

**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 = 14.20.2 hectares

MULTI-COLOUR GRANITE QUARRY

At

Irudukottai Village, Denkanikottai Taluk, Krishnagiri District,

Tamil Nadu State

TOR File No.10632

TOR Identification No. TO24B0108TN5229773N, Dated.22/04/2024

NAME AND ADDRESS OF THE PROPOSED PROJECT PROPONENT

Name and Address	Extent & S.F.No.	Production
M/s. K.P.R Granites No.2/223, Avvai Nagar, Noolahalli Post, Pennagaram Taluk, Dharmapuri – 636 813	1.97.0ha & 1121/6, 1125/3	Multi-Colour Granite 35% Recovery - 23997m³

ENVIRONMENTAL CONSULTANT

GEO TECHNICAL MINING SOLUTIONS

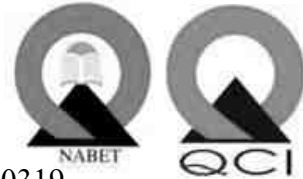
No: 1/213-B, Ground Floor, Natesan Complex

Oddapatti, Collectorate Post office,

Dharmapuri-636705. Tamil Nadu.

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

Website: www.gtmsind.com



NABET ACC. NO: NABET/EIA/23-26/RA 0319

Valid till: 31.12.2026

ENVIRONMENTAL LAB

GREEN LINK ANALYTICAL AND RESEARCH

LABORATORY (INDIA) PVT LTD

No:414/1, Tex Park Road, Coimbatore,

Tamil Nadu Accreditation number TC-6144,

valid till 18.05.2025



TERMS OF REFERENCE (ToR) COMPLIANCE

ToR File No. 10632

ToR Identification No. TO24B0108TN5229773N, dated.12.03.2024

M/s.KPR Granites, Multi-Colour Granite Quarry.

Specific Terms of Reference for (Mining of Minerals)

1. SEAC Standard Conditions

S.No	Terms of Reference	
1.1	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 our 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.
		The details regarding the AD (Mines) letter are attached in the Annexure III.
	2	Details of habitations around the proposed mining area and latest VAO
		The VAO certificate is attached in Annexure IV.

		certificate regarding the location of habitations within 300m radius from the periphery of the site	
3		The PP shall submit a detailed hydrological report indicating the impact of proposed quarrying operations on the water bodies like lake, water tanks, etc are located within 1 km of the proposed quarry.	Detailed hydrogeological study was carried out. The results have been discussed Section 3.2 under Chapter III in the EIA report page 40-48.
4		The proponent shall carry out Bio diversity study through reputed institution and the same shall be included in EIA Report.	The details of Bio diversity from the reputed institution will be submitted in the final EIA report.
5		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.
6		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	It is not applicable to this project lease area.

	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.	
7	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.	It is not applicable to this project lease area.
8	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 has been enclosed in the approved mining plan report in Annexure III.
9	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	A conceptual design of blasting has been given in Section 2.6 under Chapter II in the EIA report page 16-25.

	controlled as well as no fly rock travel beyond 30m from the blast site.	
10	The EIA coordinators shall obtain and furnish the details of quarry/quarries operated by the proponent in the past, either in the same location or elsewhere in the State with video and photographic evidences.	The details regarding will be submitted in the final EIA report.
11	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,	
12	What was the period of the operation and stoppage of the earlier mines with last work permit issued by the AD/DD mines?	The details regarding AD Mines letter is submitted in the Annexure III.
13	Quantity of minerals mined out.	
	<ul style="list-style-type: none"> Highest production achieved in any one year 	
	<ul style="list-style-type: none"> Detail of approved depth of mining. 	
	<ul style="list-style-type: none"> Actual depth of the mining achieved earlier. 	
	<ul style="list-style-type: none"> Name of the person already mined in that lease area. 	
	<ul style="list-style-type: none"> If EC and CTO already obtained, the copy of the same shall be submitted. 	
	<ul style="list-style-type: none"> Whether the mining was carried out as per the approved mine 	

		plan (or EC if issued) with stipulated benches.	
14	All corner coordinates of the mine lease area. superimposed on a High-Resolution Imagery/Toposheet, topographic sheet, geomorphology, lithology and geology of the mining lease area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).	All corner coordinates of the mine lease area have been superimposed on a high-resolution Google Earth Image, as shown in Figure 2.4, under Chapter II in the EIA report page 13.	
15	The PP shall carry out Drone video survey covering the cluster, green belt, fencing etc.,	The drone video will be submitted during final EIA presentation.	
16	The proponent shall furnish photographs of adequate fencing, green belt along the periphery including replantation of existing trees & safety distance between the adjacent quarries & water bodies nearby provided as per the approved mining plan.	Photographs of adequate fencing, green belt of the project area will be included in final EIA report.	
17	The Project Proponent shall provide the details of mineral reserves and mineable reserves, planned production capacity, proposed working methodology with justifications, The anticipated impacts of the mining operations on the surrounding environment, and the remedial measures for the same.	The Reserves of multi colour granite 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 2.3. under Chapter II in the EIA report page 14-16.	

18	The Project Proponent shall provide the Organization chart indicating the appointment of various statutory officials and other competent persons to be appointed as per the provisions of Mines Act, 1952 and the MMR, 1961 for carrying out the quarrying operations scientifically and systematically in order to ensure safety and to protect the environment.	Details of manpower required for this project have been given in Table 2.11 under Chapter II in the EIA report page 24.
19	The Project Proponent shall conduct the hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) along with the collected water level data for both monsoon and non-monsoon seasons from the PWD/ TWAD so as to assess the impacts on the wells due to mining activity. Based on actual monitored data, it may clearly – be shown whether working will intersect groundwater, Necessary data and documentation in this regard may be provided.	Detailed hydrogeological study was carried out. The results have been discussed Section 3.2 under Chapter III in the EIA report page 37-48.
20	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	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 26-83.

		including traffic/vehicular movement study.	
21	The Proponent shall carry out the Cumulative impact study due to mining operations carried out in the quarry specifically with reference to the specific environment in terms of soil health, biodiversity, air pollution, water pollution, climate change and flood control & health impacts. Accordingly, the Environment Management plan should be prepared keeping the concerned quarry and the surrounding habitations in the mind.	Results of cumulative impact study due to mining operations are given in Section 7.4 under Chapter VII in the EIA report page 112-116.	
22	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. The detailed rain water harvesting report will be submitted in the final EIA report.	
23	Land use of the study area delineating forest area, agricultural land, gazing 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 27-36. The details of surrounding sensitive ecological features have been provided in Table 3.40 under Chapter III in the EIA report page 83. Land use plan of the project area showing pre-operational,	

		operational and post-operational phases are discussed in Table 2.7 under Chapter II in the EIA report page 19.
24	Details of the land for storage of Overburden/Waste Dumps (or) Rejects outside the mine lease. such as extent of land area, distance from mine lease' its land use, R&R issues. If any, should be provided.	This condition is not applicable to this project because no dumps have been proposed outside the lease area.
25	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.
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.	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. The detailed rain water harvesting report will be submitted in the final EIA report.
27	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 80-82.
28	A tree survey study shall be carried out (nos., name of the species, age,	A detailed tree survey was carried out within 300 m radius and the results have been

	diameter etc.) both within the mining lease applied area & 300m buffer zone and its management during mining activity.	discussed in Section 3.5 under Chapter III in the EIA report page 62-77.
29	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 2.8 under Chapter II in the EIA report page 21.
30	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.
31	The purpose of green belt around the project is to capture the fugitive emissions, carbon sequestration and to attenuate the noise generated, in addition to improving the aesthetics A wide range of indigenous plant species should be planted as given in the appendix-I in consultation with the DFO, State Agriculture University and local school/college authorities. The plant species with dense/moderate canopy of native origin should be chosen. Species of small/medium/tall	A detailed greenbelt development plan has been provided in Section 4.6 under Chapter IV in the EIA report page 93-97.

		trees alternating with shrubs should be planted in a mixed manner.	
32	Taller/one year old Saplings raised in appropriate size of bags, preferably eco-friendly bags should be planted as per the advice of local forest authorities, botanist/Horticulture with regard to site specific choices. The proponent shall earmark the greenbelt area with GPS coordinates all along the boundary of the project site with at least 3 meters wide and in between blocks in an organized manner.	The FAE of ecology and biodiversity has advised the project proponent that saplings of one year old raised in the eco-friendly bags should be purchased and planted with the spacing of 3 m between each plant around the proposed project area as per the advice of local forest authorities/botanist.	
33	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 110-112.	
34	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 107-110.	
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	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 page 98-99.	

