

**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-NONFOREST LAND-FRESH QUARRY

CLUSTER EXTENT = 8.16.5 hectares

At

Kariyasandiram Village, Shoolagiri Taluk,

Krishnagiri District, Tamil Nadu State

TOR File No. 12223 and ToR Identification No. TO25B0108TN5784836N Dated:03.07.2025

NAME AND ADDRESS OF THE PROPOSED PROJECT PROPONENT

Name and address	Extent & S.F.No.	Production in m³ & Tons
M/s. Vishnusurya Projects and Infra Hosur Private Limited Agni Business Centre, No.24/46, K.B.Dasan Road,3rd Floor, Alwarpet,Chennai District, Tamil Nadu-600018	3.68.0 ha & S.F. Nos. 3/2C (P), 4/2 (P), 4/5 (P), 4/6 (P), 4/7 & 4/8 (P)	Rough stone 2024440 & 5567210 Gravel 165636 & 331272

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/23-26/RA 0319

Valid till: 31.12.2026

ENVIRONMENTAL LAB

Accuracy Analabs (OPC) Private Limited

NABL Accredited and MoEF notified Laboratory

No. 13E, First Floor, Sathya Nagar,

Dindigul Collectorate,

Dindigul– 624 004

NABL Certificate Number: TC- 15901,

Valid Until: 14/04/2029

Baseline Study Period – March 2025 - May 2025

TERMS OF REFERENCE (ToR) COMPLIANCE

ToR File No.12223

ToR Identification No. TO25B0108TN5784836N, dated. 03/07/2025,

M/s. Vishnusurya Projects and Infra Hosur Private Limited, Rough Stone and Gravel Quarry,

Specific Terms of Reference for (Mining of Minerals)

1.SEIAA Standard Conditions:

S.No	Terms of Reference		Remarks
	Cluster Management Committee		
1.1	1	Cluster Management Committee shall be framed which must include all the proponents in the cluster as members including the existing as well as proposed quarry.	A cluster management committee including all the proponents of the rough stone quarrying projects within the cluster of 500 m radius will be constituted for the effective implementation of green belt development plan, water sprinkling, blasting, etc.
	2	The members must coordinate among themselves for the effective implementation of EMP as committed including Green Belt Development, Water sprinkling, tree plantation, blasting etc.	The members of the cluster management committee will be instructed to carry out EMP in coordination.
	3	The List of members of the committee formed shall be submitted to AD/Mines before the execution of mining lease and the same shall be updated every year to the AD/Mines.	The list of members of the committee formed will be submitted to AD/Mines before the execution of mining lease.
	4	Detailed Operational Plan must be submitted which must include the blasting frequency with respect to the nearby quarry situated in the cluster, the usage of haul roads by the individual quarry in the form of route map and network.	All the information has been discussed in Section 2.6 under Chapter II in the EIA report page 17-25.

5	The committee shall deliberate on risk management plan pertaining to the cluster in a holistic manner especially during natural calamities like intense rain and the mitigation measures considering the inundation of the cluster and evacuation plan.	It will be informed to the committee.
6	The Cluster Management Committee shall form Environmental Policy to practice sustainable mining in a scientific and systematic manner in accordance with the law. The role played by the committee in implementing the environmental policy devised shall be given in detail.	It will be advised to the cluster management committee to practice sustainable mining in a scientific and systematic manner in accordance with the law. The role played by the committee in implementing the environmental policy devised will be given in detail.
7	The committee shall furnish action plan regarding the restoration strategy with respect to the individual quarry falling under the cluster in a holistic manner.	A proper action plan regarding the restoration will be followed by the committee.
8	The committee shall deliberate on the health of the workers/staff involved in the mining as well as the health of the public in the vicinity.	The information on the health of the workers and the local people will be updated periodically.
Agriculture & Agro-Biodiversity		
9	Impact on surrounding agricultural fields around the proposed mining Area.	There shall be negligible air emissions or effluents from the project site. During loading the truck, dust generation will be likely. This shall be a temporary effect and not anticipated to affect the surrounding vegetation significantly, as shown in

			Section 4.6 under Chapter IV in the EIA report page 111-114.
	10	Impact on soil flora & vegetation around the project site.	The details on flora have been provided in Section 3.6.1 under Chapter III in the EIA report page 65-76. There is no schedule I species of animals observed within study area as per Wildlife Protection Act, 1972 and no species falls in vulnerable, endangered or threatened category as per IUCN. There is no endangered red list species found in the study area.
	11	Details of type of vegetations including no. of trees & shrubs within the proposed mining area and. If so, transplantation of such vegetations all along the boundary of the proposed mining area shall committed mentioned in EMP.	Details of vegetation in the lease area have been provided in Section 3.6.1 under Chapter III in the EIA report page 65-76. Details about transplantation of plants have been provided in Section 4.6 under Chapter IV in the EIA report page 111-114.
	12	The Environmental Impact Assessment should study the biodiversity, the natural ecosystem, the soil micro flora, fauna and soil seed banks and suggest measures to maintain the natural Ecosystem.	The ecological details have been provided in Section 3.7 under Chapter III in the EIA report page 81-100 and measures have been provided in Section 4.6 under Chapter IV in the EIA report page 111-114.
	13	Action should specifically suggest for sustainable management of the area and restoration of ecosystem for flow of goods and services.	All the essential environmental protective measures will be followed by the proponent to manage the surrounding environment and restore the ecosystem, as discussed in Chapter IV in the EIA report page 98-117.

	14	The project proponent shall study and furnish the impact of project on plantations in adjoining patta lands, Horticulture, Agriculture and livestock.	The impact of project on the land environment has been discussed in Section 4.1 under Chapter IV in the EIA report page 98.
	Forests		
	15	The project proponent shall detail study on impact of mining on Reserve forests free ranging wildlife.	The project proponent shall do barbed wire fencing work and develop a green belt around the lease area to prevent wildlife from entering the site.
	16	The Environmental Impact Assessment should study impact on forest, vegetation, endemic, vulnerable and endangered indigenous flora and fauna.	The impacts of the project on ecology and biodiversity have been discussed in Section 4.6 under Chapter IV in the EIA report page 111-114.
	17	The Environmental Impact Assessment should study impact on standing trees and the existing trees should be numbered and action suggested for protection.	The impacts of the project on standing trees and the existing trees have been discussed in Section 4.6 under Chapter IV in the EIA report page 111-114.
	18	The Environmental Impact Assessment should study impact on protected areas, Reserve Forests, National Parks, Corridors and Wildlife pathways, near project site.	The protected areas, National Parks, Corridors and Wildlife pathways near project site within 10 km radius has been provided in Table 3.39 under Chapter III in the EIA report page 97.
	Water Environment		
	19	Hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) so as to assess the impacts on the nearby waterbodies due to mining activity. Based on actual monitored data,	The detailed hydro-geology will be submitted in the final EIA report.

	it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided, covering the entire mine lease period.	
20	Erosion Control measures.	Garland drainage structures will be constructed around the lease area to control the erosion, as discussed in Section 4.3 under Chapter IV in the EIA report page 99-100.
21	Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area on the nearby Villages, Water-bodies/ Rivers, & any ecological fragile areas.	The matter has been discussed under Chapter IV in the EIA report page 98-117.
22	The project proponent shall study impact on fish habitats and the food WEB/ food chain in the water body and Reservoir.	An analysis for food chain in aquatic ecosystem has been discussed in Section 3.6 under Chapter III in the EIA report page 65-82.
23	The project proponent shall study and furnish the details on potential fragmentation impact on natural environment, by the activities.	The impacts of the proposed project on the surrounding environment have discussed in Chapter IV in the EIA report page 98-117.
24	The project proponent shall study and furnish the impact on aquatic plants and animals in water bodies and possible scars on the landscape, damages to nearby caves, heritage site, and archaeological sites possible land form changes visual and aesthetic impacts.	The impact of the proposed project on aquatic plants and animals in water bodies has been discussed in Section 4.6 under Chapter IV in the EIA report page 111-114.

	25	The Terms of Reference should specifically study impact on soil health, soil erosion, the soil physical, chemical components and microbial components.	The impact of mining on soil environment has been discussed in Section 4.2 under Chapter IV in the EIA report page 99.
	26	The Environmental Impact Assessment should study on wetlands, water bodies, rivers streams, lakes and farmer sites.	The impacts on water bodies, streams, lakes have been discussed in Section 4.3 under Chapter IV in the EIA report page 99-100.
	27	The EIA shall include the impact of mining activity on the following:	
		a. Hydrothermal / Geothermal effect due to destruction in the Environment.	a. The average geothermal gradient of earth is 25 ⁰ C/km. As the proposed depth of mining is 40m below the local ground level, the temperature will increase by 1 ⁰ C at the depth of mining.
		b. Bio-geochemical processes and its foot prints including environmental stress.	b. No, Bio-geochemical processes and its foot prints including environmental stress are anticipated and at the end of life of mine the proposed quarry shall be left as an artificial reservoir structure and allowed to collect rain water and shall enrich the ecosystem.
		c. Sediment geochemistry in the surface streams	c. The details of sediment geochemistry are discussed in the Table 3.4 under Chapter III in the EIA report page 35-36.
	Energy		

	28	The measures taken to control Noise, Air, Water, Dust Control and steps adopted to efficiently utilise the Energy shall be furnished.	The measures taken to control noise, air, water, and dust have been given under Chapter IV in the EIA report page 98-117.
	Climate Change		
	29	The Environmental Impact Assessment shall study in detail the carbon emission and also suggest the measures to mitigate carbon emission including development of carbon sinks and temperature reduction including control of other emission and climate mitigation activities.	The carbon emission and the measures to mitigate carbon emission have been discussed in Section 4.6 under Chapter IV in the EIA report page 111-114.
	30	The Environmental Impact Assessment should study impact on climate change, temperature rise, pollution and above soil & below soil carbon stock, soil health and physical, chemical & biological soil features.	The matter has been discussed in Chapter IV in the EIA report page 98-117.
	31	Impact of mining on pollution leading to GHGs emissions and the impact of the same on the local livelihood.	There is no emission impact to local livelihood from this quarry project. All the vehicles used for transportation of the quarry materials will be maintained regularly to keep the GHGs emissions within statutory limits.
	Mine Closure Plan		
	32	Detailed Mine Closure Plan covering the entire mine lease period as per precise area communication order issued.	A progressive mine closure plan has been attached with the approved mining plan report in Annexure III. The budget details for the progressive mine closure plan are shown in Table 2.9 under Chapter II in the EIA report page 20.

EMP		
33	Detailed Environment Management Plan along with adaptation, mitigation & remedial strategies covering the entire mine lease period as per precise area communication order issued.	A detailed Environment Management plan has been given under Chapter X in the EIA report page 138-144.
34	The Environmental Impact Assessment should hold detailed study on EMP with budget for green belt development and mine closure plan including disaster management plan.	A detailed Environment Management plan has been given in Tables 10.1 & 10.2 under Chapter X in the EIA report page 139-144.
Risk Assessment		
35	To furnish risk assessment and management plan including anticipated vulnerabilities during operational and post operational phases of Mining.	The risk assessment and management plan for this project has been provided in Section 7.2 under Chapter VII in the EIA report page 124-127.
Disaster Management Plan		
36	To furnish disaster management plan and disaster mitigation measures in regard to all aspects to avoid/reduce vulnerability to hazards & to cope with disaster/unfavorable accidents in & around the proposed mine lease area due to the proposed method of mining activity & its related activities covering the entire mine lease period as per precise area communication order issued.	The disaster management plan for this project has been provided in Section 7.3 under Chapter VII in the EIA report page 127-128.
Others		
37	The project proponent shall furnish VAO certificate with reference to 300m radius regard to approved habitations, schools,	The VAO certificate is attached in the attached in the Annexure IV.

		Archaeological sites, Structures, railway lines, roads, water bodies such as streams, odai, vaari, canal, channel, river, lake pond, tank etc.	
	38	As per the MoEF& CC office memorandum F.No.22-65/2017-IA.III dated: 30.09.2020 and 20.10.2020 the proponent shall address the concerns raised during the public consultation and all the activities proposed shall be part of the Environment Management Plan.	The concerns raised during the public consultation will be submitted in the final EIA report.
	39	The project proponent shall study and furnish the possible pollution due to plastic and microplastic on the environment. The ecological risks and impacts of plastic & microplastics on aquatic environment and fresh water systems due to activities, contemplated during mining may be investigated and reported.	The plastic waste management has been given in Section 7.5 under Chapter VII in the EIA report page 132-133.

2. SEAC Conditions - Site Specific

S.No	Terms of Reference		Remarks
Cluster Management Committee			
2.1	1	A Cluster Management Committee (CMC) shall be constituted including all the mines in the cluster as Committee Members for the effective management of the mining operation in the cluster through systematic & scientific approach with appointment of required statutory personnel, appropriate environmental management, system of maintaining the haul roads and village/panchayat roads, authorized blasting operation, Monitoring system of the environmental & other statutory compliances & its reporting methodology, etc. The PP shall submit the following details in the form of an Affidavit during the EIA appraisal:	

		(a)	Copy of the agreement forming CMC.	The Cluster Management Committee (CMC) regarding following these conditions and same documents will be submitted during the EIA appraisal meeting.
		(b)	The Organisation chart of the Committee with defining the role of the members	
		(c)	The 'Standard Operating Procedures' (SoP) executing the planned activities	
	2	The PP should submit the detailed plan of mining as per systematic and scientific manner considering the topography of the project and the elevation difference		
	3	A drone video providing a 360° view of the entire mining lease area should be submitted.		The Drone video will be submitted in final EIA report.
	4	The structures within the radius of (i) 50 m, (ii) 100 m, (iii) 200 m and (iv) 300 m & upto 1km 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. and spell out the mitigation measures to be proposed for the protection of the above structures, if any during the quarrying operations.		The details of structures up to 1km will be submitted in final EIA report.
	5	The proponent shall furnish photographs of adequate fencing; garland drainage built with siltation tank & green belt along the periphery including replantation of existing trees; maintaining the safety		The photocopy of fencing and garland drainage will be submitted in final EIA report.

		distance between the adjacent quarries & water bodies nearby provided as per the approved mining plan.	
	6	The PP shall ensure the installation of CCTV at the proposed quarry site and ensure its inclusion during the EIA presentation.	The Photocopy of CCTV installation will be submitted in final presentation.

3.SEAC Standard Conditions

S.No	Terms of Reference		Remarks
3.1	1	In the case of existing/operating mines, a letter obtained from the concerned AD (Mines) shall be submitted and it shall include the following:	As it is a fresh quarry, the conditions are not applicable.
		(i) Original pit dimension	
		(ii) Quantity achieved vs EC Approved Quantity	
		(iii) Balance Quantity as per Mineable Reserve calculated.	
		(iv) Mined out Depth as on date Vs EC Permitted depth	
		(v) Details of illegal/illicit mining	
		(vi) Violation in the quarry during the past working.	
		(vii) Quantity of material mined out outside the mine lease area	
		(viii) Condition of Safety zone/ benches	
		(ix) Revised/Modified Mining Plan showing the benches of not exceeding 6 m height and ultimate depth of not exceeding 50m.	
	2	Details of habitations around the proposed mining area and latest VAO certificate	The VAO certificate is attached in Annexure IV.

		regarding the location of habitations within 300m radius from the periphery of the site.	
	3	The proponent is requested to carry out a survey and enumerate on the structures located within the radius of (i) 50 m, (ii) 100 m, (iii) 200 m and (iv) 300 m (v) 500m shall be enumerated with details such as dwelling houses with number of occupants, whether it belongs to the owner (or) not, places of worship, industries, factories, sheds, etc with indicating the owner of the building, nature of construction, age of the building, number of residents, their profession and income, etc.	The map showing the details of structures within the radius of 500m is shown in the Figure 4.3 under Chapter IV in the EIA report page 99-100.
	4	The PP shall submit a detailed hydrological report indicating the impact of proposed quarrying operations on the waterbodies like lake, water tanks, etc are located within 1 km of the proposed quarry.	Detailed hydrological study will be submitted in the final EIA report.
	5	The Proponent shall carry out Bio diversity study through reputed Institution and the same shall be included in EIA Report.	The details of Bio diversity from the reputed institution will be submitted in the final EIA report.
	6	The DFO letter stating that the proximity distance of Reserve Forests, Protected Areas, Sanctuaries, Tiger reserve etc, up to a radius of 25 km from the proposed site.	The DFO letter will be submitted in the final EIA report.
	7	In the case of proposed lease in an existing (or old) quarry where the benches are not formed (or) partially formed as per the approved Mining Plan, the Project Proponent (PP) shall the PP shall carry out the scientific studies to assess the slope stability of the working	As it is a fresh lease area, the Slope Stability report is not required.

		benches to be constructed and existing quarry wall, by involving any one of the reputed Research and Academic Institutions - CSIR-Central Institute of Mining & Fuel Research / Dhanbad, NIRM/Bangalore, Division of Geotechnical Engineering-IIT-Madras, NIT-Dept of Mining Engg, Surathkal, and Anna University Chennai-CEG Campus. The PP shall submit a copy of the aforesaid report indicating the stability status of the quarry wall and possible mitigation measures during the time of appraisal for obtaining the EC.	
	8	However, in case of the fresh/virgin quarries, the Proponent shall submit a conceptual 'Slope Stability Plan' for the proposed quarry during the appraisal while obtaining the EC, when the depth of the working is extended beyond 30 m below ground level.	As it is a fresh lease area, the Slope Stability report is not required.
	9	The PP shall furnish the affidavit stating that the blasting operation in the proposed quarry is carried out by the statutory competent person as per the MMR 1961 such as blaster, mining mate, mine foreman, II/I Class mines manager appointed by the proponent.	The affidavit for blasting will be enclosed in the final EIA report.
	10	The PP shall present a conceptual design for carrying out only controlled blasting operation involving line drilling and muffle blasting in the proposed quarry such that the blast-induced ground vibrations are controlled as well as no fly rock travel beyond 30 m from the blast site.	A conceptual design of blasting has been given in Section 2.6.6 under Chapter II in the EIA report page 24.

	11	The EIA Coordinators shall obtain and furnish the details of quarry/quarries operated by the proponent in the past, either in the same location or elsewhere in the State with video and photographic evidences.	In Tamil Nadu and any other state the proponent has no other quarries.
	12	If the proponent has already carried out the mining activity in the proposed mining lease area after 15.01.2016, then the proponent shall furnish the following details from AD/DD, mines,	
	13	What was the period of the operation and stoppage of the earlier mines with last work permit issued by the AD/DD mines?	As it is a new quarry, the conditions are not applicable.
	14	Quantity of minerals mined out.	
		Highest production achieved in any one year.	
		Detail of approved depth of mining.	
		Actual depth of the mining achieved earlier.	
		Name of the person already mined in that leases area.	
		If EC and CTO already obtained, the copy of the same shall be submitted.	
		Whether the mining was carried out as per the approved mine plan (or EC if issued) with stipulated benches.	
	15	All corner coordinates of the mine lease area, superimposed on a High-Resolution Imagery/Toposheet, topographic sheet, geomorphology, lithology and geology of the mining lease area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological	All corner coordinates of the mine lease area have been superimposed on a high-resolution Google Earth Image, as shown in Figure 2.3 under Chapter II in the EIA report page 11.

		features of the study area (core and buffer zone).	
	16	The PP shall carry out Drone video survey covering the cluster, green belt, fencing, etc.	The drone video will be submitted during final presentation.
	17	The proponent shall furnish photographs of adequate fencing, green belt along the periphery including replantation of existing trees & safety distance between the adjacent quarries & water bodies nearby provided as per the approved mining plan.	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.
	18	The Project Proponent shall provide the details of mineral reserves and mineable reserves, planned production capacity, proposed working methodology with justifications, the anticipated impacts of the mining operations on the surrounding environment, and the remedial measures for the same.	The Resources and Reserves of Rough Stone were calculated based on cross-section method by plotting sections to cover the maximum lease area for the proposed project. The details reserve estimation has been shown in Table 2.3 under Chapter II in the EIA report page 14.
	19	The Project Proponent shall provide the Organization chart indicating the appointment of various statutory officials and other competent persons to be appointed as per the provisions of the Mines Act'1952 and the MMR, 1961 for carrying out the quarrying operations scientifically and systematically in order to ensure safety and to protect the environment.	Details of manpower required for this project have been given in Table 2.14 under Chapter II in the EIA report page 26.
	20	The Project Proponent shall conduct the hydro-geological study considering the contour map of the water table detailing the number of groundwater pumping & open	The hydrogeological study is discussed in the Section 3.3.3 under Chapter III in the EIA report page 44-51.

		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.	
	21	The proponent shall furnish the baseline data for the environmental and ecological parameters with regard to surface water/ground water quality, air quality, soil quality & flora/fauna including traffic/vehicular movement study.	The baseline data were collected for the environmental components including land, soil, water, air, noise, biology, socio-economy, and traffic and the results have been discussed under Chapter III in the EIA report page 28-97.
	22	The Proponent shall carry out the Cumulative impact study due to mining operations carried out in the quarry specifically with reference to the specific environment in terms of soil health, biodiversity, air pollution, water pollution, climate change and flood control & health impacts. Accordingly, the Environment Management plan should be prepared keeping the concerned quarry and the surrounding habitations in the mind.	Results of cumulative impact study due to mining operations are given in Section 7.4 under Chapter VII in the EIA report page 128-132.
	23	Rain water harvesting management with recharging details along with water balance	As part of rainwater harvesting measures, the rain water from garland drainage system will be

		(both monsoon & non-monsoon) be submitted.	diverted to nearby check dams after treating the water in settling tanks. The detailed rain water harvesting report will be submitted in the final EIA report.
	24	Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.	Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features has been discussed in Section 3.1 under Chapter III in the EIA report page 28-33. The details of surrounding sensitive ecological features have been provided in Table 3.39 under Chapter III in the EIA report page 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 in the EIA report page 20.
	25	Details of the land for storage of Overburden/Waste Dumps (or) Rejects outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be provided.	This condition is not applicable to this project because no dumps have been proposed outside the lease area.
	26	Proximity to Areas declared as 'Critically Polluted' (or) the Project areas which attracts	Not Applicable.

		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.	Project area / Study area is not declared in 'Critically Polluted' Area and does not come under 'Aravalli Range.
	27	Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.	As part of rainwater harvesting measures, the rain water from garland drainage system will be diverted to nearby check dams after treating the water in settling tanks.
	28	Impact on local transport infrastructure due to the Project should be indicated.	Details regarding the impact of the project on traffic are given in Section 3.8 under Chapter III in the EIA report page 95-96.
	29	A tree survey study shall be carried out (nos., name of the species, age, diameter etc.,) both within the mining lease applied area & 300m buffer zone and its management during mining activity.	A detailed tree survey was carried out within 300 m radius and the results have been discussed in Section 3.6 under Chapter III in the EIA report page 65-82.
	30	A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific.	A progressive mine closure plan has been attached with the approved mining plan report in Annexure III. The budget details for the progressive mine closure plan are shown in Table 2.9 under Chapter II in the EIA report page 20.
	31	As a part of the study of flora and fauna around the vicinity of the proposed site, the	The EIA coordinator and the FAE for ecology and biodiversity visited

		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 study area and educated the local students about the importance of protecting the biological environment.
	32	The purpose of green belt around the project is to capture the fugitive emissions, carbon sequestration and to attenuate the noise generated, in addition to improving the aesthetics. A wide range of indigenous plant species should be planted as given in the appendix-I in consultation with the DFO, State Agriculture University. The plant species with dense/moderate canopy of native origin should be chosen. Species of small/medium/tall trees alternating with shrubs should be planted in a mixed manner.	A detailed greenbelt development plan has been provided in Section 4.6 under Chapter IV in the EIA report page 111-114.
	33	Taller/one year old Saplings raised in appropriate size of bags; preferably ecofriendly bags should be planted as per the advice of local forest authorities/botanist/Horticulturist with regard to site specific choices. The proponent shall earmark the greenbelt area with GPS coordinates all along the boundary of the project site with at least 3 meters wide and in between blocks in an organized manner.	The FAE of ecology and biodiversity has advised the project proponent that saplings of one year old raised in the eco-friendly bags should be purchased and planted with the spacing of 3m between each plant around the proposed project area as per the advice of local forest authorities/botanist.
	34	A Disaster management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.	A disaster management plan for the project has been provided in Section 7.3 under Chapter VII in the EIA report page 127-128.

	35	A Risk Assessment and management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.	A risk assessment plan for the project has been provided in Section 7.2 under Chapter VII in the EIA report page 124-127.
	36	Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.	Occupational health impacts of the project and preventive measures have been discussed in detail in Section 4.8 under Chapter IV in the EIA report 114-116.
	37	Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.	No public health implications are anticipated due to this project. Details of CSR and CER activities have been discussed in Sections 8.6 and 8.7 under Chapter VIII in the EIA report page 135-136.
	38	The Socio-economic studies should be carried out within a 5 km buffer zone from the mining activity. Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.	No negative impact on socio-economic environment of the study area is anticipated and this project shall benefit the socio-economic environment by offering employment for 29 people directly as discussed in Section 8.1 under Chapter VIII in the EIA report page 134.
	39	Details of litigation pending against the project, if any, with direction /order passed by	No litigation is pending in any court against this project.

		any Court of Law against the Project should be given.	
	40	Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.	The benefits of the project are discussed in the Chapter VIII in the EIA report page 134-136.
	41	If any quarrying operations were carried out in the proposed quarrying site for which now the EC is sought, the Project Proponent shall furnish the detailed compliance to EC conditions given in the previous EC with the site photographs which shall duly be certified by MoEF&CC, Regional Office, Chennai (or) the concerned DEE/TNPCB.	It is fresh lease area and the condition is not applicable.
	42	The PP shall prepare the EMP for the entire life of mine and also furnish the sworn affidavit stating to abide the EMP for the entire life of mine.	A detailed environment management plan has been prepared following the suggestion made by SEAC, as shown in Chapter X in the EIA report page 138-144. The sworn affidavit stating to abide the EMP for the entire life of mine will be submitted in final EIA report.
	43	Concealing any factual information or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this Terms of Conditions besides attracting penal provisions in the Environment (Protection) Act, 1986.	The EIA report has been prepared keeping in mind the fact that concealing any factual information or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may lead to withdrawal of this terms of reference besides attracting penal

		provisions in the Environment (Protection) Act, 1986.
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SEIAA Specific Conditions:

S.No	Terms of Reference	Remarks
4.1	After detailed discussions, the Authority accepts the recommendation of SEAC-I and decided to grant Terms of Reference (ToR) along with Public Hearing for the quantity of 7,96,565 m ³ of rough stone and 1,40,594 m ³ of Gravel up to the depth of 60 m BGL as per the approved mining plan, under cluster for undertaking the combined Environment Impact Assessment Study and preparation of separate Environment Management Plan subject to the conditions as recommended by SEAC-I & normal conditions & the SEIAA Standard conditions.	After the detailed discussions of SEAC, as per the ToR conditions the quantity of production has not exceed.

Standard Terms of Reference for (Mining of minerals)

1.

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

1.2	A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given	The copy of land document is attached in Annexure III.
1.3	All documents including approved mine plan, EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee	All the documents are in the name of the lessee.
1.4	All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery/ toposheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone)	All corner coordinates of the mine lease area have been superimposed on a high-resolution Google Earth Image, as shown in Figure 2.3 under Chapter II, p.11.
1.5	Information should be provided in Survey of India Toposheet in 1:50,000 scale indicating geological map of the area, geomorphology of land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics	Toposheets of Survey of India have been used for showing sampling locations of air, soil, water, and noise, as shown in Chapter III.
1.6	Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority	The lease area was inspected by the officers of Department of Geology along with revenue officials and found that the land is fit for quarrying under the policy of State Government.

1.7	It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating process/procedures to bring into focus any infringement/deviation/ violation of the environmental or forest norms/ conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large, may also be detailed in the EIA Report	The proponent has framed Environmental Policy and the same has been discussed in Section 10.1 under Chapter X, pp.138-139.
1.8	Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided	It is an opencast quarrying operation proposed to operate in Manual method. The Rough Stone formation is a hard, compact and homogeneous body. The height and width of the bench will be maintained as 5m with 90⁰ bench angles. Quarrying activities will be carried out under the supervision of Competent Persons like Mines Manager, Mines Foreman and Mining Mate. Necessary permissions will be obtained from DGMS after obtaining Environmental Clearance.

1.9	The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc. should be for the life of the mine / lease period	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.
1.10	Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given	Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features has been discussed in Section 3.1 under Chapter III, pp.28-33. The details of surrounding sensitive ecological features have been provided in Table 3.39 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.20.
1.11	Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given	It is not applicable as no dumps have been proposed outside the lease area.
1.12	A Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests,	It is not applicable as there is no forest land involved within the proposed project area. The details have been discussed in Table 3.39 under Chapter III, p.97.

	the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the State Expert Appraisal Committees	
1.13	Status of forestry clearance for the broken up area and virgin forestland involved in the Project including deposition of net present value (NPV) and compensatory afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished	It is not applicable as the proposed project area does not involve any forest land.
1.14	Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated	Not Applicable. The project doesn't attract Recognition of Forest Rights Act, 2006 as there are neither forests nor forest dwellers / forest dependent communities in the mine lease area. There shall be no forest impacted families (PF) or people (PP). Thus, the rights of Traditional Forest Dwellers will not be compromised on account of the project.
1.15	The vegetation in the RF / PF areas in the study area, with necessary details, should be given.	No Reserve Forest is found within the study area. The details of reserve forest within 10km have been discussed Table 3.39 under Chapter III, p.97. Flora and Fauna vegetation details are given in section 3.6.1 and 3.6.2 under chapter III, p.65-82.

1.16	A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly, detailed mitigative measures required, should be worked out with cost implications and submitted	There is no any wildlife/protected area from the periphery of the project area. Information regarding wildlife /protected area within 10km has been given in Table 3.39 under Chapter III, p.97. Flora and Fauna vegetation details are given in section 3.6.1 and 3.6.2 under chapter III, p.65-82.
1.17	Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves/ (existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished	The details of National Parks, Biosphere Reserves, Wildlife Corridors, and Tiger/Elephant Reserves within 10 km radius from the periphery of the project area has been given in Table 3.39 under Chapter III, p.97.
1.18	A detailed biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled- I fauna found in the study	A detailed biological study was carried out in both core and buffer zones and the results have been discussed in Section 3.6 under Chapter III, pp.65-82.

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

	In respect of SCs /STs and other weaker sections of the society in the study area, a need based sample survey, family-wise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be clearly brought out whether the village(s) located in the mine lease area will be shifted or not. The issues relating to shifting of village(s) including their R&R and socio-economic aspects should be discussed in the Report	
1.22	One season (non-monsoon) [i.e. March-May (Summer Season); October-December (post monsoon season); December-February (winter season)] primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site- specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least	Baseline data were collected for the period of March 2025 - May 2025 as per CPCB notification and MoEF & CC Guidelines. Primary baseline data and the results have been included in Sections 3.1-3.9 under Chapter III, pp. 28-97.

	one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM ₁₀ , particularly for free silica, should be given	
1.23	Air quality modeling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of mineral. The details of the model used and input parameters used for modeling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map	Air quality modelling for prediction of incremental GLCs of pollutants was carried out using AERMOD view 11.2.0. The model results have been given in Section 4.4 under the Chapter IV, pp.100-104.
1.24	The water requirement for the Project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the Project should be indicated.	The water requirement for the project, its availability and source have been provided in Table 2.11 under Chapter II, p.24.
1.25	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.
1.26	Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided	Part of the working pit will be allowed to collect rain water during the spell of rain. The water thus collected will be used for greenbelt development and dust suppression. The mine closure plan has been prepared for converting the excavated pit into rain water harvesting structure and serve as water reservoir for the project village during draught season.
1.27	Impact of the Project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided	Impact studies and mitigation measures of water environment including surface water and ground water have been discussed in Section 4.3 under Chapter IV, pp. 99-100.
1.28	Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. The Report inter-alia, shall include details of the aquifers present and impact of mining activities on these aquifers. Necessary permission from State Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished	Not Applicable. The ground water table is found at the depth of 80 m below ground level. The ultimate depth of quarry is 60 m BGL. Therefore, the mining activity will not intersect the ground water table. Data regarding the occurrence of groundwater table have been provided in Section 3.3 under Chapter III, pp.38-51.

1.29	Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion proposed, if any, and the impact of the same on the hydrology should be brought out	Not Applicable. There are no streams, seasonal or other water bodies passing within the project area. Therefore, no modification or diversion of water bodies is anticipated.
1.30	Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and bgl. A schematic diagram may also be provided for the same.	The highest elevation of the project area is 885 m AMSL. Ultimate depth of the mine is 60m BGL. Depth to the water level in the area is 80 m BGL.
1.31	A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution	Greenbelt development plan has been given in Section 4.6 under Chapter IV, pp.111-114.
1.32	Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the	Traffic density survey was carried out to analyze the impact of transportation in the study area as per IRC guidelines 1961 and it

	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	is inferred that there is no significant impact due to the proposed transportation from the project area. Details have been provided in Section 3.8 under Chapter III, p.95-96.
1.33	Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.	Infrastructure & other facilities will be provided to the mine workers after the grant of quarry lease and the same has been discussed in Section 2.6.7 under Chapter II, p.24.
1.34	Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report	Progressive mine closure plan has been prepared for this project and is given in Table 2.9 under Section 2.6.5 under Chapter II, p.20.
1.35	Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed	Occupational health impacts of the project and preventive measures have been explained in detail in Section 4.8 under Chapter IV, pp.114-116.

1.36	Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations	No public health implications are anticipated due to this project. Details of CSR and CER activities have been discussed in Sections 8.6 and 8.7 under Chapter VIII, pp.135-136.
1.37	Measures of socio economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation	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 29 people directly as discussed in Section 8.1 under Chapter VIII, p.135.
1.38	Detailed environmental management plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project	A detailed Environment Management Plan has been prepared and provided in Tables 10.1 & 10.2 under Chapter X, pp.139-144.
1.39	Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project	The outcome of public hearing will be submitted during the final EIA report.
1.40	Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given	No litigation is pending in any court against this project.

1.41	The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out	Project Cost is Rs.1,56,49,280/- CER Cost is Rs. 5,00,000/- In order to implement the environmental protection measures, an amount of Rs. 10684411 as capital cost and recurring cost as Rs. 3537702 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 10 years will be Rs. 55181246 as shown in Table 10.1 and 10.2 under Chapter X, pp.139-144.
1.42	A Disaster management Plan shall be prepared and included in the EIA/EMP Report	The disaster management plan for this project has been provided in Section 7.3 under Chapter VII, pp.127-128.
1.43	Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.	Benefits of the project details have been given under Chapter VIII, pp.134-136.
1.44	Besides the above, the below mentioned general points are also to be followed	
a)	All documents to be properly referenced with index and continuous page numbering	All the documents have been properly referenced with index and continuous page numbering
b)	Where data are presented in the Report especially in Tables, the period in which the data were collected and the sources should be indicated	List of tables and source of the data collected have been mentioned.
c)	Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF&CC/NABL	Original Baseline monitoring report will be submitted in final EIA report.

	accredited laboratories. All the original analysis/testing reports should be available during appraisal of the Project.	
d)	Where the documents provided are in a language other than English, an English translation should be provided.	All the documents provided here are in English language.
e)	The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted.	The questionnaire will be submitted in final EIA report.
f)	While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF vide O.M. No. J-11013/41/2006-IA.II(I) dated 4th August, 2009, which are available on the website of this Ministry, should be followed.	Instructions issued by MoEF & CC O.M. No. J-11013/41/2006-IA. II (I) dated 4 th August, 2009 have been followed while preparing the EIA report.
g)	Changes, if any made in the basic scope and project parameters (as submitted in Form-I and the PFR for securing the TOR) should be brought to the attention of MoEF&CC with reasons for such changes and permission should be sought, as the TOR may also have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH again with the revised documentation.	No changes are made in the basic scope and the project parameters.
h)	As per the circular no. J 11011/618/2010-IA.II(I) dated 30.5.2012, certified report of	It is a new lease area, the condition is not applicable.

	the status of compliance of the conditions stipulated in the environment clearance for the existing operations of the project, should be obtained from the Regional Office of Ministry of Environment, Forest and Climate Change, as may be applicable.	
i)	The EIA report should also include (i) surface plan of the area indicating contours of main topographic features, drainage and mining area, (ii) geological maps and sections and (iii) sections of the mine pit and external dumps, if any, clearly showing the land features of the adjoining area.	All the plans including surface & geological plans, and progressive closure plan have been included in Annexure III.

A. Standard Terms of Reference

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

	its management, mining technology etc. and should be in the name of the lessee.	
4.	All corner coordinates of the mine lease area, superimposed on a High-Resolution Imagery/ toposheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).	All corner coordinates of the mine lease area have been superimposed on a high-resolution Google Earth Image, as shown in Figure 2.3 under Chapter II in the EIA report page 11.
5.	Information should be provided in Survey of India Toposheet in 1:50,000 scale indicating geological map of the area, geomorphology of land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics.	Toposheets of Survey of India have been used for showing sampling locations of air, soil, water, and noise, as shown in Chapter III in the EIA report page 28-96.
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 Environmental Policy is discussed in the Section 10.1 under Chapter X in the EIA report page 138.

	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	It is an opencast quarrying operation proposed to operate in Manual method. The rough stone formation is a hard, compact and homogeneous body. The height and width of the bench will be maintained as 5m with 90° bench angles. Quarrying activities will be carried out under the supervision of Competent Persons like Mines Manager, Mines Foreman and Mining Mate. Necessary permissions will be obtained from DGMS after obtaining Environmental Clearance.
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	Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory

	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.	routes of fauna, water bodies, human settlements and other ecological features has been discussed in Section 3.1 under Chapter III in the EIA report page 28-33. The details of surrounding sensitive ecological features have been provided in Table 3.39 under Chapter III in the EIA report page 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 in the EIA report page 20.
11.	Details of the land for any over burden dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given.	It is not applicable as no dumps have been proposed outside the lease area. The entire quarried out rough stone will be transported to the needy customers.
12.	Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the 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.	It is not applicable as there is no forest land involved within the proposed project area. The details have been discussed in Table 3.39 under Chapter III in the EIA report page 97.

13.	Status of forestry clearance for the broken- up area and virgin forestland involved in the Project including deposition of net present value (NPV) and compensatory afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.	It is not applicable as the proposed project area does not involve any forest land.
14.	Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.	Not Applicable. The project doesn't attract Recognition of Forest Rights Act, 2006 as there are neither forests nor forest dwellers / forest dependent communities in the mine lease area. There shall be no forest impacted families (PF) or people (PP). Thus, the rights of Traditional Forest Dwellers will not be compromised on account of the project.
15.	The vegetation in the RF / PF areas in the study area, with necessary details, should be given.	There is no any reserve forest in the study area. The details of reserve forest is discussed in the Table 3.39 under Chapter III in the EIA report page 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 3.39 under Chapter III in the EIA report page 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	There are No National Parks, Biosphere Reserves, Wildlife Corridors, and Tiger/ Elephant Reserves within 10 km radius from the periphery of the project area.

	km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished.	Information regarding the same has been given in Table 3.39 under Chapter III in the EIA report page 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 present. In case of any scheduled-I fauna found in the study area, the necessary plan along with budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost.	A detailed biological study was carried out in both core and buffer zones and the results have been discussed in Section 3.6 under Chapter III in the EIA report page 65-82.
19.	Proximity to Areas declared as 'Critically Polluted' or the Project areas likely to come under the 'Aravalli Range', (attracting court restrictions for mining operations), should also be indicated and where so required, clearance	Not Applicable. Project area / Study area is not declared. in 'Critically Polluted' Area and does not come under 'Aravalli Range'.

	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 w.r.t CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority).	Not Applicable The project doesn't attract the C.R.Z. Notification, 2018.
21.	R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need-based sample survey, family-wise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be clearly brought out whether the village(s) located in the mine lease area will be shifted or not. The issues relating to shifting of village(s) including their R&R	Not Applicable. There are no approved habitations of SCs/STs and other weaker sections in the lease area. Therefore, R&R Plan / Compensation Plan for the Project Affected People (PAP) are not provided.

	and socio-economic aspect should be discussed in the Report	
22	One season (non-monsoon) [i.e., March- May (Summer Season); October-December (post monsoon season); December-February (winter season)] primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM₁₀, particularly for free silica, should be given.	Baseline data were collected for the period of October - December 2024 as per CPCB notification and MoEF & CC Guidelines. Primary baseline data and the results have been included in Sections 3.1-3.9 under Chapter III in the EIA report page 28-97.
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	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 in the EIA report page 100-104.

	habitation. The wind roses showing predominant 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.	The water requirement for the project, its availability and source have been provided in Table 2.11 under Chapter II in the EIA report page 24.
25.	Necessary clearance from the competent Authority for drawl of requisite quantity of water for the project should be provided.	Not Applicable. Water for dust suppression, greenbelt development and domestic use will be sourced from accumulated rainwater/seepage water in mine pits and purchased from local water vendors through water tankers on daily requirement basis. Drinking water will be sourced from the approved water vendors.
26.	Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.	Part of the working pit will be allowed to collect rain water during the spell of rain. The water thus collected will be used for greenbelt development and dust suppression. The mine closure plan 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 in the EIA report page 99-100.

28.	Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. The Report inter-alia, shall include details of the aquifers present and impact of mining activities on these aquifers. Necessary permission from Central Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished.	The ground water table is found at the depth of 100m below ground level. The ultimate depth of quarry is 60m BGL. Therefore, the mining activity will not intersect the ground water table. Data regarding the occurrence of groundwater table have been provided in Section 3.3 under Chapter III in the EIA report page 38-51.
29.	Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion proposed, if any, and the impact of the same on the hydrology should be brought out	Not Applicable. There are no streams, seasonal or other water bodies passing within the project area. Therefore, no modification or diversion of water bodies is anticipated
30.	Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and BGL. A schematic diagram may also be provided for the same.	The highest elevation of the project area is 776m AMSL. Ultimate depth of the mine is 55m BGL. Depth to the water level in the area is 60-65m below the ground level.
31.	A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, 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	Greenbelt development plan has been given in Section 4.6 under Chapter IV in the EIA report page 111-114.

	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.	Traffic density survey was carried out to analyses the impact of transportation in the study area as per IRC guidelines 1961 and it is inferred that there is no significant impact due to the proposed transportation from the project area. Details have been provided in Section 3.8 under Chapter III in the EIA report page 95-96.
33.	Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.	Infrastructure & other facilities will be provided to the mine workers after the grant of quarry lease and the same has been discussed in Section 2.6.7 under Chapter II in the EIA report page 24.
34.	Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report.	Progressive mine closure plan has been prepared for this project and is given in Section 2.6.5 under Chapter II in the EIA report page 20-23.

35.	Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.	Occupational health impacts of the project and preventive measures detail have been explained in Section 4.8 under Chapter IV in the EIA report page 114-116.
36.	Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.	No public health implications are anticipated due to this project. Details of CSR and CER activities have been discussed in Sections 8.6 and 8.7 under Chapter VIII in the EIA report page 135-136.
37.	Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.	No negative impact on socio-economic environment of the study area is anticipated and this project shall benefit the socio-economic environment by offering employment for 29 people directly as discussed in Section 8.1 under Chapter VIII 134.
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 Table 10.1 & 10.2 under Chapter X in the EIA report page 139-144.
39.	Public Hearing points raised and commitment of the Project Proponent on the same along	The outcome of public hearing will be submitted during the final EIA report.

	with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project.	
40.	Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given	No litigation is pending in any court against this project.
41	The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.	Project Cost is Rs.1,56,49,280/- CER Cost is Rs. 5,00,000/- In order to implement the environmental protection measures, an amount of Rs. 10684411 as capital cost and recurring cost as Rs. 3537702 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 10 years will be Rs. 55181246 as shown in Tables 10.1 & 10.2 under Chapter X, pp.139-144.
42.	A disaster management plan shall be prepared and included in the EIA/EMP Report.	The disaster management plan for this project has been provided in Section 7.3 under Chapter VII in the EIA report page 127-128.
43.	Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.	Benefits of the project details have been given under Chapter VIII in the EIA report page 134-136.

44	Besides the above, the below mentioned general points are also to be followed:	
a)	Executive Summary of the EIA/EMP Report.	Executive summary has been enclosed as a separate booklet.
b)	All documents to be properly referenced with index and continuous page numbering.	All the documents have been properly referenced with index and continuous page numbering.
c)	Where data are presented in the Report especially in Tables, the period in which the data were collected and the sources should be indicated.	List of tables and source of the data collected have been mentioned.
d)	Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF & CC/NABL accredited laboratories. All the original analysis/testing reports should be available during appraisal of the Project.	Original Baseline monitoring reports will be submitted in the final EIA report.
e)	Where the documents provided are in a language other than English, an English translation should be provided.	All the documents provided here are in English language.
f)	The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted.	The questionnaire will be submitted in the final EIA report.
g)	While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF & CC vide O.M. No. J- 11013/41/2006-IA. II(I) dated 4th August, 2009, which are available on the website of this Ministry, should be followed.	Instructions issued by MoEF & CC O.M. No. J-11013/41/2006-IA. II (I) dated 4 th 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.	As it is a new lease area, the condition is not applicable.
j)	The EIA report should also include (i) surface plan of the area indicating contours of main topographic features, drainage and mining area, (ii) geological maps and sections and (iii) sections of the mine pit and external dumps, if any, clearly showing the land features of the adjoining area.	All the plans including surface & geological plans, and progressive closure plan have been included in Annexure III.

TABLE OF CONTENTS

S No.	TITLE	PAGE No.
I	Introduction	1-6
1.0	Preamble	1
1.1	Purpose of the report	2

1.2	Environmental clearance	2
1.3	Terms of Reference (ToR)	3
1.4	Post Environment Clearance Monitoring	3
1.5	Transferability of Environmental Clearance	3
1.6	Identification of the Project Proponent	5
1.7	Brief Description of the Project	5
1.8	Scope of the Study	6
1.9	Legislation Applicable to Mining of Mineral Sector	6
II	PROJECT DESCRIPTION	7-26
2.0	General Introduction	7
2.1	Description of the Project	7
2.2	Location and Accessibility	8
2.3	Leasehold Area	10
2.3.1	Corner Coordinates	10
2.4	Geology	14
2.5	Quantity of Reserves	14
2.6	Mining Method	17
2.6.1	Conceptual Blasting Design	17
2.6.2	Magnitude of Operation	19
2.6.3	Extent of Mechanization	19
2.6.4	Progressive Quarry Closure Plan	20
2.6.5	Quarry Closure Budget	20
2.6.6	Conceptual Mining Plan	24
2.6.7	Infrastructures	24
2.6.8	Water Requirement	24
2.6.9	Energy Requirement	24
2.6.10	Capital Requirement	25
2.7	Manpower Requirement	26
2.8	Project Implementation Schedule	26
III	DESCRIPTION OF THE ENVIRONMENT	27-97
3.0	General	27
3.1	Land Environment	28
3.1.1	Geology and Geomorphology	28
3.1.2	Land Use/Land Cover	31

3.1.3	Topography	31
3.1.4	Drainage pattern	31
3.1.5	Seismic sensitivity	31
3.2	Soil Environment	34
3.2.1	Soil Characteristics	34
3.3	Water Environment	38
3.3.1	Ground Water Resources and Quality	38
3.3.1.1	Physical Parameter of ground water	38
3.3.1.2	Chemical Parameters of Water	39
3.3.2	Surface Water	40
3.3.3	Hydrogeological Studies	44
3.3.3.1	Rainfall	44
3.3.3.2	Groundwater Levels and Flow Direction	44
3.3.3.3	Electrical Resistivity Investigation	46
3.4	Air Environment	52
3.4.1	Meteorology	52
3.4.1.1	Climatic Variables	52
3.4.1.2	Wind Pattern	52
3.4.2	Ambient Air Quality Study	56
3.5	Noise Environment	62
3.6	Biological Environment	65
3.6.1	Flora	65
3.6.1.1	Objectives of the Study	65
3.6.1.2	Study Approach & Methodology	65
3.6.1.3	Survey Methodology	66
3.6.1.4	Important Value Index (IVI)	66
3.6.1.5	Floral diversity Analysis	67
3.6.2	Fauna	77
3.6.3	Agriculture & Horticulture in Krishnagiri district	81
3.7	Socio-Economic Environment	83
3.7.1	Objectives of the Study	83
3.7.2	Methodology	83
3.7.3	Demographic Profile of Krishnagiri District	84
3.7.4	Profile of Study Area - Kariyasandiram Village	85

3.7.5	Working Population- Kariyasandiram Village	86
3.7.6	Workforce Participation	92
3.8	Traffic Density	95
3.9	Site Specific Features	97
IV	ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES	98-117
4.0	General	98
4.1	Land Environment	98
4.2	Soil Environment	99
4.3	Water Environment	99
4.4	Air Environment	100
4.4.1	Modelling of Incremental Concentration	101
4.5	Noise Environment	105
4.5.1	Ground Vibrations	107
4.6	Ecology and Biodiversity	111
4.6.1	Impact on Ecology and Biodiversity	111
4.6.2	Mitigation Measures on Flora	111
4.6.3	Anticipated Impact on Fauna	113
4.6.4	Aquatic Biodiversity	113
4.6.5	Impact on agriculture and horticulture crops in 1km Radius	113
4.6.6	Mitigation Measures on agriculture and horticulture crops	113
4.7	Socio Economic Environment	114
4.8	Occupational Health and Safety	114
4.8.1	Respiratory Hazards	115
4.8.2	Noise	115
4.8.3	Physical Hazards	115
4.8.4	Occupational Health Survey	115
4.9	Mine Waste Management	116
4.10	Mine Closure	116
4.10.1	Mine Closure Criteria	116
V	ANALYSIS OF ALTERNATIVES (TECHNOLOGY AND SITE)	118
5.0	Introduction	118
5.1	Factors behind the Selection of Project Site	118
5.2	Analysis of Alternative Site	118

5.3	Factors behind Selection of Proposed Technology	118
5.4	Analysis of Alternative Technology	118
VI	ENVIRONMENTAL MONITORING PROGRAM	119-123
6.0	General	119
6.1	Methodology of Monitoring Mechanism	119
6.2	Implementation Schedule of Mitigation Measures	121
6.3	Monitoring Schedule and Frequency	121
6.4	Budgetary provision for Environment Monitoring Program	122
6.5	Reporting schedules of monitored data	123
VII	ADDITIONAL STUDIES	124-133
7.0	General	124
7.1	Public Consultation for Proposed Project	124
7.2	Risk Assessment for Proposed Project	124
7.3	Disaster Management Plan for Proposed Project	127
7.3.1	Emergency Control Procedure	128
7.4	Cumulative Impact Study	128
7.4.1	Air Environment	130
7.4.1.1	Cumulative Impact of Air Pollutants	131
7.4.2	Noise Environment	131
7.4.3	Socio Economic Environment	132
7.4.4	Ecological Environment	132
7.5	Plastic Waste Management Plan for Proposed Project	132
7.5.1	Objective	133
VIII	PROJECTS BENEFITS	134-136
8.0	General	134
8.1	Employment Potential	134
8.2	Socio-Economic Welfare Measures Proposed	134
8.3	Improvement in Physical Infrastructure	134
8.4	Improvement in Social Infrastructure	134
8.5	Other Tangible Benefits	135
8.6	Corporate Social Responsibility	135
8.7	Corporate Environment Responsibility	136
8.8	Summary Of Project Benefits	136
IX	ENVIRONMENTAL COST BENEFIT ANALYSIS	137

X	ENVIRONMENTAL MANAGEMENT PLAN	138-144
10.0	General	138
10.1	Environmental Policy	138
10.1.1	Description of the Administration and Technical Setup	138
10.2	Budgetary Provision for Environmental Management	139
10.3	Conclusion	144
XI	SUMMARY AND CONCLUSION	145-156
11.1	Introduction	145
11.2	Project Description	145
11.3	Description of the Environment	145
11.3.1	Land Environment	145
11.3.2	Soil Environment	146
11.3.3	Water Environment	147
11.3.4	Air Environment	147
11.3.5	Noise Environment	147
11.3.6	Biological Environment	147
11.3.7	Socio-Economic Environment	148
11.4	Anticipated Environmental Impacts and Mitigation Measures for Proposed Project	148
11.4.1	Land Environment	148
11.4.2	Water Environment	149
11.4.3	Air Environment	149
11.4.4	Noise Environment	151
11.4.5	Biological Environment	153
11.4.6	Socio Economic Environment	154
11.4.7	Occupational Health	154
11.5	Environment Monitoring Program	155
11.6	Additional Studies	155
11.6.1	Risk Assessment	156
11.6.2	Disaster Management Plan	156
11.6.3	Cumulative Impact Study	156
11.7	Project Benefits	156
11.8	Environment Management Plan	156
XII	DISCLOSURE OF CONSULTANT	157-161

LIST OF TABLES

TABLE No.	CONTENTS	PAGE No.
1.1	Details of Quarries within the cluster area of 500 m radius	2
1.2	Details of Project Proponent	5
1.3	Salient Features of the Proposed Project	5
2.1	Site Connectivity to the Project Area	10
2.2	Corner Coordinates of Proposed Project	10
2.3	Estimated Resources and Reserves of the Project	14
2.4	Year-wise Production Details	14
2.5	Conceptual Blasting Design	18
2.6	Operational Details for Proposed Project	19
2.7	Machinery Details	19
2.8	Land Use Data at Present, during Scheme of Mining, and at the end of Mine Life	20
2.9	Mine Closure Budget	20
2.10	Ultimate Pit Dimension	24
2.11	Water Requirement for the Project	24
2.12	Fuel Requirement Details	25
2.13	Capital Requirement Details	25
2.14	Employment Potential for the Proposed Project	26
2.15	Expected Time Schedule	26
3.1	Monitoring attributes and frequency of monitoring	27
3.2	LULC statistics of the study area	31
3.3	Soil sampling locations	33
3.4	Soil Quality of the Study Area	34
3.4a	Assigning Scores to Soil Quality Indicators	36
3.5	Water Sampling Locations	38
3.6	Surface and Ground Water Quality Result	42
3.7	Pre-monsoon water level of Open wells within 2 km radius	45
3.8	Post-monsoon water level of Open wells within 2 km radius	45

3.9	Pre-monsoon water level of Bore wells within 2 km radius	46
3.10	Post-monsoon water level of bore wells within 2 km radius	46
3.11	Vertical electrical sounding data	51
3.12	Onsite Meteorological Data	52
3.13	Methodology and Instrument used for AAQ analysis	56
3.14	National ambient air quality standards	56
3.15	Ambient air quality (AAQ) monitoring locations	57
3.16	Summary of AAQ result	59
3.17	Noise Monitoring Locations	62
3.18	Ambient Noise Quality Result	62
3.19	Flora in mine lease area	69
3.20	Calculation of Species Diversity mine lease area	70
3.21	Species Richness (Index) in mine lease area	70
3.22	Flora in 300-meter radius	71
3.23	Calculation of Species Diversity in 300 m Radius	73
3.24	Species Richness (Index) in 300 m Radius	74
3.25	Flora in Buffer Zone	74
3.26	Methodology applied during survey of fauna	77
3.27	Fauna in Core Zone	78
3.28	Fauna in Buffer Zone	79
3.29	Aquatic Fauna and Flora	81
3.30	Major Crops in 1km radius	82
3.31	Major Field Crops & Horticulture cultivation in 1km radius.	82
3.32	Demographic Status of Kariyasandiram Village	86
3.33	Population Structure and Literacy Rate of Study Area	87
3.34	Workforce Details of the Study Area (Percentage wise)	90
3.35	Traffic Survey Locations	95
3.36	Existing Traffic Volume	95
3.37	Rough Stone Transportation Requirement	95
3.38	Summary of Traffic Volume	95

3.39	Details of Environmentally Sensitive Ecological Features in the Study Area	97
4.1	Empirical Formula for Emission Rate from Overall Mine	100
4.2	Estimated Emission Rate	100
4.3	Incremental & Resultant GLC of PM _{2.5}	101
4.4	Incremental & Resultant GLC of PM ₁₀	101
4.5	Activity and noise level produced by machinery	106
4.6	Predicted noise incremental values	106
4.7	Predicted PPV Values due to Blasting	108
4.8	Predicted PPV Values due to Blasting at 100-500 radius	108
4.9	Carbon Released During Five Years of Rough Stone and Gravel Production	111
4.10	CO ₂ Sequestration	112
4.11	Recommended Species for Greenbelt Development Plan	112
4.12	Greenbelt development plan	112
6.1	Implementation schedule for proposed project	121
6.2	Proposed monitoring schedule post EC for the proposed quarry	122
6.3	Environment monitoring budget	123
7.1	Risk assessment& control measures for proposed project	125
7.2	Salient Features of P1	129
7.3	Salient Features of the Cluster E1	129
7.4	Cumulative Production Load of Rough Stone	130
7.5	Cumulative Production Load of Gravel	130
7.6	Cumulative Impact Results from the proposed projects	131
7.7	Cumulative Impact of Noise for one Cluster Projects	131
7.8	Cumulative Effect of Ground Vibrations Resulting from cluster Project	131
7.9	Socio Economic Benefits from the Cluster Project	132
7.10	Employment Benefits for Cluster Project	132
7.11	Greenbelt Development Benefits from the Cluster Project	132
7.12	Action Plan to Manage Plastic Waste	133
8.1	CER – action plan	136

8.2	Project Benefits to the state Government	136
10.1	EMP budget for proposed project	139
10.2	Estimation of overall EMP budget after adjusting 5% annual inflation	144
11.1	LULC Statistics of the Study Area	145
11.2	Environment Monitoring Program	155

LIST OF FIGURES

FIGURE NO.	TITLE	PAGE NO.
1.1	Location of the proposed and existing rough stone quarries in the cluster of 500m radius	4
2.1	Overall view of proposed project site	8
2.2	Key Map Showing Location of Project Site	9
2.3	Google Earth Image Showing Lease Area with Pillars	11
2.4	Surface & Geological Plan	12
2.4a	Surface & Geological Section	13
2.5	Year-Wise Development Production Plan	15
2.5a	Year wise Development & Production Section	16
2.6	Mine Layout Plan and Land Use Pattern	21
2.7	Conceptual Plan	22
2.7a	Conceptual Section	23
3.1	Geology Map of 5Km Radius from proposed project site	29
3.2	Geomorphology Map of 5 km Radius from Proposed Project Site	30
3.3	LULC Map of 5km radius from the proposed project site	32
3.4	Drainage Map of 5 km Radius from Proposed Project Site	33
3.5	Map Showing Soil Sampling Locations within 5 km Radius around Proposed Project Site	37
3.6	Map Showing Water Sampling Locations within 5 km Radius around Proposed Project Site	41
3.7	Long-Term Monthly Average Rainfall Vs Monthly Rainfall	44

3.8	Open Well Static Groundwater Elevation Map Showing Direction of Groundwater Flow during Pre-Monsoon Season	47
3.9	Open Well Static Groundwater Elevation Map Showing Direction of Groundwater Flow during Post-Monsoon Season	48
3.10	Borewell Static Groundwater Elevation Map Showing Direction of Groundwater Flow during Pre-Monsoon Season	49
3.11	Borewell Static Groundwater Elevation Map Showing Direction of Groundwater Flow during Post-Monsoon Season	50
3.12	Graph Showing Occurrence of Water Bearing Fracture Zones at the Depth of 60m Below Ground Level in Proposed Project	51
3.13	Windrose Diagram for 2021-2022(March to May)	53
3.13a	Windrose Diagram for 2023-2024 (March to May)	54
3.14	Onsite Wind Rose Diagram – 2025	55
3.15	Map Showing Ambient Air Quality Monitoring Station Locations Around 5 km Radius from Proposed Project Site	58
3.16	Bar Chart Showing Maximum, Minimum, and Average Concentrations of PM _{2.5} Measured from 6 Air Quality Monitoring Stations within 5 km radius.	59
3.17	Bar Chart Showing Maximum, Minimum, and Average Concentrations of PM ₁₀ Measured from 6 Air Quality Monitoring Stations within 5 km radius.	60
3.18	Bar Chart Showing Maximum, Minimum, and Average Concentrations of SO ₂ Measured from 6 Air Quality Monitoring Stations within 5 km radius.	60
3.19	Bar chart showing maximum, minimum, and the average concentrations of NO _x measured from the 6 air quality monitoring stations within 5km radius.	61
3.20	Bar Chart Showing Maximum, Minimum, And Average Concentrations of Pollutants in Atmosphere within 5 km Radius	61
3.21	Bar Chart Showing Day Time Noise Levels Measured in Core and Buffer Zones	63
3.22	Bar Chart Showing Night Time Noise Levels Measured in Core and Buffer Zones	63
3.23	Map Showing Noise Level Monitoring Station Locations around 5 km Radius from Proposed Project Site	64
3.24	Quadrates Sampling Methods of Flora	66
3.25	Species Richness (Index) in Mine Lease area	70
3.26	Species Richness (Index) in 300 m Radius Table 3.27 Flora in Buffer Zone	74

3.27	Details Village Boundaries within 1 km and 5 km Radius of the Project Lease Area	84
3.28	Demographic Details – Population, Social Groups, and Literacy Rate in the Study Villages	89
3.29	Details of Workforce in the Study Villages	93
3.30	Traffic Density Map	96
4.1	Predicted incremental concentration of PM _{2.5}	102
4.2	Predicted incremental concentration of PM ₁₀	103
4.3	Predicted PPV Values due to Blasting at 100-500 m radius	110
6.1	Proposed environmental monitoring chart	120
7.1	Disaster management team layout for proposed project	128

LIST OF ANNEXURES

Annexure No.	Contents	Page No.
I	Copy of ToR letter	163-184
II	Copy of 500 m radius letter	185-187
III	Approved mining plan along with mining plan AD/DD letter/original mining plan plates / modified plates	188-275
IV	VAO 300m radius letter	276
V	NABET certificate of EIA consultant	277

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 File No. 12223 and ToR obtained vide TO25B0108TN5784836N Dated:03.07.2025 this EIA report has been prepared for the project proponent, **M/s.Vishnusurya Projects and Infra Hosur Private Limited** applied for rough stone and gravel quarry lease in the Patta land falling in S.F.No's. 3/2C(P),4/2(P),4/5(P),4/6(P),4/7 & 4/8(P) over an extent of 3.68.0ha in Kariyasandiram Village, Shoolagiri Taluk, Krishnagiri District, Tamil Nadu. This EIA report takes into account the rough stone and Gravel quarry within the cluster of 500 m radius from the periphery of the proposed project site. The cluster contains one proposed project known as P1 and two existing quarries known as E1 and E2. 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 in the cluster is 8.16.5ha 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	M/s.Vishnusurya Projects and Infra Hosur Private Limited	3/2C(P),4/2, 4/5(P),4/6(P), 4/7 & 4/8(P)	Kariyasandiram	3.68.00	Proposed Area
Existing Quarries					
E1	M/s.Gunin Infrastructure LLP	4/3,4/4 & 6(P)	Kariyasandiram	4.48.50	02.12.2021 to 01.12.2026
Total Cluster Extent				8.16.5	---

Source: DD Letter: Roc.No.456/2024/Mines, Dated:04.10.2024

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

1.1 PURPOSE OF THE REPORT

The purpose of the report is to study baseline environmental conditions in and around the proposed project area for the period of **March to May 2025** 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/539189/2025, Dated: 27.05.2025) and decided that the project requires detailed environmental studies for the preparation of EIA report. Therefore, the proponent submitted application for Terms of Reference (ToR) on 27.05.2025.

Scoping

The proposal was placed in the 575th meeting of SEAC on 09.06.2025. Based on the presentation and documents furnished by the project proponent, SEAC decided to recommend the proposal for the grant of Terms of Reference (ToR) and the recommendation for ToR is subjected to the outcome of the Honourable NGT, Principal Bench, New Delhi (O.A No.186 of 2016 (M.A.No.350/2016) and O.A. No.200/2016 and O.A.No.580/2016 (M.A.No.1182/2016) and O.A.No.102/2017 and O.A.No.404/2016 (M.A.No. 758/2016, M.A.No.920/2016, M.A.No.1122/2016,

M.A.No.12/2017 & M.A. No. 843/2017) and O.A.No.405/2016 and O.A.No.520 of 2016 (M.A.No. 981/2016, M.A.No.982/2016 & M.A.No.384/2017).

Public Consultation

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

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 TO25B0108TN5784836N Dated 03.07.2025 for the preparation of an EIA report.

1.4 POST ENVIRONMENT CLEARANCE MONITORING

For category B projects, irrespective of its clearance by MoEF/SEIAA, the project proponent shall prominently advertise in the newspapers indicating that the project has been accorded environmental clearance and the details of MoEF website where it is displayed. After obtaining EC, the project proponent will submit a half-yearly compliance report of stipulated environmental clearance terms and conditions to MoEF & CC Regional Office & SEIAA on 1st June and 1st December of every year.

1.5 TRANSFERABILITY OF ENVIRONMENTAL CLEARANCE

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

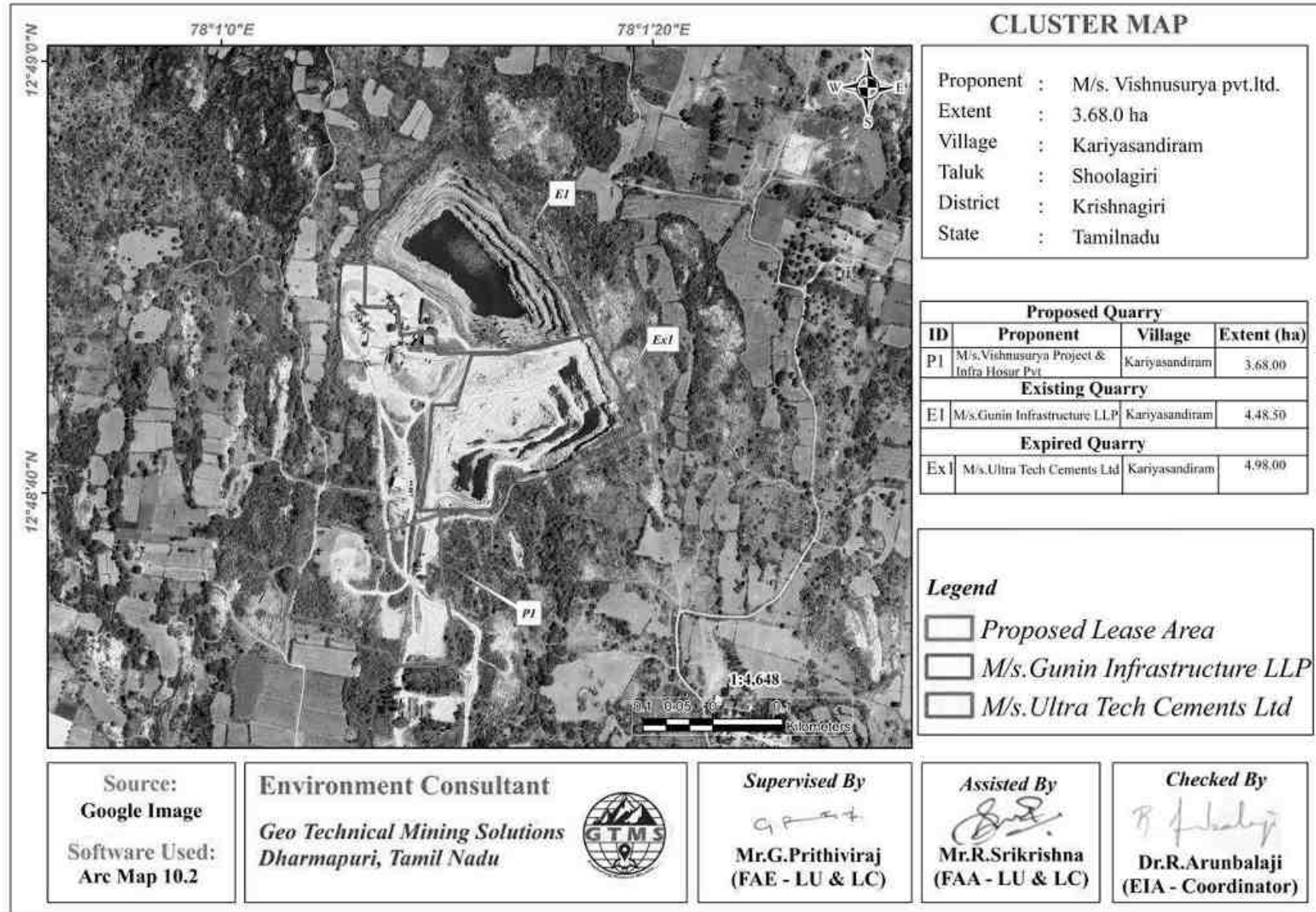


Figure 1.1 Location of Proposed and Existing Rough Stone Quarry in the Cluster of 500 m Radius

1.6 IDENTIFICATION OF THE PROJECT PROPONENT

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

1.2 Details of Project Proponent

Name of the Project Proponent	M/s.Vishnusurya Projects and Infra Hosur Pvt Ltd
Address	Agni Business Centre, No.24/46, K.B.Dasan Road, 3 rd Floor, Alwarpet, Chennai District – 600018.
Status	Proprietor

1.7 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 excavation is open cast semi mechanized method involving formation of benches with 5m height and 5m width. The proposed project site is located in Kariyasandiram Village, Shoolagiri Taluk, Krishnagiri District, Tamil Nadu. Some of the important features of the proposed project have been provided in Table 1.3.

Table 1.3 Salient Features of P1

Name of the Quarry	M/s.Vishnusurya Projects and Infra Hosur Pvt Ltd	
Type of Land	Patta Land	
Extent	3.68.0ha	
S.F. No	3/2C(P),4/2(P),4/5(P),4/6(P),4/7 & 4/8 (P)	
Toposheet No	57 L/01	
Highest Elevation	885m AMSL	
Latitude	12°48'31.93"N to 12°48'39.02"N	
Longitude	78°1'2.96"E to 78°1'10.87"E	
Proposed depth as per ToR for ten years	60m BGL	
Ultimate depth for ten years	60m BGL	
Geological Resources	Rough stone (m ³) & Tons	Gravel (m ³) & Tons
	2024440 & 5567210	165636 & 331272
Mineable Reserves	Rough stone (m ³) & Tons	Gravel (m ³) & Tons
	796565 & 2190554	140594 & 281188
Proposed production for 10 years	Rough stone (m ³) & Tons	Gravel (m ³) & Tons

	796565 & 2190554	140594 & 281188
Method of Mining	Open cast mechanized mining method	
Topography	Flat Terrain	
Machinery proposed	Jack hammer	4
	Excavator	2
	Compressor	2
	Tipper	12
Proposed Manpower Deployment	29	
Project Cost	Rs.1,56,49,280/-	
Proposed Water Requirement	4.0 KLD	

1.8 SCOPE OF THE STUDY

The main scope of the EIA study is to quantify the cumulative impact of the quarries in the cluster on the study area and formulate the effective mitigation measures for each individual lease. A detailed account of the emission sources, emissions control equipment, back ground air quality levels, meteorological measurements, dispersion model and all other aspects of pollution like effluent discharge, and dust generation has been provided in this report. The baseline monitoring study has been carried out during the period of **March to May 2025** 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.

1.9 Legislation Applicable to Mining of Mineral Sector

A few important legislations are given below:

- ❖ The Mines Act, 1952
- ❖ The Mines and Mineral (Development and Regulation) Act, 1957
- ❖ Mines Rules, 1955
- ❖ Mineral Concession Rules, 1960
- ❖ Mineral Conservation and Development Rules, 1988
- ❖ State Minor Mineral Concession Rules, 1960
- ❖ Granite Conservation and Development Rule, 1999
- ❖ 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, M/s.Vishnusurya Projects and Infra Hosur Private Limited 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 25.02.2025 to extract rough stone and gravel. The precise area communication letter was issued by Regional Joint Director/Deputy Director (FAC) of Geology and Mining, Krishnagiri vide (Roc.No.30/2024/Mines, Dated 04.04.2025). Based on the precise area communication letter, mining plan was prepared. The mining plan thus prepared was approved by Regional Joint Director/Deputy Director (FAC) Department of Geology and Mining, Krishnagiri (Rc.No.30/2024/Mines Dated 15.05.2025). The overall view of the project site is shown in Figure 2.1.



Figure 2.1 Overall View of Proposed Project Site

2.2 LOCATION AND ACCESSIBILITY

The proposed quarry project is located in Kariyasandiram Village, Shoolagiri Taluk, Krishnagiri District, Tamil Nadu as shown in Figure 2.2. The area lies between Latitudes from $12^{\circ}48'31.93''\text{N}$ to $12^{\circ}48'39.02''\text{N}$ and Longitudes from $78^{\circ}1'2.96''\text{E}$ to $78^{\circ}1'10.87''\text{E}$. The maximum altitude of the project area is 885m AMSL. Accessibility details to the proposed project site have been given in Table 2.1.

