	30	6	12	6	10	64	
S03	30	2	12	6	10	60	
S04	30	12	12	6	10	70	
S05	30	2	18	6	10	66	
S06	30	2	18	2	10	62	
S07	30	2	12	6	10	60	
S08	50	2	18	2	10	82	The soil requires moderate treatment

OM (Organic Matter) BD (Bulk Density) PH (Potential of Hydrogen) EC (Electrical Conductivity)

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. There are no surface water bodies present within the study area. Hence, data on surface water bodies are not collected for this project.

Table 3.5 Water Sampling Locations

S. No.	Sampling ID	Location	Distance (km)	Direction	Coordinates
1	OW01	Near core	0.06	E	10°59'30.44"N,77°58'1.36"E
2	OW02	Arasampalaiyam	2.99	NNW	11°0'42.51"N,77°56'45.26"E
3	BW01	MGR Nagar	3.77	SW	10°58'50.44"N,77°55'53.77"E
4	BW02	Vedirimattam Pudur	4.94	NNE	11°02'3.05"N,77°54'80.38"E
5	BW03	Punnamchatram	2.90	NNE	11°0'50.37"N,77°58'49.79"E
6	BW04	Pavithiram	3.35	SE	10°58'16.75"N,77°59'23.38"E
7	BW05	Punnam	1.61	ESE	10°59'15.94"N,77°58'49.13"E
8	BW06	Nedungur	4.22	SSW	10°57'17.64"N,77°56'58.86"E

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

3.2.1 Results and Discussion

Results of important ground water quality parameters have been shown in Tables 3.6 and the results are discussed below

Ground Water

- ❖ The pH of the water samples ranges from 6.7 to 7.9.
- ❖ TDS are found in the range between 560 and 1753 mg/l.
- ❖ The total hardness varies between 204 and 1022 mg/l.
- ❖ Calcium varies from 58 to 146 mg/l.
- ❖ Magnesium from 14 to 75 mg/l.
- ❖ Nitrate varies from 1.9 to 6.3 mg/l.
- ❖ Chloride varies from 175 to 297 mg/l;
- ❖ Sulphate from 102 to 247 mg/l; and fluoride from 0.19 to 1.2 mg/l.
- ❖ When speaking about microbiological parameters, the water samples from all the locations meet the requirement.

When compared to IS 10500:2012 all the parameters thus analysed fall within the prescribed limits.

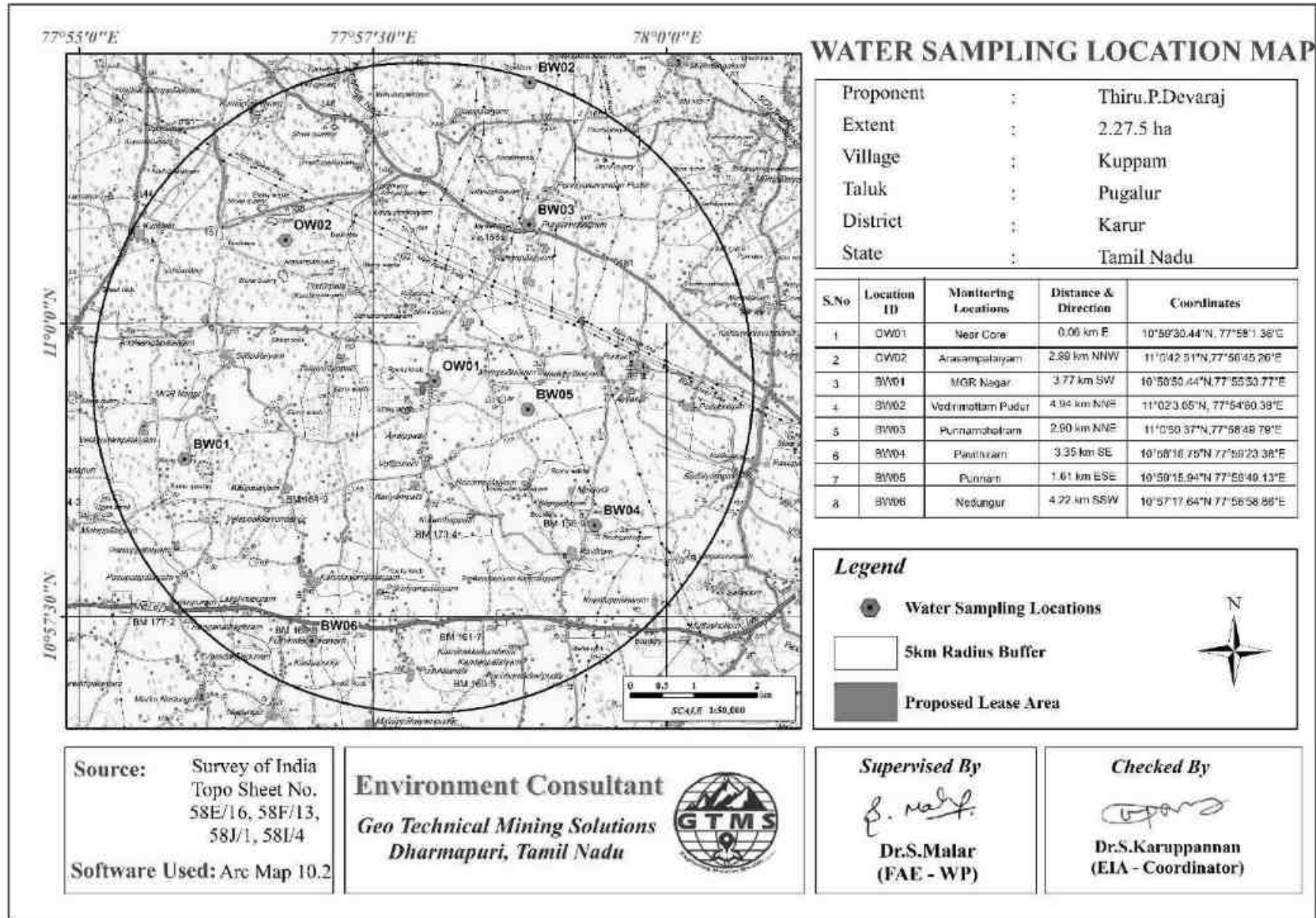


Figure 3.7 Toposheet Showing Water Sampling Locations within 5 km Radius around the Proposed Project Site

Table 3.6 Ground Water Sampling Quality Results

S.No.	Parameters	Units	Result in core	Result in buffer		10500:2012 (Acceptable)	10500:2012 (Permissible)
				Minimum	Maximum		
1	Coliforms Bacteria	MPN	Absent	Absent	Absent	Shall not be detectable in any 100 ml sample	Shall not be detectable in any 100 ml sample
2	E.Coli	MPN	Absent	Absent	Absent	Shall not be detectable in any 100 ml sample	Shall not be detectable in any 100 ml sample
3	Aluminium (Al)	mg /l	<0.02	<0.02	<0.02	0.03	0.2
4	Ammonia (NH ₃)	mg /l	<0.1	<0.1	<0.1	0.5	No relaxation
5	Anionic Detergents	mg /l	<0.01	<0.01	<0.01	0.2	1.0
6	Barium (Ba)	mg /l	<0.1	<0.1	<0.1	0.5	No relaxation
7	Boron (B)	mg /l	<0.1	<0.1	<0.1	0.5	1.0
8	Cadmium (Cd)	mg /l	<0.003	<0.003	<0.003	0.003	No relaxation
9	Calcium (Ca)	mg /l	112	58	146	75	200
10	Chloride (Cl)	mg /l	187	175	297	250	1000
11	Colour	Hazen	<1.0	<1.0	<1.0	5	15
12	Copper (Cu)	mg/l	<0.02	<0.02	<0.02	0.05	1.5
13	Cyanide (CN)	mg/l	<0.02	<0.02	<0.02	0.05	No relaxation
14	Fluoride (F)	mg/l	1.1	0.19	1.2	1.0	1.5
15	Free Residual Chlorine (RFC)	mg/l	<0.1	<0.1	<0.1	0.2	1.0
16	Iron (Fe)	mg/l	<0.05	<0.05	<0.05	0.3	No relaxation
17	Lead (Pb)	mg/l	<0.01	<0.01	<0.01	0.01	No relaxation

18	Magnesium (Mg)	mg/l	27	14	75	30	100
19	Manganese (Mn)	mg/l	<0.01	<0.01	<0.01	0.1	0.3
20	Mercury (Hg)	mg/l	<0.001	<0.001	<0.001	0.001	No relaxation
21	Molybdenum	mg/l	<0.05	<0.05	<0.05	0.07	No relaxation
22	Nitrate (NO ₃)	mg/l	2.5	1.9	6.3	45	No relaxation
23	Odour	--	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
24	pH value @ 25°C	--	7.6	6.7	7.9	6.5-8.5	No relaxation
25	Phenolic Compounds	mg/l	<0.001	<0.001	<0.001	0.001	0.002
26	Selenium (Se)	mg/l	<0.01	<0.01	<0.01	0.01	No relaxation
27	EC @ 25°C	mg/l	1240	1340	3570	-	-
28	Sulphates (SO ₄)	mg/l	111	102	247	200	400
29	Sulphide (H ₂ S)	mg/l	<0.05	<0.05	<0.05	0.05	No relaxation
30	Total Alkalinity	mg/l	245	283	615	200	600
31	Arsenic (As)	mg/l	<0.005	<0.005	<0.005	0.01	0.05
32	Chromium (Cr)	mg/l	<0.05	<0.05	<0.05	0.05	No relaxation
33	TDS	mg/l	654	560	1753	500	2000
34	TH (CaCO ₃)	mg/l	388	204	1022	200	600
35	TSS @ 105°C	mg/l	<5.0	<5.0	<5.0	-	-
36	Turbidity	NTU	<0.01	<0.01	<0.01	1	5
37	Zinc (Zn)	mg/l	<0.05	<0.05	<0.05	5	15

Source: Sampling Results by Excellence Laboratory.

* IS: 10500:2012-Drinking Water Standards. The water can be used for drinking purpose in the absence of alternate sources.

3.2.2 Hydrogeological Studies

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

3.2.2.1 Groundwater Levels and Flow Direction

As the groundwater moves from the points of highest static groundwater elevation to the points of lowest static groundwater elevation under the influence of gravity, data regarding depth to groundwater levels are essential to infer the direction of groundwater movement within the study area. Knowledge of groundwater flow direction is must in choosing location for background groundwater quality monitoring well and in locating recharge and discharge areas. Therefore, data regarding groundwater elevations were collected from 9 open wells and 9 bore wells at various locations within 2 km radius around the proposed project sites for the period from October through December, 2021 (Post-Monsoon) and March through May -2022 (Pre-Monsoon) season. The dug well data thus collected onsite are provided in Tables 3.7 and 3.7a. According to the data, average depths to the static water table in open wells range from 14.4 to 17.2 m BGL in post monsoon and from 10.6 to 14.1 m BGL in pre monsoon.

The bore well data thus collected onsite are provided in Tables 3.8 and 3.8a. The average depth to static potentiometric surface in borewells for the period of March through Oct-2021 through Dec-2021 (Post Monsoon Season) is 63.4 to 70.7 m and for the period of March through May-2022 (Pre-Monsoon Season) is 62.3 to 67.3 m. The depths to static water table and potentiometric surface data were used to calculate static groundwater table and potentiometric surface elevations for open wells and borewells, respectively to draw contour lines connecting groundwater elevation (also known as equipotential hydraulic head) to determine the groundwater flow direction perpendicular to the contour lines.

The maps thus produced are shown in Figures 3.9-3.12. From the maps of groundwater flow direction, it is understood that most of the open well groundwater for the post- and pre-monsoon seasons flows towards the open well number 6 located in SW of the proposed project sites and that most of the borewell groundwater for the two monsoon seasons flows towards the bore well number 1 located in N of the proposed project sites. 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 3.7 Post-Monsoon Water Level of Dug Wells within 2 km Radius

Station ID	Depth to Static Water Table BGL(m)				Latitude	Longitude
	Oct-2022	Nov-2022	Dec-2022	Average		
DW01	10.4	11.9	12.5	15.7	11°00'09.19"N	77°57'21.43"E
DW02	11.5	12.8	13.4	15.7	11°00'05.12"N	77°57'12.82"E
DW03	10.2	11.5	12.2	17.1	10°59'37.58"N	77°57'22.04"E
DW04	12.4	13.5	14.5	15.8	10°59'47.33"N	77°57'54.37"E
DW05	11.5	12.4	13.7	14.4	10°59'59.19"N	77°58'11.10"E
DW06	13.7	14.5	15.5	16	11°00'38.56"N	77°58'11.58"E
DW07	14.7	15.5	16.7	17.2	11°00'39.89"N	77°57'14.82"E
DW08	15.6	16.9	17.4	16.7	11°00'06.95"N	77°56'55.96"E
DW09	14.7	15.5	16.9	16.9	10°59'10.03"N	77°57'21.46"E

Source: Onsite monitoring data

Table 3.7a Pre-Monsoon Water Level of Dug Wells within 2 km Radius

Station ID	Depth to Static Water Table BGL(m)				Latitude	Longitude
	March -2022	April-2022	May- 2022	Average		
DW01	9.5	10.9	11.5	10.6	11° 0'9.19"N	77°57'21.43"E
DW02	10.5	11.7	12.5	11.5	11° 0'5.12"N	77°57'12.82"E
DW03	9.7	10.9	11.5	10.7	10°59'37.58"N	77°57'22.04"E
DW04	11.0	12.5	13.5	12.3	10°59'47.33"N	77°57'54.37"E
DW05	10.5	11.7	12.9	11.7	10°59'59.19"N	77°58'11.10"E
DW06	12.7	13.0	13.5	13.0	11° 0'38.56"N	77°58'11.58"E
DW07	13.0	14.5	15.0	14.1	11° 0'39.89"N	77°57'14.82"E
DW08	10.6	11.9	12.4	11.6	11° 0'6.95"N	77°56'55.96"E
DW09	12.7	13.5	14.5	13.5	10°59'10.03"N	77°57'21.46"E

Source: Onsite monitoring data

Table 3.8 Post-Monsoon Water Level of Bore Wells within 2 km Radius

Station ID	Depth to Static Potentiometric Surface BGL(m)				Latitude	Longitude
	Oct-2022	Nov-2022	Dec-2022	Average		
BW01	67.2	68.5	69.7	68.4	11° 0'7.86"N	77°57'44.93"E
BW02	65.5	66.7	67.5	66.5	11° 0'24.89"N	77°57'24.02"E
BW03	66.2	77.2	68.9	70.7	11° 0'52.29"N	77°57'39.58"E
BW04	67.2	68.2	69.7	68.3	10°59'40.40"N	77°57'9.97"E
BW05	67.0	68.0	69.5	68.1	10°59'19.29"N	77°56'48.66"E
BW06	62.2	63.5	64.7	63.4	10°59'37.06"N	77°57'41.18"E
BW07	65.5	66.7	67.9	66.7	10°59'30.07"N	77°58'17.41"E
BW08	66.3	67.5	68.7	67.5	11° 0'0.72"N	77°56'48.56"E
BW09	67.5	68.9	69.7	68.7	10°59'2.18"N	77°57'43.38"E

Source: Onsite monitoring data

Table 3.8a Pre-Monsoon Water Level of Bore Wells within 2 km Radius

Station ID	Depth to Static Potentiometric Surface BGL(m)				Latitude	Longitude
	March -2022	April-2022	May- 2022	Average		
BW01	65.0	66.5	67.0	66.1	11° 0'7.86"N	77°57'44.93"E
BW02	64.5	65.7	66.5	65.6	11° 0'24.89"N	77°57'24.02"E
BW03	65.0	66.2	67.5	66.2	11° 0'52.29"N	77°57'39.58"E
BW04	66.2	67.0	68.0	67.0	10°59'40.40"N	77°57'9.97"E
BW05	66.0	67.5	68.5	67.3	10°59'19.29"N	77°56'48.66"E
BW06	61.0	62.5	63.5	62.3	10°59'37.06"N	77°57'41.18"E
BW07	64.5	65.0	66.0	65.1	10°59'30.07"N	77°58'17.41"E
BW08	65.3	66.5	67.5	66.4	11° 0'0.72"N	77°56'48.56"E
BW09	66.5	67.0	68.5	67.3	10°59'2.18"N	77°57'43.38"E

3.2.2.2 Electrical Resistivity Investigation

For understanding subsurface hydrogeological conditions geophysical investigation is carried out. The geophysical investigation is especially useful in the areas where there are no adequate exploratory well data about the aquifer conditions. Electric resistivity method is one of the well-known geophysical methods for delineating lateral as well vertical discontinuities in the resistivities of the earth’s subsurface layers. It is mainly applied to locate aquifers in the field of hydrogeology. The present study makes use of vertical electric sounding (VES) to delineate earth’s subsurface layers. The electrical resistivity investigation used four electrodes collinear set up where current is sent through outer electrodes into the ground and the inner electrodes measure the potential difference, as shown in Figures 3.8

3.2.2.3 Methodology and Data Acquisition

The present study uses Schlumberger array for making vertical electrical sounding measurements since it is least influenced by lateral inhomogeneities and is capable of providing higher depth of investigation. The main goal of the present study is to search the vertical inhomogeneities that is consistent with the measured data.

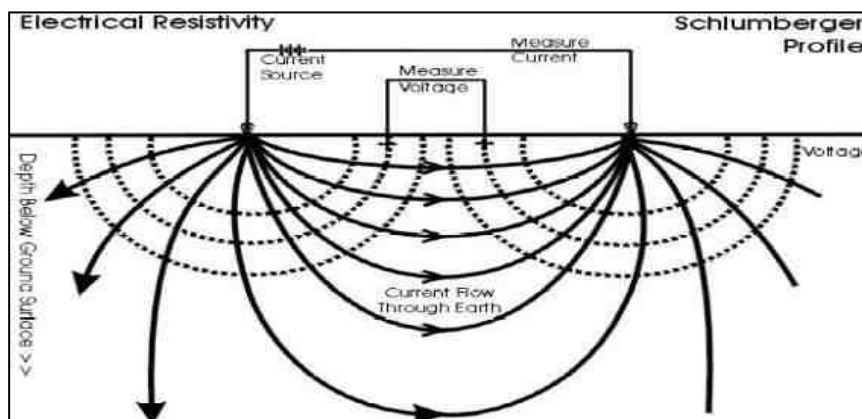


Figure 3.8 Principle of Electrical Resistivity Investigation

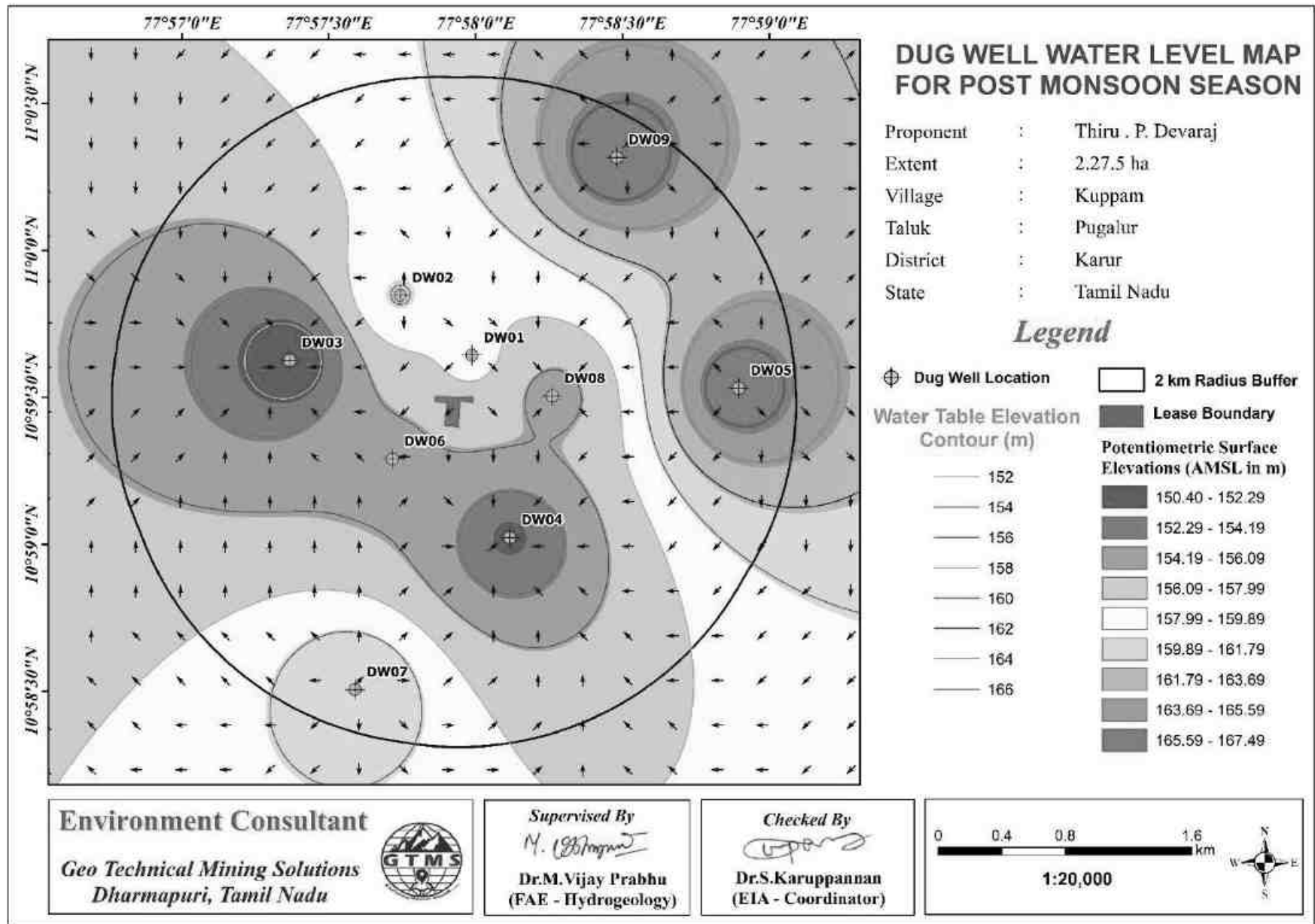


Figure 3.9 Open Well Static Groundwater Elevation Map Showing the Direction of Groundwater Flow During Post-Monsoon Season

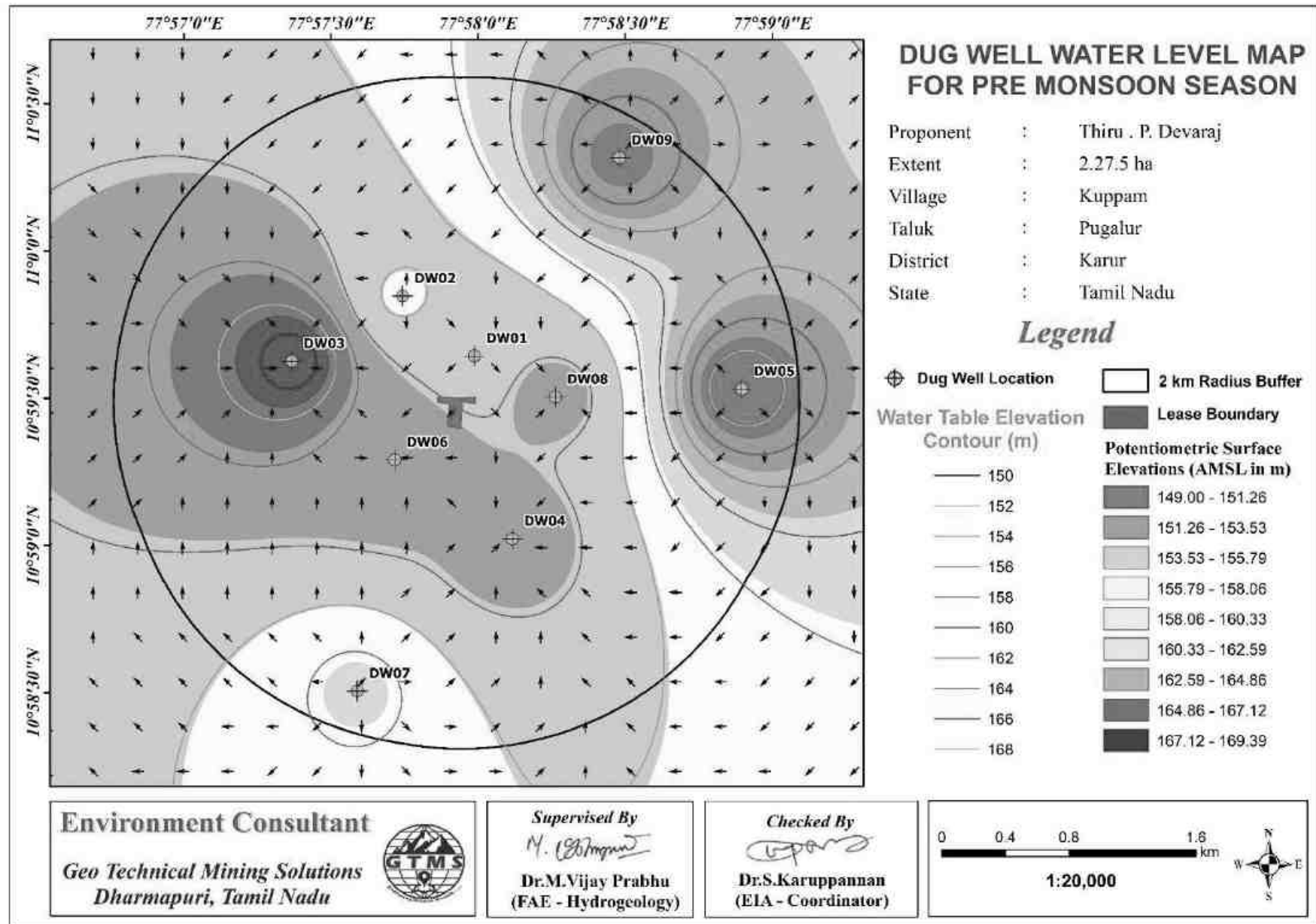


Figure 3.10 Open Well Static Groundwater Elevation Map Showing the Direction of Groundwater Flow During Pre-Monsoon Season

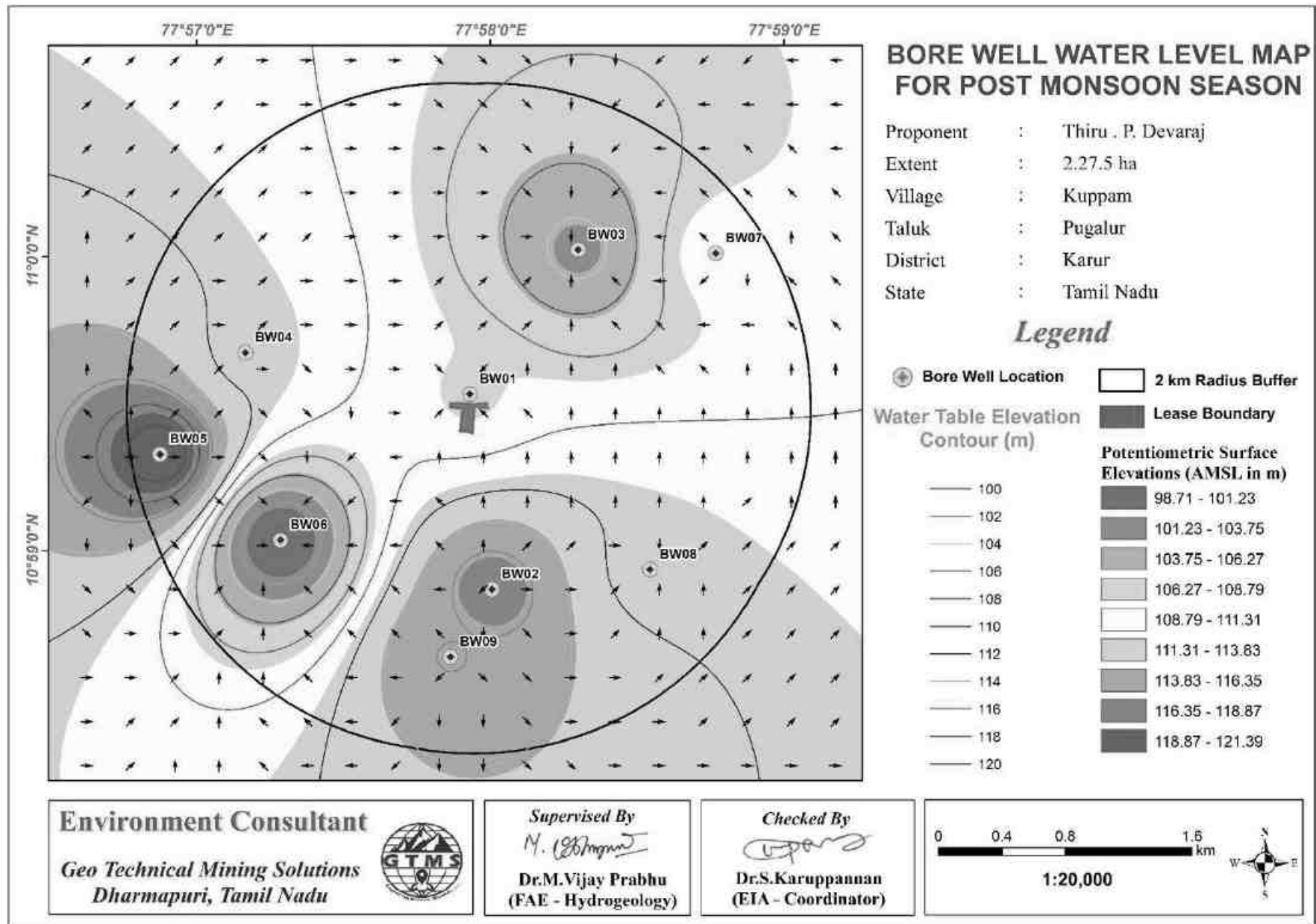


Figure 3.11 Bore Well Static Groundwater Elevation Map Showing the Direction of Groundwater Flow During Post-Monsoon Season

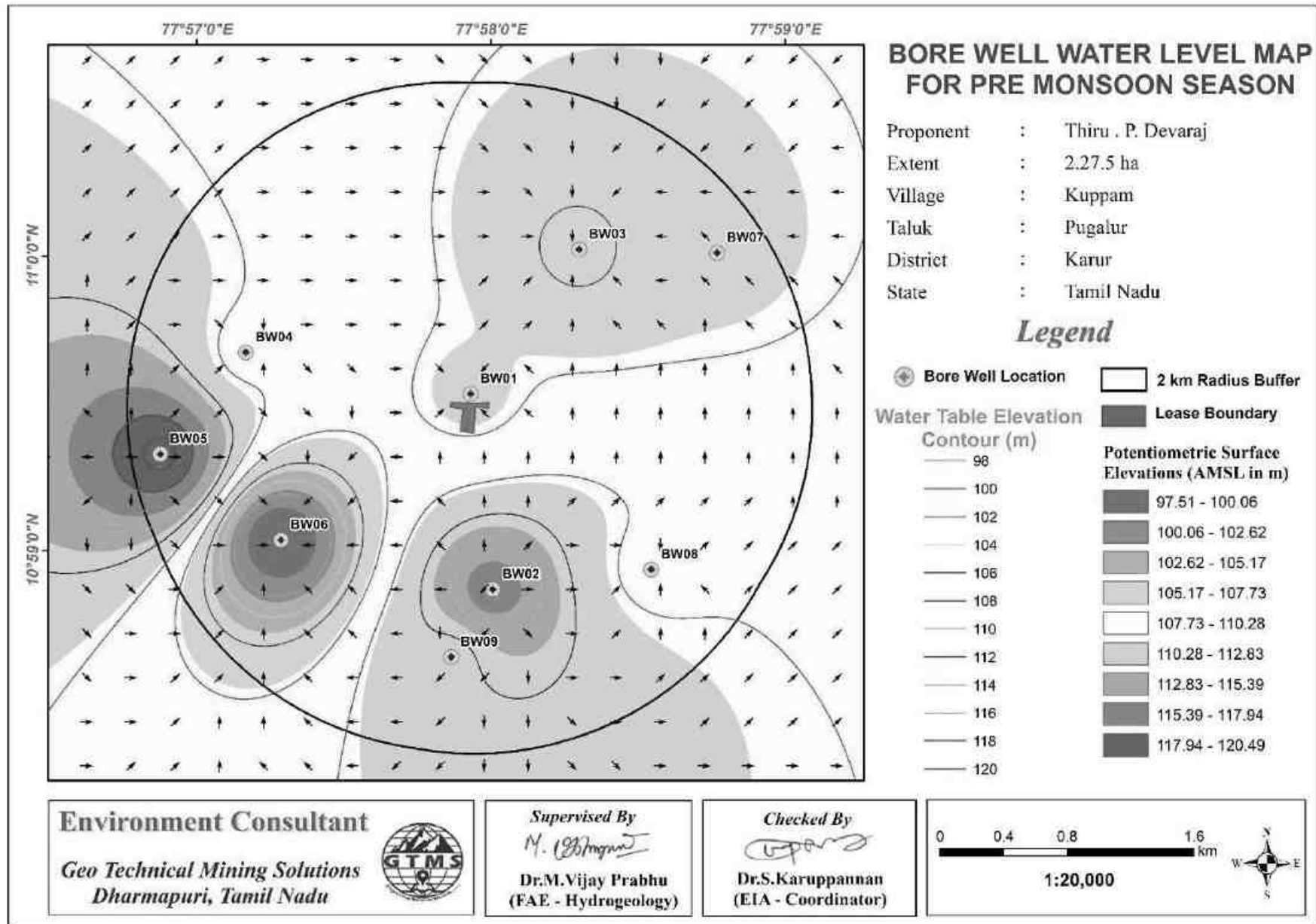


Figure 3.12 Bore Well Static Groundwater Elevation Map Showing the Direction of Groundwater Flow During Pre-Monsoon Season

The field equipment deployed for the study is a deep resistivity meter with a model of SSR – MP – ATS. This Signal Stacking Resistivity meter is a high-quality data acquisition system incorporating several innovation features for earth resistivity measurements. For more information about the instrument, refer to the manufacturer’s manual.

3.2.2.4 Data Presentation

The Geophysical VES data obtained from the project site have been shown in Table 3.9. 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 3.13.

Table 3.9 Vertical Electrical Sounding Data

Location Coordinates - 10°59'58.08"N 77°57'28.56"E					
S. No.	AB/2 (m)	MN/2 (m)	Geometrical Factor (G)	Resistance in Ω	Apparent Resistivity in Ωm
1	2	0.5	11.78	13.497	159
2	4	0.5	49.46	6.187	306
3	6	0.5	112.26	3.964	445
4	8	0.5	200.18	2.812	563
5	10	2	75.36	9.037	681
6	15	2	173.49	5.205	903
7	20	2	310.86	3.568	1109
8	25	2	487.49	2.609	1272
9	30	5	274.75	5.012	1377
10	35	5	376.80	3.891	1466
11	40	5	494.55	3.167	1566
12	45	5	628.00	2.688	1688
13	50	5	777.15	1.947	1513
14	60	10	549.50	2.921	1605
15	70	10	753.60	3.217	2424
16	80	10	989.10	2.654	2625
17	90	10	1256.00	2.198	2761
18	100	10	1554.30	1.848	2873

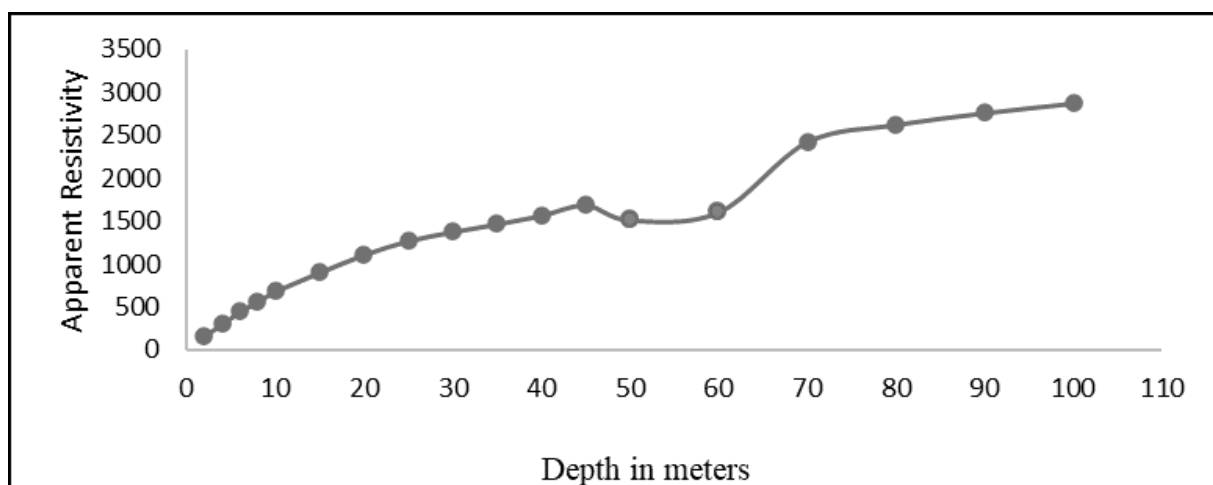


Figure 3.13 Graph Showing Occurrence of Water Bearing Fracture Zones at the Depth Range of 35 m Below Ground Level in Proposed Project

3.2.2.5 Geophysical Data Interpretation

A low resistivity rock formation indicates the presence of water at a depth of 50-60 m below ground level. The maximum depth proposed for the proposed project is 35m below ground level. Therefore, mine mining activity does not affect the groundwater level.

3.3 AIR ENVIRONMENT

The existing ambient air quality of the area is important for evaluating the impact of mining activities on the ambient air quality.

The baseline studies on air environment include identification of specific air pollution parameters and their existing levels in ambient air. The ambient air quality with respect to the study zone of 5 km radius around the cluster forms the baseline information. The sources of air pollution in the region are mostly due to vehicular traffic, dust arising from unpaved village road and domestic & agricultural activities. The prime objective of the baseline air quality study was to establish the existing ambient air quality of the study area. These will also be useful for assessing the conformity to standards of the ambient air quality during the operation of proposed project in cluster. This section describes the identification of sampling locations, methodology adopted during the monitoring period and sampling frequency.

3.3.1 Meteorology

Meteorology is the key to understand the air quality. The essential relationship between meteorological condition and atmospheric dispersion involves the wind in the broadest sense. Wind fluctuations over a very wide range of time accomplish dispersion and strongly influence other processes associated with them. 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 3.10. According to the onsite data, the temperature in October, 2022 varied from 18.62 to 34.38⁰C with the average of 26.028⁰C; in November, 2022 from 16.68 to 30.03⁰C with the average of 24.25⁰C; and in December, 2022 from 17.48 to 29.51⁰C with the average of 23.71⁰C. In October, 2022, relative humidity ranged from 40.38 to 100 % with the average of 79.30%; in November, 2022, from 58.94 to 100 % with the average of 87.46 %; and in December,2022, from 54.44 to 100 % with the average of 85.99 %. The wind speed in October, 2022 varied from 0.09 to 6.44 m/s with the average of 2.44 m/s; in November, 2022 from 0.12 to 7.75 m/s with the average of 2.60 m/s; and in December, 2022 from 0.18 to 7.93 m/s with the average of 2.75 m/s. In October,2022, wind direction varied from 1.74 to 355.73⁰ with the average of 188.79⁰; in November, 2022, from 0.46 to 359.70⁰ with the average of 125.28⁰; and in December, 2022, from 0.21 to 358.75⁰ with the average of 106.05⁰. In October,2022,

surface pressure varied from 97.86 to 98.92 kPa with the average of 98.43 kPa; in November, 2022, from 97.53 to 99.03 kPa with the average of 98.54 kPa; and in December, 2022, from 97.89 to 99.43 kPa with the average of 98.60 kPa.

Table 3.10 Onsite Meteorological Data

S. No.	Parameters		OCT,2022	NOV,2022	DEC,2022
1	Temperature (°C)	Min	18.62	16.68	17.48
		Max	34.38	30.03	29.51
		Avg	26.08	24.25	23.71
2	Relative Humidity (%)	Min	40.38	58.94	54.44
		Max	100.00	100.00	100.00
		Avg	79.30	87.46	85.99
3	Wind Speed (m/s)	Min	0.09	0.12	0.18
		Max	6.44	7.75	7.93
		Avg	2.44	2.60	2.75
4	Wind Direction (degree)	Min	1.74	0.46	0.21
		Max	355.73	359.70	358.75
		Avg	188.79	125.28	106.05
5	Surface Pressure(kPa)	Min	97.86	97.53	97.89
		Max	98.92	99.03	99.43
		Avg	98.43	98.54	98.60

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

3.3.1.1 Climate

The Karur has a tropical climate. In winter, there is much less rainfall in summer in Karur. In Karur, the average annual temperature is 28.2 °C, 82.7 °F.

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, shown in Figure 3.14. The Figure 3.14 shows that rainfall is generally high in the months of September through November in every year. Particularly, rainfall in September through November of 2021 is higher than the previous years.

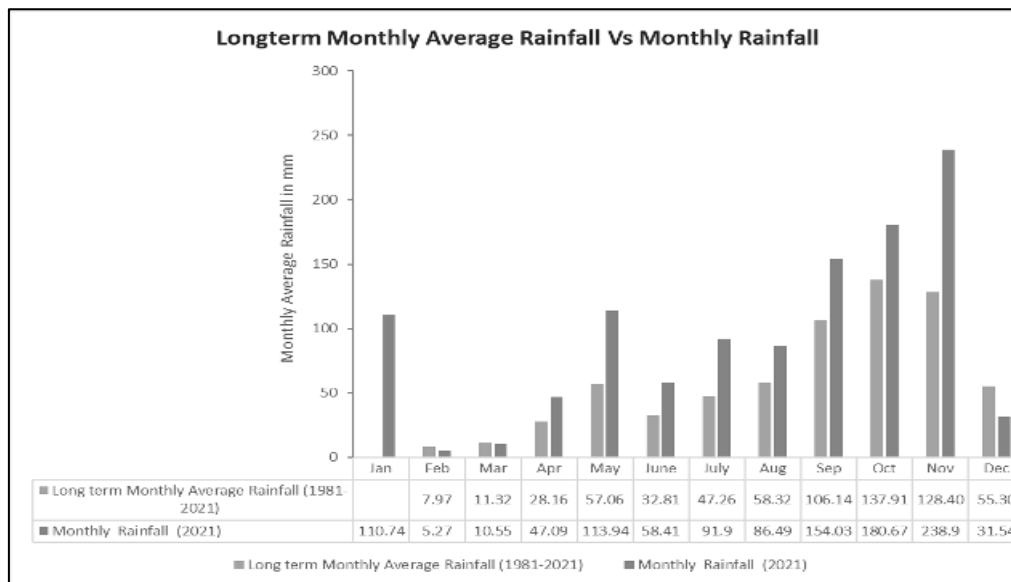


Figure 3.14 Long-Term Monthly Average Rainfall Vs Monthly Rainfall

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 October through December of the years from 2018 to 2021 and the seasonal wind rose for the study period of October through December 2022. The wind rose diagrams thus produced are shown in Figures 3.15-3.15a. Figure 3.16 reveals that:

- ❖ The measured average wind velocity during the study period is 2.54m/s
- ❖ Predominant wind was dominant in the directions ranging from northeast to southwest.
- ❖ Representatives of regional background air quality for obtaining baseline status
- ❖ Location of residential areas representing different activities
- ❖ Accessibility and power availability

3.3.2 Methodology and Objectives

The prime objective of the ambient air quality study is to assess the existing air quality of the study area and its conformity to NAAQS. The observed sources of air pollution in the study area are industrial, traffic and domestic activities. The baseline status of the ambient air quality has been established 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

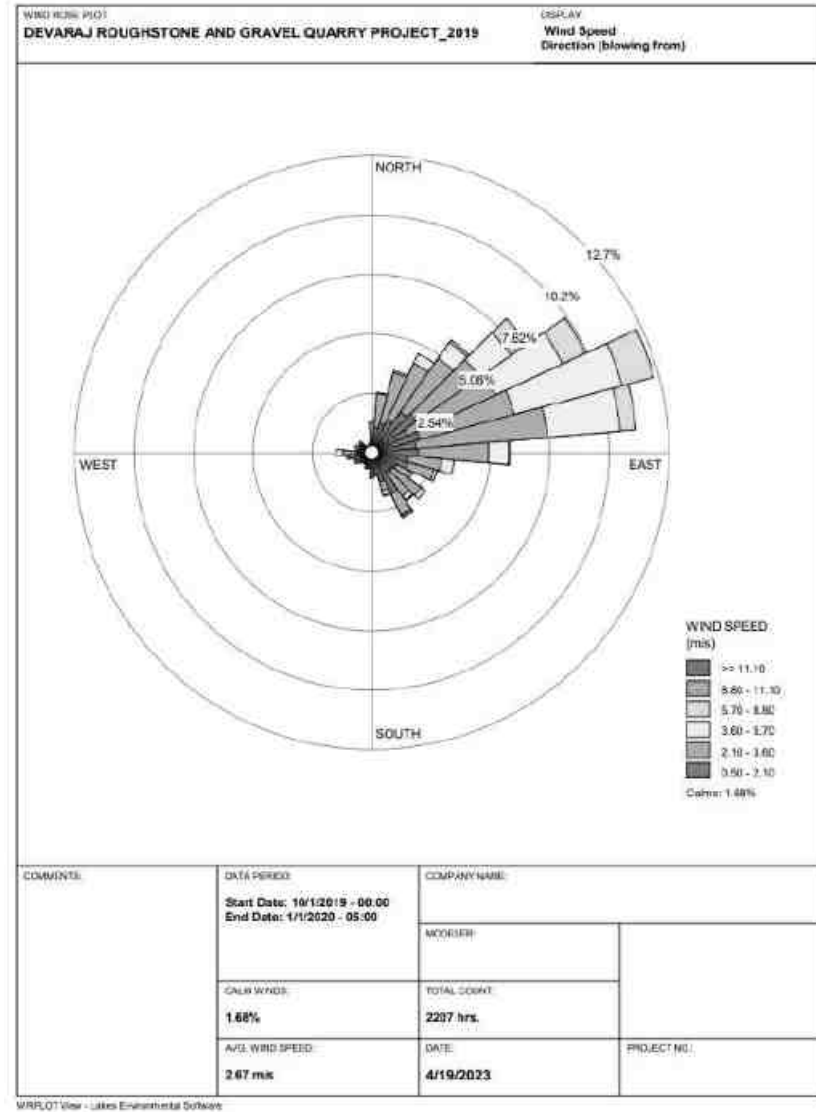
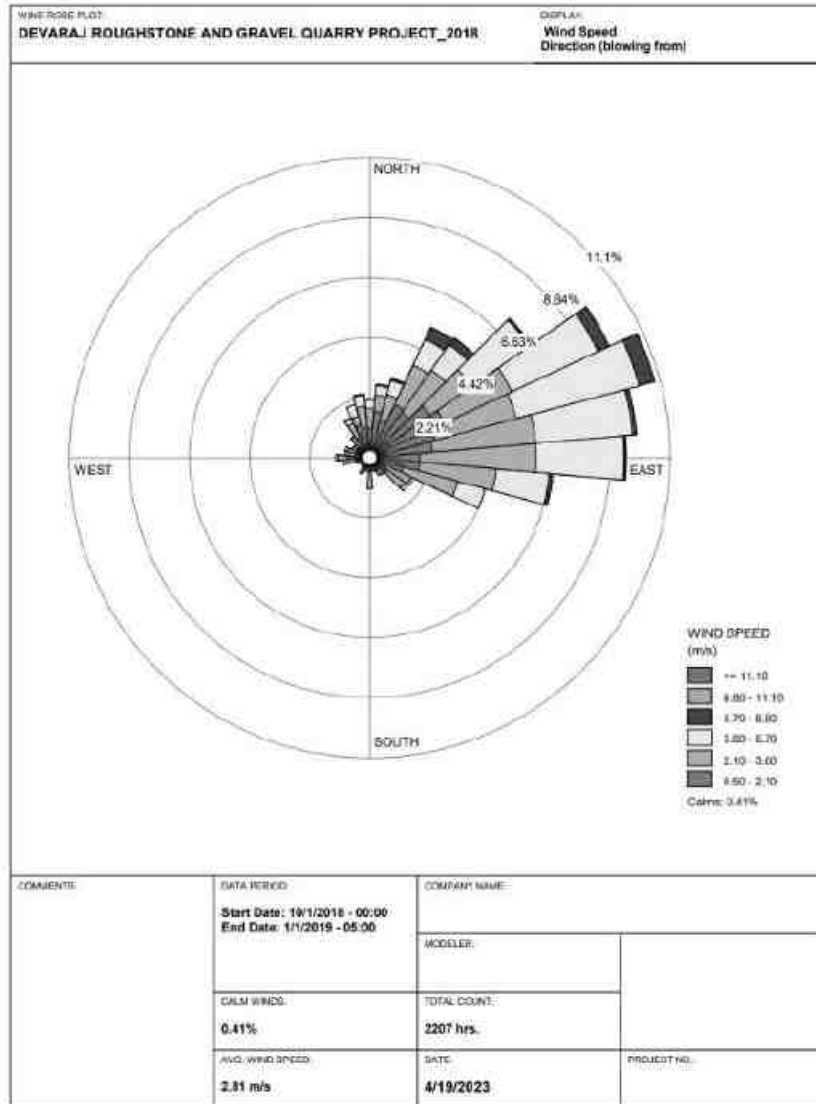


Figure 3.15 Windrose Diagram for 2018 and 2019 (October to December)

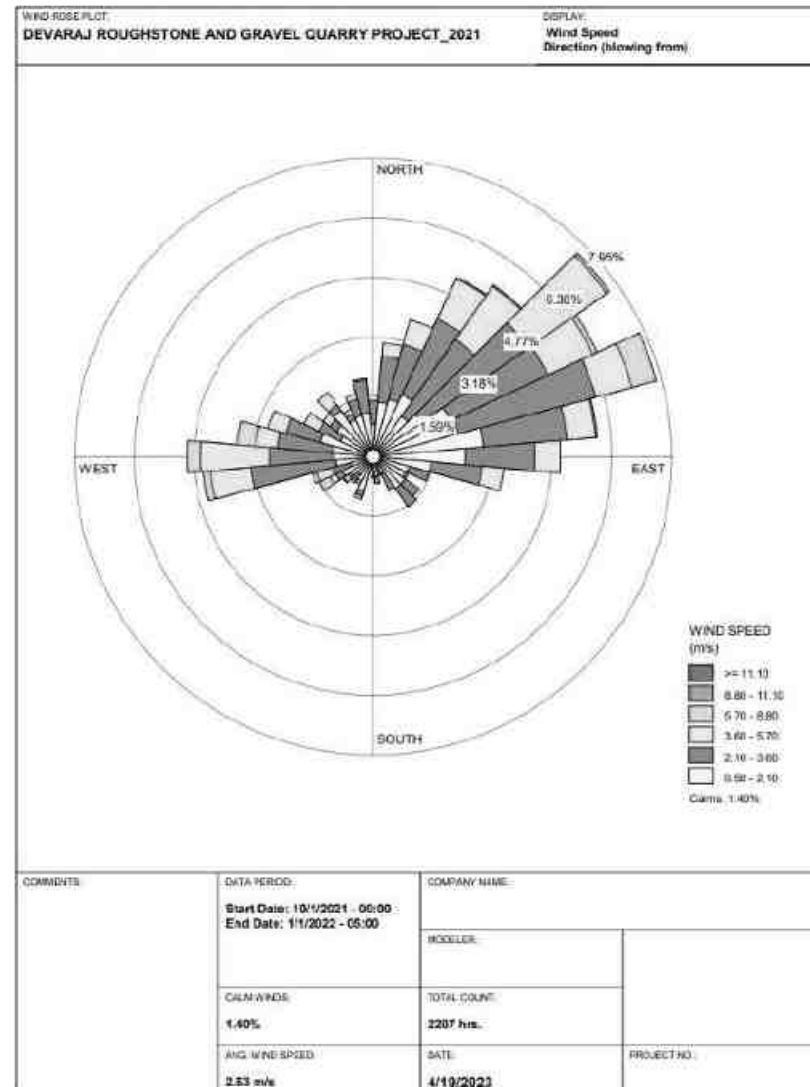
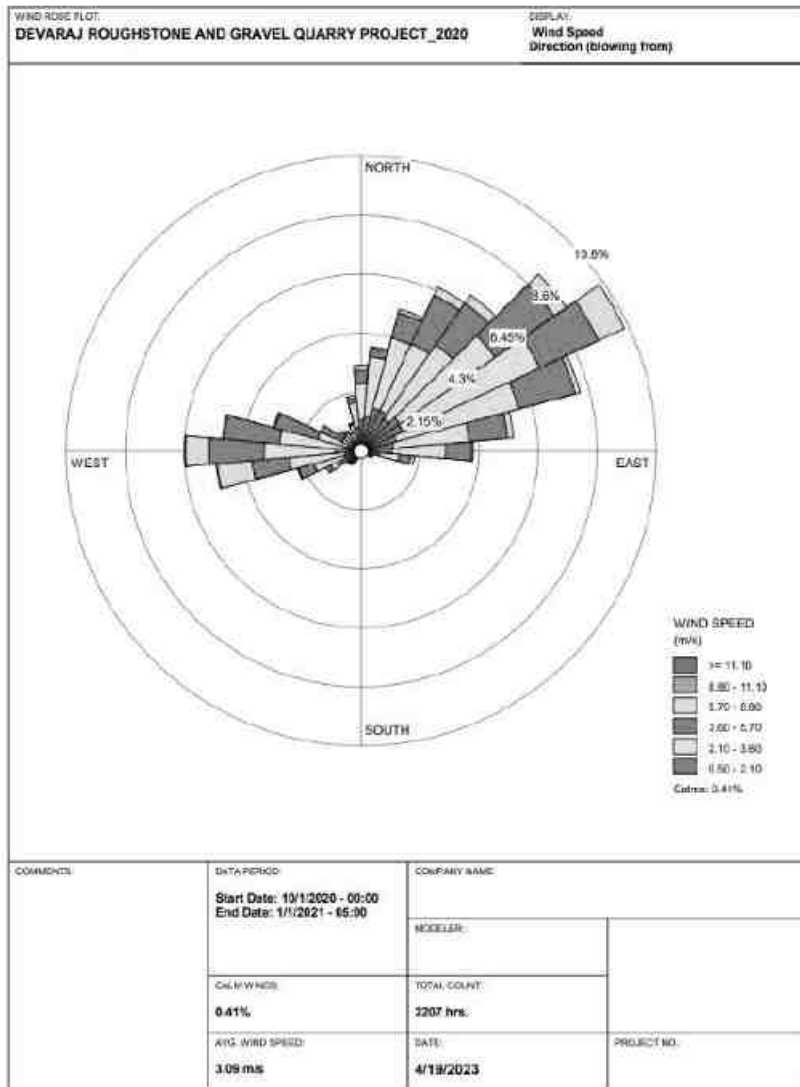
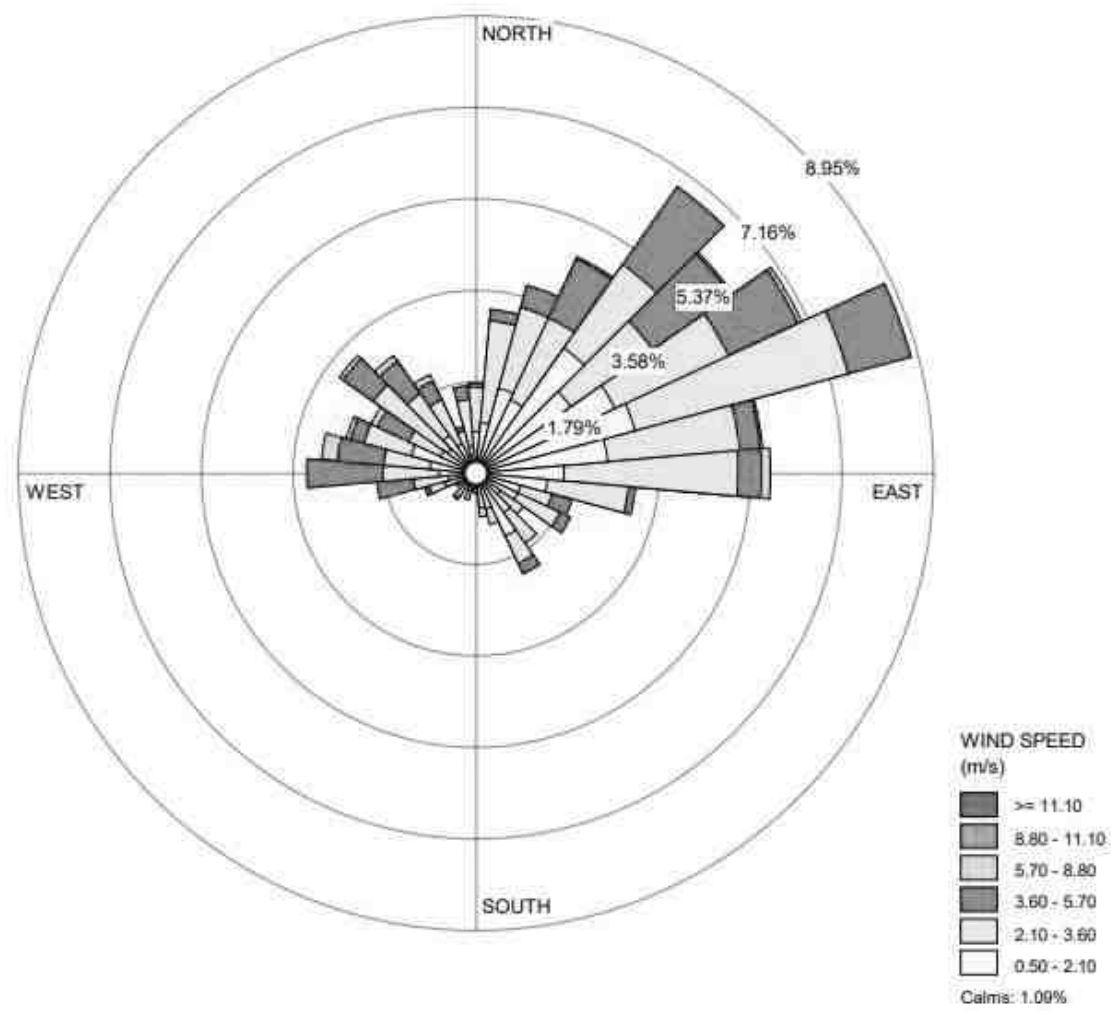


Figure 3.15(A) Windrose Diagram for 2020 and 2021 (October to December)



COMMENTS:	DATA PERIOD: Start Date: 10/1/2022 - 00:00 End Date: 1/1/2023 - 05:00	COMPANY NAME:	
	CALM WINDS: 1.09%	MODELER:	
	AVG. WIND SPEED: 2.54 m/s	TOTAL COUNT: 2135 hrs.	DATE: 4/19/2023	PROJECT NO.:

WRPLOT View - Lakes Environmental Software

Figure 3.16 Onsite Wind Rose Diagram

3.3.3 Sampling and Analytical Techniques

Table 3.11 Methodology and Instrument Used for AAQ Analysis

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

Source: Sampling methodology based on *Excellence Laboratory & CPCB Notification*.

Table 3.12 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	Sulphur Dioxide (µg/m ³)	Annual Avg.*	50.0	20.0
		24 hours**	80.0	80.0
2	Nitrogen Dioxide (µg/m ³)	Annual Avg.	40.0	30.0
		24 hours	80.0	80.0
3	Particulate matter (size less than 10µm) PM ₁₀ (µg/m ³)	Annual Avg.	60.0	60.0
		24 hours	100.0	10 ⁰ .0
4	Particulate matter (size less than 2.5 µm) PM _{2.5} (µg/m ³)	Annual Avg.	40.0	40.0
		24 hours	60.0	60.0

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

3.3.4 Frequency and Parameters for Sampling

Ambient air quality monitoring has been carried out with a frequency of two samples per week at eight locations, adopting a continuous 24 hourly (3 shift of 8-hour) schedule for the period October – December 2022. Monitoring has been carried out 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 dug space free from trees and vegetation which otherwise act as a sink of pollutants resulting in lower levels in monitoring results.

3.3.5 Ambient Air Quality Monitoring Stations

Eight monitoring stations were set up in the study area as depicted in Figure 3.17 for the assessment of the existing ambient air quality. The sampling locations and concentrations of air pollutants measured from the proposed project site have been given in Tables 3.13.

Table 3.13 Ambient Air Quality (AAQ) Monitoring Locations

S. No.	Location Code	Monitoring Locations	Distance (km)	Direction	Coordinates	
					Latitude	Longitude
1	AAQ-1	Near Core Zone	0.04	N	10°59'31.41"N	77°57'55.80"E
2	AAQ-2	VST Blue metals Core	2.00	SE	10°58'53.04"N	10°58'53.04"E
3	AAQ-3	Near Ponvinayaga Blue Metals	2.60	SW	10°58'09.02"N	77°57'14.40"E
4	AAQ-4	Andisangilipalayam	3.34	SW	11° 00'02.45"N	77°56'6.69"E
5	AAQ-5	Punnam Velayuthampalayam	4.32	SW	10°59'04.19"N	77°55'32.63"E
6	AAQ-6	Punnam Chattiram	2.81	SW	11°00'48.64"N	77°58'47.07"E
7	AAQ-7	Pavithiram	4.12	S	10°57'30.93"N	77°59'9.93"E
8	AAQ-8	Nochipalayam	5.00	E	10°59'21.43"N	78° 0'46.92"E

Source: Sampling methodology based on *Excellence Laboratory & CPCB Notification*.

3.3.6 Results & Discussion

As per the monitoring data, PM_{2.5} ranges from 17.9 µg/m³ to 23.0 µg/m³; PM₁₀ from 37.1 µg/m³ to 42.3 µg/m³; SO₂ from 6.8µg/m³ to 10.1µg/m³; NO_x from 14.8 µg/m³ to 21.2 µg/m³. The concentration levels of the pollutants fall within the acceptable limits of NAAQS prescribed by CPCB.