	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.	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 119-120.
37	The Socio-economic studies should be carried out within a 5 km buffer zone from the mining activity. Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.	No negative impact on socio-economic environment of the study area is anticipated and this project shall benefit the socio-economic environment by offering employment for 27 people directly as discussed in Section 8.1 under Chapter VIII in the EIA report page 118.
38	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.
39	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 118-120.
40	If any quarrying operation were carried out in the proposed quarrying site for	It is not applicable to this project lease area.

	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.	
41	The PP Shall prepare the EMP for the entire life/lease period of mine and also Furnish the sworn affidavit starting to Abide the EMP for the entire life of mine.	A detailed environment management plan has been prepared following the suggestion made by SEAC, as shown in Chapter X in the EIA report page 122-130. The sworn affidavit stating to abide the EMP for the entire life of mine will be submitted during final EIA presentation.
42	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.

2. SEIAA Standard Conditions

S.No	Terms of Reference	
2.1	Cluster Management Committee	
1	Cluster Management Committee shall be framed which must include all the proponents in the cluster as members	A cluster management committee including all the proponents of the rough stone quarrying projects within the cluster of 500 m radius will be

	including the existing as well as proposed quarry.	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 16-25.
5	The committee shall deliberate on risk management plan pertaining to the cluster in a holistic manner especially during natural calamities like intense rain and the mitigation measures considering the inundation of the cluster and evacuation plan.	It will be informed to the committee.
6	The Cluster Management Committee shall form Environmental Policy to practice sustainable mining in a	It will be advised to the cluster management committee to practice sustainable mining in a scientific and systematic manner in accordance

	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.	with the law. The role played by the committee in implementing the environmental policy devised will be given in detail.
7	The committee shall furnish action plan regarding the restoration strategy with respect to the individual quarry falling under the cluster in a holistic manner.	A proper action plan regarding the restoration will be followed by the committee.
8	The committee shall furnish the Emergency Management plan within the cluster.	The committee will submit the emergency management plan to the respective authority in the stipulated time period.
9	The committee shall deliberate on the health of the workers/staff involved in the mining as well as the health of the public.	The information on the health of the workers and the local people will be updated periodically.
10	The committee shall furnish an action plan to achieve sustainable development goals with reference to water, sanitation & safety.	A proper action plan with reference to water, sanitation & safety will be devised and submitted by the committee to the respective authority.
11	The committee shall furnish the fire safety and evacuation plan in the case of fire accidents.	The committee will submit the fire safety and evacuation plan as discussed in Section 7.3 under Chapter VII in the EIA report page 110-112.
Impact study of mining		
12	Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area covering the entire mine lease period as per precise area communication order issued from reputed research institutions on the following	

	a)	Soil health & soil biological, physical land chemical features	Soil health and biodiversity have been discussed in Sections 3.1 and 3.5 respectively under Chapter III in the EIA report page 27-36 & 62-77.
	b)	Climate change leading to Droughts, Floods etc.	Climatic condition of the proposed project area has been discussed in Section 3.3.1.1 under Chapter III in the EIA report page 48-49.
	c)	Pollution leading to release of Greenhouse gases (GHG), rise in Temperature, & Livelihood of the local people.	The information about CO ₂ emission has been added to Section 4.6 under Chapter IV in the EIA report page 93-97.
	d)	Possibilities of water contamination and impact on aquatic ecosystem health.	Possibilities of both surface and ground water contamination have been discussed in Section 4.3 under Chapter IV in the EIA report page 85. The impact on aquatic species has been discussed in Section 4.6 under Chapter IV in the EIA report page 96-97.
	e)	Agriculture, Forestry & Traditional practices.	Sorgum, millet, groundnut, and coconut are the primary crops that are cultivated in the study area.
	f)	Hydrothermal/Geothermal effect due to destruction in the Environment.	The average geothermal gradient of earth is 25 ⁰ C/km. As the proposed depth of mining is 30 m below the local ground level, the temperature will increase by 1.2 ⁰ C at the depth of mining.
	g)	Bio-geochemical processes and its foot prints including environmental stress.	Data is not included.
	h)	Sediment geochemistry in the surface streams.	The details of sediment geochemistry are discussed in the Table 3.4 under Chapter III in the EIA report page 36.

Agriculture & Agro-Biodiversity			
	13	Impact on surrounding agricultural fields around the proposed mining Area.	There shall be negligible air emissions or effluents from the project site. During loading the truck, dust generation will be likely. This shall be a temporary effect and not anticipated to affect the surrounding vegetation significantly, as shown in Section 4.6 under Chapter IV in the EIA report page 93-97.
	14	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 62-77. There is no schedule I species of animals observed within study area as per Wildlife Protection Act, 1972 and no species falls in vulnerable, endangered or threatened category as per IUCN. There is no endangered red list species found in the study area.
	15	Details of type of vegetations including no. of trees & shrubs within the proposed 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 62-77. Details about transplantation of plants have been provided in Section 4.6 under Chapter IV in the EIA report page 93-97.
	16	The Environmental Impact Assessment should study the biodiversity, the natural ecosystem, the soil micro flora, fauna and soil seed banks and suggest measures to maintain the natural Ecosystem.	The ecological details have been provided in Section 3.5 under Chapter III in the EIA report page 62-77 and measures have been provided in Section 4.6 under Chapter IV in the EIA report page 93-97.
	17	Action should specifically suggest for sustainable management of the area	All the essential environmental protective measures will be followed by the proponent to

		and restoration of ecosystem for flow of goods and services.	manage the surrounding environment and restore the ecosystem, as discussed in Chapter IV in the EIA report page 84-100.
	18	The project proponent shall study and furnish the impact of project on plantations in adjoining patta lands, Horticulture, Agriculture and livestock.	The impact of project on the land environment has been discussed in Section 4.1 under Chapter IV in the EIA report page 84.
Forests			
	19	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.
	20	The Environmental Impact Assessment should study impact on forest, vegetation, endemic, vulnerable and endangered indigenous flora and fauna.	The impacts of the project on ecology and biodiversity have been discussed in Section 4.6 under Chapter IV in the EIA report page 93-97.
	21	The Environmental Impact Assessment should study impact on standing trees and the existing trees should be numbered and action suggested for protection.	The impacts of the project on standing trees and the existing trees have been discussed in Section 4.6 under Chapter IV in the EIA report page 93-97.
	22	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 3.40 under Chapter III in the EIA report page 83.
Water Environment			

23	Hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) so as to assess the impacts on the nearby waterbodies due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided, covering the entire mine lease period.	The hydrogeological study is discussed in the Section 3.2.3 under Chapter III in the EIA report page 40-48.
24	Erosion Control measures.	Garland drainage structures will be constructed around the lease area to control the erosion, as discussed in Section 4.3 under Chapter IV in the EIA report page 85-86.
25	Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area on the nearby Villages, Water-bodies/ Rivers, & any ecological fragile areas.	The matter has been discussed under Chapter IV in the EIA report page 84-100.
26	The project proponent shall study impact on fish habitats and the food WEB/ food chain in the water body and Reservoir.	An analysis for food chain in aquatic ecosystem has been discussed in Section 3.5 under Chapter III in the EIA report page 62-77.
27	The project proponent shall study and furnish the details on potential fragmentation impact on natural environment, by the activities.	The impacts of the proposed project on the surrounding environment have discussed in Chapter IV in the EIA report page 84-100.

