

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT` AND ENVIRONMENT MANAGEMENT PLAN

FOR OBTAINING

Environmental Clearance under EIA Notification – 2006

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

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

CLUSTER EXTENT = 15.85.0hectares

At

Vinnamangalam Village, Ambur Taluk,
Thirupathur District, Tamil Nadu

ToR Identification No. TO25B0I08TN5986349N Dated:13.05.2025, File No.II929

NAME AND ADDRESS OF THE PROPOSED PROJECT PROPONENT

Name and Address	Extent & S.F.No.	Mineral Production
R.Purushothaman S/o.Ranganathan, No.43, Perumal Kovil Street, Vinnamangalam Village, Ambur Taluk, Tirupathur District – 635807.	0.81.0Ha & 420 (Part-6)	Rough Stone 1,15,205m ³

ENVIRONMENTAL CONSULTANT

GEO TECHNICAL MINING SOLUTIONS



No: 1/213-B, Ground Floor, Natesan Complex
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NABET ACC. NO: NABET/EIA/23-26/RA 0319
Valid till: 31.12.2026

ENVIRONMENTAL LAB

INTERSTELLAR TESTING CENTRE Pvt. Ltd

Plot.No.2, Site No.12/2A,

Industrial Estate, Perungudi, Chennai, Tamil Nadu

NABL Certificate Number:TC-6952, Valid Until : 30.07.2026

Baseline study period-October through December 2024

MAY-2025



GEO TECHNICAL MINING SOLUTIONS

TERMS OF REFERENCE (ToR) COMPLIANCE

ToR File No.11929

ToR Identification No. TO25B0108TN5986349N, dated.13/05/2025

P. Purushothaman, Rough Stone Quarry

1. SEIAA Specific Conditions:

S.No	Terms of Reference
1.1	The Authority noted that the subject was placed in the 542nd meeting of SEAC-I held on 26.03.2025. After detailed discussions, the Authority accepts the recommendation of SEAC-I and decided to grant Terms of Reference (ToR) along with Public Hearing for the quantity of 1,15,205 m³ of rough stone and annual peak production shall not exceed 19,825 m³ of rough stone for an ultimate depth of mining of 45m (25m AGL + 20m BGL) as per the approved mining plan, under cluster for undertaking the combined Environment Impact Assessment Study and preparation of separate Environment Management Plan subject to the conditions as recommended by SEAC-I & normal conditions & the conditions mentioned below.

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:	The Cluster Management Committee (CMC) regarding following these conditions and same documents will be submitted during the EIA appraisal meeting.

	(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) executing the planned activities.	
2	The PP should submit an affidavit to follow the 5m benches properly during mining as per the approved mining plan	The Affidavit regarding will be submitted in final EIA report.
3	Boundary pillars to be erected as per the mine rules and the evidence should be submitted along with the EIA report.	Boundary pillars of the lease area have shown in figure 2.3 under chapter II in the EIA report page 12.
4	Since waterbodies are situated nearby, the PP shall carry out the hydrological study including the details of waterflow pattern to determine the impacts of the mining operation in the waterbodies.	The hydrogeological study is discussed in the Section 3.3.3 under Chapter III in the EIA report page 43-53.
5	The details of enumeration of structures including schools, colleges, primary health centres should be submitted along with the EIA report.	The details of structures is discussed in the Table 2.1 under the Chapter II in the EIA report page 10.
6	The structures within the radius of (i) 50 m, (ii) 100 m, (iii) 200 m and (iv) 300 m & up to 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	The details of structures such as dwelling houses, places of worship, industries, factories, sheds, etc. within the radius of 500m from the proposed project area map will be submitted final EIA report.

		protection of the above structures, if any during the quarrying operations.	
	7	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.	Photographs of adequate fencing, green belt along the periphery of the project area and the photographs will be submitted in the final EIA report.
	8	The Proponent shall carry out Bio diversity study as a part of EIA study and the same shall be included in the Report.	The detailed bio diversity report will be submitted in final EIA report.
	9	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 133-138. The sworn affidavit stating to abide the EMP for the entire life of mine will be submitted during final Presentation.
	10	The PP shall carry out the comprehensive studies on the cumulative environmental impacts of the existing & proposed quarries which included drilling & blasting, loading & hauling on the surrounding village and structures.	Results of cumulative impact study due to mining operations are given in Section 7.4 under Chapter VII in the EIA report page 119-123.
	11	The PP shall prepare a conceptual working plan accommodating the inclusion of haul road accessibility	As it is a fresh lease area, the Slope Stability report is not required.

		keeping the benches intact, by ensuring the slope stability of the working benches to be constructed and existing quarry wall.	
	12	The PP shall install the CCTV camera for the continuous surveillance of mining activity & furnish the photographic/videographic evidence along with the EIA report.	The photographic / videographic evidence will be submitted in final EIA report.

3.SEAC Standard Conditions

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	As it is a fresh quarry, the conditions are not applicable.
		(ii)	Quantity achieved Vs EC Approved Quantity	
		(iii)	Balance Quantity as per Mineable Reserve calculated.	
		(iv)	Mined out Depth as on date Vs EC Permitted depth	
		(v)	Details of illegal/illicit mining	
		(vi)	Violation in the quarry during the past working.	
		(vii)	Quantity of material mined out outside the mine lease area	
		(viii)	Condition of Safety zone/benches	
		(ix)	Revised/Modified Mining Plan showing the benches of not exceeding 6 m height and ultimate depth of not exceeding 50m.	
	2	Details of habitations around the proposed mining area and latest VAO certificate regarding the location of		The VAO certificate is attached in Annexure IV.

	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 structures within the radius of 500m is shown in the Figure 4.3 under Chapter IV in the EIA report page 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	It is fresh quarry lease. So, the slope stability study is not required for this mine lease area.

	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.	The proposed depth of the quarry is 45m (Which is 25m AGL+20m BGL). So, the slope stability study is not required for this mine lease area.
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 under Chapter II in the EIA report page 13-20.
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.	This is only quarry in the name of lessee. There are no any other details in the past.
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 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.
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.	All the photographs 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 plate used for reserve estimation has been presented in Figure 2.5 results of geological resources and reserves have been shown in Table 2.4. under Chapter II in the EIA report page 13-14.
19	The Project Proponent shall provide the Organization chart indicating the appointment of various statutory officials and other competent persons to be	Details of manpower required for this project have been given in Table 2.14 under Chapter II in the EIA report page 21.

	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.	The hydrogeological study is discussed in the Section 3.2.2 under Chapter III in the EIA report page 36-44.
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 22-87.
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,	Results of cumulative impact study due to mining operations are given in Section 7.4 under Chapter VII in the EIA report page 119-127.

		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.	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.
	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 in the EIA report page 23-29 under Chapter III. The details of surrounding sensitive ecological features have been provided in Table 3.37 under Chapter III in the EIA report page 87. 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 17.
	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	This condition is not applicable to this project because no dumps have been proposed outside the lease area.

	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.	Not Applicable. 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 3.7 under Chapter III in the EIA report page 84-86.
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 3.5 under Chapter III in the EIA report page 58-73.
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 18.
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.	The EIA coordinator and the FAE for ecology and biodiversity visited the study area and educated the local students about the importance of protecting the biological environment.
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 101-105.
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	The FAE of ecology and biodiversity has advised the project proponent that saplings of one year old raised in the eco-friendly bags should be purchased and planted with the spacing of 3 m between each plant around the proposed project area as per the advice of local forest authorities/botanist.

	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.	A disaster management plan for the project has been provided in Section 7.3 under Chapter VII in the EIA report page 117-119.
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 115-117.
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 106-107.
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 130-131.
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	No negative impact on socio-economic environment of the study area is anticipated and this project shall benefit the socio-economic

	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.	environment by offering employment for 18 people directly as discussed in Section 8.1 under Chapter VIII in the EIA report page 129.
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.	No litigation is pending in any court against this project.
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 129-131.
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 proposed 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 133-138. The sworn affidavit stating to abide the EMP for the entire life of mine will be submitted during final EIA report.

	43	Concealing any factual information or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this Terms of Conditions besides attracting penal provisions in the Environment (Protection) Act, 1986.	The EIA report has been prepared keeping in mind the fact that concealing any factual information or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may lead to withdrawal of this terms of reference besides attracting penal provisions in the Environment (Protection) Act, 1986.
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4. SEIAA Standard Conditions:

Cluster Management Committee			
1	Cluster Management Committee shall be framed which must include all the proponents in the cluster as members including the existing as well as proposed quarry.	A cluster management committee including all the proponents of the rough stone quarrying projects within the cluster of 500 m radius will be constituted for the effective implementation of green belt development plan, water sprinkling, blasting, etc.	
2	The members must coordinate among themselves for the effective implementation of EMP as committed including Green Belt Development, Water sprinkling, tree plantation, blasting etc.,	The members of the cluster management committee will be instructed to carry out EMP in coordination.	
3	The List of members of the committee formed shall be submitted to AD/Mines 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 13-20.
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.	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 90-108.
10	Impact on soil flora & vegetation around the project site.	The details on flora have been provided in Section 3.5 under Chapter III in the EIA report page 58-73. 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 3.5 under Chapter III in the EIA report page 58-73. Details about transplantation of plants have been provided in Section 4.6 under Chapter IV in the EIA report page 101-105.
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 3.5 under Chapter III in the EIA report page 58-73 and measures have been provided in Section 4.6 under Chapter IV in the EIA report page 101-105.
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 90-108.
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 90.
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 101-105.
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 101-105.
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 3.37 under Chapter III in the EIA report page 87.
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	The hydrogeological study is discussed in the Section 3.2.2 under Chapter III in the EIA report page 36-44.

	nearby waterbodies due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided, covering the entire mine lease period.	
20	Erosion Control measures.	Garland drainage structures will be constructed around the lease area to control the erosion, as discussed in Section 4.3 under Chapter IV in the EIA report page 91-92.
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.	All environmental anticipated impact and the Mitigation measures has been discussed under Chapter IV in the EIA report page 90-108.
22	The project proponent shall study impact on fish habitats and the food WEB/ food chain in the water body.	An analysis for food chain in aquatic ecosystem has been discussed in Section 3.5 under Chapter III in the EIA report page 58-73.
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 90-108.
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	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 101-105.

	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.	The impact of mining on soil environment has been discussed in Section 4.2 under Chapter IV in the EIA report page 90.
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 90-91.
27	The EIA shall include the impact of mining activity on the following:	
	a) Hydrothermal / Geothermal effect due to destruction in the Environment.	The proposed mining area and the surrounding falls under hard rock formation i.e., migmatite formation and the district has not recorded any Hydrothermal / Geothermal effect and as per the Seismic Zonation Map of India, the district falls under the Zone III of seismic zones classification. The resultant of this open cast mining shall not have any Hydrothermal/Geothermal effect on the surrounding environment.
	b) Bio-geochemical processes and its foot prints including environmental stress.	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.	Sediment geochemistry is discussed in the Table 3.5 under the Chapter III in the EIA report page 31.
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 90-108.
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 101-105.
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 90-108.
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 18.
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 133-138.
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 134-138.
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 115-117.
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/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.	The disaster management plan for this project has been provided in Section 7.3 under Chapter VII in the EIA report page 117-119.

Others		
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.	The VAO certificate of 300 m radius have been attached in the attached in the Annexure IV.
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 127-128.

Standard Terms of Reference for (Mining of minerals)

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.
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1.2	A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given	The proposed site for quarrying is a Government Poramboke land.
1.3	All documents including approved mine plan, EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee	All the documents are in the name of the lessee.
1.4	All corner coordinates of the mine lease area, superimposed on a High-Resolution Imagery/ toposheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone)	All corner coordinates of the mine lease area have been superimposed on a high- resolution Google Earth Image, as shown in Figure 2.3 under Chapter II in the EIA report page 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 in the EIA report page 22-87.
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 Environmental Policy is discussed in the Section 10.1 under Chapter X in the EIA report page 133-134.
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 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.

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 in the EIA report page 23-29. The details of surrounding sensitive ecological features have been provided in Table 3.37 under Chapter III in the EIA report page 87. 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 17.
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. The entire quarried out rough stone will be transported to the needy customers.
1.12	A Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of	It is not applicable as there is no forest land involved within the proposed project area. The details have been

	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	discussed in Table 3.37 under Chapter III in the EIA report page 87.
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	Reserve Forest is found within the study area. The matter has been discussed Section 3.5.1 under Chapter III in the EIA report page 58-73.
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 within 10 km radius from the periphery of the project area. Information regarding the same has been given in Table 3.37 under Chapter III in the EIA report page 87.
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	There are No National Parks, Biosphere Reserves, Wildlife Corridors, and Tiger/Elephant Reserves within 10 km radius from the periphery of the project area. Information regarding the same has been given in Table 3.37 under Chapter III in the EIA report page 87.
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	A detailed biological study was carried out in both core and buffer zones and the results have been discussed in Section 3.5 under Chapter III in the EIA report page 58-73.

	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	
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 CRZ 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	Affected People (PAP) are not provided.
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	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 3.1-3.8 under Chapter III in the EIA report page 23-85.

	direction. The mineralogical composition of PM10, particularly for free silica, should be given	
1.23	Air quality modelling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of mineral. The details of the model used and input parameters used for modelling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map	Air quality modelling for prediction of incremental GLCs of pollutants was carried out using AERMOD view 11.2.0. The model results have been given in Section 4.4 under the Chapter IV in the EIA report page 92-96.
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 in the EIA report page 18.
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	Part of the working pit will be allowed to collect rain water during the spell of

	be given. Details of rainwater harvesting proposed in the Project, if any, should be provided	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 in the EIA report page 91-92.
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	The ground water table is found at the depth of 60-65m below ground level. The ultimate depth of quarry is 45m (25m AGL+20m BGL). Therefore, the mining activity will not intersect the ground water table. Data regarding the occurrence of groundwater table have been provided in Section 3.2 under Chapter III in the EIA report page 29-44.
1.29	Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion proposed, if	Not Applicable. There are no streams, seasonal or other water bodies passing within the project

	any, and the impact of the same on the hydrology should be brought out	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 430m AMSL. Ultimate depth of the mine is 45m (25m AGL+20m BGL). Depth to the water level in the area is 60-65m 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 in the EIA report page 101-105.
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	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

	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	provided in Section 3.7 under Chapter III in the EIA report page 84-86.
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 2.6.6 under Chapter II in the EIA report page 18.
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 Section 2.6.4 under Chapter II in the EIA report page 18.
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 in the EIA report page 106-107.
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 in the EIA report page 130-131.

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 18 people directly as discussed in Section 8.1 under Chapter VIII in the EIA report page 129.
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 Table 10.1 & 10.2 under Chapter X in the EIA report page 133-138.
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.1,16,95,000/- CER Cost is Rs.5,00,000/- In order to implement the environmental protection measures, an amount of Rs.25,25,385 as capital cost and recurring cost as Rs.13,84,264 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 1,99,36,508 as shown in Tables 10.1 & 10.2 under Chapter X in the EIA report page 133-138.
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 in the EIA report page 117-119.
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 in the EIA report page 129-131.
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.	List of tables and source of the data collected have been mentioned.
c)	Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF & CC/NABL accredited laboratories. All the original analysis/testing reports should be available during appraisal of the Project.	Original Baseline monitoring reports will be submitted in the final EIA report.
d)	Where the documents provided are in a language other than English, an English translation should be provided.	All the documents provided here are in English language.

e)	The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted.	The questionnaire will be submitted in the final EIA report.
f)	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
g)	Changes, if any made in the basic scope and project parameters (as submitted in Form-I and the PFR for securing the TOR) should be brought to the attention of MoEF & CC with reasons for such changes and permission should be sought, as the TOR may also have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH again with the revised documentation	No changes are made in the basic scope and the project parameters.
h)	As per the circular no. J-11011/618/2010-IA. II(I) Dated: 30.5.2012, certified report of the status of compliance of the conditions stipulated in the environment clearance for the existing operations of the project, should be obtained from the Regional Office of Ministry of Environment, Forest and Climate Change, as may be applicable.	As it is a new lease area, the condition is not applicable.
i)	The EIA report should also include (i) surface plan of the area indicating contours	All the plans including surface & geological plans, and progressive

	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.	closure plan have been included in Annexure III.
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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.	It's a government Poramboke land.
3.	All documents including approved mine plan, EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee.	All the documents are in the name of the lessee.
4.	All corner coordinates of the mine lease area, superimposed on a High-Resolution Imagery/ toposheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).	All corner coordinates of the mine lease area have been superimposed on a high- resolution Google Earth Image, as shown in Figure 2.3 under Chapter II in the EIA report page 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 22-87.
6.	Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority.	The lease area was inspected by the officers of Department of Geology along with revenue officials and found that the land is fit for quarrying under the policy of State Government.
7.	It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the. prescribed operating process/ procedures to bring into focus any infringement/ deviation/ violation of the environmental or forest norms/conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large, may also be detailed in the EIA Report	The Environmental Policy is discussed in the Section 10.1 under Chapter X in the EIA report page 132-133.
8.	Issues relating to Mine Safety, including subsidence study in case of underground	It is an opencast quarrying operation proposed to operate in Manual method.

	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	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 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 23-29. The details of surrounding sensitive ecological features have been provided in Table 3.37 under Chapter III in the EIA report page 87. 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 17.
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 3.37 under Chapter III in the EIA report page 87.
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.	Reserve Forest is found within the study area. The matter has been discussed Section 3.5.1 under Chapter III in the EIA report page 58-73.
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 3.37 under Chapter III in the EIA report page 87.
17.	Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves/ (existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished.	There are No National Parks, Biosphere Reserves, Wildlife Corridors, and Tiger/Elephant Reserves within 10 km radius from the periphery of the project area. Information regarding the same has been given in Table 3.37 under Chapter III in the EIA report page 87.

18.	A detailed biological study of the study area [core zone and buffer zone (10 KM radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled-I fauna found in the study area, the necessary plan along with budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost.	A detailed biological study was carried out in both core and buffer zones and the results have been discussed in Section 3.5 under Chapter III in the EIA report page 58-73.
19.	Proximity to Areas declared as 'Critically Polluted' or the Project areas likely to come under the 'Aravalli Range', (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Department should be secured and furnished to the effect that the proposed mining activities could be considered.	Not Applicable. Project area / Study area is not declared. in 'Critically Polluted' Area and does not come under 'Aravalli Range.
20.	Similarly, for coastal Projects, A CRZ map duly authenticated by one of the authorized agencies demarcating LTL. HTL, CRZ area, location of the mine lease w.r.t CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling	Not Applicable The project doesn't attract the CRZ Notification, 2018.

	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 aspect should be discussed in the Report	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.
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	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 3.1-3.8 under Chapter III in the EIA report page 23-85.

	stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM ₁₀ , particularly for free silica, should be given.	
23.	Air quality modelling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of mineral. The details of the model used and input parameters used for modelling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map	Air quality modelling for prediction of incremental GLCs of pollutants was carried out using AERMOD view 11.2.0. The model results have been given in Section 4.4 under the Chapter IV in the EIA report page 92-96.
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 18.
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 91-92.
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	The ground water table is found at the depth of 60-65m below ground level. The ultimate depth of quarry is 45m (25m AGL+20m BGL). Therefore, the mining activity will not intersect the ground water table. Data regarding the occurrence of groundwater table have been provided in Section 3.2 under Chapter III in the EIA report page 29-44.

	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	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 430m AMSL. Ultimate depth of the mine is 45m (25m AGL+20m BGL). Depth to the water level in the area is 60-65m BGL
31.	A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up. Front on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution	Greenbelt development plan has been given in Section 4.6 under Chapter IV in the EIA report page 101-105.
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	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

	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.	that there is no significant impact due to the proposed transportation from the project area. Details have been provided in Section 3.7 under Chapter III in the EIA report page 84-86.
33.	Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.	Infrastructure & other facilities will be provided to the mine workers after the grant of quarry lease and the same has been discussed in Section 2.6.6 under Chapter II in the EIA report page 18.
34.	Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report.	Progressive mine closure plan has been prepared for this project and is given in Section 2.6.4 under Chapter II in the EIA report page 18.
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 in the EIA report page 106-107.
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	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

	measures should be detailed along with budgetary allocations.	Chapter VIII in the EIA report page 130-131.
37.	Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.	No negative impact on socio-economic environment of the study area is anticipated and this project shall benefit the socio-economic environment by offering employment for 18 people directly as discussed in Section 8.1 under Chapter VIII in the EIA report page 129.
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 133-138.
39.	Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project.	The outcome of public hearing will be submitted during the final EIA report.
40.	Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given	No litigation is pending in any court against this project.
41	The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.	Project Cost is Rs.1,16,95,000/- CER Cost is Rs.5,00,000/- In order to implement the environmental protection measures, an amount of Rs.25,25,385 as capital cost and recurring cost as Rs.13,84,264 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 1,99,36,508 as shown in Tables 10.1 & 10.2 under Chapter X in the EIA report page 133-138.
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 117-119.
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 129-131.
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	Original Baseline monitoring reports will be submitted in the final EIA report.

	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.	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	As it is a new lease area, the condition is not applicable.

	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.	All the plans including surface & geological plans, and progressive closure plan have been included in Annexure III.

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CHAPTER I

INTRODUCTION

1.0 PREAMBLE

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

In compliance with ToR Identification No. TO25B0108TN5986349N Dated: 13.05.2025 File No.11929, this EIA report has been prepared for the project proponent, R.Purushothaman applied for rough stone quarry lease in the Government Poramboke land falling in S.F.No.420/1 (P-6) over an extent of 0.81.0Ha of Vinnamangalam Village, Ambur Taluk, Tirupathur District, Tamil Nadu. This EIA report takes into account the rough stone quarry within the cluster of 500 m radius from the periphery of the proposed project site. The cluster contains Seven proposed projects known as P1 to P7 and five Existing projects known as E1 to E5. All the projects mentioned above have been taken for cluster extent calculation as per MoEF & CC Notification S.O. 2269 (E) Dated 1st July 2016 the total extent of all the quarries is 15.85.0ha, 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 Quarry within the cluster area of 500m radius

Proposed Quarries					
Code	Name of the Owner	S.F. No	Village	Extent (ha)	Status
P1	Purusothaman	420/1 (Part-6)	Vinnamangalam	0.81.0	Proposed Area
P2	Selvam	420/1 (Part-5)	Vinnamangalam	2.00.0	Proposed Area
P3	RDS Infrastructure	419 (Part-4)	Vinnamangalam	1.00.0	Proposed Area
P4	B. Karthick	419 (P-10)	Vinnamangalam	1.00.0	Proposed Area
P5	Paranthaman	416/35(Part-5)	Vinnamangalam	1.62.0	Proposed Area
P6	Janarthanan	419 (Part-9)	Vinnamangalam	0.80.0	Proposed Area
P7	T.G.Govind	416/35 (Part-3)	Vinnamanglam	2.00.0	Proposed Area
Existing Quarry					
E1	V. Rajkamal	419 (P-7)	Vinnamangalam	0.81.0	05.07.2021 to 04.07.2031
E2	C. Sambath	419 (P-1A)	Vinnamangalam	1.00.0	10.08.2023 to 09.08.2028
E3	B. Sathish Kumar	419 (P-5)	Vinnamangalam	2.00.0	01.07.2022 to 30.06.2032
E4	K. Dinesh Kumar	416 (P-4)	Vinnamangalam	2.00.0	24.03.2023 to 23.03.2033
E5	V.Jawahar Babu	416 (P-2)	Vinnamangalam	0.81.0	15.02.2021 to 14.02.2031
Total Cluster Extent				15.85.0	

Source: AD Letter - Rc.No. 09/2024(Mines), dated 11.06.2024.

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 **October-December 2024** 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. TO25B0108TN5986349N File No.11929 Dated: 13.05.2025) 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: 13.05.2025.

Scoping

The proposal was placed in the 542th meeting of SEAC on 26.03.2025. Based on the presentation and documents furnished by the project proponent, SEAC decided to recommend the proposal for the grant of Terms of Reference (ToR) and the recommendation for ToR is subjected to the outcome of the Honourable NGT, Principal Bench, New Delhi (O.A No.186 of 2016 (M.A.No.350/2016) and O.A. No.200/2016 and O.A.No.580/2016 (M.A.No.1182/2016) and O.A.No.102/2017 and O.A.No.404/2016 (M.A.No. 758/2016, M.A.No.920/2016,

M.A.No.1122/2016, M.A.No.12/2017 & M.A. No. 843/2017) and O.A.No.405/2016 and O.A.No.520 of 2016 (M.A.No. 981/2016, M.A.No.982/2016 & M.A.No.384/2017).

Public Consultation

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

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 Identification No. TO25B0108TN5986349N File No.11929 Dated: 13.05.2025.

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).

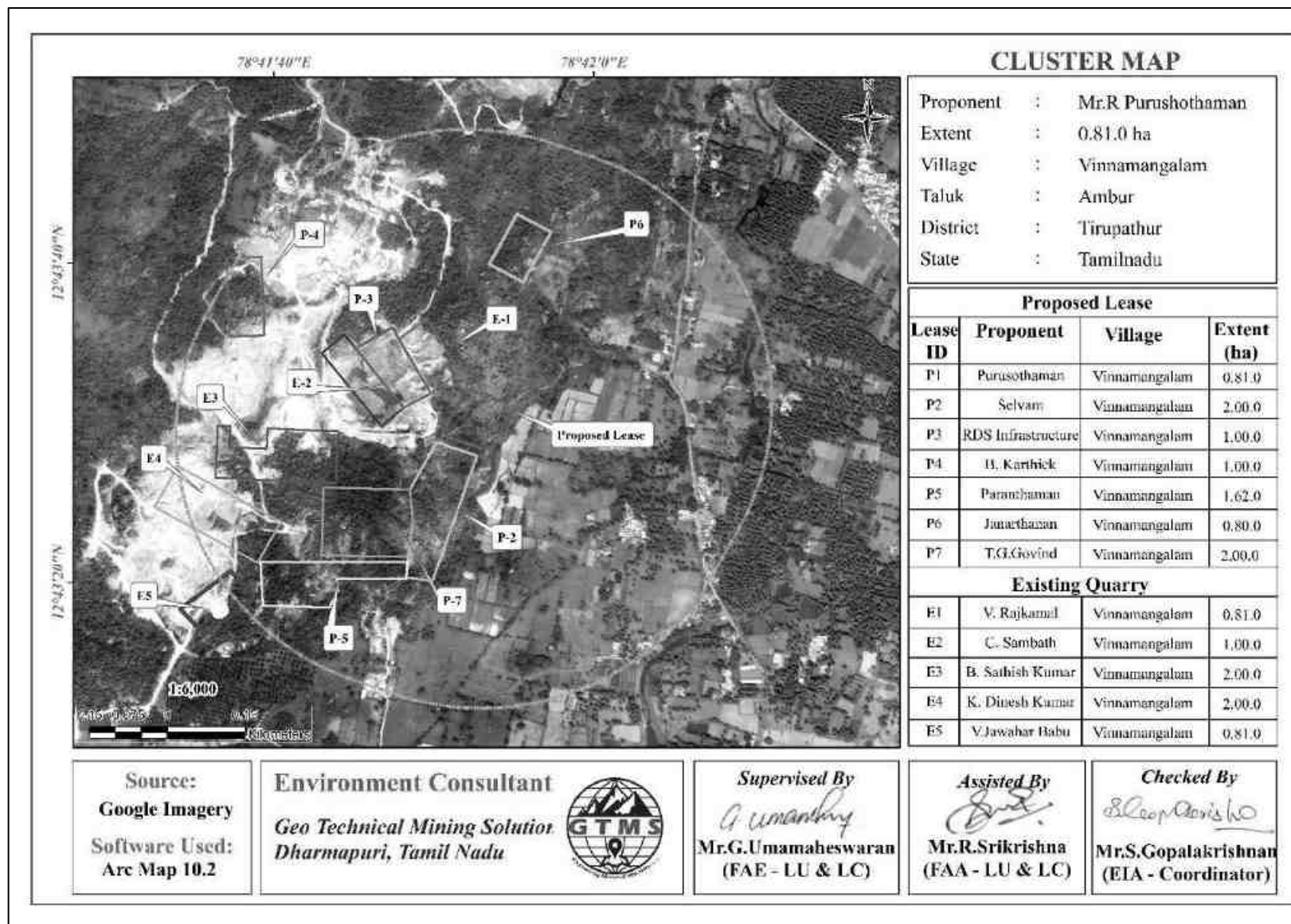


Figure 1.1 Location of the proposed and existing rough stone quarries in the cluster of 500m radius

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.

Table 1.2 Details of Project Proponent

Name of the Project Proponent	R.Purushothaman
Address	S/o.Ranganathan, No.43, Parumal Kovil Street, Vinnamangalam Village, Ambur Taluk, Tirupathur District – 635807.
Status	Proprietor

1.7 BRIEF DESCRIPTION OF THE PROJECT

The proposed project deals with excavation of rough stone which is primarily used in construction projects. The method adopted for rough stone excavation is open cast semi mechanized mining method involving formation of benches with 5 m height and 5 m width. The proposed project site is located in Vinnamangalam Village, Ambur Taluk, Tirupathur District, Tamil Nadu State. Some of the important features of the proposed project have been provided in Table 1.3.

Table 1.3 Salient Features of the Proposed Project

Name of the Quarry	R.Purushothaman	
Type of Land	Government Poramboke land	
Extent	0.81.0ha	
Toposheet No	57 L/10	
Location of Project Site	12°43'28.39"N to 12°43'32.11"N 78°41'50.45"E to 78°41'54.59"E	
Highest Elevation	430m AMSL	
Proposed depth of Mining (5 years)	45m (25m AGL + 20mBGL)	
Geological Resources	Rough Stone in m ³	Top Soil in m ³
	2,39,825	6,675
Mineable Reserves	Rough Stone in m ³	Top Soil in m ³
	1,15,205	2,944
Proposed reserves for five years	Rough Stone in m ³	Top Soil in m ³
	1,15,205	2,944
Method of Mining	Open-Cast Mechanized mining	
Topography	Elevated Terrain Topography	
Machinery proposed	Jack Hammer	2
	Compressor	1
	Tipper	7
	Hydraulic Excavator	1

Blasting Method	The quarrying operation is proposed to be carried out by open cast mining in conjunction with conventional method using jack hammer drilling and blasting for shattering effect and loosen the rough stone.
Proposed Manpower Deployment	18 Nos
Project Cost	Rs.1,16,95,000
CER Cost	Rs. 5,00,000
Proposed Water Requirement	3.0 KLD

Source: Approved Mining Plan Book

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, background air quality levels, meteorological measurements, dispersion model and all other aspects of pollution like effluent discharge, and dust generation has been provided in this report. The baseline monitoring study has been carried out during the period of **October-December 2024** 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, Mr.R.Purushothaman 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. Special publication Rc.No.76/(Mines)/2023, dated 06.02.2024 for eligible Govt Poramboke land quarry lease through tender cum action published in the Tirupathur district gazette notification No.4 dated 08.02.2024. On behalf of District Collector, the special officer appointed by District Collector had conducted the tender and the auction held on 28.02.2024, R.Purushothaman of Tirupathur district has bid the highest amount is Rs.63,00,000-. The precise area communication letter was issued by Department of Geology and Mining, Tirupathur vide Roc.No.13/2024(Mines) Dated:15.03.2024. Based on the precise area communication letter, mining

plan was prepared. The mining plan thus prepared was approved by Assistant Director Department of Geology and Mining, Tirupathur Rc.No.13/2024(Mines), dated:02.09.2024 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 Vinnamangalam Village, Ambur Taluk, Tirupathur District, Tamil Nadu as shown in Figure 2.2. The area lies between Latitudes from 12°43'28.39"N to 12°43'32.11"N and Longitudes from 78°41'50.45"E to 78°41'54.59"E. The maximum altitude of the project area is 430m AMSL. Accessibility details to the proposed project site have been given in Table 2.1.

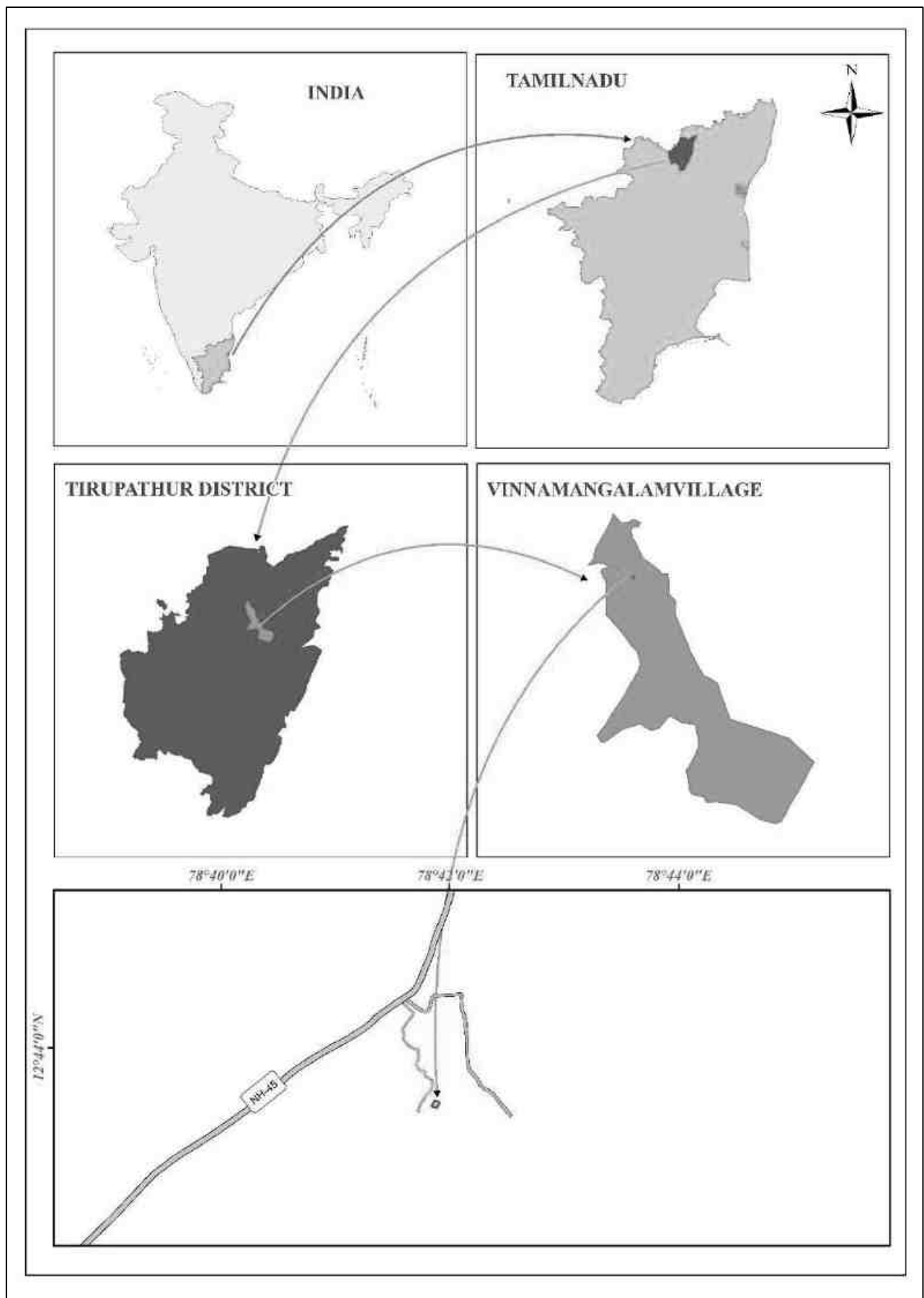


Figure 2.2 Location Map Showing the Project Site

Table 2.1 Site Connectivity to the Project Area

Nearest Road	NH – 45 Bangalore - Chennai	1.48km NW
Nearest Town	Ambur	6.9 km N
Nearest Railway Station	Vinnamangalam	2.1km W
Nearest Airport	Bangalore	119.5km W
Nearest Seaport	Chennai	176km NE
Nearest Village	Vinnamangalam	1.7km N
	Kamiyampattu Pudur	0.8km NE
	Vellakkal	5.2km S
	Minnur	1.9km W

2.3 LEASEHOLD AREA

- ❖ The extent of the proposed project site is 0.81.0ha.
- ❖ 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 & 2.4.

Table 2.2 Corner Coordinates of Proposed Project

Pillar ID	Latitude	Longitude
1	12°43'31.25"N	78°41'54.59"E
2	12°43'28.39"N	78°41'52.97"E
3	12°43'29.25"N	78°41'50.45"E
4	12°43'32.11"N	78°41'52.07"E

2.4 GEOLOGY

The lease area geologically occurs over Acid to Intermediate Charnockite, which is commercially called as rough stone occurs within the migmatite rock. Also, the lease area geomorphologically occurs Pediment Pediplain Complex.

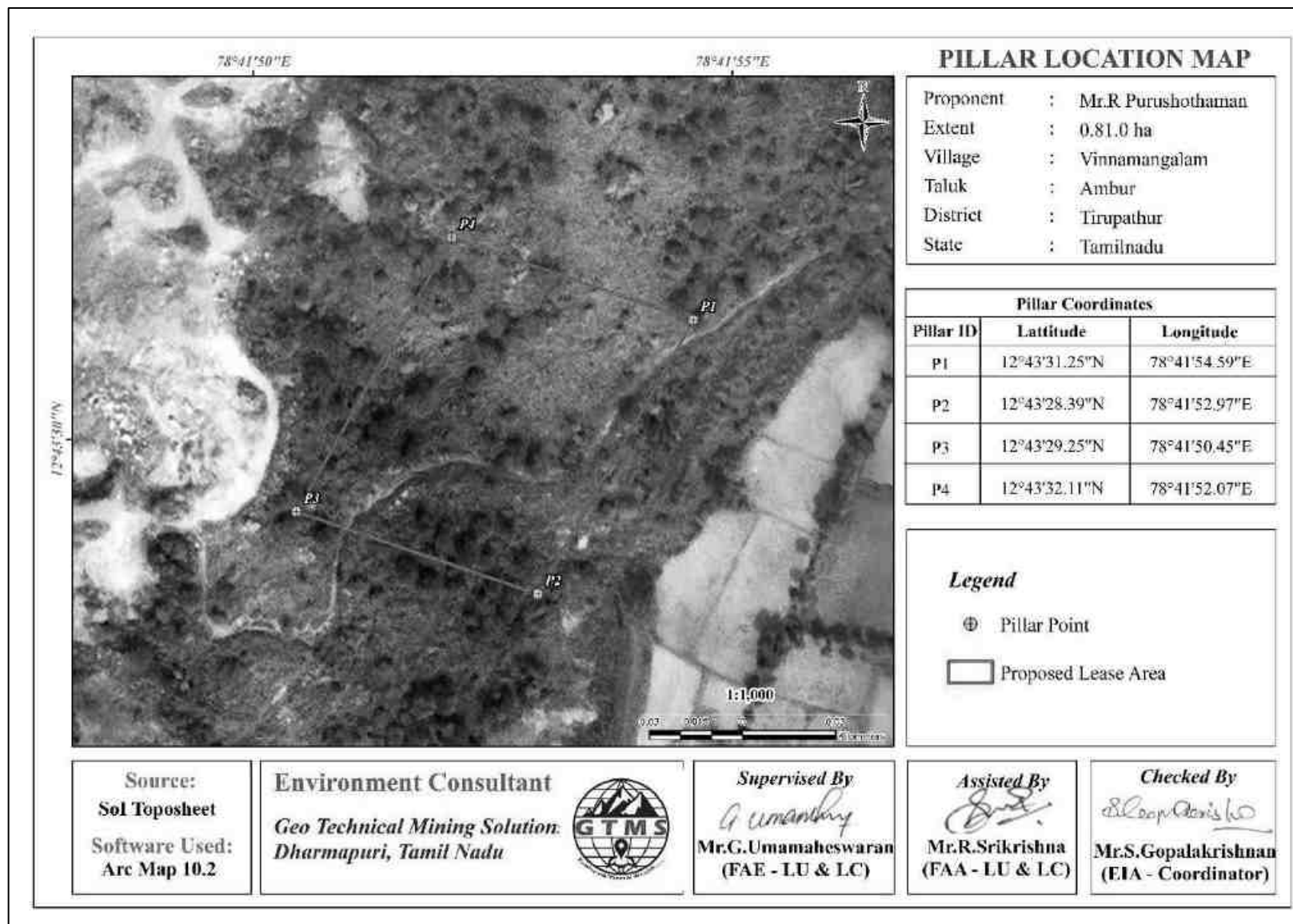


Figure 2.3 Google Earth Image Showing Lease Area with Pillars

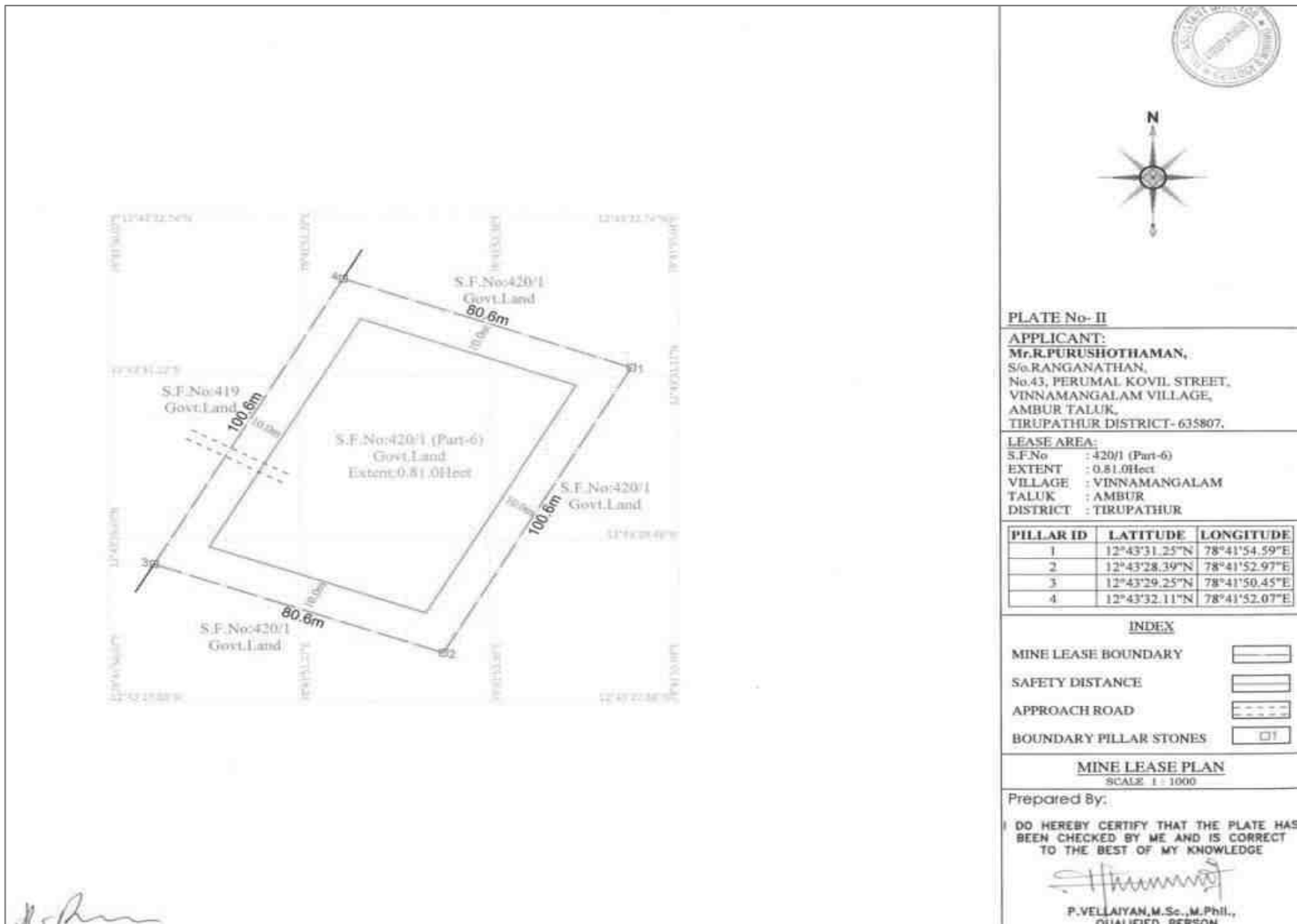


Figure 2.4 Mine Lease Plan

2.5 QUANTITY OF RESERVES

The Resources and Reserves of Rough Stone were calculated based on cross-section method by plotting sections to cover the maximum lease area for the proposed project. Based on the availability of geological resources, the mineable reserves are calculated by considering excavation system of bench formation and leaving essential safety distance of 10m safety distance as per precise area communication letter and deducting the locked-up reserves during bench formation (also called as Bench Loss). The mineable reserves are calculated up to the depth of 45m (25m AGL + 20m BGL) considering there is no waste / overburden / side burden (100% Recovery anticipated) for the proposed project. The plate used for reserve estimation has been attached in approved mining plan 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	Top soil in m ³
Geological Resource in m ³	239825	6675
Mineable Reserves in m ³	115205	2944
Proposed production for 10 years in m ³	115205	2944

Based on the year wise development and production plan and sections, the year wise production results have been given in Table 2.4, Year-Wise Production plan has been shown in Figure 2.5

Table 2.4 Year-Wise Production Details

Year	Rough Stone in (m ³)	Top soil in m ³
I	16370	2944
II	18310	--
III	18600	--
IV	19825	--
V	17850	--
VI	5125	--
VII	5125	--
VIII	4840	--
XI	4960	--
X	4200	--
Total	115205	2944

Source: Approved Mining Plan & ToR

2.6 MINING METHOD

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

Conceptual Blasting Design

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

Rules of Thumb for Blast Design

Based on practical experience and technical information, a set of rules for blasting have been provided as below ([Chapter 8 \(nps.gov\)](#)). 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	43
Number of blastholes/day	10
Blasthole pattern	Staggered
Mass of explosive /day in kg	4.11
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

2.6.1 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 in m³/ 5 years
Proposed production for 10 years	115205
Number of Working Days /Annum	270
Production of /Day (m ³)	43
No. of Lorry Loads	7

2.6.2 Extent of Mechanization

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

Table 2.7 Machinery Details

S. No.	Type	No. of Unit	Size /Capacity	Make	Motive Power
1	Jack Hammers	2	Hand held	--	Diesel
2	Compressor	1	Air	--	Diesel
3	Hydraulic Excavator	1	2.9-4.5m ³	--	Diesel
4	Tipper	7	---	--	Diesel

2.6.3 Progressive Quarry Closure Plan

The progressive quarry closure plan of the proposed project shows past, present, and future land use statistics. According to the land use results, as shown in Table 2.8. At Present about 0.81.0 of land is unutilized. Whereas, at the end of the mine life, about 0.47.70ha of land is used for area under quarry, about 0.28.3ha of land is used for green belt, 0.03.0ha will be used for roads.

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	0.47.70
Infrastructure	Nil	0.02.0
Roads	Nil	0.03.0
Green Belt	Nil	0.28.3
Unutilized area	0.81.0	Nil
Total	0.81.0	0.81.0

2.6.4 Progressive Quarry Closure Budget

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

Table 2.9 Mine Closure Budget

Activity	Capital Cost
162 plants inside the lease area	32,400
243 plants outside the lease area	72,900
Wire Fencing	1,62,000
Renovation of Garland Drain	8,100
Total	2,75,400

Source: Environment Management Plan

2.6.5 Conceptual Mining Plan

The ultimate pit size is designed based on certain practical parameters such as economical depth of mining, safety zones, permissible area, etc. Details of ultimate pit dimensions have been derived from given in Table 2.10. Conceptual Plan has been shown in Figure 2.6

Table 2.10 Ultimate Pit Dimension

Pit	Length (m)	Width (m) (Max)	Depth (m)
I	80	61	45

Source: Approved Mining Plan & ToR

2.6.6 Infrastructures

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

2.6.6.1 Other Infrastructure Requirement

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

2.6.7 Water Requirement

Detail of water requirement in 3.0KLD 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	1.0 KLD	Existing bore wells nearby the lease area
Drinking & Domestic	1.0 KLD	Existing bore wells and approved water vendors
Total	3.0KLD	

Source: Prefeasibility Report

2.6.8 Energy Requirement

High speed Diesel (HSD) will be used for quarrying machineries. As per the data shown in Table 2.12. Around 4,81,450 litres of HSD will be used for rough stone extraction during this 10 years plan period. The diesel will be brought to the site from nearby diesel pumps.

Table 2.12 Fuel Requirement Details

Fuel Requirement for Excavator			
Details	Rough Stone (115205 m³)	Top Soil (2944m³)	Total Diesel (litre)
Average Rate of Fuel Consumption (l/hr)	16	10	---
Working Capacity (m ³ /hr)	20	60	---
Time Required (hours)	5760	49	---
Total Diesel Consumption for 10 years (litre)	92160	490	92650
Fuel Requirement for Compressor			
Average Rate of Fuel Consumption/hole (litre)	0.4	---	---
Number of Drillholes/day	10	---	---
Total Diesel Consumption for 10 years (litre)	10800	---	10800
Fuel Requirement for Tipper			
Average Rate of Fuel Consumption/Trip (litre)	20	---	---
Carrying Capacity in m ³	6	---	---
Number of Trips / days	7	---	---
Number of Trips / 10 years	18900	---	---
Total Diesel Consumption for 10 years (litre)	3,78,000	---	3,78,000
Total Diesel Consumption by Excavator, Compressor and Tipper			4,81,450

2.6.9 Capital Requirement

The project proponent will invest **Rs. 1,16,95,000/-** to the project. The breakup summary of the investment has been given in Table 2.13.

Table 2.13 Capital Requirement Details

S. No.	Description	Cost (Rs.)
1	Fixed Asset Cost	70,50,000/-
2	Machinery cost	20,00,000/-
3	EMP Cost	26,45,000/-
Total Project Cost		1,16,95,000/-

Source: Approved Mining Plan

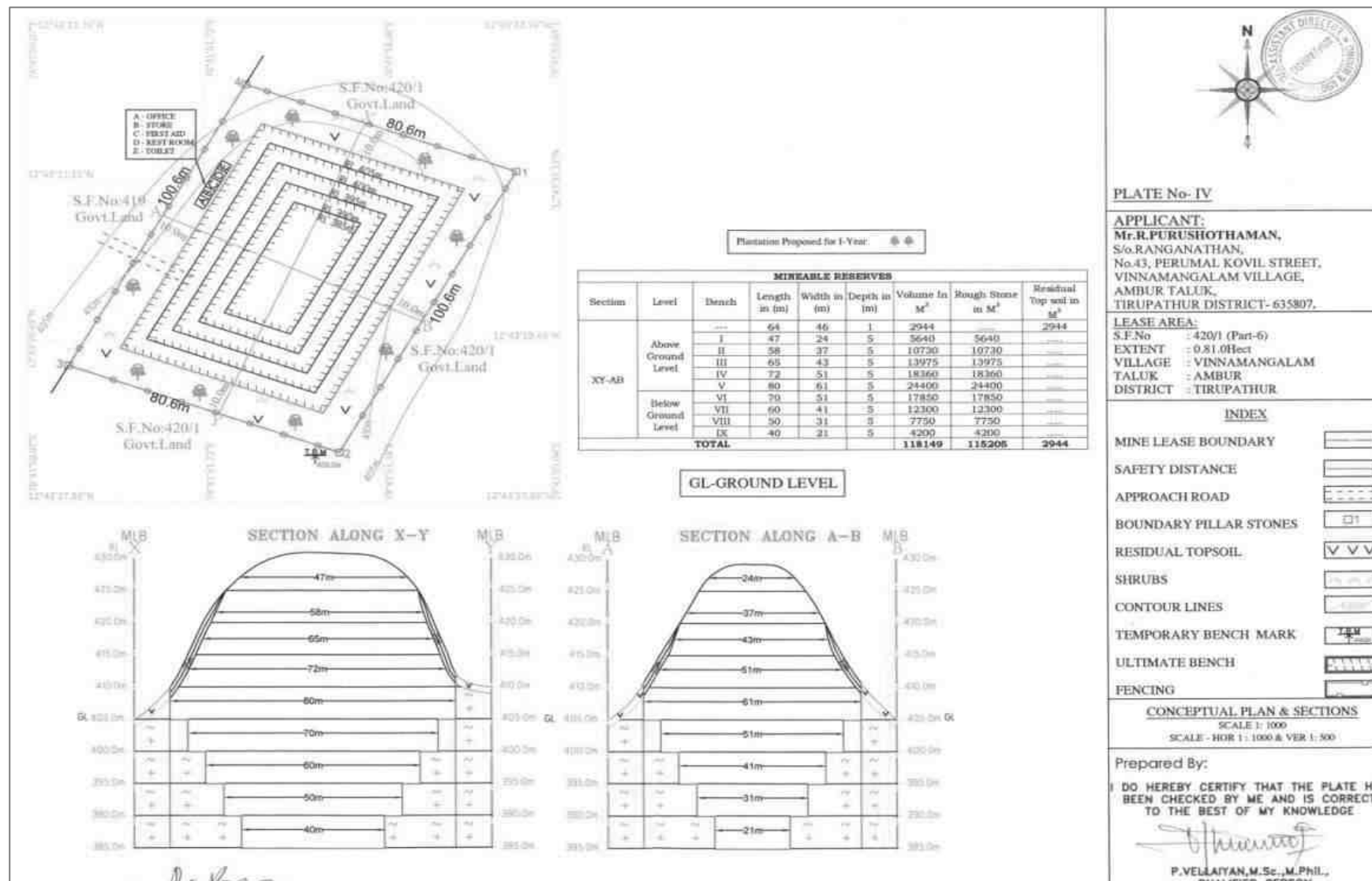


Figure 2.6 Conceptual Plan & Sections

2.7 MANPOWER REQUIREMENT

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

Table 2.14 Employment Potential for the proposed project

S. No.	Category	Role	Nos.
1.	Highly Skilled	Mine manager	1
		Mine Engineer	1
		Mine Geologist	1
		Blaster	1
2.	Unskilled	Musdoor/ Labours	14
Total			18

Source: Prefeasibility Report

2.8 PROJECT IMPLEMENTATION SCHEDULE

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

Table 2.15 Expected Time Schedule

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

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

CHAPTER III

DESCRIPTION OF THE ENVIRONMENT

3.0 GENERAL

This chapter presents a regional background to the baseline data at the very onset, which will help in better appreciation of micro-level field data, generated on several environmental and ecological attributes of the study area. The baseline status of the project environment is described section wise for better understanding of the broad-spectrum conditions. The baseline environment quality represents the background environmental scenario of various environmental components such as land, water, air, noise, biological and socio-economic status of the study area. Field monitoring studies to evaluate the base line status of the project site were carried out covering **October through December 2024 with CPCB** guidelines. Environmental baseline data were collected by an NABL accredited and MoEF notified **Interstellar Testing Centre Pvt. Ltd** for the environmental attributes including soil, water, air, and noise and by FAEs for ecology and biodiversity, traffic, and socio-economy.

Study Area

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

Table 3.1 Monitoring Attributes and Frequency of Monitoring

Attribute	Parameters	Frequency of Monitoring	No. of Locations	Protocol
Land Use/ Land Cover	Land-use Pattern within 5 km radius of the study area	Once during the study period	Study Area	Satellite Imagery & Primary Survey
*Soil	Physico- Chemical characteristics	Once during the study period	8 (1 in core & 7 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	7 (3 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	8 (1 core & 7 buffer)	IS 5182 Part 1-23 National Ambient Air Quality Standards, CPCB
*Noise Levels	Ambient noise	Hourly observation for 24 hours per location	11 (1 core & 10 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 Quadrant & 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

Geology:

The proposed quarry lease area is falling under gneiss as shown in Figure 3.1 and 3.2. It forms through high-grade metamorphism of existing rocks typically igneous or sedimentary under intense heat and pressure. The process involves the transformation of these rocks leading to the formation of characteristic layers and the crystallization of minerals like garnet. The presence of garnet a red-colored mineral is a key indicator of this high-grade rough stone process.

Geomorphology:

The geomorphic unit's pediment and pediplain complex dominate the study area as shown in Figure 3.3 and 3.4. Pediments are gently sloping bedrock surfaces typically found at the base of mountains that are formed by lateral erosion and sheet flooding. Pediplains are

broad, flat plains formed by the joining of multiple pediments resulting in a vast featureless landscape. This process known as pediplanation occurs primarily in arid and semi-arid regions.

3.1.2 Land Use/ Land Cover

Land Use and Land Cover (LULC) map, as shown in Figure 3.3 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, 7 LULCs were mapped. The areal extent of each LULC is provided in Table 3.2. Of the total area, mining area covers only 39.76 ha accounting for 0.47 %, of which lease area of 1.00.0 ha contributes only about 0.046 %. 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	152.96	1.80
2	Trees	5078.41	59.63
3	Flooded Vegetation	16.57	0.19
4	Crops	1781.73	20.92
5	Mining/Industrial Area	39.76	0.47
6	Built Area	792.56	9.31
7	Rangeland	654.78	7.69
Total		8516.7	100.0

Source: Sentinel II Satellite Imagery

3.1.3 Topography

The proposed lease area Exhibits Hillock topography. The height elevation in 430m AMSL observed in center of the site, while the minimum elevation 405m was observed Northern side of the site. The slope is towards North side and falls in Toposheet No 57-L/10.

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 III, as defined by National Centre for Seismology ([Official Website of National Centre of Seismology](#)). The Zone III is defined as the region where moderate risk zone is expected from seismic events. In this respect, the proposed lease area is located in a possible to earthquake hazard area.