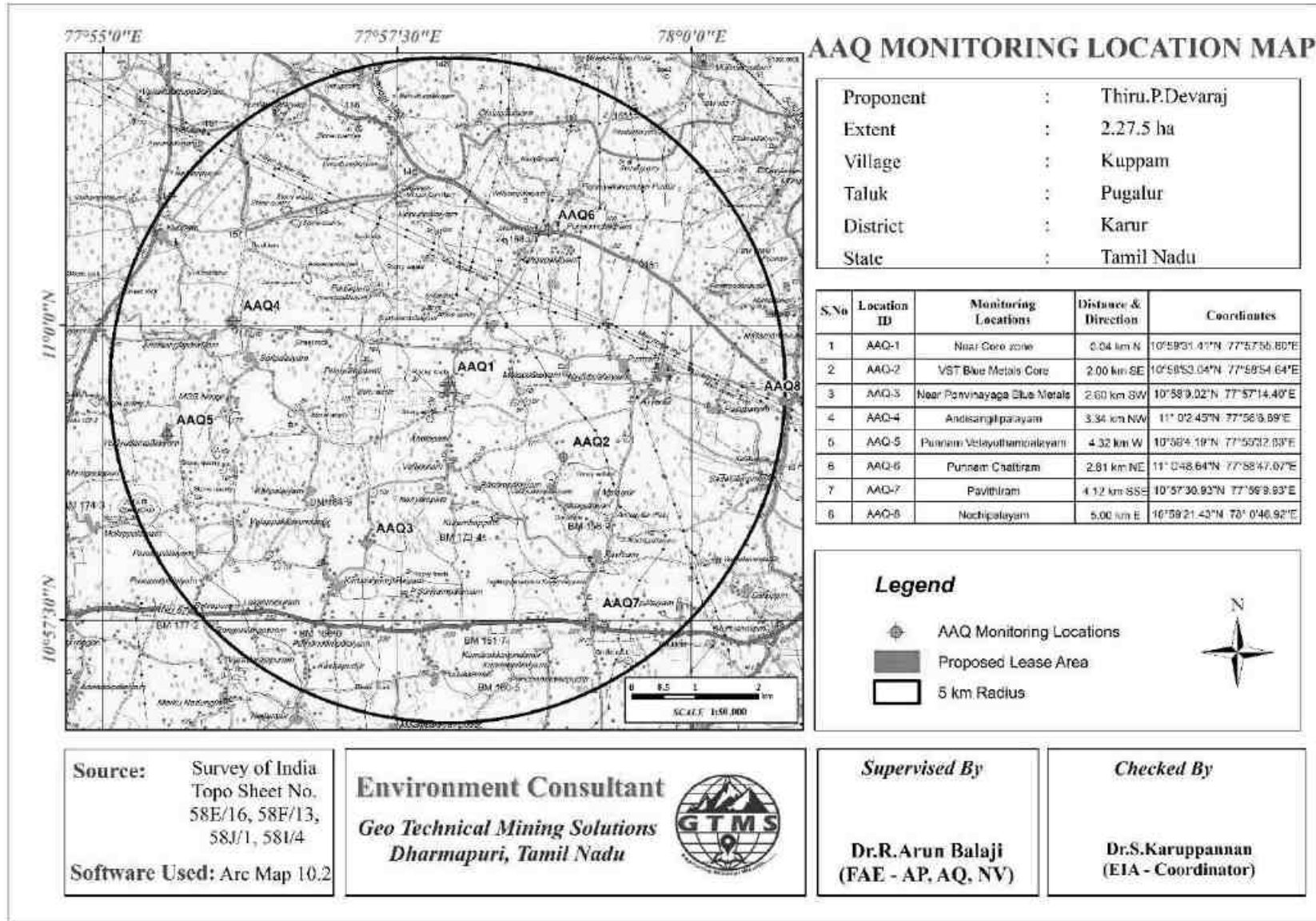


Figure 3.17 Toposheet Showing Ambient Air Quality Monitoring Station Locations Around 5 km Radius from the Proposed Project Site

Table 3.14 Summary of AAQ Result

PM _{2.5}					PM ₁₀			
Station ID	Max	Min	Mean	98 th Percentile	Max	Min	Mean	98 th Percentile
AAQ1	23.8	16.3	20.2	23.2	43.9	38.7	41.7	43.9
AAQ2	25.8	20.5	23.2	25.7	44.6	38.5	40.8	44.4
AAQ3	24.3	18.7	21.0	22.7	43.8	36.0	39.3	43.8
AAQ4	19.1	12.3	16.0	19.1	39.5	34.3	37.0	39.5
AAQ5	22.9	17.8	20.7	22.8	40.6	36.5	38.8	40.6
AAQ6	23.3	19.5	21.4	23.3	41.2	38.4	39.7	41.0
AAQ7	22.2	17.4	19.7	21.9	42.5	35.5	39.7	42.2
AAQ8	22.8	21.0	21.9	22.8	42.3	38.5	40.0	42.1
SO ₂					NO _x			
AAQ1	10.4	6.9	8.4	10.2	18.0	11.5	15.6	17.9
AAQ2	11.3	8.8	9.9	11.3	21.9	17.3	19.6	21.9
AAQ3	10.9	7.7	9.2	10.4	22.1	15.0	18.2	22.1
AAQ4	9.6	5.2	7.0	9.4	15.1	8.6	11.0	14.4
AAQ5	10.6	6.9	8.4	10.3	22.8	15.4	18.5	22.3
AAQ6	10.2	7.1	8.7	10.2	20.8	14.3	17.8	20.5
AAQ7	7.9	4.0	6.6	7.8	24.1	21.4	22.6	23.4
AAQ8	9.5	7.9	8.7	9.5	24.5	21.2	22.2	24.4

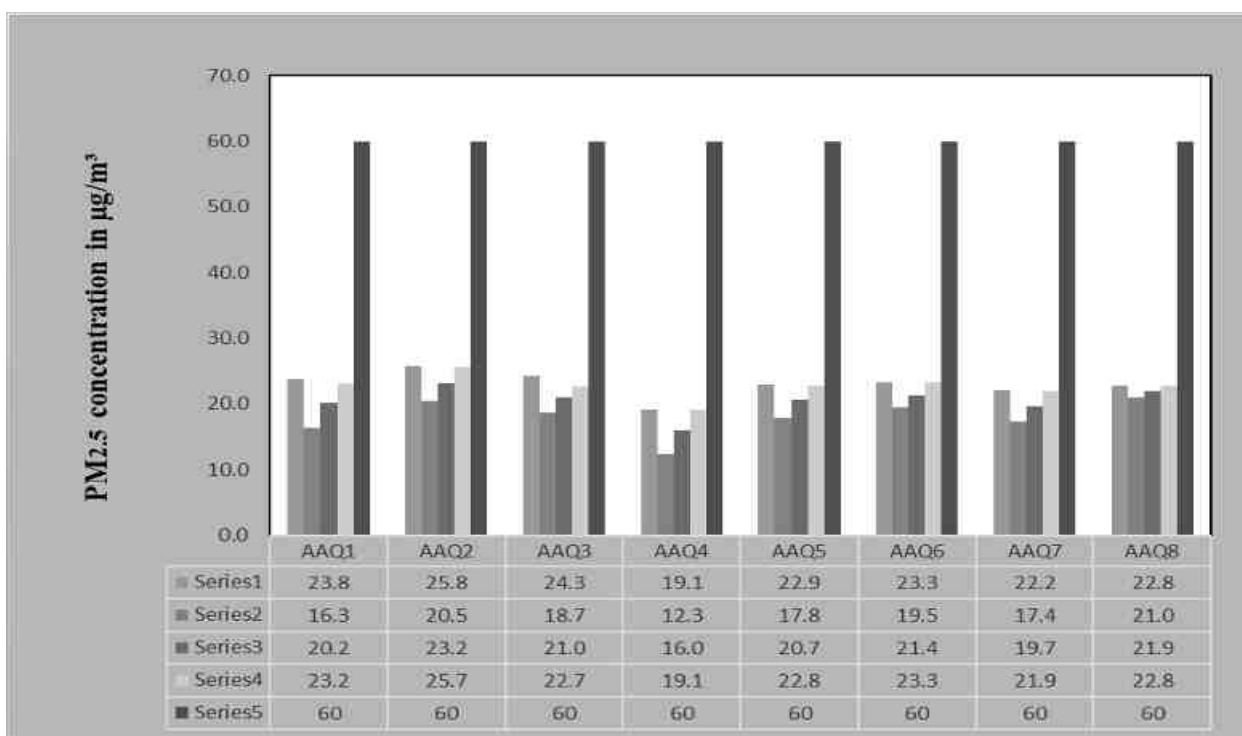


Figure 3.18 Maximum, Minimum, and the Average Concentrations of PM_{2.5} Measured from the Eight Air Quality Monitoring Stations within 5 km Radius

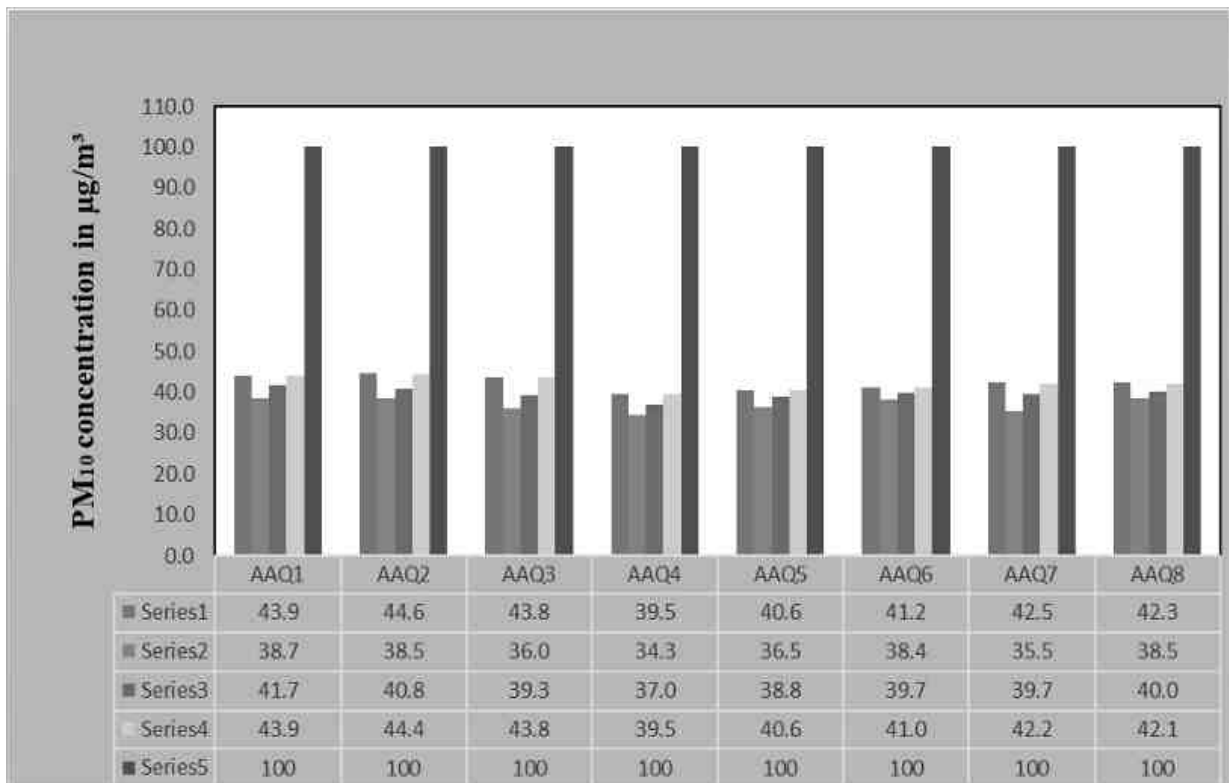


Figure 3.19 Maximum, Minimum, and the Average Concentrations of PM₁₀ Measured from the Eight Air Quality Monitoring Stations within 5 km Radius

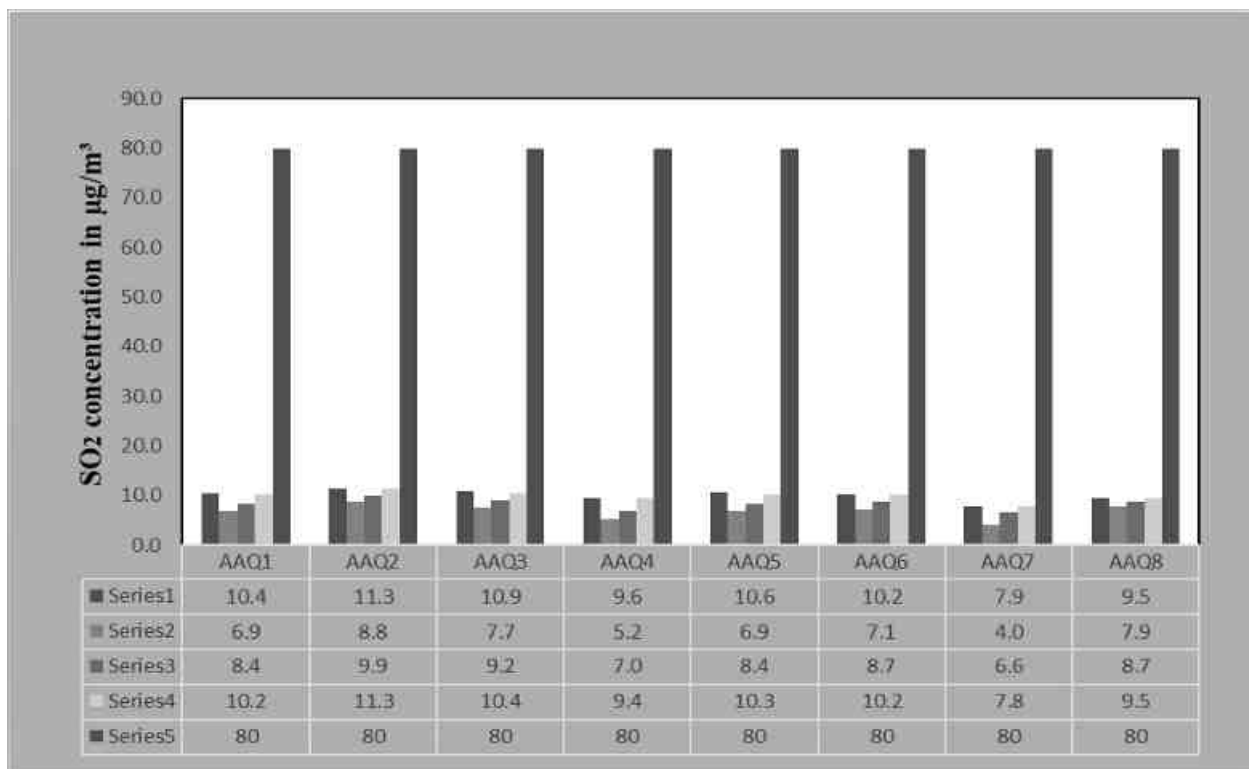


Figure 3.20 Maximum, Minimum, and the Average Concentrations of SO₂ Measured from the Eight Air Quality Monitoring Stations within 5 km Radius

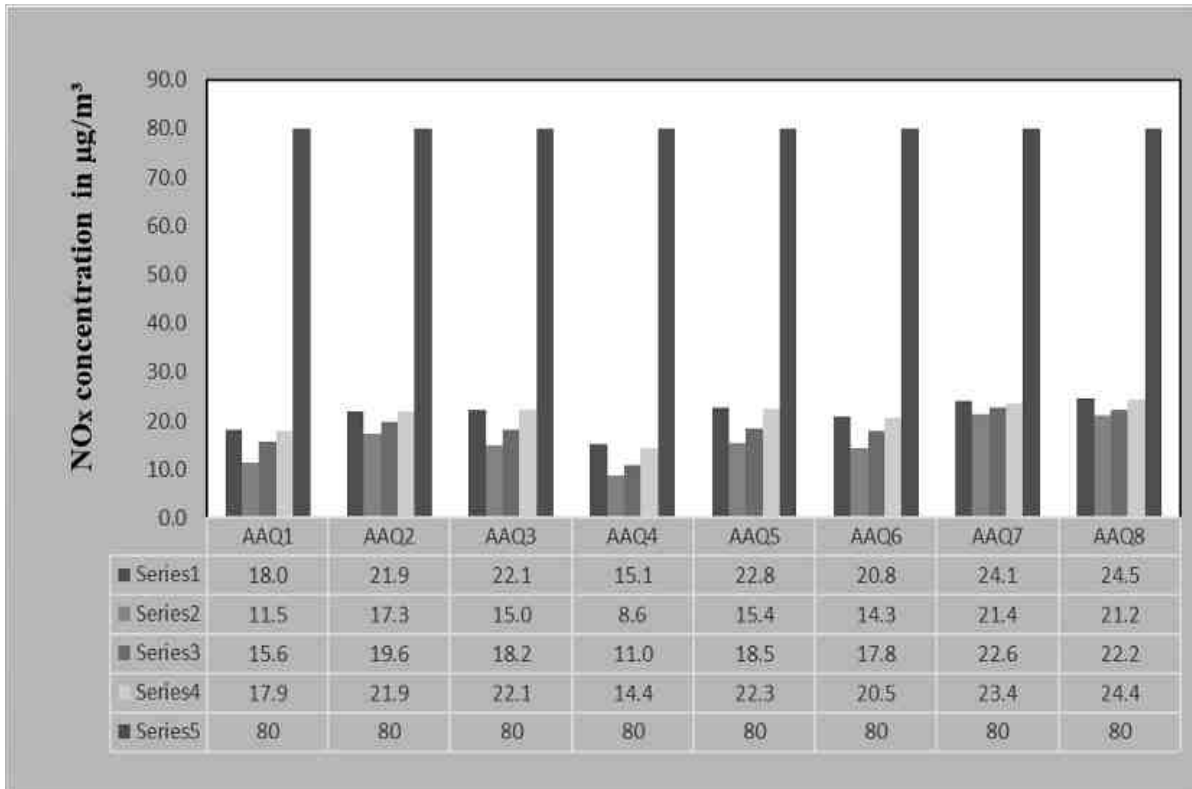


Figure 3.21 Maximum, Minimum, and the Average Concentrations of NO_x Measured from the Eight Air Quality Monitoring Stations within 5 km Radius

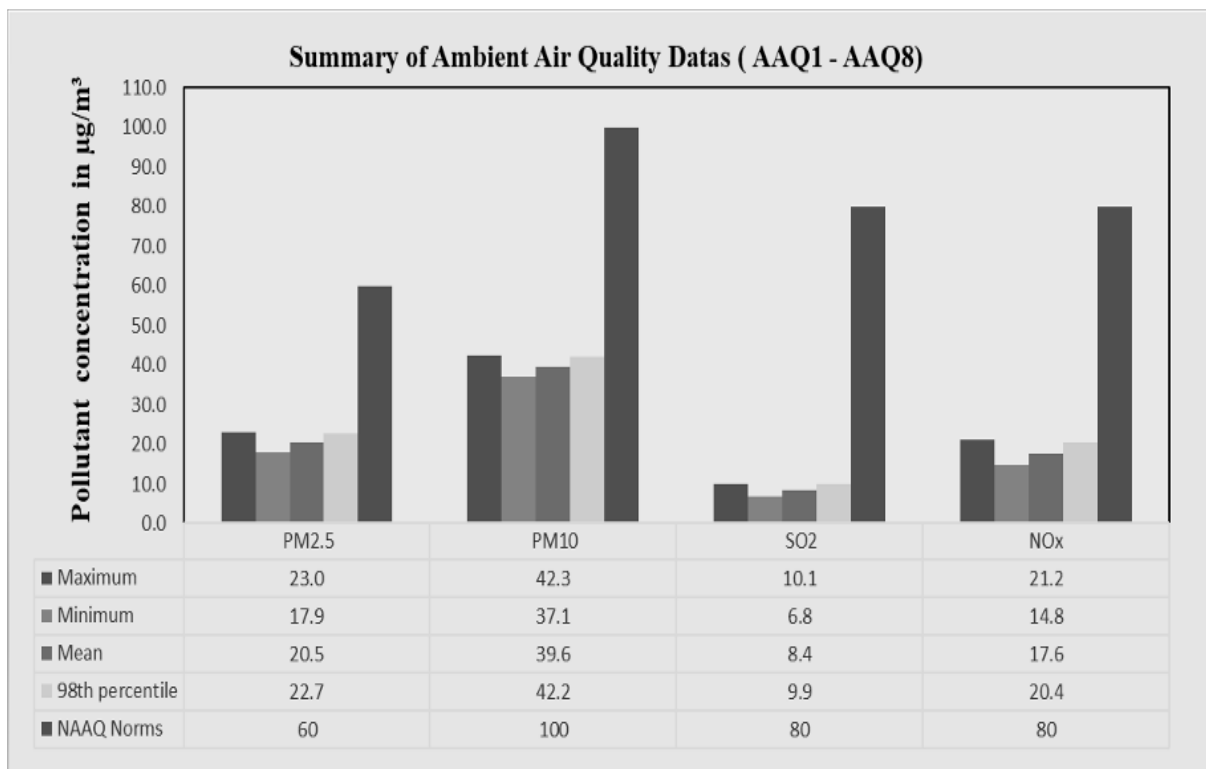


Figure 3.22 Maximum, Minimum, and the Average Concentrations of Pollutants in the Atmosphere within 5km Radius

3.4 NOISE ENVIRONMENT

The vehicular movement on road and mining activities is the major sources of noise in the study area, the environmental assessment of noise from the mining activity and vehicular traffic can be undertaken by taking into consideration various factors like potential damage to hearing, physiological responses, and annoyance and general community responses.

The main objective of noise monitoring in the study area is to establish the baseline noise level and assess the impact of the total noise expected to be generated during the project operations around the project site.

3.4.1 Identification of Sampling Locations

In order to assess the ambient noise levels within the study area, noise monitoring was carried out at nine (09) locations covering commercial, residential, rural areas within the radius of 5 km. A suitable noise monitoring methodology was chosen to meet the purpose and objectives of the study.

Table 3.15 Details of Noise Monitoring Locations

S. No.	Location ID	Monitoring Locations	Distance (km)	Direction	Coordinates	
					Latitude	Longitude
1	N-1	Core Zone	0.04	N	10°59'31.41"N	77°57'55.80"E
2	N-2	Pullaiyampalayam	0.55	N	10°59'48.21"N	77°58'00.72"E
3	N-3	VST Blue metals Core	2.01	SE	10°58'50.35"N,	77°58'54.49"E
4	N-4	Near Ponvinayaga Blue Metals	2.60	SW	10°58'09.02"N	77°57'14.40"E
5	N-5	Andisangilipalayam	3.34	NW	11°00'02.45"N	77°56'06.69"E
6	N-6	Punnam Velayuthampalayam	4.32	W	10°58'09.02"N	77°57'14.40"E
7	N-7	Punnam Chattiram	2.81	NE	11°58'09.02"N	77°57'14.40"E
8	N-8	Pavithiram	4.12	SSE	10°57'26.71"N	77°59'09.15"E
9	N-9	Nochipalayam	5.00	E	77°57'14.34"E	78° 0'49.60"E

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

3.4.2 Method of Monitoring

Digital Sound Level Meter was used for the study. All reading was taken on the 'A-Weighting' frequency network at a height of 1.5 meters from ground level. The sound level meter does not give a steady and consistent reading and it is quite difficult to assess the actual sound level over the entire monitoring period. To mitigate this shortcoming, the Continuous Equivalent Sound level indicated by Leq, is used. Equivalent sound level, 'Leq', can be obtained from variable sound pressure level,

'L', over a time period by using following equation. The equivalent noise level is defined mathematically as below:

$$Leq = 10 \text{ Log } L / T \sum (10L_n/10)$$

Where L = Sound pressure level at function of time dB (A), T = Time interval of observation

Measured noise levels, displayed as a function of time, is useful for describing the acoustical climate of the community. Noise levels recorded at each station with a time interval of about 60 minutes are computed for equivalent noise levels. Equivalent noise level is a single number descriptor for describing time varying noise levels.

3.4.3 Analysis of Ambient Noise Level in the Study Area

The Digital Sound pressure level has been measured by a sound level meter (Model: HTC SL-1352). An analysis of the different Leq data obtained during the study period has been made. Variation was noted during the day-time as well as night-time. The results are presented in below Table 3.16.

Table 3.16 Ambient Noise Quality Result

S. No.	Locations	Noise level (dB (A) Leq)		Ambient Noise Standards
		Day Time (6AM-10 PM)	Night Time (10 PM-6 AM)	
1	Core Zone	41.4	31.8	Industrial Day Time- 75 dB (A) Night Time- 70 dB (A)
2	Pullaiyampalayam	39.4	30.2	Residential Day Time- 55 dB (A) Night Time- 45 dB (A)
3	VST Blue metals Core	41.6	32.6	Industrial Day Time- 75 dB (A) Night Time- 70 dB (A)
4	Near Ponvinayaga Blue Metals	41.2	32.4	Residential Day Time- 55 dB (A) Night Time- 45 dB (A)
5	Andisangilipalayam	36.2	30.8	
6	Punnam Velayuthampalayam	39.6	30.1	
7	Punnam Chattiram	42.6	35.4	
8	Pavithiram	43.8	40.1	
9	Nochipalayam	41.3	36.2	

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

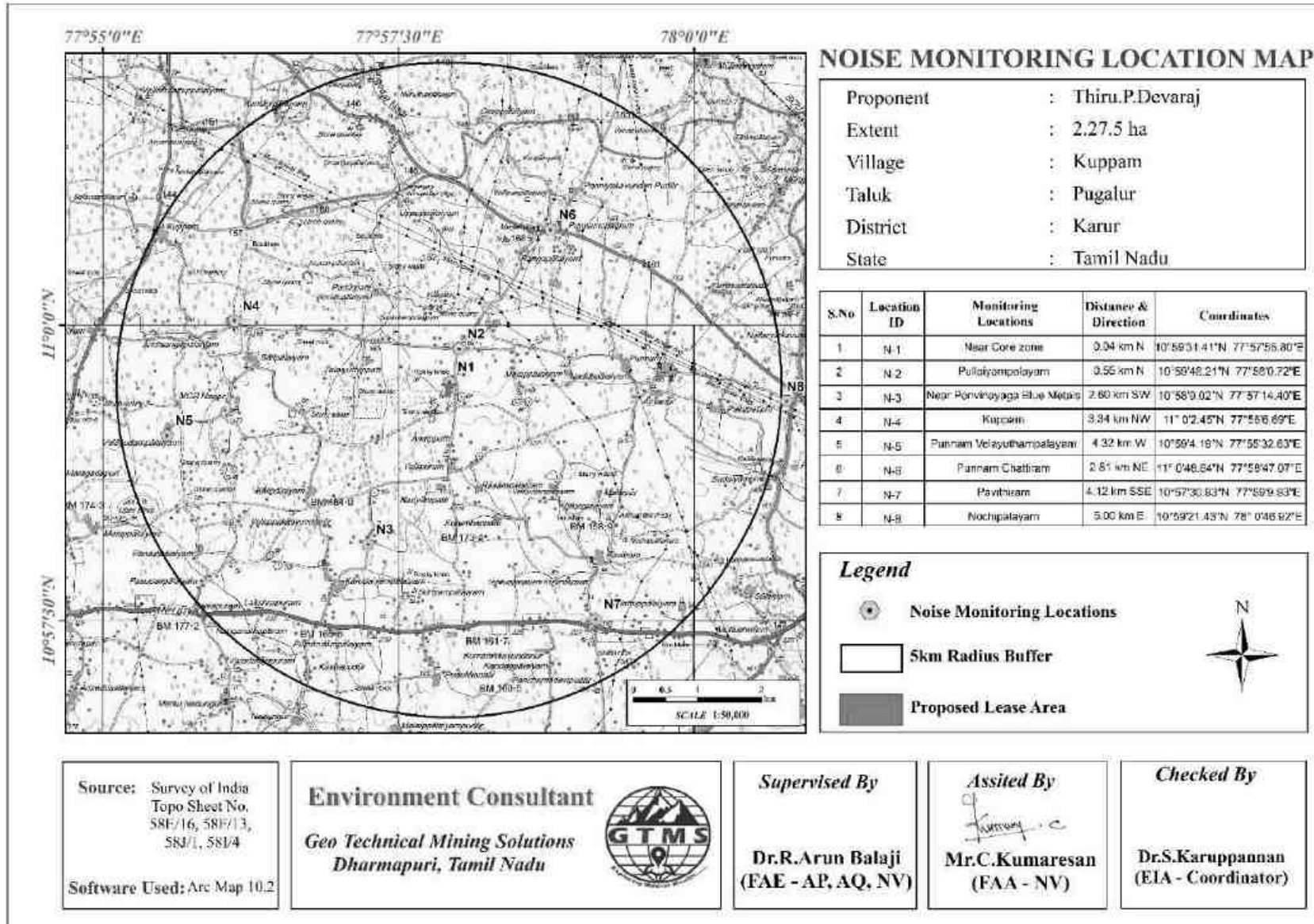


Figure 3.23 Toposheet Showing Noise Level Monitoring Station Locations around 5 km Radius from the Proposed Project Site

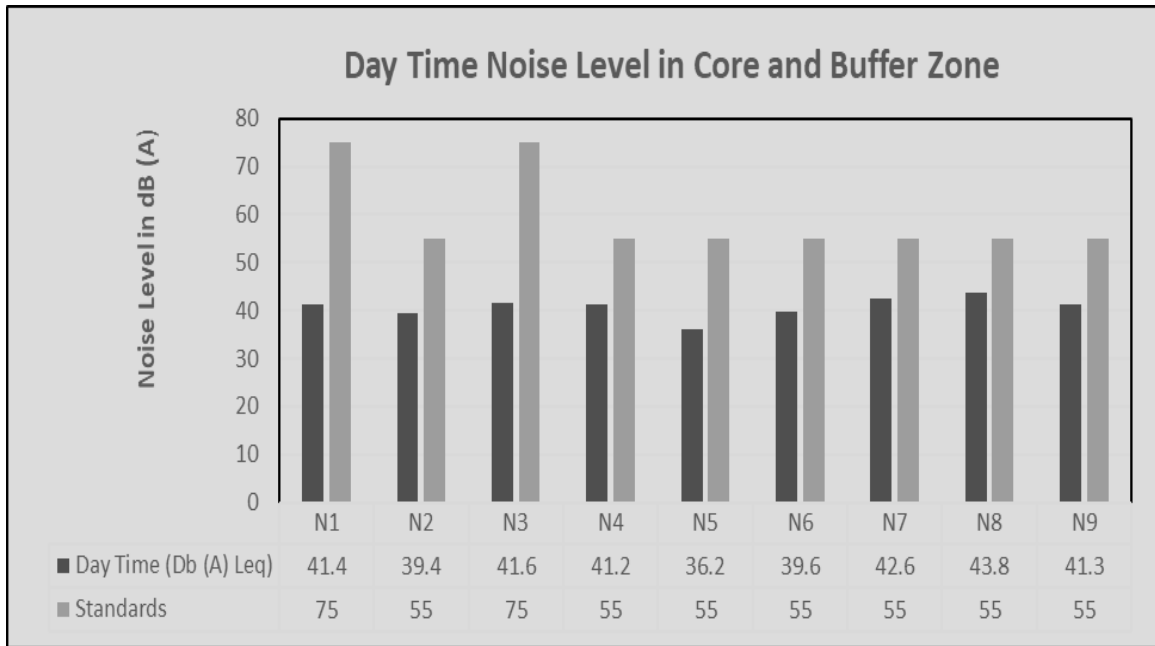


Figure 3.24 Day Time Noise Levels Measured in Core and Buffer Zones

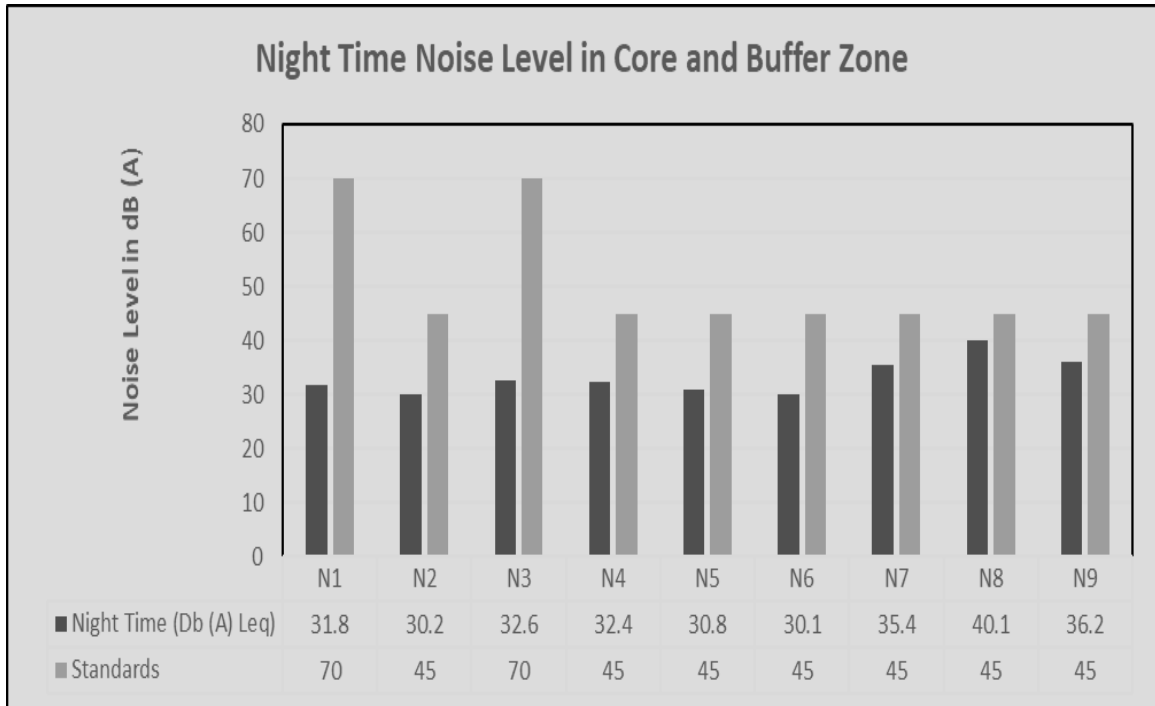


Figure 3.25 Night Time Noise Levels Measured in Core and Buffer Zones

3.4.4 Results & Discussion

Ambient noise levels were measured at 09 locations around the proposed project area. The noise level results in Table 3.16 show that noise levels in core zone was 41.4 dB (A) Leq. during day time and 31.8 dB (A) Leq. during night time and that noise levels in buffer zone varied from 36.2 to 43.8 dB (A) Leq. during day time and from 30.1 to 40.1 dB (A) Leq. during night time. Thus, the noise level for industrial and residential area meets the requirements of CPCB.

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 25m × 25m were laid down to assess trees and quadrats of 10m × 10m were laid down for shrubs.



Figure 3.26 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 3.17. 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 3.17 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 3.18.

Table 3.18 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.

Flora in core zone

There are no plant species in the mining lease area. It is a kind of dry land. The mining lease area is shown in Figure 3.27



Figure 3.27 Mine Lease Area

Flora in 300 m radius zone

Vegetation species within 300 meters radius around the lease area. It is an arid landscape. There is no agricultural land nearby. It contains a total of 18 species belonging to 12 families have been recorded from the buffer zone. Trees 4 (22%), Shrubs 4 (22%) Herbs 10 (55%) were identified. Details of flora with the scientific name details and diversity species Rich ness index were mentioned in Table 3.19-3.21.and figure 3.28 There is no threat to the Flora and Fauna species in 300-meter radius

Flora in 10 km radius zone

Similar type of environment also in buffer area but with more flora diversity compare than core zone area because nearby agriculture land was found to dominate mostly in all the directions. Majority of the flat landscape around project unit is occupied by agriculture fields. It contains a total of 66 species belonging to 37 families have been recorded from the buffer zone consisting of 30 Trees (45%), 15 Shrubs (22%) Herbs and 21 (31%) Climbers, Creeper, Grass & Cactus were identified. Details of flora with the scientific name details of diversity species Rich ness index were mentioned in Table 3.22-3.24 and figure 3.28

Table 3.19 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	Importance Value Index	IUCN Conservation Status
Trees													
1	Karuvelam	<i>Vachellia Nilotica</i>	Fabaceae	6	4	5	1.2	80.0	1.5	40.0	36.4	76.4	Not Listed
2	Usilai Wunja	<i>Albizia Amara</i>	Fabaceae	4	3	5	0.8	60.0	1.3	26.7	27.3	53.9	Not Listed
3	Vembu	<i>Azadirachta Indica</i>	Meliaceae	3	2	5	0.6	40.0	1.5	20.0	18.2	38.2	Not Listed
4	Vealli Vealan	<i>Vachellia Leucophloea</i>	Babesiae	2	2	5	0.4	40.0	1.0	13.3	18.2	31.5	Lc
Shrubs													
1	Erukku	<i>Calotropis Gigantea</i>	Apocynaceae	7	6	8	0.9	75.0	1.2	26.9	30.0	56.9	Not Listed
2	Uumaththai	<i>Datura Metel</i>	Solanaceae	4	3	8	0.5	37.5	1.3	15.4	15.0	30.4	Not Listed
3	Thuthi	<i>Abutilon Indicum</i>	Meliaceae	8	6	8	1.0	75.0	1.3	30.8	30.0	60.8	Not Listed
4	Avarai	<i>Senna Auriculata</i>	Fabaceae	7	5	8	0.9	62.5	1.4	26.9	25.0	51.9	Not Listed
Herbs													

1	Nayuruv	<i>Achyranthes Aspera</i>	Amaranthaceae	5	4	15	0.3	26.7	1.3	3.4	3.1	6.5	Not Listed
2	Veetukaayapundu	<i>Tridax Procumbens</i>	Asteraceae	7	6	15	0.5	40.0	1.2	4.7	4.7	9.4	
3	Mukkirattai	<i>Boerhaavia Diffusa</i>	Nyctaginaceae	6	5	15	0.4	33.3	1.2	4.0	3.9	8.0	Not Listed
4	Thumbai	<i>Leucas Aspera</i>	Lamiaceae	8	7	15	0.5	46.7	1.1	5.4	5.5	10.9	Not Listed
5	Nai Kadugu	<i>Celome Viscosa</i>	Capparidaceae	5	4	15	0.3	26.7	1.3	3.4	3.1	6.5	Not Listed
6	Partiniyam	<i>Parthenium Hysterophorus</i>	Asteraceae	7	6	15	0.5	40.0	1.2	4.7	4.7	9.4	Not Listed
7	Mukurattai	<i>Boerhavia Diffusa</i>	Nyctaginaceae	6	5	15	0.4	33.3	1.2	4.0	3.9	8.0	Not Listed
8	Kovakkai	<i>Trichosanthes Dioica</i>	Cucurbitaceae	8	7	15	0.5	46.7	1.1	5.4	5.5	10.9	Not Listed
9	Mookuthi Poondur	<i>Wedelia Trilobata</i>	Asteraceae	6	5	15	0.4	33.3	1.2	4.0	3.9	8.0	Not Listed
10	Perandai	<i>Cissus Quadrangularis</i>	Vitaceae	7	6	15	0.5	40.0	1.2	4.7	4.7	9.4	Not Listed

Table 3.20 Calculation of Species Diversity in 300 Meter Radius

S.No	Common Name	Scientific Name	No. Of Species	Pi	In (Pi)	Pi X In (Pi)
Trees						
1	Karuvelam	<i>Vachellia Nilotica</i>	6	0.40	-0.92	-0.37
2	Usilai Wunja	<i>Albizia Amara</i>	4	0.27	-1.32	-0.35
3	Vembu	<i>Azadirachta Indica</i>	3	0.20	-1.61	-0.32
4	Vealli Vealan	<i>Vachellia Leucophloea</i>	2	0.13	-2.01	-0.27
H (Shannon Diversity Index) =1.31						
Shrubs						
1	Erukku	<i>Calotropis Gigantea</i>	7	0.27	-1.31	-0.35
2	Uumaththai	<i>Datura Metel</i>	4	0.15	-1.87	-0.29
3	Thuthi	<i>Abutilon Indicum</i>	8	0.31	-1.18	-0.36
4	Avarai	<i>Senna Auriculata</i>	7	0.27	-1.31	-0.35
H (Shannon Diversity Index) =1.36						
Herbs						
1	Nayuruv	<i>Achyranthes Aspera</i>	10	0.13	-2.07	-0.26
2	Vetukaayapoondur	<i>Tridax Procumbens</i>	8	0.10	-2.29	-0.23
3	Mukkirattai	<i>Boerhaavia Diffusa</i>	9	0.11	-2.17	-0.25
4	Thumbai	<i>Leucas Aspera</i>	8	0.10	-2.29	-0.23
5	Nai Kadugu	<i>Celome Viscosa</i>	7	0.09	-2.42	-0.21
6	Parttiniyam	<i>Parthenium Hysterophorus</i>	8	0.10	-2.29	-0.23
7	Mukurattai	<i>Boerhavia Diffusa</i>	7	0.09	-2.42	-0.21
8	Kovakkai	<i>Trichosanthes Dioica</i>	7	0.09	-2.42	-0.21
9	Mookuthi Poondur	<i>Wedelia Trilobata</i>	9	0.11	-2.17	-0.25
10	Perandai	<i>Cissus Quadrangularis</i>	6	0.08	-2.58	-0.20
H (Shannon Diversity Index) =2.29						

Table 3.21 Species Richness (Index) In 300-Meter Radius

Details	H	H Max	Evenness	Species Richness
Tree	1.31	1.39	0.94	1.11
Shrubs	1.36	1.39	0.98	0.92
Herbs	2.29	2.30	1.00	2.06

Table 3.22 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
Trees													
1	Manga	<i>Mangifera Indica</i>	Anacardiaceae	6	5	10	0.6	50.0	1.2	4.3	4.6	8.9	Not Listed
2	Puliyamaram	<i>Tamarindus Indica</i>	Legumes	5	4	10	0.5	40.0	1.3	3.6	3.7	7.3	Not Listed
3	Vadanarayani	<i>Delonix Elata</i>	Fabaceae	6	5	10	0.6	50.0	1.2	4.3	4.6	8.9	Not Listed
4	Thenpazham	<i>Muntingia Calabura</i>	Tiliaceae	4	3	10	0.4	30.0	1.3	2.9	2.8	5.6	Not Listed
5	Punnai	<i>Calophyllu Inophyllum</i>	Calophyllaceae	5	4	10	0.5	40.0	1.3	3.6	3.7	7.3	Not Listed
6	Ilanthai	<i>Ziziphus Jujubha</i>	Rhamnaceae	6	5	10	0.6	50.0	1.2	4.3	4.6	8.9	Not Listed
7	Vembu	<i>Azadirachta Indica</i>	Meliaceae	3	2	10	0.3	20.0	1.5	2.2	1.8	4.0	Not Listed
8	Thekku	<i>Tectona Grandis</i>	Verbenaceae	4	3	10	0.4	30.0	1.3	2.9	2.8	5.6	Not Listed
9	Pongam Oiltree	<i>Pongamia Pinnata</i>	Fabaceae	5	4	10	0.5	40.0	1.3	3.6	3.7	7.3	Not Listed
10	Thennai Maram	<i>Cocos Nucifera</i>	Arecaceae	3	2	10	0.3	20.0	1.5	2.2	1.8	4.0	Not Listed
11	Nochi	<i>Vitex Negundo</i>	Lamiaceae	4	3	10	0.4	30.0	1.3	2.9	2.8	5.6	Not Listed

12	Karimurungai	<i>Moringa Olefera</i>	Moraginaceae	5	4	10	0.5	40.0	1.3	3.6	3.7	7.3	Not Listed
13	Pappali Maram	<i>Carica Papaya L</i>	Caricaceae	6	5	10	0.6	50.0	1.2	4.3	4.6	8.9	Not Listed
14	Poovarasu	<i>Thespesia Populnea</i>	Malvaceae	4	3	10	0.4	30.0	1.3	2.9	2.8	5.6	Not Listed
15	Arasanmaram	<i>Ficus Religiosa</i>	Moraceae	3	2	10	0.3	20.0	1.5	2.2	1.8	4.0	Not Listed
16	Vilvam	<i>Aegle Marmelos</i>	Rutaceae	4	3	10	0.4	30.0	1.3	2.9	2.8	5.6	Not Listed
17	Alamaram	<i>Ficus Benghalensis</i>	Moraceae	2	1	10	0.2	10.0	2.0	1.4	0.9	2.4	Not Listed
18	Vazhaimaram	<i>Musa</i>	Musaceae	4	3	10	0.4	30.0	1.3	2.9	2.8	5.6	Not Listed
19	Karuvelam Maram	<i>Vachellia Nilotica</i>	Fabaceae	5	4	10	0.5	40.0	1.3	3.6	3.7	7.3	Not Listed
20	Nelli	<i>Embllica Officinalis</i>	Phyllanthaceae	4	3	10	0.4	30.0	1.3	2.9	2.8	5.6	Not Listed
21	Eucalyptus	<i>Eucalyptus Globules</i>	Myrtaceae	3	2	10	0.3	20.0	1.5	2.2	1.8	4.0	Not Listed
22	Maramalli	<i>Millingtonia Hortensis</i>	Bignoniaceae	5	4	10	0.5	40.0	1.3	3.6	3.7	7.3	Not Listed
23	Kuduka Puli	<i>Pithecellobium Dulce</i>	Mimosaceae	6	5	10	0.6	50.0	1.2	4.3	4.6	8.9	Not Listed
24	Karungali	<i>Acacia Sundra</i>	Legumes	4	3	10	0.4	30.0	1.3	2.9	2.8	5.6	Not Listed
25	Karuvelam	<i>Acacia Nilotica</i>	Mimosaceae	5	4	10	0.5	40.0	1.3	3.6	3.7	7.3	Not Listed
26	Nettilinkam	<i>Polylathia Longifolia</i>	Annonaceae	6	5	10	0.6	50.0	1.2	4.3	4.6	8.9	Not Listed
27	Arai Nelli	<i>Phyllanthus Acidus</i>	Euphorbiaceae	4	3	10	0.4	30.0	1.3	2.9	2.8	5.6	Not Listed
28	Panai Maram	<i>Borassus Flabellifer</i>	Arecaceae	5	4	10	0.5	40.0	1.3	3.6	3.7	7.3	Not Listed
29	Sapota	<i>Manilkara Zapota</i>	Sapotaceae	7	6	10	0.7	60.0	1.2	5.0	5.5	10.5	Not Listed
30	Navalmaram	<i>Sygygium Cumini</i>	Myrtaceae	6	5	10	0.6	50.0	1.2	4.3	4.6	8.9	Not Listed
Shrubs													

1	Avarai	<i>Senna Auriculata</i>	Fabaceae	8	9	15	0.5	60.0	0.9	7.3	9.4	16.7	Not Listed
2	Sundaika	<i>Solanum Torvum</i>	Solanaceae	7	6	15	0.5	40.0	1.2	6.4	6.3	12.7	Not Listed
3	Purapirakkai	<i>Chrozophora Rottleri</i>	Euphorbiaceae	6	5	15	0.4	33.3	1.2	5.5	5.2	10.7	Not Listed
4	Arali	<i>Nerium Indicum</i>	Apocynaceae	7	6	15	0.5	40.0	1.2	6.4	6.3	12.7	Not Listed
5	Seemaiagaththi	<i>Cassia Alata</i>	Caesalpinaceae	9	8	15	0.6	53.3	1.1	8.3	8.3	16.6	Not Listed
6	Chemparuthi	<i>Hibiscu Rosa-Sinensis</i>	Malvaceae	8	7	15	0.5	46.7	1.1	7.3	7.3	14.6	Not Listed
7	Kattamanakku	<i>Jatropha Curcas</i>	Euphorbiaceae	6	5	15	0.4	33.3	1.2	5.5	5.2	10.7	Not Listed
8	Chaturakalli	<i>Euphorbia Antiquorum</i>	Euphorbiaceae	8	7	15	0.5	46.7	1.1	7.3	7.3	14.6	Not Listed
9	Idlipoo	<i>Xoracoc Cinea</i>	Rubiaceae	7	6	15	0.5	40.0	1.2	6.4	6.3	12.7	Not Listed
10	Thuthi	<i>Abutilon Indicum</i>	Meliaceae	6	5	15	0.4	33.3	1.2	5.5	5.2	10.7	Not Listed
11	Nithyakalyani	<i>Cathranthus Roseus</i>	Apocynaceae	8	7	15	0.5	46.7	1.1	7.3	7.3	14.6	Not Listed
12	Uumaththai	<i>Datura Metel</i>	Solanaceae	9	8	15	0.6	53.3	1.1	8.3	8.3	16.6	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	6	5	15	0.4	33.3	1.2	5.5	5.2	10.7	Not Listed
15	Neermulli	<i>Hydrophila Auriculata</i>	Acanthaceae	7	6	15	0.5	40.0	1.2	6.4	6.3	12.7	Not Listed
Herbs, Climber, Creeper & Grasses													
1	Nayuruv	<i>Achyranthes Aspera</i>	Amaranthaceae	6	5	20	0.3	25.0	1.2	3.7	3.5	7.2	Not Listed
2	Veetukaayapoon du	<i>Tridax Procumbens</i>	Asteraceae	7	6	20	0.4	30.0	1.2	4.3	4.2	8.5	Not Listed
3	Mukkirattai	<i>Boerhaavia Diffusa</i>	Nyctaginaceae	8	7	20	0.4	35.0	1.1	4.9	4.9	9.8	Not Listed
4	Kuppaimeni	<i>Acalypha Indica</i>	Euphorbiaceae	9	8	20	0.5	40.0	1.1	5.5	5.6	11.2	Not Listed

5	Karisilanganni	<i>Eclipta Prostrata</i>	Asteraceae	8	7	20	0.4	35.0	1.1	4.9	4.9	9.8	Not Listed
6	Korai	<i>Cyperus Rotundus</i>	Cyperaceae	6	5	20	0.3	25.0	1.2	3.7	3.5	7.2	Not Listed
7	Thumbai	<i>Leucas Aspera</i>	Lamiaceae	8	7	20	0.4	35.0	1.1	4.9	4.9	9.8	Not Listed
8	Nai Kadugu	<i>Celome Viscosa</i>	Capparidaceae	6	5	20	0.3	25.0	1.2	3.7	3.5	7.2	Not Listed
9	Parttiniyam	<i>Parthenium</i> <i>Hysterophorus</i>	Asteraceae	7	6	20	0.4	30.0	1.2	4.3	4.2	8.5	Not Listed
10	Mukurattai	<i>Boerhavia Diffusa</i>	Nyctaginaceae	8	7	20	0.4	35.0	1.1	4.9	4.9	9.8	Not Listed
11	Thulasi	<i>Ocimum Tenuiflorum</i>	Lamiaceae	10	9	20	0.5	45.0	1.1	6.1	6.3	12.5	Not Listed
12	Arugampul	<i>Cynodon Dactylon</i>	Poaceae	11	10	20	0.6	50.0	1.1	6.7	7.0	13.8	Not Listed
13	Manathakkali	<i>Solanumnigrum</i>	Solanaceae	6	5	20	0.3	25.0	1.2	3.7	3.5	7.2	Not Listed
14	Kudai Korai	<i>Cyperus Difformis</i>	Cyperaceae	7	6	20	0.4	30.0	1.2	4.3	4.2	8.5	Not Listed
15	Thoiya Keerai	<i>Digeria Muricata</i>	Amarantheceae	8	7	20	0.4	35.0	1.1	4.9	4.9	9.8	Not Listed
16	Kovai	<i>Coccinia Grandis</i>	Cucurbitaceae	6	5	20	0.3	25.0	1.2	3.7	3.5	7.2	Not Listed
17	Perandai	<i>Cissus Quadrangularis</i>	Vitaceae	9	8	20	0.5	40.0	1.1	5.5	5.6	11.2	Not Listed
18	Mudakkotan	<i>Cardiospermum</i> <i>Helicacabum</i>	Sapindaceae	7	6	20	0.4	30.0	1.2	4.3	4.2	8.5	Not Listed
19	Kovakkai	<i>Trichosanthes Dioica</i>	Cucurbitaceae	9	8	20	0.5	40.0	1.1	5.5	5.6	11.2	Not Listed
20	Sangupoo	<i>Clitoriaternatia</i>	Fabaceae	8	7	20	0.4	35.0	1.1	4.9	4.9	9.8	Not Listed
21	Siru Puladi	<i>Desmodium Triflorum</i>	Fabaceae	9	8	20	0.5	40.0	1.1	5.5	5.6	11.2	Not Listed

Table 3.23 Calculation of Species Diversity in Buffer Zone

S.No	Common Name	Scientific Name	No. of Species	Pi	In (Pi)	Pi X In (Pi)
Tree						
1	Manga	<i>Mangifera Indica</i>	6	0.04	-3.14	-0.14
2	Puliyamaram	<i>Tamarindus Indica</i>	5	0.04	-3.33	-0.12
3	Vadanarayani	<i>Delonix Elata</i>	6	0.04	-3.14	-0.14
4	Thenpazham	<i>Muntingia Calabura</i>	4	0.03	-3.55	-0.10
5	Punnai	<i>Calophyllu Inophyllum</i>	5	0.04	-3.33	-0.12
6	Ilanthai	<i>Ziziphus Jujubha</i>	6	0.04	-3.14	-0.14
7	Vembu	<i>Azadirachta Indica</i>	3	0.02	-3.84	-0.08
8	Thekku	<i>Tectona Grandis</i>	4	0.03	-3.55	-0.10
9	Pongam Oiltree	<i>Pongamia Pinnata</i>	5	0.04	-3.33	-0.12
10	Thennai Maram	<i>Cocos Nucifera</i>	3	0.02	-3.84	-0.08
11	Nochi	<i>Vitex Negundo</i>	4	0.03	-3.55	-0.10
12	Karimurungai	<i>Moringa Olefera</i>	5	0.04	-3.33	-0.12
13	Pappali Maram	<i>Carica Papaya L</i>	6	0.04	-3.14	-0.14
14	Poovarasu	<i>Thespesia Populnea</i>	4	0.03	-3.55	-0.10
15	Arasanmaram	<i>Ficus Religiosa</i>	3	0.02	-3.84	-0.08
16	Vilvam	<i>Aegle Marmelos</i>	4	0.03	-3.55	-0.10
17	Alamaram	<i>Ficus Benghalensis</i>	2	0.01	-4.24	-0.06
18	Vazhaimaram	<i>Musa</i>	4	0.03	-3.55	-0.10
19	Karuvelam Maram	<i>Vachellia Nilotica</i>	5	0.04	-3.33	-0.12
20	Nelli	<i>Emblica Officinalis</i>	4	0.03	-3.55	-0.10
21	Eucalyptus	<i>Eucalyptus Globules</i>	3	0.02	-3.84	-0.08
22	Maramalli	<i>Millingtonia Hortensis</i>	5	0.04	-3.33	-0.12
23	Kuduka Puli	<i>Pithecellobium Dulce</i>	6	0.04	-3.14	-0.14
24	Karungali	<i>Acacia Sundra</i>	4	0.03	-3.55	-0.10
25	Karuvelam	<i>Acacia Nilotica</i>	5	0.04	-3.33	-0.12
26	Nettilinkam	<i>Polylathia Longifolia</i>	6	0.04	-3.14	-0.14
27	Arai Nelli	<i>Phyllanthus Acidus</i>	4	0.03	-3.55	-0.10
28	Panai Maram	<i>Borassus Flabellifer</i>	5	0.04	-3.33	-0.12
29	Sapota	<i>Manilkara Zapota</i>	7	0.05	-2.99	-0.15
30	Navalmaram	<i>Sygygium Cumini</i>	6	0.04	-3.14	-0.14
H (Shannon Diversity Index) =3.37						

Shrubs						
1	Avarai	<i>Senna Auriculata</i>	8	0.07	-2.61	-0.19
2	Sundaika	<i>Solanum Torvum</i>	7	0.06	-2.75	-0.18
3	Purapirakkai	<i>Chrozophora Rottleri</i>	6	0.06	-2.90	-0.16
4	Arali	<i>Nerium Indicum</i>	7	0.06	-2.75	-0.18
5	Seemaiagaththi	<i>Cassia Alata</i>	9	0.08	-2.49	-0.21
6	Chemparuthi	<i>Hibiscu Rosa-Sinensis</i>	8	0.07	-2.61	-0.19
7	Kattamanakku	<i>Jatropha Curcas</i>	6	0.06	-2.90	-0.16
8	Chaturakalli	<i>Euphorbia Antiquorum</i>	8	0.07	-2.61	-0.19
9	Idlipoo	<i>Xoracoc Cinea</i>	7	0.06	-2.75	-0.18
10	Thuthi	<i>Abutilon Indicum</i>	6	0.06	-2.90	-0.16
11	Nithyakalyani	<i>Cathranthus Roseus</i>	8	0.07	-2.61	-0.19
12	Uumaththai	<i>Datura Metel</i>	9	0.08	-2.49	-0.21
13	Kundumani	<i>Abrus Precatorius</i>	7	0.06	-2.75	-0.18
14	Erukku	<i>Calotropis Gigantea</i>	6	0.06	-2.90	-0.16
15	Neermulli	<i>Hydrophila Auriculata</i>	7	0.06	-2.75	-0.18
H (Shannon Diversity Index) =2.70						
HERBs, CLIMBER, CREEPER & GRASSES						
1	Nayuruv	<i>Achyranthes Aspera</i>	6	0.04	-3.30	-0.12
2	Veetukaayapoondur	<i>Tridax Procumbens</i>	7	0.04	-3.15	-0.14
3	Mukkirattai	<i>Boerhaavia Diffusa</i>	8	0.05	-3.01	-0.15
4	Kuppaimeni	<i>Acalypha Indica</i>	9	0.06	-2.90	-0.16
5	Karisilanganni	<i>Eclipta Prostata</i>	8	0.05	-3.01	-0.15
6	Korai	<i>Cyperus Rotundus</i>	6	0.04	-3.30	-0.12
7	Thumbai	<i>Leucas Aspera</i>	8	0.05	-3.01	-0.15
8	Nai Kadugu	<i>Celome Viscosa</i>	6	0.04	-3.30	-0.12
9	Parttiniyam	<i>Parthenium</i> <i>Hysterophorus</i>	7	0.04	-3.15	-0.14
10	Mukurattai	<i>Boerhavia Diffusa</i>	8	0.05	-3.01	-0.15
11	Thulasi	<i>Ocimum Tenuiflorum</i>	10	0.06	-2.79	-0.17
12	Arugampul	<i>Cynodon Dactylon</i>	11	0.07	-2.70	-0.18
13	Manathakkali	<i>Solanumnigrum</i>	6	0.04	-3.30	-0.12
14	Kudai Korai	<i>Cyperus Difformis</i>	7	0.04	-3.15	-0.14
15	Thoiya Keerai	<i>Digeria Muricata</i>	8	0.05	-3.01	-0.15
16	Kovai	<i>Coccinia Grandis</i>	6	0.04	-3.30	-0.12
17	Perandai	<i>Cissus Quadrangularis</i>	9	0.06	-2.90	-0.16

18	Mudakkotan	<i>Cardiospermum Helicacabum</i>	7	0.04	-3.15	-0.14
19	Kovakkai	<i>Trichosanthes Dioica</i>	9	0.06	-2.90	-0.16
20	Sangupoo	<i>Clitoriaternatia</i>	8	0.05	-3.01	-0.15
21	Siru Puladi	<i>Desmodium Triflorum</i>	9	0.06	-2.90	-0.16
H (Shannon Diversity Index) =3.03						

Table 3.24 Species Richness (Index) In Buffer Zone

Details	H	H Max	Evenness	Species Richness
Tree	3.37	3.40	0.99	5.88
Shrubs	2.70	2.71	1.00	2.98
Herbs	3.03	3.04	0.99	3.93

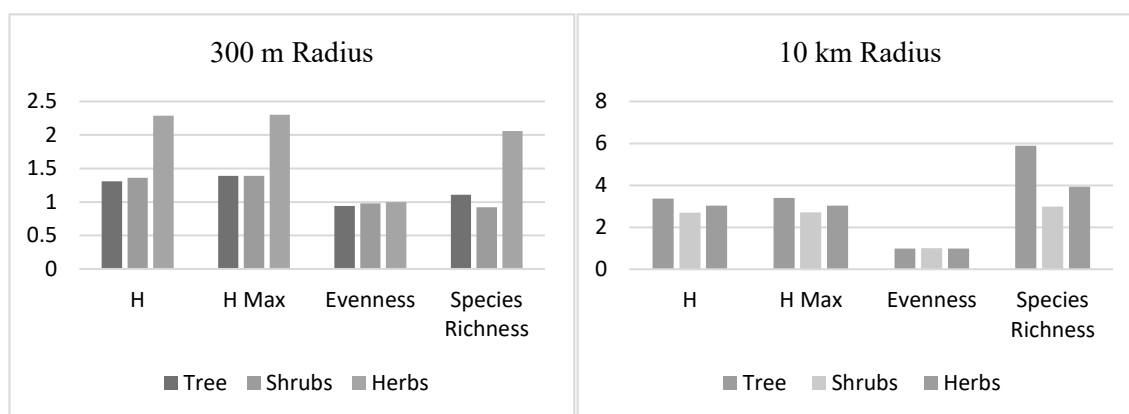


Figure 3.28 Floral Diversity Species Richness (Index) In Buffer Zone And 300m Radius



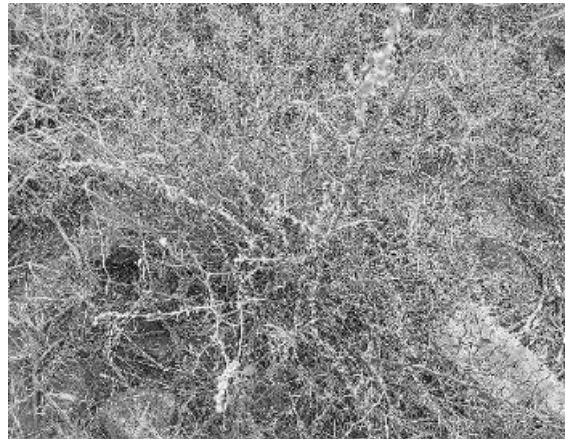
Lantana Camara



Prosopis Juliflora



Pedalium Murex



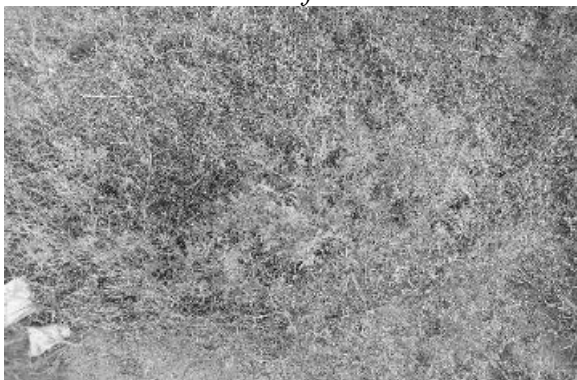
Aerva Lanata



Aloe Perfoliata



Croton Bonplandianus



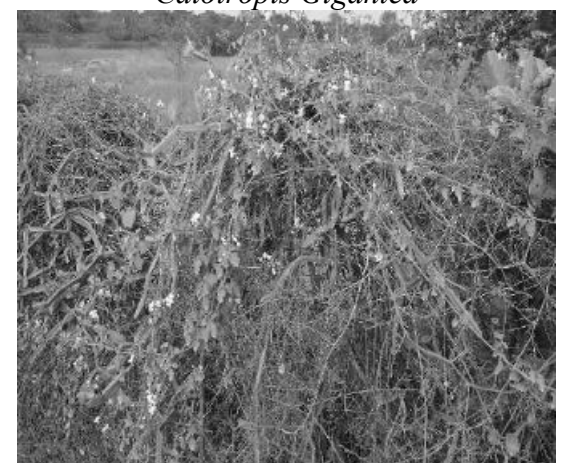
Ocimum Tenuiflorum



Calotropis Gigantea



Barleria Prionitis



Cissus Quadrangularis



Aerva Javanica



Ziziphus Zizyphus



Tephrosia Purpurea



Euphorbia Resinifera



Albizia Amara



Pergularia Daemia



Vachellia Leucophloea



Azadirachta Indica

Figure 3.29 Flora In Core And Buffer Area

Aquatic Vegetation

The Field Survey for Assessing the Aquatic Vegetation Was Also Undertaken During the Study Period. The List of Aquatic Plants Observed in The Study Area Is Given in Table 3.25

Table 3.25 Aquatic Vegetation

S.No.	Scientific Name	Common Name	Vernacular Name (Tamil)	IUCN Red List of Threatened Species
1	<i>Eichornia Crassipe</i>	Water Hyacinth	Agayatamarai	NA
2	<i>Aponogeton natans</i>	Floating Lace Plant	Kottikizhangu	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	Arugampullu	LC
6	<i>Cyperus Exaltatus</i>	Tall Flat Sedge	Koraikizhangu	LC

*Lc- Least Concern, Na-Not Yet Assessed

Forest Vegetation

There are no biosphere reserves or wildlife sanctuaries or National parks or Important Bird Areas (IBAs), or migratory routes of fauna. The Thampalayam RF Located in 6.83 km SE Side. There Are Few Plants and No Endangered Species in Thampalayam Reserve Forest. The *Prosopis Juliflora*, *Azadirachta Indica*, *Vachellia Leucophloea*, *Albizia Amara* These Three Types of Plants Are Abundant in Thathmpalayam Reserve Forest. Thus, The Area Under Study (Mine Lease Area and the 10 Km Buffer Zone) Is Not Ecologically Sensitive.