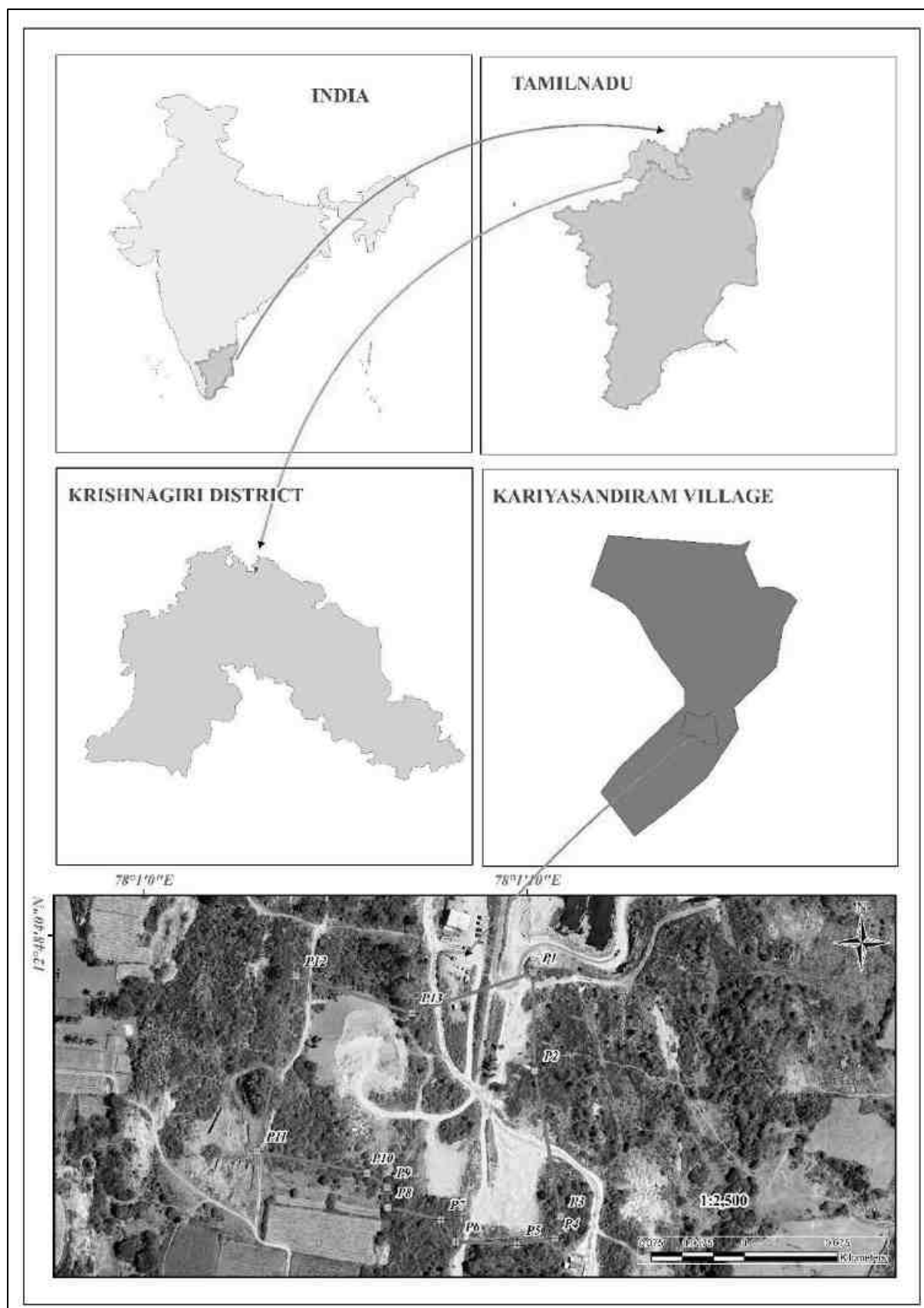


Figure 2.2 Key Map Showing Location of Project Site

Table 2.1 Site Connectivity to the Project Area

Type of Features	Name/Location	Distance (km)	Direction
Nearest Roadways	MDR -456	1.5	S
Nearest Railway	Hosur	23.5	SW
Nearest Town	Hosur	23.5	SW
Nearest Airport	Bangalore	41.2	NW
Nearest Seaport	Chennai	248	NE
Nearest Villages	Golapalli	1.7	N
	Nerigam	1.8	E
	Mutuguriki	1.2	S
	Suligunta	2.2	W

2.3 LEASEHOLD AREA

- ❖ The extent of the proposed project site is 3.68.0ha.
- ❖ The proposed project is site specific.
- ❖ There is no mineral beneficiation or processing proposed inside the project area.
- ❖ There is no forest land involved in the proposed area and is devoid of major vegetation and trees.

2.3.1 Corner Coordinates

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

Table 2.2 Corner Coordinates of Proposed Project

Pillar ID	Latitude	Longitude	Pillar ID	Latitude	Longitude
1	12°48'39.02"N	78° 1'10.15"E	10	12°48'33.80"N	78° 1'5.83"E
2	12°48'36.47"N	78° 1'10.19"E	11	12°48'34.37"N	78° 1'2.96"E
3	12°48'32.68"N	78° 1'10.87"E	12	12°48'38.94"N	78° 1'3.98"E
4	12°48'32.10"N	78° 1'10.72"E	13	12°48'37.97"N	78° 1'7.00"E
5	12°48'31.93"N	78° 1'9.73"E	--	--	--
6	12°48'32.02"N	78° 1'8.14"E	--	--	--
7	12°48'32.59"N	78° 1'7.75"E	--	--	--
8	12°48'32.91"N	78° 1'6.37"E	--	--	--
9	12°48'33.43"N	78° 1'6.35"E	--		

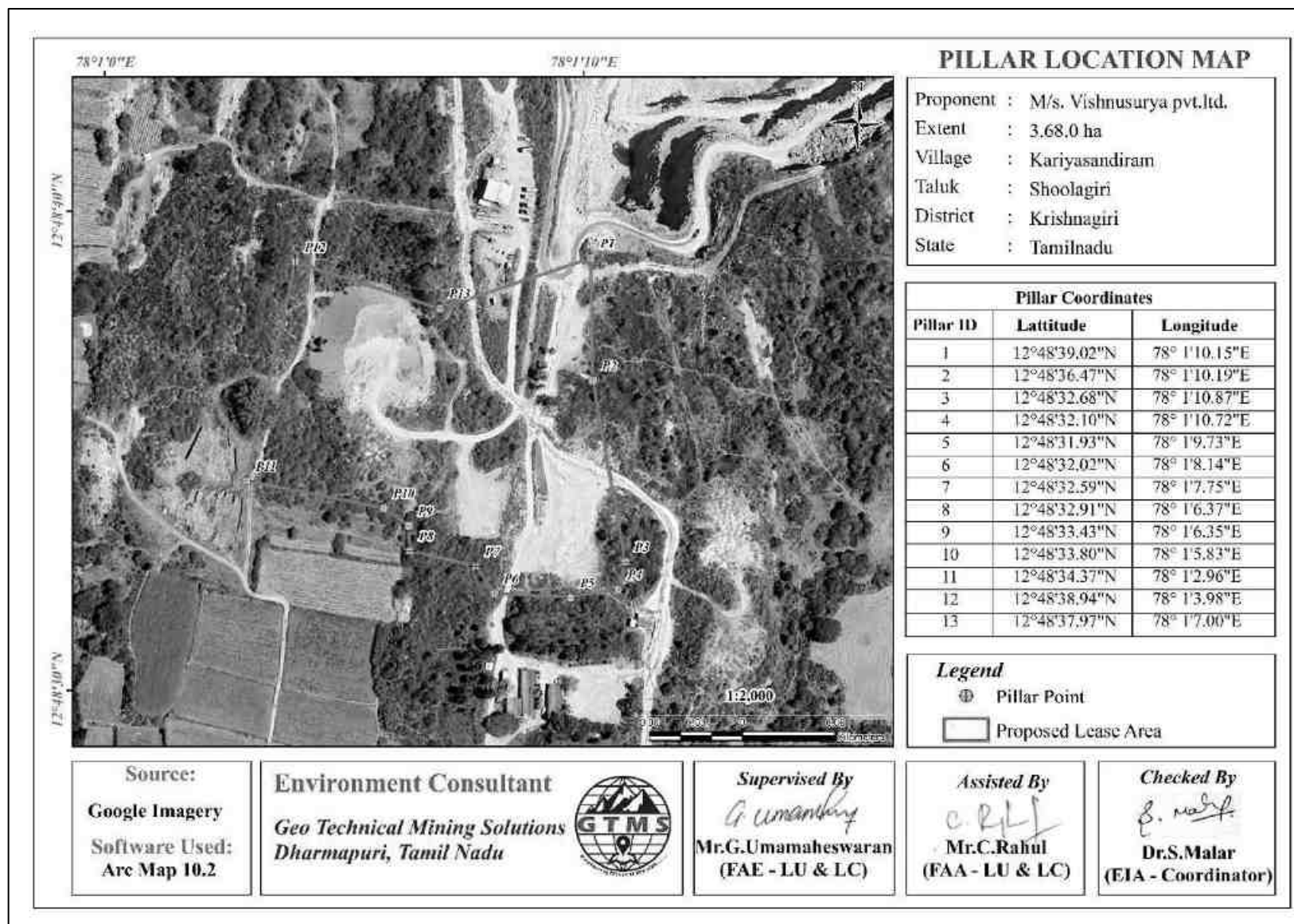
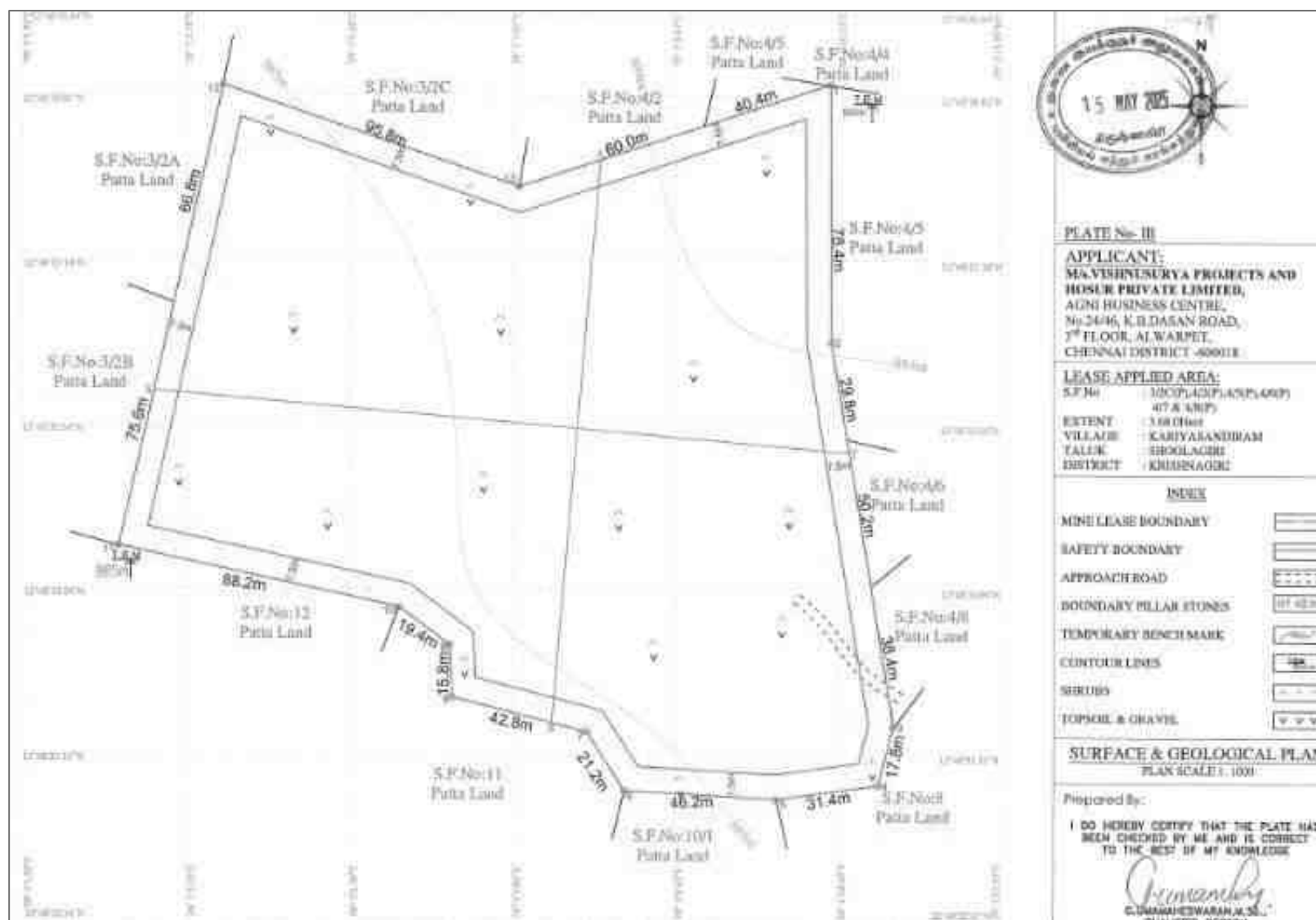


Figure 2.3 Google Earth Image Showing Pillar Coordinates of Lease Area



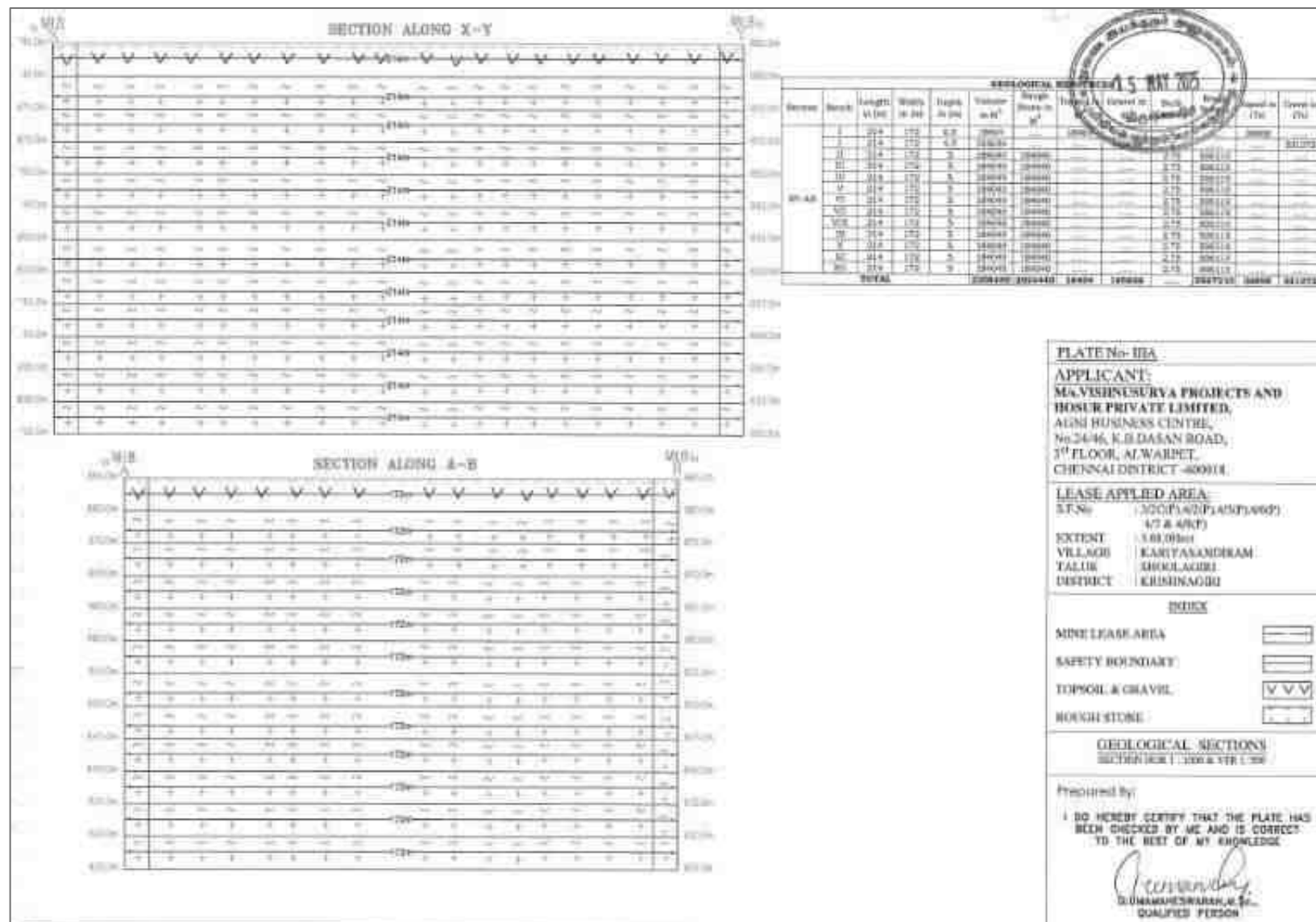


Figure 2.4a Surface & Geological Section

2.4 GEOLOGY

The lease area geologically occurs over grey hornblende biotite gneiss, commercially called as rough stone. Also, the lease area geomorphologically occurs over Pediment Pediplain Complex.

2.5 QUANTITY OF RESERVES

The resources and reserves of rough stone and gravel were calculated based on cross-section method by plotting sections to cover the maximum lease area for the proposed project. Based on the availability of geological resources, the mineable reserves are calculated by considering excavation system of bench formation and leaving essential safety margins, as shown in Figure 2.5 and deducting the locked-up reserves during bench formation (also called as Bench Loss). The mineable reserves are calculated up to the depth of 60m BGL considering there is no waste / overburden / side burden (100% Recovery anticipated) for the proposed project. The results of geological resources and reserves have been shown in Table 2.3.

Table 2.3 Estimated Resources and Reserves of the Project

Resource Type	Rough Stone in m ³ & Tons	Gravel in m ³ & Tons
Geological Resource in (m ³ & Ts)	2024440 & 5567210	165636 & 331272
Mineable Reserves in (m ³ & Ts)	796565 & 2190554	140594 & 281188
Proposed production for 10 years (m ³ & Ts)	796565 & 2190554	140594 & 281188

Based on the year wise development and production plan and sections, as exemplified in Figures 2.5 the year wise production results have been provided in Table 2.4.

Table 2.4 Year-Wise Production Details

Year	Rough Stone m ³ & Tons	Gravel m ³ & Tons
I	85450 & 234988	52988 & 105976
II	88040 & 242110	43803 & 87606
III	88040 & 242110	43803 & 87606
IV	82975 & 228181	--
V	82525 & 226944	--
VI	79915 & 219766	--
VII	76280 & 209770	--
VIII	73615 & 202441	--
IX	70830 & 194783	--
X	68895 & 189461	--
Total	796565 & 2190554	140594 & 281188

Source: Approved Mining Plan & ToR

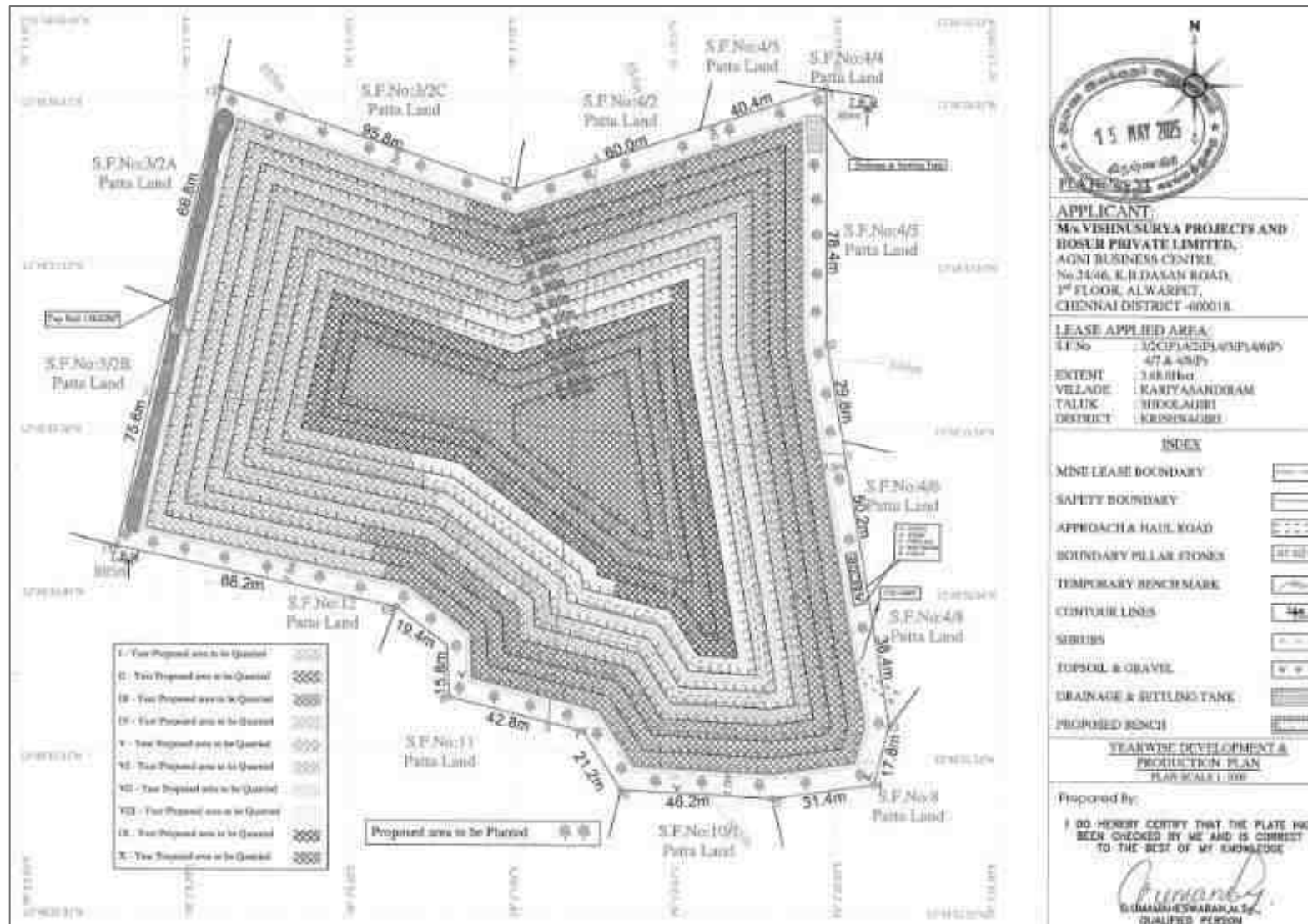


Figure 2.5 Year wise Development & Production Plan

2.6 MINING METHOD

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

2.6.1 Conceptual Blasting Design

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

Rules of Thumb for Blast Design

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

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

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

Rule 2: Generally, select the densest explosive possible.

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

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

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

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

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

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

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

Rule 6: Stemming should be equal to the burden.

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

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

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

Table 2.5 Conceptual Blasting Design

Blasthole Diameter (D) in mm	32
Burden (B) in m	1.5
Spacing (S) in m	1.30
Subdrill in m	0.45
Charge length (C) in m	0.64
Stemming	1.5
Hole Length (L) in m	2.6
Bench Height (BH) in m	2.1

Mass of explosive/hole in g	400
Stemming material size in mm	3.2
Burden stiffness ratio	1.43
Blast volume/hole in m ³	4.16
Production of rough stone/day in m ³ & Ts	295 & 811
Number of blastholes/day	71
Blasthole pattern	Staggered
Mass of explosive /day in kg	28.39
Powder factor in kg/m ³	0.10
Loading density	0.63
Type of explosives	Slurry
Diameter of packaging in mm	25
Initiation system	NONEL
Fly rock distance in m	19

2.6.2 Magnitude of Operation

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

Table 2.6 Operational Details for Proposed Project

	Rough Stone (m³) & Ts / 10 years	Gravel (m³) & Ts / 3 years
Proposed production	796565 & 2190554	140594 & 281188
Number of Working Days	270	270
Production /Day (m ³) & Ts	295 & 811	174 & 348
No. of Lorry Loads	49	29

2.6.3 Extent of Mechanization

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

Table 2.7 Machinery Details

S. No.	Type	No. of Unit	Size/Capacity	Dia of Hole (mm)	Motive Power
1	Jack Hammers	4	Hand Held	32mm	Diesel
2	Compressor	2	AIR	---	Diesel
3	Excavator	2	2.9 - 4.5 m ³	---	Diesel
Haulage & Transport Equipment					
4	Tipper	12	--	---	Diesel

2.6.4 Progressive Quarry Closure Plan

The progressive quarry closure plan of the proposed project shows past, present, and future land use statistics. According to the land use results, at Present, about 2.78.2ha of land is designated as unutilized area and Roads 0.03.0ha and Dump is 0.86.8ha. Whereas, at the end of the mine life, about 2.99.12ha of land would have been quarried; about 0.02.0ha of land would have been used for establishing infrastructures; about 0.03.0ha of land would have been used for road development; about 0.56.23ha of land would have been used for green belt development; about 0.07.65ha would have been used for Drainage & Settling Tank.

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	Nil	2.99.12
Infrastructure	Nil	0.02.0
Roads	0.03.0	0.03.0
Green Belt	Nil	0.56.23
Unutilized area	2.78.2	Nil
Dump	0.86.8	Nil
Drainage & Settling Tank	Nil	0.07.65
Total	3.68.0ha	3.68.0ha

2.6.5 Quarry Closure Budget

As the proposed project has the enormous potential for continuous operations even after the expiry of lease period, final mine closure plan is not proposed for now. Based on the environment management plan as discussed in Chapter X, the mine closure cost is given in Table 2.9.

Table 2.9 Mine Closure Budget

Activity	Capital Cost
736 Plants Inside the Lease Area	1,47,200
1104 Plants Outside the Lease Area	3,31,200
Wire Fencing	7,36,000
Garland Drain	36,800
Total	12,51,200

Source: Environment Management Plan

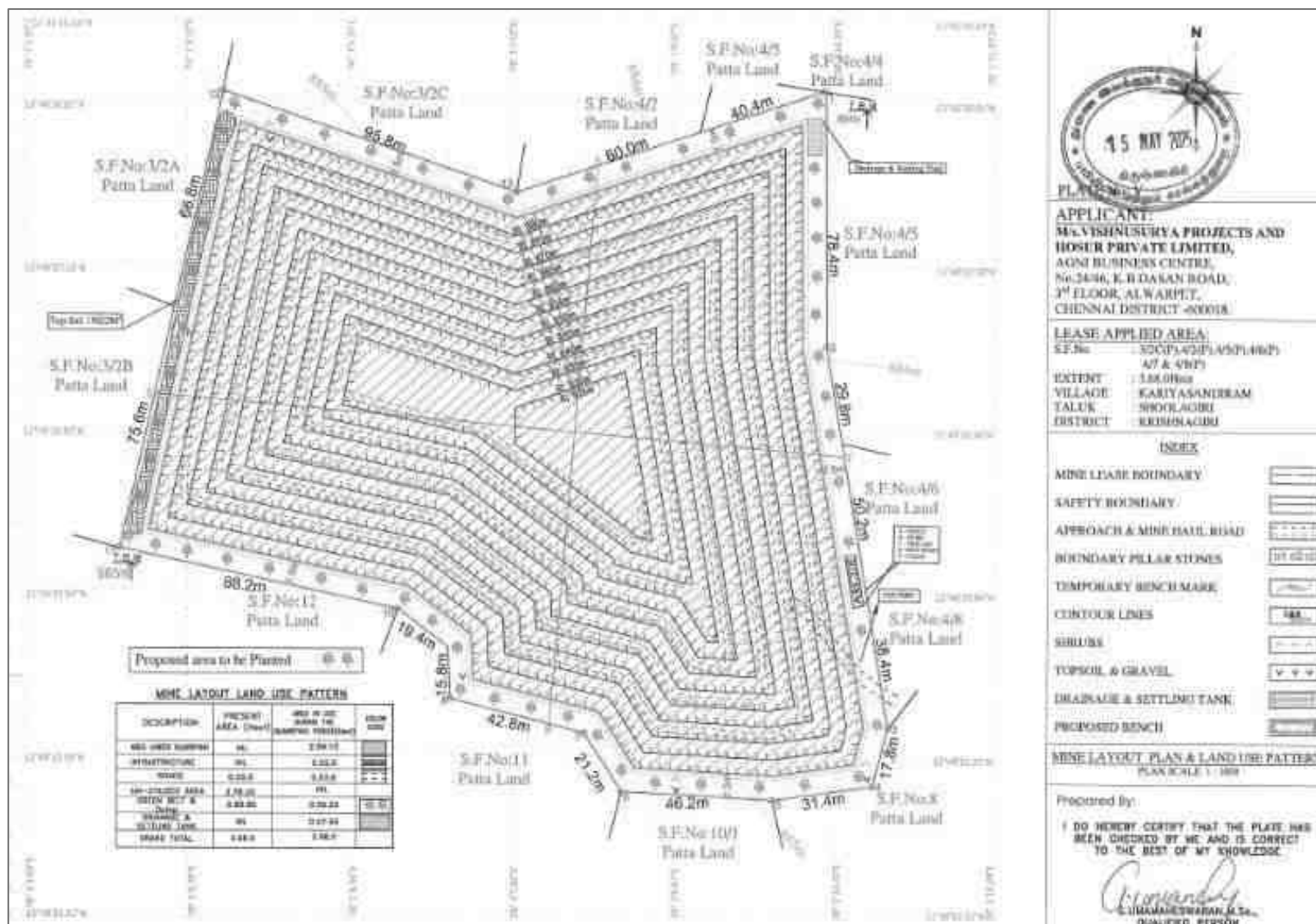


Figure 2.6 Mine Layout Plan and Land Use Pattern

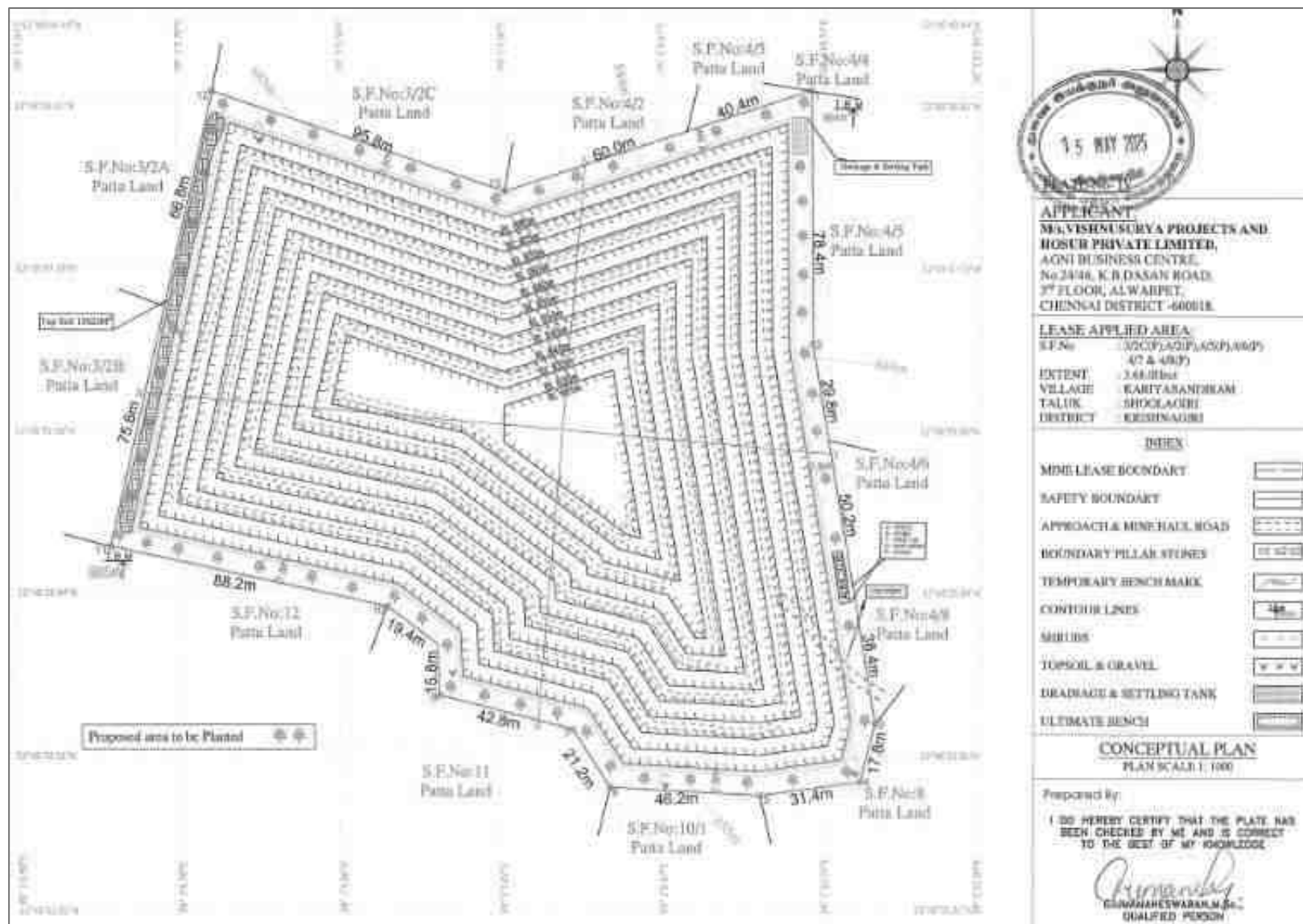


Figure 2.7 Conceptual Plan

2.6.6 Conceptual Mining Plan

The ultimate pit size is designed based on certain practical parameters such as economical depth of mining, safety zones, permissible area, etc. The ultimate pit dimension derived from Figures 2.7 is provided in Table 2.10.

Table 2.10 Ultimate Pit Dimension

Pit	Length (m)	Width (m)	Depth (m)
I	199	157	60

Source: Approved Mining Plan & ToR

2.6.7 Infrastructures

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

Other Infrastructure Requirement

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

2.6.8 Water Requirement

Details of water requirement in 4.0 KLD is given in Table 2.11.

Table 2.11 Water Requirement for the Project

Purpose	Quantity	Source
Dust Suppression	1.0 KLD	Existing bore wells nearby the lease area
Green Belt development	1.5 KLD	Existing bore wells nearby the lease area
Drinking & Domestic	1.5 KLD	Existing bore wells and approved water vendors
Total	4.0 KLD	

Source: Prefeasibility Report

2.6.9 Energy Requirement

High speed Diesel (HSD) will be used for quarrying machineries. As per the data shown in Table 2.12, Around **41,59,884 litres of HSD** will be used for rough stone 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 (796565 m³)	Gravel (140594m³)	Total Diesel (litre)
Average Rate of Fuel Consumption (l/hr)	16	10	---
Working Capacity (m ³ /hr)	20	60	---
Time Required (hours)	39,828	2,343	---
Total Diesel Consumption for 10 years (litre)	6,37,252	23,432	6,60,684
Fuel Requirement for Compressor			
Average Rate of Fuel Consumption/hole (litre)	0.4	---	---
Number of Drillholes/day	71	---	---
Total Diesel Consumption for 10 years (litre)	3,83,400	---	3,83,400
Fuel Requirement for Tipper			
Average Rate of Fuel Consumption/Trip (litre)	20	20	---
Carrying Capacity in m ³	6	6	---
Number of Trips / days	49	29	---
Number of Trips / 10 years	1,32,300	23,490	---
Total Diesel Consumption for 10 years (litre)	26,46,000	4,69,800	31,15,800
Total Diesel Consumption by Excavator, Compressor and Tipper			41,59,884

2.6.10 Capital Requirement

The project proponent will invest Rs.1,56,49,280 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	1,00,43,280
2	Machinery	25,00,000
3	EMP	31,06,000
	Total Project Cost	1,56,49,280

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
		Blaster	1
2	Unskilled	Musdoor/ Labours	26
Total			29

Source: Prefeasibility Report

2.8 PROJECT IMPLEMENTATION SCHEDULE

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

Table 2.15 Expected Time Schedule

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

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

CHAPTER III

DESCRIPTION OF THE ENVIRONMENT

3.0 GENERAL

This chapter presents a regional background to the baseline data at the very onset, which will help in better appreciation of micro-level field data, generated on several environmental and ecological attributes of the study area. The baseline status of the project environment is described section wise for better understanding of the broad-spectrum conditions. The baseline environment quality represents the background environmental scenario of various environmental components such as land, water, air, noise, biological and socio-economic status of the study area. Field monitoring studies to evaluate the base line status of the project site were carried out covering **March to May 2025** with CPCB guidelines. Environmental baseline data were collected by an NABL accredited and MoEF notified **Accuracy Analabs (OPC) Private Limited** for the environmental attributes including soil, water, air, and noise and by FAEs for ecology and biodiversity, traffic, and socio-economy.

Study Area

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

Table 3.1 Monitoring Attributes and Frequency of Monitoring

Attribute	Parameters	Frequency of Monitoring	No. of Locations	Protocol
Land Use/ Land Cover	Land-use Pattern within 5 km radius of the study area	Once during the study period	Study Area	Satellite Imagery & Primary Survey
*Soil	Physico Chemical characteristics	Once during the study period	5 (1 in core & 4 in 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	5 (1 surface water & 4 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	5 (1 core & 4 buffer)	S 5182 Part 1-23 National Ambient Air Quality Standards, CPCB
Noise Levels	Ambient noise	Hourly observation for 24 hours per location	5 (1 core & 4 buffer zone)	IS 9989 As per CPCB Guidelines
Ecology	Existing flora and fauna	Through field visit during the study period	Study area	Primary Survey by Quadrate & Transect Study Secondary Data – Forest Working Plan
Socio Economic Aspects	Socio-economic characteristics, Population statistics and existing infrastructure in the study area	Site visit & Census Handbook, 2011	Study area	Primary Survey, census handbook & need based assessments.

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

3.1 LAND ENVIRONMENT

3.1.1 Geology and Geomorphology

Study area is mainly composed of Grey Hornblende biotite gneiss and Biotite hornblende genesis, as shown in Figure 3.1. The lease area occurs in Grey Hornblende biotite gneiss terrain Among the geomorphic units, Pediment pediplain complex dominate the study area, as shown in Figure 3.2. The lease area occurs in Pediment pediplain complex terrain.

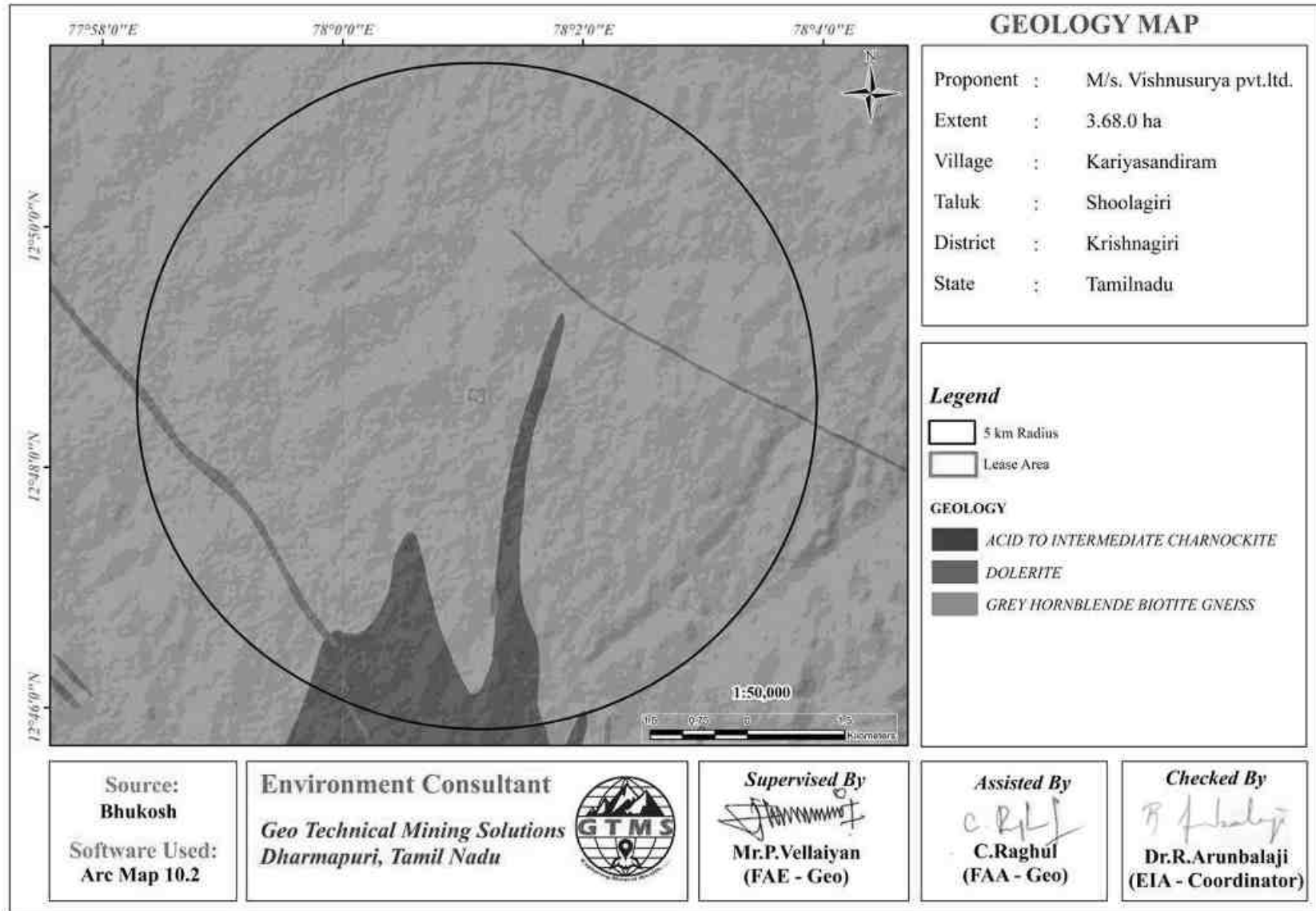


Figure 3.1 Geology Map of 5 km Radius from Proposed Project Site

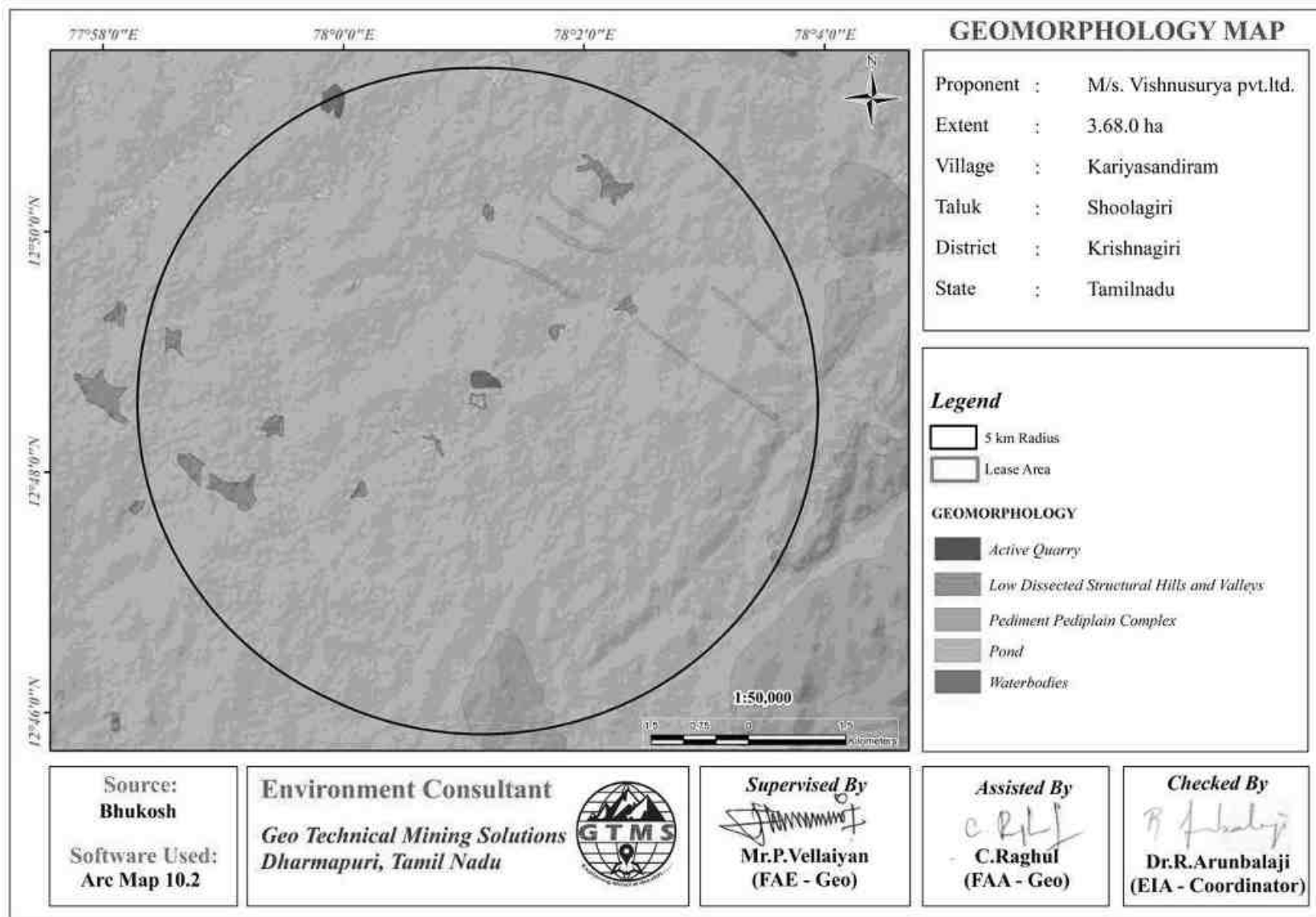


Figure 3.2 Geomorphology Map of 5 km Radius from Proposed Project Site+

3.1.2 Land Use/ Land Cover

Land Use and Land Cover (LULC) map, as shown in Figure 3.3 was prepared using Sentinel II image for the study area of 5 km radius to provide a baseline status of the study area covering 5 km radius around the proposed mine site. Totally 8 LULCs were mapped. The areal extent of each LULC is provided in Table 3.2. Of the total area, mining area covers only 28.66 ha accounting for 0.33%, of which lease area of 3.68.0 ha contributes only about 0.042 %. This small percentage of mining activities shall not have any significant impact on the land environment.

Table 3.2 LULC Statistics of the Study Area

S. No.	Classification	Area (ha)	Area (%)
1	Water	49.48	0.57
2	Trees	19.55	0.22
3	Flooded Vegetation	0.20	0.00
4	Crops	5672.83	64.96
5	Built Area	845.64	9.68
6	Mining area	28.66	0.33
7	Bare Ground	0.30	0.00
8	Rangeland	2116.67	24.24
Total		8733.33	100.0

Source: Sentinel II Satellite Imagery

3.1.3 Topography

The proposed lease area is elevated topography. The average elevation of 6 m above surface ground level. The maximum elevation 893m was observed centre of the lease area and minimum elevation 885m was observed in eastern side of project site. The slope towards Eastern side of the project site.

3.1.4 Drainage Pattern

Drainage pattern is the pattern formed by the streams, rivers, and lakes in a particular drainage basin over time that reveals characteristics of the kind of rocks and geological structures in a landscape. The proposed area shows dendritic drainage pattern indicating uniform lithology beneath the surface, as shown in Figure 3.4.

3.1.5 Seismic Sensitivity

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

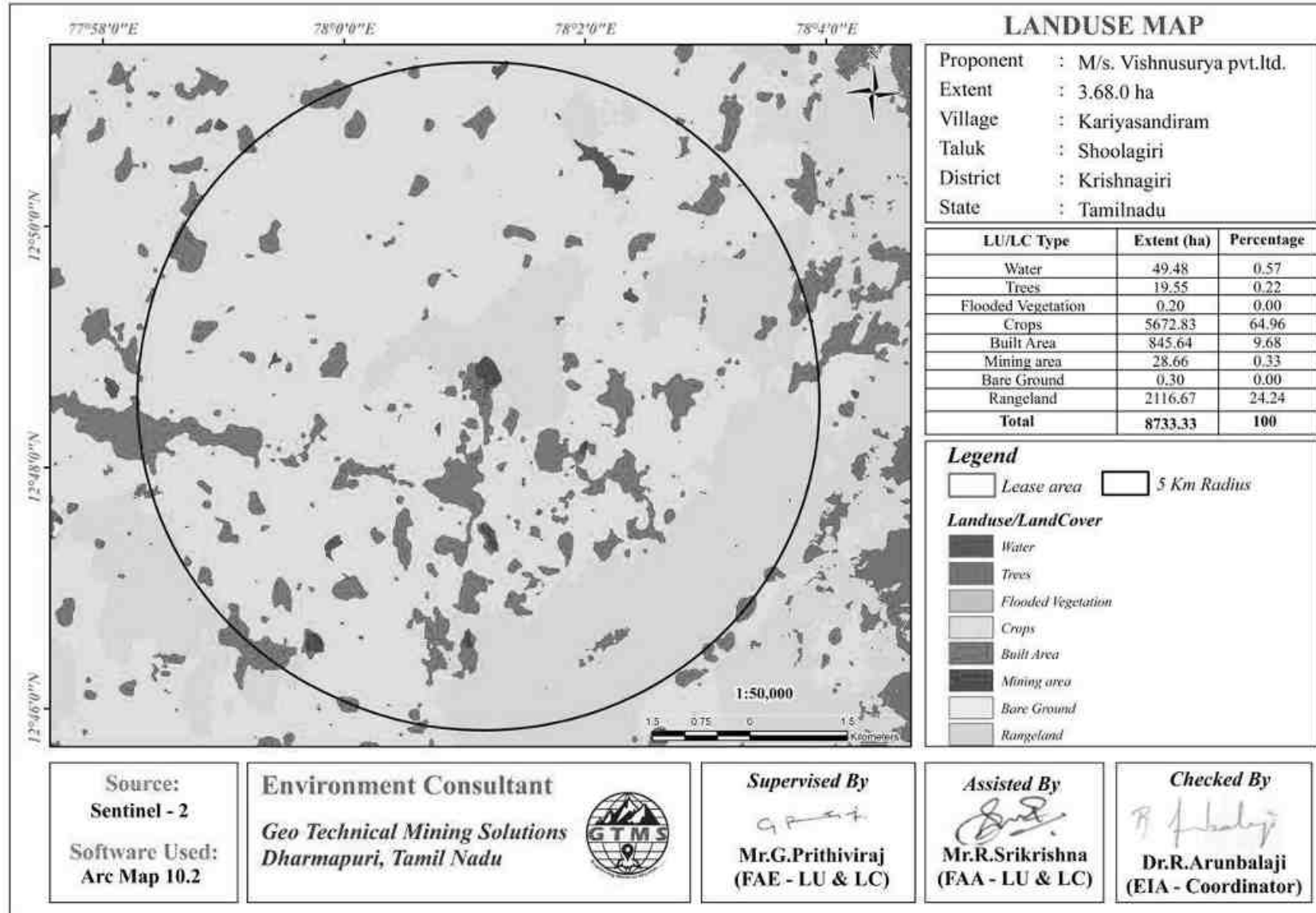


Figure 3.3 LULC Map of 5 km Radius from Proposed Project Site

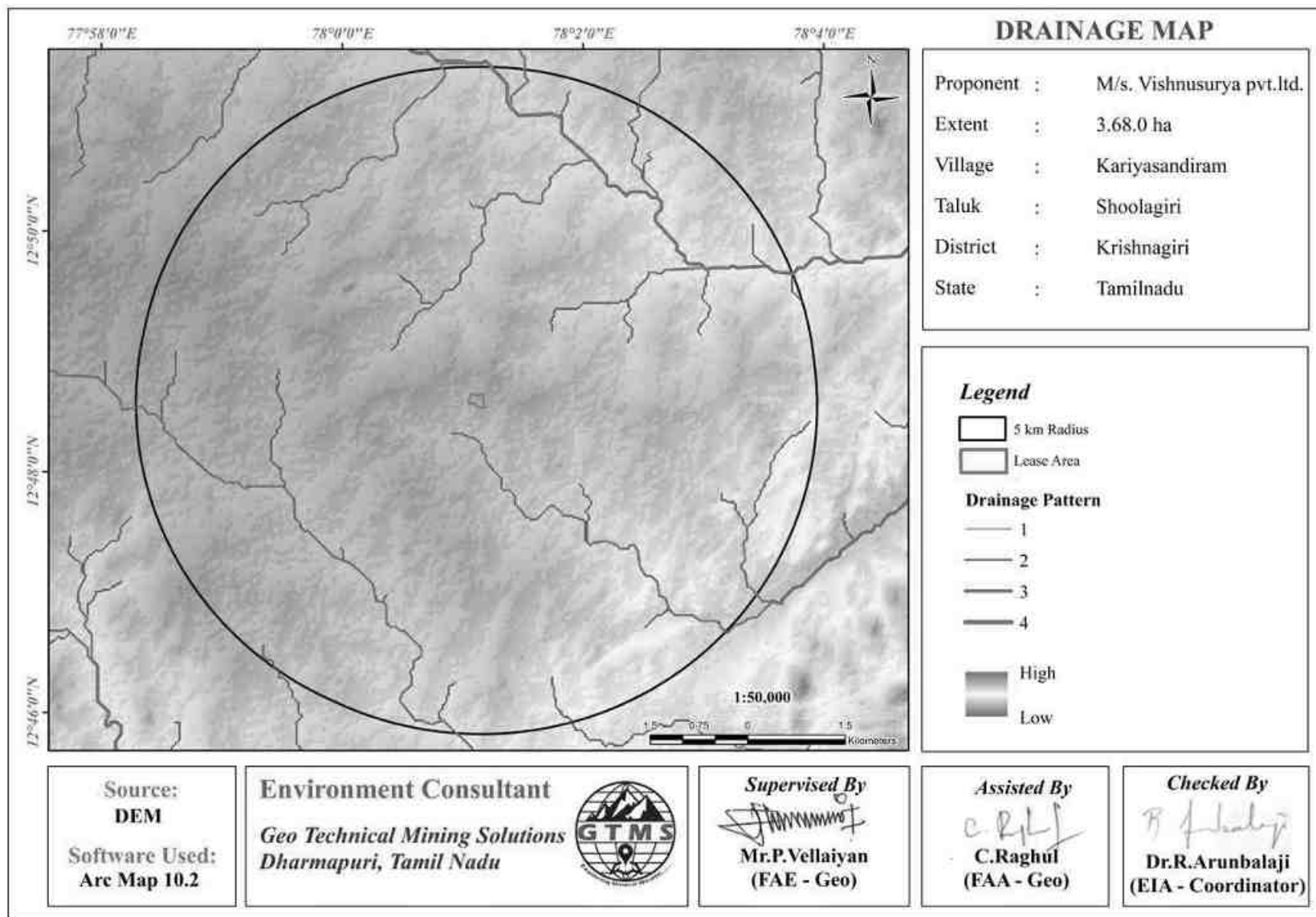


Figure 3.4 Drainage Map of 5 km Radius from Proposed Project Site

3.2 SOIL ENVIRONMENTAL

Soil quality of the study area is one the important components of the land environmental. The composite soil samples were collected from the 5 locations of the study area and analysed for different parameters. To the determine the baseline soil characteristics of the soil sample. The 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 90cm 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. The physical and chemical characteristic results of soil samples are provided in Table 3.4.

Table 3.3 Soil Sampling Locations

Sampling ID	Location	Distance (km)	Direction	Coordinates
S01	Core Zone	0.05	S	12°48'32.27"N, 78°1'4.91"E
S02	Kariyasandiram	0.68	NE	12°48'58.92"N, 78°1'20.12"E
S03	Muduguriki	1.16	S	12°47'54.16"N, 78°1'9.86"E
S04	Mahedevapuram	1.54	WSW	12°48'17.92"N, 78°0'14.82"E
S05	Gollapalli	1.83	WNW	12°49'33.72"N, 78°0'40.20"E

Source: Sampling Results by Accuracy Analabs (OPC) Private Limited, in Association with GTMS.

3.2.1 Soil Characteristics

A. Physical Characteristics

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

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

- **Consistence:** Coarse (sandy) soils may require slightly higher moisture content while fine (clay) soils may require slightly lower. A soil moisture content between 8.98% to 9.26% is generally considered optimal for plant growth in medium- textured soils (like loams). This range falls within the 45- 65% available water zone where plants are at risk of stress if a water deficit is prolonged.

B. Chemical Characteristics of Soil

- Chemical characteristics of soils through selected parameters viz. pH, soluble cations and anions, exchangeable cations, organic content and fertility status in the form of NPK values and organic matter are presented in Table 3.5. pH is an important parameter indicative of alkaline or acidic nature of soil. It greatly affects the microbial population as well as solubility of metal ions and regulates nutrient availability. Variation in the pH of the soil in the study area is presented in Table 3.5 and it is found to be from slightly acidic to neutral (7.21- 7.98) in reaction. Electrical conductivity a measure of soluble salts in the soil is in the range of 0.26 – 0.32dS/m as shown in Table 3.5.
- The important water-soluble cations in the soil are nitrogen, phosphorus, potassium, calcium and magnesium whose concentration levels ranged from N- 36mg/kg⁻¹ to 46mg/kg⁻¹, P- 12mg/kg⁻¹ to 18mg/kg⁻¹, K- 62mg/kg⁻¹ to 76mg/kg⁻¹, Cu- 0.6mg/Kg- 1.3mg/Kg & Mg- 4.1mg/kg⁻¹ – 5.0mg/kg⁻¹ respectively.
- The soil samples in the study area show loamy textures varying between Silt. pH of the soil varies from 7.21- 7.98 indicating slightly acidic to slightly alkaline nature. Electrical conductivity of the soil varies from 0.26 – 0.32dS/m. The physical and chemical properties of soil is shown in the Table 3.4.

Table 3.4 Soil Quality of the Study Area

S. No	Parameters	Unit	S1	S2	S3	S4	S5
Physical Parameters							
1	Textural Classification	--	Silt soil	Silt soil	Silt soil	Silt soil	Silt soil
2	Sand	%	20.5	22	21	20	20.5
3	Silt	%	69	68	65	64	66
4	Clay	%	10.5	10	14	16	13.5
5	pH in 5% of	-	7.95	7.59	7.66	7.21	7.98

	solution						
6	Electrical Conductivity	dS/m	0.32	0.28	0.30	0.26	0.31
7	Organic Carbon	%	1.4	1.6	1.9	1.9	1.9
8	Moisture	%	9.05	8.98	9.25	8.21	9.26
9	Organic Matter	mg/kg	3.15	3.25	4.02	2.95	3.56
Macro Nutrients							
10	Nitrogen	mg/kg	40	46	36	44	42
11	Phosphorous	mg/kg	15	18	12	18	16
12	Potassium	mg/kg	68	75	62	76	70
Micronutrients							
13	Iron	mg/kg	3.0	2.6	3.5	3.8	3.6
14	Manganese	mg/kg	4.4	4.1	5.0	4.9	4.9
15	Zinc	mg/kg	0.7	1.0	0.6	1.5	0.8
16	Copper	mg/kg	0.9	0.6	1.3	1.2	1.3

Source: Sampling Results by Accuracy Analabs (OPC) Private Limited, in Association with GTMS

Table 3.4a Assigning Scores to Soil Quality Indicators

S. No.	OM	BD	PH	EC	Total Score	Recommendation
1	33	2	13	11	59	The soil requires major and immediate treatment
2	33	2	7	11	53	
3	33	2	13	11	59	
4	33	2	13	11	59	
5	33	2	13	11	59	
6	33	2	13	11	59	

OM (Organic Matter) BD (Bulk Density) PH (Potential of Hydrogen) EC (Electrical Conductivity) *Source: PSS-2262 Soil Quality Monitoring.pdf (okstate.edu).*

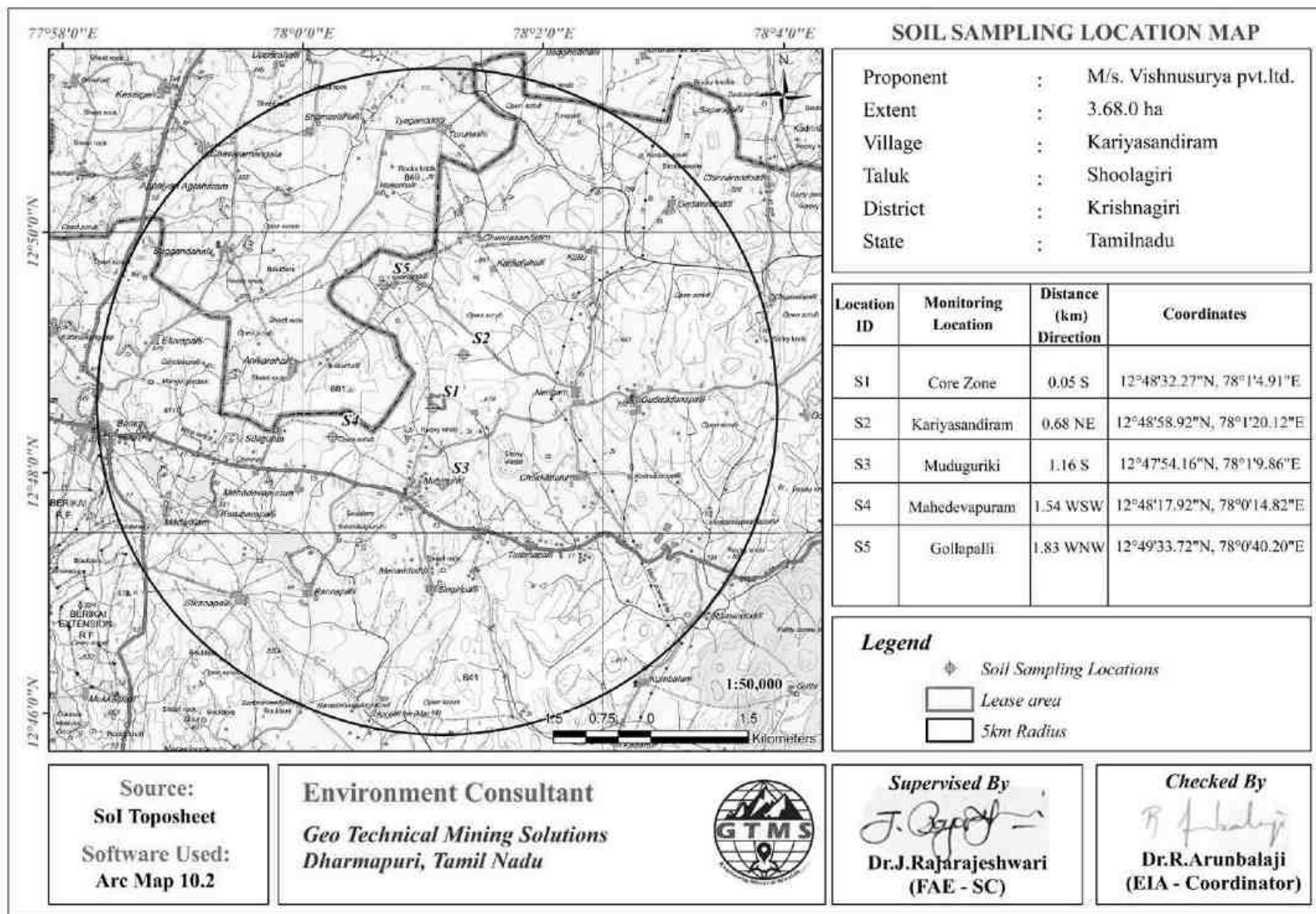


Figure 3.5 Map Showing Soil Sampling Locations within 5 km Radius around Proposed Project Site

3.3 WATER ENVIRONMENT

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

Table 3.5 Water Sampling Locations

Sampling ID	Location	Distance (km)	Direction	Coordinates
OW1	Nearby Core	0.44	S	12°48'18.37"N, 78° 1'4.03"E
OW2	Berigai	3.80	SW	12°48'4.97"N, 77°59'0.64"E
BW1	Kariyachandiram	0.42	SE	12°48'21.08"N, 78°1'19.20"E
BW2	Nerigam	1.87	NE	12°48'58.78"N, 78° 2'8.69"E
SW1	Muduguriki lake	0.71	SW	12°48'21.19"N, 78° 0'43.46"E

Source: Sampling Results by Accuracy Analabs (OPC) Private Limited, in Association with GTMS.

3.3.1 Ground Water Quality Result

3.3.1.1 Physical Parameter of ground water:

The basic physical parameters of water include

Colour:

- Value observed in Project Site (True/Apparent Color): BQL (1.0) Hazen unit.
- Acceptable and permissible limits: 5 Hazen units and 15 Hazen units respectively. The value in the project site is below the acceptable and permissible limits prescribed by IS 10500: 2012 (referred as “Standards” from herein).

Odour & Taste:

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

pH:

- Value observed in the Project Site: Min.-7.15 & Max. 7.95 mg/L.
- Acceptable and permissible limits: 6.5-8.5. The pH value is the measure of acid – base equilibrium. The value of pH in the project site clearly indicates that water is neutral in nature.

Turbidity:

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

Total Dissolved Solids:

- Value observed in the Project Site: Min. 382 & Max. 752 mg/L.
- Acceptable and permissible limits: 500 mg/L and 2000 mg/L respectively. The value of total dissolved solids in the project site clearly indicates that water is suitable for drinking purpose.
- TDS is the presence of inorganic salts and small amounts of organic matter present in the water.

3.3.1.2 Chemical parameters of water:

The chemical parameters of the drinking water include,

Calcium:

- Value observed in Min. 55 & Max. 128 mg/L.
- Acceptable and permissible limits: 75mg/L and 200 mg/L respectively.
- Calcium is an essential macronutrient. The value of the calcium is within the prescribed permissible standards. The higher level of calcium may cause hardening in domestic equipment and will also reduce the detergent efficiency. Higher levels of calcium will lead to constipation, gas, and bloating. Apart from that, extra calcium may also increase the risk of kidney stones. If the calcium deposit in blood is high, it may lead to hypercalcemia.

Magnesium:

- Value observed in Min. 22 & Max. 43 mg/L.
- Acceptable and permissible limits: 30 mg/L and 100 mg/L respectively.
- The value of Magnesium in the project site is within acceptable and permissible limit. The increase in the level of magnesium will cause diarrhea and vomiting in children.

Chloride

- Value observed in Min. 91 & Max. 158 mg/L.
- Acceptable and permissible limits: 250 mg/L and 1000 mg/L respectively.
- The chloride level in the project site is within the acceptable and permissible limit. If the level of chloride is more, it may cause galvanic and pitting corrosion, increases level of metals. It imparts bitter taste to the water.

Total Alkalinity as CaCO₃:

- Value observed in Min. 122 & Max. 265 mg/L.
- Acceptable and permissible limits: 200 mg/L and 600 mg/L respectively.
- Total Alkalinity is the measure of the concentration of all alkaline substances dissolved in the water which includes carbonates, bicarbonates and hydroxides. The value of the total alkalinity is slightly greater than acceptable limit, which will impart soda taste to the water.

Hardness:

- Value observed in Min. 230 & Max. 451 mg/L.
- Acceptable and permissible limits: 200 mg/L and 600 mg/L respectively.
- The value of Hardness in the project site is within the permissible limit and higher than the acceptable limit. The increase in the level of hardness may cause corrosion and scaling problems, increased soap consumption and it also contributes to the salty taste of water.

3.3.2 Surface water

Muduguriki lake is the prominent surface water resources present in the study area. This lake was ephemeral in nature which convey water only after rainfall events. The surface water sample known as SW1 were collected from the Muduguriki lake (0.71km SW) to assess the baseline water quality as shown in Table 3.8 and Figure 3.10.

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

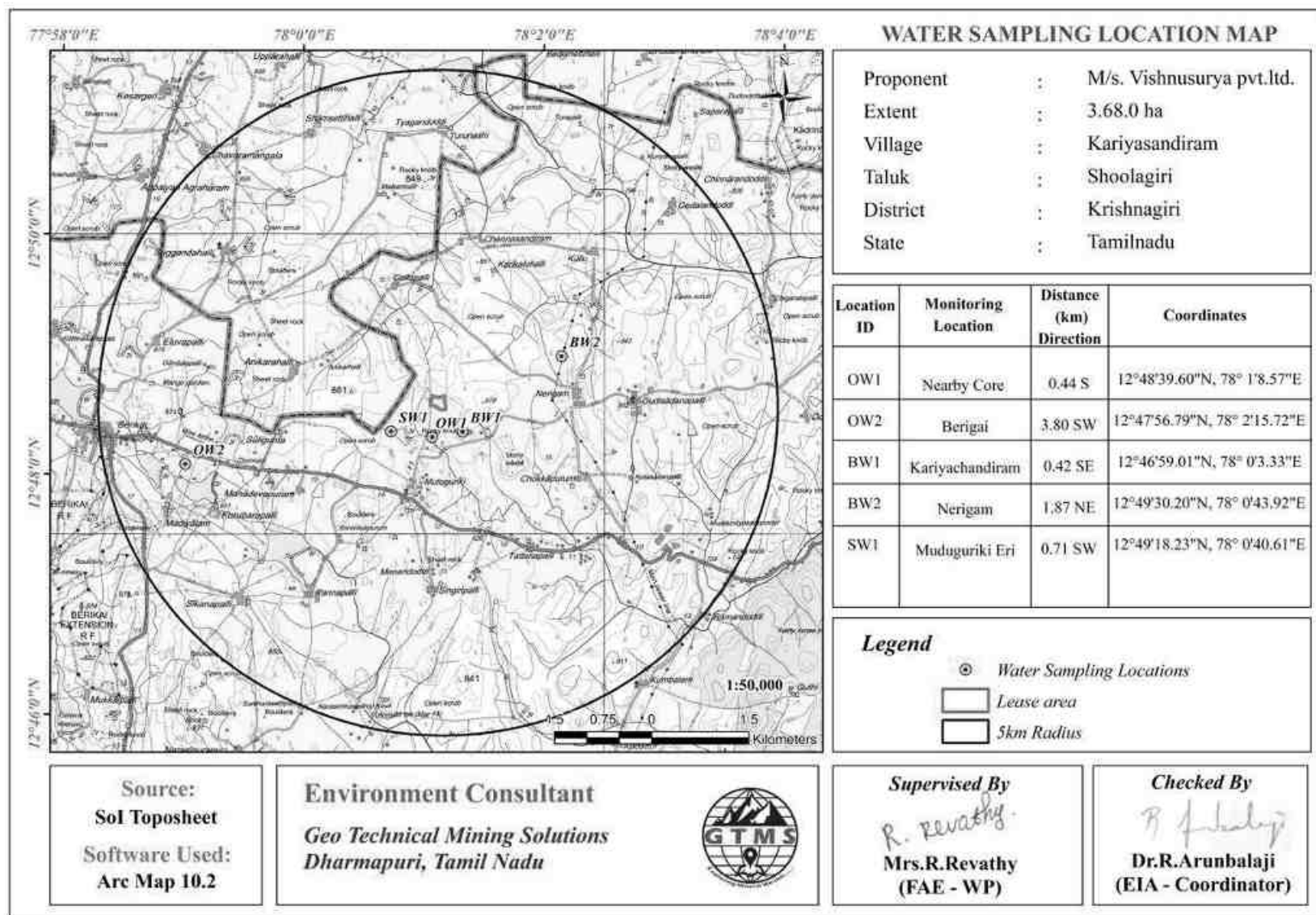


Figure 3.6 Map Showing Water Sampling Locations within 5 km Radius around Proposed Project Site

Table 3.6 Surface and Ground Water Quality Result

S. No.	Parameters	Units	Results					Permissible Limits as Per IS 10500:2012	
			OW1	OW2	BW 1	BW 2	SW1	Acceptable	Permissible
1	pH @25°C	-	7.15	7.20	7.84	7.95	7.58	6.5 - 8.5	No relaxation
2	Colour	Hazen	BQL (1.0)	BQL (1.0)	BQL (1.0)	BQL (1.0)	BQL (1.0)	5.0	15
3	Odour	Odourless	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Temperature	°C	25	25	25	25	25	-	-
5	Taste	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
6	Turbidity	NTU	BQL (1.0)	BQL (1.0)	BQL (1.0)	BQL (1.0)	BQL (1.0)	1.0	5.0
7	Electrical Conductivity @ 25°C	µmhos/cm	596	648	805	940.6	1175	-	-
8	Total Dissolved Solids	mg/L	382	415	582	602	752	500	2000
9	Aluminium as Al	mg/L	BQL (0.001)	BQL (0.001)	BQL (0.001)	BQL (0.001)	BQL (0.001)	0.03	0.2
10	Ammonia as total ammonia - N	mg/L	BQL (0.001)	BQL (0.001)	BQL (0.001)	BQL (0.001)	BQL (0.001)	0.5	No relaxation
11	Barium as Ba	mg/L	BQL (0.001)	BQL (0.001)	BQL (0.001)	BQL (0.001)	BQL (0.001)	0.7	No relaxation
12	Boron as B	mg/L	BQL (0.001)	BQL (0.001)	BQL (0.001)	BQL (0.001)	BQL (0.001)	0.5	1.0
13	Calcium as Ca	mg/L	55	60	128	87	109	75.0	200
14	Chloramines	mg/L	BQL (0.001)	BQL (0.001)	BQL (0.001)	BQL (0.001)	BQL (0.001)	4.0	No relaxation
15	Chloride as Cl	mg/L	91	99	153	132	158	250	1000
16	Copper as Cu	-	BQL (0.001)	BQL (0.001)	BQL (0.001)	BQL (0.001)	BQL (0.001)	0.05	1.5
17	Fluoride as F	mg/l	BQL (0.001)	BQL (0.001)	BQL (0.001)	BQL (0.001)	BQL (0.001)	1.0	1.5
18	Free Residual chlorine	mg/l	BQL (0.001)	BQL (0.001)	BQL (0.001)	BQL (0.001)	BQL (0.001)	0.2	1.0
19	Iron as Fe	mg/l	BQL (0.001)	BQL (0.001)	BQL (0.001)	BQL (0.001)	BQL (0.001)	0.3	No relaxation

20	Magnesium as Mg	mg/l	22	24	39	36	43	30.0	100
21	Manganese as Mn	mg/l	BQL (0.001)	BQL (0.001)	BQL (0.001)	BQL (0.001)	BQL (0.001)	0.1	0.3
22	Nitrate as NO ₃	mg/l	18	22	21	38	41	45.0	No relaxation
23	Phenolic compound as C ₆ H ₅ OH	mg/l	BQL (0.001)	BQL (0.001)	BQL (0.001)	BQL (0.001)	BQL (0.001)	0.001	0.002
24	Sulphate (as SO ₄)	mg/l	42	4	59	63	75	0.1	No relaxation
25	Sulphide (as H ₂ S)	mg/l	BQL (0.001)	BQL (0.001)	BQL (0.001)	BQL (0.001)	BQL (0.001)	200	400
26	Alkalinity to Phenolphthalein	mg/l	BQL (0.001)	BQL (0.001)	BQL (0.001)	BQL (0.001)	BQL (0.001)	0.05	No relaxation
27	Alkalinity to methyl orange	mg/l	122	132	142	203	265	200	600
28	Total Hardness (as CaCO ₃)	mg/l	230	249	305	361	451	200	600
29	Zinc (as Zn)	mg/l	BQL (0.001)	BQL (0.001)	BQL (0.001)	BQL (0.001)	BQL (0.001)	5.0	15
30	Cadmium (as Cd)	mg/l	BQL (0.001)	BQL (0.001)	BQL (0.001)	BQL (0.001)	BQL (0.001)	0.003	No relaxation
31	Lead (as Pb)	mg/l	BQL (0.001)	BQL (0.001)	BQL (0.001)	BQL (0.001)	BQL (0.001)	0.01	No relaxation
32	Mercury (as Hg)	mg/l	BQL (0.001)	BQL (0.001)	BQL (0.001)	BQL (0.001)	BQL (0.001)	0.001	No relaxation
33	Nickel (as Ni)	mg/l	BQL (0.001)	BQL (0.001)	BQL (0.001)	BQL (0.001)	BQL (0.001)	0.07	No relaxation
34	<i>Total Coliform</i>	CFU/100ml	Absent	Absent	Absent	Absent	≤500 /MPN	Absent	Absent
35	<i>Escherichia Coli</i>	CFU/100ml	Absent	Absent	Absent	Absent	≤500 /MPN	Absent	Absent

Source: Sampling Results by **Accuracy Analabs (OPC) Private Limited**, in association with GTMS

3.3.3 Hydrogeological Studies

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

3.3.3.1 Rainfall

Rainfall data for the study area were collected for the period of 1981-2022(POWER | Data Access Viewer (nasa.gov)). Long term monthly average rainfall was estimated from the data of 2014-2024 and compared with the monthly rainfall for the year 2024, shown in Figure 3.6. The Figure 3.7 shows that monthly rainfall in 2024 is generally high in the months of June, August, October when compared to the long term monthly average rainfall.