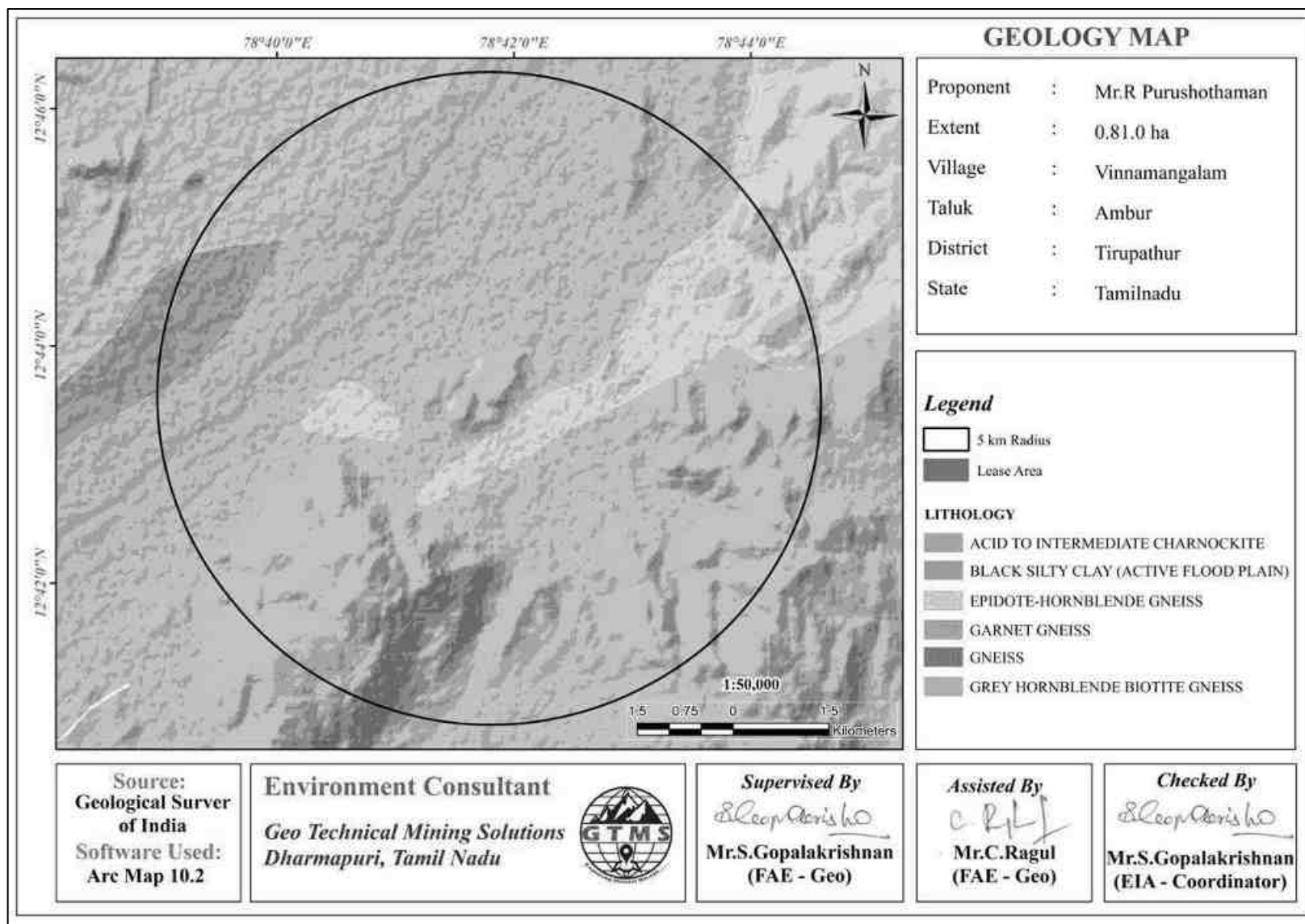


Figure 3.1 Geology Map of 5 km Radius from Proposed Project Site

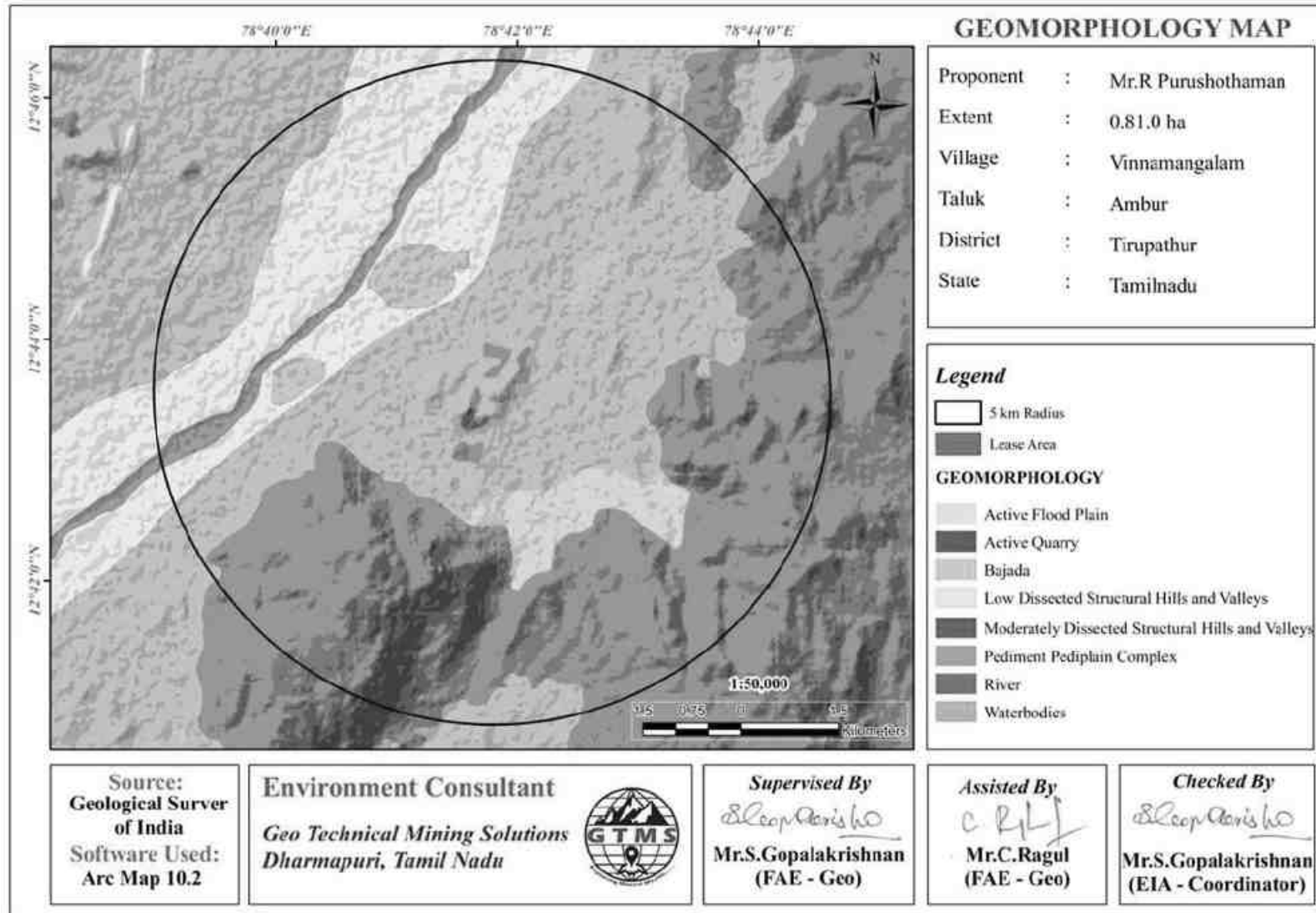


Figure 3.2 Geomorphology Map of 5 km Radius from Proposed Project Site

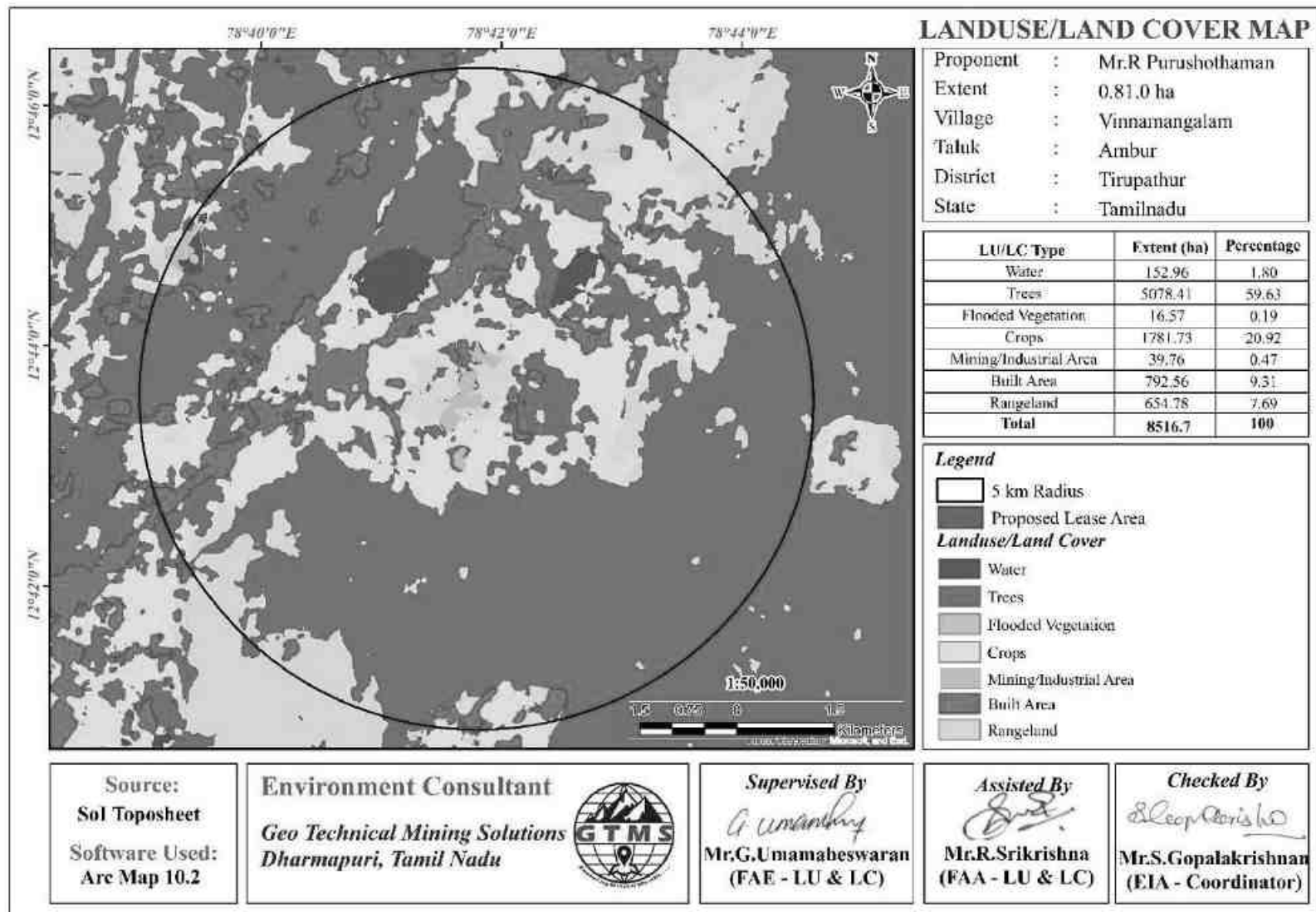


Figure 3.3 LULC Map of 5 km Radius from Proposed Project Site

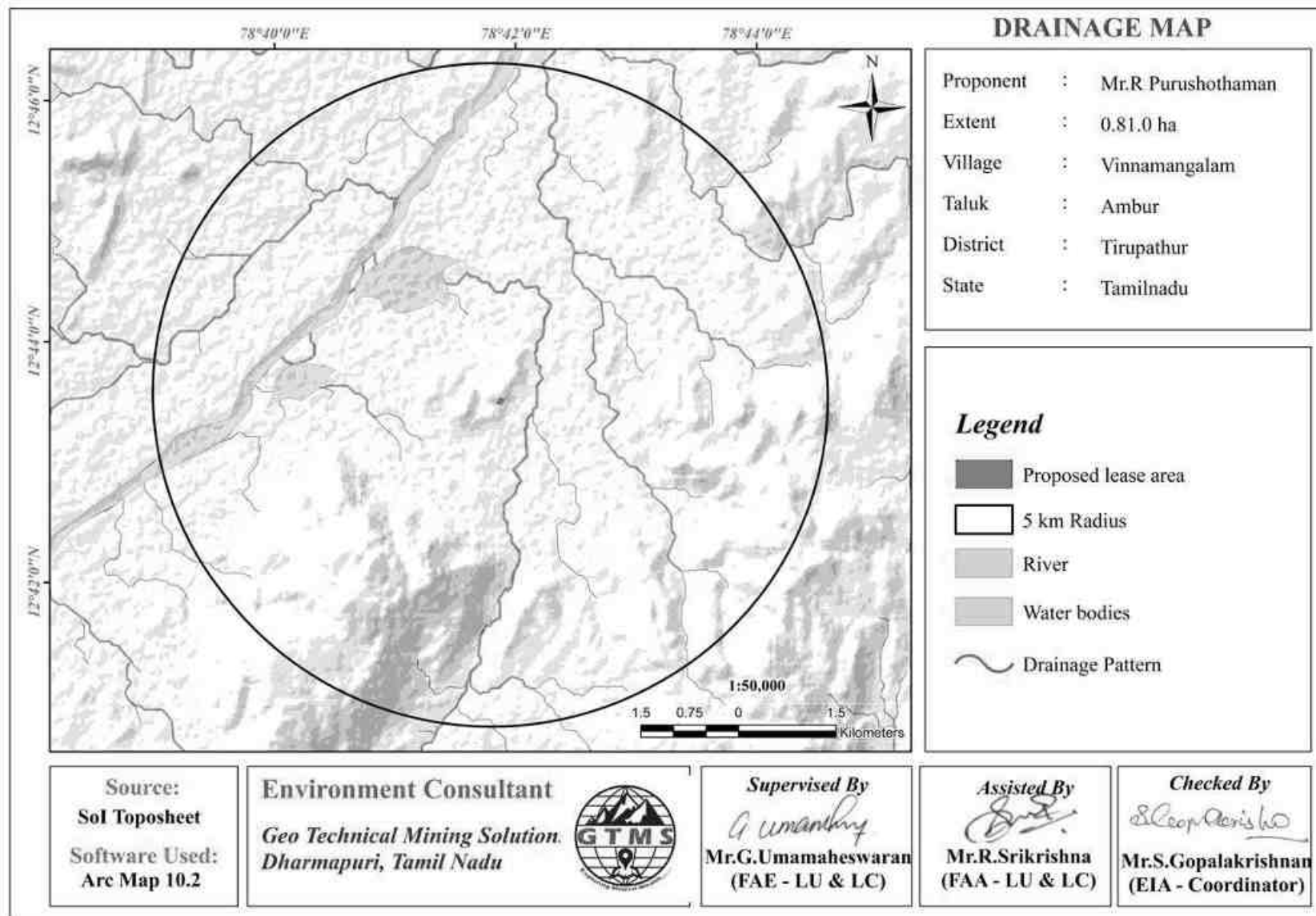


Figure 3.4 Drainage Map of 5 km Radius from Proposed Project Site

3.1.6 Soil

Composite soil samples were collected from 8 locations of the study area to determine the baseline soil characteristics of the soil. The locations were selected for soil sampling based on soil types, vegetative cover, and industrial & residential activities including infrastructure facilities. Soil samples were collected up to 90 cm depth, filled in polythene bags, coded and sent to laboratory for analysis. The locations of the sampling sites are shown in Table 3.3 and Figure 3.5. The samples thus collected were analysed for physical and chemical characteristics. The physical and chemical characteristic results of soil samples are provided in Table 3.5.

Table 3.3 Soil Sampling Locations

Sampling ID	Location	Distance & Direction (km)	Coordinates
S1	Kammiyambttu Pudur	0.46 SE	12°43'15.06"N, 78°41'59.76"E
S2	Nearby Paranthaman lease area	0.68 SW	12°43'13.67"N, 78°41'34.44"E
S3	Kandikuppam	0.76 NE	12°43'47.53"N, 78°42'13.53"E
S4	Nearby Karthik lease area	0.79 NW	12°43'51.84"N, 78°41'35.40"E
S5	Nearby Vinnamangalam RS	1.28 NNW	12°44'9.97"N, 78°41'34.75"E
S6	Vinnamangalam	1.47 W	12°43'33.93"N, 78°41'1.92"E
S7	Palar river bed	2.79 NW	12°44'22.97"N, 78°40'35.37"E
S8	Mulamaduvu cannel bed	1.54 SE	12°43'16.59"N, 78°42'43.48"E

Source: On-site monitoring/sampling Interstellar Testing Centre Pvt. Ltd, in association with GTMS.

Physical Characteristics & Chemical Characteristics

The soil samples in the study area show loamy textures varying between Silt Loam. pH of the soil varies from 7.05 to 8.45 indicating slightly acidic to slightly alkaline nature. Electrical conductivity of the soil varies from 0.118 to 0.305 ms/m. The physical and chemical properties of soil is shown in the Table 3.5.

3.2 WATER ENVIRONMENT

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

Table 3.4 Water Sampling Locations

Sampling ID	Location	Distance (km)	Direction	Coordinates
SW-1	Kannadikuppam Lake	0.92	NE	12°43'56.10"N, 78°42'11.82"E
SW-2	Periyakuppam Lake	1.83	NE	12°44'20.95"N, 78°42'28.15"E
SW-3	Palar River	2.76	NW	12°44'29.13"N, 78°40'41.43"E
BW-1	Kammiyambttu	0.46	SE	12°43'22.46"N, 78°42'6.94"E
BW-2	Alankuppam	3.63	N	12°45'30.13"N, 78°41'51.64"E
BW-3	Chengilikuppam	3.93	SW	12°42'58.56"N, 78°39'42.88"E
OW-1	Minnur	1.27	NW	12°44'1.76"N, 78°41'22.50"E

Source: On-site monitoring/sampling Interstellar Testing Centre Pvt. Ltd, in association with GTMS.

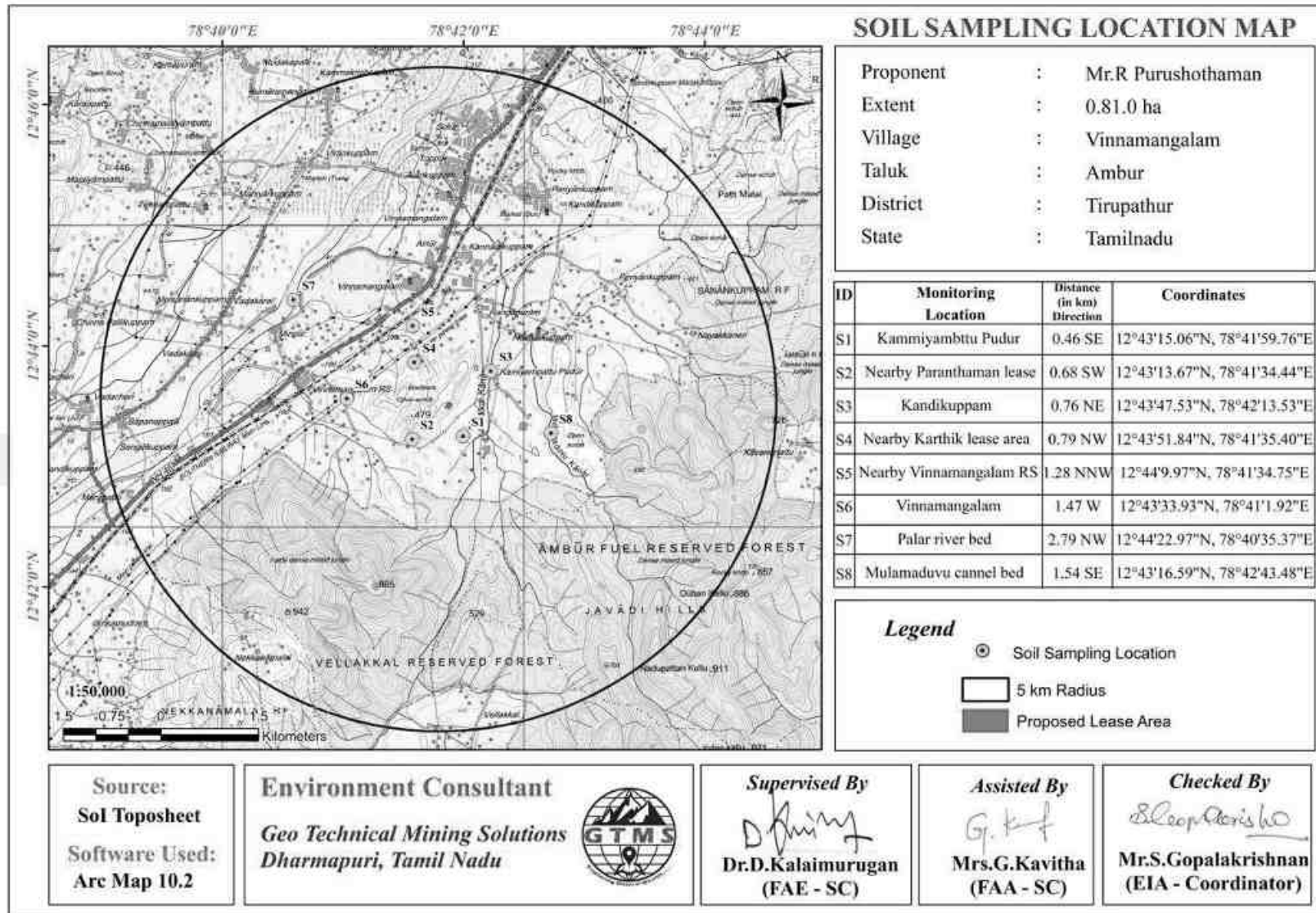


Figure 3.5 Map Showing Soil Sampling Locations within 5 km Radius around Proposed Project Site

Table 3.5 Soil Quality of the Study Area

S. No	Parameters	Unit	S-1	S-2	S-3	S-4	S-5	S-6	S-7	S-8
1	Description	---	Brown coloured soil sample	Light brown coloured Soil sample	Brown coloured soil sample	Brown coloured soil sample	Brown coloured soil sample	Light brown coloured Soil sample	Brown coloured soil sample	Brown coloured soil sample
2	Organic Matter	%	0.34	0.43	0.31	0.29	0.4	0.45	0.36	0.28
3	pH Value	---	7.45	7.89	8.05	8.15	8.45	7.39	7.05	7.29
4	Nitrogen (as N	%	0.0386	0.0256	0.0208	0.0344	0.0268	0.0234	0.0306	0.0342
5	Potassium (as K),	%	0.0022	0.0096	0.0028	0.0072	0.0034	0.0066	0.0064	0.0124
6	Phosphate (as P)	%	0.0011	0.0052	0.0009	0.0018	0.0014	0.0029	0.0016	0.0048
7	Soluble Sulphate (as SO ₄)	mg/kg	0.0089	0.0214	0.0108	0.092	0.0124	0.0288	0.072	0.0198
8	Chloride (as Cl),	%	0.0028	0.0038	0.0046	0.0064	0.0042	0.0156	0.0086	0.0032
9	Organic Carbon,	%	0.20	0.25	0.18	0.17	0.23	0.26	0.21	0.16
10	Cation Exchange Capacity	meq/100g	22	14	19	21	19	26	16	12
11	Sand	%	17.6	21.5	19.6	16.5	20.5	21.4	22.4	19.8
12	Silt	%	70.5	67.5	71.6	69.4	68.6	67.4	71.5	70.2
13	Clay	%	11.9	11	8.8	14.1	10.9	11.2	6.1	10
14	Textural Class	---	Silt Loam	Silt Loam	Silt Loam	Silt Loam	Silt Loam	Silt Loam	Silt Loam	Silt Loam
15	Bulk Density,	g/cc	1.422	1.287	1.43	1.422	1.37	1.441	1.393	1.304
16	Electrical Conductivity	(ms/m)	0.147	0.289	0.118	0.224	0.147	0.229	0.305	0.298

Source: Sampling Results by **Interstellar Testing Centre Pvt. Ltd** in association with GTMS

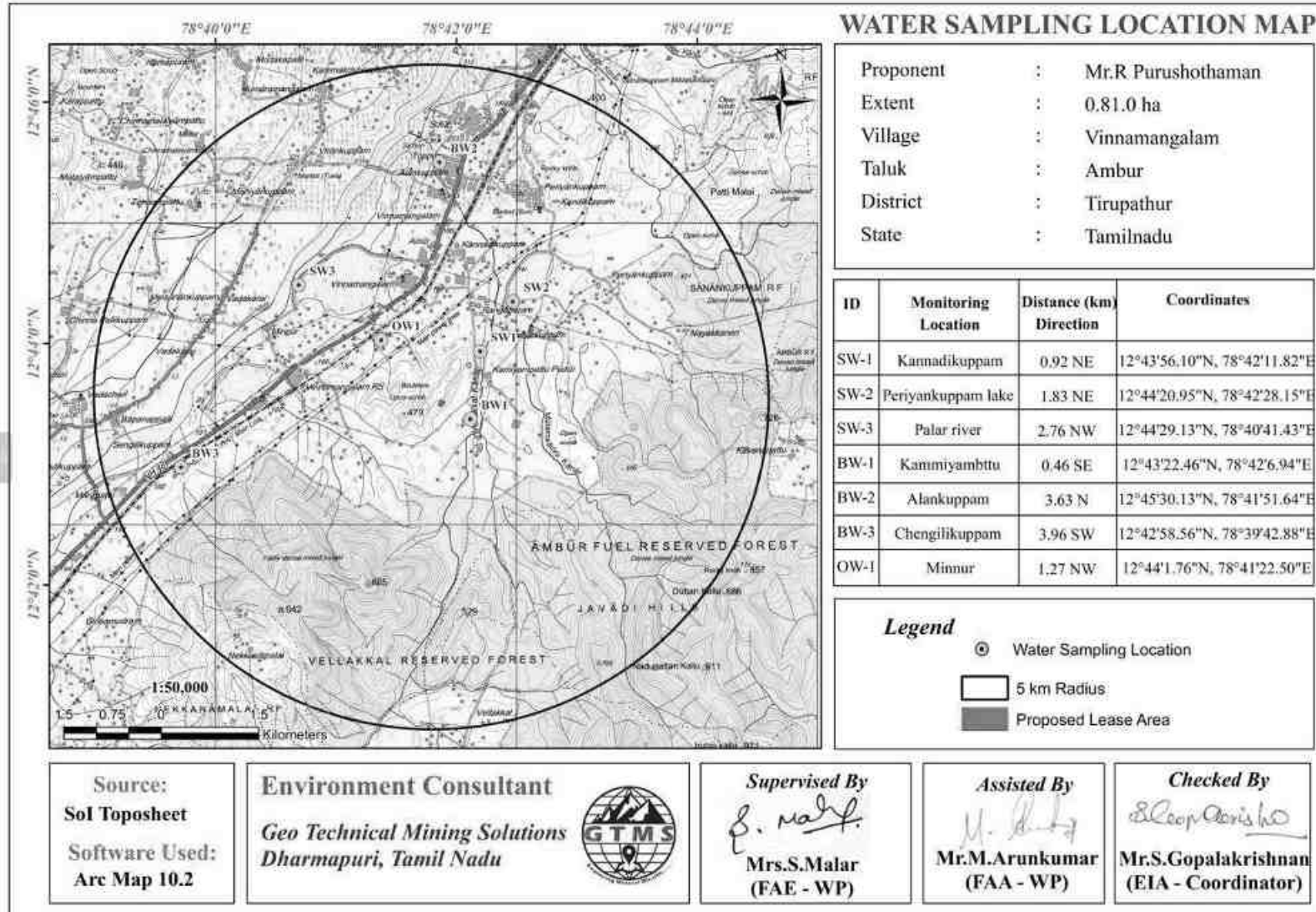


Figure 3.6 Map Showing Water Sampling Locations within 5 km Radius around Proposed Project Site

Table 3.6 Ground Water Quality Result

S. No.	Parameters	Units	Results				Permissible Limits as Per IS 10500:2012
			BW1	BW2	BW3	OW1	
1	Sample Description	-	Clear Liquid	Clear Liquid	Clear Liquid	Clear Liquid	---
2	EC @ 25°C	µS/cm	701	655	818	664	---
3	Silica (SiO ₂)	mg/l	68	44.2	58	39	---
4	pH value @ 25°C	No	6.89	7.32	6.84	7.64	6.5 – 8.5
5	Colour	NTU	5	5	5	5	5
6	Turbidity	Hazen	0.4	0.7	0.2	0.5	5
7	TDS	mg /l	466	388	532	378	2000
8	Calcium (Ca)	mg/l	54	47	63	44	200
9	Iron (Fe)	mg /l	0.16	0.24	0.22	0.27	0.3
10	Magnesium (Mg)	mg/l	3.3	2.3	3.0	2.0	100
11	Chlorides (Cl)	mg/l	123	108	140	108	1000
12	Sulphates (SO ₄)	mg/l	25.9	22.0	29.5	24.8	400
13	Fluoride (F)	mg/l	0.16	0.24	0.18	0.26	1.5
14	Nitrate (NO ₃)	mg/l	8.90	7.40	10.14	7.20	45
15	Total Alkalinity (CaCO ₃)	mg/l	110	84	126	96	600
16	Total Hardness (CaCO ₃)	mg/l	147.5	125.9	169.5	118.5	600
17	TSS	-	BLQ(LOQ:1.0)	BLQ(LOQ:1.0)	BLQ(LOQ:1.0)	BLQ(LOQ:1.0)	BLQ(LOQ:1.0)
18	Ca Hardness	mg/l	134	116.5	157	110.2	---
19	Mg Hardness	mg/l	13.5	9.4	12.5	8.3	---
20	Sodium (Na)	mg/l	88.6	74.6	100.8	78.9	200
21	Potassium (K)	mg/l	16.0	13.2	18.2	12.6	---

Source: Sampling Results by **Interstellar Testing Centre Pvt. Ltd** in association with GTMS.

Table 3.6a Surface Water Quality Result

S. No.	Parameters	Units	Results			Permissible Limits as Per IS 10500:2012
			SW1	SW2	SW3	
1	Sample Description	-	Clear Liquid	Clear Liquid	Clear Liquid	
2	EC @ 25°C	µS/cm	646	918	1558	---
3	Silica (as SiO ₂)	mg/l	37	52	88	---
4	pH value @ 25°C	No	7.05	7.33	7.12	6.5 – 8.5
5	Colour	NTU	10	10	10	15
6	Turbidity	Hazen	3.2	2.4	3.8	5
7	TDS	mg /l	412	532	904	2000
8	Calcium (Ca)	mg/l	45	65	95	200
9	Iron (Fe)	mg /l	0.34	0.52	0.47	0.3
10	Magnesium (Mg)	mg/l	2.8	8.1	13.4	100
11	Chlorides (Cl)	mg/l	113	138	248	1000
12	Sulphates (SO ₄)	mg/l	23.7	32.0	52.0	400
13	Fluoride (F)	mg/l	BLQ(LOQ:1.0)	BLQ(LOQ:1.0)	BLQ(LOQ:1.0)	-
14	Nitrate (NO ₃)	mg/l	26.4	32.6	58.8	45
15	Alkalinity (CaCO ₃)	mg/l	109	154	242	600
16	Hardness (CaCO ₃)	mg/l	123.8	195.5	292.0	600
17	TSS	-	3.2	2.4	3.8	BLQ(LOQ:1.0)
18	Ca Hardness	mg/l	112.4	162.2	237.0	---
19	Mg Hardness	mg/l	11.4	33.3	55.1	---
20	Sodium (Na)	mg/l	76.0	92.2	166.0	200
21	Potassium (K)	mg/l	12.2	16.4	28.6	---
22	BOD		3.8	2.6	4.2	3-5
23	COD		78	56	72	--
24	Dissolved Oxygen		5.6	5.9	6.1	6.5-8
25	Total Coliform	CFU/ml	Present	Present	Present	---
26	Escherichia Coli	CFU/ml	Present	Present	Present	---

Source: Sampling Results by *Interstellar Testing Centre Pvt. Ltd* in association with GTMS.

3.2.1 Surface and Ground Water Quality Resources and Result

Kannadikuppam Lake, Periyakuppam Lake and Palar River are three prominent surface water resources present in the study area. These lake and river were ephemeral in nature, which convey water only after rainfall events. Three surface water sample, known as SW1 were collected from the Kannadikuppam Lake (0.97 km NE), SW2 were collected from the Periyakuppam Lake (1.85 km NE) and SW3 were collected from the Palar River (2.55 km NW) to assess the baseline water quality, as shown in Table 3.4 and Figure 3.6.

Groundwater in the study area occurs in the crystalline rocks of Archaean age and recent alluvium. The movement of the groundwater is controlled by the intensity of weathering and fracturing of crystalline rocks. Dug wells and bore wells are the most common ground water abstraction structures in the area. However, in dry season, people in the study area heavily rely on bore wells for their domestic and agriculture purpose. Four groundwater samples, known as BW1, BW2, BW3 and OW1 were collected from bore wells and open well were analysed for physico-chemical conditions and bacteriological contents in order to assess baseline quality of ground water. Table 3.6b summarizes surface and ground water quality data of the collected sample. Result for surface and ground water sample in the Table 3.6a & b indicate that the physical, chemical and biological parameters are within permissible limits in compared with standards of IS10500:2012.

Table 3.6b Weighted Arithmetic Water Quality Index (WAWQI) of surface and ground water as per Method of Brown et al., 1972

S. No.	Water Quality Index (WQI)							WQI Range	Classification	Grading
	SW1	SW2	SW3	BW1	BW2	BW3	OW1			
1					24.58		23.03	0 – 25	Excellent	A
2								25 – 50	Good	B
3	63.45	69.12		62.12		52.34		50 – 75	Poor	C
4			86.12					75 – 100	Very Poor	D
5								> 100	Unsuitable	E

The WQI is a unique digital rating expression that expresses overall water quality status viz: excellent, good, poor, very poor and unsuitable based on various water quality parameters. It is used as an important tool to compare the quality of water and their management in a particular region. The WQI of the surface and ground water, as shown Table 3.6b indicates that two surface water (SW1 & SW2) and two groundwater (BW1 & BW3) samples are Poor quality and two groundwater (BW2 & OW1) samples are Excellent and one Surface water (SW3) sample are very poor quality. The WQI of ground water samples fall under Excellent, suitable for drinking, domestic and agriculture purpose. Poor and very poor quality indicating they are not suitability for drinking and suitable for domestic and agriculture purpose.

3.2.2 Hydrogeological Studies

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

Rainfall

Rainfall data for the study area were collected for the period of 1981-2021([POWER | Data Access Viewer \(nasa.gov\)](#)). Long term monthly average rainfall was estimated from the data of 1981-2022 and compared with the monthly rainfall for the year 2022, shown in Figure 3.10. The Figure 3.7 shows that rainfall is generally high in the months of June through October in every year. Particularly, rainfall in May, July and August of 2022 is higher than the previous years.

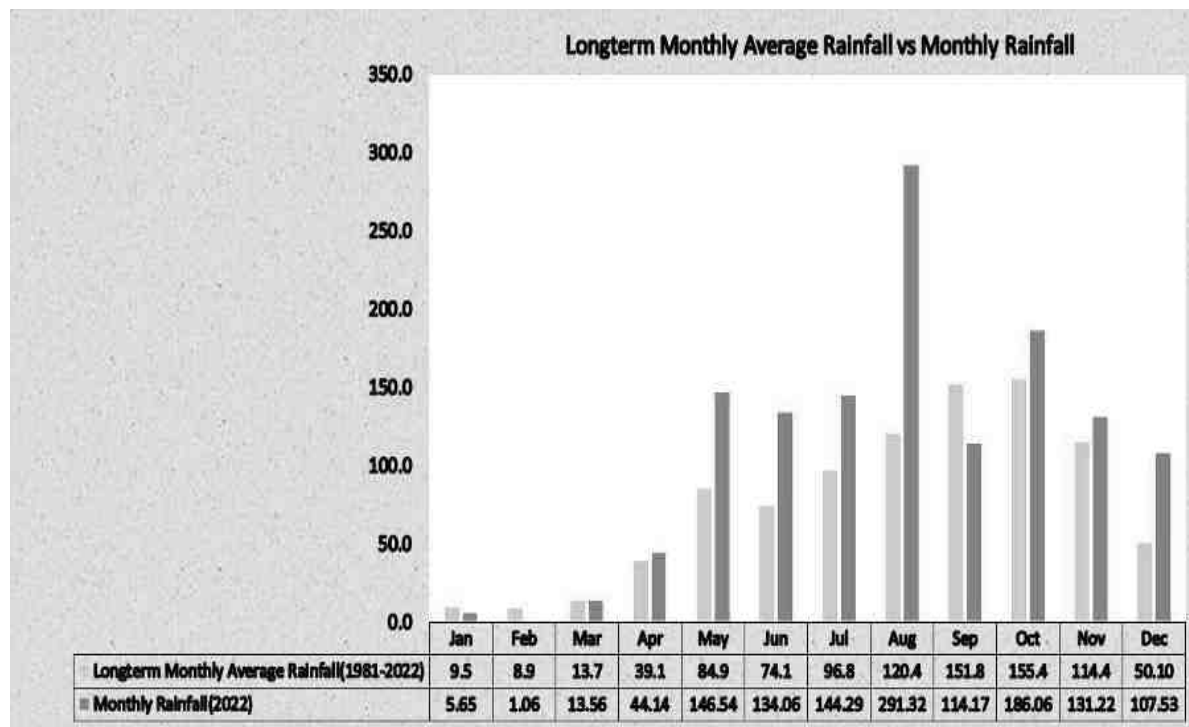


Figure 3.7 Long-Term Monthly Average Rainfall Vs Monthly Rainfall

3.2.3.1 Groundwater Levels and Flow Direction

Data regarding depth to groundwater levels are essential to infer the direction of groundwater movement within the study area. Knowledge of groundwater flow direction is must in choosing location for background groundwater quality monitoring well and in locating recharge and discharge areas. Therefore, data regarding groundwater elevations were collected from 9 open wells and 9 bore wells at various locations within 2 km radius around the proposed project sites for the period from March through May 2024 (Pre-Monsoon Season) and from October through December 2024, (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 10.17 to 13.40m BGL in pre monsoon and 9.07 to 11.43m BGL in post monsoon. The bore well data thus collected onsite are provided in Tables 3.9 and 3.10. The average depths to static potentiometric surface in bore wells for the period of October through December (Post-Monsoon Season) vary from 38.03 to 44.77m and from 41.43 to 49.07m for the period of March through May, (Pre-Monsoon Season). Data on the depths to static water table and potentiometric surface were used to draw contour lines connecting groundwater elevation (also known as equipotential hydraulic head) to determine the groundwater flow direction perpendicular to the contour lines. From the maps of open well groundwater flow direction shown in Figures 3.8-3.9, it is understood that most of the open well groundwater for the post- and pre-monsoon seasons flows towards the open well number 2 located in Northwest 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 6. It is located in Northwest 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-2024	Apr-2024	May- 2024	Average		
OW01	12.1	12.7	13.1	12.63	12°43'12.05"N	78°42'3.10"E
OW02	10.5	11.8	12.4	11.57	12°43'45.13"N	78°41'7.51"E
OW03	10.2	11.1	11.5	10.93	12°44'15.70"N	78°41'38.95"E
OW04	11.4	12.5	13.6	12.50	12°43'29.45"N	78°42'44.86"E
OW05	11.5	12.4	13.8	12.57	12°42'58.29"N	78°41'8.75"E
OW06	10.6	11.3	12.7	11.53	12°44'16.59"N	78°42'34.86"E
OW07	12.1	13.4	14.7	13.40	12°43'17.86"N	78°42'38.06"E
OW08	12.5	13.2	14.1	13.27	12°43'27.77"N	78°40'56.01"E
OW09	9.6	10.1	10.8	10.17	12°44'11.11"N	78°41'1.80"E

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
	Oct-2024	Nov- 2024	Dec-2024	Average		
OW01	11.5	11.2	10.1	10.93	12°43'12.05"N	78°42'3.10"E
OW02	10.6	10.3	9.6	10.17	12°43'45.13"N	78°41'7.51"E
OW03	10.4	10.1	9.8	10.10	12°44'15.70"N	78°41'38.95"E
OW04	11.7	11.4	10.6	11.23	12°43'29.45"N	78°42'44.86"E
OW05	11.2	10.8	9.7	10.57	12°42'58.29"N	78°41'8.75"E
OW06	10.3	9.5	9.3	9.70	12°44'16.59"N	78°42'34.86"E
OW07	12.5	11.3	10.5	11.43	12°43'17.86"N	78°42'38.06"E
OW08	12.6	11.4	10.3	11.43	12°43'27.77"N	78°40'56.01"E
OW09	9.5	9.1	8.6	9.07	12°44'11.11"N	78°41'1.80"E

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-2024	Apr-2024	May- 2024	Average		
BW01	43.2	43.6	44.1	43.63	12°43'29.15"N	78°42'1.55"E
BW02	47.5	47.8	48.2	47.83	12°43'15.47"N	78°42'1.39"E
BW03	48.4	49.2	49.6	49.07	12°42'59.06"N	78°42'3.54"E
BW04	43.1	44.5	44.7	44.10	12°43'8.57"N	78°41'9.46"E
BW05	42.6	43.6	43.8	43.33	12°43'37.53"N	78°40'56.54"E
BW06	41.4	42.1	42.5	42.00	12°44'3.65"N	78°41'3.09"E
BW07	40.5	41.2	42.6	41.43	12°44'36.21"N	78°41'43.75"E
BW08	42.3	43.1	44.2	43.20	12°44'22.30"N	78°42'4.18"E
BW09	43.2	44.1	45.6	44.30	12°43'58.30"N	78°42'21.06"E

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
	Oct-2024	Nov-2024	Dec-2024	Average		
BW01	40.1	39.8	39.4	39.77	12°43'29.15"N	78°42'1.55"E
BW02	45.6	44.3	43.5	44.47	12°43'15.47"N	78°42'1.39"E
BW03	46.5	44.2	43.6	44.77	12°42'59.06"N	78°42'3.54"E
BW04	41.4	40.5	40.1	40.67	12°43'8.57"N	78°41'9.46"E
BW05	40.1	39.6	39.2	39.63	12°43'37.53"N	78°40'56.54"E
BW06	40.3	39.8	39.1	39.73	12°44'3.65"N	78°41'3.09"E
BW07	38.4	38.2	37.5	38.03	12°44'36.21"N	78°41'43.75"E
BW08	40.2	40.1	39.2	39.83	12°44'22.30"N	78°42'4.18"E
BW09	41.2	40.5	39.4	40.37	12°43'58.30"N	78°42'21.06"E

Source: Onsite monitoring data

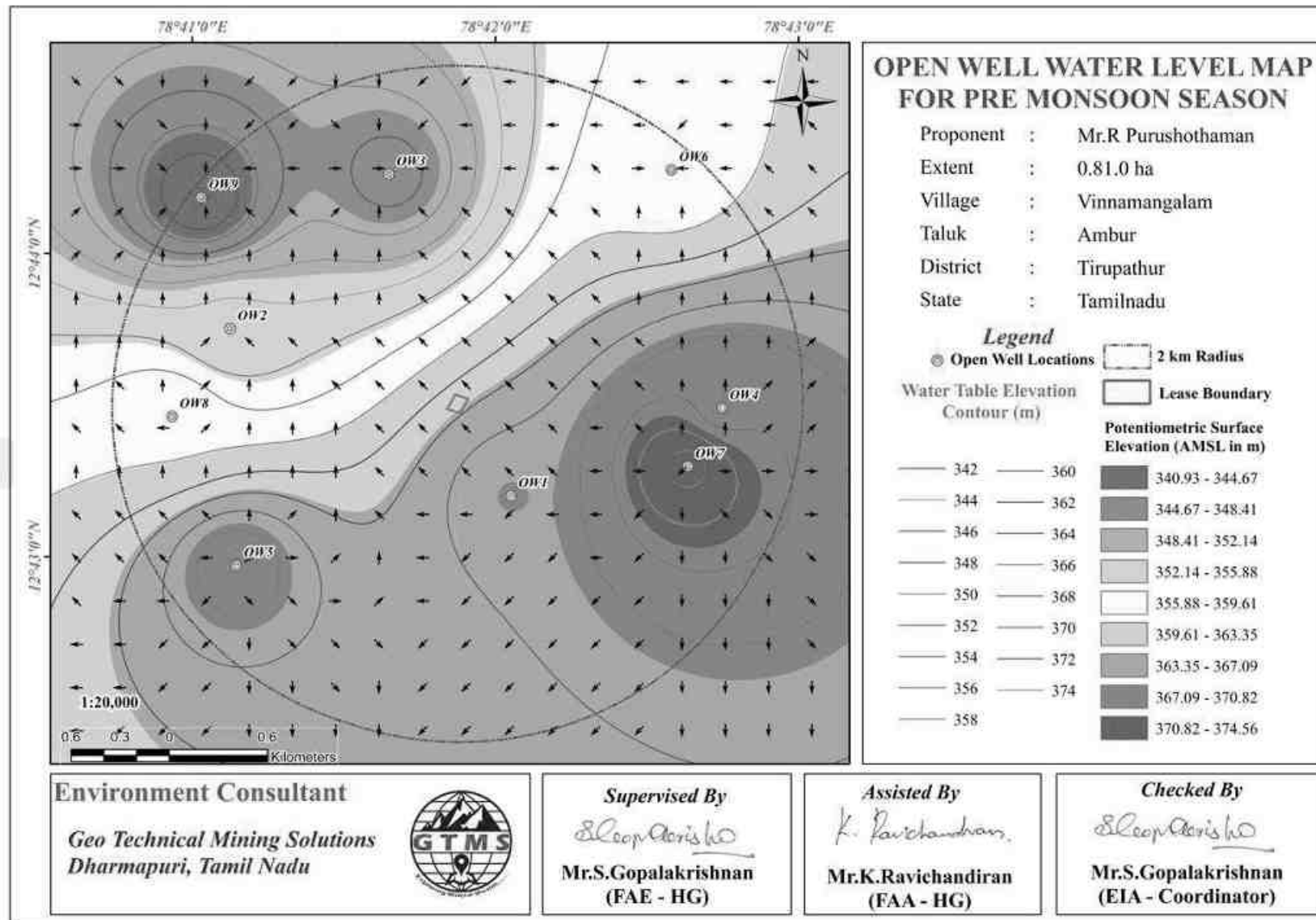


Figure 3.8 Open Well Static Groundwater Elevation Map Showing Direction of Groundwater Flow during Pre-Monsoon Season

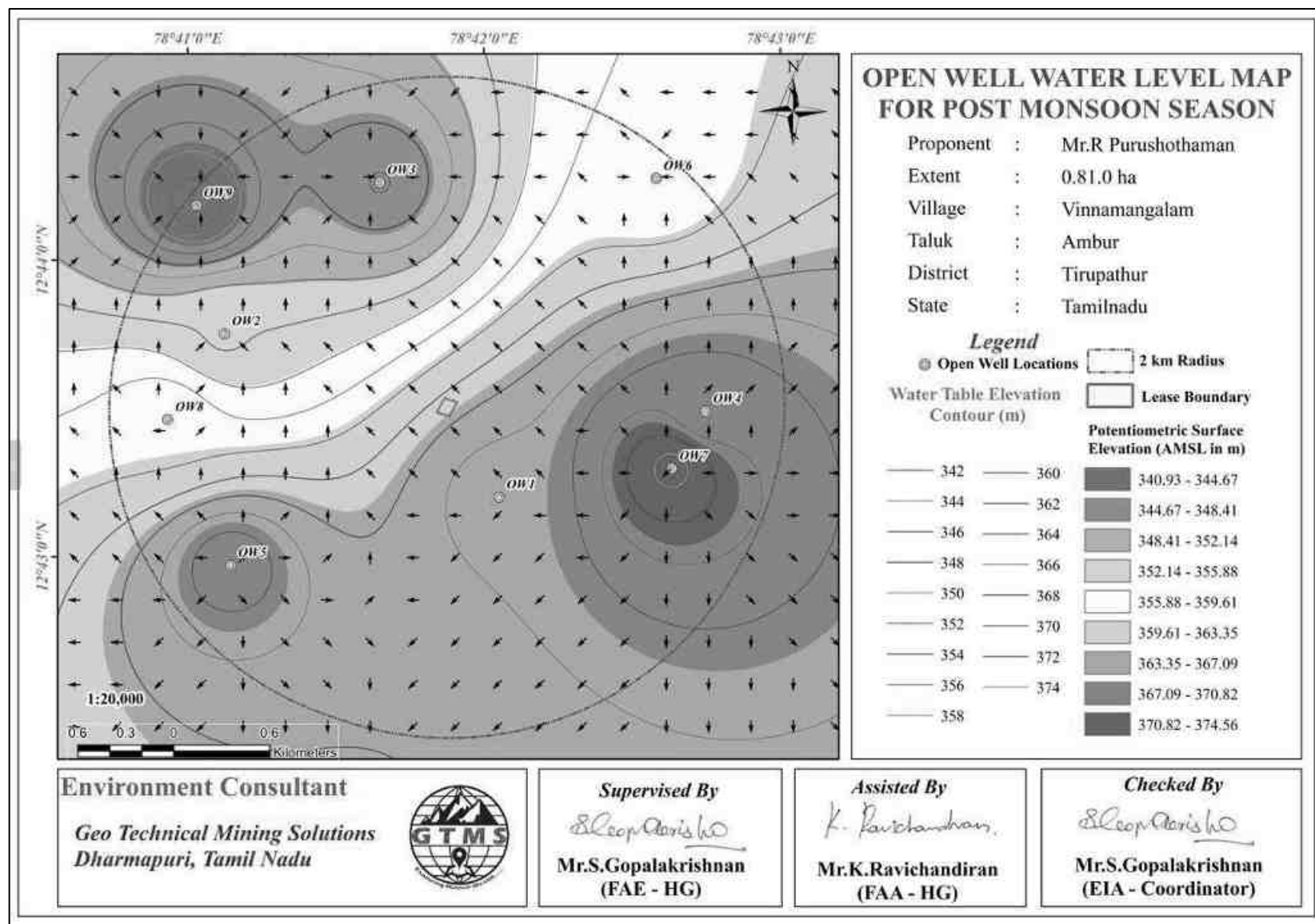


Figure 3.9 Open Well Static Groundwater Elevation Map Showing Direction of Groundwater Flow during Post-Monsoon Season

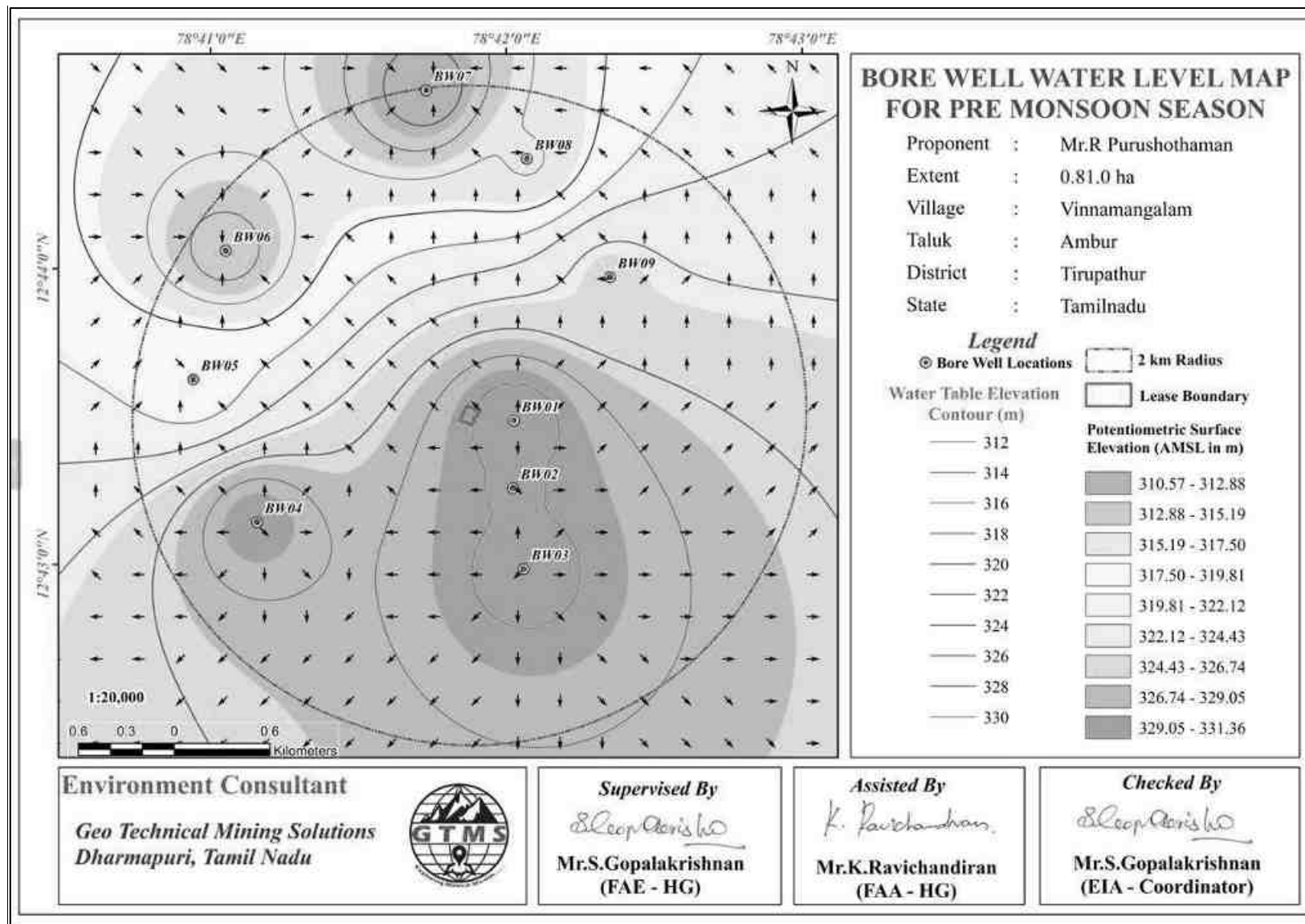


Figure 3.10 Borewell Static Groundwater Elevation Map Showing Direction of Groundwater Flow during Pre-Monsoon Season

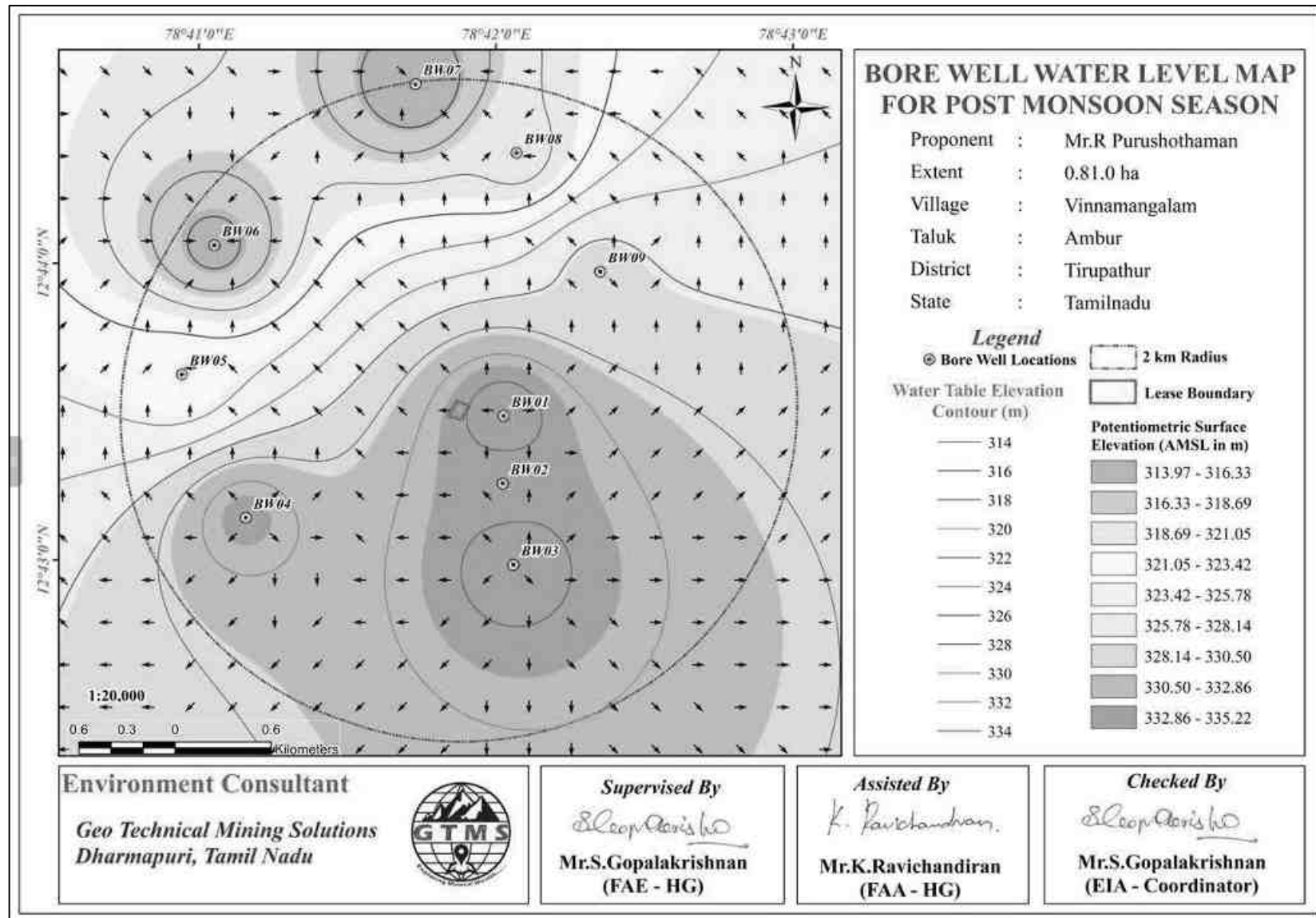


Figure 3.11 Borewell Static Groundwater Elevation Map Showing Direction of Groundwater Flow during Post-Monsoon Season

3.2.3.2 Electrical Resistivity Investigation

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

Result

The Geophysical VES data obtained from the project site have been shown in Table 3.11. 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.

Table 3.11 Vertical Electrical Sounding Data

Location Coordinates - 12°43'28.59"N, 78°41'54.38"E					
S. No.	AB/2 (m)	MN/2 (m)	Geometrical Factor (G)	Resistance in Ω	Apparent Resistivity in Ωm
1	2	1	4.71	19.91	93.90
2	4	1	23.57	7.71	181.91
3	6	1	55.00	4.33	238.61
4	8	1	99.00	2.45	243.40
5	10	2	75.43	5.38	406.18
6	12	2	110.01	3.63	400.25
7	14	2	150.86	2.66	402.68
8	16	2	198.01	2.09	414.07
9	18	2	251.44	1.83	460.20
10	20	2	311.16	1.62	505.74
11	25	5	188.58	2.64	499.21
12	30	5	275.01	2.15	592.50
13	35	5	377.16	1.88	712.85
14	40	5	495.02	1.63	811.52
15	45	5	628.60	1.46	919.66
16	50	5	777.89	1.28	999.95
17	60	10	550.03	2.25	1210.06
18	70	10	754.32	1.76	1327.04

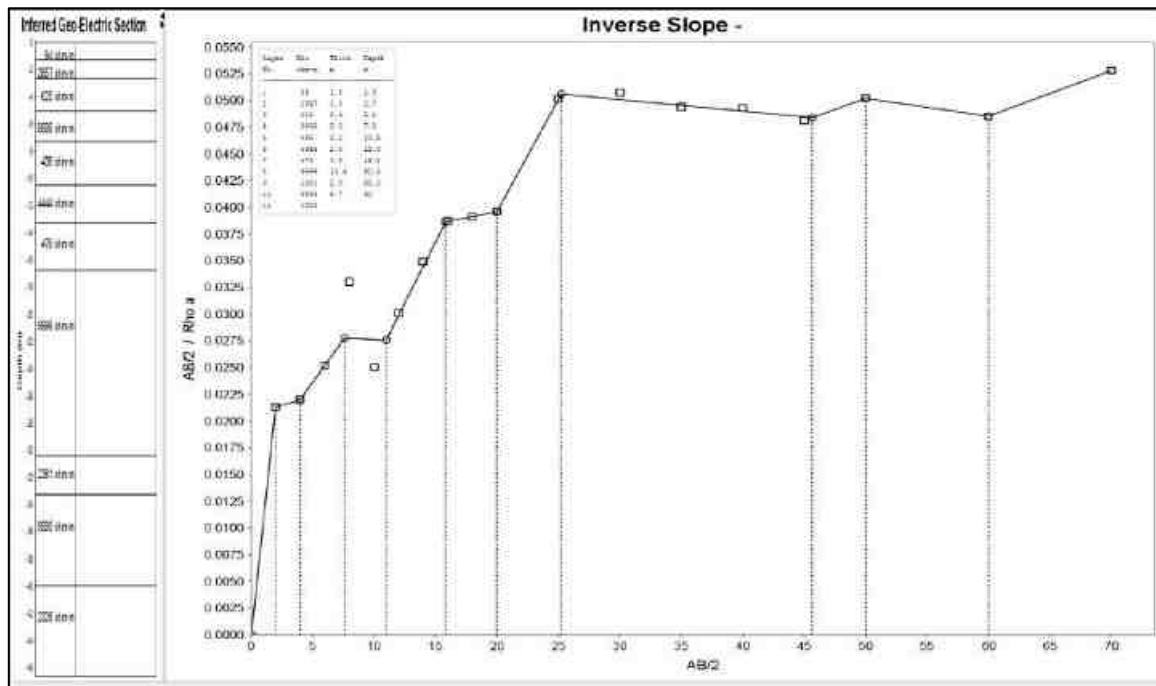


Figure 3.12 Graph Showing Occurrence of Water Bearing Fracture Zones at the Depth of 60-65m Below Ground Level in Proposed Project

The rock formation of low resistivity values indicates occurrence of water at the depth of about 60-65m below ground level. The ultimate depth of proposed project is 45m (25m AGL + 20m BGL). Therefore, the mining operation will not affect the aquifer throughout the entire mine life period.

3.3 AIR ENVIRONMENT

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

3.3.1 Meteorology

3.3.1.1 Climatic Variables

A temporary meteorological station was installed at the project sites by covering cluster quarries. The station was installed at a height of 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		OCT,2024	NOV,2024	DEC,2024
1	Temperature (⁰ C)	Min	20.39	17.67	15.67
		Max	34.45	29.69	29.13
		Avg	25.50	23.64	22.69
2	Relative Humidity (%)	Min	40.37	56.57	60.62
		Max	99.24	100.00	100.00
		Avg	83.88	86.63	89.12
3	Wind Speed (m/s)	Min	0.28	0.54	0.23
		Max	5.38	11.14	5.07
		Avg	2.00	3.56	2.20
4	Wind Direction (degree)	Min	0.00	0.00	0.20
		Max	359.50	359.90	359.70
		Avg	176.38	85.80	117.51
5	Surface Pressure(kPa)	Min	95.75	95.50	95.26
		Max	96.62	96.75	96.85
		Avg	96.22	96.37	96.23

Source: On-site monitoring/sampling by **Interstellar Testing Centre Pvt. Ltd** in association with GTMS

3.3.1.2 Wind Pattern

Wind pattern will largely influence the dispersion pattern of air pollutants and noise from the proposed project site. Analysis of wind pattern requires hourly site-specific data of wind speed and direction. Two types of wind rose were generated: historical seasonal wind rose for the period of October to December of the years from 2020 to 2023 and the seasonal wind rose for the study period of October through December 2024. 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 2.96m/s.
- ❖ Predominant wind was dominant in the directions ranging from Northeast to Southwest.