Endangered and endemic species as per the IUCN Red List

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

3.5.2 Fauna

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

Survey Methodology

The assessment of fauna was done on the basis of primary data collected from the lease area. The presence was also confirmed from the local inhabitants depending on the animal sightings and the frequency of their visits in the project area. In addition, officials, local people were another source of information for studying the fauna of the area. Field activities are physical/active search, covering rocks, burrows, hollow inspection and location of nesting sites and habitat assessment etc. Taxonomical identification was done by the field guide book and wildlife ENVIS data base ([wiienvis.nic.in/Database/Schedule Species Database](http://wiienvis.nic.in/Database/Schedule%20Species%20Database)) and Zoological Survey of India (ZSI). Detailed fauna is mentioned in the Table 3.26 and 3.27

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 30m from the first point. We have enumerated 20-point counts in each quartile, which constitute a total of 80-point counts (20 x 4) within 10 km radius area. Opportunistic bird sightings: while traveling in study area, many bird species will be detected in survey time. Such species are recorded by their appearance or by their call.

Survey and monitoring of reptiles

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

Fauna in Core Zone

A total of 18 varieties of species belonging to 18 families were observed in the core zone. Among them are 6 Insects, 3 Reptiles, 1 Mammal and 8 Avian. Number of species decreases towards the mining area due the lack of vegetation. None of these species are threatened or endemic. There is no Schedule I species and 6 species are under schedule IV according to Indian wild life Act 1972. There are no critically endangered, endangered, vulnerable and endemic species there. Details of fauna in core zone and their scientific name were mentioned in Table. 3.26.

Table 3.26 Fauna in Core Zone

S. No	Common name/English Name	Family Name	Scientific Name	Schedule list wildlife Protection act 1972	IUCN Red List data
Insects					
1	Common Tiger	Nymphalidae	<i>Danaus genutia</i>	NL	NL
2	Red-veined darter	Libellulidae	<i>Sympetrum fonscolombii</i>	NL	LC
3	Grasshopper	Acrididae	<i>Hieroglyphus sp</i>	NL	LC
4	Blue tiger	Nymphalidae	<i>Tirumala limniace</i>	Schedule IV	LC
5	Stick insect	Lonchodidae	<i>carausius morosus</i>	NL	LC
6	Mottled emigrant	Peridae	<i>Catopsilia pyranthe</i>	NL	LC
Reptiles					
7	Garden lizard	Agamidae	<i>Calotes versicolor</i>	NL	LC
8	Common house gecko	Gekkonidae	<i>Hemidactylus frenatus</i>	NL	LC
9	Fan-Throated Lizard	Agamidae	<i>Sitanaponticeriana</i>	NL	LC
Mammals					
10	Indian Field Mouse	Muridae	<i>Mus booduga</i>	Schedule IV	NL
Aves					
11	Asian green bee-eater	Meropidae	<i>Meropsorientalis</i>	NL	LC
12	Koel	Cucalidae	<i>Eudynamys</i>	Schedule IV	LC
13	Common myna	Sturnidae	<i>Acridotheres tristis</i>	NL	LC
14	Cattle egret	Ardeidae	<i>Bubulcus ibis</i>	NL	LC
15	House crow	Corvidae	<i>Corvus splendens</i>	NL	LC
16	Crow Pheasant	Cucalidae	<i>Centropus sinensis</i>	Schedule IV	LC
17	Indian pond heron	Ardeidae	<i>Ardeola grayii</i>	Schedule IV	LC
18	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 42 species belonging to 41 families were recorded in the buffer zone. Based on habitat classification the majority of species were 15 Birds (35%), followed by 13 Insects (30%), 7 Reptiles (16%), 4 Mammals (9%) and 3 Amphibians (7%). There are 4 schedule II species and 23 schedule IV species according to Indian wild life Act 1972. There are no critically endangered, vulnerable and endemic species observed. List of fauna in the buffer zone is mentioned in Table 3.27.

Table 3.27 Fauna in Buffer Zone

S.No.	Common Name/English Name	Family Name	Scientific Name	Schedule List Wildlife Protection Act 1972	IUCN Red List Data
Insects					
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
Reptiles					
14	Garden lizard	Agamidae	<i>Calotes versicolor</i>	NL	LC
15	Common house gecko	Gekkonidae	<i>Hemidactylus frenatus</i>	NL	LC
16	Indian chameleon	Chamaeleonidae	<i>Chamaeleo zeylanicus</i>	Sch II (Part I)	LC
17	Olive keelback water snake	Natricidae	<i>Atretium schistosum</i>	Sch II (Part II)	LC
18	Brahminy skink	Scincidae	<i>Eutropis carinata</i>	NL	LC
19	Rat snake	Colubridae	<i>Ptyas mucosa</i>	Sch II (Part II)	LC

20	Common skink	Scincidae	<i>Mabuya carinatus</i>	NL	LC
Mammals					
21	Indian palm squirrel	Sciuridae	<i>Funambulus palmarum</i>	Schedule IV	LC
22	Indian hare	Leporidae	<i>Lepus nigricollis</i>	Schedule IV	LC
23	Indian Field Mouse	Muridae	<i>Mus booduga</i>	Schedule IV	LC
24	Asian Small Mongoose	Herpestidae	<i>Herpestes javanicus</i>	Schedule (Part II)	LC
Aves					
25	Indian pond heron	Ardeidae	<i>Ardeola grayii</i>	Schedule IV	LC
26	Black drongo	Dicruridae	<i>Dicrurus macrocercus</i>	Schedule IV	LC
27	Asian green bee-eater	Meropidae	<i>Merops orientalis</i>	NL	LC
28	Red-breasted parakeet	Psittaculidae	<i>Psittacula alexandri</i>	NL	LC
29	Common Coot	Rallidae	<i>Fulica atra</i>	Schedule IV	LC
30	Common myna	Sturnidae	<i>Acridotheres tristis</i>	NL	LC
31	Shikra	Accipitridae	<i>Accipiter badius</i>	NL	LC
32	Koel	Cuculidae	<i>Eudynamis</i>	Schedule IV	LC
33	Common Quail	Phasianidae	<i>Coturnix coturnix</i>	Schedule IV	LC
34	Red-vented Bulbul	Pycnonotidae	<i>Pycnonotus cafer</i>	Schedule IV	LC
35	Brahminy starling	Sturnidae	<i>Sturnia pagodarum</i>	Schedule IV	LC
36	White-breasted waterhen	Rallidae	<i>Amaurornis phoenicurus</i>	NL	LC
37	Two-tailed Sparrow	Dicruridae	<i>Dicrurus macrocercus</i>	Schedule IV	LC
38	Grey Francolin	Phasianidae	<i>Francolinus pondicerianus</i>	Schedule IV	LC
39	House crow	Corvidae	<i>Corvus splendens</i>	NL	LC
Amphibians					
40	Indian Burrowing frog	Dicroglossidae	<i>Sphaerotheca breviceps</i>	Schedule IV	LC
41	Green Pond Frog	Ranidae	<i>Rana hexadactyla</i>	Schedule IV	LC
42	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-ECONOMIC ENVIRONMENT

Socio-economic study is an essential part of environmental study. It includes demographic structure of the area, provision of basic amenities viz., housing, education, health and medical services, occupation, water supply, sanitation, communication, transportation, prevailing diseases pattern as well as features like temples, historical monuments etc., at the baseline level. 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 objectives of the socio-economic study are as follows:

- ❖ To study the socio-economic status of the people living in the study area of the proposed mining project
- ❖ To assess the impact of the project on quality of life of the people in the study area
- ❖ To recommend community development measures to be taken up in the study area

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 Measures

3.6.3 Socio-Economic Status of Study area

The study area covers 9 villages including Vettamangalam (west), Vettamangalam (East), K.Paramathi, Punnam, Kuppam, Munnur, Nedungur, Karudayampalayam, Pavithiram,. As Kuppam is the village in which the proposed project site is located, the summary of population facts for the village is exclusively provided in Table 3.28 and for other 27 villages in Tables 3.29 -3.31.

Table 3.28 Kuppam village Population Facts

Kuppam Village	
Number of Households	1,120
Population	3,503
Male Population	1,697
Female Population	1,806
Children Population	264
Sex-ratio	1064
Literacy	60.11%
Male Literacy	72.80%
Female Literacy	48.17%
Scheduled Tribes (ST) %	0
Scheduled Caste (SC) %	17.13%

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

Table 3.29 Population and Literacy Data of Study Area

Name	Total Population Person	Total Population Male	Total Population Female	Population in the age group 0-6 Male	Population in the age group 0-6 Female	Scheduled Castes population Person	Scheduled Tribes population Person	Literates Population Person	Illiterate Persons
Vettamangalam (west)	5882	2887	2995	213	207	816	7	3953	1929
Vettamangalam (East)	2657	1310	1347	99	103	714	5	1521	1136
K.Paramathi	82268	40825	41443	3009	2866	21805	23	53384	28884
Punnam	5446	2839	2607	237	190	906	0	3679	1767
Kuppam	3503	1697	1806	127	137	600	0	1947	1556
Munnur	2582	1289	1293	86	88	931	0	1649	933
Nedungur	1190	586	604	33	28	298	6	800	390
Karudayampalayam	2347	1211	1136	62	70	438	0	1614	733
Pavithiram	5881	2862	3019	234	217	1546	0	3738	2143

Table 3.30 Other Facilities in the 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	Telephone (landlines)	Public Bus Service	Gravel (kuchha) Roads	Commercial Bank	Agricultural Credit Societies	Self - Help Group (SHG)	Nutritional Centres- Anganwadi Centre	Community Centre with/without TV	Power Supply for Domestic Use
K. Paramathi	1	2	2	1	2	1	1	1	1	1	1	1	2	1
Karudayampalayam	1	2	1	1	1	1	1	1	2	2	1	1	1	1
Kuppam	1	2	1	1	1	1	1	1	2	2	1	1	1	1
Munnur	1	2	2	1	1	1	1	1	2	2	1	1	2	1
Nedungur	1	2	0	1	1	1	1	1	2	2	1	1	1	1
Pavithiram	1	2	1	1	2	1	1	1	2	2	1	1	1	1
Punnam	1	2	1	1	2	1	1	1	2	1	1	1	1	1
Vettamangalam (East)	1	2	2	1	1	1	1	1	2	1	1	1	1	1
Vettamangalam (west)	1	2	2	1	1	1	1	1	1	1	1	1	1	1

Table 3.31 Educational Facilities & Water & Drainage Facilities Data of Study Area

Village Name	Tractors	Carts Driven by Animals	Black Topped (pucca) Road	ATM	Commercial Bank	Cooperative Bank	Agricultural Credit Societies	Public Distribution System (PDS) Shop	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)
K.Paramathi	2	2	1	2	1	1	1	1	2	1	1	1	Maize	Milk products	-	0	258.44
Karudayampalayam	2	2	1	1	2	1	2	1	2	2	1	1	Drum stick	Blue metal	-	0	326.73
Kuppam	2	2	1	2	2	1	2	1	2	2	1	1	Coconut	Blue metal	-	0	336.23
Munnur	2	2	1	2	2	2	2	1	2	2	1	1	Corn	Milk products	-	0	347.3
Nedungur	2	2	1	2	2	2	2	1	2	2	1	1	Drum stick	Textiles	-	0	307.83
Pavithiram	2	2	1	2	2	2	2	1	2	2	1	1	Paddy	Power loom	-	0	440.56
Punnam	2	2	1	2	2	2	1	1	2	1	1	1	Coconut	Milk products	-	0	585.36
Vettamangalam (East)	2	2	1	2	2	2	1	1	2	2	1	1	Sugarcane	-	-	0	735.58
Vettamangalam (west)	2	2	1	2	1	2	1	1	2	2	1	1	Sugarcane	-	Bricks	0	565.17

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. Maternity facility should be made available at the place to avoid going to distant places for treatment which involves risks. Apart from that, as these areas are prone to various diseases a hospital with modern facilities should be opened on a priority basis in a central place to provide better health facilities to the villagers around the project.
- ❖ While developing an Action Plan, it is very important to identify the population who falls under the marginalized and vulnerable groups. So that special attention can be given to these groups with special provisions while making action plans.

3.6.5 Summary & Conclusion

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

3.7 TRAFFIC DENSITY

The traffic survey conducted based on the transportation route of material, the Rough Stone is proposed to be transported mainly through Village Road and Erode to Karur Road (SH-84) and Karappalayam to Kattur Road (NH-67) as shown in Table 3.32 and in Figure 3.30. 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 3.32 Traffic Survey Locations

Station Code	Road Name	Distance and Direction	Type of Road
TS1	Village Road	0.55 Km-N	Village Road
TS2	Erode to Karur Road (SH-84)	2.65 Km-NNE	Erode to Karur Road (SH-84)
TS3	Karappalayam to Kattur Road (NH-67)	4.06 km-SW	Karappalayam to Kattur Road (NH-67)

Source: On-site monitoring by GTMS FAE & TM

Table 3.33 Existing Traffic Volume

Station code	HMV		LMV		2/3 Wheelers		Total PCU
	No	PCU	No	PCU	No	PCU	
TS1	35	105	38	38	68	34	177
TS2	114	342	45	45	101	51	438
TS3	181	543	55	55	117	59	657

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 3.34 Rough Stone Transportation Requirement

Transportation of Rough and Gravel per day		
Capacity of trucks	No. of Trips per day	Volume in PCU
15 tonnes	18	54

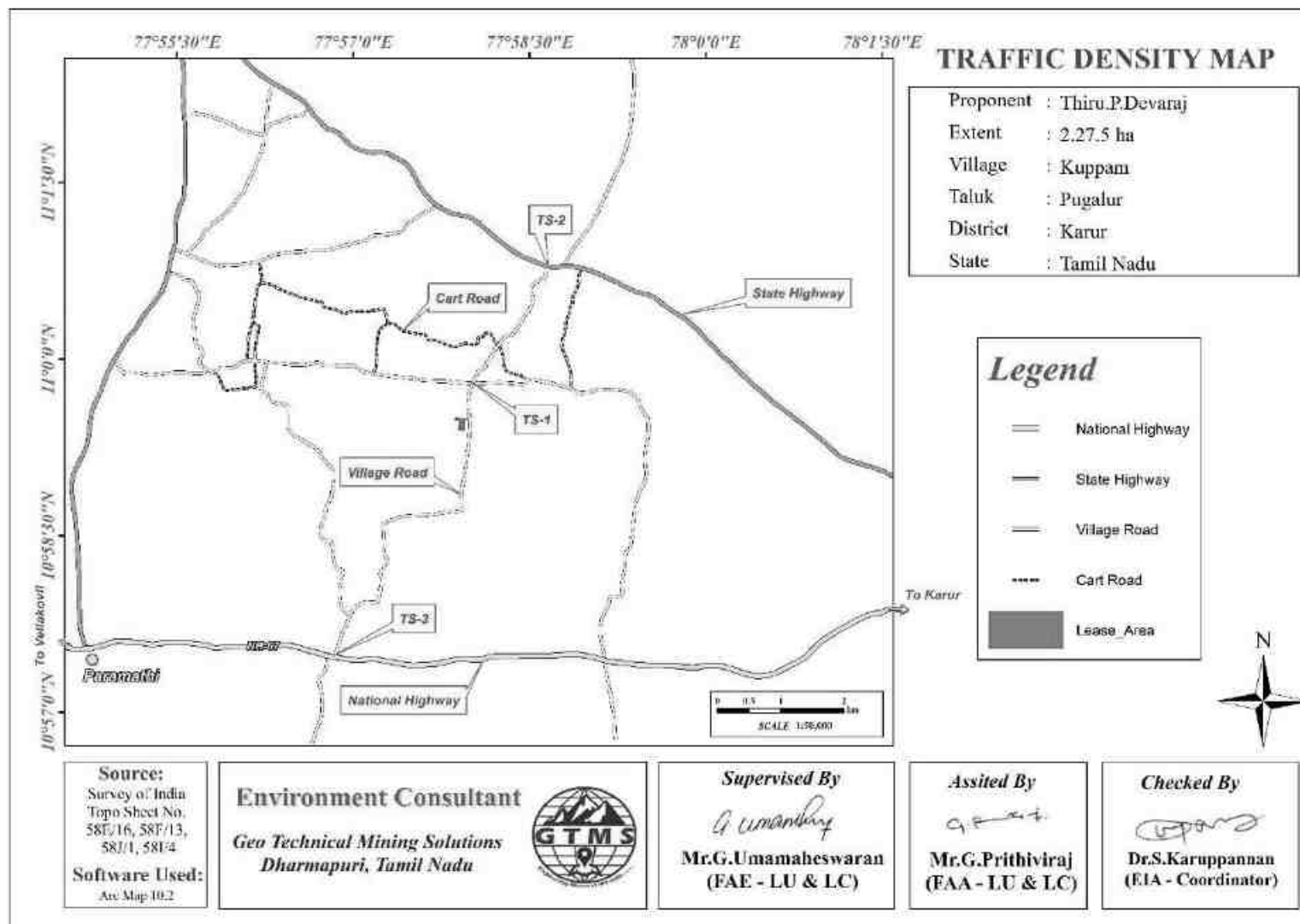
Source: Approved Mining Plan

Table 3.35 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	177	54	231	1200
Erode to Karur Road (SH)	438	54	492	1200
Vellakoil to Karur Road (NH)	657	54	711	1500

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

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



3.8 SITE SPECIFIC FEATURES

There are no Wildlife Sanctuaries, National Park and Archaeological monuments within the project area. No Protected and Reserved Forest area is located within the 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 3.36.

Table 3.36 Details of Environmentally Sensitive Ecological Features in the Study Area

S. No.	Sensitive Ecological Features	Name	Areal Distance in km
1	National Park / Wild life Sanctuaries	None	Nil within 10 km radius
2	Reserve Forest	Thathampalayam R.F.	6.68 km SE
3	Lakes/Reservoirs/ Dams/Streams/Rivers	Cauvery river	7.94 km North
		Noyyal river	8.56 km SE
		Amaravathi river	8.10 km NW
4	Tiger Reserve/Elephant Reserve/ Biosphere Reserve	None	Nil within 10 km radius
5	Critically Polluted Areas	None	Nil within 10 km radius
6	Mangroves	None	Nil within 10 km radius
7	Mountains/Hills	None	Nil within 10 km radius
8	Notified Archaeological Sites	None	Nil within 10 km radius
9	Industries/ Thermal Power Plants	TNPL Paper Mill	7.51 km NE
10	Defence Installation	None	Nil within 10 km radius

Source: Survey of India Toposheet





Figure 3.31 Field Study Photographs

CHAPTER IV

ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

4.0 GENERAL

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

In order to maintain the environmental commensuration with the mining operation, it is essential to undertake studies on the existing environmental scenario and assess the impact on different environmental components. This would help in formulating suitable management plans sustainable resource extraction.

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

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

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

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

4.1 LAND ENVIRONMENT

4.1.1 Anticipated Impact

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

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

4.1.2 Common Mitigation Measures from Proposed Project

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

4.2 SOIL ENVIRONMENT

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

4.2.1 Anticipated Impact on Soil Environment

Following impacts are anticipated due to mining operations:

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

4.2.2 Common Mitigation Measures from proposed project

- ❖ Run-off diversion – Garland drains will be constructed around the project boundary to prevent surface flows from entering the quarry works areas and will be discharged into

vegetated natural drainage lines, or as distributed flow across an area stabilised against erosion.

- ❖ Sedimentation ponds - Run-off from working areas will be routed towards sedimentation ponds. These trap sediment and reduce suspended sediment loads before runoff is discharged from the quarry site. Sedimentation ponds should be designed based on runoff, retention times, and soil characteristics. There may be a need to provide a series of sedimentation ponds to achieve the desired outcome.
- ❖ Retain vegetation – Retain existing or re-plant the vegetation at the site wherever possible.
- ❖ Monitoring and maintenance – Weekly monitoring and daily maintenance of erosion control systems so that they perform as specified specially during rainy season.

4.3 WATER ENVIRONMENT

The total water requirement for this project will be 1.7 KLD. The water will be sourced initially from outside agencies. Later the rainwater collected in the mine pit sump will be used for this purpose. The domestic effluent to be generated from the project will be collected in septic tank with soak pits arrangements. There are no waste dumps in this quarry. Based on the available information and the geophysical investigations the study concluded that the project area is considered to have poor groundwater potential. Besides, the mining area consists of hard compact rock, no major water seepage within the mine is expected.

4.3.1 Anticipated Impact

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

- ❖ Generation of waste water from vehicle washing.
- ❖ Washouts from surface exposure or working areas
- ❖ Domestic sewage
- ❖ Disturbance to drainage course in the project area
- ❖ Mine Pit water discharge
- ❖ Increase in sediment load during monsoon in downstream of lease area
- ❖ This being a mining project, there will be no process effluent. Waste from washing of machinery may result in discharge of oil & grease, suspended solids.
- ❖ The sewage from soak pit may percolate to the ground water table and contaminate it.
- ❖ Surface drainage may be affected due to Mining
- ❖ As the proposed project acquires 1.7 KLD of water from water vendors, it will not extract water by developing abstraction structures in the lease area. Therefore, the project will not deplete aquifer beneath the lease area.

4.3.2 Common Mitigation Measures for the Proposed Project

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

4.4 AIR ENVIRONMENT

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

4.4.1 Anticipated Impact from proposed project

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

4.4.2 Emission Estimation

Emission resulting from different mining activities is estimated using relevant empirical formulae developed by Chauhya et al.,2001. The equations used for SPM, SO₂, and NO_x emission estimation have been given in Table 4.1.

Table 4.1 Empirical Formula for Emission Rate from Overall Mine

	Pollutant	Source Type	Empirical Equation	Parameters
Overall Mine	SPM	Area	$E = [u0.4a0.2\{9.7 + 0.01p + b/(4 + 0.3b)\}]$	u = Wind speed(m/s); p = Mineral production (Mt/yr); b = Overburden handling (Mm ³ /yr); a = Lease area(km ²); E = Emission rate(g/s).
Overall Mine	SO ₂	Area	$E = a0.14\{u/(1.83 + 0.93u)\} [\{p/(0.48 + 0.57p)\} + \{b/(14.37 + 1.15b)\}]$	u = Wind speed(m/s); p = Mineral production (Mt/yr); b = Overburden handling (Mm ³ /yr); a = Lease area(km ²); E = Emission rate(g/s).
Overall Mine	NO _x	Area	$E = a0.25\{u/(4.3 + 32.5u)\} [1.5p + \{b/(0.06 + 0.08b)\}]$	u = Wind speed(m/s); p = Mineral production (Mt/yr); b = Overburden handling (Mm ³ /yr); a = Lease area(km ²); E = Emission rate(g/s).

The emission rate thus calculated using the empirical formula is used as one of the inputs in the AERMOD modelling. As the SPM emission calculation for overall mine is not considering pollution control measures, one-third of the SPM value is taken for derivation of PM₁₀ keeping in mind that proper control measures are followed. It is important to note that PM₁₀ emission rate

is derived from the SPM estimation in the background that PM₁₀ constitutes 52% of SPM emission. The PM_{2.5}, PM₁₀, SO₂ and NO_x emission results have been given in Table 4.2.

Table 4.2 Estimated Emission Rate

Activity	Pollutant	Calculated Value (g/s)	Lease Area in m ²	Calculated Value (g/s/m ²)
Overall Mine	PM _{2.5}	0.01415545655	21600	6.55345E-07
Overall Mine	PM ₁₀	0.02259685694	21600	1.04615E-06
Overall Mine	SO ₂	0.00985658984	21600	4.56324E-07
Overall Mine	NO _x	0.00886698859	21600	4.10509E-07

4.4.2.1 Frame work of Computation and Model Details

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

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

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

4.4.2.2 Modelling of Incremental Concentration

The air borne particulate matter such as PM₁₀ and PM_{2.5} generated by quarrying operation, transportation, and wind erosion of the exposed areas and emissions of sulphur dioxide (SO₂) and oxides of nitrogen (NO_x) due to excavation and loading equipment's and vehicles plying on haul roads are the significant air pollutants arising from mining operation, leading to an adverse impact on the ambient air environment in and around the project area. Anticipated incremental concentration and net increase in emissions due to quarrying activities within 500 m around the project area is predicted by open pit source modelling using AERMOD Software and the

incremental values of the air pollutants were added to the base line data monitored at the proposed site to predict total GLC of the pollutants, as shown in Tables 4.3-4.6.

4.4.2.3 Model Results

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

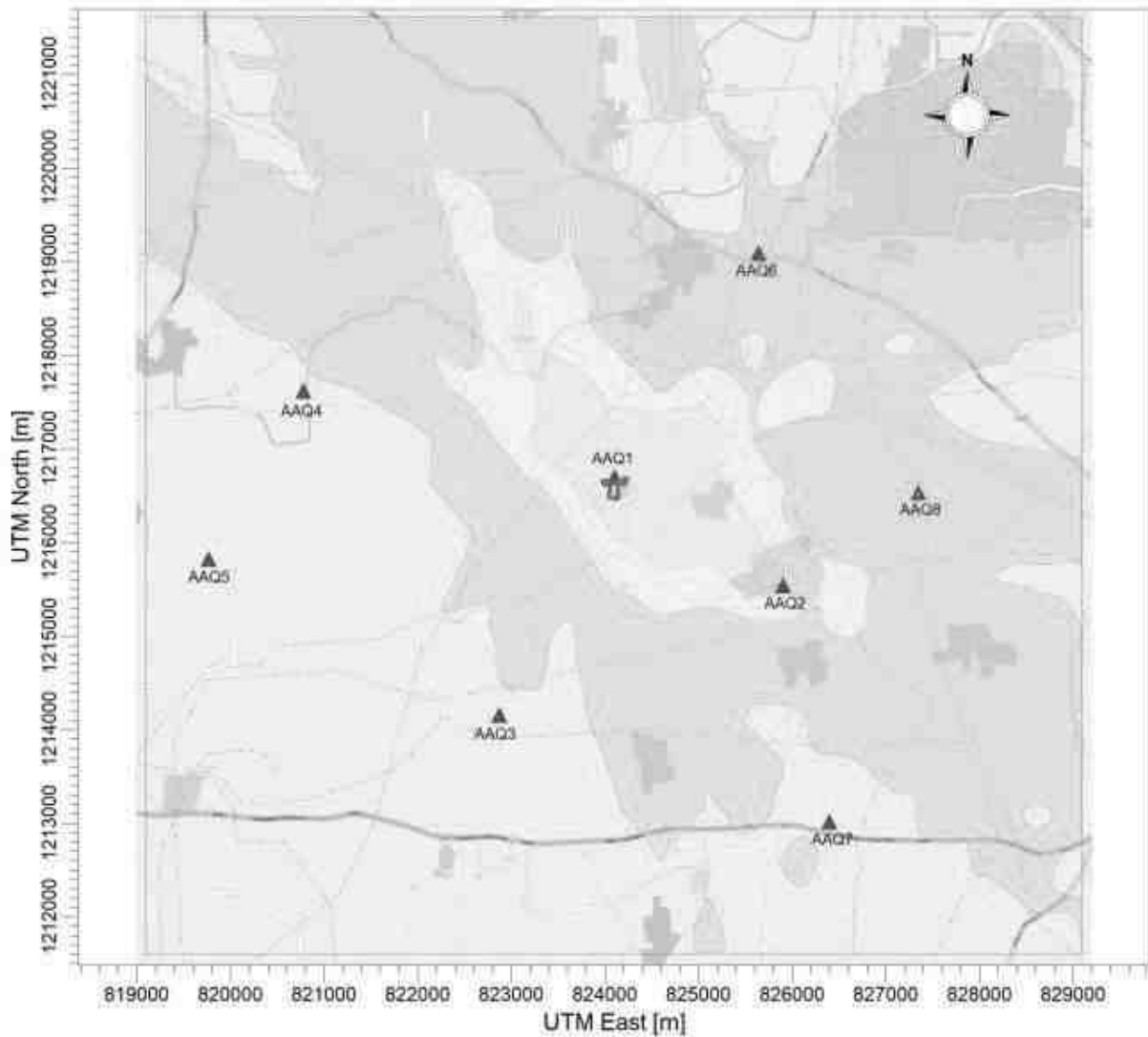
Table 4.3 Incremental & Resultant GLC of PM_{2.5}

Station ID	Distance to core area (km)	Direction	PM _{2.5} concentrations(µg/m ³)			Comparison against air quality standard (60 µg/m ³)	Magnitude of change (%)	Significance
			Base line	Pred icted	Total			
AAQ1	0.04	N	20.2	6.49	26.69	Below standard	32.13	Not significant
AAQ2	2.00	SE	23.2	5	28.2		21.55	
AAQ3	2.60	SW	21.0	0	21		0.00	
AAQ4	3.34	SW	16.0	0	16		0.00	
AAQ5	4.32	SW	20.7	0	20.7		0.00	
AAQ6	2.81	SW	21.4	0.5	21.9		2.34	
AAQ7	4.12	S	19.7	0	19.7		0.00	
AAQ8	5.00	E	21.9	0.5	22.4		2.28	

Table 4.4 Incremental & Resultant GLC of PM₁₀



Station ID	Distance to core area (km)	Direction	PM ₁₀ concentrations(µg/m ³)			Comparison against air quality standard (100 µg/m ³)	Magnitude of change (%)	Significance
			Base line	Pred icted	Total			
AAQ1	0.04	N	41.7	10.4	52.1	Below standard	24.94	Not significant
AAQ2	2.00	SE	40.8	5	45.8		12.25	
AAQ3	2.60	SW	39.3	0.5	39.8		1.27	
AAQ4	3.34	SW	37.0	0	37		0.00	
AAQ5	4.32	SW	38.8	0	38.8		0.00	
AAQ6	2.81	SW	39.7	0.5	40.2		1.26	
AAQ7	4.12	S	39.7	0	39.7		0.00	
AAQ8	5.00	E	40.0	0.5	40.5		1.25	

PROJECT TITLE:
P.DEVARAJ ROUGHSTONE AND GRAVEL PROJECT_PM2.5



Max: 6.49 [ug/m³] at (824101.01, 1216612.54) ug/m³



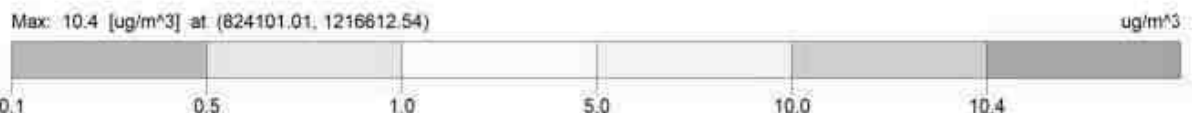
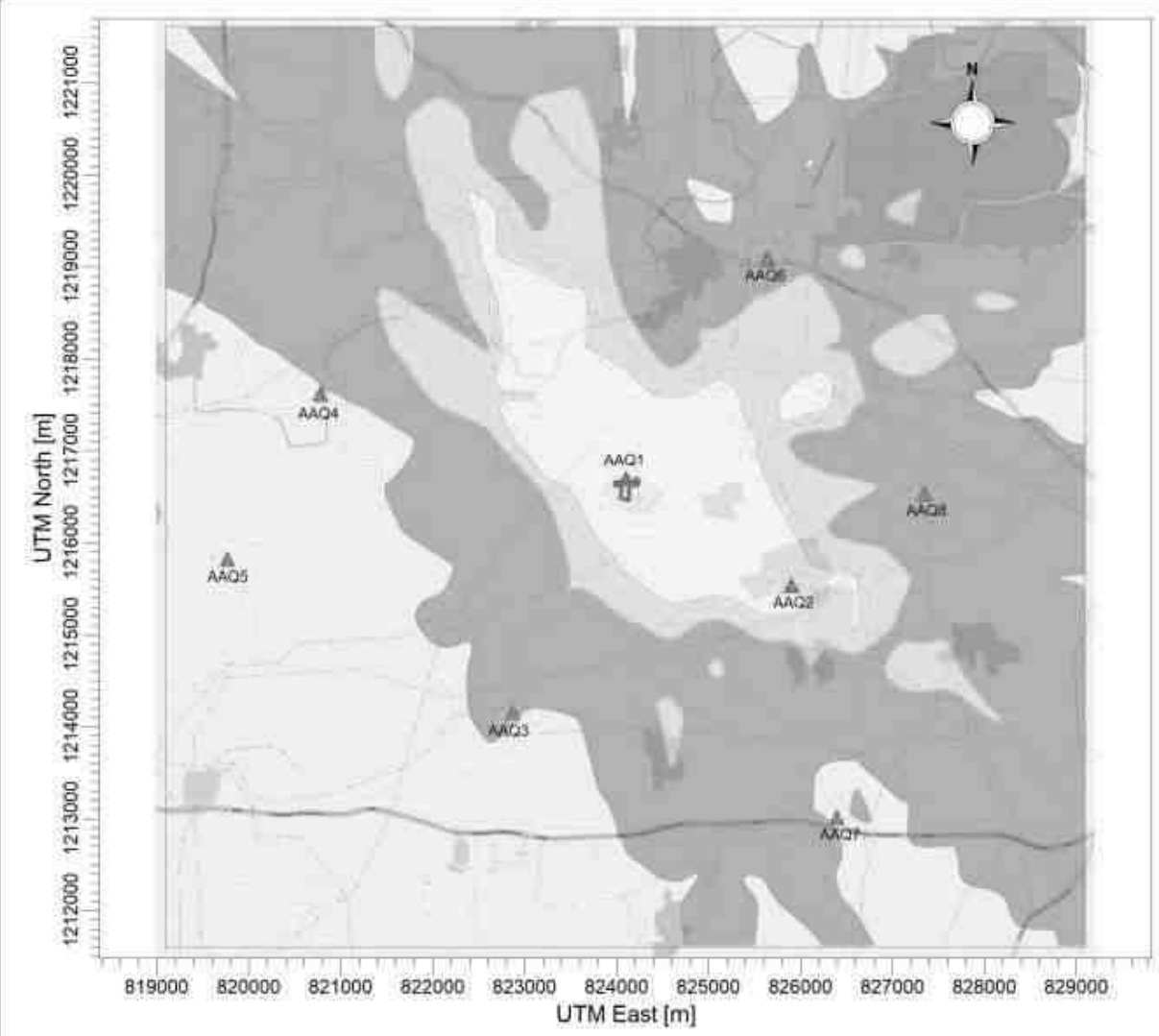
COMMENTS:	SOURCES:	COMPANY NAME:	
	RECEPTORS:	MODELER:	
	OUTPUT TYPE:	SCALE:	1:72,039
	MAX:	DATE:	PROJECT NO.:
	1		
	449		
	Concentration		
	6.49 ug/m ³	4/19/2023	

AERMOD View - Lakes Environmental Software

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Figure 4.1 Predicted Incremental Concentration of PM_{2.5}

PROJECT TITLE:
P.DEVARAJ ROUGHSTONE AND GRAVEL PROJECT_PM10



COMMENTS:	SOURCES: 1	COMPANY NAME:	
	RECEPTORS: 449	MODELER:	
	OUTPUT TYPE: Concentration	SCALE: 1:72,039 	
	MAX: 10.4 ug/m³	DATE: 4/19/2023	PROJECT NO.:

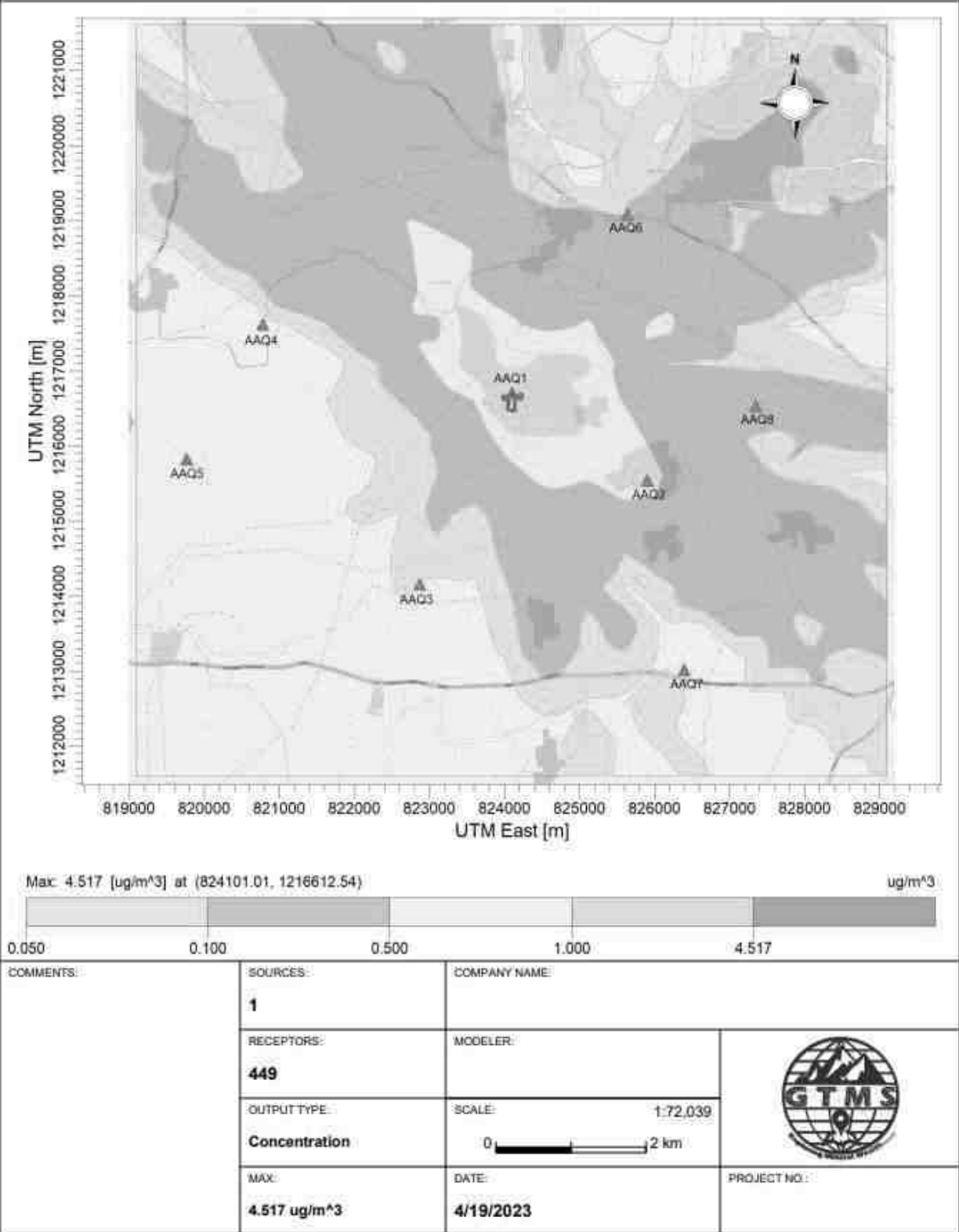
AERMOD View - Lakes Environmental Software

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Figure 4.2 Predicted Incremental Concentration of PM₁₀

PROJECT TITLE:

P.DEVARAJ ROUGHSTONE AND GRAVEL PROJECT_SO2

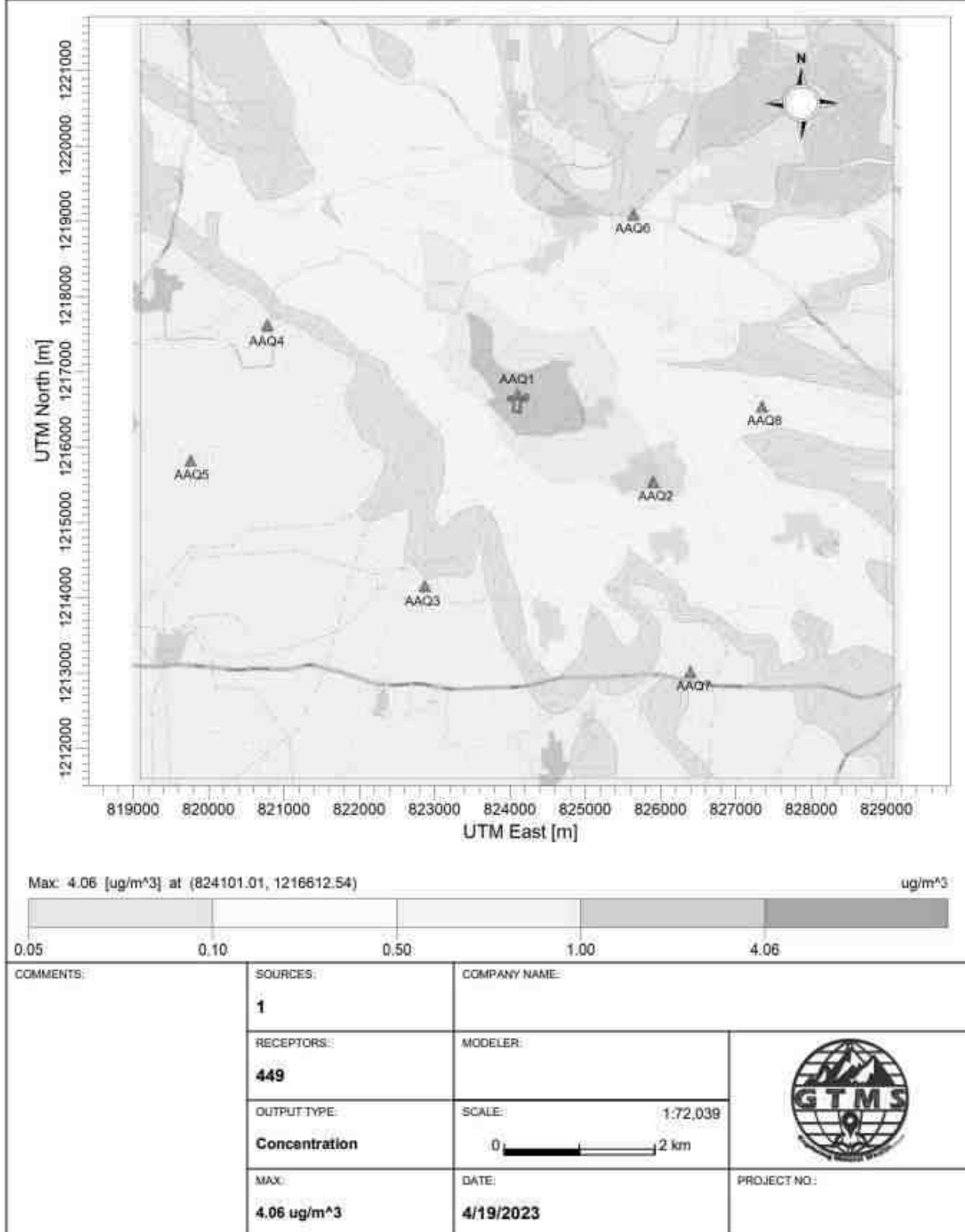


AERMOD View - Lakes Environmental Software

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Figure 4.3 Predicted Incremental Concentration of SO₂

PROJECT TITLE:
P.DEVARAJ ROUGHSTONE AND GRAVEL PROJECT_NOx



AERMOD View - Lakes Environmental Software

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Figure 4.4 Predicted Incremental Concentration of NO_x

Table 4.5 Incremental & Resultant GLC of SO₂

Station ID	Distance to core area (km)	Direction	SO ₂ concentrations (µg/m ³)			Comparison against air quality standard (80 µg/m ³)	Magnitude of change (%)	Significance
			Base line	Predicted	Total			
AAQ1	0.04	N	8.4	4.51	12.91	Below standard	53.69	Not significant
AAQ2	2.00	SE	9.9	1	10.9		10.10	
AAQ3	2.60	SW	9.2	0	9.2		0.00	
AAQ4	3.34	SW	7.0	0	7		0.00	
AAQ5	4.32	SW	8.4	0	8.4		0.00	
AAQ6	2.81	SW	8.7	0.5	9.2		5.75	
AAQ7	4.12	S	6.6	0	6.6		0.00	
AAQ8	5.00	E	8.7	0.5	9.2		5.75	

Table 4.6 Incremental & Resultant GLC of NO_x

Station ID	Distance to core area (km)	Direction	NO _x concentrations (µg/m ³)			Comparison against air quality standard (80 µg/m ³)	Magnitude of change (%)	Significance
			Base line	Predicted	Total			
AAQ1	0.04	N	15.6	4.06	19.66	Below standard	26.03	Not significant
AAQ2	2.00	SE	19.6	1	20.6		5.10	
AAQ3	2.60	SW	18.2	0	18.2		0.00	
AAQ4	3.34	SW	11.0	0	11		0.00	
AAQ5	4.32	SW	18.5	0	18.5		0.00	
AAQ6	2.81	SW	17.8	0.5	18.3		2.81	
AAQ7	4.12	S	22.6	0	22.6		0.00	
AAQ8	5.00	E	22.2	0.5	22.7		2.25	

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

4.4.3 Common Mitigation Measures

Drilling

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

Advantages of Wet Drilling

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

Blasting

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

Haul Road and Transportation

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

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

Green Belt

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

Occupational Health

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

4.5 NOISE ENVIRONMENT

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

Predictions have been carried out to compute the noise level at various distances around the working pit due to these major noise-generating sources. Noise modelling has been carried out to assess the impact on surrounding ambient noise levels.

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

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

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

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	Jack Hammer	Yes	88
2	Compressor	Yes	81
3	Excavator	Yes	85
4	Tipper	Yes	84
Total Noise Produced			91.22

*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 91.22 dB (A). Therefore, we have considered equipment and operation noise levels (max) to be approx. 91.22 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 Zone	100	41.4	39.38	43.52
Pullaiyampalayam	550	39.4	24.57	39.54
VST Blue metals Core	2010	41.6	13.32	41.61

Near Ponvinayaga Blue Metals	2600	41.2	11.08	41.20
Andisangilipalayam	3340	36.2	8.90	36.21
Punnam Velayuthampalayam	4320	39.6	6.67	39.60
Punnam Chattiram	2810	42.6	10.41	42.60
Pavithiram	4120	43.8	7.08	43.80
Nochipalayam	5000	41.3	5.40	41.30
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 39.38 dB (A) in core zone and ranges between 5.40 and 24.57dB (A) in buffer zone. The noise level at different receptors in buffer zone is lower due to the distance involved and other topographical features adding to the noise attenuation. The resultant Noise level due to monitored values and calculated values at the receptors are based on the mathematical formula considering attenuation due to several factors including ground reflection, atmosphere, wind speed, temperature, trees, and buildings as 35.5 dB (A), the barrier effect. From the above table, it can be seen that the ambient noise levels at all the locations near habitations are within permissible limits of Residential Area (buffer zone) as per THE NOISE POLLUTION (REGULATION AND CONTROL) RULES, 2000 (The Principal Rules were published in the Gazette of India, vide S.O.123(E), dated 14.2.2000 and subsequently amended vide S.O. 1046(E),dated 22.11.2000, S.O. 1088(E), dated 11.10.2002, S.O. 1569 (E), dated 19.09.2006 and S.O. 50 (E) dated 11.01.2010 under the Environment(Protection) Act, 1986.).

4.5.2 Common Mitigation Measures

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

- ❖ Usage of sharp drill bits while drilling which will help in reducing noise
- ❖ Secondary blasting will be totally avoided and hydraulic rock breaker will be used for breaking boulders
- ❖ Controlled blasting with proper spacing, burden, stemming and optimum charge/delay will be maintained
- ❖ The blasting will be carried out during favourable atmospheric condition and less human activity timings by using nonelectrical initiation system
- ❖ Proper maintenance, oiling and greasing of machines will be done every week to reduce generation of noise
- ❖ Provision of sound insulated chambers for the workers working on machines (HEMM) producing higher levels of noise
- ❖ Silencers / mufflers will be installed in all machineries

- ❖ Greenbelt/Plantation will be developed around the project area and along the haul roads. The plantation minimizes propagation of noise
- ❖ Personal Protective Equipment (PPE) like ear muffs/ear plugs will be provided to the operators of HEMM and persons working near HEMM and their use will be ensured through training and awareness
- ❖ Regular medical check-up and proper training to personnel to create awareness about adverse noise level effects

4.5.3 Ground Vibrations

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

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

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

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

Where,

V = peak particle velocity (mm/s)

K = site and rock factor constant (500)

Q = maximum instantaneous charge (kg)

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

R = distance from charge (m)

Table 4.9 Predicted PPV Values due to Blasting

Location ID	Maximum Charge in kgs	Nearest Habitation in m	PPV in mm/s	Fly rock distance in m	Air Blast	
					Pressure (kPa)	Sound Level (dB)
P1	2.2	550	0.039	18	0.00	107

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

Location ID	Maximum Charge in kgs	Radial Distance in m	PPV in mm/s	Fly rock distance in m	Air Blast	
					Pressure (kPa)	Sound Level (dB)
P1	2.2	100	0.595	18	0.03	125
		200	0.196		0.01	117
		300	0.103		0.01	113
		400	0.065		0.01	110
		500	0.045		0.00	108

4.5.3.1 Common Mitigation Measures

- ❖ The blasting operations in the cluster quarries are carried out without deep hole drilling and blasting using delay detonators which reduce the ground vibrations
- ❖ Proper quantity of explosives, suitable stemming materials and appropriate delay system will be adopted to avoid overcharging and for safe blasting
- ❖ Adequate safe distance from blasting will be maintained as per DGMS guidelines
- ❖ Blasting shelter will be provided as per DGMS guidelines
- ❖ Blasting operations will be carried out only during day time
- ❖ The charge per delay will be minimized and preferably a greater number of delays will be used per blasts
- ❖ During blasting, other activities in the immediate vicinity will be temporarily stopped
- ❖ Drilling parameters like depth, diameter and spacing will be properly designed to give proper blast
- ❖ A fully trained explosives blast man (Mining Mate, Mines Foreman, 2nd Class Mines Manager/ 1st Class Mines Manager) will be appointed
- ❖ A set of shot firing rules will be drawn up and blasting shall commence outlining the detailed operating procedures that will be followed to ensure that shot firing operations on site take place without endangering the workforce or public
- ❖ Sufficient angular stemming material will be used to confine the explosive force and minimise environmental disturbance caused by venting / misfire
- ❖ The detonators will be connected in a predetermined sequence to ensure that only one charge is detonated at any one time and a NONEL or similar type initiation system will be used
- ❖ The detonation delay sequence shall be designed so as to ensure that firing of the holes is in the direction of free faces so as to minimise vibration effects

- ❖ Appropriate blasting techniques shall be adopted in such a way that the predicted peak particle velocity shall not exceed 0.251mm/s
- ❖ Vibration monitoring will be carried out every 6 months to check the efficacy of blasting practices.

4.6 ECOLOGY AND BIODIVERSITY

4.6.1 Impact on Ecology and Biodiversity

- There shall be negligible air emissions or effluents from the project site. During loading the truck, dust generation will be likely. This shall be a temporary effect and not anticipated to affect the surrounding vegetation significantly
- There are no plant species in the mining lease area. It is a kind of dry land.
- Most of the land in the buffer area is undulating terrain with crop lands, grass patches and small shrubs. Hence, there will be no effect on flora of the region.
- Carbon released from quarrying machineries and tippers during quarrying would be 941 kg per day, 254048 kg per year and 1270239 kg over five years, as provided in Table 4.11.

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

	Per day	Per year	Per five years
Fuel consumption of excavator	64	17265	86326
Fuel consumption of compressor	4.8	1296	6480
Fuel consumption of tipper	282	76233	381163
Total fuel consumption in liters	351	94794	473970
Co ₂ emission in kg	941	254048	1270239

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.
- ❖ There is no agriculture land in nearby mine lease area. There is no impact in agriculture lands in surrounding area.
- ❖ Existing roads will be used; new roads will not be constructed to reduce impact on flora.

Carbon Sequestration

- ❖ To mitigate carbon emission due to mining activities, we recommend planting trees around the quarry to offset the carbon emission during quarrying. A tree can sequester 24 kg of carbon per year. Therefore, we recommend planting large number of trees around the quarry and near school campuses, government wasteland, roadsides etc.

- ❖ As per the greenbelt development plan as recommended by SEAC (Table 4.13), about 2183 trees will be planted within three months from the beginning of mining. These trees, when grown up would sequester carbon of about 101 kg of the total carbon, as provided in Table 4.12.

Table 4.12 CO₂ Sequestration

CO ₂ sequestration in kg	101	27273	136364
Remaining CO ₂ not sequestered in kg	840	226775	1133875
Trees required for environmental compensation	9449		
Area required for environmental compensation in hectares	19		

Greenbelt Development

The main objective of the green belt is to provide a barrier between the source of pollution and the surrounding areas. In order to compensate the loss of vegetation cover, it is suggested to carry out afforestation program mainly inside and outside of the lease area in different phases. This habitat improvement program would ensure the faunal species to re-colonize and improve the abundance status in the core zone. Greenbelt development plan and budget required for green belt development plan are given in Tables 4.14-4.15. For greenbelt development, species are recommended, as shown in Table 4.13 on the basis of:

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

Table 4.13 Recommended Species for Greenbelt Development Plan

S. No	Botanical Name of the Plant	Family Name	Common Name	Category	Dust Capturing Efficiency Features
1	<i>Azadirachta indica</i>	Meliaceae	Neem, Vembu	Tree	Well distinct thick at both the layer Palisade & Spongy parenchyma. Spongy parenchyma is
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	present at lower epidermis Many vascular bundles arranged almost parallel series
7	<i>Cassia fistula</i>	Fabaceae	Sarakondrai	Tree	
8	<i>Aegle marmelos</i>	Rutaceae	Vilvam	Tree	
9	<i>Pongamia pinnata</i>	Fabaceae	Pungam	Tree	
10	<i>Thespesia populnea</i>	Malvaceae	Puvarasu	Tree	

Table 4.14 Greenbelt Development Plan

	No. of trees proposed for plantation	No. of trees expected to survive @ 80%	Area to be covered(m ²)
Plantation in the construction phase (3 months)	Number of plants inside the mine lease area		
	455	364	4095
	Number of plants outside the mine lease area		
	683	546	6143
Total	1138	910	10238

Table 4.15 Budget for Greenbelt Development Plan

Activity	Plantation in the construction phase(3Months)	Cost	Capital Cost (Rs.)	Recurring Cost-per annum
Plantation inside the mine lease area (in safety margins)	455	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))"	91000	13650
Plantation outside the area	683	Avenue Plantation @ 300 per plant (capital) for plantation outside the lease area and @ 30 per plant maintenance (recurring)	204750	20475
Total			295750	34125

Source: EMP budget

After complete extraction of mineral, the excavated pits will be allowed to collect rainwater and seepage water to serve as a reservoir to charge the nearby wells. Fish culture will also be

attempted. A bund will be constructed around the pits. In order to minimize the impact of mining on the vegetation outside the mine lease area, it is recommended that adequate protection measures must be implemented. As mining involves movement of vehicles and increased anthropogenic activities, some of the areas can be fenced by involving local people and educating them about increased benefits of such activities.

4.6.3. Anticipated Impact on Fauna

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

4.6.4 Measures for Protection and Conservation of Wildlife Species

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

Aquatic Biodiversity

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

Table 4.16 Ecological Impact Assessments

S. No	Attributes	Assessment
1	Activities of the project affects the breeding/nesting sites of birds and animals	No breeding and nesting sites were identified in the lease area.
2	Located near an area populated by rare or endangered species	No endangered, critically endangered, vulnerable species were sighted in core area.
3	Proximity to national park/wildlife sanctuary/reserve forest /mangroves/coastline/estuary/sea	Thathampalayam RF Located in 6.83 km SE Side There are no national parks or eco-sensitive zones around 10 km radius.
4	Proposed project restricts access to waterholes for wildlife	No. The proposed project does not restrict access to water holes for wildlife.
5	Proposed mining project impact surface water quality that also provide water to wildlife	No scheduled or threatened wildlife animal were sighted in core area.
6	Proposed mining project increase siltation that would affect nearby biodiversity area.	Surface runoff management system will be developed properly. So, there will be no siltation in nearby mining area.
7	Risk of fall/slip or cause death to wild animals due to project activities	Barbed wire fencing will be installed around the lease area. Therefore, wild animals will not fall into the quarry pit.
8	The project release effluents into a water body that also supplies water to a wildlife	No water bodies were found close to core zone so chances of water becoming polluted will be low.
9	Mining project effect the forest-based livelihood/ any specific forest product on which local livelihood depended	No. The proposed project does not involve any forestland. Therefore, it will not affect the livelihood of people depending the forest product.
10	Project likely to affect migration routes	No migration routes were found crossing the lease area.
11	Project likely to affect flora of an area, which have medicinal value	No flora with medicinal values were found in the study area.
12	Forestland is to be diverted, has carbon high sequestration	As the proposed project does not involve any forestland, there will be no need for diversion.
13	The project likely to affect wetlands, fish breeding grounds, marine ecology	Wetland was not present in and around mining lease area. No fish breeding grounds were present in core area.

Table 4.17 Anticipated Impact of Ecology and Biodiversity

S. No	Aspect Description	Likely Impacts on Ecology and Biodiversity (EB)	Impact Consequence - Probability Description / Justification	Significance	Mitigation Measures
Pre-Mining Phase					
1	Uprooting of vegetation of lease area	Site specific loss of common floral diversity (Direct impact)	Site possesses common floral (not trees) species. Clearance of these species will not result in loss of flora	Less severe	No immediate action required. However, Greenbelt /plantation will be developed in project site and in periphery of the project boundary, which will improve flora and fauna diversity of the project area.
		Site specific loss of associated faunal diversity (Partial impact)	Site supports only common species, which use wide variety of habitats of the buffer zone reserve forest area. So, there is no threat of faunal diversity.		
		-Loss of Habitat (Direct impact)	Site does not form Unique / critical habitat structure for unique flora or fauna.		
Mining Phase					
2	Excavation of mineral using machine and labours, Transportation activities will generate noise.	Site-specific disturbance to normal faunal movements at the site due to noise. (Partial impact)	Site does not form unique / critical habitat structure for unique flora or fauna.	Less severe	Mining activity should not be operated after 5PM. Excavation of dump and transportation work should stop before 7PM.
3	Vehicular Movement for transportation of materials will result in generation of dust (SPM) due to haul roads and emission of SO ₂ , NO ₂ , CO etc.	Impact on surrounding agriculture and associated fauna due to deposition of dust and Emission of CO. (Indirect impact)	Impact is less as the agricultural land far from core area.	Less severe	All vehicles will be certified for appropriate Emission levels. More plantation has been suggested Upgrade the vehicles with alternative fuel such biodiesel, methanol and biofuel around the mining area.

4.7 SOCIO ECONOMIC ENVIRONMENT

4.7.1 Anticipated Impact from Proposed and Existing Projects

- ❖ Dust generation from mining activity can have negative impact on the health of the workers and people in the nearby area.
- ❖ Approach roads can be damaged by the movement of tippers
- ❖ Increase in Employment opportunities both direct and indirect thereby increasing economic status of people of the region.