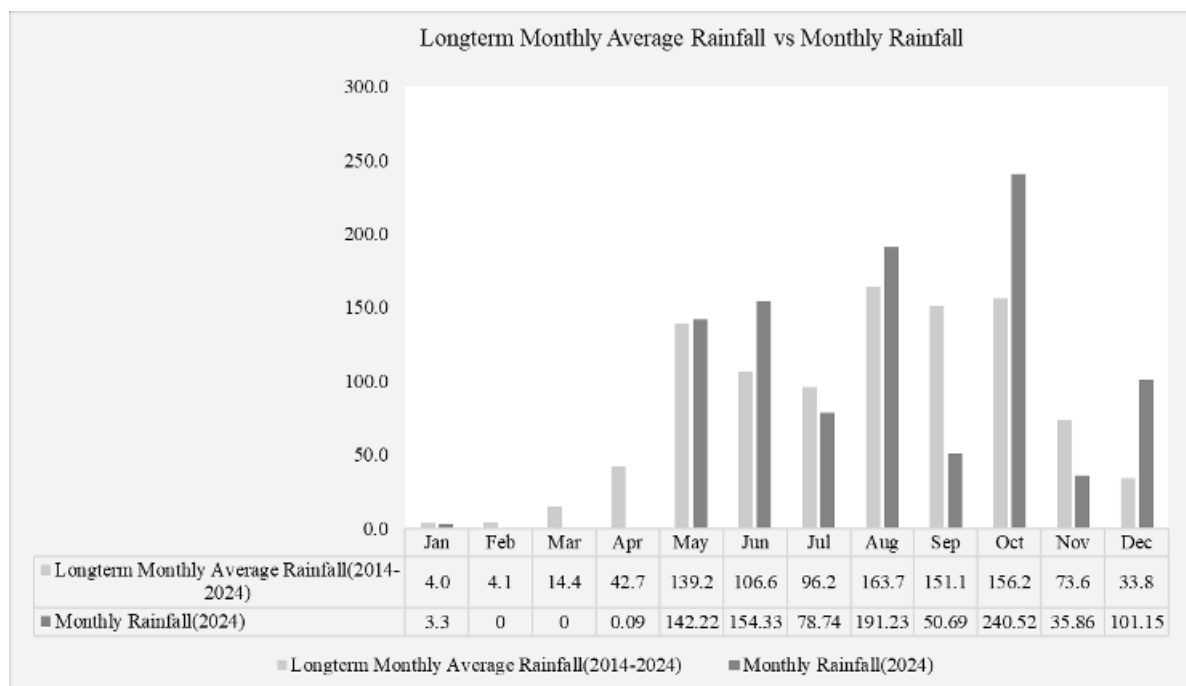


Figure 3.7 Long-Term Monthly Average Rainfall Vs Monthly Rainfall

3.3.3.2 Groundwater Levels and Flow Direction

Data regarding depth to groundwater levels are essential to infer the direction of groundwater movement within the study area. Knowledge of groundwater flow direction is must in choosing location for background groundwater quality monitoring well and in locating recharge and discharge areas. Therefore, data regarding groundwater elevations were collected from 9 open wells and 9 bore wells at various locations within 2km radius around the proposed project sites for the period from March through May 2025 (Pre-Monsoon Season) and from December 2024 through February, 2025 (Post Monsoon Season).

The open well water level data thus collected onsite are provided in Tables 3.7 and 3.8. According to the data, average depths to the static water table in open wells range from

19.40 to 22.17m BGL in pre monsoon and 17.60-19.30m BGL in post monsoon. The bore well data thus collected onsite are provided in Tables 3.9 and 3.10. The average depths to static potentiometric surface in bore wells for the period of December 2024 through February, 2025 (Post Monsoon Season) vary from 53.27-56.67m and from 55.17 – 59.27 m for the period of March through May, 2025 (Pre-Monsoon Season). Data on the depths to static water table and potentiometric surface were used to draw contour lines connecting groundwater elevation (also known as equipotential hydraulic head) to determine the groundwater flow direction perpendicular to the contour lines. From the maps of open well groundwater flow direction shown in Figures 3.8-3.9, it is understood that most of the open well groundwater for the post- and pre-monsoon seasons flows towards the open well number 1 located in southeast direction of the proposed project site. The groundwater flow maps in Figures 3.10-3.11 show that most of the bore well groundwater for the post- and pre-monsoon seasons flow towards the bore well number 3. It is located in south direction of the proposed project site. On the basis of the groundwater flow information, both open wells and bore wells mentioned above can be chosen for water quality monitoring purpose as the wells may get easily affected by the contaminants resulting from the mining activities of the sites in future.

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

Station ID	Depth to Static Water Table BGL(m)				Latitude	Longitude
	Mar-25	Apr-25	May-25	Average		
DW01	18.9	19.5	20.4	19.6	12°48'20.41"N	78° 1'14.14"E
DW02	19.2	20.1	20.8	20.0	12°48'24.57"N	78° 0'58.50"E
DW03	19.8	20.6	21.1	20.5	12°48'30.48"N	78° 0'46.39"E
DW04	21.5	22.4	22.6	22.2	12°48'45.31"N	78° 0'49.68"E
DW05	19.5	20.7	21.4	20.5	12°49'6.56"N	78° 1'3.42"E
DW06	20.1	20.8	21.5	20.8	12°48'46.63"N	78° 1'50.32"E
DW07	18.6	19.4	20.2	19.4	12°48'1.80"N	78° 1'32.53"E
DW08	19.6	20.2	20.6	20.1	12°48'17.92"N	78° 0'37.45"E
DW09	20.4	21.1	21.8	21.1	12°48'30.06"N	78° 0'24.02"E

Source: Onsite monitoring data

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

Station ID	Depth to Static Water Table BGL(m)				Latitude	Longitude
	Dec-2024	Jan-2025	Feb-2025	Average		
DW01	17.2	17.6	18.4	17.7	12°48'20.41"N	78° 1'14.14"E
DW02	17.5	18.1	18.5	18.0	12°48'24.57"N	78° 0'58.50"E
DW03	18.1	18.5	19.2	18.6	12°48'30.48"N	78° 0'46.39"E
DW04	18.2	19.3	20.4	19.3	12°48'45.31"N	78° 0'49.68"E
DW05	17.6	18.2	18.8	18.2	12°49'6.56"N	78° 1'3.42"E

DW06	18.2	18.8	19.5	18.8	12°48'46.63"N	78° 1'50.32"E
DW07	17.1	17.5	18.2	17.6	12°48'1.80"N	78° 1'32.53"E
DW08	17.5	18.4	19.1	18.3	12°48'17.92"N	78° 0'37.45"E
DW09	20.60	18.8	17.2	18.87	12°46'58.98"N	77°57'54.92"E

Source: Onsite monitoring data

Table 3.9 Pre-Monsoon Water Level of Bore Wells within 2 km Radius

Station ID	Depth to Static Potentiometric Surface BGL(m)				Latitude	Longitude
	Mar-2025	Apr-2025	May- 2025	Average		
BW01	57.6	58.4	60.2	58.7	12°48'29.22"N	78° 1'22.54"E
BW02	56.5	57.5	59.4	57.8	12°48'39.99"N	78° 1'52.79"E
BW03	55.7	54.6	56.5	55.6	12°48'18.69"N	78° 1'4.04"E
BW04	58.4	57.2	59.2	58.3	12°47'48.13"N	78° 0'52.13"E
BW05	59.2	58.4	60.2	59.3	12°48'30.21"N	78° 0'35.31"E
BW06	55.4	54.3	55.8	55.2	12°47'53.04"N	78° 1'44.07"E
BW07	56.1	55.6	56.4	56.0	12°49'36.19"N	78° 0'41.49"E
BW08	56.3	55.2	56.2	55.9	12°48'52.77"N	78° 1'52.26"E
BW09	56.5	55.4	57.4	56.4	12°49'20.89"N	78° 0'45.47"E

Source: Onsite monitoring data

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

Station ID	Depth to Static Potentiometric Surface BGL (m)				Latitude	Longitude
	Dec-2024	Jan-2025	Feb-2025	Average		
BW01	54.2	55.1	56.4	55.2	12°48'29.22"N	78° 1'22.54"E
BW02	53.1	54.6	55.2	54.3	12°48'39.99"N	78° 1'52.79"E
BW03	52.5	53.2	54.3	53.3	12°48'18.69"N	78° 1'4.04"E
BW04	54.1	55.4	57.5	55.7	12°47'48.13"N	78° 0'52.13"E
BW05	55.4	56.5	58.1	56.7	12°48'30.21"N	78° 0'35.31"E
BW06	52.4	53.1	54.3	53.3	12°47'53.04"N	78° 1'44.07"E
BW07	53.6	54.2	55.2	54.3	12°49'36.19"N	78° 0'41.49"E
BW08	53.5	54.7	55.4	54.5	12°48'52.77"N	78° 1'52.26"E
BW09	52.4	53.2	55.2	53.6	12°49'20.89"N	78° 0'45.47"E

Source: Onsite monitoring Data

3.3.3.3 Electrical Resistivity Investigation

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

Result

The Geophysical VES data obtained from the project site have been shown in Table 3.11. The field data obtained from a detailed geophysical investigation were plotted using excel spreadsheet for interpretation. The plot for the purpose of interpretation has been shown in Figure 3.12

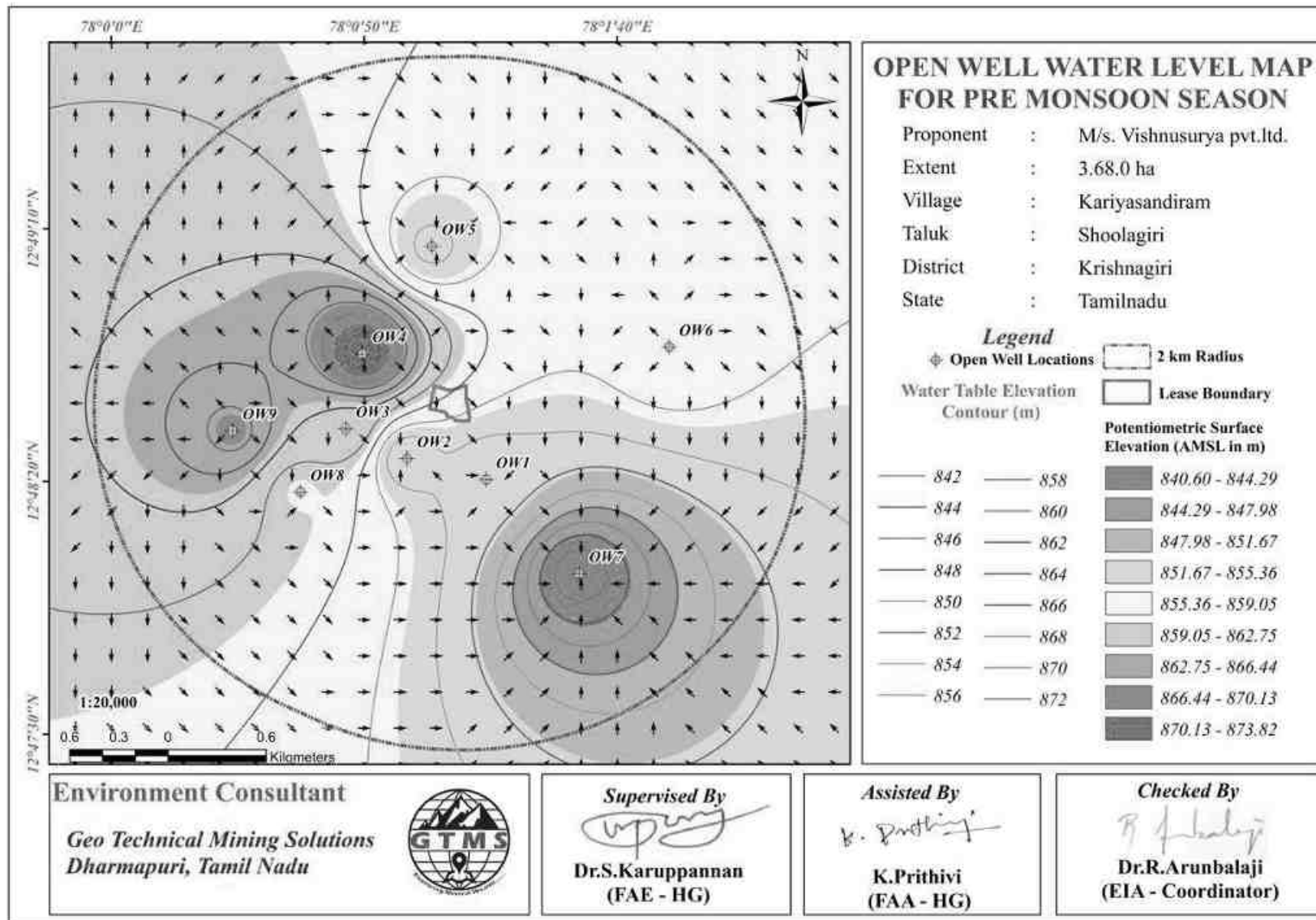


Figure 3.8 Open Well Static Groundwater Elevation Map Showing Direction of Groundwater Flow During Pre-Monsoon Season

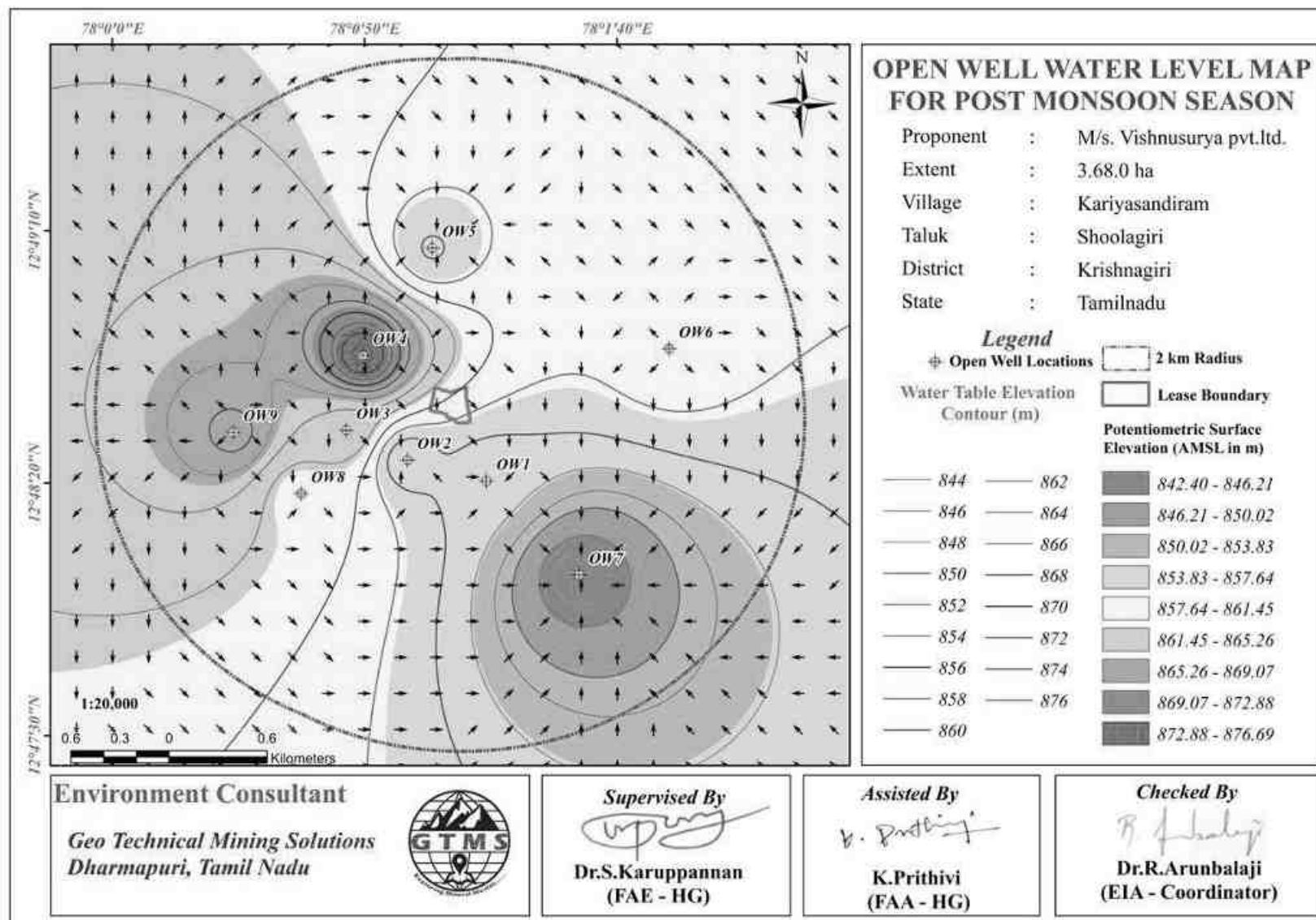


Figure 3.9 Open Well Static Groundwater Elevation Map Showing Direction of Groundwater Flow During Post-Monsoon Season

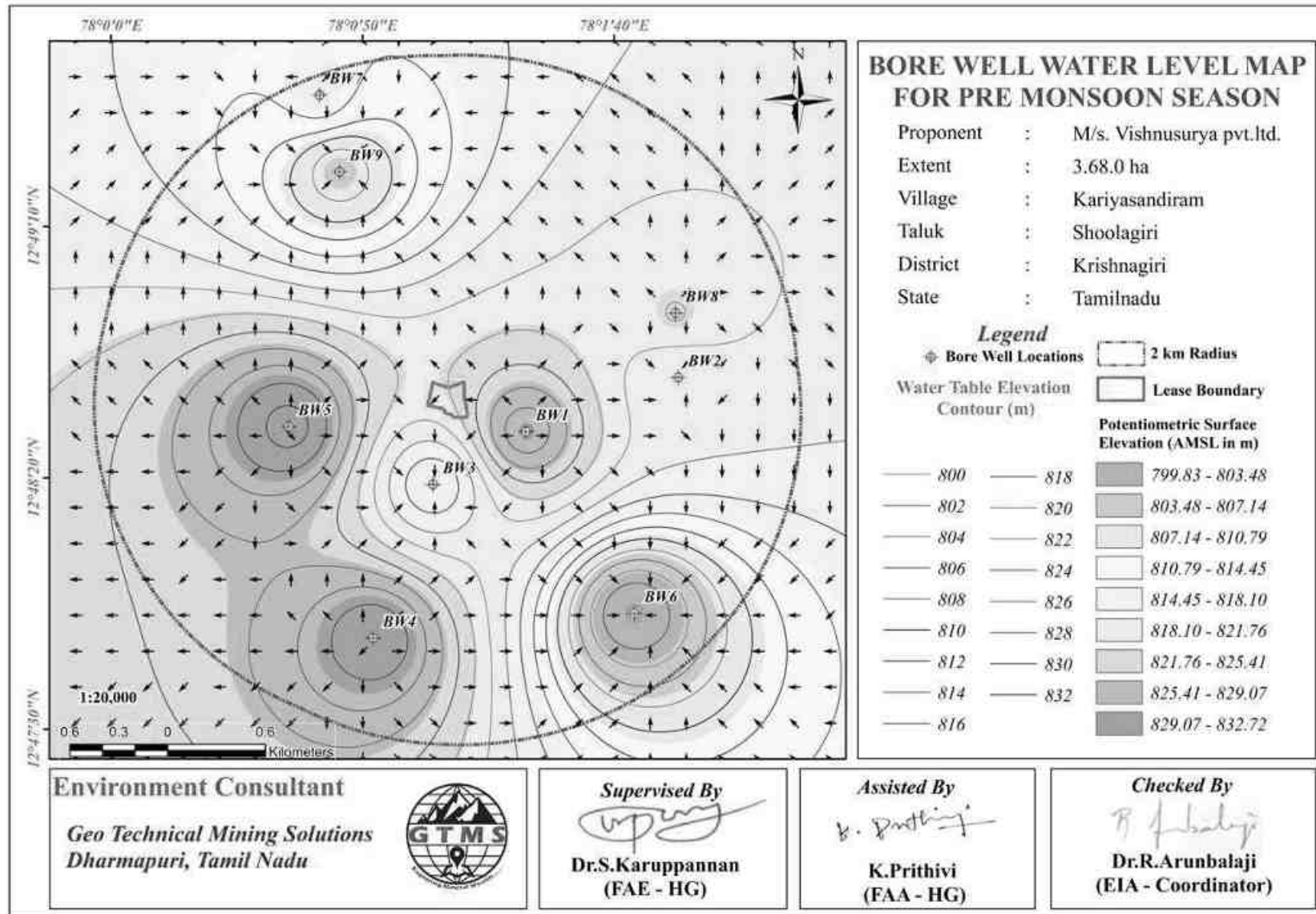


Figure 3.10 Borewell Static Groundwater Elevation Map Showing Direction of Groundwater Flow During Pre-Monsoon Season

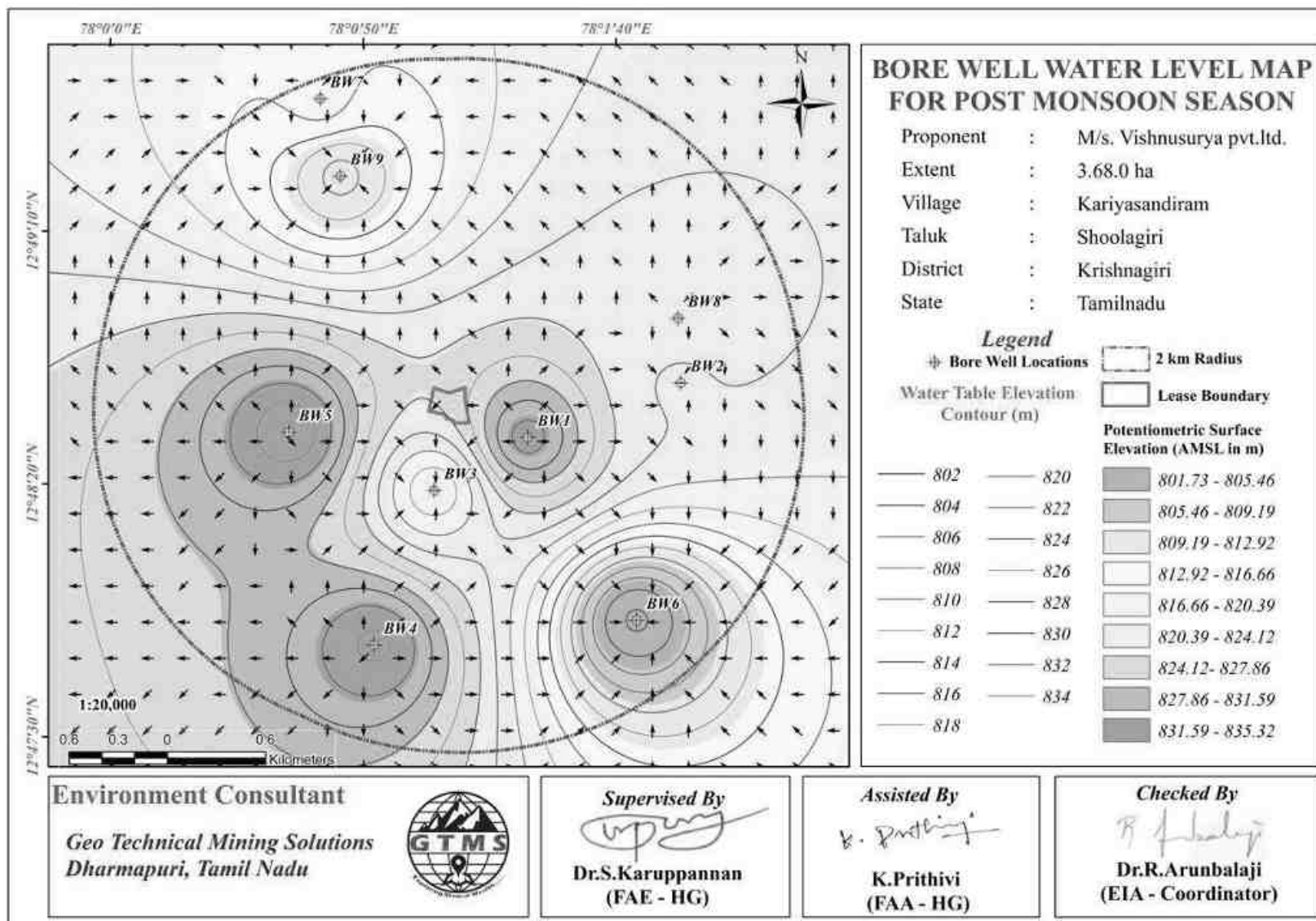


Figure 3.11 Borewell Static Groundwater Elevation Map Showing Direction of Groundwater Flow During Post-Monsoon Season

Table 3.11 Vertical Electrical Sounding Data

Location Coordinates - 12°48'36.07"N 78° 1'8.35"E					
S. No.	AB/2 (m)	MN/2 (m)	Geometrical Factor (G)	Resistance in Ω	Apparent Resistivity in Ωm
1	2	2	11.78	12.44	146.5
2	4	2	49.46	7.42	367.04
3	6	5	112.26	4.98	559.28
4	8	5	200.18	2.86	572.71
5	10	5	75.36	8.49	640.03
6	15	10	173.49	4.53	786.42
7	20	10	310.86	3.18	987.56
8	25	10	487.49	2.29	1118.76
9	30	10	274.75	5.28	1451.78
10	35	10	376.8	4.22	1590.54
11	40	10	494.55	3.33	1649.12
12	45	10	628	2.75	1729.18
13	50	10	777.15	2.39	1857.16
14	65	20	453.6	4.50	2041.05
15	70	20	989.1	2.17	2149.5
16	80	20	1256	1.25	1567.45
17	90	20	1554.3	1.69	2630.93
18	100	20	1653.6	1.62	2680.44

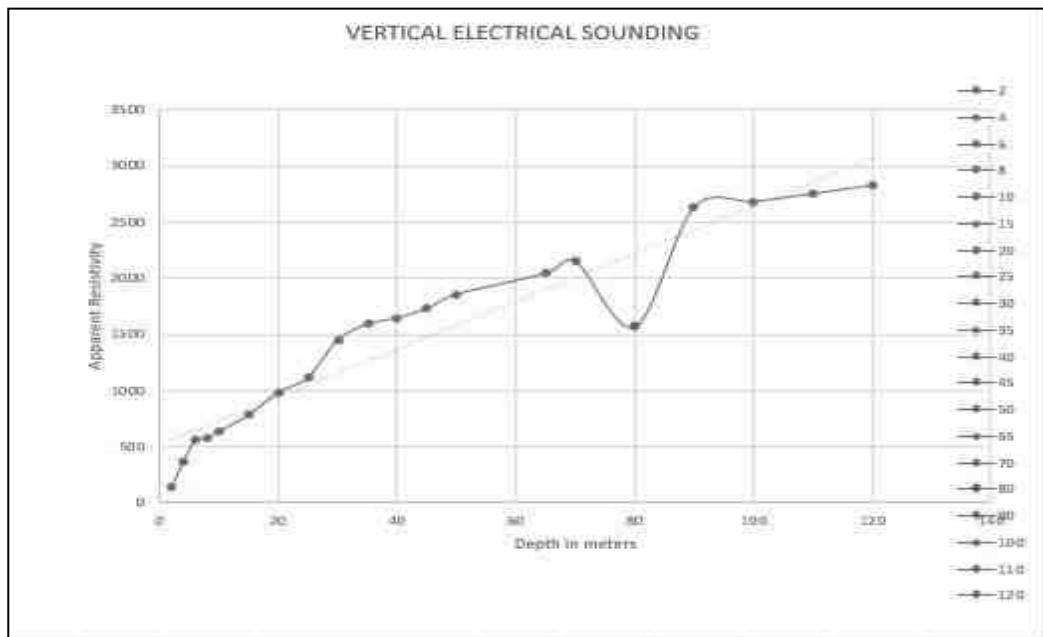


Figure 3.12 Graph Showing Occurrence of Water Bearing Fracture Zones at the Depth of 100 m Below Ground Level in Proposed Project

The rock formation of low resistivity values indicates occurrence of water at the depth of about 80m below ground level. The maximum depth proposed for the proposed project is 60 BGL. Therefore, the mining operation will not affect the aquifer throughout the entire mine life period.

3.4 AIR ENVIRONMENT

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

3.4.1 Meteorology

3.4.1.1 Climatic Variables

A temporary meteorological station was installed at the project sites by covering cluster quarries. The station was installed at a height of 3m 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 3.12.

Table 3.12 Onsite Meteorological Data

S. No.	Parameters		March,2025	April,2025	May,2025
1	Temperature (⁰ C)	Min	15.17	18.99	20.94
		Max	37.53	40.58	40.54
		Avg	27.29	29.70	27.81
2	Relative Humidity (%)	Min	9.29	11.26	21.02
		Max	99.59	97.86	97.59
		Avg	42.63	42.70	65.96
3	Wind Speed (m/s)	Min	0.50	0.25	0.01
		Max	5.65	5.63	7.48
		Avg	2.79	3.04	2.56
4	Wind Direction (degree)	Min	52.80	10.10	2.50
		Max	258.10	258.70	355.80
		Avg	132.66	132.62	179.62
5	Surface Pressure(kPa)	Min	91.91	91.63	91.35
		Max	92.92	92.60	92.44
		Avg	92.42	92.15	91.93

Source: Sampling Results by Accuracy Analabs (OPC) Private Limited, in association with GTMS.

3.4.1.2 Wind Pattern

Wind pattern will largely influence the dispersion pattern of air pollutants and noise from the proposed project site. Analysis of wind pattern requires hourly site-specific data of wind speed and direction. Two types of wind rose were generated: historical seasonal wind rose for the period of March to May of the years from 2021 to 2024 and the seasonal wind rose for the study period of March to May 2025. The wind rose diagrams thus produced are shown in Figures 3.13-3.13a. Figure 3.14 reveals that:

- ❖ The measured average wind velocity during the study period is 2.57m/s.
- ❖ Predominant wind was dominant in the directions ranging from Southeast to Northwest.

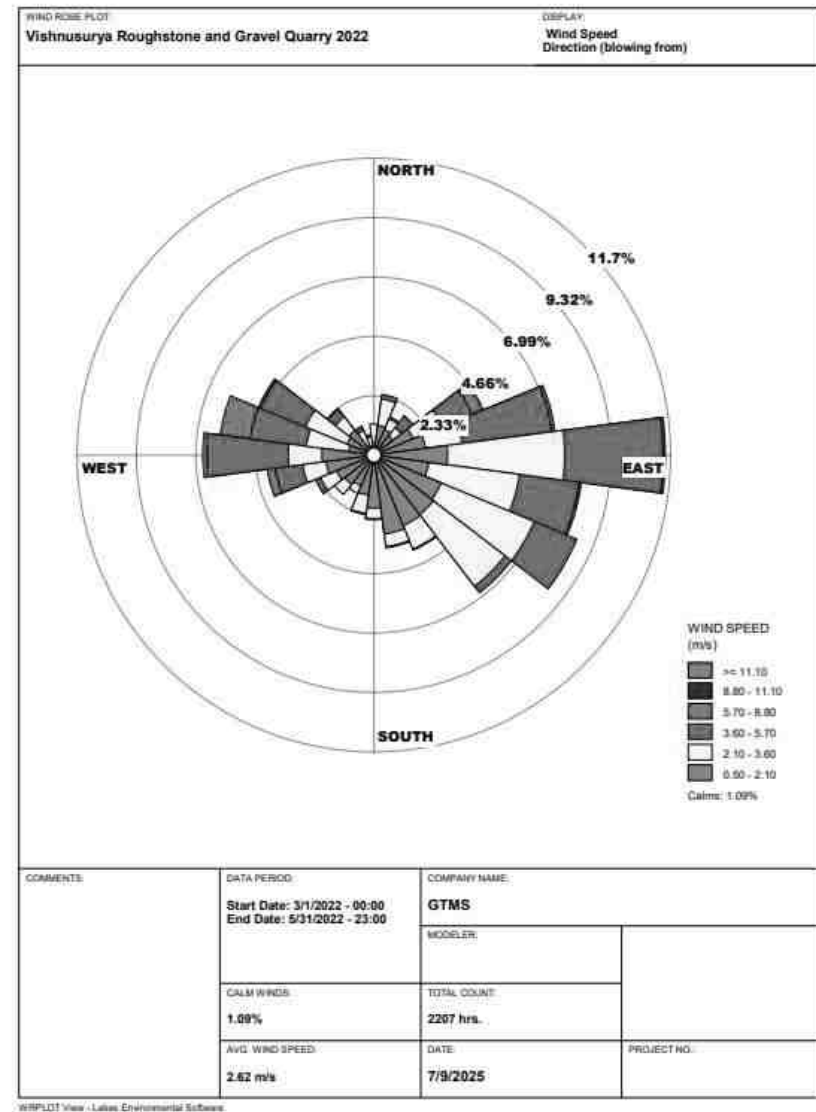
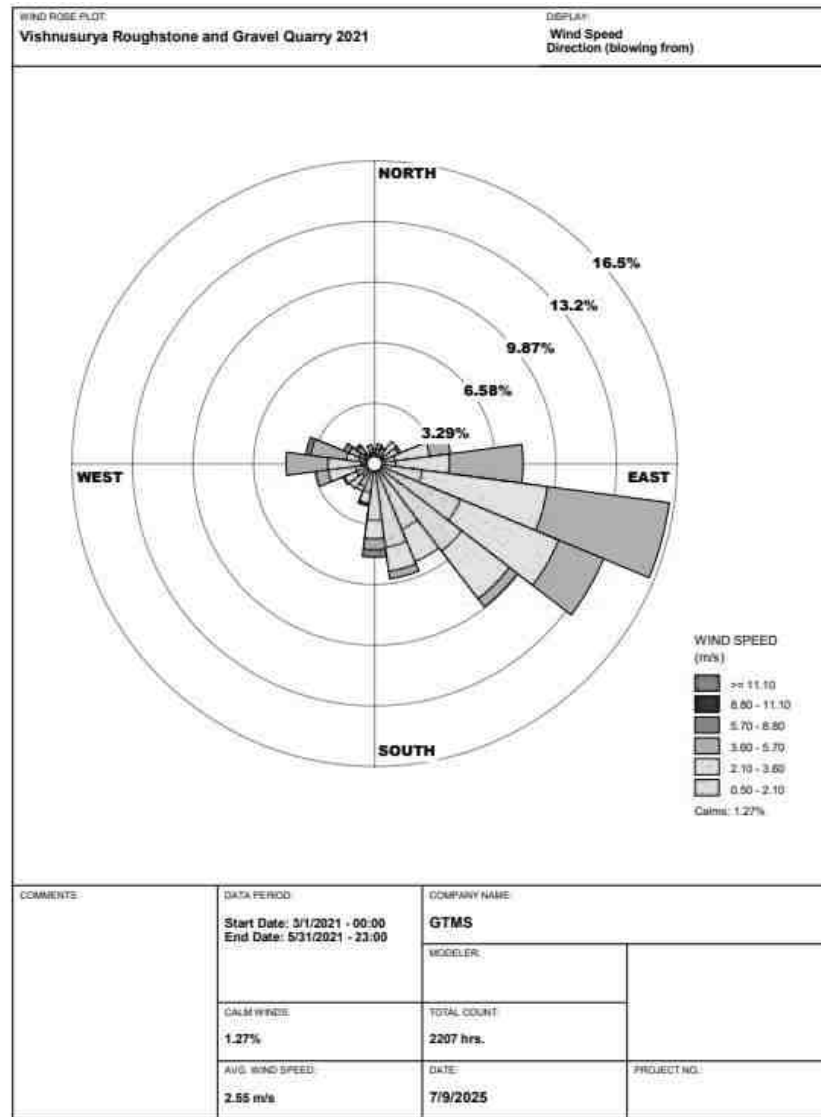


Figure 3.13 Windrose Diagram for 2021-2022(March to May)

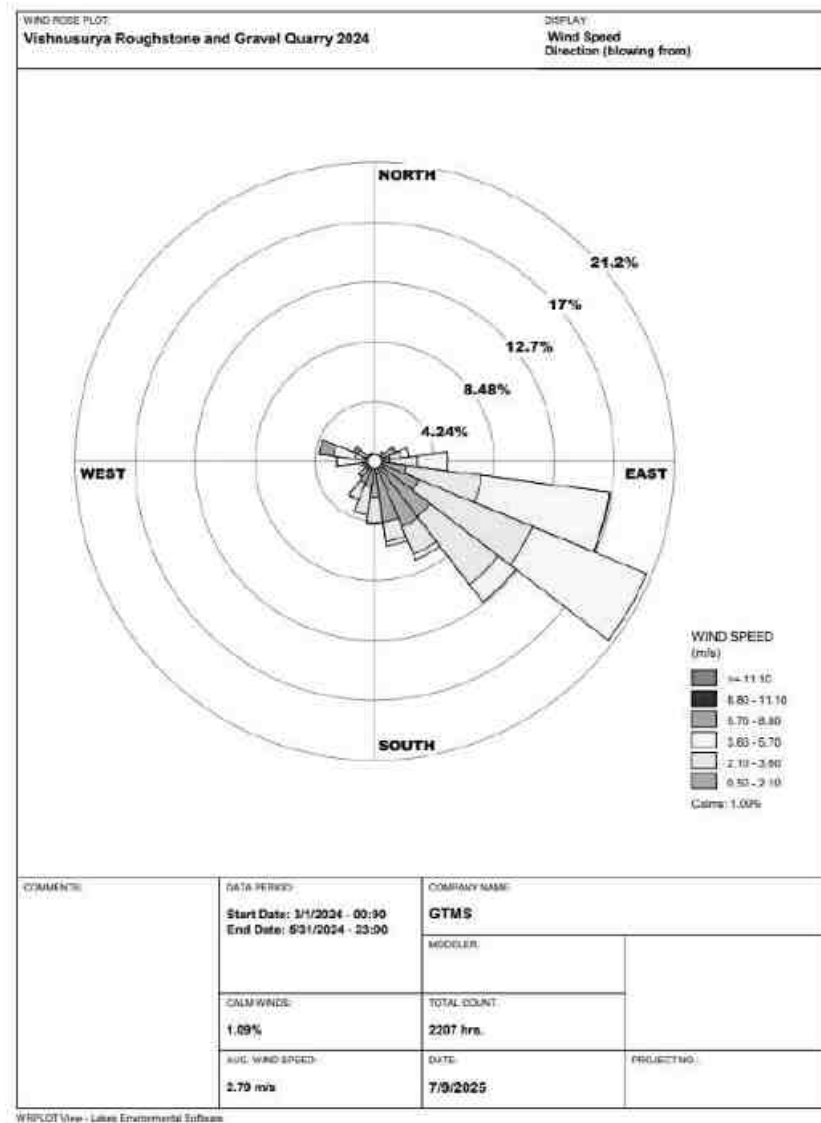
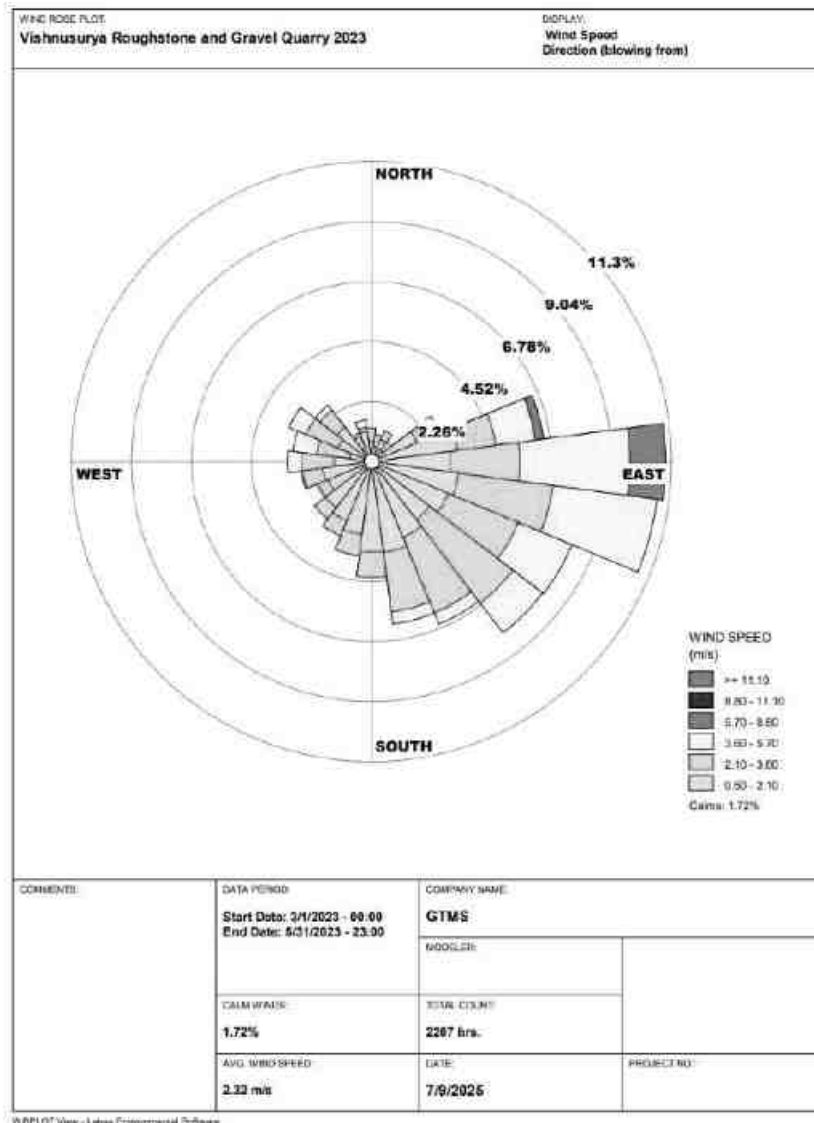


Figure 3.13a Windrose Diagram for 2023-2024 (March to May)

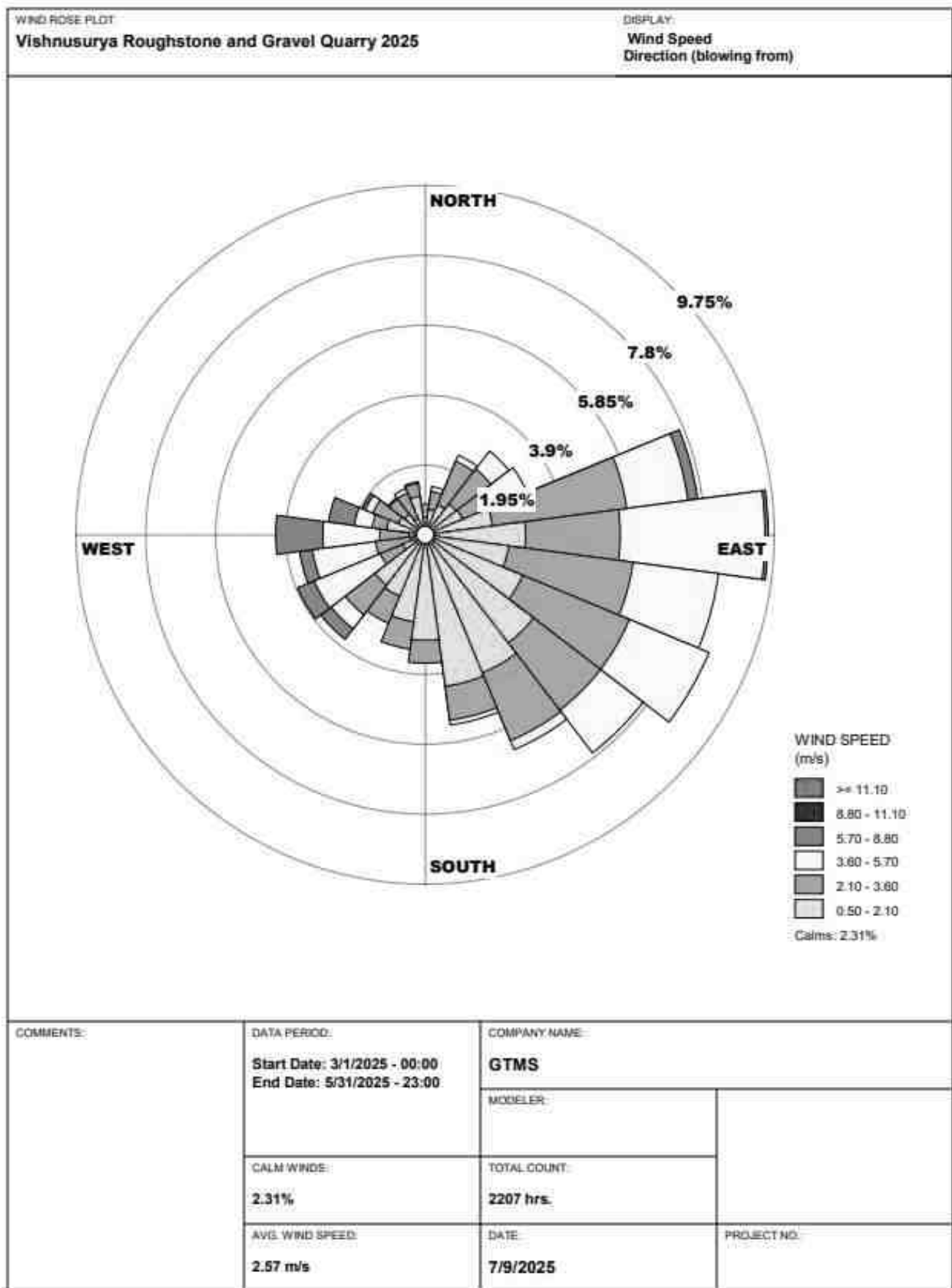


Figure 3.14 Onsite Wind Rose Diagram 2025

3.4.2 Ambient Air Quality Study

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

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

Table 3.13 Methodology and Instrument Used for AAQ Analysis

Parameter	Method	Instrument
PM _{2.5}	Gravimetric method Beta attenuation method	Fine Particulate Sampler
PM ₁₀	Gravimetric method Beta attenuation method	Respirable Dust Sampler
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 Accuracy Analabs (OPC) Private Limited & CPCB Notification

Table 3.14 National Ambient Air Quality Standards

S. No.	Pollutant	Time Weighted Average	Industrial, Residential, Rural & other areas	Ecologically Sensitive area (Notified by Central Govt.)
1	SO ₂ (µg/m ³)	Annual Avg.* 24 hours**	50.0 80.0	20.0 80.0
2	NO _x (µg/m ³)	Annual Avg. 24 hours	40.0 80.0	30.0 80.0
3	PM ₁₀ (µg/m ³)	Annual Avg. 24 hours	60.0 100.0	60.0 100.0
4	PM _{2.5} (µg/m ³)	Annual Avg. 24 hours	40.0 60.0	40.0 60.0

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

Methodology

Ambient air quality monitoring was carried out with a frequency of two samples per week at five (05) locations, adopting a continuous 24 hourly (3 shift of 8-hour) schedule for the period **March to May 2025**, as per the CPCB, MoEF guidelines and notifications. It was ensured that the equipment was placed preferably at a height of at least 3 ± 0.5 m above the ground level at each monitoring station for negating the effects of wind-blown ground dust. The equipment was placed at space free from trees and vegetation which otherwise act as a sink of pollutants resulting in lower levels in monitoring results. The baseline data of ambient air were generated for PM_{2.5}, PM₁₀, sulphur dioxide (SO₂) and nitrogen dioxide (NO_x). The sampling locations are shown in Figure 3.15 and average concentrations of air pollutants are summarized in Tables 3.15 and are shown in Figures 3.16-3.20.

Table 3.15 Ambient Air Quality (AAQ) Monitoring Locations

Location Code	Monitoring Locations	Distance (km)	Direction	Coordinates	
				Latitude	Longitude
AAQ1	Near Core	0.03	N	12°48'39.60"N	78° 1'8.57"E
AAQ2	Muthurayanpudur	2.24	SE	12°47'56.79"N	78° 2'15.72"E
AAQ3	Pannapalli	3.46	SW	12°46'59.01"N	78° 0'3.33"E
AAQ4	B.Gollapalli	1.69	NNW	12°49'30.20"N	78° 0'43.92"E
AAQ5	Suggondahalli	2.10	NW	12°48'51.74"N	77°59'59.25"E

Source: On-site monitoring/sampling by Accuracy Analabs (OPC) Private Limited in association with GTMS

Results

As per the monitoring data, PM_{2.5} ranges from 17.5µg/m³ to 20.5µg/m³, PM₁₀ from 42.4µg/m³ to 46.4µg/m³, SO₂ from 4.1µg/m³ to 6.1µg/m³, NO_x from 13.7µg/m³ to 21.1g/m³. The concentration levels of the pollutants fall within the acceptable limits of NAAQS prescribed by CPCB.

Air quality Index (AQI)

The AQI shows that the air quality of the study area falls within good category 44 causing minimal impact to human health.

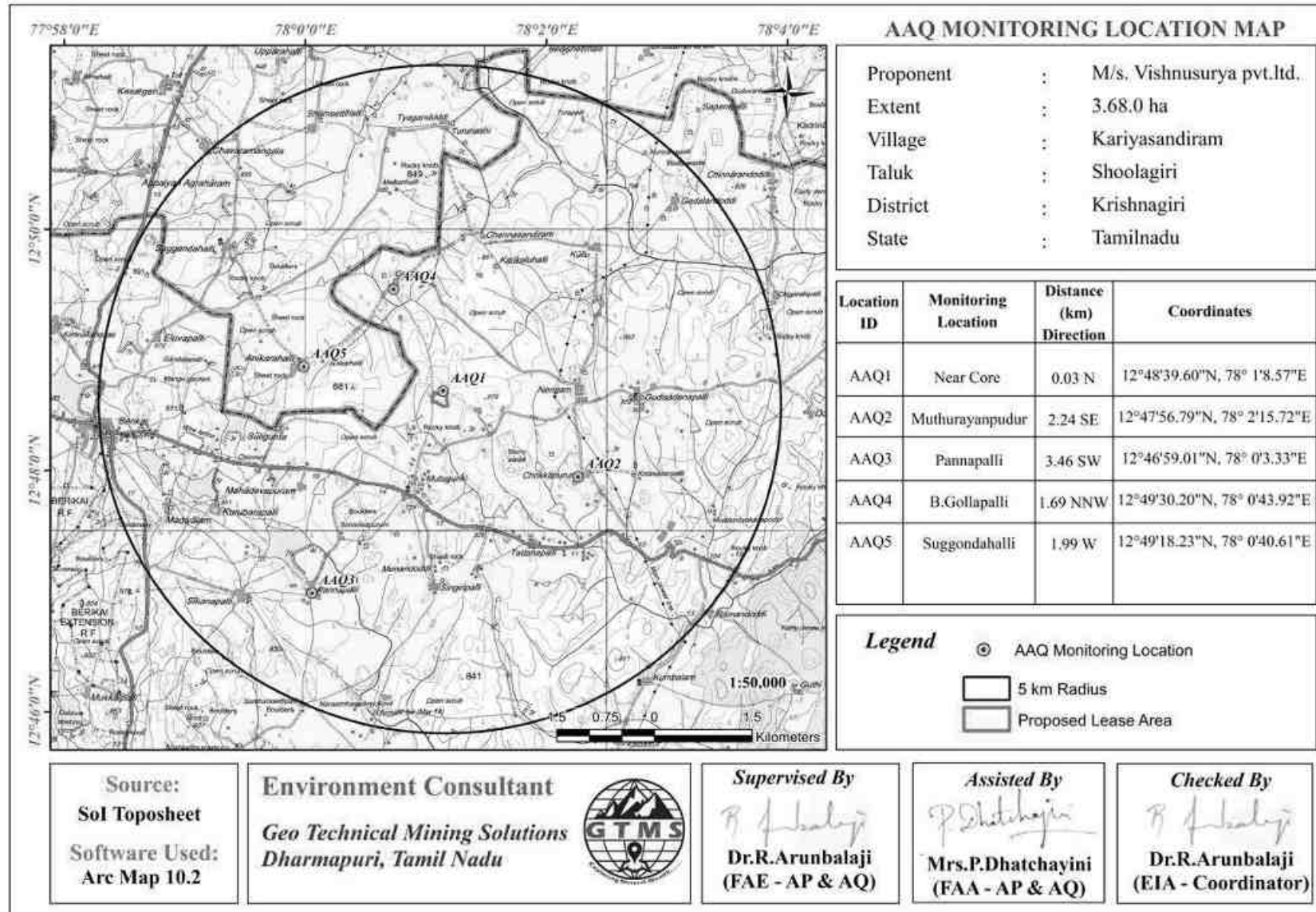


Figure 3.15 Map Showing Ambient Air Quality Monitoring Station Locations Around 5 km Radius from Proposed Project Site

Table 3.16 Summary of AAQ Result

PM _{2.5}					PM ₁₀			
Station ID	Max	Min	Mean	98th Percentile	Max	Min	Mean	98th Percentile
AAQ1	23.6	20.5	22.0	23.6	51.9	47.1	49.2	51.9
AAQ2	18.9	15.2	17.0	18.6	43.7	40.2	42.0	43.6
AAQ3	21.6	18.5	20.0	20.7	50.9	46.1	48.2	50.9
AAQ4	18.9	16.1	17.4	18.7	41.9	38.2	40.0	41.4
AAQ5	19.7	17.0	18.1	19.7	43.8	40.2	41.8	43.7
SO ₂					NO _x			
AAQ1	6.9	4.5	5.6	6.8	22.2	15.7	20.0	22.2
AAQ2	6.7	4.3	5.4	6.7	19.6	13.7	16.8	19.4
AAQ3	5.8	4.3	5.1	5.5	20.9	9.7	17.9	20.7
AAQ4	5.8	3.6	4.9	5.8	20.8	14.3	17.8	20.5
AAQ5	5.3	3.6	4.2	5.1	22.1	15.0	18.2	22.1

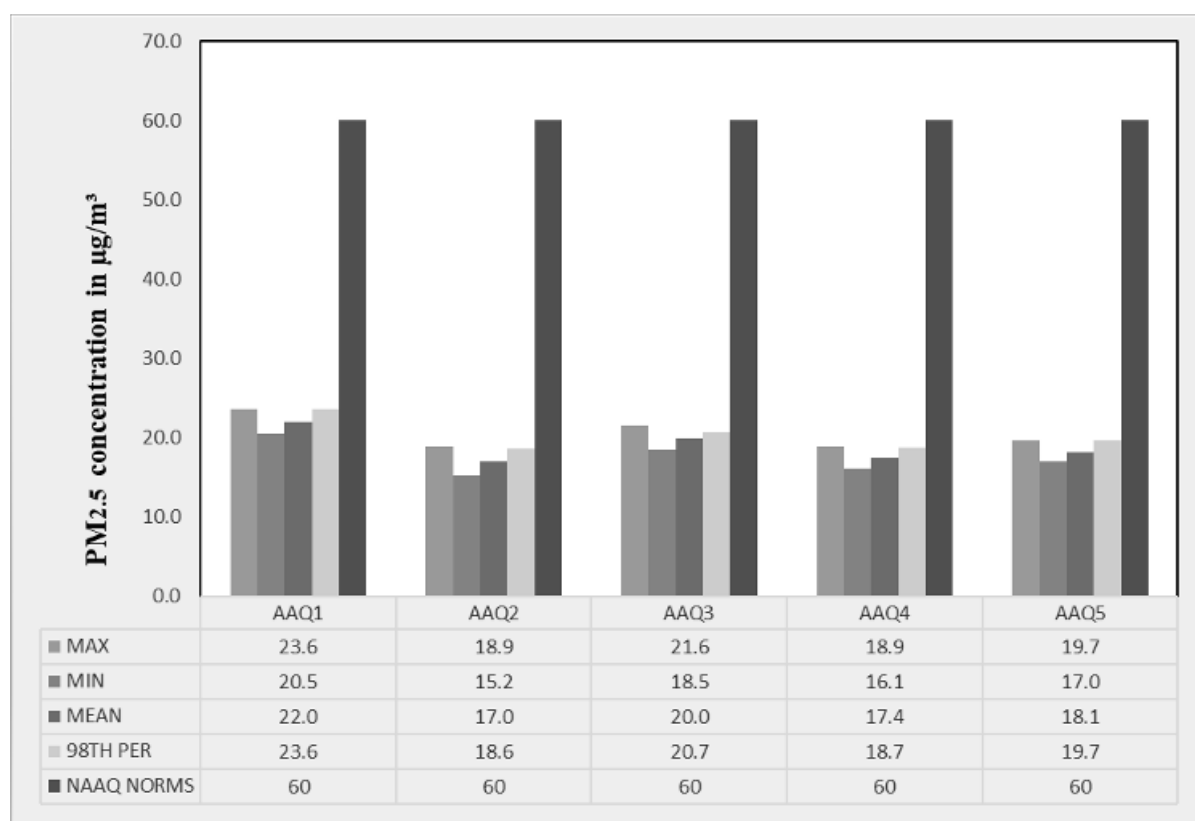


Figure 3.16 Bar Chart Showing Maximum, Minimum, and Average Concentrations of PM_{2.5} Measured from 5 Air Quality Monitoring Stations within 5 km Radius

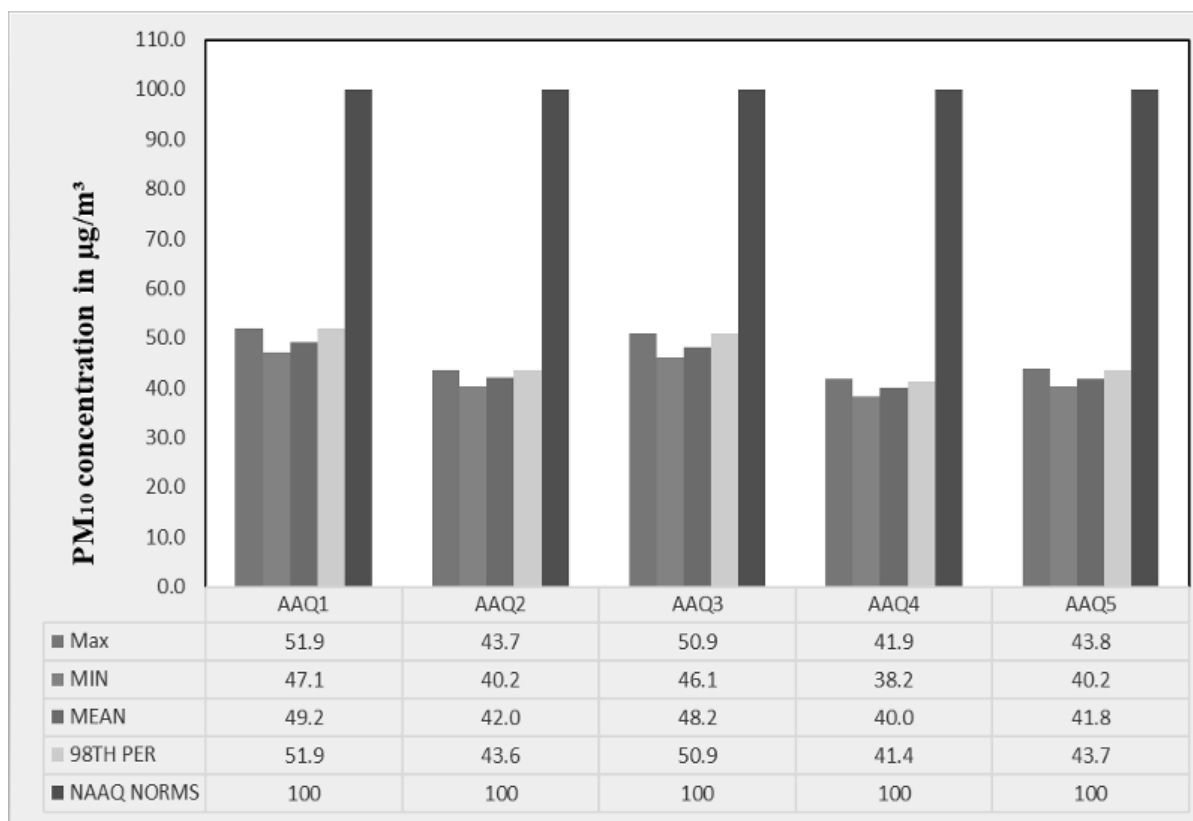


Figure 3.17 Bar Chart Showing Maximum, Minimum, and Average Concentrations of PM₁₀ Measured from 5 Air Quality Monitoring Stations within 5 km Radius

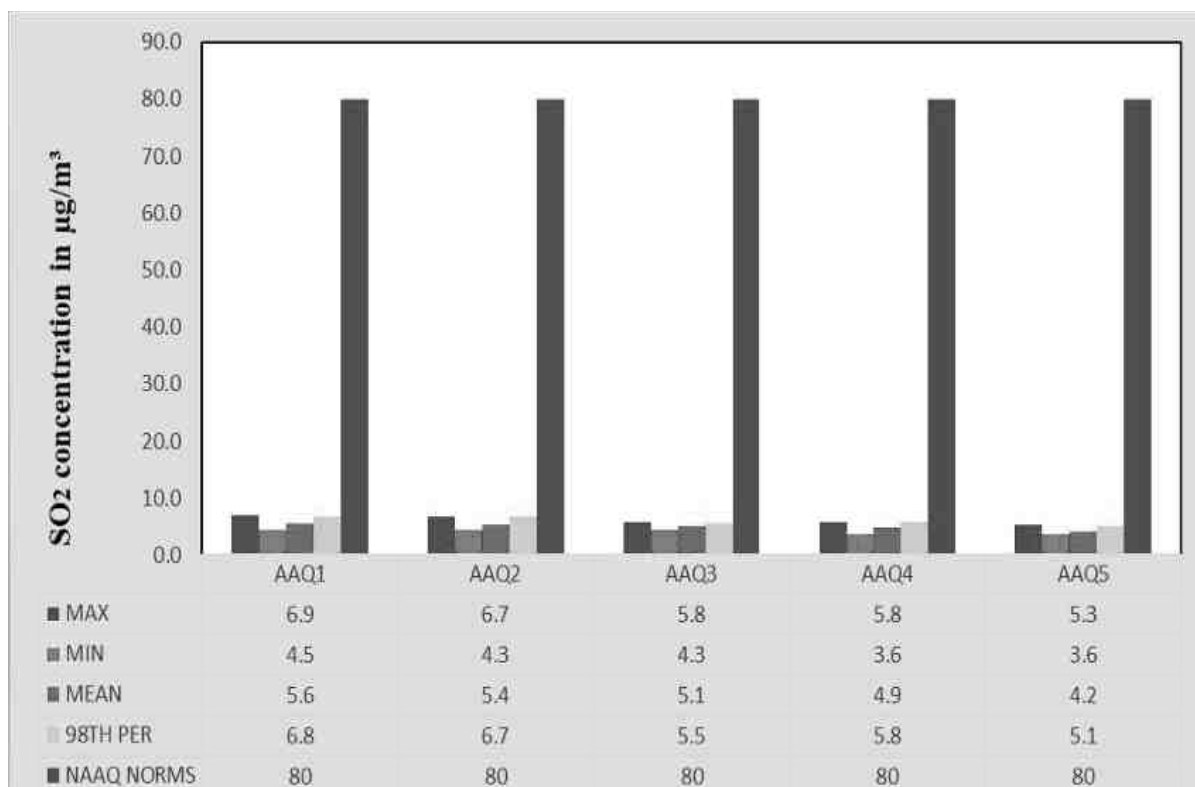


Figure 3.18 Bar Chart Showing Maximum, Minimum, and Average Concentrations of SO₂ Measured from 5 Air Quality Monitoring Stations within 5 km Radius

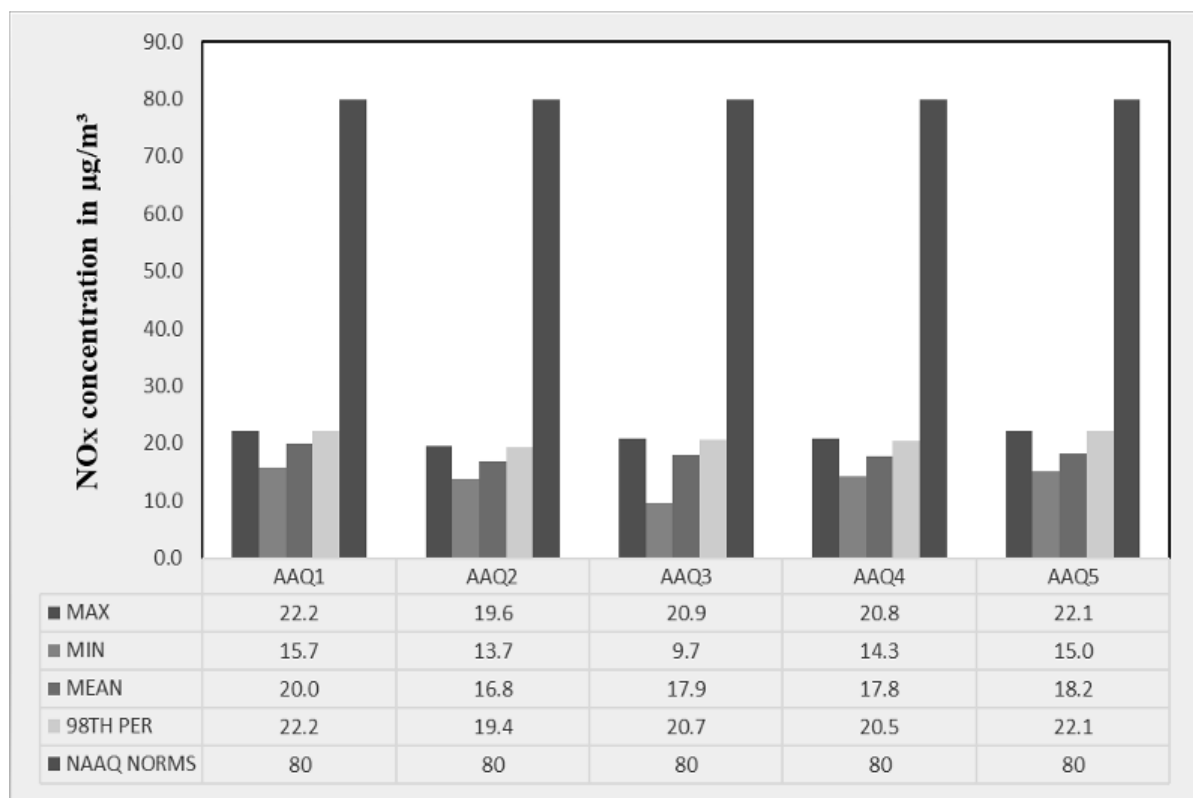


Figure 3.19 Bar Chart Showing Maximum, Minimum, and Average Concentrations of NO_x Measured from 5 Air Quality Monitoring Stations within 5 km Radius

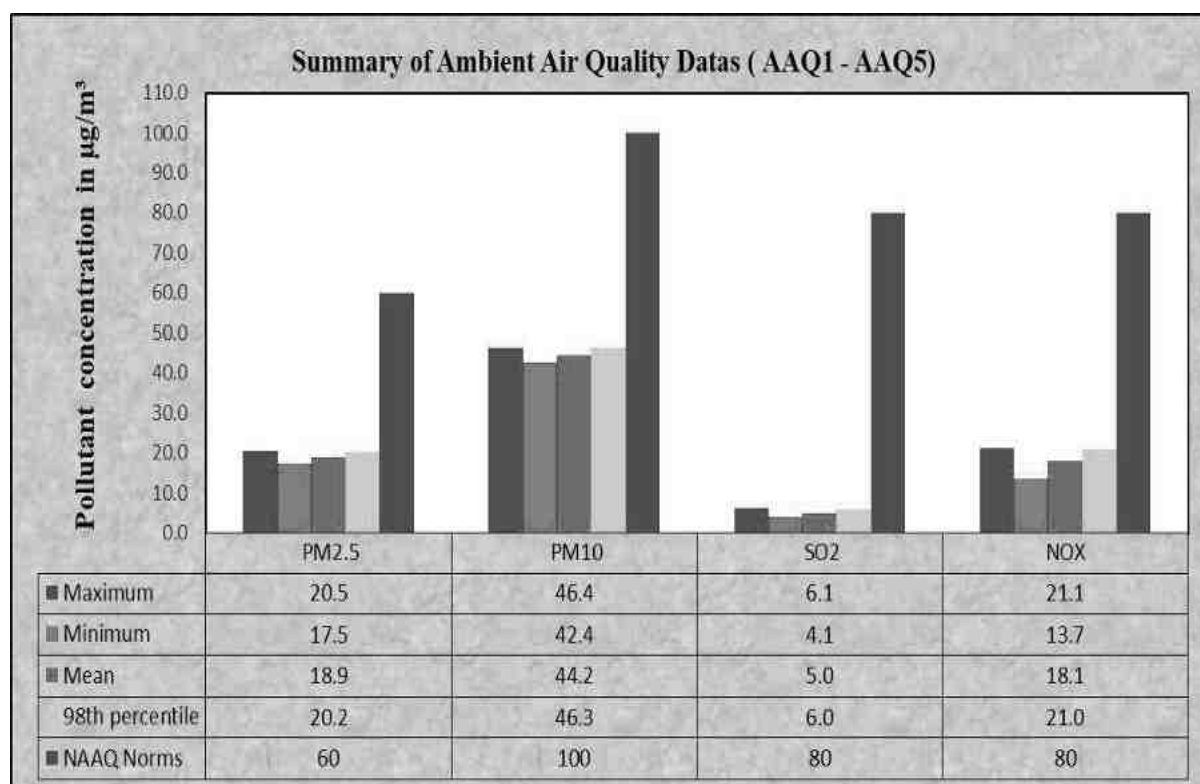


Figure 3.20 Bar Chart Showing Maximum, Minimum, and Average Concentrations of Pollutants in Atmosphere within 5 km Radius

3.5 NOISE ENVIRONMENT

The vehicular movement on road and mining activities is the major sources of noise in the study area. The main objective of noise monitoring in the study area is to establish the baseline noise level, which will in turn be used to assess the impact of the total noise expected to be generated during the project operations around the project site. In order to assess the ambient noise levels within the study area, noise monitoring was carried out at five (5) locations covering commercial, residential, rural areas within the radius of 5 km. Details of noise monitoring locations are provided in Table 3.17 and spatial occurrence of the locations are shown in Figure 3.23.

Table 3.17 Noise Monitoring Locations

S. No.	Location Code	Monitoring Location	Distance (km)	Direction	Coordinates	
					Latitude	Longitude
1	N1	Core	--	--	12°48'37.49"N	78° 1'9.52"E
2	N2	Kariyachandiram	0.38	SE	12°48'28.01"N	78°1'22.66"E
3	N3	Muduguriki	1.44	SSW	12°47'48.94"N	78°0'48.36"E
4	N4	Suggondahalli	2.06	WNW	12°48'50.09"N	77°59'56.53"E
5	N5	B.Gollapalli	1.73	NNW	12°49'31.88"N	78° 0'44.95"E

Source: On-site Monitoring/Sampling by Accuracy Analabs (OPC) Private Limited in Association with GTMS

Table 3.18 Ambient Noise Quality Result

Station ID	Location	Environmental setting	Average day noise level (dB(A))	Average night noise level (dB(A))	Day time (6.00 AM – 10.00 PM)	Night time (10.00 PM – 6.00 AM)
					Standard (Leq in dB (A))	
N1	Core	Industrial Area	58.4	37.6	75	70
N2	Kariyachandiram	Residential Area	48.2	38.6	55	45
N3	Muduguriki		47.8	40.2		
N4	Suggondahalli		48.5	39.9		
N5	B.Gollapalli		46.3	38.5		

Source: On-site Monitoring/Sampling by Accuracy Analabs (OPC) Private Limited in Association with GTMS

The Table 3.18 shows that noise level in core zone was 58.4dB (A) Leq during day time and 37.6dB(A) Leq during night time. Noise levels recorded in buffer zone during day time varied from 48.5 to 46.3dB (A) Leq and during night time from 40.2 to 38.5dB (A) Leq. Thus, the noise level for industrial and residential area meets the requirements of CPCB. The results are also depicted below in Figures 3.21 and 3.22.