	28	The project proponent shall study and furnish the impact on aquatic plants and animals in water bodies and possible scars on the landscape, damages to nearby caves, heritage site, and archaeological sites possible land form changes visual and aesthetic impacts.	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 93-97.
	29	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 85.
	30	The Environmental Impact Assessment should study on wetlands, water bodies, rivers streams, lakes and farmer sites.	The impacts on water bodies, streams, lakes have been discussed in Section 4.3 under Chapter IV in the EIA report page 85.
Energy			
	31	The measures taken to control Noise, Air, Water, Dust Control and steps adopted to efficiently utilize 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 84-100.
Climate Change			
	32	The Environmental Impact Assessment shall study in detail the carbon emission and also suggest the measures to mitigate carbon emission including development of carbon sinks and temperature reduction including control of other	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 93-97.

		emission and climate mitigation activities.	
	33	The Environmental Impact Assessment should study impact on climate change, temperature rise, pollution and above soil & below soil carbon stock.	The matter has been discussed in Chapter IV in the EIA report page 84-100.
Mine Closure Plan			
	34	Detailed Mine Closure Plan covering the entire mine lease period as per precise area communication order issued.	A progressive mine closure plan has been attached with the approved mining plan report in Annexure III. The budget details for the progressive mine closure plan are shown in Table 2.8 under Chapter II in the EIA report page 21.
EMP			
	35	Detailed Environment Management Plan along with adaptation, mitigation & remedial strategies covering the entire mine lease period as per precise area communication order issued.	A detailed Environment Management plan has been given under Chapter X in the EIA report page 122-130.
	36	The Environmental Impact Assessment should hold detailed study on EMP with budget for Green belt development and mine closure plan including disaster management plan.	A detailed Environment Management plan has been given in Tables 10.1 & 10.2 under Chapter X in the EIA report page 123-130.
Risk Assessment			
	37	To furnish risk assessment and management plan including anticipated vulnerabilities during operational and post operational phases of Mining.	The risk assessment and management plan for this project has been provided in Section 7.2 under Chapter VII in the EIA report page 107-110.

Disaster Management Plan			
	38	To furnish disaster management plan and disaster mitigation measures in regard to all aspects to avoid/reduce vulnerability to hazards & to cope with disaster/untoward accidents in & around the proposed mine lease area due to the proposed method of mining activity & its related activities covering the entire mine lease period as per precise area communication order issued.	The disaster management plan for this project has been provided in Section 7.3 under Chapter VII in the EIA report page 110-112.
Others			
	39	The project proponent shall furnish VAO certificate with reference to 300m radius regard to approved habitations, schools, Archaeological sites, Structures, railway lines, roads, water bodies such as streams, odai, vaari, canal, channel, river, lake pond, tank etc.	The VAO certificate of 300 m radius have been attached in the attached in the Annexure IV.
	40	As per the MoEF& CC office memorandum F.No.22-65/2017-IA.III dated: 30.09.2020 and 20.10.2020 the proponent shall address the concerns raised during the public consultation and all the activities proposed shall be part of the Environment Management Plan.	The concerns raised during the public consultation is submitted in final EIA.

	41 The project proponent shall study and furnish the possible pollution due to plastic and microplastic on the environment. The ecological risks and impacts of plastic & microplastics on aquatic environment and fresh water systems due to activities, contemplated during mining may be investigated and reported.	The matter on plastic waste management has been given in Section 7.5 under Chapter VII in the EIA report page 116-117.
--	---	--

Standard Terms of Reference for (Mining of minerals)

S.No	Terms of Reference	
1.1	An EIA-EMP Report shall be prepared for peak capacity (...MTPA) operation in an ML/project area of... ha based on the generic structure specified in Appendix III of the EIA Notification, 2006.	Yes, it is based on the generic structure specified in Appendix III of the EIA Notification, 2006. i.e., the peak capacity of the proposed quarry is 67192 MTPA and operation in an ML/project area of 1.97.0 ha.
1.2	An EIA-EMP Report would be prepared for peak capacity operation to cover the impacts and environment management plan for the project specific activities on the environment of the region, and the environmental quality encompassing air, water, land, biotic community, etc. through collection of data and information, generation of data on impacts including prediction modelling for.... MTPA of mineral production based on approved project/Mining Plan for.... MTPA. Baseline data collection can be for any season (three months) except monsoon.	The baseline environment quality represents the background environmental scenario of various environmental components such as land, water, air, noise, biological and socio-economic status of the study area. Field monitoring studies to evaluate the base line status of the project site were carried out covering March through May 2023 with CPCB guidelines. The detailed baseline environmental monitoring studies were carried out and the results are discussed in the Chapter III and the approved mining plan is attached in the Annexure III.

1.3	Proper KML file with pin drop and coordinate of mine at 500-1000 m interval be provided	The KML file with proper pin drop and coordinate of the mine will be uploaded during the online submission.
1.4	A Study area map of the core zone (project area) and 10 km area of the buffer zone (1: 50,000 scale) clearly delineating the major topographical features such as the land use, surface drainage pattern including rivers/streams/nullahs/canals, locations of human habitations, major constructions including railways, roads, pipelines, major industries, mines and other polluting sources. In case of ecologically sensitive areas such as Biosphere Reserves/National Parks/WL Sanctuaries/ Elephant Reserves, forests (Reserved/Protected), migratory corridors of fauna, and areas where endangered fauna and plants of medicinal and economic importance found in the 15 km study area should be given. The above details to be furnished in tabular form also	The details of environmentally sensitive ecological features in the study area are given in the Table 3.40 under Chapter III in the EIA report page 83.
1.5	Map showing the core zone delineating the agricultural land (irrigated and un-irrigated, uncultivable land as defined in the revenue records, forest areas (as per records), along with other physical features such as water bodies, etc should be furnished.	The map showing the lease area with cluster details is shown in the Figure 1.1, Chapter I in the EIA report page 3. The details are given in the Table 3.40 under Chapter III in the EIA report page 83.
1.6	A contour map showing the area drainage of the core zone and 25 km of the study area (where the water courses of the core zone	The contour map will be submitted in the final EIA report.

	ultimately join the major rivers/streams outside the lease/project area) should also be clearly indicated in the separate map.	
1.7	Catchment area with its drainage map of 25 km area within and outside the mine shall be provided with names, details of rivers/ riverlet system and its respective order. The map should clearly indicate drainage pattern of the catchment area with basin of major rivers. Diversion of drains/ river need elaboration in form of length, quantity and quality of water to be diverted.	The catchment area map will be submitted in the final EIA report.
1.8	(Details of mineral reserves, geological status of the study area and the seams to be worked, ultimate working depth and progressive stage-wise working scheme until the end of mine life should be provided on the basis of the approved rated capacity and calendar plans of production from the approved Mining Plan. Geological maps and sections should be included. The Progressive mine development and Conceptual Final Mine Closure Plan should also be shown in figures. Details of mine plan and mine closure plan approval of Competent Authority should be furnished for green field and expansion projects.	The reserve details are discussed in the Section 2.5 in Chapter II in the EIA report page 16.
1.9	Details of mining methods, technology, equipment to be used, etc., rationale for selection of specified technology and	The details of mining method, technology, equipment, etc is discussed in the Section 2.6 in the Chapter II in the EIA report page 16-25.

	equipment proposed to be used vis-à-vis the potential impacts should be provided.	
1.10	Impact of mining on hydrology, modification of natural drainage, diversion and channelling of the existing rivers/water courses flowing through the ML and adjoining the lease/project and the impact on the existing users and impacts of mining operations thereon.	There is no any drainage within or around the lease area. The drainage map is shown in Figure 3.4 under Chapter III in the EIA report page 32.
1.11	A detailed Site plan of the mine showing the proposed break-up of the land for mining operations such as the quarry area, OB dumps, green belt, safety zone, buildings, infrastructure, Stockyard, township/colony (within and adjacent to the ML), undisturbed area -if any, and landscape features such as existing roads, drains/natural water bodies to be left undisturbed along with any natural drainage adjoining the lease /project areas, and modification of thereof in terms of construction of embankments/bunds, proposed diversion/re-channelling of the water courses, etc., approach roads, major haul roads, etc should be indicated.	<p>Land use plan of the project area showing pre-operational, operational and post-operational phases are discussed in Table 2.7 under Chapter II in the EIA report page 19.</p> <p>There is no any drainage within or around the lease area. The drainage map is shown in Figure 3.4 under Chapter III in the EIA report page 32.</p> <p>The traffic survey conducted based on the transportation route of material, multi colour granite is proposed to be transported mainly through Village Road as shown in Table 3.36 and in Figure 3.27 under Chapter III in the EIA report page 81-82.</p>
1.12	Original land use (agricultural land/forestland/grazing land / wasteland / water bodies) of the area should be provided as per the tables given below. Impacts of project, if any on the land use, in particular, agricultural land/forestland/grazing land/water bodies falling within the lease/project and acquired for mining operations should be analysed. Extent of area under surface rights and under mining rights should be specified. Area under Surface Rights.	