4.7.2 Common Mitigation Measures for Proposed Project

- ❖ Good maintenance practices will be adopted for all machinery and equipment, which will help to avert potential noise problems.
- ❖ Green belt will be developed in and around the project site as per Central Pollution Control Board (CPCB) guidelines.
- ❖ Air pollution control measure will be taken to minimize the environmental impact within the core zone.
- ❖ For the safety of workers, personal protective appliances like hand gloves, helmets, safety shoes, goggles, aprons, nose masks and ear protecting devices will be provided as per mines act and rules.
- ❖ Benefit to the State and the Central governments through financial revenues by way of royalty, tax, duties, etc., from this project directly and indirectly.
- ❖ From above details, the quarry operations will have highly beneficial positive impact in the area

4.8 OCCUPATIONAL HEALTH AND SAFETY

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

- ❖ Respiratory hazards
- ❖ Noise
- ❖ Physical hazards
- ❖ Explosive storage and handling

4.8.1 Respiratory Hazards

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

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

4.8.2 Noise

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

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

4.8.3 Physical Hazards

The following measures are proposed for control of physical hazards

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

4.8.4 Occupational Health Survey

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

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

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

4.9 MINE WASTE MANAGEMENT

No waste is anticipated from any of the proposed quarries.

4.10 MINE CLOSURE

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

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

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

4.10.1 Mine Closure Criteria

The criteria involved in mine closure are discussed below:

4.10.1.1 Physical Stability

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

4.10.1.2 Chemical Stability

The solid wastes on the mine site should be chemically stable. This means that the consequences of chemical changes or conditions leading to leaching of metals, salts or organic compounds should not endanger public health and safety nor result in the deterioration of environmental attributes. If the pollutant discharge likely to cause adverse impacts is predicted in advance, appropriate mitigation measures like settling of suspended solids or passive treatment to

improve water quality as well as quantity, etc., could be planned. Monitoring should demonstrate that there is no adverse effect of pollutant concentrations exceeding the statutory limits for the water, soil and air qualities in the area around the closed mine.

4.10.1.3 Biological Stability

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

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

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

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

CHAPTER V

ANALYSIS OF ALTERNATIVES (TECHNOLOGY AND SITE)

5.0 INTRODUCTION

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

5.1 FACTORS BEHIND THE SELECTION OF PROJECT SITE

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

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

5.2 ANALYSIS OF ALTERNATIVE SITE

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

5.3 FACTORS BEHIND SELECTION OF PROPOSED TECHNOLOGY

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

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

5.4 ANALYSIS OF ALTERNATIVE TECHNOLOGY

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

CHAPTER VI

ENVIRONMENTAL MONITORING PROGRAMME

6.0 GENERAL

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

6.1 METHODOLOGY OF MONITORING MECHANISM

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

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

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

- ❖ Seeking expert's advice when needed.

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

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

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

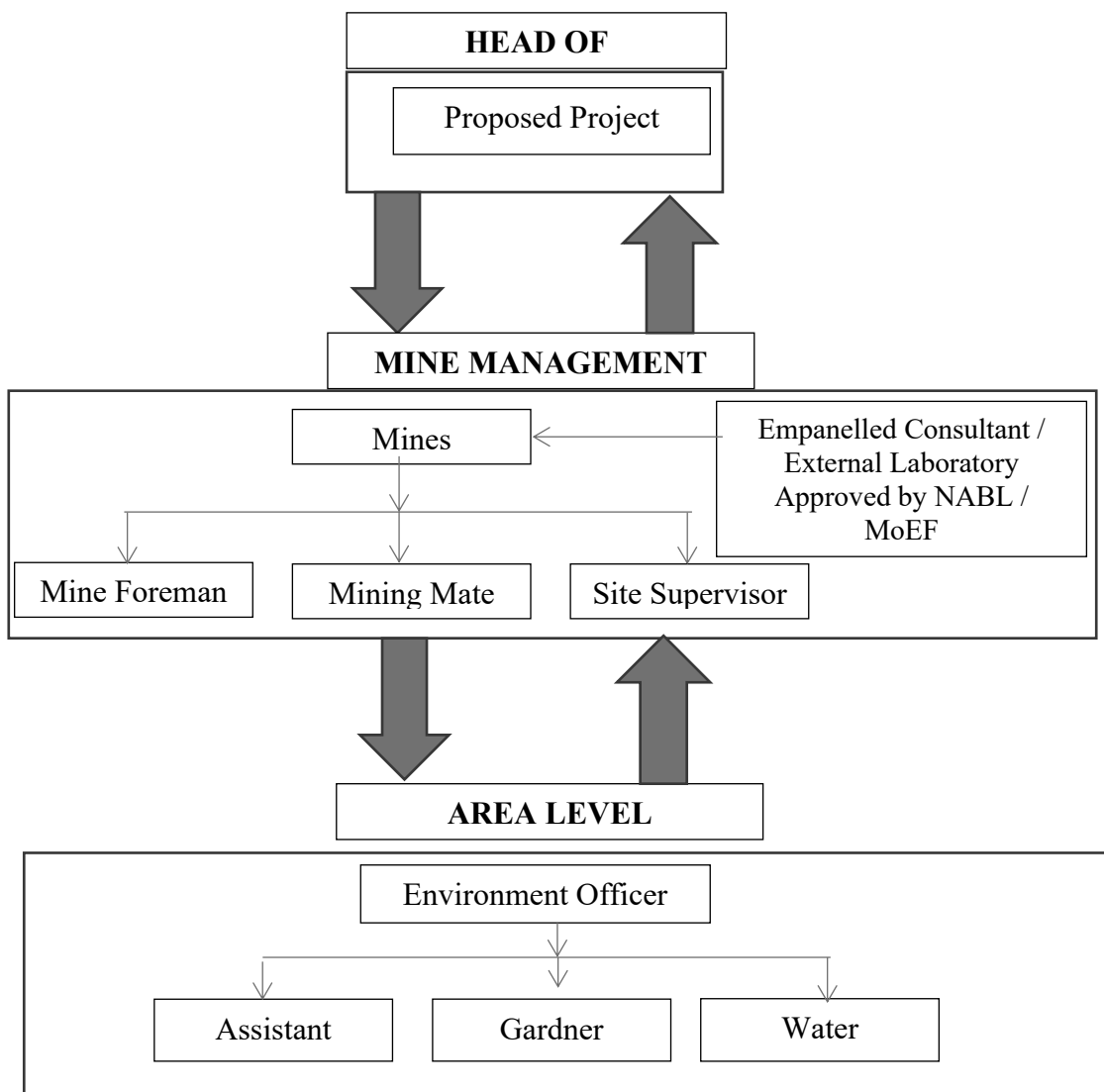


Figure 6.1 Proposed environmental monitoring chart

6.2 IMPLEMENTATION SCHEDULE OF MITIGATION MEASURES

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

Table 6.1 Implementation Schedule for Proposed Project

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

6.3 MONITORING SCHEDULE AND FREQUENCY

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

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

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

- ❖ Soil quality and
- ❖ Greenbelt development

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

Table 6.2 Proposed Monitoring Schedule Post EC for the Proposed Quarry

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

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

6.4 BUDGETARY PROVISION FOR ENVIRONMENT MONITORING PROGRAM

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

Table 6.3 Environment Monitoring Budget

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

Source: Field Data

6.5 REPORTING SCHEDULES OF MONITORED DATA

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

Periodical reports to be submitted to:

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

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

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

CHAPTER VII

ADDITIONAL STUDIES

7.0 GENERAL

Additional studies deal with:

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

7.1 PUBLIC CONSULTATION FOR PROPOSED PROJECT

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

7.2 RISK ASSESSMENT FOR PROPOSED PROJECT

Risk Assessment is all about prevention of accidents and to take necessary steps to prevent it from happening. The methodology for the risk assessment is based on the specific risk assessment guidance issued by the Directorate General of Mine Safety (DGMS), Dhanbad, vide circular No.13 of 2002, dated 31st December, 2002. The DGMS risk assessment process is intended to identify existing and probable hazards in the work environment and all operations and assess the risk levels of those hazards in order to prioritize those that need immediate attention. Further, mechanisms responsible for these hazards are identified and their control measures, set to timetable are recorded along with pinpointed responsibilities. The whole quarry operation will be carried out under the direction of a Qualified Competent Mine Manager holding certificate of competency to manage a metalliferous mine granted by the DGMS, Dhanbad for proposed project.

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

Table 7.1 Risk Assessment & Control Measures for Proposed Project

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

			<ul style="list-style-type: none"> ✓ Periodical preventive maintenance and replacement of worn-out accessories in the compressor and drill equipment as per operator manual. ✓ All drills unit shall be provided with wet drilling shall be maintained in efficient working in condition. ✓ Operator shall regularly use all the personal protective equipment.
3	Transportation	<p>Potential hazards and unsafe workings contributing to accident and injuries</p> <p>Overloading of material</p> <p>While reversal & overtaking of vehicle</p> <p>Operator of truck leaving his cabin when it is loaded.</p>	<ul style="list-style-type: none"> ✓ 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. ✓ Not allow any unauthorized person to ride on the vehicle nor allow any unauthorized person to operate the vehicle. ✓ Concave mirrors should be kept at all corners ✓ All vehicles should be fitted with reverse horn with one spotter at every tipping point ✓ Loading according to the vehicle capacity ✓ Periodical maintenance of vehicles as per operator manual
4	Natural calamities	Unexpected happenings	<ul style="list-style-type: none"> ✓ 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	<ul style="list-style-type: none"> ✓ Ultimate or over all pit slope shall be below 60° and each bench height shall be 5m.

Source: Analysed and Proposed by FAE & EC

7.3 DISASTER MANAGEMENT PLAN FOR PROPOSED PROJECT

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

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

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

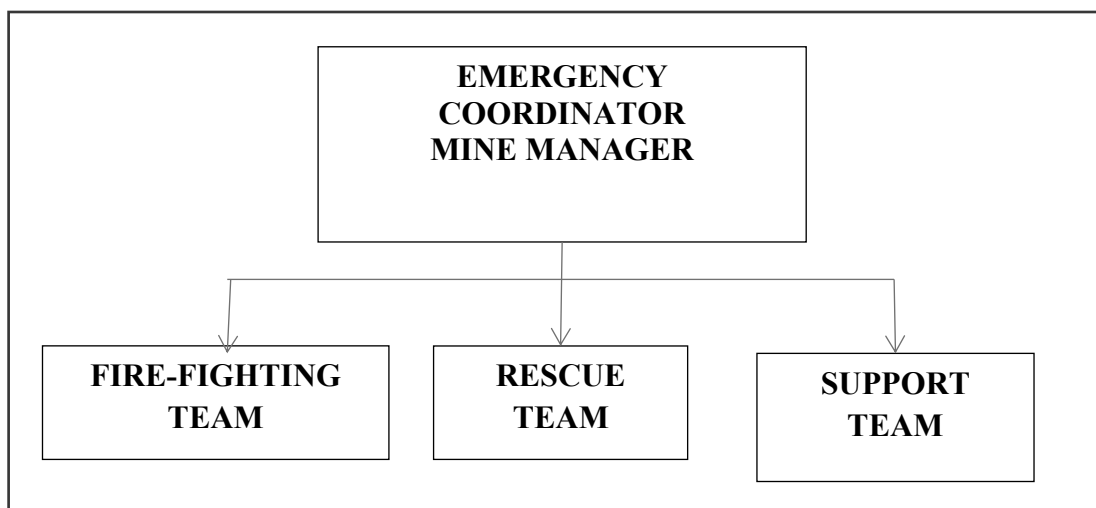


Figure 7.1 Disaster management team layout for proposed project

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

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

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

7.3.1 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 carry out 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.,

7.3.2 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

7.3.3 Proposed Fire Extinguishers

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

Table 7.3 Proposed Fire Extinguishers at Different Locations in P1

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

7.3.4 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.

7.4 CUMULATIVE IMPACT STUDY

The Cumulative Impact is mainly anticipated due to drilling & blasting and excavation and transportation activities in all the quarries within the cluster and major impact anticipated is on Air & Noise Environment and Ground Vibrations due to blasting. For this cumulative study, 2 proposed projects, known as P1, P2 re 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	Thiru.N.Sakthivel	
Extent	3.87.0 ha	
S.F.No	105/1B(P),112/1A(P),112/2A(P)	
Toposheet No	58-F/13	
Latitude between	10°59'18.71"N to 10°59'29.09"N	
Longitude between	77°57'50.35"E to 77°57'58.30"E	
Highest Elevation	177 m AMSL	
Proposed Depth of Mining	30 m BGL	
Geological Resources	Roughstone in m ³	Gravel in m ³
	3,82,593	18,548
Mineable Reserves	Roughstone in m ³	Gravel in m ³
	2,35,425	10,285
Proposed reserves for five years	Rough Stone in m ³	Gravel in m ³
	2,35,425	10,285
Ultimate Pit Dimension (Proposed)	127 m (L) x 92 m (W) x 25 m (D)	
Water Level in the surrounding area	60 m BGL	
Method of Mining	Opencast Semi mechanized mining	
Topography	The proposed lease area exhibits almost flat terrain and at an average altitude of about 162m AMSL.	
Machinery proposed	Jacks Hammer	3
	Compressor	1
	Hydraulic Excavator	2
	Tippers	4
Blasting Method	Controlled blasting involving shot-holes and slurry explosives of 25 mm diameter.	
Proposed Manpower Development	17	
Project Cost	Rs.30,32,800	
CER Cost	Rs. 5,00,000	

7.4.1 Air Environment

As the production of rough stone and gravel plays a vital role in affecting the air environment. The data on the cumulative production resulting from the 2 proposed projects have been given in Tables 7.5 and 7.6.

Table 7.5 Cumulative Production Load of Rough Stone

Proposed Production Details				
Quarry	5 Years in m³	Per Year in m³	Per Day in m³	Number of Lorry Load Per Day
P1	106213	21243	79	13
P2	235425	47085	174	29
Grand Total	341638	68328	253	42

Table 7.6 Cumulative Production Load of Gravel

Quarry	Production for 5 Years (m³)	Yearly Production(m³)	Daily Production(m³)	Number of Lorry Loads Per Day
P1	8136	1627	6	1
P2	10285	2057	8	1
Grand Total	18,421	3,684	14	2

The cumulative study shows that the overall production of rough stone from the 2 quarries is 253 m³ per day with a capacity of 42 trips of rough stone per day and that production of gravel from the 2 proposed quarry is 14 m³ per day accounting for 2 trips/day.

7.4.1.1 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 7.7. The cumulative values resulting from the 2 projects for each pollutant do not exceed the permissible limits set by CPCB.

Table 7.7 Cumulative Impact Results from the 2 proposed projects

Pollutants	Baseline Data (µg/m³)	Incremental Values (µg/m³)		Cumulative Value (µg/m³)
		P1	P2	
PM _{2.5}	20.2	6.49	9.84	36.53
PM ₁₀	41.7	10.40	14.32	66.42
SO ₂	8.4	4.51	7.47	20.38
NO ₂	15.6	4.06	6.49	26.15

7.4.2 Noise Environment

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

Table.7.8 Cumulative Impact of Noise from 2 Proposed Quarries on Pullaiyampalayam 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	550	N	39.4	24.57	39.54	55
Habitation Near P2	580	N	39.4	24.11	39.53	
Cumulative Noise (dB (A))					42.55	

Source: Lab Monitoring Data

The cumulative analysis of noise due to 2 proposed projects shows that habitation of Pullaiyampalayam will receive about 42.55 dB (A) respectively. The cumulative results for the village in consideration do not exceed the limit set by CPCB for residential areas for day time.

Ground Vibrations

Cumulative results of ground vibrations due to mining activities in the all the 3 mines have been shown in Table 7.9.

Table 7.9 Cumulative Effect of Ground Vibrations Resulting from 3 Mines on Habitation of Pullaiyampalayam

Location ID	Maximum Charge in kgs	Nearest Habitation in m	PPV in mm/s
P1	2.2	550	0.039
P2	17	580	0.183
E1	2.1	560	0.037
Total			0.259

Results from the above tables 7.9 indicate that the cumulative PPV value of each habitation is well below the peak particle velocity of 8 mm/s as per Directorate General of Mines Safety for safe level criteria through Circular No. 7 dated 29/8/1997.

7.4.3 Socio Economic Environment

Socio Economic benefits of the 2 proposed projects were calculated and the results have been shown in Table 7.10. The 2 projects together will contribute Rs.10,00,000 towards CER fund.

Table 7.10 Socio Economic Benefits from 2 Mines

Location ID	Project Cost	CER Cost
P1	Rs.28,86,700	Rs. 5,00,000
P2	Rs 30,32,800	Rs. 5,00,000
Grand Total	Rs 59,19,500	Rs. 10,00,000

Table 7.11 Employment Benefits from 2 Mines

Location ID	Employment
P1	14
P2	17
Grand Total	31

A total of 31 people will get employment due to 2 proposed mines in cluster

7.4.4 Ecological Environment

Table 7.12 Greenbelt Development Benefits From 2 Mines

Code	Number of Trees proposed	Area to be covered (ha)	No. of Trees expected to be grown @ 80% survival rate	Species recommended
P1	1138	10238	910	<i>Azadirachta indica, Albizia lebbeck, Delonix regia, Tectona grandis, etc.,</i>
P2	1935	17415	1548	
Total	3073	27653	2458	

Cumulative studies show that the 2 proposed projects will plant about 3073 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., 2,458 trees will survive in this green belt development program.

7.5 PLASTIC WASTE MANAGEMENT PLAN FOR PROPOSED PROJECT

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

7.5.1 Objective

- ❖ To investigate the actual supply chain network of plastic waste.
- ❖ To identify and propose a sustainable plastic waste management by installing bins for collection of recyclables with all the plastic waste
- ❖ Preparation of a system design layout, and necessary modalities for implementation and monitoring.

A detailed action plan to manage plastic waste has been provided in Table 7.13.

Table 7.13 Action Plan to Manage Plastic Waste

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

Source: Proposed by FAEs and EC

7.6 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.

7.6.1 Post-COVID Follow up Protocol

- ❖ Continue COVID appropriate behaviour (use of mask, hand & respiratory hygiene, physical distancing).
- ❖ Drink adequate amount of warm water (if not contra-indicated).
- ❖ Make sure your workplaces are clean and hygienic
- ❖ Surfaces (e.g., desks and tables) and objects (e.g., telephones, helmet) need to be wiped with disinfectant regularly
- ❖ Put sanitizing hand rub dispensers in prominent places around the workplace. Make sure these dispensers are regularly refilled
- ❖ Display posters promoting hand-washing
- ❖ Make sure that staff, contractors and customers have access to places where they can wash their hands with soap and water
- ❖ Display posters promoting respiratory hygiene.
- ❖ Brief your employees, contractors and customers that if COVID-19 starts spreading in your community anyone with even a mild cough or low-grade fever (37.3°C or more) need to stay at home. They should also stay home (or work from home) if they have had to take simple medications, such as paracetamol/acetaminophen, ibuprofen or aspirin, which may mask symptoms of infection
- ❖ Keep communicating and promoting the message that people need to stay at home even if they have just mild symptoms of COVID-19.
- ❖ Consider whether a face-to-face meeting or event is needed. Could it be replaced by a teleconference or online event?
- ❖ Could the meeting or event be scaled down so that fewer people attend?

- ❖ Pre-order sufficient supplies and materials, including tissues and hand sanitizer for all employees. Have surgical masks available to offer anyone who develops respiratory symptoms.
- ❖ It is also suggested by the Ministry of AYUSH that the use of Chyawanprash in the morning (1 teaspoonful) with Luke warm water/milk is highly recommended (under the direction of Registered Ayurveda physician) as in the clinical practice Chyawanprash is believed to be effective in post-recovery period.
- ❖ If there is persistent dry cough / sore throat, do saline gargles and take steam inhalation. The addition of herbs/spices for gargling/steam inhalation. Cough medications, should be taken on advice of medical doctor or qualified practitioner of Ayush.
- ❖ Look for early warning signs like high grade fever, breathlessness, Sp O₂ < 95%, unexplained chest pain, new onset of confusion, focal weakness.
- ❖ Avoid smoking and consumption of alcohol.
- ❖ Communicate to your employees and contractors about the plan and make sure they are aware of what they need to do – or not do – under the plan. Emphasize key points such as the importance of staying away from work even if they have only mild symptoms or have had to take simple medications (e.g., paracetamol, ibuprofen) which may mask the symptoms.
- ❖ The plan should address how to keep your business running even if a significant number of employees, contractors and suppliers cannot come to your place of business - either due to local restrictions on travel or due to illness.

CHAPTER VIII

PROJECT BENEFITS

8.0 GENERAL

The proposed project at Kuppam Village aims to produce **106213 m³** of rough stone and **8136 m³** of gravel over a period of 5 years. This will enhance the socio-economic activities in the adjoining areas and will result in the following benefits:

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

8.1 EMPLOYMENT POTENTIAL

It is proposed to provide employment to about 14 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 Kuppam Village, Pugalur Taluk and Karur 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 Kuppam 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 ≤ 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
	Total	Rs.5, 00,000

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

8.8 SUMMARY OF PROJECT BENEFITS

The project would pay about **Rs. 83,42,067** to the state government through various ways, as provided in Table 8.2.

Table 8.2 Project Benefits to the State Government

Particulars	Budget for Rough stone (Rs.)	Budget for Gravel (Rs.)
CER	5,00,000	-----
Seigniorage @ Rs.59/m ³ of rough stone Rs.33/m ³ of Gravel	62,66,567	2,68,488
District Mineral Foundation Tax @ 10% of Seigniorage	6,26,657	26,849
Green Tax @ 10% of Seigniorage	6,26,657	26,849
Total	80,19,881	3,22,186

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. P. Davaraj**, will:

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

10.1.1 Description of the Administration and Technical Setup

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

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

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

10.2 LAND ENVIRONMENT MANAGEMENT

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

Table 10.1 Proposed Controls for Land Environment

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

Source: Proposed by FAEs & EIA Coordinator

10.3 SOIL MANAGEMENT

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

10.4 WATER MANAGEMENT

In the proposed quarrying project, no process is involved for the effluent generation, only oil & grease from the machinery wash and domestic sewage from mines office is anticipated. The quarrying operation is proposed up to a depth of 35 m. The water table in the area is at 60 m below ground level. Hence, the proposed project will not intersect the ground water table during entire quarry period. A detailed water environment management plan has been provided in Table 10.2.

Table 10.2 Proposed Controls for Water Environment

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

Source: Proposed by FAEs & EIA Coordinator

10.5 AIR QUALITY MANAGEMENT

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

exhaust emission requirements. A detailed ambient air environment management plan is provided in Table 10.3.

Table 10.3 Proposed Controls for Air Environment

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

Source: Proposed by FAEs & EIA Coordinator

10.6 NOISE POLLUTION CONTROL

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

Table 10.4 Proposed Controls for Noise Environment

Control	Responsibility
Development of thick greenbelt all along the buffer zone (7.5 meters) of the project area to attenuate the noise and the same will be maintained	Mines Manager
Preventive maintenance of mining machinery and replacement of worn-out accessories to control noise generation	Mines Foreman
Deployment of mining equipment with an inbuilt mechanism to reduce noise	Mines Manager
Provision of earmuff/ ear plugs to workers working in noise prone zones in the mines	Mining Mate
Provision of effective silencers for mining machinery and transport vehicles	Mines Manager
Provision of sound proof AC operator cabins to HEMM	Mines Manager

Sharp drill bits are used to minimize noise from drilling	Mines Foreman
Controlled blasting technologies are adopted by using delay detonators to minimize noise from blasting	Mines Manager
Annual ambient noise level monitoring is carried out in the project area and in surrounding villages to assess the impact due to the mining activities and the efficacy of the adopted noise control measures. Additional noise control measures will be adopted if required as per the observations during monitoring	Mines Manager
Reduce maximum instantaneous charge using delays while blasting	Mining Mate
Change the burden and spacing by altering the drilling pattern and/or delay layout, or altering the hole inclination	Mines Manager
Undertake noise or vibration monitoring	Mines Manager

Source: Proposed by FAEs & EIA Coordinator

10.7 GROUND VIBRATION AND FLY ROCK CONTROL

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

Table 10.5 Proposed Controls for Ground Vibrations & Fly Rock

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

Source: Proposed by FAEs & EIA Coordinator

10.8 BIOLOGICAL ENVIRONMENT MANAGEMENT

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

- ❖ Greenbelt development all along the safety barrier of the project area.
- ❖ It is also proposed to implement the greenbelt development program and post plantation status will be regularly checked for every season.
- ❖ The main attributes that retard the survival of sapling is fugitive dust, this fugitive dust can be controlled by water sprinkling on the haul roads and installing a sprinkler unit near the newly planted area.
- ❖ Year wise greenbelt development will be recorded and monitored based on the area of plantation, period of plantation, type of plantation, spacing between the plants, type of manuring and fertilizers and its periods, lopping period, interval of watering, survival rate and density of plantation.
- ❖ The ultimate reclamation planned leaves a congenial environment for development of flora & immigration of small fauna through green belt and water reservoir. The green belt and water reservoir developed within the Project at the end of mine life will attract the birds and animals towards the project area in the post mining period.

10.8.1 Green Belt Development Plan

The main objectives of the greenbelt development plan are to:

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

Table 10.6 Proposed Greenbelt Development Plan

	No. of trees proposed for plantation	No. of trees expected to survive @ 80%	Area to be covered(m²)
	Number of plants inside the mine lease area		
	455	364	4095

Plantation in the construction phase (3 months)	Number of plants outside the mine lease area		
		683	546	6143
Total	1138	910	10238

Source: Proposed by FAEs & EIA Coordinator

About 1138 saplings will be planted in and around the lease area with the survival rate of 80%. A well-planned green belt of trees with long canopy leaves shall be developed with dense plantations around the boundary and along the haul roads to prevent air, dust noise propagation to undesired places and efforts will be taken for the enhancement of survival rate.

10.9 OCCUPATIONAL SAFETY & HEALTH MANAGEMENT

Occupational safety and health are very closely related to productivity and good employer-employee relationship. The main factors of occupational health impact in quarries are fugitive dust and noise. Safety of employees during quarrying operation and maintenance of mining equipment will be taken care as per Mines Act 1952 and Rule 29 of Mines Rules 1955. To avoid any adverse effect on the health of workers due to dust, noise and vibration sufficient measures have been provided.

10.9.1 Medical Surveillance and Examinations

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

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

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

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

Table 10.7 Medical Examination Schedule

S. No.	Activities	1 st Year	2 nd Year	3 rd Year	4 th Year	5 th Year
1	Initial Medical Examination (Mine Workers)					
A	Physical Check-up					
B	Psychological Test					
C	Audiometric Test					
D	Respiratory Test					
2	Periodical Medical Examination (Mine Workers)					
A	Physical Check – up					
B	Audiometric Test					
C	Eye Check – up					
D	Respiratory Test					
3	Medical Camp (Mine Workers & Nearby Villagers)					
4	Training (Mine Workers)					
Medical Follow ups: Work force will be divided into three targeted groups age wise as follows:						
Age Group		PME as per Mines Rules 1955		Special Examination		
Less than 25 years		Once in a Three Years		In case of emergencies		
Between 25 to 40 Years		Once in a Three Years		In case of emergencies		
Above 40 Years		Once in a Three Years		In case of emergencies		
Medical help on top priority immediately after diagnosis/ accident is the essence of preventive aspects.						

10.9.2 Proposed Occupational Health and Safety Measures

- ❖ The mine site will have adequate drinking water supply so that workers do not get dehydrated.
- ❖ Lightweight and loose-fitting clothes having light color will be preferred to wear.
- ❖ Noise exposure measurements will be taken to determine the need for noise control strategies.
- ❖ The personal protective equipment will be provided for mine workers.
- ❖ Supervisor will be instructed for reporting any problems with hearing protectors or noise control equipment.

- ❖ At noisy working activity, exposure time will be minimized.
- ❖ Dust generating sources will be identified and proper control measure will be adopted.
- ❖ Periodic medical examinations will be provided for all workers.
- ❖ Strict observance of the provisions of DGMS Acts, Rules and Regulations in respect of safety both by management and the workers.
- ❖ The width of road will be maintained more than thrice the width of the vehicle. A code of traffic rules will be implemented.
- ❖ In respect of contract work, safety code for contractors and workers will be implemented. They will be allowed to work under strict supervision of statutory person/officials only after they will impart training at vocational training centers. All personal protective equipment's will be provided to them.
- ❖ A safety committee meeting every month will be organized to discuss the safety of the mines and the persons employed.
- ❖ Celebration of annual mines safety week and environmental week in order to develop safety awareness and harmony amongst employees and co quarry owners.



Figure 10.1 Personal Protective Equipment to the Mine Workers

10.9.3 Health and Safety Training Program

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

Table 10.8 List of Periodical Trainings Proposed for Employees

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

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

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

10.9.4 Budgetary Provision for Environmental Management

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

Table 10.9 EMP Budget for Proposed Project

Attribute	Mitigation measures	Provision for Implementation	Capital Cost	Recurring Cost/annum
			(Rs.)	(Rs.)
Air Environment	Compaction, gradation and drainage on both sides	Rental Dozer & drainage construction on haul road @ Rs. 10,000/- per hectare and yearly maintenance @ Rs. 10,000/- per hectare	22750	22750
	Fixed Water Sprinkling Arrangements + Water sprinkling by own water tankers	Fixed sprinkler installation and new water tanker cost for capital; and water sprinkling (thrice a day) cost for recurring	800000	50000
	Air quality will be regularly monitored as per norms within ML area & ambient area	Yearly compliance as per CPCB norms	0	50000
	Muffle blasting – To control fly rocks during blasting	Blasting face will be covered with sand bags / steel mesh / old tyres / used conveyor belts	0	5000
	Wet drilling procedure / latest eco-friendly drill machine with separate dust extractor unit	Dust extractor @ Rs. 25,000/- per unit deployed as capital & @ Rs. 2500 per unit recurring cost for maintenance	100000	10000

	No overloading of trucks/tippers/tractors	Manual Monitoring through Security guard	0	5000
	Stone carrying trucks will be covered by tarpaulin to avoid escape of fines to the atmosphere	Monitoring if trucks will be covered by tarpaulin	0	10000
	Enforcing speed limits of 20 km/hr within ML area	Installation of Speed Governors @ Rs. 5000/- per tipper/dumper deployed	0	0
	Regular monitoring of exhaust fumes as per RTO norms	Monitoring of Exhaust Fumes	0	0
	Regular sweeping and maintenance of roads for at least about 200 m from quarry entrance	Provision for 2 labours @ Rs.10,000/labour (Contractual) / hectare	0	45500
	Installing wheel wash system near exit gate of quarry	Installation + Maintenance + Supervision	50000	20000
Noise Environment	Source of noise will be transportation vehicles, and HEMM. For this, proper maintenance will be done at regular intervals.	Provision made in Operating Cost	0	0

Oiling & greasing of Transport vehicles and HEMM at regular interval will be done.	Provision made in Operating Cost	0	0
Adequate silencers will be provided in all the diesel engines of vehicles.	Provision made in Operating Cost	0	0
It will be ensured that all transportation vehicles carry a fitness certificate.	Provision made in Operating Cost	0	0
Safety tools and implementations that are required will be kept adequately near blasting site at the time of charging.	Provision made in OHS part	0	0
Line Drilling all along the boundary to reduce the PPV from blasting activity and implementing controlled blasting.	Provision made in Operating Cost	0	0
Proper warning system before blasting will be adopted and clearance of the area before blasting will be ensured.	Blowing Whistle by Mining Mate / Blaster / Competent Person	0	0
Provision for Portable blaster shed	Installation of portable blasting shelter	50000	2000
NONEL Blasting will be practiced to control Ground vibration and fly rocks	Rs. 30/- per 6 tons of blasted material	0	297396

Water Environment	Water Management	Provision for garland drain @ Rs. 10,000/- per hectare with maintenance of Rs. 5,000/- per annum (2.91.5 ha X 10000)	22750	11375
Waste Management	Waste management (Spent Oil, Grease etc.,)	Provision for domestic waste collection and disposal through authorized agency (capital cost, recurring cost for collection /disposal).	25000	20000
		Installation of dust bins	5000	2000
	Bio toilets will be made available outside mine lease on the land of owner itself	Provision made in Operating Cost	0	0
Implementation of EC, Mining Plan & DGMS Condition	Size 6' X 5' with blue background and white letters as mentioned in MoM Appendix II by the SEAC TN	Fixed display board at the quarry entrance as permanent structure	10000	1000
Occupational Health	Workers will be provided with Personal Protective Equipment	Provision of PPE @ Rs. 4000/- per employee with recurring based on wear and tear (say, @ Rs. 1000/- per employee)	56000	14000
and Safety	Health checkup for workers will be provisioned	IME & PME Health checkup @ Rs. 1000/- per employee	0	14000

	First aid facility will be provided	Provision of 2 Kits per Hectare @ Rs. 2000/-	0	9100
	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 (2.91.5 hectare)	455000	22750
	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	113750	22750
	Installation of CCTV cameras in the mines and mine entrance	Camera 4 Nos, DVR, Monitor with internet facility	30000	5000
	Implementation as per Mining Plan and ensure safe quarry working	Mines Manager (1 st Class / 2 nd Class / Mine Foreman) under regulation 34 / 34 (6) of MMR, 1961 and Mining Mate under regulation 116 of MMR,1961 @ 40,000/- for Manager & @ 25,000/- for Foreman / Mate	0	780000

Development of Green Belt	Green belt development - 500 trees per hectare (200 Inside Lease Area & 300 Outside Lease Area)	Site clearance, preparation of land, digging of pits /trenches, soil amendments, transplantation of saplings @ 200 per plant (capital) for plantation inside the lease area and @ 30 per plant maintenance (recurring))"	91000	13650
		Avenue Plantation @ 300 per plant (capital) for plantation outside the lease area and @ 30 per plant maintenance (recurring)	204750	20475
Mine Closure	Closure includes 10% of the amount allotted for Greenbelt development, wire fencing, and garland drainage (Rule 27 in MCDR 2017 for Cat B mines will pay 2 lakhs per hectare or minimum amount of financial assurance of 5 lakhs)		0	0
Green fund	G.O.(Ms).No.23, Dated: 28.09.2021	Section IVA of TNMMCR 1959 (@10% of Seigniorage Fee) (Seigniorage Fee for Rough stone = Rs.59 and for Gravel= Rs.33)	653506	0
TOTAL			2699506	1455746 (Excl. Mine Closure Cost)

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

Ist Year	IInd Year	IIIrd Year	IVth Year	Vth Year (Including Mine Closure Cost)	Total Recurring Cost	Total EMP Cost (Capital Cost + Total Recurring Cost)
1455746	1528534	1604960	1685208	1846819	8121268	10820773

In order to implement the environmental protection measures, an amount of Rs. **2699506** as capital cost and recurring cost as Rs. **1455746** as recurring cost/annum is proposed considering present market price considering present market scenario for the proposed project. After the adjustment of 5% inflation per year, the total recurring cost over 5 years is Rs. **8121268** and the overall EMP cost for 5 years will be Rs. **10820773** as shown in Table 10.10.

10.10 CONCLUSION

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

CHAPTER XI

SUMMARY AND CONCLUSION

11.0 INTRODUCTION

This EIA report was prepared in compliance with ToR obtained vide Lr.No:SEIAA-TN/F.No.9653/ToR-1458/2023 dated 15.05.2023 by considering 2 proposed and 1 existing and 2 expired quarries in a cluster with the total extent of 11.46.5 hectares in Kuppam Village, Pugalur Taluk, Karur District and Tamil Nadu State. Cluster area was calculated as per MoEF & CC Notification S.O. 2269(E) Dated 1st July 2016. Baseline Monitoring studies were carried out during the period of October through December 2022.

11.1 PROJECT DESCRIPTION

The proposed project deals with excavation of rough stone and gravel which is primarily used in construction projects. The method adopted for rough stone and gravel excavation is an open cast manual mining method involving drilling, blasting and formation of benches with 5 m height and 5 m width and secondary blasting. The proposed project area is located between latitudes from 10°59'23.69"N to 10°59'30.32"N and from longitudes from 77°57'51.60"E to 77°57'59.63"E in Kuppam Village, Pugalur Taluk, and Karur District. The project site is a Patta land with the extent of 11.46.5 owned by the project proponent. The proponent had applied for quarry lease on 10.12.2019 to extract rough stone and gravel and obtained the precise area communication letter issued by Department of Geology and Mining, Karur vide Rc.No.743/Mines/2019, dated:15.09.2022. Based on the precise area communication letter, mining plan was prepared. The mining plan thus prepared was approved by Deputy Director of Geology and Mining, Karur Rc.No.743/Mines/2019, dated:16.11.2022.

According to the approved mining plan, about 106213 m³ of rough stone and about 8136 m³ of gravel will be mined up to the depth of 35 m BGL in the first five years. To achieve the estimated production, 4 jack hammers, 2 compressor, 1 excavator with bucket/rock breaker, and 5 tippers will be deployed. To operate the machineries and to break the rough stone to preferred dimension, about 14 persons will be employed. At the end of the quarry life, the dimension of the ultimate pit will be 142 m*41 m*35 m and about 1.60.0 ha of land would have been quarried; the progressive quarry closure plan of the proposed project shows present and future land use statistics. According to the land use results, as shown in Table 2.7, about 1.08.0 ha of land is unutilized. Whereas, at the end of the mine life, about 1.60.0 ha of land will have been quarried; about 0.08.0 ha of land will be used for green belt development; about

1.08.0 ha of land will be left unutilized; The final mine closure plan shows that about Rs. 7,73,500 with the annual recurring cost of Rs. 68,250 will be spent towards mine closure.

11.2 DESCRIPTION OF THE ENVIRONMENT

The baseline monitoring studies were carried out during October through December, 2022 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

From the land use/land cover analysis, it is known that the majority of the land in the study area is crop land covering 90.68% of the total land area, followed by plantations (3.02%), dense forest (0.92%), fallow land (2.45%) and settlement (0.07%). The total mining area within the study area is 219.58 ha (2.83%) among other LULC types. The Extend of the quarry is 2.21.5 ha contributes only 0.0285 % to the study area. This small percentage of mining activities shall not have any significant impact on the environment.

11.2.2 Soil Characteristics

Eight soil samples were obtained from the study area and sent to laboratory for analysing physical and chemical characteristics of soil.

Physical Characteristics

The soil samples in the study area show loamy textures varying between sandy loam, to silty clay loam. pH of the soil varies from 6.5 to 7.7 indicating slightly acidic to slightly alkaline nature. Electrical conductivity of the soil varies from 161 to 338 $\mu\text{s}/\text{cm}$. Bulk density ranges between 1.4 and 9.2 g/cm^3 and organic matter ranges between to 4.2 %.

Chemical Characteristics

Calcium ranges between 301 and 513 mg/kg. Magnesium ranges between 110 and 180 mg/kg. Sulphate ranges between 0.15 and 0.73 %. Potassium ranges between 0.12 and 0.16 %. Organic matter content ranges between 0.25 and 4.2 % and Iron ranges between 7845 and 37397 mg/kg.

11.2.3 Water Environment

Surface Water Resources

There are no surface water bodies present within the study area. Hence, data on surface water bodies are not collected for this project.

Ground Water Resources

Dug wells and bore wells are the most common ground water abstraction structures in the area. Seven groundwater samples were collected from open wells and bore wells 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 October, 2022 varied from 18.62 to 34.38⁰C with the average of 26.028⁰C; in November, 2022 from 16.68 to 30.03⁰C with the average of 24.25⁰C; and in December, 2022 from 17.48 to 29.51⁰C with the average of 23.71⁰C. In October, 2022, relative humidity ranged from 40.38 to 100 % with the average of 79.30%; in November, 2022, from 58.94 to 100 % with the average of 87.46 %; and in December, 2022, from 54.44 to 100 % with the average of 85.99 %. The wind speed in October, 2022 varied from 0.09 to 6.44 m/s with the average of 2.44 m/s; in November, 2022 from 0.12 to 7.75 m/s with the average of 2.60 m/s; and in December, 2022 from 0.18 to 7.93 m/s with the average of 2.75 m/s. In October, 2022, wind direction varied from 1.74 to 355.73⁰ with the average of 188.79⁰; in November, 2022, from 0.46 to 359.70⁰ with the average of 125.28⁰; and in December, 2022, from 0.21 to 358.75⁰ with the average of 106.05⁰. In October, 2022, surface pressure varied from 97.86 to 98.92 kPa with the average of 98.43 kPa; in November, 2022, from 97.53 to 99.03 kPa with the average of 98.54 kPa; and in December, 2022, from 97.89 to 99.43 kPa with the average of 98.60 kPa.

Ambient Air Quality Results

As per the monitoring data, PM_{2.5} ranges from 17.9 µg/m³ to 23.0 µg/m³; PM₁₀ from 37.1 µg/m³ to 42.3 µg/m³; SO₂ from 6.8 µg/m³ to 10.1 µg/m³; NO_x from 14.8 µg/m³ to 21.2 µg/m³. The concentration levels of the pollutants fall within the acceptable limits of NAAQS prescribed by CPCB

11.4 NOISE ENVIRONMENT

Noise levels in core zone was 41.4 dB (A) Leq. during day time and 31.8 dB (A) Leq. during night time and that noise levels in buffer zone varied from 36.2 to 43.8 dB (A) Leq. during day time and from 30.1 to 40.1 dB (A) Leq. during night time. 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

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

	<ul style="list-style-type: none"> ❖ Construction of garland ❖ Construction of garland drains all around the quarry pit and construction of settling traps at strategic location in lower elevations to prevent soil erosion due to surface runoff during rainfall and also to collect the storm water for various uses within the proposed area
Water Environment	
<ul style="list-style-type: none"> ❖ Decrease in aquifer recharge and increase in surface runoff; ❖ Disturbance to land drainage, overload and erosion of watercourses; ❖ Changes to the surface over which water flows; ❖ Changes to surface and groundwater resources quantity and quality due to stream blockage and contamination by particulate matter or waste; ❖ Contamination of aquifers due to removal of the natural filter medium. 	<ul style="list-style-type: none"> ❖ Construction of garland drains all around the quarry pit and construction of settling traps at strategic location in lower elevations to prevent soil erosion due to surface runoff during rainfall and also to collect the storm water for various uses within the proposed area ❖ De-silting will be carried out before and immediately after the monsoon season and the settling tank and drains will be cleaned weekly, especially during monsoons ❖ Domestic sewage from site office & urinals/latrines provided in project area will be discharged through septic tank followed by soak pit system. ❖ Tippers & HEMM will be washed in a designated area and the washed water will be routed through drains to a settling tank, which has an oil & grease trap, only clear water will be reused for greenbelt development.
Air Environment	
<ul style="list-style-type: none"> ❖ Generation of Fugitive Dust ❖ Dust will be generated mainly during excavation, loading & unloading activities. 	<ul style="list-style-type: none"> ❖ Haul roads will be well maintained by sprinkling water twice a day ❖ The access road will be cleaned and brushed to ensure that mud and dust deposits do not accumulate.

<ul style="list-style-type: none"> ❖ Gaseous pollutants will be generated mostly by the traffic. ❖ Reduction in visibility due to dust plumes. ❖ Coating of surfaces leading to annoyance and loss of amenity. ❖ Physical and/or chemical contamination and corrosion. ❖ Increase in the concentration of suspended particles in runoff water. ❖ Coating of vegetation leading to reduced photosynthesis, ❖ Inhibited growth, destroying of foliage, degradation of crops; ❖ Increase in health hazards due to inhalation of dust. 	<ul style="list-style-type: none"> ❖ To ensure that dust and debris is minimised on the access road, all the tipper drivers will be instructed to use water spray system on all the tyres and spray water on the loaded material that is provided at the compound area before leaving the site ❖ Speed restrictions will be imposed to avoid spillage of loaded materials upon the road and to reduce wear and tear of the road. ❖ Weekly inspections of the condition of the access road by competent person employed, and immediate action will be taken to address any potholes or damage to the road surface. ❖ Dust wetting agents can be mixed with the water applied to haul roads during hot, dry weather conditions to increase the duration that the road surface remains damp. ❖ Personal Protective Equipment's will be provided to all workers ❖ All drilling rods used will have dust suppression systems fitted which injects water into the hole. ❖ Wet gunny bags will be used as a cover while drilling. ❖ The blast zone will be kept damp by the application of water from the rain gun fitted to the water tanker prior to each blast to control any fugitive dust emissions that could arise from the surface during detonation. ❖ 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
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	<p>abnormal emissions from the quarry operations.</p> <ul style="list-style-type: none"> ❖ A site speed limit of 20 km/h will be set to minimise the potential for dust generation ❖ Weekly maintenance programme to identify machinery due for maintenance, based on the number of hours it has been in operation. ❖ Air filters are renewed after every 10⁰ hours of use, unless otherwise indicated by an on-board computer system. ❖ All site machineries & tippers will be serviced and maintained 6 months once and drivers will report any defects immediately to the site manager to enable repairs to be carried out promptly.
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Noise & Vibration

<ul style="list-style-type: none"> ❖ Annoyance and deterioration of the quality of life; ❖ Propelling of rocks fragments by blasting. ❖ Shaking of buildings and people due to blasting; 	<ul style="list-style-type: none"> ❖ Usage of sharp drill bits while drilling which will help in reducing noise; ❖ Secondary blasting will be totally avoided and hydraulic rock breaker will be used for breaking boulders; ❖ Controlled blasting with proper spacing, burden, stemming and optimum charge/delay will be maintained; ❖ The blasting will be carried out during favourable atmospheric condition and less human activity timings by using nonelectrical initiation system; ❖ Proper maintenance, oiling and greasing of machines will be done every week to reduce generation of noise;
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	<ul style="list-style-type: none"> ❖ Provision of sound insulated chambers for the workers working on machines (HEMM) producing higher levels of noise; ❖ Silencers / mufflers will be installed in all machineries; ❖ Green Belt/Plantation will be developed around the project area and along the haul roads. The plantation minimizes propagation of noise; ❖ Personal Protective Equipment (PPE) like ear muffs/ear plugs will be provided to the operators of HEMM and persons working near HEMM and their use will be ensured through training and awareness.
Biological Environment	
<ul style="list-style-type: none"> ❖ Direct impacts include land clearance and excavation causing destruction of flora and fauna and loss of habitats; ❖ Indirect impacts include habitat degradation due to noise, dust, and human activity. 	<ul style="list-style-type: none"> ❖ Only some common herbs, shrubs and grass will be cleared. So, there will be no impact on the biodiversity. ❖ Green belt development with suitable species will enhance the biodiversity of the project area. ❖ The core zone or buffer zone does not encompass any threatened flora or fauna species.
Socio-Economic Environment	
<ul style="list-style-type: none"> ❖ Health and safety of workers and the general public; ❖ Increase in traffic volumes and sizes of road vehicles; ❖ Economic issues, including the increase in employment opportunities; 	<ul style="list-style-type: none"> ❖ The mining activity puts negligible change in the socio-economic profile. ❖ Around 88 local workers will get employment opportunities along with periodical training to generate local skills. ❖ New patterns of indirect employment/ income will generate. ❖ Regular health check-up camp.

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

11.8 ANALYSIS OF ALTERNATIVES

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

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

- ❖ Availability of skilled, semi-skilled and unskilled workers in this region.
- ❖ All the basic amenities such as medical, firefighting, education, transportation, communication and infrastructural facilities are accessible.
- ❖ Mine connectivity through road and rail is good.
- ❖ The proposed mining operations do not intersect the ground water level. Hence, no impact on ground water environment.

11.9 ENVIRONMENTAL MONITORING PROGRAM

Environmental Monitoring program will be conducted for various environmental components such as air quality, meteorology, water quality, water level monitoring, soil quality, noise level, vibration, and greenbelt as per conditions stipulated in Environmental Clearance Letter issued by SEIAA & Consent to Operate issued by TNPCB. For this environmental monitoring program, Rs **2,95,000** /- per annum will spent by the project proponent. The monitored data on air quality, water quality, noise levels and other environmental attributes will be periodically examined by the cluster mine management coordinator and Respective Head of Organization and submitted to Tamil Nadu State Pollution Control Board in the Compliance to CTO Conditions & environmental audit statements every year to MoEF & CC and Half-Yearly Compliance Monitoring Reports to MoEF & CC Regional Office and SEIAA.

11.10 ADDITIONAL STUDIES

Risk Analysis & Disaster Management Plan

The methodology for the risk assessment has been based on the specific risk assessment guidance issued by the Directorate General of Mine Safety (DGMS), Dhanbad vide Circular No.13 of 2002, dated 31st December, and 2002. The DGMS risk assessment process is intended to identify existing and probable hazards in the work environment and all operations and assess the risk levels of those hazards in order to prioritize those that need immediate attention. Further, mechanisms responsible for these hazards are identified and their control measures set to time table are recorded along with pinpointed responsibilities.

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

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

Cumulative Impact Studies

- The results on the cumulative impact of the two proposed projects on air environment of the cluster do not exceed the permissible limits set by CPCB for air pollutants.
- The cumulative results of noise for the habitation in consideration do not exceed the limit set by CPCB for residential areas for day time.
- PPV resulting from two proposed and one existing projects is well below the permissible limit of Peak Particle Velocity of 8 mm/s.
- The two proposed projects will allocate Rs.10,00,000/- towards CER as recommended by SEAC.
- The two proposed projects will directly provide jobs to about 31 local people.
- The two proposed projects will plant about 3073 saplings in and around the lease area.
- The two proposed projects will add 132 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 13 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 Kuppam 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. **2699506** as capital cost and recurring cost as Rs. **1455746** as recurring cost/annum is proposed considering present market price considering present market scenario for the proposed project. After the adjustment of 5% inflation per year, the total recurring cost over 5 years is Rs. **8121268** and the overall EMP cost for 5 years will be Rs. **10820773**.

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

Address of the consultancy:

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

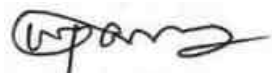
The accredited experts and associated members who were engaged in this EIA study are given below:

S.No.	Name of the expert	In house/ Empanelled	Sector	Functional Area	Category
Approved Functional Area Experts & EC					
1.	Dr. S. Karuppannan	EIA Coordinator (EC) In-house	1(a)(i)	Mining	B
2.	Dr. M. Vijayprabhu	In-house FAE	1(a)(i)	HG, LU, GEO	B
3.	Dr. J. Rajarajeswari	In-house, FAE	1(a)(i)	EB, SC	B
4.	Dr. G. Prabakaran	In-house, FAE	1(a)(i)	SE	B
5.	Dr. R. Arunbalaji	In-house, FAE	1(a)(i)	AP, AQ, NV	B
6.	J.N. Manikandan	Empanelled FAE	1(a)(i)	RH, SHW, AP	B
7.	Dr. S. Malar	In-house, FAE	1(a)(i)	WP	B
8.	G. Umamaheswaran	In-house, FAE	1(a)(i)	HG, LU, GEO	B
9.	S. Gopalakrishnan	In-house, FAE	1(a)(i)	HG, GEO	B
10.	P. Venkatesh	In-house, FAE	1(a)(i)	AP	B
11.	Dr. D.Kalaimurugan	In-house, FAE	1(a)(i)	SC	B
Approved Functional Area Associates					
12.	G. Prithiviraj	FAA	1(a)(i)	LU, HG	B
13.	C. Kumaresan	FAA	1(a)(i)	NV	B
14.	P. Vellaiyan	FAA	1(a)(i)	HG, GEO	B
15.	S. Vasugi	FAA	1(a)(i)	AQ	B
16.	P. Dhatchayini	FAA	1(a)(i)	AQ	B
17.	V. Malavika	FAA	1(a)(i)	NV, SHW	B

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

DECLARATION BY EXPERTS CONTRIBUTING TO THE EIA & EMP

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

Signature : 

Date :

Name : **Dr. S. Karuppannan**



Designation : EIA Coordinator




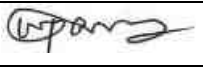






Name of the EIA Consultant Organization : Geo Technical Mining Solutions


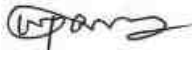





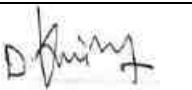

Period of Involvement : Till date

We, the FAEs and FAAs hereby declare that information furnished in this EIA/EMP report for Mr. P. Devaraj rough stone and gravel quarry project with the extent of 2.27.5 ha situated in the cluster with the extent of 11.46.5 ha in Kuppam Village of Pugalur Taluk, Karur District of Tamil Nadu is true and correct to the best of our knowledge.







List of Functional Area Experts Engaged in this Project

S. No.	Functional Area	Involvement	Name of the Experts	Signature
1	AP	○ Identification of different sources of air pollution due to the proposed mine activity	J.N. Manikandan	
		○ Prediction of air pollution and propose mitigation measures / control measures	P.Venkatesh	

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

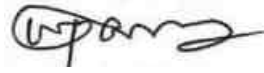
7	RH	<ul style="list-style-type: none"> ○ Identification of hazards and hazardous substances ○ Risks and consequences analysis ○ Vulnerability assessment ○ Preparation of Emergency Preparedness Plan ○ Management plan for safety. 	J.N. Manikandan	
8	LU	<ul style="list-style-type: none"> ○ Construction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

List of Functional Area Associate Engaged in this Project

S.No.	Name	Functional Area	Involvement	Signature
1	G. Prithiviraj	LU, HG	<ul style="list-style-type: none"> ○ Site visit with FAE ○ Provide inputs & Assisting FAE for LU and HG 	
2	C. Kumaresan	NV	<ul style="list-style-type: none"> ○ Assistance to FAE in both primary and secondary data collection ○ Assistance in noise prediction modelling 	
3	P. Vellaiyan	HG & GEO	<ul style="list-style-type: none"> ○ Field visits along with FAE ○ Assistance to FAE in both primary and secondary data collection 	
4	S.Vasugi	AQ	<ul style="list-style-type: none"> ○ Field visits along with FAE ○ Assistance to FAE in both primary and secondary data collection 	
5	P. Dhatchayini	AQ	<ul style="list-style-type: none"> ○ Site visit with FAE ○ Assistance to FAE in collection of both primary and secondary data 	
6	V. Malavika	NV, SHW	<ul style="list-style-type: none"> ○ Site visit along with FAE ○ Assistance in report preparation 	

DECLARATION BY THE HEAD OF THE ACCREDITED CONSULTANT ORGANIZATION

I, **Dr. S. KARUPPANNAN**, Managing Partner, **Geo Technical Mining Solutions**, hereby, confirm that the above-mentioned functional area experts and team members prepared the EIA/EMP report for Mr. P. Devaraj rough stone and gravel quarry project with the extent of 2.27.5 ha located within the cluster of 11.46.5 ha in Kuppam Village of Pugalur Taluk, Karur District of Tamil Nadu is true and correct to the best of my knowledge.

Signature : 

Date :

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

3rd Floor, PanagalMaaligai,

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.9653/ToR-1458/2023 Dated:15.05.2023.

To

Thiru. P.Devaraj,
S/o. Pichaimuthu,
Pullaiyampalayam,
Punnamchatram Post,
Pugalur Taluk,
Karur District – 639 136.

Sir / Madam,

Sub: SEIAA, Tamil Nadu – Terms of Reference with public Hearing (ToR) for the Proposed Rough Stone and gravel quarry lease over an extent 2.27.5 Ha at S.F.No.104/1, 104/2A (Part), 104/2BI (Part), 105/1A (Part) & 105/2 of Kuppam Village, Pugalur Taluk, Karur district, Tamil Nadu by Thiru.P.Devaraj - 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/407980/2022 dated 12.12.2022.
 2. Your application submitted for Terms of Reference dated: 20.12.2022.
 3. Minutes of the 347th SEAC meeting held on 13.01.2023
 4. Minutes of the 592nd SEIAA meeting held on 16.02.2023.
 5. Minutes of the 370th SEAC meeting held on 25.04.2023.


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6. Minutes of the 617th SEIAA meeting held on 15.05.2023.

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

The proponent, Thiru.P.Devaraj has submitted application for Terms of Reference (ToR) on 20.12.2022. in Form-I, Pre- Feasibility report for the Proposed Rough Stone and gravel quarry lease over an extent 2.27.5 Ha at S.F.No.104/1, 104/2A (Part), 104/2B1 (Part), 105/1A (Part) & 105/2 of Kuppam Village, Pugalur Taluk, Karur district, Tamil Nadu.

Discussion by SEAC and the Remarks:-

The proposal was placed in this 370th meeting of SEAC held on 25.04.2023. The details of the project are available in the website (parivesh.nic.in).

The SEAC noted the following:

1. The project proponent, **Thiru.P.Devaraj** has applied for Terms of Reference for the proposed Rough stone & gravel quarry lease over an extent of 2.27.5 Ha at S.F.No.104/1, 104/2A (Part), 104/2B1 (Part), 105/1A (Part) & 105/2 of Kuppam Village, Pugalur Taluk, Karur district, Tamil Nadu.
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. Earlier, EC was accorded to the proponent vide Lr.no.SEIAA-TN/F.No.944/EC/1(a)/252/2013 dated.23.04.2013 for the quantity of 76975 cu.m of rough stone and 19880 cu.m of gravel.
4. Now the proponent has submitted an application for Terms of Reference for a quantity of 1,06,213 cu.m of rough stone and 8136 cu.m of gravel.
5. Earlier, the proposal was placed for appraisal in the 347th meeting of SEAC held on 13.01.2023. Based on the presentation and details furnished by the project proponent, the Committee decided to obtain the following details from the project proponent to consider the proposal for appraisal:
 - i) 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.
 - ii) The proponent shall also furnish details/photographs of the garland drains provided.

The proponent submitted the details to SEIAA-TN on 02.02.2023. In this regard, the proposal is again


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SEIAA-TN

placed in this 370th SEAC meeting.

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

1. The proponent 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.
2. The proponent is requested to carry out a survey and enumerate on the structures located within the radius of (i) 50 m, (ii) 100 m, (iii) 200 m and (iv) 300 m (v) 500m shall be enumerated with details such as dwelling houses with number of occupants, whether it belongs to the owner (or) not, places of worship, industries, factories, sheds, etc with indicating the owner of the building, nature of construction, age of the building, number of residents, their profession and income, etc.
3. The PP shall submit a detailed hydrological report indicating the impact of proposed quarrying operations on the waterbodies like lake, water tanks, etc are located within 1 km of the proposed quarry.
4. The Proponent shall carry out Bio diversity study through reputed Institution and the same shall be included in EIA Report.
5. **In the case of proposed lease in an existing (or old) quarry where the benches are not formed (or) partially formed as per the approved Mining Plan, the Project Proponent (PP) shall prepare and submit a conceptual 'Action Plan' for carrying out the realignment of the benches in the proposed quarry lease after it is approved by the concerned Asst. Director of Geology and Mining during the time of appraisal for obtaining the EC.**
6. During the EIA appraisal, the PP shall furnish the Mining Plan approved by the Competent Authority stating that the heavy blasting operation in the proposed quarry is not carried out and only hand-breaking operation is adopted for the extraction of dimension blocks using non-explosive techniques in the proposed quarrying-operation.

7. 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.
8. 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.
9. 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).
10. The PP shall carry out Drone video survey covering the cluster, Green belt, fencing etc.,
11. The PP shall furnish the revised manpower including the statutory & competent persons as required under the provisions of the MMR 1961 for the prosed quarry based on the volume of rock handled & area of excavation.
12. 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.
13. The Project Proponent shall provide the Organization chart indicating the appointment of various statutory officials and other competent persons to be appointed as per the provisions of Mines Act 1952 and the MMR, 1961 for carrying out the quarrying operations scientifically and systematically in order to ensure safety and to protect the environment.




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SEIAA-TN

14. The Project Proponent shall conduct the hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) along with the collected water level data for both monsoon and non-monsoon seasons from the PWD / TWAD so as to assess the impacts on the wells due to mining activity. 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.
15. 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.
16. 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.
17. Rain water harvesting management with recharging details along with water balance (both monsoon & non-monsoon) be submitted.
18. 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.
19. Details of the land for storage of Overburden/Waste Dumps (or) Rejects outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be provided.
20. 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.
21. Description of water conservation measures proposed to be adopted in the Project should be


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- given. Details of rainwater harvesting proposed in the Project, if any, should be provided.
22. Impact on local transport infrastructure due to the Project should be indicated.
 23. 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.
 24. A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific.
 25. 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.
 26. The Public hearing advertisement shall be published in one major National daily and one most circulated vernacular daily.
 27. The PP shall produce/display the EIA report, Executive summary and other related information with respect to public hearing in Tamil Language also.
 28. 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.
 29. 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.
 30. 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
 31. 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.