3.3.2 Ambient Air Quality Study

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

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

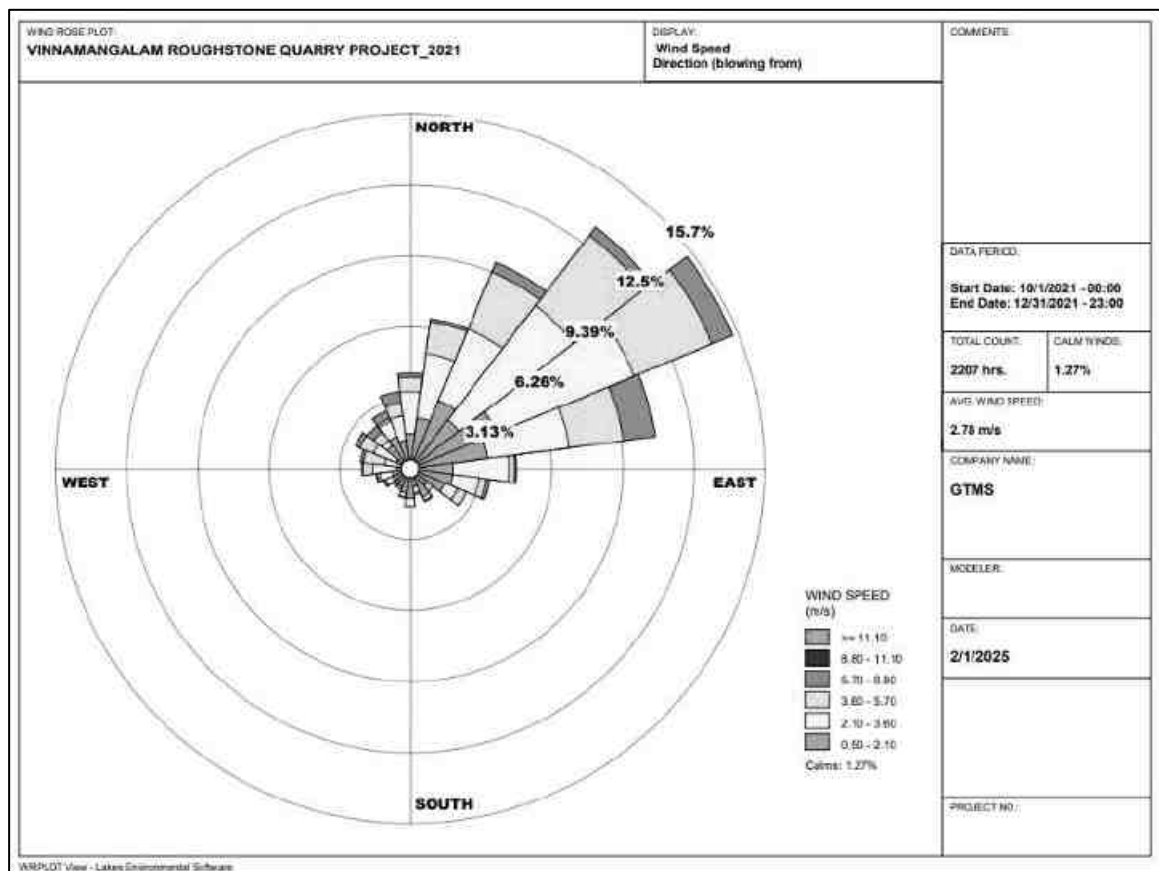
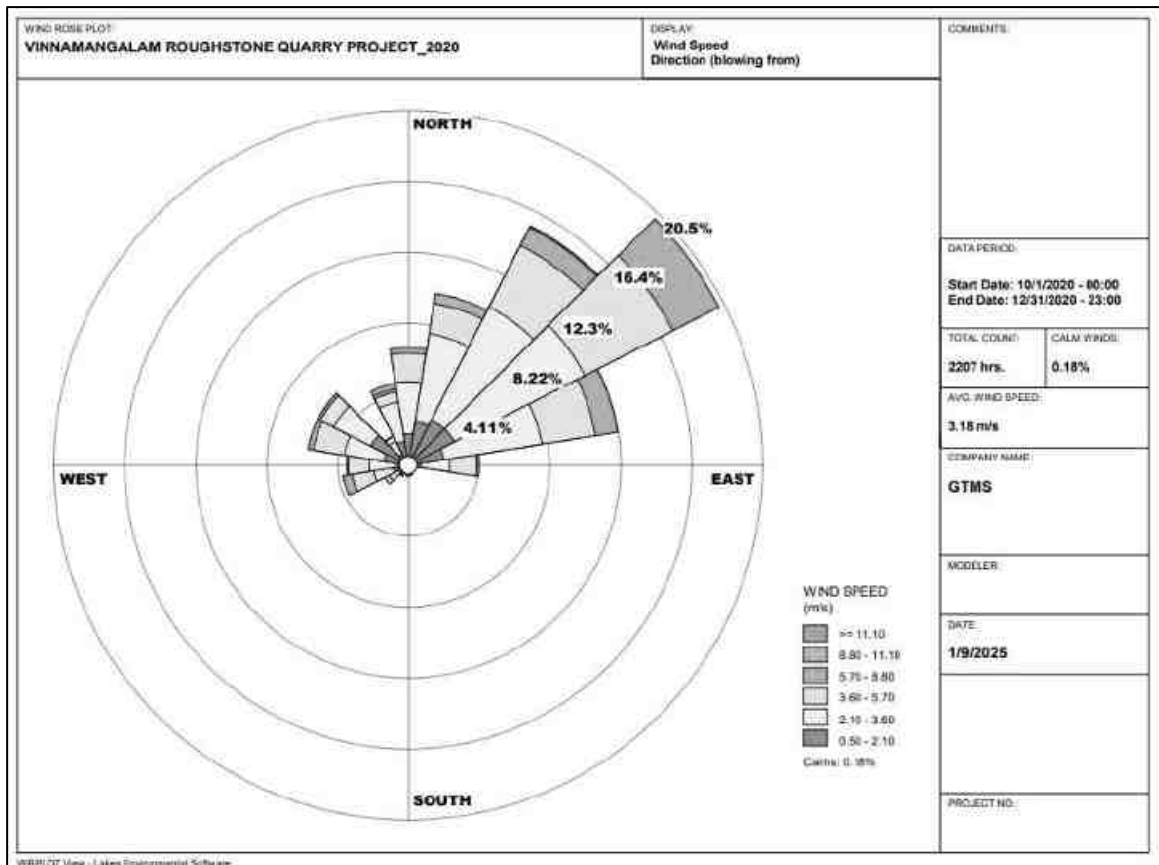


Figure 3.13 Windrose Diagram for 2020 and 2021 (October to December)

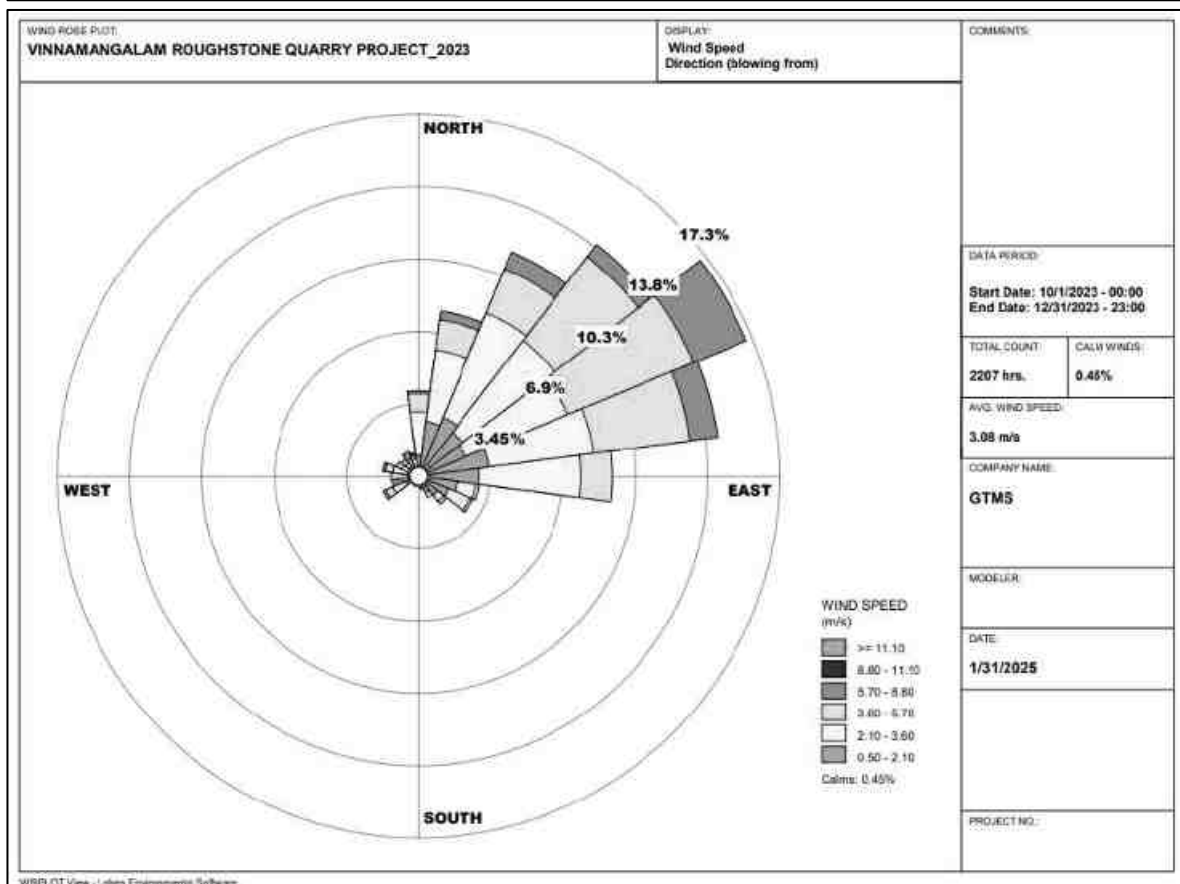
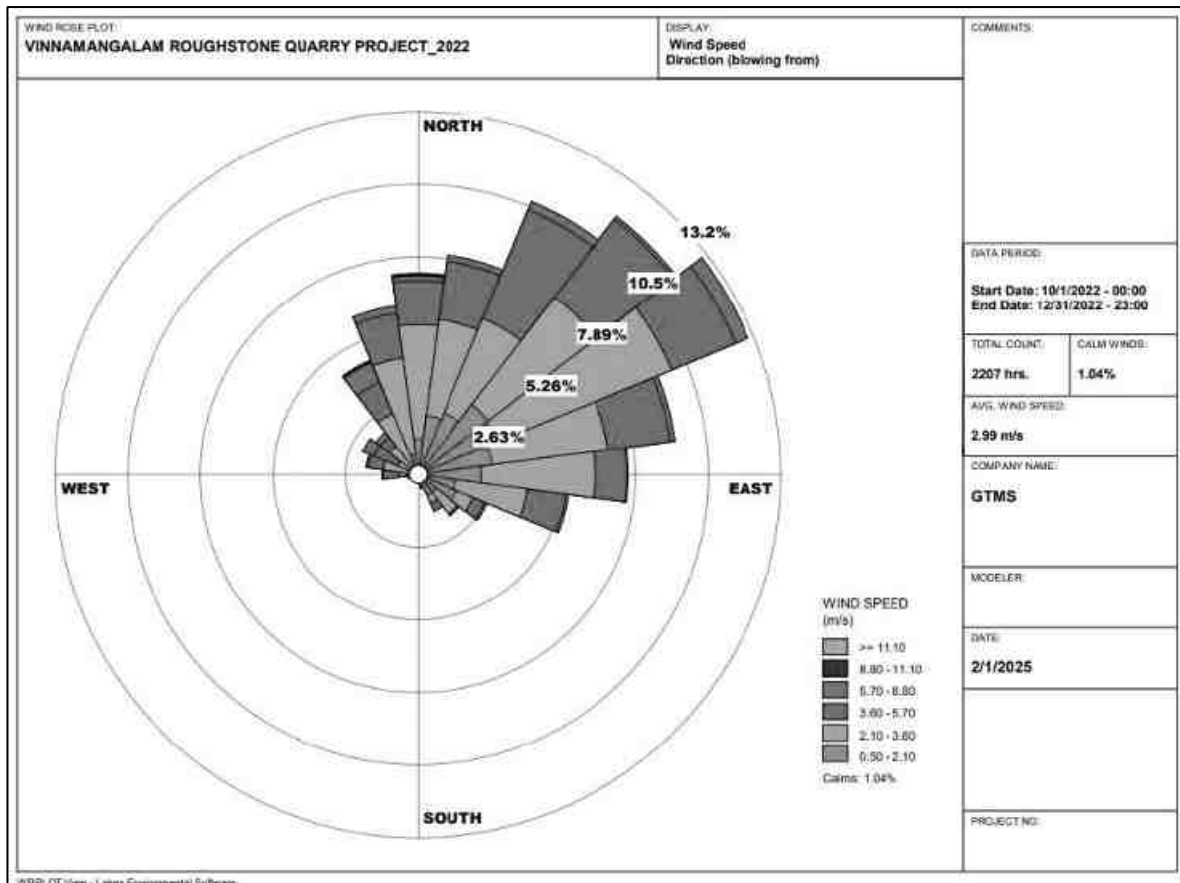


Figure 3.13a Windrose Diagram for 2022 and 2023 (October to December)

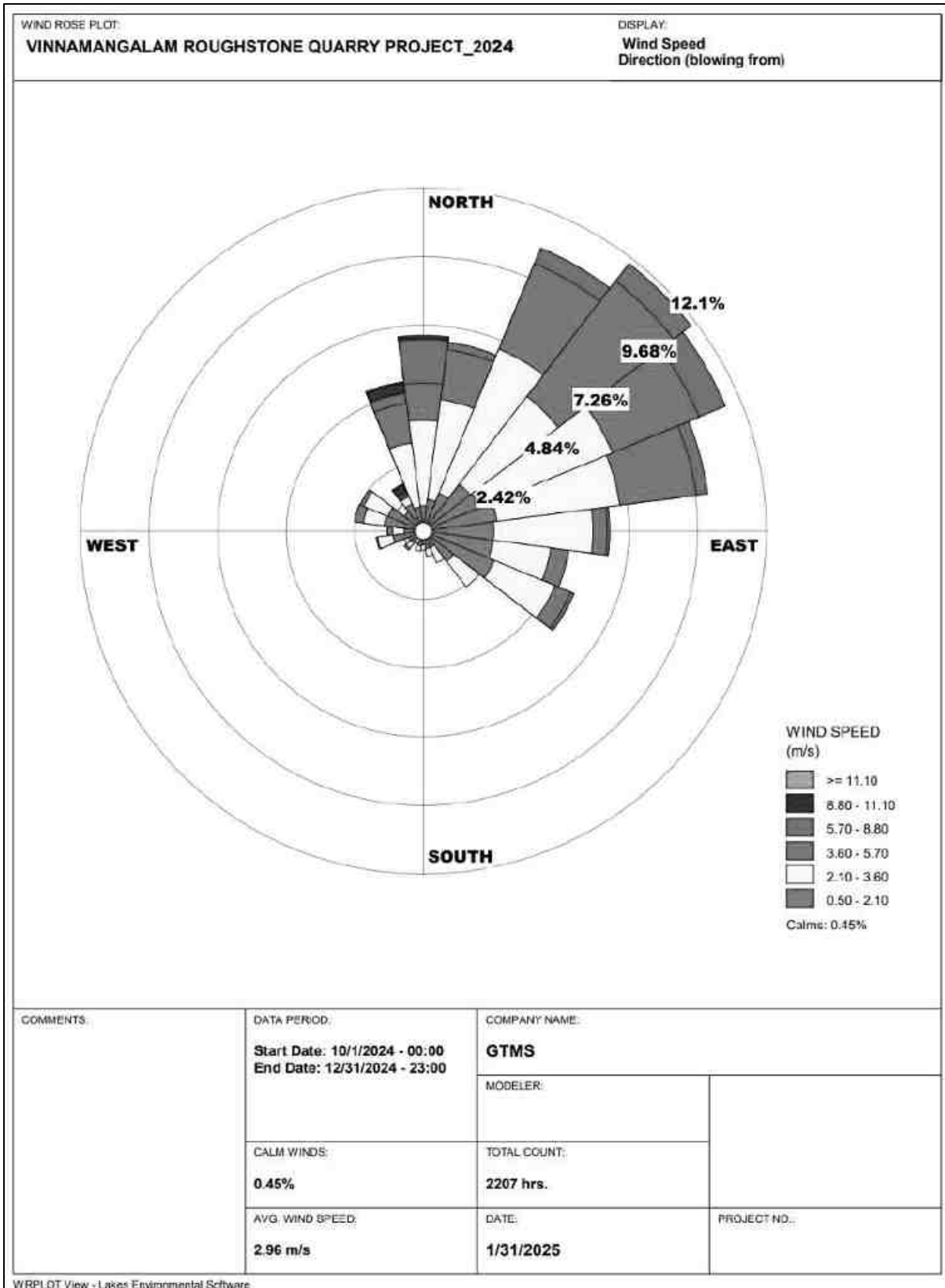


Figure 3.14 Onsite Wind Rose Diagram

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
Free Silica	NIOSH – 7601	Visible Spectrophotometry

Source: Sampling Methodology based Interstellar Testing Centre Pvt. Ltd & CPCB Notification

Table 3.14 National Ambient Air Quality Standards

S. No.	Pollutant	Time Weighted Average	Concentration in ambient air	
			Industrial, Residential, Rural & other areas	Ecologically Sensitive area (Notified by Central Govt.)
1	SO ₂ (µg/m ³)	Annual Avg.* 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 Eight (08) locations, adopting a continuous 24 hourly (3 shift of 8-hour) schedule for the period October to December, 2024 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	Nearby Core	0.44	S	12°43'15.30"N	78°41'47.36"E
AAQ2	Nearby Core	0.51	NNW	12°43'43.99"N	78°41'40.16"E
AAQ3	Kamiyampattu Pudur	0.44	SE	12°43'23.90"N	78°42'6.80"E
AAQ4	Minnur	2.52	W	12°43'45.96"N	78°40'28.66"E
AAQ5	Vinnamangalam	2.07	N	12°44'38.66"N	78°41'42.39"E
AAQ6	Periyankuppam	1.82	NE	12°44'5.95"N	78°42'43.43"E
AAQ7	Vinnamangalam RS	1.36	SW	12°43'10.35"N	78°41'9.49"E
AAQ8	Veerankuppam	3.98	NW	12°45'27.70"N	78°40'52.71"E

Source: On-site monitoring/sampling *Interstellar Testing Centre Pvt. Ltd* in association with GTMS

Results

As per the monitoring data, PM_{2.5} ranges from 16.5µg/m³ to 19.8µg/m³; PM₁₀ from 42.0µg/m³ to 48.5µg/m³; SO₂ from 5.0µg/m³ to 5.8µg/m³; NO_x from 13.5µg/m³ to 16.3g/m³. The concentration levels of the pollutants fall within the acceptable limits of NAAQS prescribed by CPCB.

Air quality Index

The AQI shows that the air quality of the study area falls within good category 45 causing minimal impact to human health.

Table 3.16 Summary of AAQ Result

PM _{2.5}					PM ₁₀			
Station ID	Max	Min	Mean	98 th Percentile	Max	Min	Mean	98 th Percentile
AAQ1	21.6	18.7	19.6	21.6	50.6	46.0	47.9	50.1
AAQ2	20.8	18.0	18.7	20.7	49.9	45.0	47.8	49.8
AAQ3	19.5	16.2	17.5	18.0	51.3	42.2	45.0	49.0
AAQ4	19.5	16.6	17.4	19.3	46.6	41.8	44.2	46.1
AAQ5	18.7	15.3	16.6	18.7	45.8	39.7	42.6	45.3
AAQ6	19.5	15.7	17.3	19.5	52.3	40.8	44.6	51.8
AAQ7	19.3	16.2	17.1	19.0	45.8	41.1	43.4	45.7
AAQ8	21.6	18.7	19.6	21.6	45.9	39.5	43.0	45.6
SO ₂					NO _x			
AAQ1	6.0	4.2	5.3	6.0	13.4	11.4	12.0	13.3
AAQ2	6.5	6.0	6.2	6.5	19.4	16.8	17.3	19.3
AAQ3	5.6	5.1	5.3	5.6	16.7	13.7	14.7	16.7
AAQ4	5.7	5.0	5.3	5.6	16.4	13.6	14.5	16.3
AAQ5	5.7	5.0	5.2	5.6	15.9	12.9	12.8	15.9
AAQ6	5.7	5.0	5.3	5.7	16.6	13.3	14.5	16.6
AAQ7	5.9	5.0	5.4	5.9	16.3	13.4	14.3	14.5
AAQ8	5.4	5.0	5.2	5.4	16.0	12.8	14.0	16.0

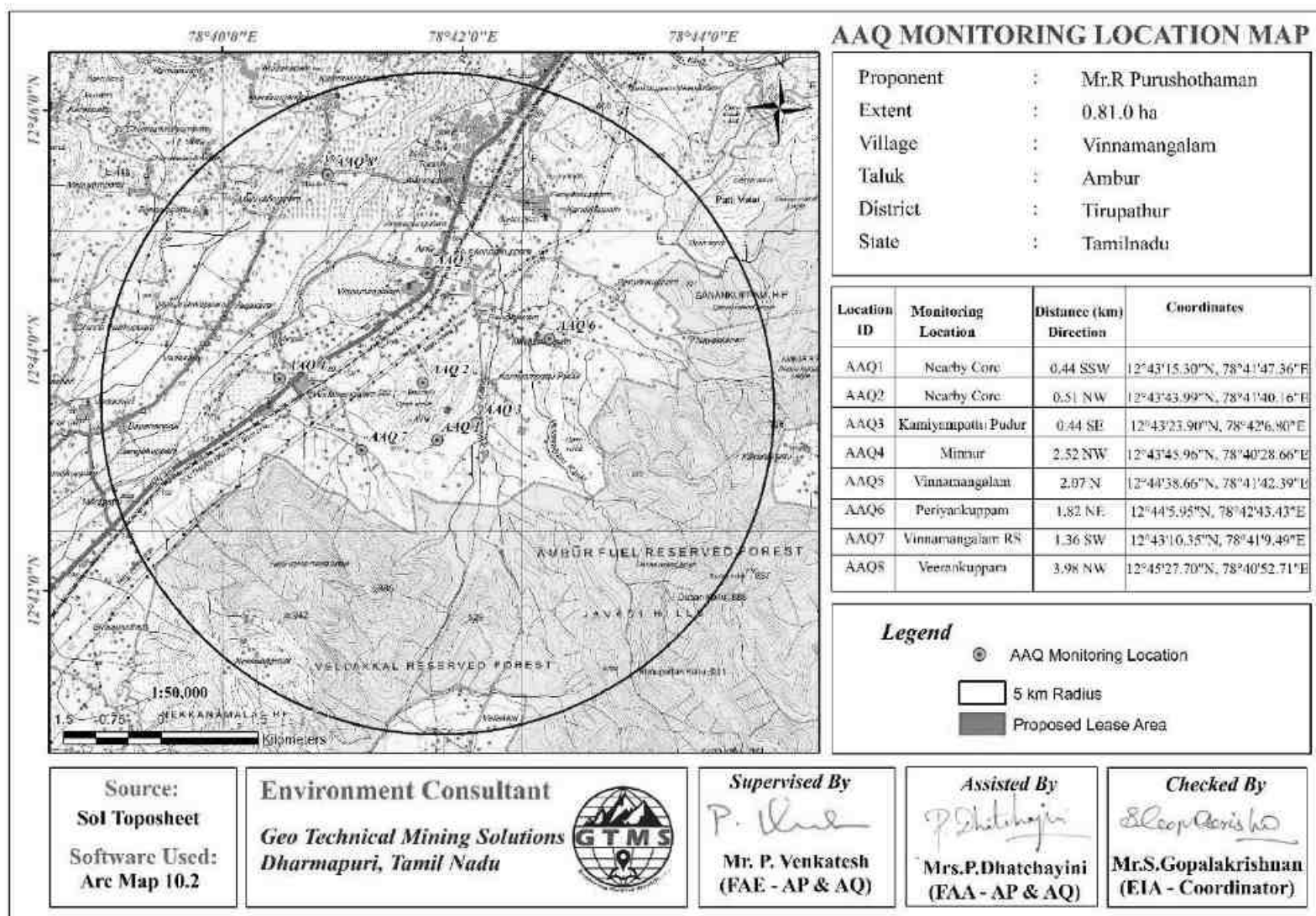


Figure 3.15 Map Showing Ambient Air Quality Monitoring Station Locations Around 5 km Radius from Proposed Project Site

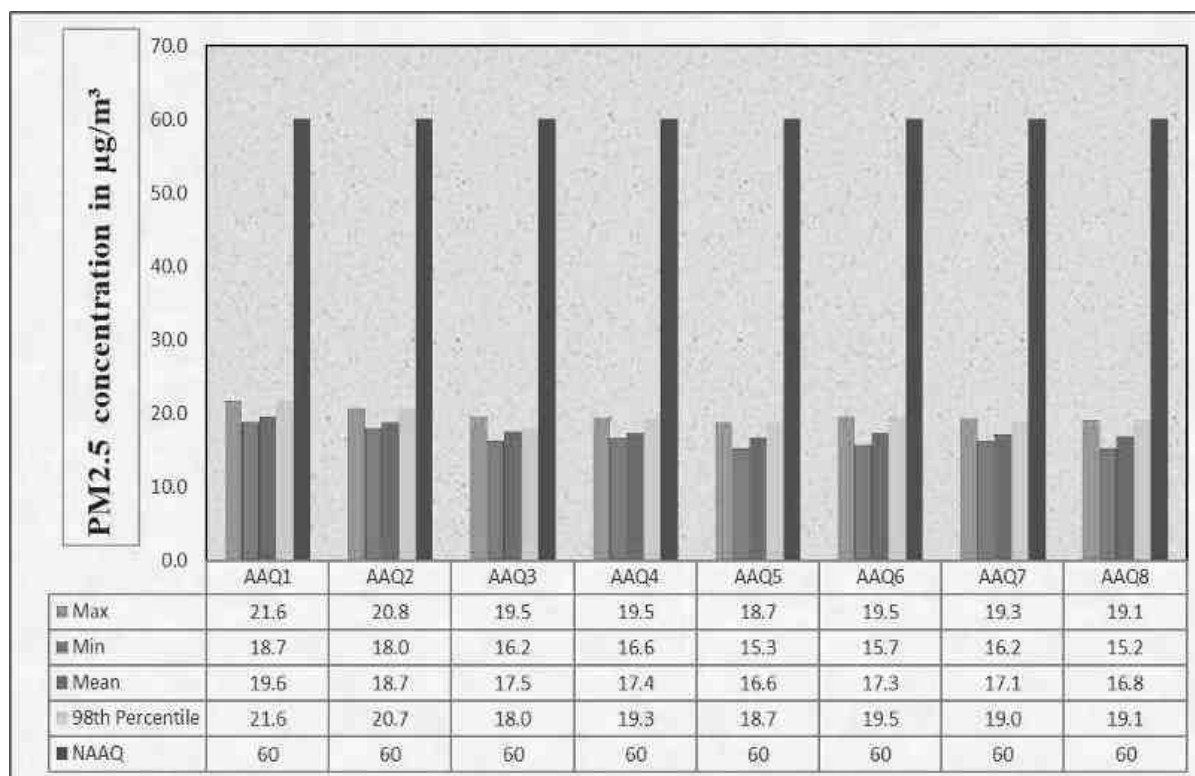


Figure 3.16 Bar Chart Showing Maximum, Minimum, and Average Concentrations of PM_{2.5} Measured from 8 Air Quality Monitoring Stations within 5 km Radius

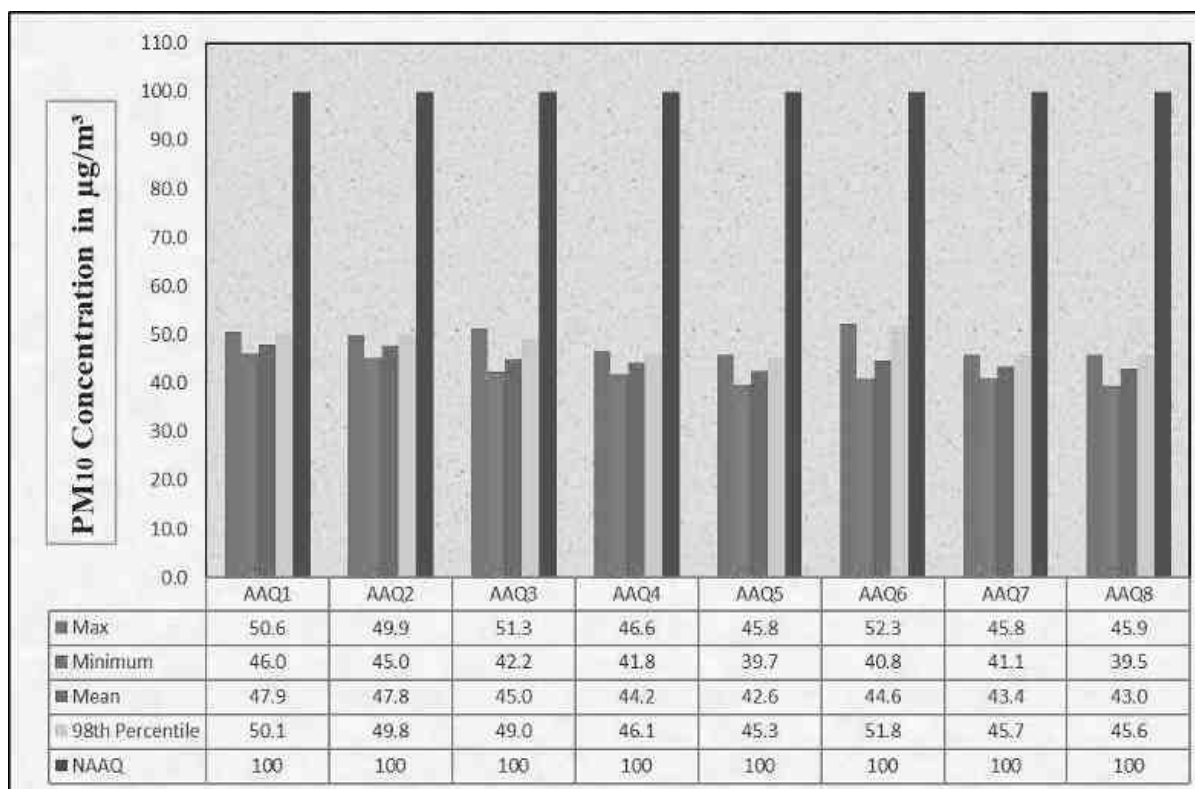


Figure 3.17 Bar Chart Showing Maximum, Minimum, and Average Concentrations of PM₁₀ Measured from 8 Air Quality Monitoring Stations within 5 km Radius

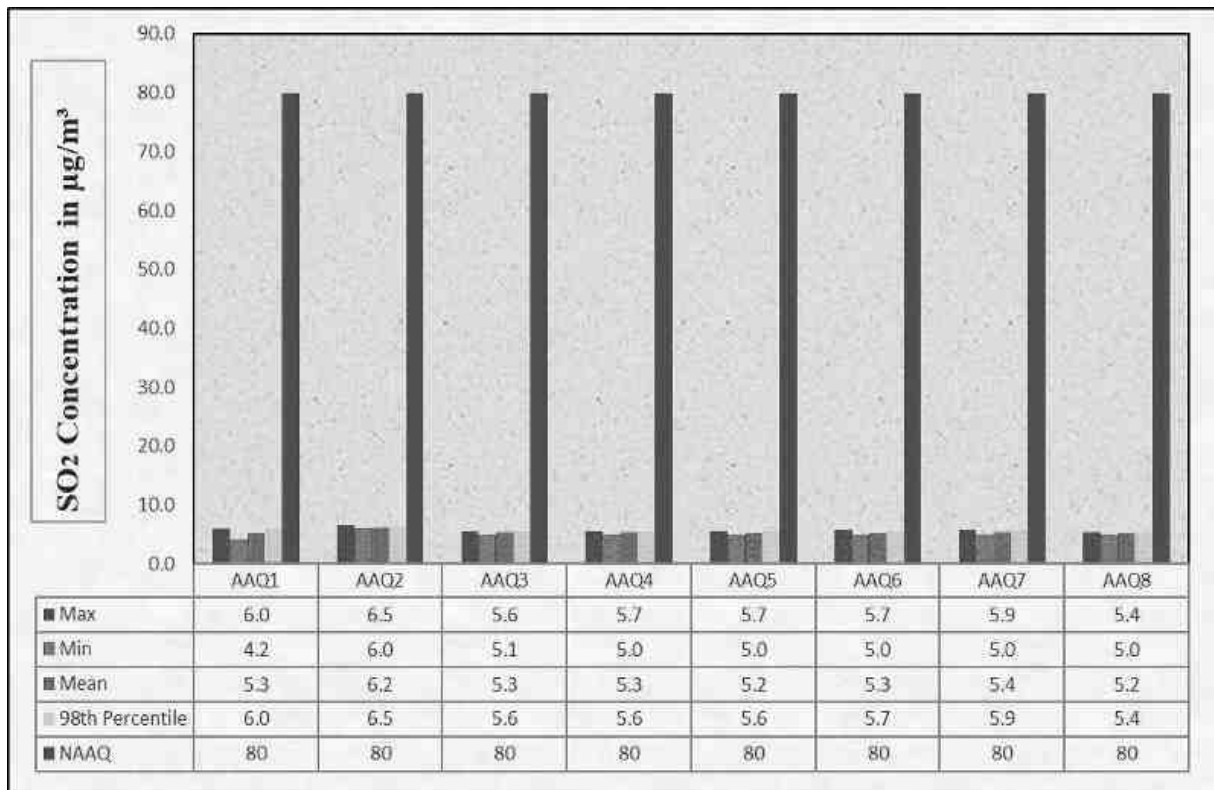


Figure 3.18 Bar Chart Showing Maximum, Minimum, and Average Concentrations of SO₂ Measured from 8 Air Quality Monitoring Stations within 5 km Radius

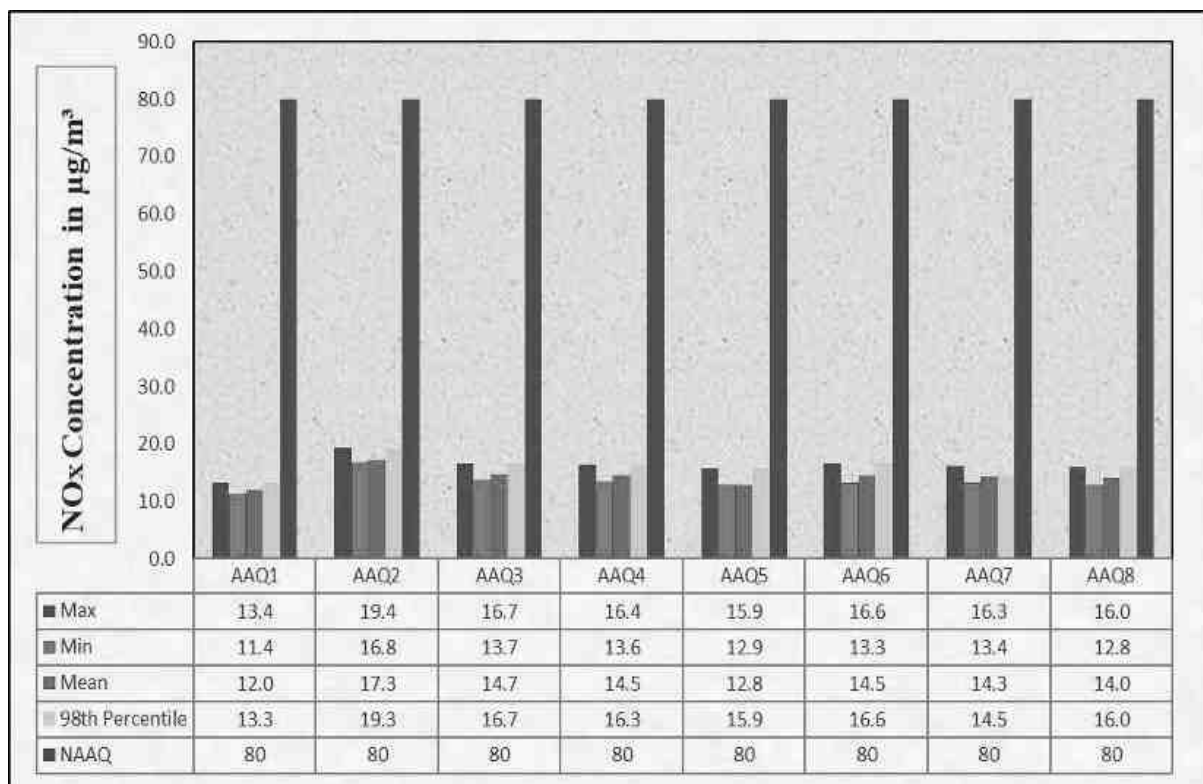


Figure 3.19 Bar Chart Showing Maximum, Minimum, and Average Concentrations of NO_x Measured from 8 Air Quality Monitoring Stations within 5km Radius

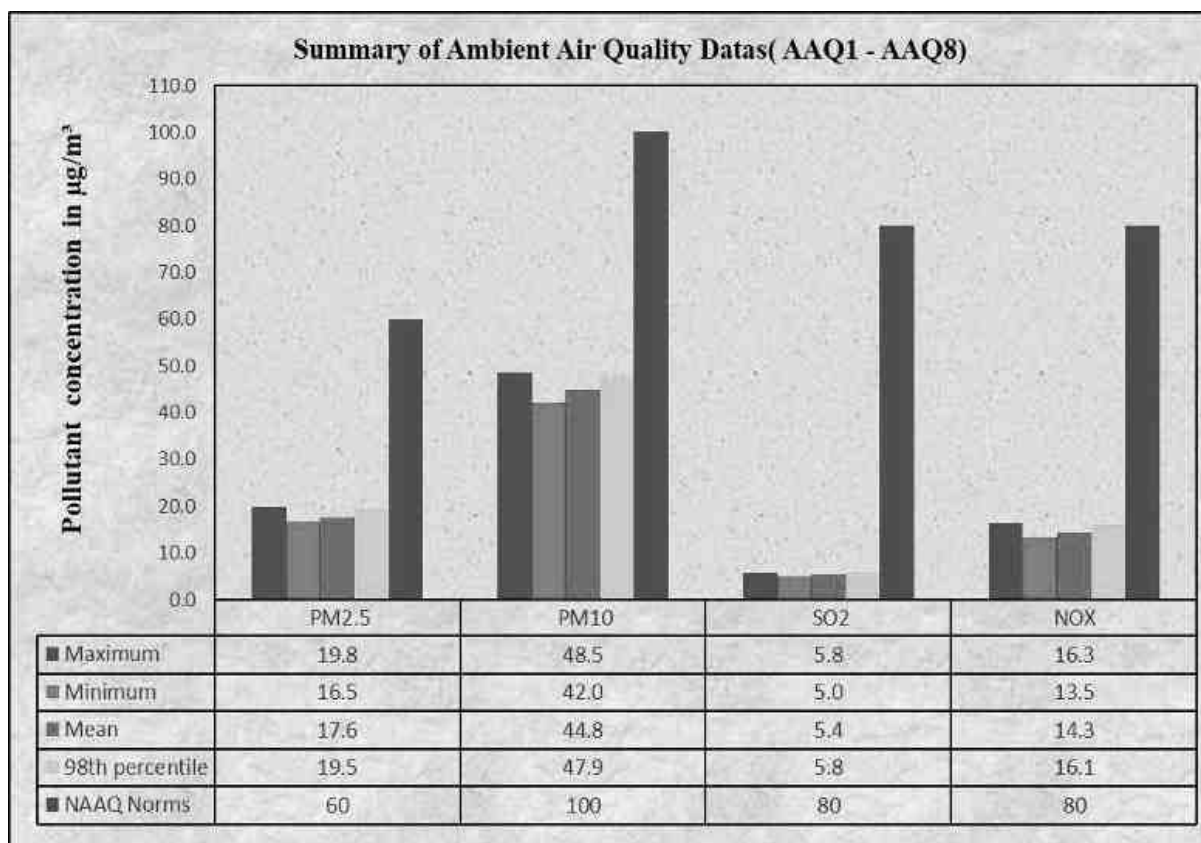


Figure 3.20 Bar Chart Showing Maximum, Minimum, And Average Concentrations of Pollutants in Atmosphere within 5 km Radius

3.4 NOISE ENVIRONMENT

The vehicular movement on road and mining activities is the major sources of noise in the study area. The main objective of noise monitoring in the study area is to establish the baseline noise level, which will in turn be used to assess the impact of the total noise expected to be generated during the project operations around the project site. In order to assess the ambient noise levels within the study area, noise monitoring was carried out at eleven (11) 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 3.21.

Table 3.17 Noise Monitoring Locations

Location Code	Monitoring Locations	Distance in km	Direction	Coordinates	
N1	Parathamam Core	0.35	S	12°43'20.44"N	78°41'48.04"E
N2	Selvam Core	0.36	S	12°43'20.26"N	78°41'49.77"E
N3	T.G.Govind	0.28	S	12°43'22.77"N	78°41'46.68"E

N4	RDS Core	--	--	12°43'32.33"N	78°41'49.20"E
N5	Karthick Core	0.28	NW	12°43'39.60"N	78°41'37.40"E
N6	Kamiyampattu Pudur	0.47	SE	12°43'23.92"N	78°42'1.98"E
N7	Minnur	2.08	NW	12°43'50.21"N	78°40'37.35"E
N8	Vinnamangalam	2.01	N	12°44'41.90"N	78°41'44.73"E
N9	Periyankuppam	1.81	NE	12°44'7.15"N	78°42'39.72"E
N10	Vinnamangalam RS	1.37	SW	12°43'10.12"N	78°41'8.86"E
N11	Veerankuppam	3.82	NW	12°45'28.24"N	78°40'50.27"E

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 (L _{eq} in dB (A))	
N1	Parathaman Core	Industrial Area	45.1	39.7	75	70
N2	Selvam Core		44.0	39.5		
N3	T.G.Govind		43.2	37.6		
N4	RDS Core		40.3	35.8		
N5	Karthick Core		42.7	36.7		
N6	Kamiyampattu Pudur	Residential Area	41.2	37.8	55	45
N7	Minnur		40.5	35.8		
N8	Vinnamangalam		42.9	36.5		
N9	Periyankuppam		42.7	38.7		
N10	Vinnamangalam RS		42.4	37.6		
N11	Veerankuppam		43.3	37.7		

Source: On-site monitoring/sampling by *Interstellar Testing Centre Pvt. Ltd* in association with *GTMS*

The Table 3.18 shows that noise level in core zone was 40.3 dB (A) Leq during day time and 35.8dB(A) Leq during night time. Noise levels recorded in buffer zone during day time varied from 40.3to 45.1dB (A) Leq and during night time from 37.0 to 40.9dB (A) Leq. Thus, the noise level for industrial and residential area meets the requirements of CPCB. The results are also depicted below in Figures 3.22 and 3.23.

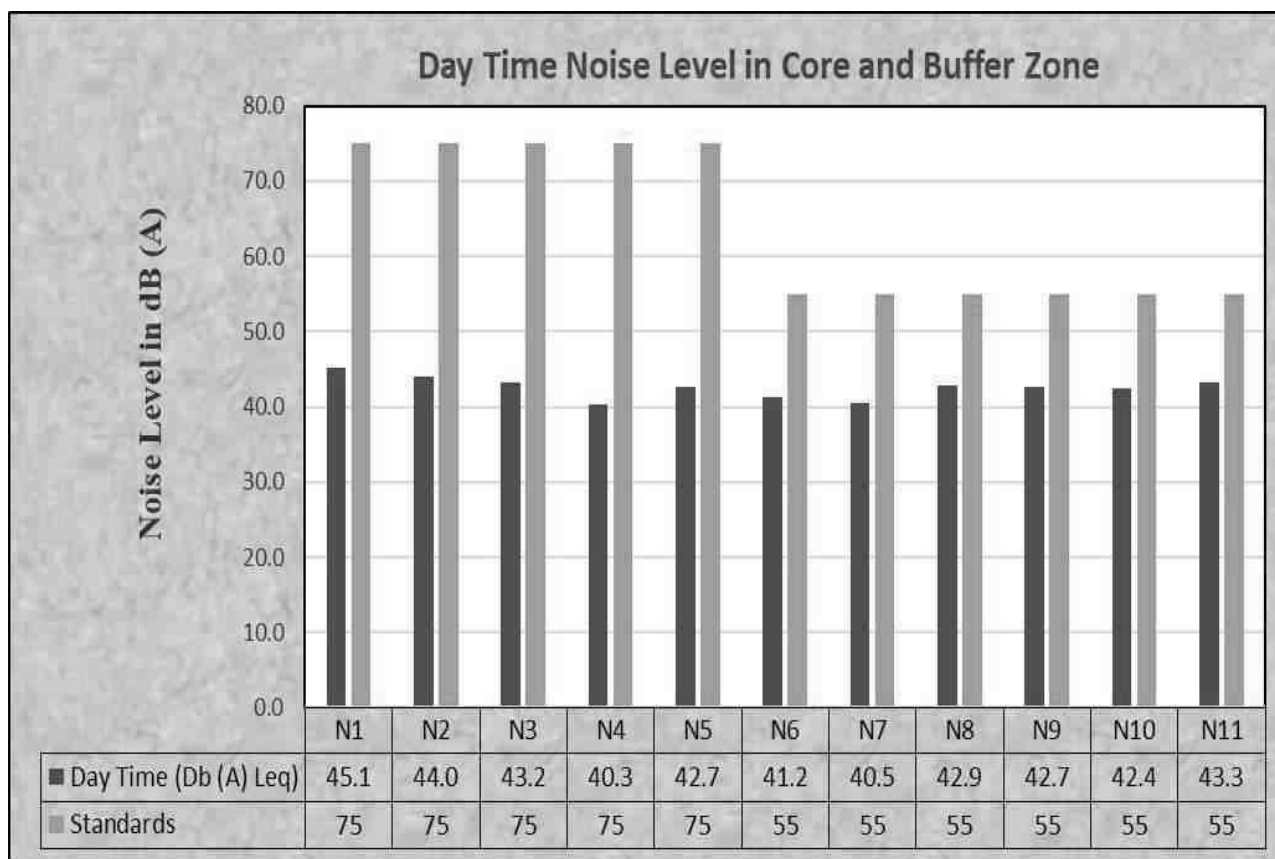


Figure 3.21 Bar Chart Showing Day Time Noise Levels Measured in Core and Buffer Zones

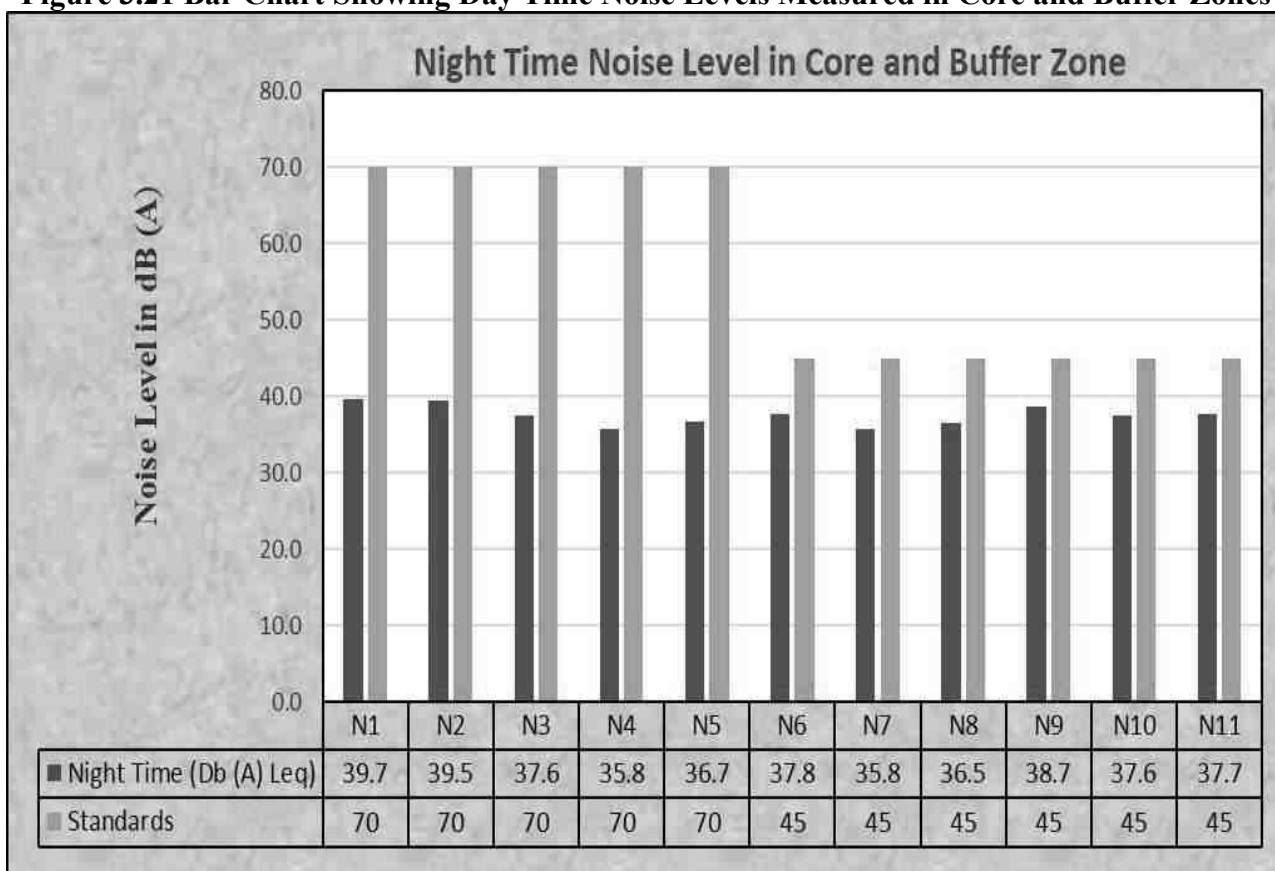


Figure 3.22 Bar Chart Showing Night Time Noise Levels Measured in Core and Buffer Zones

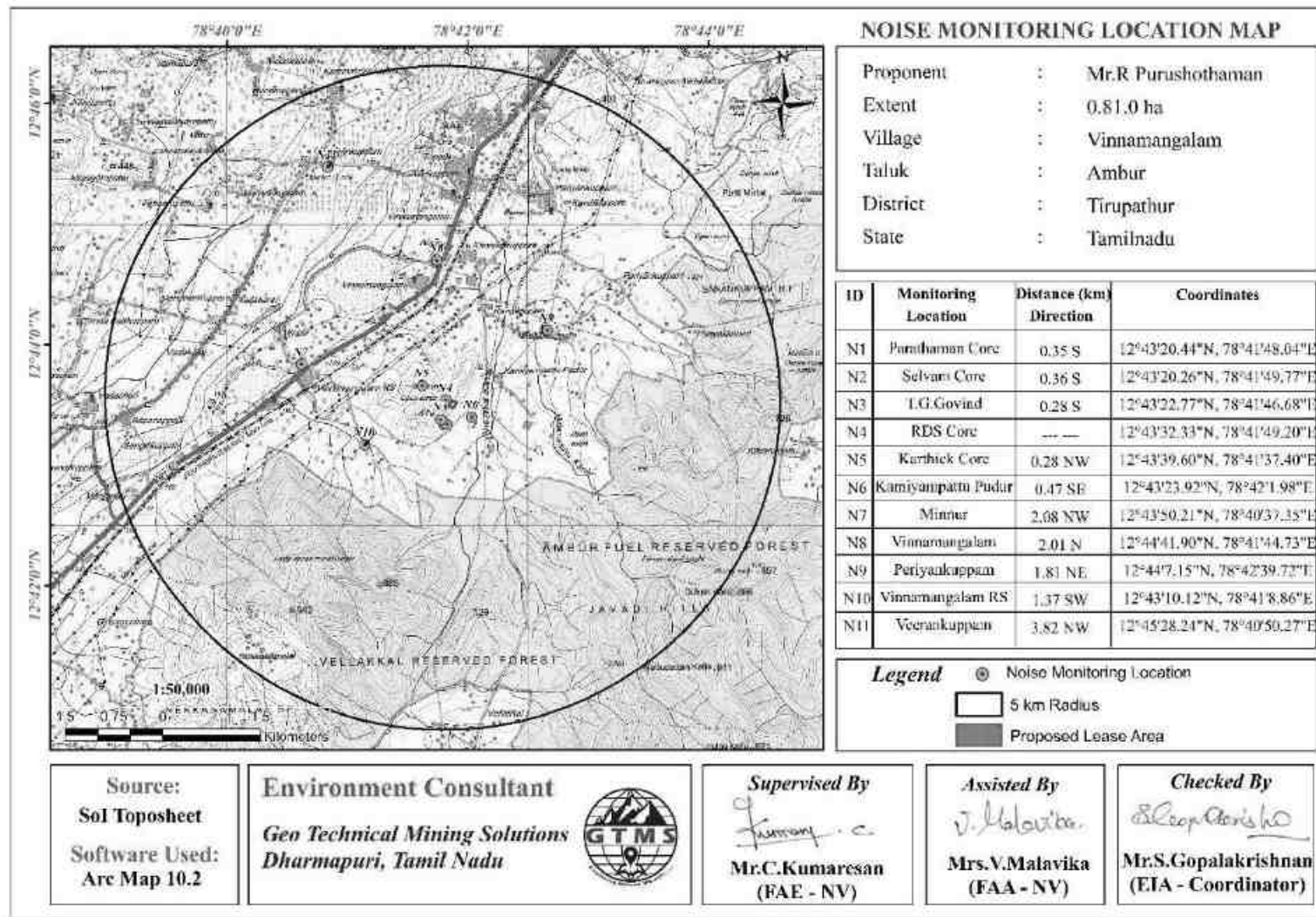


Figure 3.23 Map Showing Noise Level Monitoring Station Locations around 5 km Radius from Proposed Project Site

3.5 BIOLOGICAL ENVIRONMENT

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

Methodology

Nested quadrat sampling method was used for the study of community structure of the vegetation. The sampling consisted of randomly placed quadrats of 10m × 10m were laid down to assess trees, and sub quadrats of 5 m × 5 m were laid down for shrubs, 1m x 1m were laid down for herbs. The size and number of quadrats needed were determined using the species- area curve (Misra, 1968). The data on vegetation were quantitatively analysed for abundance, density, frequency as per Curtis & McIntosh (1950). The Important Value Index (IVI) for trees was determined as the sum of relative density, relative frequency and relative dominance (Curtis, 1959).



Figure 3.24 Quadrates Sampling Methods of Flora

Important Value Index (IVI)

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

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

Relative Value Index (RVI) = Relative Density + 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.

3.5.1 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 quarry lease area is an already excavated mine lease area. There are no plants or trees in the lease area.

Flora in 1km radius zone

Taxonomically, a total of 80 species belonging to 35 families have been recorded from the 1km radius from the mining lease area. The species in the 1km radius include herbs (39), trees (25), shrubs (16), the 35 families, Fabaceae and Lamiaceae are the main dominating families in the study area, Species Richness (margalef Index) in the study area it mentioned in Table 3.19-3.21. the family pattern and Species Richness bar chart showing in figure 3.25&3.26.

Table 3.19 Flora in 1km radius from the mine lease area

S. No.	Local Name	Scientific name	Family name	Total No. of species	Total of Quadrants with	Total No. of Quadrants	Density	Frequency (%)	Abundance	Relative Density	Relative Frequency	IVI	IUCN Conservation Status
Trees													
1	Vembu	<i>Azadirachta indica</i>	Meliaceae	5	4	10	0.5	40	1.3	3.68	3.85	7.52	LC
2	Pongam oiltree	<i>Pongamia pinnata</i>	Fabaceae	6	3	10	0.6	30	2.0	4.41	2.88	7.30	LC
3	Karuvelam	<i>Acacia nilotica</i>	Mimosaceae	4	3	10	0.4	30	1.3	2.94	2.88	5.83	LC
4	Thennai maram	<i>Cocos nucifera</i>	Arecaceae	7	6	10	0.7	60	1.2	5.15	5.77	10.92	NL
5	Puliyamaram	<i>Tamarindus indica</i>	Legumes	7	6	10	0.7	60	1.2	5.15	5.77	10.92	LC
6	Athi	<i>Ficus recemosa</i>	Moraceae	3	3	10	0.3	30	1.0	2.21	2.88	5.09	NL
7	Nettilinkam	<i>Polylathia longifolia</i>	Annonaceae	4	3	10	0.4	30	1.3	2.94	2.88	5.83	NL
8	Perumungil	<i>Bambusa bambos</i>	Poaceae	8	4	10	0.8	40	2.0	5.88	3.85	9.73	NL
9	Eucalyptus	<i>Eucalyptus globules</i>	Myrtaceae	7	6	10	0.7	60	1.2	5.15	5.77	10.92	NL
10	Navalmaram	<i>Sygygium cumini</i>	Myrtaceae	6	6	10	0.6	60	1.0	4.41	5.77	10.18	NL
11	Alamaram	<i>Ficus benghalensis</i>	Moraceae	3	2	10	0.3	20	1.5	2.21	1.92	4.13	NL
12	Panai maram	<i>Borassus flabellifer</i>	Arecaceae	8	5	10	0.8	50	1.6	5.88	4.81	10.69	LC
13	Manga	<i>Mangifera indica</i>	Anacardiaceae	6	3	10	0.6	30	2.0	4.41	2.88	7.30	DD
14	Nelli	<i>Emblica officinalis</i>	Phyllanthaceae	4	4	10	0.4	40	1.0	2.94	3.85	6.79	LC
15	Vadanarayani	<i>Delonix elata</i>	Fabaceae	6	5	10	0.6	50	1.2	4.41	4.81	9.22	LC
16	Pappali maram	<i>Carica papaya L</i>	Caricaceae	4	4	10	0.4	40	1.0	2.94	3.85	6.79	NL
17	Vilvam	<i>Aegle marmelos</i>	Rutaceae	4	3	10	0.4	30	1.3	2.94	2.88	5.83	NT
18	Nuna maram	<i>Morinda citrifolia</i>	Rubiaceae	7	6	10	0.7	60	1.2	5.15	5.77	10.92	LC
19	Koyya	<i>Psidium guajava</i>	Myrtaceae	2	2	10	0.2	20	1.0	1.47	1.92	3.39	LC
20	Seethapazham	<i>Annona reticulata</i>	Annonaceae	11	7	10	1.1	70	1.6	8.09	6.73	14.82	LC
21	Vagai	<i>Albizia lebbeck</i>	Fabaceae	6	4	10	0.6	40	1.5	4.41	3.85	8.26	LC
22	Teaku	<i>Tectona grandis</i>	Lamiaceae	3	3	10	0.3	30	1.0	2.21	2.88	5.09	EN
23	Veallai vealan	<i>Vachellia leucophloea</i>	Fabaceae	10	7	10	1.0	70	1.4	7.35	6.73	14.08	LC

24	Thikuche Maram	<i>Ailanthus excelsa</i>	Simaroubaceae	2	2	10	0.5	40	1.3	3.68	3.85	7.52	DD
25	Velikathan maram	<i>Prosopis juliflora</i>	Fabaceae	3	3	10	0.6	30	2.0	4.41	2.88	7.30	LC
Shrubs													
1	Erukku	<i>Calotropis gigantea</i>	Apocynaceae	16	12	15	1.1	80.0	1.3	10.06	10.08	20.15	NL
2	Thanga arali	<i>Tecoma castanifolia</i>	Bignoniaceae	19	11	15	1.3	73.3	1.7	11.95	9.24	21.19	LC
3	Indu mullu	<i>Acacia caesia</i>	Fabaceae	9	8	15	0.6	53.3	1.1	5.66	6.72	12.38	LC
4	Kela chadi	<i>Carissa carandas</i>	Apocynaceae	3	3	15	0.2	20.0	1.0	1.89	2.52	4.41	DD
5	Arali	<i>Casapella thevetia</i>	Apocynaceae	8	6	15	0.5	40.0	1.3	5.03	5.04	10.07	NL
6	Sappathikalli	<i>Opuntia dillenii</i>	Cactaceae	17	11	15	1.1	73.3	1.5	10.69	9.24	19.94	LC
7	Unichedi	<i>Lantana camara</i>	Verbenaceae	19	14	15	1.3	93.3	1.4	11.95	11.76	23.71	NL
8	Karaipalam	<i>Canthium parviflorum Roxb</i>	Rubiaceae	12	8	15	0.8	53.3	1.5	7.55	6.72	14.27	NL
9	Madukaarai	<i>Catunaregam spinosa thunb</i>	Rubiaceae	9	7	15	0.6	46.7	1.3	5.66	5.88	11.54	NL
10	Vidathalam thazha	<i>Dichrostachys cinerea (L.)</i>	Fabaceae	7	6	15	0.5	40.0	1.2	4.40	5.04	9.44	NL
11	Pulanji	<i>Flueggea leucopyrus Willd.</i>	Phyllanthaceae	8	6	15	0.5	40.0	1.3	5.03	5.04	10.07	NL
12	Konji	<i>Glycosmis mauritiana</i>	Rutaceae	3	3	15	0.2	20.0	1.0	1.89	2.52	4.41	LC
13	Peiyavarai	<i>Senna occidentalis</i>	Fabaceae	4	4	15	0.3	26.7	1.0	2.52	3.36	5.88	LC
14	Nochi	<i>Vitex negundo L</i>	Lamiaceae	9	7	15	0.6	46.7	1.3	5.66	5.88	11.54	NL
15	Illandhai	<i>Ziziphus jujuba</i>	Rhamnaceae	8	5	15	0.5	33.3	1.6	5.03	4.20	9.23	LC
16	Soorai pazham	<i>Ziziphus oenopolia</i>	Rhamnaceae	8	8	15	0.5	53.3	1.0	5.03	6.72	11.75	LC
Herbs, Climbers & Grass													
1	Kundumani	<i>Abrus precatorius</i>	Fabaceae	9	8	20	0.5	40.0	1.1	1.43	1.79	3.22	NL
2	Communist pacha	<i>Chromolaena odorata</i>	Asteraceae	25	18	20	1.3	90.0	1.4	3.97	4.04	8.00	NL
3	Mosukkattan	<i>Passiflora foetida</i>	Passifloraceae	14	11	20	0.7	55.0	1.3	2.22	2.47	4.69	NL
4	Pink Blumea	<i>Blumea axillaris</i>	Asteraceae	13	9	20	0.7	45.0	1.4	2.06	2.02	4.08	NL
5	Paspalum	<i>Paspalum quadrifarium</i>	Poaceae	17	12	20	0.9	60.0	1.4	2.70	2.69	5.39	NL
6	Nayuruvi	<i>Achyranthes aspera</i>	Amaranthaceae	21	15	20	1.1	75.0	1.4	3.33	3.36	6.70	NL
7	Vetukaayapoond	<i>Tridax procumbens</i>	Asteraceae	31	17	20	1.6	85.0	1.8	4.92	3.81	8.73	NL
8	Koraikkilangu	<i>Cyperus articulatus</i>	Cyperaceae	34	18	20	1.7	90.0	1.9	5.40	4.04	9.43	NL
9	Kuppaimeni	<i>Acalypha indica</i>	Euphorbiaceae	21	16	20	1.1	80.0	1.3	3.33	3.59	6.92	NL
10	Karisilanganni	<i>Eclipta prostrata</i>	Asteraceae	10	9	20	0.5	45.0	1.1	1.59	2.02	3.61	NL
11	Korai	<i>Cyperus rotundus</i>	Cyperaceae	26	15	20	1.3	75.0	1.7	4.13	3.36	7.49	LC