	S.No	ML/Project Land use	Area under Surface Area Rights(ha)	Area Under Mining Rights(ha)	Area under Both (ha)	
	1	Agricultural land	---	---	---	
	2	Forest Land	---	---	---	
	3	Grazing Land	---	---	---	
	4	Settlements	---	---	---	
	5	Others (specify)	1.97.0	1.97.0	1.97.0	
	S. No	Details		Area (ha)		
	1	Buildings		---		
	2	Infrastructure		---		
	3	Roads		---		
	4	Others (area under quarry)		1.97.0		
	Total			1.97.0		
1.13	Study on the existing flora and fauna in the study area (10km) should be carried out by an institution of relevant discipline. The list of flora and fauna duly authenticated separately for the core and study area and a statement clearly specifying whether the study area forms a part of the migratory corridor of any endangered fauna should be given. If the study area has endangered flora and fauna, or if the area is occasionally visited or used as a habitat by Schedule-I species, or if the project falls within 15 km of an ecologically sensitive area, or used as a migratory corridor then a Comprehensive Conservation Plan along with the appropriate budgetary provision should be			The details on flora and fauna have been provided in Section 3.5 under Chapter III in the EIA report page 62-77.		

	prepared and submitted with EIA-EMP Report; and comments/observation from the CWLW of the State Govt. should also be obtained and furnished.	
1.14	One-season (other than monsoon) primary baseline data on environmental quality - air (PM10, PM2.5, SOx, NOx and heavy metals such as Hg, Pb, Cr, As, etc), noise, water (surface and groundwater), soil - along with one-season met data coinciding with the same season for AAQ collection period should be provided. The detail of NABL/ MoEF&CC certification of the respective laboratory and NABET accreditation of the consultant to be provided.	The baseline environment quality represents the background environmental scenario of various environmental components such as land, water, air, noise, biological and socio-economic status of the study area. Field monitoring studies to evaluate the base line status of the project site were carried out covering March through May 2024 with CPCB guidelines. Environmental baseline data were collected by an NABL accredited and MoEF notified <i>Greenlink Analytical and Research Laboratory (India) Private Ltd</i> for the environmental attributes including soil, water, air, and noise and by FAEs for ecology and biodiversity, traffic, and socio-economy.
1.15	Map (1: 50, 000 scale) of the study area (core and buffer zone) showing the location of various sampling stations superimposed with location of habitats, other industries/mines, polluting sources, should be provided. The number and location of the sampling stations in both core and buffer zones should be selected on the basis of size of lease/project area, the proposed impacts in the downwind (air)/downstream (surface water)/groundwater regime (based on flow). One station should be in the	The detailed study is discussed in the Chapter III in the EIA report page 26-83.

	<p>upwind/upstream/non-impact/non-polluting area as a control station. The monitoring should be as per CPCB guidelines and parameters for water testing for both ground water and surface water as per ISI standards and CPCB classification wherever applicable. Observed values should be provided along with the specified standards.</p>	
1.16	<p>For proper baseline air quality assessment, Wind rose pattern in the area should be reviewed and accordingly location of AAMSQ shall be planned by the collection of air quality data by adequate monitoring stations in the downwind areas. Monitoring location for collecting baseline data should cover overall the 10 km buffer zone i.e. dispersed in 10 km buffer area. In case of expansion, the displayed data of CAAQMS and its comparison with the monitoring data to be provided.</p>	<p>10km baseline study can be conducted only when total cluster area extent of the projects is above 25ha. Here, the proposed cluster area of the projects is less than 25ha, (i.e,14.20.2ha) and so baseline monitoring study is done for 5 km only.</p> <p>The baseline study of the air quality is discussed in the Section 3.3, in Chapter III in the EIA report page 48-58.</p>
1.17	<p>A detailed traffic study along with presence of habitation in 100m distance from both side of road, the impact on the air quality with its proper measures and plan of action with timeline for widening of road. The project will increase the no. of vehicle along the road which will indirectly contribute to carbon emission so what will be the compensatory action plan should be clearly spell out in EIA/ EMP report.</p>	<p>There is no need of road widening, the details of traffic study are discussed in the Section 3.7 under Chapter III in the EIA report page 80-82.</p> <p>Carbon released from quarrying machineries and tippers during quarrying would be 74 kg per day, 19998 kg per year and 99989 kg over five years.</p>

1.18	<p>The socio-economic study to be conducted with actual survey report and a comparative assessment to be provided from the census data should be provided in EIA/EMP report also occupational status & economic status of the study area and what economically project will contribute should be clearly mention. The study also include the status of infrastructural facilities and amenities present in the study area and a comparative assessment with census data to be provided and to link it with the initialization and quantification of need based survey for CSR activities to be followed.</p>	<p>The socio-economic study is discussed in the Section 3.6 under Chapter III in the EIA report page 77-80.</p>
1.19	<p>The Ecology and biodiversity study should also indicate the likely impact of change in forest area for surface infrastructural development or mining activity in relation to the climate change of that area and what will be the compensatory measure to be adopted by PP to minimize the impact of forest diversion.</p>	<p>There is no forest within 10km. The Ecology and biodiversity study is discussed in the Section 3.5 in Chapter III in the EIA report page 62-77.</p> <p>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 23616 kg of carbon per year. Therefore, we recommend planting large number of trees around the quarry and near school campuses, government wasteland, roadsides etc.</p>
1.20	<p>Baseline data on the health of the population in the impact zone and measures for occupational health and safety of the personnel and manpower for the mine should be submitted.</p>	<p>The occupational health and safety of the personnel and manpower for the mine is submitted in the Section 4.8 in Chapter IV in the EIA report page 98-99.</p>

1.21	Impact of proposed project/activity on hydrological regime of the area shall be assessed and report be submitted. Hydrological studies as per GEC 2015 guidelines to be prepared and submitted.	Hydrological studies as per GEC 2015 guidelines will be prepared and submitted in the final EIA report.		
1.22	Impact of mining and water abstraction from the mine on the hydrogeology and groundwater regime within the core zone and 10 km buffer zone including long-term monitoring measures should be provided. Details of rainwater harvesting and measures for recharge of groundwater should be reflected in case there is a declining trend of groundwater availability and/or if the area falls within dark/grey zone.	Artificial recharge structures will be established in suitable locations as part of the rainwater harvesting management program. The detailed rain water harvesting will be submitted in the final EIA report.		
1.23	Study on land subsidence including modelling for prediction, mitigation/prevention of subsidence, continuous monitoring measures, and safety issues should be carried out.	It is not applicable to this project lease area.		
1.24	Detailed water balance should be provided. The breakup of water requirement as per different activities in the mining operations, including use of water for sand stowing should be given separately. Source of water for use in mine, sanction of the Competent Authority in the State Govt. and impacts vis-à-vis the competing users should be provided.	Purpose	Quantity	Source
		Dust Suppression	1.0 KLD	The water requirement is purchased from the authorized water vendor.
		Green Belt development	1.0 KLD	
		Drinking & Domestic	1.3 KLD	
		Total	3.3 KLD	