32. 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.
33. 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.
34. 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.
35. 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.
36. Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.
37. 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.
38. 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.
39. The PP shall prepare the EMP for the entire life/lease of mine and also furnish the sworn affidavit stating to abide the EMP for the entire life of mine.
40. 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	விலவம்
2	<i>Azadirachta indica</i>	Marqadi	மருகாடி ஆனந்தத்தேர்மணி
3	<i>Albizia lebbek</i>	Vaagai	வாகை
4	<i>Albizia amara</i>	Usil	உசில்
5	<i>Bauhinia purpurea</i>	Maytharai	மந்தாரை
6	<i>Bauhinia racemosa</i>	Aathu	ஆத்து
7	<i>Bauhinia tomentosa</i>	Iruvathi	இருவாத்தி
8	<i>Buchanania axillaris</i>	Kattunna	காட்டுமர
9	<i>Borassus flabellifer</i>	Parai	பரிளை
10	<i>Butea monosperma</i>	Murukkamaram	முருக்கமரம்
11	<i>Bobax cobi</i>	Ilava, Sevvilavu	இலவு
12	<i>Calophyllum inophyllum</i>	Punnai	புள்ளை
13	<i>Cassia fistula</i>	Sarakondrai	சரக்கொண்டை
14	<i>Cassia roxburghii</i>	Sengondrai	செங்கொண்டை
15	<i>Citroxylon sweetena</i>	Puramaram	புரம்மரம்
16	<i>Cochlospermum religiosum</i>	Kongu, Mayallavu	கோங்கு, மஞ்சள இலவு
17	<i>Cordia dichotoma</i>	Narvudi	நருவூதி
18	<i>Croton adansonii</i>	Mavalungum	மாவலங்கம்
19	<i>Dillenia indica</i>	Uva, Usha	உசா
20	<i>Dillenia pentagyna</i>	Sirulva, Siruzha	சிறு உசா
21	<i>Diospyros seboum</i>	Karungali	கருங்காலை
22	<i>Diospyros schloroxylon</i>	Vagana	வாகனை
23	<i>Ficus amplissima</i>	Kallitchi	கல் இச்சி
24	<i>Hibiscus tiliaceus</i>	Aatrupoovarasu	ஆற்றுப்பலகை
25	<i>Hardwickia binata</i>	Aacha	ஆச்சா
26	<i>Holoptelia integrifolia</i>	Aavili	ஆயா மரம் ஆயில்
27	<i>Laurus coromandelica</i>	Odham	ஓதம்மரம்
28	<i>Lagerstroemia speciosa</i>	Poo Marudhu	பூ மருது
29	<i>Leprosanthus tetraphylla</i>	Neikottaimaram	நெய் கொட்டை மரம்
30	<i>Limonia acidissima</i>	Vilamaram	வில்லா மரம்
31	<i>Litsea glutinosa</i>	Pirampattai	பிரம்பா பிச்சம்பலகை
32	<i>Madhuca longifolia</i>	Illuppa	இலுப்பை
33	<i>Mantilka hexandra</i>	UlakkaPaalai	உலக்கை பாலை
34	<i>Mimusops elenei</i>	Magizhamaram	மகிழ்மரம்
35	<i>Mitragyna parvifolia</i>	Kadambu	கடம்பு
36	<i>Morinda pubescens</i>	Nuna	நுணா
37	<i>Morinda citrifolia</i>	Vellai Nuna	வெள்ளை நுணா
38	<i>Phoenix sylvestris</i>	Eachi	ஏச்சம்மரம்
39	<i>Pongamia pinnat</i>	Pungani	பங்குமரம்



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40	<i>Premna mollissima</i>	Mirunai	முனை
41	<i>Premna serratifolia</i>	Naranurthai	நறு முனை
42	<i>Premna tomentosa</i>	Malupoovarasu	மலை பூவரசு
43	<i>Prosopis cinerata</i>	Varu maram	வள்ளி மரம்
44	<i>Pterocarpus marsupium</i>	Vengai	வேங்கை
45	<i>Pterospermum canescens</i>	Veruangu, Tada	வேண்ணாங்கு
46	<i>Pterospermum xylocarpum</i>	Polavu	புலவு
47	<i>Pithecolobium roxburghii</i>	Kanpala	கன்பலா
48	<i>Salvidora persica</i>	Ugan Maram	உகா மரம்
49	<i>Sapindus emarginatus</i>	Marupungan Soapuka	மாறு பூக்கள் சோப்புகா
50	<i>Sesce asoca</i>	Asoca	அசோகா
51	<i>Streblus asper</i>	Piray maram	பிராய மரம்
52	<i>Strychnos nuxvomica</i>	Yethi	யேதி
53	<i>Strychnos potatorum</i>	Therthang Kotta	தேத்தாங் கோட்டை
54	<i>Syzygium cumini</i>	Naval	நாவல்
55	<i>Terminalia belleric</i>	Thandri	தாந்திரி
56	<i>Terminalia arjuna</i>	Ven marudhu	வேணி மருது
57	<i>Terminalia alata</i>	Sandhana vembu	சந்தா வேம்பு
58	<i>Thecopsis populina</i>	Puvarasu	பூவரசு
59	<i>Walsuratrifoliata</i>	valsura	வால்சூரா
60	<i>Wrightia tinctoria</i>	Veppalu	வேப்பலா
61	<i>Pithecolobium dulce</i>	Kodukkapuli	கோடுக்காபுளி

Discussion by SEIAA and the Remarks:-

The subject was placed in the 617th authority meeting held on 15.05.2023. The authority noted that the subject was appraised in the 370th SEAC meeting held on 25.04.2023. After detailed discussions, the Authority accepts the recommendation of SEAC and decided 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 following conditions and the conditions mentioned in 'Annexure B' of this minutes.

- The proponent shall take appropriate measures to comply all the non-compliance conditions mentioned in the Certified Compliance Report dated.28.12.2022 obtained from IRO of MoEF&CC for the FC issued earlier dated.23.04.2013.


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Annexure 'B'**Cluster Management Committee**

1. Cluster Management Committee shall be framed which must include all the proponents in the cluster as members including the existing as well as proposed quarry.
2. The members must coordinate among themselves for the effective implementation of EMP as committed including Green Belt Development, Water sprinkling, tree plantation, blasting etc.,
3. The List of members of the committee formed shall be submitted to AD/Mines before the execution of mining lease and the same shall be updated every year to the AD/Mines.
4. Detailed Operational Plan must be submitted which must include the blasting frequency with respect to the nearby quarry situated in the cluster, the usage of haul roads by the individual quarry in the form of route map and network.
5. The committee shall deliberate on risk management plan pertaining to the cluster in a holistic manner especially during natural calamities like intense rain and the mitigation measures considering the inundation of the cluster and evacuation plan.
6. The Cluster Management Committee shall form Environmental Policy to practice sustainable mining in a scientific and systematic manner in accordance with the law. The role played by the committee in implementing the environmental policy devised shall be given in detail.
7. The committee shall furnish action plan regarding the restoration strategy with respect to the individual quarry falling under the cluster in a holistic manner.
8. The committee shall furnish the Emergency Management plan within the cluster.
9. The committee shall deliberate on the health of the workers/staff involved in the mining as well as the health of the public.
10. The committee shall furnish an action plan to achieve sustainable development goals with reference to water, sanitation & safety.
11. The committee shall furnish the fire safety and evacuation plan in the case of fire accidents.

Impact study of mining

12. Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area covering the entire mine lease period as per precise area communication order issued from reputed research institutions on the following
 - a) Soil health & soil biological, physical land/chemical features.
 - b) Climate change leading to Droughts, Floods etc.

- c) Pollution leading to release of Greenhouse gases (GHG), rise in Temperature, & Livelihood of the local people.
- d) Possibilities of water contamination and impact on aquatic ecosystem health.
- e) Agriculture, Forestry & Traditional practices.
- f) Hydrothermal/Geothermal effect due to destruction in the Environment.
- g) Bio-geochemical processes and its foot prints including environmental stress.
- h) Sediment geochemistry in the surface streams.

Agriculture & Agro-Biodiversity

- 13. Impact on surrounding agricultural fields around the proposed mining Area.
- 14. Impact on soil flora & vegetation around the project site.
- 15. Details of type of vegetations including no. of trees & shrubs within the proposed mining area and, if so, transplantation of such vegetations all along the boundary of the proposed mining area shall committed mentioned in EMP.
- 16. The Environmental Impact Assessment should study the biodiversity, the natural ecosystem, the soil micro flora, fauna and soil seed banks and suggest measures to maintain the natural Ecosystem.
- 17. Action should specifically suggest for sustainable management of the area and restoration of ecosystem for flow of goods and services.
- 18. The project proponent shall study and furnish the impact of project on plantations in adjoining patta lands, Horticulture, Agriculture and livestock.

Forests

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


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Water Environment

Hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) so as to assess the impacts on the nearby waterbodies due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided, covering the entire mine lease period.

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

Energy

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

Climate Change

31. 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.
32. The Environmental Impact Assessment should study impact on climate change, temperature rise, pollution and above soil & below soil carbon stock.

Mine Closure Plan

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

EMP

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

Risk Assessment

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

Disaster Management Plan

37. To furnish disaster management plan and disaster mitigation measures in regard to all aspects to avoid/reduce vulnerability to hazards & to cope with disaster/untoward accidents in & around the proposed mine lease area due to the proposed method of mining activity & its related activities covering the entire mine lease period as per precise area communication order issued.

Others

38. 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.
39. 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.
40. The project proponent shall study and furnish the possible pollution due to plastic and microplastic on the environment. The ecological risks and impacts of plastic & microplastics on aquatic environment and fresh water systems due to activities, contemplated during mining may be investigated and reported.

A. STANDARD TERMS OF REFERENCE

- 1) Year-wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had


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been any increase in production after the EIA Notification 1994 came into force, w.r.t. the highest production achieved prior to 1994.

- 2) A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given.
- 3) All documents including approved mine plan, EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee.
- 4) All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery/topo sheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).
- 5) Information should be provided in Survey of India Topo sheet in 1:50,000 scale indicating geological map of the area, geomorphology of land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics.
- 6) Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority.
- 7) It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating process/procedures to bring into focus any infringement/deviation/ violation of the environmental or forest norms/ conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large, may also be detailed in the EIA Report.
- 8) Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided.
- 9) The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc. should be for the life of the mine / lease

period.

- 10) Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.
- 11) Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given.
- 12) Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.
- 13) Status of forestry clearance for the broken up area and virgin forestland involved in the Project including deposition of Net Present Value (NPV) and Compensatory Afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.
- 14) Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.
- 15) The vegetation in the RF / PF areas in the study area, with necessary details, should be given.
- 16) A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly, detailed mitigative measures required, should be worked out with cost implications and submitted.
- 17) Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves/(existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished.


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- 18) A detailed biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled-I fauna found in the study area, the necessary plan along with budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost.
- 19) Proximity to Areas declared as 'Critically Polluted' or the Project areas likely to come under the 'Aravali Range', (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Department should be secured and furnished to the effect that the proposed mining activities could be considered.
- 20) Similarly, for Coastal Projects, a CRZ map duly authenticated by one of the authorized agencies demarcating LTL, HTL, CRZ area, location of the mine lease with respect to CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority).
- 21) R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need based sample survey, family-wise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be clearly brought out whether the village(s) located in the mine lease area will be shifted or not. The issues relating to shifting of village(s) including their R&R and socio-economic aspects should be discussed in the Report.
- 22) One season (non-monsoon) [i.e. March-May (Summer Season); October-December (post monsoon season) ; December-February (winter season)] primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and


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- EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM10, particularly for free silica, should be given.
- 23) Air quality modeling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of Vehicles for transportation of mineral. The details of the model used and input parameters used for modeling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.
 - 24) The water requirement for the Project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the Project should be indicated.
 - 25) Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.
 - 26) Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.
 - 27) Impact of the Project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided.
 - 28) Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. The Report inter-alia, shall include details of the aquifers present and impact of mining activities on these aquifers. Necessary permission from Central Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished.
 - 29) Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion proposed, if any, and the impact of the same on the hydrology should be brought out.
 - 30) Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and bgl. A schematic diagram may also be provided for the same.


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- 31) A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution.
- 32) Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those outside the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as State Government) should be covered. Project Proponent shall conduct Impact of Transportation study as per Indian Road Congress Guidelines.
- 33) Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.
- 34) Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report.
- 35) Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.
- 36) Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.
- 37) Measures of socio economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.
- 38) Detailed Environmental Management Plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land,

- if any, occupational health impacts besides other impacts specific to the proposed Project.
- 39) Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project.
 - 40) Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.
 - 41) The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.
 - 42) A Disaster management Plan shall be prepared and included in the EIA/EMP Report.
 - 43) Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.
 - 44) Besides the above, the below mentioned general points are also to be followed:-
 - a) Executive Summary of the EIA/EMP Report
 - b) All documents to be properly referenced with index and continuous page numbering.
 - c) Where data are presented in the Report especially in Tables, the period in which the data were collected and the sources should be indicated.
 - d) Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF&CC/NABL accredited laboratories. All the original analysis/testing reports should be available during appraisal of the Project.
 - e) Where the documents provided are in a language other than English, an English translation should be provided.
 - f) The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted.
 - g) While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF&CC vide O.M. No. J-11013/41/2006-IA.II(I) dated 4th August, 2009, which are available on the website of this Ministry, should be followed.
 - h) Changes, if any made in the basic scope and project parameters (as submitted in Form-I and the PFR for securing the TOR) should be brought to the attention of MoEF&CC with reasons for such changes and permission should be sought, as the ToR may also have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH


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SEIAA-TN

again with the revised documentation.

- i) As per the circular no. J-11011/618/2010-IA,II(I) dated 30.5.2012, certified report of the status of compliance of the conditions stipulated in the Environment Clearance for the existing operations of the project, should be obtained from the Regional Office of Ministry of Environment, Forest and Climate Change, as may be applicable.
- j) The EIA report should also include (i) surface plan of the area indicating contours of main topographic features, drainage and mining area, (ii) geological maps and sections and (iii) sections of the mine pit and external dumps, if any, clearly showing the land features of the adjoining area.

In addition to the above, the following shall be furnished:-

The Executive summary of the EIA/EMP report in about 8-10 pages should be prepared incorporating the information on following points:

1. Project name and location (Village, District, State, Industrial Estate (if applicable)).
2. Process description in brief, specifically indicating the gaseous emission, liquid effluent and solid and hazardous wastes.
3. Measures for mitigating the impact on the environment and mode of discharge or disposal.
4. Capital cost of the project, estimated time of completion.
5. The proponent shall furnish the contour map of the water table detailing the number of wells located around the site and impacts on the wells due to mining activity.
6. A detailed study of the lithology of the mining lease area shall be furnished.
7. Details of village map, "A" register and FMB sketch shall be furnished.
8. Detailed mining closure plan for the proposed project approved by the Geology of Mining department shall be submitted along with EIA report.
9. Obtain a letter /certificate from the Assistant Director of Geology and Mining standing that there is no other Minerals/resources like sand in the quarrying area within the approved depth of mining and below depth of mining and the same shall be furnished in the EIA report.
10. EIA report should strictly follow the Environmental Impact Assessment Guidance Manual for Mining of Minerals published February 2010.
11. Detail plan on rehabilitation and reclamation carried out for the stabilization and restoration of the mined areas.
12. The EIA study report shall include the surrounding mining activity, if any.


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13. Modeling study for Air, Water and noise shall be carried out in this field and incremental increase in the above study shall be substantiated with mitigation measures.
14. A study on the geological resources available shall be carried out and reported.
15. A specific study on agriculture & livelihood shall be carried out and reported.
16. Impact of soil erosion, soil physical chemical and biological property changes may be assumed.
17. Site selected for the project - Nature of land - Agricultural (single/double crop), barren, Govt./ private land, status of its acquisition, nearby (in 2-3 km.) water body, population, within 10km other industries, forest, eco-sensitive zones, accessibility, (note - in case of industrial estate this information may not be necessary)
18. Baseline environmental data - air quality, surface and ground water quality, soil characteristic, flora and fauna, socio-economic condition of the nearby population
19. Identification of hazards in handling, processing and storage of hazardous material and safety system provided to mitigate the risk.
20. Likely impact of the project on air, water, land, flora-fauna and nearby population
21. Emergency preparedness plan in case of natural or in plant emergencies
22. Issues raised during public hearing (if applicable) and response given
23. CER plan with proposed expenditure.
24. Occupational Health Measures
25. Post project monitoring plan
26. The project proponent shall carry out detailed hydro geological study through intuitions/NABET Accredited agencies.
27. A detailed report on the green belt development already undertaken is to be furnished and also submit the proposal for green belt activities.
28. The proponent shall propose the suitable control measure to control the fugitive emissions during the operations of the mines.
29. A specific study should include impact on flora & fauna, disturbance to migratory pattern of animals.
30. Reserve funds should be earmarked for proper closure plan.
31. A detailed plan on plastic waste management shall be furnished. Further, the proponent should strictly comply with, Tamil Nadu Government Order (Ms) No.84 Environment and forests (EC.2) Department dated 25.06.2018 regarding ban on one time use and throw away plastics


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irrespective of thickness with effect from 01.01.2019 under Environment (Protection) Act, 1986. In this connection, the project proponent has to furnish the action plan.

Besides the above, the below mentioned general points should also be followed:-

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

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. Monitoring Cell, IA Division, Ministry of Environment, Forests & CC, Paryavaran Bhavan, CGO Complex, New Delhi 110003
5. The District Collector, Karur, District.
6. Stock File.

From
Dr.P.Jayapal, M.Sc., Ph.D.,
Deputy Director,
Geology and Mining,
Karur.

To
Thiru.P.Devaraj,
S/o.Pitchaimuthu,
Pullaiyampalayam,
Punnamchatram Post,
Pugalur Taluk,
Karur District.

Rc.No.743/Mines/2019, Dated:05.12.2022

Sir,

Sub: Mines and Minerals – Minor Mineral – Karur District – Pugalur Taluk – Kuppam Village - S.F.Nos.104/1 (0.62.50 hect.), 104/2A(Part) 0.09.00 hect.), 104/2B1(Part) 0.27.0 hect., 105/1A(Part) 0.50.50 hect., and 105/2 (0.78.50 hect., Over an extant 2.27.50 hectares - Quarry lease application for Rough Stone and Gravel – Preferred by Thiru.P.Devaraj – Mining Plan approved - requested for the details of Existing/ proposed/ abandoned quarries situated within 500 mts radial distance - furnished – Regarding.

- Ref:
1. Quarry lease application for Rough stone and Gravel preferred by Thiru.P.Devaraj, S/o.Pitchaimuthu, Pullaiyampalayam, Punnamchatram Post, Pugalur Taluk, Karur District dated: 10.12.2019
 2. Precise Area Communication Notice Rc.No.743/Mines/2019, Dated: 15.09.2022
 3. Mining Plan submitted by Thiru.P.Devaraj letter Dated: 29.09.2022
 4. The Deputy Director, Geology and Mining, Karur letter Rc.No.743/Mines/2019, Dated:16.11.2022
 5. Thiru.P.Devaraj, letter dated:16.11.2022

In the reference 1st cited, Thiru.P.Devaraj have applied quarry lease for quarrying Rough stone and Gravel in S.F.Nos.104/1 (0.62.50 hect.), 104/2A(Part) 0.09.00 hect., 104/2B1(Part) 0.27.0 hect., 105/1A(Part) 0.50.50 hect., and 105/2 0.78.50 hect., Over an extant 2.27.50 hectares of patta lands in Kuppam Village, Pugalur Taluk, Karur District. The Deputy Director of Geology and Mining, Karur have issued precise area letter to the proposed lease area vide reference 2nd cited.

Accordingly, the applicant has submitted the 3 copies of draft Mining Plan and the same was approved by the Deputy Director, Geology and Mining, Karur vide reference 4th cited.

In the reference 5th cited, the applicant has requested the Deputy Director of Geology and Mining, Karur for the Details of Existing, Proposed and abandoned quarries situated within 500 meter radial distance from subject area and same has been furnished as follows:-

I. Existing Other Quarries: -

Sl No.	Name of the Owner	S.F.No.	Extent (hect)	Lease Period	Remarks.
1.	Thiru.M.Arunachalam, S/o.Maraappan, Kariyam Patty, Punnam Village, Aravakurichi Taluk, Karur District.	104/2B2 , 104/2B3	1.37.5	21.2.2018 to 20.2.2023	

II. Proposed Area: -

Sl No.	Name of the Owner	S.F.No.	Extent (hect)	Lease Period	Remarks
1.	Thiru.P.Devaraj, S/o.Pitchaimuthu, Pullaiyampalayam, Punnamchatram Post, Pugalur Taluk, Karur District	104/1 105/2 105/1A(P) 104/2B1(P) 104/2A(P)	2.27.50		Proposed Area
2.	Thiru.N.Sakthivel, S/o. Nallappagounder, Andipatty, Karudaiyampalayam Post, Kuppam village, Aravakurichi Taluk, Karur District	105/1B(P) 112/1A(P) 112/2A(P)	3.87.00		Applied Area

III. Lease Expired and abandoned Area: -

Sl No.	Name of the Owner	S.F.No.	Total Extent (hect)	Lease Period	Remarks
1.	R.Murugesan S/o.Raman Vadamalai goundanur Athur Karur	108/1	5.82.0	15.5.2006 to 14.5.2011	---
2.	V.K.Subramani, S/o.Karuppanna Gounder, Velliyampalayam, Punnam Chadram, Karur.	99/2(P)	0.63.0	21.10.2010 to 20.10.2015	--

3.	K.Chellappan, Thalaiyeethupatti Kuppam Post, Karur	106/2	2.25.0	8.6.2012 to 7.6.2017	Last permit obtained on 22.06.2015
4.	Tmt.T.Sathiya W/o. Thangaraj New No. 2 Masagoundanpudhur Punjai Pugalur South Village	1287/1 1287/3	1.83.0	31.07.2017 to 30.07.2022	Last permit obtained on 14.07.2022
5.	Thiru.P.Marappan S/o.Palaniyappan Andipatti Kuppam Village Aravkurichi Tlauk Karur District.	74 75/3B Total	2.11.5	14.10.2016 to 13.10.2021	Last permit obtained on 08.10.2021

[Handwritten Signature]
05/12/22

Deputy Director,
Geology and Mining,
Karur.

[Handwritten Signature]
05/12/2022

MINING PLAN

FOR KUPPAM VILLAGE ROUGH STONE AND GRAVEL MINING LEASE WITH
PROGRESSIVE QUARRY CLOSURE PLAN

Patta land/ Open Cast - Manual Mining / Non- Forest/Non-Captive Use- "B2" Category

Lease period 5 Years from the date of lease execution

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

LOCATION OF THE LEASE AREA

STATE : TAMILNADU
DISTRICT : KARUR
TALUK : PUGALUR
VILLAGE : KUPPAM
S.F.NO : 104/1, 104/2A (Part), 104/2B1 (Part),
105/1A (Part) & 105/2
EXTENT : 2.27.5 HECTARES

ADDRESS OF THE APPLICANT (This Mining Plan is approved subject
to the conditions/stipulations

Mr. P. Devaraj

S/o. Mr. Pitchaimuthu,
Pullaiyampalayam,

Punnamchatram Post, Pugalur Taluk, Karur District.

Pin code - 639136

indicated in the Mining Plan approval

Letter No: 743/Mines 2019

Dated: 16/11/2022

PREPARED BY

GEO TECHNICAL MINING SOLUTIONS

NABET/APA-MPPA/IA/017

(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 ,

Website: www.gtmsind.com

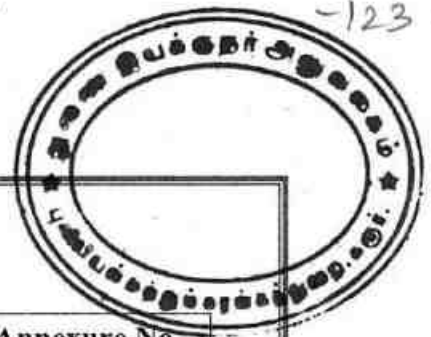


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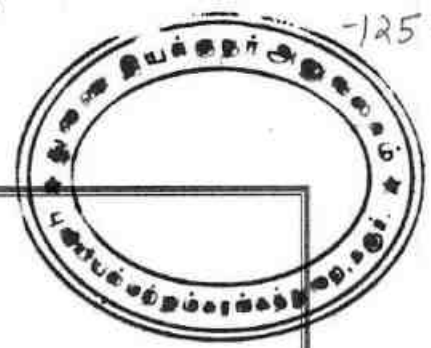
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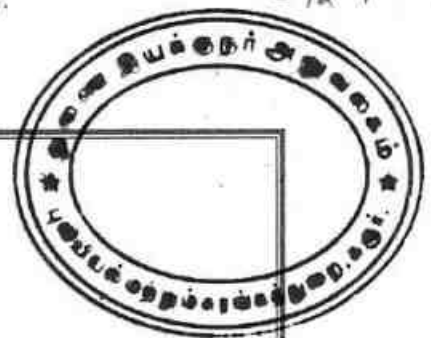
ANNEXURES

S.No	Description	Annexure No.
1.	Copy of Precise area communication letter	I
2.	Copy of Previous lease particulars	II
3.	Copy of FMB (Field Measurement book)	III
4.	Copy of Village map	IV
5.	Copy of "A" register	V
6.	Copy of computer Chitta & Adangal	VI
7.	Copy of Land Consent documents	VII
8.	Photo copy of the proposed lease area	VIII
9.	Copy of ID Proof of the lessee	IX
10.	Copy of Prospecting/ Exploration & Mining Plan Preparing Agency certificate	X



LIST OF PLATES

S. No	Description	Plate No.	Scale
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	Plan: 1:1000
7.	Surface & Geological Plan	III	Plan: 1:1000
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9.	Year wise Development and Production Plan	IV	Plan: 1:1000
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11.	Mine Layout Plan and Land Use Pattern	V	Plan: 1:1000
12.	Conceptual Plan	VI	Plan: 1:1000
13.	Conceptual Sections	VIA	Sections: HOR 1:1000 VER 1:500



Mr.P.Devaraj,
S/o. Mr.Pichaimuthu,
Pullaiyampalayam,
Punnamchatram Post, Pugalur Taluk, Karur District.
Pincode – 639136

CONSENT LETTER FROM THE APPLICANT

The Mining Plan for rough stone and gravel quarry lease over an extent of 2.27.5Hectares in S.F.No's: 104/1, 104/2A (Part), 104/2B1 (Part), 105/1A (Part) & 105/2 of Patta Land Kuppam Village, Pugalur Taluk, Karur District, Tamil Nadu State has been prepared by

Geo Technical Mining Solutions, Certificate No. NABET/APA-MPPA/IA/017

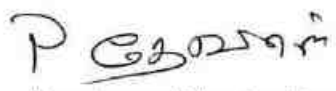
I request "The Deputy Director", Department of Geology and Mining, Karur District to make further correspondence regarding modifications of the Mining Plan with the said Recognized Qualified Person on this following address,

GEO TECHNICAL MINING SOLUTIONS
Certificate No.NABET/APA-MPPA/IA/017
(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,
Website: www.gtmsind.com

I hereby assure that all modifications so made in the Mining Plan by the Recognized Qualified Person may be deemed to made with my knowledge and consent and shall be acceptable and binding on me in all respects.

Place: Karur, TN

Date: 29.09.2022.


Signature of the Applicant
(P. DEVARAJ)



Mr.P.Devaraj,
S/o. Mr.Pichaimuthu,
Pullaiyampalayam,
Punnamchatram Post, Pugalur Taluk, Karur District.
Pincode – 639136

DECLARATION

The Mining Plan of rough stone and Gravel quarry lease over an extent of 2.27.5Hectares in S.F.No's: 104/1, 104/2A (Part), 104/2B1 (Part), 105/1A (Part) & 105/2 of Kuppam Village, Pugalur Taluk, Karur District and Tamil Nadu State have been prepared with my consultation and I have understood the contents and agree to implement the same in accordance with the Mining Laws.

Place: Karur, TN

Date: 29.09.2022

Signature of the Applicant
(P. DEVARAJ)



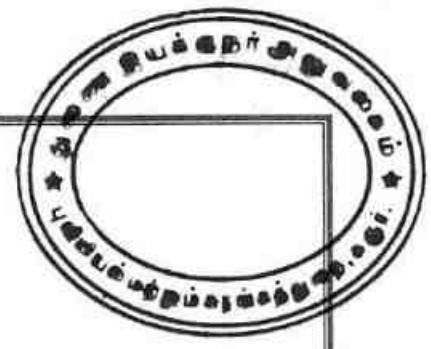
CERTIFICATE

Geo Technical Mining Solutions, Dharmapuri is the NABET accredited **Prospecting/Exploration & Mining Plan Preparation Agency** to prepare mining plan have an office at No: 1/213-B, Ground Floor, Natesan Complex, Oddapatti, Collectorate Post office, Dharmapuri-636705, TamilNadu.

Geo Technical Mining Solutions prepared this Mining plan and progressive Quarry Closure plan in respect of rough stone and gravel quarry lease in S.F.No's: 104/1, 104/2A (Part), 104/2B1 (Part), 105/1A (Part) & 105/2, over an extent of 2.27.5Hect, Patta land of Kuppam Village, Pugalur Taluk, Karur District, Tamil Nadu State. Since the mining plan is prepared as per the provisions contained in Rule 15(1)(a) and (1)(b) of Minerals (Other than Atomic and Hydro Carbons Energy Minerals) Concession Rules, 2016.

Place: Dharmapuri, TN
Date: 25/9/22

Geo Technical Mining Solutions
NABET/APA-MPPA/IA/017
GEO TECHNICAL MINING SOLUTIONS
A NABET Accredited and ISO Certified Company
1/213-B, Ground Floor, Natesan Complex,
Collectorate Post Office, Oddapatti,
Dharmapuri - 636 705, Tamil Nadu, India.
Ph: 04342-232777, 94439 37841



GEO TECHNICAL MINING SOLUTIONS

Certificate No.NABET/APA-MPPA/IA/017

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Oddapatti, Collectorate Post office, Dharmapuri-636705

Ph: +91 9443937841, 7010076633.

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

Website: www.gtmsind.com

CERTIFICATE

This is to certify that the provisions of 19(1), 20 and 33 of Tamil Nadu Minor Minerals Concession Rules, 1959 have been observed in the Mining Plan for the grant of rough stone and gravel quarry lease over an extent of 2.27.5 Hectares of Patta Land in S.F.No's 104/1, 104/2A (Part), 104/2B1 (Part), 105/1A (Part) & 105/2 of Kuppam Village, Pugalur Taluk, Karur District, Tamilnadu State applied to **Mr.P.Devaraj**, Pugalur Taluk, Karur District.

Wherever specific permission / exemptions / relaxations or approvals are required the applicant will approach the concerned authorities of State and Central governments for granting such permissions etc.

Place: Dharmapuri, TN

Date: 28/9/22

Geo Technical Mining Solutions

NABET/APA-MPPA/IA/017

GEO TECHNICAL MINING SOLUTIONS

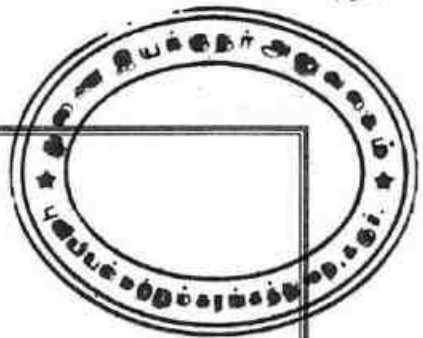
A NABET Accredited and ISO Certified Company

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Ph: +91 9443937841, 7010076633.

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

Website: www.gtmsind.com

CERTIFICATE

I certified that the preparation of Mining Plan for rough stone and gravel quarry lease over an extent of 2.27.5 Hectares of Patta Land in S.F.No's: 104/1, 104/2A (Part), 104/2B1 (Part), 105/1A (Part) & 105/2 of Kuppam Village, Pugalur Taluk, Karur District, Tamil Nadu State prepared to **Mr.P.Devaraj**, Pugalur Taluk, Karur District covers all the provisions of Mines Act, Rules and Regulations etc. made there in and if any specific permission is required the applicant will approach "The Director General of Mines Safety", Chennai. The standards prescribed by DGMS regarding Mines Health will be strictly implemented.

Place: Dharmapuri, TN

Date: 25/9/22

Geo Technical Mining Solutions

NABET/APA-MPPA/IA/017

GEO TECHNICAL MINING SOLUTIONS

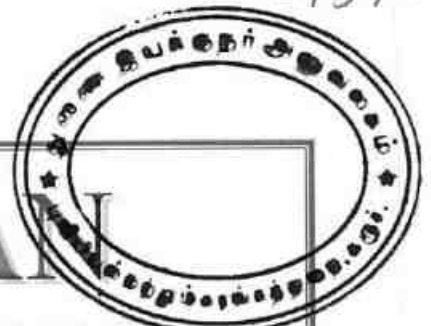
A NABET Accredited and ISO Certified Company

1/213-B, Ground Floor, Natesan Complex,

Collectorate Post Office, Oddapatti,

Dharmapuri - 636 705, Tamil Nadu, India.

Ph: 94342-232777, 94439 37841



MINING PLAN

FOR KUPPAM VILLAGE ROUGH STONE AND GRAVEL MINING LEASE WITH PROGRESSIVE QUARRY CLOSURE PLAN

Patta land/Open Cast-Manual Mining/Non- Forest/Non-Captive Use- "B2' Category
Lease period 5 Years from the date of lease execution

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

INTRODUCTORY NOTES:

- 1) **Introduction:** The applicant **Mr.P.Devaraj** S/o. Mr.Pichaimuthu have residing at Pullaiyampalayam, Punnamchatram Post, Pugalur Taluk, Karur District, Tamil Nadu State. The applicant was submit application on 10.12.2019 for request to the Deputy Director, Department of Geology and Mining, Karur, renewed to be continued quarrying operation for rough stone and gravel at S.F.No's. 104/1, 105/2, 105/1A(P), 104/2B1(P) & 104/2A(P) over an extent of 2.27.5 Hectares of Kuppam Village, Pugalur Taluk, Karur District, Tamil Nadu State further the period of 5 years.

- 2) **Precise area communication letter particulars:** The Deputy Director, Department of Geology and Mining, Karur has directed to the applicant **Mr.P.Devaraj** through his precise area communication letter Rc.No.743/Mines/2019 Dated 15.09.2022, 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.141 (E) dated 15th January, 2016, 1st July 2016 & S.O.3977 (E), dated 14th August 2018 and MoEF & CC office memorandum vide letter no.L-11011/175/2018- IA-II (M) dated: 12th December, 2018. Accordingly, the mining plan prepared for a grant of quarrying of rough stone and gravel quarry lease at Tamil Nadu State, Karur District, Pugalur Taluk, Kuppam Village in S.F.No's: 104/1, 104/2A (Part), 104/2B1 (Part), 105/1A (Part) & 105/2, over an area of 2.27.5 hectares and should be submitted draft mining plan for approval for the period of 90 days the following conditions for a period of five (5) years under Rule 19 (1), 20 & 33 of Tamil Nadu Minor Mineral Concession Rules, 1959.

This Mining Plan is approved subject to the conditions/stipulations indicated in the Mining Plan approval Letter No: 742/Mines/2019 Dated: 16/11/2022

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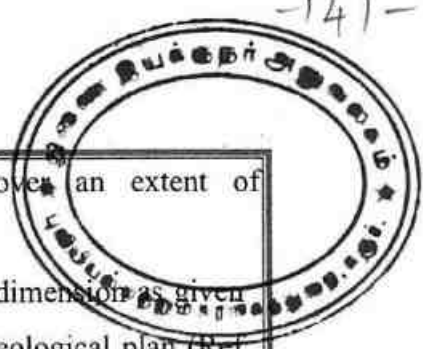
- i. In north side there is a farmhouse at a distance of 80m from the applied lease area they given consent letter to be quarrying. So should not give clearance to the farm house owners.
- ii. A safety distance should be left out nearby the applied area 7.5m and 10m of Patta and Poramboke lands as respectively while quarrying activities.
- iii. Quarrying operation to be carried out with controlled blasting techniques viz, hand-hack-Hammer, Driller for drilling shot holes and use mild explosives substance for blasting the rocks.
- iv. To ensure the safety of quarry workers as per Metalliferous Mines Acts should formed wide, safe benches. Inside the quarry in safe manner vehicles come and go, do the quarry work ensuring the safety of the quarry workers.
- v. To provide quarrying lease by the Deputy Director, Karur, approved mining plan, obtain Environmental Clearance from the competent authority of State Level Environment Impact Assessment Authority-Tamil Nadu (SEIAA) and should be submitted.

3) **The Previous lease particulars:** The proposed lease area was previously granted to quarrying of rough stone in favor of **Mr.P.Devaraj**, S/o. Pichaimuthu by the District Collector, Karur proceedings vide Rc.D.53/2006, dated 11.04.2006 in S.F.No. 104/2A, 104/1, 105/1A & 105/2 Karur District, Aravakurichi Taluk, Kuppam Village, over an extent of 2.14.5hectares. The lease was executed on 12.05.2006 to 11.05.2011 for a period of 5 years.

The **1st renewed application** of the same applicant for the lease application and granted vide letter Rc.No.238/Mines/2011, dated 19.06.2013 in S.F.No. 104/2A, 104/1, 105/1A & 105/2, over an extent of 2.14.5Hectares. The applicant got Environmental Clearance from SEIAA-TN vide Lr.no.SEIAA-TN/F.No.944/EC/1(a)/252/2013 dated 23.04.2013. The lease was executed 19.06.2013 to 18.06.2018 for a period of 5 years.

Now, **2nd Renewal application** for new proposals has submitted to the Deputy Director, Department of Geology and Mining (DDG & M), Karur dated 10.12.2019 and the Deputy Director, recommended to his precise area communication letter Roc.No. 743/Mines/2019, dated 15.09.2022 for period of five years recommended to favor of Mr.P.Devaraj, Karur for quarrying lease rough stone and gravel at Tamil Nadu State, Karur District, Pugalur Taluk, Kuppam Village in S.F.No: 104/1,

P. G. Gopinath

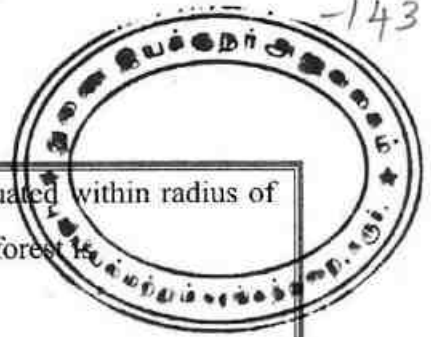


104/2A (Part), 104/2B1 (Part), 105/1A (Part) & 105/2, over an extent of 2.27.5hectares

There is an existing pit was noticed with an average pit dimension as given under the table and the existing pit marked in the surface and geological plan (Ref Plate No's: III).

Pit levels	Length(m)	Width(m)	Depth(m)
1	58	46	1
2	90	14	5
3	127	71	15

- 4) **Preparation and Submission of Mining Plan:** The Mining Plan with progressive quarry mine closure has been prepared under rule 41 (1) (i) and submission under rule 41, 42 of Tamil Nadu Minor Mineral Concession Rules, 1959 for a mining lease as per conditions mentioned in the precise area communication letter **Rc.No.743/ Mines/2019, dated 15.09.2022.**
- 5) **Geological resources and Mineable Reserves:** Geological resource of rough stone is estimated as **586025m³** and gravel is **15550m³**. Mineable reserves of rough stone are estimated about **106213m³** and gravel is **8136m³** as respectively up to depth of 35m below ground level (0-2m gravel + 3-35m rough stone) (R.L.175-140m) (Refer Plate No's.VI & VIA) after leaving necessary safety distance from the lease boundary.
- 6) **Proposed Production Schedule:** Total proposed production of rough stone is about **106213m³** and gravel is **8136m³**. Gravel is available in 0 to 2m thickness. The next layer in the lease area is covered by roughstone present upto indefinite depth. This mining plan is allowed upto a depth of 35m below ground level (R.L.175-140m) (Refer Plate No's. IV & IVA) for the 5 years plan period. Average production shall be **21243m³** of rough stone per year and gravel is **8136m³** per year.
- 7) **Environmental Sensitivity of the proposed lease area: -**
 - i). **Interstate boundary:** There is no interstate boundary around 10Km radius periphery of proposed lease area.
 - ii). **Wildlife Protection Act, 1972:** There is no wild life sanctuary within radius of 10Km from the project site area under the Wildlife (Protection) Act, 1972.



iii). **Indian Reserve Forest Act, 1980:** No reserved forest situated within radius of 1Km periphery of the proposed site. The Nearest reserve forest is

- 1.Thathampalayam R.F -6.68km - Southeast
- 2.Vangal R.F -17.83km – Northeast
- 3. Kattalai R.F – 22.91km - East

iv). **CRZ Notification, 1991:** There is no Sea coastal zone found within radius of 10km and this project site doesn't attract CRZ Notification, 1991.

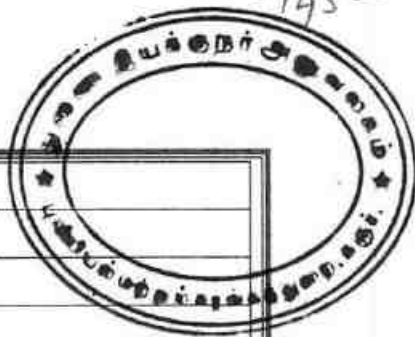
8) **Environmental measures to be adopted shall be during the ongoing activity period,**

- i) Usage of sharp drill bits while drilling which will help in reducing noise.
- ii) Green Belt/Plantation will be developed around the project area and along the haul roads. The plantation minimizes propagation of noise.
- iii) Water will be sprinkled on haul roads twice a day to avoid dust generation during transportation.
- iv) Transportation of material will be carried out during day time and material will be covered with tarpaulin.
- v) The speed of tippers plying on the haul road will be limited below 20 km/hr to avoid generation of dust.
- vi) And any other conditions as stipulated by the concerned authorities should be followed to protect the environment.

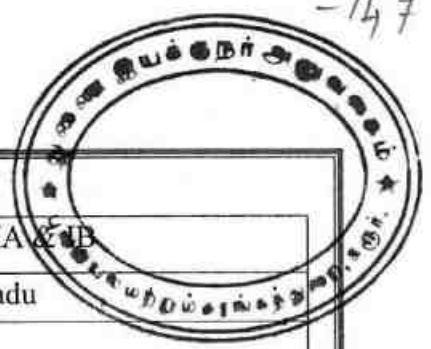
1.0 **GENERAL:**

a.	Name of the Applicant	:	Mr.P.Devaraj
	Applicant address	:	S/o. Pichaimuthu, Pullaiyampalayam, Punnamchatram Post, Pugalur Taluk,
	District	:	Karur
	State	:	Tamil Nadu
	Pin code	:	639136
	Phone	:	+91 7010209046
	Fax	:	Nil
	Gram	:	Nil
	Telex	:	Nil
	E-mail	:	.....
b.	Status of the Applicant		
	Private individual	:	Private Individual

P. G. Srinivasan

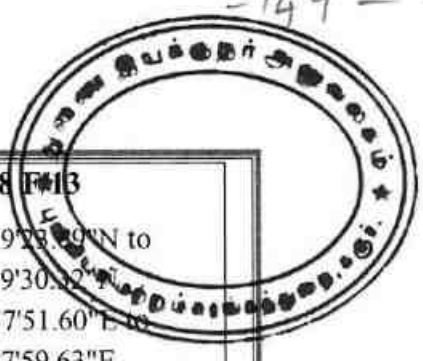


	Cooperative Association	:	---
	Private company	:	---
	Public Company	:	---
	Public Sector Undertaking	:	---
	Joint Sector Undertaking	:	---
	Other (pl. specify)	:	---
c.	Mineral(s) Which are occurring in the area and which the applicant intends to mine	:	Rough Stone and Gravel
d.	Period for which the mining lease granted /renewed/ proposed to be applied	:	The precise area has been communicated to the applicant for quarrying period of five years.
e.	Name of the NABET accredited company preparing the Mining Plan	:	Geo Technical Mining Solutions GSR 286(E) No:272, Ministry of Mines Notification 7th April 2022.
	Address	:	Geo Technical Mining Solutions (A NABET Accredited & ISO certified Company) No: 1/213-B, Ground Floor, Natesan Complex, Oddapatti, Collectorate Post office, Dharmapuri-636705 Web site: www.gtmsind.com
	Phone	:	+91 9443937841, 7010076633
	Fax	:	Nil
	e-mail	:	info.gtmsdpi@gmail.com
	Telex	:	Nil
	Certificate Number	:	NABET/APA-MPPA/IA/017
	Date of grant/renewal	:	28.03.2022
	Valid upto	:	27.03.2025
	f.	Name of the prospecting agency	:	Geo Technical Mining Solutions GSR 286(E) No:272, Ministry of Mines Notification 7th April 2022.
Address		:	No: 1/213-B, Ground Floor, Natesan Complex, Oddapatti, Collectorate Post office, Dharmapuri-636705
Phone		:	+91 9443937841, 7010076633
g.	Reference No. and date of consent letter from the state government	:	The Precise area communication letter was received from the Deputy Director, Department of Geology and Mining, District Collectorate, Karur Vide Rc.No.743/Mines/2019 dated 15.09.2022.



2.0 LOCATION AND ACCESSIBILITY:

a.	Details of the Area:	:	Refer plate no: IA & IB
	District & State	:	Karur, Tamil Nadu
	Taluk	:	Pugalur
	Village	:	Kuppam
	Khasra No./ Plot No./ Block Range/ Felling Series etc.	:	104/1, 104/2A (Part), 104/2B1 (Part), 105/1A (Part) & 105/2
	Lease area (hectares)	:	2.27.5 Hect
	Whether the area is recorded to be in forest (please specify whether protected, reserved, etc)	:	No, forest is involved. This is recorded as patta land.
	Ownership / Occupancy	:	This is a patta land S.F.No. 104/2A, 105/1A is registered on the name of Mr.Devaraj S/o Mr.Pichaimuthu vide Patta No.1390. S.F.No. 104/1, 105/2 & 104/2B1 is registered on the name of Mrs.Saraswathi W/o. Mr.Devaraj vide Patta No.311 & 956. (Ref. Annex.no:V). Hence, the applicant has got consent from the pattadhar. (Ref. Annex. No:VI)
	Existence of Public Road / Railway line if any nearby and approximate distance	:	<ul style="list-style-type: none"> ✓ Exploited materials shall be transported through the village road on the northern side of the lease area. ✓ The SH-84 road is situated about 2.63km away from the northern side which is connecting Karur - Kodumudi Road ✓ The NH-81 road is situated about 3.61km away from the Southern side which is connecting Karur-Vellakoil Road. ✓ The Nearest Railway line is situated about 7.19km away from northern side.



Toposheet No. with latitude and longitude : SOI Toposheet No. 58 FMB
 Latitude : From 10°59'28.09"N to 10°59'30.32"N
 Longitude: From 77°57'51.60"E to 77°57'59.63"E

Geo-Coordinates of the lease boundary:

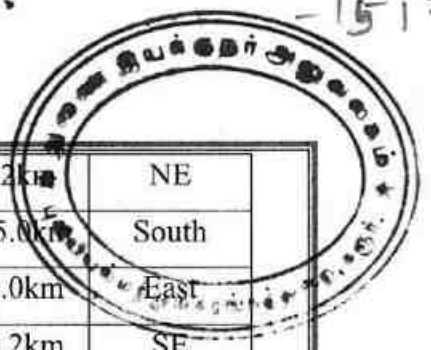
PILLAR ID	LATITUDE (N)	LONGITUDE (E)
1	10°59'30.32"N	77°57'59.54"N
2	10°59'28.82"N	77°57'59.63"E
3	10°59'29.23"N	77°57'56.94"E
4	10°59'23.69"N	77°57'56.59"E
5	10°59'24.01"N	77°57'55.31"E
6	10°59'24.16"N	77°57'53.61"E
7	10°59'28.54"N	77°57'54.12"E
8	10°59'28.76"N	77°57'54.15"E
9	10°59'29.15"N	77°57'51.60"E
10	10°59'30.31"N	77°57'51.76"E
11	10°59'30.32"N	77°57'52.90"E
12	10°59'30.09"N	77°57'55.80"E
13	10°59'30.06"N	77°57'56.94"E

Land use pattern (Forest, Agricultural, Grazing, Barren etc.) : It is an existing and renewed quarry lease.

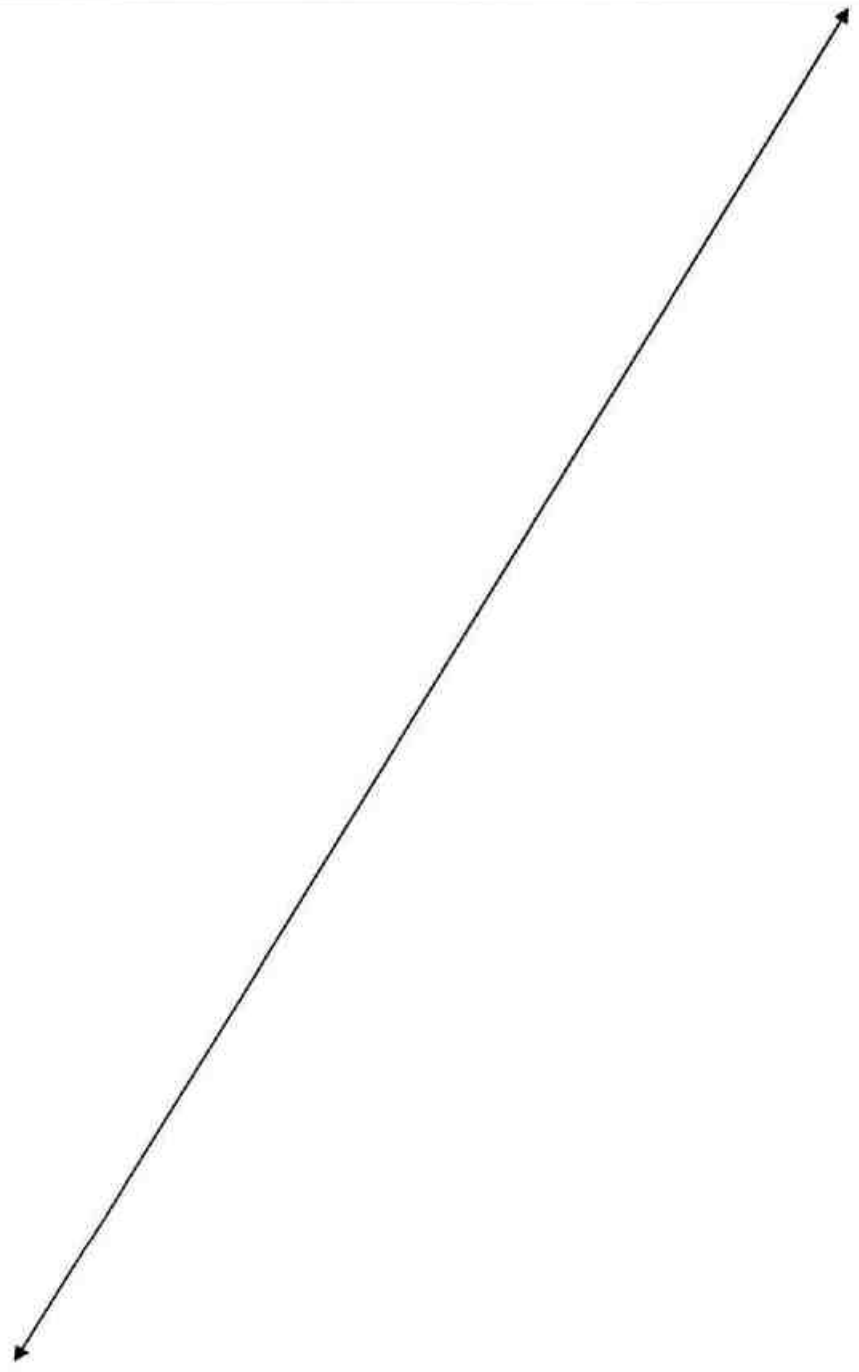
b) *Attach a general location and vicinity map showing area boundaries and existing and proposed access routs. It is preferred that the area to be marked on a survey of India topographical map or a cadastral map or forest map as the case may be. However if none of these are available, the area should be shown on an accurate sketch map on scale of 1 : 5000.* : Refer plate no-IA & IB

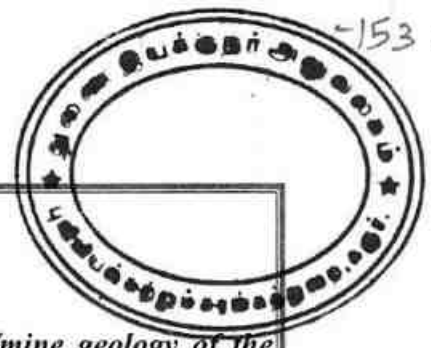
i) INFRASTRUCTURE AND COMMUNICATION:

S.No	Description	Place	Distance	Direction
a.	Nearest post office	Karudaiyampalayam	3.3Km	SW
b.	Nearest police station	K.Paramathy	7.8km	SW
c.	Nearest fire station	Karaipalayam	9.9km	NE
d.	Nearest medical facility	Punnam	2.8Km	East
e.	Nearest school	Punnamchatram	2.9Km	NE



f.	Nearest railway station	Pugalur	7.2km	NE
g.	Nearest port facility	Tuticorin	245.0km	South
h.	Nearest airport	Tiruchirappalli	85.0km	East
i.	Nearest DSP office	Karur	10.2km	SE
j.	Nearest villages	Pullaiyampalayam	1.12m	North
		Pudukkanalli	4.0km	South
		Punam	2.67km	East
		Talaiyuttupatti	1.25km	West





PART – A

3.0 GEOLOGY AND MINERAL RESERVES:

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

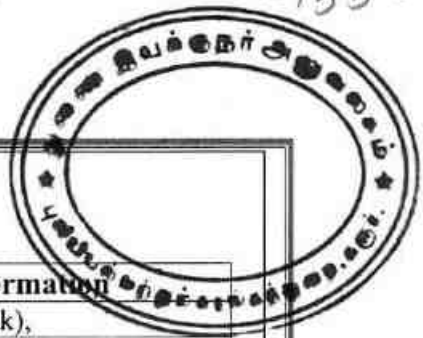
(i)	Topography	: The lease area is exhibits plain topography which is an average altitude of about 175m AMSL. The proposed site shows the relief of 1m; the maximum elevation (176m) was observed in SE side of the site, while the minimum elevation (174m) was observed NW side of the site. The slope is towards NW side and falls in Toposheet no. 58-F/13
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(ii) a) Geology of the District:

The Karur district forms part of the Archean complex of peninsular gneiss. The general rock types of this area are Biotite gneiss. Karur District is blessed with good reserves of crystalline limestone known as “Palayam belt” in Varavanai, Thennilai, Gudalur etc., villages in Kulithalai Taluk and the occurrences of good quality of pegmatite veins constituting with glassy quartz and potash feldspar in lensoid patches in Nagampalli and Pungambadi areas in Aravakurichi Taluk. The major mineral such as limestone, quartz and feldspar are exploited in Karur district and utilized in the mineral-based industries.

The Granite gneiss rocks are found to occur in K.Paramathi, Athur, Thennilai, Punnam, Godanthur South, Munnur, Punnam, Anjur villages in Karur and Aravakurichi Taluk are exploited to produce building materials and road metal (Jelly) and over burden soil appear as gray to reddish in colour called as gravel. The commercially known “Coloumbo Zubrana” the unique type in the Multi coloured granite / Granite gneiss category is occurring in Thogamalai, Naganur and Kazhugur Villages in Kulithalai Taluk. These rock type belong to minor mineral category. The arrangement of alternate layers of felsic and mafic minerals in linear pattern and exhibits wavy pattern in the rock and giving very good structure for the rock type. The well-developed gneissic pattern with linear arrangement, the rock type have attracted the granite market and found to be suitable for the exploitation of granite blocks. But in this area the banded gneissic rock has many fractures and foliation in it. So, this is not viable for dimensional

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stone.

Order of superposition of the proposed lease area,

Age	Group	Rock Formation
Recent to Sub recent	----	Topsoil (1-2m thick),
Proterozoic	Acid intrusive	Pink medium grained granite/ Granite gneiss
Archaean	Charnockite Group	Pyroxene Granulite, Charnockite (acid to intermediate) / Crystalline limestone / Quartzite

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

a) Topography of the proposed lease area:

The lease area is exhibits plain topography which is an average altitude of about 175m AMSL. The proposed site shows the relief of 1m; the maximum elevation (176m) was observed in SE side of the site, while the minimum elevation (174m) was observed NW side of the site. The slope is towards NW side. The applied lease area is existing, with covered gravel and beneath the charnockite rocks found based on existing pit nearby the lease area. Surface plan preparing for contour lines, surface features and Geological mapped the applied lease area.

b) Mode of origin:

The Charnockite series originally was assumed to have developed by the fractional crystallization of silicate magma. Subsequent studies have shown, however, that many, if not all, of the rocks are metamorphic, formed by recrystallization at high pressures and moderately high temperatures.

c) Physiography of the rocks:

General characteristics of the rocks of this series has recorded that the rocks are in general bluish gray or darkish in colour and extremely fresh in appearance with an even grained granular structure.

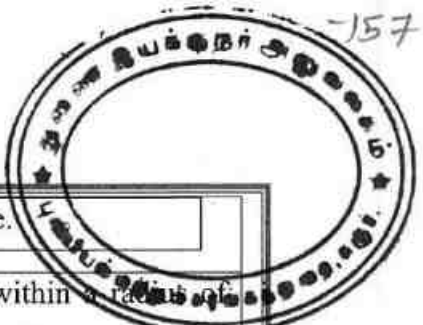
d) Chemical composition of rocks:

The compositional characteristics of coexisting orthopyroxene, garnet and biotite have established several petrographic varieties within the Charnockites-Enderbites such as the granulites and gneisses. Plagioclase feldspars, alkali feldspars and quartz are the salic minerals present in this series of rocks.

Order of superposition of the proposed lease area,

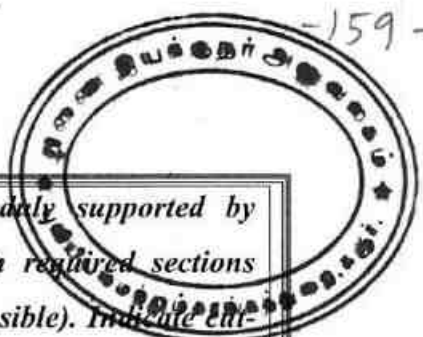
Age	Group	Rock Formation
Recent to Sub recent	----	Red Soil (0-2m thick)

PC 2005



	Archaean	Charnockite Group	Charnockite.																															
(iv)	Drainage Pattern	:	There is no major river located within a radius of 500m radius. The drainage is dendritic in nature.																															
(b)	<i>The topographic plan of the lease area prepared on a scale of 1 :1000 or 1: 2000 with contour interval of 3 to 10m depending upon the topography of the area should be taken as the base plan for preparation of geological plan. The details of exploration already carried out including evidences of mineral existence should be shown on the geological plan:</i>																																	
	a. Present status:	:	There is an existing pit was noticed by NABET team with a pit level-I is L58m X W46m X D1m, pit level-II is L90m X W14m X D5m & pit level-III is L127m X W71m X D15m. The granite genesis rocks are well seen in the existing pit with covered by gravel over the part of lease area.																															
	b. Surface Plan	:	Surface plan is prepared as 1: 1000 Scales with ground level at various places in grid pattern with various lithological considerations of the surface.																															
(c)	Geological sections should be prepared at suitable intervals on a scale of 1: 1000 / 1: 2000:	:	Longitudinal and transverse geological cross sections were prepared at the horizontal scale of 1: 1000 and at the vertical scale of 1:500, as shown in Plate No.III.																															
(d)	<i>Broadly indicate the Year wise future programme of exploration, taking into consideration the future production programme planned in next five years as in table below: -</i>																																	
	<table border="1"> <thead> <tr> <th>Year</th> <th>No.of boreholes</th> <th>Total meterage</th> <th>No.of Pits and Dimensions</th> <th>No.of Trenches and Dimensions</th> </tr> </thead> <tbody> <tr> <td>First</td> <td>N.A</td> <td>---</td> <td>---</td> <td>N.A</td> </tr> <tr> <td>Second</td> <td>N.A</td> <td>---</td> <td>---</td> <td>N.A</td> </tr> <tr> <td>Third</td> <td>N.A</td> <td>---</td> <td>---</td> <td>N.A</td> </tr> <tr> <td>Fourth</td> <td>N.A</td> <td>---</td> <td>---</td> <td>N.A</td> </tr> <tr> <td>Fifth</td> <td>N.A</td> <td>---</td> <td>---</td> <td>N.A</td> </tr> </tbody> </table>				Year	No.of boreholes	Total meterage	No.of Pits and Dimensions	No.of Trenches and Dimensions	First	N.A	---	---	N.A	Second	N.A	---	---	N.A	Third	N.A	---	---	N.A	Fourth	N.A	---	---	N.A	Fifth	N.A	---	---	N.A
Year	No.of boreholes	Total meterage	No.of Pits and Dimensions	No.of Trenches and Dimensions																														
First	N.A	---	---	N.A																														
Second	N.A	---	---	N.A																														
Third	N.A	---	---	N.A																														
Fourth	N.A	---	---	N.A																														
Fifth	N.A	---	---	N.A																														
	No future programmed proposed in this area. Its massive homogeneous parent rock. Hence exploration proposal is not required to this mining project.																																	

P. G. Srinivas

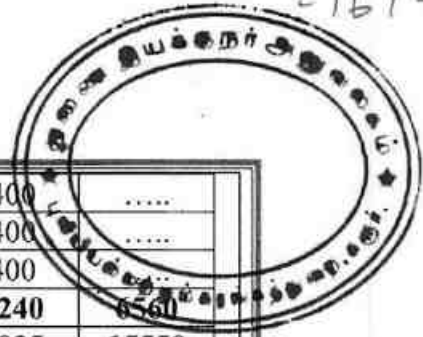


(e) *Indicate geological and recoverable reserves and grade, duly supported by standard method of estimation and calculations along with required sections (giving split up of various categories i.e. proved, probable, possible). Indicate off grade. Availability of resources should also be indicated for the entire leasehold.*

The geological resources were computed by cross section method with respect to the boundaries of the lease area. In this method, the lease area was divided into Three sections (longitudinal and transverse) to calculate the volume of material up to the depth of 35m below ground level. The longitudinal and transverse cross sections were assigned XY-AB, X1Y1-CD & X2Y2-EF as respectively. Using the cross-sectional method, total reserve is estimated to be **601575m³** including the resources of safety zone, and gravel. Of which, rough stone is about **586025m³** and gravel resource of about **15550m³**.

The gravel is obtained about 2m (R.L.175-173m) from the surface and a rough stone starts from 2 to 35m (R.L.173-140m) below ground level. (Refer plate no.III).

GEOLOGICAL RESOURCES							
Sect ion	Ben ch	Length in (m)	Width in (m)	Depth in (m)	Volume In M ³	Rough stone in M ³	Gravel in M ³
XY-AB	I	61	18	2	2196	.....	2196
	I	62	24	3	4464	4464	.....
	II	69	44	5	15180	15180	.....
	III	81	56	5	22680	22680	.....
	IV	188	86	5	80840	80840	.....
	V	188	86	5	80840	80840	.....
	VI	188	86	5	80840	80840	.....
	VII	188	86	5	80840	80840	.....
TOTAL					367880	365684	2196
X1Y1-CD	I	79	43	2	6794	.....	6794
	I	79	43	3	10191	10191	.....
	II	79	43	5	16985	16985	.....
	III	79	43	5	16985	16985	.....
	IV	79	43	5	16985	16985	.....
	V	79	43	5	16985	16985	.....
	VI	79	43	5	16985	16985	.....
	VII	79	43	5	16985	16985	.....
TOTAL					118895	112101	6794
X2Y2-EF	I	80	41	2	6560	.....	6560
	I	80	41	3	9840	9840	.....
	II	80	41	5	16400	16400	.....
	III	80	41	5	16400	16400	.....
	IV	80	41	5	16400	16400	.....