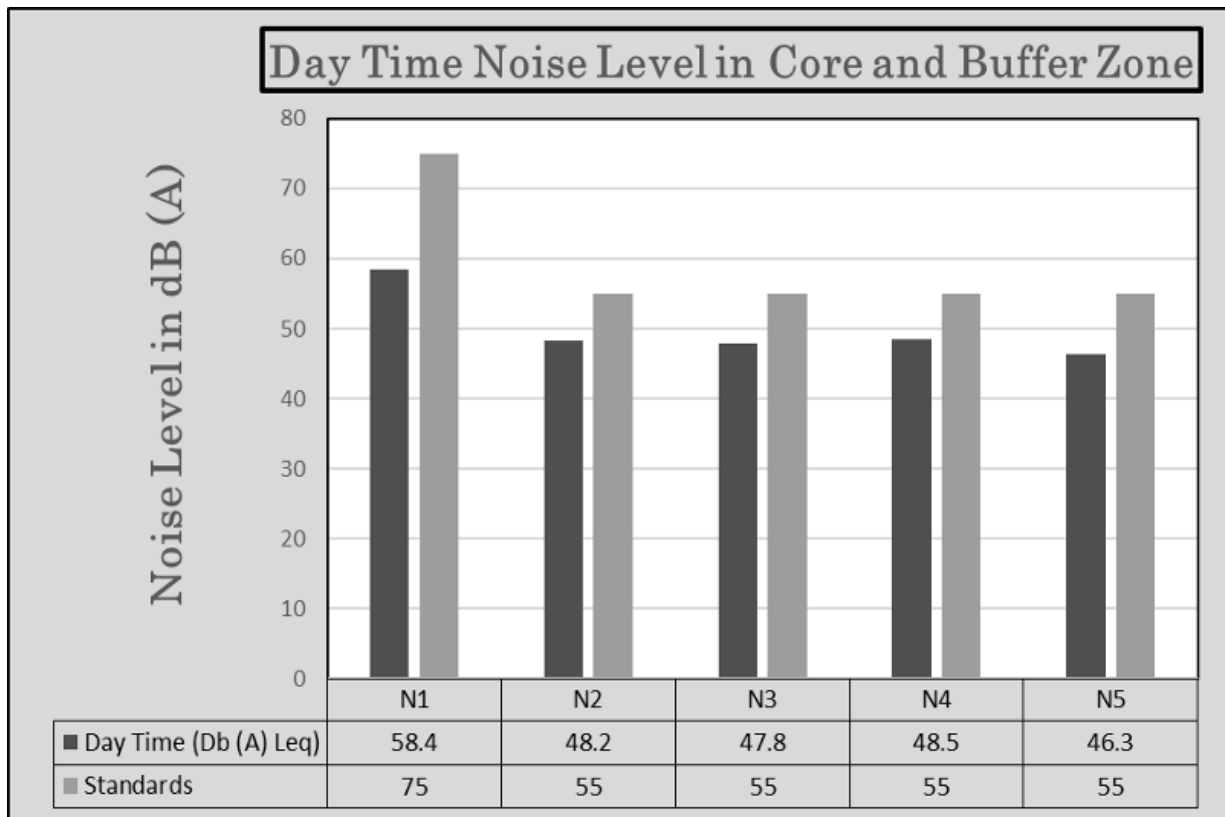


Figure 3.21 Bar Chart Showing Day Time Noise Levels Measured in Core and Buffer Zones

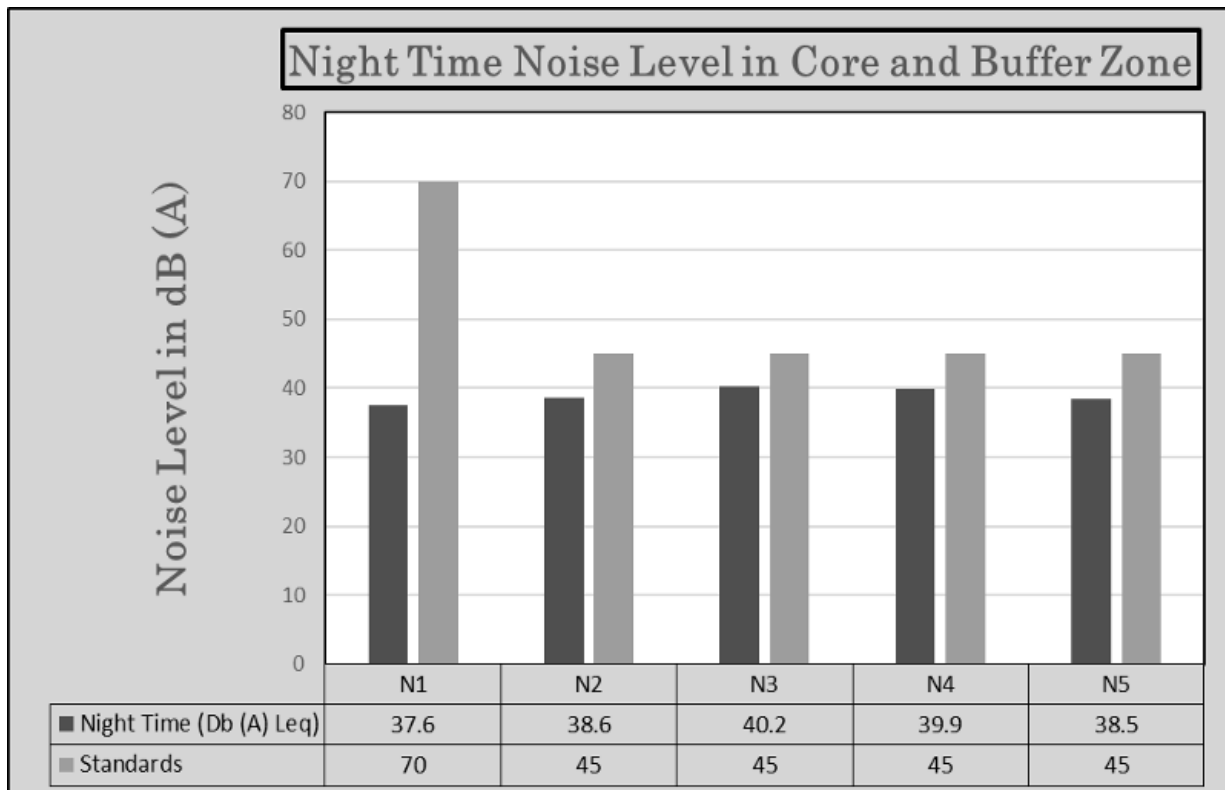


Figure 3.22 Bar Chart Showing Night Time Noise Levels Measured in Core and Buffer Zones

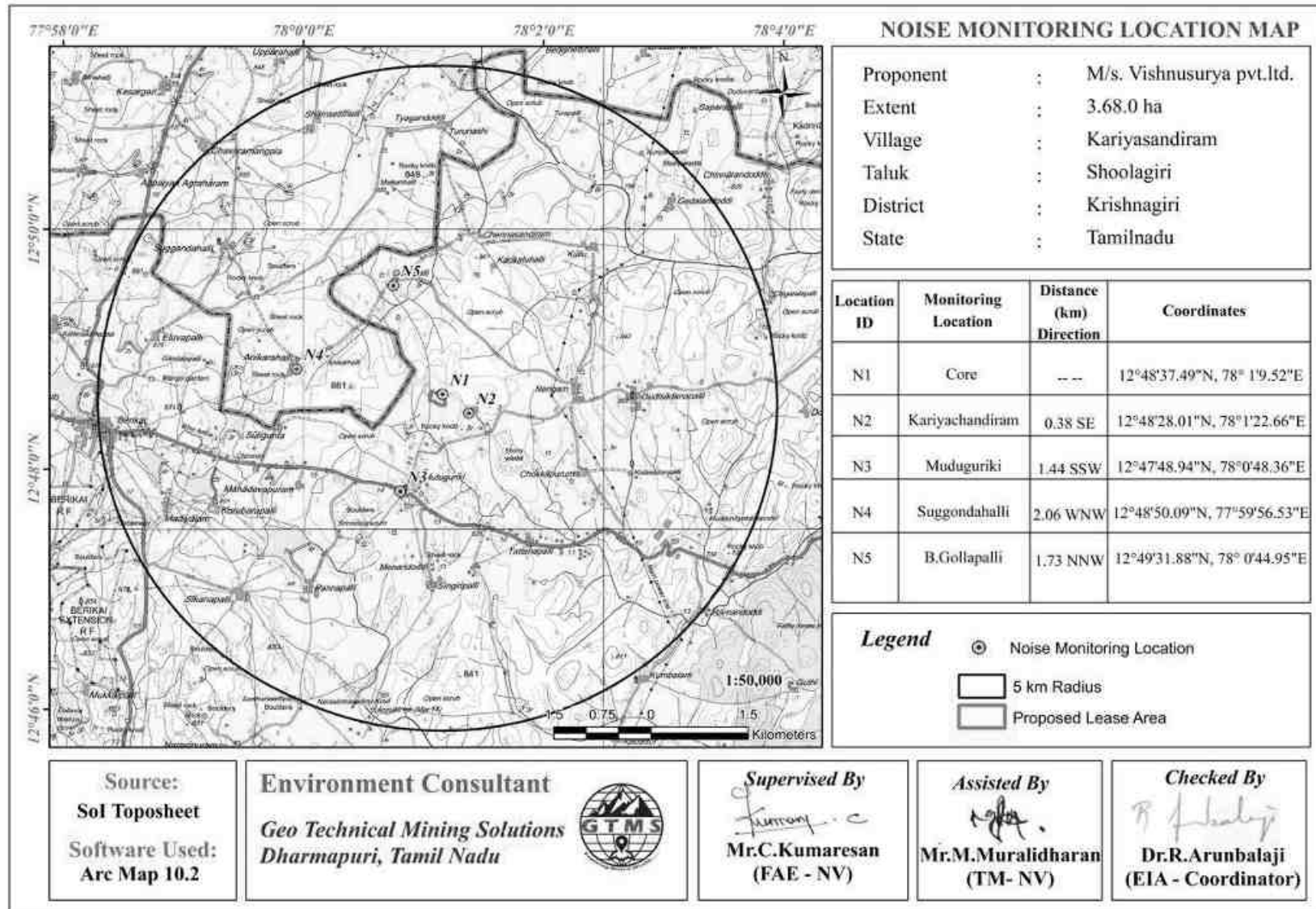


Figure 3.23 Map Showing Noise Level Monitoring Station Locations around 5 km Radius from Proposed Project Site

3.6 BIOLOGICAL ENVIRONMENT

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

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

3.6.1 Flora

3.6.1.1 Objectives of the Study

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

3.6.1.2 Study Approach & Methodology

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

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

done for herbs. The size and number of quadrats needed were determined using the species-area curve (Misra, 1968). The data on vegetation were quantitatively analysed for abundance, density, frequency as per Curtis & McIntosh (1950).



Figure 3.24 Quadrates Sampling Methods of Flora

3.6.1.3 Survey Methodology

The baseline study for existing biological environmental was carried out in Nov 2024. Study of flora and fauna carried out as per prescribed method addressed in SOP. Field visits were under taken for survey of the vegetation and animals in the study area. The study area is divided into three parts as project site area along with 500m from all direction surrounding site is being considered as core area and rest of 10km study area is buffer part of the study area.

3.6.1.4 Important Value Index (IVI)

The concept of ‘Important Value Index (IVI)’ has been developed for expressing the dominance and ecological success of any species, with a single value (Mishra, 1968, Sharma, 2005). This index utilizes three characteristics, they are (i) Relative frequency and (ii) Relative density. The three characteristics computed using frequency, density and abundance for all the

species falling in all the quadrat by using the following formula. The relative frequency, relative density and relative abundance has been calculated to calculate the IVI value

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

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

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

Shannon – Wiener Index, Evenness and Richness

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

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

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

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

- Where, n_i is individual density of a species and n is total density of all the species
- The Evenness Index (E) is calculated by using Shannon's Evenness formula (Magurran, 2004).
- The higher the value of H, the higher the diversity of species in a particular community

The lower the value of H, the lower the diversity. A value of $H = 0$ indicates a community that only has one species

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

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

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

3.6.1.5 Floral diversity Analysis

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

Flora in core zone

The core zone presents in tree, shrubs, herbs and grasses. Taxonomically total of 17 species belonging to 13 families were recorded. Among them are tree 3, herbs, climabers & Grass 8, Shrubs 6. Majority of the species belongs to the family of Fabaceae and Poaceae. The species richness (Margalef index) and plant details are given in Table 3.19-3.20. There are no endangered or threatened plant species in the quarry lease area.

Flora in 300m radius

The vegetation habit analysis indicates that the flora of the 300m radius of the study area consists of 43 species belonging to 25 families. Three species were recorded from the Amaranthaceae, Apocynaceae, and Asteraceae families, while two species each were recorded from the Arecaceae, Boraginaceae, Convolvulaceae, Cucurbitaceae, Euphorbiaceae, and Lamiaceae families. The endangered or threatened and Species Richness (margalef Index) in the study area it mentioned in Table 3.21 - 3.24 & Figures 3.29. There is no threat to the Flora Species in 300m radius.

Flora in 10km radius zone

Similar type of environment also in buffer area but with more flora diversity compare than core zone area, because of nearby agriculture land was found to be dominate in all the directions. Majority of the flat landscape around project unit is occupied by agriculture fields. It contains a total of 89 species belonging to 43 families have been recorded from the buffer zone. The floral (89) varieties among them Trees 37 (42%) Shrubs 13 (14%) and Herbs & Climbers & Creeper & Cactus 39 (44%). Details of flora with the scientific name were mentioned in Table.3.26

Table 3.19 Flora in Mine Lease Area

S. No	Local name	Scientific name	Family name	Total No. of species	Total of Quadrants with species	Total No. of Quadrants	Density	Frequency (%)	Abundance	Relative Density	Relative Frequency	IVI	UCN Conservation Status
Trees													
1	Karuvealan	<i>Prosopis juliflora</i>	Fabaceae	4	3	5	0.8	60.0	1.3	50.0	50.0	100.0	NE
2	Unjai maram	<i>Albizia amara</i>	Fabaceae	2	2	5	0.4	40.0	1.0	10.5	12.5	23.0	LC
3	Vetpalai maram	<i>Wrightia tinctoria</i>	Apocynaceae	3	2	5	0.6	40.0	1.5	37.5	33.3	70.8	NE
Shrubs													
4	Avaram chadi	<i>Senna auriculata</i>	Fabaceae	4	3	5	0.8	60.0	1.3	21.1	18.8	39.8	NE
5	Earuku	<i>Calotropis gigantea</i>	Apocynaceae	3	3	5	0.6	60.0	1.0	15.8	18.8	34.5	NE
6	Unichadi	<i>Landana camera</i>	Verbenaceae	5	4	5	1.0	80.0	1.3	26.3	25.0	51.3	NE
7	Surai mullui	<i>Ziziphus oenopolia</i>	Rhamnaceae	1	1	5	0.2	20.0	1.0	5.3	6.3	11.5	NE
8	Sapathikalli	<i>Cereus pterogonus</i>	Cactus	4	3	5	0.8	60.0	1.3	21.1	18.8	39.8	NE
9	Karaimullu	<i>Canthium coromandelicum</i>	Rubiaceae	2	2	5	0.4	40.0	1.0	10.5	12.5	23.0	NE
Herbs/ Climber													
10	Perandai	<i>Cissus quadrangularis</i>	Vitaceae	3	2	5	0.6	40.0	1.5	5.1	6.3	11.3	NE
11	Thathapondu	<i>Tridax procumbens</i>	Asteraceae	8	5	5	1.6	100.0	1.6	13.6	15.6	29.2	NE
12	Kolunji chadi	<i>Tephrosia purpurea</i>	Fabaceae	7	4	5	1.4	80.0	1.8	11.9	12.5	24.4	NE
13	Onnakodi	<i>Ipomoea staphylina</i>	Convolvulaceae	9	5	5	1.8	100.0	1.8	15.3	15.6	30.9	NE
14	Korai	<i>Cyperus rotundus</i>	Cyperaceae	10	5	5	2.0	100.0	2.0	16.9	15.6	32.6	NE
15	Nerunji	<i>Tribulus terrestris</i>	Zygophyllales	7	4	5	1.4	80.0	1.8	11.9	12.5	24.4	NE
16	Nayuruvi	<i>Achyranthes aspera</i>	Amaranthaceae	6	3	5	1.2	60.0	2.0	10.2	9.4	19.5	NE
17	Communist pacha	<i>Chromolaena odorata</i>	Asteraceae	9	4	5	1.8	80.0	2.3	15.3	12.5	27.8	NE

Table 3.20 Calculation of Species Diversity mine lease area

S. No	Local name	Scientific name	No. of Species	Pi	In (Pi)	Pi x in (Pi)
Trees						
1	Karuvealan	<i>Prosopis juliflora</i>	2	0.11	-2.25	-0.24
2	Unjai maram	<i>Albizia amara</i>	9	0.13	-2.08	-0.26
3	Vetpalai maram	<i>Wrightia tinctoria</i>	3	0.38	-0.98	-0.37
Shrubs						
4	Avaram chadi	<i>Senna auriculata</i>	4	0.21	-1.56	-0.33
5	Earuku	<i>Calotropis gigantea</i>	3	0.16	-1.85	-0.29
6	Unichadi	<i>Landana camera</i>	5	0.26	-1.34	-0.35
7	Surai mullui	<i>Ziziphus oenopolia</i>	1	0.05	-2.94	-0.15
8	Sapathikalli	<i>Cereus pterogonus</i>	4	0.21	-1.56	-0.33
9	Karaimullu	<i>Canthium coromandelicum</i>	2	0.11	-2.25	-0.24
Herbs /climber						
10	Perandai	<i>Cissus quadrangularis</i>	3	0.06	-2.81	-0.17
11	Thathapondu	<i>Tridax procumbens</i>	8	0.16	-1.83	-0.29
12	Kolunji chadi	<i>Tephrosia purpurea</i>	7	0.14	-1.97	-0.28
13	Onnakodi	<i>Ipomoea staphylina</i>	9	0.18	-1.71	-0.31
14	Korai	<i>Cyperus rotundus</i>	10	0.20	-1.61	-0.32
15	Nerunji	<i>Tribulus terrestris</i>	7	0.14	-1.97	-0.28
16	Nayuruvi	<i>Achyranthes aspera</i>	6	0.12	-2.12	-0.25
17	Communist pacha	<i>Chromolaena odorata</i>	9	0.18	-1.71	-0.31

Table 3.21 Species Richness (Index) in mine lease area

Details	H	H max	Evenness	Species Richness
Trees	0.97	1.10	0.89	0.96
Shrubs	1.69	1.79	0.94	1.70
Herbs	1.90	1.95	0.98	1.53

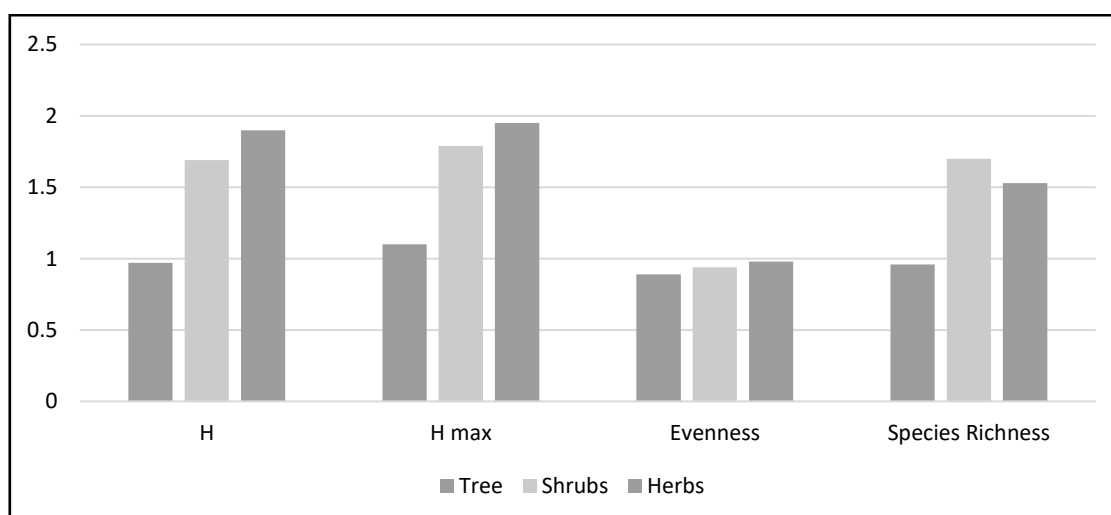


Figure 3.25 Species Richness (Index) in Mine Lease area

Table 3.22 Flora in 300-meter radius

S. No	Local Name	Scientific name	Family name	Total No. of species	Total of Quadrants with species	Total No. of Quadrants	Density	Frequency (%)	Abundance	Relative Density	Relative Frequency	IVI	IUCN Conservation Status
Trees													
1	Velikathan maram	<i>Prosopis juliflora</i>	Fabaceae	6	4	5	1.2	80.0	0.1	2.4	50.0	52.4	Not Listed
2	Pongam oiltree	<i>Pongamia pin nata</i>	Fabaceae	4	3	5	0.8	60.0	1.3	6.7	7.1	13.8	Not Listed
3	Panai maram	<i>Borassus flabellifer</i>	Arecaceae	1	1	5	0.2	20.0	1.0	1.7	2.4	4.0	Not Listed
4	Nuna maram	<i>Morinda citrifolia</i>	Rubiaceae	4	3	5	0.8	60.0	1.3	6.7	7.1	13.8	Not Listed
5	Vembu	<i>Azadirachta indica</i>	Meliaceae	7	4	5	1.4	80.0	1.8	11.7	9.5	21.2	Not Listed
6	Manga maram	<i>Mangifera indica</i>	Anacardiaceae	4	3	5	0.8	60.0	1.3	6.7	7.1	13.8	Not Listed
7	Thennai maram	<i>Cocos nucifera</i>	Arecaceae	6	3	5	1.2	60.0	2.0	10.0	7.1	17.1	Not Listed
8	Wetpalai maram	<i>Wrightia tinctoria</i>	Apocynaceae	2	2	5	0.4	40.0	1.0	3.3	4.8	8.1	Not Listed
9	Unjai maram	<i>Albizia amara</i>	Fabaceae	8	4	5	1.6	80.0	2.0	13.3	9.5	22.9	Not Listed
10	Neruppu Kondrai	<i>Delonix regia</i>	Fabaceae	2	2	5	0.4	40.0	1.0	3.3	4.8	8.1	Not Listed
11	Kodukkapuli maram	<i>Pithecellobium dulce</i>	Fabaceae	1	1	5	0.2	20.0	1.0	1.7	2.4	4.0	Not Listed
12	Teak	<i>Tectona grandis</i>	Lamiaceae	4	2	5	0.8	40.0	2.0	6.7	4.8	11.4	Not Listed
13	Savukku	<i>Casuarina equisetifolia</i>	Casuarinaceae	5	2	5	1.0	40.0	2.5	8.3	4.8	13.1	LC
14	Thailamaram	<i>Eucalyptus</i>	Myrtaceae	6	3	5	1.2	60.0	2.0	10.0	7.1	17.1	Not Listed
15	Puliyamaram	<i>Tamarindus indica</i>	Fabaceae	2	1	5	0.4	20.0	2.0	3.3	2.4	5.7	LC
Shrubs													
1	Unichedi	<i>Lantana camara</i>	Verbenaceae	10	8	10	1.0	80.0	0.2	2.4	60.0	62.4	Not Listed
2	Sundaika	<i>Solanum torvum</i>	Solanaceae	5	5	10	0.5	50.0	1.0	8.3	11.9	20.2	Not Listed
3	Erukku	<i>Calotropis gigantea</i>	apocynaceae	13	9	10	1.3	90.0	1.4	21.7	21.4	43.1	Not Listed

4	Avarai	<i>Senna auriculata</i>	Fabaceae	6	4	10	0.6	40.0	1.5	10.0	9.5	19.5	Not Listed
5	Sappathikalli	<i>Cereus pterogonus</i>	Cactus	8	7	10	0.8	70.0	1.1	13.3	16.7	30.0	Not Listed
6	Kattamanaku	<i>Jatropha gossypifolia L</i>	Euphorbiaceae	13	6	10	1.3	60.0	2.2	21.7	14.3	36.0	Not Listed
7	Nochi	<i>Vitex negundo</i>	Lamiaceae	5	3	10	0.5	30.0	1.7	8.3	7.1	15.5	Not Listed
Herbs, Climbers & Grass													
1	Ponnangani	<i>Alternanthera pungens</i>	Amaranthaceae	9	8	10	0.9	80.0	1.1	3.9	6.3	10.2	Not Listed
2	Wild thulasi	<i>Hyptis suaveolens (L.)</i>	Lamiaceae	12	6	10	1.2	60.0	2.0	5.2	4.8	9.9	Not Listed
3	Gopuram Tangi	<i>Andrographis echiioides</i>	Acanthaceae	10	5	10	1.0	50.0	2.0	4.3	4.0	8.3	Not Listed
4	Amman Paccharisi	<i>Euphorbia hirta</i>	Euphorbiaceae	16	9	10	1.6	90.0	1.8	6.9	7.1	14.0	Not Listed
5	Paca poondu	<i>Pavonia gallaensis</i>	Malvaceae	8	6	10	0.8	60.0	1.3	3.4	4.8	8.2	Not Listed
6	Perandai	<i>Cissus quadrangularis</i>	Vitaceae	6	4	10	0.6	40.0	1.5	2.6	3.2	5.8	Not Listed
7	Vishnukrandai	<i>Evolvulus alsinoides</i>	Convolvulaceae	12	4	10	1.2	40.0	3.0	5.2	3.2	8.3	Not Listed
8	Musumusukkai	<i>Mukia maderaspatana</i>	Cucurbitaceae	4	3	10	0.4	30.0	1.3	1.7	2.4	4.1	Not Listed
9	Sirupunaikkali	<i>Passiflora foetida</i>	Passifloraceae	7	4	10	0.7	40.0	1.8	3.0	3.2	6.2	Not Listed
10	Nagathali	<i>Opuntia dillenii</i>	Cactaceae	5	3	10	0.5	30.0	1.7	2.2	2.4	4.5	Not Listed
11	Thumbai	<i>Leucas aspera</i>	Lamiaceae	18	7	10	1.8	70.0	2.6	7.8	5.6	13.3	Not Listed
12	Kantang kathrikai	<i>Solanum virginianum</i>	Solanaceae	24	10	10	2.4	100.0	2.4	10.3	7.9	18.3	Not Listed
13	Arugampul	<i>Cynodon dactylon</i>	Poaceae	27	10	10	2.7	100.0	2.7	11.6	7.9	19.6	Not Listed
14	Poolai poondu	<i>Aerva lanata</i>	Amaranthaceae	7	6	10	0.7	60.0	1.2	3.0	4.8	7.8	Not Listed
15	Korai	<i>Cyperus rotundus</i>	Cyperaceae	13	7	10	1.3	70.0	1.9	5.6	5.6	11.2	Not Listed
16	Nerunji	<i>Tribulus terrestris</i>	Zygophyllales	9	6	10	0.9	60.0	1.5	3.9	4.8	8.6	Not Listed
17	Nayuruvi	<i>Achyranthes aspera</i>	Amaranthaceae	8	7	10	0.8	70.0	1.1	3.4	5.6	9.0	Not Listed
18	Thottalchinungi	<i>Mimosa pudica</i>	Mimosaceae	9	6	10	0.9	60.0	1.5	3.9	4.8	8.6	Not Listed
19	Anachundaikai	<i>Solanum violaceum</i> <i>Ortega</i>	Solanaceae	6	4	10	0.6	40.0	1.5	2.6	3.2	5.8	Not Listed
20	Kombumul	<i>Acanthospermum</i> <i>hispidum</i>	Asteraceae	19	8	10	1.9	80.0	2.4	8.2	6.3	14.5	Not Listed
21	Agave	<i>Agave sisalana</i>	Asparagaceae	3	3	10	0.3	30.0	1.0	1.3	2.4	3.7	Not Listed

Table 3.23 Calculation of Species Diversity in 300 m Radius

S. No	Common name	Scientific name	No. of Species	Pi	In (Pi)	Pi x in (Pi)
Trees						
1	Velikathan maram	<i>Prosopis juliflora</i>	6	0.10	-2.34	-0.23
2	Pongam oiltree	<i>Pongamia pin nata</i>	4	0.06	-2.74	-0.18
3	Panai maram	<i>Borassus flabellifer</i>	1	0.02	-4.13	-0.07
4	Nuna maram	<i>Morinda citrifolia</i>	4	0.06	-2.74	-0.18
5	Vembu	<i>Azadirachta indica</i>	7	0.11	-2.18	-0.25
6	Manga maram	<i>Mangifera indica</i>	4	0.06	-2.74	-0.18
7	Thennai maram	<i>Cocos nucifera</i>	6	0.10	-2.34	-0.23
8	Wetpalai maram	<i>Wrightia tinctoria</i>	2	0.03	-3.43	-0.11
9	Unjai maram	<i>Albizia amara</i>	8	0.13	-2.05	-0.26
10	Neruppu Kondrai	<i>Delonix regia</i>	2	0.03	-3.43	-0.11
11	Kodukkapuli maram	<i>Pithecellobium dulce</i>	1	0.02	-4.13	-0.07
12	Teak	<i>Tectona grandis</i>	4	0.06	-2.74	-0.18
13	Savukku	<i>Casuarina equisetifolia</i>	5	0.08	-2.52	-0.20
14	Thailamaram	<i>Eucalyptus</i>	6	0.10	-2.34	-0.23
15	Puliyamaram	<i>Tamarindus indica</i>	2	0.03	-3.43	-0.11
H (Shannon Diversity Index) = 2.56						
Shrubs						
1	Unichedi	<i>Lantana camara</i>	10	0.17	-1.79	-0.30
2	Sundaika	<i>Solanum torvum</i>	5	0.08	-2.48	-0.21
3	Erukku	<i>Calotropis gigantea</i>	13	0.22	-1.53	-0.33
4	Avarai	<i>Senna auriculata</i>	6	0.10	-2.30	-0.23
5	Sappathikalli	<i>Cereus pterogonus</i>	8	0.13	-2.01	-0.27
6	Kattamanaku	<i>Jatropha gossypifolia L</i>	13	0.22	-1.53	-0.33
7	Nochi	<i>Vitex negundo</i>	5	0.08	-2.48	-0.21
H (Shannon Diversity Index) =1.87						
Herbs						
1	Thumbai	<i>Leucas aspera</i>	9	0.04	-3.25	-0.13
2	Katang kathrikai	<i>Solanum virginianum</i>	12	0.05	-2.96	-0.15
3	Arugampul	<i>Cynodon dactylon</i>	10	0.04	-3.14	-0.14
4	Poolai poondu	<i>Aerva lanata</i>	16	0.07	-2.67	-0.18
5	Korai	<i>Cyperus rotundus</i>	8	0.03	-3.37	-0.12
6	Nerunji	<i>Tribulus terrestris</i>	6	0.03	-3.65	-0.09
7	Nayuruvi	<i>Achyranthes aspera</i>	12	0.05	-2.96	-0.15
8	Thottalchinungi	<i>Mimosa pudica</i>	4	0.02	-4.06	-0.07
9	Anachundaikai	<i>Solanum violaceum Ortega</i>	7	0.03	-3.50	-0.11
10	Kombumul	<i>Acanthospermum hispidum</i>	5	0.02	-3.84	-0.08
11	Ponnangani	<i>Alternanthera pungens</i>	18	0.08	-2.56	-0.20
12	wild thulasi	<i>Hyptis suaveolens (L.)</i>	24	0.10	-2.27	-0.23
13	Gopuram Tangi	<i>Andrographis echinoides</i>	27	0.12	-2.15	-0.25
14	AmmanPaccharisi	<i>Euphorbia hirta</i>	7	0.03	-3.50	-0.11
15	Paca poondu	<i>Pavonia gallaensis</i>	13	0.06	-2.88	-0.16
16	Perandai	<i>Cissus quadrangularis</i>	9	0.04	-3.25	-0.13

17	Vishnukrandai	<i>Evolvulus alsinoides</i>	8	0.03	-3.37	-0.12
18	Musumusukkai	<i>Mukia maderaspatana</i>	9	0.04	-3.25	-0.13
19	Sirupunaikkali	<i>Passiflora foetida</i>	6	0.03	-3.65	-0.09
20	Nagathali	<i>Opuntia dillenii</i>	19	0.08	-2.50	-0.20
21	Agave	<i>Agave sisalana</i>	3	0.01	-4.35	-0.06
H (Shannon Diversity Index) = 3.67						

Table 3.24 Species Richness (Index) in 300 m Radius

Details	H	H max	Evenness	Species Richness
Trees	2.56	2.71	0.95	3.39
Shrubs	1.87	1.95	0.96	1.47
Herbs	2.90	3.04	0.95	3.67

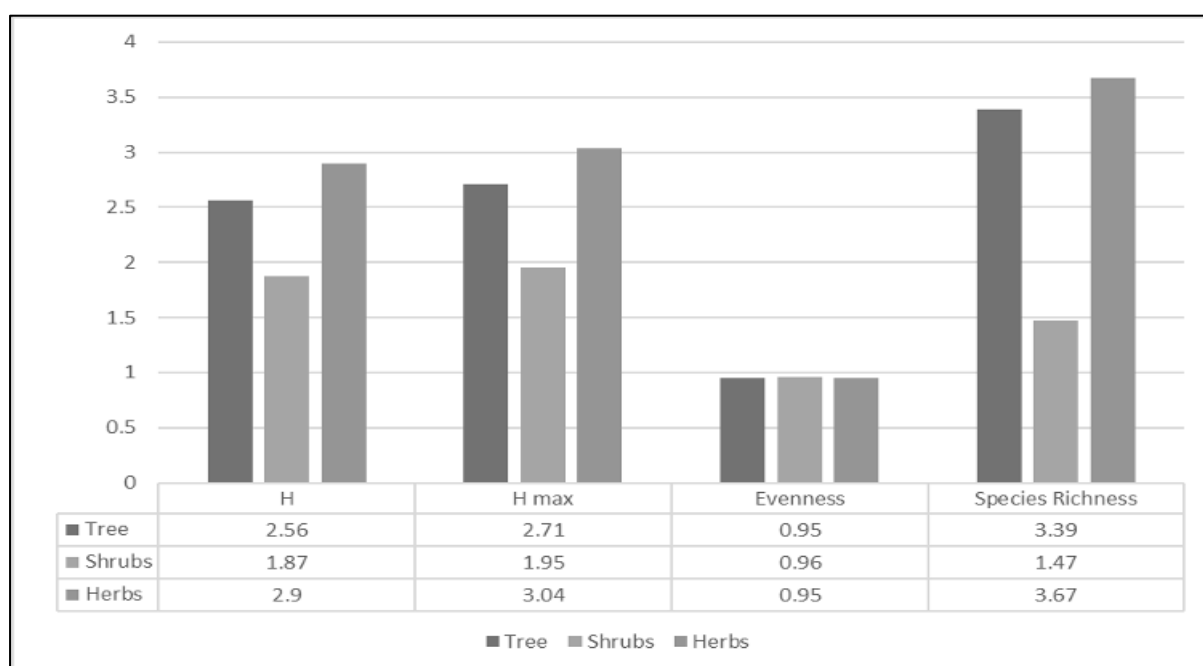


Figure 3.26 Species Richness (Index) in 300 m Radius

Table 3.25 Flora in Buffer Zone

S. No	Local Name	Scientific name	Family name	IUCN Conservation Status
Trees				
1	Vembu	<i>Azadirachta indica</i>	Meliaceae	Not Listed
2	Pongam oiltree	<i>Pongamia pinnata</i>	Fabaceae	Not Listed
3	Karuvelam	<i>Acacia nilotica</i>	Mimosaceae	Not Listed
4	Thennai maram	<i>Cocos nucifera</i>	Arecaceae	Not Listed
5	Arasanmaram	<i>Ficus religiosa</i>	Moraceae	Not Listed
6	Puliyamaram	<i>Tamarindus indica</i>	Legumes	Not Listed
7	Puliyamaram	<i>Calophyllu inophyllum</i>	Calophyllaceae	Not Listed
8	Athi	<i>Ficus recemosa</i>	Moraceae	Not Listed

9	Vazhaimaram	<i>Musa</i>	Musaceae	Not Listed
10	Kadukkai	<i>Terminalia chebula</i>	Combretaceae	Not Listed
11	Nettilinkam	<i>Polylathia longifolia</i>	Annonaceae	Not Listed
12	Amanakku	<i>Ricinus communis</i>	Euphorbiaceae	Not Listed
13	Perumungil	<i>Bambusa bambos</i>	Poaceae	Not Listed
14	Karungali	<i>Acacia sundra</i>	Legumes	Not Listed
15	Sapota	<i>Manilkara zapota</i>	Sapotaceae	Not Listed
16	Eucalyptus	<i>Eucalyptus globules</i>	Myrtaceae	Not Listed
17	Navalmaram	<i>Sygygium cumini</i>	Myrtaceae	Not Listed
18	Ezhumuchaipalam	<i>Citrus lemon</i>	Rutaceae	Not Listed
19	Alamaram	<i>Ficus benghalensis</i>	Moraceae	Not Listed
20	Panai maram	<i>Borassus flabellifer</i>	Arecaceae	Not Listed
21	Manga	<i>Mangifera indica</i>	Anacardiaceae	Not Listed
22	Thekku	<i>Tectona grandis</i>	Verbenaceae	Not Listed
23	Nelli	<i>Embllica officinalis</i>	Phyllanthaceae	Not Listed
24	Nettilinkam	<i>Polylathia longifolia</i>	Annonaceae	Not Listed
25	Karuvelam maram	<i>Vachellia nilotica</i>	Fabaceae	Not Listed
26	Palamaram	<i>Artocarpus heterophyllus</i>	Moraceae	Not Listed
27	Vadanarayani	<i>Delonix elata</i>	Fabaceae	Not Listed
28	Marudaani	<i>Lawsonia inermis</i>	Lythraceae	Not Listed
29	Manja kadambai	<i>Adina cordifolia</i>	Rubiaceae	Not Listed
30	Pappali maram	<i>Carica papaya L</i>	Caricaceae	Not Listed
31	Nochi	<i>Vitex negundo</i>	Verbenaceae	Not Listed
32	Vilvam	<i>Aegle marmelos</i>	Rutaceae	Not Listed
33	Nuna maram	<i>Morinda citrifolia</i>	Rubiaceae	Not Listed
34	Koyya	<i>Psidium guajava</i>	Myrtaceae	Not Listed
35	Seethapazham	<i>Annona reticulata</i>	Annonaceae	Not Listed
36	Velipparuthi	<i>Murraya koenigii</i>	Asclepiadaceae	Not Listed
37	Moonghil	<i>Bambusa bambo</i>	Poaceae	Not Listed
Shrubs				
1	Avarai	<i>Senna auriculata</i>	Fabaceae	Not Listed
2	Sundaika	<i>Solanum torvum</i>	Solanaceae	Not Listed
3	Arali	<i>Nerium indicum</i>	Apocynaceae	Not Listed
4	Idlipoo	<i>xoracoc cineia</i>	Rubiaceae	Not Listed
5	Neermulli	<i>Hydrophila auriculata</i>	Acanthaceae	Not Listed
6	Icham	<i>Phoenix pusilla</i>	Arecaceae	Not Listed
7	Chaturakalli	<i>Euphorbia antiquorum</i>	Euphorbiaceae	Not Listed
8	Kattamanakku	<i>Jatropha curcas</i>	Euphorbiaceae	Not Listed
9	Thuthi	<i>Abutilon indicum</i>	Meliaceae	Not Listed
10	Chemparuthi	<i>Hibiscu rosa-sinensis</i>	Malvaceae	Not Listed
11	Kundumani	<i>Abrus precatorius</i>	Fabaceae	Not Listed
12	Erukku	<i>Calotropis gigantea</i>	Apocynaceae	Not Listed

13	Thottalchinungi	<i>Mimosa pudica</i>	Mimosaceae	Not Listed
Herbs, Climber, Creeper, Grass & Cactus				
1	Nayuruvi	<i>Achyranthes aspera</i>	Amaranthaceae	Not Listed
2	Vetukaayapoondur	<i>Tridax procumbens</i>	Asteraceae	Not Listed
3	Kaattu piral	<i>Hibiscus hispidissimus</i>	Malvaceae	Not Listed
4	Kuppaimeni	<i>Acalypha indica</i>	Euphorbiaceae	Not Listed
5	Karisilanganni	<i>Eclipta prostrata</i>	Asteraceae	Not Listed
6	Korai	<i>Cyperus rotundus</i>	Cyperaceae	Not Listed
7	Kumattikkirai	<i>Allmania nodiflora</i>	Amaranthaceae	Not Listed
8	Kunnakora	<i>Cyperus compressus</i>	Cyperaceae	Not Listed
9	Keelaneeli	<i>Phyllanthus niruri</i>	Phyllanthaceae	Not Listed
10	Kanamvazha	<i>Commelina benghalensis</i>	Commelinaceae	Not Listed
11	Thumbai	<i>Leucas aspera</i>	Lamiaceae	Not Listed
12	Partiniyam	<i>Parthenium</i>	Asteraceae	Not Listed
13	Thoiya keera	<i>Digeria muricata</i>	Amaranthaceae	Not Listed
14	Pulliyari	<i>Oxalis corniculata</i>	Oxalidaceae	Not Listed
15	Mukurattai	<i>Boerhavia diffusa</i>	Nyctaginaceae	Not Listed
16	Kaduku	<i>Brassica juncea</i>	Brassicaceae	Not Listed
17	Thulasi	<i>Ocimum tenuiflorum</i>	Lamiaceae	Not Listed
18	Arugampul	<i>Cynodon dactylon</i>	Poaceae	Not Listed
19	Manjal	<i>Curcuma longa</i>	Zingiberaceae	Not Listed
20	Manathakkali	<i>Solanum nigrum</i>	Solanaceae	Not Listed
21	Kanamvazha	<i>Commelina benghalensis</i>	Commelinaceae	Not Listed
22	Nai kadugu	<i>Celastrus viscosus</i>	Celastraceae	Not Listed
23	Koraikkilangu	<i>Cyperus articulatus</i>	Cyperaceae	Not Listed
24	Karisilanganni	<i>Eclipta prostrata</i>	Asteraceae	Not Listed
25	Korai	<i>Cyperus rotundus</i>	Cyperaceae	Not Listed
26	Kunnakora	<i>Cyperus compressus</i>	Cyperaceae	Not Listed
27	Mukurattai	<i>Boerhavia diffusa</i>	Nyctaginaceae	Not Listed
28	Kovai	<i>Coccinia grandis</i>	Cucurbitaceae	Not Listed
29	Perandai	<i>Cissus quadrangularis</i>	Vitaceae	Not Listed
30	Mudakkotan	<i>Cardiospermum helicacabum</i>	Sapindaceae	Not Listed
31	Sangupoo	<i>Clitoria ternata</i>	Fabaceae	Not Listed
32	Malli	<i>Jasminum augustifolium</i>	Oleaceae	Not Listed
33	Vallikeera	<i>Ipomoea aquatica</i>	Convolvulaceae	Not Listed
34	Siru puladi	<i>Desmodium triflorum</i>	Fabaceae	Not Listed
35	Sithrapaalavi	<i>Euphorbia prostrata</i>	Euphorbiaceae	Not Listed
36	mookuthi poondur	<i>Wedelia trilobata</i>	Asteraceae	Not Listed
37	Pullu	<i>Eragrostis ferruginea</i>	Poaceae	Not Listed
38	Chevvarakupul	<i>Chloris barbata</i>	Amaranthaceae	Not Listed
39	Nagathali	<i>Opuntia dillenii</i>	Nagathali	Not Listed

3.6.2 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 Mine lease area.

Table 3.26 Methodology applied during survey of fauna

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

Fauna in Core Zone

A total of 26 varieties of species were observed in the Core zone (Table.3.28). Among them are 8 Insects, 5 Reptiles, 4 Mammals and 9 Avian. A total of 26 species belonging to 20 families were recorded from the core area. The study shows that number of species decreases towards the mining area. This might be due the lack of vegetation. None of these species in the core zone are threatened or endemic. The survey was conducted to identify species listed in IUCN Red List. According to the field data, any species are not of Schedule I and nine species are of schedule IV. There are no critically endangered, endangered, vulnerable and endemic species were observed. Details of fauna in core zone with the scientific name were mentioned in Table 3.27.

Fauna in Buffer Zone

A total of 50 species belonging to 36 families have been recorded from the buffer zone area (Table.3.28). Based on habitat classification the majority of species were Birds 15 (30%), followed by Insects 14 (28%), Reptiles 13 (26%), Mammals 5 (10%) and Amphibians 3 (6%). There are 7 Schedule II species and 27 species are under schedule IV according to Indian wild life Act 1972. A total fifteen species of bird were sighted in the study area. There are no critically endangered, endangered, vulnerable and endemic species were observed.

Table 3.27 Fauna in Core Zone

S. No	Common name/English Name	Family Name	Scientific Name	Schedule list wildlife protection act 1972	IUCN Red List data
Reptiles					
1	Garden lizard	Agamidae	<i>Calotes versicolor</i>	NE	NE
2	Common house gecko	Gekkonidae	<i>Hemidactylus frenatus</i>	NE	NE
3	Rat snake	Colubridae	<i>Ptyas mucosa</i>	Sch II (Part II)	LC
4	Common krait	Elapid snakes	<i>Bungarus caeruleus</i>	Schedule IV	LC
5	Fan-Throated Lizard	Agamidae	<i>Sitanaponticeriana</i>	NL	LC
Insects					
1	Plain Tiger	Nymphalidae	<i>Dananeuschrysippus</i>	NL	LC
2	Tawny coster	Nymphalidae	<i>Danaus chrysippus</i>	Schedule IV	LC
3	Red-veined darter	Libellulidae	<i>Sympetrum fonscolombii</i>	NE	LC
4	Grasshopper	Acrididae	<i>Hieroglyphus sp</i>	NL	LC
5	Termite	Blattodea	<i>Hamitermes silvestri</i>	NE	LC
6	Blue tiger	Nymphalidae	<i>Tirumala limniace</i>	Schedule IV	LC
7	Striped tiger	Nymphalidae	<i>Danaus plexippus</i>	Schedule IV	LC
8	Ant	Formicidae	<i>Camponotus vicinus</i>	NL	NL
Mammals					
1	Indian Field Mouse	Muridae	<i>Mus booduga</i>	Schedule IV	LC
2	Asian Small Mongoose	Herpestidae	<i>Herpestes javanicus</i>	Schedule II	LC
3	Rat	Murids	<i>Rattusrattus</i>	Schedule IV	LC
4	Rat snake	Colubridae	<i>Ptyas mucosa</i>	Sch II (Part II)	LC
Avian					
1	Common myna	Sturnidae	<i>Acridotheres tristis</i>	NE	LC
2	Black drongo	Dicruridae	<i>Dicrurus macrocercus</i>	NE	LC
3	Koel	Cuculidae	<i>Dynamism scolopaceus</i>	Schedule IV	LC
4	Common cuckoo	Cuculidae	<i>Cuculus canorus</i>	NE	LC
5	House crow	Corvidae	<i>Corvus splendens</i>	NE	LC
6	Crow Pheasant	Cuculidae	<i>Centropus sinensis</i>	Schedule IV	LC
7	Rose-ringed parakeet	Psittaculidae	<i>Psittacula krameri</i>	Schedule IV	LC
8	Asian green bee-eater	Meropidae	<i>Meropsorientalis</i>	NL	LC
9	Cattle egret	Ardeidae	<i>Bubulcus ibis</i>	NE	LC

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

Table 3.28 Fauna in Buffer Zone

S. No	Common name/ English Name	Family Name	Scientific Name	Schedule list wildlife Protection act 1972	UCN Red List data
Insects					
1	Honey bee	Apidae	<i>Apis cerana</i>	Schedule IV	LC
2	Blue tiger	Nymphalidae	<i>Tirumala limniace</i>	Schedule IV	LC
3	Common Indian crow	Nymphalidae	<i>Euploea core</i>	Schedule IV	LC
4	Tawny coster	Nymphalidae	<i>Danaus chrysippus</i>	Schedule IV	LC
5	Grasshopper	Acrididae	<i>Hieroglyphus sp</i>	NL	LC
6	Jewel beetle	Buprestidae	<i>Eurythyrea austriaca</i>	Schedule IV	LC
7	Red-veined darter	Libellulidae	<i>Sympetrum fonscolombii</i>	NL	LC
8	Ant	Formicidae	<i>Camponotus vicinus</i>	NL	LC
9	Praying mantis	Mantidae	<i>mantis religiosa</i>	NL	LC
10	Dragonfly	Gomphidae	<i>Ceratogomphus pictus</i>	Schedule IV	LC
11	Milkweed butterfly	Nymphalidae	<i>Danainae</i>	NL	LC
12	Striped tiger	Nymphalidae	<i>Danaus plexippus</i>	Schedule IV	LC
13	Lesser grass blue	Lycaenidae	<i>Zizina otis indica</i>	Schedule IV	LC
14	Common Tiger	Nymphalidae	<i>Danaus genutia</i>	Schedule IV	LC
Reptiles					
1	Garden lizard	Agamidae	<i>Calotes versicolor</i>	NL	LC
2	Chameleon	Chamaeleonidae	<i>Chameleon zeylanicus</i>	Schedule II	LC
3	Fan-Throated Lizard	Agamidae	<i>Sitanaponticeriana</i>	NL	LC
4	Common house gecko	Gekkonidae	<i>Hemidactylus frenatus</i>	NL	LC
5	Rat snake	Colubridae	<i>Ptyas mucosa</i>	Sch II (Part II)	LC
6	Olive keel back water snake	Natricidae	<i>Atretium schistosum</i>	Sch II (Part II)	LC
7	Whip Snake	Elapidae	<i>Dryphis nasutus</i>	Sch II (Part II)	LC
8	Common krait	Elapid snakes	<i>Bungarus caeruleus</i>	Schedule IV	LC
9	Indian wall lizard	Gekkonidae	<i>Hemidactylus flaviviridis</i>	Schedule IV	NL
10	Saw scaled viper	Elapidae	<i>Echis carinatus</i>	Sch II (Part II)	LC
11	Brahminy skink	Scincidae	<i>Eutropis carinata</i>	NL	LC
12	Scincidae	Viperidae	<i>Vipera russelli</i>	Sch II (Part II)	LC
13	Common skink		<i>Mabuya carinatus</i>	NL	LC
Mammals					

1	Indian palm squirrel	Sciuridae	<i>Funambulus palmarum</i>	Schedule IV	LC
2	Indian Field Mouse	Muridae	<i>Mus booduga</i>	Schedule IV	LC
3	Indian hare	Leporidae	<i>Lepus nigricollis</i>	Schedule IV	LC
4	Asian Small Mongoose	Herpestidae	<i>Herpestes javanicus</i>	Schedule (Part II)	LC
5	Brown rat	Muridae	<i>Rattus norvegicus</i>	Schedule IV	LC
Aves					
1	Koel	Cuculidae	<i>Eudynamis</i>	Schedule IV	LC
2	Cattle egret	Ardeidae	<i>Bubulcus ibis</i>	NL	LC
3	Common myna	Sturnidae	<i>Acridotheres tristis</i>	NL	LC
4	House crow	Corvidae	<i>Corvus splendens</i>	NL	LC
5	Asian green bee-eater	Meropidae	<i>Merops orientalis</i>	NL	LC
6	Red-vented Bulbul	Pycnonotidae	<i>Pycnonotus cafer</i>	Schedule IV	LC
7	Rose-ringed parakeet	Psittaculidae	<i>Psittacula krameri</i>	Schedule IV	LC
8	Shikra	Accipitridae	<i>Accipiter badius</i>	NL	LC
9	Common quail	Phasianidae	<i>Coturnix coturnix</i>	Schedule IV	LC
10	Black drongo	Dicruridae	<i>Dicrurus macrocercus</i>	Schedule IV	LC
11	Two-tailed Sparrow	Dicruridae	<i>Passer domesticus</i>	Schedule IV	LC
12	Grey Francolin	Phasianidae	<i>Francolinus pondicerianus</i>	Schedule IV	LC
13	Common Quail	Phasianidae	<i>Coturnix coturnix</i>	Schedule IV	LC
14	White-breasted waterhen	Rallidae	<i>Amaurornis phoenicurus</i>	NL	LC
15	Common Coot	Rallidae	<i>Fulica atra</i>	Schedule IV	LC
Amphibians					
1	Indian Burrowing frog	Dicroglossidae	<i>Sphaerotheca breviceps</i>	Schedule IV	LC
2	Pond Frog	Ranidae	<i>Rana hexadactyla</i>	Schedule IV	LC
3	Tiger Frog	Chordata	<i>Hoplobatrachus tigerinus (Rana tigerina)</i>	Schedule IV	LC

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

Aquatic Vegetation

The field survey for assessing the aquatic vegetation was also undertaken during the study period. Fish is commonly found in all types of natural water bodies and very common source of food in Eastern South India. The local fishermen were enquired and also the secondary resources were reviewed to collect information on the fishes found in the study area. Few common species are; *Catla (Catla catla)*, *Channa striata*, *Oreochromis niloticus*.

Table 3.29 Aquatic Fauna and Flora

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

*LC- Least Concern, NA-Not yet assessed

Phytoplankton's:

Microcystis, Nitzschia, Oscillatoria, Navicula and Pediatrum sps.

Zooplanktons:

These consist of microscopic organisms from groups Protozoa, Rotifers, Cladocera and Copepoda etc. Some common species of zooplanktons are; *Deflandre*, *Arcella vulgaris*, *Centropyxis spinosa*, *Arcella discoides*, *Arcella hemispherica*, *Centropyxis aculeate*, *Trigonopyxis arcula*, *Brachionus calyciflorus*, *Lecane curvicornis*, *Brachionus angularis*, *Polyarthra vulgaris*, *Filinia longiseta*.

Food chain

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

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

3.6.3 Agriculture & Horticulture in Krishnagiri district:

Major horticulture crops cultivated in this district are fruits crops like mango, banana, sapota, amla and guava, vegetables like brinjal, bhendi, capsicum, onion and chillies, spices like turmeric and pepper, and flower crops like rose, gerbera and carnations.

Major Agricultural Crops

Major horticulture crops cultivated in this district are vegetables crops like tomato, brinjal, chillies, onion and turmeric. Details of major field crops and Agricultural in 1km radius is given in Table. 3.30.

Table 3.30 Major Crops in 1km radius

S. No	Major crops	Scientific name	Families
1	Sorghum	<i>Sorghum bicolor</i>	Poaceae
2	Gingelly	<i>Sesamum indicum</i>	Pedaliaceae
3	Groundnut	<i>Arachis hypogaea</i>	Legumes
4	Millets	<i>Panicum miliaceum L</i>	Poaceae
5	Sesame	<i>Sesamum indicum</i>	Pedaliaceae
6	Cotton	<i>Gossypium herbaceum</i>	Malvaceae

Major Horticulture Crops

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

Horticulture

Major horticulture crops cultivated in Krishnagiri district are fruit crops like mango, banana, Sapota and guava, vegetables like tomato, brinjal, ladies finger, chillies, onion and tapioca, spices like turmeric. Details of major field crops and horticulture cultivation in 1km radius is given in Table 3.31.

Table 3.31 Major Field Crops & Horticulture cultivation in 1km radius.

S. No	Common Name	Scientific Name	Family
Major Horticultural Crops			
1	Guava	<i>Psidium guajava</i>	Myrtaceae
2	Sapota	<i>Manilkara zapota</i>	Sapotaceae
3	Lemon	<i>Citrus × limon</i>	Rutaceae
4	Papaya	<i>Carica papaya</i>	Caricaceae
5	mango	<i>Mangifera indica</i>	Anacardiaceae
6	banana	<i>Musa × paradisiaca</i>	Musaceae
Vegetables			
7	Onion	<i>Allium cepa</i>	Amaryllidaceae
8	Tapioca	<i>Manihot esculenta</i>	Spurges
9	Brinjal	<i>Solanum melongena</i>	Nightshade
10	Tomato	<i>Solanum lycopersicum</i>	Nightshade
11	Bottle Gourd	<i>Lagenaria siceraria</i>	Cucurbits
12	Ladies finger	<i>Abelmoschus esculentus</i>	Mallows
13	Moringa	<i>Moringa oleifera</i>	Moringaceae

3.7 SOCIO ECONOMIC ENVIRONMENT

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

3.7.1 Objectives of the Study

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

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

3.7.2 Methodology

The study employed cluster sampling to outline two zones around the proposed project site: Zone 1 (Core Zone, 0-1 km radius) and Zone 2 (Low Impact Zone, 1-5 km radius). The primary data collection was conducted through structured interviews, field observation, and focus group discussions with the local people of in Kariyasandiram Village, Shoolagiri Taluk of Krishnagiri District, Tamil Nadu. The secondary data were collected from the Census report 2011 and official records, covering demographics and basic services including information on population, number of households, literacy rates, sex ratios, worker details and the availability of basic services. This study covers the positive and negative impacts of the project's establishment, and provides recommendations for analysing and mitigating adverse effects. The study areas are illustrated in Figure 3.30.

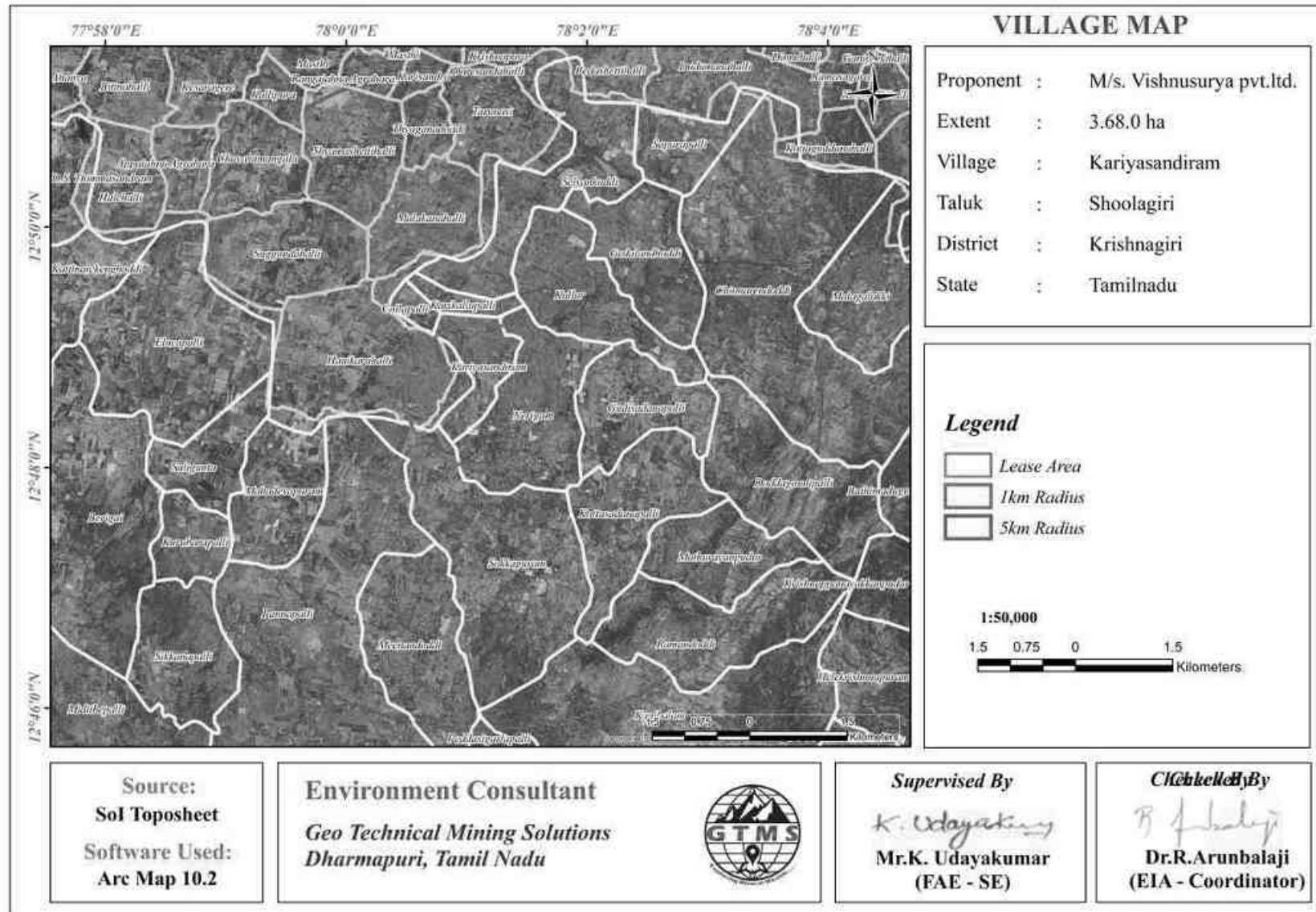


Figure 3.27 Details Village Boundaries within 1 km and 5 km Radius of the Project Lease Area

3.7.3 Demographic Profile of Krishnagiri District

Krishnagiri district, located in Tamil Nadu, is bordered by Vellore and Thiruvannamalai districts to the east, Karnataka to the west, Andhra Pradesh to the north, and Dharmapuri district to the south. The district covers an area of 5,143 sq. km and receives an average annual rainfall of 830 mm. The primary languages spoken are Tamil, Telugu, and Kannada. According to the 2011 Census, the district had a total population of 1,879,809 (males: 960,232; females: 919,577), up from 1,561,118 in 2001. The overall literacy rate in 2011 was 71.46%, with male literacy at 78.72% and female literacy at 63.91%, reflecting significant improvement over 2001 levels (72.50% for males and 51.62% for females). The number of literates in 2011 was 1,187,958.

The sex ratio improved from 944 females per 1,000 males in 2001 to 958 in 2011, which is above the national average of 940. The child sex ratio also rose from 869 in 2001 to 926 in 2011. Children aged 0–6 years constituted 11.56% of the population in 2011 (217,323 children), slightly down from 13.77% in 2001 (214,954 children), indicating a 2.21% decrease. Hinduism is the major religion, practiced by 91.70% of the population, followed by Islam (6.13%). Scheduled Castes and Scheduled Tribes account for 14.22% and 1.19% of the population, respectively.

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

3.7.4 Profile of Study Area - Kariyasandiram Village

Kariyasandiram is a small village located in the Shoolagiri Block of Krishnagiri District, Tamil Nadu. It falls under the Nerigam Panchayat and is geographically surrounded by Malur Block (North), Bangalore Rural Block (West), Veppanapalli Block (South), and Hosur Block (also West). As per the 2011 Census, the village comprises 95 households with a total population of 346 individuals 184 males and 162 females. Children aged 0–6 years account for 56 individuals, representing 16.18% of the total population. The average sex ratio in Kariyasandiram is 880 females per 1,000 males, which is lower than the Tamil Nadu state average of 996. The child sex ratio is 931, also below the state average of 943.

Literacy levels in the village are significantly lower than the state average. The overall literacy rate in 2011 was only 16.21%, compared to 80.09% for Tamil Nadu. Male literacy stood at 14.84%, while female literacy was 17.78%, indicating minimal gender disparity but highlighting the need for educational development in the area. The profile of Kariyasandiram Village includes demographic details such as the number of households, population statistics, literacy levels, child population (0–6 years), caste composition, and workforce, as presented in Table 3.32.

Table. 3.32 Demographic Status of Kariyasandiram Village

Particulars	Total	Male	Female
Total No. of Houses	95	-	-
Population	346	184	162
Child (0-6)	56	29	27
Schedule Caste	0	0	0
Schedule Tribe	0	0	0
Literacy %	16.21 %	14.84 %	17.78 %
Total Workers	241	130	111
Main Worker	240	-	-
Marginal Worker	1	0	1

Source: <https://www.census2011.co.in/data/village/643705-kariyasandiram-tamil-nadu.html>

3.7.5 Working Population- Kariyasandiram Village

Kariyasandiram village out of total population, 241 were engaged in work activities. 99.59 % of workers describe their work as Main Work (Employment or Earning more than 6 Months) while 0.41 % were involved in Marginal activity providing livelihood for less than 6 months. Of 241 workers engaged in Main Work, 0 were cultivators (owner or co-owner) while 240 were Agricultural labourer.

Benefits:

The local people have been provided with either direct employments or indirect employment such as business, contract works and development work like roads, etc. and other welfare amenities such as medical facilities, conveyance, free education, drinking water supply etc. The number of villages and human settlements within a radius of 5 km from the project site along with population, their education level etc. Table 3.34 presents detailed demographic, social, and economic indicators for villages in the study area. The study area has a population of 22,755 males and 21,749 females, with a sex ratio of 956 females per 1,000 males, slightly below the national average. The child population (0-6 years) is 11.8% of the total, indicating a young demographic. Nearly 83% of the habitation and human settlement area is located in the state of Tamil Nadu, while 17% of the villages are situated in Karnataka. The village of Berigai is the most populous, followed by Pannapalli and Suligunta.

Scheduled Castes (SC) are notably present in villages such as Kurubarapalli, Pannapalli, and Suligunta, with Kurubarapalli having the largest SC population. Approximately 70% of the SC population resides in Tamil Nadu, while only 30% are in Karnataka. Scheduled Tribes (ST) are concentrated in villages across both Tamil Nadu and Karnataka. The majority of the ST population (65%) is in Karnataka, with the remaining 35% in Tamil Nadu.

In terms of literacy, the area shows a gender gap, with male literacy at 53.1% and female literacy at 46.9%. Berigai leads in literacy rates, especially for females, while other villages like Suligunta, Pannapalli, and Peddasigarlapalli show relatively higher literacy. However, many smaller villages report very low literacy levels due to limited educational resources.

Table 3.33 Population Structure and Literacy Rate of Study Area

Village Name	No. of Houses	Population in Gender wise		Child (0-6)		Schedule Caste		Schedule Tribe		Literacy Rate		Total Workers	
		Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Villages in Krishnagiri District of State Tamil Nadu													
Berigai	1807	3970	3914	419	448	284	313	4	2	21.83	24.88	2404	931
Chinnarendoddi	164	363	352	50	35	20	15	0	0	1.56	1.66	240	218
Collapalli	97	234	206	38	29	12	12	0	0	0.87	0.71	140	127
Doddagounipalli	202	484	456	86	86	52	50	115	125	1.50	1.39	283	249
Elucapalli	93	210	210	30	29	164	158	0	0	1.02	0.95	135	37
Gedalandhoddi	112	242	230	20	23	17	19	0	0	1.37	1.29	158	164
Gudisadanapalli	321	674	681	72	78	147	153	0	0	3.35	3.44	450	439
Kariyasandiram	95	184	162	29	27	0	0	0	0	0.17	0.24	130	111
Kottasadanapalli	26	48	52	8	7	15	10	0	0	0.24	0.25	28	32
Kullur	107	229	224	24	21	46	49	0	0	1.13	0.94	121	63
Kumbalam	164	394	367	45	42	0	0	52	43	1.84	1.57	182	147
Kurubarapalli	339	820	751	95	78	376	337	0	0	3.17	3.16	467	249
Mahadevapuram	89	189	182	26	28	0	0	0	0	0.77	0.70	109	80
Malagalakki	157	397	415	50	44	24	20	33	43	1.68	1.91	245	229
Meenandoddi	83	180	178	23	25	28	34	0	0	0.68	0.81	110	90
Muthurayanpudur	100	202	180	28	30	0	1	77	63	0.76	0.67	117	110
Nerigam	242	537	497	61	70	228	208	0	0	2.30	1.92	322	246
Pannapalli	997	2275	2156	259	261	295	288	0	0	9.38	9.03	1414	654
Peddasigarlapalli	841	2025	1903	283	252	219	206	52	55	7.05	6.61	1176	880
Ramandoddi	133	295	287	56	47	0	1	4	4	1.11	1.00	160	148
Saparapalli	51	117	114	16	16	47	43	0	0	0.42	0.48	86	85
Selvankoddi	246	588	567	92	72	113	110	0	0	2.06	2.11	330	263

Sikkanapalli	135	279	276	29	34	82	85	0	0	1.45	1.44	175	31
Sokkapuram	280	633	652	87	72	141	133	0	0	2.52	3.09	375	232
Suligunta	1420	3311	3004	470	377	82	80	0	0	12.92	11.25	1929	1715
Sub-Total	8301	18880	18016	2396	2231	2392	2325	337	335	81.16	81.5	11286	7530
Villages in Kolar District of Karnataka State													
Anikarahalli	120	275	252	21	21	0	0	65	67	1.55	1.47	168	145
Appaiana Agrahara	135	356	347	30	34	64	80	1	1	2.01	1.93	182	131
Chavaramangala	76	161	139	21	8	3	2	9	6	0.79	0.72	88	58
Duduvanahalli	364	824	826	78	85	251	251	65	56	4.38	4.73	493	319
Durasandahalli	95	238	211	21	14	2	2	228	202	1.11	1.02	152	116
Kallipura	102	252	252	21	25	84	92	16	10	1.29	1.30	135	105
Karisandra	218	470	459	41	43	277	278	0	0	2.19	1.94	253	99
Krishnapura	184	405	389	34	40	114	111	81	81	1.94	1.80	254	185
Malkanahalli	175	451	391	45	45	48	42	0	0	1.89	1.71	271	107
Suggondahalli	87	204	224	26	42	64	63	96	107	0.50	0.56	123	104
Thrunasi	104	239	243	25	24	43	41	60	70	1.18	1.33	155	92
Sub-Total	1660	3875	3733	363	381	950	962	621	600	18.84	18.5	2274	1461
Total	9961	22755	21749	2759	2612	3342	3287	958	935	100	100	13560	8991

Source: Tamil Nadu & Karnataka districts Census Reports – 2011.

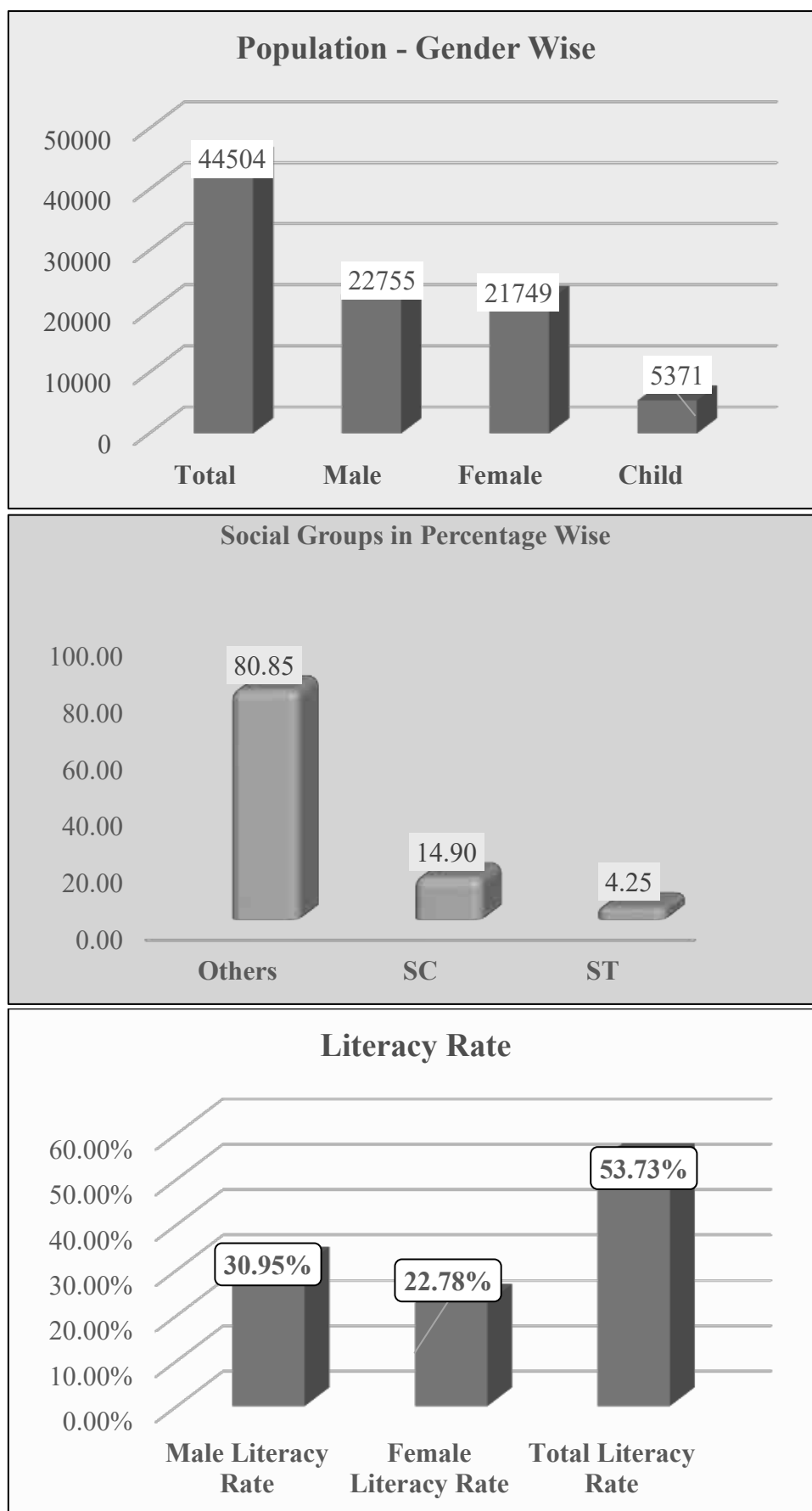


Figure 3.28: Demographic Details – Population, Social Groups, and Literacy Rate in the Study Villages

Table 3.34 Workforce Details of the Study Area (Percentage wise)

Village Name	Total Worker	Total Male Workers	Total Female Workers	Total Main Workers	Total Main Cultivators	Total Main Agricultural Labourers	Total Other Workers	Total Non-Workers
<i>Villages in Krishnagiri District of State Tamil Nadu</i>								
Berigai	14.23	17.03	9.98	14.71	6.38	9.41	38.96	19.97
Chinnarendoddi	1.95	1.70	2.34	2.17	2.74	2.78	0.14	1.13
Collapalli	1.14	0.99	1.36	1.23	0.22	2.93	0.00	0.76
Doddagounipalli	2.27	2.00	2.67	2.51	2.27	3.58	0.85	1.79
Elucapalli	0.73	0.96	0.40	0.81	0.41	1.64	0.07	1.09
Gedalandhoddi	1.37	1.12	1.76	1.53	0.00	3.86	0.09	0.66
Gudisadanapalli	3.79	3.19	4.71	4.22	5.65	4.97	0.48	2.05
Kariyasandiram	1.03	0.92	1.19	1.14	0.00	2.91	0.00	0.46
Kottasadanapalli	0.26	0.20	0.34	0.24	0.43	0.11	0.07	0.18
Kullur	0.78	0.86	0.68	0.86	0.72	1.46	0.07	1.18
Kumbalam	1.40	1.29	1.58	1.08	0.57	2.11	0.16	1.90
Kurubarapalli	3.05	3.31	2.67	2.92	2.15	3.91	2.32	3.75
Mahadevapuram	0.81	0.77	0.86	0.89	0.79	1.29	0.39	0.80
Malagalakki	2.02	1.74	2.46	2.25	4.53	1.14	0.32	1.48
Meenandoddi	0.85	0.78	0.97	0.95	0.31	1.63	0.94	0.69
Muthurayanpudur	0.97	0.83	1.18	0.25	0.42	0.21	0.02	0.68
Nerigam	2.42	2.28	2.64	2.62	3.72	1.93	2.07	2.05
Pannapalli	8.82	10.01	7.01	8.62	12.24	6.51	5.82	10.37
Peddasigarlapalli	8.77	8.33	9.44	9.34	9.40	9.17	10.24	8.22
Ramandoddi	1.31	1.13	1.59	1.46	2.05	1.14	1.04	1.20

Saparapalli	0.73	0.61	0.91	0.80	0.02	2.02	0.02	0.26
Selvankoddi	2.53	2.34	2.82	2.31	1.89	4.01	0.05	2.47
Sikkalapalli	3.81	3.97	3.57	3.97	1.86	6.24	3.27	3.64
Sikkanapalli	0.88	1.24	0.33	0.94	0.93	0.93	1.06	1.53
Sokkapuram	2.59	2.66	2.49	2.88	2.91	3.64	1.59	2.98
Suligunta	15.54	13.66	18.39	15.06	24.00	8.40	9.55	11.72
Sub-Total	84.07	83.90	84.33	85.79	86.64	87.92	79.61	83.00
Villages in Kolar District of Karnataka State								
Anikarahalli	1.34	1.19	1.56	1.24	0.94	2.16	0.16	0.94
Appaiana Agrahara	1.34	1.29	1.40	1.43	2.74	0.66	0.55	1.71
Chavaramangala	0.62	0.62	0.62	0.48	0.34	0.21	1.29	0.68
Duduvanahalli	3.46	3.49	3.42	3.49	2.01	3.17	7.13	3.68
Durasandahalli	1.14	1.08	1.24	1.24	0.10	2.46	1.15	0.79
Kallipura	1.02	0.96	1.13	1.05	0.94	0.83	1.47	1.16
Karisandra	1.50	1.79	1.06	1.05	1.66	0.42	1.13	2.53
Krishnapura	1.87	1.80	1.98	1.51	1.61	1.19	2.07	1.56
Malkanahalli	1.61	1.92	1.15	1.19	1.97	0.51	1.10	2.04
Suggondahalli	0.97	0.87	1.12	1.08	0.19	0.44	4.05	0.88
Thrunasi	1.05	1.10	0.99	0.45	0.84	0.04	0.28	1.03
Sub-Total	15.93	16.10	15.67	14.21	13.36	12.08	20.39	17.00
Total	100	100	100	100	100	100	100	100

Source: Tamil Nadu & Karnataka districts Census Reports – 2011

3.7.6 Workforce Participation

The table 3.35 provides a breakdown of the workforce distribution across various villages in terms of the total workers, main workers, cultivators, agricultural laborers, other workers, and non-workers. The worker distribution across the study area highlights significant variation in labour participation between villages. Berigai (14.23%) and Suligunta (15.54%) lead with the highest percentages of workers, likely due to their agricultural base or labor-intensive industries. In contrast, Chinnarendoddi (1.95%) and Karikallupalli (0.00%) show minimal worker participation, possibly due to low population densities or limited employment opportunities. Villages like Pannapalli (8.82%) and Peddasigarlapalli (8.77%) exhibit notable worker populations as well, suggesting a blend of agricultural and small-scale industrial activities.