12	Kunnakora	<i>Cyperus compressus</i>	Cyperaceae	14	12	20	0.7	60.0	1.2	2.22	2.69	4.91	LC
13	Kanamvazha	<i>Commelina benghalensis</i>	Commelinaceae	17	14	20	0.9	70.0	1.2	2.70	3.14	5.84	LC
14	Nai kadugu	<i>Celome viscosa</i>	Capparidaceae	22	16	20	1.1	80.0	1.4	3.49	3.59	7.08	NL
15	Thumbai	<i>Leucas aspera</i>	Lamiaceae	18	15	20	0.9	75.0	1.2	2.86	3.36	6.22	NL
16	Partiniyam	<i>Parthenium hysterophorus</i>	Asteraceae	33	28	20	1.7	90.0	1.8	5.24	4.04	9.27	NL
17	Mukurattai	<i>Boerhavia diffusa</i>	Nyctaginaceae	19	17	20	0.95	85	1.1	3.02	3.81	6.83	NL
18	Thulasi	<i>Ocimum tenuiflorum</i>	Lamiaceae	15	9	20	0.75	45	1.7	2.38	2.02	4.40	NL
19	Manathakkali	<i>Solanumnigrum</i>	Solanaceae	7	7	20	0.35	35	1.0	1.11	1.57	2.68	NL
20	Kumipoondur	<i>Gomphrena celosioides</i>	Amaranthaceae	11	8	20	0.55	40	1.4	1.75	1.79	3.54	NL
21	Kattuthulasi	<i>Ocimum sanctum</i>	Lamiaceae	9	6	20	0.45	30	1.5	1.43	1.35	2.77	NL
22	Kovai	<i>Coccinia grandis</i>	Cucurbitaceae	7	5	20	0.35	25	1.4	1.11	1.12	2.23	NL
23	Perandai	<i>Cissus quadrangularis</i>	Vitaceae	9	6	20	0.45	30	1.5	1.43	1.35	2.77	NL
24	Mudakkotan	<i>Cardiospermum helicacabum</i>	Sapindaceae	9	7	20	0.5	35.0	1.3	1.43	1.57	3.00	NL
25	Karkakartum	<i>Clitoria ternatea</i>	Fabaceae	7	7	20	0.4	35.0	1.0	1.11	1.57	2.68	NL
26	Nannari	<i>Hemidesmus indicus</i>	Asclepiadaceae	4	3	20	0.2	15.0	1.3	0.63	0.67	1.31	NL
27	Malli	<i>Jasminum augustifolium</i>	Oleaceae	9	7	20	0.5	35.0	1.3	1.43	1.57	3.00	NL
28	Musumusukkai	<i>Mukia maderaspatana</i>	Cucurbitaceae	5	3	20	0.3	15.0	1.7	0.79	0.67	1.47	NL
29	Siru puladi	<i>Desmodium triflorum</i>	Fabaceae	7	6	20	0.4	30.0	1.2	1.11	1.35	2.46	LC
30	Sithrapaalavi	<i>Euphorbia prostrata</i>	Euphorbiaceae	5	4	20	0.3	20.0	1.3	0.79	0.90	1.69	CR
31	mookuthi poondur	<i>Wedelia trilobata</i>	Asteraceae	4	4	20	0.2	20.0	1.0	0.63	0.90	1.53	NL
32	Pullu	<i>Eragrostis ferruginea</i>	Poaceae	10	8	20	0.5	40.0	1.3	1.59	1.79	3.38	NL
33	Chevvarakupul	<i>Chloris barbata</i>	Amaranthaceae	27	18	20	1.4	90.0	1.5	4.29	4.04	8.32	NL
34	Arugampul	<i>Cynodon dactylon</i>	Poaceae	23	13	20	1.2	65.0	1.8	3.65	2.91	6.57	NL
35	Sapathikalli	<i>Opuntia dillenii</i>	Cactaceae	12	9	20	0.6	45.0	1.3	1.90	2.02	3.92	LC
36	Nilatutti	<i>Sida cordifolia</i>	Malvaceae	38	17	20	1.9	85.0	2.2	6.03	3.81	9.84	NL
37	Rail poondur	<i>Croton bonplandianus</i>	Euphorbiaceae	21	15	20	1.1	75.0	1.4	3.33	3.36	6.70	NL
38	Thuthi	<i>Abutilon indicum</i>	Malvaceae	18	13	20	0.9	65.0	1.4	2.86	2.91	5.77	NL
39	Arivalmanai poondur	<i>Sida acuta</i>	Malvaceae	19	14	20	0.95	70	1.4	3.02	3.14	6.15	NL

LC- Least Concern - [Species categorized as Least Concern (LC) is a taxon when it has been evaluated against the Red List criteria and does not qualify for Endangered Near Threatened.]. DD – Data Deficient [Species categorized as DD is a taxon when there is no inadequate information to make a direct, indirect assessment of its risk of extinction based on its distribution and/or population status. <https://www.iucnredlist.org/>]

Table 3.20 Calculation of Species Diversity in buffer Zone

S. No	Scientific name	No. of Species	Pi	In (Pi)	Pi x in(Pi)
Trees					
1	<i>Azadirachta indica</i>	5	0.04	-3.30	-0.12
2	<i>Pongamia pinnata</i>	6	0.04	-3.12	-0.14
3	<i>Acacia nilotica</i>	4	0.03	-3.53	-0.10
4	<i>Cocos nucifera</i>	7	0.05	-2.97	-0.15
5	<i>Tamarindus indica</i>	7	0.05	-2.97	-0.15
6	<i>Ficus recemosa</i>	3	0.02	-3.81	-0.08
7	<i>Polylathia longifolia</i>	4	0.03	-3.53	-0.10
8	<i>Bambusa bambos</i>	8	0.06	-2.83	-0.17
9	<i>Eucalyptus globules</i>	7	0.05	-2.97	-0.15
10	<i>Sygygium cumini</i>	6	0.04	-3.12	-0.14
11	<i>Ficus benghalensis</i>	3	0.02	-3.81	-0.08
12	<i>Borassus flabellifer</i>	8	0.06	-2.83	-0.17
13	<i>Mangifera indica</i>	6	0.04	-3.12	-0.14
14	<i>Embllica officinalis</i>	4	0.03	-3.53	-0.10
15	<i>Delonix elata</i>	6	0.04	-3.12	-0.14
16	<i>Carica papaya L</i>	4	0.03	-3.53	-0.10
17	<i>Aegle marmelos</i>	4	0.03	-3.53	-0.10
18	<i>Morinda citrifolia</i>	7	0.05	-2.97	-0.15
19	<i>Psidium guajava</i>	2	0.01	-4.22	-0.06
20	<i>Annona reticulata</i>	11	0.08	-2.51	-0.20
21	<i>Albizia lebbeck</i>	6	0.04	-3.12	-0.14
22	<i>Tectona grandis</i>	3	0.02	-3.81	-0.08
23	<i>Vachellia leucophloea</i>	10	0.07	-2.61	-0.19
24	<i>Ailanthus excelsa</i>	2	0.01	-4.22	-0.06
25	<i>Prosopis juliflora</i>	3	0.02	-3.81	-0.08
H (Shannon Diversity Index) = 3.13					
Shrubs					
1	<i>Calotropis gigantea</i>	16	0.10	-2.30	-0.23
2	<i>Tecoma castanifolia</i>	19	0.12	-2.12	-0.25
3	<i>Acacia caesia</i>	9	0.06	-2.87	-0.16
4	<i>Carissa carandas</i>	3	0.02	-3.97	-0.07
5	<i>Casapella thevetia</i>	8	0.05	-2.99	-0.15
6	<i>Opuntia dillenii</i>	17	0.11	-2.24	-0.24
7	<i>Lantana camara</i>	19	0.12	-2.12	-0.25
8	<i>Canthium parviflorum Roxb</i>	12	0.08	-2.58	-0.20
9	<i>Catunaregam spinosa thunb tirveng</i>	9	0.06	-2.87	-0.16
10	<i>Dichrostachys cinerea (L.) White & Arn.</i>	7	0.04	-3.12	-0.14
11	<i>Flueggea leucopyrus Willd.</i>	8	0.05	-2.99	-0.15
12	<i>Glycosmis mauritiana</i>	3	0.02	-3.97	-0.07
13	<i>Senna occidentalis</i>	4	0.03	-3.68	-0.09

14	<i>Vitex negundo L</i>	9	0.06	-2.87	-0.16
15	<i>Ziziphus jujuba</i>	8	0.05	-2.99	-0.15
16	<i>Ziziphus oenopolia</i>	8	0.05	-2.99	-0.15
H (Shannon Diversity Index) = 2.64					
Herbs					
1	<i>Abrus precatorius</i>	9	0.01	-4.23	-0.06
2	<i>Chromolaena odorata</i>	25	0.04	-3.21	-0.13
3	<i>Passiflora foetida</i>	14	0.02	-3.79	-0.09
4	<i>Blumea axillaris</i>	13	0.02	-3.86	-0.08
5	<i>Paspalum quadrifarium</i>	17	0.03	-3.60	-0.10
6	<i>Achyranthes aspera</i>	21	0.03	-3.39	-0.11
7	<i>Tridax procumbens</i>	31	0.05	-3.00	-0.15
8	<i>Cyperus articulatus</i>	34	0.05	-2.90	-0.16
9	<i>Acalypha indica</i>	21	0.03	-3.39	-0.11
10	<i>Eclipta prostrata</i>	10	0.02	-4.13	-0.07
11	<i>Cyperus rotundus</i>	26	0.04	-3.17	-0.13
12	<i>Cyperus compressus</i>	14	0.02	-3.79	-0.09
13	<i>Commelina benghalensis</i>	17	0.03	-3.60	-0.10
14	<i>Celome viscosa</i>	22	0.04	-3.34	-0.12
15	<i>Leucas aspera</i>	18	0.03	-3.54	-0.10
16	<i>Parthenium hysterophorus</i>	33	0.05	-2.93	-0.16
17	<i>Boerhavia diffusa</i>	19	0.03	-3.49	-0.11
18	<i>Ocimum tenuiflorum</i>	15	0.02	-3.72	-0.09
19	<i>Solanum nigrum</i>	7	0.01	-4.48	-0.05
20	<i>Gomphrena celosioides</i>	11	0.02	-4.03	-0.07
21	<i>Ocimum sanctum</i>	9	0.01	-4.23	-0.06
22	<i>Coccinia grandis</i>	7	0.01	-4.48	-0.05
23	<i>Cissus quadrangularis</i>	9	0.01	-4.23	-0.06
24	<i>Cardiospermum helicacabum</i>	9	0.01	-4.23	-0.06
25	<i>Clitoria ternatea</i>	7	0.01	-4.48	-0.05
26	<i>Hemidesmus indicus</i>	4	0.01	-5.04	-0.03
27	<i>Jasminum augustifolium</i>	9	0.01	-4.23	-0.06
28	<i>Mukia maderaspatana</i>	5	0.01	-4.82	-0.04
29	<i>Desmodium triflorum</i>	7	0.01	-4.48	-0.05
30	<i>Euphorbia prostrata</i>	5	0.01	-4.82	-0.04
31	<i>Wedelia trilobata</i>	4	0.01	-5.04	-0.03
32	<i>Eragrostis ferruginea</i>	10	0.02	-4.13	-0.07
33	<i>Chloris barbata</i>	27	0.04	-3.13	-0.14
34	<i>Cynodon dactylon</i>	23	0.04	-3.29	-0.12
35	<i>Opuntia dillenii</i>	12	0.02	-3.94	-0.08
36	<i>Sida cordifolia</i>	38	0.06	-2.79	-0.17
37	<i>Croton bonplandianus</i>	21	0.03	-3.39	-0.11
38	<i>Abutilon indicum</i>	18	0.03	-3.54	-0.10
39	<i>Sida acuta</i>	19	0.03	-3.49	-0.11

Table 3.21 Species Richness (Index) in 1km radius

Details	H	H max	Evenness	Species Richness
Trees	3.13	3.22	0.97	4.89
Shrubs	2.64	2.77	0.95	2.96
Herbs	3.51	3.66	0.96	5.91

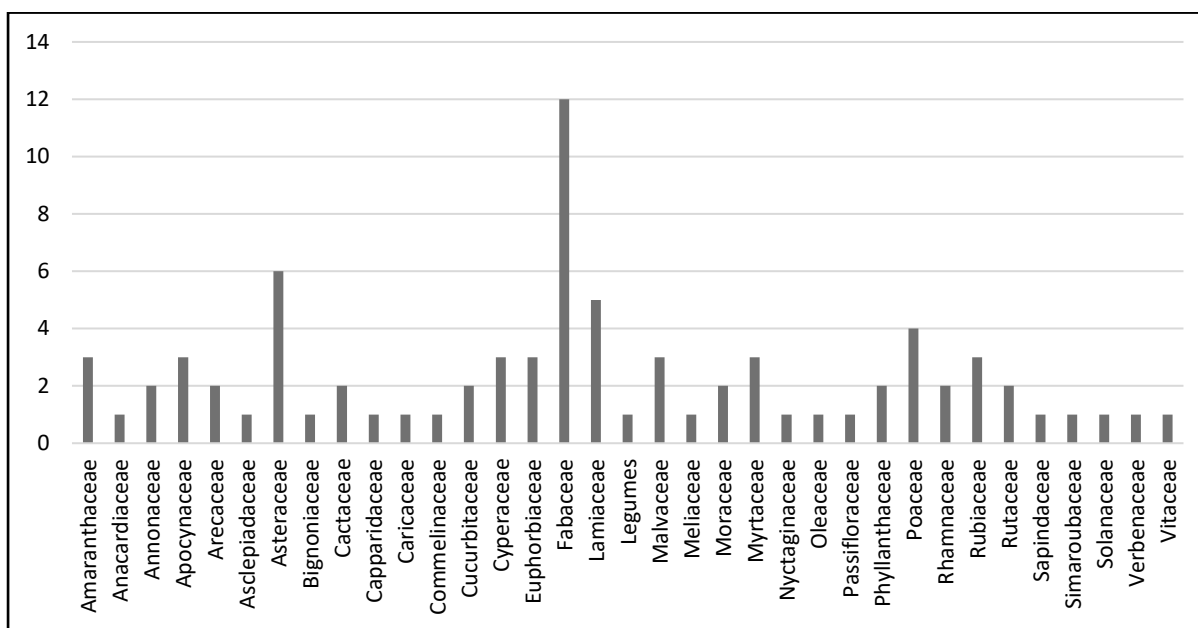


Figure 3.25 Flora Family Composition in 1km Radius

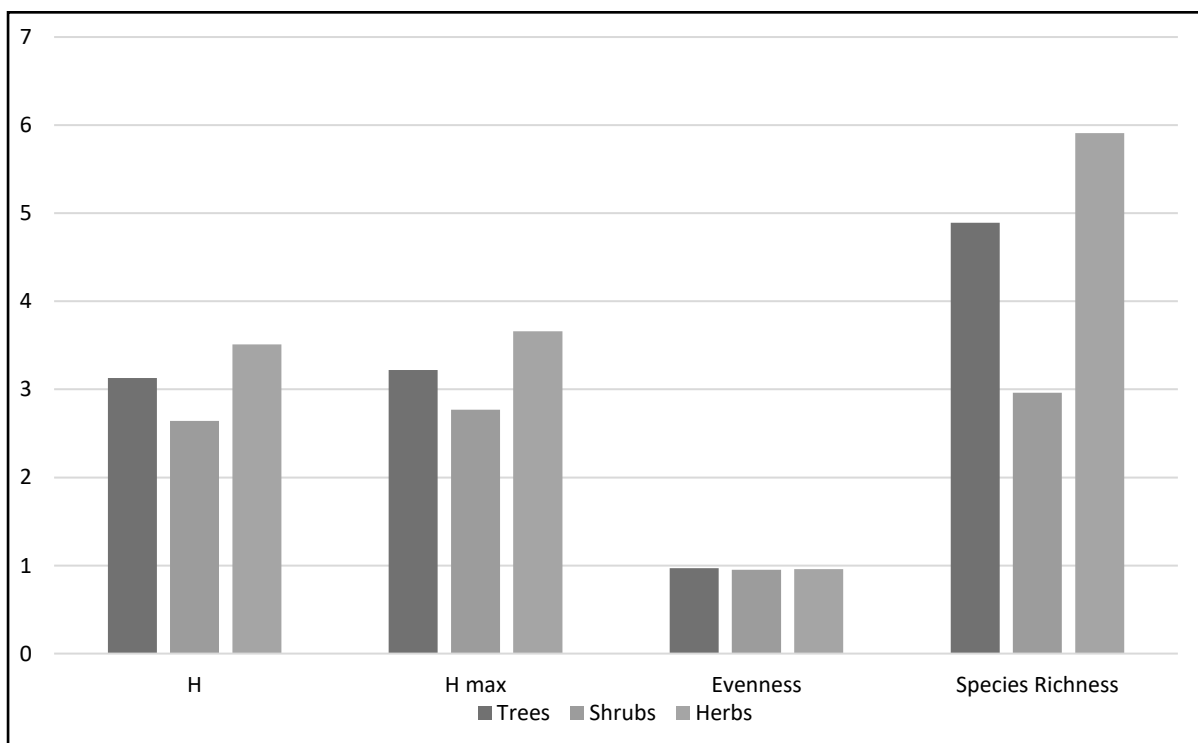


Figure 3.26 Floral Diversity Species Richness (Index) in Buffer Zone

3.5.2 Fauna

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

Table 3.22 Methodology applied during survey of fauna

S. No	Taxa	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 1km radius from the mine lease area

The faunal species observed in the study area are listed in Table 3.23. A total of 39 species were recorded in 1km radius of the project area. Among the 39 species recorded, the distribution was as follows: 13 birds, 16% insects, 04% reptiles, and 06% mammals. These species were cross-checked against the IUCN Red List Database version 3.1 to identify any threatened species. Data analysis revealed that 21 species are categorized as Least Concern on the Red List, while 18 species were not listed. The analysis indicates that there are no REET species in the core and buffer zones of the proposed quarry site.

Table 3.23 Fauna in 1km radius from the mine lease area

S.No	Local Name	Scientific name	Family Name	IUCN Status
Aves				
1	Indian myna	<i>Acridotheres tristis</i>	Sturnidae	LC
2	Rose-ringed Parakeet	<i>Alexandrinus krameri</i>	Psittacidae	LC
3	Rock Pigeon	<i>Columba livia</i>	Columbidae	LC
4	Indian robin	<i>Copsychus fulicatus</i>	Muscicapidae	LC
5	Indian Roller	<i>Coracias benghalensis</i>	Coraciidae	LC
6	House Crow	<i>Corvus splendens</i>	Corvidae	LC
7	Black drongo	<i>Dicrurus macrocercus</i>	Dicruridae	LC
8	Asian koel	<i>Eudynamys scolopaceus</i>	Cuculidae	LC
9	Yellow Wagtail	<i>Motacilla flava</i>	Motacillidae	LC
10	White browed Wagtail	<i>Motacilla maderaspatensis</i>	Motacillidae	LC
11	Gray francolin	<i>Ortygornis pondicerianus</i>	Phasianidae	LC
12	House Sparrow	<i>Passer domesticus</i>	Passeridae	LC
13	Spotted dove	<i>Spilopelia chinensis</i>	Columbidae	LC
Insects				
14	Tawny coster	<i>Acraea terpsicore</i>	Nymphalidae	NL

15	Grasshopper	<i>Acrotylus humbertianus</i>	Acrididae	NL
16	Lemon emigrant	<i>Catopsilia pomona</i>	Pieridae	NL
17	Mottled emigrant	<i>Catopsilia pyranthe</i>	Pieridae	NL
18	Grasshopper	<i>Chrotogonus</i> sp.	Pyrgomorphidae	NL
19	Plaina tiger butterfly	<i>Danaus chrysippus</i>	Nymphalidae	LC
20	Potter wasps	<i>Delta esuriens</i>	Vespidae	NL
21	Chocolate pansy	<i>Junonia iphita</i>	Nymphalidae	NL
22	Lemon pansy	<i>Junonia lemonias</i>	Nymphalidae	NL
23	Black-and-red-bug	<i>Lygaeus equestris</i>	Lygaeidae	NL
24	Antlion	<i>Myrmeleon</i> sp.	Myrmeleontidae	NL
25	Slender skimmer	<i>Orthetrum sabina</i>	Libellulidae	LC
26	Lime swallowtail	<i>Papilio demoleus</i>	Papilionidae	NL
27	Common Mormon`	<i>Papilio polytes</i>	Papilionidae	NL
28	Silvandu	<i>Platypleura kaempferi</i>	Cicadidae	NL
29	Crimson dropwing	<i>Trithemis aurora</i>	Libellulidae	LC
Mammals				
30	Cow	<i>Bos taurus</i>	Bovidae	NL
31	Dog	<i>Canis lupus familiaris</i>	Canidae	NL
32	Goat	<i>Capra hircus</i>	Bovidae	NL
33	Cat	<i>Felis catus</i>	Felidae	NL
34	Indian hare	<i>Lepus nigricollis</i>	Leporidae	LC
35	Sheep	<i>Ovis aries</i>	Bovidae	NL
Reptiles				
36	Oriental garden lizard	<i>Calotes versicolor</i>	Agamidae	LC
37	Indian palm squirrel	<i>Funambulus palmarum</i>	Sciuridae	LC
38	Common skink	<i>Mabuya carinatus</i>	Scincidae	LC
39	Fan-Throated Lizard	<i>Sitana ponticeriana</i>	Agamidae	LC

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

Flora and Fauna composition on 10km radius

The plant species found within a 1 km radius are same plant species present within a 10 km radius, but they are in greater numbers. The Jawathu Hills are located 1.24 km south of the mining lease area. Jawadhu hills have covered with dry-deciduous forest patch. The area has the rich cover of deciduous trees. The hills have a mean elevation of 762 metres with the highest points being 1094 metres. Of the total area, 14% constitutes forests. The mean annual rainfall is 1,100 mm of which about 480 mm is received in the southwest monsoon period (June – September) and 429 mm in the northeast monsoon period (October – December). About half of the soil of the land is red loam clay and sandy soil. The nectarine plant diversity over the area is good, but the only problem is the variation in rainfall, as a result, the flowering is also getting delayed. The flora and fauna data were collection in secondary source the link mention in below table. The common nectar plants. The details of the flora and fauna within a 10 km radius are given in Table 3.24-3.25.

Table 3.24 Floral diversity in 10km radius

S.no	Scientific name	Common Name
1	<i>Abutilon persicum</i>	Persian mallow
2	<i>Acacia nilotica</i>	Arabic gum
3	<i>Actinodaphne bourdillonii</i>	Actinodaphne
4	<i>Aegle marmelos</i>	Bael tree
5	<i>Agave americana</i>	Agave
6	<i>Alangium salviifolium</i>	Sage leaved alangium
7	<i>Albizia saman</i>	Rain tree
8	<i>Anisomeles indica</i>	Catmint
9	<i>Annona squamosa</i>	Custard apple
10	<i>Anogeissus latifolia</i>	Axlewood
11	<i>Argemone mexicana</i>	Mexican poppy
12	<i>Artocarpus heterophyllus</i>	Jackfruit
13	<i>Asclepias curassavica</i>	Indian blood flower
14	<i>Azadirachta indica</i>	Neem
15	<i>Bacopa monnieri</i>	Thyme leaved gratiola
16	<i>Bambusa bamboo</i>	Bamboo
17	<i>Boerhavia diffusa</i>	Spreading hogweed
18	<i>Bridelia retusa</i>	Spinous kino tree
19	<i>Caesalpinia pulcherrima</i>	Peacock flower
20	<i>Calotropis gigantea</i>	Giant milkweed
21	<i>Cardiospermum halicacabum</i>	Balloon vine
22	<i>Carica papaya</i>	Papaya
23	<i>Carissa carandas</i>	Cherry
24	<i>Caryota urens</i>	Toddy palm
25	<i>Cassia fistula</i>	Golden shower tree
26	<i>Casuarina equisetifolia</i>	Casuarina
27	<i>Cesalpinia mimosoides</i>	Mimosa thorn
28	<i>Ceiba pentandra</i>	White silk cotton tree
29	<i>Centella asiatica</i>	Indian pennywort
30	<i>Chromolaena odorata</i>	Siam weed
31	<i>Citrus limon</i>	Lemon
32	<i>Coccinia grandis</i>	Ivy gourd
33	<i>Cocos nucifera</i>	Coconut
34	<i>Crotalaria pallida</i>	Crotalaria
35	<i>Cryptolepis buchananii</i>	Waxleaved climber
36	<i>Curculigo orchoides</i>	Golden eye grass
37	<i>Cycas circinalis</i>	Cycas
38	<i>Dalbergia latifolia</i>	Indian rosewood
39	<i>Dalbergia sissoo</i>	North indian rosewood
40	<i>Datura stramonium</i>	Devil's snare
41	<i>Delonix regia</i>	Gulmohar

42	<i>Dendrocalamus strictus</i>	Solid bamboo
43	<i>Eucalyptus globulus</i>	Eucalyptus
44	<i>Evolvulus alsinoides</i>	Dwarf morning glory
45	<i>Ficus bengalensis</i>	Banayan trr
46	<i>Ficus religiosa</i>	Peepal tree
47	<i>Ficus tsjahela</i>	Ficus
48	<i>Glycomis pentaphylla</i>	Gin berry
49	<i>Gmelina arborea</i>	White teak
50	<i>Grevillea robusta</i>	Silver oak
51	<i>Holoptelea integrifolia</i>	Indian elm
52	<i>Indigo feratinctoria</i>	True indigo
53	<i>Jatropha curcas</i>	Physic nut
54	<i>Lantana camara</i>	Lantana
55	<i>Leucasaspera</i>	Leucas
56	<i>Limonia acidissima</i>	Wood apple
57	<i>Mangifera indica</i>	Mango tree
58	<i>Melia dubia</i>	Malabar neem
59	<i>Mimosa pudica</i>	Touch me not
60	<i>Morinda citrifolia</i>	Indian mulberry
61	<i>Morinda pubescens</i>	Morinda tree
62	<i>Moringa oleifera</i>	Drumstick tree
63	<i>Murraya koenigii</i>	Curry leaf
64	<i>Osbeckia wightiana</i>	Rough small leaved spider flower
65	<i>Parthenium hysterophorus</i>	Parthenium
66	<i>Peltophorum pterocarpum</i>	Copper pod
67	<i>Phyllanthus emblica</i>	Indian gooseberry
68	<i>Plumeria alba</i>	Plumeria
69	<i>Polyalthia longifolia</i>	Indian mast tree
70	<i>Pongamia pinnata</i>	Indian beech tree
71	<i>Prosopis juliflora</i>	Prosopis
72	<i>Psidium guajava</i>	Guava
73	<i>Pterocarpus santalinus</i>	Red sandalwood
74	<i>Punica granatum</i>	Pomegranate
75	<i>Ricinus communis</i>	Castor oil plant
76	<i>Rivina humilis</i>	Blood berry
77	<i>Rotheca serrata</i>	Blue fountain bush
78	<i>Senna occidentalis</i>	Coffee senna
79	<i>Senna siamea</i>	Senna
80	<i>Sida acuta</i>	Common wireweed
81	<i>Solanum torvum</i>	Turkey berry
82	<i>Swietenia macrophylla</i>	Mahogany
83	<i>Syzygium cumini</i>	Black plum
84	<i>Tectona grandis</i>	Teak
85	<i>Terminalia bellerica</i>	Belleric myrobalan
86	<i>Terminalia chebula</i>	Black myrobalan

87	<i>Terminalia tomentosa</i>	Indian laurel
88	<i>Tithonia diversifolia</i>	Tree marigold
89	<i>Trewia nudiflora</i>	False white teak
90	<i>Vitex altissima</i>	Peacock chaste tree
91	<i>Vitex negundo</i>	Chinese chaste tree
92	<i>Wattakaka volubilis</i>	Sneeze wort
93	<i>Wedelia trilobata</i>	Singapore daisy
94	<i>Wrightia tinctoria</i>	Pala indigo
95	<i>Ziziphus trinervia</i>	Ziziphus

Sours: <https://www.ties.org.in/collection/reports/reportsedit-130621162357874522.pdf>

Table 3.25 Fauna in 10km Radius

S.No	Scientific name	Common Name
BIRDS		
1	<i>Dicrurus macrocercus</i>	black drongo
2	<i>Coracias benghalensis</i>	indian roller
3	<i>Acridotheres tristis</i>	common myna
4	<i>Prinia socialis</i>	ashy prinia
5	<i>Prinia inornata</i>	plain prinia
6	<i>Turdoides affinis</i>	yellow billed babbler
7	<i>Spilornis cheela</i>	crested serpent eagle
8	<i>Lonchura punctulata</i>	scaly-breasted munia
9	<i>Pycnonotus jocosus</i>	red whiskered bulbul
10	<i>Pycnonotus cafer</i>	red vented bulbul
11	<i>Saxicoloides fulicatus</i>	indian robin
12	<i>Motacilla maderaspatensis</i>	white browed wagtail
13	<i>Accipiter badius</i>	shikra
14	<i>Saxicola caprata</i>	pied bushchat
15	<i>Passer domesticus</i>	house sparrow
16	<i>Corvus splendens</i>	house crow
17	<i>Corvus culminatus</i>	indian jungle crow
18	<i>Sturnia pagodarum</i>	brahminy starling
19	<i>Turdoides striata</i>	jungle babbler
20	<i>Athene brama</i>	spotted owlet
21	<i>Glaucidium radiatum</i>	jungle owlet
22	<i>Ardeola grayii</i>	indian pond heron
23	<i>Bubulcus ibis</i>	cattle egret
24	<i>Mesophoyx intermedia</i>	intermediate egret
25	<i>Elanus caeruleus</i>	black winged kite
26	<i>Amaurornis phoenicurus</i>	white breasted waterhen
27	<i>Columba livia</i>	rock pigeon
28	<i>Stigmatopelia chinensis</i>	spotted dove
29	<i>Psittacula eupatria</i>	alexandrine parakeet
30	<i>Psittacula krameri</i>	rose ringed parakeet
31	<i>Psittacula cyanocephala</i>	plum headed parakeet

32	<i>Centropus sinensis</i>	greater coucal
33	<i>Strix ocellata</i>	mottled wood owl
34	<i>Cypsiurus balasiensis</i>	asian palm swift
35	<i>Halcyon smyrnensis</i>	white throated kingfisher
36	<i>Merops orientalis</i>	green bee eater
37	<i>Megalaima viridis</i>	white cheeked barbet
38	<i>Megalaima haemacephala</i>	coppersmith barbet
39	<i>Dinopium benghalense</i>	black rumped flameback
40	<i>Aegithina tiphia</i>	common iora
41	<i>Oriolus xanthornus</i>	black hooded oriole
42	<i>Dendrocitta vagabunda</i>	rufous treepie
43	<i>Parus major</i>	great tit
44	<i>Alauda gulgula</i>	oriental skylark
45	<i>Orthotomus sutorius</i>	common tailorbird
46	<i>Acridotheres fuscus</i>	jungle myna
47	<i>Copsychus saularis</i>	oriental magpie robin
48	<i>Chloropsis jerdoni</i>	jerdon's leafbird
49	<i>Dicaeum erythrorhynchos</i>	pale billed flowerpecker
50	<i>Cinnyris asiaticus</i>	purple sunbird
51	<i>Leptocoma zeylonica</i>	purple rumped sunbird
52	<i>Ploceus philippinus</i>	baya weaver
53	<i>Anthus rufulus</i>	paddyfield pipit
BUTTERFLIES		
1	<i>Tirumala limniace</i>	blue tiger
2	<i>Parantica aglea</i>	glassy tiger
3	<i>Acraea violae</i>	tawny Coster
4	<i>Euploea core</i>	common Indian crow
5	<i>Junonia almana</i>	peacock pansy
6	<i>Junonia orithya</i>	blue pansy
7	<i>Junonia atlites</i>	grey pansy
8	<i>Junonia lemonias</i>	lemon pansy
9	<i>Junonia iphita</i>	chocolate pansy
10	<i>Graphium nomius</i>	spot swordtail
11	<i>Anaphaeis aurota</i>	pioneer
12	<i>Parerona valeria</i>	common wanderer
13	<i>Papilio demoleus</i>	lime butterfly
14	<i>Eurema hecabe</i>	common grass yellow
15	<i>Captopsilia pomona</i>	common emigrant
16	<i>Papilio polytes</i>	common mormon
17	<i>Euthalia aconthea</i>	common baron
18	<i>Pachliopta aristolochiae</i>	common rose
19	<i>Pachliopta hector</i>	crimson rose
20	<i>Neptis hylas</i>	common sailor
21	<i>Danaus chrysippus</i>	plain tiger

22	<i>Captopsilla pyranthe</i>	mottled emigrant
23	<i>Phalanta phalantha</i>	common leopard
24	<i>Colotis amata</i>	small salmon arab
25	<i>Jamides celeno</i>	common cerulean
26	<i>Graphium sarpedon</i>	common bluebottle
27	<i>Graphium agamemnon</i>	tailed jay
28	<i>Graphium doson</i>	common jay
29	<i>Papilio clytia</i>	common mime
30	<i>Papilio crino</i>	common banded peacock
31	<i>Cepora nerissa</i>	common gull
32	<i>Polyura athamas</i>	common nawab
33	<i>Neptis jumbah</i>	chestnut streaked sailer
34	<i>Tanaecia lepidae</i>	grey count
35	<i>Hypolimnias bolina</i>	great eggfly
36	<i>Hypolimnias missipus</i>	danaid eggfly

Sours: <https://www.ties.org.in/collection/reports/reportsedit-130621162357874522.pdf>

3.5.3 Aquatic Vegetation

The field survey for assessing the aquatic vegetation was also undertaken during the study period. The list of aquatic plants observed in the study area is given in Table 3.26.

Table 3.26 Aquatic Vegetation

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

LC- Least Concern, NA-Not yet assessed

3.5.4 Agriculture & Horticulture Activities in the Thirupathur District.

The major crops grown in the district are paddy, millets, pulses mainly red gram, Black gram, Horse gram, Groundnut, Cotton, Sugarcane and Banana. The normal Gross Cropped Area and Net Sown Area for the district are 73849 ha. and 57934 ha. respectively. The Net sown area constituted about 33% of the total Geographical area, which is 183199 ha. Out of the Net sown area, 32% is irrigated and the remaining is under rain fed irrigation. The gross irrigated area is 27,753 ha and net area unirrigated is 36,079 ha. The district is also popular for production of tomato, Brinjal, mint leaves, tomato, cabbage, cauliflower, beans, potatoes, carrots and other vegetables. Ragi is the staple diet for the majority of the population. Other major crops grown in the district are paddy, maize, groundnut, coconut, banana and flowers.

Major Agricultural & Horticulture crops

The 1km radius from the mine lease area Mainly they are cultivating millets, for example, maize, fox-tail millet, little millet, and paddy. Some of them are also doing Marygold and Cotton. Table.3.27 shows the list of Agricultural crops seen over there

Table 3.27 Major agricultural & Horticulture crops in 1km radius

S.No	Scientific Name	Common name
1	<i>Zea mays</i>	Maize
2	<i>Pennisetum glaucum</i>	Pearl millet
3	<i>Paspalum scrobiculatum</i>	Kodo millet
4	<i>Eleusine coracana</i>	Finger millet
5	<i>Setaria italica</i>	Foxtail millet
6	<i>Panicum sumatrense</i>	Little millet
7	<i>Oryza sativa</i>	Paddy
8	<i>Solanum lycopersicum</i>	Tomato
9	<i>Solanum melongena</i>	Brinjal
10	<i>Tagetes erecta</i>	Marigold
11	<i>Gossypium hirsutum</i>	Cotton
12	<i>Musa acuminata</i>	Banana
13	<i>Sesbania grandiflora</i>	Agati
14	<i>Cucumis sativus</i>	Cucumber

Results

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

3.6 SOCIO ECONOMIC ENVIRONMENT

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

and evaluation of the likely impacts on the socio economics and parameters of human interest due to the project.

3.6.1 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.

Baseline Information:

The baseline information is collected in order to define the socio-economic profile of the study area. The process related database thus generated includes:

- Demographic structure
- Infrastructure base in the area
- Economic structure
- Health status
- Cultural attributes
- Public awareness and their concern about the project

3.6.2 Scope of Work

- To study the Socio-economic Environment of area from the secondary sources
- Primary and secondary Data Collection and Analysis
- Identification of impacts due to the mining projects
- Mitigation Measures

3.6.3 Methodology

The methodology adopted for the socio-economic impact assessment is as follows:

- a) Data such as number of houses, population, literacy, employment opportunities etc. will be collected directly from local people and analysed.
- b) The details of the activities and population structure have been obtained from Census 2011 and analysed.
- c) Based on the above data, impacts due to plant operation on the community have been assessed and recommendations for further improvement have been made.

3.6.4 Sources of Information and Data Base

To achieve the above objectives, the information has been collected from both primary and secondary sources. Both primary data and secondary data have been analysed by means of suitable statistical techniques for the purpose of verifying the above selected hypotheses concerned with the surrounding area.

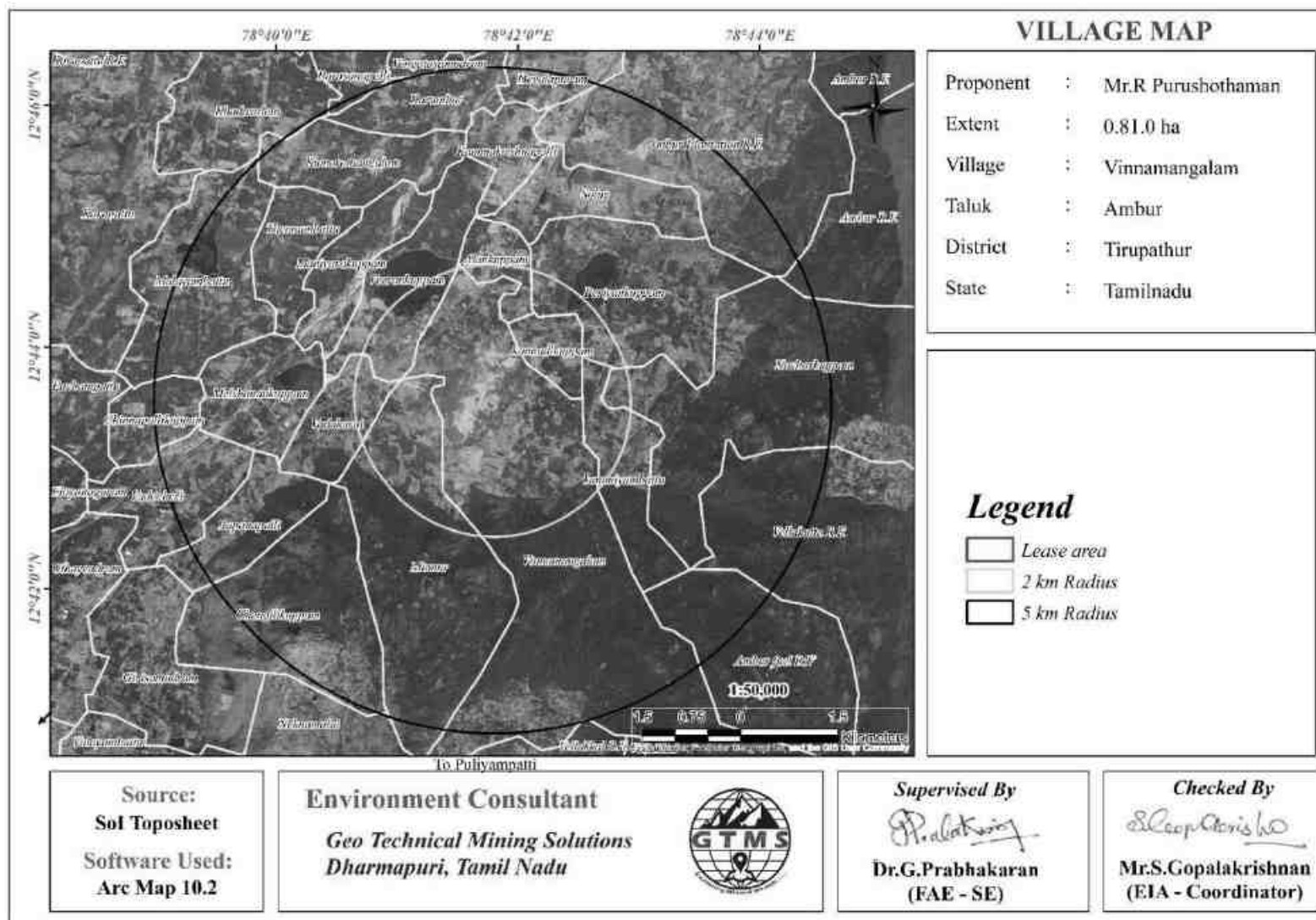


Figure 3.27 Socio Economic Village Boundary Map

3.6.5 Tirupathur District

The Tirupathur city is divided into 33 wards for which elections are held every 5 years. The Tirupathur Municipality has population of 64,125 of which 31,903 are males while 32,222 are females as per report released by Census India 2011. Population of Children with age of 0-6 is 7255 which is 11.31 % of total population of Tirupathur (M). In Tirupathur Municipality, Female Sex Ratio is of 1010 against state average of 996. Moreover, Child Sex Ratio in Tirupathur is around 952 compared to Tamil Nadu state average of 943. Literacy rate of Tirupathur city is 85.94 % higher than state average of 80.09 %. In Tirupathur, Male literacy is around 90.63 % while female literacy rate is 81.33 %. Tirupathur Municipality has total administration over 14,084 houses to which it supplies basic amenities like water and sewerage. It is also authorized to build roads within Municipality limits and impose taxes on properties coming under its jurisdiction.

Out of total population, 22,895 were engaged in work or business activity. Of this 17,340 were males while 5,555 were females. In census survey, worker is defined as person who does business, job, service, and cultivator and labour activity. Of total 22895 working population, 88.79 % were engaged in Main Work while 11.21 % of total workers were engaged in Marginal Work.

3.6.6 Primary Survey

The primary data collection includes the collection of data through a structured interview schedule by direct observation method. The questionnaire survey includes both open and closed methods. The sample size is limited respondents, who were selected on the basis of simple random sampling from Vinnamangalam village, Ambur Taluk, Tirupathur District, Tamil Nadu State, in the field survey has been divided into two major segments namely Primary Zone (0 -1 km) and Secondary Zone (1- 5 km). The questionnaires were designed to suit the subjects considering their rural background enabling to furnish correct information and data as par as possible. Data were collected at village level and household level by questionnaires and focused group discussions.

Primary data was collected through household survey, Focus Group Discussions (FGD) with key stakeholders and public consultations. The primary data collection and consultations were carried out with the objectives of:

- Assessing the socio-economic situation of the local people
- Creating public awareness about the project
- Assessing the views of local people about the project and understanding the needs of the community for possible incorporation into community development plans.

For the primary survey, the study area was divided into three zones depending upon the distance from the project site: the study area of three impact zones is given as Figure

Zone 1 (Core Zone):0-1km from the proposed project site

Zone 2 (Low impact zone):1-5km from the proposed project site

Table 3.28: Number of Villages and household surveyed

Zones	No. of Villages	Number of Households
Zone 1	1 Village	1712
Zone 2	23 Villages	17789
Total		18901

3.6.7 Study area- Vinnamangalam village, Ambur Taluk

Vinnamangalam is a large village located in Ambur Taluka of Vellore district, Tamil Nadu with total 1712 families residing. The Vinnamangalam village has population of 7532 of which 3698 are males while 3834 are females as per the field observation. In Vinnamangalam village population of children with age 0-6 is 783 which makes up 10.40 % of total population of village. Average Sex Ratio of Vinnamangalam village is 1037 which is higher than Tamil Nadu state average of 996. Child Sex Ratio for the Vinnamangalam as per census is 966, higher than Tamil Nadu average of 943. Vinnamangalam village has higher literacy rate compared to Tamil Nadu. In 2011, literacy rate of Vinnamangalam village was 81.41 % compared to 80.09 % of Tamil Nadu. In Vinnamangalam Male literacy stands at 88.97 % while female literacy rate was 74.18 %.

Table. 3.29 Vinnamangalam Village Population Facts

Particulars	Total	Male	Female
Total No. of Houses	1712	-	-
Population	7532	3698	3834
Child (0-6)	783	398	385
Schedule Caste	3703	1835	1868
Schedule Tribe	2	1	1
Literacy	6101	3254	2837
Total Workers	3454	2164	1290
Main Worker	3113	-	-
Marginal Worker	341	191	150

Source: *On-Site Data*

3.6.8 Working Population- Vinnamangalam Village, Ambur Taluk

In Vinnamangalam village out of total population, 3454 were engaged in work activities. 90.13 % of workers describe their work as Main Work (Employment or Earning

more than 6 Months) while 9.87 % were involved in Marginal activity providing livelihood for less than 6 months. Of 3113 workers engaged in Main Work, 198 were cultivators (owner or co-owner) while 279 were Agricultural labourer.

Benefits:

The local people have been provided with either direct employments or indirect employment such as business, contract works and development work like roads, etc. and other welfare amenities such as medical facilities, conveyance, free education, drinking water supply etc. The number of villages and settlements within a radius of 5 km from the project site along with population, their education level etc. are given in the table 3.30.



Figure 3.28: photographs of the household survey

Cultural Heritage/Religious Monument

- 1.Vayalur Murugan Temple
- 2.Sri Muneeshwaran Temple
- 3.Pavalamalai Murugan Temple
- 4.Lakshmi Nyanapuram Perumal Temple
- 5.Sri Athikesava Perumal Temple
6. St. Matthew's IELC Lutheran Church
- 7.Rehoboth Joy Church



Figure 3.29: Photocopy of Cultural Heritage in Vinnamangalam Village

Secondary data of Socio-Economic Profile of the Study Area – for Zone 2 (1-5km)

Radius

The Secondary data collected from the source of census 2011 for the zone 2 around (1-5 kms) of the study area the details are given in table 3.30 to 3.32

3.6.6 Collection of Data from Secondary Sources

Data from secondary sources were collected on following aspects:

- Demographic profile of the area
- Economic profile of the area

Table 3.30 Type of Information and Sources

Information	Source
Demography	District Census Handbook, Govt. of India
Economic profile of the area	Census of India, Tamil Nadu State

Table 3.31 Population and Literacy Data of Study Area

Village Name	No. of Houses	Total Population		Child (0-6)		Schedule Caste		Schedule Tribe		Literacy %		Total Workers	
		Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Alankuppam	615	1244	1349	120	126	407	442	0	0	89.59	74.24	768	376
Bapanapalli	198	424	429	49	40	149	167	35	42	88.80	79.69	236	164
Chengilikuppam	599	1239	1209	126	132	603	617	0	0	89.40	78.74	735	371
Chinnapallikuppam	1036	2014	2050	234	241	668	742	8	10	82.70	69.26	1200	706
Devalapuram	916	2030	2104	267	245	543	589	0	0	85.31	70.41	1134	553
Girisamudram	1200	2654	2617	298	282	1026	1003	1	2	83.06	69.72	1495	780
Kammakrishnapalli	161	374	355	50	40	2	4	3	11	82.72	75.56	236	180
Kammiyambattu	305	698	673	82	74	312	321	9	9	77.92	62.44	397	256
Kannadikuppam	433	901	990	95	102	618	666	10	9	87.84	71.73	524	345
Karumbur	259	460	482	58	44	113	109	0	0	93.03	78.31	229	91
Kumaramangalam	659	1410	1421	163	154	610	565	11	12	85.40	68.11	829	371
Malayambattu	529	1015	1047	110	106	353	337	0	0	80.0	63.44	624	365
Maniyarakuppam	166	350	350	27	26	205	218	0	0	83.28	64.81	229	81
Melshanankuppam	392	740	830	70	89	472	514	7	7	88.06	73.50	440	141
Minnur	1017	2106	2118	257	223	669	691	0	0	87.83	76.52	1170	557
Nacharkuppam	322	754	693	84	69	530	488	0	0	84.63	74.04	456	232
Nekanamalai	467	1031	967	146	115	234	193	0	0	66.21	50.94	637	448
Periyankuppam	2139	4710	4734	570	537	1838	1889	32	37	86.33	73.93	2748	1449
Solur	1194	2512	2560	300	279	1129	1144	0	0	90.96	79.57	1469	891
Thennambattu	208	452	431	57	40	18	14	0	0	86.84	68.03	239	141
Vadacheri	639	1224	1326	112	130	598	666	0	0	90.20	81.02	624	438
Vadakarai	288	572	634	62	71	337	383	0	0	92.35	81.53	379	288
Veerankuppam	441	894	1000	116	112	363	413	0	0	91.0	74.32	528	346
Total	15463	32573	33236	3751	3565	13169	13572	117	140	85.93	72.251	18944	10535

Source: <https://www.census2011.co.in/data/town/631161-tirupattur-tamil-nadu.htm>

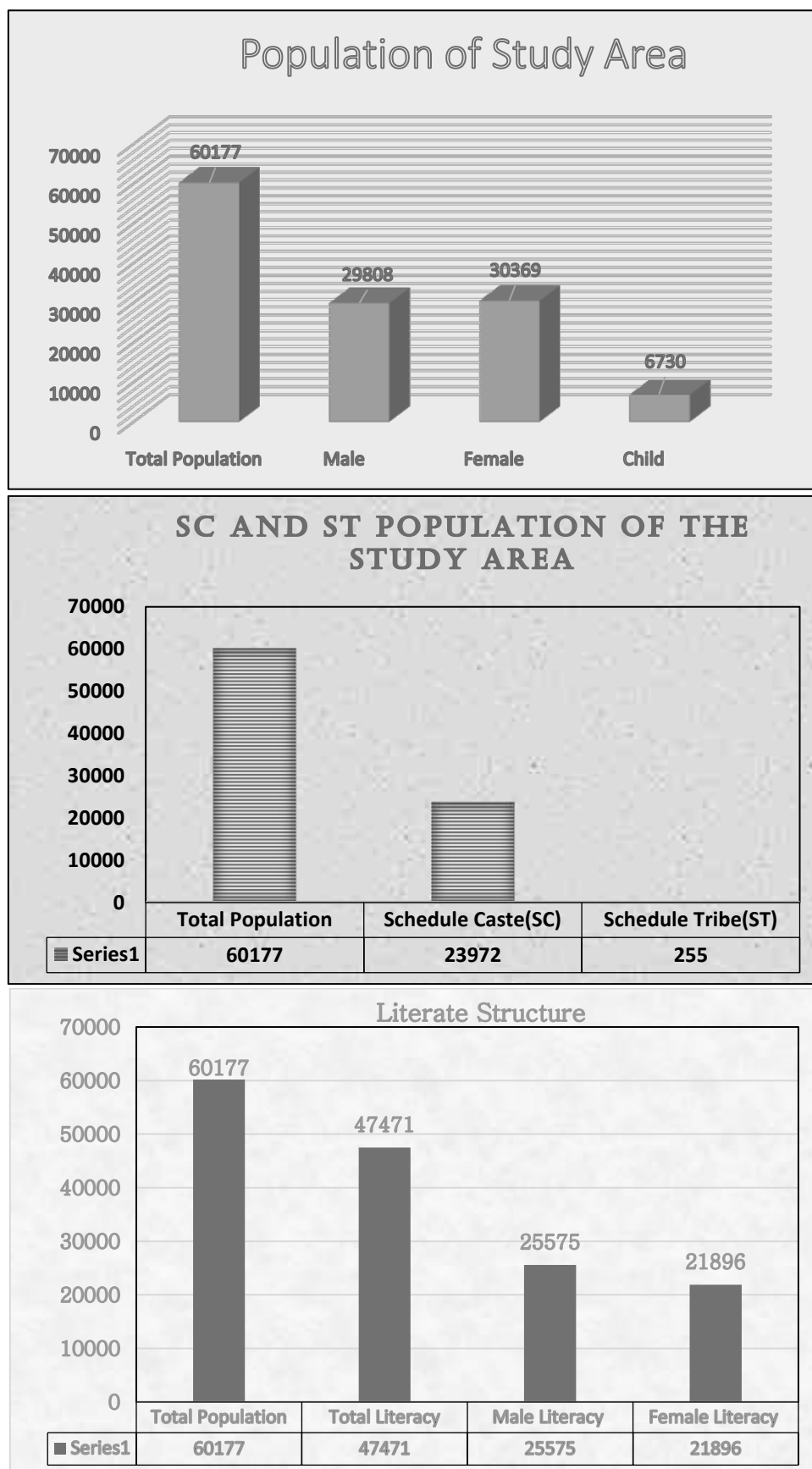


Figure 3.30 Chart Diagram about Population, SC, ST and Literacy in Surrounding Villages

Table 3.32 Workers Profile of Study Area

Village	Total Worker Population Person	Total Worker Population Male	Total Worker Population Female	Main Working Population Person	Main Cultivator Population Person	Main Agricultural Labourers Population Person	Main Other Workers Population Person	Non- Working Population Person
Alankuppam	1144	768	376	1018	31	44	126	1203
Bapanapalli	400	236	164	298	9	29	102	364
Chengilikuppam	1106	735	371	1044	63	137	62	1084
Chinnapallikuppam	1906	1200	706	1438	125	441	468	1683
Devalapuram	1687	1134	553	1619	26	63	68	1935
Girisamudram	2275	1495	780	1831	67	273	444	2416
Kammakrishnapalli	416	236	180	354	31	128	62	223
kammiyambattu	653	397	256	581	73	136	72	562
kannadikuppam	869	524	345	739	19	16	130	825
Karumbur	320	229	91	141	8	37	179	520
Kumaramangalam	1200	829	371	781	208	108	419	1314
Malayambattu	989	624	365	976	134	285	13	857
Maniyarakuppam	310	229	81	306	11	255	4	337
Melshanankuppam	581	440	141	571	29	167	10	830
Minnur	1727	1170	557	745	54	41	982	2017
Nacharkuppam	688	456	232	666	19	175	22	606
Nekanamalai	1085	637	448	565	73	28	520	652
Periyankuppam	4197	2748	1449	3766	115	720	431	4140
Solur	2360	1469	891	2105	41	39	255	2133
Thennambattu	380	239	141	284	32	18	96	406
Vadacheri	1062	624	438	565	40	34	497	1246
Vadakarai	667	379	288	381	39	27	286	406
Veerankuppam	874	528	346	554	62	228	320	792

Source: <https://www.census2011.co.in/data/town/631161-tirupattur-tamil-nadu.html>

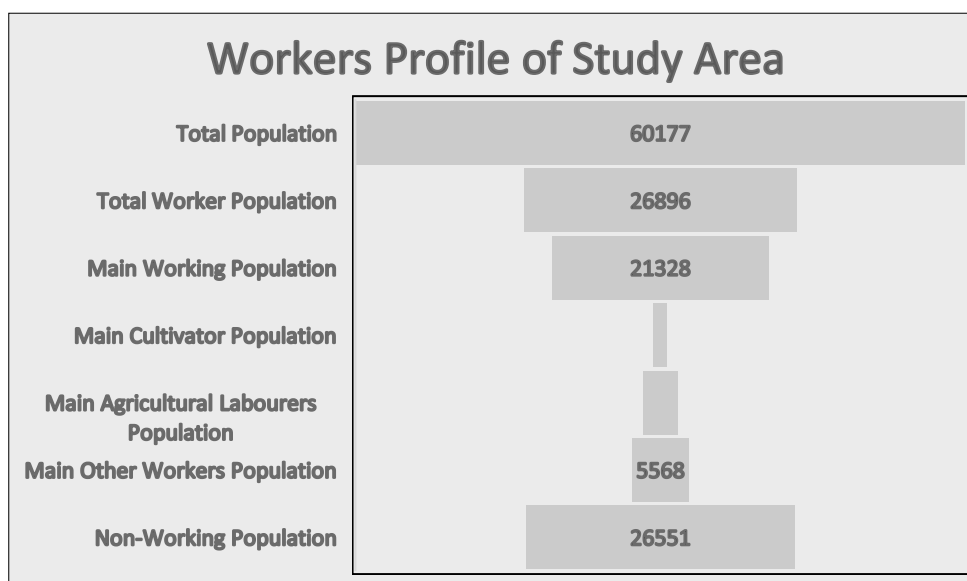


Figure 3.31 Chart Diagram about Workers Profile in Surrounding Villages

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 for the assessment of awareness about the project activities and opinion about it, following salient observations were recorded, during survey it was observed that only nearby villagers are aware and other villagers are not aware about the proposed project. People in the region expect job opportunities and improvement in educational, transportation and sanitation facility from project authority.

3.6.9 Recommendation and Suggestions

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, additional schools for girls, furniture and equipment in schools, up-gradation of existing school infrastructure.

- Agriculture/livestock – Infrastructure such as agricultural practices, electricity connections, assistance with buying improved tools and equipment, capacity building, supply and/or knowledge of better variety of seeds, pasture land development and trainings on animal husbandry & facility of veterinary doctor.
- Health – Improvements in sanitary conditions of villages, assistance with construction of latrines, improvement in drainage system, health camps and awareness campaigns for diseases like common cold, malaria, typhoid, tuberculosis, yellow fever and pneumonia. Repairing of PHCs and Anganwadi centres.
- People with disability – Establishment of centre for special education, sensitization of the community towards disabled and awareness on Government schemes.
- While Developing an Action Plan, it is very important to identify the population who falls under the marginalized and vulnerable groups. So that special attention can be given to these groups with special provisions while making action plans.
- Connectivity –Transport connectivity to easiness accessibility to the region.

3.6.10 Conclusion

The socio-economic study of surveyed villages gives a clear picture of its population, average household size, literacy rate and sex ratio etc. It is also found that a part of population is suffering from lack of permanent job to run their day-to-day life. To evaluate the impacts of proposed quarry project on the surrounding area, it is vital to assess the baseline status of the environmental quality in the locality of the site. Hence, it can be concluded that the present environment status of the study area will not be affected by the Vinnamangalam rough stone cluster Quarries project. Hence, we adopt adequate control measures to protect the surrounding environment and will contribute in development of the study areas. The proposed project will provide preferential of employment to the local people there by the livelihood standards will be improved.

3.7 TRAFFIC DENSITY

The traffic survey conducted based on the transportation route of material, the Rough Stone is proposed to be transported mainly through Village Road and NH-45 (Bengaluru – Chennai) as shown in Table 3.33- 3.36 and in Figure 3.32. 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 3.33 Traffic Survey Locations

Station Code	Road Name	Distance and Direction
TS1	Village road	0.90 km - East
TS2	NH-45 (Bengaluru – Chennai)	1.48km - West

Source: On-site monitoring by GTMS FAE & TM

Table 3.34 Existing Traffic Volume

Station code	HMV		LMV		2/3 Wheelers		Total PCU
	No	PCU	No	PCU	No	PCU	
TS1	85	255	115	115	125	63	433
TS2	250	750	310	310	320	160	1220

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 3.35 Rough Stone Transportation Requirement

Transportation of Rough Stone Per day		
Capacity of trucks	No. of Trips per day	Volume in PCU
15 tonnes	7	21

Source: Approved Mining Plan

Table 3.36 Summary of Traffic Volume

Route	Existing traffic volume in PCU	Incremental traffic due to the project	Total traffic volume	Hourly Capacity in PCU as per IRC – 1960 guidelines
Village road	433	21	454	1200
NH-45 (Bengaluru – Chennai)	1220	21	1241	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

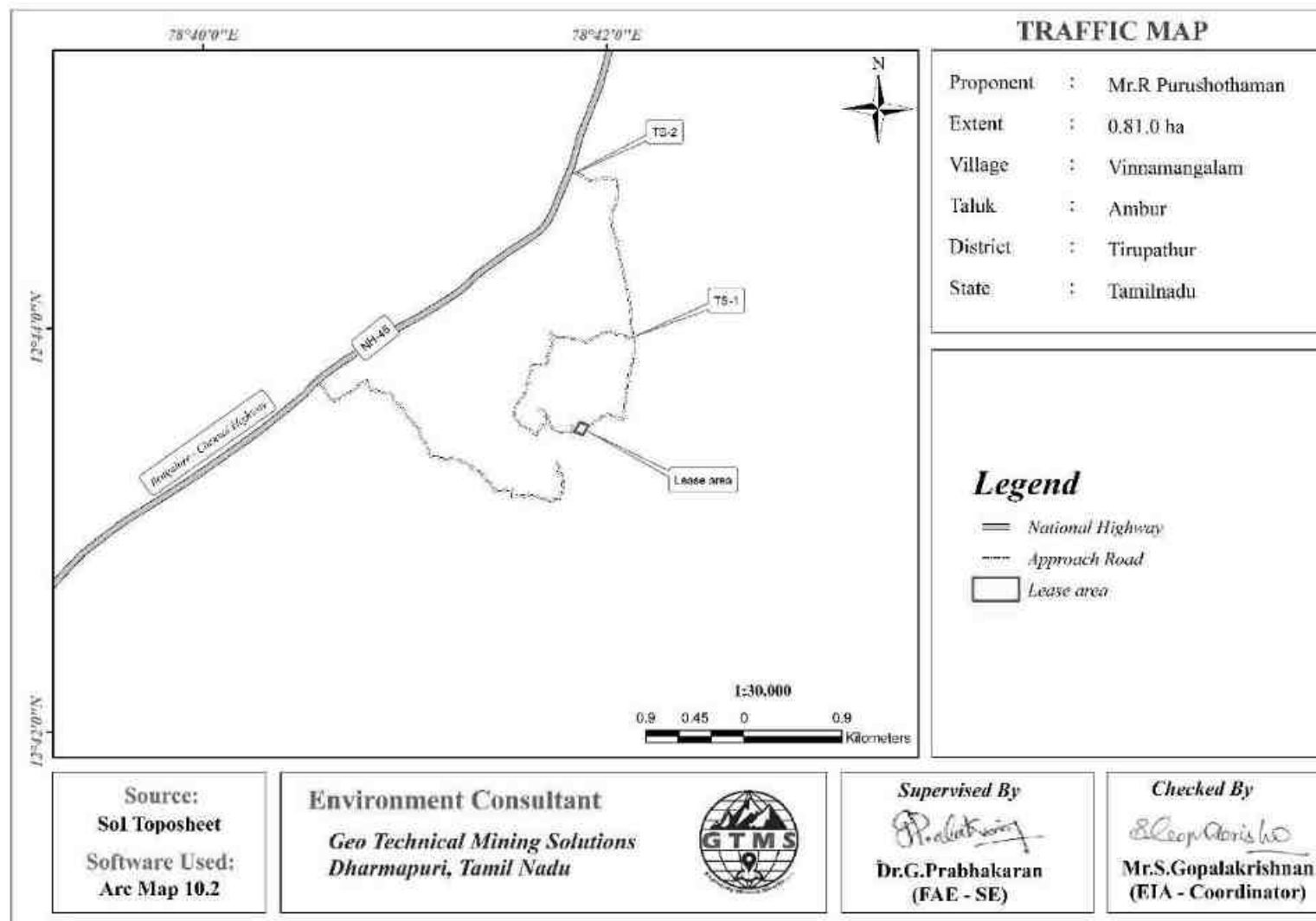


Figure 3.32 Traffic Density Map

3.8 SITE SPECIFIC FEATURES

The Details of the environmentally sensitive ecological features within a radius of 25 km of the mining lease area. Details of the environmentally sensitive areas around the proposed mining lease area and the nearby water bodies are given in Table 3.37.