V	80	41	5	16400	16400	.....
VI	80	41	5	16400	16400	.....
VII	80	41	5	16400	16400	.....
TOTAL				114800	108240	8560
GRAND TOTAL				601575	586025	15550

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

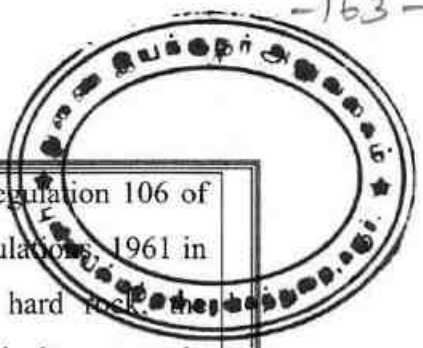
The total mineable reserve is estimated to be **114349m³** by deducting the reserve safety zone, block in benches from the total Geological resources up to a depth of 35m (R.L.175-140m) below ground level. Of which, rough stone is about **106213m³** and gravel is about **8136m³**. The commercially viable rough stone has been prepared on 1: 1000 scale and sections are prepared in a scale of 1:1000 in horizontal axis and 1:500 as vertical axis (Refer plate no. VI).

MINEABLE RESERVES							
Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume In M ³	Rough stone in M ³	Gravel in M ³
XY-AB	I	45	4	2	360	.....	360
	I	47	9	3	1269	1269	.....
	II	49	18	5	4410	4410	.....
	III	46	20	5	4600	4600	.....
	IV	142	41	5	29110	29110	.....
	V	132	31	5	20460	20460	.....
	VI	122	21	5	12810	12810	.....
VII	112	11	5	6160	6160	.....
TOTAL				35	79179	78819	360
XIY1-CD	I	72	28	2	4032	.....	4032
	I	72	28	3	6048	6048	.....
	II	67	18	5	6030	6030	.....
	III	62	8	5	2480	2480	.....
TOTAL				15	18590	14558	4032
XIY1-EF	I	72	26	2	3744	.....	3744
	I	72	26	3	5616	5616	.....
	II	67	16	5	5360	5360	.....
	III	62	6	5	1860	1860	.....
TOTAL				15	16580	12836	3744
GRAND TOTAL					114349	1016213	8136

4.0 MINING:

a.	Briefly describe the existing / proposed method for	:	It is an existing quarry lease. open cast manual methods will be made and on single
----	---	---	---

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P. Gnan



developing / working the deposit with all design parameters.
 (Note: In case of pocket deposits, sequence of development/working may be indicated on the same plan)

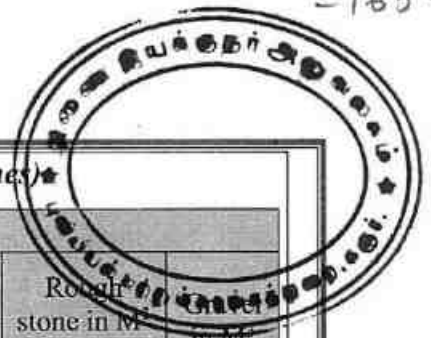
shift basis only. Under the regulation 106 of the Metalliferous Mines Regulations, 1961 in all open cast workings in hard rock benches and sides should be properly benched and sloped. The bench height should not exceed 5m and the bench width should not less than the bench height. The slope of the benches should not exceed 45° from horizontal

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

Total proposed production **114349m³**. Of which, rough stone is **106213m³** and gravel is **8136m³** up to a depth of 35m below the ground level (R.L.175m-140m) for five years plan period. Average production is **21243m³** of rough stone per year and gravel is **8136m³** per year. (Refer Plate No. IV).

Year	Pit No.(s)	Topsoil/Over burden (m ³)	ROM (m ³)	Saleable rough stone (m ³) @ 100%	Rough stone rejects(m ³)	Sub grade/ Weathered rock in (m ³)	Saleable Gravel (m ³)	Rough stone to topsoil ratio
First	I	--	30079	21943	...	...	8136	...
Second	I	---	20500	20500	...	...	...	...
Third	I	--	24340	24340	...	...	...	...
Fourth	I	---	20460	20460	...	...	...	...
Fifth	I	---	18970	18970	...	...	...	...
Total	---	...	114349	106213	...	...	8136	...

c. **Composite plans and Year wise sections (In case of 'A' class mines):** ; Not applicable



Composite plans and Year wise sections (In case of 'B' class mines)

YEARWISE PRODUCTIONS								
Year	Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume In M ³	Rough stone in M ³	m-M
I-YEAR	XY-AB	I	45	4	2	360	.....	360
		I	47	9	3	1269	1269	.....
		II	49	18	5	4410	4410	.....
		III	46	20	5	4600	4600	.....
	X1Y1-CD	I	72	28	2	4032	.....	4032
		I	72	28	3	6048	6048	.....
	X2Y2-EF	I	72	26	2	3744	.....	3744
		I	72	26	3	5616	5616	.....
TOTAL						30079	21943	8136
II-YEAR	XY-AB	I	100	41	5	20500	20500	.....
TOTAL						20500	20500	0
III-YEAR	XY-AB	IV	42	41	5	8610	8610	.....
		II	67	18	5	6030	6030	.....
	X1Y1-CD	III	62	8	5	2480	2480	.....
		II	67	16	5	5360	5360	.....
	X2Y2-EF	III	62	6	5	1860	1860	.....
TOTAL						24340	24340	0
IV-YEAR	XY-AB	V	132	31	5	20460	20460	.....
TOTAL						20460	20460	0
V-YEAR	XY-AB	VI	122	21	5	12810	12810	.....
		VII	112	11	5	6160	6160	.....
TOTAL						18970	18970	0
GRAND TOTAL						114349	106213	8136

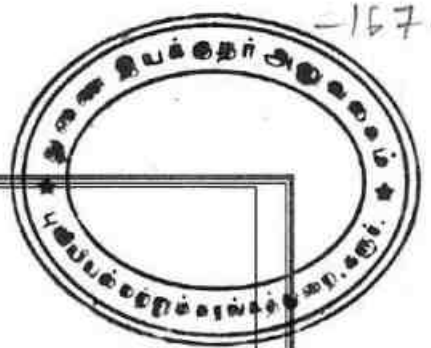
d. Attach supporting composite plan and section showing pit layouts, dumps, stacks of sub-grade mineral, if any, etc. : Composite plan not prepared in this proposed lease area. It is "B₂" category of mine.

e. **Indicate proposed rate of production when the mine is fully developed and the expected life of the mine and the year from which effected:**

At this rate of production, the expected life of quarry is calculated for periods and production details are given as below: -

Rough stone:

- Mineable reserves of rough stone = 106213m³
- Five years production = 106213m³
- Monthly production of rough stone = 1770m³



Gravel:

- Mineable reserves of gravel = 8136m³
- One year production of gravel = 8136m³
- Monthly production of gravel = 678m³

The market is always fluctuating and flexible one. Accordingly, there is a possibility to increase or decrease the production. The year wise production, anticipated life of quarry etc., are only a tentative figure.

f. *Attach a note furnishing a conceptual mining plan for the entire lease period (for "B" category mines) and up to the life of the mine (for "A" category mines) based on the geological, mining and environments considerations:*

i) Time frame of completion of mineral exploration program in leasehold area: Give broad description identified potential areas to be covered in the given time frame: : Considering the indefinite depth persistence of the rough stone deposit is proved beyond the workable limits about up to a depth of 35m below ground level (R.L.175m-140m) from the petrogenetic character of the rock as well as from the actual mining practice in the area and with the current trend of rough stone production the quarry may sustain for 5 years

ii) Whether ultimate pit limit has been determined and demarcated on surface and geological plan:-

The ultimate pit limit has been determined and demarcated in the conceptual mining plan

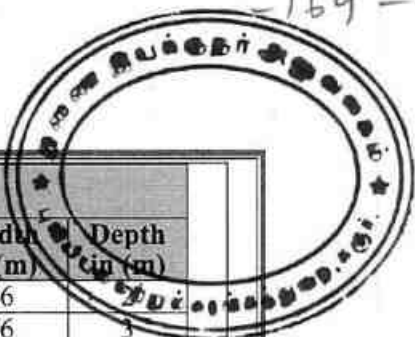
ULTIMATE PIT LIMIT XY-AB

Section	Bench R.L	Overburden/ Mineral	length in (m)	Width in (m)	Depth in (m)
XY-AB	R.L.175-173m	Gravel	45	4	2
	R.L.173-170m	Rough stone	47	9	3
	R.L.170-165m	Rough stone	49	18	5
	R.L.165-160m	Rough stone	46	20	5
	R.L.160-155m	Rough stone	142	41	5
	R.L.155-150m	Rough stone	132	31	5
	R.L.150-145m	Rough stone	122	21	5
	R.L.150-145m	Rough stone	112	11	5
Total depth					35m

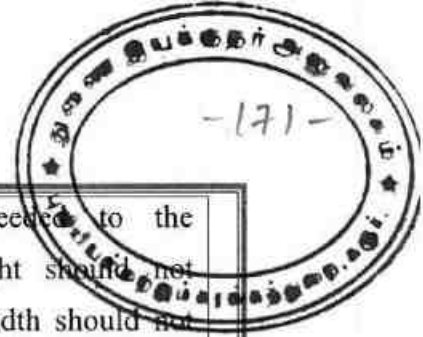
ULTIMATE PIT LIMIT X1Y1-CD

Section	Bench R.L	Overburden/ Mineral	length in (m)	Width in (m)	Depth in (m)
X1Y1-CD	R.L.175-173m	Gravel	72	28	2
	R.L.173-170m	Rough stone	72	28	3
	R.L.170-165m	Rough stone	67	18	5
	R.L.165-160m	Rough stone	62	8	5
Total depth					15m

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ULTIMATE PIT LIMIT X2Y2-EF					
Section	Bench R.L	Overburden/ Mineral	length in (m)	Width in (m)	Depth in (m)
X2Y2-EF	R.L.175-173m	Gravel	72	26	3
	R.L.173-170m	Rough stone	72	26	3
	R.L.170-165m	Rough stone	67	16	5
	R.L.165-160m	Rough stone	62	6	5
Total depth					15m
iii)	Whether the site for disposal of waste rock or an un-saleable material have/ has been examined for adequacy of land and suitability of long term use in the event of continuation of mining activity:-	:	The recovery of rough stone and gravel in this quarry is 100%. There is no waste rock will be proposed in this lease area.		
iv)	Whether back filling of pits after recovery of mineral up to techno-economically feasible depth envisaged. If so, describe the broad features of the proposal:-	:	As the depth of persistence of the deposit may likely to continue for further depth, it is proposed not to backfilled the quarry pit.		
v)	Whether post mining land use envisaged:-	:	At the end of mining activities over the quarry pit may be utilized fish culture or storage of rain water reservoir used for irrigation purposes.		
g.	Open cast Mines:				
	i).Describe briefly giving salient features of the mode of working (Mechanized, Semi-Mechanized, manual)	:	It is an existing quarry lease. No change of mining method and its worked out on single shift basis only. Under the regulation 106 of the Metalliferous Mines Regulations, 1961 in all open cast workings in hard rock, the benches and sides should be properly benched and sloped. The weathered rock will be removed by manual loaded into the trucks and will be dumped on the safety barrier. The rough stone will be loaded manually to the		



		trucks for dispatch to needed to the customers. The bench height should not exceed 5m and the bench width should not less than the bench height. The slope of the benches should not exceed 45° from horizontal.																																			
ii) Describe briefly the layout of mine workings, the layout of faces and sites for disposal of overburden/waste. A reference to the plans enclosed under 4(b) and 4(d) will suffice	:	The rough stone is proposed to quarry at 5m bench height & width conventional opencast semi mechanized quarrying operation using drilling with the help of tractor mounted compressor attached with jack hammers, nonel blasting and waste and are removal using Hydraulic excavator and loaded directly to the tippers. Bench height = 5mts. Bench width = 5mts.																																			
a. Details of Topsoil/ Overburden	:	No separate of topsoil will be removed.																																			
b. Rough Stone waste and side burden waste:-	:	The recovery of rough stone and gravel in this quarry is 100%. There is no waste or side burden shall be removed.																																			
h. Underground Mines:	:	Not applicable																																			
i. Extent of mechanization: Describe briefly including the calculation for adequacy and type of machinery and equipment proposed to be used in different mining operations. (1) Drilling Machines: Quarrying operation will be carried out tractor mounted compressor attached with Jack hammers is proposed to drilling and without any blasting the rocks. Details of drilling equipment's are given below.																																					
<table border="1"> <thead> <tr> <th>Type</th> <th>Nos</th> <th>Dia of hole (mm)</th> <th>Size / Capacity</th> <th>Make</th> <th>Motive power</th> <th>H.P</th> </tr> </thead> <tbody> <tr> <td>Hand-hack-Hammer</td> <td>4</td> <td>32 mm</td> <td>Hand held</td> <td>---</td> <td>Diesel</td> <td>60</td> </tr> <tr> <td>Compressor</td> <td>2</td> <td>---</td> <td>Air</td> <td>--</td> <td>Diesel</td> <td>42</td> </tr> <tr> <td>Shoval</td> <td>10</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> </tr> <tr> <td>Picas</td> <td>10</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> </tr> </tbody> </table>			Type	Nos	Dia of hole (mm)	Size / Capacity	Make	Motive power	H.P	Hand-hack-Hammer	4	32 mm	Hand held	---	Diesel	60	Compressor	2	---	Air	--	Diesel	42	Shoval	10	--	--	--	--	--	Picas	10	--	--	--	--	--
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(2) Loading Equipment:

Gravel will be removed by manual loaded into the trucks and will be dumped on the safety barrier. The rough stone will be loaded manually the trucks for dispatch to needed to the customers.

(3) Haulage and Transport Equipment

(a) Haulage within the mining leasehold:

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

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 quarry.

(b) Transport from mine head to the destination	:	--
c. Describe briefly the transport system (please specify)	:	--
d. Ore transported by : own trucks / hired trucks	:	The excavated stone materials will be supplied to the consumers like stone pillar, sized stone, etc
e. Main destination to which ore is transported (giving to and from distance)	:	The excavated stone materials will be supplied to the consumers like stone pillar, sized stone, etc

f. Details of hauling / transport equipment:

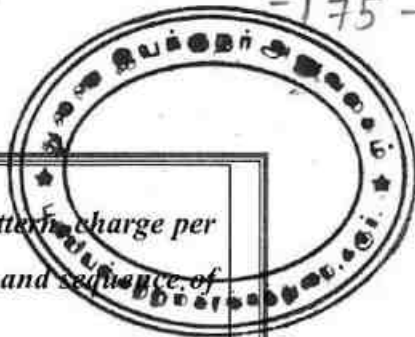
Type	Nos	Size / Capacity	Make	Motive power	H.P.
--	--	--	--	--	--

(4). Miscellaneous:

Describe briefly any allied operations and machineries related to the mining of the deposit not covered earlier.

(A) Operations	:	The mining operation is open-cost, semi-machined methods are adopted and on single shift basis only.
(B) Machineries deployed	:	Machineries like Tractor mounted compressor attached with Jack hammers is proposed to drilling.

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5. **BLASTING :**

a) *Broad blasting parameters like charge per hole, blasting pattern, charge per delay, maximum number of holes blasted in a round, manner and sequence of firing, etc.*

Blasting pattern:

Eco-friendly quarry operation is proposed in this quarry lease area. Tractor mounted compressor attached with Jack hammers is proposed to drilling

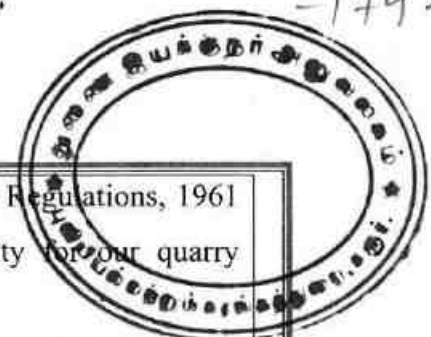
b) Powder factor in ore and overburden / waste / development heading / stope	:	Not applicable
c) Whether secondary blasting is needed, if so describe it briefly	:	Not applicable
d) Storage of explosives (like capacity and type of explosive magazine)	:	1. First Aid Box will be keeping ready at all the time.

6. ***MINE DRAINAGE***

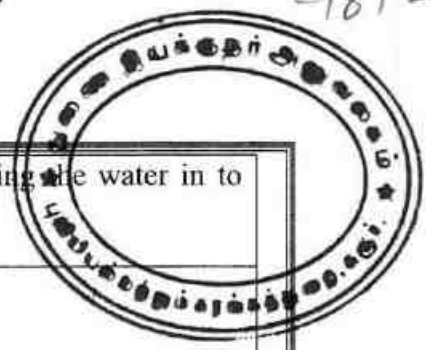
a) Likely depth of water table based on observations from nearby wells and water bodies	:	The ground water table is reported as of 50m in rainy season and 55m in summer from the general ground level in the adjacent bore wells of the area.
b) Workings expected to be _____ m. above / reach below water table by the year _____.	:	Proposed ultimate depth of mining is 35m bgl. Now, the present Mining lease shall be proposed above the water table and hence, quarrying may not affect the ground water.
c) Quantity and quality of water likely to be encountered, the pumping arrangements and places where the mine water is finally proposed to be discharged	:	The ground water may not rise immediately in this type of mining. However, the rain water percolation and collection of water from the seepage will be less than 300 Lpm and it will be pumped out periodically by a stand by diesel powered Centrifugal pump motivated with 7.5 H.P. Motor. The quality of water is potable and doesn't contaminate with any hazardous things.



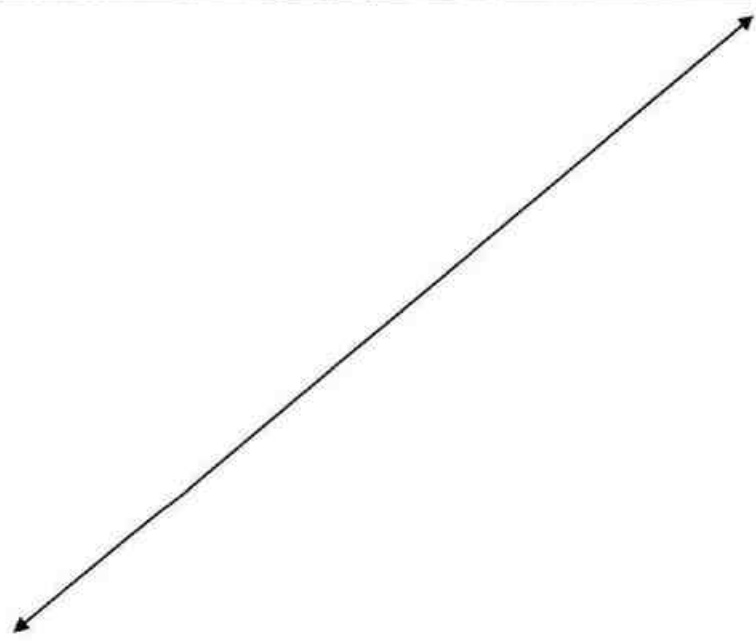
7. STACKING OF MINERAL REJECTS AND DISPOSAL OF WASTE:	
a) Indicate briefly the nature and quantity of top soil, overburden, waste and mineral rejects likely to be generated during the next five years: No separate of topsoil will be removed	
b) Land chosen for disposal of waste with proposed justification	: There is no waste are proposed.
c) Attach a note indicating the manner of disposal and configuration, sequence of buildup of dumps along with the proposals for the stacking of sub-grade ore, to be indicated Year wise.	: There is no waste or any other mineral dumps are proposed. If stone pillar may be unsold will be keep within the lease boundary.
8. USE OF MINERAL:	
a) Describe briefly the end-use of the mineral (sale to intermediary parties, captive consumption, export, industrial use)	: The excavated stone materials will be supplied to the consumers like pillar stone, sized stone, carving stone, Kattu kal, etc.
b) Indicate physical and chemical specifications stipulated by buyers	: Basically, the materials produced at this quarry are rough stone and the same are used for pillar stone, sized stone, Kattu kal materials only, so there are no chemical specifications are specified. Only physical specifications are involved.
c) Give details in case blending of different grades of ores is being practiced or is to be practiced at the mine to meet specifications stipulated by buyers.	: Not blending process is involved.
9. OTHERS	
Describe briefly the following a) Site services	: Infrastructure required for such mines like office, stores, canteen, first aid station, shelter latrine and booth rooms have been provided as per the

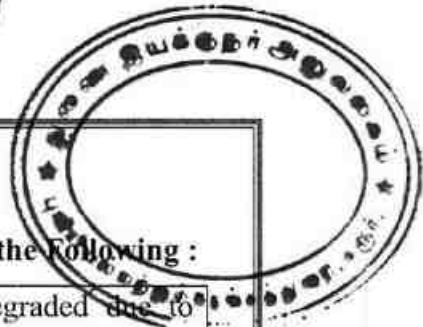


		Metalliferous Mines Regulations, 1961 as a welfare amenity for our quarry laborers.																								
<p>b) Employment potential :</p> <p>As per Mines safety under the provisions of Metalliferous Mines Regulations, 1961 and under the Mines Act, 1952, whenever the workers are employed more than 10, it is preferred to have a qualified mining mate to keep all the production workers directly under his control and supervision.</p> <p>The following man power is proposed for quarrying stone material during the five years period the same manpower will be utilize for this mining plan period to achieve the proposed production and to comply the provisions of as per the MMR, 1961 norms.</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="width: 5%;">1.</td> <td style="width: 25%;">Highly Skilled</td> <td style="width: 50%;">Mines Manager</td> <td style="width: 20%;">1No.</td> </tr> <tr> <td></td> <td></td> <td>Mine Engineer</td> <td>1No.</td> </tr> <tr> <td></td> <td></td> <td>Mine Geologist</td> <td>1No</td> </tr> <tr> <td></td> <td></td> <td>Blaster</td> <td>---</td> </tr> <tr> <td>2.</td> <td>Unskilled</td> <td>Musdoor / Labours</td> <td>11 No's</td> </tr> <tr> <td colspan="3" style="text-align: right;">Total =</td> <td>14 No's</td> </tr> </table>			1.	Highly Skilled	Mines Manager	1No.			Mine Engineer	1No.			Mine Geologist	1No			Blaster	---	2.	Unskilled	Musdoor / Labours	11 No's	Total =			14 No's
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10	MINERAL PROCESSING/BENEFICIATIONS:																									
<p>a) If processing / beneficiations of the ore or minerals mined is planned to be conducted on site or adjacent to the extraction area, briefly describe the nature of the processing /beneficiation. This should indicate size and grade of feed material and concentrate (finished marketable product), recovery rate.</p>	:	<p>Excavated rough stone and gravel materials shall be directly sale to the needy customer. No processing / beneficiations are proposed</p>																								
<p>b) Explain the disposal method for tailings or waste from the processing plant (quantity and quality of tailings proposed to be discharged, size and capacity of tailing pond, toxic effect of such tailings, if any, with process adopted to neutralize any such effect before their disposal and dealing of excess water from the tailing dam).</p>	:	<p>No water shall be used for quarrying or any other processing except drinking water to be drawn from public sources. Some stagnation of rain water in the pit shall be used for drilling and spraying haul roads. Therefore, need for tailing dam doesn't arise. But tailing control of rain water flow during rainy season has to be done by decanting the SPM</p>																								



		in a pit before passing the water in to natural system.
	c) A flow sheet or schematic diagram of the processing procedure should be attached.	: Not applicable.
	d) Specify quantity and type of chemicals to be used in the processing plant.	: Not applicable
	e) Specify quantity and type of chemicals to be stored on site / plant.	: Not applicable
	f) Indicate quantity (cu.m. per day) of water required for mining and processing and sources of supply of water. Disposal of water and extent of recycling.	: Drinking is 0.2KLD, utilized water is 0.5KLD, Dust suppression is 0.5KLD and Green Belt is 0.5KLD. Minimum quantity of water 1.7KLD per day. Drinking water will be bought to authorized vendor of the nearby the village. The dust suppression and green belt development will be bought to water tanker. The sewage water to a tune of 0.8KLD generated from the mine office toilet and mine labour toilet will be diverted to the septic tank followed by soak pit.



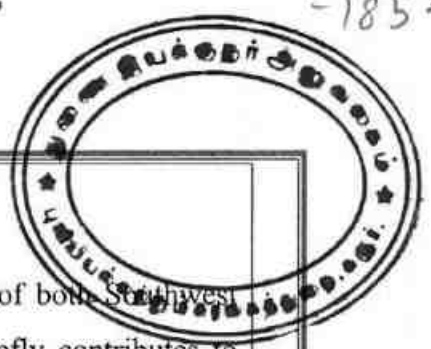


PART - B

11.0 ENVIRONMENTAL MANAGEMENT PLAN :

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

11.1	Existing land use pattern indicating the area already degraded due to quarrying /pitting, dumping, roads, processing plant, workshop, township etc in a tabular form. The present and proposed land use pattern is given as below.																									
	<table border="1"> <thead> <tr> <th>Sl. No.</th> <th>Land Use</th> <th>Present area (Hect.)</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>Area under mining</td> <td>1.08.5</td> </tr> <tr> <td>2</td> <td>Infrastructure</td> <td>0.01.0</td> </tr> <tr> <td>3</td> <td>Road</td> <td>0.02.0</td> </tr> <tr> <td>4</td> <td>Green belt</td> <td>0.08.0</td> </tr> <tr> <td>5</td> <td>Drainage & Settling Tank</td> <td>Nil</td> </tr> <tr> <td>6</td> <td>Un-utilized area</td> <td>1.08.0</td> </tr> <tr> <td colspan="2">Grand total</td> <td>2.27.5</td> </tr> </tbody> </table>	Sl. No.	Land Use	Present area (Hect.)	1.	Area under mining	1.08.5	2	Infrastructure	0.01.0	3	Road	0.02.0	4	Green belt	0.08.0	5	Drainage & Settling Tank	Nil	6	Un-utilized area	1.08.0	Grand total		2.27.5	
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Grand total		2.27.5																								
11.2	Water Regime	: Water table in this area is noticed at a depth of 55m in summer and 50m in rainy season from the general ground level and presently the quarrying of rough stone is proposed up to a depth of 35m bgl. Hence, it will not affect the ground water depletion of this area. It is made own borewell for providing uninterrupted supply of RO drinking water, dust suppression and green belt development.																								
11.3	Flora and Fauna	: There is no major flora observed in this area and except acacia bushes, no other valuable trees are noticed in the lease area. Further, neither flora of botanical interest nor fauna of zoological interest is noticed in this area.																								
11.4	Quality of air, ambient noise level and water	: Air or dust expected to be generated from drilling process, hauling roads, places of excavation etc., will be suppressed by periodical wetting of land by water spraying. Quarrying of rough stone will be carried out by hand-hack-Hammer.																								



11.5 Climatic conditions:
Climate:
 The district receives the rain under the influence of both Southwest and Northeast monsoons. The Northeast monsoon chiefly contributes to the rainfall in the district. Most of the precipitation occurs in the form of cyclonic storms caused due to the depressions in Bay of Bengal. The Southwest monsoon rainfall is highly erratic and summer rains are negligible. The average annual rainfall over the district varies from about 620 mm to 745 mm.
Rainfall:
 The annual rainfall normal (1970-2000) of Karur district is 742 mm. Projections of rainfall over Karur for the periods 2010-2040 (2020s), 2040- 2070 (2050s) and 2070-2100 (2080s) with reference to the baseline (1970-2000) indicate a general decrease of 4.0%, 3.0% and 11.0% respectively.

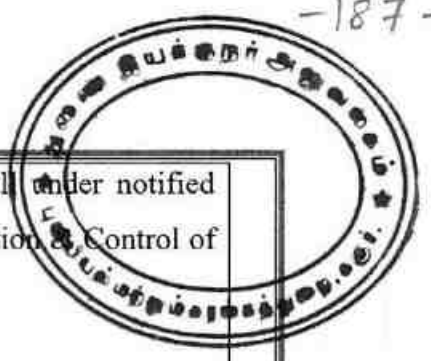
11.6 Human Settlement:
 The nearest villages are found in the buffer zone with population as per 2011 census.

S. N	Village	Direction	Distance in Kms	Population
1	Pullaiyampalayam	North	1.12m	4671
2	Pudukkanalli	South	4.0km	1190
3	Punam	East	2.67km	5446
4	Talaiyuttuppatti	West	1.25km	431

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

11.8 Attach plans showing the locations of sampling stations : The proposed Ambient air quality, Water quality Ambient noise level and vibration are periodically tested for every season (6 months once) around 5km radius as per the guidance of MoEF and EIA Notification 2006 and also covering DGMS norms.

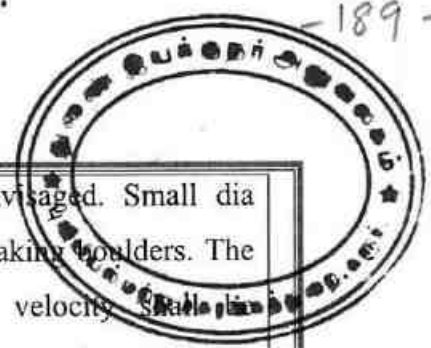
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11.9	Does area (partly or fully) fall under notified area under Water (Prevention & Control of Pollution), Act, 1974	: The proposed area not fall under notified area under Water (Prevention & Control of Pollution), Act, 1974
------	---	---

b) Attach an Environmental Impact Assessment Statement describing the impact of Mining and beneficiation on environment on the following over the next five years (and upto conceptual plan period for 'A' category mines)

i)	Land area indicating the area likely to be degraded due to quarrying / pitting, dumping, roads, workshop, processing plant, township etc:																									
	Due to quarrying and exploitation of the rough stone, there will impact in the form i.e. change in the ground profile, pits, and dumps. The details of the land use pattern, during the ensuing plan period and till lease period is shown in the tabular form:																									
	<table border="1"> <thead> <tr> <th>Sl. No.</th> <th>Land Use</th> <th>Area in use during the quarrying period (Hect)</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>Area under mining</td> <td>1.60.0</td> </tr> <tr> <td>2</td> <td>Infrastructure</td> <td>0.02.0</td> </tr> <tr> <td>3</td> <td>Road</td> <td>0.03.0</td> </tr> <tr> <td>4</td> <td>Green belt</td> <td>0.51.64</td> </tr> <tr> <td>5</td> <td>Drainage & Settling Tank</td> <td>0.09.48</td> </tr> <tr> <td>6</td> <td>Un-utilized area</td> <td>0.01.38</td> </tr> <tr> <td colspan="2">Grand total</td> <td>2.27.5</td> </tr> </tbody> </table>		Sl. No.	Land Use	Area in use during the quarrying period (Hect)	1.	Area under mining	1.60.0	2	Infrastructure	0.02.0	3	Road	0.03.0	4	Green belt	0.51.64	5	Drainage & Settling Tank	0.09.48	6	Un-utilized area	0.01.38	Grand total		2.27.5
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ii).	Air Quality	Air or dust expected to be generated from drilling process, hauling roads, places of excavation etc..., will be suppressed by periodical wetting of land by water spraying.																								
iii).	Water quality	A water sample from the open/bore wells was tested to NABL approved lab to assess hardness, Salinity, colour, Specific gravity, etc.																								
iv).	Noise levels	Quarrying of rough stone will be carried out by drilling and blasting by using low power explosives, and hence, noise will be very minimum. However, periodical noise level monitoring will be carried out every six months around the quarry site.																								

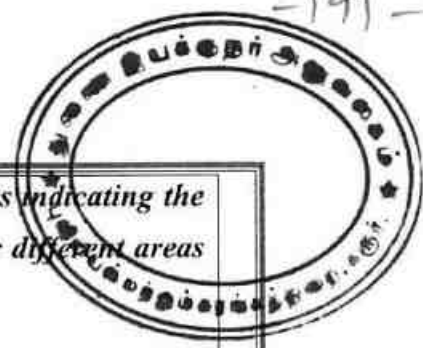


v).	Vibration levels (due to blasting)	No deep hole blasting envisaged. Small dia shot holes are used for breaking boulders. The maximum peak particles velocity recorded using mini seismograph devises as per the guidance of MoEF and EIA Notification 2006 and also covering DGMS norms.
vi).	Water regime	No major water bodies like rivers, pond, lake etc., located within a radius of 500m.
vii).	Socio-economics	1. To provide Employment opportunities of the nearby villagers. 2. For the cultural development of the nearby villagers.
viii).	Historical monuments etc.	There are no historical monuments, etc found around 10km radius.

c) Attach an Environmental Management Plan (supported by appropriate plans and sections) defining the time bound action proposed to be taken with sequence & timing in the following areas (or diagrams should be used):

i).	Temporary storage and utilization of topsoil	: No separate of topsoil removed.
ii).	Yearwise proposal for reclamation of land affected by abandoned quarries and other mining activities during first five years (and upto conceptual plan period for 'A' category mines) clarifying the extent of back filling and re-contouring and / or alternative use of unfilled / partially filled excavations / road sides / slopes and mine. In case abandoned quarries/ pits are proposed to be used as reservoir, their size, water holding capacity and proposal for utilization of such water be given.	: The present mining is proposed to an average depth of 35m bgl has been envisaged as workable depth for safe & economic mining during the lease period. The mined-out area will be fenced on top of working bench with S1 fencing. No immediate proposals for closure of pit as the rough stone persist still at deeper level.

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iii) *Programme of afforestation, Yearwise for the initial five years indicating the number of plants with name of species to be afforested under different areas in hectares.*

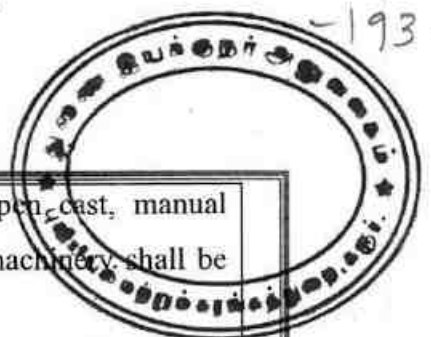
Green Belt Development:

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

Year	Place	Area in Sq.m	No.of Plants	Rate of survival	Rate	Amount in Rs
First	Lease Boundary	5164	575	80%	@100 Rs Per sapling	57,500/-
Second	Haul road and Nearby Village Road	--	300	80%		30000/-
Third	Schools	--	200	80%		20000/-
Total						1,07,500/-

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).	:	No waste or rejects removed in this lease area..
v).	Measures to control erosion / sedimentation of water courses.	:	Not applicable. There are no major dumps are stabilized in this quarry area.
vi).	Treatment and disposal of water from mine.	:	It will not be harmful and it does not require any treatment before discharging into the natural courses.
Vii)	Measures for minimizing adverse effects on water regime.	:	There is no water to be pumped out will be very pure and portable and therefore, it will not affect any water regime surrounding the quarry. The worked-out pit will be protected with barbed wire and the mined-out pit will be used as storage rain water pit. The open pit will be used as rain water storage structure to augment groundwater levels which improve the mine environment.

P. Srinivasan



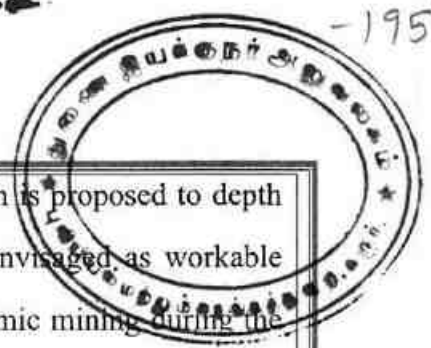
viii).	Protective measures for ground vibrations / air blast caused by blasting,	:	It is a B2 category open cast, manual mining and no heavy machinery shall be used.
ix).	Measures for protecting historical monuments and for rehabilitation of human settlements likely to be disturbed due to mining activity.	:	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)

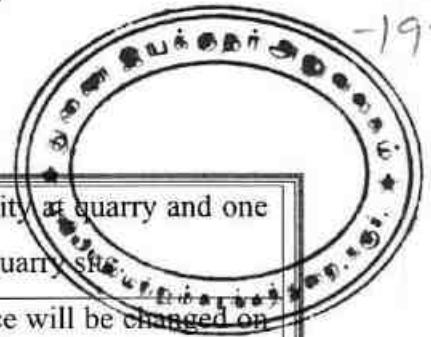
Not applicable. It is B2 category quarry

12.0 PROGRESSIVE QUARRY CLOSURE PLAN:

12.1	Steps proposed for phased restoration, reclamation of already mined out area.	:	The Ultimate mining is proposed to an average depth of 35m bgl. The mined-out area will be fenced on top of working bench with S1 fencing to arrest the entry of cattle's and public in to the quarry site.
12.2	Measures to be under taken on mine closure as per Act & Rules	:	Measures will be taken as per the Acts and Rules. The quarried pit will be fenced by Barbed wire fencing. Green belt development at the rate of 575 trees per year will be proposed. No immediate proposals for closure of pit as the Rough Stone persist still at deeper level.
12.3	Mitigation measures to be undertaken for safety and restoration/ reclamation of the already mined out area	:	It is an existing open cast manual quarry lease. Proper bench parameters developed while quarrying operation. No mitigation measures adopted.



12.4	Mine closure activity	: The present mining plan is proposed to depth of 35m bgl has been envisaged as workable depth for safe & economic mining during the lease period. The mined-out area will be fenced on top of open cast working with S1 fencing. No immediate proposals for closure of pit as the rough stone persist still at deeper level.
12.5	Safety and security	: Safety measures implement to the prevent access to surface opening excavations will be taken as Metalliferous mine regulations, 1961, it is a small open cast mining method adopted. Safety provisions like helmet, goggles, safety shoes, Dust mask, Ear muffs etc have to be provided as per the circulars and amendments made for Mine labours under the guidance of DGMS being a mechanized operation.
12.6	Disaster management and Risk Assessment	: Open cast manual mining method is adopted in this quarry. If the benches are made with proposed height and with no risk will be there. Even then if any minor or major accident happens the quarry staffs having First aid facilities with first aid box with all necessary medicine and stretches etc., to give first aid treatment at the site and will arrange immediately the vehicle to reach nearest hospital, if any disaster happens the lessee is capable to meet such eventualities. At the time of any accident during mining activity,

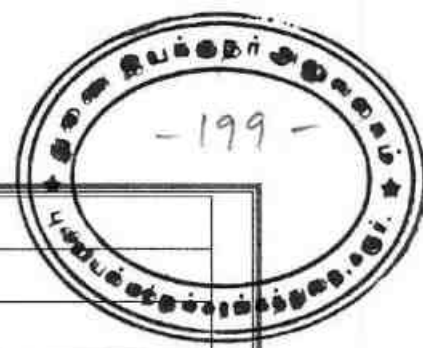


		proposal of first aid facility at quarry and one vehicle always ready at quarry site.
12.7	Care and maintenance during temporary discontinuance	: A board of discontinuance will be changed on the main entrance of the working place. One watch man will be kept on the quarry area for security purposes also look after the survival of the plants.
12.8	Economic repercussions of closure of quarry and man power entrenchments	: During the five years mining period the employment potential will be generated, general financial status and socio-economic conditions of approx. 14 labors will be improved.
12.9	Reclamation and Rehabilitation	: Land degradation is one of the major adverse impacts of open-cast mining activities and any effort to control adverse impacts would be incomplete without appropriate land reclamation strategy. After the exhaustion of entire mineable rough stone, mined out pit will be converted in fish culture or storage of rain water reservoir purposes.

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

A	Fixed Asset Cost:	
	1. Land Cost	: Rs. 6,00,000/-
	2. Labour Shed	: Rs. 1,50,000/-
	3. Sanitary Facility	: Rs. 1,00,000/-
	4. Fencing	: Rs. 4,00,000/-
	5. Other expenses (Security guard, dust bin, etc)	: Rs. 3,00,000/-
	Total	: Rs. 15,50,000/-
B	B. Machinery cost	: ---
C	Total Expenditure of EMP cost (for five years)	
	1. Drinking Water Facility	: Rs. 1,00,000/-
	2. Sanitary facility & Maintenance	: Rs. 50,000/-

P. Chandrasekaran



3. Permanent water sprinkler	:	Rs. 50,000/-
4. Afforestation and its maintenance	:	Rs. 1,07,500/-
5. Safety Kits	:	Rs. 50,000/-
6. Provision of tyre washing facility	:	Rs. 1,00,000/-
7. Surface runoff management structures like garland drain, settling pond & Bund (0.09.48Hect or 948Sq.m X 400	:	Rs. 3,79,200/-
8. Blasting materials with blast mat cost	:	---
9. Environment monitoring	:	Rs. 5,00,000/-
Total	:	Rs. 13,36,700/-
D	Total Project Cost (A+B)	Rs. 15,50,000/-

13.0 FINANCIAL ASSURANCE:

Not applicable, it is a small B2 rough stone and gravel quarry.

14.0 CERTIFICATES:

All required certificates are enclosed.

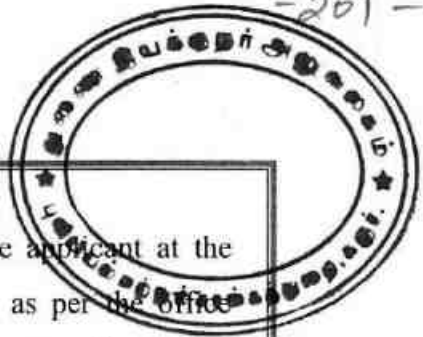
15.0 PLAN AND SECTIONS, ETC:

Plan and Sections are submitted along with mining plan.

16.0 ANY OTHER DETAILS INTEND TO FURNISH BY THE APPLICANT

- (i) Care and precautionary measures will be taken for the safety of workers as per Rules and Acts.
- (ii) The applicant will endeavor every attempt to quarry the rough stone economically without any wastage and to improve the environment and ecology.
- (iii) The Mining Plan is prepared by incorporating the conditions stipulated in the precise area communication issued by the Deputy Director of Geology and Mining, Karur vide letter no **Rc.No.743/Mines/2019 Dated 15.09.2022.**
- (iv) Total proposed production of **114349m³**. Of which, rough stone is about **106213m³** and gravel is about **8136m³** up to a depth of 35m below the ground level (R.L.175m-140m) for five years plan period. Average production is **21243m³** of rough stone and **8136m³** of gravel per year.

J. G. Srinivasan



17.0 CER Expenditure:

CER (Corporate Environment responsibility) will assure by the applicant at the time of appraisal before State Expert Appraisal Committee (SEAC) as per the office memorandum issued date 30th September, 2020 by Ministry of Environment, Forest and Climate Change Impact Assessment Division.

Place: Dharmapuri, TN

Date: 26/9/22

Geo Technical Mining Solutions

Certificate No. NABET/APA-MPPA/IA/017

GEO TECHNICAL MINING SOLUTIONS
A NABET Accredited and ISO Certified Company
1/213-B, Ground Floor, Natesan Complex,
Collectorate Post Office, Oddapatti,
Dharmapuri - 636 705, Tamil Nadu, India.
Ph: 94342-232777, 94439 37841

This Mining Plan is approved based on incorporation of the particulars specified in clause 7 (iv) of the Commissioner of Geology and Mining Chennai Lr No 3868 / LC / 2012 dt 19-11-2012 and Draft Minor Mineral Conservation & Development Rules 2010

**Deputy Director of Geology and Mining
Karur District**

this Mining Plan is approved subject to the conditions/stipulations indicated in the Mining Plan approved Letter No: 743/ming/2019 Dated: 16/11/2022

76/11/2022

ந.க.எண். 743/கனிமம்/2019

மாவட்ட ஆட்சியர் அலுவலகம்,
புவியியல் மற்றும் சுரங்கத்துறை,
கரூர்
நாள்: 09.2022.



குறிப்பாணை

பொருள்: கனிமங்களும் குவாரிகளும் - கரூர் மாவட்டம் - புகளூர் வட்டம் - குப்பம் கிராமம் - பட்டா புல எண்கள். 104/1 (0.62.50 ஹெக்டேர்), 104/2எ(பகுதி) 0.09.00 ஹெக்டேர், 104/2பி1(பகுதி) 0.27.0 ஹெக்டேர், 105/1எ(பகுதி) 0.50.50 ஹெக்டேர், 105/2(0.78.50 ஹெக்டேர்) மற்றும் ஆகியவற்றின் மொத்தம் 2.27.50 ஹெக்டேர் பரப்பில் சாதாரண சுற்கள் மற்றும் கிராவல் குவாரி குத்தகை உரிமம் வேண்டி திரு.பி.தேவராஜ் என்பவர் விண்ணப்பம் செய்தது - உரிமம் வழங்க பரிந்துரை செய்யப்பட்டது - தகுதியான நிலப்பரப்பாக கருதி ஏற்பளிக்கப்பட்ட சுரங்க திட்டம் மற்றும் மாநில சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணைய இசைவினை பெற்று சமர்ப்பிக்கக் கோருதல் - தொடர்பாக - தொடர்பாக.

- பார்வை:**
1. திரு.பி.தேவராஜ், த/பெ.பிச்சைமுத்து, புள்ளையாம்பாளையம், புன்னம் சத்திரம் அஞ்சல், புகளூர் வட்டம், கரூர் மாவட்டம் என்பவரின் மனு நாள்: 10.12.2019.
 2. வருவாய் கோட்டாட்சியர், கரூர் அவர்களின் அறிக்கை ந.க.எண். அ1/268/2020, நாள்:06.10.2020
 3. மாண்புமைய சென்னை உயர்நீதி மற்றும் மதுரைக்கிளை வழக்கு எண்.W.P(MD) No.16324 of 2022, நாள்:08.08.2022
 4. திரு.பி.தேவராஜ், த/பெ.பிச்சைமுத்து, புள்ளையாம்பாளையம், புன்னம் சத்திரம் அஞ்சல், புகளூர் வட்டம், கரூர் மாவட்டம் என்பவரின் கடிதம் நாள்:01.09.2022
 5. உதவி புவியியலாளர், புவியியல் மற்றும் சுரங்கத்துறை கரூர் என்பவரது புலத்தணிக்கை அறிக்கை நாள்:02.09.2022.
 6. அரசாணை (பல்வகை) எண். 169, தொழில் (எம்.எம்.சி-1) குறை நாள்: 04.08.2020 இணைத்து வரப்பெற்றுள்ளது. (தமிழ்நாடு அரசிதழ் சிறப்பு வெளியீடு எண். 315 நாள்: 04.08.2020).

கரூர் மாவட்டம், புகளூர் வட்டம், குப்பம் கிராமம், பட்டா புல எண்கள். 104/1 (0.62.50 ஹெக்டேர்), 104/2எ(பகுதி) 0.09.00 ஹெக்டேர், 104/2பி1(பகுதி) 0.27.0



ஹெக்டேர், 105/1எ(பகுதி) 0.50.50 ஹெக்டேர், 105/2(0.78.50 ஹெக்டேர்) மற்றும் ஆகியவற்றின் மொத்தம் 2.27.50 ஹெக்டேர் பரப்பில் ஐந்து வருடங்களுக்கு சாதாரண கற்கள் மற்றும் கிராவல் வெட்டியெடுக்க கரூர் மாவட்டம், புகளூர் வட்டம், புள்ளம் சத்திரம் அஞ்சல், புள்ளையாம்பாளையம் என்ற முகவரியில் வசிக்கும் திரு.பி.தேவராஜ் என்பவர் பார்வை 1-இல் கண்டுள்ளவாறு விண்ணப்பம் செய்துள்ளார்.

மேற்படி விண்ணப்பம் தொடர்பாக, வருவாய் கோட்டாட்சியர், கரூர் மற்றும் உதவிப் புவியியலாளர், புவியியல் மற்றும் சுரங்கத்துறை, கரூர் ஆகியோர் புலத்தணிக்கை மேற்கொண்டு கரூர் மாவட்டம், புகளூர் வட்டம், குப்பம் கிராமம், பட்டா புல எண்கள். 104/1 (0.62.50 ஹெக்டேர்), 104/2எ(பகுதி) 0.09.00 ஹெக்டேர், 104/2பி1(பகுதி) 0.27.0 ஹெக்டேர், 105/1எ(பகுதி) 0.50.50 ஹெக்டேர், 105/2(0.78.50 ஹெக்டேர்) ஆகியவற்றின் மொத்தம் 2.27.50 ஹெக்டேர் பரப்பில் மட்டும் தமிழ்நாடு சிறு கனிமச்சலுகை சலுகை விதிகளில் விதி எண்கள்.19-(1), 20 மற்றும் 33-இன் கீழ் திரு.பி.தேவராஜ் என்பவருக்கு சாதாரணக்கல் மற்றும் கிராவல் குவாரி உரிமம் கீழ்க்கண்ட நிபந்தனைகளுக்குட்பட்டு ஐந்து ஆண்டுகளுக்கு வழங்கலாம் என பரிந்துரை செய்துள்ளனர்.

1. விண்ணப்ப புலத்திற்கு வடக்கில் 80 மீட்டர் தொலைவில் 1 பண்ணை வீடு உள்ளது. மேற்படி பண்ணை வீட்டின் உரிமையாளர் பண்ணை வீட்டிற்கு பாதிப்பின்றி குவாரிப்பணி செய்ய சம்மத கடிதம் அளித்துள்ளார். எனவே மேற்படி வீட்டிற்கு எவ்வித பாதிப்பின்றி குவாரிப்பணி செய்ய வேண்டும்.
2. விண்ணப்ப புலத்திற்கு அருகில் உள்ள பட்டா நிலங்களுக்கு 7.5 மீட்டர் மற்றும் புறம்போக்கு நிலத்திற்கு 10 மீட்டர் பாதுகாப்பு இடைவெளி விட்டு யாதொரு சேதமுமின்றி முறையாக குவாரிப்பணி செய்ய வேண்டும்.
3. குத்தகைக்காலத்தில் கைத்துளைப்பான் கருவி கொண்டு பாறைகளை துளையிட்டும், மிதமான வெடிபொருள் பயன்படுத்தியும், பொதுமக்களுக்கோ, பொது சொத்துக்களுக்கோ யாதொரு சேதமுமின்றி விதிமுறைகளின்படி குவாரிப்பணி செய்ய வேண்டும்.
4. குவாரித் தொழிலாளர்களின் பாதுகாப்பினை உறுதி செய்ய Mettalliferrous Mines, விதிகளின்படி அகலமானதும், பாதுகாப்பானதுமான Benches அமைத்து பாதுகாப்பான முறையில் குவாரிக்குள் வாகனங்கள் சென்றுவரவும் மற்றும் குவாரி தொழிலாளர்களின் பாதுகாப்பினை உறுதி செய்தும் குவாரிப்பணி செய்ய வேண்டும்.
5. குவாரி குத்தகை வழங்க ஏதுவாக துணை இயக்குநர் (சுரங்கம்) அவர்களால் ஏற்பளிக்கப்பட்ட சுரங்கத்திட்டத்தினையும், மாநில அளவிலான சுற்றுச்சூழல் தாக்க



மதிப்பீட்டு ஆணையத்தின் (SEIAA) அனுமதி பெற்று
விண்ணப்பதாரரால் சமர்ப்பிக்கப்பட வேண்டும்.

எனவே, வருவாய் கோட்டாட்சியர், கரூர் மற்றும் உதவிப் புவியியலாளர், புவியியல் மற்றும் சுரங்கத்துறை, கரூர் ஆகியோரின் பரிந்துரைகள் மற்றும் நிபந்தனைகளின் அடிப்படையில் கரூர் மாவட்டம், புகளூர் வட்டம், குப்பம் கிராமம், பட்டா புல எண்கள். 104/1 (0.62.50 ஹெக்டேர்), 104/2எ(பகுதி) 0.09.00 ஹெக்டேர், 104/2பி1(பகுதி) 0.27.0 ஹெக்டேர், 105/1எ(பகுதி) 0.50.50 ஹெக்டேர், 105/2(0.78.50 ஹெக்டேர்) மற்றும் ஆகியவற்றின் மொத்தம் 2.27.50 ஹெக்டேர் பரப்பில் 1959-ஆம் வருட தமிழ்நாடு சிறுகனிம விதிகள், விதி எண். 19(1), 20 மற்றும் 33-இன்படியும் மேலும் மேற்கண்ட நிபந்தனைகளுக்கும் உட்பட்டு 5 (ஐந்து) வருட காலத்திற்கு திரு.பி.தேவராஜ் என்பவருக்கு சாதாரணக்கல் மற்றும் கிராவல் குவாரி உரிமம் வழங்குவதற்குரிய தகுதியான நிலப்பரப்பாக கருதப்படுகிறது.

அதற்கிணங்க, தமிழ்நாடு சிறுகனிம சலுகை விதிகள்-1959 விதி எண். 41-இன்படி குவாரிப்பணி மேற்கொள்வது தொடர்பாக வரைவு சுரங்க திட்டத்தினை 90 தினங்களுக்குள் சமர்ப்பிக்குமாறு திரு.பி.தேவராஜ் என்பவர் கேட்டுக்கொள்ளப்படுகிறார். மேலும் ஏற்பளிக்கப்பட்ட சுரங்கத்திட்டத்தின் தொடர்ச்சியாக 1959-ம் வருடத்திய தமிழ்நாடு சிறுகனிம சலுகை விதிகள், விதி எண்.42-இன்படி சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையத்தின் இசைவினைப் பெற்று சமர்ப்பிக்கும் பட்சத்தில் மட்டுமே குவாரி உரிமம் வழங்கப்படும் என இதன் மூலம் தெரிவிக்கப்படுகிறது.

துணை இயக்குநர்,
புவியியல் மற்றும் சுரங்கத்துறை,
கரூர்.

பெறுநர்

திரு.பி.தேவராஜ்,
த/பெ.பி.ச்சைமுத்து,
புள்ளையாம்பாளையம்,
புன்னம் சத்திரம் அஞ்சல்,
புகளூர் வட்டம்,
கரூர் மாவட்டம்.

15/09/2022

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கரூர் மாவட்ட ஆட்சியர் அவர்களின் செயல்முறை ஆணை முன்னிலை:- திருமதி.ச.ஜெயந்தி, இ.ஆ.ப.,

ந.க.238 / கனிமம் / 2011

நாள்: 19.06.2013

பொருள்: கனிமங்களும் குவாரிகளும் - கரூர் மாவட்டம் - அரவக்குறிச்சி வட்டம் - குப்பம் கிராமம் - புல எண்கள்.104/2ஏ 104/1 105/1ஏ மற்றும் 105/2 ஆகியவற்றில் 2.14.5 ஹெக்டர் பரப்பு பட்டா பூமி - சாதாரண கற்கள் வெட்டி எடுக்க 5 ஆண்டுகளுக்கு குவாரி குத்தகை உரிமம் திரு.பி.தேவராஜ் என்பவருக்கு வழங்கி உத்தரவிடப் படுகிறது.

- பார்வை:
1. திரு.பி.தேவராஜ், த/பெ.பிச்சைமுத்து, புளியம்பாளையம், புன்னம்சத்திரம் அஞ்சல், கரூர் மாவட்டம் என்பவரின் மனு நாள்:இல்லை.
 2. கரூர், வருவாய் கோட்டாட்சியர் அவர்களின் அறிக்கை ந.க.அ1/3275/2012 நாள்:13.12.2012.
 3. கரூர் புவியியல் மற்றும் சுரங்கத்துறை உதவி இயக்குநர் அவர்களின் இடப்பார்வை அறிக்கை நாள்:09.01.2013.
 4. உதவி இயக்குநர், புவியியல் மற்றும் சுரங்கத்துறை, கரூர் அவர்களின் ஏற்பளிக்கப்பட்ட சுரங்கத் திட்டம் நாள்:08.03.2013.
 5. மாநில சுற்றுச் சூழல் தாக்க மதிப்பீட்டு ஆணையம், சென்னை ஒப்புதல் ஆணை எண்:SEIAA,TN/F.No.944/EC/1(a)/252/2013, நாள்:23.04.2013.

உத்தரவு:-

கரூர் மாவட்டம், அரவக்குறிச்சி வட்டம், குப்பம் கிராமம், புல எண்கள்.104/2ஏ (0.11.5 ஹெக்டேர்) 104/1 (0.62.5 ஹெக்டேர்) 105/1ஏ (0.62.0 ஹெக்டேர்) மற்றும் 105/2 (0.78.5 ஹெக்டேர்) ஆகியவற்றில் மொத்தம் 2.14.5 ஹெக்டேர் பரப்பு பட்டா நிலத்திலிருந்து ஐந்து ஆண்டுகளுக்கு சாதாரண கற்கள் வெட்டி எடுக்க கல்குவாரி குத்தகை உரிமம் வழங்கிடக் கோரி திரு.பி.தேவராஜ், த/பெ.பிச்சைமுத்து, புளியம்பாளையம், புன்னம்சத்திரம் அஞ்சல், அரவக்குறிச்சி வட்டம், கரூர் மாவட்டம் என்பவர் பார்வை1-ல் கண்டவாறு விண்ணப்பித்துள்ளார்.

2. மனுதாரர் உரிய படிவத்தில் மனு செய்திருப்பதுடன், விண்ணப்பக் கட்டணம் மற்றும் அடிப்படை செலவினங்களுக்காக ரூ.1500/- ஐ சலான் எண்.27, நாள்:15.06.2011-ல் கரூர் பாரத மாநில வங்கியில் செலுத்தியுள்ளார். மேலும், மனுதாரர் அரசுக்கு செலுத்த வேண்டிய வருவான வரி மற்றும் கனிம வரி எதுவும்



நிலுவை இல்லை என்பதற்கான சான்றுறுதி ஆவணம் மற்றும் கிராம கணக்கு நகல்களையும் சமர்ப்பித்துள்ளார்.

3. மனுதாரர் சாதாரண கற்கள் வெட்டி எடுக்க உரிமம் கோரிய பிரகடனப் புலத்தை கரூர் வருவாய் கோட்டாட்சியர் மற்றும் உதவி இயக்குநர், புவியியல் மற்றும் சுரங்கத்துறை, கரூர் ஆகியோர் இடப்பார்வை செய்து அறிக்கை சமர்ப்பித்துள்ளனர்.

4. பார்வை 2ல் கண்ட கரூர் வருவாய் கோட்டாட்சியர் அவர்களின் அறிக்கையில், அரவக்குறிச்சி வட்டம், குப்பம் கிராமம், புல எண்கள்.104/2ஏ மற்றும் பலவற்றில் மொத்தப் பரப்பளவு 2.14.5 ஹெக்டேர் நிலத்திலிருந்து கல் குவாரி / கிராவல் வெட்டி எடுக்க பிச்சைமுத்து மகன் திரு.பி.தேவராஜ் என்பவர் அனுமதி கோரியது தொடர்பாக 05.12.2012 அன்று புலத்தணிக்கை செய்யப்பட்டது எனவும், விண்ணப்ப புல எண்கள்.104/2ஏ மற்றும் 105/2 பட்டா எண்.1390ன்படி பிச்சைமுத்து மகன் தேவராஜ் பெயரிலும், புல எண்கள்.104/1 மற்றும் 105/2 பட்டா எண்.311ன்படி தேவராஜ் மனைவி சரஸ்வதி ஆகியோர் பெயரில் பட்டா பதிவாகியுள்ளது எனவும், மனுதாரர் பிச்சைமுத்து மகன் தேவராஜ் பெயரில் கல் குவாரி குத்தகை உரிமம் வழங்க தேவராஜ் மனைவி சரஸ்வதி சம்மத் தெரிவித்துள்ளார் எனவும், விண்ணப்ப புல எண்களுக்கு கீழ்க்கண்டவாறு நான்கு எல்லைகள் அமைந்துள்ளன எனவும்,

புல எண்கள்	திசைகள்	எல்லைகள்
104/2ஏ	வடக்கு	101
	மேற்கு	105/1ஏ
	தெற்கு	104/1
	கிழக்கு	104/2பி1
105/1ஏ	வடக்கு	101
	மேற்கு	106
	தெற்கு	105/1பி
	கிழக்கு	104/2ஏ, 105/2

புல எண்கள்	திசைகள்	எல்லைகள்
104/1	வடக்கு	104/2ஏ
	மேற்கு	105/2
	தெற்கு	112
	கிழக்கு	104/2பி2, 2பி3
105/2	வடக்கு	105/1ஏ
	மேற்கு	105/1பி
	தெற்கு	112
	கிழக்கு	104/1

விண்ணப்ப இடத்தில் கல் மற்றும் கிராவல் குவாரி செய்ய பொது மக்களிடமிருந்து ஆட்சேபனை ஏதும் உள்ளதா என்பது குறித்த "ஏ1" விளம்பரம் செய்யப்பட்டு ஆட்சேபனை இல்லையென ஒப்புதல் பெறப்பட்டுள்ளது எனவும், குவாரி செய்யும் இடத்திலிருந்து 300 மீட்டர் தொலைவில் குடியிருப்புகள் ஏதும் இல்லை எனவும், 50 மீட்டர் தூரத்தில் உயர் தாழ்வழுத்த மின்கம்பிகள் செல்லவில்லை எனவும், கோவில், மசூதி, சர்ச், மயானம் மற்றும் நீர்நிலைகள் ஏதுமில்லை எனவும், இந்த குவாரியினுடைய நீளம் மற்றும் அகலம் அளவீடு செய்யப்பட்டு வரைபடத்தில் குறிக்கப்பட்டுள்ளது எனவும், குவாரி செய்யப்படவுள்ள புலத்தில் பறம்போக்கு

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இடங்கள் ஏதுமில்லை எனவும், ஏற்கனவே இவ்விடத்தில் குவாரி செய்யப்பட்டு தற்போது இயங்காமல் உள்ளது எனவும், உரிமம் கோரும் கல் மற்றும் கிராமல் குவாரி செய்யப்படும் புல எண்களுக்கு எல்லைகள் வரையறுக்கப்பட்டு எல்லைக் கற்கள் நடப்பட்டுள்ளது எனவும் தெரிவித்துள்ளார். எனவே அரவக்குறிச்சி வட்டம், குப்பம் கிராமம், புல எண்கள். 104/2ஏ, 104/1, 105/1ஏ மற்றும் 105/2ல் 2.14.5 ஹெக்டர் பரப்பில் கல்குவாரி வெட்டி எடுப்பதற்கு திரு.பி.தேவராஜ், த/பெ.பிச்சைமுத்து என்பவருக்கு அரசு விதிமுறைகளுக்குப்பட்டு குத்தகை உரிமம் வழங்கலாம் என பரிந்துரை செய்துள்ளார்.