When looking at main workers those engaged in a primary occupation for over six months. Berigai stands out with 14.71% of its population working, particularly in agriculture, with 6.38% as main cultivators and 9.41% as agricultural laborers. Suligunta also has a significant portion of main workers (15.06%), with 24.00% being main cultivators. On the other hand, Elucapalli (0.73%) and Kottasadanapalli (0.26%) have low main worker engagement, indicating either a focus on non-agricultural sectors or a small, inactive labor force. The data suggests that while some villages are diversifying into other sectors, many still rely heavily on agriculture as the primary source of livelihood.

Despite some signs of industrial or service sector growth in places like Peddasigarlapalli (10.24%) and Sikkalapalli (3.27%), agriculture continues to dominate in most of the villages, as seen in Suligunta (8.40%) and Doddagounipalli (3.58%) where agricultural laborers are the majority. However, villages like Kottasadanapalli, Saparapalli, and Sikkalapalli show fewer agricultural laborers, likely due to a shift in economic focus or limited agricultural land. Non-workers, particularly in Berigai (19.97%) and Suligunta (11.72%), are relatively high, possibly indicating large portions of the population that are dependent on agriculture or are too young or elderly to work. Gender disparities in workforce participation are also visible, with males typically more involved in work, although villages like Suligunta show higher female participation.

The data reveals a diverse demographic across the study area, with some villages like Berigai and Pannapalli showing better development in population, literacy, and workforce participation, while others, particularly those with high SC/ST populations, face educational and economic challenges. Gender disparities persist in both literacy and employment, though

Suligunta stands out with higher female workforce participation. Agriculture remains the dominant sector, though some villages are diversifying into other industries.

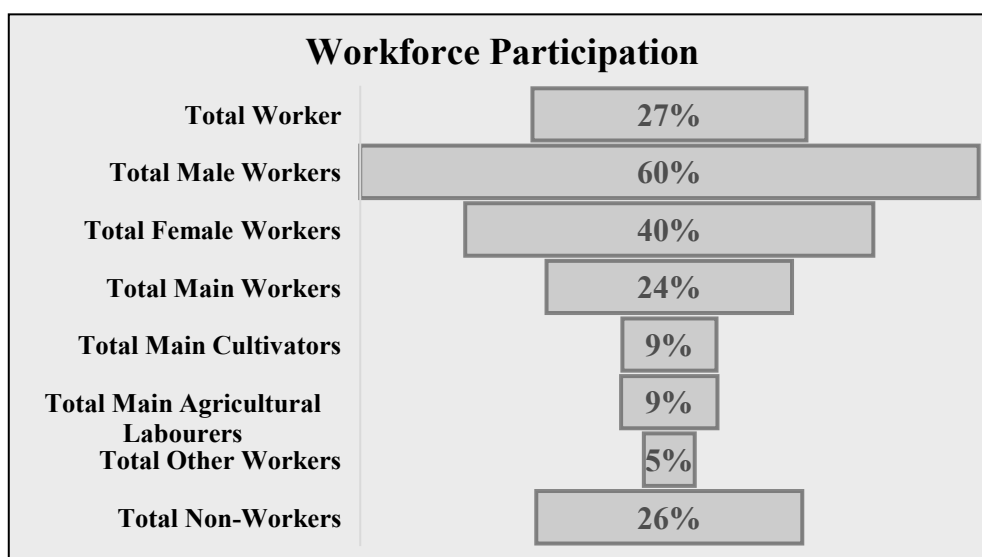


Figure 3.29 Details of Workforce in the Study Villages

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

- ❖ Awareness and Opinion of the People About the Project, to assess public awareness and opinions regarding the proposed project, the following key observations were recorded:
- ❖ During the survey, it was observed that only residents of nearby villages were aware of the proposed project, while those in more distant villages were largely unaware.

People in the region expressed expectations that the project would generate employment opportunities and lead to improvements in education, transportation, and sanitation facilities provided by the project authorities.

Recommendation and Suggestion

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

- Women empowerment: Home based income generation activities, vocational training programs and common education centre for increasing the literacy rate.

- Education: Free uniform, construction of common rooms and library, computer education and physical education, furniture and equipment in schools, up-gradation of existing school infrastructure through the CSR funds.
- Agriculture/livestock: Infrastructure such as agricultural practices, electricity connections, assistance with buying improved tools and equipment, capacity building, supply and/or knowledge of better variety of seeds, pasture land development and trainings on animal husbandry & facility of veterinary doctor.
- Health: Improvements in sanitary conditions of villages, assistance with construction of latrines, improvement in drainage system, health camps and awareness campaigns for diseases like common cold, malaria, typhoid, tuberculosis, yellow fever and pneumonia. Repairing of PHCs and Anganwadi centres.
- People with disability: Establishment of centre for special education, sensitization of the community towards disabled and awareness on Government schemes.
- Marginalized Communities and Vulnerable Groups: While Developing an Action Plan, it is very important to identify the population who falls under the marginalized and vulnerable groups. So that special attention can be given to these groups with special provisions while making action plans.
- Connectivity: Transport connectivity to easiness accessibility to the region.
- Greenbelt: Establish a greenbelt and plant saplings around quarry boundaries, village schools, and village roads.

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.

Conclusion

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

3.8 TRAFFIC DENSITY

The traffic survey conducted based on the transportation route of material, the Rough Stone and gravel is proposed to be transported mainly through Village Road and Berigai – Sokkapuram as shown in Table 3.35 and in Figure 3.33. 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 3.35 Traffic Survey Locations

Station Code	Road Name	Distance and Direction	Type of Road
TS1	Village Road	0.57 Km-S	Village Road
TS2	Berigai – Sokkapuram	1.45 Km- S	Berigai – Sokkapuram

Source: On-site monitoring by GTMS FAE & TM

Table 3.36 Existing Traffic Volume

Station code	HMV		LMV		2/3 Wheelers		Total PCU
	No	PCU	No	PCU	No	PCU	
TS1	33	99	43	43	65	33	175
TS2	75	225	105	105	151	76	406

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 3.37 Rough Stone Transportation Requirement

Transportation of Rough and Gravel per day		
Capacity of trucks	No. of Trips per day	Volume in PCU
15 tonnes	78	234

Source: Approved Mining Plan

Table 3.38 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
TS1	175	234	409	1200
TS2	406	234	640	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.

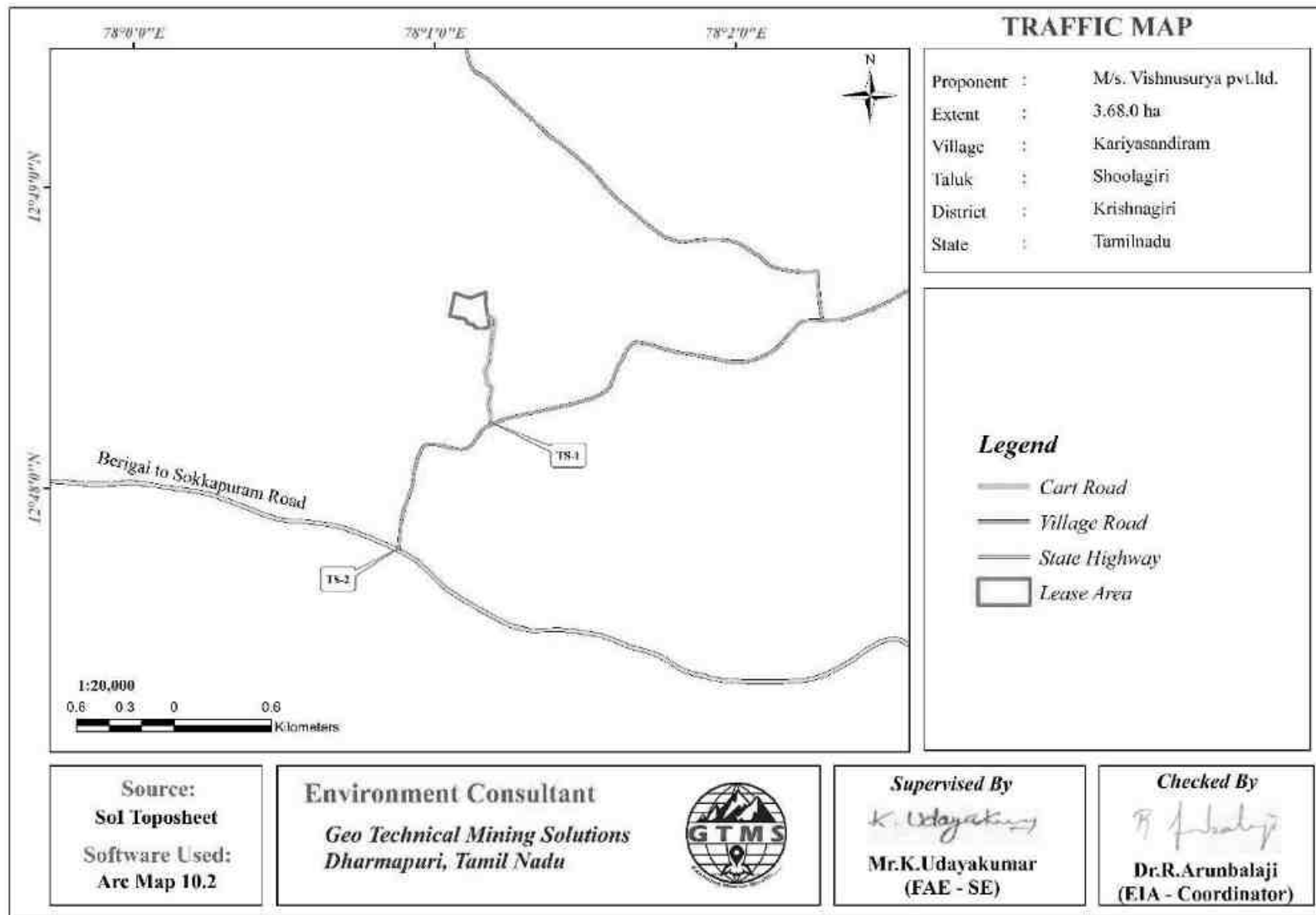


Figure 3.30 Traffic Density Map

3.9 SITE SPECIFIC FEATURES

There are no Wildlife Sanctuaries and National Park within 25 km radius. Therefore, there will be no need of acquisition/diversion of forest land. The details related to the environmentally sensitive areas around the proposed mine lease area i.e., 25 km radius and the nearby water bodies are given in the Table 3.39.

Table 3.39 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	Cauvery North Wildlife Sanctuary	31.35Km - S
		None	Nil within 10 km radius
2	Reserve Forest	Gullu RF	2.51Km - NE
		Midethepalli RF	4.75Km - SW
		Kodattur RF	3.62Km - S
		Kumbalam I RF	5.51Km - SE
		Chinnaradoddi RF	5.23Km - NE
		Berigai RF	5.61Km - SW
		Berigai EXTN RF	7.11Km - SW
		Athimugam II RF	8.61Km - SW
		Amudugondapalli RF	6.95Km - W
		Kariyanapalli I RF	9.8Km - S
		Theertham RF	12.88Km - SE
		Veppanapalli EXTN	12.93Km - E
		Kumbalam II	12.03Km - W
		Nariganapuram	12.18Km - SW
		Settipalli RF	10.82Km - S
		Sanamavu RF	14.53Km - S
3	Lakes/Reservoirs/ Dams/Streams/Rivers	Mudugurki Lake	0.50Km - S
		Kullur Lake	1.39Km - N
		Berikai Lake	5.18Km - W
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		Nil within 10 km radius
8	Centrally Protected Archaeological Sites	None	Nil within 10 km radius
9	Industries/ Thermal Power Plants	None	Nil within 10 km radius
10	Defence Installation	None	Nil within 10 km radius

Source: Survey of India Toposheet

CHAPTER IV

ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

4.0 GENERAL

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

4.1 LAND ENVIRONMENT

Anticipated Impact

- ❖ Permanent change on land use and land cover.
- ❖ Change in topography of the mine lease area.
- ❖ Problems to agricultural land and human habitations due to dust, and noise caused by movement of heavy vehicles
- ❖ Degradation of the aesthetic environment of the core zone due to quarrying
- ❖ Soil erosion and sediment deposition in the nearby agricultural fields during the rainy season
- ❖ Increase in agricultural productivity of land when mine water is discharged to the surrounding lands for irrigation

Common Mitigation Measures from Proposed Project

- ❖ 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
- ❖ At conceptual stage, the land use pattern of the quarry will be changed into Greenbelt area and temporary reservoir.
- ❖ In terms of aesthetics, natural vegetation surrounding the quarry will be retained (such as in a buffer area i.e., 7.5 m safety barrier and other safety provided) so as to help minimize dust emissions.
- ❖ Proper fencing will be carried out at the conceptual stage, Security will be posted round the clock, to prevent inherent entry of the public and cattle.

4.2 SOIL ENVIRONMENT

Anticipated Impact on Soil Environment

- ❖ Deterioration of soil quality in the surrounding area due to runoff from the project area
- ❖ Decrease in the agricultural productivity of the surrounding land due to soil quality degradation

Common Mitigation Measures from proposed project

- ❖ Construction of garland drains, settling pits, and check dams to prevent runoff and siltation
- ❖ 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 the settling tanks to reduce suspended sediment loads before runoff is discharged from the quarry site.
- ❖ Retain existing or re-plant the vegetation will be retained at the site wherever possible.
- ❖ Monitoring and maintenance – Weekly monitoring and daily maintenance of erosion control systems so that they perform as specified specially during rainy season.

4.3 WATER ENVIRONMENT

Anticipated Impact

- ❖ Surface and ground water resources may be contaminated due to pit water discharge, domestic sewage, discharge of oil and grease bearing waste water from washing of vehicles and machineries, and washouts from surface exposure or working areas
- ❖ As the proposed project acquires 4.0 KLD of water from water vendors, it will not extract water by developing abstraction structures in the lease area. Therefore, the project will not have impact on depletion of aquifer beneath the lease area.

Common Mitigation Measures for the Proposed Project

- ❖ Rain water from mine pit will be treated in settling tanks before being used for dust suppression and tree plantation purposes.
- ❖ Domestic sewage from site office will be discharged in septic tank and then directed to soak pits.
- ❖ Water from the tipper wash-down facility and machinery maintenance yard will be passed through interceptor traps/oil separators prior to its reuse
- ❖ The garland drainage will be connected to settling tank and sediments will be trapped in the settling tanks and only clear water will be discharged to the natural drainage
- ❖ Periodic (every 6 month once) analysis of ground water quality of quarry pit water and ground water of nearby villages will be conducted

- ❖ Artificial recharge structures will be established in suitable locations as part of the rainwater harvesting management program.

4.4 AIR ENVIRONMENT

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

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	$E = [u^{0.4} a^{0.2} \{9.7 + 0.01p + b/(4 + 0.3b)\}]$	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).

The emission rate thus calculated using the empirical formula is used as one of the inputs in the AERMOD modelling. It is important to note that 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}	0.63435096	36800	1.72378E-05
Overall Mine	PM ₁₀	1.268701919	36800	3.44756E-05

4.4.1 Modelling of Incremental Concentration

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

Model Results

The post project resultant concentrations of PM₁₀, PM_{2.5} is given in Tables 4.3-4.4.

Table 4.3 Incremental & Resultant GLC of PM_{2.5}

Station ID	Distance to core area (km)	PM _{2.5} concentrations(µg/m ³)				Comparison against air quality standard (60 µg/m ³)	Magnitude of change (%)	Significance
		Direction	Baseline	Predicted	Total			
AAQ1	0.03	N	22.0	6.75	28.75	Below standard	30.7	Not significant
AAQ2	2.24	SE	17.0	0.6	17.6		3.5	
AAQ3	3.46	SW	20.0	0.1	20.1		0.5	
AAQ4	1.69	NNW	17.4	1	18.4		5.7	
AAQ5	2.10	NW	18.1	0.6	18.7		3.3	

Table 4.4 Incremental & Resultant GLC of PM₁₀

Station ID	Distance to core area	PM ₁₀ concentrations(µg/m ³)				Comparison against air quality standard (100 µg/m ³)	Magnitude of change (%)	Significance
		Direction	Baseline	Predicted	Total			
AAQ1	0.03	N	49.2	13.1	62.3	Below standard	26.6	Not significant
AAQ2	2.24	SE	42.0	1	43		2.4	
AAQ3	3.46	SW	48.2	0.1	48.3		0.2	
AAQ4	1.69	NNW	40.0	1	41		2.5	
AAQ5	2.10	NW	41.8	1	42.8		2.4	

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

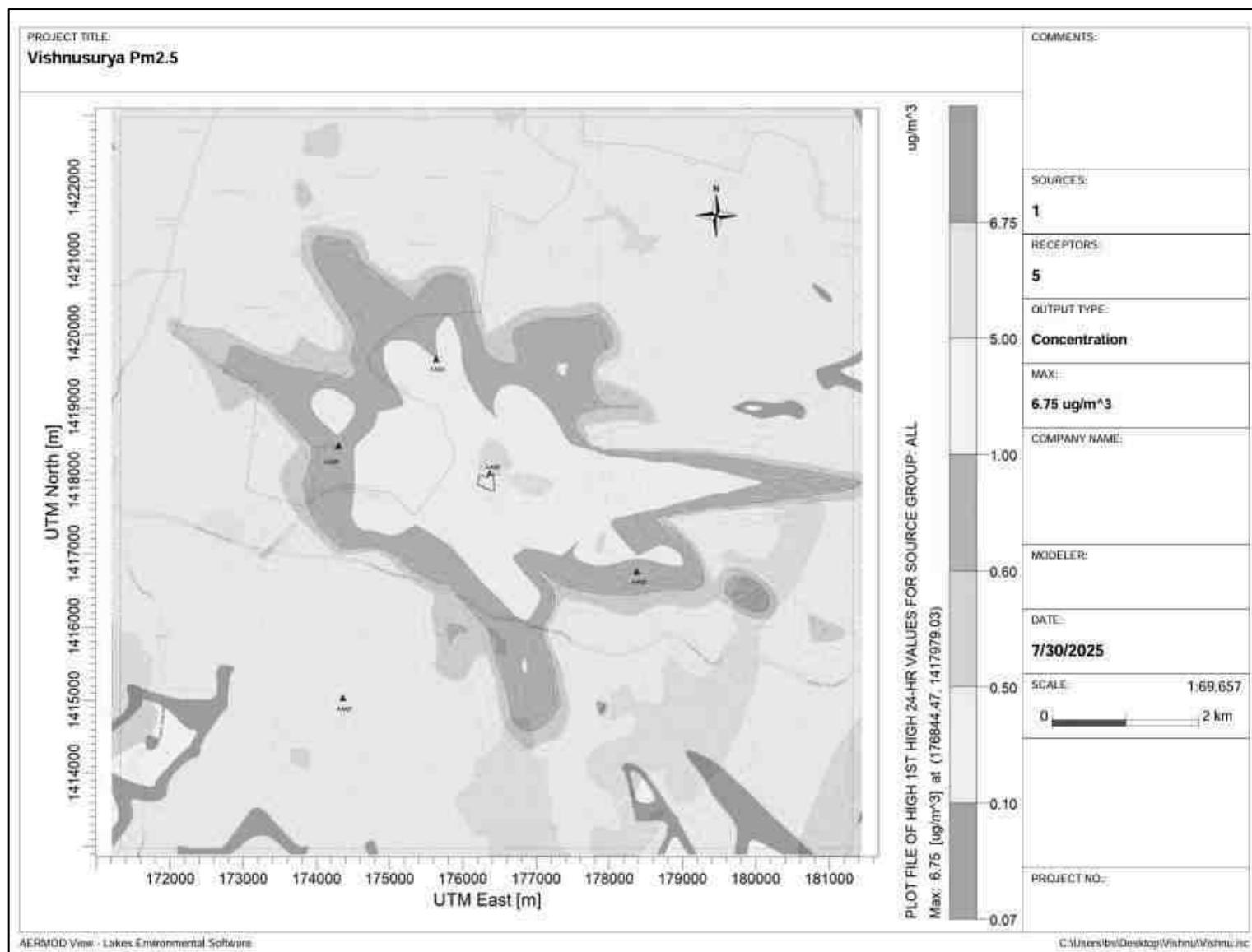


Figure 4.1 Predicted Incremental Concentration of PM_{2.5}

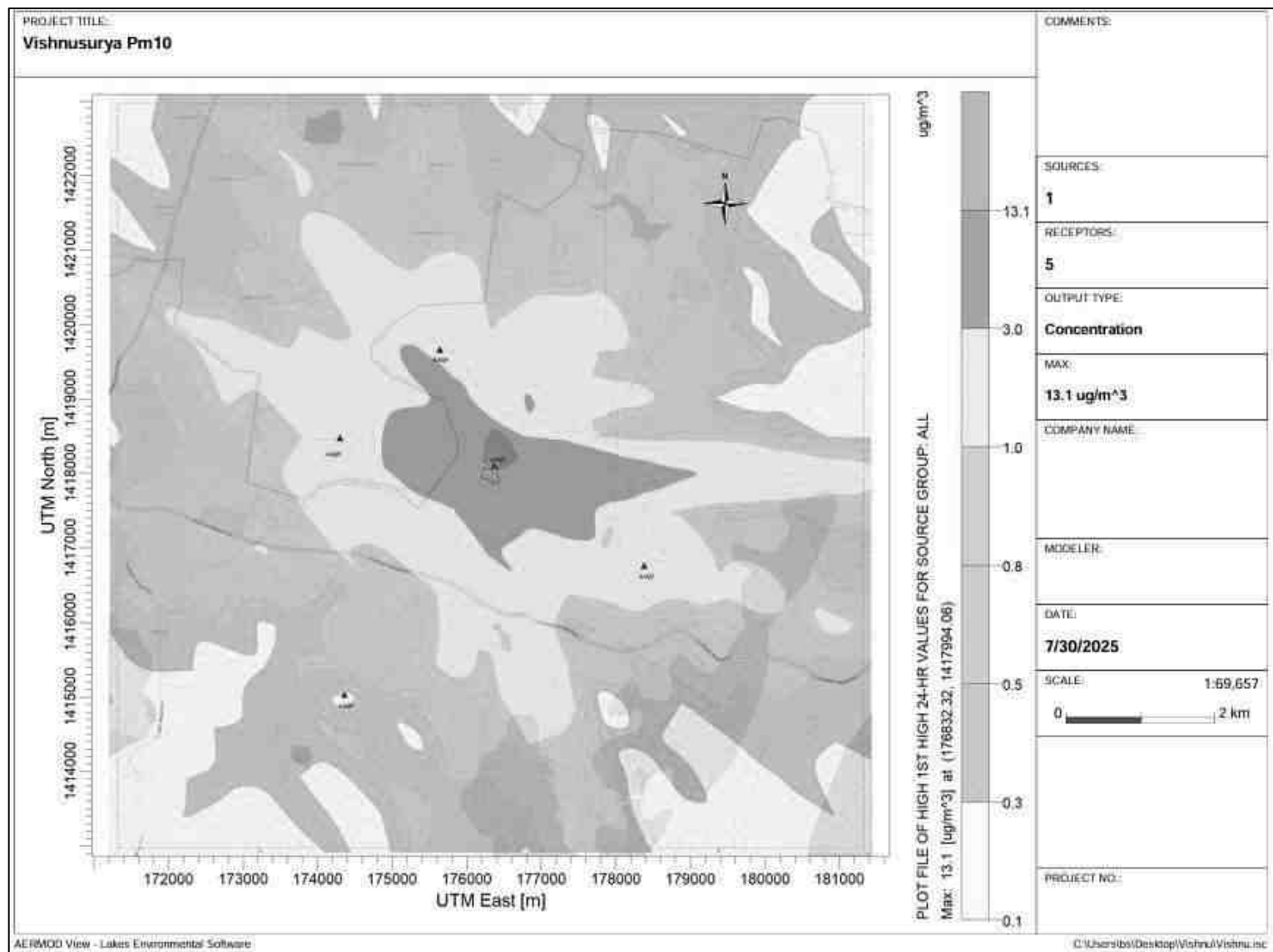


Figure 4.2 Predicted Incremental Concentration of PM₁₀

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.

Haul Road and Transportation

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

Green Belt

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

Occupational Health

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

4.5 NOISE ENVIRONMENT

Noise 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.

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

Anticipated Impact

- ✚ Mining operations generate significant noise impacting both worker health and nearby communities.
- ✚ These impacts can range from annoyance and sleep disturbance to structural damage and hearing loss. Effective management of noise is crucial to mitigate these adverse effects.

Sources of Noise in Mining:

- ✚ **Drilling and Blasting:** Prolonged exposure to high-intensity noise from drilling and blasting can lead to hearing loss and other auditory problems
- ✚ **Heavy Machinery:** Excavators, haul trucks, and other equipment used in mining operations generate substantial noise.
- ✚ **Loading and Transportation:** The movement and handling of materials within the mine site contribute to noise pollution.

The attenuation due to several factors including ground reflection, atmosphere, wind speed, temperature, trees, and buildings as 35.5 dB (A), the barrier effect. Attenuation due to Green Belt has been taken to be 4.9 dB (A). The inputs required for the model are: source data,

receptor data, and attenuation factor. Source data has been computed taking into account of all the machinery and activities used in the mining process. Same has been listed in Table 4.5.

Table 4.5 Activity and Noise Level Produced by Machinery

S. No.	Machinery / activity	Impact on environment?	Noise produced in dB(A) at 50 ft from source*
1	Blasting	Yes	94
2	Jack hammer	Yes	88
3	Compressor	No	81
4	Excavator	No	85
5	Tipper	No	84
Total			95.8

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

Table 4.6 Predicted Noise Incremental Values

Noise Monitoring Location	Distance From Project Site(m)	Baseline Noise Level (dBA)m During Day Time	Predicted Noise Level (dBA)	Total (dBA)
Core	100	58.4	44.0	58.6
Kariyasandiram	380	48.2	32.4	48.3
Muduguriki	1440	47.8	20.8	47.8
Suggondahalli	2060	48.5	17.7	48.5
B.Gollapalli	1730	46.3	19.2	46.3
NAAQ Standards	Industrial Day Time -75 dB (A) & Night Time- 70 dB (A) Residential Day Time -55 dB (A) & Night Time- 45 dB (A)			

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

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

4.5.1 Ground Vibrations

Anticipated Impact

- 🏠 Mining operations generate significant noise and vibration impacting both worker health and nearby communities.
- 🏠 These impacts can range from annoyance and sleep disturbance to structural damage and hearing loss. Effective management of noise and vibration is crucial to mitigate these adverse effects.

Sources of Noise and Vibration in Mining:

- 🏠 ***Drilling and Blasting:*** A primary source of both noise and ground vibrations, with the intensity dependent on the amount of explosives, atmospheric conditions and proximity to the blast.
- 🏠 **Heavy Machinery:** Excavators, haul trucks, and other equipment used in mining operations generate substantial noise.
- 🏠 **Loading and Transportation:** The movement and handling of materials within the mine site contribute to noise pollution.

The major source of ground vibration from the quarry is blasting. The major impact of the ground vibrations is observed on the domestic houses located in the villages nearby the mine lease area. The kutcha houses are more prone to cracks and damage due to the vibrations induced by blasting whereas RCC framed structures can withstand more ground vibrations. Apart from this, the ground vibrations may develop a fear factor in the nearby settlements.

Another impact due to blasting activities is fly rocks. These may fall on the houses or agricultural fields nearby the mining lease area and may cause injury to persons or damage to the structures. The ground vibrations due to the blasting in the quarry are calculated using the empirical equation. The empirical equation for assessment of peak particle velocity (PPV) is given below:

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

Where,

V = peak particle velocity (mm/s), K = site and rock factor constant (500)

Q = maximum instantaneous charge (kg)

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

R = distance from charge (m)

Table 4.7 Predicted PPV Values due to Blasting

Location ID	Maximum Charge in kgs	Nearest Habitation in m	PPV in mm/s	Fly rock distance in m	Air Blast	
					Pressure (kPa)	Sound Level (dB)
P1	28.39	380	0.542	19	0.15	137

Table 4.8 Predicted PPV Values due to Blasting at 100-500m 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	28.39	100	4.587	19	0.73	151
		200	1.513		0.32	144
		300	0.791		0.19	140
		400	0.499		0.14	137
		500	0.349		0.11	134

The PPV results shows that the ground vibration is well below the permissible limits set by DGMS through circular 71,997 for domestic houses near by the lease area at the dominant frequency of <8 Hz

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
- ❖ Vibration monitoring will be carried out every 6 months to check the efficacy of blasting practices.

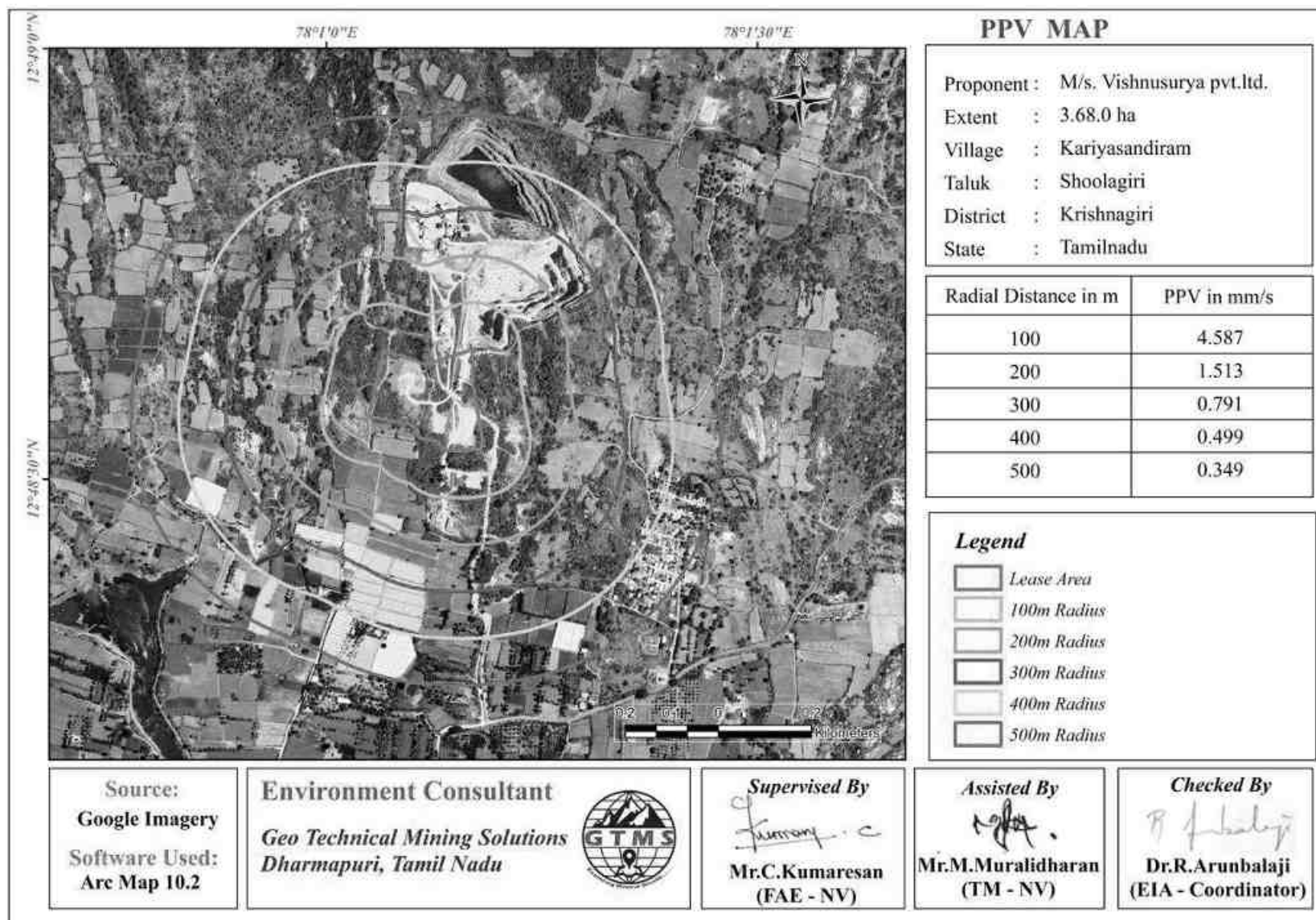


Figure 4.3 100-500m PPV Map

4.6 ECOLOGY AND BIODIVERSITY

4.6.1 Impact on Ecology and Biodiversity

- ❖ During loading the truck, dust generation will be likely. This shall be a temporary effect and not anticipated to affect the surrounding vegetation significantly
- ❖ The Number of plants in the mining lease area is given in Chapter III Table 3.21 which vegetation in the lease area may be affected during mining.
- ❖ Carbon released from quarrying machineries and tippers during quarrying would be 718kg per day, 194005kg per year and 970026kg over ten years, as provided in Table 4.9.

Table 4.9 Carbon Released During Ten Years of Rough Stone and Gravel Production

	Per day	Per year	Per ten years
Fuel consumption of excavator	3	9065	45326
Fuel consumption of tipper	718	194005	970026
Total fuel consumption in Liters	721	203070	1015352
CO ₂ emission in kg	1933	544228	2721143
Fuel consumption of compressor	28.4	7668	76680

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.
- ❖ None of the plants in the lease area will be cut during operational phase of the mine. we recommend uprooting and planting of the 10 trees along the 7.5 m safety zone to prevent environmental pollution during quarrying. As the survival rate due to uprooting was only 30%, 100 seedlings will be procured at the rate of 10 seedlings per tree and planted in 7.5 m safety zone.
- ❖ Existing roads will be used; new roads will not be constructed to reduce impact on flora.
- ❖ To mitigate carbon emission due to mining activities, we recommend planting trees around the quarry to offset the carbon emission during quarrying. A tree can sequester 19911kg of carbon per year. Therefore, we recommend 500 planting large number of trees around the quarry and near school campuses, government wasteland, roadsides etc.
- ❖ As per the greenbelt development plan as recommended by SEAC (Table 4.11), about 1840 trees (Table 4.12) will be planted within three months from the beginning of

mining. These trees, when grown up would sequester carbon of about 220579kg of the total carbon, as provided in Table 4.10.

Table 4.10 CO₂ Sequestration

CO ₂ sequestration in kg	163	44116	220579
Remaining CO ₂ not sequestered in kg	1770	500112	2500564
Trees required for environmental compensation	19911		
Area required for environmental compensation in hectares	40		

Table 4.11 Recommended Species for Greenbelt Development Plan

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

Table 4.12 Greenbelt Development Plan

	No. of trees proposed for plantation	No. of trees expected to survive @ 80%	Area to be covered(m2)
Plantation in the construction phase (3 months)	Number of plants inside the mine lease area		
	736	589	6624
	Number of plants outside the mine lease area		
	1104	883	9936
Total	1840	1472	16560

4.6.3. *Anticipated Impact on Fauna*

- ❖ Direct impact is anticipated on fauna of core zone
- ❖ Insignificant impact is anticipated on fauna in the buffer area due to air emissions, noise, vibration, transportation, waste water discharges, and changes in land use
- ❖ Berigai R.F. located on 280m north west of the mine lease area. There is a possibility that birds will be affected by mining activities and migrate.

4.6.4. *Mitigation Measures on Fauna*

- ❖ Fencing will be constructed around the proposed mine lease area to restrict the entry of stray animals
- ❖ The workers shall be trained not to harm any wildlife near the project site
- ❖ The quarry operation using in NONAL blasting Method Technic so controlled in sound and vibration.
- ❖ The awareness in employs

4.6.4. *Aquatic Biodiversity*

- ❖ There is no aquatic vegetation around 1km of the mine lease area.

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

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

4.6.6 *Mitigation Measures on agriculture and horticulture crops.*

- ❖ The main objective of the green belt is to provide a barrier between the source of pollution and the surrounding areas. In order to compensate the loss of vegetation cover, it is suggested to carry out afforestation program mainly inside and outside of the lease area in different phases.
- ❖ Quarry approach roads are sprayed with water 3 times a day to control dust. Thus, the damage to the nearby farmlands is controlled.

- ❖ A green belt will be created in 7.5m & 10m safety zone around the quarry to contain the dust from the quarry and prevent the dust from spreading to the adjacent agricultural land.
- ❖ Transportation of material will be carried out during day time and material will be covered with tarpaulin
- ❖ The speed of tippers plying on the haul road will be limited to < 20 km/hr to avoid generation of dust.

4.7 SOCIO ECONOMIC ENVIRONMENT

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.

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 85dB(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 85dB(A), the peak sound levels reach 140dB(C), or the average maximum sound level reaches 110dB(A)
- ❖ Ear muffs provided will be capable of reducing sound levels at the ear to at least 85dB(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, spirometry tests, periodic medical examination – yearly, lung function test – yearly, those who are exposed to dust, and eye test Essential medicines will be provided at the site. The medicines and other test

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

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:

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.,

Chemical Stability

The solid wastes on the mine site should be chemically stable. This means that the consequences of chemical changes or conditions leading to leaching of metals, salts or organic

compounds should not endanger public health and safety nor result in the deterioration of environmental attributes. If the pollutant discharges likely to cause adverse impacts is predicted in advance, appropriate mitigation measures like settling of suspended solids or passive treatment to improve water quality as well as quantity, etc., could be planned. Monitoring should demonstrate that there is no adverse effect of pollutant concentrations exceeding the statutory limits for the water, soil and air qualities in the area around the closed mine.

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.

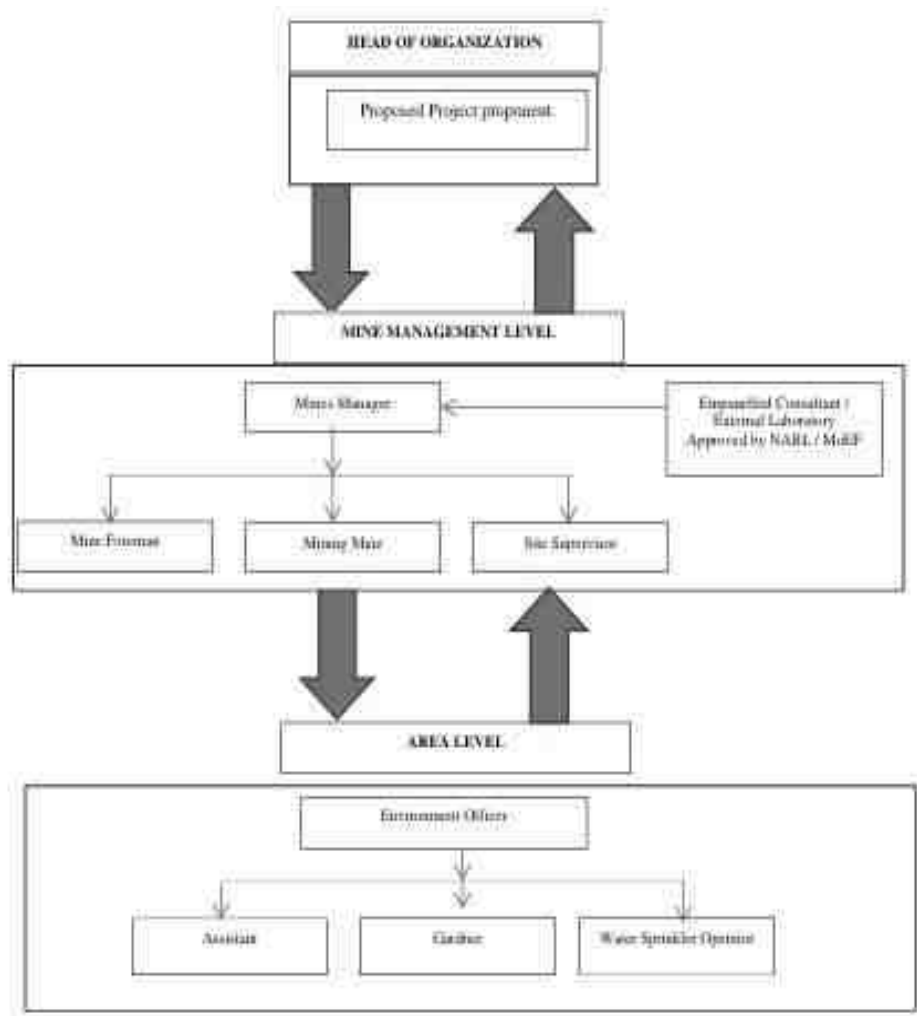


Figure 6.1 Proposed environmental monitoring chart

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:

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

7.1 PUBLIC CONSULTATION FOR PROPOSED PROJECT

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

7.2 RISK ASSESSMENT FOR PROPOSED PROJECT

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

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

Table 7.1 Risk Assessment & Control Measures for Proposed Project

S. No.	Risk factors	Causes of risk	Control measures
1	Accidents due to explosives and heavy mining machineries.	Improper handling and unsafe working practice	✓ All safety precautions and provisions of Mine Act, 1952, Metalliferous Mines Regulation, 1961 and Mines Rules, 1955 will be strictly followed during all mining operations. ✓ 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;	✓ 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,

		Drill Rod may break;	✓ Drilling shall not be carried on simultaneously on the benches at places directly one above the other. ✓ 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	Blasting	Fly rock, ground vibration, Noise and dust. Improper charging, stemming & Blasting/ fining of blast holes Vibration due to movement of vehicles	✓ The maximum charge per delay and by optimum blast hole pattern, vibrations will be controlled within the permissible limit and blast can be conducted safely. ✓ SOP for Charging, Stemming & Blasting/Firing of Blast Holes will be followed by blasting crew during initial stage of operation ✓ Shots are fired during daytime only. ✓ All holes charged on any one day shall be fired on the same day. ✓ The danger zone is and will be distinctly demarcated (by means of red flags)
4	Transportation	Potential hazards and unsafe workings contributing to accident and injuries Overloading of material	✓ 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.

		While reversal & overtaking of vehicle Operator of truck leaving his cabin when it is loaded.	✓ 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
5	Natural calamities	Unexpected happenings	✓ Escape Routes will be provided to prevent inundation of storm water ✓ Fire Extinguishers & Sand buckets
6	Failure of Mine Benches and Pit Slope	Slope geometry, Geological structure	✓ Ultimate or over all pit slope shall be below 60° and each bench height shall be 5m.

Source: Analysed and proposed by FAE & EC

7.3 DISASTER MANAGEMENT PLAN FOR PROPOSED PROJECT

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

- ❖ Rescue and medical treatment of casualties;
- ❖ Safeguard other people;
- ❖ Minimize damage to property and the environment;
- ❖ Initially contain and ultimately bring the incident under control;
- ❖ Secure the safe rehabilitation of affected area; and
- ❖ Preserve relevant records and equipment for the subsequent inquiry into the cause and circumstances of the emergency.
- ❖ In case a disaster takes place, despite preventive actions, disaster management will have to be done in line with the descriptions below. There is an organization proposed for dealing with the emergency situations. Structure of the team has been shown in Figure 7.1.

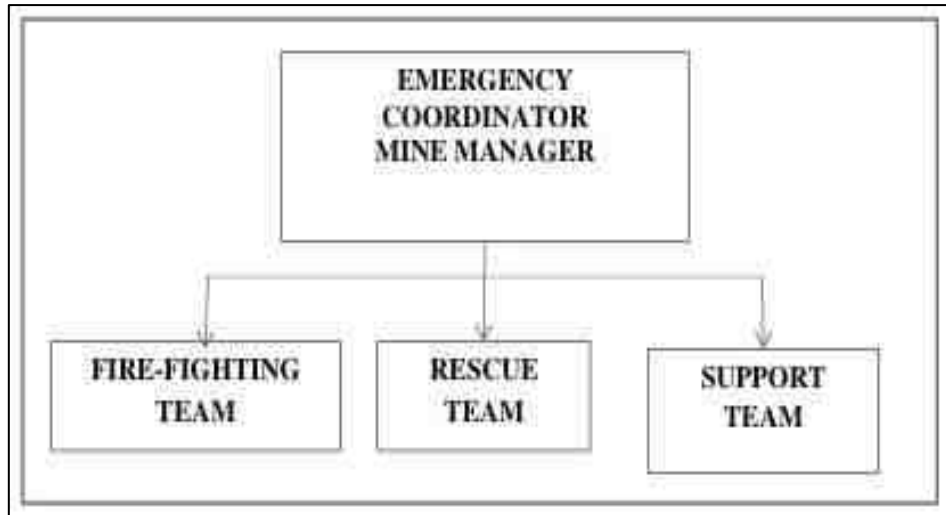


Figure 7.1 Disaster management team layout for proposed project

7.3.1 Emergency Control Procedure

The onset of emergency, will in all probability, commence with a major fire or explosion or collapse of wall along excavation and shall be detected by various safety devices and also by members of operational staff on duty. If located by a staff member on duty, he (as per site emergency procedure of which he is adequately briefed) will go to nearest alarm call point, break glass and trigger off the alarms. He will also try his best to inform about location and nature of accident to the emergency control room. In accordance with work emergency procedure the following key activities will immediately take place to interpret and take control of emergency.

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

7.4 CUMULATIVE IMPACT STUDY

The Cumulative Impact is mainly anticipated due to drilling & blasting and excavation and transportation activities in all the projects within the cluster and major impact anticipated is on Air & Noise Environment and Ground Vibrations due to blasting. For this cumulative

study, the proposed project, known as P1, E1 are taken into consideration. The details of P1 & E1 have been given in Table 7.2 & 7.3.

Table 7.2 Salient Features of P1

Name of the Quarry	M/s.Vishnusurya Projects and Infra Hosur Pvt Ltd	
Type of Land	Patta Land	
Extent	3.68.0ha	
S.F. No	3/2C(P),4/2(P),4/5(P),4/6(P),4/7 & 4/8 (P)	
Toposheet No	57 L/01	
Highest Elevation	885m AMSL	
Latitude	12°48'31.93"N to 12°48'39.02"N	
Longitude	78°1'2.96"E to 78°1'10.87"E	
Proposed depth as per ToR for ten years	60m BGL	
Ultimate depth for ten years	60m BGL	
Geological Resources	Rough stone (m ³) & Tons	Gravel (m ³) & Tons
	2024440 & 5567210	165636 & 331272
Mineable Reserves	Rough stone (m ³) & Tons	Gravel (m ³) & Tons
	796565 & 2190554	140594 & 281188
Proposed production for 10 years	Rough stone (m ³) & Tons	Gravel (m ³) & Tons
	796565 & 2190554	140594 & 281188
Method of Mining	Open cast mechanized mining method	
Topography	Flat Terrain	
Machinery proposed	Jack hammer	4
	Excavator	2
	Compressor	2
	Tipper	12
Proposed Manpower Deployment	29	
Project Cost	Rs.1,56,49,280/-	
Proposed Water Requirement	4.0 KLD	

Table 7.3 Salient Features of the Cluster E1

Name of the Quarry	M/s.Gunin Infrastructure LLP	
Type of Land	Patta Land	
Extent	4.48.5 ha	
S.F.No	4/3, 4/4 & 6(P)	
Toposheet No	57 L/01	
Location of Project Site	12°48'47.2770"N to 12°48'39.1537"N 78°01'17.2051"E to 78°01'12.5059"E	
Highest Elevation	883m AMSL	
Ultimate depth of Mining	71 m BGL	
Geological Resources	Rough Stone in m ³ & Tons	
	2691304 & 7401086	

Mineable Reserves	Rough Stone in m ³ & Tons	
	986314 & 2712364	
Proposed reserves for five years	Rough Stone in m ³ & Tons	
	986314 & 2712364	
Method of Mining	Open-Cast Mechanized mining	
Topography	Elevated Topography	
Machinery proposed	Jack Hammer	7
	Compressor	1
	Tipper	4
	Excavator	1
Proposed Manpower Deployment	23 Nos	
Project Cost	Rs.1,36,70,000/-	
Proposed Water Requirement	3.5 KLD	

7.4.1 Air Environment

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

Table 7.4 Cumulative Production Load of Rough Stone

Proposed Production Details				
Quarry	10 Years in (m ³ & Ts)	Per Year in (m ³ & Ts)	Per Day in (m ³ & Ts)	Number of Lorry Load Per Day
P1	796565 & 2190554	79656 & 219054	295 & 811	49
E1	986314 & 2712364	197263 & 542473	730 & 2009	121
Grand Total	1782879 & 4902917	276919 & 761527	1025 & 2820	170

Table 7.5 Cumulative Production Load of Gravel

Proposed Production Details				
Quarry	3 Years in (m ³ & Ts)	Per Year in (m ³ & Ts)	Per Day in (m ³ & Ts)	Number of Lorry Load Per Day
P1	140594 & 281188	46865 & 93729	174 & 348	29
E1	--	--	--	--
Grand Total	140594 & 281188	46865 & 93729	174 & 348	29

The cumulative study shows that the overall production of rough stone from the quarry is 1025 m³ or 2820 Ts per day with a capacity of 170 trips of rough stone per day and gravel from the quarry is 174m³ or 348 Ts per day with a capacity of 29 trips of gravel per day.

7.4.1.1 Cumulative Impact of Air Pollutants

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

Table 7.6 Cumulative Impact Results from the proposed project

Pollutants	Baseline Data ($\mu\text{g}/\text{m}^3$)	Incremental Values ($\mu\text{g}/\text{m}^3$)	Cumulative Value ($\mu\text{g}/\text{m}^3$)
		P1	
PM _{2.5}	18.9	6.75	25.65
PM ₁₀	44.2	13.1	57.3

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.7.7 Cumulative Impact of Noise for one Cluster Projects

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	380	SE	48.2	32.4	48.3	55
Habitation Near E1	590	SE	48.2	28.5	48.2	
Cumulative Noise (dB (A))					48.2	

Source: Lab Monitoring Data

The cumulative analysis of noise due to cluster project shows that habitation will receive about 48.2dB(A) respectively. The cumulative results for all the villages in consideration do not exceed the limit set by CPCB for residential areas for day time.

Ground Vibrations

Cumulative results of ground vibrations due to mining activities from the cluster project have been shown in Table 7.8.

Table 7.8 Cumulative Effect of Ground Vibrations Resulting from cluster Project

Location ID	Maximum Charge in kgs	Nearest Habitation in m	PPV in mm/s
P1	28.39	380	0.542
E1	52.00	590	0.435
Total			0.977

Results from the above 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 proposed project were calculated and the results have been shown in Table 7.9 the project together will contribute Rs. 10,00,000/-towards CER fund.

Table 7.9 Socio Economic Benefits from the Cluster Project

Location ID	Project Cost	CER Cost
P1	Rs.1,56,49,280/-	Rs. 5,00,000
E1	Rs.1,36,70,000/-	Rs. 5,00,000
Grand Total	Rs. 2,93,19,280/-	Rs. 10,00,000

Table 7.10 Employment Benefits for Cluster Project

Location ID	Employment
P1	29
E1	23
Grand Total	52

A total of 52 people will get employment from the cluster project.

7.4.4 Ecological Environment

Table 7.11 Greenbelt Development Benefits from the Cluster Project

Code	Number of Trees proposed	Area to be covered (m ²)	No. of Trees expected to be grown @ 80% survival rate	Species recommended
P1	1840	16560	1472	<i>Azadirachta indica</i> , <i>Albizia lebbeck</i> , <i>Delonix regia</i> , <i>Tectona grandis</i> , etc.,
E1	2243	20183	1794	
Total	4083	36743	3266	

Cumulative studies show that the proposed project will plant about 4083 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., 3266 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 7.12.

Table 7.12 Action Plan to Manage Plastic Waste

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

Source: Proposed by FAEs and EC

CHAPTER VIII

PROJECT BENEFITS

8.0 GENERAL

The proposed project at Kariyasandiram Village, aims to produce 796565m³ or 2190554 Ts of rough stone and 140594m³ or 281188 Ts of gravel over a period of 10 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 29 persons for carrying out mining operations and give preference to the local people in providing employment in this cluster. In addition, there will be an opportunity for indirect employment to the form of contractual jobs, business opportunities, and service facilities etc. Because of this, the economic status of the local people will improve.

8.2 SOCIO-ECONOMIC WELFARE MEASURES PROPOSED

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

8.3 IMPROVEMENT IN PHYSICAL INFRASTRUCTURE

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

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

8.4 IMPROVEMENT IN SOCIAL INFRASTRUCTURE

Employment is expected during civil construction period, in trade, garbage lifting, sanitation and other ancillary services, Employment in these sectors will be primarily

temporary or contractual and involvement of unskilled labour will be more. A major part of the labour force will be mainly from local villagers who are expected to engage themselves both in agriculture and mining activities. This will enhance their income and lead to overall economic growth of the area.

8.5 OTHER TANGIBLE BENEFITS

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

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

8.6 CORPORATE SOCIAL RESPONSIBILITY

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

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

- ❖ Health Services Social Development
- ❖ Infrastructure Development
- ❖ Education & Sports
- ❖ Self-Employment
- ❖ CSR Cost Estimation
- ❖ CSR activities mainly contributing to education, health, training of women self-help groups and infrastructure etc., will be taken up in the Kariyasandiram Village. CSR budget is allocated.

8.7 CORPORATE ENVIRONMENT RESPONSIBILITY

Allocation for Corporate Environment Responsibility (CER) shall be made as per Government of India, MoEF & CC Office Memorandum F.No.22-65/2017-IA.III dated 01.05.2018. As per para 6 (II) of the office memorandum, being a green field project & capital investment is ≤ 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. 9,54,76,936** 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.90/m ³ of rough stone / Rs.56/m ³ of gravel	7,16,90,850	78,73,264
District Mineral Foundation Tax @ 10% of Seigniorage	71,69,085	7,87,326
Green Tax @ 10% of Seigniorage	71,69,085	7,87,326
Total	8,60,29,020	94,47,916

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 M/s.Vishnusurya Projects and Infra Hosur Private Limited 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 Budgetary Provision for Environmental Management

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

Table 10.1 EMP Budget for Proposed Project

Attribute	Mitigation measures	Provision for Implementation	Capital Cost	Recurring Cost/annum
			(Rs.)	(Rs.)
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	36800	36800
	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. 2,500 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. 5,000/- per tipper/dumper deployed	60000	0
	Regular monitoring of exhaust fumes as per RTO norms	Monitoring of Exhaust Fumes	0	15000
	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	73600
	Installing wheel wash system near exit gate of quarry	Installation + Maintenance + Supervision	50000	20000
	Total Air Environment		1046800	275400
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	2230382
Total Noise Environment			50000	2232382
Water Environment	Water Management	Provision for garland drain @ Rs. 10,000/- per hectare with maintenance of Rs. 5,000/- per annum	36800	18400
Total Water Environment			36800	18400
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
Total Waste Management			30000	22000
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
Total Implementation of EC, Mining Plan			10000	1000
Occupational Health and Safety	Workers will be provided with Personal Protective Equipment	Provision of PPE @ Rs. 4,000/- per employee with recurring based on wear and tear (say, @ Rs. 1,000/- per employee)	116000	29000
	Health checkup for workers will be provisioned	IME & PME Health checkup @ Rs. 1,000/- per employee	0	29000
	First aid facility will be provided	Provision of 2 Kits per Hectare @ Rs. 2,000/-	0	14720
	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	736000	36800
	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	184000	36800

	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 (1st Class / 2nd Class / Mine Foreman) under regulation 34 / 34 (6) of MMR, 1961 and Mining Mate under regulation 116 of MMR,1961 @ 40,000/- for Manager & @ 25,000/- for Foreman / Mate	0	780000
Total Occupational Health and Safety			1076000	933320
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))"	147200	22080
		Avenue Plantation @ 300 per plant (capital) for plantation outside the lease area and @ 30 per plant maintenance (recurring)	331200	33120
Total Development of Green Belt			478400	55200
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)		125120	0
	G.O.(Ms)No.23, Dated: 28.09.2021	Section IVA of TNMMCR 1959 (@10% of Seigniorage	7956411	0

		Fee) (Seigniorage Fee for Rough stone = Rs.90)		
TOTAL			10684411	3537702

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

Ist Year	IInd Year	IIIrd Year	IVth Year	Vth Year	VIth Year	VIIth Year
3537702	3714587	3900316	4095332	4300099	4515104	4740859

VIIIth Year	IXth Year	Xth Year	Total Recurring Cost	Total EMP Cost
4977902	5226797	5488137	44496835	55181246

In order to implement the environmental protection measures, an amount of **Rs. 10684411** as capital cost and recurring cost as **Rs. 3537702** 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 10 years will be **Rs. 55181246** as shown in Table 10.2.

10.3 CONCLUSION

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

CHAPTER XI

SUMMARY AND CONCLUSION

11.1 INTRODUCTION

As the proposed rough stone mining project (P1) falls within the quarry cluster of 500 m radius with the total extent of 8.16.5ha, it requires submission of EIA report for grant of Environmental Clearance (EC) after conducting public hearing. The proposed project falling in S.F.No. 3/2C(P),4/2(P),4/5(P),4/6(P),4/7 & 4/8(P) over the extent of 3.68.0 ha is situated in the cluster falling in Kariyasandiram Village, Shoolagiri Taluk, Krishnagiri District and Tamil Nadu. The quarries involved in the calculation of cluster extent are one proposed quarry, two existing quarries.

11.2 PROJECT DESCRIPTION

The proposed project area is located between Latitudes from 12°48'31.93"N to 12°48'39.02"N and Longitudes from 78°1'2.96"E to 78°1'10.87"E in Kariyasandiram Village, Shoolagiri Taluk, Krishnagiri District and Tamil Nadu. According to the approved mining plan, about 796565m³ & 2190554 Ts of rough stone and 140594 m³ & 281188 Ts of gravel will be mined up to the ultimate depth of 60m BGL in the ten years. The quarrying operation is proposed to be carried out by opencast semi mechanized mining method involving drilling, blasting, and formation of benches of the prescribed dimensions.

11.3 DESCRIPTION OF THE ENVIRONMENT

Baseline data were collected to evaluate the existing environmental condition in the core and buffer areas during March 2025 to May 2025 as per CPCB guidelines. The data were collected by both the FAEs and NABL accredited and MoEF notified **Accuracy Analabs (OPC) Private Limited** for the environmental attributes including soil, water, noise, air and by FAEs for ecology and biodiversity, traffic, and socio-economy.

11.3.1 Land Environment

Land use pattern of the area of 5 km radius was studied using Sentinel II imagery. LULC types and their extent are given in Table 1.

Table.1 LULC Statistics of the Study Area

S. No.	Classification	Area (ha)	Area (%)
1	Water	49.48	0.57
2	Trees	19.55	0.22
3	Flooded Vegetation	0.20	0.00
4	Crops	5672.83	64.96
5	Built Area	845.64	9.68
6	Mining area	28.66	0.33
7	Bare Ground	0.30	0.00
8	Rangeland	2116.67	24.24
Total		8733.33	100.0

Source: Sentinel II Satellite Imagery

11.3.2 Soil Environment

Physical Characteristics

- **Texture:** In lease area the soil is sand, Silt & Clay. They are mostly sandy & silt characterised by the hard and compact layer of lime. In other places the soil found is brown in colour.
- **Structure:** The grain size is greater than 2mm in the lease area and in other places where the samples collected ranges from 0.002mm to 2mm.
- **Porosity:** The porosity of the soils is significantly impacted by the degree of weathering and fracture development in the underlying bedrock. The 500m radius cluster consists of Charnockite formations affect the porosity found in this study.
- **Consistence:** Coarse (sandy) soils may require slightly higher moisture content while fine (clay) soils may require slightly lower. A soil moisture content between 8.98% to 9.26% is generally considered optimal for plant growth in medium- textured soils (like loams). This range falls within the 45- 65% available water zone where plants are at risk of stress if a water deficit is prolonged.

Chemical Characteristics of Soil

- Chemical characteristics of soils through selected parameters viz. pH, soluble cations and anions, exchangeable cations, organic content and fertility status in the form of NPK values and organic matter are presented in Table 3.5. pH is an important parameter indicative of alkaline or acidic nature of soil. It greatly affects the microbial population as well as solubility of metal ions and regulates nutrient availability. Variation in the pH of the soil in the study area is presented in Table 3.5 and it is found to be from slightly acidic to neutral (7.21- 7.98) in reaction. Electrical conductivity a measure of soluble salts in the soil is in the range of 0.26 – 0.32dS/m as shown in Table 3.5.
- The important water-soluble cations in the soil are nitrogen, phosphorus, potassium, calcium and magnesium whose concentration levels ranged from N- 36mg/kg⁻¹ to 46mg/kg⁻¹, P- 12mg/kg⁻¹ to 18mg/kg⁻¹, K- 62mg/kg⁻¹ to 76mg/kg⁻¹, Cu- 0.6mg/Kg- 1.3mg/Kg & Mg- 4.1mg/kg⁻¹ – 5.0mg/kg⁻¹ respectively.
- The soil samples in the study area show loamy textures varying between Silt and sandy loam. pH of the soil varies from 7.21- 7.98 indicating slightly acidic to slightly alkaline nature. Electrical conductivity of the soil varies from 0.26 – 0.32dS/m.

11.3.3 Water Environment

Muduguriki lake is the prominent surface water resources present in the study area. This lake was ephemeral in nature which convey water only after rainfall events. The surface water sample known as SW1 were collected from the Muduguriki lake (0.71km SW) to assess the baseline water quality as shown in Table 3.8 and Figure 3.10.

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

11.3.4 Air Environment

As per the monitoring data, PM_{2.5} ranges from 17.5µg/m³ to 20.5µg/m³, PM₁₀ from 42.4µg/m³ to 46.4µg/m³, SO₂ from 4.1µg/m³ to 6.1µg/m³, NO_x from 13.7µg/m³ to 21.1g/m³. The concentration levels of the pollutants fall within the acceptable limits of NAAQS prescribed by CPCB.

Air quality Index (AQI)

The AQI shows that the air quality of the study area falls within good category 44 causing minimal impact to human health.

11.3.5 Noise Environment

Noise level in core zone was 58.4dB (A) Leq during day time and 37.6dB(A) Leq during night time. Noise levels recorded in buffer zone during day time varied from 48.5 to 46.3dB (A) Leq and during night time from 40.2 to 38.5dB (A) Leq. Thus, the noise level for industrial and residential area meets the requirements of CPCB.

11.3.6 Biological Environment

The study found that there is no endemic, endangered migratory fauna found in the area. This area is not also a migratory path of any faunal species. Hence, this small mining operation over short period of time will not have any significant impact on the surrounding flora and fauna.

Flora in mine lease area (core zone)

The core zone presents in tree, shrubs, herbs and grasses. Taxonomically total of 17 species belonging to 13 families were recorded. Amongthem are trees 3, herbs, climabers & Grass 8, Shrubs 6. Majority of the species belongs to the family of Fabaceae and Poaceae. The species richness (Margalef index) and plant details are given in Table 3.20-3.22. There are no endangered or threatened plant species in the quarry lease area.

Flora in 300 m radius buffer zone

The vegetation habit analysis indicates that the flora of the 300m radius of the study area consists of 43 species belonging to 25 families. Three species were recorded from the Amaranthaceae, Apocynaceae, and Asteraceae families, while two species each were recorded from the Arecaceae, Boraginaceae, Convolvulaceae, Cucurbitaceae, Euphorbiaceae, and Lamiaceae families. The endangered or threatened and Species Richness (margalef Index) in the study area it mentioned in Table 3.23 - 3.25 & Figures 3.29. There is no threat to the Flora Species in 300m radius.

Flora in 10 km radius buffer zone

Similar type of environment also in buffer area but with more flora diversity compare than core zone area, because of nearby agriculture land was found to be dominate in all the directions. Majority of the flat landscape around project unit is occupied by agriculture fields. It contains a total of 89 species belonging to 43 families have been recorded from the buffer zone. The floral (89) varieties among them Trees 37 (42%) Shrubs 13 (14%) and Herbs & Climbers & Creeper & Cactus 39 (44%).

Fauna in Core Zone

A total of 26 varieties of species were observed in the Core zone (Table.3.28). Among them are 8 Insects, 5 Reptiles, 4 Mammals and 9 Avian. A total of 26 species belonging to 20 families were recorded from the core area. The study shows that number of species decreases towards the mining area. This might be due the lack of vegetation. None of these species in the core zone are threatened or endemic. The survey was conducted to identify species listed in IUCN Red List. According to the field data, any species are not of Schedule I and nine species are of schedule IV. There are no critically endangered, endangered, vulnerable and endemic species were observed.

11.3.7 Socio Economic Environment

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

11.4 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

11.4.1 Land Environment

Anticipated Impact

- ✚ Change in land use and land cover and topography of the mine lease area
- ✚ Problems to human habitations due to dust and noise caused by movement of heavy vehicles
- ✚ Soil erosion and sediment deposition in the nearby water bodies during the rainy season
- ✚ Siltation of water course due to wash off from the exposed working area
- ✚ Deterioration of soil quality in the surrounding area due to runoff from the project area

- ✚ Decrease in the agricultural productivity of the surrounding land due to soil quality degradation

Mitigation Measures

- ✚ Construction of garland drains, settling pits, and check dams to prevent runoff and siltation
- ✚ Runoff water will be discharged into the settling tanks to reduce suspended sediment loads before runoff is discharged from the quarry site
- ✚ The vegetation will be retained at the site wherever possible
- ✚ Weekly monitoring and daily maintenance of erosion control systems so that they perform as specified specially during rainy season

11.4.2 Water Environment

Anticipated Impact

- ✚ Surface and ground water resources may be contaminated due to pit water discharge, domestic sewage, discharge of oil and grease bearing waste water from washing of vehicles and machineries, and washouts from surface exposure or working areas
- ✚ As the proposed project acquires 4.0 KLD of water from water vendors, it will not extract water by developing abstraction structures in the lease area. Therefore, the project will not have impact on depletion of aquifer beneath the lease area.

Mitigation Measures

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

11.4.3 AIR ENVIRONMENT

Anticipated Impact

- ✚ 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

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.

Haul Road and Transportation

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

Green Belt

- ✚ Planting of trees all along mine haul roads outside the lease and regular grading of haul roads will be practiced to prevent the generation of dust due to movement of tractors/tippers.

- ✚ Green belt of adequate width will be developed around the project site.

Occupational Health

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

11.4.4 Noise Environment

Anticipated Impact

- ✚ Mining operations generate significant noise impacting both worker health and nearby communities.
- ✚ These impacts can range from annoyance and sleep disturbance to structural damage and hearing loss. Effective management of noise is crucial to mitigate these adverse effects.

Sources of Noise in Mining:

- ✚ **Drilling and Blasting:** Prolonged exposure to high-intensity noise from drilling and blasting can lead to hearing loss and other auditory problems
- ✚ **Heavy Machinery:** Excavators, haul trucks, and other equipment used in mining operations generate substantial noise.
- ✚ **Loading and Transportation:** The movement and handling of materials within the mine site contribute to noise pollution.

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

Ground Vibrations

Anticipated Impact

- ✚ Mining operations generate significant noise and vibration impacting both worker health and nearby communities.
- ✚ These impacts can range from annoyance and sleep disturbance to structural damage and hearing loss. Effective management of noise and vibration is crucial to mitigate these adverse effects.

Sources of Noise and Vibration in Mining:

- ✚ ***Drilling and Blasting:*** A primary source of both noise and ground vibrations, with the intensity dependent on the amount of explosives, atmospheric conditions and proximity to the blast.
- ✚ **Heavy Machinery:** Excavators, haul trucks, and other equipment used in mining operations generate substantial noise.
- ✚ **Loading and Transportation:** The movement and handling of materials within the mine site contribute to noise pollution.

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
- ❖ Vibration monitoring will be carried out every 6 months to check the efficacy of blasting practices.

11.4.5 Biological Environment

Impact on Ecology and Biodiversity

- ✚ During loading the truck, dust generation will be likely. This shall be a temporary effect and not anticipated to affect the surrounding vegetation significantly
- ✚ The Number of plants in the mining lease area is given in chapter 3 table 3.21 which vegetation in the lease area may be removed during mining.
- ✚ Carbon released from quarrying machineries and tippers during quarrying would be 718kg per day, 194005kg per year and 970026kg over ten years.

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.

- ✚ None of the plants in the lease area will be cut during operational phase of the mine. we recommend uprooting and planting of the 10 trees along the 7.5 m safety zone to prevent environmental pollution during quarrying. As the survival rate due to uprooting was only 30%, 100 seedlings will be procured at the rate of 10 seedlings per tree and planted in 7.5 m safety zone.
- ✚ Existing roads will be used; new roads will not be constructed to reduce impact on flora.
- ✚ To mitigate carbon emission due to mining activities, we recommend planting trees around the quarry to offset the carbon emission during quarrying. A tree can sequester 11988kg of carbon per year. Therefore, we recommend 500 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 1,840 trees (Table 4.13) will be planted within three months from the beginning of mining. These trees, when grown up would sequester carbon of about 220579kg of the total carbon.

Anticipated Impact on Fauna

- ✚ Direct impact is anticipated on fauna of core zone
- ✚ Insignificant impact is anticipated on fauna in the buffer area due to air emissions, noise, vibration, transportation, waste water discharges, and changes in land use

Mitigation Measures on Flora

- ✚ Fencing will be constructed around the proposed mine lease area to restrict the entry of stray animals
- ✚ The workers shall be trained not to harm any wildlife near the project site

11.4.6 Socio Economic Environment

An essential part of environmental study is socio-economic environment incorporating various facts related to socio-economic conditions in the area, which deals with the total environment. Socio economic study 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 feature of aesthetic significance such as temples, historical monuments etc. at the baseline level. This would help in visualizing and predicting the possible impact depending upon the nature and magnitude of the project. Socio-economic study of an area provides a good opportunity to assess the socio -economic condition and possibly makes a change in living and social standards of the particular area benefitted due to the project.

11.4.7 Occupational Health

- ✚ All the persons will undergo pre-employment and periodic medical examination

- ✚ Employees will be monitored for occupational diseases by conducting medical tests: General physical tests, Audiometric tests, Full chest, X-ray, Lung function tests, Spiro metric tests, Periodic medical examination – yearly, Lung function test – yearly, those who are exposed to dust and Eye test
- ✚ Essential medicines will be provided at the site. The medicines and other test facilities will be provided at free of cost.
- ✚ The first aid box will be made available at the mine for immediate treatment. First aid training will be imparted to the selected employees regularly. The lists of first aid trained members shall be displayed at strategic places.

11.5 Environment Monitoring Program

S. No.	Environment Attributes	Location	Monitoring		Parameters
			Duration	Frequency	
1	Air Quality	2 Locations (1 Core & 1 Buffer)	24 hours	Once in 6 months	Fugitive Dust, PM _{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 (1 SW & 1 GW)	-	Once in 6 months	Parameters specified under IS:10500, 1993 & CPCB Norms
4	Hydrology	Water level in open wells in buffer zone around 1 km at specific wells	-	Once in 6 months	Depth in m BGL
5	Noise	2 Locations (1 Core & 1 Buffer)	Hourly – 1 Day	Once in 6 months	Leq, Lmax, Lmin, Leq Day & Leq Night
6	Vibration	At the nearest habitation (in case of reporting)	–	During blasting operation	Peak particle velocity
7	Soil	2 Locations (1 Core & 1 Buffer)	–	Once in six months	Physical and chemical characteristics
8	Greenbelt	Within the project area	Daily	Monthly	Maintenance

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

11.6 ADDITIONAL STUDIES

11.6.1 Risk Assessment

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

11.6.2 Disaster Management Plan

The objective of the disaster management plan is to make use of the combined resources of the mine and the outside services to:

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

11.6.3 Cumulative Impact Study

The results on the cumulative impact of the proposed project 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 the proposed project is well below the permissible limit of Peak Particle Velocity of 5 mm/s
- ✚ The cluster project will allocate Rs. 10,00,000/- towards CER as recommended by SEAC
- ✚ The cluster project will directly provide jobs to 52 local people, in addition to indirect jobs
- ✚ The cluster project will plant 4083 about trees in and around the lease area
- ✚ The cluster project will add 199PCU per day to the nearby roads.