1.25	PP shall submit design details of all Air Pollution control equipment (APCEs) to be implemented as part of Environment Management Plan vis-à-vis reduction in concentration of emission for each APCEs	Quarry project proponent controls air pollution by water sprinkling method on roads and quarry sites and green belt development method is adopted.
1.26	PP shall propose to use LNG/CNG based mining machineries and trucks for mining operation and transportation of mineral. The measures adopted to conserve energy or use of renewable sources shall be explored	The PP is advised to use LNG/CNG trucks in mining operation because these trucks can control air pollution and noise pollution.
1.27	PP to evaluate the greenhouse emission gases from the mine operation/ washery plant and corresponding carbon absorption plan.	There is no greenhouse emission in the project lease area.
1.28	Site specific Impact assessment with its mitigation measures, Risk Assessment and Disaster Preparedness and Management Plan should be provided.	The details are discussed in the Section 7.2 & 7.3 in Chapter VII in the EIA report page 107-112.
1.29	Impact of choice of mining method, technology, selected use of machinery and impact on air quality, mineral transportation, handling & storage/stockyard, etc, Impact of blasting, noise and vibrations should be provided.	The impact on the air quality is discussed in the Section 4.4 in Chapter IV in the EIA report page 86-90.
1.30	Impacts of mineral transportation within the mining area and outside the lease/project along with flow-chart indicating the specific areas generating fugitive emissions should be provided. Impacts of transportation, handling, transfer of mineral and waste on air quality, generation of	The details regarding is discussed in the Section 4.5.2 under Chapter IV in the EIA report page 92.

	<p>effluents from workshop etc, management plan for maintenance of HEMM and other machinery/equipment should be given. Details of various facilities such as rest areas and canteen for workers and effluents/pollution load emanating from these activities should also be provided.</p>	
1.31	<p>Details of various facilities to be provided to the workers in terms of parking, rest areas and canteen, and effluents/pollution load resulting from these activities should also be given.</p>	<p>The details are given in the Section 2.6 under Chapter II in the EIA report page 16-25.</p>
1.32	<p>The number and efficiency of mobile/static water jet, Fog cannon sprinkling system along the main mineral transportation road inside the mine, approach roads to the mine/stockyard/siding, and also the frequency of their use in impacting air quality should be provided.</p>	<p>Quarry project proponent controls air pollution by water sprinkling method on roads and quarry sites and green belt development method is adopted.</p>
1.33	<p>Conceptual Final Mine Closure Plan and post mining land use and restoration of land/habitat to the pre- mining status should be provided. A Plan for the ecological restoration of the mined-out area and post mining land use should be prepared with detailed cost provisions. Impact and management of wastes and issues of re-handling (wherever applicable) and backfilling and progressive mine closure and reclamation should be furnished.</p>	<p>The ultimate mining is proposed to an average depth 30m bgl. the mined-out area will be fenced on top of working bench with SI fencing to arrest the entry of cattle's and public in to the quarry site.</p> <p>The details of mine closure budget is discussed in the Table 2.8 under Chapter II in the EIA report page 21.</p>
1.34	<p>Adequate greenbelt nearby areas, mineral stock yard and transportation area of</p>	<p>The details are given in the Section 4.6 under Chapter IV in the EIA report page 93-97.</p>

	mineral shall be provided with details of species selected and survival rate Greenbelt development should be		
1.35	Cost of EMP (capital and recurring) should be included in the project cost and for progressive and final mine closure plan.		The detailed EMP is given in the Chapter X in the EIA report page 122-130.
1.36	Details of R&R. Detailed project specific R&R plan with data on the existing socio-economic status of the population (including tribals, SC/ST, BPL families) found in the study area and broad plan for resettlement of the displaced population, site for the resettlement colony, alternate livelihood concerns/employment for the displaced people, civic and housing amenities being offered, etc and costs along with schedule of the implementation of the R&R plan should be given.		Not Applicable. The proposed lease area belongs to the lessee and there is no any habitation in the lease area.
1.37	CSR Plan along with details of villages and specific budgetary provisions (capital and recurring) for specific activities over the life of the project should be given.		The CSR plan is discussed in the Section 8.6 in Chapter VIII in the EIA report page 119.
1.38	Corporate Environment Responsibility:		
1.39	a)	The Company must have a well laid down Environment Policy approved by the Board of Directors.	The CER plan is discussed in the Section 8.7 in Chapter VIII in the EIA report page 120.
1.40	b)	The Environment Policy must prescribe for standard operating process/procedures to bring into focus any infringements/deviation/violation of	

		the environmental or forest norms/conditions.	
1.41	c)	The hierarchical system or Administrative Order of the company to deal with environmental issues and for ensuring compliance with the environmental clearance conditions must be furnished.	
1.42	d)	To have proper checks and balances, the company should have a well laid down 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.	
1.43	e)	Environment Management Cell and its responsibilities to be clearly spelled out in EIA/ EMP report	
1.44	f)	In built mechanism of self-monitoring of compliance of environmental regulations should be indicated.	
1.45		Status of any litigations/ court cases filed/pending on the project should be provided.	No litigation is pending in any court against this project.
1.46		PP shall submit clarification from DFO that mine does not fall under corridors of any National Park and Wildlife Sanctuary with certified map showing distance of nearest sanctuary.	The DFO letter will be submitted in the final EIA report.

1.47	Copy of clearances/approvals such as Forestry clearances, Mining Plan Approval, mine closer plan approval. NOC from Flood and Irrigation Dept. (if req.), etc. wherever applicable.		The clearance copy of approved mining plan letter is attached in the Annexure III.			
1.48	Details on the Forest Clearance should be given as per the format given:					
	Total ML Project Area	Total Forest land (ha) If more than one provides details of each FC	Date of FC	Extent of Forest Land	Balance area for which FC is yet to be obtained	Status of appl For diversion of forest land
	NA	NA	NA	NA	NA	NA
1.49	In case of expansion of the proposal, the status of the work done as per mining plan and approved mine closure plan shall be detailed in EIA/ EMP report		Approved Mining plan of the expansion proposal is attached in the Annexure III and the mine closure plan is discussed in the Section 2.6 in Chapter II in the EIA report page 16-25.			
1.50	Details on Public Hearing should cover the information relating to notices issued in the newspaper, proceedings/minutes of Public Hearing, the points raised by the general public and commitments made by the proponent and the time bound action proposed with budgets in suitable time frame. These details should be presented in a tabular form. If the Public Hearing is in the regional language, an authenticated English Translation of the same should be provided.		The public hearing comments will be submitted during final EIA report.			
1.51	PP shall carry out survey through drone highlighting the ground reality for atleast 10 minutes		The drone video survey will be submitted in the final EIA report.			

1.52	Detailed Chronology of the project starting from the first lease deed allotted/Block allotment/ Land acquired to its No. of renewals, CTO /CTE with details of no. renewals, previous EC(s) granted details and its compliance details, NOC details from various Govt bodies like Forest NOC(s), CGWA permissions, Power permissions, etc as per the requisites respectively to be furnished in tabular form.	The required documents for the proposed quarry are provided in the chronology order in Annexure III.
1.53	The first page of the EIA/ EMP report must mention the peak capacity production, area, detail of PP, Consultant (NABET accreditation) and Laboratory (NABL / MoEF & CC certification)	The first page of the EIA report mentions the peak capacity production, area, project proponent details, Consultant and NABET details and authorized Laboratory (NABL / MoEF & CC certification) details.
1.54	The compliances of ToR must be properly cited with respective chapter section and page no in tabular form and also mention sequence of the respective ToR complied within the EIA-EMP report in all the chapter's section.	ToR Compliance is cited with respective chapter section and page no in tabular form.