5. பார்வை 3ல் கண்ட கரூர், புவியியல் மற்றும் சுரங்கத்துறை, உதவி இயக்குநரின் இடப்பார்வை அறிக்கையில், அரவக்குறிச்சி வட்டம், குப்பம் கிராமம், கணக்கு பட்டா எண்.1390ன்படி புல எண்.104/2ஏ மற்றும் 105/1ஏ ஆகியன மனுதாரர் திரு.தேவராஜ் பெயரிலும், பட்டா எண்.311ன்படி புல எண்கள்.104/1 மற்றும் 105/2 ஆகியன சரஸ்வதி என்பவரது பெயரிலும் தாக்கலாகியுள்ளது எனவும், இதில் மனுதாரர் கல்குவாரி உரிமம் பெற பட்டாதாரர் திருமதி.சரஸ்வதி என்பவர் சம்மத பத்திரம் அளித்துள்ளார் எனவும், விண்ணப்ப புலங்களில் மனுதாரருக்கு கரூர் மாவட்ட ஆட்சியர் செயல்முறை ஆணை நக.டி.53/2006 நாள்.11.04.2006ன்படி 5 ஆண்டுகள் வழங்கப்பட்ட கல்குவாரி குத்தகை உரிமம் 11.5.2011 உடன் முடிவடைந்துள்ளது எனவும், விண்ணப்ப புலம் சமதளமானது எனவும், இதில் முந்தைய கல்குவாரி குத்தகை உரிம காலங்களில் கல்லுடைத்த சமச்சீரற்ற கற்குழி உள்ளது எனவும், கோட்டாட்சியர் அறிக்கையுடன் இணைக்கப்பட்டுள்ள வரைபடத்தில் உள்ளவாறு கற்குழியின் நீளம் வடக்கில் 90 மீட்டர், தெற்கில் 64.6 மீட்டர் எனவும் , அகலம் கிழக்கில் 149 மீட்டர், மேற்கில் 91.4 மீட்டர் எனவும், ஆழம் 4 மீட்டர் முதல் 10 மீட்டர் எனவும், மண் மற்றும் கழிவுப்பாறைகள் 1 மீட்டர் முதல் 2 மீட்டர் வரை உள்ளது எனவும், அதன் கீழ் சார்னோகைட் வகை பாறை காணப்படுகிறது எனவும், இவ்வகைபாறை சாதாரண கற்கள் மற்றும் ஐல்லி கற்கள் உற்பத்தி செய்ய ஏற்றது எனவும் தெரிவித்து தமிழ்நாடு சிறுகனிம சலுகை விதிகள் 1959ன் விதி எண்.19 (1), 20 மற்றும் 33-ன் கீழ் 5 ஆண்டுகளுக்கு கல்குவாரி குத்தகை உரிம அனுமதி கீழ்கானும் நிபந்தனைகளுக்குப்பட்டு வழங்க பரிந்துரை செய்துள்ளார்.

6. உதவி இயக்குநர், புவியியல் மற்றும் சுரங்கத்துறை, கரூர் அவர்களால் 08.03.2013 அன்று ஏற்பளிக்கப்பட்ட சுரங்கத் திட்டத்தை மனுதாரர் பார்வை 4ல் கண்டவாறு சமர்ப்பித்துள்ளார். மேற்படி சுரங்கத் திட்டத்தில் வரும் ஐந்தாண்டு குத்தகை காலத்தில் 76,975 கன மீட்டர் சாதாரண கற்களை வெட்டி எடுத்துக் கொள்வதாக தெரிவிக்கப்பட்டுள்ளது.

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7. பார்வை 5-ல் கண்ட சென்னை மாநில சுற்றுப்புற சூழ்நிலை செயல் விளைவு மதிப்பீட்டு குழு, உறுப்பினர் செயலர் அவர்கள் கடிதத்தில் சிறப்பு நிபந்தனை எண். 4 பிரிவு (i)-ல் கண்டவாறு குவாரிப்பணி ஆரம்பிப்பதற்கு நிபந்தனை தமிழ்நாடு மாசுக்கட்டுப்பாட்டு வாரியத்தின் ஒப்புதல் பெற வேண்டும் என்ற சிறப்பு நிபந்தனை உட்பட வேறுபல சிறப்பு நிபந்தனைகளுடன் மனுதாரருக்கு குவாரி குத்தகை உரிமம் வழங்கலாம் என பரிந்துரை செய்துள்ளார்.

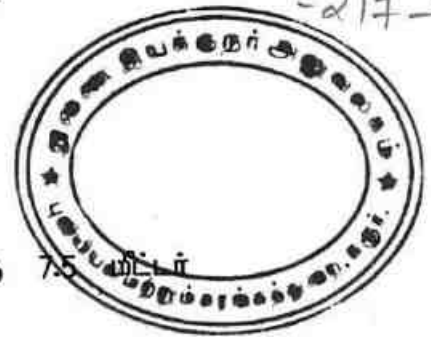
8. அரவக்குறிச்சி வட்டம், குப்பம் கிராமம், புல எண்கள். 104/2ஏ, 104/1, 105/1ஏ மற்றும் 105/2ல் 2.14.5 ஹெக்டேர் பரப்பில் மனுதாரருக்கு கரூர் மாவட்ட ஆட்சியர் செயல்முறை ஆணை நக.டி.53/2006 நாள்.11.04.2006ன்படி 5 ஆண்டுகளுக்கு வழங்கப்பட்ட கல்குவாரி குத்தகை உரிமம் 11.05.2011 உடன் முடிவடைந்துள்ளது.

9. இவ்வலுவலகத்தில் பராமரிக்கப்படும் ஆவணங்களின் அடிப்படையில் மனுதாரர் செலுத்த வேண்டிய கனிம வரி ஏதும் நிலுவையில் இல்லை.

10. மேற்கண்ட அலுவலர்களின் பரிந்துரை மற்றும் சிறுகனிம சலுகை விதிகளின் பேரில், மனுதாரருக்கு குவாரி குத்தகை உரிமம் வழங்க ஒப்புதல் தெரிவிக்கப்பட்டதன் பேரில், மனுதாரர் விதிகளின்டி காப்புத் தொகையாக ரூ.5000/-ஐ பாரத மாநில வங்கி, தாந்தோணி சலான் எண்.23, நாள்:07.06.2013-ன்படி செலுத்தி அசல் சலானையும், 1959-ம் தமிழ்நாடு சிறுகனிம சலுகை விதிகளின் பின் இணைப்பு V கண்டுள்ள படிவத்தில் உரிய முத்திரைத்தாளில் குத்தகை ஒப்பந்தப் பத்திரம் தயார் செய்து அளித்துள்ளார்.

எனவே, திரு.பி.தேவராஜ், த/பெ.பிச்சைமுத்து, புளியம்பாளையம், புன்னம்சத்திரம் அஞ்சல், கரூர் மாவட்டம் என்பவருக்கு அரவக்குறிச்சி வட்டம், குப்பம் கிராமம், புல எண்கள்.104/2ஏ (0.11.5 ஹெக்டேர்), 104/1 (0.62.5 ஹெக்டேர்), 105/1ஏ (0.62.0 ஹெக்டேர்) மற்றும் 105/2 (0.78.5 ஹெக்டேர்) ஆகியவற்றில் மொத்தம் 2.14.5 ஹெக்டேர் பரப்பில் சாதாரண கற்கள் வெட்டியெடுக்க குத்தகை ஒப்பந்தப் பத்திரம் நிறைவேற்றிய நாளான 19.06.2013 முதல் 18.06.2018 வரை ஐந்து ஆண்டுகளுக்கு 1959-ம் ஆண்டு, தமிழ்நாடு சிறுகனிம சலுகை விதி 19 (1), 20 மற்றும் 33-ன்படி குத்தகை ஒப்பந்தப் பத்திரத்தில் கண்டுள்ள நிபந்தனைகள் மாநில சுற்றுச் சூழல் தாக்க மதிப்பீட்டு ஆணையத்தின் நிபந்தனைகள் மற்றும் தமிழ்நாடு சிறுகனிம சலுகை விதிகளின் பேரிலும் குவாரி குத்தகை உரிமம் வழங்கி ஆணையிடப்படுகிறது.

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நிபந்தனைகள்:-

1. குத்தகை புலத்தினை அடுத்துள்ள பட்டா நிலங்களுக்கு இடைவெளி அளித்து குவாரிப்பணி புரிய வேண்டும்.
2. பொதுமக்களுக்கோ, பொது சொத்துக்களுக்கோ யாதொரு சேதமும் இன்றி பாதுகாப்பான முறையில் குவாரிப்பணி செய்ய வேண்டும்.
3. பொதுமக்களின் நலன் கருதி பாதுகாப்பான முறையில் குறைந்த அழுத்தமுள்ள வெடிபொருட்கள் பயன்படுத்தியும், கைத்துளைப்பான் கருவி கொண்டு துளையிட்டும், தொழிலாளர்களின் பாதுகாப்பினை உறுதி செய்ய பாதுகாப்பானதும், அகலமான Benches அமைத்து குவாரிப்பணி செய்ய வேண்டும்.
4. மாநில சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையத்தின் பரிந்துரை கடிதம் SEIAA, TN/F. No. 944/ EC / 1 (a) / 252 / 2013 நாள்:23.04.2013ல் கண்ட சிறப்பு நிபந்தனைகளை முறையாக கடைபிடித்து குவாரிப்பணி செய்வதுடன், சிறப்பு நிபந்தனை 4 (i) ல் கண்டவாறு குவாரிப் பணி ஆரம்பிப்பதற்கு முன்பாக தமிழ்நாடு மாசுக்கட்டுப்பாட்டு வாரியத்தின் தடையின்மை சான்று பெற்று அதன் பின்னரே குவாரிப்பணி துவங்க வேண்டும்.
5. குத்தகைதாரர் தனக்கு அளிக்கப்பட்ட குத்தகை பகுதியின் எல்லைகளை தெளிவாக காட்டும் வகையில் கல் நட்டு வண்ணம் இட்டு குத்தகை காலம் முழுமைக்கும் பராமரிக்க வேண்டும்.
6. குத்தகைதாரர் குவாரியின் அருகே குத்தகைதாரர் பெயர், கிராமத்தின் பெயர், வட்டத்தின் பெயர், புல எண். பரப்பு, குத்தகை ஆணை எண். குத்தகை காலம், கனிமத்தின் பெயர், போன்ற விபரங்கள் குறிக்கப்பட்ட தகவல் பலகையை தமது சொந்த செலவில் வைத்து நன்கு பராமரிக்க வேண்டும்.
7. குவாரிக்கு சென்றுவரும் பாதை வசதிகள் குத்தகைதாரர்கள் அவர் தம் சொந்த பொறுப்பிலேயே அமைத்துக் கொள்ள வேண்டும்.
8. குத்தகை வழங்கப்பட்ட பாறையில் குண்டுக்கல், ஜல்லி, அரளை கல், வேலிக்கற்கள், போன்ற சிறுகனிமங்கள் உடைத்தெடுக்க மட்டுமே அனுமதியுண்டு. வெளிநாடுகளுக்கு ஏற்றுமதியாகும் மெருகூட்டும் கனவடிவ கற்கள் வெட்டி எடுக்கக் கூடாது.
9. குவாரியிலிருந்து கொண்டு செல்லப்படும் மேற்கண்ட வகை கற்களுக்கு 1959ம் ஆண்டு தமிழ்நாடு சிறுகனிம சலுகை விதிகள் பின் இணைப்பு 2ல் கண்டுள்ளவாறு உரிமவரி செலுத்த வேண்டும். அரசு அவ்வப்போது அறிவிக்கும் உரிமவரி மாற்றங்களுக்கு ஏற்ப எவ்வித ஆட்சேபணை இன்றி செலுத்துதல் வேண்டும்.
10. குத்தகை அனுமதி வழங்கப்பட்ட நிலத்திலிருந்து கொண்டு செல்லப்பட்ட கற்களுக்கு முறையான கணக்குகளும், குழிவாயில் பதிவேடும் முறையாக பராமரித்தல் வேண்டும். அவற்றை சம்பந்தப்பட்ட அலுவலர்கள் தணிக்கைக்கு ஆஜர்படுத்த கோரினால் தவறாது சமர்ப்பிக்க வேண்டும்.
11. உதவி இயக்குநர் (புவியியல் மற்றும் சுரங்கத்துறை)-ன் அலுவலக முத்திரை, கையொப்ப முத்திரையுடன் கூடிய உரிய அனுப்புகைச் சீட்டை வாகனங்களுக்கு கொடுக்கப்பட்டு 264 பாது அனுப்புகைச் சீட்டில் வாகன எண்.

P. சேனா



தேதி, புறப்படும் நேரம், செலுத்துமிடம் ஆகியவற்றை முறையாகக் குறிப்பிட்டு கையொப்பம் இட்ட பின்னரே, குத்தகைதாரரோ அல்லது அவரது அனுமதி பெற்ற நபரோ கொடுக்க வேண்டும். மேற்கண்டவாறு குறிப்பிடுவதில் ஏதேனும் தவறுகள் இருந்தாலோ, கலங்கள் பூர்த்தி செய்யப்படாமல் இருந்தாலோ முறையற்ற வகையில் கனிமம் எடுத்துச் செல்வதற்குக் கருதப்பட்டு வாகனத்தை கைப்பற்றி அபராதம் விதிப்பதோடு, அதற்கு குத்தகைதாரரை பொறுப்பாக்கி கனிம விதிகளின் படி மேல் நடவடிக்கை எடுக்கப்படும்.

- 12. இந்த ஆணையில் குத்தகை அனுமதி வழங்கப்பட்ட புலத்ததை முழுமையாகவோ, பகுதியாகவோ எவருக்கும் உள் குத்தகைக்கு விடுவதோ அல்லது கிரையம் செய்வதோ கூடாது.
- 13. குத்தகைதாரர் ஒவ்வொரு நாளும் குவாரியில் இருந்து எவ்வளவு சிறுகனிமங்கள் எடுக்கப்பட்டது என்பதையும் எந்த அளவு கனிமங்கள் லாரி/வண்டி மூலம் வெளியே அனுப்பப்பட்டது என்ற விபரத்தையும் காட்டும் பதிவேட்டினைப் பராமரித்து வரவேண்டும்.
- 14. குத்தகைதாரர், தமக்கு குத்தகை வழங்கப்பட்ட பகுதிக்கு அருகில் உள்ள பட்டா நிலத்திற்கு எவ்வித இடையூறும் இல்லாமல் குவாரிப் பணி செய்யப்பட வேண்டும்.
- 15. வண்டிப்பாதை மற்றும் நடைபாதைகளில் இருந்து 10 மீட்டர் தூரம் தள்ளி குவாரி செய்ய வேண்டும். ரோடுகள், புகைவண்டிப்பாதை, பொதுப்பணித்துறை, வாய்க்கால், பொதுமக்கள் உபயோகத்திற்கான பகுதிகள், மின்சாரம் மற்றும் தொலைபேசி கம்பி செல்லும் பகுதிகள், வழிபாட்டு இடங்கள் மற்றும் பழங்கால சின்னங்கள் உள்ள பகுதிகள் ஆகியவற்றில் இருந்து 50 மீட்டர் பாதுகாப்பு தூரம் விட்டு குவாரி செய்ய வேண்டும்.
- 16. குத்தகைக்கு விடப்பட்டுள்ள விஸ்தீரணத்தில் மட்டுமே குத்தகைதாரர் குவாரி செய்ய வேண்டும். அதற்கான கூடுதலான விஸ்தீரணத்தில் குவாரி செய்வது தெரியவந்தால் அபராத நடவடிக்கை மேற்கொள்வதுடன் குத்தகை இரத்து செய்ய நடவடிக்கை எடுக்கப்படும்.
- 17. குத்தகை நிபந்தனை மீறப்பட்டால் குத்தகை இரத்து செய்யவோ, செய்யப்பட்ட தவறுதலுக்கு அபராத நடவடிக்கை எடுத்து தண்டம் விதிக்கவோ அல்லது கிரிமினல் வழக்குத் தொடுக்க மாவட்ட ஆட்சியருக்கு அதிகாரம் உண்டு. குத்தகை ரத்து செய்யப்பட்டால் காப்புத் தொகை உட்பட அனைத்து தொகைகளும் அரசுக்கு ஆதாயமாக்கப்படும்.
- 18. குத்தகைதாரர் தமிழ்நாடு சிறுவகைக்கனிம சலுகை விதிகள் 1959ல் கண்டுள்ள விதிகளுக்கும் மற்றும் அரசு அவ்வப்போது அறிவிக்கும் சட்டதிட்டங்களுக்கும் உட்பட்டு குவாரிப்பணிகள் செய்ய வேண்டும்.
- 19. குவாரி குத்தகை உரிமம் காலாவதியான பின்பு எக்காரணத்தை முன்னிட்டும் மீண்டும் புதுப்பிக்கவோ அல்லது கால நீட்டிப்போ செய்து தரப்பட மாட்டாது.
- 20. வெடிபொருள் சட்டம் 1884ல் தெரிவிக்கப்பட்ட சரத்துக்கள்படி குறைந்த அளவு வெடிபொருளை உபயோகித்து கற்கள் வெளியே சிதறாமலும், சத்தம் அதிகம் ஏற்படாமலும், பொதுமக்களுக்கும், கால்நடைகளுக்கும், எவ்வித பாதிப்பும் இன்றியும் கல்குவாரி பணி செய்யப்பட வேண்டும்.

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- 21. வெடிபொருள்கள் அரசு உரிமம் பெற்ற விற்பனைதாரரிடம் மட்டுமே பெற்று வெடிப்பதற்கு உரிமம் / அங்கீகாரம் பெற்ற வெடிப்பாளர்களை (Blaster / Mines mate) கொண்டு கல் குவாரியில் வெடி வைக்க வேண்டும்.
- 22. குழுந்தை தொழிலாளர்கள் எவரையும் வேலைக்கு அமர்த்துதல் கூடாது.

மேற்கூறிப்பட்ட நிபந்தனைகள், மற்றும் கனிம சட்டம் விதிகளை மீறியுள்ளது உறுதிபடும் தருணத்தில் விதிமுறைகளுக்கு உட்பட்டு குத்தகை இரத்து செய்ய நடவடிக்கை எடுக்கப்படும். மேற்கண்ட நிபந்தனைகள் ஒப்பந்தப் பத்திரத்தில் கண்டுள்ள நிபந்தனைகள், மாநில சுற்றுச் சூழல் தாக்க மதிப்பீட்டு ஆணையத்தின் நிபந்தனைகள் மற்றும் 1959-ம் ஆண்டு தமிழ்நாடு சிறுகனிம சலுகை விதிகள் ஆகியவற்றின் அடிப்படையில் குத்தகைதாரர் குவாரிப் பணி புரிய வேண்டும்.

(ஓம்)/- ச.ஜெயந்தி,
மாவட்ட ஆட்சித்தலைவர்,
கரூர்

// உண்மை நகல் / உத்தரவுப்படி //


மாவட்ட ஆட்சித்தலைவருக்காக,
கரூர்.

பெறுநர்

திரு.பி.தேவராஜ், ✓
த/பெ.பிச்சைமுத்து,
புளியம்பாளையம்,
புன்னம்சத்திரம் அஞ்சல்,
கரூர் மாவட்டம்.


24/06/2013

நகல்:-

- 1. வருவாய் கோட்டாட்சியர் - கரூர்
- 2. வருவாய் வட்டாட்சியர் — ஆரவக்குறிச்சி
- 3. கிராம நிர்வாக அலுவலர் - குப்பம் (வட்டாட்சியர் மூலமாக)
- 4. மாவட்ட சுற்று சூழல் பொறியாளர், மாசு கட்டுப்பாட்டு வாரியம், கரூர்.

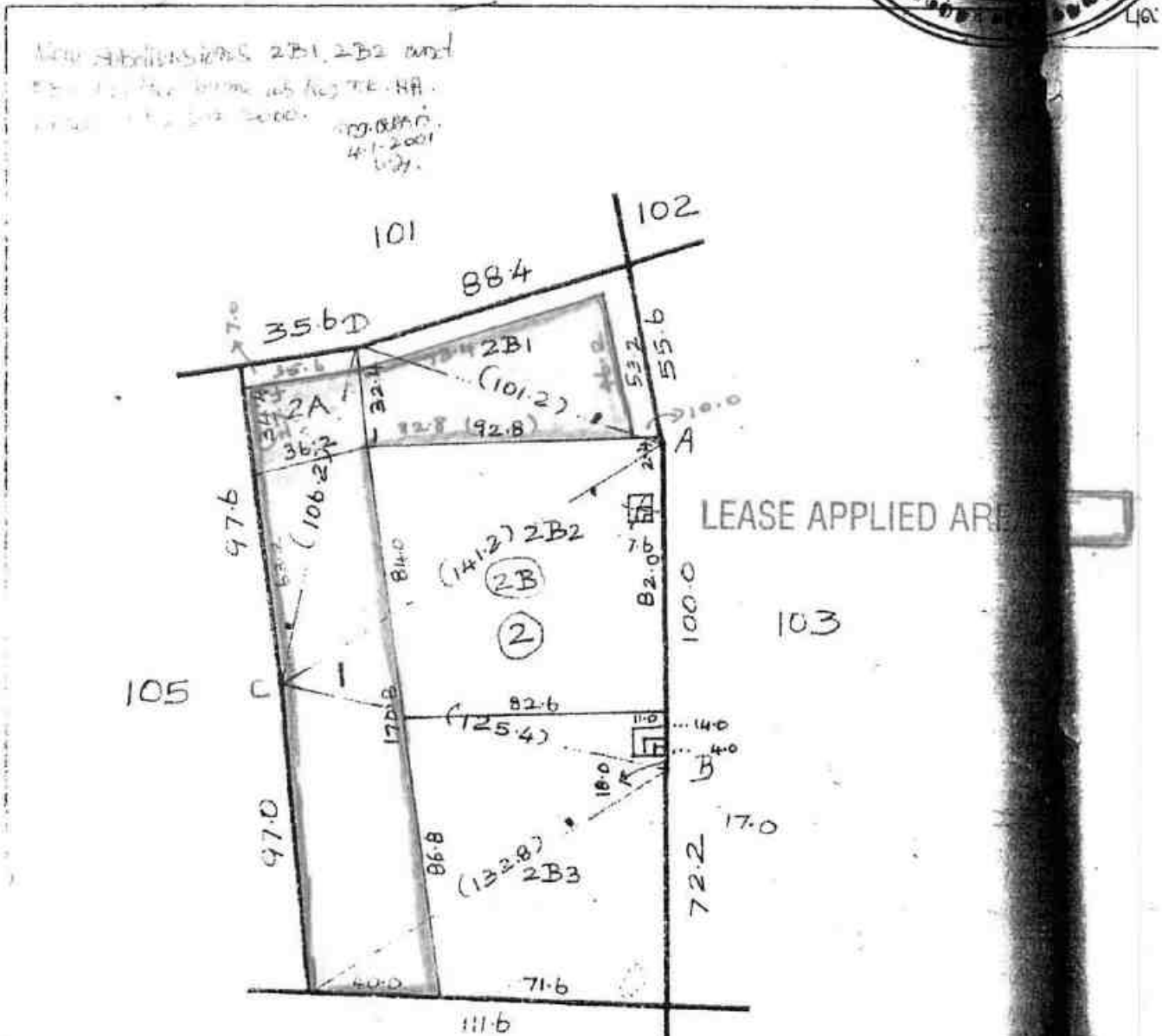
மாவட்டம். தஞ்சை நகராட்சி

வட்டம். கரூர்

புல எண். 104

கிராமம்

பரப்பு: ஹெக்டேர்



	A (100.0)		
	14.0	Line	
	4.0	Line	
	B		
	C (106.2)		
1	108	29.8	
	D		
	(B)		
	(100.0)		
	24.5	3.0	3.0
	15.8	32	32
	A		

SF: 104/1-2 சமீபத்தில் கட்டி வைக்கப்பட்ட பரப்பு: 0.62 ஹெக்டேர்
 SF: 104/2A-2 சமீபத்தில் கட்டி வைக்கப்பட்ட பரப்பு: 0.09 ஹெக்டேர்
 SF: 104/2B1-3 சமீபத்தில் கட்டி வைக்கப்பட்ட பரப்பு: 0.27 ஹெக்டேர்
 New Subdivisions 2A and 2B
 Plotted by me as Per T.K. BA
 40/11410 Dt B. 11.2000
 07.0000
 20.11.2000
 உயி
 New subdivisions 1 and 2
 Plotted by me as Per T.K.
 2A. 48/1408 Dt 22.3.99.
 07.0000
 8.4.99
 H.T.

31/01/15
 கிராம நிர்வாக அலுவலர்
 10. தம்பம் கிராமம்,
 தஞ்சை நகராட்சி வட்டம்,
 தஞ்சை மாவட்டம்

மாவட்ட நிர்வாக அலுவலர்
 மாவட்டம். கரூர்
 புல எண். 104
 பரப்பு: ஹெக்டேர்
 267000 ம²
 P 2259+



KUPPAM (4 PARTS)
PART 2
KARUR TALUK
TIRUCHIRAPPALLI DISTRICT
(Area included in Part 1)
Scale 1 : 5000



No. 9
KUPPAM PART: 4

No. 9
KUPPAM PART 1



No. 35
PUNNAM

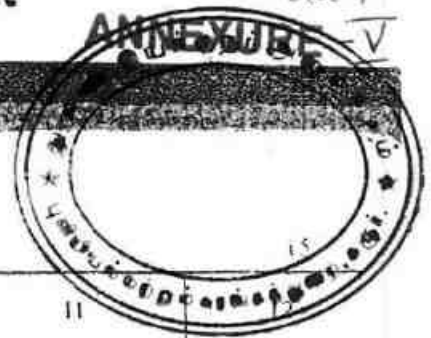
S. No.	Name of decult
108	Thyts Karadu
135	Audipatti
103	Thalairichappatti
116	Kalpalayam
118	Kattar

No. 38
KARUDAITAMPAL PART 1

□ சட்டம் உரிமை சம்பந்தம். தலா: ரூபாய் 2-27-50 ரூபாய் 2 சம்பந்தம்!

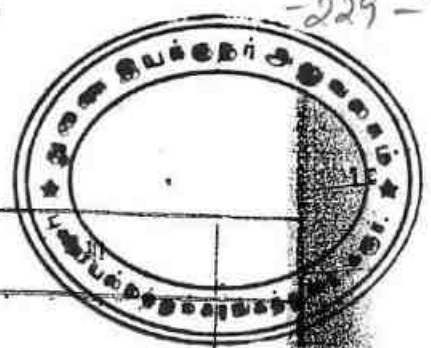
Handwritten signatures and notes in Tamil, including the name 'சுப்பிரமணியன்' and other illegible text.

PCBanni



கி. எண் 9 குப்பம்.

1	2	3	4	5	6	7	8	9	10	11
(28)	92-பா	ர	ய	...	8-3	5	2 00	0 03.0	0 06	429 வீ. முத்துசாமி.
29	-பா	ர	ய	...	8-3	5	2 00	0 05.0	0 16	39 வீ. கத்தசாமி.
(30)	..பா.	ர	ய	...	8-3	5	2 00	0 09.0	0 18	429 வீ. முத்துசாமி
								4 01.5	8 12	
...	93	அ	ய	...	...	...	...	0 43.5	...	..... வண்டிப் பாதை.
...	94	அ	ய	...	...	...	...	0 88.5	...	..... வண்டிப் பாதை.
...	95	ர	ய	...	8-4	6	1 38	4 49.5	6 22	1164 ரா. பிச்சமுத்து கவுண்டர் மற்றும் ஆறு பேர்களும்.*
...	96	ர	ய	...	8-3	5	2 00	4 92.0	9 85	1164 ரா. பிச்சை முத்து கவுண்டர் மற்றும் ஆறு பேர்களும்.*
...	97	அ	ய	...	...	...	...	0 46.0	...	..... வண்டிப் பாதை.
...	98	ர	ய	...	8-4	6	1 38	2 70.0	3 74	955 க. மாரப்ப கவுண்டர் மற்றும் மூன்று பேர்களும்.*
...	99	ர	ய	...	8-4	6	1 38	5 24.5	7 26	1042 க. சுப்ப நாவீதன் மற்றும் தான்கு பேர்களும்.*
...	100	ர	ய	...	8-4	6	1 38	2 36.0	3 26	1109 மா. வேல நாவீதன் மற்றும் ஐந்து பேர்களும்.*
...	101	ர	ய	...	8-3	5	2 00	2 75.0	5 31	1165 கா. துப்புசாமி கவுண்டர் மற்றும் ஆறு பேர்களும்.*
...	102	அ	ய	...	...	...	...	0 26.5	...	..... வண்டிப் பாதை.
...	103	அ	ய	...	...	...	...	0 26.0	...	..... வண்டிப் பாதை.
...	104	ர	ய	...	8-4	6	1 38	2 49.0	3 44	956 ரா. பிச்சை முத்து கவுண்டர் மற்றும் மூன்று பேர்களும்.*



1	2	3	4	5	6	7	8	9	10	
105	105	ர	4	...	8-3	5	2 00	2 62 0	5 24	829 கா. குப்புசாமிக் கவுண்டர் (1); கா. பழனிப்ப கவுண்டர் (2). கா. கருமண கவுண்டர் (3).
106	106	ர	4	...	8-4	6	1 38	4 55-0	6 29	1210 க. செல்ல முத்துக் கவுண்டர் மற்றும் ஏழு பேர்களும்.*
107	107	ர	4	...	8-4	6	1 38	3 39-0	4 69	1166 க. செல்ல முத்துக் கவுண்டர் மற்றும் ஆறு பேர்களும்.*
108	108	ர	4	...	8-4	6	1 38	8 65.0	11 97	831 அங்கமுத்தன் (1), பழனி (2), காணி (3).
109	109	ர	4	...	8-4	6	1 38	4 86.5	6 73	1211 தா. முத்துசாமிக் கவுண்டர் மற்றும் ஏழு பேர்களும்.*
110	110	அ	தி. ஏ. த	...	...	...	...	3 10-0	...	.....
111	111	அ	புற	...	...	...	...	0 22.0	...	.....
112	112	ர	4	...	8-4	6	1 38	5 02-0	6 95	1110 ப. காளியப்ப கவுண்டர் மற்றும் ஐந்து பேர்களும்.*
113	113	அ	புற	...	...	...	...	0 21 0	...	.....
114	114	அ	புற	...	...	...	...	0 22.5	...	.....
115	115	ர	4	...	8-4	6	1 38	2 52.5	3 49	94 ப. காளியப்ப கவுண்டர்.
116	116	ர	4	...	8-4	6	1 38	3 24.5	4 49	627 கா. மாறப்ப கவுண்டர் (1), சி. கருப்பண கவுண்டர் (2).
117	117	ர	4	...	8-4	6	1 38	2 75.0	3 80	1167 தா. முத்துசாமிக் கவுண்டர் மற்றும் ஆறு பேர்களும்.*
118	118	ர	4	...	8-4	6	1 38	0 62.5	0 86	1168 தா. முத்துசாமிக் கவுண்டர் மற்றும் ஆறு பேர்களும்.*

திர்வை
படாத
தடைபு
வண்டிப்
பாதை
வண்டிப்
பாதை

* விளரப்பட்டிருக்கிற பார்ச்சுகளும்.

PG 29/1

சென்னை (2010)
2/1/10
சென்னை (2010)
சென்னை (2010)



தமிழக அரசு

வருவாய்த் துறை

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

மாவட்டம் : கரூர்

வட்டம் : புகளூர்

வருவாய் கிராமம் : குப்பம்

பட்டா எண் : 956

உரிமையாளர்கள் பெயர்

1. தேவராஜ்

மனைவி

சரஸ்வதி

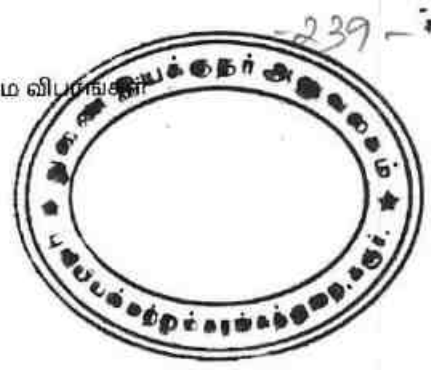


புல எண்	உட்பிரிவு	புன்செய்		நன்செய்		மற்றவை		குறிப்புரைகள்
		பரப்பு	தீர்வை	பரப்பு	தீர்வை	பரப்பு	தீர்வை	
		ஹெக் - ஏர்	ரூ - பை	ஹெக் - ஏர்	ரூ - பை	ஹெக் - ஏர்	ரூ - பை	
104	2B1	0 - 37.50	0.55	--	--	--	--	2019/0103/14/105345- -- -- 01-10-2019
		0 - 37.50	0.55					

குறிப்பு 2 :



- மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் <https://eservices.tn.gov.in> என்ற இணைய தளத்தில் 14/07/018/00956/90830 என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.
- இத் தகவல்கள் 30-06-2022 அன்று 03:53:30 PM நேரத்தில் அச்சடிக்கப்பட்டது.
- கைப்பேசி கேமராவின் 2D barcode படிப்பான் மூலம் படித்து 3G/GPRS வழி இணையதளத்தில் சரிபார்க்கவும்



தமிழக அரசு

வருவாய்த் துறை

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

மாவட்டம் : கரூர்

வட்டம் : புகளூர்

வருவாய் கிராமம் : குப்பம்

பட்டா எண் : 311

உரிமையாளர்கள் பெயர்

1. தேவராஜ்

மனைவி

சரஸ்வதி

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	
104	1	0 - 62.50	0.86	--	--	--	--	---- -- 21-02-2001
105	2	0 - 78.50	1.57	--	--	--	--	---- -- 21-02-2001
		1 - 41.00	2.43					

குறிப்பு2 :



- மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் <https://eservices.tn.gov.in> என்ற இணைய தளத்தில் 14/07/018/00311/30885 என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.
- இத் தகவல்கள் 30-06-2022 அன்று 03:49:58 PM நேரத்தில் அச்சடிக்கப்பட்டது.
- கைப்பேசி கேமராவின் 2D barcode படிப்பான் மூலம் படித்து 3G/GPRS வழி இணையதளத்தில் சரிபார்க்கவும்

276



தமிழ்நாடு தமிழ்நாடு TAMIL NADU

12 JAN 2019

சென்னை

58AB 317944

P. THIRYAGARAJAN

STAMP VENDOR.

P. NO: 16/94 PARAMATHI

சம்மதக்கடிதம்

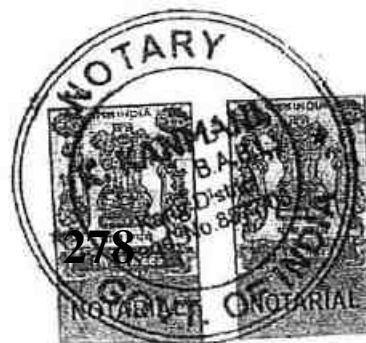
கரூர் மாவட்டம், அரவக்குறிச்சி வட்டம், புன்னம்சத்திரம் அஞ்சல், புள்ளையாம்பாளையம் என்ற முகவரியில் வசிக்கும் தேவராஜ் என்பவரது மனைவி சரஸ்வதி ஆகிய நான் எழுதிக்கொடுக்கும் உறுதிமொழி பத்திரம் என்னவென்றால்.

கரூர் மாவட்டம், அரவக்குறிச்சி வட்டம், குப்பம் கிராமம், புல எண்.104/1, 105/2 (பட்டா எண்.311)ல் 1.41.00 ஹெக்டேர் புஞ்சை நிலம் எனக்கு பாத்தியப்பட்டது. மேற்படி புலத்தில் கரூர் மாவட்டம், அரவக்குறிச்சி வட்டம், புன்னம்சத்திரம் அஞ்சல், புள்ளையாம்பாளையம் என்ற முகவரியில் வசிக்கும் பிச்சைமுத்து அவர்கள் குமாரர் P.தேவராஜ் என்பவருக்கு சாதாரண கற்கள்/கிராவல் வெட்டியெடுக்க அரசு அனுமதி பெற்று ஐந்து வருடங்களுக்கு கல்குவாரி பணி செய்வதற்கு எனக்கு எவ்வித ஆட்சேபணையும் இல்லை என உறுதி அளிக்கிறேன். கல்குவாரி குத்தலுக்கு உரிமம் வழங்க எனது முழு சம்மதத்தை தெரிவித்துக் கொள்கிறேன்.

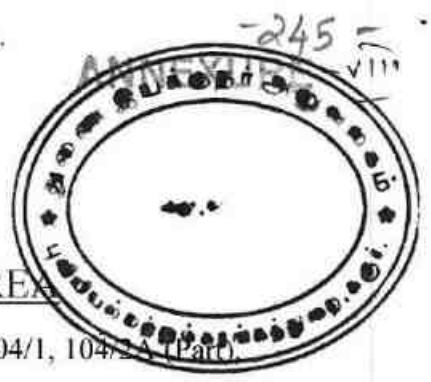
பிரமாணதாரர்.

சரஸ்வதி

08/2/19
Cell: 99944 45789
K. KANMANI, B.A.B.L.
Advocate & Notary Public
Govt. of India-Regd No:6877/08
Pudur, Andan Kovil Post,
KARUR - 639 008. T.N.



PG...



PHOTOCOPY OF THE APPLIED LEASE AREA

Field photos in respect of rough stone and Gravel quarry lease in S.F.No's: 104/1, 104/2A (Part),
104/2B1 (Part), 105/1A (Part) & 105/2 - Patta land – over an extent of 2.27.5 Hectares - Kuppam
Village – Pugalur Taluk - Karur District - Tamil Nadu State belongs to Mr.P.Devaraj





Government of India



தகவல்

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

INFORMATION

- Aadhaar is proof of identity, not of citizenship.
- To establish identity, authenticate online.

ஆதார் நாடு முழுவதிலும் செல்லுபடியாகும்.
வருங்காலத்தில் அரசு மற்றும் அரசு சாரா சேவைகளை பயன்படுத்திக் கொள்ள ஆதார் உதவிகரமாக இருக்கும்.

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Aadhaar will be helpful in availing Government and Non-Government services in future.

2557658



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UNIQUE IDENTIFICATION AUTHORITY OF INDIA

முகவரி:
S/O பிச்சைமுத்து, 3/96,
புள்ளையம் பாளையம்,
புள்ளம், புள்ளம்சத்திரம், கரூர்,
தமிழ்நாடு, 639136

Address:
S/O Pichaimuthu, 3/96,
PULLAYAM PALAYAM,
Punnam, Punnamchattram,
Karur, Tamil Nadu, 639136

1947
14200 180 1947

help@uidai.gov.in

www.uidai.gov.in

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



இந்திய அரசாங்கம்
Unique Identification Authority of India
Government of India

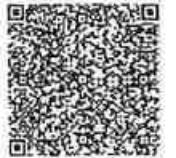
பதிவு அடையாளம் / Enrolment No.: 1189/55870/04366

To
22/12/2011
பி தேவராஜ்
P Devaraj
S/O Pichaimuthu
3/96
PULLAJYAM PALAYAM Punnam
Punnamchattram Karur
Tamil Nadu 639136

2557658



UG025576584IN



உங்கள் ஆதார் எண் / Your Aadhaar No. :

8840 2128 4752

ஆதார் - சாதாரண மனிதனின் அதிகாரம்



भारत सरकार
GOVERNMENT OF INDIA



பி தேவராஜ்
P Devaraj
பிறந்தவகுடம் / Year of Birth : 1952
ஆண்பால் / Male

8840 2128 4752



ஆதார் - சாதாரண மனிதனின் அதிகாரம்



भारत का राजपत्र The Gazette of India

सी.जी.-डी.एल.-अ.-07042022-234960
CG-DL-E-07042022-234960

असाधारण
EXTRAORDINARY

भाग II—खण्ड 3—उप-खण्ड (i)
PART II—Section 3—Sub-section (i)

प्राधिकार से प्रकाशित
PUBLISHED BY AUTHORITY

सं. 272]
No. 272]

नई दिल्ली, बृहस्पतिवार, अप्रैल 7, 2022/चैत्र 17, 1944
NEW DELHI, THURSDAY, APRIL 7, 2022/CHAITRA 17, 1944

खान मंत्रालय

अधिसूचना

नई दिल्ली, 7 अप्रैल, 2022

सा.का.नि. 286(अ).—केंद्रीय सरकार, खान और खनिज (विकास और विनियमन) अधिनियम, 1957 (1957 का 67) की धारा 4 की उपधारा (1) के दूसरे परंतुक द्वारा प्रदत्त शक्तियों का प्रयोग करते हुए और भारतीय गुणवत्ता परिषद् के राष्ट्रीय शिक्षा और प्रशिक्षण प्रत्यायन बोर्ड (क्यूसीआई-एनएवीईटी) द्वारा प्रदत्त प्रत्यायन के परिणामस्वरूप, उक्त अधिनियम की धारा 4 की उपधारा (1) के उक्त दूसरे परंतुक के प्रयोजनों के लिए भारत सरकार के खान मंत्रालय के आदेश संख्या एम.VI-16/15/2021-खान VI, तारीख 12 अगस्त, 2021 (जिसे इसमें इसके पश्चात् प्रत्यायित प्राइवेट खोज अभिकरणों की अधिसूचना के लिए उक्त मार्गदर्शक सिद्धांत कहा गया है) द्वारा जारी किए गए प्रत्यायित प्राइवेट खोज अभिकरणों की अधिसूचना के लिए मार्गदर्शक सिद्धांतों में यथा विनिर्दिष्ट "प्रवर्ग 'ख' खोज अभिकरण" के अधीन मैसर्स जियोटेक्निकल माइनिंग सोल्यूशन्स को अधिसूचित करती है।

2. अभिकरण, प्रत्यायित प्राइवेट खोज अभिकरणों की अधिसूचनाओं के लिए उक्त मार्गदर्शक सिद्धांतों में विनिर्दिष्ट शर्तों की अनुपालना के साथ भावी संक्रियाएं करेगा।

3. यह अधिसूचना राजपत्र में इसके प्रकाशन की तारीख को प्रवृत्त होगी और अधिसूचना की तारीख से तीन वर्ष की अवधि के लिए या उसकी समाप्ति तक या प्रदत्त प्रत्यायन की समाप्ति तक, जो भी पहले हो विधिमान्य होगी।

[फा.सं. एम-VI-16/22/2022-खान VI (भाग 2)]

डॉ. वीणा कुमारी डरमल, संयुक्त सचिव



MINISTRY OF MINES

NOTIFICATION

New Delhi, the 7th April, 2022

G.S.R. 286(E).—In exercise of the powers conferred under the second proviso to sub-section (1) of section 4 of the Mines and Minerals (Development and Regulation) Act, 1957 (67 of 1957) and consequent upon accreditation provided by the National Accreditation Board for Education and Training of the Quality Council of India (QCI-NABET), the Central Government hereby notifies the M/s. Geotechnical Mining Solutions under 'Category B Exploration Agencies' as specified in the guidelines for notification of accredited private exploration agencies issued by the Government of India in the Ministry of Mines vide order no. M.VI-16/15/2021-Mines VI, dated the 12th August, 2021 (hereafter referred to as the said guidelines for notification of accredited private exploration agencies) for the purposes of the said second proviso to sub-section (1) of section 4 of the said Act.

2. The agency shall carry out prospecting operations in compliance with the conditions specified in the said guidelines for notifications of accredited private exploration agencies.
3. This notification shall come into force on the date of its publication in the Official Gazette and shall remain valid for a period of three years from the date of notification or till expiry or termination of the accreditation granted, whichever is earlier.

[F. No. M.VI-16/22/2022-Mines VI (Part 2)]

Dr. VEENA KUMARI DERMAL, Jt. Secy.

P 2015

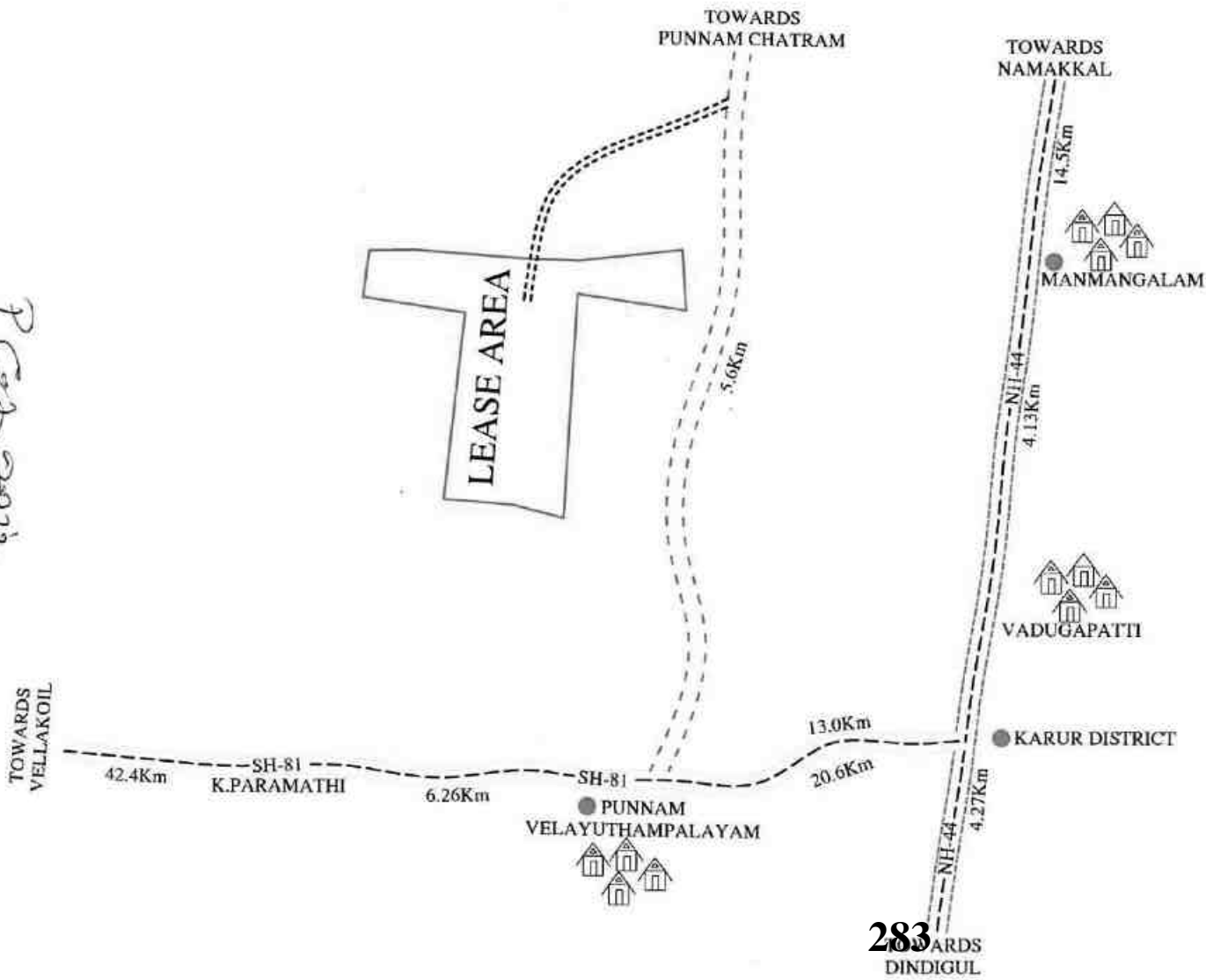
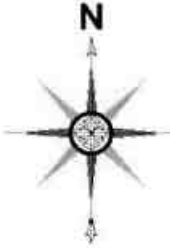


PLATE NO-I

APPLICANT:
 Mr. P.DEVARAJ,
 S/o. Mr.PITCHAIMUTHU,
 3/96, PULLAIYAMPPALAYAM,
 PUNNAMCHATRAM POST,
 PUGALUR TALUK,
 KARUR DISTRICT - 639 136

LEASE APPLIED AREA:
 S.F.NO : 104/1,105/2, 104/2A(PART),
 104/2B1(PART) & ,105/1A(PART)
 EXTENT : 2.27.5Hect,
 VILLAGE : KUPPAM,
 TALUK : PUGALUR,
 DISTRICT : KARUR.

INDEX

MINE LEASE AREA	
APPROACH ROAD	
VILLAGE ROAD	
NH -44 ROAD	
SH -81 ROAD	

KEY MAP

North Scale

Prepared By:

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



GEO TECHNICAL MINING SOLUTIONS
 NABET/APA-MPPA/IA/017

283 TOWARDS DINDIGUL

10° 59'30.32"N

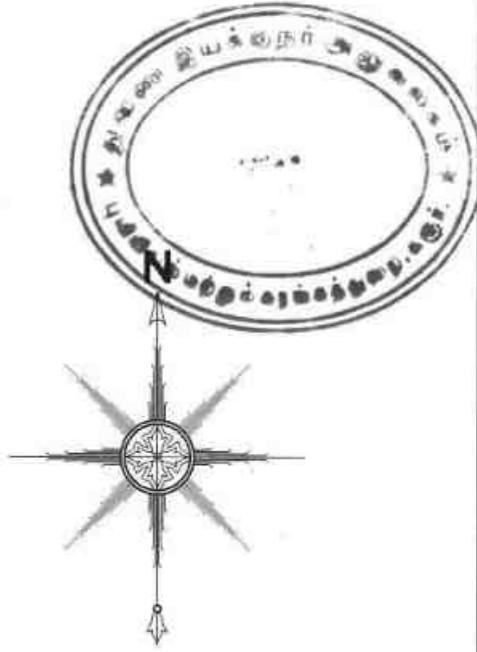
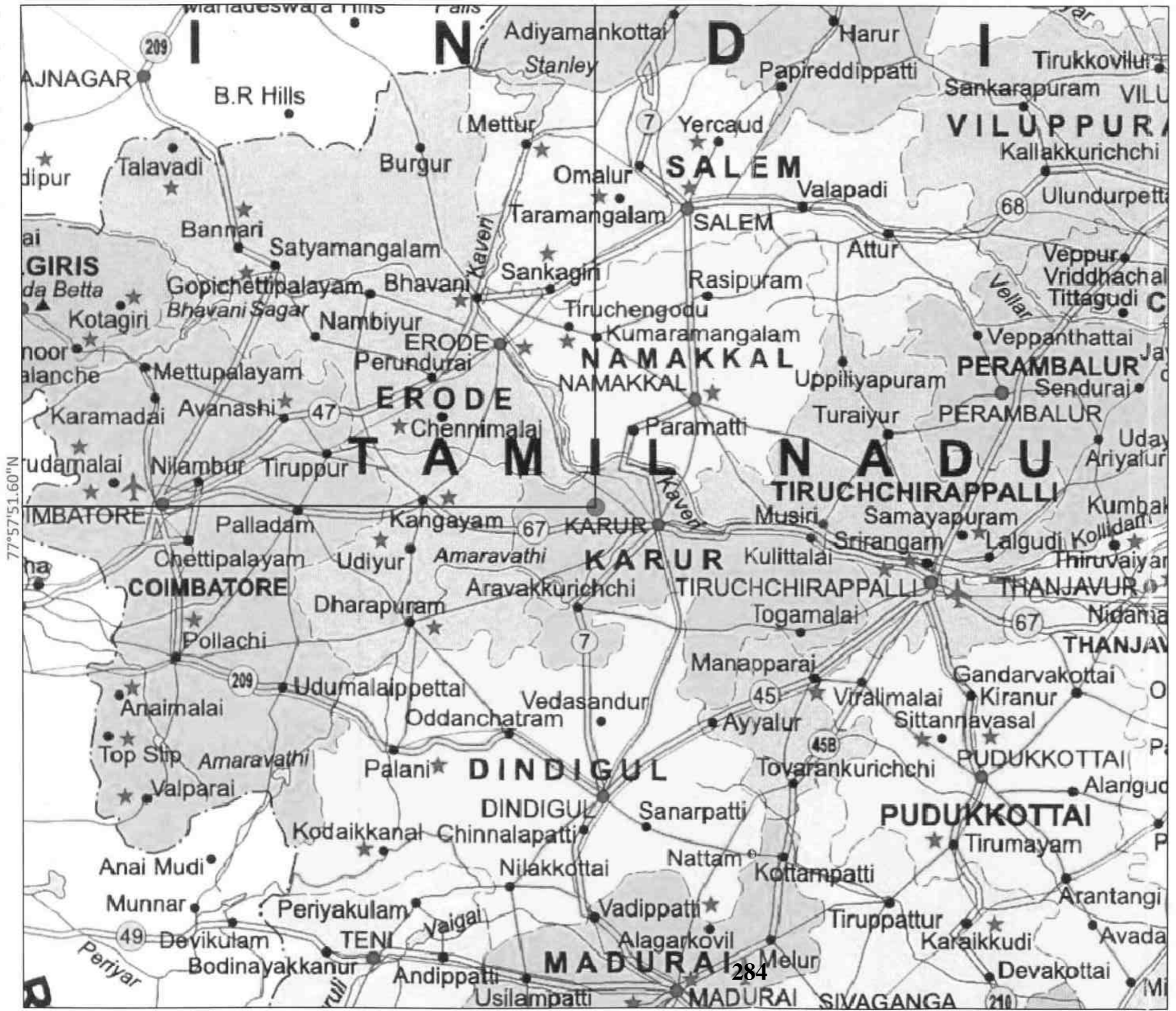


PLATE NO-IA

APPLICANT:
 Mr. P.DEVARAJ,
 S/o. Mr.PITCHAIMUTHU,
 3/96, PULLAIYAMPALAYAM,
 PUNNAMCHATRAM POST,
 PUGALUR TALUK,
 KARUR DISTRICT - 639 136

LEASE APPLIED AREA:
 S.F.NO : 104/1,105/2, 104/2A(PART),
 104/2B1(PART) & ,105/1A(PART)
 EXTENT : 2.27.5Hect,
 VILLAGE : KUPPAM,
 TALUK : PUGALUR,
 DISTRICT : KARUR.

INDEX

MINE LEASE AREA: ●
 TOPO SHEET NO : 58-F/13
 LATITUDE : 10°59'23.69"N to 10°59'30.32"N
 LONGITUDE: 77°57'51.60"E to 77°57'59.63"N

LOCATION PLAN

NOT TO SCALE

Prepared By:

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 HAS BEEN CHECKED BY ME AND IS CORRECT
 TO THE BEST OF MY KNOWLEDGE

GEO TECHNICAL MINING SOLUTIONS
 NABET/APA-MPPA/IA/017

P. 220/17

10° 59'30.32"N

TOWARDS
PUNNAM CHATRAM

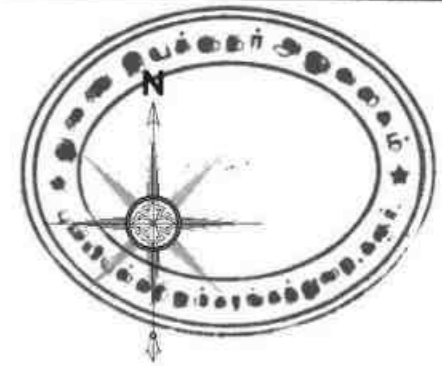





PLATE NO-IC

APPLICANT:
Mr. P.DEVARAJ,
S/o. Mr.PITCHAIMUTHU,
3/96, PULLAIYAMPALAYAM,
PUNNAMCHATRAM POST,
PUGALUR TALUK,
KARUR DISTRICT - 639 136

LEASE APPLIED AREA:
S.F.NO : 104/1,105/2, 104/2A(PART),
104/2B1(PART) & .105/1A(PART)
EXTENT : 2.27.5Hect,
VILLAGE : KUPPAM,
TALUK : PUGALUR,
DISTRICT : KARUR.

INDEX

- MINE LEASE AREA 
- SAFETY DISTANCE 
- APPROACH ROAD 
- VILLAGE ROAD 
- 300m RADIUS 
- 500m RADIUS 
- EXISTING QUARRY PIT 

TOPO SHEET NO : 58-F/13
LATITUDE : 10°59'23.69"N to 10°59'30.32"N
LONGITUDE: 77°57'51.60"E to 77°57'59.63"N

SATELLITE IMAGERY MAP
SCALE- 1:5000

Prepared By:

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TO THE BEST OF MY KNOWLEDGE

GEO TECHNICAL MINING SOLUTIONS
NABET/APA-MPPA/IA/017



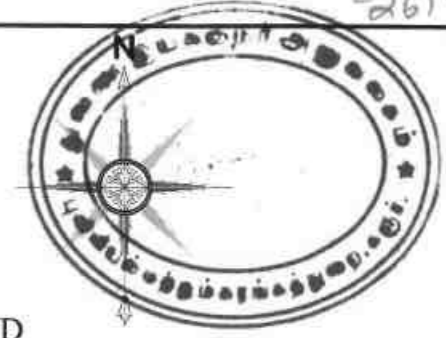
77°57'51.60"N

TOWARDS
MELAPPALAYAM

TOWARDS
VALLIPURAM

TOWARDS
KALIPALAYAM

P. Devaraj



OCTOBER TO DECEMBER

10° 59'30.32"N TOWARDS PUNNAM CHATRAM

77°57'51.60"E

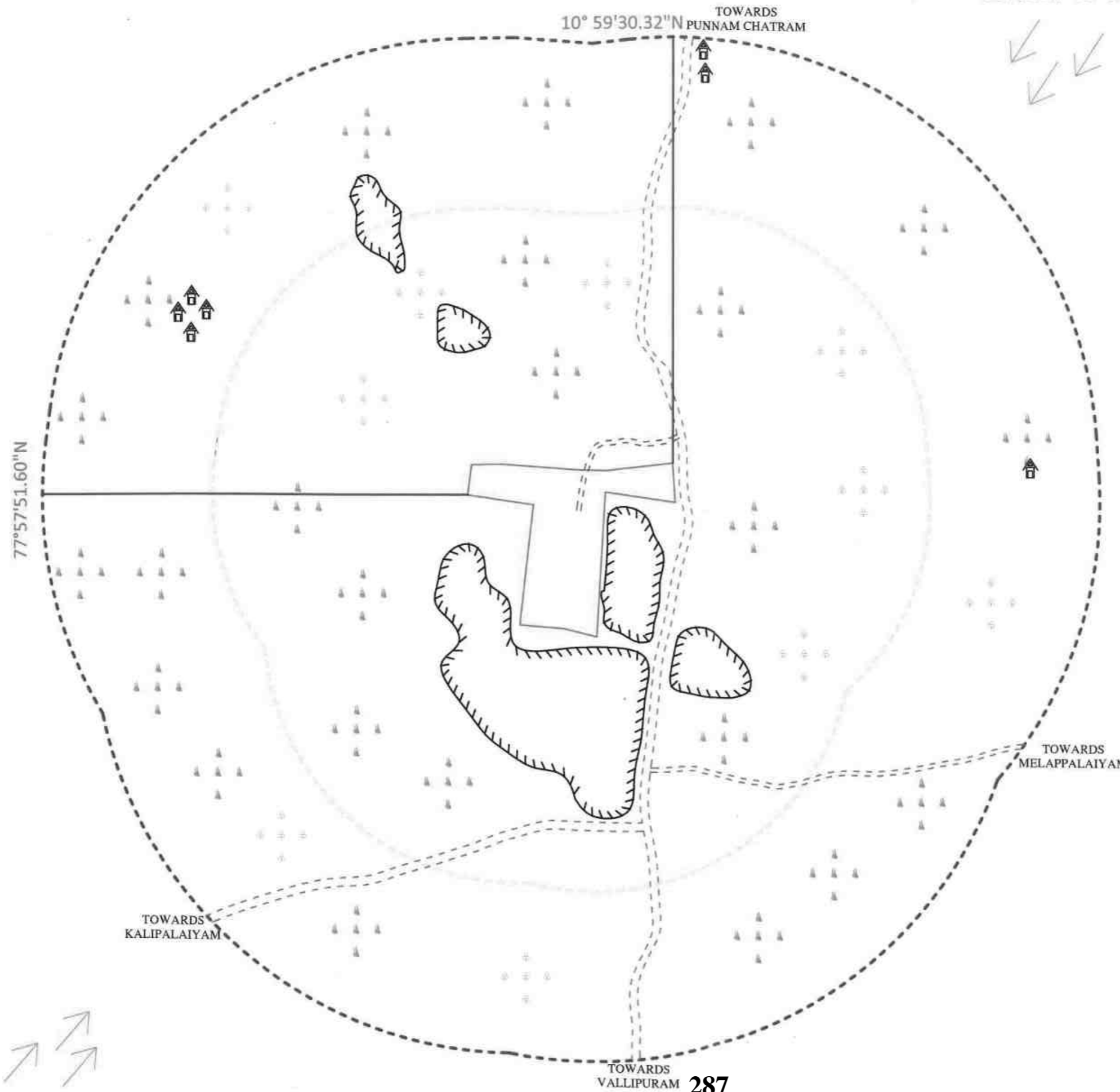


PLATE NO-ID

APPLICANT:
Mr. P.DEVARAJ,
S/o. Mr.PITCHAIMUTHU,
3/96, PULLAIYAMPALAYAM,
PUNNAMCHATRAM POST,
PUGALUR TALUK,
KARUR DISTRICT - 639 136

LEASE APPLIED AREA:
S.F.NO : 104/1,105/2, 104/2A(PART),
104/2B1(PART) & ,105/1A(PART)
EXTENT : 2.27.5Hect,
VILLAGE : KUPPAM,
TALUK : PUGALUR,
DISTRICT : KARUR.

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MINE LEASE AREA	
SAFETY DISTANCE	
APPROACH ROAD	
CART ROAD	
VILLAGE ROAD	
300m RADIUS	
500m RADIUS	
EXISTING QUARRY PIT	
HABITATIONS	
TREES	
SHRUB	

TOPO SHEET NO : 58-F/13
LATITUDE : 10°59'23.69"N to 10°59'30.32"N
LONGITUDE: 77°57'51.60"E to 77°57'59.63"N

ENVIRONMENTAL PLAN

SCALE- 1:5000

Prepared By:

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

GEO TECHNICAL MINING SOLUTIONS
NABET/APA-MPPA/IA/017

JULY TO SEPTEMBER

P. Rajan

TOWARDS VALLIPURAM 287

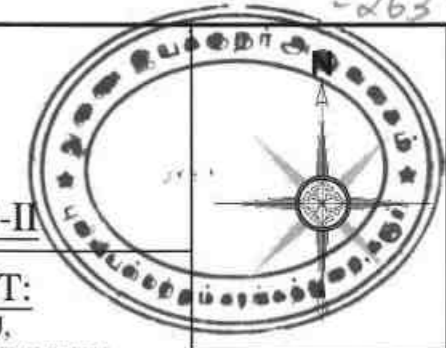


PLATE NO-II

APPLICANT:
 Mr. P.DEVARAJ,
 S/o. Mr.PITCHAIMUTHU,
 3/96, PULLAIYAMPPALAYAM,
 PUNNAMCHATRAM POST,
 PUGALUR TALUK,
 KARUR DISTRICT - 639 136

LEASE APPLIED AREA:
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 104/2B1(PART) & ,105/1A(PART)
EXTENT : 2.27.5Hect,
VILLAGE : KUPPAM,
TALUK : PUGALUR,
DISTRICT : KARUR.