11.7 Project Benefits

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

- ✚ Direct employment to 29 local people
- ✚ Creation of community assets (infrastructure) like school buildings, village roads/ linked roads, dispensary & health Centre, community Centre, market place etc.,
- ✚ Strengthening of existing community facilities through the Community Development Program
- ✚ Skill development & capacity building like vocational training.
- ✚ Rs. 5,00,000 will be allocated for CER

11.8 ENVIRONMENT MANAGEMENT PLAN

In order to implement the environmental protection measures, an amount of **Rs. 10684411** as capital cost and recurring cost as **Rs. 3537702** 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 10 years will be **Rs. 55181246**.

CHAPTER XII

DISCLOSURES OF CONSULTANT

The Project Proponent, **M/s.Vishnusurya Projects and Infra Hosur Private Limited** 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. R. Arunbalaji	EIA Coordinator (EC) In-house	1(a)(i)	AQ	B
2.	P.Vellaiyan	In-house, FAE	1(a)(i)	GEO	B
3.	G. Prithiviraj	In-house, FAE	1(a)(i)	LU	B
4.	Dr. S.Karuppannan	In-house, FAE	1(a)(i)	HG	B
5.	P.Venkatesh	In-house, FAE	1(a)(i)	AP	B
6.	R.Revathy	In-house, FAE	1(a)(i)	WP	B
7.	C.Kumaresan	In-house, FAE	1(a)(i)	NV	B
8.	J.Rajarajeshwari	In-house, FAE	1(a)(i)	SC, EB	B
9.	K. Udayakumar	In-house, FAE	1(a)(i)	SE	B
10.	J.N. Manikandan	Empanelled FAE	1(a)(i)	RH, SHW	B
Approved Functional Area Associates					
11.	R.Srikrishna	FAA	1(a)(i)	LU	B
12.	K.Prithivi	FAA	1(a)(i)	HG	B
13.	C.Raghul	FAA	1(a)(i)	Geo	B
14.	P.Dhatchayini	FAA	1(a)(i)	AQ	B
Team Members					

15.	G. Umamaheswaran	In-house, FAE	1(a)(i)	TM for EC	-
16.	M.Muralidharan	In-house, FAE	1(a)(i)	TM for FAE NV, HW	-

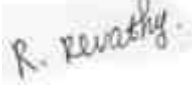
DECLARATION BY EXPERTS CONTRIBUTING TO THE EIA & EMP

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.R. Arun Balaji**
Designation : EIA Coordinator
Name of the EIA Consultant Organization : Geo Technical Mining Solutions
Period of Involvement : Till date

We, the FAEs, FAAs and TM hereby declare that information furnished in this EIA/EMP report for **M/s.Vishnusurya Projects and Infra Hosur Private Limited**, rough stone and gravel quarry project with the extent of 3.68.0ha situated in the cluster with the extent of 8.16.50ha in Kariyasandiram Village, Shoolagiri Taluk, Krishnagiri District, and Tamil Nadu is true and correct to the best of our knowledge.

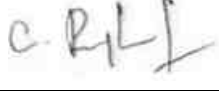
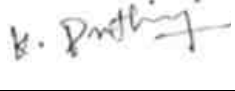
List of Functional Area Experts Engaged in this Project

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 - Prediction of air pollution and propose mitigation measures / control measures	P.Venkatesh	
2	WP	- Suggesting water treatment systems, drainage facilities - Evaluating probable impacts of effluent/waste water discharges into the receiving environment/water bodies and	R.Revathy	

		suggesting control measures.		
3	HG	○ Interpretation of ground water table and predict impact and propose mitigation measures. ○ Analysis and description of aquifer Characteristics	Dr. S.Karuppannan	
4	GEO	○ Field Survey for assessing the regional and local geology of the area. ○ Preparation of mineral and geological maps. ○ Geology and Geo morphological analysis/description and Stratigraphy/Lithology.	P.Vellaiyan	
5	SE	○ Revision in secondary data as per Census of India, 2011. ○ Impact Assessment & Preventive Management Plan ○ Corporate Environment Responsibility.	K. Udayakumar	
6	EB	○ 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.	J.Rajarajeshwari	
7	RH	○ Identification of hazards and hazardous substances ○ Risks and consequences analysis	J.N. Manikandan	

		○ Vulnerability assessment ○ Preparation of Emergency Preparedness Plan ○ Management plan for safety.		
8	LU	○ Construction of Land use Map ○ Impact of project on surrounding land use ○ Suggesting post closure sustainable land use and mitigative measures.	G. Prithiviraj	
9	NV	○ Identify impacts due to noise and vibrations ○ Suggesting appropriate mitigation measures for EMP.	C. Kumaresan	
10	AQ	○ Identifying different source of emissions and propose predictions of incremental GLC using AERMOD. ○ Recommending mitigations measures for EMP	Dr.R. Arun Balaji	
11	SC	○ Assessing the impact on soil environment and proposed mitigation measures for soil conservation	J.Rajarajeshwari	
12	SHW	○ 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	R.Srikrishna	LU	- Site visit with FAE - Provide inputs & Assisting FAE for LU	
2	C.Raghul	GEO	- Field visits along with FAE - Assistance to FAE in both primary and secondary data collection	
3	K.Prithivi	HG	- Site visit with FAE - Provide inputs & Assisting FAE for HG	
4	P. Dhatchayini	AQ	- Site visit with FAE - Assistance to FAE in collection of both primary and secondary data	

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 **M/s.Vishnusurya Projects and Infra Hosur Private Limited**, rough stone and gravel quarry project with the extent of 3.68.0ha situated in the cluster with the extent of 8.16.50ha in Kariyasandiram Village, Shoolagiri Taluk, Krishnagiri District, and Tamil Nadu is true and correct to the best of our 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/23-26/RA 0319

Validity : Till 31.12.2026



File No: 12223
Government of India

Ministry of Environment, Forest and Climate Change
(Issued by the State Environment Impact Assessment Authority(SEIAA),
TAMIL NADU)



Dated 03/07/2025



To,

Thiru.Elangovan.S
M/s. Vishnusurya Projects and Infra Hosur Private Limited
Agni Business Centre, No.24/46, K.B.Dasan Road, 3rd Floor, Alwarpet, Chennai District, TAMIL
NADU-600018
vishnusurya438@gmail.com

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

Sir/Madam,

Sub: SEIAA, Tamil Nadu – Proposed Rough Stone and Gravel Quarry over an extent of 3.68.0 Ha in S.F. Nos. 3/2C (P), 4/2 (P), 4/5 (P), 4/6 (P), 4/7 & 4/8 (P) of Kariyasandiram Village, Shoolagiri Taluk, Krishnagiri District, Tamil Nadu by M/s. Vishnusurya Projects and Infra Hosur Private Limited - under project category – “B1” and Schedule S.No.1(a) “Mining of Minerals Projects” of EIA Notification, 2006, as amended – ToR issued along with Public Hearing - preparation of EIA report – Regarding.

Ref: 1. Online proposal No. SIA/TN/MIN/539189/2025 Dated 27.05.2025.

2. Your application submitted for Terms of Reference dated: 27.05.2025.

3. Minutes of the 575th SEAC meeting held on 09.06.2025.

4. Minutes of the 846th SEAC meeting held on 26.06.2025.

2. The particulars of the proposal are as below :

(i) TOR Identification No.	TO25B0108TN5784836N
(ii) File No.	12223
(iii) Clearance Type	TOR
(iv) Category	B1
(v) Project/Activity Included Schedule No.	1(a) Mining of minerals, 1(a) Mining of minerals
(vii) Name of Project	Kariyasandiram Village Rough Stone and Gravel Mining Lease
(viii) Name of Company/Organization	VISHNUSURYA PROJECTS AND INFRA HOSUR PRIVATE LIMITED
(ix) Location of Project (District, State)	KRISHNAGIRI, TAMIL NADU
(x) Issuing Authority	SEIAA

(xii) Applicability of General Conditions	no
(xiii) Applicability of Specific Conditions	no

1. In view of the particulars given in the Para 1 above, the project proposal interalia including Form-1 (Part A and B) were submitted to the SEIAA for an appraisal by the SEAC under the provision of EIA notification 2006 and its subsequent amendments.

2. The above-mentioned proposal has been considered by SEIAA in the meeting held on 26.06.2025. The minutes of the meeting and all the Application and documents submitted [(viz. Form-1 Part A, Part B,)] are available on PARIVESH portal which can be accessed by scanning the QR Code above.

3. The State Expert Appraisal Committee (SEAC), based on the information & clarifications provided by the project proponent and after detailed deliberations on all technical aspects recommended the proposal for grant of Terms of Reference with public hearing under the provision of EIA Notification, 2006 and as amended thereof subject to the stipulation of specific and general conditions as detailed in Annexure (2).

4. The SEIAA has examined the proposal in accordance with the Environment Impact Assessment (EIA) Notification, 2006 & further amendments thereto and after accepting the recommendations of the SEAC hereby decided to issue the following Terms of Reference with public hearing for instant proposal of M/s. Vishnusurya Projects and Infra Hosur Private Limited under the provisions of EIA Notification, 2006 and as amended thereof.

5. The Ministry/SEIAA-TN reserves the right to stipulate additional conditions, if found necessary.

6. The Terms of Reference with public hearing to the aforementioned project is under provisions of EIA Notification, 2006. It does not tantamount to approvals/consent/permissions etc. required to be obtained under any other Act/Rule/regulation. The Project Proponent is under obligation to obtain approvals /clearances under any other Acts/Regulations or Statutes, as applicable, to the project.

7. This issues with the approval of the Competent Authority.

8. 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, Krishnagiri District.
6. Stock File.

Annexure 1

Specific Terms of Reference for (Mining Of Minerals)

1. Seiaa Standard Conditions:

S. No	Terms of Reference
1.1	<u>Cluster Management Committee</u> 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.,

S. No	Terms of Reference
	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 & emergency management plan, fire safety & evacuation plan and sustainable development goals pertaining to the cluster in a holistic manner especially during natural calamities like intense rain and the mitigation measures considering the inundation of the cluster and evacuation plan. 6. The Cluster Management Committee shall form Environmental Policy to practice sustainable mining in a scientific and systematic manner in accordance with the law. The role played by the committee in implementing the Environmental policy devised shall be given in detail in the EIA Report. 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 deliberate on the health of the workers/staff involved in the mining as well as the health of the public in the vicinity. <u>Agriculture & Agro-Biodiversity</u> 9. Impact on surrounding agricultural fields around the proposed mining Area. 10. Impact on soil flora & vegetation around the project site. 11. Details of type of vegetation including no. of trees & shrubs within the proposed mining area and. If so, transplantation of such vegetation all along the boundary of the proposed mining area shall committed mentioned in EMP. 12. The Environmental Impact Assessment should study the agro-biodiversity, agro- forestry, horticultural plantations, the natural ecosystem, the soil micro flora, fauna and soil seed banks and suggest measures to maintain the natural Ecosystem. 13. Action should specifically suggest for sustainable management of the area and restoration of ecosystem for flow of goods and services. 14. The project proponent shall study and furnish the impact of project on plantations in adjoining patta lands, Horticulture, Agriculture and livestock. <u>Forests</u> 15. The project proponent shall detailed study on impact of mining on Reserve forests and free ranging wildlife. 16. The Environmental Impact Assessment should study impact on forest, vegetation, endemic, vulnerable and endangered indigenous flora and fauna. 17. The Environmental Impact Assessment should study impact on standing trees and the existing trees should be numbered and action suggested for protection. 18. The Environmental Impact Assessment should study impact on protected areas, Reserve Forests, National Parks, Corridors and Wildlife pathways, near project site. <u>Water Environment</u> 19. Hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) so as to assess the impacts on the nearby waterbodies due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided, covering the entire mine lease period. 20. Erosion Control measures. 21. Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area on the nearby Villages, Water-bodies/ Rivers, & any ecological fragile areas. 22. The project proponent shall study impact on fish habitats and the food WEB/ food chain in the water body and Reservoir. 23. The project proponent shall study and furnish the details on potential fragmentation impact on

S. No	Terms of Reference
	natural Environment, by the activities. 24. The project proponent shall study and furnish the impact on aquatic plants and animals in water bodies and possible scars on the landscape, damages to nearby caves, heritage site, and archaeological sites possible land form changes visual and aesthetic impacts. 25. The Terms of Reference should specifically study impact on soil health, soil erosion, the soil physical, chemical components and microbial components. 26. The Environmental Impact Assessment should study on wetlands, water bodies, rivers streams, lakes and farmer sites. 27. The EIA shall include the impact of mining activity on the following: - Hydrothermal/Geothermal effect due to destruction in the Environment. - Bio-geochemical processes and its foot prints including Environmental stress. - Sediment geochemistry in the surface streams. <u>Energy</u> 28. The measures taken to control Noise, Air, Water, Dust Control and steps adopted to efficiently utilise the Energy shall be furnished. <u>Climate Change</u> 29. The Environmental Impact Assessment shall study in detail the carbon emission and also suggest the measures to mitigate carbon emission including development of carbon sinks and temperature reduction including control of other emission and climate mitigation activities. 30. The Environmental Impact Assessment should study impact on climate change, temperature rise, pollution and above soil & below soil carbon stock, soil health and physical, chemical & biological soil features. 31. Impact of mining on pollution leading to GHGs emissions and the impact of the same on the local livelihood. <u>Mine Closure Plan</u> 32. Detailed Mine Closure Plan covering the entire mine lease period as per precise area communication order issued. <u>EMP</u> 33. Detailed Environment Management Plan along with adaptation, mitigation & remedial strategies covering the entire mine lease period as per precise area communication order issued and the scope for achieving SDGs. 34. The Environmental Impact Assessment should hold detailed study on EMP with budget for Green belt development and mine closure plan including disaster management plan. <u>Risk Assessment</u> 35. To furnish risk assessment and management plan including anticipated vulnerabilities during operational and post operational phases of Mining. <u>Disaster Management Plan</u> 36. To furnish disaster management plan and disaster mitigation measures in regard to all aspects to avoid/reduce vulnerability to hazards & to cope with disaster/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. <u>Others</u> 37. The project proponent shall furnish VAO certificate with reference to 300m radius regard to approved habitations, schools, Archaeological sites, Structures, railway lines, roads, water bodies such as streams, odai, vaari, canal, channel, river, lake pond, tank etc. 38. As per the MoEF& CC office memorandum F.No.22-65/2017-IA.III dated: 30.09.2020 and 20.10.2020 the proponent shall address the concerns raised during the public consultation and all the activities proposed shall be part of the Environment Management Plan. 39. The project proponent shall study and furnish the possible pollution due to plastic and microplastic on the Environment. The ecological risks and impacts of plastic & microplastics on aquatic Environment and fresh water systems due to activities, contemplated during mining may be investigated and reported.

2. Seac Conditions - Site Specific

S. No	Terms of Reference
2.1	1. A Cluster Management Committee (CMC) shall be constituted including all the mines in the cluster as Committee Members for the effective management of the mining operation in the cluster through systematic & scientific approach with appointment of statutory personnel, appropriate environmental monitoring, good maintenance of haul roads and village/panchayat roads, authorized blasting operation etc. The PP shall submit the following details in the form of an Affidavit during the EIA appraisal: (i) Copy of the agreement forming CMC. (ii) The Organisation chart of the Committee with defining the role of the members (iii) The 'Standard Operating Procedures' (SoP) towards executing the planned activities. 3. The PP should submit the detailed plan of mining as per systematic and scientific manner considering the topography of the project and the elevation difference. 4. A drone video providing a 360° view of the entire mining lease area should be submitted. 5. The structures within the radius of (i) 50 m, (ii) 100 m, (iii) 200 m and (iv) 300 m & upto 1km 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. and spell out the mitigation measures to be proposed for the protection of the above structures, if any during the quarrying operations. 6. The proponent shall furnish photographs of adequate fencing; garland drainage built with siltation tank & green belt along the periphery including replantation of existing trees; maintaining the safety distance between the adjacent quarries & water bodies nearby provided as per the approved mining plan. 7. The PP shall install the CCTV camera for the continuous surveillance of mining activity & furnish the photographic/video graphic evidence along with the EIA report.

3. Seac Standard Conditions

S. No	Terms of Reference
3.1	1. In the case of existing/operating mines, a letter obtained from the concerned AD (Mines) shall be submitted and it shall include the following: (i) Original pit dimension (ii) Quantity achieved Vs EC Approved Quantity (iii) Balance Quantity as per Mineable Reserve calculated. (iv) Mined out Depth as on date Vs EC Permitted depth (v) Details of illegal/illicit mining (vi) Violation in the quarry during the past working. (vii) Quantity of material mined out outside the mine lease area (viii) Condition of Safety zone/benches (ix) Revised/Modified Mining Plan showing the benches of not exceeding 6 m height and ultimate depth of not exceeding 50m. 2. Details of habitations around the proposed mining area and latest VAO certificate regarding the location of habitations within 300m radius from the periphery of the site. 3. The proponent is requested to carry out a survey and enumerate on the structures located within the radius of (i) 50 m, (ii) 100 m, (iii) 200 m and (iv) 300 m (v) 500m shall be enumerated with details such as dwelling houses with number of occupants, whether it belongs to the owner (or) not, places of worship, industries, factories, sheds, etc with indicating the owner of the building, nature of construction, age of the building, number of residents, their profession and income, etc. 4. The PP shall submit a detailed hydrological report indicating the impact of proposed quarrying

S. No	Terms of Reference
	operations on the waterbodies like lake, water tanks, etc are located within 1 km of the proposed quarry. 5. The Proponent shall carry out Bio diversity study through reputed Institution and the same shall be included in EIA Report. 6. The DFO letter stating that the proximity distance of Reserve Forests, Protected Areas, Sanctuaries, Tiger reserve etc., up to a radius of 25 km from the proposed site. 7. In the case of proposed lease in an existing (or old) quarry where the benches are not formed (or) partially formed as per the approved Mining Plan, the Project Proponent (PP) shall the PP shall carry out the scientific studies to assess the slope stability of the working benches to be constructed and existing quarry wall, by involving any one of the reputed Research and Academic Institutions - CSIR-Central Institute of Mining & Fuel Research / Dhanbad, NIRM/Bangalore, Division of Geotechnical Engineering-IIT-Madras, NIT-Dept of Mining Engg, Surathkal, and Anna University Chennai-CEG Campus. The PP shall submit a copy of the aforesaid report indicating the stability status of the quarry wall and possible mitigation measures during the time of appraisal for obtaining the EC. 8. However, in case of the fresh/virgin quarries, the Proponent shall submit a conceptual 'Slope Stability Plan' for the proposed quarry during the appraisal while obtaining the EC, when the depth of the working is extended beyond 30 m below ground level. 9. The PP shall furnish the affidavit stating that the blasting operation in the proposed quarry is carried out by the statutory competent person as per the MMR 1961 such as blaster, mining mate, mine foreman, II/I Class mines manager appointed by the proponent. 10. The PP shall present a conceptual design for carrying out only controlled blasting operation involving line drilling and muffle blasting in the proposed quarry such that the blast-induced ground vibrations are controlled as well as no fly rock travel beyond 30 m from the blast site. 11. The EIA Coordinators shall obtain and furnish the details of quarry/quarries operated by the proponent in the past, either in the same location or elsewhere in the State with video and photographic evidences. 12. If the proponent has already carried out the mining activity in the proposed mining lease area after 15.01.2016, then the proponent shall furnish the following details from AD/DD, mines, 13. What was the period of the operation and stoppage of the earlier mines with last work permit issued by the AD/DD mines? 14. Quantity of minerals mined out. · Highest production achieved in any one year · Detail of approved depth of mining. · Actual depth of the mining achieved earlier. · Name of the person already mined in that leases area. · If EC and CTO already obtained, the copy of the same shall be submitted. · Whether the mining was carried out as per the approved mine plan (or EC if issued) with stipulated benches. 15. All corner coordinates of the mine lease area, superimposed on a High-Resolution Imagery/Topo sheet, topographic sheet, geomorphology, lithology and geology of the mining lease area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone). 16. The PP shall carry out Drone video survey covering the cluster, green belt, fencing, etc., 17. The 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. 18. The Project Proponent shall provide the details of mineral reserves and mineable reserves, planned production capacity, proposed working methodology with justifications, the anticipated impacts of the mining operations on the surrounding environment, and the remedial measures for the same. 19. The Project Proponent shall provide the Organization chart indicating the appointment of

S. No	Terms of Reference
	various statutory officials and other competent persons to be appointed as per the provisions of the Mines Act 1952 and the MMR, 1961 for carrying out the quarrying operations scientifically and systematically in order to ensure safety and to protect the environment. 20. The Project Proponent shall conduct the hydro-geological study considering the contour map of the water table detailing the number of groundwater pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds, etc. within 1 km (radius) along with the collected water level data for both monsoon and non-monsoon seasons from the PWD / TWAD so as to assess the impacts on the wells due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. 21. The proponent shall furnish the baseline data for the environmental and ecological parameters with regard to surface water/ground water quality, air quality, soil quality & flora/fauna including traffic/vehicular movement study. 22. The Proponent shall carry out the Cumulative impact study due to mining operations carried out in the quarry specifically with reference to the specific environment in terms of soil health, biodiversity, air pollution, water pollution, climate change and flood control & health impacts. Accordingly, the Environment Management plan should be prepared keeping the concerned quarry and the surrounding habitations in the mind. 23. Rain water harvesting management with recharging details along with water balance (both monsoon & non-monsoon) be submitted. 24. Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given. 25. Details of the land for storage of Overburden/Waste Dumps (or) Rejects outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be provided. 26. Proximity to Areas declared as 'Critically Polluted' (or) the Project areas which attracts the court restrictions for mining operations, should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the TNPCB (or) Dept. of Geology and Mining should be secured and furnished to the effect that the proposed mining activities could be considered. 27. Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided. 28. Impact on local transport infrastructure due to the Project should be indicated. 29. A tree survey study shall be carried out (nos., name of the species, age, diameter etc.,) both within the mining lease applied area & 300m buffer zone and its management during mining activity. 30. A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific. 31. As a part of the study of flora and fauna around the vicinity of the proposed site, the EIA coordinator shall strive to educate the local students on the importance of preserving local flora and fauna by involving them in the study, wherever possible. 32. The purpose of Green belt around the project is to capture the fugitive emissions, carbon sequestration and to attenuate the noise generated, in addition to improving the aesthetics. A wide range of indigenous plant species should be planted as given in the appendix-I in consultation with the DFO, State Agriculture University. The plant species with dense/moderate canopy of native origin should be chosen. Species of small/medium/tall trees alternating with shrubs should be planted in a mixed manner. 33. Taller/one year old Saplings raised in appropriate size of bags, preferably ecofriendly bags should be planted as per the advice of local forest authorities/botanist/Horticulturist with regard to

S. No	Terms of Reference
	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 34. A Disaster management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period. 35. A Risk Assessment and management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period. 36. Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed. 37. Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations. 38. The Socio-economic studies should be carried out within a 5 km buffer zone from the mining activity. Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation. 39. Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given. 40. Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc. 41. If any quarrying operations were carried out in the proposed quarrying site for which now the EC is sought, the Project Proponent shall furnish the detailed compliance to EC conditions given in the previous EC with the site photographs which shall duly be certified by MoEF&CC, Regional Office, Chennai (or) the concerned DEE/TNPCB. 42. The PP shall prepare the EMP for the entire life of mine and also furnish the sworn affidavit stating to abide the EMP for the entire life of mine. 43. Concealing any factual information or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this Terms of Conditions besides attracting penal provisions in the Environment (Protection) Act, 1986.

4. Seiaa Specific Conditions:

S. No	Terms of Reference
4.1	After detailed discussions, the Authority accepts the recommendation of SEAC-I and decided to grant Terms of Reference (ToR) along with Public Hearing for the quantity of 7,96,565 m3 of Rough stone and 1,40,594 m3 of Gravel up to the depth of 60 m BGL as per the approved mining plan, under cluster for undertaking the combined Environment Impact Assessment Study and preparation of separate Environment Management Plan subject to the conditions as recommended by SEAC-I & normal conditions & the SEIAA Standard conditions.

Standard Terms of Reference for (Mining of minerals)

1.

S. No	Terms of Reference
1.1	Year-wise production details since 1994 should be given, clearly stating the highest production

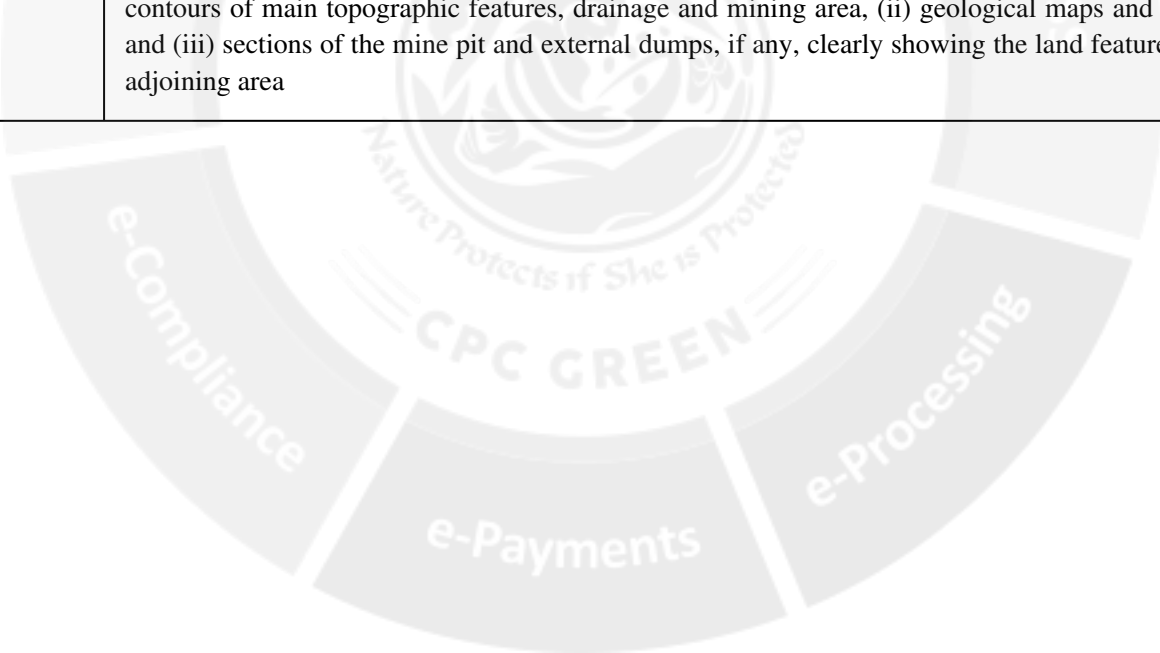
S. No	Terms of Reference
	achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification 1994 came into force, w.r.t. the highest production achieved prior to 1994
1.2	A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given
1.3	All documents including approved mine plan, EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee
1.4	All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery/ toposheet, topographic sheet, geomorphology and geology of the areashould 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)
1.5	Information should be provided in Survey of India Toposheet in 1:50,000 scale indicating geological map of the area, geomorphology of land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics
1.6	Details about the land proposed for mining activities should be givenwith information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority
1.7	It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating process/procedures to bring into focus any infringement/deviation/ violation of the environmental or forest norms/ conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large,may also be detailed in the EIA Report
1.8	Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided
1.9	The study rea will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc. should be for the life of the mine / lease period
1.10	Land use of the study rea delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given
1.11	Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given
1.12	A Certificate from the Competent Authority in the State Forest Department should be provided,

S. No	Terms of Reference
	confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the State Expert Appraisal Committees
1.13	Status of forestry clearance for the broken up area and virgin forestland involved in the Project including deposition of net present value (NPV) and compensatory afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished
1.14	Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated
1.15	The vegetation in the RF / PF areas in the study area, with necessary details, should be given
1.16	A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly, detailed mitigative measures required, should be worked out with cost implications and submitted
1.17	Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves/(existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished
1.18	A detailed biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled- I fauna found in the study area, the necessary plan alongwith budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost
1.19	Proximity to Areas declared as Critically Polluted or the Project areas likely to come under the Aravali Range, (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Dept. Should be secured and furnished to the effect that the proposed mining activities could be considered
1.20	Similarly, for coastal Projects, A CRZ map duly authenticated by one of the authorized agencies demarcating LTL, HTL, CRZ area, location of the mine lease w.r.t CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority)
1.21	R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be

S. No	Terms of Reference
	kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need based sample survey, family-wise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be clearly brought out whether the village(s) located in the mine lease area will be shifted or not. The issues relating to shifting of village(s) including their R&R and socio-economic aspects should be discussed in the Report
1.22	One season (non-monsoon) [i.e. March-May (Summer Season); October-December (post monsoon season) ; December-February (winter season)]primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM10, particularly for free silica, should be given
1.23	Air quality modeling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of mineral. The details of the model used and input parameters used for modeling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map
1.24	The water requirement for the Project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the Project should be indicated
1.25	Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided
1.26	Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided
1.27	Impact of the Project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided
1.28	Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. The Report inter-alia, shall include details of the aquifers present and impact of mining activities on these aquifers. Necessary permission from State Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished
1.29	Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion proposed, if any, and the impact of the same on the hydrology should be brought out
1.30	Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and bgl. A schematic diagram may also be provided for the same

S. No	Terms of Reference
1.31	A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution
1.32	Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those outside the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as State Government) should be covered. Project Proponent shall conduct Impact of Transportation study as per Indian Road Congress Guidelines
1.33	Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report
1.34	Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report
1.35	Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed
1.36	Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations
1.37	Measures of socio economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation
1.38	Detailed environmental management plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project
1.39	Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project
1.40	Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given
1.41	The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out
1.42	A Disaster management Plan shall be prepared and included in the EIA/EMP Report

S. No	Terms of Reference
1.43	Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc
1.44	Besides the above, the below mentioned general points are also to be followed:- a) All documents to be properly referenced with index and continuous page numbering. b) Where data are presented in the Report especially in Tables, the period in which the data were collected and the sources should be indicated. c) Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF&CC/NABL accredited laboratories. All the original analysis/testing reports should be available during appraisal of the Project. d) Where the documents provided are in a language other than English, an English translation should be provided. e) The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted. f) While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF vide O.M. No. J-11013/41/2006-IA.II(I) dated 4th August, 2009, which are available on the website of this Ministry, should be followed. g) Changes, if any made in the basic scope and project parameters (as submitted in Form-I and the PFR for securing the TOR) should be brought to the attention of MoEF&CC with reasons for such changes and permission should be sought, as the TOR may also have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH again with the revised documentation. h) As per the circular no. J-11011/618/2010-IA.II(I) dated 30.5.2012, certified report of the status of compliance of the conditions stipulated in the environment clearance for the existing operations of the project, should be obtained from the Regional Office of Ministry of Environment, Forest and Climate Change, as may be applicable. i) The EIA report should also include (i) surface plan of the area indicating contours of main topographic features, drainage and mining area, (ii) geological maps and sections and (iii) sections of the mine pit and external dumps, if any, clearly showing the land features of the adjoining area



A. STANDARD TERMS OF REFERENCE

- 1) Year-wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification 1994 came into force, w.r.t. the highest production achieved prior to 1994.
- 2) A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given.
- 3) All documents including approved mine plan, EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee.
- 4) All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery/ topo sheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).
- 5) Information should be provided in Survey of India Topo sheet in 1:50,000 scale indicating geological map of the area, geomorphology of land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics.
- 6) Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority.
- 7) It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating process/procedures to bring into focus any infringement/deviation/violation of the environmental or forest norms/ conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large, may also be detailed in the EIA Report.
- 8) Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The

proposed safeguard measures in each case should also be provided.

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

the Standing Committee of National Board of Wildlife and copy furnished.

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

location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM10, particularly for free silica, should be given.

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

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

proposed Project.

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

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

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

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

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

- increase in the above study shall be substantiated with mitigation measures.
14. A study on the geological resources available shall be carried out and reported.
 15. A specific study on agriculture & livelihood shall be carried out and reported.
 16. Impact of soil erosion, soil physical chemical and biological property changes may be assumed.
 17. Site selected for the project - Nature of land - Agricultural (single/double crop), barren, Govt./ private land, status of its acquisition, nearby (in 2-3 km.) water body, population, within 10km other industries, forest, eco-sensitive zones, accessibility, (note - in case of industrial estate this information may not be necessary)
 18. Baseline environmental data - air quality, surface and ground water quality, soil characteristic, flora and fauna, socio-economic condition of the nearby population
 19. Identification of hazards in handling, processing and storage of hazardous material and safety system provided to mitigate the risk.
 20. Likely impact of the project on air, water, land, flora-fauna and nearby population
 21. Emergency preparedness plan in case of natural or in plant emergencies
 22. Issues raised during public hearing (if applicable) and response given
 23. CER plan with proposed expenditure.
 24. Occupational Health Measures
 25. Post project monitoring plan
 26. The project proponent shall carry out detailed hydro geological study through intuitions/NABET Accredited agencies.
 27. A detailed report on the green belt development already undertaken is to be furnished and also submit the proposal for green belt activities.
 28. The proponent shall propose the suitable control measure to control the fugitive emissions during the operations of the mines.
 29. A specific study should include impact on flora & fauna, disturbance to migratory pattern of animals.
 30. Reserve funds should be earmarked for proper closure plan.
 31. A detailed plan on plastic waste management shall be furnished. Further, the proponent should strictly comply with, Tamil Nadu Government Order (Ms) No.84 Environment and forests (EC.2) Department dated 25.06.2018 regarding ban on one time use and throw away plastics irrespective of thickness with effect from 01.01.2019 under Environment (Protection) Act, 1986. In this connection, the project proponent has to furnish the action plan.

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

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

Signature Not Verified

Digitally Signed by : A R Rahul Nadh IAS
Member Secretary, SEIAA

Date: 03/07/2025 ☐

From

Thiru.A.Arumuganainar, M.Sc.,
Regional Joint Director/
Deputy Director (FAC),
Dept. of Geology and Mining,
Krishnagiri.

To

M/s. Vishnusurya Projects and
Infra Hosur Private Limited,
Agri Business Centre,
No.24/46, KB Dasan Road,
3rd Floor, Alwarpet, Chennai-
600018.

Roc.No.30/2024/Mines**dated : 23.05.2025**

Sub: Mines and Minerals-Minor Mineral - Rough Stone-Krishnagiri District- Shoolagiri Taluk – Kariyasandiram Village - Patta land - S.F.No.3/2C(P) (1.15.4), 4/2(P) (1.08.2), 4/5(P) (0.46.0), 4/6(P) (0.44.0), 4/7 (0.39.0) & 4/8(P) (0.15.5) - Over an extent of 3.68.0ha - Precise area communicated to M/s. Vishnusurya Projects and Infra Hosur Private Limited – Mining plan approved - Details of quarries situated within 500m radial distance requested – Quarry details furnished - Reg.

Ref:

1. Application preferred by M/s. Gunin Infrastructures LLP & M/s. Vishnusurya Projects and Infra Hosur Private Limited, dated 04.01.2024 & 25.02.2025.
2. The Deputy Director of Geology and Mining vide Letter No. 30/2024/Mines, dated 04.04.2025 (Precise area, communication).
3. The Deputy Director of Geology & Mining, Krishnagiri letter No.30/2024/Mines, dated: 15.05.2025 (Mining plan approval).
4. Representation of M/s. Vishnusurya Projects and Infra Hosur Private Limited, dated 22.05.2025.

Kind attention is invited to the references cited above.

2. In the reference 1st cited, M/s. Vishnusurya Projects and Infra Hosur Private Limited had preferred an application for quarrying rough stone over an extent of 3.68.0ha of patta land in S.F.Nos. 3/2C(P) (1.15.4), 4/2(P) (1.08.2), 4/5(P) (0.46.0), 4/6(P) (0.44.0), 4/7 (0.39.0) & 4/8(P) (0.15.5) in Kariyasandiram Village, Shoolagiri Taluk, Krishangiri District for a period of 10 years under the provision of Rule 19 (1) of Tamil Nadu Minor Mineral Concession Rules, 1959. In this regard, the precise area has been communicated to the applicant vide the reference 2nd cited with a direction to submit approved mining plan and Environment Clearance as required under Rules 41 & 42 of the Tamilnadu Minor Mineral Concession Rules, 1959.

3. Accordingly, the applicant submitted Mining Plan and the same was approved by the Deputy Director of Geology & Mining vide the reference 3rd cited.

4. At this juncture, the applicant has requested the details of quarries situated within 500m radial distance from the lease applied area vide letter dated: 22.05.2025. As requested by the applicant, the details of quarries situated within 500m radial distance from the subject area is furnished as follows:

I. Details of Existing Quarries

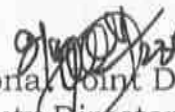
S. No.	Name of the Lessee	Village/ Taluk	S.F.No.	Extent in ha	Proceedings Rc.No. & date	Lease period
1	M/s. Gunin Infrastructure LLP, No.5, Balaji Market Opp., Central Bank, Kamal Chowk, Neemuch, Madhyapradesh-458 411.	Kariya Sandiram/ Shoolagiri	4/3,4/ 4 & 6(P)	4.48.50	Rc.No.1089/2023 /Mines, dated 20.10.2023	02.12.2021 to 01.12.2026
2	M/s.Ultra Tech Cements Ltd., 3 rd Floor, Ahuan Centre, Opp. MIDC office, Andheri (E), Mumbai.	Kariya Sandiram/ Shoolagiri	5/3A,5 /3B, 5/3C & 6(P)	4.98.00	Rc.No.224/2011/ Mines-2, dated 24.10.2011	31.10.2011 to 30.10.2016
Total				9.46.50		

II. Details of Expired/Abandoned Quarries

S. No.	Name of the Applicant/Lessee	Village/Taluk	S.F.No.	Extent (ha)	Proceeding Rc.No. & date	Lease Period
1	-----Nil-----					

III. Details of Proposed/Applied Quarries

S. No.	Name of the Applicant/Lessee	Village/Taluk	S.F.No.	Extent (ha)	Proceeding Rc. No. & date	Status
1	M/s.Vishnusurya Projects and Infra Hosur Private Limited, Agri Business Centre, No.24/46, KB Dasan Road, 3rd Floor, Alwarpet, Chennai-600018.	Kariya Sandiram/Shoolagiri	3/2C,4/2, 4/5(P), 4/6(P), 4/7 &4/8(P)	3.68.00	----	Instant Proposal
Total				7.40.0		


 Regional Joint Director /
 Deputy Director(FAC),
 Dept. of Geology and Mining,
 Krishnagiri.


 J.A.
 23.5.17

Copy to:

The Chairman, Tamil Nadu State Environment Impact Assessment Authority, 3rd Floor, Panakal Maligai, No. 1 Jeenes Road, Saidapet, Chennai -15.

From

Thiru.A.Arumuganainar, M.Sc.,
Regional Joint Director/
Deputy Director (FAC),
Dept. of Geology and Mining,
Krishnagiri.

To

M/s. Vishnusurya Projects and Infra
Hosur Private Limited,
Agri Business Centre,
No.24/46, KB Dasan Road,
3rd Floor, Alwarpet, Chennai-600018

Rc.No. 30 /2024/Mines Dated: 15.05.2025

Sir,

Sub: Mines and Minerals-Minor Mineral - Rough Stone-Krishnagiri
District- Shoolagiri Taluk - Kariyasandiram Village - Patta
land -S.F.No.3/2C(P) (1.15.4), 4/2(P) (1.08.2), 4/5(P) (0.46.0),
4/6(P) (0.44.0), 4/7 (0.39.0) & 4/8(P) (0.15.5) - Over an extent
of 3.68.0ha - Precise area communicated to M/s.
Vishnusurya Projects and Infra Hosur Private Limited - Draft
mining plan submitted -Mining plan approved - Reg.

Ref: 1. Application preferred by M/s. Gunin Infrastructures LLP
& M/s. Vishnusurya Projects and Infra Hosur Private
Limited, dated 04.01.2024 & 25.02.2025.
2. The Deputy Director of Geology and Mining vide Letter No.
30/2024/Mines, dated 04.04.2025 (Precise area
communication).
3. Representation of M/s. Vishnusurya Projects and Infra
Hosur Private Limited, dated 11.04.2025 (Draft mining
plan submission).

Kind attention is invited to the references cited above.

2. In the reference 1st cited, M/s. Vishnusurya Projects and Infra Hosur Private Limited had preferred an application for quarrying rough stone over an extent of 3.68.0ha of patta land in S.F.Nos. 3/2C(P) (1.15.4), 4/2(P) (1.08.2), 4/5(P) (0.46.0), 4/6(P) (0.44.0), 4/7 (0.39.0) & 4/8(P) (0.15.5) in Kariyasandiram Village, Shoolagiri Taluk, Krishangiri District for a period of 10 years under the provision of Rule 19 (1) of Tamil Nadu Minor Mineral Concession Rules, 1959. In this regard, the precise area has been communicated to the applicant vide the reference 2nd cited with a direction to submit approved mining plan and Environment Clearance as required under Rules 41 & 42 of the Tamilnadu Minor Mineral Concession Rules, 1959.

3. Accordingly, M/s. Vishnusurya Projects and Infra Hosur Private Limited have submitted 03 copies of draft mining plan vide letter dated 11.04.2025. The same has been examined with the ground validation of the lease applied area and found correct.

4. Further, in the draft mining plan, it is observed that the year wise production up to depth of 60m BGL has been proposed for the proposed first and second five years and details of the same are as follows.

Yearwise production for the first five years

Year	Roughstone		Topsoil	
	m ³	MT	m ³	MT
1 st Year	85450	234988	52988	105976
2 nd Year	88040	242110	43803	87606
3 rd Year	88040	242110	43803	87606
4 th Year	82975	228181	---	---

5 th Year	82525	226944	---	---
Total	427030	1174333	140594	281188

Yearwise production for the second five years

Year	Roughstone		Topsoil	
	m ³	MT	m ³	MT
6 th Year	79915	219766	---	---
7 th year	76280	209770	---	---
8 th year	73615	202441	---	---
9 th year	70830	194783	---	---
10 th year	68895	189461	---	---
Total	369535	1016221	---	---

4. Hence, the power delegated under Rule 4 of TNMMCR, 1959 and as per the guidelines/instructions issued by the Commissioner of Geology and Mining, vide letter Rc.No.3868/LC/2012 dated 19.11.2012, the said mining plan submitted by the applicant is hereby approved subject to the following conditions.

Conditions:

i) The draft mining plan is approved without prejudice to any other law applicable to the quarry lease from time to time whether such laws are made by the Central Government, State Government or any other authority.

ii) This approval of the draft mining plan does not in any way imply the approval of the Government in terms of any other provisions of Mines and Minerals Development and Regulation Act, 1957 or any other connected laws including Forest (Conservation) Act, 1957 Forest (Conservation) Act, 1980 Forest Conservation Rules, 1981, Environment protection Act, 1980 Indian Explosive Act, 1884 (Central

Act IV of 1884) and the rules made there under the Tamil Nadu Minor Mineral Concession rules, 1959.

iii) The draft mining plan is approved without prejudice to any other orders or directions from any court of competent jurisdiction.

iv) All the conditions mentioned in the precise area letter shall be followed during the quarry operation as per Rules.

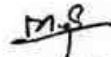
v) The applicant shall get prior Environmental clearance from the appropriate authority and shall submit it to the District Collector, Krishnagiri for quarrying minerals in the lease applied area as per the Rule 42 of the Tamil Nadu Minor Mineral Concession rules, 1959.

vi) Every mining plan duly approved under the Rule 41(9) of TNMMCR, 1959 shall be valid for a period of five years. Further, the applicant shall review the mining plan and submit the scheme of mining for the next five years of the lease period for approval wherever quarrying lease is required beyond 5 years.

vii) If the approved mining plan requires any modifications within the lease period, the applicant shall carry out such modifications and resubmit the modified mining plan for approval.

Encl.: Approved mining plan


Deputy Director (FAC),
Dept. of Geology and Mining,
Krishnagiri.


15.05.25

- Copy to :**
1. The Commissioner,
Dept of Geology and Mining,
Guindy, Chennai -32.
 2. The Chairman, Tamil Nadu State
Environment Impact Assessment
Authority, 3rd Floor, Panakal Maligai,
No. 1 Jeenes Road, Saidapet,
Chennai -15.

MINING PLAN

FOR

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

Patta land /Open Cast-Semi-Mechanized mining/Non- Forest/Non-Captive Use

Lease period 10 Years from the date of lease execution

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

LOCATION OF THE LEASE AREA

STATE : TAMILNADU
DISTRICT : KRISHNAGIRI
TALUK : SHOOLAGIRI
VILLAGE : KARIYASANDIRAM
S.F. No'S : 3/2C (P), 4/2 (P), 4/5 (P), 4/6 (P),
4/7 & 4/8 (P)
EXTENT : 3.68.0 Hectares

ADDRESS OF THE APPLICANT

**M/s.Vishnusurya Projects and Infra Hosur
Private Limited,
Agni Business Centre,
No.24/46, K.B.Dasan Road,
3rd Floor, Alwarpet,
Chennai District – 600018.**

PREPARED BY

G.UMAMAHESWARAN, M.Sc.,
QUALIFIED PERSON

GEO TECHNICAL MINING SOLUTIONS

(A NABET Accredited & ISO Certified Company)

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

Oddapatti, Collectorate Post office,

Dharmapuri -636705, Tamil Nadu.

Mob. : +91 9443937841, +917010076633,

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

Website: www.gtmsind.com



CONTENTS



Sl. No.	Description	Page No.
-	Certificates	
-	Introductory notes	9
1.0	General	11
2.0	Location and Accessibility	13
	<u>PART-A</u>	
3.0	Geology and Mineral reserves	16
4.0	Mining	21
5.0	Blasting	28
6.0	Mine Drainage	30
7.0	Stacking of Mineral rejects and disposal of waste	30
8.0	Uses of Mineral	30
9.0	Others	31
10.0	Mineral processing/Beneficiations	32
	<u>PART-B</u>	
11.0	Environmental management plan	34
12.0	Progressive quarry closure plan	39
13.0	Financial assurance	41
14.0	Certificates	41
15.0	Plan and sections, etc	41
16.0	Any other details intend to furnish by the applicant	41
17.0	CSR Expenditure	42

ANNEXURES



Sl. No.	Description	Annexure No.
1.	Copy of precise area communication letter	
2.	Copy of FMB (Field Measurement book)	II
3.	Copy of Village Map	III
4.	Copy of EB Shift request letter	IIIA
5.	Copy of Patta & "A" register	IV
6.	Copy of Company Registration & Pan Card	V
7.	Copy of GST Certificate	VI
8.	Photo copy of the applied lease area	VII
9.	Copy of ID Proof of the authorized signatory	VIII
10.	Copy of Qualified Person Certificate	IX

LIST OF PLATES



Sl. No.	Description	Plate No.	Scale
1	Key Map	I	Not to scale
2	Location Plan	I-A	Not to scale
3	Toposheet Map	I-B	1:1,00,000
4	Satellite Imagery Map	I-C	1: 5,000
5	Environmental Plan	I-D	1: 5,000
6	Mine Lease Plan	II	1:1000
7	Surface & Geological Plan	III	Plan 1:1000
8	Geological Sections	IIIA	Sections Hor 1:1000 Ver 1:500
9	Conceptual Plan	IV	Plan 1:1000
10	Conceptual Sections	IVA	Sections Hor 1:1000 Ver 1:500
11	Mine Layout Plan and Land Use Pattern	V	Plan 1:1000
12	Year wise Development & Production Plan	VI	Plan 1:1000
13	Year wise Development & Production Sections	VIA	Sections Hor 1:1000 Ver 1:500

M/s.Vishnusurya Projects and Infra Hosur Private Limited,
Agni Business Centre,
No.24/46, K.B.Dasan Road,
3rd Floor, Alwarpet,
Chennai District – 600018.



CONSENT LETTER FROM THE APPLICANT

The Mining Plan in respect of rough stone and gravel quarry lease in patta land at S.F.No's: 3/2C (P), 4/2 (P), 4/5 (P), 4/6 (P), 4/7 & 4/8 (P), over an extent of 3.68.0 hectares of Kariyasandiram Village, Shoolagiri Taluk, Krishnagiri District, Tamil Nadu State has been prepared by

G.UMAMAHESWARAN, M.Sc., QUALIFIED PERSON

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

**G.UMAMAHESWARAN, M.Sc.,
QUALIFIED PERSON**

GEO TECHNICAL MINING SOLUTIONS

(A NABET accredited & ISO certified Company)

No: 1/213-B, Natesan Complex,
Oddapatti, Collectorate Post office, Dharmapuri-636705

Ph: +91 9443937841, +91 7010076633

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

Website: www.gtmsind.com

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

Place: Chennai, TN

Date: 11/04/2022

Signature of the applicant

(M/s.Vishnusurya Projects and Infra Hosur
Private Limited)

M/s.Vishnusurya Projects and Infra Hosur Private Limited

Agni Business Centre,
No.24/46, K.B.Dasan Road,
3rd Floor, Alwarpet,
Chennai District – 600018.



DECLARATION

The Mining Plan in respect of rough stone quarry and gravel lease in Patta land at S.F.No's: 3/2C (P), 4/2 (P), 4/5 (P), 4/6 (P), 4/7 & 4/8 (P), over an extent of 3.68.0 hectares of Kariyasandiram Village, Shoolagiri Taluk, Krishnagiri District, Tamil Nadu State have been prepared with my consultation and I have understood the contents and agree to implement the same in accordance with the Mining Laws.

Place: Chennai, TN

Date: 11/04/2025

Signature of the applicant

(M/s.Vishnusurya Projects and Infra Hosur
Private Limited)

G.UMAMAHESWARAN, M.Sc.,

QUALIFIED PERSON

GEO TECHNICAL MINING SOLUTIONS

(A NABET accredited & ISO certified Company)

No: 1/213-B, Natesan Complex,

Oddapatti, Collectorate Post office, Dharmapuri-636705

Ph: +91 9443937841, +91 7010076633

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

Website: www.gtmsind.com



CERTIFICATE

This is to certify that, the provisions of 19, 20(2) & 22 Tamil Nadu Minor Minerals Concession Rules, 1959 have been observed in the Mining Plan for the grant of rough stone and gravel quarry lease at S.F.No's: 3/2C (P), 4/2 (P), 4/5 (P), 4/6 (P), 4/7 & 4/8 (P), over an extent of 3.68.0 hectares of Kariyasandiram Village, Shoolagiri Taluk, Krishnagiri District, Tamil Nadu State granted to **M/s.Vishnusurya Projects and Infra Hosur Private Limited**, Krishnagiri District.

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

Place: Dharmapuri, TN

Date: 11/04/2025


Signature of the Qualified Person

G.UMAMAHESWARAN, M.Sc.,
Qualified Person
GEO TECHNICAL MINING SOLUTIONS
A NABET Accredited and ISO Certified Company
1/213-B, Ground Floor, Natesan Complex,
Collectorate Post Office, Oddapatti,
Dharmapuri-636705, TamilNadu, India

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Ph: +91 9443937841, +91 7010076633

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

Website: www.gtmsind.com



CERTIFICATE

I certify that, in preparation of Mining Plan for rough stone and gravel quarry lease at S.F.No's: 3/2C (P), 4/2 (P), 4/5 (P), 4/6 (P), 4/7 & 4/8 (P), over an extent of 3.68.0 hectares of Kariyasandiram Village, Shoolagiri Taluk, Krishnagiri District, Tamil Nadu State prepared to **M/s.Vishnusurya Projects and Infra Hosur Private Limited**, Chennai District covers all the provisions of Mines Act, Rules, and Regulations etc., made there under and whenever specific permission are required, the applicant will approach the Director General of Mines Safety, Chennai. The standards prescribed by DGMS in respect of Mines Health will be strictly implemented.

Place: Dharmapuri, TN

Date: 11/04/2015


Signature of the Qualified Person

G.UMAMAHESWARAN, M.Sc.,
Qualified Person
GEO TECHNICAL MINING SOLUTIONS
A NABET Accredited and ISO Certified Company
1/213-B, Ground Floor, Natesan Complex,
Collectorate Post Office, Oddapatti,
Dharmapuri-636705, TamilNadu, India

MINING PLAN

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

Patta land / Open cast-Semi-Mechanized mining/Non-forest/Non-forest land

Lease period 10 Years from the date of lease execution

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

INTRODUCTORY NOTES:

- a) **Introduction:** The Mining plan with progressive quarry closure plan is prepared for M/s.Vishnusurya Projects and Infra Hosur Private Limited, office at Agni Business Centre, No.24/46, K.B.Dasan Road, 3rd Floor, Alwarpet, Chennai District, Tamilnadu State and filed with application for new proposals has submitted to the Deputy Director, Department of Geology and Mining (DDG & M), Krishnagiri dated 04.01.2024 & 25.02.2025 had requested to grant the quarry lease for rough stone and gravel in S.F.No's. 3/2C (P), 4/2 (P), 4/5 (P), 4/6 (P), 4/7 & 4/8 (P), over an extent of 3.68.0 hectares of Kariyasandiram Village, Shoolagiri Taluk, Krishnagiri District, Tamil Nadu State.
- b) **The Precise area communication letter:** The Deputy Director, Department of Geology and mining, Krishnagiri has directed to the applicant M/s.Vishnusurya Projects and Infra Hosur Private Limited, through his precise area communication letter vide Roc.No.30/2024/Mines Dated: 04.04.2025, for quarrying lease rough stone and gravel at Tamil Nadu State, Krishnagiri District, Shoolagiri Taluk, Kariyasandiram Village in S.F.No's. 3/2C (P), 4/2 (P), 4/5 (P), 4/6 (P), 4/7 & 4/8 (P), over an extent of 3.68.0 hectares has recommended as following conditions for a period of Ten (10) years under Rule 19, 20(2) & 22 Tamil Nadu Minor Mineral concession rules, 1959.
- Minerals should be transported on payment of seniority amount for quarried minerals as seen in Schedule II of the Tamil Nadu Minor Mineral Concession Rules, 1959 from time to time.
 - Excavation work should be carried out leaving a safety distance of 7.5m to the adjacent patta lands.
 - The low voltage electrical line in the applied lease area must be removed before the execution of the lease deed and the documents for this must be submitted to this office.

- d) Excavation shall be carried out without disturbance to adjacent lease holders using low strength explosives by authorized experienced explosives operators.
- e) As per the rules, the approved mining plan should be submitted within due time.
- f) Quarrying license will be issued only after approval is submitted to the Environmental Impact Assessment Authority for the area for which the quarrying license is to be issued.
- c) **Preparation and Submission of Mining Plan:** The Mining Plan with progressive quarry closure plan has been prepared under rule 41 and submitted under rule 42 of Tamil Nadu Minor Mineral Concession Rules, 1959 for mining lease as per conditions mentioned in the precise area communication letter Roc.No.30/2024/Mines Dated: 04.04.2025.
- d) **Geological resources and Mineable reserves:** Geological resource of estimated as 2208480m³ or 5935290Ts including the resources of safety zone, gravel etc. Of which, rough stone resources of about 2024440m³ or 5567210Ts, Topsoil is 18404m³ or 36808Ts and gravel is 165636m³ or 331272Ts up to a depth of 60m below ground level. The total mineable reserve is estimated to be 952780m³ or 2502986Ts by deducting the reserve safety zone, block in benches from the total Geological resources. of which, rough stone is about 796565m³ or 2190554Ts, Topsoil is 15622m³ or 31244Ts and gravel is 140594m³ or 281188Ts up to a depth of 60m below ground level (Refer Plate No. IIIA & IVA).
- e) **Proposed Production Schedule:** Total proposed production of rough stone is 796565m³ or 2190554Ts, Topsoil is 15622m³ or 31244Ts and gravel is 140594m³ or 281188Ts up to a depth of 60m below ground level for ten years plan period. (Refer Plate No. VIA).
- f) **Environmental Sensitivity of the proposed lease area: -**
- i). **Interstate boundary:** There is a Karnataka interstate boundary situated 0.4Km radius away on west side of the lease area.
- ii). **Wildlife Sanctuaries any:** There are no notified wildlife sanctuaries within the radius of 10km from the project site under the wildlife (Protection) Act, 1972.
- iii). **Forest (conservation) Act, 1980:** No forest land granted for quarrying and there is no reserve forest within the radius of 60m.

iv). **CRZ Notification, 2019:** There is no Sea coastal zone found within radius of 10km and this project site doesn't attract CRZ Notification, 2019.

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

- Usage of sharp drill bits while drilling which will help in reducing noise.
- Secondary blasting will be totally avoided and hydraulic rock breaker will be used for breaking boulders.
- Controlled blasting with proper spacing, burden, stemming and optimum charge/delay will be maintained.
- Green Belt/Plantation will be developed around the project area and along the haul roads. The plantation minimizes propagation of noise.
- Water will be sprinkled on haul roads twice a day to avoid dust generation during transportation.
- Transportation of material will be carried out during day time and material will be covered with tarpaulin.
- The speed of tippers plying on the haul road will be limited below 20 km/hr to avoid generation of dust.
- And any other conditions as stipulated by the concerned authorities should be followed to protect the environment.

1.0 GENERAL:

a.	Name of the Applicant	:	M/s.Vishnusurya Projects and Infra Hosur Private Limited
	Applicant address	:	Agni Business Centre, No.24/46, K.B.Dasan Road, 3 rd Floor, Alwarpet,
	District	:	Chennai.
	State	:	Tamilnadu
	Pin code	:	600018
	Phone	:	
	Fax	:	Nil
	Gram	:	Nil
	Telex	:	Nil
	E-mail	:	.....
b.	Status of the Applicant		
	Private individual	:	---
	Cooperative Association	:	---
	Private company	:	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 Ten (10) years.
	Name of the QP preparing the Mining Plan	:	G.UMAMAHESWARAN, M.Sc., Qualified Person
	Address	:	Geo Technical Mining Solutions (A NABET Accredited & ISO certified Company) No: 1/213-B, 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
	Registration number	:	Nil
	Date of grant/renewal	:	Nil
	Valid upto	:	Nil
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, Natesan Complex, Oddapatti, Collectorate Post office, Dharmapuri-636705 Web site: www.gtmsind.com
	Phone	:	+91 9443937841, 7010076633
g.	Reference No. and date of consent letter from the state government	:	The precise area communication letter issued by the Deputy Director, Department Geology and Mining, Krishnagiri vide Roc.No.30/2024/Mines Dated: 04.04.2025



2.0 LOCATION AND ACCESSIBILITY:

a. Details of the Area:	:	Refer plate no: IA & IB
District & State	:	Krishnagiri, Tamil Nadu
Taluk	:	Shoolagiri
Village	:	Kariyasandiram



Khasra No./ Plot No./ Block Range/ Felling Series etc.:

Survey No	Sub Division	Total Extent in Hect	Patta No.	Village and Name of the Land Owner	Mine lease Applied S.F.No.	Mine lease Applied area out of total area in hect.
3	2C	1.72.5	348	M/s.Vishnusurya Projects and Infra Hosur Private Limited	3/2C (P)	1.15.4
4	2	2.18.0			4/2 (P)	1.08.1
4	5	0.84.0			4/5 (P)	0.46.0
4	6	0.54.0			4/6 (P)	0.44.0
4	7	0.39.0			4/7	0.39.0
4	8	0.20.0			4/8 (P)	0.15.5
Total Extent		5.87.5	Applied lease area extent			3.68.0

Lease area (hectares)	:	3.68.0 Hectares
Whether the area is recorded to be in forest (please specify whether protected, reserved, etc)	:	The proposed lease area is recorded as patta land. Copy of land documents are enclosed. (Ref.Anne.No: IV)
Ownership / Occupancy	:	This is a patta land S.F.No's. 3/2C (P), 4/2 (P), 4/5 (P), 4/6 (P), 4/7 & 4/8 (P) is registered on the name of M/s.Vishnusurya Projects and Infra Hosur Private Limited as patta no. 348.
Existence of Public Road / Railway line if any nearby and approximate distance	:	✓ Exploited quarry materials will be transported through the approach road is situated on the southeast side of the lease area. ✓ There is an MDR-456 is situated about 1.5km radius away on the south side of the lease area. ✓ There is a SH-53 road situated about 5km radius away on west side of the lease area.

	✓ There is no NH road situated around radius from the lease area. ✓ There is no railway line is situated around 5km radius from the lease area.																																										
Toposheet No. with latitude and longitude	: Toposheet No. 57 L/01 Latitude: From 12°48'31.93"N to 12°48'39.02"N Longitude: From 78°1'2.96"E to 78°1'10.87"E																																										
Geo-Coordinates of the lease boundary:																																											
<table border="1"> <thead> <tr> <th>PILLAR No</th><th>LATITUDE</th><th>LONGITUDE</th></tr> </thead> <tbody> <tr><td>1</td><td>12°48'39.02"N</td><td>78° 1'10.15"E</td></tr> <tr><td>2</td><td>12°48'36.47"N</td><td>78° 1'10.19"E</td></tr> <tr><td>3</td><td>12°48'32.68"N</td><td>78° 1'10.87"E</td></tr> <tr><td>4</td><td>12°48'32.10"N</td><td>78° 1'10.72"E</td></tr> <tr><td>5</td><td>12°48'31.93"N</td><td>78° 1'9.73"E</td></tr> <tr><td>6</td><td>12°48'32.02"N</td><td>78° 1'8.14"E</td></tr> <tr><td>7</td><td>12°48'32.59"N</td><td>78° 1'7.75"E</td></tr> <tr><td>8</td><td>12°48'32.91"N</td><td>78° 1'6.37"E</td></tr> <tr><td>9</td><td>12°48'33.43"N</td><td>78° 1'6.35"E</td></tr> <tr><td>10</td><td>12°48'33.80"N</td><td>78° 1'5.83"E</td></tr> <tr><td>11</td><td>12°48'34.37"N</td><td>78° 1'2.96"E</td></tr> <tr><td>12</td><td>12°48'38.94"N</td><td>78° 1'3.98"E</td></tr> <tr><td>13</td><td>12°48'37.97"N</td><td>78° 1'7.00"E</td></tr> </tbody> </table>		PILLAR No	LATITUDE	LONGITUDE	1	12°48'39.02"N	78° 1'10.15"E	2	12°48'36.47"N	78° 1'10.19"E	3	12°48'32.68"N	78° 1'10.87"E	4	12°48'32.10"N	78° 1'10.72"E	5	12°48'31.93"N	78° 1'9.73"E	6	12°48'32.02"N	78° 1'8.14"E	7	12°48'32.59"N	78° 1'7.75"E	8	12°48'32.91"N	78° 1'6.37"E	9	12°48'33.43"N	78° 1'6.35"E	10	12°48'33.80"N	78° 1'5.83"E	11	12°48'34.37"N	78° 1'2.96"E	12	12°48'38.94"N	78° 1'3.98"E	13	12°48'37.97"N	78° 1'7.00"E
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Land use pattern (Forest, Agricultural, Grazing, Barren etc.)	: It is an barren and Ryotwari land.																																										
b. <i>Attach a general location and vicinity map showing area boundaries and existing and proposed access routs. It is preferred that the area to be marked on a survey of India topographical map or a cadastral map or forest map as the case may be. However if none of these are available, the area should be shown on an accurate sketch map on scale of 1 : 5000.</i>	: Refer plate no-IA & IB																																										

i) INFRASTRUCTURE AND COMMUNICATION:

S.No	Description	Place	Distance	Direction
a.	Nearest post office	Berigai	4.8km	West
b.	Nearest police station	Berigai	5.0km	West
c.	Nearest fire station	Hosur	23.2km	Southwest
d.	Nearest medical facility	Berigai	5.2Km	West
e.	Nearest school	Berigai	4.3km	West
f.	Nearest railway station	Hosur	23.5km	Southwest
g.	Nearest port facility	Chennai	248km	Northeast
h.	Nearest airport	Bangalore	41.2km	Northwest
i.	Nearest DSP office	Hosur	23.3km	Southwest
j.	Nearest villages	Golapalli	1.7km	North
		Nerigam	1.8km	East
		Mutuguriki	1.2Km	South
		Suligunta	2.2km	West

PART – A

3.0 GEOLOGY AND MINERAL RESERVES:

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

(i)	Topography	:	The proposed lease area is flat topography. The maximum elevation (885m) was observed west side of the lease area and minimum elevation (884m) was observed east side of the site. The slope is towards east side and falls in Toposheet no. 57 L/01
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(ii) **General Geology of the District:**

The geological formations of the district belong mainly to Archaean age along with rock of Proterozoic age. The former is represented by Khondalite Group of rocks, Charnockite Group of rocks, Migmatites Complex, Sathyamangalam Group of rocks, while the latter is represented by Alkaline rocks. The Khondalite Group includes garnet sillimanite gneiss and quartzite which occur as small patches. The migmatite complex includes garnetiferous quartz feldspathic gneiss and hornblends biotite gneiss, the former exposed on the western part of the district. The Sathyamangalam Group includes fuchsite quartzite, sillimanite mica schist and amphibolites. The Bhavani Group in this area includes fissile hornblende-biotite gneiss, granitoid gneiss and pink migmatite. Amphibolites with barbed ferruginous quartzite and associated quartzo-feldspathic rocks (Champion Gneiss) represent the Kolar group and are found west and southwest of Epiphany. Following this there are basic intrusions occurring as dykes.

The Charnockite Group occupies a major part of the south-west portion of this district with small bands of garnetiferous quartzo-feldspathic gneiss, Granite gneiss and dolerite dykes. The North-East and Northern part of the district mainly consist of granite gneiss with small patches of Pink Migmatite, hornblende-biotite gneiss and dolerite dykes. The Eastern part of the district consists of Epidote-Hornblende Gneiss, Ultra Mafics, Syenite and Carbonatite.

Order of superposition of the proposed lease area,

Age	Group	Rock Formation
Recent to Sub recent	----	Top Soil (2m Thick)

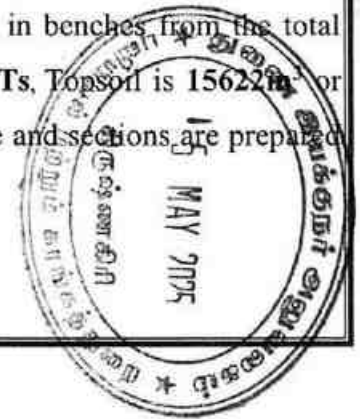
	Archean to Lower Proterozoic	Migmatite complex	Pegmatite and Quartz veins Dolerite dyke Peninsular gneisses and Migmatites									
	Archean	Charnockite Group	Charnockite quartzo-feldspathic gneisses									
(iii)	Local / Mine Geology of The Mineral Deposit: Topography of the proposed lease area: The proposed lease area is flat terrain. The maximum elevation (885m) was observed west side of the lease area and minimum elevation (884m) was observed east side of the site. The rocks exhibits layered, medium to coarse grained hornblende biotite, orthopyroxene charnockite gneiss. The topsoil is obtained the average of 0-0.5m, gravel is obtained the average of 0.5-5.0m and a rough stone starts from 5.0m to 60m (R.L885m-825m). The Surface plan showing elevation, contour, accessibility road and Geological map was prepared the proposed lease area. 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. 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. 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 granulite's 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, <table><tr><th>Age</th><th>Group</th><th>Rock Formation</th></tr><tr><td>Recent to Sub recent</td><td>----</td><td>Top soil & Gravel</td></tr><tr><td>Archaean</td><td>Charnockite Group</td><td>Charnockites.</td></tr></table>			Age	Group	Rock Formation	Recent to Sub recent	----	Top soil & Gravel	Archaean	Charnockite Group	Charnockites.
Age	Group	Rock Formation										
Recent to Sub recent	----	Top soil & Gravel										
Archaean	Charnockite Group	Charnockites.										
(iv)	Drainage Pattern	:	There is no major river or water bodies found									

		within 50m radius. The drainage in the area is sub-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:	: The QP examined the surface features during survey. It is a fresh quarry lease.
	b. Surface Plan	: Surface plan showing elevation contour and accessibility road was prepared at the scale of 1: 1000, as shown in Plate No. III.
(c)	Geological sections should be prepared at suitable intervals on a scale of 1: 1000 / 1: 2000:	: Longitudinal and transverse geological cross sections were prepared at the horizontal scale of 1: 1000 and at the vertical scale of 1:500, as shown in Plate No. IIIA
(d)	<i>Broadly indicate the Yearwise future programme of exploration, taking into consideration the future production programme planned in next five years as in table below:-</i> No future programmed proposed in this area. Its massive homogeneous parent rock. Hence exploration proposal is not required to this mining project.	
<i>(e) Indicate geological and recoverable reserves and grade, duly supported by standard method of estimation and calculations along with required sections (giving split up of various categories i.e. proved, probable, possible). Indicate cut-off grade. Availability of resources should also be indicated for the entire leasehold.</i> The geological resources were computed by cross section method with respect to the boundaries of the lease area. In this method, the lease area was divided into one longitudinal and three transverse section to calculate the volume of material up to the depth of 60m below ground level for ten years plan period. (Refer Plate No. III & IIIA). The one longitudinal and transverse cross section were assigned XY-AB as respectively. Using the cross-sectional method, total reserve is estimated to be 2208480m³ or 5935290Ts including the resources of safety zone, and gravel, etc. Of which, rough stone resources of about 2024440m³ or 5567210Ts, Topsoil is 18404m³ or 36808Ts and gravel is 165636m³ or 331272Ts.		

GEOLOGICAL RESOURCES												
Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume in M ³	Rough Stone in M ³	Topsoil in M ³	Gravel in M ³	Bulk Density	Rough Stone in (Ts)	Topsoil in (Ts)	Gravel in (Ts)
XY-AB	I	214	172	0.5	18404	.....	18404	.....	2	.....	36808	.....
	I	214	172	4.5	165636	.....	.....	165636	2	.....	.....	331272
	II	214	172	5	184040	184040	.....	.....	2.75	506110	.....	.....
	III	214	172	5	184040	184040	.....	.....	2.75	506110	.....	.....
	IV	214	172	5	184040	184040	.....	.....	2.75	506110	.....	.....
	V	214	172	5	184040	184040	.....	.....	2.75	506110	.....	.....
	VI	214	172	5	184040	184040	.....	.....	2.75	506110	.....	.....
	VII	214	172	5	184040	184040	.....	.....	2.75	506110	.....	.....
	VIII	214	172	5	184040	184040	.....	.....	2.75	506110	.....	.....
	IX	214	172	5	184040	184040	.....	.....	2.75	506110	.....	.....
	X	214	172	5	184040	184040	.....	.....	2.75	506110	.....	.....
	XI	214	172	5	184040	184040	.....	.....	2.75	506110	.....	.....
	XII	214	172	5	184040	184040	.....	.....	2.75	506110	.....	.....
TOTAL					2208480	2024440	18404	165636	.....	5567210	36808	331272

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

The mineable reserve is estimated to be **952780m³** or **2502986Ts** by deducting the reserve safety zone, block in benches from the total Geological resources up to a depth of 60m below ground level. Of which, rough stone is about **796565m³** or **2190554Ts**, Topsoil is **15622m³** or **31244Ts** and gravel is **140594m³** or **281188Ts**. The commercially viable rough stone has been prepared on 1: 1000 scale and sections are prepared in a scale of 1:1000 in horizontal axis and 1:500 as vertical axis (Refer plate no's. IV & IVA).



MINEABLE RESEVES

Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume In M ³	Rough Stone in M ³	Topsoil in M ³	Gravel in M ³	Bulk Density	Rough Stone in (Ts)	Topsoil in (Ts)	Gravel in (Ts)
XY-AB	I	199	157	0.5	15622	.....	15622	.....	2	.....	31244	.....
	I	199	157	4.5	140594	.....	.....	140594	2	.....	.....	281188
	II	189	147	5	138915	138915	.....	.....	2.75	382016	.....	.....
	III	179	137	5	122615	122615	.....	.....	2.75	337191	.....	.....
	IV	169	127	5	107315	107315	.....	.....	2.75	295116	.....	.....
	V	159	117	5	93015	93015	.....	.....	2.75	255791	.....	.....
	VI	149	107	5	79715	79715	.....	.....	2.75	219216	.....	.....
	VII	139	97	5	67415	67415	.....	.....	2.75	185391	.....	.....
	VIII	129	87	5	56115	56115	.....	.....	2.75	154316	.....	.....
	IX	119	77	5	45815	45815	.....	.....	2.75	125991	.....	.....
	X	109	67	5	36515	36515	.....	.....	2.75	100416	.....	.....
	XI	99	57	5	28215	28215	.....	.....	2.75	77591	.....	.....
	XII	89	47	5	20915	20915	.....	.....	2.75	57516	.....	.....
TOTAL					952780	796565	15622	140594	.....	2190554	31244	281188



4.0 MINING:

- a) Briefly describe the existing / proposed method for developing / working the deposit with all design parameters.
(Note: In case of pocket deposits, sequence of development/working may be indicated on the same plan)
- The mining operation is open-cast, semi-mechanized method are adopted and on single shift basis only. Under the regulation 106 of the Metalliferous Mines Regulations, 1961 in all open cast workings in hard rock, the benches and sides should be properly benched and sloped. The bench height should not exceed 6m and the bench width should not less than the bench height. The slope of the benches should not exceed 45° from horizontal.

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

Total proposed production for ten years of rough stone is about 796565m³ or 2190554Ts, Topsoil is 15622m³ or 31244Ts and gravel is 140594m³ or 281188Ts up to a depth of 60m below ground level. Refer Plate No's. VI & VIA).

Year	Pit No.(s)	Topsoil/ Overburden (m ³)	ROM (m ³)	Saleable rough stone (m ³) @ 100%	Saleable rough stone (Ts) @ 100%	Rough stone rejects(m ³)	Sub grade/ Weathered rock (m ³)	Saleable Gravel (m ³)	Saleable Gravel (m ³)	Rough stone to waste ratio
I	I	5888	144325	85450	234988	...	...	52988	105976	...
II	I	4867	136710	88040	242110	...	...	43803	87606	...
III	I	4867	136710	88040	242110	...	...	43803	87606	...
IV	I	...	82975	82975	228181	...	...	...	...	...
V	I	...	82525	82525	226944	...	...	...	...	...
VI	I	...	79915	79915	219766	...	...	...	...	...
VII	I	...	76280	76280	209770	...	...	...	...	...
VIII	I	...	73615	73615	202441	...	...	...	...	...
IX	I	...	70830	70830	194783	...	...	...	...	...
X	I	...	68895	68895	189461	...	...	...	...	...
Grand Total		15622	952780	796565	2190554	...	...	140594	281188	...