TABLE OF CONTENTS

S No.	TITLE	PAGE No.
I	Introduction	1-7
1.0	Preamble	1
1.1	Purpose of the report	1
1.2	Environmental clearance	4
1.3	Terms of reference (Tor)	5
1.4	Post environment clearance monitoring	5
1.5	Transferability of environmental clearance	5
1.6	Identification of the project proponent	5
1.7	Brief Description Of The Project	5
1.8	Scope of the study	7
1.9	Legislation Applicable to Mining of Mineral Sector	7
II	PROJECT DESCRIPTION	8-25
2.0	Introduction	8
2.1	Description of the project	8
2.2	Location and accessibility	9
2.3	Leasehold area	10
2.4	Geology	10
2.5	Resources and Reserve	16
2.6	Mining method	16
2.7	Project Implementation Schedule	25
III	DESCRIPTION OF THE ENVIRONMENT	26-83
3.0	General	26
3.1	Land environment	27
3.1.1	Geology and Geomorphology	27
3.1.2	Land Use/Land Cover	28
3.1.3	Topography	28
3.1.4	Drainage pattern	28
3.1.5	Seismic sensitivity	28
3.1.6	Soil Environment	28
3.1.6.1	Methodology	33
3.1.6.2	Results and Discussion	33

3.2	Water Environment	37
3.2.1	Surface Water Resources and Quality	37
3.2.2	Ground water Resources and Quality	37
3.2.3	Hydrogeological Studies	40
3.2.3.1	Groundwater level and flow direction	40
3.2.3.2	Electrical resistivity investigation	47
3.3	Air Environment	48
3.3.1	Meteorology	48
3.3.1.1	Climatic Variables	48
3.3.1.2	Wind Pattern	49
3.3.2	Ambient Air Quality Study	53
3.4	Noise Environment	59
3.5	Biological Environment	62
3.5.1	Flora	63
3.5.2	Fauna	71
3.5.3	Agriculture & Horticulture in dindigul district	75
3.6	Socio-Economic environment	77
3.6.1	Objectives of the Study	77
3.6.2	Scope of work	77
3.6.3	Socio-Economic status of Study area	78
3.6.4	Recommendation and Suggestion	80
3.6.5	Summary and Conclusion	80
3.7	Traffic density	80
3.8	Site Specific Features	83
IV	ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES	84-100
4.0	General	84
4.1	Land Environment	84
4.1.1	Anticipated Impact	84
4.1.2	Common Mitigation Measures from Proposed Project	84
4.2	Soil Environment	85
4.2.1	Anticipated Impact on Soil Environment	85
4.2.2	Mitigation Measures from Proposed Project	85
4.3	Water Environment	85

4.3.1	Anticipated Impact	85
4.3.2	Common Mitigation Measures from Proposed Project	85
4.4	Air Environment	86
4.4.1	Anticipated impact from Proposed Project	86
4.4.1.1	Emission Estimation	86
4.4.1.2	Modelling of Incremental Concentration	87
4.4.1.3	Model Results	87
4.5	Noise Environment	90
4.5.1	Anticipated Impact	91
4.5.2	Common Mitigation Measures	92
4.5.3	Ground Vibrations	92
4.6	Ecology And Biodiversity	93
4.6.1	Impact on Ecology and Biodiversity	93
4.6.2	Mitigation Measures on Flora	93
4.6.3	Anticipated Impact on Fauna	96
4.6.4	Impact on Aquatic Biodiversity	96
4.6.5	Mitigation Measures on agriculture and horticulture crops.	96
4.7	Socio Economic Environment	97
4.7.1	Anticipated Impact	97
4.7.2	Mitigation Measures	97
4.8	Occupational Health and Safety	98
4.8.1	Respiratory Hazards	98
4.8.2	Noise	98
4.8.3	Physical Hazards	98
4.8.4	Occupational Health Survey	99
4.9	Mine Waste Management	99
4.10	Mine Closure	99
4.10.1	Mine Closure Criteria	99
4.10.1	Physical Stability	99
4.10.1.2	Chemical Stability	100
4.10.1.3	Biological Stability	100
V	ANALYSIS OF ALTERNATIVES (TECHNOLOGY AND SITE)	101
5.0	Introduction	101

5.1	Factors behind the Selection of Project Site	101
5.2	Analysis of Alternative Site	101
5.3	Factors behind Selection of Proposed Technology	101
5.4	Analysis of Alternative Technology	101
VI	ENVIRONMENTAL MONITORING PROGRAM	102-106
6.0	General	102
6.1	Methodology of Monitoring Mechanism	102
6.2	Implementation Schedule of Mitigation Measures	104
6.3	Monitoring Schedule and Frequency	104
6.4	Budgetary provision for Environment Monitoring Program	106
6.5	Reporting schedules of monitored data	106
VII	ADDITIONAL STUDIES	107-117
7.0	General	107
7.1	Public Consultation for Proposed Project	107
7.2	Risk Assessment for Proposed Project	107
7.3	Disaster Management Plan for Proposed Project	110
7.3.1	Emergency Control Procedure	111
7.4	Cumulative Impact Study	112
7.4.1	Air Environment	114
7.4.1.1	Cumulative Impact of Air Pollutants	115
7.4.2	Noise Environment	115
7.4.3	Socio Economic Environment	116
7.4.4	Ecological Environment	116
7.5	Plastic Waste management Plan for Proposed Project	116
7.5.1	Objective	117
VIII	PROJECTS BENEFITS	118- 120
8.0	General	118
8.1	Employment Potential	118
8.2	Socio-Economic Welfare Measures Proposed	118
8.3	Improvement in Physical Infrastructure	118
8.4	Improvement in Social Infrastructure	118
8.5	Other Tangible Benefits	119
8.6	Corporate Social Responsibility	119
8.7	Corporate Environment Responsibility	120

8.8	Summary of project benefits	120
IX	ENVIRONMENTAL COST BENEFIT ANALYSIS	121
X	ENVIRONMENTAL MANAGEMENT PLAN	122-130
10.0	General	122
10.1	Environmental Policy	122
10.1.1	Description of the Administration and Technical setup	122
10.2	Budgetary Provision for Environmental Management	123
10.10	Conclusion	130
XI	SUMMARY AND CONCLUSION	131-140
11.0	Introduction	131
11.1	Project Description	131
11.3	Description of the Environment	131
11.3.1	Land Environment	131
11.3.2	Soil Characteristics	132
11.3.3	Water Environment	132
11.3.4	Air Environment	133
11.3.5	Noise Environment	133
11.3.6	Biological Environment	133
11.3.7	Socio-Economic Environment	134
11.4	Anticipated Environmental Impacts and Mitigation Measures for Proposed Project	134
11.4.1	Land Environment	134
11.4.2	Water Environment	135
11.4.3	Air Environment	135
11.4.4	Noise Environment	136
11.4.5	Biological Environment	137
11.4.6	Socio Economic Environment	137
11.4.7	Occupational Health	138
11.5	Environment Management program	138
11.6	Additional Studies	139
11.6.1	Risk Assessment	139
11.6.2	Disaster Management Plan	139
11.6.3	Cumulative Impact Study	139
11.7	Project Benefits	140

11.8	Environment Management Plan	140
XII	DISCLOSURE OF CONSULTANT	141-145

LIST OF TABLES

TABLE No.	CONTENTS	PAGE No.
1.1	Details of Quarries within the cluster area of 500 m radius	2
1.2	Details of project proponent	5
1.3	Details of the project	6
2.1	Site connectivity to the project area	10
2.2	Corner coordinates of proposed project	10
2.3	Estimated resources and reserves of the project	16
2.4	Year-wise production details	16
2.5	Operational details for proposed project	17
2.6	Machinery details	17
2.7	Land use data at present, during scheme of mining, and at the end of mine life	19
2.8	Progressive Mine closure budget	21
2.9	Water requirement for the project	21
2.10	Fuel requirement details	23
2.11	Employment potential for the proposed project	24
2.12	Capital requirement details	25
2.13	Expected time schedule	25
3.1	Monitoring attributes and frequency of monitoring	26
3.2	LULC statistics of the study area	28
3.3	Soil sampling locations	33
3.4	Soil quality of the study area	36
3.5	Water Sampling Locations	37
3.6	Water Quality Result	39
3.7	Pre-Monsoon Water Level of Open Wells within 2 km Radius	41
3.8	Post-Monsoon Water Level of Open Wells within 2 km Radius	42