Table 3.37 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	Koundiniya Wildlife Sanctuary	24.17km- N
	Eco Sensitive Areas under Environment (Protection) Act, 1986	Koundiniya Wildlife Sanctuary	24.17km-N
2	Reserve Forest	Vellakkal R.F	1.41km – South
		Ambur Fuel R.F	2.29km - SE
		Sanankuppam R.F	3.58km - NE
		Nekkanamalai R.F	4.18km - SW
		Alangayam R.F	7.33km - SE
		Vellakuttai R.F	7.55km - SE
		Karupattu R.F	8.04km - West
		Madhanancheri R.F	10.58km SW
		Ambur R.F	4.9km - NE
		Narasingapuram R.F	11.23km - South
		Mangalam R.F	11.76km - SW
		Vallipattu R.F	11.75km - SW
		Kollakottai R.F	11.82km - SW
		Kalarapatti R.F	14.28km - SE
		Thumberi R.F	12.35km – West
		Madhakadappa R.F	11.94km - NW
		Mittalam R.F	8.92km - North
		Ambur Durg R.F	9.02km - NW
		Karuthamalai R.F	13.51km - East
		Pallalakuppam R.F	12.55km - North
3	Lakes/ Reservoirs/ Dams/Streams/Rivers	Vinnamangalam lake	1.90km - NW
		Periyankuppam lake	1.77km - NE
		Melsanankuppam lake	4.62km - NW
		Ayyanoor Temple pond	2.48km - North
		Palar River	2.88km – NW
		Malatar River	8.78km - NE
4	Tiger Reserve/Elephant Reserve/ Biosphere Reserve	None	Nil within 10 km radius
5	Densely Polluted Areas	None	Nil within 10 km radius
6	Mangroves	None	Nil within 10 km radius
7	Mountains/Hills	None	Nil within 10 km radius
8	Centrally Protected Archaeological Sites	None	Nil within 10 km radius
9	Industries/ Thermal Power Plants	None	Nil within 10 km radius
10	Defence Installation	None	Nil within 10 km radius

Source: Survey of India Toposheet





Figure 3.33 Field Study Photographs

CHAPTER IV

ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

4.0 GENERAL

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

4.1 LAND ENVIRONMENT

4.1.1 Anticipated Impact

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

4.1.2 Mitigation Measures from Proposed Project

- ❖ The mining activity will be gradual confined in blocks and excavation will be undertaken progressively along with other mitigate measures like phase wise development of greenbelt etc.
- ❖ Construction of garland drains all around the quarry pits and construction of check dam at strategic location in lower elevations to prevent erosion due to surface runoff during rainfall and also to collect the storm water for various uses within the proposed area.
- ❖ Green belt development along the boundary within safety zone. The small quantity of water stored in the mined-out pit will be used for greenbelt
- ❖ Thick plantation will be carried out on unutilized area, top benches of mined out pits, on safety barrier, etc.,
- ❖ At conceptual stage, the land use pattern of the quarry will be changed into Greenbelt area and temporary reservoir.
- ❖ In terms of aesthetics, natural vegetation surrounding the quarry will be retained (such as in a buffer area i.e., 7.5 m, 10m and 50m safety barrier and other safety provided) so as to help minimize dust emissions.

- ❖ Proper fencing will be carried out at the conceptual stage, Security will be posted round the clock, to prevent inherent entry of the public and cattle.

4.2 SOIL ENVIRONMENT

4.2.1 Anticipated Impact on Soil Environment

Following impacts are anticipated due to mining operations:

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

4.2.2 Common Mitigation Measures from proposed project

- ❖ Run-off diversion – Garland drains will be constructed around the project boundary to prevent surface flows from entering the quarry works areas and will be discharged into vegetated natural drainage lines, or as distributed flow across an area stabilised against erosion.
- ❖ Sedimentation ponds - Run-off from working areas will be routed towards sedimentation ponds. These trap sediment and reduce suspended sediment loads before runoff is discharged from the quarry site. Sedimentation ponds should be designed based on runoff, retention times, and soil characteristics. There may be a need to provide a series of sedimentation ponds to achieve the desired outcome.
- ❖ Retain vegetation – Retain existing or re-plant the vegetation at the site wherever possible.
- ❖ Monitoring and maintenance – Weekly monitoring and daily maintenance of erosion control systems so that they perform as specified specially during rainy season.

4.3 WATER ENVIRONMENT

4.3.1 Anticipated Impact

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

4.3.2 Common Mitigation Measures for the Proposed Project

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

- ❖ The garland drainage will be connected to settling tank and sediments will be trapped in the settling tanks and only clear water will be discharged to the natural drainage
- ❖ Periodic (every 6 month once) analysis of ground water quality of quarry pit water and ground water of nearby villages will be conducted
- ❖ Artificial recharge structures will be established in suitable locations as part of the rainwater harvesting management program.

4.4 AIR ENVIRONMENT

4.4.1 Anticipated Impact from proposed project

- ❖ During mining at various stages of activities such as excavation, drilling and transportation of materials, particular matter (PM₁₀ and PM_{2.5}) are the main air pollutants.
- ❖ Emissions of noxious gases due to incomplete detonation of explosive may sometimes pollute the air.
- ❖ The fugitive dust released from the mining operations may cause effect on the mine workers who are directly exposed to the fugitive dust.
- ❖ Simultaneously, the air-borne dust may travel to longer distances and settle in the villages located near the mine lease area.

4.4.2 Emission Estimation

Emission resulting from different mining activities is estimated using relevant empirical formulae developed by Chauha et al.,2001. The equations used for SPM 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} and PM₁₀ 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}	0.0000006101	8500	5.0841E-05
Overall Mine	PM ₁₀	0.0000012202		0.000101681927

4.4.2.1 Modelling of Incremental Concentration

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

4.4.2.2 Model Results

The post project resultant concentrations of PM₁₀ and PM_{2.5} (GLC) 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)	Direction	PM _{2.5} concentrations(µg/m ³)			Comparison against air quality standard (60 µg/m ³)	Magnitude of change (%)	Significance
			Baseline	Predicted	Total			
AAQ1	0.44	SSW	19.6	1.0	20.6	Below standard	5.1	Not significant
AAQ2	0.51	NW	18.7	0.2	18.9		1.1	
AAQ3	0.44	SE	17.5	0.2	17.7		1.1	
AAQ4	2.52	NW	17.4	0	17.4		0.0	
AAQ5	2.07	N	16.6	0.06	16.66		0.4	
AAQ6	1.82	NE	17.3	0.06	17.36		0.3	
AAQ7	1.36	SW	17.1	1.0	18.1		5.8	
AAQ8	3.98	NW	19.6	0.06	19.66		0.3	

Table 4.4 Incremental & Resultant GLC of PM₁₀

Station ID	Distance to core area (km)	Direction	PM ₁₀ concentrations(µg/m ³)			Comparison against air quality standard (100 µg/m ³)	Magnitude of change (%)	Significance
			Baseline	Predicted	Total			
AAQ1	0.44	SSW	47.9	2.0	49.9	Below standard	4.2	Not significant
AAQ2	0.51	NW	47.8	0.70	48.5		1.5	
AAQ3	0.44	SE	45.0	0.70	45.7		1.6	
AAQ4	2.52	NW	44.2	0	44.2		0.0	
AAQ5	2.07	N	42.6	0.5	43.1		1.2	
AAQ6	1.82	NE	44.6	0.5	45.1		1.1	
AAQ7	1.36	SW	43.4	2.0	45.4		4.6	
AAQ8	3.98	NW	43.0	0.5	43.5		1.2	

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.

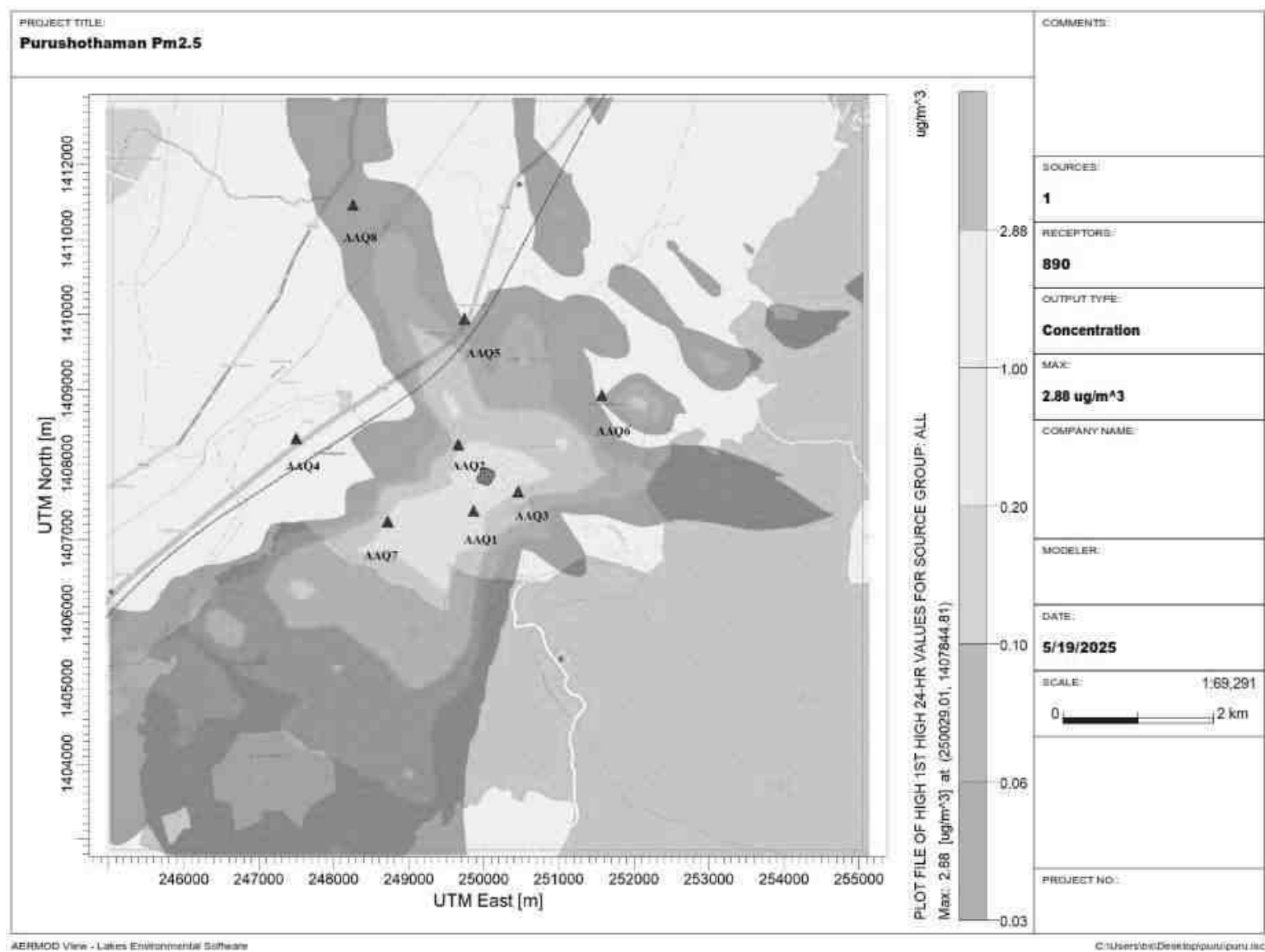


Figure 4.1 Predicted Incremental Concentration of PM_{2.5}

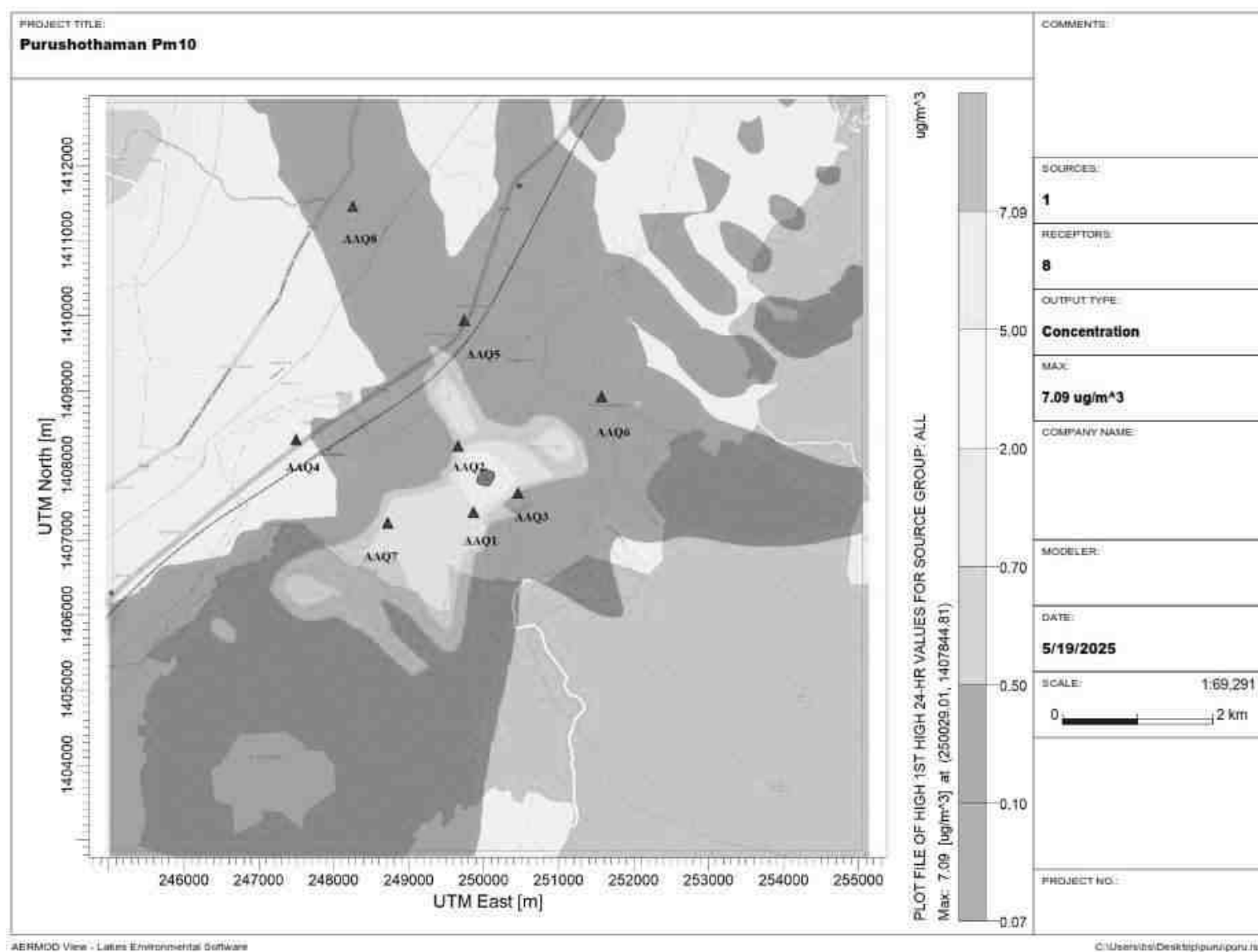


Figure 4.2 Predicted Incremental Concentration of PM₁₀

4.4.3 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.

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

4.5.1 Anticipated Impact

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). Generally, most mining operations produce noise between 95.8 dB (A).

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)
Parathamam Core	350	45.1	33.1	45.4
Selvam Core	360	44.0	32.8	44.3
T.G.Govind	280	43.2	35.0	43.8

RDS Core	100	40.3	44.0	45.5
Karthick Core	280	42.7	35.0	43.4
Kamiyampattu Pudur	470	41.2	30.5	41.6
Minnur	2080	40.5	17.60	40.52
Vinnamangalam	2010	42.9	17.90	42.91
Periyankuppam	1810	42.7	18.81	42.72
Vinnamangalam RS	1370	42.4	21.23	42.43
Veerankuppam	3820	43.3	12.32	43.30
NAAQ Standards	Industrial Day Time - 75 dB (A) & Night Time- 70 dB (A) Residential Day Time -55 dB (A) & Night Time- 45 dB (A)			

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

4.5.2 Common Mitigation Measures

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

- ❖ Usage of sharp drill bits while drilling which will help in reducing noise
- ❖ Secondary blasting will be totally avoided and hydraulic rock breaker will be used for breaking boulders
- ❖ Controlled blasting with proper spacing, burden, stemming and optimum charge/delay will be maintained
- ❖ The blasting will be carried out during favourable atmospheric condition and less human activity timings by using nonelectrical initiation system
- ❖ Proper maintenance, oiling and greasing of machines will be done every week to reduce generation of noise
- ❖ Provision of sound insulated chambers for the workers working on machines (HEMM) producing higher levels of noise
- ❖ Silencers / mufflers will be installed in all machineries
- ❖ Greenbelt/Plantation will be developed around the project area and along the haul roads. The plantation minimizes propagation of noise
- ❖ Personal Protective Equipment (PPE) like ear muffs/ear plugs will be provided to the operators of HEMM and persons working near HEMM and their use will be ensured through training and awareness
- ❖ Regular medical check-up and proper training to personnel to create awareness about adverse noise level effects

4.5.3 Ground Vibrations

Ground vibrations due to the proposed mining activities are anticipated due to operation of mining machines like excavators, drilling and blasting, transportation vehicles, etc., however, the major source of ground vibration from the quarry is blasting. The major impact of the ground vibrations is observed on the domestic houses located in the villages nearby the mine lease area. The 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. Nearest habitation from the proposed project areas is listed in below table. The ground vibrations due to the blasting in the quarry are calculated using the empirical equation.

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

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

Where,

V = peak particle velocity (mm/s)

K = site and rock factor constant (500)

Q = maximum instantaneous charge (kg)

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

R = distance from charge (m)

Table 4.7 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	4.11	305	0.164	19	0.02	119

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

Location ID	Maximum Charge in kgs	Radial Distance in m	PPV in mm/s	Fly rock distance in m	Air Blast	
					Pressure (kPa)	Sound Level (dB)
P1	4.11	100	0.977	19	0.07	131
		200	0.322		0.04	124
		300	0.169		0.02	120
		400	0.106		0.01	117
		500	0.074		0.01	114

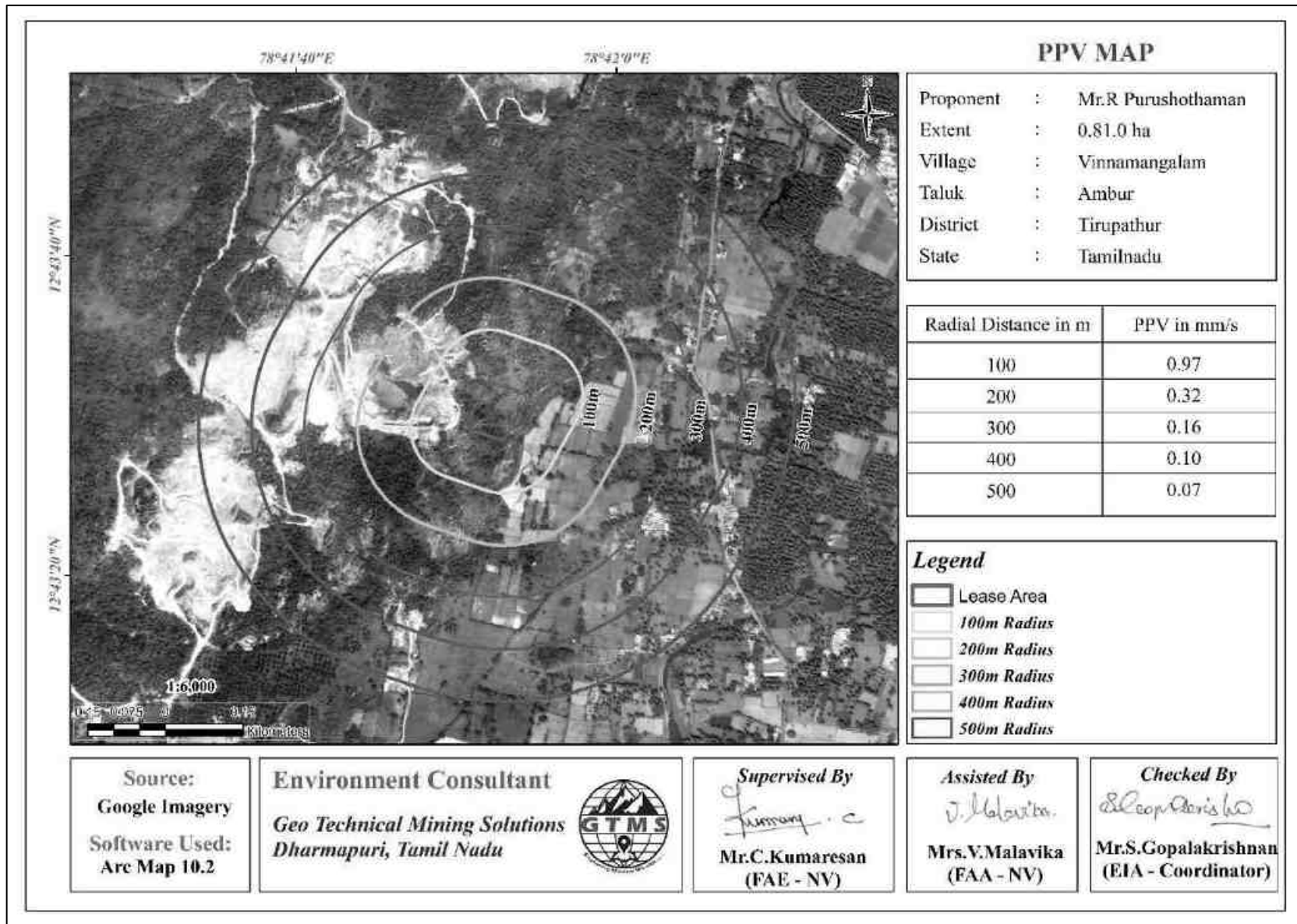


Figure 4.3 Predicted PPV Values due to Blasting at 100-500 m radius

4.5.3.1 Common Mitigation Measures

- ❖ The blasting operations in the cluster quarries are carried out without deep hole drilling and blasting using delay detonators which reduce the ground vibrations
- ❖ Proper quantity of explosives, suitable stemming materials and appropriate delay system will be adopted to avoid overcharging and for safe blasting
- ❖ Adequate safe distance from blasting will be maintained as per DGMS guidelines
- ❖ Blasting shelter will be provided as per DGMS guidelines
- ❖ Blasting operations will be carried out only during day time
- ❖ The charge per delay will be minimized and preferably a greater number of delays will be used per blasts
- ❖ During blasting, other activities in the immediate vicinity will be temporarily stopped
- ❖ Drilling parameters like depth, diameter and spacing will be properly designed to give proper blast
- ❖ A fully trained explosives blast man (Mining Mate, Mines Foreman, 2nd Class Mines Manager/ 1st Class Mines Manager) will be appointed
- ❖ A set of shot firing rules will be drawn up and blasting shall commence outlining the detailed operating procedures that will be followed to ensure that shot firing operations on site take place without endangering the workforce or public
- ❖ Sufficient angular stemming material will be used to confine the explosive force and minimise environmental disturbance caused by venting / misfire
- ❖ The detonators will be connected in a predetermined sequence to ensure that only one charge is detonated at any one time and a NONEL or similar type initiation system will be used
- ❖ The detonation delay sequence shall be designed so as to ensure that firing of the holes is in the direction of free faces so as to minimise vibration effects.
- ❖ Appropriate blasting techniques shall be adopted in such a way that the predicted peak particle velocity shall not exceed 0.251mm/s.
- ❖ Vibration monitoring will be carried out every 6 months to check the efficacy of blasting practices.

4.6 ECOLOGY AND BIODIVERSITY

4.6.1 Impact on Ecology and Biodiversity

- ❖ **Vegetation Loss and Habitat Disruption:** Mining operations often lead to the removal or destruction of local vegetation, which can disrupt ecosystems and habitats for various wildlife species. This loss of plant life can cause a significant decrease in biodiversity in the affected area.

- ❖ **Soil Erosion and Degradation:** The removal of vegetation exposes soil to the elements, making it more susceptible to erosion. Without plant roots to hold the soil together, the land can degrade, leading to loss of fertility and further environmental damage.
- ❖ **Altered Hydrological Balance:** Vegetation plays a crucial role in regulating water flow and maintaining the hydrological balance of an area. Mining can alter the natural flow of water, potentially leading to issues like flooding or reduced water quality due to sedimentation.
- ❖ **Dust and Air Quality:** Mining activities, such as drilling and blasting, can create dust that settles on nearby plants and reduces their ability to photosynthesize. This can weaken vegetation and even result in plant death over time.
- ❖ **Introduction of Invasive Species:** Disturbance caused by mining may facilitate the spread of invasive plant species that can outcompete native vegetation, further altering the ecosystem.
- ❖ **Rehabilitation Efforts:** After mining, efforts to rehabilitate the land often include replanting native vegetation. However, the success of these efforts depends on the extent of the damage, the survival rate of replanted vegetation, and the management of invasive species.
- ❖ **Carbon Sequestration Impact:** Trees and plants are essential for carbon sequestration, and their removal can contribute to increased atmospheric CO₂ levels, exacerbating climate change effects.
- ❖ Most of the land in the buffer area is undulating terrain with crop lands, grass patches and small shrubs. Hence, there will be no effect on flora of the region. There are no trees in mine lease area.
- ❖ Carbon released from quarrying machineries and tippers during quarrying would be 36kg per day, 9710kg per year and 97100kg over ten years, as provided in Table 4.9.

Table 4.9 Carbon Released During Five Years of Rough Stone Production

	Per day	Per year	Per ten years
Fuel consumption of excavator	34	9065	90650
Fuel consumption of compressor	718	194005	1940050
Fuel consumption of tipper	752	203070	2030700
Total fuel consumption in liters	2014	544228	5442280
CO ₂ emission in kg	36	9710	97100

4.6.2 Mitigation Measures on Flora

- ❖ During conceptual stage, the top bench will be re-vegetated by planting local /native species and lower benches will be converted into rainwater harvesting structure following completion of mining activities, which will replace habitat resources for fauna species in this locality over a longer time.
- ❖ Existing roads will be used; new roads will not be constructed to reduce impact on flora.

Carbon Sequestration

- ❖ To mitigate carbon emission due to mining activities, we recommend planting trees around the quarry to offset the carbon emission during quarrying. A tree can sequester 9710kg of carbon per year. Therefore, we recommend planting large number of trees around the quarry and near school campuses, government wasteland, roadsides etc.
- ❖ As per the greenbelt development plan as recommended by SEAC (Table 4.11), about 500 trees will be planted within three months from the beginning of mining. These trees, when grown up would sequester carbon of about 97100kg of the total carbon, as provided in Table 4.10.

Table 4.10 CO₂ Sequestration

CO ₂ sequestration in kg	36	9710	97100
Remaining CO ₂ not sequestered in kg	1978	534518	5345150
Trees required for environmental compensation	22255		
Area required for environmental compensation in hectares	45		

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 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	Nettilling	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>	Rutaceae	Vilvam	Tree	
9	<i>Pongamia pinnata</i>	Fabaceae	Pungam	Tree	
10	<i>Thespesia populnea</i>	Malvaceae	Puvarasu	Tree	

Table 4.12 Greenbelt Development Plan

	No. of trees proposed for plantation	No. of trees expected to survive @ 80%	Area to be covered(m ²)
Plantation in the construction phase (3 months)	Number of plants inside the mine lease area		
	162	130	1458
	Number of plants outside the mine lease area		
	243	194	2187
Total	405	324	3645

After complete extraction of mineral, the excavated pits will be allowed to collect rainwater and seepage water to serve as a reservoir to charge the nearby wells. Fish culture will also be attempted. A bund will be constructed around the pits. In order to minimize the impact of mining on the vegetation

outside the mine lease area, it is recommended that adequate protection measures must be implemented. As mining involves movement of vehicles and increased anthropogenic activities, some of the areas can be fenced by involving local people and educating them about increased benefits of such activities.

4.6.3. Anticipated Impact on Fauna

- ❖ 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. There is no fauna in mine lease area.
- ❖ Javadhu hills is located 1.24km south side of the mine lease area, there is a possibility that the animals there may come into the quarry area.

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
- ❖ Strict monitoring of labourers and associated workers for any activity related to endangering the life or habitat of forest animals and birds.
- ❖ Strict restrictions will be imposed on the workers at Project sites to ensure that they do not harvest any produce from the natural forests and cause any danger or harm to the animals and birds in forest.
- ❖ The Project authorities will be bound by the rules and regulations of the Wildlife Protection Acts or any such agency of the State, which may exist or will be promulgated from time to time for the preservation of habitats and protection of forest animals.
- ❖ It is to be ensured that the noise levels in no case go above 100-150 dB in the Project area. One of the measures that is proposed to be adopted is that the blasting is to be restricted during nights, early mornings and late afternoons, which are the feeding times of most of the fauna. Blasting will be resorted to only if necessary. For this strict blasting regime i.e. controlled blasting under constant and strict surveillance is to be followed. The suggested methodologies aim at reducing and mitigating noise so as to cause as little disturbance to the animals as possible
- ❖ Each worker shall be provided with identity card and would not be allowed access to forest areas without permission.
- ❖ The workers shall be discouraged for plantation of nonnative species in the surroundings of labour colony.
- ❖ Possession of firearms by Project workers shall be strictly prohibited, except for dedicated security personnel.

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

Aquatic Biodiversity

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

4.7 SOCIO ECONOMIC ENVIRONMENT

4.7.1 Anticipated Impact from Proposed and Existing Projects

- ❖ Dust generation from mining activity can have negative impact on the health of the workers and people in the nearby area.
- ❖ Approach roads can be damaged by the movement of tippers.

4.7.2 Common Mitigation Measures for Proposed Project

- ❖ Good maintenance practices will be adopted for all machinery and equipment, which will help to avert potential noise problems.
- ❖ Green belt will be developed in and around the project site as per Central Pollution Control Board (CPCB) guidelines.

- ❖ Air pollution control measure will be taken to minimize the environmental impact within the core zone.
- ❖ For the safety of workers, personal protective appliances like hand gloves, helmets, safety shoes, goggles, aprons, nose masks and ear protecting devices will be provided as per mines act and rules.
- ❖ Benefit to the State and the Central governments through financial revenues by way of royalty, tax, duties, etc., from this project directly and indirectly.
- ❖ From above details, the quarry operations will have highly beneficial positive impact in the area.
- ❖ Increase in Employment opportunities both direct and indirect thereby increasing economic status of people of the region

4.8 OCCUPATIONAL HEALTH AND SAFETY

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

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

4.8.1 Respiratory Hazards

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

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

4.8.2 Noise

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

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

4.8.3 Physical Hazards

The following measures are proposed for control of physical hazards

- ❖ Specific personnel training on work-site safety management will be taken up;
- ❖ Natural barriers, temporary railing, or specific danger signals will be provided along rock benches or other pit areas where work is performed at heights more than 2m from ground level;

- ❖ Maintenance of yards, roads and footpaths, providing sufficient water drainage and preventing slippery surfaces with an all-weather surface, will be taken up.

4.8.4 Occupational Health Survey

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

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

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

4.9 MINE WASTE MANAGEMENT

No waste is anticipated from any of the proposed quarries.

4.10 MINE CLOSURE

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

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

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

4.10.1 Mine Closure Criteria

The criteria involved in mine closure are discussed below:

4.10.1.1 Physical Stability

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

4.10.1.2 Chemical Stability

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

4.10.1.3 Biological Stability

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

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

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

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

CHAPTER V

ANALYSIS OF ALTERNATIVES (TECHNOLOGY AND SITE)

5.0 INTRODUCTION

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

5.1 FACTORS BEHIND THE SELECTION OF PROJECT SITE

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

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

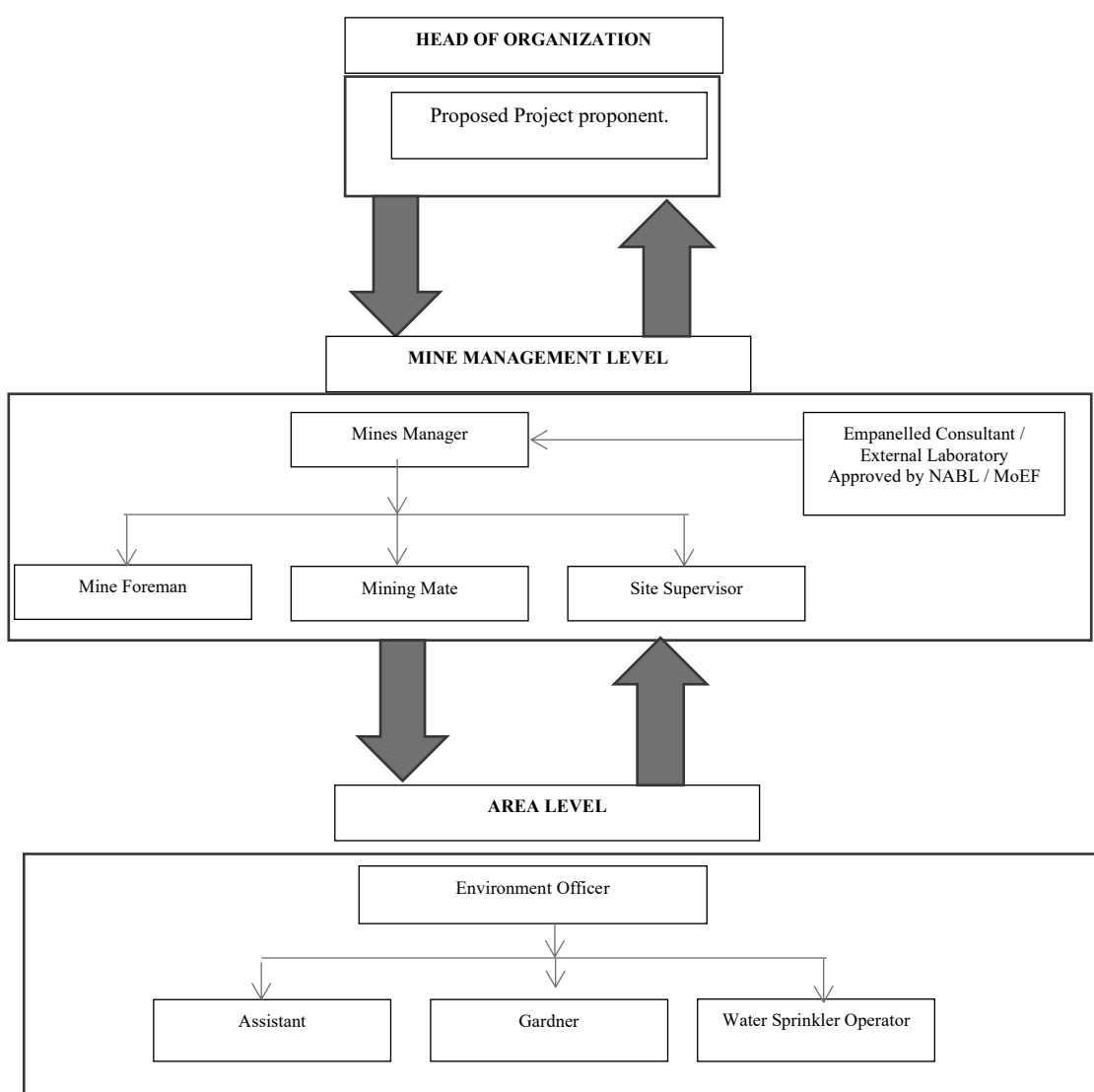


Figure 6.1 Proposed environmental monitoring chart

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; Drill Rod may break;	✓ Safe operating procedure established for drilling (SOP) will be strictly followed. ✓ Only trained operators will be deployed. ✓ No drilling shall be commenced in an area where shots have been fired until the blaster/blasting foreman has made a thorough Examination of all places, ✓ Drilling shall not be carried on simultaneously on the benches at places directly one above the other. ✓ 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	✓ 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.

		blast holes Vibration due to movement of vehicles	✓ 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 While reversal & overtaking of vehicle Operator of truck leaving his cabin when it is loaded.	✓ Before commencing work, drivers personally check the truck/tipper for oil(s), fuel and water levels, tyre inflation, general cleanliness and inspect the brakes, steering system, warning devices including automatically operated audio-visual reversing alarm, rear view mirrors, side indicator lights etc., are in good condition. ✓ Not allow any unauthorized person to ride on the vehicle nor allow any unauthorized person to operate the vehicle. ✓ Concave mirrors should be kept at all corners ✓ All vehicles should be fitted with reverse horn with one spotter at every tipping point ✓ Loading according to the vehicle capacity ✓ Periodical maintenance of vehicles as per operator manual
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 III. The area is far away from the sea. Hence, the disaster due to heavy floods and tsunamis are not anticipated. The Disaster Management Plan is aimed to ensure safety of life, protection of environment, protection of installation, restoration of production and salvage operations in this same order of priorities. The objective of the Disaster Management Plan is to make use of the combined resources of the mine and the outside services to achieve the following:

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

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

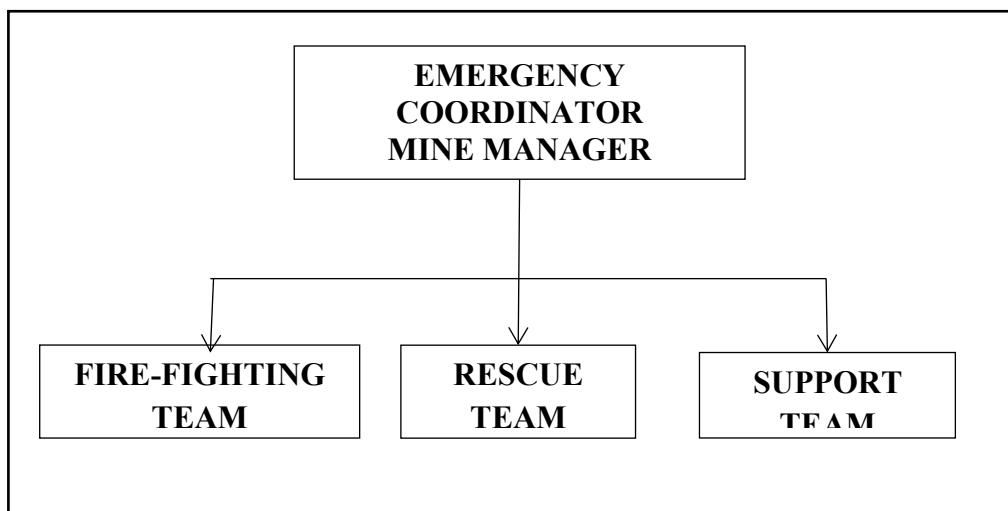


Figure 7.1 Disaster management team layout for proposed project

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

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, seven proposed projects, known as P1, P2, P3, P4, P5, P6 and P7 are taken into consideration. The details of P1 have been given in Table 1.3 and the details of P2, P3, P4, P5, P6 and P7 are given in the Table 7.2, 7.3, 7.4, 7.5, 7.6 and 7.7

Table 7.2 Salient Features of the Proposed Project ‘P2’

Name of the Quarry	Mr.A.Selvam, Rough Stone Quarry	
Type of Land	Government Poramboke Land	
Extent	2.00.0Ha	
S.F. No	420/1 (Part-5)	
Toposheet No	57 L/10	
Location of Project Site	12° 43'20.09"N to 12°43'28.79"N 78°41'48.29"E to 78°41'52.71"E	
Highest Elevation	415m AMSL	
Proposed depth of Mining ten years	50m (30m AGL + 20m BGL)	
Geological Resources	Rough Stone in m ³	Top Soil in m ³
	694420	2894
Mineable Reserves	Rough Stone in m ³	Top Soil in m ³
	278405	2083
Proposed reserves for ten years	Rough Stone in m ³	Gravel in m ³
	278405	2083
Method of Mining	Open-Cast Mechanized mining	

Topography	Hillock Topography	
Machinery proposed	Jack Hammer	2
	Compressor	1
	Tipper	7
	Excavator	1
Blasting Method	The quarrying operation is proposed to carried out by open cast, using jack hammer drilling followed by manual breaking will be adopted to release the rough stone and nonel blasting is proposed in this lease area.	
Proposed Manpower Deployment	18 Nos	
Project Cost	Rs.1,47,18,500/-	
CER Cost	Rs. 5,00,000/-	
Proposed Water Requirement	3.0 KLD	

Table 7.3 Salient Features of the Proposed Project ‘P3’

Name of the Quarry	M/s. RDS INFRASTRUCTURE	
Type of Land	Government Poramboke land	
Extent	1.00.0ha	
Toposheet No	57 L/10	
Location of Project Site	12°43'30.94"N to 12°43'35.96"N 78°41'45.11"E to 78°41'49.79."E	
Highest Elevation	435m AMSL	
Proposed depth of Mining (5 years)	20m BGL	
Geological Resources	Rough Stone in m ³	Top Soil in m ³
	2,00,100	175
Mineable Reserves	Rough Stone in m ³	---
	77,300	---
Proposed reserves for five years	Rough Stone in m ³	---
	77,300	---
Method of Mining	Open-Cast Mechanized mining	
Topography	Elevated Terrain Topography	
Machinery proposed	Jack Hammer	1
	Compressor	1
	Tipper	4
	Hydraulic Excavator	1
Blasting Method	The quarrying operation is proposed to carried out by open cast mining in conjunction with conventional	

	method using jack hammer drilling and blasting for shattering effect and loosen the rough stone.
Proposed Manpower Deployment	16 Nos
Project Cost	Rs.1,05,95,000
CER Cost	Rs. 5,00,000
Proposed Water Requirement	3.0 KLD

Table 7.4 Salient Features of the Proposed Project 'P4'

Name of the Quarry	Mr. B. Karthik, Rough Stone Quarry	
Type of Land	Govt Poramboke Land	
Extent	1.00.0 Ha	
S.F. No	419 (Part-10)	
Toposheet No	58 E/03	
Location of Project Site	12°43'35.38"N to 12°43'40.38"N 78°41'37.03"E to 78°41'39.41"E	
Highest Elevation	410m AMSL	
Ultimate depth of Mining	40m (30m AGL + 10m BGL)	
Geological Resources	Rough Stone in m ³	Top Soil in m ³
	286080	10286
Mineable Reserves	Rough Stone in m ³	Top Soil in m ³
	149415	6500
Proposed reserves for five years	Rough Stone in m ³	Gravel in m ³
	129635	6500
Method of Mining	Open-Cast Mechanized mining	
Topography	Flat Topography	
Machinery proposed	Jack Hammer	2
	Compressor	1
	Tipper	7
	Excavator	1
Blasting Method	The quarrying operation is proposed to carried out by open cast, using jack hammer drilling followed by manual breaking will be adopted to release the rough stone and nonel blasting is proposed in this lease area.	
Proposed Manpower Deployment	17 Nos	
Project Cost	Rs.1,39,97,500/-	
CER Cost	Rs. 5,00,000/-	
Proposed Water Requirement	3.0 KLD	

Table 7.5 Salient Features of the Proposed Project 'P5'

Name of the Quarry	Mr.R.Paranthaman, Rough Stone Quarry	
Type of Land	Govt Poramboke Land	
Extent	1.62.0Ha	
S.F. No	416/35 (Part-5)	
Toposheet No	58 E/03	
Location of Project Site	12° 43'18.44"N to 12°43'21.28"N 78°41'39.15"E to 78°41'48.36"E	
Highest Elevation	415m AMSL	
Ultimate depth of Mining 10 years	40m (25m AGL + 15m BGL)	
Geological Resources	Rough Stone in m ³ / 10 years	Top Soil in m ³
	666125	4450
Mineable Reserves	Rough Stone in m ³	Top Soil in m ³
	11022	1527
Proposed reserves for ten years	Rough Stone in m ³	Gravel in m ³
	110222	1527
Method of Mining	Open-Cast Mechanized mining	
Topography	Hillock Topography	
Machinery proposed	Jack Hammer	2
	Compressor	1
	Tipper	7
	Excavator	1
Blasting Method	The quarrying operation is proposed to carried out by open cast, using jack hammer drilling followed by manual breaking will be adopted to release the rough stone and nonel blasting is proposed in this lease area.	
Proposed Manpower Deployment	19 Nos	
Project Cost	Rs.1,30,04,500/-	
CER Cost	Rs. 5,00,000/-	
Proposed Water Requirement	3.0 KLD	

Table 7.6 Salient Features of the Proposed Project 'P6'

Name of the Quarry	Mr.R.Janarthanan, Rough Stone Quarry	
Type of Land	Government Poramboke Land	
Extent	0.80.0Ha	
S.F. No	419 (Part-9)	
Toposheet No	57 L/10	

Location of Project Site	12° 43'38.80"N to 12°43'43.07"N 78°41'53.48"E to 78°41'57.34"E	
Highest Elevation	425m AMSL	
Ultimate depth of the quarry	45m (25m AGL + 20m BGL)	
Geological Resources	Rough Stone in m ³	Top Soil in m ³
	231850	8888
Mineable Reserves	Rough Stone in m ³	Top Soil in m ³
	94850	6256
Proposed reserves for ten years	Rough Stone in m ³	Gravel in m ³
	94850	6256
Method of Mining	Open-Cast Mechanized mining	
Topography	Hillock Topography	
Machinery proposed	Jack Hammer	2
	Compressor	1
	Tipper	7
	Excavator	1
Blasting Method	The quarrying operation is proposed to be carried out by open cast, using jack hammer drilling followed by manual breaking will be adopted to release the rough stone and nonel blasting is proposed in this lease area.	
Proposed Manpower Deployment	18 Nos	
Project Cost	Rs.1,03,90,000	
CER Cost	Rs. 5,00,000/-	
Proposed Water Requirement	3.0 KLD	

Table 7.7 Salient Features of the Proposed Project 'P7'

Name of the Quarry	Mr.T.G.Govind, Rough Stone quarry	
Type of Land	Government Poramboke Land	
Extent	2.00.0ha	
Toposheet No	57-L/10	
Location of Project Site	12°43'21.54"N to 12°43'25.88"N 78°41'43.00"E to 78°41'48.70"E	
Highest Elevation	412m AMSL	
Proposed depth of Mining	40m (20m AGL + 20m BGL)	
Geological Resources	Rough Stone in m ³	Topsoil in m ³
	1205080	21060
Mineable Reserves	Rough Stone in m ³	Topsoil in m ³

	408765	15730
Proposed reserves for five years	Rough Stone in m ³	Topsoil in m ³
	358265	15730
Method of Mining	Open-Cast Mechanized mining	
Topography	Hillock Terrain	
Machinery proposed	Jack Hammer	3
	Compressor	2
	Tipper	10
	Hydraulic Excavator	1
Blasting Method	The quarrying operation is proposed to carried out by open cast mining in conjunction with conventional method using jack hammer drilling and blasting for shattering effect and loosen the rough stone.	
Proposed Manpower Deployment	23 Nos	
Project Cost	Rs.1,09,80,000	
CER Cost	Rs. 5,00,000	
Proposed Water Requirement	3.7 KLD	

7.4.1 Air Environment

As the production of rough stone plays a vital role in affecting the air environment. The data on the cumulative production resulting from six proposed project have been given in Tables 7.8.

Table 7.8 Cumulative Production Load of Rough Stone

Quarry	Total Production in m ³	Production Per Year in m ³	Production Per Day in m ³	Number of Lorry Load Per Day
P1 – (10 years)	115205	11520	43	7
P2 – (10 years)	278405	27840	103	17
P3 – (5 years)	77300	15460	57	10
P4 – (5 years)	129635	25927	96	16
P5 – (10 years)	110222	11022	41	7
P6 – (10 years)	94850	9485	35	6
P7 – (5 years)	358265	71653	265	44
Grand Total	1163882	172907	640	107

The cumulative study shows that the overall production of rough stone from seven quarries are 375m³ per day with a capacity of 107 trips of rough stone per day.

7.4.1.1 Cumulative Impact of Air Pollutants

The results on the cumulative impact of the seven proposed projects on air environment of the cluster have been provided in Table 7.9 The cumulative values resulting from the six projects for each pollutant do not exceed the permissible limits set by CPCB.

Table 7.9 Cumulative impact results from the seven proposed projects

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	P2	P3	P4	P5	P6	P7	
PM _{2.5}	17.5	2.30	9.86	1.45	2.88	2.35	1.65	5.69	43.68
PM ₁₀	45.0	7.20	5.64	4.76	7.93	7.23	4.85	14.5	97.11

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 projects within the 500m radius.

Table.7.10 Cumulative impact of noise from seven proposed projects

Fast-track Cumulative Impact of Noise from seven proposed 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	305	E	41.2	34.3	42.0	55
Habitation Near P2	310	E		34.1	42.0	
Habitation Near P3	440	SE		31.1	41.6	
Habitation Near P4	770	SE		26.2	41.3	
Habitation Near P5	420	E		31.5	41.6	
Habitation Near P6	490	SE		30.2	41.5	
Habitation Near P7	400	E		31.92	41.68	
Cumulative Noise (dB (A))					48.0	

Source: Lab Monitoring Data

The cumulative analysis of noise due to seven proposed projects shows that habitation will receive about 48.0dB (A) respectively. The cumulative results for all the villages in consideration do not exceed the limit set by CPCB for residential areas for day time.

Ground Vibrations

Cumulative results of ground vibrations due to mining activities in the all the six projects have been shown in Table 7.11.

Table 7.11 Cumulative effect of ground vibrations resulting from seven projects

Location ID	Maximum Charge in kgs	Nearest Habitation in m	PPV in mm/s
P1	4.11	305	0.28
P2	19.84	310	0.56
P3	5.5	440	0.11
P4	9.24	770	0.071
P5	7.86	420	0.16
P6	6.76	490	0.114
P7	25.54	400	0.45
Total			1.745

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

7.4.3 Socio Economic Environment

Socio Economic benefits of the seven proposed project were calculated and the results have been shown in Table 7.12 the seven projects together will contribute Rs. 30,00,000/-towards CER fund.

Table 7.12 Socio Economic benefits from seven proposed projects

Location ID	Project Cost	CER Cost
P1	Rs.1,16,95,000	Rs. 5,00,000
P2	Rs.1,47,18,500/-	Rs. 5,00,000
P3	Rs.1,05,95,000	Rs. 5,00,000
P4	Rs.1,39,97,500/-	Rs. 5,00,000
P5	Rs.1,30,04,500/-	Rs. 5,00,000
P6	Rs.1,03,90,000	Rs. 5,00,000
P7	Rs.1,09,80,000	Rs. 5,00,000
Grand Total	Rs. 8,53,80,500	Rs. 35,00,000

Table 7.13 Employment benefits from seven proposed projects

Location ID	Employment
P1	18
P2	18
P3	16
P4	17
P5	19
P6	18
P7	23
Grand Total	129

A total of 129 people will get employment due to six proposed projects in cluster

7.4.4 Ecological Environment

Table 7.14 Greenbelt Development Benefits from six Projects

Code	Number of Trees proposed	Area to be covered (m ²)	No. of Trees expected to be grown @ 80% survival rate	Species recommended
P1	405	3645	324	<i>Azadirachta indica, Albizia lebbeck, Delonix regia, Tectona grandis, etc.,</i>
P2	1000	9000	800	
P3	500	4500	400	
P4	500	4500	400	
P5	810	7290	648	
P6	400	3600	320	
P7	1000	400	600	
Total	4,615	32,935	3,492	

Cumulative studies show that the seven proposed projects will plant about 4,615 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., 3,492 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 7.15.

Table 7.15 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 Vinnamangalam Village aims to produce **115205m³** of rough stone and Top Soil 2944m³ 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 18 persons for carrying out mining operations and give preference to the local people in providing employment in this cluster. In addition, there will be an opportunity for indirect employment to 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 Vinnamangalam Village, Ambur Taluk, Tirupathur 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 Vinnamangalam 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. 88,48,400** to the state government through various ways, as provided in Table 8.2.

Table 8.2 Project Benefits to the State Government

Particulars	Budget for Rough Stone (Rs.)
CER	5,00,000
Seigniorage @ Rs.90/m ³ of rough stone	1,03,68,450
District Mineral Foundation Tax @ 10% of Seigniorage	10,36,845
Green Tax @ 10% of Seigniorage	10,36,845
Total	1,29,42,140

CHAPTER IX
ENVIRONMENTAL COST BENEFIT ANALYSIS

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

CHAPTER X

ENVIRONMENTAL MANAGEMENT PLAN

10.0 GENERAL

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

10.1 ENVIRONMENTAL POLICY

The project proponent is committed to conduct all its operations and activities in an environmentally responsible manner and to continually improve environmental performance. The Proponent Mr.R.Purushothaman 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	8100	8100
	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	Dust extractor @ Rs. 25,000/- per unit deployed as capital & @ Rs. 2500	50000	5000

	separate dust extractor unit	per unit recurring cost for maintenance		
	No overloading of trucks/tippers/tractors	Manual Monitoring through Security guard	0	5000
	Stone carrying trucks will be covered by tarpaulin to avoid escape of fines to the atmosphere	Monitoring if trucks will be covered by tarpaulin	0	10000
	Enforcing speed limits of 20 km/hr within ML area	Installation of Speed Governors @ Rs. 5000/- per tipper/dumper deployed	35000	0
	Regular monitoring of exhaust fumes as per RTO norms	Monitoring of Exhaust Fumes	0	8750
	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	16200
	Installing wheel wash system near exit gate of quarry	Installation + Maintenance + Supervision	50000	20000
Total Air Environment			943100	178050
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	322574
Total Noise Environment			50000	324574
Water Environment	Water Management	Provision for garland drain @ Rs. 10,000/- per hectare with maintenance of Rs. 5,000/- per annum	8100	4050
Total Water Environment			8100	4050
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	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. 4000/- per employee with recurring based on wear and tear (say, @ Rs. 1000/- per employee)	72000	18000
	Health checkup for workers will be provisioned	IME & PME Health checkup @ Rs. 1000/- per employee	0	18000
	First aid facility will be provided	Provision of 2 Kits per Hectare @ Rs. 2000/-	0	3240
	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 (0.81.0 hectare)	162000	8100
	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	40500	8100
	Installation of CCTV cameras in the mines and mine entrance	Camera 4 Nos, DVR, Monitor with internet facility	30000	5000
	Implementation as per Mining Plan and ensure safe quarry working	Mines Manager (1 st Class / 2 nd Class / Mine Foreman) under regulation 34 / 34 (6) of MMR, 1961 and Mining Mate under regulation 116 of MMR,1961 @ 40,000/- for Manager & @ 25,000/- for Foreman / Mate	0	780000
Total Occupational Health and Safety			314500	842440
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	32400	4860

		plant maintenance (recurring))"		
		Avenue Plantation @ 300 per plant (capital) for plantation outside the lease area and @ 30 per plant maintenance (recurring)	72900	7290
Total Development of Green Belt			105300	12150
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)		27540	0
	G.O.(Ms)No.23, Dated: 28.09.2021	Section IVA of TNMMCR 1959 (@10% of Seigniorage Fee) (Seigniorage Fee for Roughstone = Rs.90 and for Gravel= Rs.56)	1036845	0
TOTAL			2525385	1384264

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

I st Year	II nd Year	III rd Year	IV th Year	V th Year	VI th Year	VII th Year	VIII th Year	IX th Year	X th Year	Total Recurring Cost	Total EMP
1384264	1453477	1526151	1602459	1682582	1766711	1855046	1947798	2045188	2147447	17411123	19936508

In order to implement the environmental protection measures, an amount of **Rs. 25,25,385** as capital cost and recurring cost as **Rs. 13,84,264** 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. 1,99,36,508** 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 (B1) falls within the quarry cluster of 500 m radius with the total extent of 15.85.0ha, it requires submission of EIA report for grant of Environmental Clearance (EC) after conducting public hearing. The proposed project falling in S.F.No. 420/1 (Part-6) over the extent of 0.81.0ha is situated in the cluster falling in Vinnamangalam Village, Ambur Taluk, Thirupathur District, Tamil Nadu. The projects involved in the calculation of cluster extent are of seven proposed quarries and five existing quarries.

11.2 PROJECT DESCRIPTION

The proposed project area is located between Latitudes 12°43'28.39"N to 12°43'32.11"N and Longitudes from 78°41'50.45"E to 78°41'54.59"E in Vinnamangalam Village, Ambur Taluk, Thirupathur District, Tamil Nadu. According to the approved mining plan, about 115205m³ of rough stone and Top Soil 2944m³ will be mined up to the depth of 45m (25m AGL + 20m BGL) in the ten years. The quarrying operation is proposed to be carried out by open cast semi-mechanized mining method involving drilling 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 **October through December 2024** as per CPCB guidelines. The data were collected by both the FAEs and NABL accredited and MoEF notified **Interstellar Testing Centre Pvt. Ltd**, 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 11.1.

Table.11.1 LULC Statistics of the Study Area

S. No.	Classification	Area (ha)	Area (%)
1	Water	152.96	1.80
2	Trees	5078.41	59.63
3	Flooded Vegetation	16.57	0.19
4	Crops	1781.73	20.92
5	Mining/Industrial Area	39.76	0.47
6	Built Area	792.56	9.31
7	Rangeland	654.78	7.69
Total		8516.7	100.0

11.3.2 Soil Environment

The soil samples in the study area show loamy textures varying between Silt Loam. pH of the soil varies from 7.05 to 8.45 indicating slightly acidic to slightly alkaline nature. Electrical conductivity of the soil varies from 0.118 to 0.305 ms/m.

11.3.3 Water Environment

Surface and Ground Water Quality Resources and Result

Kannadikuppam Lake, Periyakuppam Lake and Palar River are three prominent surface water resources present in the study area. These lake and river were ephemeral in nature, which convey water only after rainfall events. Three surface water sample, known as SW1 were collected from the Kannadikuppam Lake (0.97 km NE), SW2 were collected from the Periyakuppam Lake (1.85 km NE) and SW3 were collected from the Palar River (2.55 km NW) to assess the baseline water quality.

Groundwater in the study area occurs in the crystalline rocks of Archaean age and recent alluvium. The movement of the groundwater is controlled by the intensity of weathering and fracturing of crystalline rocks. Dug wells and bore wells are the most common ground water abstraction structures in the area. However, in dry season, people in the study area heavily rely on bore wells for their domestic and agriculture purpose. Four groundwater samples, known as BW1, BW2, BW3 and OW1 were collected from bore wells and open well were analysed for physico-chemical conditions and bacteriological contents in order to assess baseline quality of ground water. Table 3.6b summarizes surface and ground water quality data of the collected sample. Result for surface and ground water sample in the Table 3.6a & b indicate that the physical, chemical and biological parameters are within permissible limits in compared with standards of IS10500:2012.

11.3.4 Air Environment

As per the monitoring data, PM_{2.5} ranges from 16.5µg/m³ to 19.8µg/m³; PM₁₀ from 42.0µg/m³ to 48.5µg/m³; SO₂ from 5.0µg/m³ to 5.8µg/m³; NO_x from 13.5µg/m³ to 16.3g/m³. The concentration levels of the pollutants fall within the acceptable limits of NAAQS prescribed by CPCB.

Air quality Index

The AQI shows that the air quality of the study area falls within good category 45 causing minimal impact to human health.

11.3.5 Noise Environment

Noise level in core zone was 40.3 dB (A) Leq during day time and 35.8dB(A) Leq during night time. Noise levels recorded in buffer zone during day time varied from 40.3to 45.1dB (A) Leq and during night time from 37.0 to 40.9dB (A) Leq. Thus, the noise level for industrial and residential area meets the requirements of CPCB.

11.3.6 Biological Environment

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 quarry lease area is an already excavated mine lease area. There are no plants or trees in the lease area.

Flora in 1km radius zone

Taxonomically, a total of 80 species belonging to 35 families have been recorded from the 1km radius from the mining lease area. The species in the 1km radius include herbs (39), trees (25), shrubs (16), the 35 families, Fabaceae and Lamiaceae are the main dominating families in the study area, Species Richness (margalef Index) in the study area it mentioned in Table 3.19-3.21. the family pattern and Species Richness bar chart showing in figure 3.25&3.26.

Fauna in 1km radius from the mine lease area

The faunal species observed in the study area are listed in Table 3.23. A total of 39 species were recorded in 1km radius of the project area. Among the 39 species recorded, the distribution was as follows: 13 birds, 16% insects, 04% reptiles, and 06% mammals. These species were cross-checked against the IUCN Red List Database version 3.1 to identify any threatened species. Data analysis revealed that 21 species are categorized as Least Concern on the Red List, while 18 species were not listed. The analysis indicates that there are no REET species in the core and buffer zones of the proposed quarry site.

Flora and Fauna composition on 10km radius

The plant species found within a 1 km radius are same plant species present within a 10 km radius, but they are in greater numbers. The Jawathu Hills are located 1.24 km south of the mining lease area. Jawadhu hills have covered with dry-deciduous forest patch. The area has the rich cover of deciduous trees. The hills have a mean elevation of 762 metres with the highest points being 1094 metres. Of the total area, 14% constitutes forests. The mean annual rainfall is 1,100 mm of which about 480 mm is received in the southwest monsoon period (June –

September) and 429 mm in the northeast monsoon period (October – December). About half of the soil of the land is red loam clay and sandy soil. The nectarine plant diversity over the area is good, but the only problem is the variation in rainfall, as a result, the flowering is also getting delayed. The flora and fauna data were collection in secondary source the link mention in below table. The common nectar plants. The details of the flora and fauna within a 10 km radius are given in Table 3.24-3.25.

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

- ✦ Permanent or temporary change on land use and land cover.
- ✦ Change in topography of the mine lease area will change at the end of the life of the mine.
- ✦ Problems to agricultural land and human habitations due to dust, and noise caused by movement of heavy vehicles
- ✦ Degradation of the aesthetic environment of the core zone due to quarrying
- ✦ Soil erosion and sediment deposition in the nearby water bodies due to earthworks during the rainy season
- ✦ Siltation of water course due to wash off from the exposed working area

Mitigation Measures

- ✦ The mining activity will be gradual confined in blocks and excavation will be undertaken progressively along with other mitigate measures like phase wise development of greenbelt etc.
- ✦ Construction of garland drains all around the quarry pits and construction of check dam at strategic location in lower elevations to prevent erosion due to surface runoff during rainfall and also to collect the storm water for various uses within the proposed area.
- ✦ Green belt development along the boundary within safety zone. The small quantity of water stored in the mined-out pit will be used for greenbelt
- ✦ Thick plantation will be carried out on unutilized area, top benches of mined out pits, on safety barrier, etc.,
- ✦ At conceptual stage, the land use pattern of the quarry will be changed into Greenbelt area and temporary reservoir.

- ✦ In terms of aesthetics, natural vegetation surrounding the quarry will be retained (such as in a buffer area i.e., 7.5 m, 10m safety barrier and other safety provided) so as to help minimize dust emissions.
- ✦ Proper fencing will be carried out at the conceptual stage, Security will be posted round the clock, to prevent inherent entry of the public and cattle.