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

YEARWISE PRODUCTION RESERVES													
Year	Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume In M ³	Rough Stone in M ³	Topsoil in M ³	Gravel in M ³	Bulk Density	Rough Stone in (Ts)	Topsoil in (Ts)	Gravel in (Ts)
I-YEAR	XY-AB	I	75	157	0.5	5888	.....	5888	.....	2	.....	11776	.....
		I	75	157	4.5	52988	.....	.....	52988	2	.....	.....	105976
		II	65	147	5	47775	47775	.....	.....	2.75	131381	.....	.....
		III	55	137	5	37675	37675	.....	.....	2.75	103606	.....	.....
TOTAL						144325	85450	5888	52988	.....	234988	11776	105976
II-YEAR	XY-AB	I	62	157	0.5	4867	.....	4867	.....	2	.....	9734	.....
		I	62	157	4.5	43803	.....	.....	43803	2	.....	.....	87606
		II	62	147	5	45570	45570	.....	.....	2.75	125318	.....	.....
		III	62	137	5	42470	42470	.....	.....	2.75	116793	.....	.....
TOTAL						136710	88040	4867	43803	.....	242110	9734	87606
III-YEAR	XY-AB	I	62	157	0.5	4867	.....	4867	.....	2	.....	9734	.....
		I	62	157	4.5	43803	.....	.....	43803	2	.....	.....	87606
		II	62	147	5	45570	45570	.....	.....	2.75	125318	.....	.....
		III	62	137	5	42470	42470	.....	.....	2.75	116793	.....	.....
TOTAL						136710	88040	4867	43803	.....	242110	9734	87606
IV-YEAR	XY-AB	IV	80	127	5	50800	50800	.....	.....	2.75	139700	.....	.....
		V	55	117	5	32175	32175	.....	.....	2.75	88481	.....	.....
TOTAL						82975	82975	0	0	.....	228181	0	.....



V-YEAR	XY-AB	V	15	117	5	8775	8775	.....	.....	2.75	24131	.....	.....
		VI	60	107	5	32100	32100	.....	.....	2.75	88275	.....	.....
		VII	50	97	5	24250	24250	.....	.....	2.75	66688	.....	.....
		VIII	40	87	5	17400	17400	.....	.....	2.75	47850	.....	.....
TOTAL						82525	82525	0	0	.....	226944	0	0
VI-YEAR	XY-AB	III	89	127	5	56515	56515	.....	.....	2.75	155416	.....	.....
		IV	40	117	5	23400	23400	.....	.....	2.75	64350	.....	.....
TOTAL						79915	79915	0	0	.....	219766	0	0
VII-YEAR	XY-AB	V	49	117	5	28665	28665	.....	.....	2.75	78829	.....	.....
		VI	89	107	5	47615	47615	.....	.....	2.75	130941	.....	.....
TOTAL						76280	76280	0	0	.....	209770	0	0
VIII-YEAR	XY-AB	VII	89	97	5	43165	43165	.....	.....	2.75	118704	.....	.....
		VIII	70	87	5	30450	30450	.....	.....	2.75	83738	.....	.....
TOTAL						73615	73615	0	0	.....	202441	0	0
IX-YEAR	XY-AB	VIII	19	87	5	8265	8265	.....	.....	2.75	22729	.....	.....
		IX	119	77	5	45815	45815	.....	.....	2.75	125991	.....	.....
		X	50	67	5	16750	16750	.....	.....	2.75	46063	.....	.....
TOTAL						70830	70830	0	0	.....	194783	0	0
X-YEAR	XY-AB	X	59	67	5	19765	19765	.....	.....	2.75	54354	.....	.....
		XI	99	57	5	28215	28215	.....	.....	2.75	77591	.....	.....
		XII	89	47	5	20915	20915	.....	.....	2.75	57516	.....	.....
TOTAL						68895	68895	0	0	.....	189461	0	0
GRAND TOTAL						952780	796565	15622	140594	.....	2190554	31244	81188



d)	Attach supporting composite plan and section showing pit layouts, dumps, stacks of sub-grade mineral, if any, etc.	:	Composite plan not prepared in this proposed lease area
e)	Indicate proposed rate of production when the mine is fully developed and the expected life of the mine and the year from which effected: At this rate of production, the expected life of quarry is calculated as given below: <u>Rough stone:</u> Mineable reserves of rough stone (10 Years) = 796565m³ or 2190554Ts Annual Peak production = 88040m³ or 242110Ts <u>Gravel:</u> Mineable reserves of gravel = 140594m³ or 281188Ts		
f)	Attach a note furnishing a conceptual mining plan for the entire lease period (for "B" category mines) and upto the life of the mine (for "A" category mines) based on the geological, mining and environments considerations:		
i)	Time frame of completion of mineral exploration program in leasehold area: Give broad description identified potential areas to be covered in the given time frame:	:	Considering the indefinite depth persistence of the rough stone deposit is proved beyond the workable limits about up to a depth of 60m below ground level from the petrogenetic character of the charnockite rock as well as from the actual mining practice in the area and with the current trend of rough stone production the quarry may sustain for 10 years.
ii)	Whether ultimate pit limit has been determined and demarcated on surface and geological plan :- The ultimate pit limit has been determined and demarcated in the conceptual plan		



SECTION XY-AB						
Bench	Period	Overburden/ Mineral	L (m)	W (m)*	D (m)	
I	Ten years plan Period	Topsoil	199	137	0.5	4.31ருந்துணைகிரி மற்றும் காகுத்திமுறை
I		Gravel	199	157	4	
II		Rough Stone	189	147	5	
III			179	137	5	
IV			169	127	5	
V			159	117	5	
VI			149	107	5	
VII			139	97	5	
VIII			129	87	5	
IX			119	77	5	
X			109	67	5	
XI			99	57	5	
XII	89	47	5			
Total Depth					60	
iii)	Whether the site for disposal of waste rock or an un-saleable material have/ has been examined for adequacy of land and suitability of long term use in the event of continuation of mining activity: -		:	The recovery of rough stone in this quarry is 100%. 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 for storage of rain water and may be converted in to dumping yards for solid waste by adopting suitable technologies.		
g)	Open cast mining					
i)	Describe briefly giving salient features of the mode of working (Mechanized, Semi-Mechanized, manual)		:	It is a fresh quarry lease. The mining operation is opencast, semi-mechanized methods are adopted and on single shift basis only. Under the regulation 106 of the		

		Metalliferous Mines Regulations, 1961 in all opencast workings in hard rock, the benches and sides should be properly benched and sloped. The bench height should not exceed 6m and the bench width should not less than the bench height. The slope of the benches should not exceed 45° from horizontal.
ii)	Describe briefly the layout of mine workings, the layout of faces and sites for disposal of overburden/waste. A reference to the plans enclosed under 4(b) and 4(d) will suffice	The rough stone is proposed to quarry at 5m bench height & width conventional opencast semi mechanized quarrying operation using shot hole drilling with the help of tractor mounted compressor attached with jack hammers, smooth blasting and waste and are removal using Hydraulic excavator and loaded directly to the tippers and transported to the needy customer. Bench height = 5mts. Bench width = 5mts.
	a. Details of Topsoil/Overburden	There is a topsoil of 15622m ³ or 31244Ts will be removed and stacked for earth bund in the lease area.
	b. Rough Stone waste and side burden waste:-	The recovery of rough stone and gravel in this quarry is 100%. There is no rough stone waste or side burden will be removed.
H	Underground Mining	Not applicable
i)	Extent of mechanization: Describe briefly including the calculation for adequacy and type of machinery and equipment proposed to be used in different mining operations.	

(1) Drilling Machines:

Drilling of shot holes will be carried out using tractor mounted compressor and jack hammer. Details of drilling equipment's are given below.

Type	Nos	Dia of hole (mm)	Size / Capacity	Make	Motive power	H.P.
Jack Hammer	4	32 mm	Hand held	--	Diesel	--
Compressor	2	--	Air	--	Diesel	--

(2) Loading Equipment:

Type	Nos	Size / Capacity	Make	Motive power	H.P.
Hydraulic Excavator	2	2.9-4.5m ³	--	Diesel	--

(3) Haulage and Transport Equipment

(a) Haulage within the mining leasehold:

Type	Nos	Size / Capacity	Make	Motive power	H.P.
Tipper	12	--	--	Diesel	--

Whether the dumpers are fitted with exhaust conditioner should be indicated:

The dumpers not used in this quarry area, hence it's a small B category mine.

- b) Transport from mine head to the destination : Tipper will be used for transport rough stone from the mine head to needy customer.
- c) Describe briefly the transport system (please specify) : Hydraulic excavator and tippers utilized for internal transport sizeable rough stone lumps and deliver to the customer's area.
- i) Ore transported by: own trucks / hired trucks : Hired trucks for initially production purposes.
- ii) Main destination to which ore is transported (giving to and from distance) : The excavated stone materials road metal will be supplied to the consumers like road laying, earth filling, building construction, etc

a) Details of hauling / transport equipment:

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

4) (4). Miscellaneous:

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

- (A) Operations : The mining operation is open-cast, semi-mechanized methods are adopted and on single shift basis only.

(B) Machineries deployed : Machineries like Tractor mounted compressor attached with jack hammers is proposed to drilling and blasting. Hydraulic Excavators and tipper combination are adapted.

5 **BLASTING:**

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

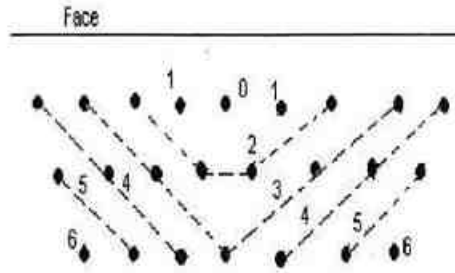
Blasting pattern:

The quarrying operation is proposed to carried by open cast mining in conjunction with conventional method using jack hammer drilling and blasting for shattering effect and loosen the rough stone.

Rough stone production for 10 years = **796565m³** or **2190554Ts**

BLAST DESIGN	
Blasthole Diameter (D) in mm	32
Burden (B) in m	1.2
Spacing (S) in m	1.38
Subdrill in m	0.5
Charge length (C) in m	0.70
Stemming	0.5
Hole Length (L) in m	1.2
Bench Height (BH) in m	2.5
Mass of explosive/hole in g	437.5
Stemming material size in mm	3.2
Burden stiffness ratio	2.08
Blast volume/hole in m ³	4.14
Production of rough stone/day in m ³	284
Number of blast holes/day	69
Number of blast round/day	3
Blasthole pattern	Staggered
Mass of explosive /day in kg	30.06
Powder factor in kg/m ³	0.11
Loading density	0.63
Type of explosives	Slurry
Diameter of packaging in mm	25
Initiation system	NONEL

Note: If >2kg of explosives per day use for blasting if proponent get the permission from the DGMS



Staged method of mining



b) Type of explosives used / to be used:

Following explosives are recommended for efficient blasting with safe practice.

Small dia. 25mm slurry explosives are proposed to be used for shattering and heaving effect for removal and winning of rough stone. No deep hole drilling or primary blasting is proposed.

c) Measures proposed to minimize ground vibration due to blasting:

The control blasting measures is being adopted for minimizing ground vibration and fly rock.

Shallow depths jack hammer drilling and blasting is proposed to be carried out with minimum use of explosive mainly to give hearing effect in rough stone for easy excavation and to control fly rock.

Delay detonators:

Delay blasting permits to divide the shot to smaller charges, which are detonated in a predetermined millisecond sequence at specific time intervals. The major advantages of delay blasting are:

- ❖ Reduction of ground vibration
- ❖ Reduction in air blast
- ❖ Reduction in over break
- ❖ Improved fragmentation
- ❖ Better control of fly rock

Blasting program for the production per day

No of holes	:	69 holes
Yield	:	284m ³
Total explosive required	:	30.06kg-Slurry explosives
Charge per hole	:	0.5kg
Blasting at day time only	:	12.0p.m-1.0p.m

c)	Powder factor in ore and overburden / waste / development heading / stope	:	Powder factor is proposed as 0.11kg per hole of explosives
d)	Whether secondary blasting is needed, if so describe it briefly	:	There is no secondary blasting involved.
e)	Storage of explosives (like capacity and type of explosive magazine)	:	1. The applicant is advised to engage an authorized explosive agency to carry out blasting. 2. First Aid Box will be keeping ready at all the time.

		3. Necessary precautionary announcement will be carried out before the blasting operation.
6.	MINE DRAINAGE:	
a)	Likely depth of water table based on observations from nearby wells and water bodies :	The ground water table is reported as of 75m in summer and 70m in rainy season from the below ground level observed in the adjacent bore well.
b)	Workings expected to be _____ m. above / reach below water table by the year _____ :	Proposed mining depth is 60m below ground level. Now, the present Mining lease shall be proposed above the water table and hence, quarrying may not affect the ground water.
c)	Quantity and quality of water likely to be encountered, the pumping arrangements and places where the mine water is finally proposed to be discharged :	The ground water may not rise immediately in this type of mining. However, the rain water percolation and collection of water from the seepage shall be less than 300 L pm and it shall be pumped out periodically by a stand by diesel powered Centrifugal pump motivated with 7.5 H.P. Motor. The quality of water is potable and it is not contaminated with any hazardous things.
7.	STACKING OF MINERAL REJECTS AND DISPOSAL OF WASTE:	
a).	Indicate briefly the nature and quantity of top soil, overburden / waste and mineral rejects likely to be generated during the years: No other wastes are removed during years.	
b).	Land chosen for disposal of waste with proposed justification :	There is a topsoil of 15622m ³ or 31244Ts will be removed and stacked for earth bund in the lease area.
c).	Attach a note indicating the manner of disposal and configuration, sequence of buildup of dumps along with the proposals for the stacking of sub-grade ore, to be indicated Year wise. :	The recovery of rough stone in this quarry is 100%. If rough stone may be unsold will be keep within the lease boundary.
8.	USE OF MINERAL:	
a).	Describe briefly the end-use of the mineral (sale to :	The excavated stone materials will be supplied to the consumers like stone pillar,

	intermediary parties, captive consumption, export, industrial use)		sized stone, etc. For instance, aggregates are mostly used for building, roads and footpaths., etc
b).	Indicate physical and chemical specifications stipulated by buyers	:	Basically, the materials produced at this quarry are rough stone (charnockite) the same are used for building materials and road metal. So, there is no chemical specifications are specified. Only physical specifications are involved.
c).	Give details in case blending of different grades of ores is being practiced or is to be practiced at the mine to meet specifications stipulated by buyers.	:	Not blending process is involved, after blasting the rough stone will be directly loaded to the needy customer.
9.	OTHERS		
	Describe briefly the following a) Site services	:	Infrastructure required for such mines like office, stores, canteen, first aid station, shelter latrine and bath rooms have been provided as per the Metalliferous Mines Regulations, 1961 as a welfare amenity for our quarry laborers.
	b) Employment potential: As per Mines safety under the provisions of Metalliferous Mines Rules, 1961 under the Mines Act, 1952, whenever the workers are employed more than 10, it is preferred to have a qualified Mining Mate to keep all the production workers directly under his control and supervision. The following man power is proposed for quarrying stone material during the ten years period the same manpower will be utilize for this mining plan period to achieve the proposed production and to comply the provisions of as per the MMR, 1961 norms.		
1.	Highly Skilled	Mines Manager	1No.
		Mine Engineer	1No.
		Mine Geologist	--
		Blaster	1No
2.	Unskilled	Musdoor / Labours	26 No's
			Total = 29No's

10	MINERAL PROCESSING/BENEFICIATIONS:	
(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.	Excavated rough stone minerals directly will be used by the applicant for required size ½, ¾ and 1½ inches Jelly which are mainly used in road and building construction purpose. The recovery of rough stone in this quarry is 100%.
(b)	Explain the disposal method for tailings or waste from the processing plant (quantity and quality of tailings proposed to be discharged, size and capacity of tailing pond, toxic effect of such tailings, if any, with process adopted to neutralize any such effect before their disposal and dealing of excess water from the tailing dam).	No 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 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	Drinking is 0.3KLD, utilized water is 0.7KLD, Dust suppression is 1.5KLD and

mining and processing and sources of supply of water. Disposal of water and of recycling.

Green Belt is 1.5KLD. Minimum quantity of water 4.0KLD per day. It is proposed to make an authorized water vendors for drinking water, dust suppression. The workers utilized water will be used for green belt development.

The sewage water to a tune of 0.9KLD generated from the mine office toilet and mine labour toilet will be diverted to the septic tank followed by soak pit.

PART – B

11.0 ENVIRONMENTAL MANAGEMENT PLAN:

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

11.1	Fresh lease land use pattern indicating the area already degraded due to quarrying /pitting, dumping, roads, processing plant, workshop, township etc in a tabular form. The present land use pattern is given as below.																									
	<table><tr><th>Sl. No.</th><th>Land Use</th><th>Present area (Hect.)</th></tr><tr><td>1.</td><td>Area under Mining</td><td>Nil</td></tr><tr><td>2</td><td>Infrastructure</td><td>Nil</td></tr><tr><td>3</td><td>Roads</td><td>0.03.0</td></tr><tr><td>4</td><td>Unutilized</td><td>2.78.2</td></tr><tr><td>5</td><td>Dump</td><td>0.86.8</td></tr><tr><td>6</td><td>Settling Tank & Drainage</td><td>Nil</td></tr><tr><td></td><td>Grand Total</td><td>3.68.0</td></tr></table>	Sl. No.	Land Use	Present area (Hect.)	1.	Area under Mining	Nil	2	Infrastructure	Nil	3	Roads	0.03.0	4	Unutilized	2.78.2	5	Dump	0.86.8	6	Settling Tank & Drainage	Nil		Grand Total	3.68.0	
Sl. No.	Land Use	Present area (Hect.)																								
1.	Area under Mining	Nil																								
2	Infrastructure	Nil																								
3	Roads	0.03.0																								
4	Unutilized	2.78.2																								
5	Dump	0.86.8																								
6	Settling Tank & Drainage	Nil																								
	Grand Total	3.68.0																								
11.2	Water Regime	: Water table in this area is noticed at a depth of 75m in summer and 70m in rainy season from the below ground level and presently the quarrying of rough stone is ultimate up to a depth of 60m below ground level. Hence, it will not affect the ground water depletion of this area. It is proposed to make an authorized water vendors for drinking water, dust suppression. The workers utilized water will be used for green belt development.																								
11.3	Flora and Fauna	: There is no major flora observed in this area and except bushes, shrubs, no other valuable trees are noticed in the lease area. Further, neither flora of botanical interest nor fauna of zoological interest is noticed in this area.																								
11.4	Quality of air, ambient noise level and water	: Air or dust expected to be generated from drilling process, hauling roads, places of excavation etc., will be suppressed by periodical wetting of land by water spraying. Quarrying of rough stone will be carried out by drilling and blasting by using low power explosives, and hence, noise will be very																								



			minimum. However, periodical noise level monitoring will be carried out every six months around the quarry site.																									
11.5	Climatic conditions: Krishnagiri, India weather forecasted for the maximum temperature of 29°C / 84°F. Min temperature will be 18°C/64°F. Most precipitation falling will be 8.20mm/0.32inch. Windiest day is expected to see wind of upto 17kmph/ 11mph.																											
11.6	Human Settlement: The nearest villages are found in the buffer zone with population as per 2011 census. <table><tr><th>S.No</th><th>Village</th><th>Direction</th><th>Distance in Kms</th><th>Population</th></tr><tr><td>1</td><td>Golapalli</td><td>North</td><td>1.7km</td><td>534</td></tr><tr><td>2</td><td>Nerigam</td><td>East</td><td>1.8km</td><td>1034</td></tr><tr><td>3</td><td>Mutuguriki</td><td>South</td><td>1.2Km</td><td>822</td></tr><tr><td>4</td><td>Suligunta</td><td>West</td><td>2.2km</td><td>962</td></tr></table>			S.No	Village	Direction	Distance in Kms	Population	1	Golapalli	North	1.7km	534	2	Nerigam	East	1.8km	1034	3	Mutuguriki	South	1.2Km	822	4	Suligunta	West	2.2km	962
S.No	Village	Direction	Distance in Kms	Population																								
1	Golapalli	North	1.7km	534																								
2	Nerigam	East	1.8km	1034																								
3	Mutuguriki	South	1.2Km	822																								
4	Suligunta	West	2.2km	962																								
11.7	Public buildings, places of worship and monuments	:	No infrastructure like residential building, are found within radius of 300m. The places of special interest like archeological monuments, Sanctuaries, etc., are not found around 10km radius.																									
11.8	Attach plans showing the locations of sampling stations	:	The proposed Ambient air quality, Water quality Ambient noise level and vibration are periodically tested for every season (6 months once) around 5km radius as per the guidance of MoEF and EIA Notification 2006 and also covering DGMS norms.																									
11.9	Does area (partly or fully) fall under notified area under Water (Prevention & Control of Pollution), Act, 1974	:	The proposed area not fall under notified area under Water (Prevention & Control of Pollution), Act, 1974																									

b) Attach an Environmental Impact Assessment Statement describing the impact of Mining and beneficiation on environment on the following over the next five years (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> <tr> <th>Sl. No.</th><th>Land Use</th><th>Area in use during the quarrying period (Hect.)</th></tr> <tr> <td>1</td><td>Area under Mining</td><td>2.99.12</td></tr> <tr> <td>2</td><td>Infrastructure</td><td>0.02.0</td></tr> <tr> <td>3</td><td>Roads</td><td>0.03.0</td></tr> <tr> <td>4</td><td>Green Belt</td><td>0.56.23</td></tr> <tr> <td>5</td><td>Un-Utilized Area</td><td>Nil</td></tr> <tr> <td>6</td><td>Drainage & Settling Tank</td><td>0.07.65</td></tr> <tr> <td colspan="2">Grand Total</td><td>3.68.0</td></tr> </table>		Sl. No.	Land Use	Area in use during the quarrying period (Hect.)	1	Area under Mining	2.99.12	2	Infrastructure	0.02.0	3	Roads	0.03.0	4	Green Belt	0.56.23	5	Un-Utilized Area	Nil	6	Drainage & Settling Tank	0.07.65	Grand Total		3.68.0
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Grand Total		3.68.0																								
ii).	Air Quality	Air or dust expected to be generated from drilling process, hauling roads, places of excavation etc., will be suppressed by periodical wetting of land by water spraying.																								
iii).	Water quality	A water sample from the open/bore wells was tested to NABL approved lab to assess hardness, Salinity, colour, Specific gravity, etc.																								
iv).	Noise levels	Quarrying of rough stone will be carried out by drilling and blasting by using low power explosives, and hence, noise will be very minimum. However, periodical noise level monitoring will be carried out every six months around the quarry site.																								
v).	Vibration levels (due to blasting)	No deep hole blasting envisaged. Small dia shot holes are used for breaking boulders. The maximum peak particles velocity shall be recoded using mini seismograph devises as per the guidance of MoEF and EIA Notification 2006 and also covering DGMS norms.																								
vi).	Water regime	No major river or any odai track are found																								

		around 50m radius.
vii).	Socio-economics	1. To provide Employment opportunities for the nearby villagers. 2. For the cultural development of the nearby villagers.
viii).	Historical monuments etc.	There are no historical monuments, etc found around 500m radius.

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

i).	temporary storage and utilization of topsoil	: There is a topsoil of 15622m ³ or 31244Ts will be removed and stacked for earth bund in the lease area.
ii).	Yearwise proposal for reclamation of land affected by abandoned quarries and other mining activities during ten years (and upto conceptual plan period for 'A' category mines) clarifying the extent of back filling and re-contouring and / or alternative use of unfilled / partially filled excavations / road sides / slopes and mine. In case abandoned quarries/ pits are proposed to be used as reservoir, their size, water holding capacity and proposal for utilization of such water be given.	: The present mining is proposed to an average depth of 60m below ground level has been envisaged as workable depth for safe & economic mining during the lease period. The mined-out area will be fenced on top of working bench with S1 fencing. No immediate proposals for closure of pit as the rough stone persist still at deeper level.
iii).	Programme of afforestation, Yearwise for the initial ten years (and upto conceptual plan period for 'A' category mines) indicating the number of plants with name of species to be afforested under different areas in hectares. Green Belt Development: Safety barrier, nearby school area and Nearest Panchayat approach Roads has been identified to be utilized for Greenbelt appropriate native species of Neem, Pungan and other regional trees will be planted in a phased manner as described below	

Year	Place	Area in Sq.m	No.of Plants	Rate of survival	Rate	Amount in Rs
First	Lease Boundary	5623	650	80%	@100 Rs Per sapling	65,000/-
Second	Approach road and Nearby Village Road	--	300	80%		30,000/-
Third	Schools	--	300	80%		30,000/-
Total						1,25,000/-

15 MAY 2017

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iv).	Stabilization and vegetation of dumps along with waste dump management Year wise for the ten years (and upto conceptual plan period for 'A' category mines).	:	No waste or rejects shall be proposed.
v).	Measures to control erosion / sedimentation of water courses.	:	Not applicable. There is no major dumps are stabilize in this quarry area.
vi).	Treatment and disposal of water from mine.	:	It will not be harmful and it does not require any treatment before discharging into the natural courses.
vii).	Measures for minimizing adverse effects on water regime.	:	There is no water to be pumped out will be very pure and portable and therefore, it will not affect any water regime surrounding the quarry.
viii).	Protective measures for ground vibrations / air blast caused by blasting,	:	It is a small "B" category open cast, semi mechanized mining and no heavy machinery shall be used. The only smooth blasting is proposed, therefore no change for ground vibration or noise from the quarry.
ix).	Measures for protecting historical monuments and for rehabilitation of human settlements likely to be disturbed due to mining activity.	:	No historical monuments and for rehabilitation of human settlements doesn't to be disturbed during mining activity.
x).	Socioeconomic benefits arising out of mining.	:	The nearest villagers 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 B category quarry

12.0 PROGRESSIVE QUARRY CLOSURE PLAN:

12.1	Steps proposed for phased restoration, reclamation of already mined out area.	:	Present mining is proposed to depth of 60m below ground level. The mined-out area will be fenced on top of working bench with S1 fencing to arrest the entry of cattle's and public in to the quarry site.
12.2	Measures to be under taken on mine closure as per Act & Rules	:	Measures will be taken as per the Acts and Rules. The quarried pit will be fenced by Barbed wire fencing. Green belt development at the rate of 650 trees will be proposed in the quarry area. No immediate proposals for closure of pit as the rough stone persist still at deeper level.
12.3	Mitigation measures to be undertaken for safety and restoration/ reclamation of the already mined out area	:	The quarry lease is a fresh mining lease, no mitigation measures observed.
12.4	Mine closure activity	:	The mining plan is proposed to depth of 60m below ground level has been envisaged as workable depth for safe & economic mining during the lease period. The mined-out area will be fenced on top of open cast working with S1 fencing. No immediate proposals for closure of pit as the rough stone persist still at deeper level.
12.5	Safety and security	:	Safety measures implement to the prevent access to surface opening excavations will be taken as Metalliferous mine regulations, 1961, it is a small open cast mining method adopted. Safety provisions like helmet, goggles, safety shoes, Dust mask, Ear muffs etc have to be provided as per the circulars and amendments made for Mine labours under the guidance of DGMS being a mechanized operation.
12.6	Disaster management and Risk Assessment	:	Open cast mining method is adopted in this quarry. If the benches are made with proposed height and with no risk will be

		there. Even then if any minor or major accident happens the quarry staffs having First aid facilities with first aid box with all necessary medicine and stretches, etc. to give first aid treatment at the site and will arrange immediately the vehicle to reach nearest hospital, if any disaster happens the lessee is capable to meet such eventualities. At the time of any accident during mining activity, proposal of first aid facility at quarry and one vehicle always ready at quarry site.
12.7	Care and maintenance during temporary discontinuance	: A board of discontinuance will be changed on the main entrance of the working place. One watch man will be kept on the quarry area for security purposes also look after the survival of the plants.
12.8	Economic repercussions of closure of quarry and man power entrenchments	: During the ten years mining period the employment potential will be generated, general financial status and socio-economic conditions of approx. 29 labors will be improved.

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

A	Fixed Asset Cost:	
	1. Land Cost	: Rs. 90,93,280
	2. Labour Shed	: Rs. 1,00,000/-
	3. Sanitary Facility	: Rs. 1,00,000/-
	4. Fencing	: Rs. 3,50,000/-
	5. Other expenses (Security guard, dust bin, etc)	: Rs. 4,00,000/-
	Total	: Rs. 1,00,43,280/-
B	B. Machinery cost	: Rs. 25,00,000/- (Hire Basis)

C	Total Expenditure of EMP cost (for ten years)	
	1. Drinking Water Facility	: Rs. 1,00,000/-
	2. Sanitary facility & Maintenance	: Rs. 1,50,000/-
	3. Permanent water sprinkler	: Rs. 2,00,000/-
	4. Afforestation and its maintenance	: Rs. 1,25,000/-
	5. Safety Kits	: Rs. 75,000/-
	6. Provision of tyre washing facility	: Rs. 1,50,000/-
	7. Blasting materials with blast mat cost	: Rs. 15,00,000/-
	8. Drainage & Settling Tank (0.07.65Hect or 765Sq.m x 400)	Rs. 3,06,000/-
	9. Environment monitoring	: Rs. 5,00,000/-
	Total	: Rs. 31,06,000/-
D	Total Project Cost (A+B+C)	: Rs. 1,56,49,280/-



13.0 FINANCIAL ASSURANCE:

Not applicable, it is a small "B" rough stone quarry.

14.0 CERTIFICATES:

All required certificates are enclosed.

15.0 PLAN AND SECTIONS, ETC:

Plan and Sections are submitted along with mining plan.

16.0 ANY OTHER DETAILS INTEND TO FURNISH BY THE APPLICANT

- (i) Care and precautionary measures will be taken for the safety of workers as per Rules and Acts.
- (ii) The applicant will endeavor every attempt to quarry the rough stone economically without any wastage and to improve the environment and ecology.
- (iii) The Mining Plan is prepared by incorporating the conditions stipulated in the precise area communication issued by the Deputy Director, Department of Geology and Mining, Krishnagiri vide letter **Roc.No.30/2024/Mines Dated: 04.04.2025.**
- (iv) Total proposed production rough stone is **796565m³** or **2190554Ts**, Topsoil is **15622m³** or **31244Ts** and gravel is **140594m³** or **281188Ts** up to a depth of 60m below ground level for ten years plan period.

17.0 CSR Expenditure:

CSR (Corporate Social responsibility) shall provide by the applicant @ 1.0% of average net profit of the company for the last three financial years to the nearby villages. The Ministry has notified the amendments in section 135 of the Act as well as the CSR Rules on 22nd January 2021 as circular no. CSR-05/01/2021-CSR-MCA dated 25th August 2021.

Place: Dharmapuri, TN

Date: 11/04/2025

Signature of the Qualified Person

G.UMAMAHESWARAN, M.Sc.,
Qualified Person
GEO TECHNICAL MINING SOLUTIONS
A NABET Accredited and ISO Certified Company
1/213-B, Ground Floor, Natesan Complex,
Collectorate Post Office, Oddapatti,
Dharmapuri-636705, TamilNadu, India

This Mining Plan is approved based on guidelines / instruction issued and in corporation of the particulars specified in the letter Roc. No. 30/2024 Dated 15.5.25 of the Deputy Director of Geology and Mining, Krishnagiri and subject to further fulfillment of the conditions laid down under Tamil Nadu Minor Mineral Concession Rules, 1959 and Minor Mineral Conservation and Development Rule 2010.

DEPUTY DIRECTOR (1/1)
Geology and Mining,
Collectorate, Krishnagiri.

This Mining Plan is approved subject to the conditions / Stipulation indicated in the Mining Plan Approval

Letter Roc. No. 30/2024

Dated 15.5.25

J.A.
15.5.25

15/5/2024



ந.க.எண். 30/2024/கனிமம் நாள்: 04.04.2025.

புவியியல் மற்றும் சுரங்கத்துறை
மாவட்ட ஆட்சியர் அலுவலகம்,
கிருஷ்ணகிரி.

குறிப்பாணை

பொருள் : கனிமங்களும் சுரங்கங்களும் - சிறு கனிமம் - சாதாரண கற்கள் - கிருஷ்ணகிரி மாவட்டம் - குளகிரி வட்டம் கரியசந்திரம் கிராமம் - பட்டா புல எண்.3/2C(1.15.4), 4/2(1.08.2), 4/5(P)(0.46.0), 4/6(P)(0.44.0), 4/7(0.39.0) & 4/8(P)(0.15.5)-ல் 3.68.0 ஹெக்டேர் பரப்பில் தி/ள்.குனின் இன்ப்ரா ஸ்ட்ரக்சர்ஸ் எல்எல்பி என்னும் பெயரில் விண்ணப்பம் அளித்தது - தற்போது மேற்படி நிறுவனம் தி/ள்.விஷ்ணு சூர்யா ப்ராஜக்ட்ஸ் அண்ட் இன்ப்ரா ஒசூர் பிரைவேட் லிட்டெட் என்று பெயர் மாற்றம் செய்து விண்ணப்பம் அளித்தது - வருவாய்துறை, வனத்துறை மற்றும் புவியியல் மற்றும் சுரங்கத்துறை புலத்தணிக்கை அறிக்கை சமர்ப்பிக்கப்பட்டது - தகுதியான நிலப்பரப்பாக கருதி ஏற்பளிக்கப்பட்ட சுரங்க திட்டம் மற்றும் சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணைய இசைவினை பெற்று சமர்ப்பிக்கக் கோருதல் - தொடர்பாக.

- பார்வை :
1. தி/ள்.குனின் இன்ப்ரா ஸ்ட்ரக்சர்ஸ் எல்எல்பி, ஒசூர் வட்டம், (தற்போது தி/ள்.விஷ்ணு சூர்யா ப்ராஜக்ட்ஸ் அண்ட் இன்ப்ரா ஒசூர் பிரைவேட் லிட்டெட்,) கிருஷ்ணகிரி மாவட்டம் விண்ணப்பம் நாள்: 04.01.2024 (ம) 25.02.2025.
 2. இவ்வலுவலக ந.க.30/2024/கனிமம், நாள்: 24.01.2024.
 3. சார் ஆட்சியர் (பொ), ஒசூர் ந.க.எண்.746/2024/பி2 நாள்:25.07.2024.
 4. வன உயிரினக்காப்பாளர், ஒசூர் கடித ந.க.எண்.3879/2024/எல் நாள்: 23.08.2024
 5. அரசு ஆணை (3D) எண்.243 தொழில், முதலீட்டு ஊக்குவிப்பு மற்றும் வர்த்தகம் (எம்எம்இ-2) துறை நாள்: 14.12.2022.



6. உதவி புவியியலாளர் (கனிமம்)
புலத்தணிக்கை அறிக்கை நாள்: 03.04.2025.
7. மற்றும் உரிய ஆவணங்கள்.

தி/ள்.குனின் இன்ப்ரா ஸ்ட்ரக்சர்ஸ் எல்எல்பி என்னும் நிறுவனம், கிருஷ்ணகிரி மாவட்டம், குளகிரி வட்டம், கரியசந்திரம் கிராமம், பட்டா புல எண்கள்.3/2C (1.15.4), 4/2(1.08.2), 4/5(P)(0.46.0), 4/6(P)(0.44.0), 4/7(0.39.0) & 4/8(P)(0.15.5)-ல் 3.68.0 ஹெக்டேர் பரப்பில் 10 வருடங்களுக்கு சாதாரண கற்குவாரி குத்தகை உரிமம் வழங்க கோரி விண்ணப்பம் சமர்ப்பித்திருந்தது.

2. இந்நிலையில், தி/ள்.குனின் இன்ப்ரா ஸ்ட்ரக்சர்ஸ் எல்எல்பி என்னும் நிறுவனத்தின் சாதாரண கற்குவாரி விண்ணப்ப பகுதிகளான குளகிரி வட்டம், கரியசந்திரம் கிராமம், பட்டா புல எண்கள்.3/2C, 4/2, 4/5(P), 4/6(P), 4/7 & 4/8(P)-ல் 3.68.0 ஹெக்டேர் நிலத்தை கரியசந்திரம் கிராம பட்டா எண்.348-ன்படி தி/ள்.விஷ்ணு சூர்யா ப்ராஜக்ட்ஸ் அண்ட் இன்ப்ரா ஓசூர் பிரைவேட் லிட்டெட் என்னும் நிறுவனத்தினருக்கு பெயர் மாற்றம் செய்து அதற்கான உரிய விண்ணப்பத்தினை இவ்வலுவலகத்தில் 25.02.2025 அன்று உரிய ஆவணங்களுடன் சமர்ப்பித்துள்ளனர்.

3. மேற்கண்ட விண்ணப்பம் தொடர்பாக வட்டாட்சியர், குளகிரி, சார் ஆட்சியர்(பொ), ஓசூர், வன உயிரின காப்பாளர், ஓசூர் மற்றும் உதவி புவியியலாளர் (கனிமம்) கிருஷ்ணகிரி ஆகியோர் புலத்தணிக்கை மேற்கொண்டு குளகிரி வட்டம், கரியசந்திரம் கிராமம், பட்டா புல எண்கள்.3/2C(1.15.4), 4/2(1.08.2), 4/5(P)(0.46.0), 4/6(P)(0.44.0), 4/7(0.39.0) & 4/8(P)(0.15.5)-ல் 3.68.0 ஹெக்டேர் பரப்பளவில் தி/ள்.விஷ்ணு சூர்யா ப்ராஜக்ட்ஸ் அண்ட் இன்ப்ரா ஓசூர் பிரைவேட் லிட்டெட் என்ற நிறுவனத்திற்கு நிபந்தனைகளுக்குட்பட்டு சாதாரண கற்குவாரி உரிமம் அனுமதி வழங்கலாம் என பரிந்துரை செய்துள்ளனர்.

நிபந்தனைகள்:

- a. 1959ம் வருடத்திய தமிழ்நாடு சிறு கனிம சலுகை விதிகள், அட்டவணை-II-ல் கண்டுள்ளபடி குவாரி செய்யப்படும்



கனிமங்களுக்குரிய சீனியரேஜ் தொகையினை

செலுத்தி கனிமம் கொண்டு செல்லப்பட வேண்டும்.

- b. அருகிலுள்ள பட்டா நிலங்களுக்கு 7.5 மீ பாதுகாப்பு இடைவெளி விட்டு குவாரிப் பணி மேற்கொள்ள வேண்டும்.
- c. விண்ணப்ப புலத்தில் உள்ள தாழ்வழுத்த மின்கம்பிகளை ஒப்பந்த பத்திரம் நிறைவேற்றுவதற்கு முன்னர் அகற்றியும், அதற்கான ஆவணங்களை இவ்வலுவலகத்தில் சமர்ப்பிக்க வேண்டும்.
- d. அங்கீகாரம் மற்றும் அனுபவம் வாய்ந்த வெடிபொருள் பயன்படுத்துவோர் மூலம் குறைந்த அளவு சக்தி கொண்ட வெடிபொருட்களை பயன்படுத்தி அருகிலுள்ள பட்டாதாரர்களுக்கு எவ்வித இடையூறுமின்றி குவாரிப்பணி மேற்கொள்ள வேண்டும்.
- e. விதிகளின்படி ஏற்பளிக்கப்பட்ட சுரங்கத்திட்டத்தினை உரிய காலத்திற்குள் சமர்ப்பிக்க வேண்டும்.
- f. குவாரி உரிமம் வழங்க உள்ள பகுதிக்கு சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையத்தின் முன் அனுமதி பெற்று சமர்ப்பிக்கும் பட்சத்தில் மட்டுமே குவாரி உரிமம் வழங்கப்படும்.

4. எனவே, வட்டாட்சியர், சூளகிரி, சார் ஆட்சியர்(பொ), ஓசூர் மற்றும் உதவி புவியியலாளர் (கனிமம்) கிருஷ்ணகிரி, ஆகியோரின் பரிந்துரை மற்றும் நிபந்தனைகளின் அடிப்படையில், கிருஷ்ணகிரி மாவட்டம் சூளகிரி வட்டம், கரியசந்திரம் கிராம புல எண்கள்.3/2C (1.15.4), 4/2(1.08.2), 4/5(P)(0.46.0), 4/6(P)(0.44.0), 4/7(0.39.0) & 4/8(P)(0.15.5)-ல் 3.68.0 ஹெக்டேர் பரப்பளவில் தி/ள்.விஷ்ணு சூர்யா ப்ராஜக்ட்ஸ் அண்ட் இன்ப்ரா ஓசூர் பிரைவேட் லிட்டெட் என்ற நிறுவனத்திற்கு 1959ம் வருட தமிழ்நாடு சிறுகனிம விதிகள், விதி எண்.19, 20(2) மற்றும் 22-ன்படி மேற்கண்ட நிபந்தனைகளுக்குட்பட்டு 10 (பத்து) வருட காலத்திற்கு சாதாரண வகை கற்குவாரி உரிமம் வழங்குவதற்குரிய தகுதியான நிலப்பரப்பாக கருதப்படுகிறது.

5. மேலும், தமிழ்நாடு சிறு கனிம சலுகை விதிகள்-1959 விதி எண். 41(4)-ன்படி குவாரிப்பணி மேற்கொள்வது தொடர்பாக வரைவு சுரங்க திட்டத்தினை 90



தினங்களுக்குள் சமர்ப்பிக்குமாறு மனுதாரரைக் கேட்டுக்கொள்ளப்படுகிறது. மேலும் ஏற்பளிக்கப்பட்ட சுரங்கத்திட்டத்தின் தொடர்ச்சியாக 1959ம் வருடத்திற்கு தமிழ்நாடு சிறுகனிம சலுகை விதிகள், விதி எண்.42-ன்படி சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையத்தின் இசைவினைப் பெற்று சமர்ப்பித்த பின்னரே குவாரி உரிமம் வழங்க தக்க நடவடிக்கைகள் எடுக்கப்படும் எனத் தெரிவித்துக் கொள்ளப்படுகிறது.

W. S. S. S.
04/4/25

துணை இயக்குநர்,
புவியியல் மற்றும் சுரங்கத்துறை,
கிருஷ்ணகிரி.

4/4/25

பெறுநர்:

தி/ள்.விஷ்ணு சூர்யா ப்ராஜக்ட்ஸ்
அண்ட் இன்ப்ரா ஓசூர் பிரைவேட் லிட்டெட்,
அக்னி பிசினஸ் சென்டர்,
எண்.24/46, கே.பி.தாசன் ரோடு,
3வது தளம், ஆழ்வார்பேட்டை,
சென்னை-18.

நகல்:

1. ஆணையர், புவியியல் மற்றும் சுரங்கத்துறை, சென்னை.
2. மாவட்ட ஆட்சித் தலைவர், கிருஷ்ணகிரி - தகவலுக்காக.

District : Krishnagiri

Taluk : Shoolagiri

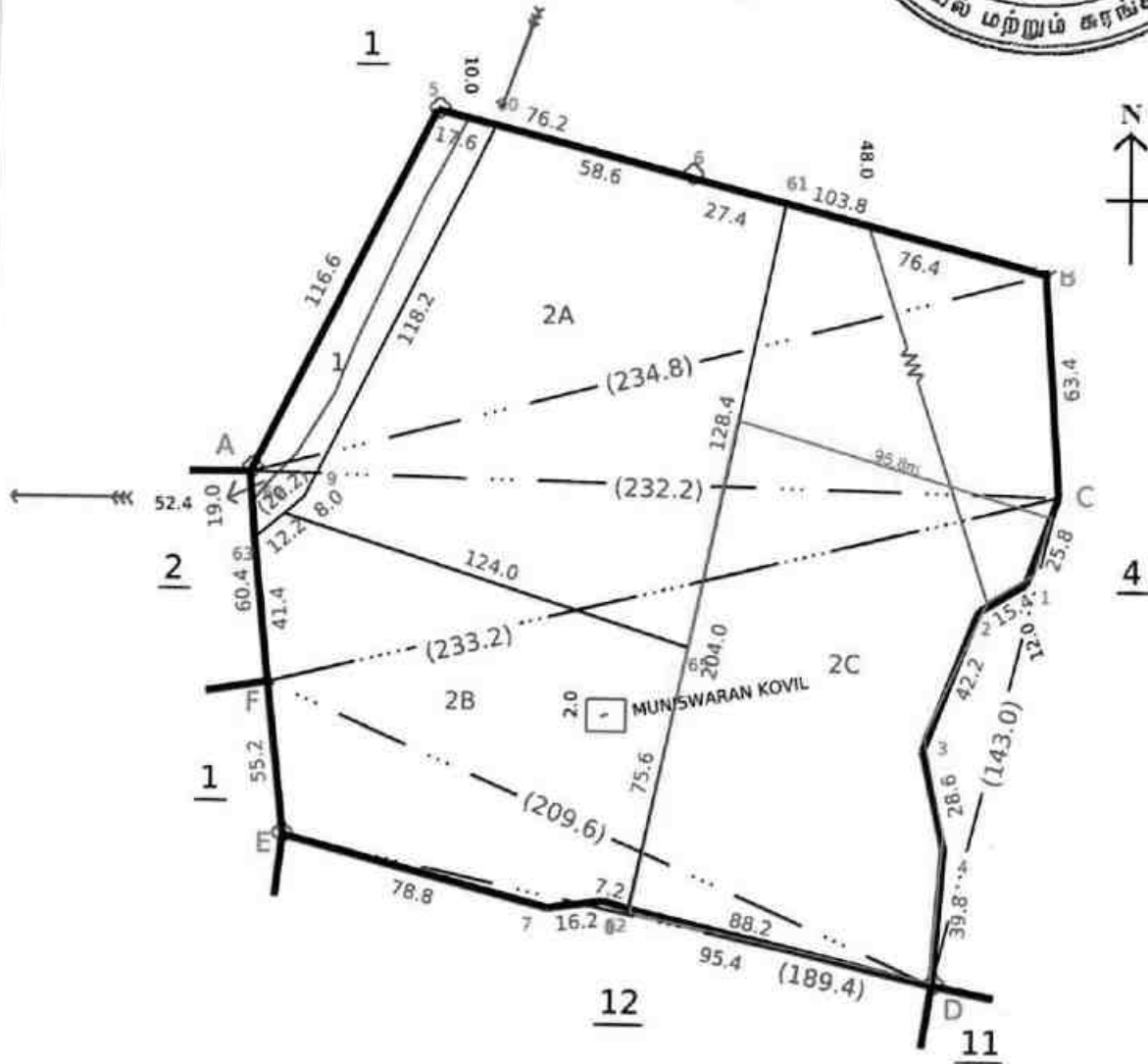
Village : Kariyasandiram [51]



Survey No. 3

Area Hect 04 Ar 33

Scale 1:2000



LEASE APPLIED AREA



Signed By Tahsildar

Name of approver : peru

Date of Approval : 09-08-2017



Date of Issue: 09-04-2025 15:22:30

Survey and Settlement Department, Government of TamilNadu

240 fv.1

District : Krishnagiri

Taluk : Shoolagiri

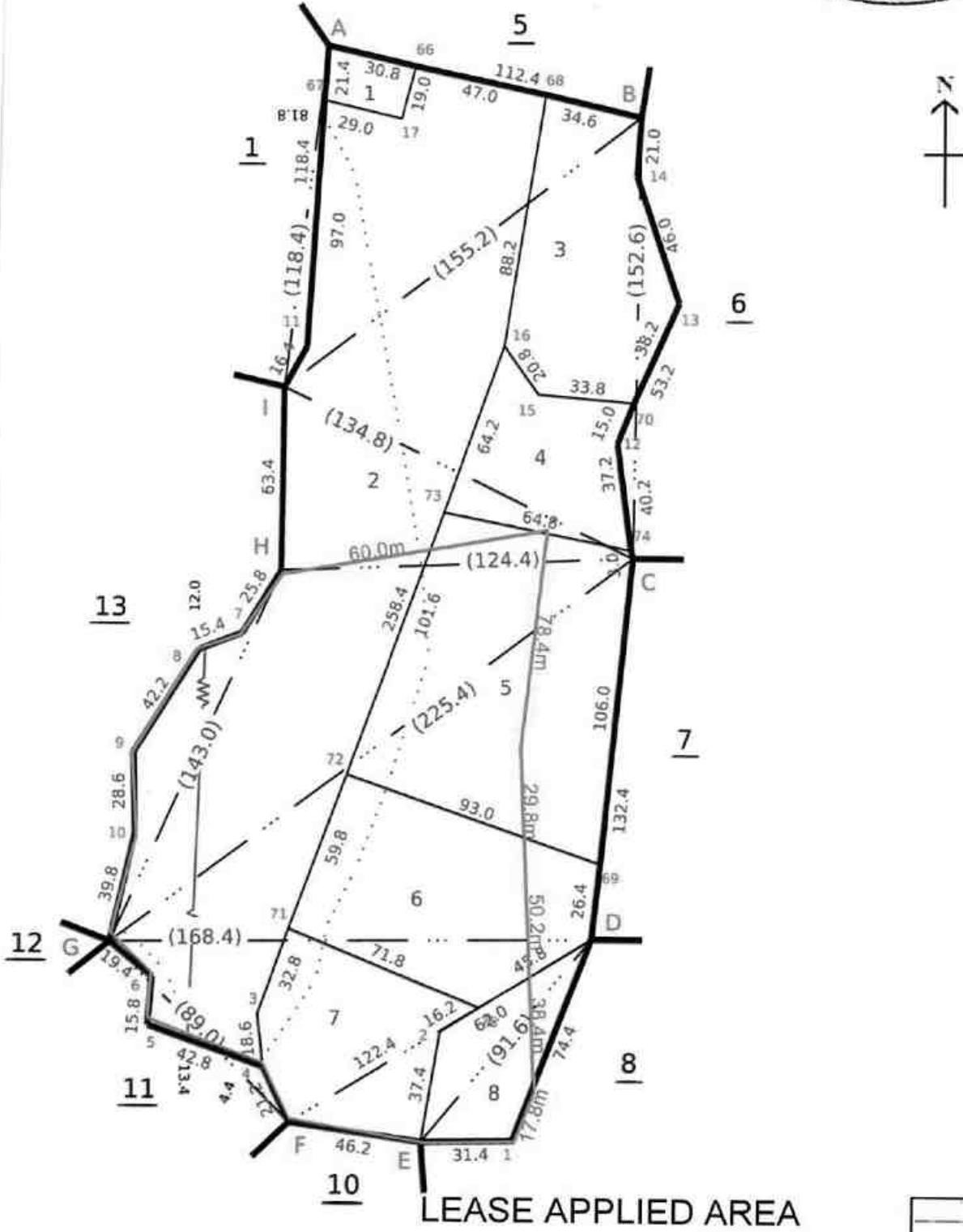
Village : Kariyasandiram [51]



Survey No. 4

Area : Hect 04 Ares 92.00

Scale : 1 : 2000



Signed By Tahsildar

Name of approver : peru

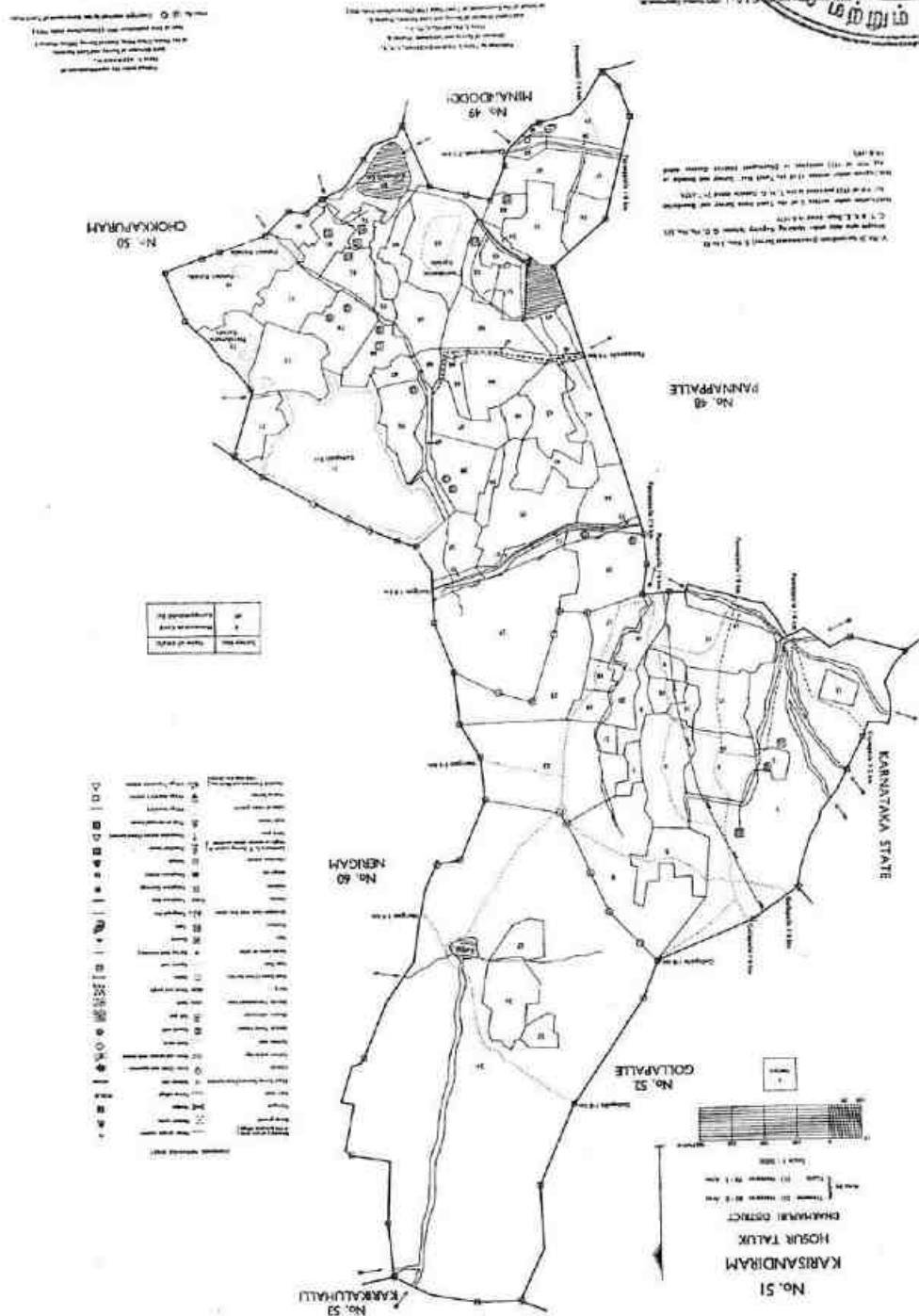
Date of Approval : 09-08-2017



Date of Issue: 09-04-2025 15:25:20

Survey and Settlement Department, Government of TamilNadu

240 fv.1



VISHNUSURYA
PROJECTS AND INFRA HOSUR PRIVATE LIMITED
CIN:U08990TN2024FTC175467GSTNo:33AAKCV6197Q



Date: 25.03.2025

To:

The Assistant Engineer,
O & M, TANGEDCO,
Barigai, Krishnagiri.

Respected Sir;

Sub: Shifting of 11KV HT line poles 3 to 4 No's at Kariyasandirm Village in
S.F.No's. 3 and 4 – Regarding.

We have proposed apply new mining lease in S.F.No's. 3 and 4 of Kariyasandirm Village in that a 11KV HT line is going from Kariyasandirm sub-station to Gollapalli Village. Hence, we request to you kindly inspect and give an estimate for shifting the required poles as per field requirements. We request kindly do needful at the earliest.

Thanking You

Yours faithfully

Copy to

1. The Assistant Executive Engineer, O & M, Bagalur
2. The Executive Engineer, O & M, Hosur

For Vishnusurya Projects and Infra Hosur Private Limited

Authorised Signatory



தமிழ்நாடு அரசு

வருவாய் மற்றும் பேரிடர் மேலாண்மைத் துறை

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

மாவட்டம் : கிருஷ்ணகிரி

வட்டம் : சூளகிரி

வருவாய் கிராமம் : கரியசந்திரம்

பட்டா எண் : 348

உரிமையாளர்கள் பெயர்

1. -... எம்/எஸ் விஷ்ணு சூரியா ப்ராஜெக்ட் அண்ட் இன்ப்ரா ஓசூர் பிரைவேட் லிமிடெட்

புல எண்	உட்பிரிவு	புன்செய்		நன்செய்		மற்றவை		குறிப்புரைகள்
		பரப்பு	தீர்வை	பரப்பு	தீர்வை	பரப்பு	தீர்வை	
		ஹெக்டர் - ஏர்	ரூ - பை	ஹெக்டர் - ஏர்	ரூ - பை	ஹெக்டர் - ஏர்	ரூ - பை	
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10	2	0 - 39.00	0.54	--	--	--	--	2025/0103/31/371723- ----- Digitally signed:Prakash B Head Quarters Deputy Tahsildar 07/02/2025 05:22:41:PM
10	3	0 - 11.50	0.16	--	--	--	--	2025/0103/31/371723- ----- Digitally signed:Prakash B Head Quarters Deputy Tahsildar 07/02/2025 05:22:41:PM
10	4	0 - 18.50	0.26	--	--	--	--	2025/0103/31/371723- ----- Digitally signed:Prakash B Head Quarters Deputy Tahsildar 07/02/2025 05:22:41:PM
11	-	0 - 64.00	0.88	--	--	--	--	2025/0103/31/371723- ----- Digitally signed:Prakash B Head Quarters Deputy Tahsildar 07/02/2025 05:22:41:PM



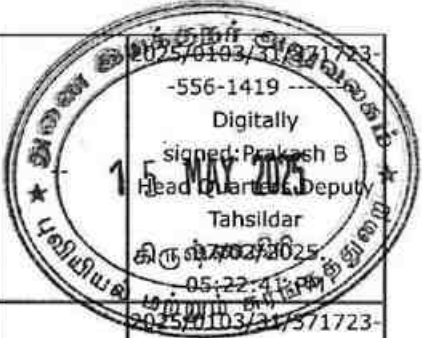
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15	3	0 - 2.50	0.06	--	--	--	2025/0103/31/371723-368-1418 ----- Digitally signed:Prakash B Head Quarters Deputy Tahsildar 07/02/2025 05:22:41:PM
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16	2	1 - 8.50	1.02	--	--	--	2025/0103/31/371723-368-1418 ----- Digitally signed:Prakash B Head Quarters Deputy Tahsildar 07/02/2025 05:22:41:PM
17	1B	0 - 2.00	0.06	--	--	--	2025/0103/31/371723-368-1418 ----- Digitally signed:Prakash B Head Quarters Deputy Tahsildar 07/02/2025 05:22:41:PM
17	2A	0 - 40.50	0.38	--	--	--	2025/0103/31/371723-368-1418 ----- Digitally signed:Prakash B Head Quarters Deputy Tahsildar 07/02/2025 05:22:41:PM
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20	4	0 - 11.50	0.10	--	--	--	--	2025/0103/31/371723- ----- Digitally signed:Prakash B Head Quarters Deputy Tahsildar 07/02/2025 05:22:41:PM
20	5	0 - 9.00	0.06	--	--	--	--	2025/0103/31/371723- -- --புலப்பட்டா சதுக்க ரேட்--- Digitally signed:Prakash B Head Quarters Deputy Tahsildar 07/02/2025 05:22:41:PM
21	2	0 - 30.00	0.27	--	--	--	--	2025/0103/31/371723- ----- Digitally signed:Prakash B Head Quarters Deputy Tahsildar 07/02/2025 05:22:41:PM
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28	1E1	0 - 0.50	0.10	--	--	--	--	2025/0103/31/371723- -597-1420 ----- Digitally signed:Prakash B Head Quarters Deputy Tahsildar



28	5A1	0 - 1.00	0.10	--	--	--	--	07/02/2025 05:22:41:PM 2025/0103/31/371723- 597-1420 Digitally signed: Prakash B Head Quarters Deputy Tahsildar 07/02/2025 05:22:41:PM
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4	1	0 - 5.50	0.08	--	--	--	--	2025/0103/31/371723- Digitally signed: Prakash B Head Quarters Deputy Tahsildar 07/02/2025 05:22:41:PM
4	2	2 - 18.00	3.01	--	--	--	--	2025/0103/31/371723- Digitally signed: Prakash B Head Quarters Deputy Tahsildar 07/02/2025 05:22:41:PM
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8	-	1 - 7.00	0.66	--	--	--	--	2025/0103/31/371723- ----புலப்பட்டா சலுகை ரேட்---- Digitally signed:Prakash B Head Quarters Deputy Tahsildar 07/02/2025 05:22:41:PM
9	1A	0 - 7.00	0.10	--	--	--	--	2025/0103/31/371723- -556-1419 ----- Digitally signed:Prakash B Head Quarters Deputy Tahsildar 07/02/2025 05:22:41:PM
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9	2A	0 - 4.50	0.10	--	--	--	--	2025/0103/31/371723- -556-1419 ----- Digitally signed:Prakash B Head Quarters Deputy Tahsildar 07/02/2025 05:22:41:PM

9	2B	0 - 9.50	0.13	--	--	--	
9	2C	0 - 9.50	0.13	--	--	--	2025/0103/31/371723-556-1419 ----- Digitally signed:Prakash B Head Quarters Deputy Tahsildar 07/02/2025 05:22:41:PM
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4	1	4-1	r	y	...	7-3	6	1 38	0 05-5	0 08
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	7	-7	r	y	...	7-3	6	1 38	0 39-0	0 54
	8	-8	r	y	...	7-3	6	1 38	0 20-0	0 28
									4 92-0	6 81
5	1A	5-1பா	r	y	...	7-3	6	1 38	0 42-5	0 57
	1B	-1பா	r	y	...	7-3	6	1 38	0 34-0	0 48
	1C	-1பா	r	y	...	7-3	6	1 38	0 94-0	1 31
	2	-2	r	y	...	7-3	6	1 38	0 47-0	0 65
	3A	-3பா	r	y	...	7-3	6	1 38	0 34-0	0 48
	3B	-3பா	r	y	...	7-3	6	1 38	0 39-5	0 53



107 கோ.சம்பங்கி
ராமப்பா (1)
ச.கோபாலப்பா
(2).

107 கோ.சம்பங்கி
ராமப்பா (1),
ச.கோபாலப்பா
(2).

108 த.சி.ரூபண்ணா
(1), த.முனியப்
பா (2).

109 ஸ்.நாராயணப்
பா (1), இ.சத்தி
ரப்பா (2).

101 வெங்கடேசப்பா
மணவி ஜெயம்
மாள்.

5 சி.கிருஷ்ணப்பா.

79 பூனப்பள்ளி ரா.
வெங்கடேசப்பா.

110 சி.கிருஷ்ணப்பா
(1), பூனப்பள்ளி
ரா.வெங்கடேசப்
பா (2).

80 வெ.வெங்கடிகி
யப்பா.

38 மு.நாராயணப்
பா.

81 ரா.வெங்கடப்
பா.

156 சா.வெங்கடப்பா
(1), பில்லப்பா
மணவி லக்ஷ்மம்
மா (2).

1 வெ.அன்பத்தப்
பா.

109 சி.நாராயணப்
பா (1), இ.சத்தி
ரப்பா (2).



GOVERNMENT OF INDIA
MINISTRY OF CORPORATE AFFAIRS

Central Registration Centre

Certificate of Incorporation

[Pursuant to sub-section (2) of section 7 and sub-section (1) of section 8 of the Companies Act, 2013 (18 of 2013) and rule 18 of the Companies (Incorporation) Rules, 2014]

I hereby certify that VISHNUSURYA PROJECTS AND INFRA HOSUR PRIVATE LIMITED is incorporated on this SEVENTEENTH day of DECEMBER TWO THOUSAND TWENTY FOUR under the Companies Act, 2013 (18 of 2013) and that the company is Company limited by shares

The Corporate Identity Number of the company is **U08990TN2024PTC175467**

The Permanent Account Number (PAN) of the company is **AAKCV6197Q***

The Tax Deduction and Collection Account Number (TAN) of the company is **CHEV24923D***

Given under my hand at Manesar this SEVENTEENTH day of DECEMBER TWO THOUSAND TWENTY FOUR

Signature Not Verified

Digitally signed by
DS MINISTRY OF CORPORATE
AFFAIRS, CRC MANESAR 1
Date: 2024.12.17 14:12:48 IST

PRAMOD KUMAR

Assistant Registrar of Companies/ Deputy Registrar of Companies/ Registrar of Companies

For and on behalf of the Jurisdictional Registrar of Companies

Registrar of Companies

Central Registration Centre

Disclaimer: This certificate only evidences incorporation of the company on the basis of documents and declarations of the applicant(s). This certificate is neither a license nor permission to conduct business or solicit deposits or funds from public. Permission of sector regulator is necessary wherever required. Registration status and other details of the company can be verified on mca.gov.in

Mailing Address as per record available in Registrar of Companies office:

VISHNUSURYA PROJECTS AND INFRA HOSUR PRIVATE LIMITED

AGNI BUSINESS CENTER, NO. 24/46, K B DASAN ROAD, Teynampet, Chennai, Chennai- 600018, Tamil Nadu

*as issued by Income tax Department



आयकर विभाग INCOME TAX DEPARTMENT



भारत
GOVT. OF INDIA



ई-स्थायी लेखा संख्या कार्ड e - Permanent Account Number (e-PAN) Card AAKCV6197Q

नाम / Name	VISHNUSURYA PROJECTS AND INFRA HOSUR PRIVATE LIMITED
निगमन/गठन की तारीख Date of Incorporation / Formation	17/12/2024
	 Signature valid Digitally signed by Income Tax Dept Date: 24.12.24 09:57:56 GMT+05:30

- ✓ Permanent Account Number (PAN) facilitate Income Tax Department linking of various documents, including payment of taxes, assessment, tax demand tax arrears, matching of information and easy maintenance & retrieval of electronic information etc. relating to a taxpayer. स्थायी लेखा संख्या (पैन) एक करदाता से संबंधित विभिन्न दस्तावेजों को जोड़ने में आयकर विभाग का सहायक होता है, जिसमें करों के भुगतान, आकलन, का मांग, टैक्स बकाया, सूचना के मिलान और इलेक्ट्रॉनिक जानकारी का आसान रखरखाव व बहाली आदि भी शामिल है।
- ✓ Quoting of PAN is now mandatory for several transactions specified under Income Tax Act, 1961 (Refer Rule 114B of Income Tax Rules, 1962) आयकर अधिनियम, 1961 के तहत निर्दिष्ट कई लेनदेन के लिए स्थायी लेखा संख्या (पैन) का उल्लेख अब अनिवार्य है (आयकर नियम, 1962 के नियम 114B, का संदर्भ लें)
- ✓ Possessing or using more than one PAN is against the law & may attract penalty of upto Rs. 10,000. एक से अधिक स्थायी लेखा संख्या (पैन) का रखना वा उपयोग करना, कानून के विरुद्ध है और इसके लिए 10,000 रुपये तक का दंड लगाया जा सकता है।
- ✓ The PAN Card enclosed contains Enhanced QR Code which is readable by a specific Android Mobile App. Keyword to search this specific Mobile App on Google Play Store is "Enhanced QR Code Reader for PAN Card". संलग्न पैन कार्ड में एनहांस्ड क्यूआर कोड शामिल है जो एक विशिष्ट एंड्रॉइड मोबाइल ऐप द्वारा पठनीय है। Google Play Store पर इस विशिष्ट मोबाइल ऐप को खोजने के लिए कीवर्ड "Enhanced QR Code Reader for PAN Card" है।

Cut

आयकर विभाग INCOME TAX DEPARTMENT भारत सरकार GOVT. OF INDIA स्थायी लेखा संख्या कार्ड Permanent Account Number Card AAKCV6197Q नाम / Name VISHNUSURYA PROJECTS AND INFRA HOSUR PRIVATE LIMITED निगमन/गठन की तारीख Date of Incorporation/Formation 17/12/2024 	इस कार्ड के खोने/पाने पर कृपया सूचित करें/कीजिए :- आयकर विभाग के पास इस कार्ड की प्रतिलिपि सुरक्षित रखी जायेगी। (यदि यह कार्ड किसी अन्य व्यक्ति के हाथों में है तो उसे वापस कर देंगे।) बिना-शर्त, अनायास कर देंगे। फोन: 011-23500000 फैक्स: 011-23500001 If this card is lost / someone's lost card is found, please inform / return to :- Income Tax PAN Services Unit, Prasarit eGov Technologies Limited (Formerly NSDC e-Governance Infrastructure Limited) 4th Floor, 3rd Avenue, Connaught Place New Delhi, India. Phone: 011-23500000 (Fax: 011-23500001)
---	--

Electronically issued and Digitally signed ePAN is a valid mode of issue of Permanent Account Number (PAN) post amendments in clause (c) In the Explanation occurring after sub-section (8) of Section 139A of Income Tax Act, 1961 and sub-rule (6) of Rule 114 of the Income Tax Rules, 1962. For more details, [click here](#)



Government of India

Form GST REG-06

[See Rule 10(1)]

Registration Certificate

Registration Number : 33AAKCV6197Q1ZB



1.	Legal Name	VISHNUSURYA PROJECTS AND INFRA HOSUR PRIVATE LIMITED		
2.	Trade Name, if any	VISHNUSURYA PROJECTS AND INFRA HOSUR PRIVATE LIMITED		
3.	Additional trade names, if any			
4.	Constitution of Business	Private Limited Company		
5.	Address of Principal Place of Business	Floor No.: 4th Floor Building No./Flat No.: 24/46 Name Of Premises/Building: Agni Business Centre Road/Street: K B Dasan Road Locality/Sub Locality: Alwarpet City/Town/Village: Chennai District: Chennai State: Tamil Nadu PIN Code: 600018		
6.	Date of Liability			
7.	Period of Validity	From	07/01/2025	To Not Applicable
8.	Type of Registration	Regular		
9.	Particulars of Approving	Tamil Nadu		
Signature Signature Not Verified Digitally signed by DS GOODS AND SERVICES TAX NETWORK 15 Date: 2025.01.07 15:15:58 IST				
Name		Vinoth		
Designation		Assistant Commissioner		
Jurisdictional Office		ALWARPET		
Date of issue of Certificate		07/01/2025		
Note: The registration certificate is required to be prominently displayed at all places of business in the State.				

This is a system generated digitally signed Registration Certificate issued based on the approval of application granted on 07/01/2025 by the jurisdictional authority.



Goods and Services Tax Identification Number: 33AAKCV6197Q1ZB

Details of Additional Place of Business(s)

Legal Name	VISHNUSURYA PROJECTS AND INFRA HOSUR PRIVATE LIMITED
Trade Name, if any	VISHNUSURYA PROJECTS AND INFRA HOSUR PRIVATE LIMITED

Total Number of Additional Places of Business in the State 0



Goods and Services Tax Identification Number: 33AAKCV6197Q1ZB

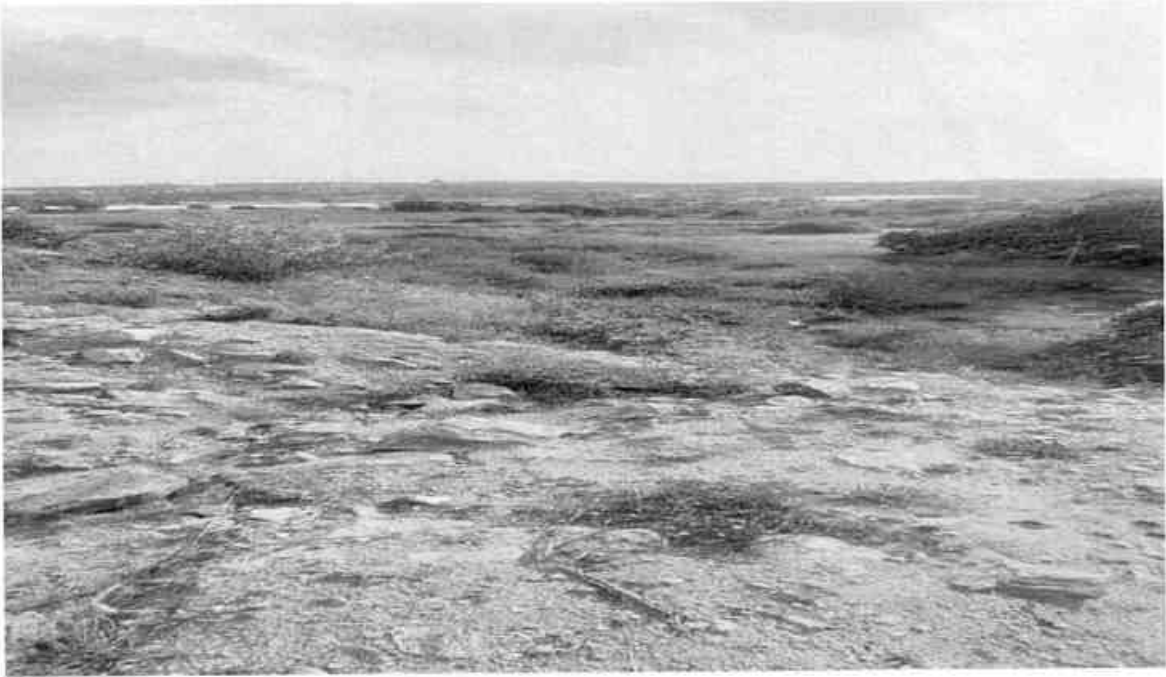
Legal Name VISHNUSURYA PROJECTS AND INFRA HOSUR PRIVATE LIMITED
Trade Name, if any VISHNUSURYA PROJECTS AND INFRA HOSUR PRIVATE LIMITED

Details of Managing / Whole-time Directors and Key Managerial Persons

1		Name	vengatte Sanal Kumar
		Designation/Status	Whole-Time Director
		Resident of State	Tamil Nadu
2		Name	ARUNACHALAM CHARIMA THANGAM
		Designation/Status	Whole-Time Director
		Resident of State	Tamil Nadu

PHOTOCOPY OF THE APPLIED LEASE AREA

Site photos in respect of rough stone and gravel quarry lease in S.F.No's. S/2C
(P), 4/2 (P), 4/5 (P), 4/6 (P), 4/7 & 4/8 (P)– Patta land - over an extent of 358.00
hectares –Kariyasandiram Village – Shoolagiri Taluk – Krishnagiri District, Tamil
Nadu State in belongs to **M/s.Vishnusurya Projects and Infra Hosur Private
Limited** Krishnagiri District.