3.9	Pre-Monsoon Water Level of Bore Wells within 2 km Radius	42
3.10	Post-Monsoon Water Level of Bore Wells within 2 km Radius	42
3.11	Vertical electrical sounding data	47
3.12	Onsite Meteorological Data	49
3.13	Methodology and Instrument used for AAQ analysis	53
3.14	National ambient air quality standards	53
3.15	Ambient air quality (AAQ) monitoring locations	54
3.16	Summary of AAQ result	56
3.17	Noise Monitoring Locations	59
3.18	Ambient Noise Quality Result	59
3.19	Calculation of density, frequency (%), dominance, relative density, relative frequency, relative dominance & important value index	63
3.20	Calculation of Species Diversity by Shannon – Wiener Index, Evenness and Richness	63
3.21	Flora in Mine Lease area	64
3.22	Flora in 300- meter radius	65
3.23	Calculation of Species Diversity in 300m radius	67
3.24	Species Richness(Index) in 300m radius	68
3.25	Flora in Buffer Zone	68
3.26	Aquatic Vegetation	70
3.27	Methodology applied during survey of fauna	71
3.28	Fauna in Core Zone	72
3.29	Fauna in Buffer Zone	73
3.30	Major Crops in 1km radius	75
3.31	Major Field Crops & Horticulture cultivation in 1km radius.	76
3.32	Irudukottai Village Population Facts	78
3.33	Population and Literacy Data of Study Area	78
3.34	Details on Educational Facilities, Water and Drainage & Health Facilities	79
3.35	Workers Profile of Study Area	79

3.36	Traffic Survey Locations	81
3.37	Existing Traffic Volume	81
3.38	Rough Stone Transportation Requirement	81
3.39	Summary of Traffic Volume	81
3.40	Details of Environmentally Sensitive Ecological Features in the Study Area	83
4.1	Empirical formula for emission rate from overall mine	86
4.2	Estimated emission rate	87
4.3	Incremental & Resultant GLC of PM2.5	90
4.4	Incremental & Resultant GLC of PM10	90
4.5	Activity and Noise Level Produced by Machinery	91
4.6	Predicted Noise Incremental Values	91
4.7	Carbon Released During Five Years of Rough Stone and Gravel Production	93
4.8	CO ₂ Sequestration	94
4.9	Recommended Species for Greenbelt Development Plan	94
4.10	Greenbelt development plan	95
4.11	Budget for greenbelt development plan	95
6.1	Implementation schedule for proposed project	104
6.2	Proposed monitoring schedule post EC for the proposed quarry	105
6.3	Environment monitoring budget	106
7.1	Risk assessment & control measures for proposed project	108-110
7.2	Salient Features of Proposed Project Site “P2”	112
7.3	Salient Features of Proposed Project Site “P3”	113
7.4	Cumulative production Load of granite	114
7.5	Incremental and Resultant Ground level concentration from the three quarry	115
7.6	Predicted Noise incremental values from cluster	115
7.7	Socio economic benefits from three quarries	116
7.8	Employment benefits from 3 Quarries	116
7.9	Greenbelt development benefits	116

7.10	Action plan to manage plastic waste	117
8.1	CER – action plan	120
8.2	Project Benefits to the state Government	120
10.1	EMP budget for proposed project	123-129
10.2	Estimation of overall EMP budget after adjusting 5% annual inflation	130
11.1	LULC Statistics of the Study Area	131
11.2	Environment Monitoring Program	138-139

LIST OF FIGURES

FIGURE NO.	TITLE	PAGE NO.
1.1	Location of the proposed and existing rough stone quarries in the cluster of 500m radius	3
2.1	Overall view of proposed project site	9
2.2	Key map showing location of the project site	11
2.3	Site Connectivity to the Lease Area	12
2.4	Google earth image showing lease area with pillars	13
2.5	Surface and Geological Plan	14
2.6	Geological Section	15
2.7	Year wise Development and Production Plan & Section	18
2.8	Progressive Quarry Closure Plan & Sections	20
2.9	Conceptual Plan & Sections	22
3.1	Geology Map of 5Km Radius from proposed project site	29
3.2	Geomorphology Map of 5Km Radius from proposed project site	30
3.3	LULC map of 5km radius from the proposed project site	31
3.4	Drainage map of 5 km radius from the proposed project site	32
3.5	Soil Erosion map within 5 km Radius around the Proposed Project Site	34
3.6	Map showing soil sampling location within 5 km radius around the proposed project site	35
3.7	Toposheet showing water sampling locations within 5 km radius around the proposed project site	38

3.8	Long-Term Monthly Average Rainfall Vs Monthly Rainfall	40
3.9	Open well static groundwater elevation map showing the direction of groundwater flow during pre-monsoon season	43
3.10	Open well static groundwater elevation map showing the direction of groundwater flow during post-monsoon season	44
3.11	Bore well Static Groundwater Elevation Map Showing direction of groundwater flow during pre-monsoon season	45
3.12	Bore well Static Groundwater Elevation Map Showing direction of groundwater flow during post-monsoon season	46
3.13	Graph Showing Occurrence of Water Bearing Fracture Zones at the Depth of 60 m Below Ground Level in Proposed Project area	48
3.14	Windrose Diagram for 2020 and 2021 (March to May)	50
3.14(a)	Windrose Diagram for 2022 and 2023 (March to May)	51
3.15	Onsite Wind Rose Diagram	52
3.16	Ambient Air Quality Monitoring Station Locations Around 5 km Radius from Proposed Project Site	55
3.17	Bar Chart Showing Maximum, Minimum, and Average Concentrations of PM2.5 Measured from 6 Air Quality Monitoring Stations within 5 km Radius	56
3.18	Bar Chart Showing Maximum, Minimum, and Average Concentrations of PM10 Measured from 6 Air Quality Monitoring Stations within 5 km Radius	57
3.19	Bar Chart Showing Maximum, Minimum, and Average Concentrations of SO2 Measured from 6 Air Quality Monitoring Stations within 5 km Radius	57
3.20	Bar Chart Showing Maximum, Minimum, and Average Concentrations of NOx Measured from 6 Air Quality Monitoring Stations within 5km Radius	58
3.21	Bar Chart Showing Maximum, Minimum, And Average Concentrations of Pollutants in Atmosphere within 5 km Radius	58
3.22	Bar Chart Showing Day Time Noise Levels Measured in Core and Buffer Zones	60
3.23	Bar Chart Showing Night Time Noise Levels Measured in Core and Buffer Zones	60
3.24	Noise Level Monitoring Station Locations around 5 km Radius from Proposed Project Site	61
3.25	Quadrates Sampling Methods of Flora	62

3.26	Species Richness(Index) in 300m Radius	68
3.27	Traffic Density Map	82
4.1	Predicted incremental concentration of PM _{2.5}	88
4.2	Predicted incremental concentration of PM ₁₀	89
4.3	Green Belt and Fencing Photos	96
6.1	Proposed environmental monitoring chart	103
7.1	Disaster management team layout for proposed project	111

LIST OF ANNEXURES

Annexure No.	Contents	Page No.
I	Copy of ToR letter	147-160
II	Copy of 500 m radius letter	161-163
III	Approved mining plan along with mining plan AD/DD letter/original mining plan plates/Existing Pit Letter	164-273
IV	VAO 300m radius letter	274
V	NABET certificate of EIA consultant	275

CHAPTER I

INTRODUCTION

1.0 PREAMBLE

Environmental Impact Assessment (EIA) study is a process used to identify the environmental, social and economic impacts of a project prior to decision-making. EIA systematically examines both beneficial and adverse consequences of the proposed project and ensure that these impacts are considered during the project designing. According to the Ministry of Environment and Forests, Govt. of India, EIA notification S.O. 1533(E) of 14th September 2006 and its subsequent amendments as per Gazette Notification S.O. 3977 (E) of 14th August 2018, all the mining projects are broadly classified into two categories, i.e., category A and category B, based on the spatial extent of the projects. The category B projects are further divided in to B1 and B2 on the basis of the guidelines issued of the Ministry of Environment and Forests. All mining projects included in category B2 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 100 ha, 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.