11.4.2 Soil Environment

Anticipated Impact

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

Mitigation Measures

- ✦ Run-off diversion – Garland drains will be constructed around the project boundary to prevent surface flows from entering the quarry works areas and will be discharged into vegetated natural drainage lines, or as distributed flow across an area stabilised against erosion.
- ✦ Sedimentation ponds - Run-off from working areas will be routed towards sedimentation ponds. These trap sediment and reduce suspended sediment loads before runoff is discharged from the quarry site. Sedimentation ponds should be designed based on runoff, retention times, and soil characteristics. There may be a need to provide a series of sedimentation ponds to achieve the desired outcome.
- ✦ Retain vegetation – Retain existing or re-plant the vegetation at the site wherever possible.
- ✦ Monitoring and maintenance – Weekly monitoring and daily maintenance of erosion control systems so that they perform as specified specially during rainy season.

11.4.3 Water Environment

Anticipated Impact

- ✦ Surface and ground water resources may be contaminated due to pit water discharge, domestic sewage, discharge of oil and grease bearing waste water from washing of vehicles and machineries, and washouts from surface exposure or working areas
- ✦ As the proposed project acquires 3.0 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 month once) analysis of ground water quality of quarry pit water and ground water of nearby villages will be conducted
- ✦ Artificial recharge structures will be established in suitable locations as part of the rainwater harvesting management program.

11.4.4 AIR ENVIRONMENT

Anticipated Impact

Anticipated increase of the air pollutants due to quarrying activities have been predicted using AERMOD software. 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.

Mitigation Measures

- ✦ 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
- ✦ Controlled blasting will be carried out using suitable explosive charge and short delay detonators, adequate stemming of holes at collar zone
- ✦ Blasting will be restricted to a particular time of the day i.e., at the time of lunch hours
- ✦ Before loading of material water will be sprayed on blasted material
- ✦ Dust mask will be provided to the workers and their use will be strictly monitored
- ✦ 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
- ✦ The un-metalled haul roads will be compacted weekly before being put into use
- ✦ 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
- ✦ Planting of trees all along main mine haul roads and around the project site will be practiced to prevent the generation of dust
- ✦ Dust mask will be provided to the workers and their use will be strictly monitored

11.4.5 Noise Environment

Anticipated Impact

Total noise level in all the sampling areas is well below the CPCB standards for industrial and residential areas. The peak particle velocity produced by the charge of 4.11kg is well below that of 0.3 mm/s as per Directorate General of Mines Safety for safe level criteria through Circular No. 7 dated 29/8/1997.

Mitigation Measures

- ✦ The blasting operations in the cluster quarries will use shallow holes and delay detonators to reduce the ground vibrations
- ✦ Proper quantity of explosives, suitable stemming materials and appropriate delay system will be used during 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
- ✦ 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.

11.4.6 Biological Environment

Anticipated Impact

- ✦ There shall be negligible air emissions or effluents from the project site. During loading the truck, dust generation will be likely. This shall be a temporary effect and not anticipated to affect the surrounding vegetation significantly
- ✦ Most of the land in the buffer area is undulating terrain with crop lands, grass patches and small shrubs. Hence, there will be no effect on flora of the region. There are no trees in mine lease area.
- ✦ Carbon released from quarrying machineries and tippers during quarrying would be 36kg per day, 9710kg per year and 97100kg over ten years
- ✦ 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. There is no fauna in mine lease area.
- ✦ Jawadhu hills is located 1.45km south side of the mine lease area, there is a possibility that the animals there may come into the quarry area.

Mitigation Measures

- ✦ During conceptual stage, the top bench will be re-vegetated by planting local /native species and lower benches will be converted into rainwater harvesting structure following completion of mining activities, which will replace habitat resources for fauna species in this locality over a longer time.
- ✦ Existing roads will be used; new roads will not be constructed to reduce impact on flora.
- ✦ To mitigate carbon emission due to mining activities, we recommend planting trees around the quarry to offset the carbon emission during quarrying. A tree can sequester 35544kg of carbon per year. Therefore, we recommend planting large number of trees around the quarry and near school campuses, government wasteland, roadsides etc.

- ✦ As per the greenbelt development plan as recommended by SEAC (Table 4.11), about 405 trees will be planted within three months from the beginning of mining. These trees, when grown up would sequester carbon of about 97100kg of the total carbon.
- ✦ 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
- ✦ Strict monitoring of labourers and associated workers for any activity related to endangering the life or habitat of forest animals and birds.
- ✦ Strict restrictions will be imposed on the workers at Project sites to ensure that they do not harvest any produce from the natural forests and cause any danger or harm to the animals and birds in forest.
- ✦ The Project authorities will be bound by the rules and regulations of the Wildlife Protection Acts or any such agency of the State, which may exist or will be promulgated from time to time for the preservation of habitats and protection of forest animals.
- ✦ It is to be ensured that the noise levels in no case go above 100-150 dB in the Project area. One of the measures that is proposed to be adopted is that the blasting is to be restricted during nights, early mornings and late afternoons, which are the feeding times of most of the fauna. Blasting will be resorted to only if necessary. For this strict blasting regime i.e. controlled blasting under constant and strict surveillance is to be followed. The suggested methodologies aim at reducing and mitigating noise so as to cause as little disturbance to the animals as possible
- ✦ Each worker shall be provided with identity card and would not be allowed access to forest areas without permission.
- ✦ The workers shall be discouraged for plantation of nonnative species in the surroundings of labor colony.
- ✦ Possession of firearms by Project workers shall be strictly prohibited, except for dedicated security personnel.

11.4.7 Socio Economic Environment

Anticipated Impact

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

Mitigation Measures

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

11.4.8 Occupational Health

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

11.5 Environment Monitoring Program

Table 11.2 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 (1SW & 1 GW)	-	Once in 6 months	Parameters specified under IS:10500,

					1993 & CPCB Norms
4	Hydrology	Water level in open wells in buffer zone around 1 km at specific wells	-	Once in 6 months	Depth in m BGL
5	Noise	2 Locations (1 Core & 1 Buffer)	Hourly – 1 Day	Once in 6 months	Leq, Lmax, Lmin, Leq Day & Leq Night
6	Vibration	At the nearest habitation (in case of reporting)	–	During blasting operation	Peak particle velocity
7	Soil	2 Locations (1 Core & 1 Buffer)	–	Once in six months	Physical and chemical characteristics
8	Greenbelt	Within the project area	Daily	Monthly	Maintenance

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

11.6 ADDITIONAL STUDIES

11.6.1 Risk Assessment

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

11.6.2 Disaster Management Plan

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

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

11.6.3 Cumulative Impact Study

- ✚ The results on the cumulative impact of the seven proposed projects on air environment of the cluster do not exceed the permissible limits set by CPCB for air pollutants.
- ✚ The cumulative results of noise for the habitation in consideration do not exceed the limit set by CPCB for residential areas for day time

- ✦ PPV resulting from seven proposed project is well below the permissible limit of Peak Particle Velocity of 5 mm/s
- ✦ The proposed seven projects will allocate Rs. 35,00,000/- towards CER as recommended by SEAC
- ✦ The proposed seven projects will directly provide jobs to 129 local people, in addition to indirect jobs
- ✦ The proposed seven projects will plant 4615 about trees in and around the lease area.
- ✦ The proposed seven projects will add 107 PCU per day to the nearby roads.

11.7 Project Benefits

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

- ✦ Direct employment to 18 local people
- ✦ 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. 25,25,385** as capital cost and recurring cost as **Rs. 13,84,264** 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. 1,99,36,508**.

CHAPTER XII

DISCLOSURES OF CONSULTANT

The Project Proponent, **R.Purushothaman** 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	S. Gopalakrishnan	EIA Coordinator (EC) In-house	1(a)(i)	HG, GEO	B
2	S. Gopalakrishnan	In-house, FAE	1(a)(i)	GEO	B
3	R.Elavarasan	In-house, FAE	1(a)(i)	EB	B
4	K. Udayakumar	In-house, FAE	1(a)(i)	SE	B
5	Dr. D.Kalaimurugan	In-house, FAE	1(a)(i)	SC	B
6	Dr. R. Arun Balaji	In-house, FAE	1(a)(i)	AP, AQ	B
7	J.N. Manikandan	Empanelled FAE	1(a)(i)	RH, SHW,	B
8	Dr. S. Malar	In-house, FAE	1(a)(i)	WP	B
9	S. Gopalakrishnan	In-house, FAE	1(a)(i)	HG	B
10	P. Venkatesh	In-house, FAE	1(a)(i)	AP	B
11	C. Kumaresan	In-house, FAE	1(a)(i)	NV	B
12	G. Umamaheswaran	In-house, FAE	1(a)(i)	HG, GEO, LU	B
Approved Functional Area Associates					
12	V.Malavika	FAA	1(a)(i)	NV	B
13	P. Dhatchayini	FAA	1(a)(i)	AQ	B
14	M.Arunkumar	FAA	1(a)(i)	WP	B

15	C.Ragul	FAA	1(a)(i)	Geo	B
16	K.Ravichandiran	FAA	1(a)(i)	GEO, HG	B
17	R. Srikrishna	FAA	1(a)(i)	LU, LC	B
18	G.Kavitha	FAA	1(a)(i)	EB, SC	B
Abbreviations					
EC	EIA Coordinator	NV	Noise and Vibration		
FAE	Functional Area Expert	SE	Socio Economics		
FAA	Functional Area Associates	HG	Hydrology, ground water and water conservation		
TM	Team Member	SC	Soil conservation		
GEO	Geology	RH	Risk assessment and hazard management		
WP	Water pollution monitoring, prevention and control	SHW	Solid and hazardous wastes		
AP	Air pollution monitoring, prevention and control	MSW	Municipal Solid Wastes		
LU	Land Use	ISW	Industrial Solid Wastes		
AQ	Meteorology, air quality modelling, and prediction	HW	Hazardous Wastes		
EB	Ecology and bio-diversity	GIS	Geographical Information System		

DECLARATION BY EXPERTS CONTRIBUTING TO THE EIA & EMP

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

Signature : 

Date :

Name : S. Gopalakrishnan

Designation : EIA Coordinator

Name of the EIA Consultant Organization : Geo Technical Mining Solutions

Period of Involvement : Till date

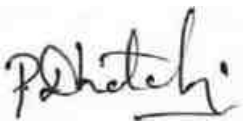
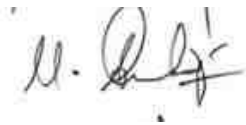
We, the FAEs and FAAs hereby declare that information furnished in this EIA/EMP report for R.Purushothaman rough stone quarry project with the extent of 0.81.0ha situated in the cluster with the extent of 15.85.0ha, in Vinnamangalam Village, Ambur Taluk, Thirupathur District of Tamil Nadu is true and correct to the best of our knowledge.

List of Functional Area Experts Engaged in this Project

S. No.	Functional Area	Involvement	Name of the Experts	Signature
1	AP	- Identification of different sources of air pollution due to the proposed mine activity - Prediction of air pollution and propose mitigation measures / control measures	J.N. Manikandan	
			P. Venkatesh	
2	WP	- Suggesting water treatment systems, drainage facilities - Evaluating probable impacts of effluent/waste water discharges into the receiving environment/water bodies and suggesting control measures.	S. Malar	
3	HG	- Interpretation of ground water table and predict impact and propose mitigation measures. - Analysis and description of aquifer Characteristics	S. Gopalakrishnan	
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.	S. Gopalakrishnan	
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	R. Elavarasan	

		per IUCN list. ○ Impact of the project on flora and fauna. ○ Suggesting species for greenbelt development.		
7	RH	○ Identification of hazards and hazardous substances ○ Risks and consequences analysis ○ Vulnerability assessment ○ Preparation of Emergency Preparedness Plan ○ Management plan for safety.	J.N. Manikandan	
8	LU	○ Construction of Land use Map ○ Impact of project on surrounding land use ○ Suggesting post closure sustainable land use and mitigative measures.	G. Umamaheswaran	
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	Dr. D. Kalaimurugan	
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	V. Malavika	NV, SHW	○ Site visit along with FAE Assistance in report preparation. ○ Assistance to FAE in both primary and secondary data collection ○ Assistance in noise prediction modelling	
2	P. Dhatchayini	AQ	○ Site visit with FAE ○ Assistance to FAE in collection of both primary and secondary data	
3	K.Ravichandiran	HG	○ Field visits along with FAE ○ Assistance to FAE in both primary and secondary data collection	
4	C.Ragul	GEO	○ Field visits along with FAE Assistance to FAE in both primary and secondary data collection	
5	R. Srikrishna	LU & LC	○ Site visit with FAE ○ Provide inputs & Assisting FAE for LU and HG	
6	G.Kavitha	EB, SC	○ Site visit with FAE ○ Collection of Baseline data of Flora and Fauna. ○ Impact of the project on flora and fauna.	
7	M.Arunkumar	WP	○ Field visits along with FAE ○ Assistance to FAE in both primary and secondary data collection	

**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 R.Purushothaman rough stone quarry project with the extent of 0.81.0ha situated in the cluster with the extent of 15.85.0ha, in Vinnamangalam Village, Ambur Taluk, Thirupathur District of 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: 11929
Government of India
Ministry of Environment, Forest and Climate Change
(Issued by the State Environment Impact Assessment Authority(SEIAA),
TAMIL NADU)



Dated 13/05/2025



To,

Thiru. R. Purushothaman
S/o.Ranganathan,No.43, Perumal Kovil street,Vinnamangalam Village,Ambur Taluk, Tirupathur
District , TAMIL NADU, 635807
purushrangu1960@gmail.com

Subject: Grant of Terms of Reference under the provision of the EIA Notification 2006- as amended regarding.

Sir/Madam,

Sub: SEIAA, Tamil Nadu – Proposed Rough stone Quarry over an extent of 0.81.0 Ha in S.F.Nos. 420/1 (Part-6), Vinnamangalam Village, Ambur Taluk, Tirupathur District, Tamil Nadu by Thiru. R. Purushothaman - 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/528541/2025 Dated 10.03.2025.
2. Your application submitted for Terms of Reference dated:11.03.2025.
3. Minutes of the 542nd SEAC meeting held on 26.03.2025.
4. Minutes of the 817th SEAC meeting held on 07.05.2025.

2. The particulars of the proposal are as below :

(i) TOR Identification No.	TO25B0108TN5986349N
(ii) File No.	11929
(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	Vinnamangalam Village Rough Stone Mining Lease
(viii) Name of Company/Organization	R PURUSHOTHAMAN
(ix) Location of Project (District, State)	Tirupathur, TAMIL NADU
(x) Issuing Authority	SEIAA
(xii) Applicability of General 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 07.05.2025. The minutes of the meeting and all the Application and documents submitted [(viz. Form-1 Part A, Part B,)] are available on PARIVESH portal which can be accessed by scanning the QR Code above.
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 Thiru. R. Purushothaman 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, Tirupathur District.
6. Stock File.

Annexure 1

Specific Terms of Reference for (Mining Of Minerals)

1. Seiaa Specific Conditions:

S. No	Terms of Reference
1.1	The Authority noted that the subject was placed in the 542 nd meeting of SEAC-I held on 26.03.2025. After detailed discussions, the Authority accepts the recommendation of SEAC-I and decided to grant Terms of Reference (ToR) along with Public Hearing for the quantity of 1, 15,205 m³ of rough stone and annual peak production shall not exceed 19,825 m³ of rough stone for an ultimate depth of mining of 45m (25m AGL + 20m BGL) as per the approved

S. No	Terms of Reference
	mining plan, under cluster for undertaking the combined Environment Impact Assessment Study and preparation of separate Environment Management Plan subject to the conditions as recommended by SEAC-I & normal conditions & the conditions mentioned below.

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) executing the planned activities. 2. The PP should submit an affidavit to follow the 5m benches properly during mining as per the approved mining plan. 3. Boundary pillars to be erected as per the mine rules and the evidence should be submitted along with the EIA report. 4. Since waterbodies are situated nearby, the PP shall carry out the hydrological study including the details of waterflow pattern to determine the impacts of the mining operation in the waterbodies. 5. The details of enumeration of structures including schools, colleges, primary health centres should be submitted along with the EIA report. 6. 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. 7. 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 Proponent shall carry out Bio diversity study as a part of EIA study and the same shall be included in the Report. 8. 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. 9. The PP shall carry out the comprehensive studies on the cumulative environmental impacts of the existing & proposed quarries which included drilling & blasting, loading & hauling on the surrounding village and structures. 10. The PP shall prepare a conceptual working plan accommodating the inclusion of haul road accessibility keeping the benches intact, by ensuring the slope stability of the working benches to be constructed and existing quarry wall. 11. The PP shall install the CCTV camera for the continuous surveillance of mining activity & furnish the photographic/videographic 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 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

S. No	Terms of Reference
	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 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,

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	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 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

S. No	Terms of Reference
	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 Standard Conditions:

S. No	Terms of Reference
4.1	<u>Cluster Management Committee</u> - 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. - 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 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. - 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. - 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. - 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. - The committee shall furnish action plan regarding the restoration strategy with respect to the individual quarry falling under the cluster in a holistic manner. - 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> - Impact on surrounding agricultural fields around the proposed mining Area. - Impact on soil flora & vegetation around the project site. - 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. - 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. - Action should specifically suggest for sustainable management of the area and restoration of ecosystem for flow of goods and services. - The project proponent shall study and furnish the impact of project on plantations in adjoining patta lands, Horticulture, Agriculture and livestock. <u>Forests</u> - The project proponent shall detailed study on impact of mining on Reserve forests and free ranging wildlife. - The Environmental Impact Assessment should study impact on forest, vegetation, endemic, vulnerable and endangered indigenous flora and fauna. - The Environmental Impact Assessment should study impact on standing trees and the existing trees should be numbered and action suggested for protection. - The Environmental Impact Assessment should study impact on protected areas, Reserve Forests, National Parks, Corridors and Wildlife pathways, near project site.

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	<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 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

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	proposed mine lease area due to the proposed method of mining activity & its related activities covering the entire mine lease period as per precise area communication order issued. Others 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.

Standard Terms of Reference for (Mining of minerals)

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S. No	Terms of Reference
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
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

S. No	Terms of Reference
	ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large, may also be detailed in the EIA Report
1.8	Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided
1.9	The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc. should be for the life of the mine / lease period
1.10	Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given
1.11	Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given
1.12	A Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the 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

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

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

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



GEOLOGY AND MINING DEPARTMENT

From

To

Thiru.S.Loganathan, M.Sc.,M.Tech.,
Assistant Director,
Geology and Mining,
Tirupathur .

Thiru.R.Purushothaman,
S/o. Ranganthan,
No.43, Perumal Kovil Street,
Vinnamangalam Village,
Ambur Taluk,
Tirupattur District.

Rc. No.13/2024(Mines), dated.02.09.2024.

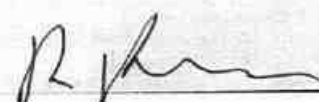
Sir,

Sub: Mines and Minerals - Minor Mineral - Rough stone -
Mines and Minerals - Minor Mineral - Rough stone -
Tirupathur District - Ambur Taluk - Vinnamangalam
Village - Govt. Poramboke land - S.F. No. 420/1(Part-6) -
Over an extent of 0.81.00 Hects - Application preferred by
Thiru.Purushothaman - Declared as highest bidder -
Precise Area Communicated - Draft Mining Plan
submitted - Approval accorded - Details of quarries within
500 mts radius - Requested - Regarding.

- Ref:**
1. Tirupathur District Gazette Notification No.04,
dated.08.02.2024
 2. Application preferred by Thiru.Purushothaman S/o.
Ranganathan dated.26.02.2024.
 3. Precise Area Communication letter Rc No.
13/2024(Mines), dated.15.03.2024
 4. Letter from Thiru.Purushothaman along with draft
mining plan Received on 10.06.2024.
 5. Mining Plan approved by the Assistant Director,
Department of Geology and Mining, Tirupattur vide
letter Rc.No.13/2024(Mines).dated.02.09.2024.

In the above reference 1st cited, the District Administration had issued District Gazette Notification No.04, dated.08.02.2024 to conduct tender cum auction for 12 Roughstone quarries on 28.02.2024 in Tirupathur District.

2) Thiru.R.Purushothaman S/o. Ranganthan, No.43, Perumal Kovil Street, Vinnamangalam Village, Ambur Taluk, Tirupathur District has declared as highest bidder and Precise Area was communicated by the Assistant Director to the highest bidder with a direction to submit the mining plan for the S.F. No. 420/1(Part-6) over an extent of 0.81.00 Hects of Vinnamangalam Village, Ambur Taluk, Tirupathur District as stipulated in Rule 42 of Tamil Nadu Minor Mineral Concession Rules, 1959. Accordingly,



Thiru.R.Purushothaman has submitted the draft Mining Plan and the same have been approved on 02.09.2024.

3) In this connection, the applicant has requested to furnish the details of quarry lease / mining lease situated within 500 mts radius from the subject quarry for obtaining Environment Clearance from the State level Environment Impact Assessment Authority.

Hence, the following existing, abandoned / expired and proposed quarries are located within 500m radius distance from the proposed area.

a. Existing quarries

Sl No	Name of the Owner	Village	S.F.No.	Extent (in hecets)	Collector's Proceedings No & date	Lease period
1.	V.Rajkamal	Vinnamanglaam	419 (Part-7)	0.81.0	District Collector, Vellore Proceedings Rc.No.367/2019	05.07.2021 to 04.07.2031
2.	C.Sambath	Vinnamanglaam	419 (P-1A)	1.00.0	District Collector, Vellore Proceedings Rc.No.364/2019	10.08.2023 to 19.08.2028 (5 years)
3.	B.,Sathishkumar	Vinnamanglaam	419 (P-5)	2.00.0	District Collector, Vellore Proceedings Rc.No.365/2019	01.07.2022 to 30.06.2032 (10 years)
4.	K.Dineshkumar	Vinnamanglaam	416 (P-4)	2.00.0	District Collector, Vellore Proceedings Rc.No.370/2019	24.03.2023 to 23.03.2033 (10 years)
5.	V.Jawahar Babu	Vinnamanglaam	416 (P-2)	0.81.0	District Collector, Vellore Proceedings Rc.No.368/2019	15.02.2021 to 14.02.2031 (10 years)



b. Expired / Abandoned quarries

Sl No	Name of the Owner	Village	S.F. No.	Extent (in hec)	Collector's Proceedings No	Lease period
1.	E.Selvaraj	Vinnamangalam	419 (P-2)	0.80.0	District Collector, Vellore Proceedings Rc.No.781/2 015	18.02.2019 to 17.02.2024 (5 years)
2.	B.Karthick	Vinnamangalam	419 (P-1)	1.00.0	District Collector, Vellore Proceedings Rc.No.782/2 015	28.12.2016 to 27.12.2021 (5 years)

c. Present proposed quarries

Sl No	Name of the Owner	Village	S.F. No.	Extent (in hec)
1.	Selvam	Vinnamangalam	420/1(Part-5)	2.00.0
2.	RDS Infrastructure	Vinnamangalam	419(P-4)	1.00.0
3.	B.Karthick	Vinnamangalam	420/1(Part-5)	1.00.0
4.	Paranthaman	Vinnamangalam	416/35(P-5)	1.62.0
5.	Janarthanan	Vinnamangalam	419(P-9)	0.80.0
6.	R.Purushothaman	Vinnamangalam	420/1(Part-6)	0.81.0


 Assistant Director,
 Geology and Mining,
 Tirupathur

Copy to:

The Chairman,
 State Level Environment Impact,
 Assessment Authority, Tamil Nadu,
 3rd Floor, Panagal Maaligai,
 No.1 Jeenis Road,
 Saidapet, Chennai-15.


 02.09.2024



From

Thiru.S.Loganathan, M.Sc.,M.Tech.,
Assistant Director,
Geology and Mining,
Tirupathur .

To

Thiru.R.Purushothaman,
S/o. Ranganthan,
No.43, Perumal Kovil Street,
Vinnamangalam Village,
Ambur Taluk,
Tirupattur District.

Rc. No.13/2024(Mines),dated.02.09.2024

Sir,

Sub: Mines and Minerals - Minor Mineral - Rough stone -
Tirupathur District - Ambur Taluk - Vinnamangalam
Village - Govt. Poramboke land - S.F. No. 420/1(Part-6) -
Over an extent of 0.81.00 Hects - Application preferred by
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Ref: 1. Tirupathur District Gazette Notification No.04,
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One Thiru.R.Purushothaman S/o. Ranganthan, No.43, Perumal Kovil Street, Vinnamangalam Village, Ambur Taluk, Tirupathur District has declared as highest bidder and Precise Area was communicated by the Assistant Director to the highest bidder with a direction to submit the mining plan for the S.F.No. 420/1(Part-6) over an extent of 0.81.00 Hects of Vinnamangalam Village, Ambur Taluk, Tirupathur District as stipulated in Rule 41 of Tamil Nadu Minor Mineral Concession Rules, 1959.

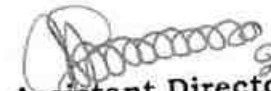


Accordingly, Thiru.R.Purushothaman S/o. Ranganthan has submitted the draft Mining Plan and the same has been examined in detail and found correct. The mining plan submitted by Thiru.R.Purushothaman in respect of the subject area is approved subject to the following conditions:

- (i). That the mining plan is approved without prejudice to any other Law applicable to the quarry lease from time to time whether such Laws are made by the Central Government, State Government or any other authority.
- (ii). This approval of the mining plan does not in any way imply the approval of the Government in terms of any other provisions of the Mines and Minerals (Development and Regulation) Act, 1957, or any other connected laws including Forest (Conservation) Act, 1980, Forest Conservation Rules, 1981, Environment Protection Act, 1980, Indian Explosives Act, 1884(Central Act IV of 1884) and the rules made there under the Tamil Nadu Minor Mineral Concession Rules, 1959.
- (iii). That the mining plan is approved without prejudice to any other order or direction from any court of competent jurisdiction.
- (iv). Quarrying shall be done as per the approved Mining Plan and that the mining plan is approved without prejudice to any other law applicable to the quarry lease from time to time whether such laws are made by the Central Government, State Government or any other authority.
- (v). If anything is found to be concealed as required by the Mines Act in the contents of the Mining Plan and the proposal for rectification has not been made, the approval shall be deemed to have been withdrawn with immediate effect.
- (vi). Waste material should be dumped within the lease granted area as earmarked in the Mining Plan.
- (vii). Quarrying operations and production shall be carried out as per the approved Mining Plan and the applicant shall be liable to pay the cost of mineral if there is any deviation in the quantum indicated

- 175-
- in the approved year wise quantum of production and any such cases as on date are to be dealt with as per Court direction.
- (viii). If any violation is found during quarrying operation, the penal provisions of Tamil Nadu Minor Mineral Concession Rules 1959 and other rules and act in force will attract.
- (ix). The applicant shall strictly adhere to the statutory and safety requirements.

Encl: Approved Mining Plan.


Assistant Director,
Geology and Mining,
Tirupathur. 2/9/24

Copy To:

The Commissioner,
Department of Geology and Mining,
Guindy, Chennai - 600 032


02092024





MINING PLAN

FOR

VINNAMANGALAM VILLAGE ROUGH STONE MINING LEASE WITH PROGRESSIVE
QUARRY CLOSURE PLAN

Govt Poramboke land /Open Cast-Semi-Mechanized mining/Non- Forest/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 : TIRUPATHUR
TALUK : AMBUR
VILLAGE : VINNAMANGALAM
S.F. No : 420/1 (Part-6)
EXTENT : 0.81,0 Hectares

ADDRESS OF THE APPLICANT

Mr. R.Purushothaman,
S/o.Ranganathan,
No.43, Perumal Kovil street,
Vinnamangalam Village,
Ambur Taluk,
Tirupathur District- 635807.

PREPARED BY

P.VELLAIYAN, M.Sc., M.Phil.,
Qualified Person
D.No.6-106-B, Athirampatti Village,
Amaragundhi Panchayat & Post,
Omalur Taluk,
Salem District-636 503.
Mob: +91 7010076626, 9751256465



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R. M.



ANNEXURES

Sl. No.	Description	Annexure No.
1.	Copy of District Tender Gazette	I
2.	Copy of precise area communication letter	II
3.	Copy of FMB (Field Measurement book)	III
4.	Copy of "A" register	IV
5.	Photo copy of the applied lease area	V
6.	Copy of ID Proof of the authorized signatory	VI
7.	Copy of Qualified Person Certificate	VII



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 & Sections	III	Plan 1:1000 Sections Hor 1:1000 Ver 1:500
8	Conceptual Plan & Sections	IV	Plan 1:1000 Sections Hor 1:1000 Ver 1:500
9	Mine Layout Plan and Land Use Pattern	V	Plan 1:1000
10	Year wise Development, Production Plan & Sections	VI	Plan 1:1000 Sections Hor 1:1000 Ver 1:500



Mr. R.Purushothaman,
S/o.Ranganathan,
No.43, Perumal Kovil street,
Vinnamangalam Village,
Ambur Taluk,
Tirupathur District- 635807.

CONSENT LETTER FROM THE APPLICANT

The Mining Plan in respect of rough stone quarry lease in Government Poramboke land at S.F.No: 420/1 (Part-6), over an extent of 0.81.0 hectares of Vinnamangalam Village, Ambur Taluk, Tirupathur District, Tamil Nadu State has been prepared by

Mr. P.VELLAIYAN, M.Sc., M.Phil., Qualified Person

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

P.VELLAIYAN, M.Sc., M.Phil.,
Qualified Person
D.No.6-106-B, Athirampatti Village,
Amaragundhi Panchayat & Post,
Omalur Taluk,
Salem District-636 503.
Mob: +91 7010076626, 9751256465

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: Tirupathur, TN.
Date:


Signature of the applicant
(R.Purushothaman)





Mr. R.Purushothaman,
S/o.Ranganathan,
No.43, Perumal Kovil street,
Vinnamangalam Village,
Ambur Taluk,
Tirupathur District- 635807.

DECLARATION

The Mining Plan in respect of rough stone quarry lease in Government Poramboke land at S.F.No: 420/1 (Part-6), over an extent of 0.81.0hectares of Vinnamangalam Village, Ambur Taluk, Tirupathur 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: Tirupathur, TN.

Date:


Signature of the applicant
(R.Purushothaman)





P.VELLAIYAN, M.Sc., M.Phil.,
Qualified Person
D.No.6-106-B, Athirampatti Village,
Amaragundhi Panchayat & Post,
Omalur Taluk,
Salem District-636 503.
Mob: +91 7010076626, 9751256465

CERTIFICATE

This is to certify that, the provisions of 8(6)(B) & 8(8) Tamil Nadu Minor Minerals Concession Rules, 1959 have been observed in the Mining Plan for the grant of rough stone quarry lease in S.F.No: 420/1 (Part-6), over an extent of 0.81.0 hectares of Vinnamangalam Village, Ambur Taluk, Tirupathur District, Tamil Nadu State granted to **Mr.R.Purushothaman, Tirupathur 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: Salem, TN

Date:

Signature of the Qualified Person

P.VELLAIYAN, M.Sc., M.Phil.,
Qualified Person
D.No. 6-106-B, Athirampatti (Vill),
Amaragundhi Panchayat & Post,
Omalur Taluk, Salem District - 636503.

-191-



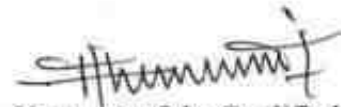
P.VELLAIYAN, M.Sc., M.Phil.,
Qualified Person
D.No.6-106-B, Athirampatti Village,
Amaragundhi Panchayat & Post,
Omalur Taluk,
Salem District-636 503.
Mob: +91 7010076626, 9751256465

CERTIFICATE

I certify that, in preparation of Mining Plan for rough stone quarry lease in S.F.No:420/1 (Part-6) over an extent of 0.81.0 hectares of Vinnamangalam Village, Ambur Taluk, Tirupathur District, Tamil Nadu State prepared to **Mr.R.Purushothaman**, Tirupathur 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: Salem, TN

Date:



Signature of the Qualified Person

P. VELLAIYAN, M.Sc, M.Phil.,
Qualified Person
D.No. 6-106-B, Athirampatti (Vill),
Amaragundhi Panchayat & Post,
Omalur Taluk, Salem District - 636503.

MINING PLAN

FOR VINNAMANGALAM VILLAGE ROUGH STONE MINING LEASE WITH PROGRESSIVE QUARRY CLOSURE PLAN

Govt Poramboke land / Open cast-Semi-Mechanized mining/Non-forest/Captive Use

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 Mr.R.Purushothaman, S/o.Ranganathan, No.43, Perumal Kovil street, Vinnamangalam Village, Ambur Taluk, Tirupathur District – 635807, Tamilnadu State and got auction of quarry lease for Rough stone in S.F.No.420/1 (Part-6), over an extent of 0.81.0hectares of Vinnamangalam Village, Ambur Taluk, Tirupathur District, Tamil Nadu State. Special publication Rc.No.76/(Mines)/2023, dated 06.02.2024 for eligible Govt Poramboke land quarry lease through tender cum action published in the Tirupathur district gazette notification No.4 dated 08.02.2024. On behalf of District Collector, the special officer appointed by District Collector had conducted the tender and the auction held on 28.02.2024, Mr.R.Janarthanan of Tirupathur district has bid the highest amount is Rs.63,00,000/-.

Therefore, the District Collector granted rough stone quarry lease in government poramboke land for a period of 10 years in S.F.No: 420/1 (Part-6), over an extent of 0.81.0Hectare, Vinnamangalam Village, Ambur Taluk, Tirupathur District.

- b) **The Precise area communication letter:** The Assistant Director, Department of Geology and mining, Tirupathur has directed to the applicant Mr.R.Purushothaman, through his precise area communication letter vide Roc.No.13/2024/(Mines) Dated 15.03.2024, for quarrying lease rough stone at Tamil Nadu State, Tirupathur District, Ambur Taluk, Vinnamangalam Village in S.F.No: 420/1 (Part-6) over an extent of 0.81.0 hectares has recommended as following conditions for a period of Ten (10) years under Rule 8(6)(B) & 8(8), Tamil Nadu Minor Mineral concession rules, 1959.

- i. Tamil Nadu Minor Mineral Concession Rules, 1959 as found in Schedule II, requires that the amount of seniority in respect of mined minerals be paid from time to time and the mineral transported.



- ii. Excavation work should be carried out leaving a safety distance of 7.5m to adjacent patta lands and 10m to government lands.
- iii. Excavation work should be carried out leaving a 10m safety distance to nearby village road and cart road.
- iv. Excavation work should be carried out leaving a safety distance of 50m from nearby power lines/poles, water bodies, national highways, railways, ancient monuments, temples and buildings.
- v. Quarry work should be carried out leaving a safety distance of 300m to nearby habitations and Archaeological/Ancient Monuments.
- 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.13/2024/ (Mines) Dated 15.03.2024.**
- d) **Geological resources and Mineable reserves:** Geological resource of estimated as **246500m³** including the resources of safety zone, topsoil etc. Of which, rough stone resources of about **239825m³** and residual topsoil is **6675m³**. The total mineable reserve is estimated to be **118149m³** by deducting the reserve safety zone, block in benches from the total Geological resources. of which, rough stone is about **115205m³** and residual topsoil is **2944m³** up to a depth of 45m (Which is 25m above ground level + 20m below ground level) (Refer Plate No. III & IV).
- e) **Proposed Production Schedule:** Total proposed production of rough stone is **115205m³** and residual topsoil is **2944m³** up to a depth of 45m (Which is 25m above ground level + 20m below ground level) for ten years plan period. (Refer Plate No. VI).
- f) **Environmental Sensitivity of the proposed lease area: -**
- i). **Interstate boundary:** There is no interstate boundary around 10Km radius periphery of proposed lease area.
- ii). **Wildlife Protection Act, 1972:** There is no wild life animal sanctuary within radius of 10Km from the project site area under the Wildlife (Protection) Act, 1972.
- iii). **Indian Reserve Forest:** There is no Reserved Forest is situated around 60m radius from the lease area.

R. Pin



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

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

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

1.0 GENERAL:

a.	Name of the Applicant	:	Mr. R.Purushothaman,
	Applicant address	:	S/o.Ranganathan, No.43, Perumal Kovil street, Vinnamangalam Village, Ambur Taluk,
	District	:	Tirupathur.
	State	:	Tamilnadu
	Pin code	:	635807
	Phone	:	Nil
	Fax	:	Nil
	Gram	:	Nil
	Telex	:	Nil
	E-mail	:	-----
b.	Status of the Applicant		
	Private individual	:	Private Individual
	Cooperative Association	:	---
	Private company	:	---
	Public Company	:	--

R. Purushothaman



	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 quarry lease
d.	Period for which the mining lease granted /renewed/ proposed to be applied	:	The precise area has been communicated to the applicant for quarrying period of Ten (10) years.
	Name of the QP preparing the Mining Plan	:	P.Vellaiyan, M.Sc., M.Phil.,
	Address	:	D.No.6-106-B, Athirampatti Village, Amaragundhi Panchayat & Post, Omalur Taluk, Salem District-636 503.
	Phone	:	+91 7010076626, 9751256465
	Fax	:	Nil
	e-mail	:	pvellaiyangp@gmail.com
	Telex	:	Nil
	Registration number	:	Nil
	Date of grant/renewal	:	Nil
	Valid upto	:	Nil
f.	Reference No. and date of consent letter from the state government	:	The precise area communication letter issued by the Assistant Director, Department Geology and Mining, Tirupathur vide Roc.No.13/2024/(Mines) Dated 15.03.2024

2.0 LOCATION AND ACCESSIBILITY:

a.	Details of the Area:	:	Refer plate no: IA & IB
	District & State	:	Tirupathur, Tamil Nadu
	Taluk	:	Ambur
	Village	:	Vinnamangalam
	Khasra No./ Plot No./ Block Range/ Felling Series etc.:		
	Survey No.	Sub division	Total Extent in Hect
	420	1 (Part-6)	0.81.0
	Total		0.81.0
	Patta No.	Ownership / Occupancy	
	---	Govt Poramboke land	

[Handwritten signature]

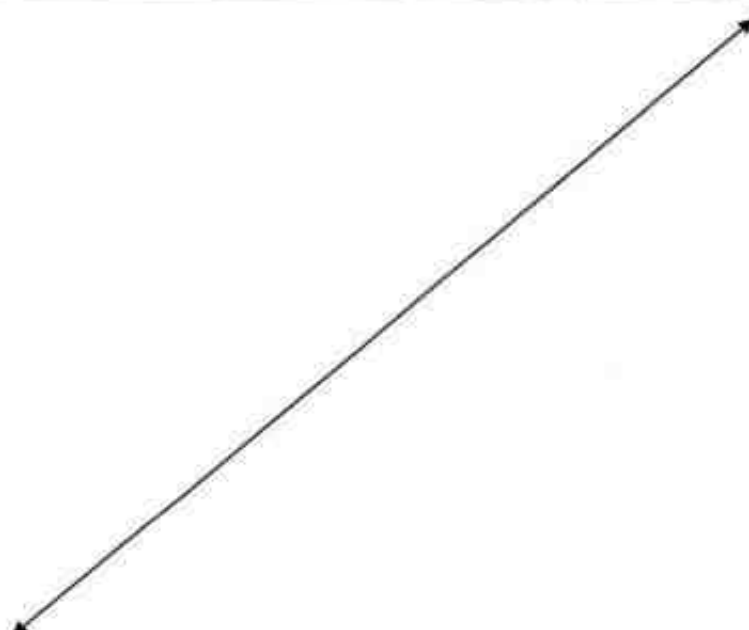
Lease area (hectares)	: 0.81.0 Hectares															
Whether the area is recorded to be in forest (please specify whether protected, reserved, etc)	: It is a Government Poramboke Land															
Ownership / Occupancy	: Government of Tamil Nadu															
Existence of Public Road / Railway line if any nearby and approximate distance	: ✓ Exploited quarry materials will be transported through the cart road is situated on the west side. ✓ There is an NH-4 is situated on the western side about 1.6m which is connecting Bangalore-Chennai Road. ✓ There is no SH road situated around 5km radius from the lease area. ✓ There is a railway line is situated on the western side about 1.4km.															
Toposheet No. with latitude and longitude	: Toposheet No. 57 L/10 Latitude: From 12°43'28.39"N to 12°43'32.11"N Longitude: From 78°41'50.45"E to 78°41'54.59"E															
Geo-Coordinates of the lease boundary:																
<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="width: 25%;">PILLAR ID</th> <th style="width: 25%;">LATITUDE</th> <th style="width: 25%;">LONGITUDE</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>12°43'31.25"N</td> <td>78°41'54.59"E</td> </tr> <tr> <td>2</td> <td>12°43'28.39"N</td> <td>78°41'52.97"E</td> </tr> <tr> <td>3</td> <td>12°43'29.25"N</td> <td>78°41'50.45"E</td> </tr> <tr> <td>4</td> <td>12°43'32.11"N</td> <td>78°41'52.07"E</td> </tr> </tbody> </table>		PILLAR ID	LATITUDE	LONGITUDE	1	12°43'31.25"N	78°41'54.59"E	2	12°43'28.39"N	78°41'52.97"E	3	12°43'29.25"N	78°41'50.45"E	4	12°43'32.11"N	78°41'52.07"E
PILLAR ID	LATITUDE	LONGITUDE														
1	12°43'31.25"N	78°41'54.59"E														
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3	12°43'29.25"N	78°41'50.45"E														
4	12°43'32.11"N	78°41'52.07"E														
Land use pattern (Forest, Agricultural, Grazing, Barren etc.)	: It is an barren 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</i>	: Refer plate no-IA & IB															



the case may be. However if none of these are available, the area should be shown on an accurate sketch map on scale of 1 : 5000.

i) INFRASTRUCTURE AND COMMUNICATION:

S.No	Description	Place	Distance	Direction
a.	Nearest post office	Minnur	2.3Km	West
b.	Nearest police station	Ambur	6.9km	North
c.	Nearest fire station	Ambur	7.0km	North
d.	Nearest medical facility	Melsanangkuppam	4.7km	West
e.	Nearest school	Nacharkuppam	2.2km	Northeast
f.	Nearest railway station	Vinnamangalam	2.1km	West
g.	Nearest port facility	Chennai	176km	Northeast
h.	Nearest airport	Bengaluru	119.5km	West
i.	Nearest DSP office	Ambur	6.7km	North
j.	Nearest villages	Vinnamangalam	1.7km	North
		Kamiyampattu Pudur	0.8km	Northeast
		Vellakkal	5.2km	South
		Minnur	1.9km	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 Hillock topography. The maximum elevation (430m) was observed center of the site, while the minimum elevation (405m) was observed Northern side of the site. The slope is towards North side and falls in Toposheet no. 57 L/10.
-----	------------	---	---

- (ii) **General Geology of the District:**
- a) **Geology:** The major part of the district is covered by metamorphosed crystalline rocks of the Charnockite Group and the Migmatite Complex of Archaean age. The area where the Charnockite Group of rocks is spread over comprises Charnockite, pyroxene granulite, magnetite quartzites and younger basic dykes intruding into them. The Migmatite Complex comprising biotite gneisses.
 - b) **Soils:** The analysis of the soil type reveals that the proposed lease area is predominantly covered by red with loamy soils.
 - c) **Lineaments:** Lineaments trending majorly NW-SE, NE-SW and E-W mark the major drainage network in Palar River drainage basin. Lower order streams and higher order streams follow NW-SE, NE-SW lineaments. The data have been checked by field studies and Survey of India topographical maps at the 1:1,00,000 scales.

Age	Group	Rock Formation
Recent to Sub recent	---	Red Soil (1-3m Thick)
Archean to Lower Proterozoic	Migmatite complex	Biotite gneisses, Agmatitic gneisses, Sub-augen gneiss, Quartzofeldspathic gneisses and gneissic granites
Archean	Charnockite Group	Charnockite, pyroxene granulite, quartzite's and younger basic dykes

- (iii) **Local / Mine Geology of The Mineral Deposit:**
- Topography of the proposed lease area:**
- The applied lease area exhibits an almost hillock and the maximum

R. P. M.



elevation 430m was observed center of the site, while the minimum elevation (405m) was observed North side of the site. The rocks exhibits layered, medium to coarse grained hornblende biotite, orthopyroxene charnockite gneiss.

The Residual topsoil is obtained the slope of the hillock average of 0-1.0m and a rough stone starts from 0m to 45m (R.L.430-385m) from top of the hillock. 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,

Age	Group	Rock Formation
Recent to Sub recent	---	Topsoil
Archaean	Charnockite Group	Charnockites.

(iv)	Drainage Pattern	:	There is no major river found within 50m radius. The drainage in the area is sub-dendritic in nature.
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(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.
--	--------------------	---	---

R. P. [Signature]



	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. III
(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.		

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

The geological resources were computed by cross section method with respect to the boundaries of the lease area. In this method, the lease area was divided into one longitudinal and transverse section to calculate the volume of material up to the depth of 45m (which is 25m above ground level and 20m below ground level) for ten years plan period. (Refer Plate No. III). The one longitudinal and transverse cross section were assigned XY-AB as respectively. Using the cross-sectional method, total reserve is estimated to be **246500m³** including the resources of safety zone, and residual topsoil, etc. Of which, rough stone resources of about **239825m³** and residual topsoil is **6675m³**.

Geological Resources								
Section	Level	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume In M ³	Rough Stone in M ³	Residual Top soil in M ³
XY-AB	Above Ground Level	---	89	75	1	6675	.....	6675
		I	47	24	5	5640	5640	.....
		II	58	37	5	10730	10730	.....
		III	65	43	5	13975	13975	.....
		IV	72	51	5	18360	18360	.....
		V	91	64	5	29120	29120	.....
	Below Ground Level	VI	100	81	5	40500	40500	.....
		VII	100	81	5	40500	40500	.....
		VIII	100	81	5	40500	40500	.....
		IX	100	81	5	40500	40500	.....
TOTAL						246500	239825	6675

K. R. Patil



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

The total mineable reserve is estimated to be **118149m³** by deducting the reserve safety zone, block in benches from the total Geological resources up to a depth of 45m (which is 25m above ground level and 20m below ground level). Of which, rough stone is about **115205m³** and residual topsoil is **2944m³**. 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).

Mineable Reserves								
Section	Level	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume In M ³	Rough Stone in M ³	Residual Top soil in M ³
XY-AB	Above Ground Level	---	64	46	1	2944	.....	2944
		I	47	24	5	5640	5640	.....
		II	58	37	5	10730	10730	.....
		III	65	43	5	13975	13975	.....
		IV	72	51	5	18360	18360	.....
		V	80	61	5	24400	24400	.....
	Below Ground Level	VI	70	51	5	17850	17850	.....
		VII	60	41	5	12300	12300	.....
		VIII	50	31	5	7750	7750	.....
		IX	40	21	5	4200	4200	.....
TOTAL						118149	115205	2944

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 rough stone is about 115205m³ and residual		

R. Sharma

topsoil is 2944m³ up to a depth of 45m (which is 25m above ground level and 20m below ground level) for ten years plan period. (Refer Plate No's. VI).

Year	Pit No.(s)	Topsoil/ Overburden (m ³)	ROM (m ³)	Saleable rough stone (m ³) @ 100%	Rough stone rejects(m ³)	Sub grade/ Weathered rock (m ³)	Saleable Gravel (m ³)	Rough stone to waste ratio
I	I	2944	19314	16370	...	...	...	1:0.17
II	I	...	18310	18310	...	...	...	...
III	I	...	18600	18600	...	...	...	...
IV	I	...	19825	19825	...	...	...	...
V	I	...	17850	17850	...	...	...	...
VI	I	...	5125	5125	...	...	...	...
VII	I	...	5125	5125	...	...	...	...
VIII	I	...	4840	4840	...	...	...	...
IX	I	...	4960	4960	...	...	...	...
X	I	...	4200	4200	...	...	...	...
Total	—	2944	118149	115205	...	...	...	1:0.17

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	Level	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume In M ³	Rough Stone in M ³	Residual Top soil in M ³
I-Year	XY-AB	AGL	---	64	46	1	2944	.....	2944
			I	47	24	3	5640	5640	.....
			II	58	37	3	10730	10730	.....
TOTAL							19314	16370	2944
II-Year	XY-AB	AGL	III	65	42	3	13975	13975	.....
			IV	17	31	3	4335	4335	.....
TOTAL							18310	18310	0
III-Year	XY-AB	AGL	IV	55	31	3	14025	14025	.....
			V	15	61	3	4575	4575	.....
TOTAL							18600	18600	0
IV-Year	XY-AB	AGL	V	65	61	3	19825	19825	.....
			TOTAL							19825	19825	0
V-Year	XY-AB	BGL	VI	70	31	3	17850	17850	.....
			TOTAL							17850	17850	0
VI-Year	XY-AB	BGL	VII	25	41	3	5125	5125	.....
			TOTAL							5125	5125	0
VII-Year	XY-AB	BGL	VII	25	41	3	5125	5125	.....
			TOTAL							5125	5125	0
VIII-Year	XY-AB	BGL	VII	10	41	3	2050	2050	.....
			VIII	18	31	3	2790	2790	.....
TOTAL							4840	4840	0
IX-Year	XY-AB	BGL	VIII	32	31	3	4960	4960	.....
			TOTAL						
X-Year	XY-AB	BGL	IX	40	21	3	4200	4200	
			TOTAL						
GRAND TOTAL							118149	115205	2944

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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> <table style="width: 100%; margin-left: 40px;"> <tr> <td>Mineable reserves of rough stone (10 Years)</td> <td style="text-align: right;">=</td> <td style="text-align: right;">115205m³</td> </tr> <tr> <td>Annual Peak production</td> <td style="text-align: right;">=</td> <td style="text-align: right;">19825m³</td> </tr> </table>			Mineable reserves of rough stone (10 Years)	=	115205m ³	Annual Peak production	=	19825m ³																																																							
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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 45m (which is 25m above ground level and 20m below ground level) (R.L.430m to 385m) 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 <table border="1" style="width: 100%; margin-top: 10px; border-collapse: collapse;"> <thead> <tr> <th colspan="6" style="text-align: center;">SECTION XY-AB</th> </tr> <tr> <th style="text-align: center;">Bench</th> <th style="text-align: center;">Period</th> <th style="text-align: center;">Overburden/ Mineral</th> <th style="text-align: center;">L (m)</th> <th style="text-align: center;">W (m)</th> <th style="text-align: center;">D (m)</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">---</td> <td rowspan="10" style="text-align: center; vertical-align: middle;">Ten years Period</td> <td style="text-align: center;">Residual Topsoil</td> <td style="text-align: center;">64</td> <td style="text-align: center;">46</td> <td style="text-align: center;">1</td> </tr> <tr> <td style="text-align: center;">I</td> <td rowspan="9" style="text-align: center; vertical-align: middle;">Rough stone</td> <td style="text-align: center;">47</td> <td style="text-align: center;">24</td> <td style="text-align: center;">5</td> </tr> <tr> <td style="text-align: center;">II</td> <td style="text-align: center;">58</td> <td style="text-align: center;">37</td> <td style="text-align: center;">5</td> </tr> <tr> <td style="text-align: center;">III</td> <td style="text-align: center;">65</td> <td style="text-align: center;">43</td> <td style="text-align: center;">5</td> </tr> <tr> <td style="text-align: center;">IV</td> <td style="text-align: center;">72</td> <td style="text-align: center;">51</td> <td style="text-align: center;">5</td> </tr> <tr> <td style="text-align: center;">V</td> <td style="text-align: center;">80</td> <td style="text-align: center;">61</td> <td style="text-align: center;">5</td> </tr> <tr> <td style="text-align: center;">VI</td> <td style="text-align: center;">70</td> <td style="text-align: center;">51</td> <td style="text-align: center;">5</td> </tr> <tr> <td style="text-align: center;">VII</td> <td style="text-align: center;">60</td> <td style="text-align: center;">41</td> <td style="text-align: center;">5</td> </tr> <tr> <td style="text-align: center;">VIII</td> <td style="text-align: center;">50</td> <td style="text-align: center;">31</td> <td style="text-align: center;">5</td> </tr> <tr> <td style="text-align: center;">IX</td> <td style="text-align: center;">40</td> <td style="text-align: center;">21</td> <td style="text-align: center;">5</td> </tr> <tr> <td colspan="5" style="text-align: center;">Total Depth</td> <td style="text-align: center;">45</td> </tr> </tbody> </table>			SECTION XY-AB						Bench	Period	Overburden/ Mineral	L (m)	W (m)	D (m)	---	Ten years Period	Residual Topsoil	64	46	1	I	Rough stone	47	24	5	II	58	37	5	III	65	43	5	IV	72	51	5	V	80	61	5	VI	70	51	5	VII	60	41	5	VIII	50	31	5	IX	40	21	5	Total Depth					45
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[Handwritten Signature]



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)	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

R. Phin



	and 4(d) will suffice	loaded directly to the tippers and transported to the needy customer. Bench height = 5mts. Bench width = 5mts.					
	a. Details of Topsoil/ Overburden	The residual topsoil of 2944m³ shall be removed.					
	b. Rough Stone waste and side burden waste:-	The recovery of rough stone 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	2	32 mm	Hand held	--	Diesel	--
	Compressor	1	---	Air	--	Diesel	--
(2) Loading Equipment:							
	Type	Nos	Size / Capacity	Make	Motive power	H.P.	
	Hydraulic Excavator	1	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	7	--	--	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.					

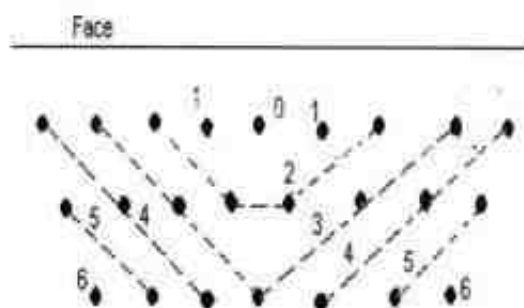
R. P.



	i) Ore transported by: own trucks / hired trucks	Hired trucks for initially production purpose																				
	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:																					
	<table border="1"> <thead> <tr> <th>Type</th><th>Nos</th><th>Size / Capacity</th><th>Make</th><th>Motive power</th><th>H.P.</th></tr> </thead> <tbody> <tr> <td>--</td><td>--</td><td>--</td><td>--</td><td>--</td><td>--</td></tr> </tbody> </table>	Type	Nos	Size / Capacity	Make	Motive power	H.P.	--	--	--	--	--	--									
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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 = 115205m³																					
	<table border="1"> <thead> <tr> <th colspan="2">BLAST DESIGN</th></tr> </thead> <tbody> <tr> <td>Blasthole Diameter (D) in mm</td><td>32</td></tr> <tr> <td>Burden (B) in m</td><td>1.2</td></tr> <tr> <td>Spacing (S) in m</td><td>1.38</td></tr> <tr> <td>Subdrill in m</td><td>0.5</td></tr> <tr> <td>Charge length (C) in m</td><td>0.70</td></tr> <tr> <td>Stemming</td><td>0.5</td></tr> <tr> <td>Hole Length (L) in m</td><td>1.2</td></tr> <tr> <td>Bench Height (BH) in m</td><td>2.5</td></tr> <tr> <td>Mass of explosive/hole in g</td><td>437.5</td></tr> </tbody> </table>		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
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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	41
Number of blast holes/day	10
Number of blast round/day	1
Blasthole pattern	Staggered
Mass of explosive /day in kg	4.35
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



Staggered method of mining

b) Type of explosives used / to be used:

Following explosives are recommended for efficient blasting with safe practice.

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

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

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

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

Delay detonators:

Delay blasting permits to divide the shot to smaller charges, which are detonated in a predetermined millisecond sequence at specific time intervals. The 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	:	10holes
Yield	:	41m ³
Total explosive required	:	4.35kg-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 55m in summer and 50m in rainy season from the general ground level observed in the adjacent bore well.
- b) Workings expected to be _____ m. above / reach below water table by the year _____ : Proposed mining depth is 45m (which is 25m above ground level and 20m below ground level). Now, the present Mining lease shall be proposed above the water table and hence, quarrying may not affect the ground water.



c)	Quantity and quality of water likely to be encountered, the pumping arrangements and places where the mine water is finally proposed to be discharged	:	The ground water may not rise immediately in this type of mining. However, the rain water percolation and collection of water from the seepage shall be less than 300 Lpm and it shall be pumped out periodically by a stand by diesel powered Centrifugal pump motivated with 7.5 H.P. Motor. The quality of water is potable and it is not contaminated with any hazardous things.
7.	STACKING OF MINERAL REJECTS AND DISPOSAL OF WASTE:		
a).	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	:	The Residual topsoil 2944m ³ shall be removed.
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 intermediary parties, captive consumption, export, industrial use)	:	The excavated stone materials will be supplied to the consumers like stone pillar, sized stone, etc. For instance, aggregates are mostly used for building, roads and footpaths., etc
b).	Indicate physical and chemical specifications stipulated by buyers	:	Basically, the materials produced at this quarry are rough stone (charnockite) 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. <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="width: 5%;">1.</td> <td style="width: 25%;">Highly Skilled</td> <td style="width: 40%;">Mines Manager</td> <td style="width: 30%;">1No.</td> </tr> <tr> <td></td> <td></td> <td>Mine Engineer</td> <td>1No.</td> </tr> <tr> <td></td> <td></td> <td>Mine Geologist</td> <td>1No.</td> </tr> <tr> <td></td> <td></td> <td>Blaster</td> <td>1No.</td> </tr> <tr> <td>2.</td> <td>Unskilled</td> <td>Musdoor / Labours</td> <td>14 No's</td> </tr> <tr> <td colspan="3" style="text-align: right;">Total =</td> <td>18 No's</td> </tr> </table>			1.	Highly Skilled	Mines Manager	1No.			Mine Engineer	1No.			Mine Geologist	1No.			Blaster	1No.	2.	Unskilled	Musdoor / Labours	14 No's	Total =			18 No's
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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	:	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%.																								



	concentrate (finished marketable product), recovery rate.		
(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 mining and processing and sources of supply of water. Disposal of water and of recycling.	:	Drinking is 0.2KLD, utilized water is 0.8KLD, Dust suppression is 1.0KLD and Green Belt is 1.0KLD. Minimum quantity of water 3.0KLD per day. It is proposed to make an authorized water vendors for drinking water, dust suppression. The workers utilized water will be used for green belt development. 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 border="1"> <thead> <tr> <th>Sl. No.</th><th>Land Use</th><th>Present area (Hect.)</th></tr> </thead> <tbody> <tr> <td>1.</td><td>Area under Mining</td><td>Nil</td></tr> <tr> <td>2</td><td>Infrastructure</td><td>Nil</td></tr> <tr> <td>3</td><td>Roads</td><td>Nil</td></tr> <tr> <td>4</td><td>Unutilized</td><td>0.81.0</td></tr> <tr> <td>5</td><td>Green belt</td><td>Nil</td></tr> <tr> <td>6</td><td>Settling Tank & Drainage</td><td>Nil</td></tr> <tr> <td colspan="2">Grand Total</td><td>0.81.0</td></tr> </tbody> </table>	Sl. No.	Land Use	Present area (Hect.)	1.	Area under Mining	Nil	2	Infrastructure	Nil	3	Roads	Nil	4	Unutilized	0.81.0	5	Green belt	Nil	6	Settling Tank & Drainage	Nil	Grand Total		0.81.0
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11.2	Water Regime	: Water table in this area is noticed at a depth of 55m in summer and 50m in rainy season from the general ground level and presently the quarrying of rough stone is ultimate up to a depth of 45m (Which is 25m above ground level and 20m 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																								

R. J. M.



			monitoring will be carried out every six months around the quarry site.		
11.5	Climatic conditions: The summers here have a good deal of rainfall, while the winters have very little. The temperature here averages 26.8°C | 80.2°F. The annual rainfall is 877 mm | 34.5 inch. At an average temperature of 30.1°C | 100°F, May is the hottest month of the year. December is the coldest month, with temperatures averaging 23.3°C | 73.9°F.				
11.6	Human Settlement: The nearest villages are found in the buffer zone with population as per 2011 census.				
	S.No	Village	Direction	Distance in Kms	Population
	1	Vinnamangaiam	North	1.7km	8395
	2	Karniyampattu Pudur	Northeast	0.8km	534
	3	Vellakkal	South	5.2km	8363
	4	Minnur	West	1.9km	1502
11.7	Public buildings, places of worship and monuments	:	No infrastructure like residential building, are found within radius of 300m. The places of special interest like archeological monuments, Sanctuaries, etc., are found around 10km radius.		
11.8	Attach plans shewing the locations of sampling stations	:	The proposed Ambient air quality, Water quality Ambient noise level and vibration are periodically tested for every season (6 months once) around 5km radius as per the guidance of MoEF and EIA Notification 2006 and also covering DGMS norms.		
11.9	Does area (partly or fully) fall under notified area under Water (Prevention & Control of Pollution), Act, 1974	:	The proposed area not fall under notified area under Water (Prevention & Control of Pollution), Act, 1974		





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

i)	Land area indicating the area likely to be degraded due to quarrying / pitting, dumping, roads, workshop, processing plant, township etc: Due to quarrying and exploitation of the rough stone, there will impact in the form i.e. change in the ground profile, pits, and dumps. The details of the land use pattern, during the ensuing plan period and till lease period is shown in the tabular form:																						
	<table border="1"> <thead> <tr> <th>Sl. No.</th><th>Land Use</th><th>Area in use during the quarrying period (Hect.)</th></tr> </thead> <tbody> <tr> <td>1</td><td>Area under Mining</td><td>0.47.70</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>0.28.3</td></tr> <tr> <td>5</td><td>Un-Utilized Area</td><td>Nil</td></tr> <tr> <td colspan="2">Grand Total</td><td>0.81.0</td></tr> </tbody> </table>		Sl. No.	Land Use	Area in use during the quarrying period (Hect.)	1	Area under Mining	0.47.70	2	Infrastructure	0.02.0	3	Roads	0.03.0	4	Green Belt	0.28.3	5	Un-Utilized Area	Nil	Grand Total		0.81.0
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5	Un-Utilized Area	Nil																					
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ii).	Air Quality	Air or dust expected to be generated from drilling process, hauling roads, places of excavation etc., will be suppressed by periodical wetting of land by water spraying.																					
iii).	Water quality	A water sample from the open/bore wells was tested to NABL approved lab to assess hardness, Salinity, colour, Specific gravity, etc.																					
iv).	Noise levels	Quarrying of rough stone and gravel 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.																					

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vi).	Water regime	No major river or any odai track are found around 500m radius.
vii).	Socio-economics	1. To provide Employment opportunities of the nearby villagers. 2. For the cultural development of the nearby villagers.
viii).	Historical monuments etc.	There are no historical monuments, etc found around 300m radius.