भारत सरकार
GOVERNMENT OF INDIA



இலங்கோவன்
Elangovan
பிறந்த நாள்/DOB: 29/09/1959
ஆண்/ MALE

5702 4317 1038

எனது ஆதார், எனது அடையாளம்

Scanned with OKEN Scanner



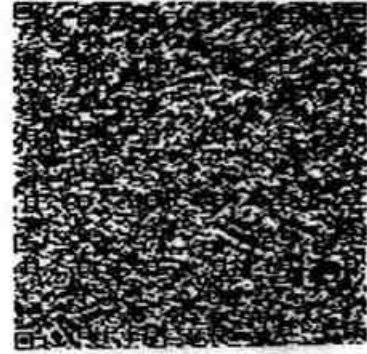
भारतीय विशिष्ट पहचान प्राधिकरण
UNIQUE IDENTIFICATION AUTHORITY OF INDIA

முகவரி:

சுப்பிரமணியன், 15, நர்மதா தெரு, சூர்யா
நகர், மீன்கூர், திருவள்ளூர்,
தமிழ் நாடு - 601203

Address :

SUBRAMANIYAN, 15, NARMADHA STREET,
SURYA NAGAR, Minjur, Tiruvallur,
Tamil Nadu - 601203



1947



help@uidai.gov.in

WWW

www.uidai.gov.in



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

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BALAJI MINES

Proprietor: E. SANTHARAMAN,
PURITY LIME STONE SUPPLIERS

5/88, CHINNAGOLLAPATTI, KANNANKURICHI P.O.,
SALEM-636 008. Tamil Nadu



Mines : Devar Malai Village, Kulithalai Tk., KARUR Dt. (Via) Karur to Palsyam.

Date _____

EXPERIENCE CERTIFICATE

I E.SANTHARAMAN being the Managing Director of BALAJI MINES do hereby certify that Thiru. G.UMAMAHESWARAN, son of P.GOPAL (Whose signature is appended) worked as a Geologist in the above mine from 01.08.2011 to 31.10.2016. During his term of work aforesaid, he has obtained practical experience as detailed overleaf. The duties connected with his work have involved his continuous attendance at the mine, and have been efficiently performed by him.

I believe him to be of good character and a fit and proper person to be examined for Certificate of Competency.

(Signature with date and official Seal)

TIN No: 33852702141

CST No: 704829 / 7-4-99

BALAJI MINES

5/88, Chinnagollapatti,
Kannankurichi (P.O.), SALEM-8.

(Signature of Candidate)



BALAJI MINES

Proprietor: E. SANTHARAMAN,
PURITY LIME STONE SUPPLIERS,

5/88, CHINNAGOLLAPATTI, KANNANKURICHI,
SALEM-636 008. Tamil Nadu



Mines : Devar Malai Village, Kulithalai Tk., KARUR Dt. (Via) Karur to Palayam.

Date _____

Particular of Practical experience	Place of experience	Period of Practical Experience		Total experience		
(a)	(b)	(c)		(e)		
		From	To	Year	Months	Days
Worked as Geologist and it Include Mine Workings, Exploration, Surveying, Drilling & Sampling Quality Control	Open cast Workings	01.08.2011	31.10.2016	05	02	30
Grand Total				05	02	30

AVERAGE MONTHLY OUTPUT (D) / AVERAGE DAILY EMPLOYMENT (e) DURING THE ABOVE PERIOD IS GIVEN BELOW:

In below ground working	In open - cast working	In all
NIL	30	30

E. Santharaman

(Signature of Managing Director with date and official Seal)

TIN No: 33852702141

CST No: 704829 / SLM - 20 BALAJI MINES

BALAJI MINES

5/88, Chinnagollapatti,
Kannankurichi (P.O.), SALEM

G. Umamaheswari
(Signature of Candidate)

15 MAY 2025

கிருஷ்ணகிரி



அறிவியல் புலம்
FACULTY OF SCIENCE

பெரியார் பல்கலைக்கழக ஆட்சிக்குழு 2009 ஆம் ஆண்டு ஏப்ரல் மாதம் நடந்த பயன்பாட்டுப்புவியமைப்பியல் தேர்வில் அரசு கலைக் கல்லூரி, சேலம் - 636 007 (தன்னாட்சி) பயின்ற G உமாமகேஸ்வரன் என்பவர் தனிச்சிறப்புடன் முதல் வகுப்பில் தேர்ச்சி பெற்றார் என்று தக்க தேர்வாளர்கள் சான்றளித்தபடி அறிவியல் நிறைஞர் என்னும் பட்டத்தை அவருக்குப் பல்கலைக்கழக இலச்சினையுடன் வழங்குகிறது.

The Syndicate of the Periyar University hereby makes known that UMAMAHESWARAN G has been admitted to the DEGREE OF MASTER OF SCIENCE in APPLIED GEOLOGY he/she having been certified by duly appointed Examiners to be qualified to receive the same and was placed in the FIRST CLASS WITH DISTINCTION at the Examination held in APR-2009 through GOVERNMENT ARTS COLLEGE, SALEM - 636 007 (AUTONOMOUS).



Given under the seal of this university

நாள்
Dated 16-04-2010
சேலம் 636011, தமிழ்நாடு, இந்தியா.
Salem 636011, Tamil Nadu, India.

பதிவாளர்
Registrar
261

துணைவேந்தர்
Vice-Chancellor



ATTESTED

**NOTARY PUBLIC
DELHI (India)**

122 DEC 2011

Ys Arangan

24/12



**S. K. NIGAM
SDM (Sadar Bazar)
Govt. of NCT of Delhi
Old Civil Supplies Building
Tis Hazari, Delhi - 110054**

Processed by	<i>P. Raju</i>
Read by	<i>Arangan</i>
Examined by	<i>b</i>

The Ministry of External Affairs
accepts no responsibility for the
contents of the above documents

दिनांक
Date

23 DEC 2011

27/12/11
अतिरिक्त जिला मजिस्ट्रेट/सब डिवजनरी
मजिस्ट्रेट/कार्यकारी मजिस्ट्रेट/विवाह
रजिस्ट्रार/मामलतवार के हस्ताक्षर
सत्यापित किय जाते हैं।
The Signature of ADM/SDM/(Executive)
Magistrate/Registrar of Marriage/
Mamlatdar attested.



Oh
SASI LEACHIOUS K.P.
अनुपाय अधिकारी (ओ.आई.)
Section Officer (O.I.)
विदेश मंत्रालय, नई दिल्ली
Ministry of External Affairs
New Delhi

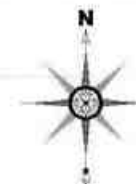


PLATE No-I

APPLICANT:

**M/s.VISHNUSURYA PROJECTS AND
HOSUR PRIVATE LIMITED,**
AGNI BUSINESS CENTRE,
No.24/46, K.B.DASAN ROAD,
3rd FLOOR, ALWARPET,
CHENNAI DISTRICT -600018.

LEASE APPLIED AREA:

S.F.No : 3/2C(P),4/2(P),4/5(P),4/6(P)
4/7 & 4/8(P)
EXTENT : 3.68.0Hect
VILLAGE : KARIYASANDIRAM
TALUK : SHOOLAGIRI
DISTRICT : KRISHNAGIRI

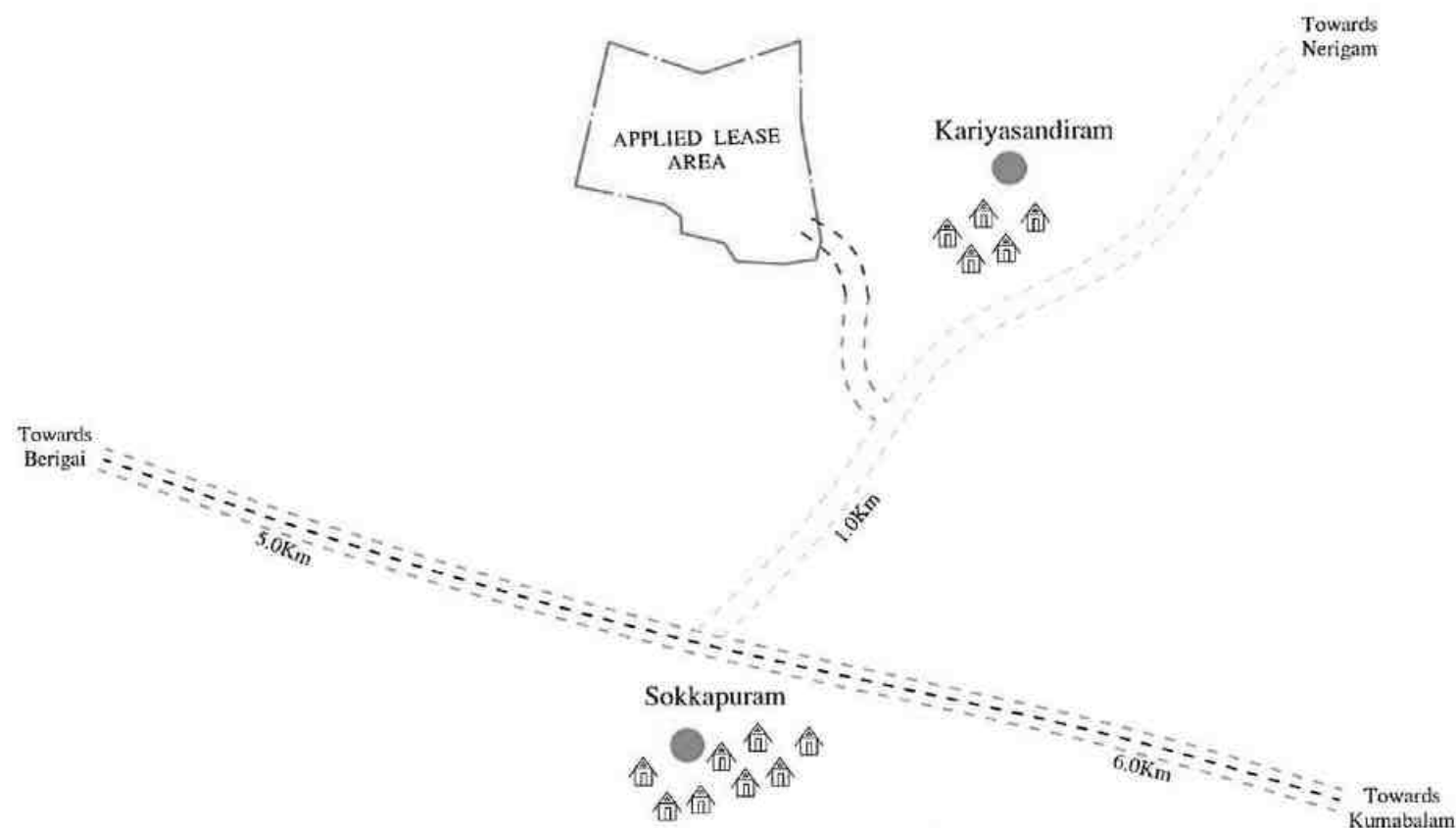
INDEX

MINE LEASE AREA	
APPROACH ROAD	
CART ROAD	
VILLAGE ROAD	
SH- 456 ROAD	
HABITATION	

Prepared by:

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

G.UMAMAHESWARAN, M.S.,
QUALIFIED PERSON



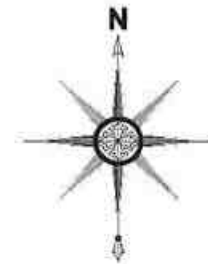


PLATE No-IA

APPLICANT:

M/s.VISHNUSURYA PROJECTS AND HOSUR PRIVATE LIMITED,
AGNI BUSINESS CENTRE,
No.24/46, K.B.DASAN ROAD,
3rd FLOOR, ALWARPET,
CHENNAI DISTRICT -600018.

LEASE APPLIED AREA:

S.F.No : 3/2C(P),4/2(P),4/5(P),4/6(P)
4/7 & 4/8(P)
EXTENT : 3.68.0Hect
VILLAGE : KARIYASANDIRAM
TALUK : SHOOLAGIRI
DISTRICT : KRISHNAGIRI

INDEX

MINE LEASE AREA: ●

TOPO SHEET NO : 57-L/01

LATITUDE : 12°48'31.93"N to 12°48'39.02"N

LONGITUDE : 78°1'2.96"E to 78°1'10.87"E

LOCATION PLAN

NOT TO SCALE

Prepared By:

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

G. Umamaheswaran
G.UMAMAHESWARAN,M.Sc.,
QUALIFIED PERSON

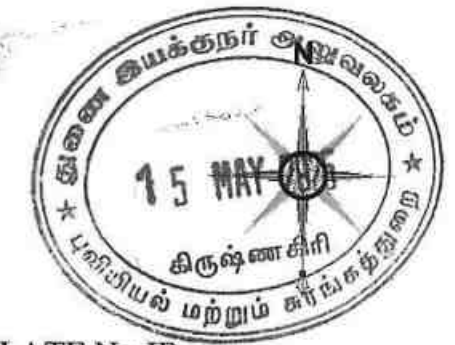
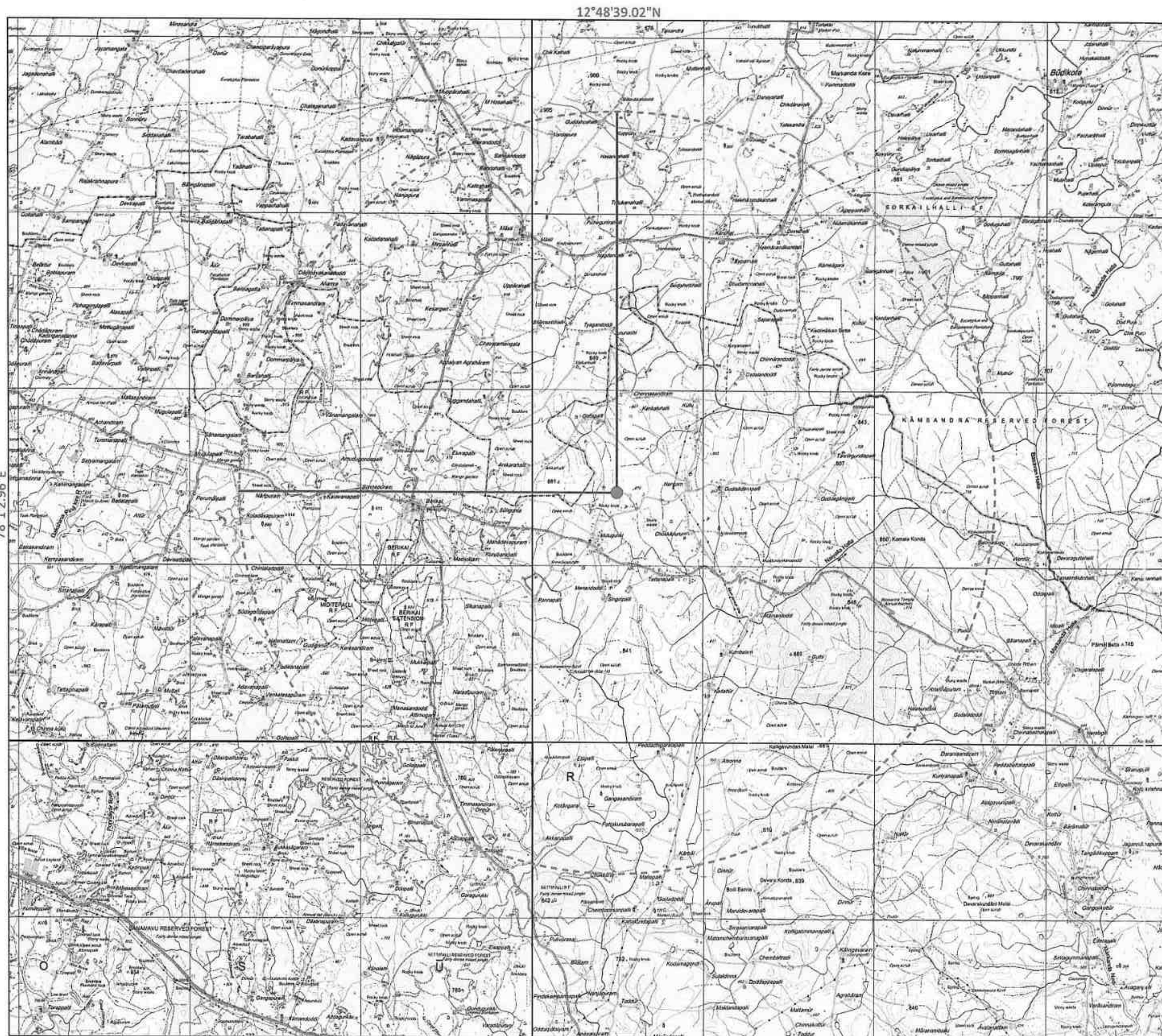


PLATE No-IB

APPLICANT:

**M/s.VISHNUSURYA PROJECTS AND
HOSUR PRIVATE LIMITED,**
AGNI BUSINESS CENTRE,
No.24/46, K.B.DASAN ROAD,
3rd FLOOR, ALWARPET,
CHENNAI DISTRICT -600018.

LEASE APPLIED AREA:

S.F.No : 3/2C(P),4/2(P),4/5(P),4/6(P)
4/7 & 4/8(P)

EXTENT : 3.68.0Hect
VILLAGE : KARIYASANDIRAM
TALUK : SHOOLAGIRI
DISTRICT : KRISHNAGIRI

[illegible]

TOPO SHEET NO : 57-L/01

LATITUDE : 12°48'31.93"N to 12°48'39.02"N

LONGITUDE : 78°1'2.96"E to 78°1'10.87"E

TOPOSHEET MAP
SCALE- 1:1,00,000

Prepared By:

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

G. Umamaheswaran, M.Sc.,
QUALIFIED PERSON

12°48'39.02"N

78°12.96"E

Towards
Sokkapuram**APPLICANT:**

**M/s.VISHNUSURYA PROJECTS AND
HOSUR PRIVATE LIMITED,**
AGNI BUSINESS CENTRE,
No.24/46, K.B.DASAN ROAD,
3rd FLOOR, ALWARPET,
CHENNAI DISTRICT -600018.

LEASE APPLIED AREA:

S.F.No : 3/2C(P),4/2(P),4/5(P),4/6(P)
4/7 & 4/8(P)
EXTENT : 3.68.0Hect
VILLAGE : KARIYASANDIRAM
TALUK : SHOOLAGIRI
DISTRICT : KRISHNAGIRI

INDEX

MINE LEASE AREA	
APPROACH ROAD	
CART ROAD	
100m RADIUS	
200m RADIUS	
300m RADIUS	
400m RADIUS	
500m RADIUS	
EXISTING PIT	

TOPO SHEET NO : 57-L/01

LATITUDE : 12°48'31.93"N to 12°48'39.02"N

LONGITUDE : 78°12.96"E to 78°11'10.87"E

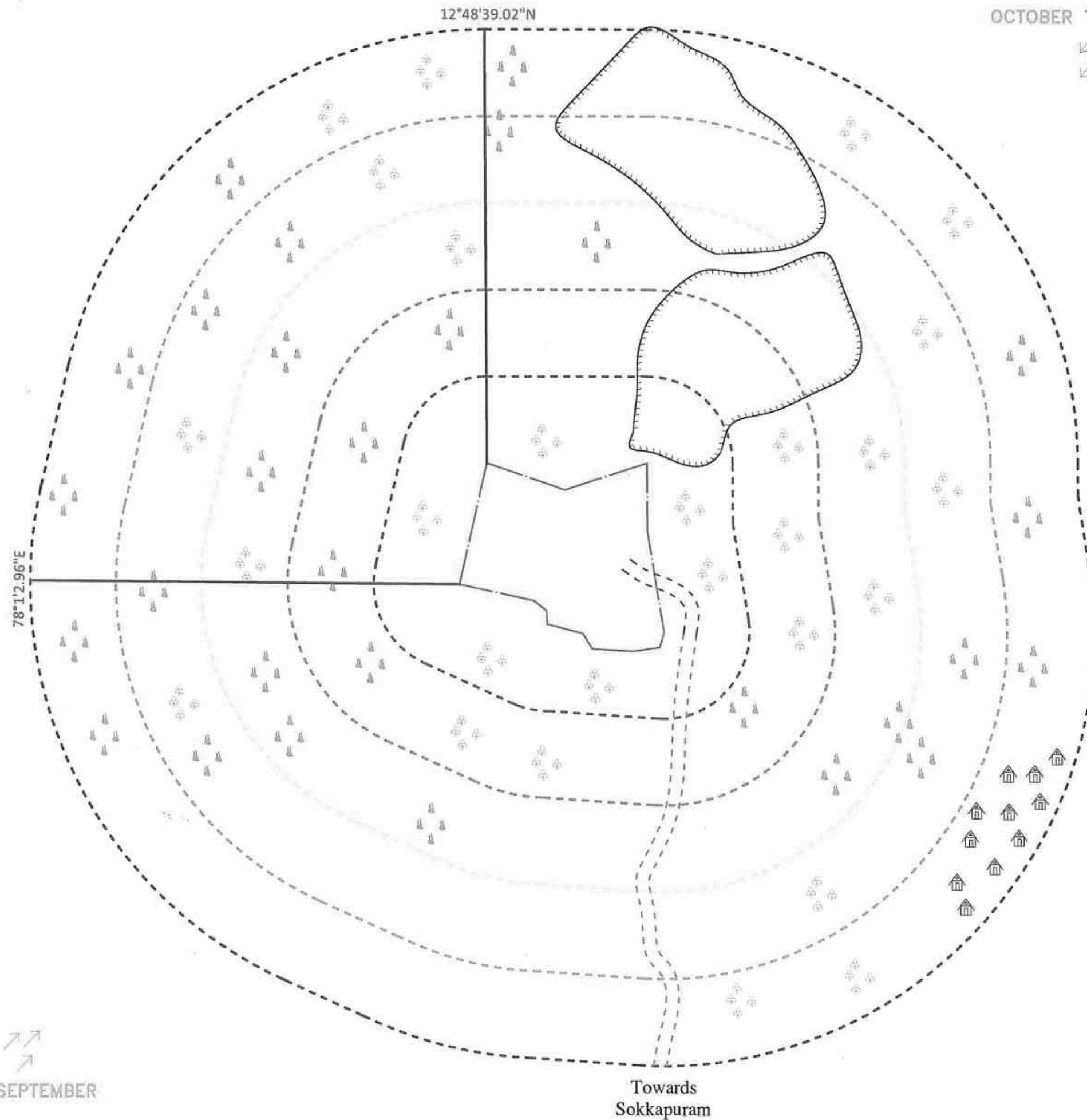
SATELITE IMAGERY MAP

SCALE- 1:5000

Prepared By:

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

G. Umamaheswaran
G.UMAMAHESWARAN, M.Sc.,
QUALIFIED PERSON



APPLICANT:
M/s.VISHNUSURYA PROJECTS AND HOSUR PRIVATE LIMITED,
 AGNI BUSINESS CENTRE,
 No.24/46, K.B.DASAN ROAD,
 3rd FLOOR, ALWARPET,
 CHENNAI DISTRICT -600018.

LEASE APPLIED AREA:
 S.F.No : 3/2C(P),4/2(P),4/5(P),4/6(P)
 4/7 & 4/8(P)
 EXTENT : 3.68.0Hect
 VILLAGE : KARIYASANDIRAM
 TALUK : SHOOLAGIRI
 DISTRICT : KRISHNAGIRI

INDEX

MINE LEASE AREA	
APPROACH ROAD	
CART ROAD	
100m RADIUS	
200m RADIUS	
300m RADIUS	
400m RADIUS	
500m RADIUS	
EXISTING PIT	
SHRUBS & TREES	
HABITATION	

TOPO SHEET NO : 57-L/01
 LATITUDE : 12°48'31.93"N to 12°48'39.02"N
 LONGITUDE : 78°1'2.96"E to 78°1'10.87"E

ENVIRONMENTAL PLAN
 SCALE- 1:5000

Prepared By:

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

G.UMAMAHESWARAN,M.Sc.,
 QUALIFIED PERSON

JULY TO SEPTEMBER

Towards
 Sokkapuram

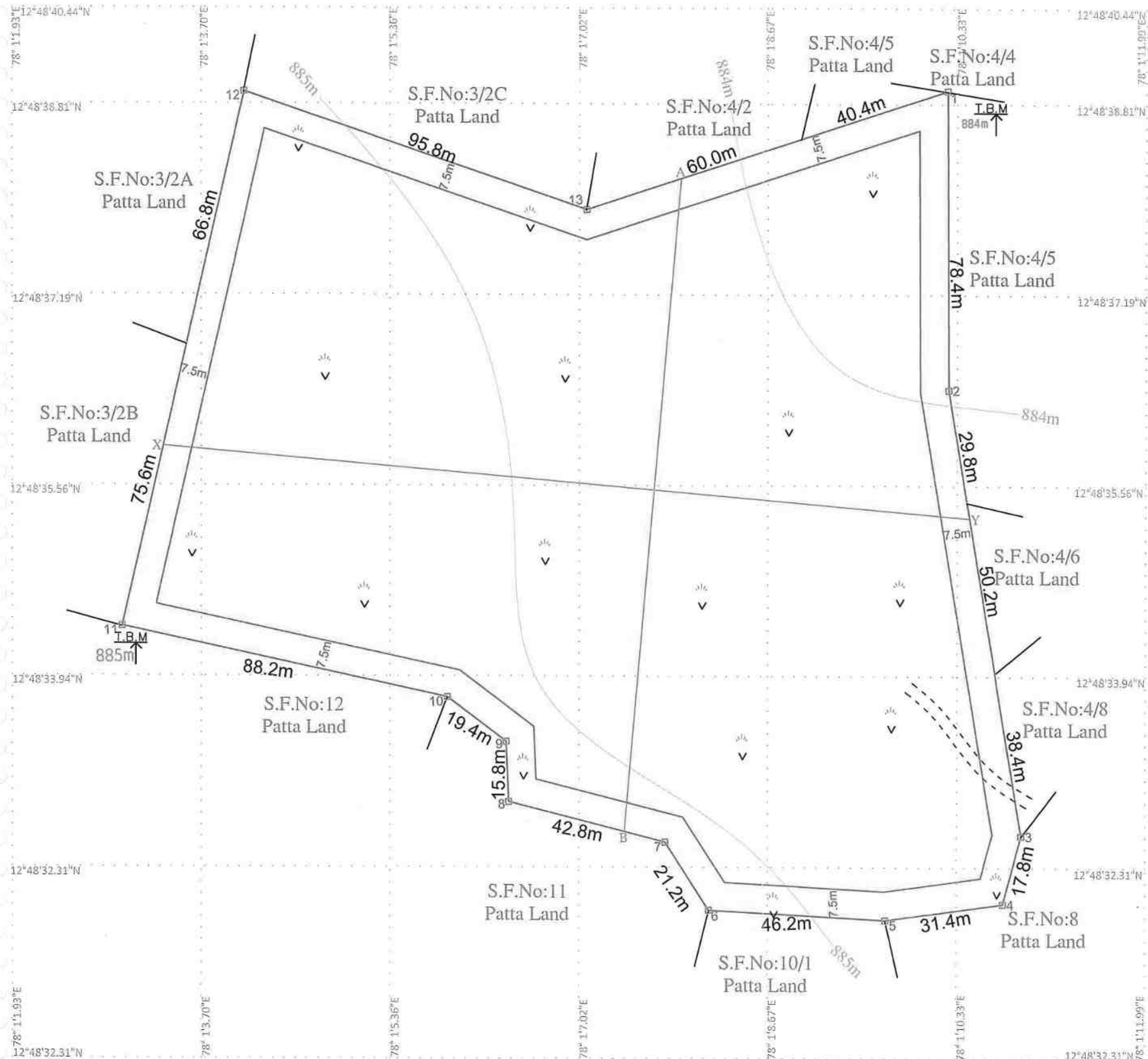


PLATE No- III

APPLICANT:
M/s.VISHNUSURYA PROJECTS AND
HOSUR PRIVATE LIMITED,
 AGNI BUSINESS CENTRE,
 No.24/46, K.B.DASAN ROAD,
 3rd FLOOR, ALWARPET,
 CHENNAI DISTRICT -600018.

LEASE APPLIED AREA:

S.F.No : 3/2C(P),4/2(P),4/5(P),4/6(P)
 4/7 & 4/8(P)
 EXTENT : 3.68.0Hect
 VILLAGE : KARIYASANDIRAM
 TALUK : SHOOLAGIRI
 DISTRICT : KRISHNAGIRI

INDEX

MINE LEASE BOUNDARY	
SAFETY BOUNDARY	
APPROACH ROAD	
BOUNDARY PILLAR STONES	
TEMPORARY BENCH MARK	
CONTOUR LINES	
SHRUBS	
TOPSOIL & GRAVEL	

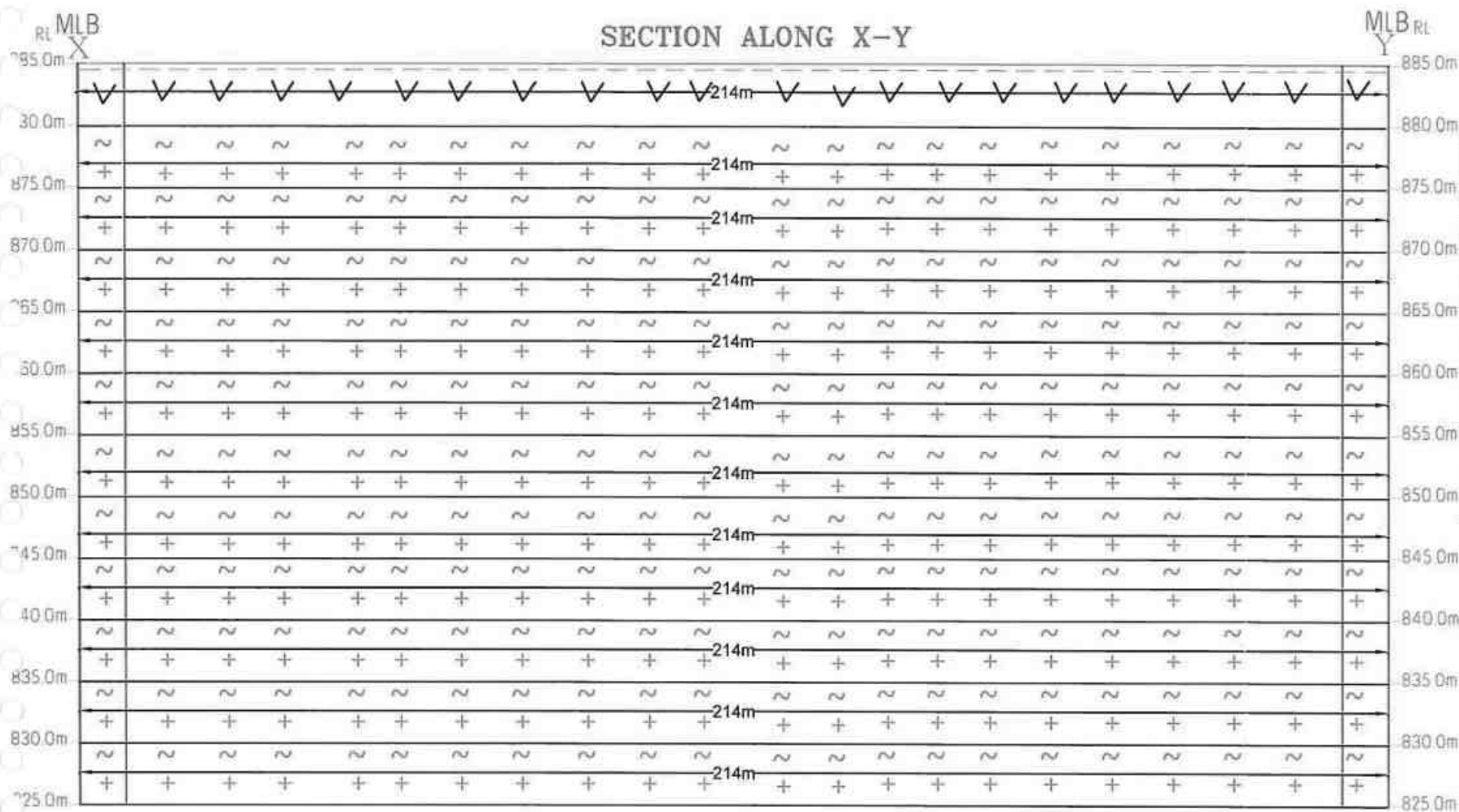
SURFACE & GEOLOGICAL PLAN

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

G.UMAMAHESWARAN,M.Sc.,
 QUALIFIED PERSON



GEOLOGICAL RESOURCES												
Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume in M ³	Rough Stone in M ³	Topsoil in M ³	Gravel in M ³	Bulk Density (T/m ³)	Rough Stone in Ts	Topsoil in (Ts)	Gravel in (Ts)
XY-AB	I	214	172	0.5	18404	.....	18404	.....	.....	.....	36808	.....
	I	214	172	4.5	165636	.....	.....	165636	.....	.....	.....	331272
	II	214	172	5	184040	184040	.....	.....	2.75	506110	.....	.....
	III	214	172	5	184040	184040	.....	.....	2.75	506110	.....	.....
	IV	214	172	5	184040	184040	.....	.....	2.75	506110	.....	.....
	V	214	172	5	184040	184040	.....	.....	2.75	506110	.....	.....
	VI	214	172	5	184040	184040	.....	.....	2.75	506110	.....	.....
	VII	214	172	5	184040	184040	.....	.....	2.75	506110	.....	.....
	VIII	214	172	5	184040	184040	.....	.....	2.75	506110	.....	.....
	IX	214	172	5	184040	184040	.....	.....	2.75	506110	.....	.....
	X	214	172	5	184040	184040	.....	.....	2.75	506110	.....	.....
	XI	214	172	5	184040	184040	.....	.....	2.75	506110	.....	.....
	XII	214	172	5	184040	184040	.....	.....	2.75	506110	.....	.....
TOTAL					2208480	2024440	18404	165636	.....	5567210	36808	331272

PLATE No- IIIA

APPLICANT:

M/s.VISHNUSURYA PROJECTS AND
HOSUR PRIVATE LIMITED,
AGNI BUSINESS CENTRE,
No.24/46, K.B.DASAN ROAD,
3rd FLOOR, ALWARPET,
CHENNAI DISTRICT -600018.

LEASE APPLIED AREA:

S.F.No : 3/2C(P),4/2(P),4/5(P),4/6(P)
4/7 & 4/8(P)

EXTENT : 3.68.0Hect
VILLAGE : KARIYASANDIRAM
TALUK : SHOOLAGIRI
DISTRICT : KRISHNAGIRI

INDEX

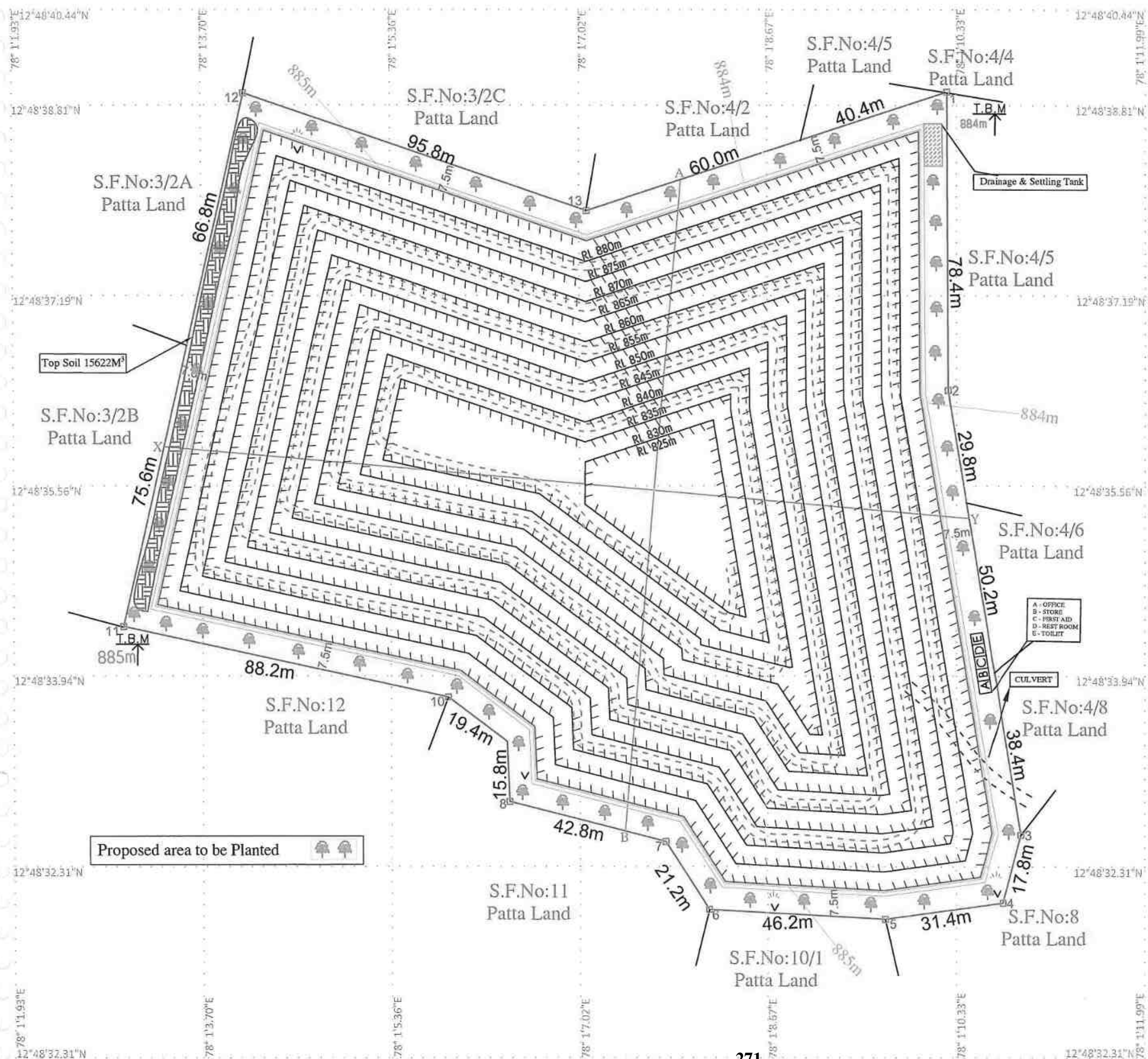
MINE LEASE AREA ☐
SAFETY BOUNDARY ☐
TOPSOIL & GRAVEL ☒
ROUGH STONE ☒

GEOLOGICAL SECTIONS
SECTION HOR 1 : 1000 & VER 1 : 500

Prepared By:

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

G.UMAMAHESWARAN, M.Sc.,
QUALIFIED PERSON



APPLICANT:

**M/s.VISHNUSURYA PROJECTS AND
HOSUR PRIVATE LIMITED,**
AGNI BUSINESS CENTRE,
No.24/46, K.B.DASAN ROAD,
3rd FLOOR, ALWARPET,
CHENNAI DISTRICT -600018.

LEASE APPLIED AREA:

S.F.No : 3/2C(P),4/2(P),4/5(P),4/6(P)
4/7 & 4/8(P)
EXTENT : 3.68.0Hect
VILLAGE : KARIYASANDIRAM
TALUK : SHOOLAGIRI
DISTRICT : KRISHNAGIRI

INDEX

MINE LEASE BOUNDARY	
SAFETY BOUNDARY	
APPROACH & MINE HAUL ROAD	
BOUNDARY PILLAR STONES	
TEMPORARY BENCH MARK	
CONTOUR LINES	
SHRUBS	
TOPSOIL & GRAVEL	
DRAINAGE & SETTLING TANK	
ULTIMATE BENCH	

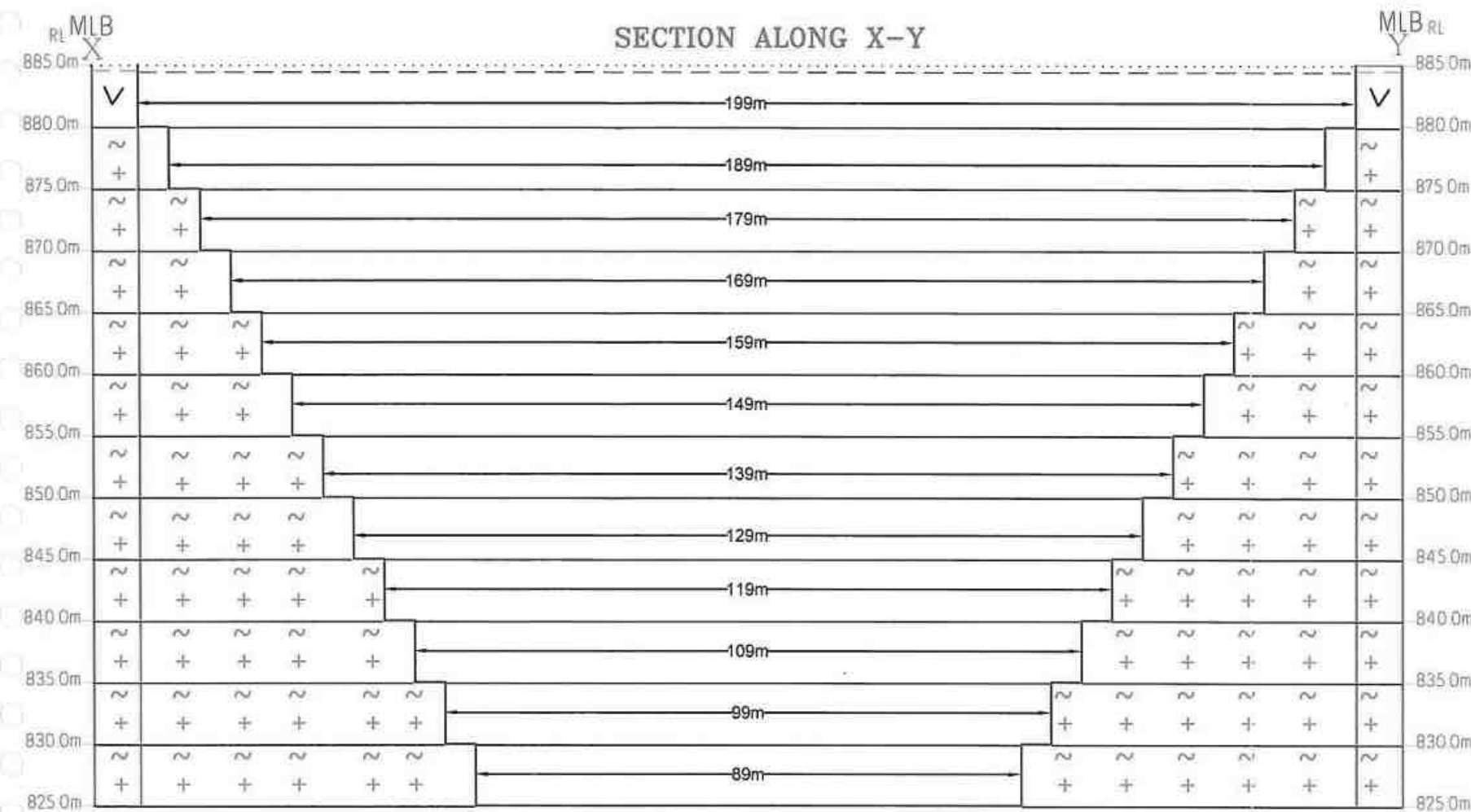
CONCEPTUAL PLAN

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

GIUMAMAHESWARAN, M.Sc.,
QUALIFIED PERSON



MINEABLE RESEVES												
Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume In M³	Rough Stone in M³	Topsoil in M³	Gravel in M³	Bulk Density	Rough Stone in (Ts)	Topsoil in (Ts)	Gravel in (Ts)
XY-AB	I	199	157	0.5	15622	.....	15622	.....	2	.....	31244	.....
	I	199	157	4.5	140594	.....	.....	140594	2	.....	.....	281188
	II	189	147	5	138915	138915	.....	.....	2.75	382016	.....	.....
	III	179	137	5	122615	122615	.....	.....	2.75	337191	.....	.....
	IV	169	127	5	107315	107315	.....	.....	2.75	295116	.....	.....
	V	159	117	5	93015	93015	.....	.....	2.75	255791	.....	.....
	VI	149	107	5	79715	79715	.....	.....	2.75	219216	.....	.....
	VII	139	97	5	67415	67415	.....	.....	2.75	185391	.....	.....
	VIII	129	87	5	56115	56115	.....	.....	2.75	154316	.....	.....
	IX	119	77	5	45815	45815	.....	.....	2.75	125991	.....	.....
	X	109	67	5	36515	36515	.....	.....	2.75	100416	.....	.....
	XI	99	57	5	28215	28215	.....	.....	2.75	77591	.....	.....
XII	89	47	5	20915	20915	.....	.....	2.75	57516	.....	.....	
TOTAL					952780	796565	15622	140594	.....	2190554	31244	281188

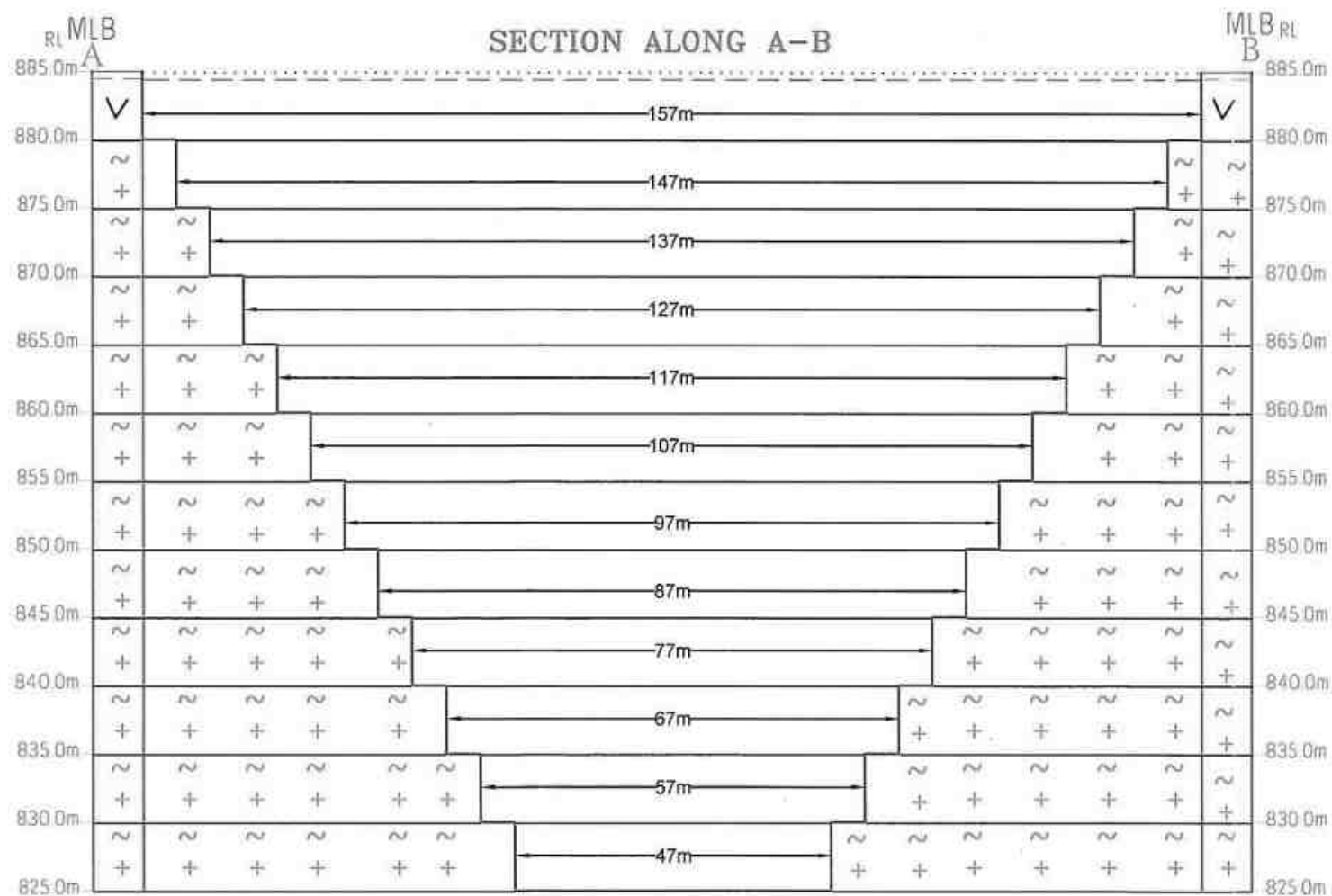


PLATE No- IVA

APPLICANT:

M/s.VISHNUSURYA PROJECTS AND HOSUR PRIVATE LIMITED,
AGNI BUSINESS CENTRE,
No.24/46, K.B.DASAN ROAD,
3rd FLOOR, ALWARPET,
CHENNAI DISTRICT -600018.

LEASE APPLIED AREA:

S.F.No : 3/2C(P),4/2(P),4/5(P),4/6(P)
4/7 & 4/8(P)
EXTENT : 3.68.0Hect
VILLAGE : KARIYASANDIRAM
TALUK : SHOOLAGIRI
DISTRICT : KRISHNAGIRI

INDEX

MINE LEASE AREA

SAFETY BOUNDARY

TOPSOIL & GRAVEL

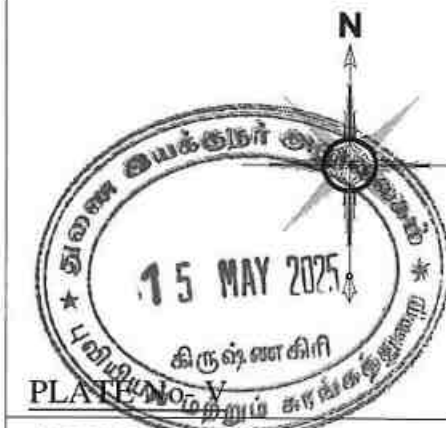
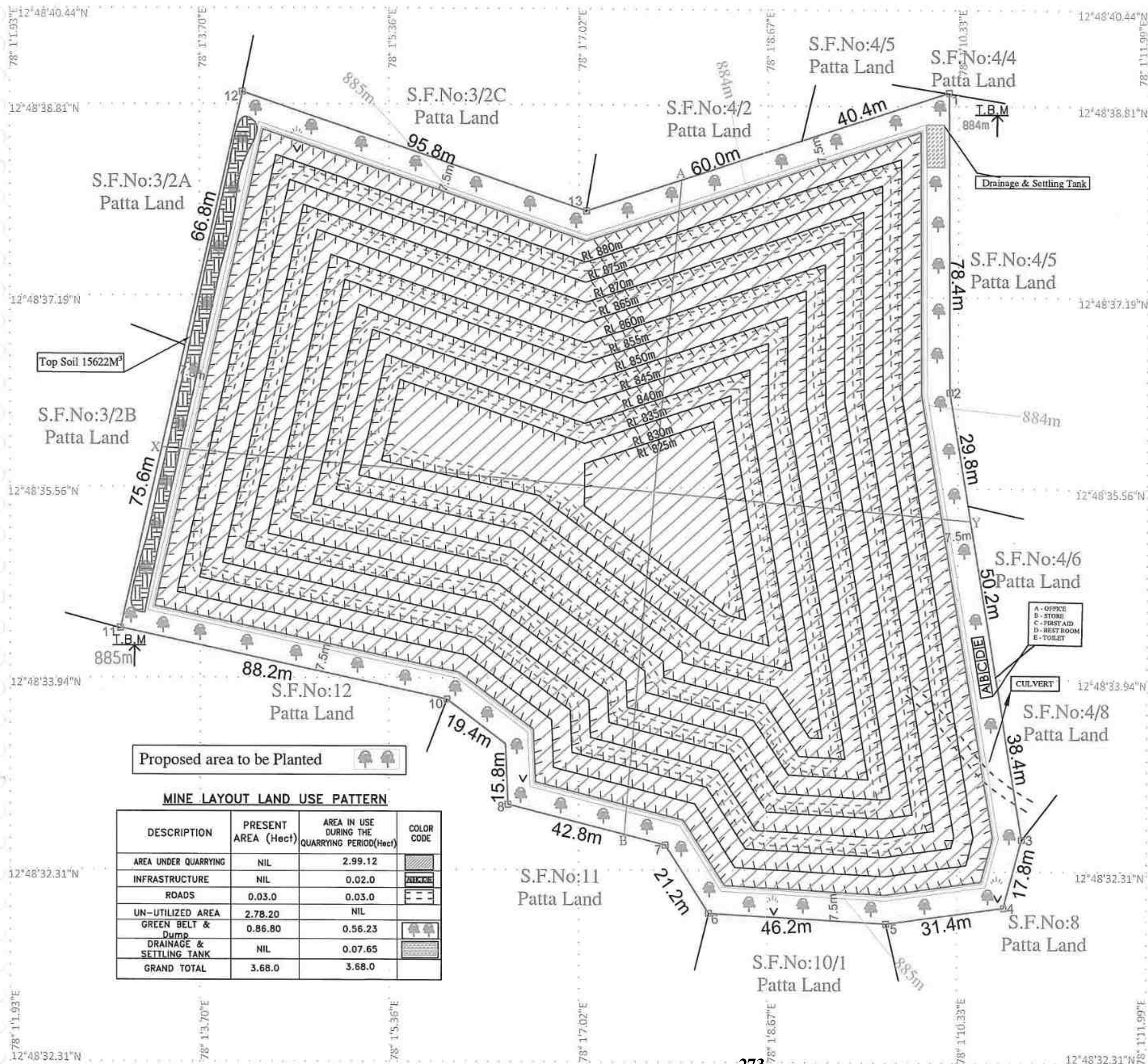
ROUGH STONE

ULTIMATE BENCH

Prepared By:

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

G.UMAMAHESWARAN, M.Sc.,
QUALIFIED PERSON



APPLICANT:
M/s.VISHNUSURYA PROJECTS AND HOSUR PRIVATE LIMITED,
 AGNI BUSINESS CENTRE,
 No.24/46, K.B.DASAN ROAD,
 3rd FLOOR, ALWARPET,
 CHENNAI DISTRICT -600018.

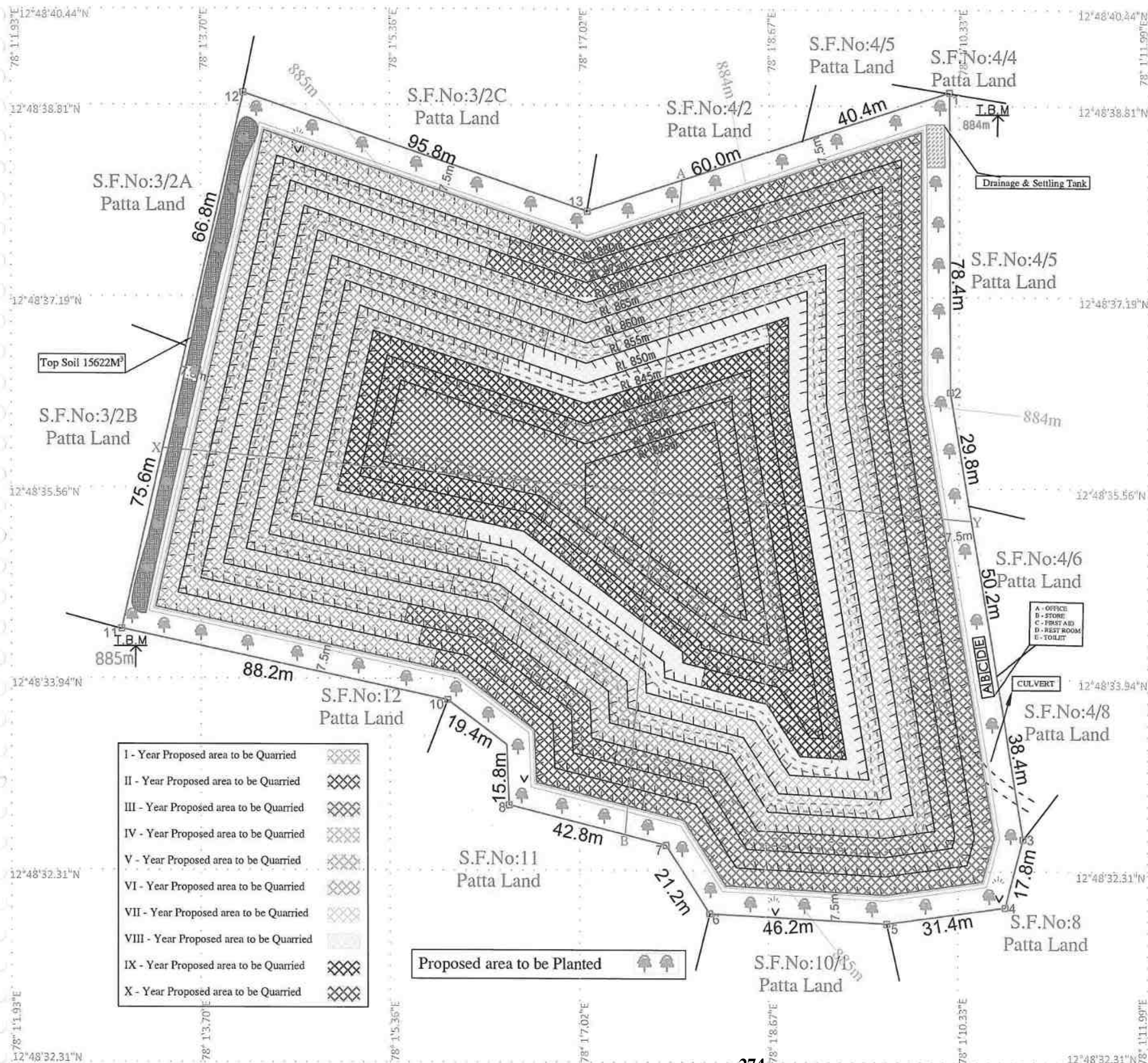
LEASE APPLIED AREA:
 S.F.No : 3/2C(P),4/2(P),4/5(P),4/6(P)
 4/7 & 4/8(P)
 EXTENT : 3.68.0Hect
 VILLAGE : KARIYASANDIRAM
 TALUK : SHOOLAGIRI
 DISTRICT : KRISHNAGIRI

INDEX	
MINE LEASE BOUNDARY	
SAFETY BOUNDARY	
APPROACH & MINE HAUL ROAD	
BOUNDARY PILLAR STONES	
TEMPORARY BENCH MARK	
CONTOUR LINES	
SHRUBS	
TOPSOIL & GRAVEL	
DRAINAGE & SETTLING TANK	
PROPOSED BENCH	

MINE LAYOUT PLAN & LAND USE PATTERN
 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

 G.UMAMAHESWARAN, M.Sc.,
 QUALIFIED PERSON



APPLICANT:
M/s.VISHNUSURYA PROJECTS AND HOSUR PRIVATE LIMITED,
 AGNI BUSINESS CENTRE,
 No.24/46, K.B.DASAN ROAD,
 3rd FLOOR, ALWARPET,
 CHENNAI DISTRICT -600018.

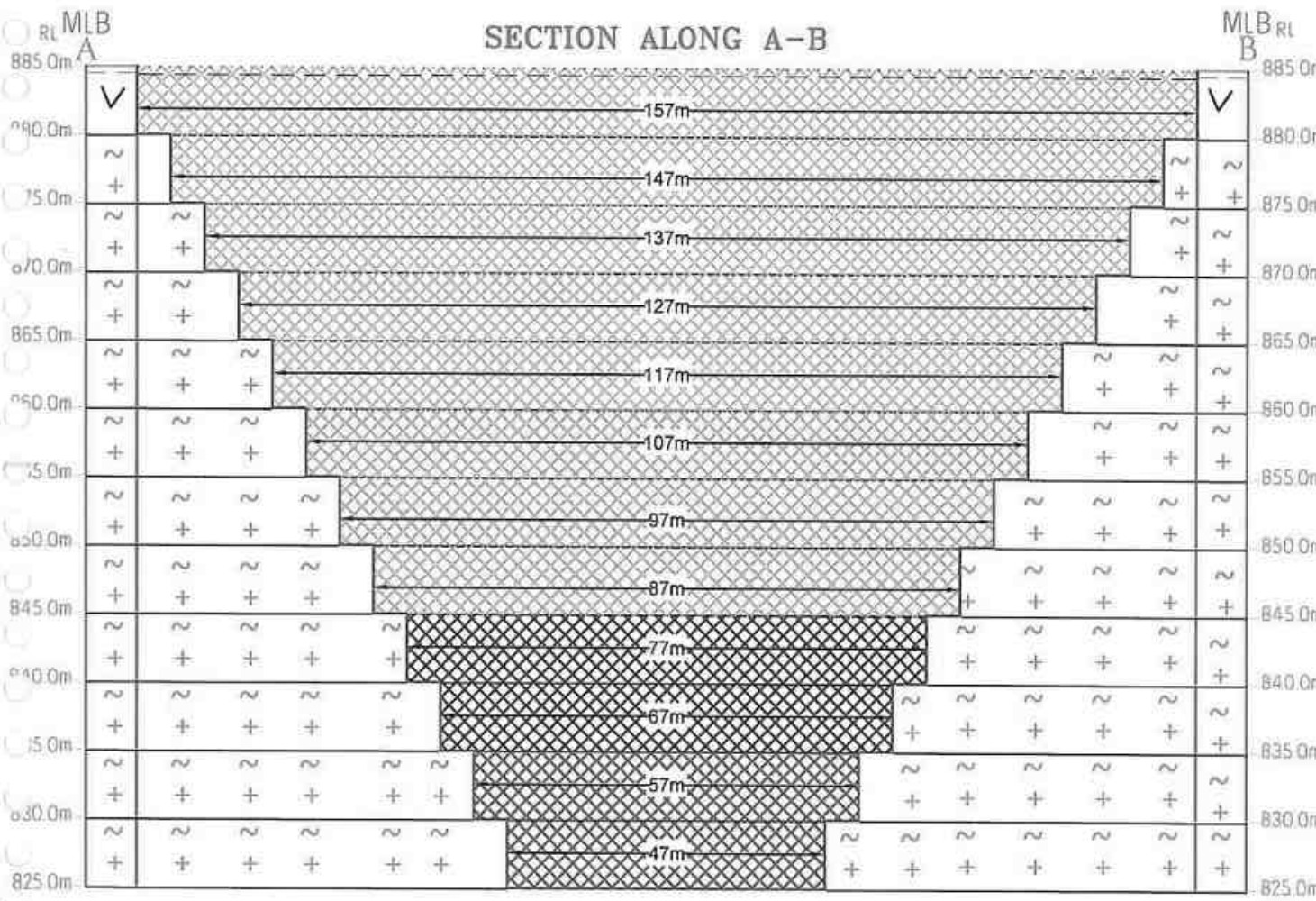
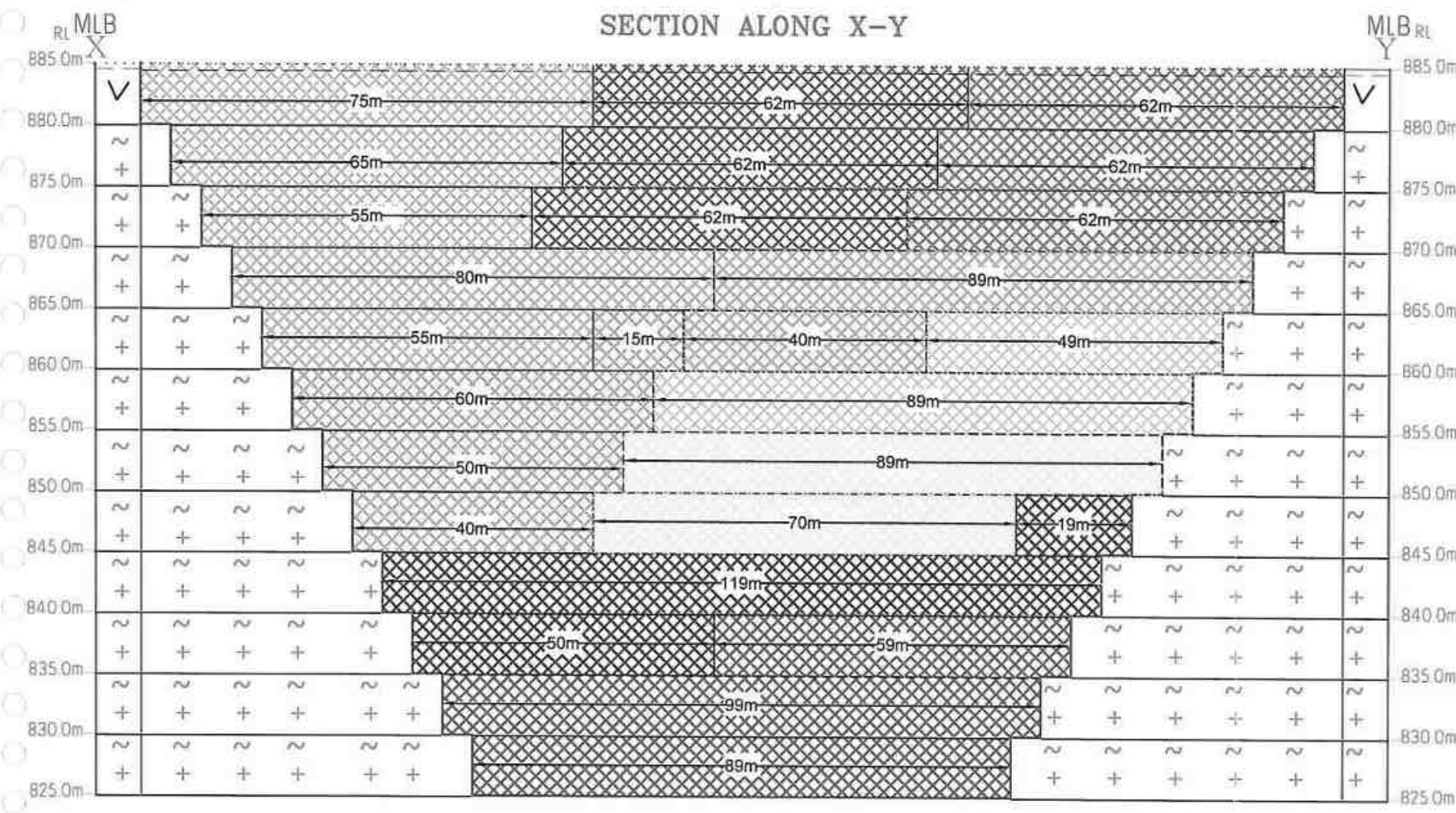
LEASE APPLIED AREA:
 S.F.No : 3/2C(P),4/2(P),4/5(P),4/6(P)
 4/7 & 4/8(P)
 EXTENT : 3.68.0Hect
 VILLAGE : KARIYASANDIRAM
 TALUK : SHOOLAGIRI
 DISTRICT : KRISHNAGIRI

INDEX	
MINE LEASE BOUNDARY	
SAFETY BOUNDARY	
APPROACH & HAUL ROAD	
BOUNDARY PILLAR STONES	
TEMPORARY BENCH MARK	
CONTOUR LINES	
SHRUBS	
TOPSOIL & GRAVEL	
DRAINAGE & SETTLING TANK	
PROPOSED BENCH	

YEARWISE DEVELOPMENT & PRODUCTION 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

 G.U.MAHESWARAN, M.Sc.,
 QUALIFIED PERSON



- I - Year Proposed area to be Quarried
- II - Year Proposed area to be Quarried
- III - Year Proposed area to be Quarried
- IV - Year Proposed area to be Quarried
- V - Year Proposed area to be Quarried
- VI - Year Proposed area to be Quarried
- VII - Year Proposed area to be Quarried
- VIII - Year Proposed area to be Quarried
- IX - Year Proposed area to be Quarried
- X - Year Proposed area to be Quarried



PLATE No- VIA

APPLICANT:
M/s.VISHNUSURYA PROJECTS AND
HOSUR PRIVATE LIMITED,
 AGNI BUSINESS CENTRE,
 No.24/46, K.B.DASAN ROAD,
 3rd FLOOR, ALWARPET,
 CHENNAI DISTRICT -600018.

LEASE APPLIED AREA:
 S.F.No : 3/2C(P),4/2(P),4/5(P),4/6(P)
 4/7 & 4/8(P)
 EXTENT : 3.68.0Hect
 VILLAGE : KARIYASANDIRAM
 TALUK : SHOOLAGIRI
 DISTRICT : KRISHNAGIRI

INDEX

- MINE LEASE AREA
- SAFETY BOUNDARY
- TOPSOIL & GRAVEL
- ROUGH STONE
- PROPOSED BENCH

YEARWISE DEVELOPMENT & PRODUCTION
SECTIONS
 SECTION HOR 1 : 1000 & VER 1: 500

Prepared By:

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

G. Umamaheswaran
G.UMAMAHESWARAN,M.Sc.,
QUALIFIED PERSON

YEARWISE PRODUCTION RESERVES															
Year	Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume In M ³	Rough Stone in M ³	Topsoil in M ³	Gravel in M ³	Bulk Density	Rough Stone in (Ts)	Topsoil in (Ts)	Gravel in (Ts)		
I-YEAR	XY-AB	I	75	157	0.5	5888		5888		2		11776			
		II	75	157	4.5	52988		52988		2			105976		
		III	65	147	5	47775	47775		2.75	131381					
		III	55	137	5	37675	37675		2.75	103606					
TOTAL						144325	85450	5888	52988		234988	11776	105976		
II-YEAR	XY-AB	I	62	157	0.5	4867		4867		2		9734			
		II	62	157	4.5	43803		43803		2			87606		
		II	62	147	5	45570	45570		2.75	125318					
		III	62	137	5	42470	42470		2.75	116793					
TOTAL						136710	88040	4867	43803		242110	9734	87606		
III-YEAR	XY-AB	I	62	157	0.5	4867		4867		2		9734			
		II	62	157	4.5	43803		43803		2			87606		
		II	62	147	5	45570	45570		2.75	125318					
		III	62	137	5	42470	42470		2.75	116793					
TOTAL						136710	88040	4867	43803		242110	9734	87606		
IV-YEAR	XY-AB	IV	90	127	5	50800	50800		43803		2.75	139700			
		V	55	117	5	32175	32175		43803		2.75	88481			
		TOTAL						82975	82975	0	0		228181	0	0
		TOTAL						82975	82975	0	0		228181	0	0
V-YEAR	XY-AB	V	15	117	5	8775	8775		43803		2.75	24131			
		VI	60	107	5	32100	32100		43803		2.75	88275			
		VII	50	97	5	24250	24250		43803		2.75	66688			
		VIII	40	87	5	17400	17400		43803		2.75	47850			
TOTAL						82525	82525	0	0		226944	0	0		
VI-YEAR	XY-AB	III	89	127	5	56515	56515		43803		2.75	155416			
		IV	40	117	5	23400	23400		43803		2.75	64350			
		TOTAL						79915	79915	0	0		219766	0	0
		TOTAL						79915	79915	0	0		219766	0	0
VII-YEAR	XY-AB	V	49	117	5	28565	28565		43803		2.75	78829			
		VI	89	107	5	47615	47615		43803		2.75	130941			
		TOTAL						76280	76280	0	0		209770	0	0
		TOTAL						76280	76280	0	0		209770	0	0
VIII-YEAR	XY-AB	VII	89	97	5	43165	43165		43803		2.75	118704			
		VIII	70	87	5	30450	30450		43803		2.75	83738			
		TOTAL						73615	73615	0	0		202441	0	0
		TOTAL						73615	73615	0	0		202441	0	0
IX-YEAR	XY-AB	VIII	19	87	5	8265	8265		43803		2.75	22729			
		IX	119	77	5	45815	45815		43803		2.75	125991			
		X	50	67	5	16750	16750		43803		2.75	46063			
		TOTAL						70830	70830	0	0		194783	0	0
X-YEAR	XY-AB	X	59	67	5	19765	19765		43803		2.75	54354			
		XI	99	57	5	28215	28215		43803		2.75	77591			
		XII	89	47	5	20915	20915		43803		2.75	57516			
		TOTAL						68895	68895	0	0		189461	0	0
GRAND TOTAL						952780	796565	15622	140594		2190584	31244	281188		

54-കുറിയ പട്ടണിനും മറ്റും

മിത്രമേന്മയിൻ ഗുരുക്കൾ, മേനോൻ മേനോൻ,
 പെരുന്തൻ മേനോൻ, മേനോൻ മേനോൻ, കുറിയ പട്ടണിനും
 മറ്റും പേരുകൾ - 3/20(P), 4/2(P), 4/5(P), 4/6(P)
 4/7 ഗുരുക്കൾ 4/8(P) മേനോൻ മേനോൻ
 മേനോൻ കുറിയ പട്ടണിനും മറ്റും മേനോൻ മേനോൻ
 മേനോൻ മേനോൻ മേനോൻ മേനോൻ മേനോൻ
 പേരുകൾ മേനോൻ മേനോൻ മേനോൻ മേനോൻ
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R. K. K. K.
 Village Administrative Officer
 Nerigam Village, Berigal Birka
 Shoolagiri (T.K), Krishnagiri (D.T)



National Accreditation Board for Education and Training

Certificate of Accreditation

Geo Technical Mining Solutions, Dharmapuri

5/1485-3, Salem Main Road, Elakkiyampatty, Dharmapuri, Tamil Nadu

The organization is accredited as **Category-A** under the QCI-NABET Scheme for Accreditation of EIA Consultant Organization, Version 3: for preparing EIA/EMP reports in the following Sectors.

S. No	Sector Description	Sector (as per)		Cat.
		NABET	MoEFCC	
1.	Mining of minerals - including opencast and underground mining	1	1 (a) (i)	A

Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in RAAC minutes dated January 24, 2024, posted on QCI-NABET website.

The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in QCI-NABET's letter of accreditation bearing no QCI/NABET/ENV/ACO/24/3142 dated Feb 19, 2024. The accreditation needs to be renewed before the expiry date by Geo Technical Mining Solutions, Dharmapuri following due process of assessment.

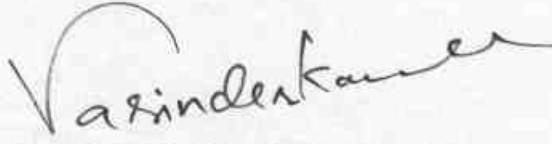
Issue Date
Feb 19, 2024

Valid up to
Dec 31, 2026




Mr. Ajay Kumar Jha
Sr. Director, NABET

Certificate No.
NABET/EIA/23-26/RA 0319


Prof (Dr) Varinder S Kanwar
(CEO NABET)

For the updated List of Accredited EIA Consultant Organizations with approved Sectors please refer to QCI-NABET website.