INDEX

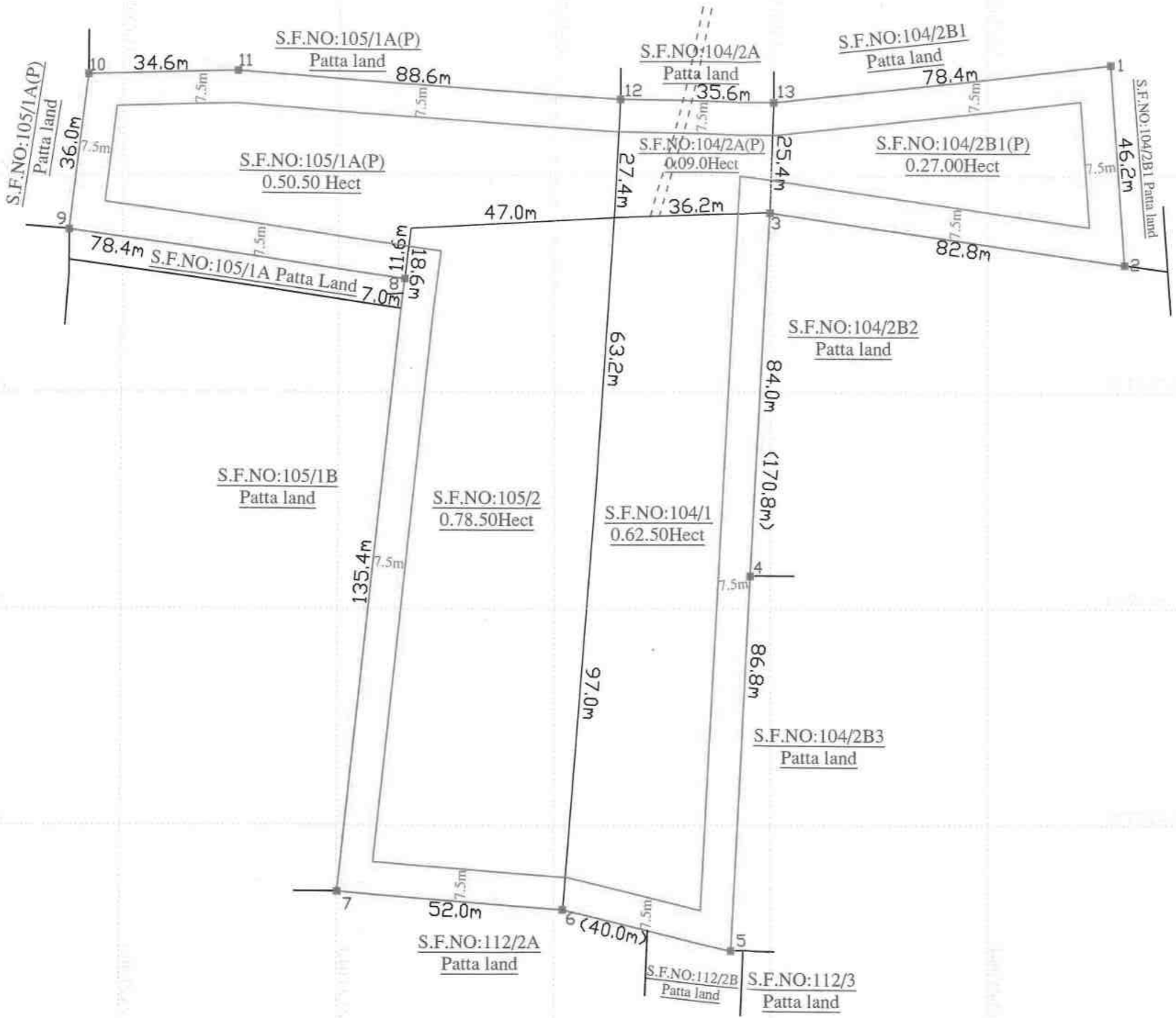
- MINE LEASE AREA
- SAFETY BOUNDARY
- APPROACH ROAD
- PILLAR STONES

PILLAR ID	LATITUDE	LONGITUDE
1	10°59'30.32"N	77°57'59.54"E
2	10°59'28.82"N	77°57'59.63"E
3	10°59'29.23"N	77°57'56.94"E
4	10°59'23.69"N	77°57'56.59"E
5	10°59'24.01"N	77°57'55.31"E
6	10°59'24.16"N	77°57'53.61"E
7	10°59'28.54"N	77°57'54.12"E
8	10°59'28.76"N	77°57'54.15"E
9	10°59'29.15"N	77°57'51.60"E
10	10°59'30.31"N	77°57'51.76"E
11	10°59'30.32"N	77°57'52.90"E
12	10°59'30.09"N	77°57'55.80"E
13	10°59'30.06"N	77°57'56.94"E

MINE LEASE PLAN
 SCALE 1: 1000

Prepared By:
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 TO THE BEST OF MY KNOWLEDGE

 GEO TECHNICAL MINING SOLUTIONS
 NABET/APA-MPPA/IA/017



P. Chinn

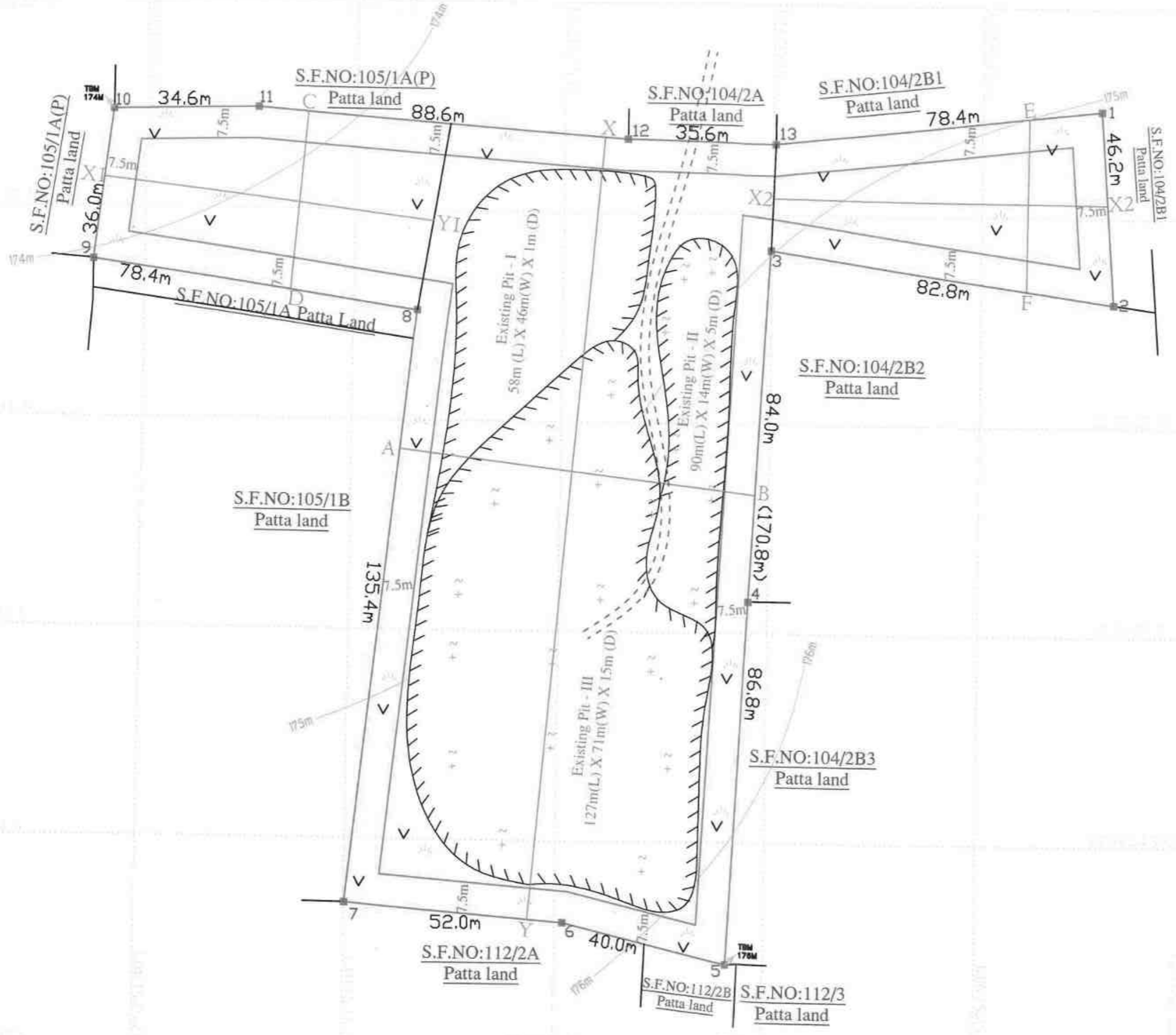
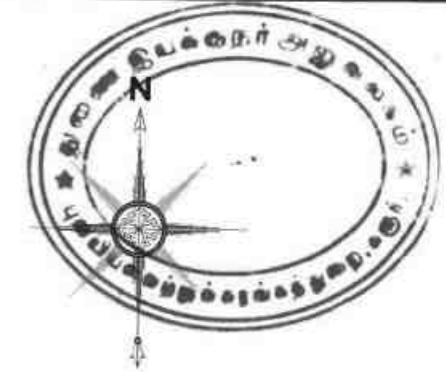


PLATE NO-III

APPLICANT:
 Mr. P.DEVARAJ,
 S/o. Mr.PITCHAIMUTHU,
 3/96, PULLAIYAMPALAYAM,
 PUNNAMCHATRAM POST,
 PUGALUR TALUK,
 KARUR DISTRICT - 639 136

LEASE APPLIED AREA:
 S.F.NO : 104/1,105/2, 104/2A(PART),
 104/2B1(PART) & ,105/1A(PART)
EXTENT : 2.27.5Hect,
VILLAGE : KUPPAM,
TALUK : PUGALUR,
DISTRICT : KARUR.

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MINE LEASE AREA	
SAFETY BOUNDARY	
APPROACH ROAD	
PILLAR STONES	
TEMPORARY BENCH MARK	
CONTOUR LINES	
GRAVEL	
SHRUBS	
EXISTING PIT	
ROUGH STONE	

SURFACE & GEOLOGICAL PLAN
 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

GEO TECHNICAL MINING SOLUTIONS
 NABET/APA-MPPA/IA/017

P 25/11

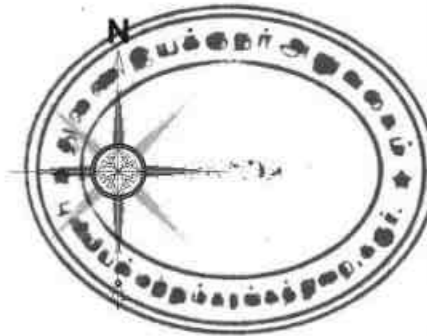


PLATE NO-IV

APPLICANT:
 Mr. P.DEVARAJ,
 S/o. Mr.PITCHAIMUTHU,
 3/96, PULLAIYAMPPALAYAM,
 PUNNAMCHATRAM POST,
 PUGALUR TALUK,
 KARUR DISTRICT - 639 136

LEASE APPLIED AREA:
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 104/2B1(PART) & ,105/1A(PART)
 EXTENT : 2.27.5Hect,
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 TALUK : PUGALUR,
 DISTRICT : KARUR.

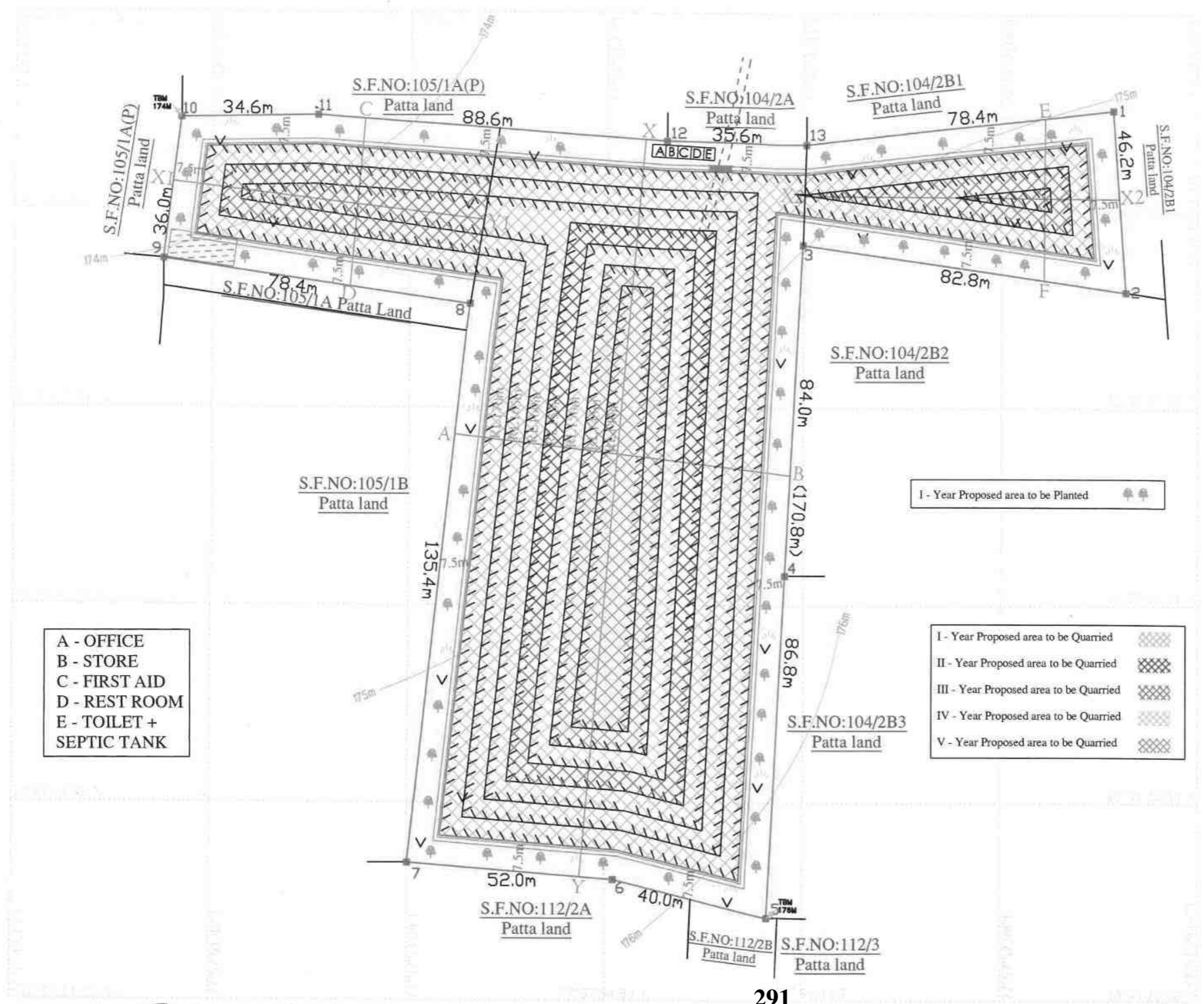
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MINE LEASE AREA	
SAFETY BOUNDARY	
APPROACH ROAD	
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CONTOUR LINES	
GRAVEL	
SHRUBS	
PROPOSED BENCH	
CULVERT	
DRAINAGE & SETTLING TANK	

YEARWISE DEVELOPMENT & PRODUCTION 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

 GEO TECHNICAL MINING SOLUTIONS
 NABET/APA-MPPA/IA/017

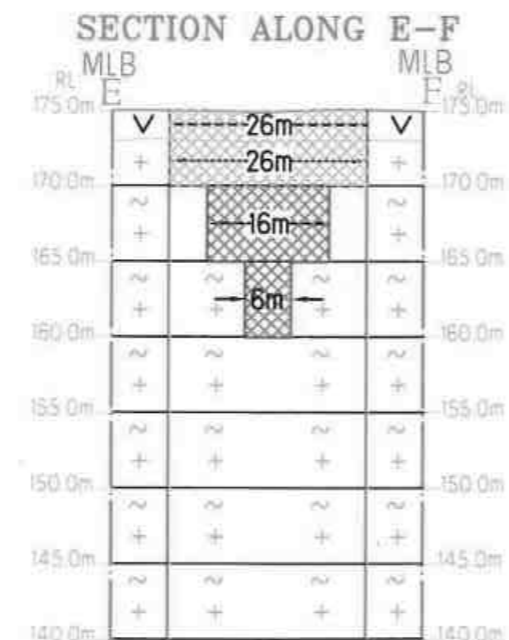
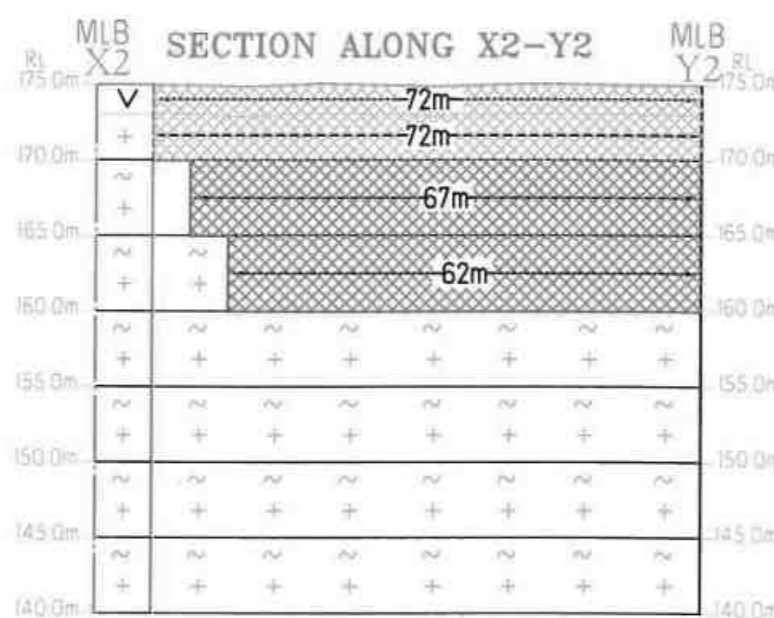
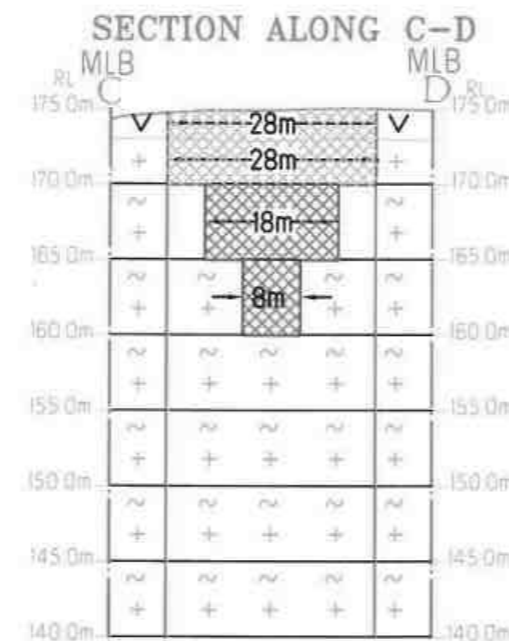
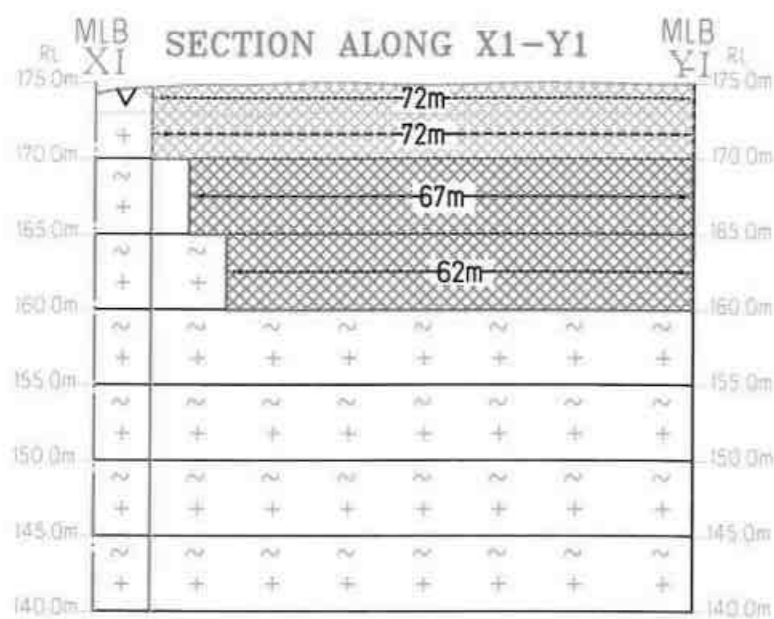
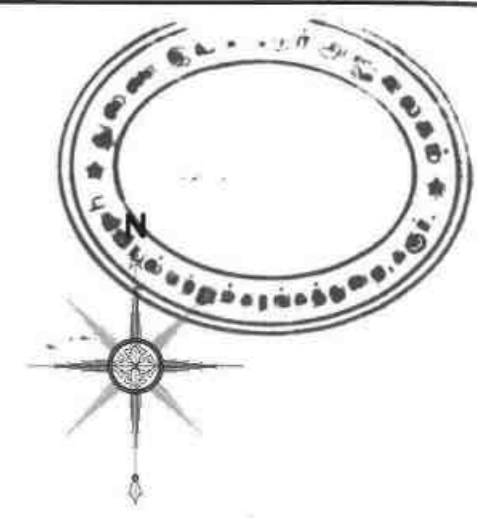
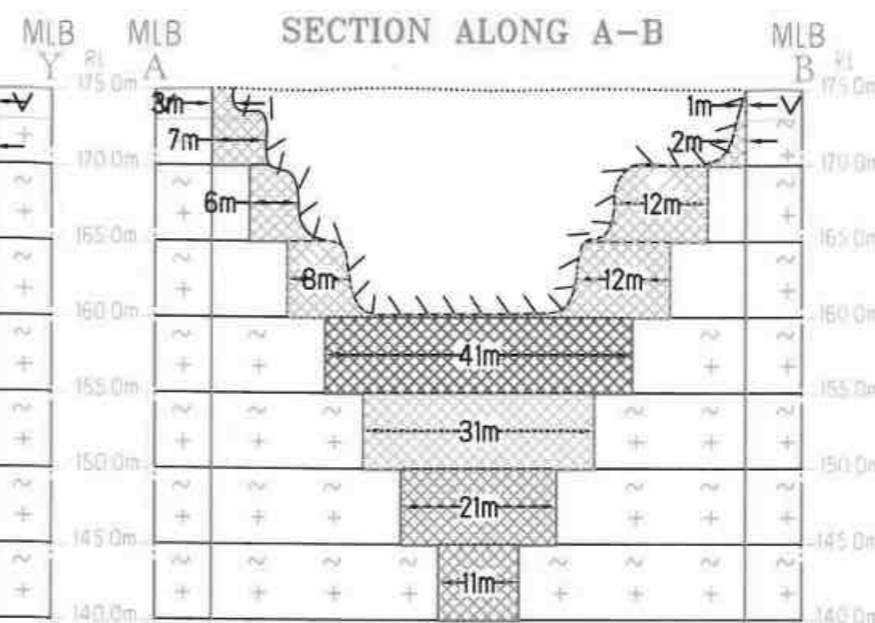
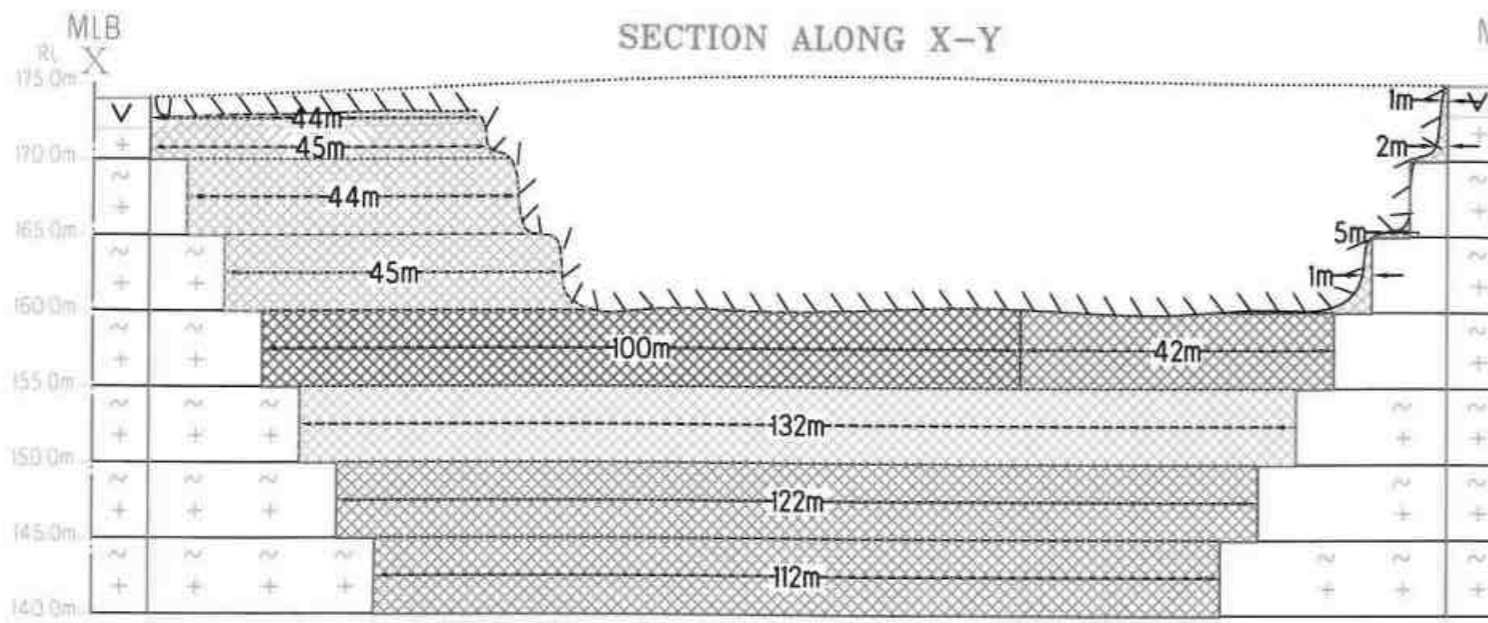


A - OFFICE
 B - STORE
 C - FIRST AID
 D - REST ROOM
 E - TOILET + SEPTIC TANK

I - Year Proposed area to be Planted

I - Year Proposed area to be Quarried
 II - Year Proposed area to be Quarried
 III - Year Proposed area to be Quarried
 IV - Year Proposed area to be Quarried
 V - Year Proposed area to be Quarried

P. G. S. 2017



YEARWISE PRODUCTIONS								
Year	Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume In CBM	Production in CBM	Gravel in CBM
I-YEAR	XY-AB	I	45	4	2	360	.....	360
		I	47	9	3	1269	1269	.....
		II	49	18	5	4410	4410	.....
	X1Y1-CD	I	72	28	2	4032	.....	4032
		I	72	28	3	6048	6048	.....
X2Y2-EF	I	72	26	2	3744	.....	3744	
	I	72	26	3	5616	5616	.....
TOTAL						30079	21943	8136
II-YEAR	XY-AB	I	100	41	5	20500	20500	.....
TOTAL						20500	20500	0
III-YEAR	XY-AB	IV	42	41	5	8610	8610	.....
		II	67	18	5	6030	6030	.....
	X1Y1-CD	III	62	8	5	2480	2480	.....
		II	67	16	5	5360	5360	.....
X2Y2-EF	III	62	6	5	1860	1860	.....
	TOTAL						24340	24340	0
IV-YEAR	XY-AB	V	132	31	5	20460	20460	.....
TOTAL						20460	20460	0
V-YEAR	XY-AB	VI	122	21	5	12810	12810	.....
		VII	112	11	5	6160	6160	.....
TOTAL						18970	18970	0
GRAND TOTAL						114349	106213	8136

- I - Year Proposed area to be Quarried
- II - Year Proposed area to be Quarried
- III - Year Proposed area to be Quarried
- IV - Year Proposed area to be Quarried
- V - Year Proposed area to be Quarried

PLATE NO-IVA

APPLICANT:
 Mr. P.DEVARAJ,
 S/o. Mr.PITCHAIMUTHU,
 3/96, PULLAIYAMPALAYAM,
 PUNNAMCHATRAM POST,
 PUGALUR TALUK,
 KARUR DISTRICT - 639 136

LEASE APPLIED AREA:
 S.F.NO : 104/1,105/2, 104/2A(PART),
 104/2B1(PART) & ,105/1A(PART)
 EXTENT : 2.27.5Hect,
 VILLAGE : KUPPAM,
 TALUK : PUGALUR,
 DISTRICT : KARUR.

INDEX

- MINE LEASE AREA
- SAFETY BOUNDARY
- GRAVEL
- ROUGH STONE
- EXISTING PIT
- PROPOSED BENCH

YEARWISE DEVELOPMENT & PRODUCTION SECTIONS
 SECTION HOR 1 : 1000 & VER 1: 500

Prepared By:

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GEO TECHNICAL MINING SOLUTIONS
 NABET/APA-MPPA/IA/017

P. G. Srinivasan

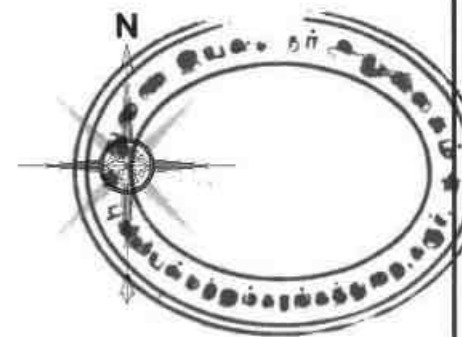


PLATE NO-V

APPLICANT:
 Mr. P.DEVARAJ,
 S/o. Mr.PITCHAIMUTHU,
 3/96, PULLAIYAMPPALAYAM,
 PUNNAMCHATRAM POST,
 PUGALUR TALUK,
 KARUR DISTRICT - 639 136

LEASE APPLIED AREA:
 S.F.NO : 104/1,105/2, 104/2A(PART),
 104/2B1(PART) & ,105/1A(PART)
 EXTENT : 2.27.5Hect,
 VILLAGE : KUPPAM,
 TALUK : PUGALUR,
 DISTRICT : KARUR.

INDEX

- MINE LEASE AREA
- SAFETY BOUNDARY
- APPROACH ROAD
- PILLAR STONES
- TEMPORARY BENCH MARK
- CONTOUR LINES
- GRAVEL
- SHRUBS
- PROPOSED BENCH
- CULVERT
- DRAINAGE & SETTLING TANK

**MINE LAYOUT PLAN AND
 LAND USE PATTERN
 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

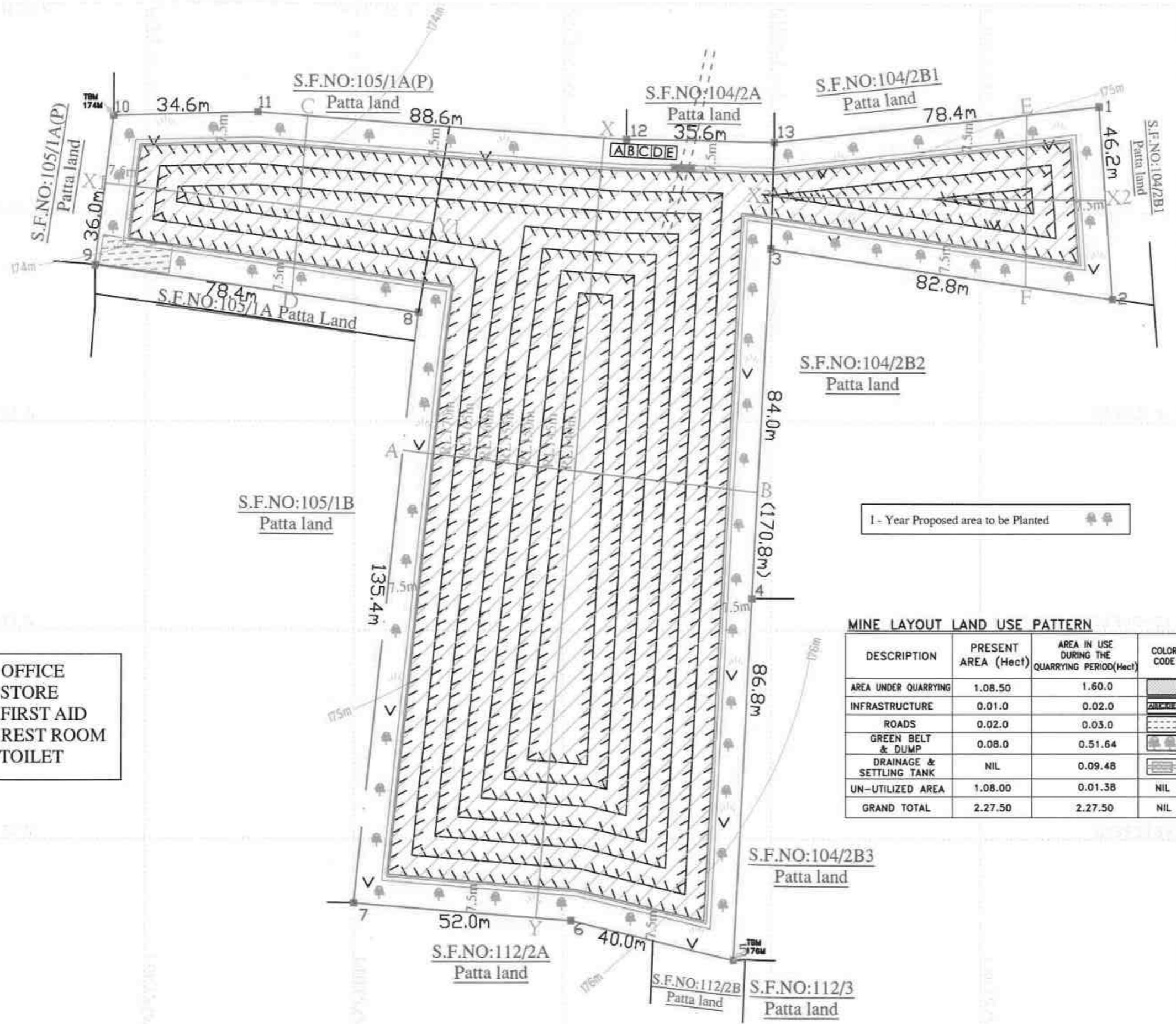
 GEO TECHNICAL MINING SOLUTIONS
 NABET/APA-MPPA/IA/017

- A - OFFICE
- B - STORE
- C - FIRST AID
- D - REST ROOM
- E - TOILET

MINE LAYOUT LAND USE PATTERN

DESCRIPTION	PRESENT AREA (Hect)	AREA IN USE DURING THE QUARRYING PERIOD(Hect)	COLOR CODE
AREA UNDER QUARRYING	1.08.50	1.60.0	
INFRASTRUCTURE	0.01.0	0.02.0	
ROADS	0.02.0	0.03.0	
GREEN BELT & DUMP	0.08.0	0.51.64	
DRAINAGE & SETTLING TANK	NIL	0.09.48	
UN-UTILIZED AREA	1.08.00	0.01.38	NIL
GRAND TOTAL	2.27.50	2.27.50	NIL

1 - Year Proposed area to be Planted



P. G. S. 2017

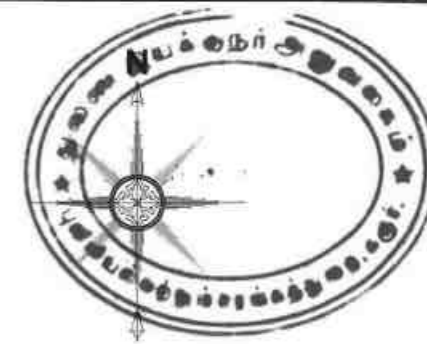


PLATE NO-VI

APPLICANT:

Mr. P.DEVARAJ,
S/o. Mr.PITCHAIMUTHU,
3/96, PULLAIYAMPPALAYAM,
PUNNAMCHATRAM POST,
PUGALUR TALUK,
KARUR DISTRICT - 639 136

LEASE APPLIED AREA:

S.F.NO : 104/1,105/2, 104/2A(PART),
104/2B1(PART) & ,105/1A(PART)
EXTENT : 2.27.5Hect,
VILLAGE : KUPPAM,
TALUK : PUGALUR,
DISTRICT : KARUR.

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CONTOUR LINES	
GRAVEL	
SHRUBS	
ULTIMATE BENCH	
CULVERT	
DRAINAGE & SETTLING TANK	

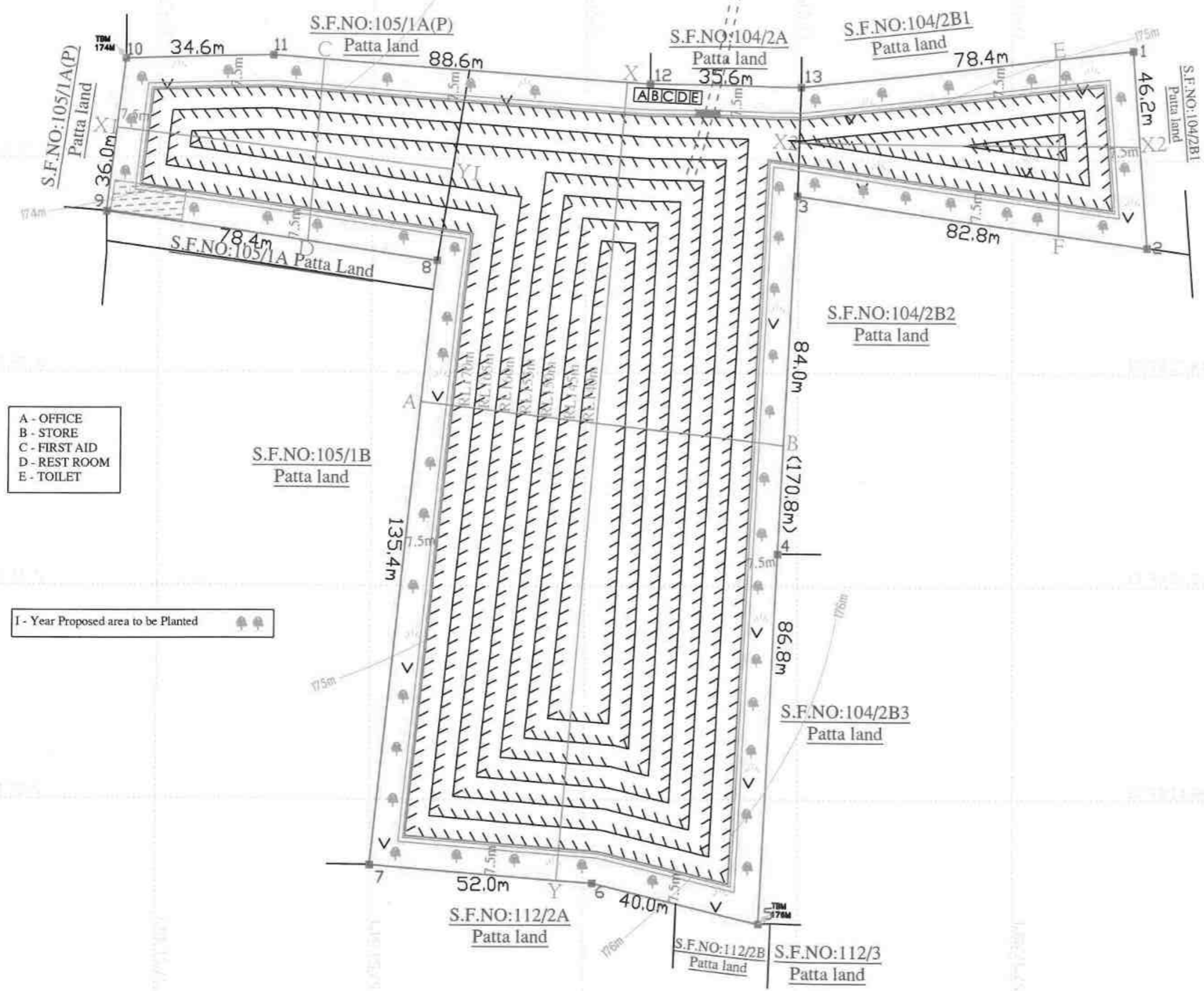
CONCEPTUAL PLAN

SCALE 1 : 1000

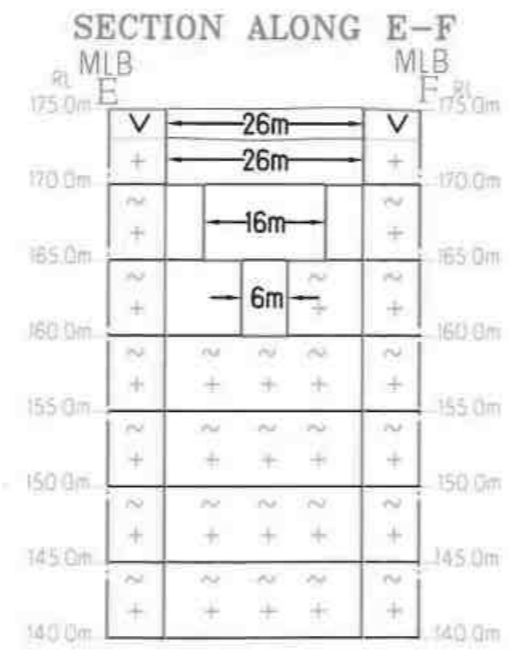
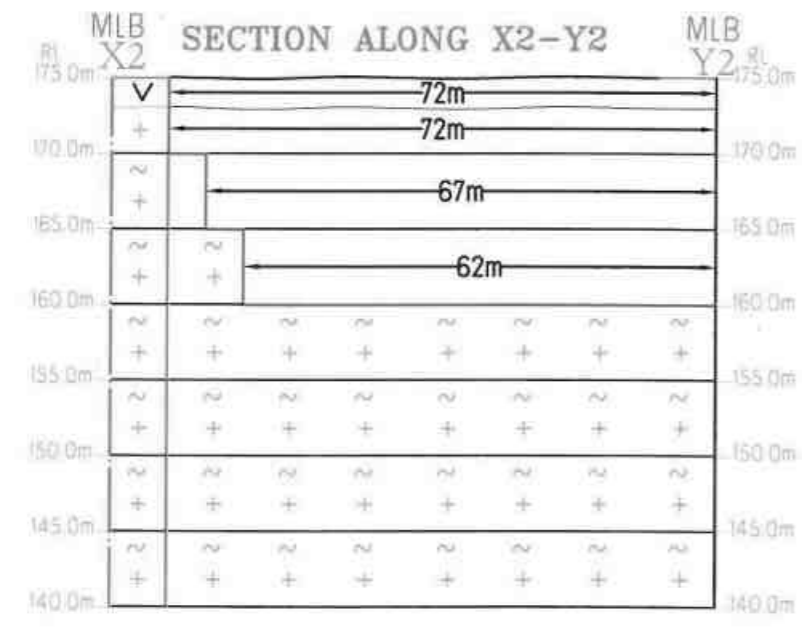
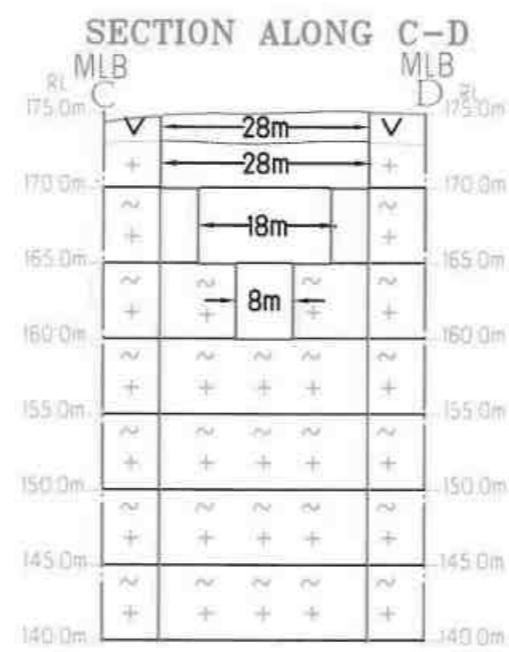
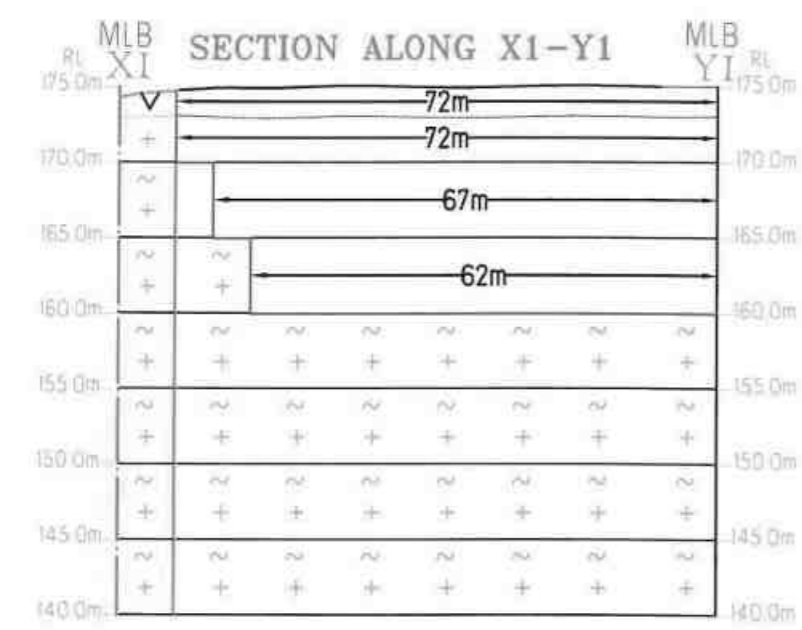
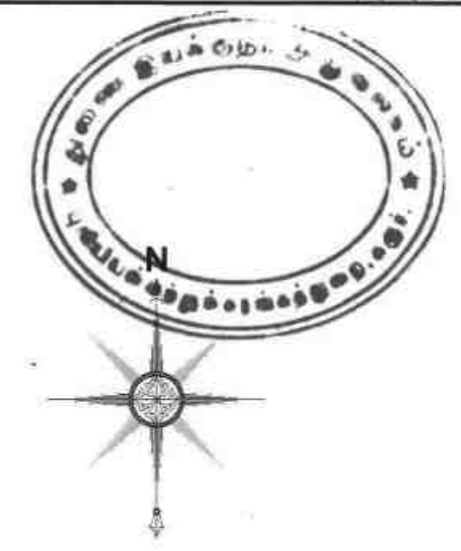
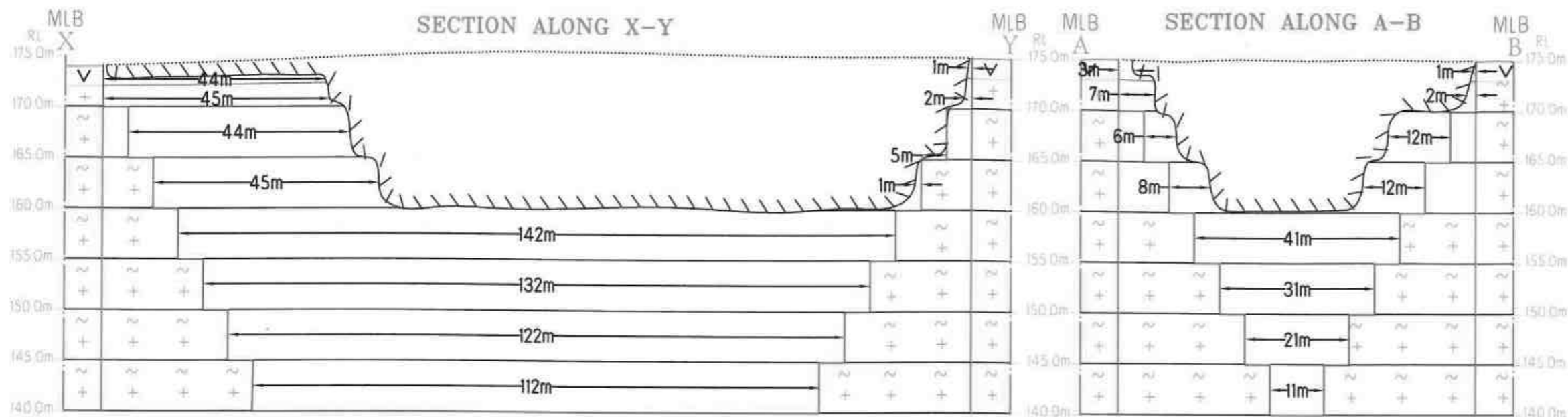
Prepared By:

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

GEO TECHNICAL MINING SOLUTIONS
NABET/APA-MPPA/IA/017



P. G. ...



MINEABLE RESERVES							
Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume In CBM	Mineable Reserves in CBM	Gravel in CBM
XY-AB	I	45	4	2	360	.....	360
	I	47	9	3	1269	1269	.....
	II	49	18	5	4410	4410	.....
	III	46	20	5	4600	4600	.....
	IV	142	41	5	29110	29110	.....
	V	132	31	5	20460	20460	.....
	VI	122	21	5	12810	12810	.....
VI	112	11	5	6160	6160	.....
TOTAL				35	79179	78819	360
X1Y1-CD	I	72	28	2	4032	.....	4032
	I	72	28	3	6048	6048	.....
	II	67	18	5	6030	6030	.....
	III	62	8	5	2480	2480	.....
TOTAL				15	18590	14558	4032
X2Y2-EF	I	72	26	2	3744	.....	3744
	I	72	26	3	5616	5616	.....
	II	67	16	5	5360	5360	.....
	III	62	6	5	1860	1860	.....
TOTAL				15	16580	12836	3744
GRAND TOTAL					114349	106213	8136

PLATE NO-VIA

APPLICANT:
Mr. P.DEVARAJ,
S/o. Mr.PITCHAIMUTHU,
3/96, PULLAIYAMPALAYAM,
PUNNAMCHATRAM POST,
PUGALUR TALUK,
KARUR DISTRICT - 639 136

LEASE APPLIED AREA:
S.F.NO : 104/1,105/2, 104/2A(PART),
104/2B1(PART) & ,105/1A(PART)
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VILLAGE : KUPPAM,
TALUK : PUGALUR,
DISTRICT : KARUR.

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- MINE LEASE AREA
- SAFETY BOUNDARY
- GRAVEL
- ROUGH STONE
- EXISTING PIT
- ULTIMATE BENCH

CONCEPTUAL SECTIONS
SECTION HOR 1 : 1000 & VER 1 : 500

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HAS BEEN CHECKED BY ME AND IS CORRECT
TO THE BEST OF MY KNOWLEDGE

GEO TECHNICAL MINING SOLUTIONS
NABET/APA-MPPA/IA/017

P. G. Srinivasan

From
Dr.P.Jayapal M.Sc., Ph.D.,
Deputy Director,
Geology and Mining,
Karur.

To
Thiru.P.Devaraj,
S/o.Pitchaimuthu,
Pullaiyampalayam,
Punnamchatram Post,
Pugalur Taluk,
Karur District.

Rc.No.743/Mines/2019, Dated:16.11.2022

Sir,

Sub: Mines and Minerals - Minor Mineral - Karur District - Pugalur Taluk - Kuppam Village - S.F.Nos.104/1 (0.62.50 hect.), 104/2A(Part) 0.09.00 hect.), 104/2B1(Part) 0.27.0 hect., 105/1A(Part) 0.50.50 hect., and 105/2 (0.78.50 hect., Over an extant 2.27.50 hectares - Quarry lease application for Rough Stone and Gravel - Preferred by Thiru.P.Devaraj - Precise area communicated - mining plan submitted for approval - Approved - Regarding.

- Ref: 1. Quarry lease application for Rough stone and Gravel preferred by Thiru.P.Devaraj, S/o.Pitchaimuthu, Pullaiyampalayam, Punnamchatram Post, Pugalur Taluk, Karur District - dated: 10.12.2019.
2. Order of the Hon'ble Supreme Court of India in I.A.Nos.12-13/2011 in SLP (C) No.19628-19629/2009, dt: 27.02.2012.
3. Government of India, Ministry of Environment and Forest Office Memorandum, Dated:18.05.2012.
4. The Chairman, State Level Environment Impact Assessment Authority, Tamil Nadu D.O.Lr.No.SEIAA-TN/Minor Minerals/2012, Dated: 17.09.2012.
5. The Commissioner of Geology and Mining, Chennai letter Rc.No.3868/LC/2012, dt: 19.11.2012.
6. Deputy Director, Geology and Mining, Karur Notice Rc.No.743/Mines/2019, Dated: 15.09.2022.
7. Mining Plan submitted by Thiru.P.Devaraj letter Dated: 29.09.2022.

Thiru.P.Devaraj applied for quarry lease to quarry Rough Stone and Gravel vide in the reference 1st cited and Precise area communicated to the applicant regarding to submit the mining plan for approval as per rule 41 and also submit the Environmental Clearance as per Rule 42 of Tamil Nadu Minor Mineral Concession Rules

Accordingly Thiru.P.Devaraj have submitted three copies of draft mining plan for approval in respect of Rough stone and Gravel quarry

lease applied areas, over an extent of 2.27.50 hectares of patta lands in S.F.Nos.104/1 (0.62.50 hect.), 104/2A(Part) 0.09.00 hect., 104/2B1(Part) 0.27.0 hect., 105/1A(Part) 0.50.50 hect., and 105/2 (0.78.50 hect., of Kuppam Village, Pugalur Taluk, Karur District in the reference 7th cited.


The above submitted mining plan for the grant of Rough stone and Gravel quarry lease in S.F.Nos.104/1 (0.62.50 hect.), 104/2A(Part) 0.09.00 hect.), 104/2B1(Part) 0.27.0 hect., 105/1A(Part) 0.50.50 hect., and 105/2 (0.78.50 hect., Over an extant 2.27.50 hectares of patta lands in Kuppam Village, Pugalur Taluk, Karur District has been examined in detail.

As per the guidelines/ instructions issued by the Commissioner of Geology and Mining, Chennai vide letter Rc.No.3868/LC/2012, date: 19.11.2012., the mining plan submitted by the applicant 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) Act, 1957; 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) Minor Mineral Concession and Development Rules, 2010 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, Karur notice in Rc.No.743/Mines/2019, Dated:15.09.2022 the following conditions are incorporated in the Mining Plan plates.

1. விண்ணப்ப புலத்திற்கு வடக்கில் 80 மீட்டர் தொலைவில் 1 பண்ணை வீடு உள்ளது. மேற்படி பண்ணை வீட்டின் உரிமையாளர் பண்ணை வீட்டிற்கு பாதிப்பின்றி குவாரிப்பணி செய்ய சம்மத கடிதம் அளித்துள்ளார். எனவே மேற்படி வீட்டிற்கு எவ்வித பாதிப்பமின்றி குவாரிப்பணி செய்ய வேண்டும்.
 2. விண்ணப்ப புலத்திற்கு அருகில் உள்ள பட்டா நிலங்களுக்கு 7.5 மீட்டர் மற்றும் புறம்போக்கு நிலத்திற்கு 10 மீட்டர் பாதுகாப்பு இடைவெளி விட்டு யாதொரு சேதமுமின்றி முறையாக குவாரிப்பணி செய்ய வேண்டும்.
 3. குத்தகைக்காலத்தில் கைத்துளைப்பான் கருவி கொண்டு பாறைகளை துளையிட்டும், மிதமான வெடிபொருள் பயன்படுத்தியும், பொதுமக்களுக்கோ, பொது சொத்துக்களுக்கோ யாதொரு சேதமுமின்றி விதிமுறைகளின்படி குவாரிப்பணி செய்ய வேண்டும்.
 4. குவாரித் தொழிலாளர்களின் பாதுகாப்பினை உறுதி செய்ய Mettaliferrous Mines, விதிகளின்படி அகலமானதும், பாதுகாப்பானதுமான Benches அமைத்து பாதுகாப்பான முறையில் குவாரிக்குள் வாகனங்கள் சென்றுவரவும் மற்றும் குவாரி தொழிலாளர்களின் பாதுகாப்பினை உறுதி செய்தும் குவாரிப்பணி செய்ய வேண்டும்.
 5. குவாரி குத்தகை வழங்க ஏதுவாக துணை இயக்குநர் (சுரங்கம்) அவர்களால் ஏற்பளிக்கப்பட்ட சுரங்கத்திட்டத்தினையும், மாநில அளவிலான சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையத்தின் (SEIAA) அனுமதி பெற்று மாவட்ட நிர்வாகத்திற்கு விண்ணப்பதாரரால் சமர்ப்பிக்கப்பட வேண்டும்.
- (V) Quarrying shall be done as per the approved Mining Plan and that 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.
- (VI) If anything is found to be concealed as required by the Mines Act in the contents of the Mining Plan and the proposal for rectification has not been made, the approval shall be deemed to have been withdrawn with immediate effect.

Encl: Two copies of Approved Mining Plan.


Deputy Director,
Geology and Mining,
Karur.

Copy to:
GEO Technical Mining Solutions,
No.1/213-B Ground Floor,
Natesan Complex,
Oddapatti, Collectorate Post Office,
Dharmapuri - 636 705.


16/11/2022

கீரம் மாவட்டம், புகளூர் வட்டம்,
 கிராமம், புலவாண்கள் 104/1, 105/2,
 105/1A (பஞ்ச), 104/2B1 (பஞ்ச) 104/2A (பஞ்ச) ஆகியவை
 -கரின் மொத்த வர்த்திப்பை ரூ. 2,27.5 ஏக்கர்
 பிளத்தித் தவாரி குடிநீரை உரிமம் கோரியுள்ள
 பிச்சைக்கு மகன் சுவராஜ் ராஜ்யவாஜ்
 சேரியு புலத்தை கீரம் 300 கட்டிப் சற்றளவிற்குள்ள
 கிராம குடிநீர், அங்கீகரிக்கப்பட விடாமலாக்கப்படுவதாக
 ஏஜன்ட் கமிட்டி ராஜ்யம், கீரம் ஒன்றி உரிமம்
 ராஜ்யம் எதுவாகியும் உரிமம் கீரம்.

H
 23/11/2022
 கிராம நிர்வாக அலுவலர்
 18, குப்பம் கிராமம்
 புகளூர் வட்டம்
 கீரம் மாவட்டம்

ந.க.எண்.3316/2022 வ

மாவட்ட வன அலுவலகம்.

கரூர் வனக்கோட்டம்.

கரூர்.

நாள்.03.10.2022

பொருள் : கனிமம் - கல்குவாரி - கரூர் மாவட்டம், புகளூர் வட்டம், குப்பம் கிராமத்தில் உள்ள கல்குவாரிக்கும் காப்புக்காடு பகுதிக்கும் இடைப்பட்ட தூர விபரங்களை தெரிவித்தல் - தொடர்பாக.

- பார்வை : 1. திரு.பி.தேவராஜ் த/பெ.பிச்சைமுத்து. கரூர் கடித எண்.இல்லை நாள்.29.09.2022
2. வனச்சரக அலுவலர், கரூர் வனச்சரகம் கடித எண்.144/2022 நாள்.03.10.2022

பார்வை 1-ல் காணும் கடிதத்தில் கரூர் மாவட்டம், புகளூர் வட்டம், குப்பம் கிராம புல எண்கள்.104/1, 104/2A(பகுதி), 104/2B1(பகுதி), 105/1A(பகுதி) மற்றும் 105/2-ல் 2.27.50 எக்டேர் பரப்பளவில் திரு.பி.தேவராஜ் த/பெ.பிச்சைமுத்து என்பவரின் கல்குவாரியை அமைக்க மாநில சுற்றுச்சூழல் ஆணையத்திற்கு விண்ணப்பித்துள்ளதால், மேற்படி கல்குவாரியின் புலத்திலிருந்து 25 கி.மீ சுற்றளவுக்குள் உள்ள காப்புக்காடுகளின் விபரங்களை தெரிவிக்குமாறும் கோரப்பட்டது.

அதன்படி மேற்படி இடமானது கரூர் வனச்சரக அலுவலரால் களத்தணிக்கை செய்யப்பட்டு பார்வை 2-ல் கண்டவாறு சமர்ப்பித்த அறிக்கையின் படி கரூர் மாவட்டம், புகளூர் வட்டம், குப்பம் கிராம புல எண்கள்.104/1, 104/2A(பகுதி), 104/2B1(பகுதி), 105/1A(பகுதி) மற்றும் 105/2-ல் 2.27.50 எக்டேர் பரப்பளவில் திரு.பி.தேவராஜ் த/பெ.பிச்சைமுத்து என்பவரின் மூலம் அமைக்கப்படவுள்ள கல்குவாரியிலிருந்து 6.97 கிலோமீட்டர் தூரத்தில் தாதம்பாளையம் காப்புக்காடு அமைந்துள்ளது. மேலும் கல்குவாரியின் புலத்திலிருந்து 25 கி.மீ சுற்றளவுக்குள் பாதுகாக்கப்பட்ட வனப்பகுதி, புலிகள் காப்பகம் மற்றும் சரணாலயங்கள் ஏதுமில்லை என தெரிவிக்கப்படுகிறது.

ஓம்/- வி.ஏ.சரவணன்,
மாவட்ட வன அலுவலர்,
கரூர் வனக்கோட்டம்,
கரூர்.

பெறுநர்
திரு.பி.தேவராஜ்,
த/பெ.பிச்சைமுத்து,
புள்ளையாம்பாளையம்,
புன்னம்சத்திரம் அஞ்சல்,
புகளூர் வட்டம்,
கரூர் மாவட்டம்..

// உ.ந.உ.ப //

300
பி.தேவராஜ்

கண்காணிப்பாளர்.
3/10/2022



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

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