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

i).	temporary storage and utilization of topsoil	: No separate of topsoil will be removed.
ii).	Yearwise proposal for reclamation of land affected by abandoned quarries and other mining activities during ten years (and upto conceptual plan period for 'A' category mines) clarifying the extent of back filling and re-contouring and / or alternative use of unfilled / partially filled excavations / road sides / slopes and mine. In case abandoned quarries/ pits are proposed to be used as reservoir, their size, water holding capacity and proposal for utilization of such water be given.	: The present mining is proposed to an average depth of 45m (Which is 25m above ground level and 20m below ground level) from the below ground level has been envisaged as workable depth for safe & economic mining during the lease period. The mined-out area will be fenced on top of working bench with S1 fencing. No immediate proposals for closure of pit as the rough stone persist still at deeper level.
iii).	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	2830	350	80%	@100 Rs Per sapling	35,000/-
Second	Approach road and Nearby Village Road	--	300	80%		30,000/-
Third	Schools	--	300	80%		30,000/-
Total						95,000/-

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



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

Not applicable. It is B category quarry

12.0 PROGRESSIVE QUARRY CLOSURE PLAN:

12.1	Steps proposed for phased restoration, reclamation of already mined out area.	:	The Ultimate mining is proposed to an average depth of 45m (Which is 25m above ground level and 20m 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 350 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 present mining plan is proposed to depth of 45m (Which is 25m above ground level and 20m 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 manpower entrenchments	: During the ten years mining period the employment potential will be generated, general financial status and socio-economic conditions of approx. 18 labors will be improved.

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

A	Fixed Asset Cost:	
	1. Land Cost (Tender Cost)	: Rs. 63,00,000
	2. Labour Shed	: Rs. 1,00,000/-
	3. Sanitary Facility	: Rs. 1,00,000/-
	4. Fencing	: Rs. 1,50,000/-
	5. Other expenses (Security guard, dust bin, etc)	: Rs. 4,00,000/-
	Total	: Rs. 70,50,000/-



B	B. Machinery cost	:	Rs. 20,00,000/- (Hire Basis)
C	Total Expenditure of EMP cost (for ten years)		
	1. Drinking Water Facility	:	Rs. 1,00,000/-
	2. Sanitary facility & Maintenance	:	Rs. 1,00,000/-
	3. Permanent water sprinkler	:	Rs. 1,50,000/-
	4. Afforestation and its maintenance	:	Rs. 95,000/-
	5. Safety Kits	:	Rs. 1,00,000/-
	6. Provision of tyre washing facility	:	Rs. 1,00,000/-
	7. Blasting materials with blast mat cost	:	Rs. 15,00,000/-
	8. Environment monitoring	:	Rs. 5,00,000/-
	Total!	:	Rs. 26,45,000/-
D	Total Project Cost (A+B+C)	:	Rs. 1,16,95,000/-

13.0 FINANCIAL ASSURANCE:

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

14.0 CERTIFICATES:

All required certificates are enclosed.

15.0 PLAN AND SECTIONS, ETC:

Plan and Sections are submitted along with mining plan.

16.0 ANY OTHER DETAILS INTEND TO FURNISH BY THE APPLICANT

- (i) Care and precautionary measures will be taken for the safety of workers as per Rules and Acts.
- (ii) The applicant will endeavor every attempt to quarry the rough stone economically without any wastage and to improve the environment and ecology.
- (iii) The Mining Plan is prepared by incorporating the conditions stipulated in the precise area communication issued by the Assistant Director, Department of Geology and Mining, Tirupathur vide letter **Roc.No.13/2024/ (Mines) Dated 15.03.2024.**
- (iv) Total proposed production rough stone is **115205m³** and gravel is **2944m³** up to a depth of 45m (Which is 25m above ground level and 20m below ground level) for ten years plan period).



17.0 CSR Expenditure:

CSR (Corporate Social responsibility) shall provide by the applicant @ 2.0% of average net profit of the company for the last three financial years to the nearby village on the Ministry has notified the amendments in section 135 of the Act as well in the CSR Rules on 22nd January 2021 as circular no. CSR-05/01/2021-CSR-MCA dated 25th August 2021.

Place: Salem, TN

Date:

Signature of the Qualified Person

P. VELLAIYAN, M.Sc, M.Phil.,
Qualified Person

D.No. 6-106-B, Athirampatti (VIII),
Amaragundhi Panchayat & Post,
Omair Taluk, Salem District - 636503.

This Mining Plan is approved as per the powers conferred under Rule 41 (2) of Tamilnadu Minor Mineral Concession Rules 1959

ASSISTANT DIRECTOR (MINES)
TIRUPUR DISTRICT.

02.09.2024

This Mining Plan is approved subject to the condition stipulated in the Mining Plan approval

Letter No. R.C. 116.13/2024 (M. 46)
Dated. 02.09.2024



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2024



திருப்பத்தூர் மாவட்ட அரசிதழ்
சிறப்பு வெளியீடு
ஆணையின்படி வெளியிடப்பட்டது

எண் 4 |

திருப்பத்தூர், வியாழக்கிழமை, பிப்ரவரி 8, 2024.

தை 25, சோபகிருது, திருவன்குவர் ஆண்டு 2055.

மாவட்ட ஆட்சியர் அறிவிக்கை

(நக.எண்.75/(கனிமம்)/2023, நாள் : 06-02-2024

திருப்பத்தூர் மாவட்டத்தில் அரசு புறம்போக்கு நிலங்களில் அமைந்துள்ள கல்குளங்களிலிருந்து சிறுகனிமங்களை குவாரி செய்து எடுத்துச் செல்வதற்கு டெண்டர் மற்றும் ஏலமுறையில் குத்தகை உரிமம் வழங்குவதற்கு ரூப முத்திரையிடப்பட்ட டெண்டர் விண்ணப்பங்கள் கோகுதல் மற்றும் ஏலம் பற்றிய அறிவிப்பு.

1959-ஆம் ஆண்டு தமிழ்நாடு சிறுகனிம சலுகை விதிகள், விதி 8-ன்படி திருப்பத்தூர் மாவட்டத்தில் கிந்த அறிவிக்கையுடன் திணைக்கப்பட்டிருள்ள அட்டவணையில் குறிப்பிட்டுள்ள அரசு புறம்போக்கு நிலங்களில் அமைந்துள்ள சாதாரண கல் குவாரியிலிருந்து கட்டுக்கல், சக்கைக்கல் மற்றும் ஜல்லி முதலிய சிறுகனிமங்களை (விதிகள் 8ஏ மற்றும் 8சி-ல் கண்டுள்ள கனிமங்களைத் தவிர) குவாரி செய்து எடுத்துச் செல்வதற்கு ஒப்பந்தப்புள்ளி (டெண்டர்) மற்றும் ஏலமுறையில் குத்தகை உரிமம் வழங்க கீழ்க்கண்ட நிபந்தனைகளுக்குட்பட்டு ரூப முத்திரையிடப்பட்ட டெண்டர் விண்ணப்பங்கள் ரூபங்களில் திருப்பத்தூர் மாவட்ட ஆட்சியரால் வரவேற்கப்படுகின்றது.

கிந்த அறிவிக்கையின்படி விண்ணப்பிக்கும் அனைத்து விண்ணப்பங்களும் 1959-ம் ஆண்டு தமிழ்நாடு சிறு கனிம சலுகை விதிகள் திணைப்பு-VIல் உள்ள படிவத்தில் திருக்க வேண்டும். யாதிரி விண்ணப்ப படிவம் திணைப்பு (11)-ல் கொடுக்கப்பட்டுள்ளது.

திருப்ப. ம. அ. சி. எண். 41

[Handwritten signature]



மற்றும் நேரத்தில் இல்லாதிருந்தால் ஏலம் நடத்துதல் மற்றும் டெண்டர் விண்ணப்பங்களை திறுத்தி வைக்கப்படமாட்டாது. ஏலம் நடத்துகின்ற இடத்தில் திருக்கும் மற்ற டெண்டர் விண்ணப்பத்தாரர்கள் அல்லது அவர்களால் நியமிக்கப்பட்டவர்கள் மற்றும் உள்ளவர்கள் முன்னிலையில் டெண்டர் விண்ணப்பங்கள் திறுக்கப்படும்.

10. டெண்டர் விண்ணப்பத்தில் விண்ணப்பிக்கும் இடத்திற்கு விண்ணப்பதாரர் செலுத்த விரும்பும் டெண்டர் தொகையை குறிக்காமல் திருந்தாலோ அல்லது பிணை வைப்புத்தொகைக்கான கேட்பு வரைவோலை மற்றும் டெண்டர் தொகையில் 10%-க்கான கேட்பு வரைவோலை இணைக்கத்தவறினாலோ விண்ணப்பத்தில் கையொப்பமிடவில்லையென்றாலோ விண்ணப்பப்படிவம் VI-ல் குறிப்பிடப்பட்ட ஆணை உறுதி வாக்குமூலங்களை (Affidavit) இணைக்கத் தவறினாலோ அப்படிப்பட்ட டெண்டர் விண்ணப்பங்கள் மாவட்ட ஆட்சியர் அல்லது அன்னாரின் அதிகாரம் பெற்ற அலுவலரால் நிராகரிக்கப்படும். திவ்வாறு நிராகரிக்கப்படும் விண்ணப்பங்களை விண்ணப்பதாரர்கள் டெண்டர் விண்ணப்பங்களைத் திறுக்கும் இடத்தில் திருந்தால் அவர்களிடம் தக்க ஒப்புதல் பெற்று பிணைவைப்புத் தொகைக்குரிய கேட்பு வரைவோலை விண்ணப்பதாரரிடம் கொடுக்கப்படும். இல்லையெனில் பின்பு அஞ்சலில் டெண்டர் அனுப்பப்படும்.

11. மாவட்ட ஆட்சியர் அல்லது அவரது அதிகாரம் பெற்ற அலுவலரால் ஒவ்வொரு குவாரிக்கும் வரப்பெற்ற மொத்த செல்லத்தக்க விண்ணப்பங்கள், விண்ணப்பதாரர்களின் பெயர்கள் ஒவ்வொரு விண்ணப்பதாரராலும் குறிப்பிடப்பட்ட அதிகப்பட்ச டெண்டர் தொகை ஆகியவற்றையும் அதிகப்பட்சத் தொகைக்கு ஏலம் கேட்ட நபர் மற்றும் அதிகப்பட்ச டெண்டர் தொகை குறிப்பிட்ட நபர் பெயர்களையும் ஏலம் முடிவடைந்தவுடன் அறிவிப்பார்.

12. ஒரு குவாரிக்கு அதிகப்பட்ச ஏலத்தொகை / அதிகப்பட்ச டெண்டர் தொகையை திரண்டு அல்லது அதற்கு மேற்பட்ட விண்ணப்பதாரர்களால் குறிப்பிடப்பட்டிருந்தால் மாவட்ட ஆட்சியர் அல்லது அன்னாரின் அதிகாரம் பெற்ற அலுவலர் சம்பந்தப்பட்ட விண்ணப்பதாரர்களை அழைத்து மேலும் அதிகப்படியான தொகையை ஏலம் கோரும்படி கேட்டு முடிவு செய்வார்.

13. ஒவ்வொரு குவாரிக்கும் பெறப்பட்ட டெண்டர் விண்ணப்பங்களில் குறிப்பிடப்பட்டுள்ள அதிகப்பட்ச டெண்டர் தொகை அல்லது பொது ஏலத்தின் மூலம் கேட்கப்படும் அதிகப்பட்ச ஏலத்தொகை கிவற்றில் எது அதிகமோ அந்த தொகைக்கு ஏலம் / டெண்டர் கேட்ட நபர் அதிகப்பட்ச தொகைக்கு கேட்டவராக அறிவிக்கப்படுவார். அதிகப்பட்ச தொகைக்கு ஏலம் / டெண்டர் கேட்ட நபர் மாவட்ட ஆட்சித்தலைவர் அல்லது அன்னாரின் அதிகாரம் பெற்ற அலுவலர் மூலம் உறுதி செய்யப்பட்டவுடன், ஏலம் / டெண்டர் கேட்ட நபர் அவரால் அதிகப்பட்சமாக கேட்கப்பட்ட / குறிப்பிடப்பட்ட தொகையில் 10 சதவிகித தொகையினை உடனடியாக செலுத்திவிட வேண்டும். திவ்வாறு செலுத்த தவறும்பட்சத்தில் அவரது ஏலம்/டெண்டர் ரத்து செய்யப்பட்டு அவருக்கு அடுத்தபடியாக அதிகப்பட்ச தொகை கேட்ட நபருக்கு வாய்ப்பு அளிக்கப்படும். அவரும் 10 சதவிகித தொகையினை செலுத்த தவறும்பட்சத்தில் இதே நடைமுறையை அரசின் குழு தொகையை கணக்கில் கொண்டு தொடர்ந்து நடத்துவது அல்லது மறுஏலம் நடத்த ஆணையிருந்து போன்றவை மாவட்ட ஆட்சித்தலைவர் அவர்களின் திறுதி முடிவு மற்றும் அதிகார வரம்பிற்கு உட்பட்டதாகும். அதிகப்பட்ச ஏலம் / டெண்டர் கேட்டு 10 சதவிகித தொகையை செலுத்திய பிறகு மற்ற நபர்களின் பிணை வைப்புத்தொகைக்கான கேட்பு வரைவோலைகளை திரும்ப தரப்படும். ஏலம்/டெண்டர் உறுதி செய்யப்பட்ட நபர் மீதமுள்ள 90 சதவிகித தொகையினை ஏலம்/ டெண்டர் நடத்தப்பட்ட தாளிலிருந்து ஒருவார காலத்திற்குள் அரசுக்கணக்கில் செலுத்தி அசல் சலானிகள்/அதற்குண்டான கேட்பு வரைவோலை போன்றவற்றை மாவட்ட ஆட்சியரிடம் சமர்ப்பிக்கப்பட வேண்டும். தவறும்பட்சத்தில்



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ஏலம்/டெண்டர் ரத்து செய்யப்படுவதுடன் அவர் செலுத்திய பிணை வைப்புத் தொகை ரூ.25,000/- மற்றும் 10 சதவிகித ஒப்பந்தப்புள்ளி/ஏலத்தொகை ஆகியவற்றை பறிமுதல் செய்து அரசு கணக்கில் சேர்க்கப்படும். இவருக்கு அடுத்தபடியாக ஏலம் /டெண்டர் கேட்ட நபர்/அரசின் குழும தொகையை விட அதிக தொகைக்கு ஏலம்/டெண்டர் கேட்டிருப்பின் அவருக்கு குவாரி குத்தகை வழங்கும்பொருட்டு அவரின் விருப்பத்தினை நோட்டீஸ் கிடைத்த 10 தினங்களுக்குள் எழுத்து மூலமாக தெரிவிக்குமாறு கேட்டு நோட்டீஸ் அனுப்பி மேல் நடவடிக்கை எடுக்கப்படும்.

14. ஒரு குவாரிக்கு அதிகப்பட்சத்தொகை ஏலதாரர் / டெண்டர் விண்ணப்பதாரரை அறிவித்த பின்பு, மற்ற ஏலதாரர்கள் / விண்ணப்பதாரர்கள் டெண்டர் விண்ணப்பங்கள் திறக்கப்படும் இடத்தில் இருந்தால் அவர்களிடம் தக்க ஒப்புதல் பெற்றுக்கொண்டு பிணை வைப்புத்தொகையை மாவட்ட ஆட்சியர் அல்லது அன்னாரின் அதிகாரம் பெற்ற அலுவலர் வழங்குவார். மேற்படி இடத்தில் இல்லாத ஏலதாரர் / விண்ணப்பதாரர்களின் பிணை வைப்புத்தொகை பதிவு அஞ்சலில் பின்னர் அனுப்பிவைக்கப்படும்.

15. ஒரு குவாரிக்கு ஒரு டெண்டர் விண்ணப்பம் மட்டும் அர்ப்பெற்று ஏலம் கேட்கப்படும் முன்னரவில்லைமேலில் அந்த ஒரு விண்ணப்பதாரர் குறிப்பிட்ட தொகை நியாயமானது என்றும் கனிய அபிவிருத்திக்கு உகந்தது என்றும் மாவட்ட ஆட்சியர் அவர்களால் கருதும் பட்சத்தில் அவருக்கு மாவட்ட ஆட்சியரால், ஏற்றுக்கொள்ளப்பட்டு குத்தகை உரியம் உறுதிசெய்யப்படும். அந்த ஒரு விண்ணப்பதாரரால் குறிப்பிட்ட தொகை நியாயமானதல்ல எனவும் அவருக்கு உரியம் வழங்குவது கனிய அபிவிருத்திக்கு உகந்ததல்ல எனவும் மாவட்ட ஆட்சியர் கருதினால், அவருடைய விண்ணப்பம் மாவட்ட ஆட்சியரால் நிராகரிக்கப்படும். ஒரு குவாரிக்கு கிரண்டு அல்லது அதற்கு மேற்பட்ட விண்ணப்பங்கள் வரப்பெறின் சாதாரணமாக அதிகப்பட்ச ஏலத்தொகை அல்லது / டெண்டர் தொகை கேட்டவர்க்கு குத்தகை உரியம் வழங்க மாவட்ட ஆட்சியருக்கு அதிகாரம் உண்டு. ஆனால் அந்த அதிகப்பட்ச ஏலதாரர் / டெண்டர்தாரரால் குறிப்பிடப்பட்ட தொகை நியாயமானதல்ல எனவும் அவருக்கு உரியம் வழங்குவது கனிய அபிவிருத்திக்கு உகந்ததல்ல எனவும் மாவட்ட ஆட்சியர் கருதினால் அவருக்கு குத்தகை உரியம் வழங்கப்படமாட்டாது.

16. தமிழ்நாட்டில் எல்லா மாவட்டங்களிலும் சேர்த்து ஒரு மனுதாரருக்கு கிரண்டு கல் குவாரி குத்தகைக்கு மேல் வழங்கப்பட மாட்டாது. தவறான தகவல் தந்து கிரண்டுக்கு மேற்பட்ட குத்தகைகள் பெறப்பட்டிருப்பது பின்னர் தெரியவந்தால் கடைசியாக கொடுக்கப்பட்ட குத்தகையை ரத்து செய்ய நடவடிக்கை எடுக்கப்படும்.

17. அதிகத்தொகை கோரிய நபருக்கு குத்தகை உரியம் உறுதி செய்யப்படின், ஏலம் நடத்தப்பட்ட நாளிலிருந்து ஏழு தினங்களுக்குள் மீதமுள்ள தொகையை அரசு கணக்கில் செலுத்த தெரிவித்து அறிவிப்பு கடிதம் அனுப்பி வைக்கப்படும்.

18. உயர்ந்தபட்ச ஏலதாரர் / டெண்டர்தாரர் என அறிவிக்கப்படும் நபர் குத்தகை தொகை செலுத்துவதுடன், குத்தகைத் தொகைக்கு உண்டான வருமான வரி 2% செலுத்தப்பட வேண்டும். செலுத்தப்பட்ட வருமானவரிக்கு 10% கூடுதல் வரி செலுத்தப்பட வேண்டும். மேலும் செலுத்தப்பட்ட வருமான வரி மற்றும் கூடுதல் வரிக்கு 3% தீர்வை செலுத்தப்பட வேண்டும்.

19. குவாரி உரியம் பெறுவது தொடர்பாக உயர்ந்தபட்ச டெண்டர்/ஏலதாரர் குத்தகை தொகையைச் செலுத்தி அதற்குரிய சலாபை மாவட்ட ஆட்சியர் / உதவி இயக்குநர் அவர்களிடம் ஒப்படைத்த பின்பு குவாரி உரியம் வழங்க உத்தேசிக்கப்பட்டுள்ள பரப்பாக கருதி அறிவித்து குறிப்பானை வழங்கப்படும்.

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20. கற்குவாரி குத்தகை அனுமதி வழங்க தேர்ந்தெடுக்கப்படும் டெண்டர்தாரர்/ஏலதாரர் கரங்கத்திட்ட அறிக்கை தமிழ்நாடு சிறுகனிச் சலுகை விதிகள் 1959, விதி எண்.41 மற்றும் 42-ஐப் பின்பற்றி ஒப்புதல் பெறப்பட்ட கரங்கத்திட்ட அறிக்கை, மற்றும் மாநில சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையத்தின்(SEIAA)-இன் தடையின்மைச் சான்று பெற்று சமர்ப்பித்த பின்னரே குவாரி அனுமதி வழங்கப்படும்.

21. சம்மந்தப்பட்ட உதவி இயக்குநரால் ஒப்புதல் செய்யப்பட்ட கரங்கத்திட்ட அங்கீகாரம் பெற்றதொதி வாய்ந்த நபர் (RQP) மூலம் அரசு தெரிவித்துள்ள விதிகள் மற்றும் வழிக்காட்டுதலின்படி தயாரித்து அறிவிக்கையை பெற்ற நாளிலிருந்து குன்று மாத காலத்திற்குள் திருப்பத்தூர், புவியியல் மற்றும் கரங்கத்துறை, உதவி இயக்குநரிடம் அங்கீகாரம் பெற சமர்ப்பிக்க வேண்டும்.

22. மேற்கண்ட உயர்ந்தபட்ச டெண்டர்தாரர்/ஏலதாரர் புவியியல் மற்றும் கரங்கத்துறை, உதவி இயக்குநர் அவர்களால் அங்கீகாரம் வழங்கப்பட்ட கரங்கத்திட்டத்தை மாநில அளவிலான சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையம்/ வனத்துறையின் தடையின்மைச்சான்று மற்றும் தமிழ்நாடு மாகாணக்குப்பாட்டு வாரியத்தின் இசைவு ஆகியவற்றை பெற்று சமர்ப்பிக்கும் பட்சத்தில் மாவட்ட ஆட்சித்தலைவர் அவர்களால் உயர்ந்தபட்ச டெண்டர்தாரர்/ ஏலதாரருக்கு குவாரி அனுமதி வழங்க நடவடிக்கை எடுக்கப்படும்.

23. கரங்கத்திட்ட அறிக்கை முதல் ஐந்தாண்டிற்கு மட்டும் செல்லத்தக்கதாகும்.

24. உயர்ந்தபட்ச டெண்டர்தாரர்/ஏலதாரர் கரங்கத்திட்ட அறிக்கை மற்றும் மாநில சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணைய தடையின்மை சான்றை குறிப்பிட்ட காலத்திற்குள் சமர்ப்பிக்க தவறும்பட்சத்தில் மாவட்ட ஆட்சித்தலைவர் அவர்கள் உயர்ந்தபட்ச டெண்டர்தாரர்/ ஏலதாரருக்கு அளித்த உத்தரவை சம்மந்தப்பட்டவர்களிடம் நேரடி விசாரணை மேற்கொண்டு ரத்து செய்வ தீர்மானம்.

25. உயர்ந்தபட்ச டெண்டர்தாரர்/ஏலதாரர் கரங்கத்திட்ட அறிக்கை, மாநில சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையத்தின் தடையின்மை சான்று மற்றும் மாகாணக்குப்பாட்டு வாரியத்தின் இசைவு பெற்று சமர்ப்பிக்கும் பட்சத்தில் மேற்படி நபர்களுக்கு குத்தகை அனுமதி வழங்கப்பட்டதற்கான ஆணை வழங்கப்பட்டு மற்றும் உத்தரவு ஒப்பந்தப்பத்திரம் நிறைவேற்றப்படும்.

26. குத்தகை ஒப்பந்தப்பத்திரம், குவாரியின் எல்லை வரையறை செய்யப்பட்ட வரைபடத்துடன் நிறைவேற்றப்பட வேண்டும். ஒப்பந்தப்பத்திரம் நிறைவேற்றிய நாளிலிருந்து 30 தினங்களுக்குள் குத்தகைதாரர் தன் சொந்த செலவில் சம்பந்தப்பட்ட ஆவண பதிவு அலுவலகத்தில் ஒப்பந்தப்பத்திரத்தை சொத்து மாற்றுச்சட்டம் 1882, பிரிவு 107-ன்கீழ் கட்டாயமாக பதிவு செய்யப்பட வேண்டும். பதிவு செய்து மீண்டும் இவ்வலுவலகத்தில் ஒப்படைக்க வேண்டும். தவறும்பட்சத்தில் விதிகளின்படி நடவடிக்கை மேற்கொள்ளப்படும்.

27. குவாரிப் பணிகள் கரங்கத்திட்ட அறிக்கையில் தெரிவித்துள்ளவாறு மேற்கொள்ளப்பட வேண்டும். அவ்வாறு கரங்கத்திட்ட அறிவிக்கையில் தெரிவித்ததற்கு மாறாக குவாரிப்பணிகள் மேற்கொள்வது கண்டறியப்பட்டால் மேற்படி குவாரிப் பணியை நிறுத்தி வைப்பதற்கு மாவட்ட ஆட்சித்தலைவர் அவர்களால் நடவடிக்கை மேற்கொள்ளப்படும்.

28. குத்தகை அனுமதி பெற்று பின் குத்தகைதாரர் வருமான வரித்துறைமூலம் வழங்கப்படும் நிரந்தர கணக்கு எண் (PAN-CARD) அட்டையின் நகல் ஒப்படைக்க வேண்டும்.

29. குத்தகை ஒப்பந்தப்பத்திரத்தில் உள்ள நிபந்தனைகளை பொதுநலன் கருதி விதிகளுக்குட்பட்டு மாற்றவோ அல்லது புதிய நிபந்தனைகளை சேர்க்கவோ மாவட்ட ஆட்சியருக்கு முழு அதிகாரம் உண்டு.



திருப்பத்துர் மாவட்ட அரசிதழ் சிறப்பு வெளியீடு

30. டெண்டர் அறிவிக்கை பிரசுரிக்கப்பட்ட பின்னர், குத்தகை உறுதி அளிப்பதற்குப் பிறப்பிப்பதற்குமுன்னரே அல்லது பின்னரே நிபந்தனைகளை மாற்றலோ அல்லது ரத்து செய்யலோ மற்றும் பட்டியலில் கண்டுள்ள எல்லா குவாரிகளின் குத்தகை உரிமம் கோரும் ஏலம் மற்றும் டெண்டர் விண்ணப்பங்களை திறந்து பரிசீலிப்பதையோ சூழ்நிலை கருதி ரத்து செய்யலோ அல்லது ஏலம் மற்றும் முத்திரைவிடப்பட்ட டெண்டர் உறைகளை திறக்கும் நாள் தேரம் ஆகியவைகளைத்தள்ளி வைக்கலோ, தீவிரத்தி வைக்கலோ மாவட்ட ஆட்சியருக்கு முழு அதிகாரம் உண்டு. அதற்கு மனுதாரர் நஷ்டசூ கோர முடியாது.

31. இந்த அறிவிக்கையில் கண்டுள்ள எந்த குவாரியையும் முன்னறிவிப்பின்றி நீக்க மாவட்ட ஆட்சியருக்கு அதிகாரமுண்டு.

32. ஒப்பந்தப்புள்ளி (டெண்டர்) விண்ணப்பம் அனுப்புவதற்கு முன்/ஏலத்தில் கலந்து கொள்வதற்கு முன் கீழ்க்கண்ட அரசிதழ் அறிவிக்கையுடன் கிணைக்கப்பட்டுள்ள பட்டியலில் கண்ட சம்மந்தப்பட்ட குவாரியை / குவாரிகளை விண்ணப்பதாரர் தனது சொந்த செலவிலேயே தேரில் பார்வையிட்டு பாதை வசதி, கனிமத்தின் தரம் மற்றும் கனிமத்தின் கிடுப்பு ஆகியவற்றை ஆராய்ந்து பின்னர் குத்தகை அனுமதி கோரி விண்ணப்பிக்க வேண்டும் மற்றும் ஏலத்தில் கலந்து கொள்ளவேண்டும். அண்ண வழங்கப்பட்ட பின் குவாரி அமைந்துள்ள புலச்சல், பாப்பு, குவாரிகளின் நான்கு எல்லைகள், பாதை வசதி, கனிமத்தின் தரம் கனிமத்தின் கிடுப்புக்குறித்து எவ்வித தாவாவும் செய்ய குத்தகைதாரருக்கு உரிமை கிடையாது.

33. மாவட்ட ஆட்சியரால் ஒருவருக்கு குத்தகை உரிமம் வழங்கப்பட்டு அவர் மாவட்ட ஆட்சியரின் உத்திரவில் குறிப்பிட்டுள்ளபடி, குறிப்பிட்டுள்ள காலத்திற்குள் 20% சதவிகிதம் பாதுகாப்புத் தொகையினை அரசுக்கணக்கில் செலுத்திய அசல்சலான் கொடுக்க தவறினாலோ அல்லது பரப்புத்தீர்வை செலுத்த தவறினாலோ அல்லது குத்தகை ஒப்பந்தப்பத்திரத்தை நிறைவேற்றத்தவறினாலோ அல்லது தவறுபவருக்கு வழங்கப்பட்ட குத்தகை உரிமத்தை ரத்து செய்து அவர் அரசிற்கு செலுத்தியுள்ள அனைத்து தொகைகளும் மாவட்ட ஆட்சியரால் பறிமுதல் செய்து அரசிற்கு ஆதாயமாக்கப்படும். அல்லது குத்தகை உரிம உத்திரவு ரத்து செய்யப்படும் பட்சத்தில் அமுத்தபடியாக அதிக ஏலத்தொகை அல்லது டெண்டர் தொகைக்கு கோரிய நபருக்கு விதி 8(6)(பி)-க்குட்பட்டு மாவட்ட ஆட்சியரால் குத்தகை உரிமம் வழங்கப்படும். அமுத்தப்படியாக அதிக தொகை உரிமம் கோரிய நபர் மாவட்ட ஆட்சியரின் உத்திரவினை பெற்ற 10(பத்து) தினங்களுக்குள் தன்னுடைய விடுப்புத்தினை தெரிவிக்கவில்லை எனில் மாவட்ட ஆட்சியரால் அந்த விடத்திற்கு மறுபடியும் டெண்டர் விண்ணப்பங்களை வரவேற்க வேண்டிய புதிய அறிவிக்கை வெளியிடப்படும்.

34. குத்தகை உரிமம் வழங்கப்பட்ட குவாரிக்கு, பொத்தக் குத்தகை காலத்திற்கு செலுத்தப்படும் குத்தகை தொகையை தவிர குத்தகைதாரர் மேற்படி குவாரியிலிருந்து எடுத்துச் செல்லும் ஒவ்வொரு வகையான சிறுகனிமங்களுக்கும் 1959-ஆம் ஆண்டு தமிழ்நாடு சிறு கனிம சலுகை விதிகளில் கிணைப்பு 2-ல் குறிப்பிட்டுள்ளபடி சீனியரேஜ் கட்டணத்தை செலுத்தி அனுமதி சீட்டு பெற்றுத்தான் சிறு கனிமங்களை கொண்டு செல்லவேண்டும். சீனியரேஜ் தொகை அல்லது முடக்குவரி கீழில் எது அதிகமோ அதனை செலுத்த வேண்டும். கிது தவிர பரப்புத்தீர்வை மற்றும் அரசால் அவ்வப்போது அறிவிக்கப்படும் கிது தொகைகளையும் செலுத்த வேண்டும்.

K. R.



3. குத்தகைக் காலம் முடிந்தவுடன் அல்லது உரிமம் ரத்து செய்யப்படிள் குத்தகை குத்தகைதாரர் மறு தினமே மாவட்ட ஆட்சியரிடம் ஒப்படை செய்து அதற்குரிய அத்துவிதம் பெற்றுக்கொள்ள வேண்டும். இதனை மீறபவர்கள் மீது தமிழ்நாடு சிறுகனிம சலுகை விதிஎண்.36 ஏ-ன்ஈழ் தண்டனைக்கு உள்ளாவார்கள்.

4. குத்தகைதாரரால் குத்தகை நிலத்தில் குவாரி செய்யப்படும்போது அருகிலுள்ள கட்டிடங்கள், இதர பொதுச் சொத்துக்கள், ஆறு, குளம் ஆகியவற்றின் கரைகள், மரங்கள், ரோடுகள், வண்டிப்பாதைகள் ஆகியவற்றிற்கு சேதம் ஏற்படாமலும், பொதுமக்களுக்கு திடையுறுகள் ஏற்படாமலும் குவாரி செய்துகொள்ள வேண்டும்.

5. குத்தகைக்கு வழங்கப்பட்ட கற்குவாரிகளில் குண்டுக்கல் கட்டுக்கல், சக்கைக் கல், மற்றும் ஜல்லிக்கற்கள் ஆகியவைகளை மட்டுமே குவாரி செய்ய வேண்டும். அபல் நாட்டிற்கு ஏற்றுமதி செய்வதற்கும், மெருகேற்றுவதற்கும் பயன்படும் கத்துண்டங்களை (Granite Block) குவாரி செய்யக் கூடாது.

6. அரசு, ஆணையர் புலியியல் மற்றும் சுரங்கத்துறை மற்றும் மாவட்ட ஆட்சியரால் துது தொடர்பாக ஏற்படுத்தப்பட்டுள்ள மற்றும் அவ்வப்போது ஏற்படுத்தப்படும் சட்ட திட்டங்களுக்கும் குத்தகைதாரர் கட்டுப்பட்டு நடக்க வேண்டும். குத்தகைதாரர் குவாரி தொடர்பான அனைத்து பதிவேடுகளையும் பராமரிக்க வேண்டும்.

7. குத்தகைதாரர் ஒவ்வொரு திங்களும் குவாரி செய்த அளவிற்குரிய கணக்குகளை பிரதி திங்கள் 5-ஆம் தேதிக்குள் உதவி லிபக்குநர், புலியியல் மற்றும் சுரங்கத்துறை, திருப்பத்தூர் அவர்களுக்கு உரிய படிவத்தில் தணிக்கைக்கு ஆஜர் செய்ய வேண்டும்.

8. குத்தகைக்கு விடப்பட்ட கிடங்களை எந்த நேரத்திலும் புலியியல் மற்றும் சுரங்கத்துறை மற்றும் வருவாய்த்துறை அலுவலர்கள் பார்வையிட அதிகாரமுண்டு. துது சம்பந்தமாக பராமரிக்கப்படும் கணக்குகளை தணிக்கை செய்யவும் அதிகாரமுண்டு.

9. குவாரியின் எல்லைகள் தெள்ளாகத் தெரியுப்படி கலந்து அடையாளமிட்ட ப்டு குவாரி செய்ய வேண்டும். எல்லைக் கற்கள் குத்தகைக்காலம் முழுமைக்கும் சரியானபடி பராமரிக்கப்பட்டு வரவேண்டும். குவாரி முகப்பில் குத்தகை விபரம் அிடங்கிய தகவல் பலகை திருத்தல் வேண்டும்.

10. குத்தகை காலத்திலோ, அதற்கு பின்னரோ அனுமதிக்கப்பட்ட பரப்பிற்கு அதிகமாக குவாரி செய்தால் ஏற்படும் சகல நஷ்டங்களுக்கும் குத்தகைதாரர்கள் பொறுப்பு ஏற்க வேண்டும். இதற்காக விதிக்கப்படும் அபராதத்தையும் செலுத்த வேண்டும்.

11. குத்தகை எடுத்த நபர்கள் குத்தகைப் பகுதியை வேறு நபர்களுக்கு உள் குத்தகைக்கு விடவோ அல்லது பிற சாரியங்களுக்காக உபயோகிக்கவோ கூடாது.

12. குத்தகைதாரர் தன் சொந்தப்பொறுப்பில் வழிப்பாதைகள் அமைத்துக்கொள்ள வேண்டும். வழிப்பாதைகள் சம்பந்தமாக ஏற்படும் தகராறுகளுக்கு அரசு பொறுப்பல்ல.

13. குத்தகை எடுத்தவர் எந்தக் காரணத்தை முன்னிட்டும் தனக்கு தீழ்ப்பு ஏற்படின் நஷ்டஈடு கோரக் கூடாது.

14. குவாரியில் குழந்தை தொழிலாளர்களை பணியமர்த்தக் கூடாது.



திருப்பத்தூர் மாவட்ட அரசிதழ் சிறப்பு வெளியீடு

15. குவாரியில் வேலை செப்பும் தொழிலாளர்களுக்கும் மற்றும் இதர நபர்களுக்கும் ஏற்படும் குத்தகைதாரரே முழுப்பொறுப்பு ஏற்க வேண்டும் இதற்கு அரசு பொறுப்பல்ல.

16. குத்தகை நிபந்தனை மீறப்பட்டால் குத்தகையை ரத்து செய்யலாம். செய்த தவறுக்கு குத்தகைதாரருக்கு அபராதம் விதிக்கலாம், கிரமினல் வழக்குகள் தொடரலாம் மாவட்ட ஆட்சியருக்கு அதிகாரம் உண்டு.

17. குத்தகைதாரரை மேற்குறிப்பிட்ட நிபந்தனைகளும் 1959 ஆம் ஆண்டு தமிழ்நாடு சிறுகுடி சலுகை விதிகள், கரங்கங்கள் மற்றும் கனிமங்கள் (ஒழுங்குமுறை மற்றும் அபிவிருத்தி) சட்டம் 1957 மற்றும் அரசால் அவ்வப்போது கொண்டுவரப்படும் ஆணைகளும் விதிகளும் கட்டுப்படுத்தும்.

18. மேற்கண்ட நிபந்தனைகள் மற்றும் சட்டத்திட்டங்களை தவறாமல் கடைபிடிக்க வேண்டும். தவறும்பட்சத்தில் வழங்கப்பட்டுள்ள குவாரிக் குத்தகையை விதிகளுக்குட்பட்டு ரத்து செய்யப்படும்.

அட்டவணை

திருப்பத்தூர் மாவட்ட கற்குவாரிகள் டிஸு நான் } நான் : 28-02-2024
மற்றும் டென்டர் விண்ணப்பம் திறத்தல் } தேரம் : காலை 11.00 மணி

வ.எண்	கிராமத்தின் பெயர்	புலனெண்ணும் உட்பிரிவும்	மரப்பு (ஹெக்டேரில்)
ஆம்பூர் வட்டம்			
1.	விண்ணமங்கலம்	416/35(பகுதி.5) புதியது	1.62.0
2.	விண்ணமங்கலம்	419 (பகுதி.4)	1.00.0
3.	விண்ணமங்கலம்	419 (பகுதி.9) புதியது	0.80.0
4.	விண்ணமங்கலம்	419 (பகுதி.10) புதியது	1.00.0
5.	விண்ணமங்கலம்	420/1 (பகுதி.5) புதியது	2.00.0
6.	விண்ணமங்கலம்	420/1 (பகுதி.6) புதியது	0.81.0
7.	கதவாளம்	203 (பகுதி) புதியது	1.75.64
8.	காரப்பட்டு	296/2A2 (பகுதி.2)	0.80.0
9.	காரப்பட்டு	296/2A2 (பகுதி.3) புதியது	0.80.0
வாணியம்பாடி வட்டம்			
10.	வெள்ளகுட்டை	177/1 (பகுதி.3) புதியது	1.21.5
11.	ஆம்பூர்பேட்டை	54/2 (பகுதி) புதியது	0.81.0
நாடூரம்பள்ளி வட்டம்			
12.	அக்ரஹாரம்	638/1 (பகுதி.4) புதியது	2.50.0

திருப்பத்தூர்,
2024 பெப்ரவரி 5.

K. தர்பகராஜ்,
மாவட்ட ஆட்சியர்,
திருப்பத்தூர் மாவட்டம்

தமிழ்நாடு அரசு எழுதுபொருள் மற்றும் அச்சுதொறை ஆணையரால் சிறுதொடரலம் அரசின் கிளை அச்சகத்தில் அச்சிடப்பட்டு மாவட்ட ஆட்சியரால் வெளியிடப்பட்டது.

R. R.

புவியியல் மற்றும் சுரங்கத்துறை

ந.க.எண். 13/2024(கனிமம்)

மாவட்ட ஆட்சியர் அலுவலகம்,
திருப்பத்தூர்.

நாள்.15.03.2024



குறிப்பாணை

பொருள்: கனிமங்களும் சுரங்கங்களும் - திருப்பத்தூர் மாவட்டம் - ஆம்பூர் வட்டம் - விண்ணமங்கலம் கிராமம் - புல எண். 420/1 (பகுதி-6) -இல் 0.81.0 ஹெக்டேர் பரப்பளவில் கல்குவாரி குத்தகை உரிமம் டெண்டருடன் இணைந்த ஏலம் முறையில் வழங்குவது - 28.02.2024 அன்று நடைபெற்ற டெண்டர்/ஏலத்தில் திரு.R.புருஷோத்தமன் த/பெ. ரங்கநாதன் என்பவரால் உயர்ந்தபட்ச ஏலத் தொகையாக ரூ.63,00,000/-க்கு ஏலம் கோரப்பட்டது - ஏலத்தொகை முழுவதும் செலுத்தப்பட்டது - கல்குவாரி செய்ய தகுதிவாய்ந்த பரப்பாக தெரிவித்தல் - தொடர்பாக.

- பார்வை:**
1. திருப்பத்தூர் மாவட்ட அரசிதழ் சிறப்பு வெளியீடு: எண்.04, நாள்: 08.02.2024
 2. திரு.R.புருஷோத்தமன் த/பெ. ரங்கநாதன் மற்றும் 8 நபர்கள் ஆகியோரது ஏல/டெண்டர் விண்ணப்பம் நாள்: .02.2024
 3. இவ்வலுவலக குறிப்பாணை எண். ந.க.எண்.13/2024 (கனிமம்) நாள்:04.03.2024
 4. திரு.R.புருஷோத்தமன் த/பெ.ரங்கநாதன் என்பவரின் கடித நாள்.13.03.2024 உடன் IFHRMS செலுத்துச்சீட்டு

பார்வை 1-ல் காணும் திருப்பத்தூர் மாவட்ட அரசிதழ் சிறப்பு வெளியீட்டின்படி அரசுப் புறம்போக்கு புலங்களில் அமைந்துள்ள கல்குவாரிகளுக்கு டெண்டருடன் இணைந்த ஏல முறையில் சாதாரண கல்குவாரி குத்தகை உரிமம் வழங்கும் பொருட்டு அறிவிக்கை செய்யப்பட்டதற்கிணங்க 28.02.2024 அன்று டெண்டருடன் இணைந்த பொது ஏலம் நடத்தப்பட்டது.

2) மாவட்ட அரசிதழ் சிறப்பு வெளியீட்டில் கண்ட வரிசை எண்.06-இல் இடம்பெற்ற குவாரியான திருப்பத்தூர் மாவட்டம், ஆம்பூர் வட்டம், விண்ணமங்கலம் கிராம புல எண். 420/1 (பகுதி-6) -இல் 0.81.0 ஹெக்டேர் பரப்பில் அமைந்துள்ள கல்குவாரிக்கு டெண்டர் இணைந்த ஏலத்தில் கலந்து கொண்ட நபர்களில் திருப்பத்தூர் மாவட்டம், ஆம்பூர் வட்டம், விண்ணமங்கலம் பகுதியைச் சேர்ந்த

R. R.



திரு.R.புருஷோத்தமன் த/பெ. ரங்கநாதன் என்பவர் உயர்ந்தபட்ச ஏலத்தொகையாக ரூ.63,00,000/- (ரூபாய் அறுபத்து மூன்று லட்சம் மட்டும்) கோரியிருந்தார்.

3) பொது ஏலம் முடிந்தவுடன் மேற்படி குவாரிக்கு வரப்பெற்ற ஒரு மூடி முத்திரையிடப்பட்ட டெண்டர் விண்ணப்பம் பிரித்து பரிசீலனை செய்யப்பட்டது. பரிசீலனையில் 1) ஜோலார்பேட்டை ஏலகிரி கிராம பகுதியைச் சேர்ந்த திரு.G.குமரேசன் த/பெ. காந்தி என்பவர் உயர்ந்தபட்ச டெண்டர் தொகையாக ரூ.5,00,000/- கோரியிருந்தார். 2) ஆம்பூர் வட்டம் விண்ணமங்கலம் பகுதியைச் சேர்ந்த திரு.R.புருஷோத்தமன் த/பெ. ரங்கநாதன் என்பவர் உயர்ந்தபட்ச டெண்டர் தொகையாக ரூ.15,00,000/- கோரியிருந்தார்.

4) மேற்படி குவாரிக்கு அரசின் குறுமத்தொகை ரூ.42,00,000/- (ரூபாய் நூற்பத்து இரண்டு லட்சம்) என நிர்ணயிக்கப்பட்டு இருந்தது. டெண்டருடன் இணைந்த பொது ஏலத்தில் கலந்து கொண்ட 9 நபர்களில் திரு.R.புருஷோத்தமன் த/பெ. ரங்கநாதன் என்பவர் அரசின் குறுமத்தொகையை காட்டிலும் அதிகமாக ஏலத்தொகை ரூ.63,00,000/- (ரூபாய் அறுபத்து மூன்று லட்சம் மட்டும்) கோரியிருந்ததால் அவரை உயர்ந்தபட்ச ஏலதாரராக அறிவிக்கப்பட்டு தமிழ்நாடு சிறுகனிம சலுகை விதி 1959- 8(5)(b)(vi)-ன்படி உடன் 10% ஏலத் தொகை ரூ.6,30,000/- மற்றும் கூடுதலாக ரூ.20,000/- ஆக மொத்தம் ரூ.6,50,000/-ஐ வங்கி வரைவோலையாக (வங்கி பைரேபோலஸ் எண்.6262/6, 626245 தொகை: ரூ.6,50,000/- நாள்.28.02.2024, CANARA BANK) 28.02.2024 அன்றைய தினமே ஏலம் நடைபெற்ற இடத்தில் நேரடியாக செலுத்தியுள்ளார்.

5) மேற்படி தொகையினை இவ்வலுவலகத்தின் வாயிலாக IFHRMS (e-challan No.20240301009989 Dated: 01.03.2024 Total Amount Rs.6,50,000) உரிய அரசு கணக்கு தலைப்பின் கீழ் வரவு வைக்கப்பட்டுள்ளது.

6) திரு.R.புருஷோத்தமன் த/பெ.ரங்கநாதன் என்பவரை தமிழ்நாடு சிறு கனிமச் சலுகை விதிகள் விதி 1959, 8(5)(b)(vii)-ன்படி மீதமுள்ள 90% ஏலத் தொகையான ரூ.56,50,000/- (ரூபாய் ஐம்பத்து ஆறு லட்சத்து ஐம்பதாயிரம் மட்டும்), குத்தகை தொகைக்கு உண்டான வருமான வரி 2%, செலுத்தப்பட்ட வருமான வரிக்கு 10% கூடுதல் வரி, செலுத்தப்பட்ட வருமான வரி மற்றும் கூடுதல் வரிக்கு 3% தீர்வை



செலுத்த விதிகளின்படி ஏலம் நடைபெற்று நாளிலிருந்து 15 (பதினைந்து) தினங்களுக்குள் செலுத்தமாறு பார்வை 3-இல் காணும் இவ்வலுவலக குறிப்பானை வாயிலாக அறிவினுத்தப்பட்டது.

7) அதன்படி மீதமுள்ள 90% ஏலத்தொகை ரூ.56,50,000/- (ரூபாய் ஐம்பத்து ஆறு லட்சத்து ஐம்பதாயிரம் மட்டும்) திரு.R.புருஷோத்தமன் என்பவர் 11.03.2024 அன்று பாரத ஸ்டேட் வங்கியில் உரியஅரசுக் கணக்கில் செலுத்தி அசல் செலானை கீழ்க்கண்டவாறு சமர்ப்பித்துள்ளார்.

வ. எண்.	நாள்	இ-சலான் எண்	தொகை (ரூ)
1.	11.03.2024	20240311007992	56,50,000/-
		மொத்தம்	56,50,000/-

8) மேலும் குத்தகை தொகைக்கு உண்டான வருமான வரி 2% ரூ.1,26,000/- செலுத்தப்பட வருமான வரிக்கு 10% கூடுதல் வரி ரூ.12,600/- செலுத்தப்பட்ட வருமான வரி மற்றும் கூடுதல் வரிக்கு 3% தீர்வை ரூ.4,158/- ஆகமொத்தம் ரூ.1,42,758/-ஐ (ரூபாய் ஒரு லட்சத்து நாற்பத்து இரண்டாயிரத்து எழ்நூற்று ஐம்பத்து எட்டு மட்டும்)-ஐ, வருமான வரித்துறை சலான் CRN எண்.24031100128424, நாள்.12.03.2024 கனரா வங்கி மூலம் செலுத்தியுள்ளார்.

9) மேற்கண்ட விபரப்படி உடர்ந்தபட்ச ஏலதாரர் திரு.R.புருஷோத்தமன் த/பெ. ரங்கநாதன் அரசுக்கு செலுத்த வேண்டிய தொகையினை அரசுக் கணக்கில் செலுத்திவிட்டதால் 1959-ம் வருடத்திய தமிழ்நாடு சிறுகனிம சலுகை எண்.8(6)(B) & 8(8)-ன்படி, பத்து (10 வருட) ஆண்டு காலத்திற்கு திருப்பத்தூர் மாவட்டம், ஆம்பூர் வட்டம், விண்ணமங்கலம் கிராம புல எண். 420/1 (பகுதி-6) -இல் 0.81.0 ஹெக்டேர் பரப்பில் உடைசல்/ஐஸ்லி/சக்கைகல் வெட்டி எடுப்பதற்குரிய தகுதியான நிலப்பரப்பாக கருதி, கீழ்க்கண்ட நிபந்தனைகளுக்கு உட்பட்டு குத்தகை உரிம அனுமதி வழங்கப்படுகிறது.

R. P.



நிபந்தனைகள்:

1. 1959 தமிழ்நாடு சிறு கனிம சலுகை விதிகள், அட்டவணை II-ல் கண்டுள்ளபடி, குவாரி செய்யப்படும் கனிமங்களுக்குரிய சீனியரேஜ் தொகை அவ்வப்போது செலுத்தி கனிமம் கொண்டு செல்லப்பட வேண்டும்.
2. அருகில் உள்ள பட்டா நிலங்களுக்கு 7.5மீ மற்றும் அரகப் புறம்போக்கு நிலங்களுக்கு 10மீ பாதுகாப்பு இடைவெளி விட்டு குவாரிப் பணி மேற்கொள்ள வேண்டும்.
3. அருகில் உள்ள கிராமச் சாலைகள், வண்டிபாதைகளுக்கு 10மீ பாதுகாப்பு இடைவெளி விட்டு குவாரிப் பணி மேற்கொள்ளப்பட வேண்டும்.
4. அருகில் உள்ள மின் கம்பி/மிள்கம்பங்கள், நீர்நிலை புறம்புகல், தேசிய நெடுஞ்சாலைகள், இரயில்பாதைகள், கோவில்கள், கட்டிடங்களுக்கு 50மீ பாதுகாப்பு இடைவெளி விட்டு குவாரிப் பணி மேற்கொள்ளப்பட வேண்டும்.
5. அருகில் உள்ள குடியிருப்பு பகுதிகள் மற்றும் தொல்லியியல் / புராதானச் சின்னங்கள், ஆகியவற்றுக்கு 300மீ பாதுகாப்பு இடைவெளி விட்டு குவாரிப்பணி மேற்கொள்ளப்பட வேண்டும்.

10) மேலும் 1959-ம் வருடத்திய தமிழ்நாடு சிறு கனிம சலுகை விதிகள் விதி எண்.41 மற்றும் 42-ன்படி குவாரிப்பணி மேற்கொள்வது தொடர்பாக இக்குறிப்பாணை கிடைக்கப் பெற்ற 3 (மூன்று) மாத காலத்திற்குள் வரைவு கரங்கத் திட்டத்தினை சமர்ப்பிக்குமாறும், திருப்பத்தூர் புலியியல் மற்றும் கரங்கத்துறை உதவி இயக்குநரால் ஏற்பளிக்கப்பட்ட கரங்க வரைவுத் திட்டத்தினை பெற்றும், மாநில சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையத்தின் (SEIAA) இசைவினைப் பெற்றும் சமர்ப்பிக்குமாறு உயர்ந்தபட்ச ஏலதாரர் திரு.R.புருஷோத்தமன் த/பெ. ரங்கநாதன் என்பவருக்கு இதன் மூலம் தெரிவிக்கப்படுகிறது.

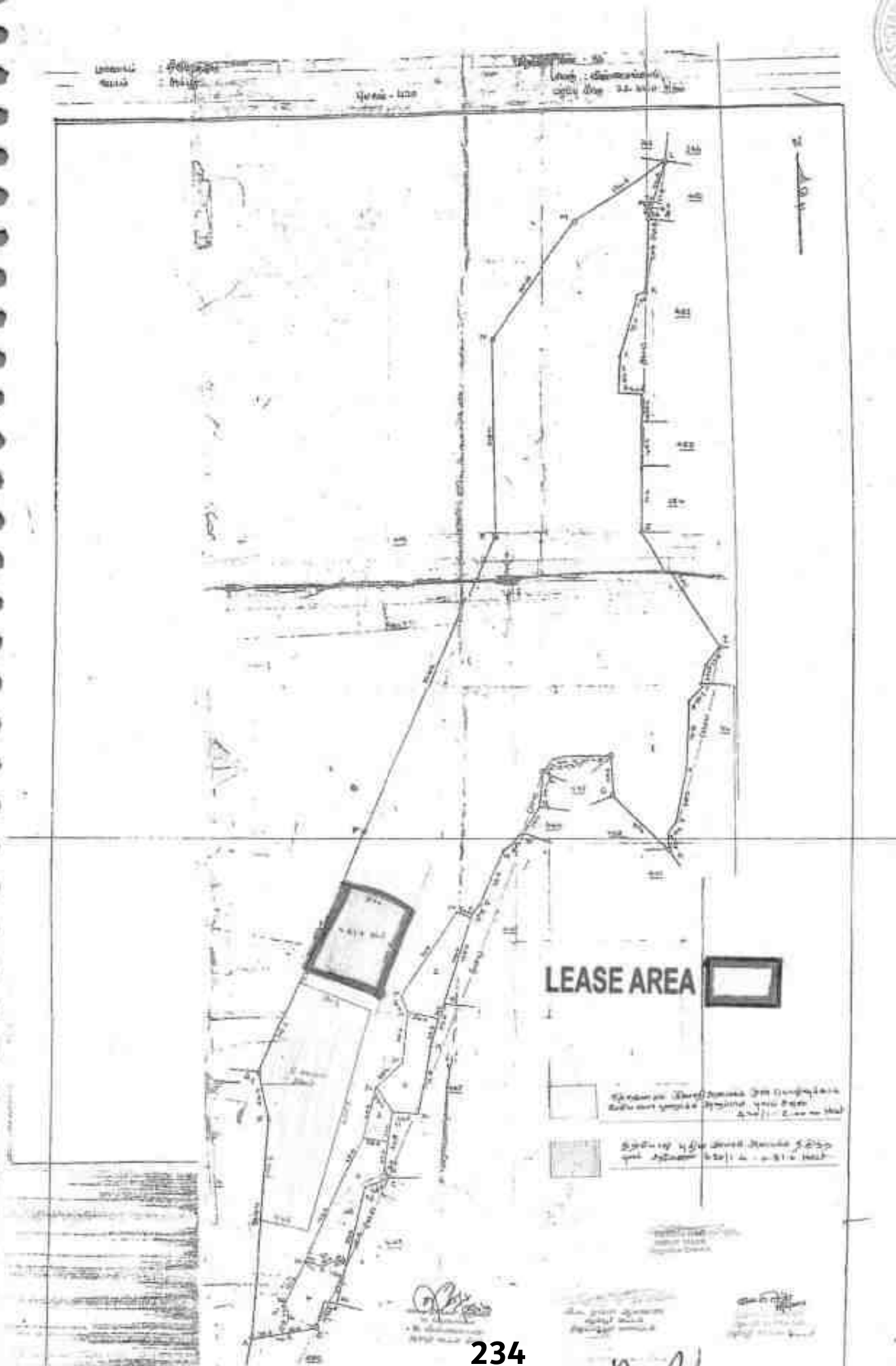
இணைப்பு: குவாரி புல வரைபடம்.

ச. சண்முகம்
15/03/2024
உதவி இயக்குநர்,
புலியியல் மற்றும் கரங்கத்துறை,
திருப்பத்தூர்.

பெறுநர்:

திரு.R.புருஷோத்தமன் த/பெ.ரங்கநாதன்,
எண்.43, பெருமாள்கோயில் தெரு,
விண்ணமங்கலம் கிராமம்,
ஆம்பூர் வட்டம்,
திருப்பத்தூர் மாவட்டம். 635807.

R. Ph



R. P. R.

த. எண் 5A கட்டிட அளவீடுகள்

2	3	4	5	6	7	8	9	10	11	12
										சாலை
420	அ	40					22	44.0		பாளையம் அருள்மிகு காளியம்மாள் கோயில் அருள்மிகு பெருமாள் கோயில்
421	அ	40					2	67.5		
422-1	ப	4		8-3	5	2	62	0 84 0	2 20	388 க. பழனி முதலியார்
-2	ப	4		8-3	5	2	62	0 73.0	1 91	753 ஸ்ரீ கிருஷ்ண மூர்த்தி (1), ரா. சரஸ்வதி (2).
								1 57.0	1 11	
423	ப	4		8-3	5	2	62	0 84 0	0 63	(47) வ. கண்ணன் கவுண்டர் D.C.
424	ப	4		8-3	5	2	42	0 41.0	1 07	754 ஸ்ரீ கோவிந்தன் (1), வெங்கடேசன் (2).
425	அ	40						0 23.5		
426-1	ப	4		8-3	5	2	62	0 52.0	1 36	47 வ. கண்ணன் கவுண்டர்
-2	ப	4		8-3	5	2	62	0 55.0	1 45	47 வ. கண்ணன் கவுண்டர்
								1 07.0	2 81	
427	ப	4		8-3	5	2	62	0 19 0	0 50	583 ஸ்ரீ. ராணியம்மாள்
428-1	அ	40						0 40.5		
-2A	ப	4		8-3	5	2	62	0 47.0	1 23	583 ஸ்ரீ. ராணியம்மாள்
2B	அ	40						0 48.0		
-2Cum	ப	4		8-3	5	2	62	0 16.5	0 43	570 த. ராஜா
2C2	ப	4		8-3	5	2	62	0 04.0	0 10	47 த. ராஜா



ம. அ. என். க. சி. சி.
13/6/96
01.3.7.96
D.C. லை.
க. ராஜா
வெங்கடேசன்
ராஜா
10.4.96

ம. அ. என். க. சி. சி.
13/6/96
01.3.7.96
D.C. லை.
க. ராஜா
வெங்கடேசன்
ராஜா
10.4.96

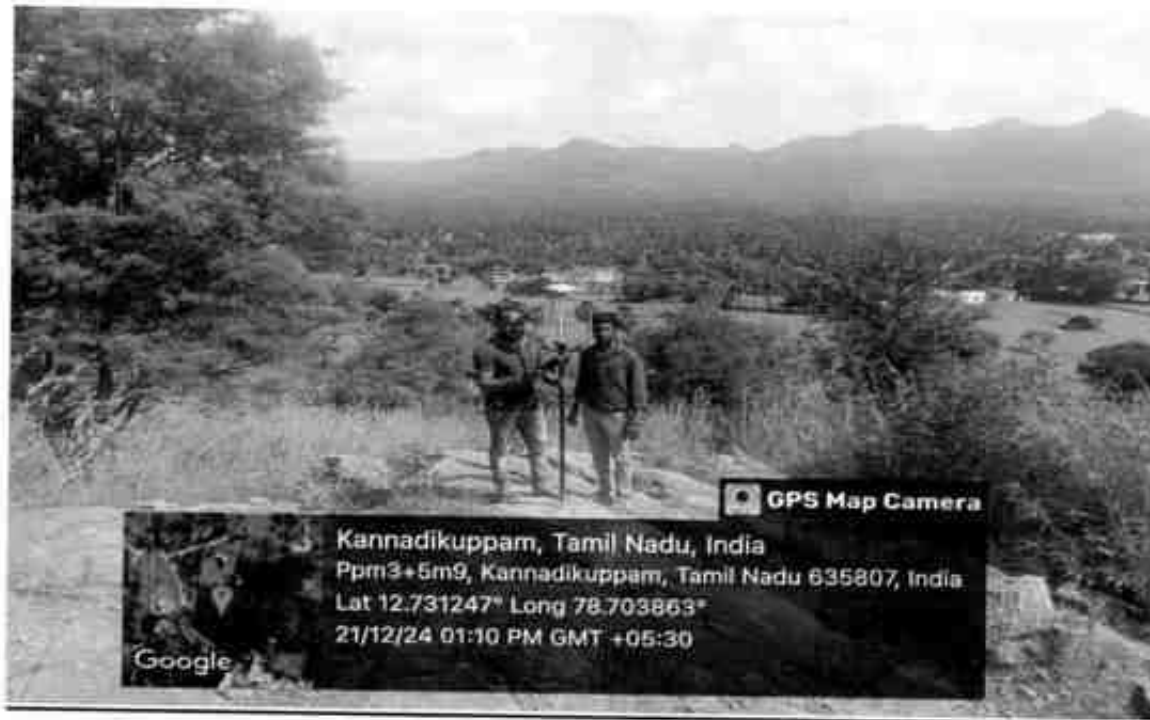
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13/6/96
01.3.7.96
D.C. லை.
க. ராஜா
வெங்கடேசன்
ராஜா
10.4.96

R. P.



PHOTOCOPY OF THE LEASE AREA

Site photos in respect of Rough stone quarry lease in S.F.No's: 420/1(Part-6) - Govt.
Poramboke Land - over an extent of 0.81.0 hectares - Vinnamangalam village -
Ambur Taluk - Tirupathur District, Tamil Nadu State in belongs to Mr.
R.Purushothaman,



R. Purushothaman



R. R.



आयकर विभाग
INCOME TAX DEPARTMENT



भारत सरकार
GOVT. OF INDIA



स्थायी लेखा संख्या कार्ड
Permanent Account Number Card

DPEPP9663A



नाम / Name
R PURUSHOTHAMAN

पिता का नाम / Father's Name
RANGANATHAN

जन्म की तारीख / Date of Birth
10/12/1960


हस्ताक्षर / Signature



28042017





Cell: 9885799345
E-mail -ellammangranites@gmail.com

M/s ELLAMMAN GRANITES

PLOT NO 1, ROOM NO 10, BANKERS COLONY, SRIKAKULAM ANDHRA PRADESH-532001

Ref. No.- EG/EC/2022/02

Date - 02.11.2022

EXPERIENCE CERTIFICATE

This is to certify that Mr.P.Vellaiyan Geologist worked in M/s Ellamman Granites as Mines Manager in Sy.No.71, Mukhalingapuram Village, Tekkali Mandal, Srikakulam District, Andhra Pradesh State from 20.07.2017 to 31.10.2022. During his working period he carried out Boundary demarcation survey using DGPS, Reserve Estimation, direct and co-ordinate the production activities, Ensure Mine Safety and Surface plan prepared. We found him a sincere, honest, hardworking, dedicated employee with a professional attitude and very good job knowledge. He is amiable in nature and character is well.

We wish him every success in life.

For ELLAMMAN GRANITES

R. P. V. S. S.

Proprietor
(Signature with date and official Seal)

(Signature of Employee)

R. P. V. S. S.



Cell: 9885799345
E-mail -ellammangranites@gmail.com

M/s ELLAMMAN GRANITES

PLOT NO 1, ROOM NO 10, BANKERS COLONY, SRIKAKULAM ANDHRA PRADESH-532001

S.No	Nature of Practical Experience	Place of Work	Period of Experience		Total Working Experience		
			From	To	Year	Month	Days
1	Worked as Geologist and it Boundary demarcation survey using DGPS, Reserve Estimation, direct and co-ordinate the production activities, Ensure Mine Safety and Surface plan prepared.	Open Cast Mines and Office	20.07.2017	31.10.2022	5	3	11

For ELLAMMAN GRANITES

R. R. R.

Proprietor

(Signature with date and official Seal)

[Handwritten Signature]

(Signature of Employee)

[Handwritten Signature]

Reg. No M16GEO101
College Code 514

No.2KN 043495



பெரியார் பல்கலைக்கழகம் PERIYAR UNIVERSITY

அறிவியல் புலம்
FACULTY OF SCIENCE



பெரியார் பல்கலைக்கழகம் ஜூலை 2017

ஆம் ஆண்டு நடத்திய

பயன்பாட்டுப் புவியமைப்பியல்

தேர்வில்

P வேளாளயன்

முதல் வகுப்பில் உயர் தகைமையுடன் O தரத்தில் தேர்ச்சி பெற்றதைத் தகுதிமதிப்பிடுபவர்கள்

உரிய தேர்வாளர்கள் சான்றுத்தலை ஏற்று

ஆய்வியல் நிறைஞர்

சான்றார்

நடத்தியதை அடிப்படையில் பல்கலைக்கழக இலாசியை உயர்

பெரியார் பல்கலைக்கழக ஆட்சிக்குழு

ஏற்றுக்கொண்டு

The Syndicate of the **PERIYAR UNIVERSITY** hereby makes known that
VELLAIYAN P has been

admitted to the Degree of **MASTER OF PHILOSOPHY**

Having been certified by duly appointed Examiners to be qualified to receive the same in
APPLIED GEOLOGY

and was placed in **FIRST CLASS EXEMPLARY WITH O GRADE**

at the Examination held in **JULY 2017** by Periyar University.



Given under the Seal of the University

Dated: 20-03-2018
Salem - 636011,
Tamil Nadu, India.

Controller of Examinations

Registrar

Vice-Chancellor

N



PLATE No-I

APPLICANT:

MR. R. PURUSHOTHAMAN,
S/O RANGANATHAN,
No.43, PERUMAL KOVIL STREET,
VINNAMANGALAM VILLAGE,
AMBUR TALUK,
TIRUPATHUR DISTRICT- 635807.

LEASE AREA:

S.F.No : 420/1 (Part-6)
EXTENT : 0.81.0Hect
VILLAGE : VINNAMANGALAM
TALUK : AMBUR
DISTRICT : TIRUPATHUR

INDEX

MINE LEASE AREA

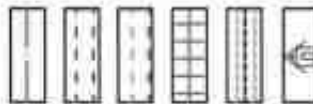
APPROACH ROAD

CART & VILLAGE ROAD

RAILWAY TRACK

NH - 4 ROAD

HABITATION



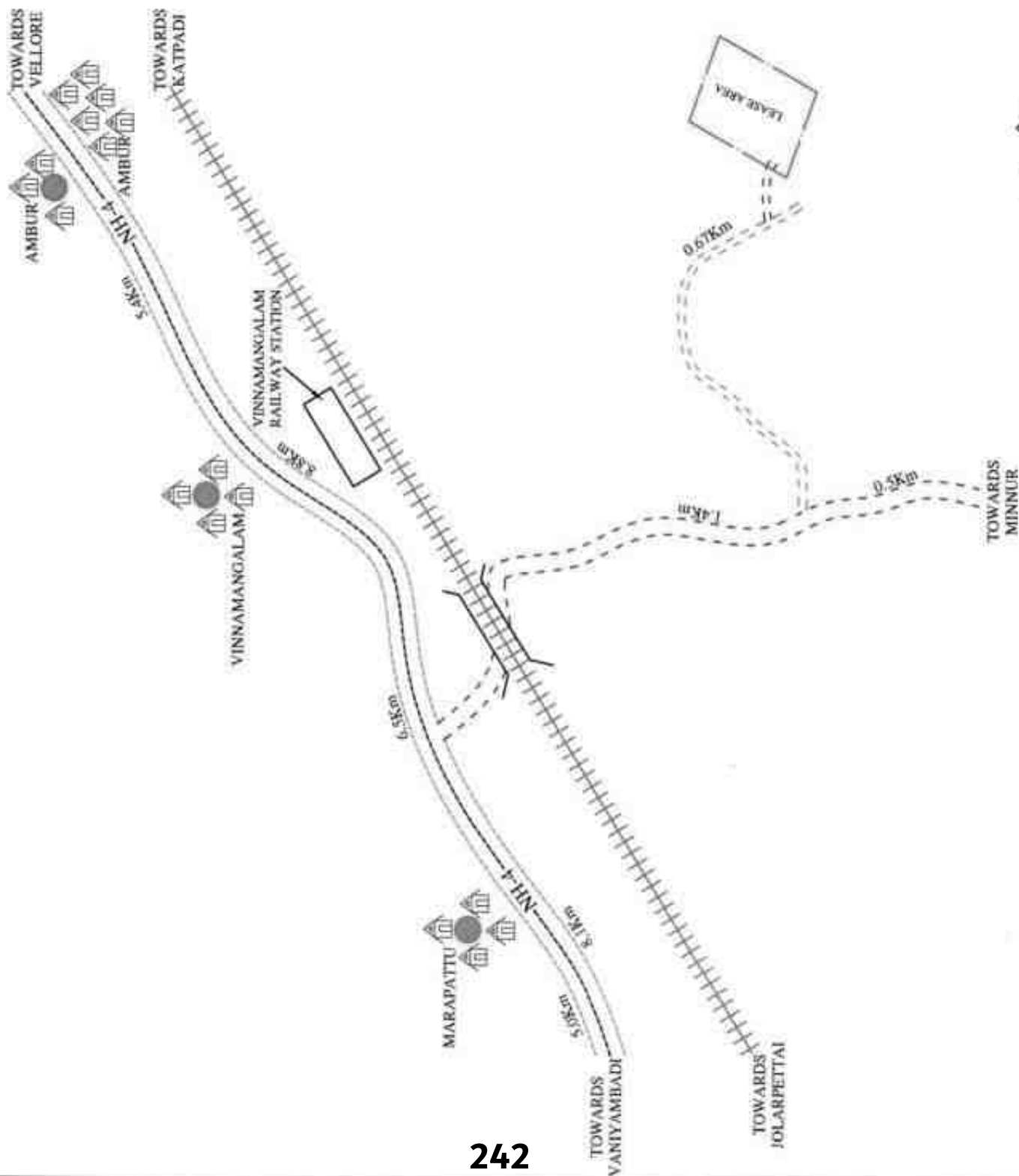
KEY MAP

Not to Scale

Prepared By:

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

[Signature]
P. VELLAIYAN, M.Sc., M.Phil.,
QUALIFIED PERSON



12°43'32.11"N



78°41'50.45"E

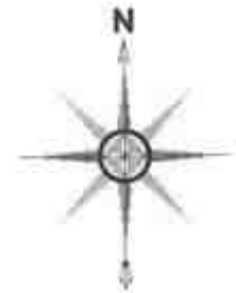


PLATE No-IA

APPLICANT:
Mr.R.PURUSHOTHAMAN,
S/o.RANGANATHAN,
No.43, PERUMAL KOVIL STREET,
VINNAMANGALAM VILLAGE,
AMBUR TALUK,
TIRUPATHUR DISTRICT- 635807.

LEASE AREA:
S.F.No : 420/1 (Part-6)
EXTENT : 0.81.0Hect
VILLAGE : VINNAMANGALAM
TALUK : AMBUR
DISTRICT : TIRUPATHUR

INDEX

MINE LEASE AREA : ●
TOPO SHEET NO : 57-L/10
LATITUDE : 12°43'28.39"N to 12°43'32.11"N
LONGITUDE : 78°41'50.45"E to 78°41'54.59"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


P.VELLAIYAN, M.Sc., M.Phil.,
QUALIFIED PERSON

12°43'32.11"N



PLATE No-IB

APPLICANT:

Mr.R.PURUSHOTHAMAN,
S/o.RANGANATHAN,
No.43, PERUMAL KOVIL STREET,
VINNAMANGALAM VILLAGE,
AMBUR TALUK,
TIRUPATHUR DISTRICT- 635807.

LEASE AREA:

S.F.No : 420/1 (Part-6)
EXTENT : 0.81.0Hect
VILLAGE : VINNAMANGALAM
TALUK : AMBUR
DISTRICT : TIRUPATHUR

TOPO SHEET NO : 57-L/10

LATITUDE : 12°43'28.39"N to 12°43'32.11"N

LONGITUDE : 78°41'50.45"E to 78°41'54.59"E

MINE LEASE AREA



10KM RADIUS

[illegible]

TOPOSHEET MAP

SCALE- 1:1,00,000

Prepared By:

I DO HEREBY CERTIFY THAT THE PLATE HAS
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TO THE BEST OF MY KNOWLEDGE

Thurman

P. VELLAIYAN, M.Sc., M.Phil.,
QUALIFIED PERSON

TOWARDS
VINNAMANGALAM

12°43'32.11"N

78°41'50.45"E

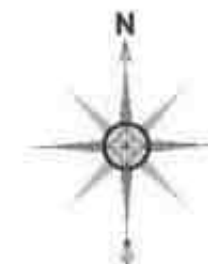
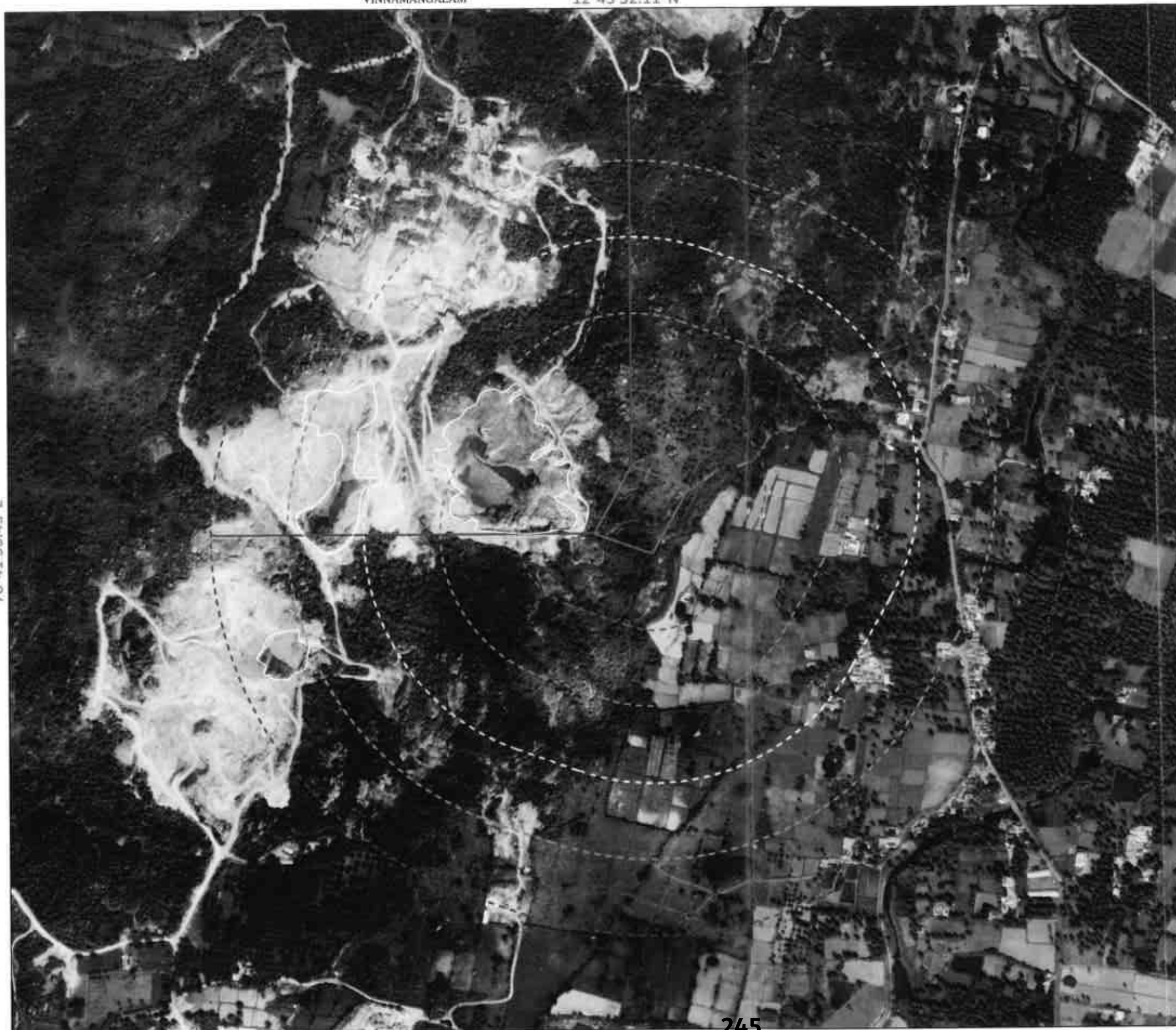


PLATE No-IC

APPLICANT:

Mr.R.PURUSHOTHAMAN,
S/o.RANGANATHAN,
No.43, PERUMAL KOVIL STREET,
VINNAMANGALAM VILLAGE,
AMBUR TALUK,
TIRUPATHUR DISTRICT- 635807.

LEASE AREA:

S.F.No : 420/1 (Part-6)
EXTENT : 0.81.0Hect
VILLAGE : VINNAMANGALAM
TALUK : AMBUR
DISTRICT : TIRUPATHUR

INDEX

MINE LEASE AREA



APPROACH ROAD



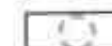
CART ROAD



100m RADIUS



200m RADIUS



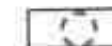
300m RADIUS



400m RADIUS



500m RADIUS



EXISTING PIT



TOPO SHEET NO : 57-L/10

LATITUDE : 12°43'28.39"N to 12°43'32.11"N

LONGITUDE : 78°41'50.45"E to 78°41'54.59"E

SATELLITE IMAGERY MAP

SCALE- 1:5000

Prepared By:

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TO THE BEST OF MY KNOWLEDGE

P.VELLAIYAN,M.Sc.,M.Phil.,
QUALIFIED PERSON

OCTOBER TO DECEMBER



PLATE No-ID

APPLICANT:
Mr.R.PURUSHOTHAMAN,
S/o.RANGANATHAN,
No.43, PERUMAL KOVIL STREET,
VINNAMANGALAM VILLAGE,
AMBUR TALUK,
TIRUPATHUR DISTRICT- 635807.

LEASE AREA:
S.F.No : 420/1 (Part-6)
EXTENT : 0.81.0Hect
VILLAGE : VINNAMANGALAM
TALUK : AMBUR
DISTRICT : TIRUPATHUR

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/10

LATITUDE : 12°43'28.39"N to 12°43'32.11"N

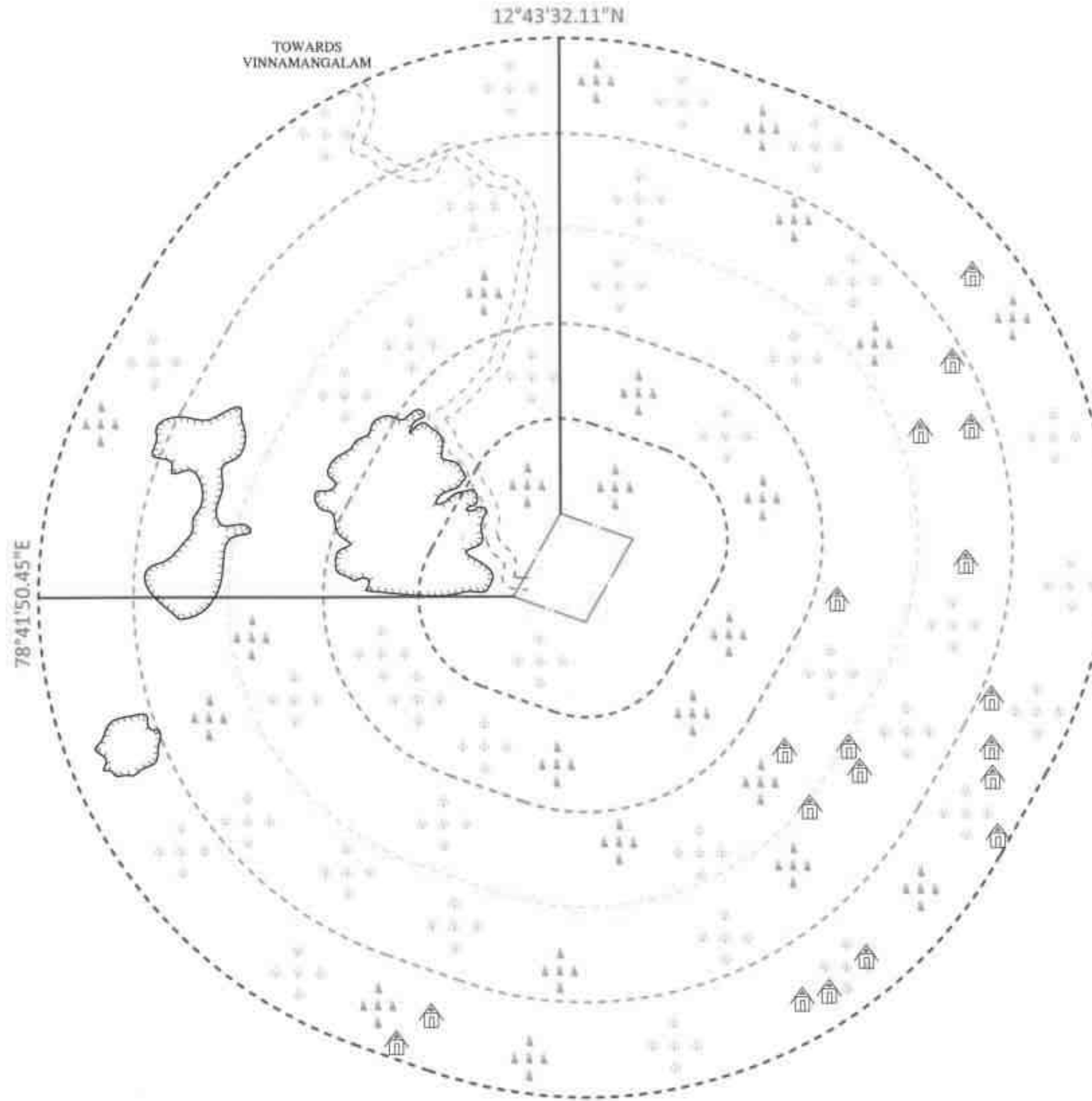
LONGITUDE : 78°41'50.45"E to 78°41'54.59"E

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

P. VELLAIYAN, M.Sc., M.Phil.,
QUALIFIED PERSON



JULY TO SEPTEMBER

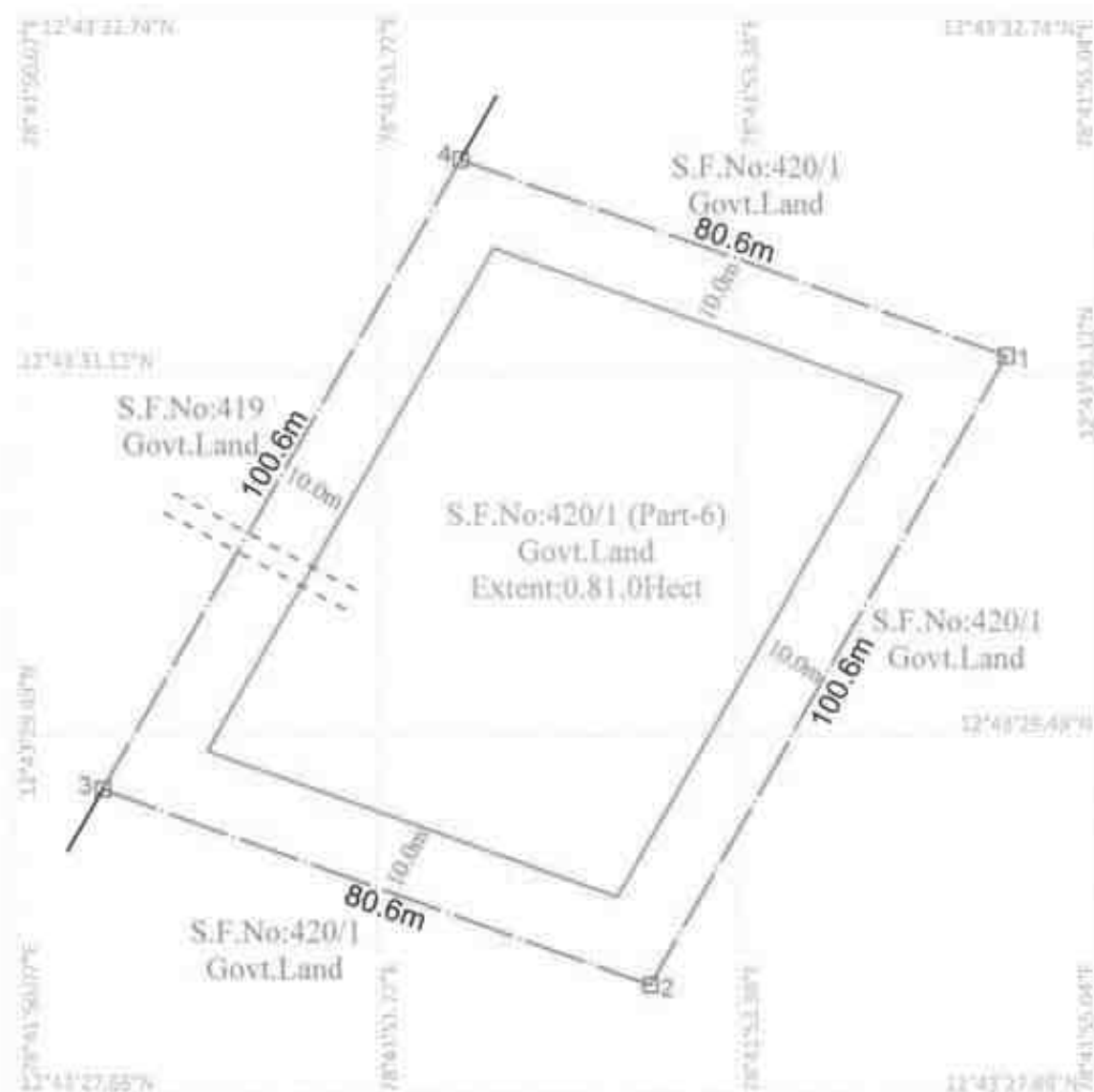


PLATE No- II

APPLICANT:

Mr.R.PURUSHOTHAMAN,
S/o.RANGANATHAN,
No.43, PERUMAL KOVIL STREET,
VINNAMANGALAM VILLAGE,
AMBUR TALUK,
TIRUPATHUR DISTRICT- 635807.

LEASE AREA:

S.F.No : 420/1 (Part-6)
EXTENT : 0.81.0Hect
VILLAGE : VINNAMANGALAM
TALUK : AMBUR
DISTRICT : TIRUPATHUR

PILLAR ID	LATITUDE	LONGITUDE
1	12°43'31.25"N	78°41'54.59"E
2	12°43'28.39"N	78°41'52.97"E
3	12°43'29.25"N	78°41'50.45"E
4	12°43'32.11"N	78°41'52.07"E

INDEX

MINE LEASE BOUNDARY	
SAFETY DISTANCE	
APPROACH ROAD	
BOUNDARY PILLAR STONES	

MINE LEASE PLAN

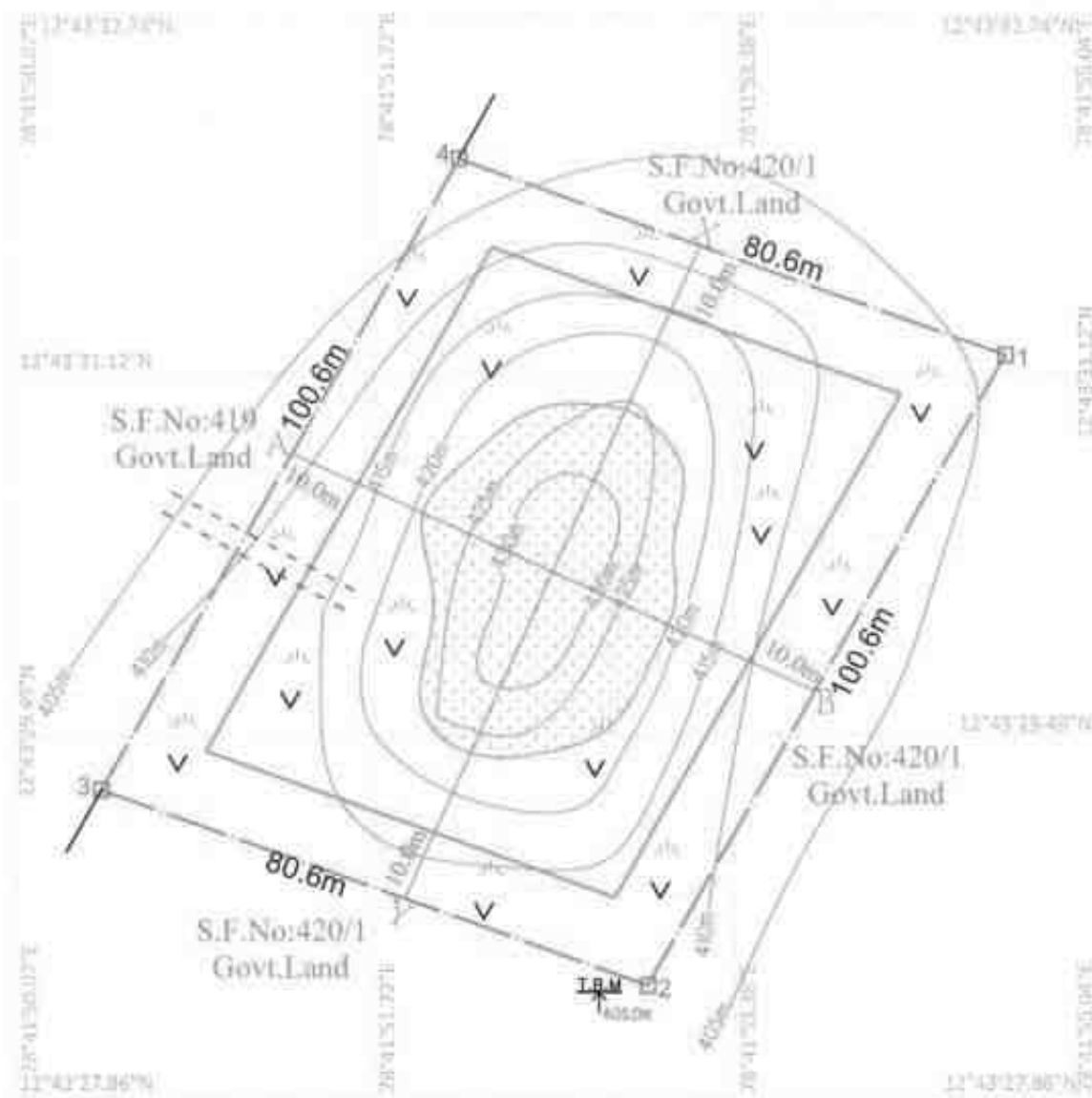
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Prepared By:

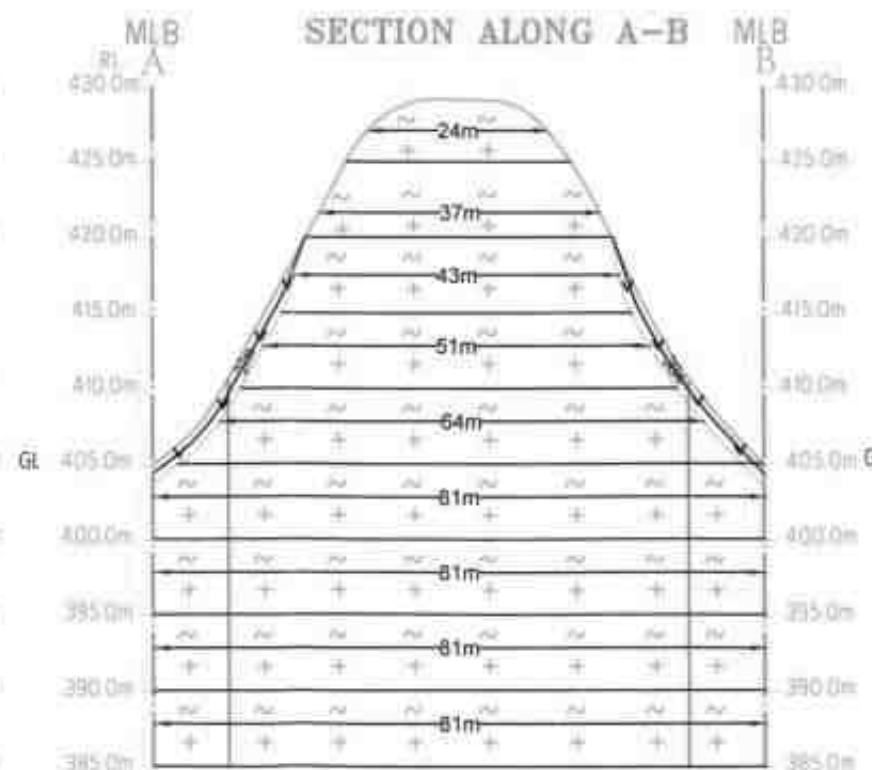
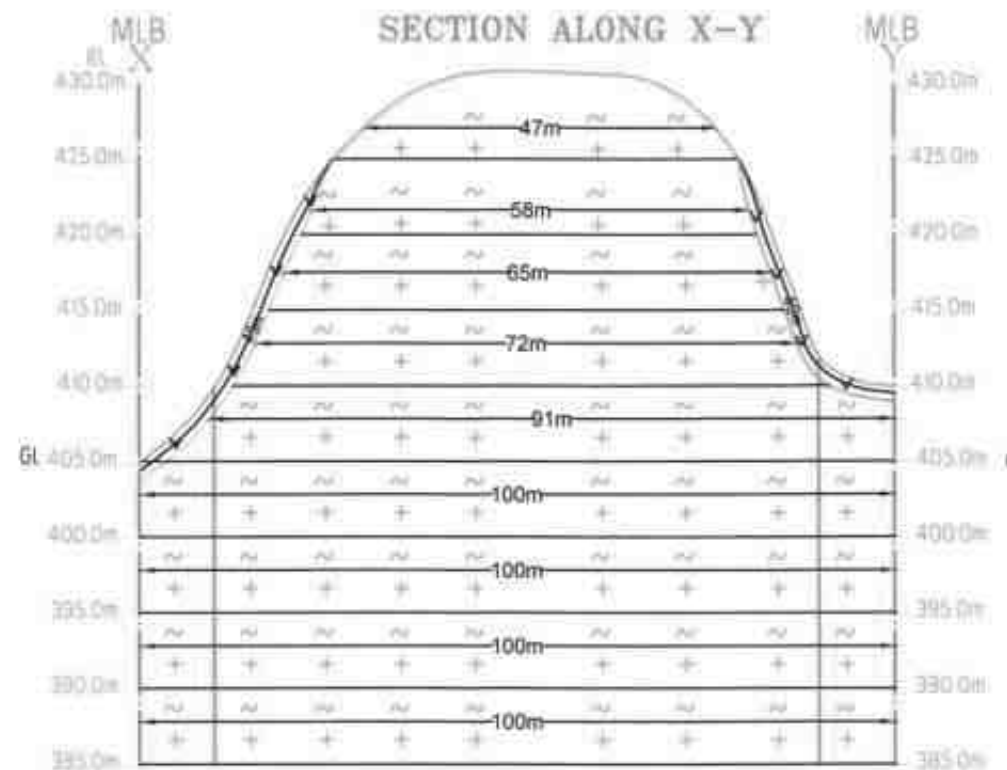
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P.VELLAIYAN, M.Sc., M.Phil.,
QUALIFIED PERSON



GEOLOGICAL RESOURCES								
Section	Level	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume In M ³	Rough Stone in M ³	Residual Top soil M ³
XY-AB	Above Ground Level	---	89	75	1	6675	-----	6675
		I	47	24	5	5640	5640	-----
		II	58	37	5	10730	10730	-----
		III	65	43	5	13975	13975	-----
		IV	72	51	5	18360	18360	-----
	Below Ground Level	V	91	64	5	29120	29120	-----
		VI	100	81	5	40500	40500	-----
		VII	100	81	5	40500	40500	-----
		VIII	100	81	5	40500	40500	-----
		IX	100	81	5	40500	40500	-----
TOTAL						246500	239825	6675



GL-GROUND LEVEL

PLATE No- III

APPLICANT:
Mr.R.PURUSHOTHAMAN,
 S/o.RANGANATHAN,
 No.43, PERUMAL KOVIL STREET,
 VINNAMANGALAM VILLAGE,
 AMBUR TALUK,
 TIRUPATHUR DISTRICT- 635807.

LEASE AREA:
 S.F.No : 420/1 (Part-6)
 EXTENT : 0.81.0Hect
 VILLAGE : VINNAMANGALAM
 TALUK : AMBUR
 DISTRICT : TIRUPATHUR

INDEX

MINE LEASE BOUNDARY	
SAFETY DISTANCE	
APPROACH ROAD	
BOUNDARY PILLAR STONES	
RESIDUAL TOPSOIL	
SHRUBS	
CONTOUR LINES	
TEMPORARY BENCH MARK	
OUTCROP	

SURFACE, GEOLOGICAL PLAN & SECTIONS

SCALE 1: 1000
 SCALE - HOR 1: 1000 & VER 1: 500

Prepared By:

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 BEEN CHECKED BY ME AND IS CORRECT
 TO THE BEST OF MY KNOWLEDGE

P.VELLAIYAN, M.Sc., M.Phil.,
 QUALIFIED PERSON



PLATE No- IV

APPLICANT:
Mr.R.PURUSHOTHAMAN,
 S/o.RANGANATHAN,
 No.43, PERUMAL KOVIL STREET,
 VINNAMANGALAM VILLAGE,
 AMBUR TALUK,
 TIRUPATHUR DISTRICT- 635807.

LEASE AREA:
 S.F.No : 420/1 (Part-6)
 EXTENT : 0.81.0Hect
 VILLAGE : VINNAMANGALAM
 TALUK : AMBUR
 DISTRICT : TIRUPATHUR

INDEX

MINE LEASE BOUNDARY	
SAFETY DISTANCE	
APPROACH ROAD	
BOUNDARY PILLAR STONES	
RESIDUAL TOPSOIL	
SHRUBS	
CONTOUR LINES	
TEMPORARY BENCH MARK	
ULTIMATE BENCH	
FENCING	

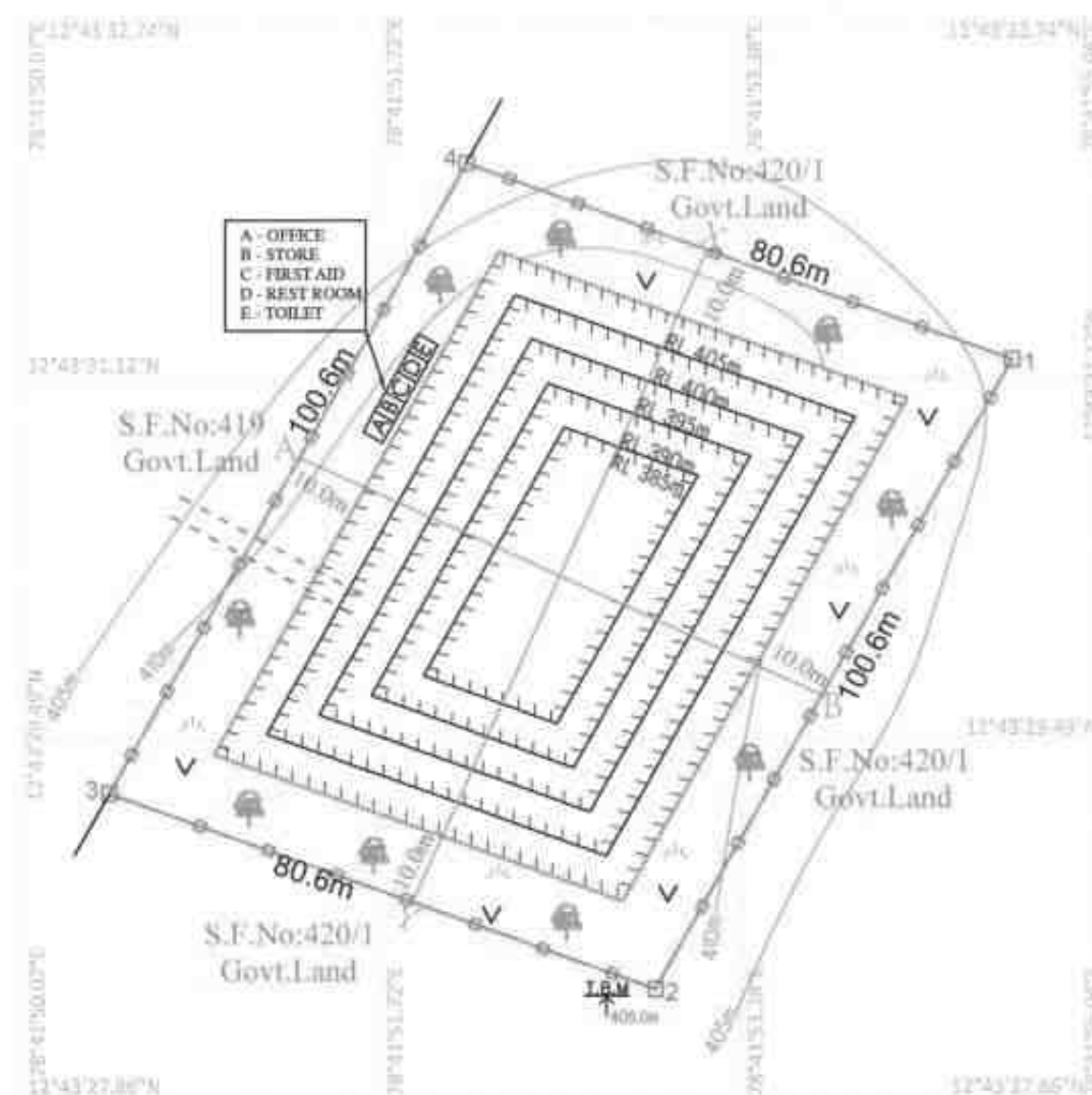
CONCEPTUAL PLAN & SECTIONS

SCALE 1: 1000
 SCALE - HOR 1: 1000 & VER 1: 500

Prepared By:

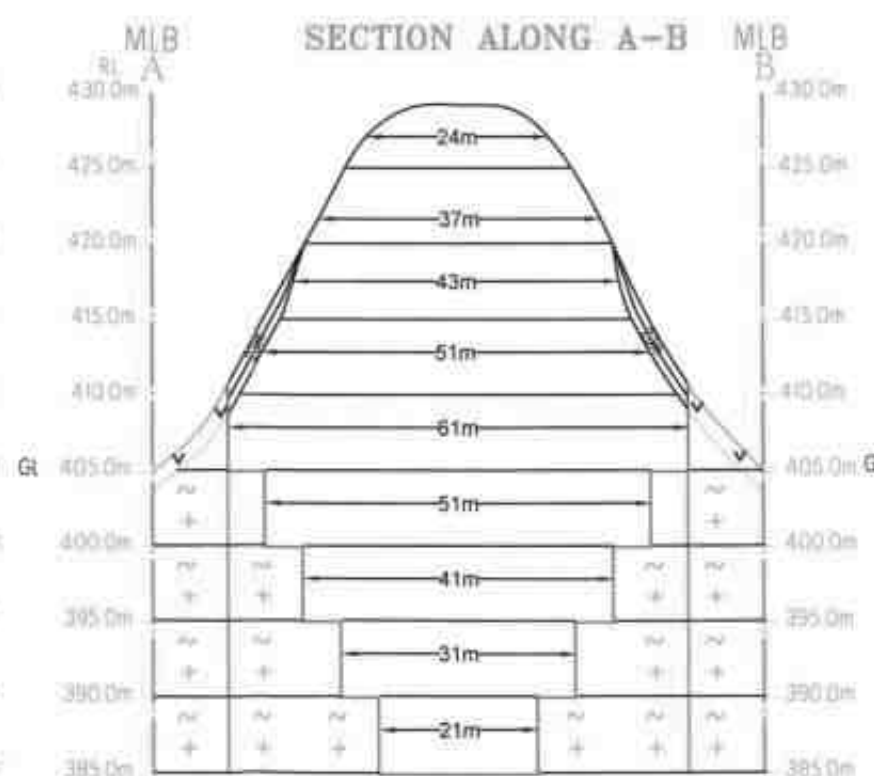
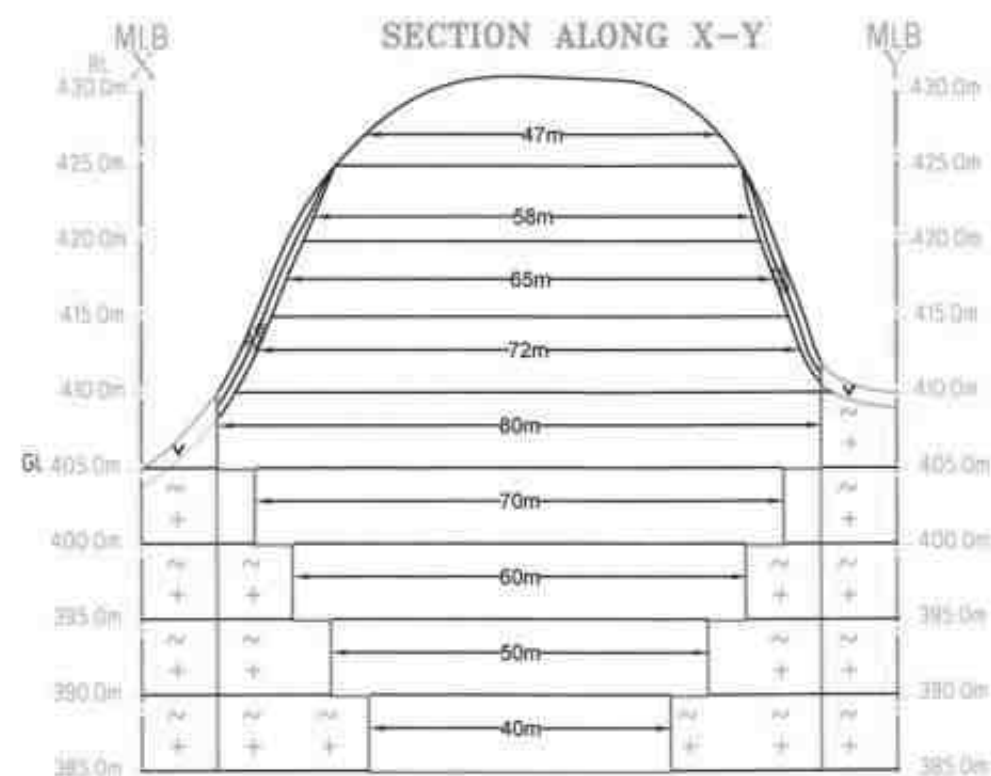
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 TO THE BEST OF MY KNOWLEDGE

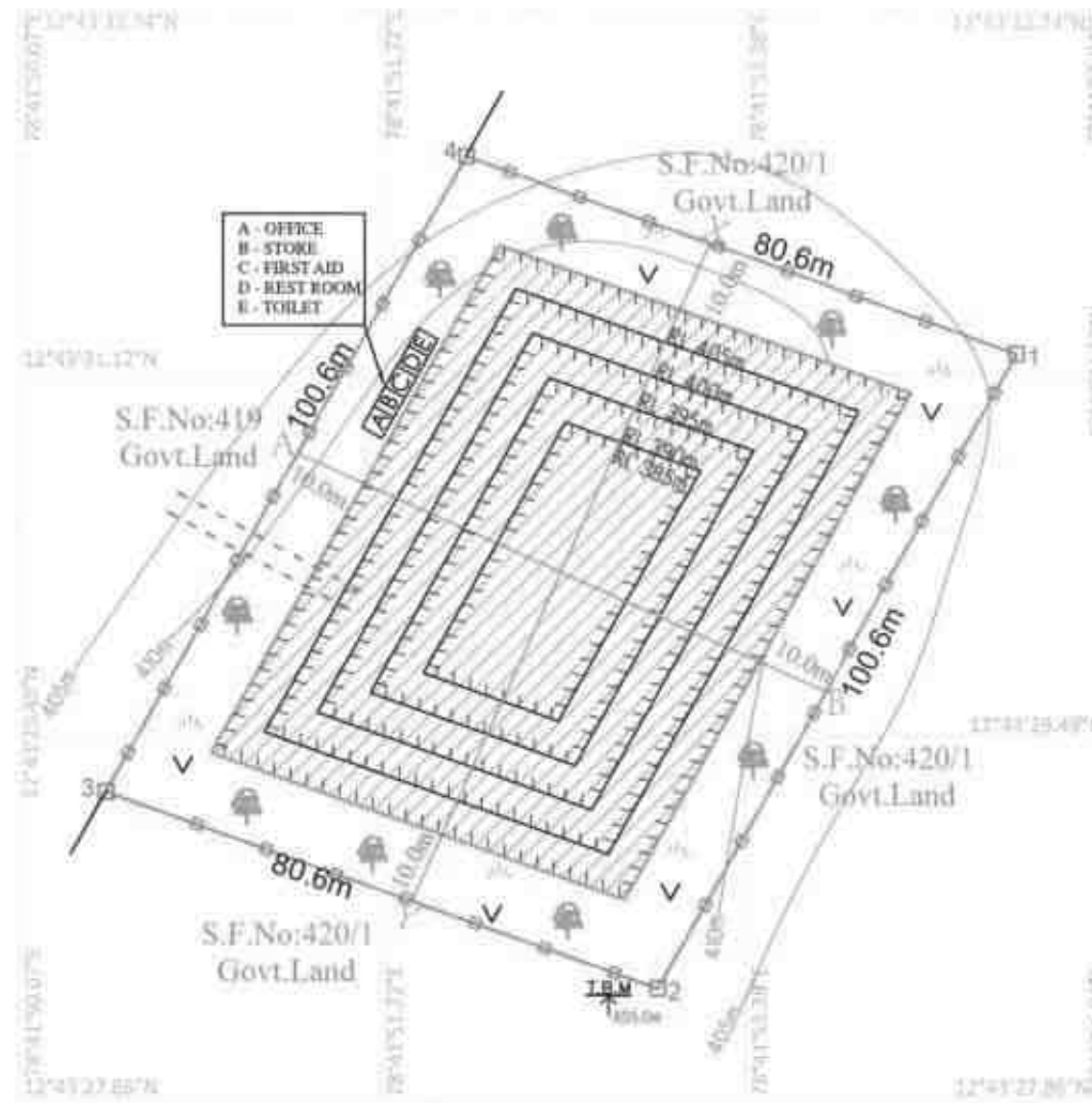
P. VELLAIYAN, M.Sc., M.Phil.,
 QUALIFIED PERSON



MINEABLE RESERVES								
Section	Level	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume In M ³	Rough Stone in M ³	Residual Top soil in M ³
XY-AB	Above Ground Level	---	64	46	1	2944	---	2944
		I	47	24	5	5640	5640	---
		II	58	37	5	10730	10730	---
		III	65	43	5	13975	13975	---
		IV	72	51	5	18360	18360	---
	Below Ground Level	V	80	61	5	24400	24400	---
		VI	70	51	5	17850	17850	---
		VII	60	41	5	12300	12300	---
		VIII	50	31	5	7750	7750	---
IX		40	21	5	4200	4200	---	
TOTAL					118149	115205	2944	

GL-GROUND LEVEL





Plantation Proposed for 1-Year

MINE LAYOUT LAND USE PATTERN

DESCRIPTION	PRESENT AREA (Hect)	AREA IN USE DURING THE QUARRYING PERIOD(Hect)	COLOR CODE
AREA UNDER QUARRYING	NIL	0.47.70	
INFRASTRUCTURE	NIL	0.02.0	
ROADS	NIL	0.03.0	
UN-UTILIZED AREA	0.81.00	NIL	
GREEN BELT	NIL	0.28.30	
GRAND TOTAL	0.81.00	0.81.00	



PLATE No-V

APPLICANT:

Mr.R.PURUSHOTHAMAN,
S/o.RANGANATHAN,
No.43, PERUMAL KOVIL STREET,
VINNAMANGALAM VILLAGE,
AMBUR TALUK,
TIRUPATHUR DISTRICT-635807.

LEASE AREA:

S.F.No : 420/1 (Part-6)
EXTENT : 0.81.0Hect
VILLAGE : VINNAMANGALAM
TALUK : AMBUR
DISTRICT : TIRUPATHUR

INDEX

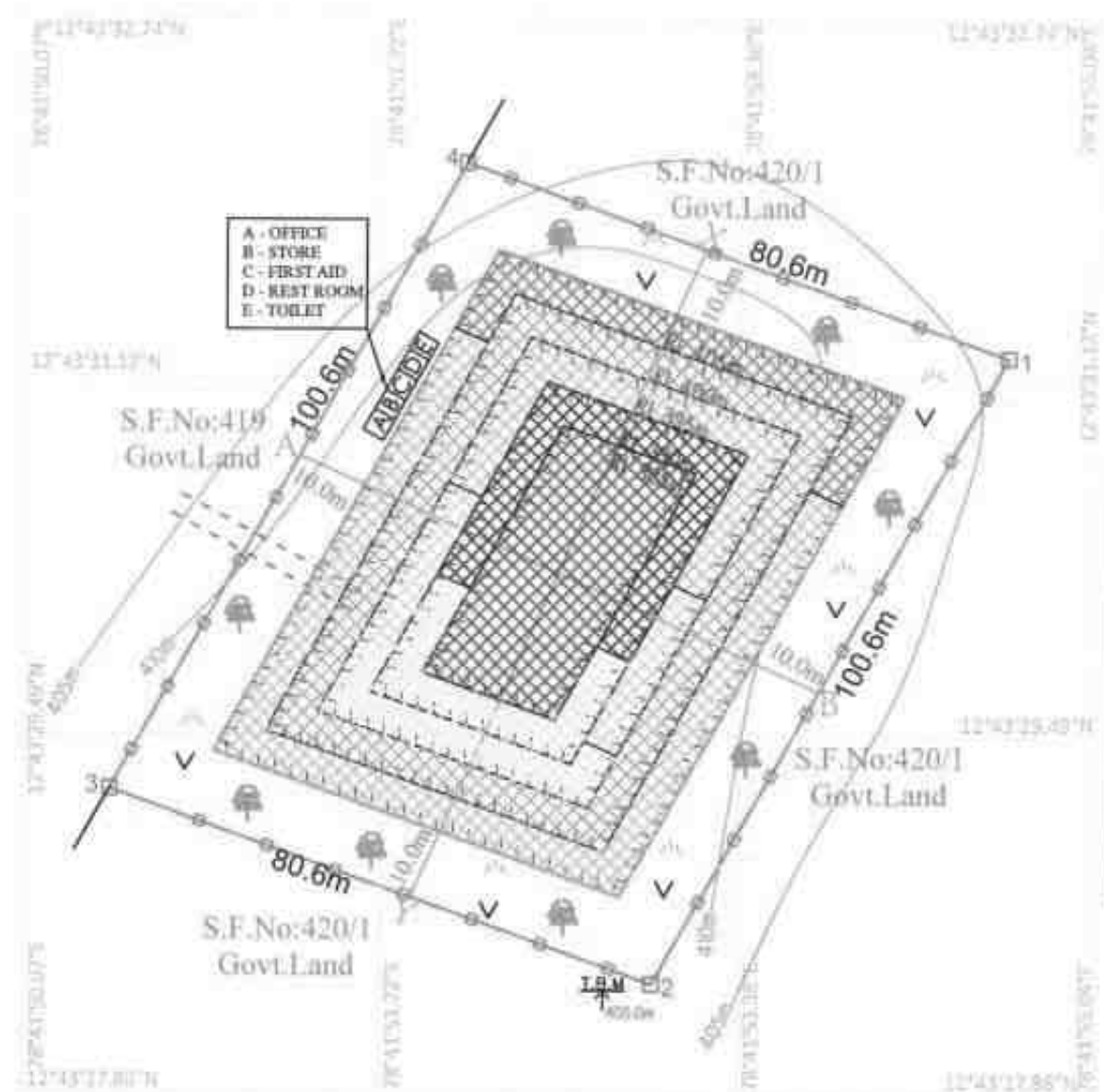
MINE LEASE BOUNDARY	
SAFETY DISTANCE	
APPROACH ROAD	
BOUNDARY PILLAR STONES	
RESIDUAL TOPSOIL	
SHRUBS	
CONTOUR LINES	
TEMPORARY BENCH MARK	
PROPOSED BENCH	
FENCING	

MINE LAYOUT PLAN & LAND USE PATTERN SCALE 1 : 1000

Prepared By:

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BEEN CHECKED BY ME AND IS CORRECT
TO THE BEST OF MY KNOWLEDGE

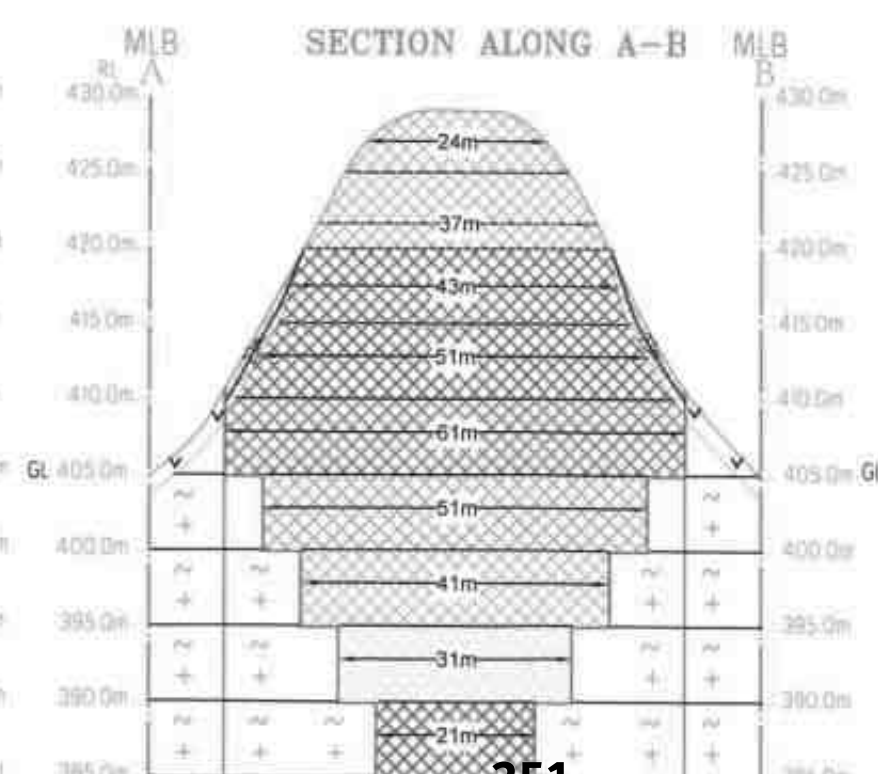
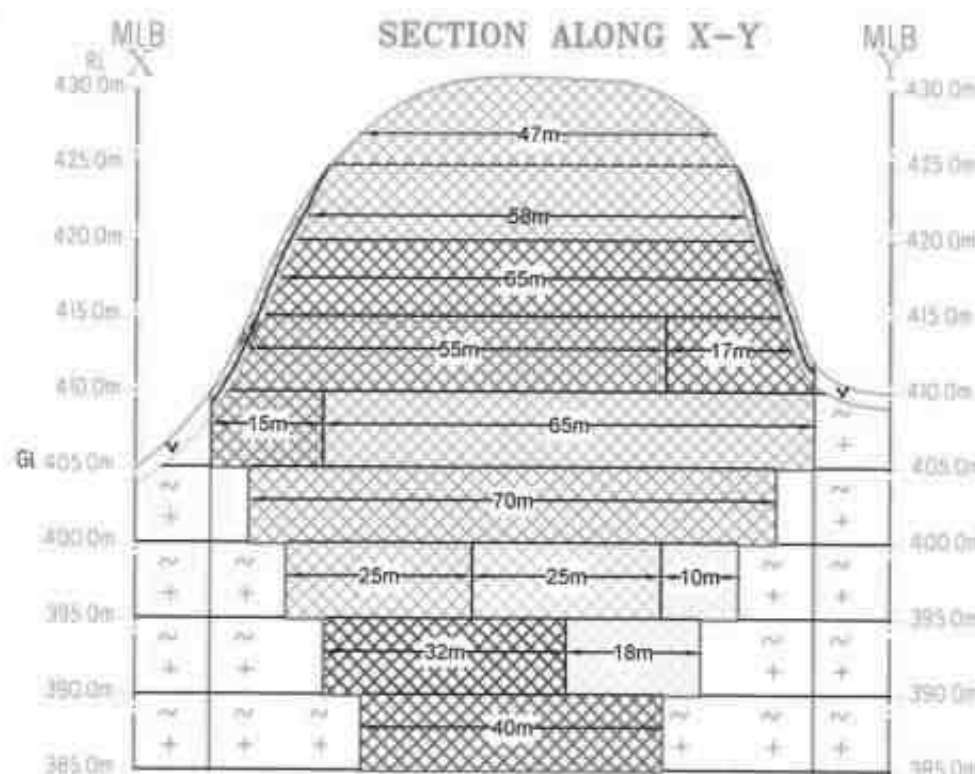
P.VELLAIYAN, M.Sc., M.Phil.,
QUALIFIED PERSON



YEARWISE PRODUCTION RESERVES									
Year	Section	Level	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume In M ³	Rough Stone in M ³	Residual Top soil in M ³
I-YEAR	XY-AB	AGL	---	64	46	1	2944	.....	2944
			I	47	24	5	5640	5640	.....
			II	58	37	5	10730	10730	.....
TOTAL							19314	16370	2944
II-YEAR	XY-AB	AGL	III	65	43	5	13975	13975	.....
			IV	17	51	5	4335	4335	.....
			TOTAL							18310	18310	0
III-YEAR	XY-AB	AGL	IV	55	51	5	14025	14025	.....
			V	15	61	5	4575	4575	.....
			TOTAL							18600	18600	0
IV-YEAR	XY-AB	AGL	V	65	61	5	19825	19825	.....
TOTAL							19825	19825	0
V-YEAR	XY-AB	BGL	VI	70	51	5	17850	17850	.....
TOTAL							17850	17850	0
VI-YEAR	XY-AB	BGL	VII	25	41	5	5125	5125	.....
TOTAL							5125	5125	0
VII-YEAR	XY-AB	BGL	VII	25	41	5	5125	5125	.....
TOTAL							5125	5125	0
VIII-YEAR	XY-AB	BGL	VII	10	41	5	2050	2050	.....
			VIII	18	31	5	2790	2790	.....
			TOTAL							4840	4840	0
IX-YEAR	XY-AB	BGL	VIII	32	31	5	4960	4960	.....
TOTAL							4960	4960	0
X-YEAR	XY-AB	BGL	IX	40	21	5	4200	4200	.....
TOTAL							4200	4200	0
GRAND TOTAL							118149	115205	2944

GL-GROUND LEVEL

Plantation Proposed for I-Year



I - Year Proposed area to be Quarried	XXXX
II - Year Proposed area to be Quarried	XXXX
III - Year Proposed area to be Quarried	XXXX
IV - Year Proposed area to be Quarried	XXXX
V - Year Proposed area to be Quarried	XXXX
VI - Year Proposed area to be Quarried	XXXX
VII - Year Proposed area to be Quarried	XXXX
VIII - Year Proposed area to be Quarried	XXXX
IX - Year Proposed area to be Quarried	XXXX
X - Year Proposed area to be Quarried	XXXX

PLATE No-VI

APPLICANT:
Mr.R.PURUSHOTHAMAN,
S/o.RANGANATHAN,
No.43, PERUMAL KOVIL STREET,
VINNAMANGALAM VILLAGE,
AMBUR TALUK,
TIRUPATHUR DISTRICT- 635807.

LEASE AREA:
S.F.No : 420/1 (Part-6)
EXTENT : 0.81.0Hect
VILLAGE : VINNAMANGALAM
TALUK : AMBUR
DISTRICT : TIRUPATHUR

INDEX

MINE LEASE BOUNDARY	----
SAFETY DISTANCE	----
APPROACH ROAD	----
BOUNDARY PILLAR STONES	□1
RESIDUAL TOPSOIL	V V V
SHRUBS	|||||
CONTOUR LINES	430m
TEMPORARY BENCH MARK	1BM
PROPOSED BENCH	----
FENCING	----

YEARWISE DEVELOPMENT,
PRODUCTION PLAN & SECTIONS
SCALE 1: 1000
SCALE - 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

P.VELLAIYAN, M.Sc., M.Phil.,
QUALIFIED PERSON

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.

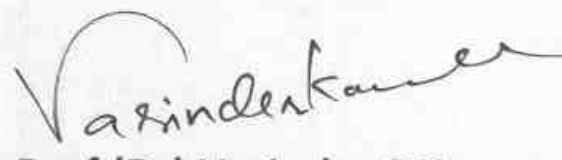
Issue Date
Feb 19, 2024

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.