In compliance with ToR obtained vide TOR File No.10632 and TOR Identification No. TO24B0108TN5229773N, dated.22/04/2024. This EIA report is prepared for the project proponent, M/s. K.P.R Granites applied for Multi-Colour Granite quarry lease in the Patta land falling in S.F.No.1121/6 and 1125/3 over an extent of 1.97.0ha in Irudukottai Village, Denkanikottai Taluk, Krishnagiri District and Tamil Nadu. Considering cumulative load of all the multi-colour granite quarry project including three proposed quarries and five existing quarries falling in the cluster of 500 m radius from the periphery of the proposed project. The total extent of all the quarries in the cluster is 14.20.2ha. All the quarries in the cluster are shown in Figure 1.1.

1.1 PURPOSE OF THE REPORT

The purpose of the report is to study baseline environmental conditions in and around the proposed project area for the period of **March - May 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.

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

Proposed Quarries					
Code	Name of the Lease	S.F. No	Village	Extent (ha)	Lease Period
P1	M/s. K.P.R Granites	1121/6, 1125/3	Irudukottai	1.97.0	Proposed Area
P2	M/s. Anbura Minerals Pvt.Ltd	1127/4, 1127/5	Irudukottai	1.93.5	Applied Area
P3	Tvl. Top Granites	1124/5,6 1151/5,6 & 1172/2A	Irudukottai	2.40.40	Applied Area
Existing Quar Quarries					
E1	M/s. K.P.R Granites	1123/4A, 4B, 5A, 5B, 6A, 6B 1125/6, 1183/8(P)	Irudukottai	2.34.3	16.09.2023 to 15.09.2043
E2	Thiru. R.Mahendhar	1105/2 (P), 1105/3 (P)	Irudukottai	1.00.0	27.07.2009 to 26.07.2029
E3	Tvl. Ramachandra Granite & Construction	1104/4, 1104/5 (P), 1104/6 (P), 1104/8	Irudukottai	1.43.0	28.02.2011 to 27.02.2031
E4	Tvl. Mahaboob Shereef	1106/1, 1123/1	Irudukottai	1.20.5	08.10.2014 to 07.10.2034
E5	M/s. S.V. Granites	1124/7 (P), 1130/7 (P), 1131/7, 1131/8	Irudukottai	1.91.5	14.11.2023 to 13.11.2043
Total Cluster Extent				14.20.2	---

Source:*DD Letter – Rc.No.986/2019/Mines dated 26.12.2023***Note:** Cluster area is calculated as per MoEF & CC Notification – S.O. 2269 (E) Dated: 01.07.2016.

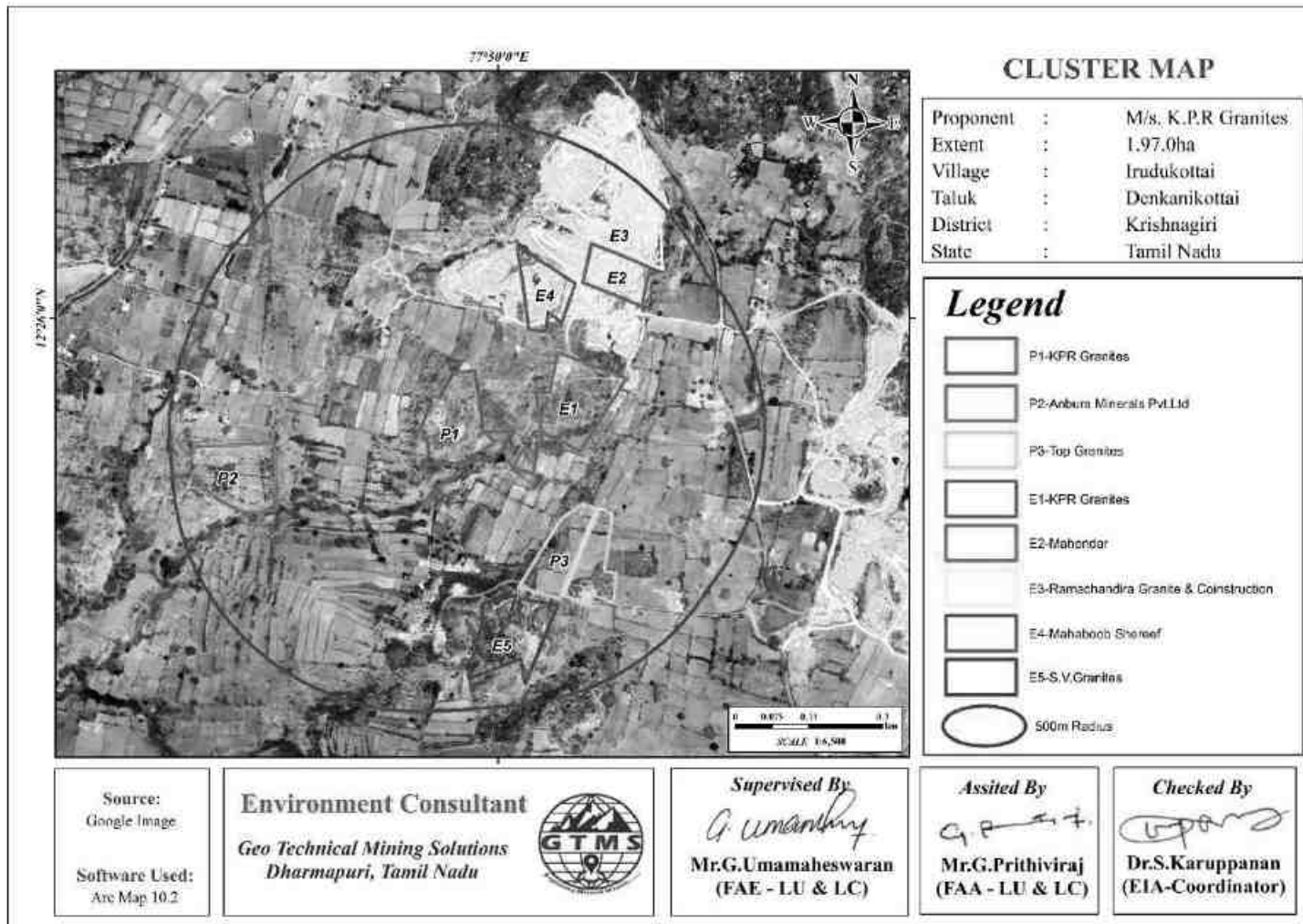


Figure 1.1 Location of Proposed and Existing Quarries in the Cluster of 500 m Radius

1.2 ENVIRONMENTAL CLEARANCE

The Environmental Clearance process for the project will comprise of four stages.

These stages are given below:

- ❖ Screening
- ❖ Scoping
- ❖ Public consultation
- ❖ Appraisal

Screening

Screening is the first stage of the EIA process. In this stage, the State level Expert Appraisal Committee (SEAC) examined the application of EC made by the proponent in Form 1 through online (Proposal No. SIA/TN/MIN/458030/2024 dated:09.01.2024) 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 11.01.2024.

Scoping

The proposal was placed in the 451st meeting of SEAC on 13.03.2024. Based on the presentation and documents furnished by the project proponent, SEAC decided to recommend the proposal for the grant of Terms of Reference (ToR) and the recommendation for ToR is subjected to the outcome of the Honourable NGT, Principal Bench, New Delhi (O.A No.186 of 2016 (M.A.No.350/2016) and O.A. No.200/2016 and O.A.No.580/2016 (M.A.No.1182/2016) and O.A.No.102/2017 and O.A.No.404/2016 (M.A.No. 758/2016, M.A.No.920/2016, M.A.No.1122/2016, M.A.No.12/2017 & M.A. No. 843/2017) and O.A.No.405/2016 and O.A.No.520 of 2016 (M.A.No. 981/2016, M.A.No.982/2016 & M.A.No.384/2017).

Public Consultation

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

Appraisal

In this stage, an application along with final EIA report including the outcome of the public consultations will be made to the SEIAA. The application thus made will be scrutinized

by the SEAC. Then, the SEAC will make recommendations to grant EC or reject the application to the SEIAA.

1.3 TERMS OF REFERENCE (ToR)

The SEAC framed a comprehensive Terms of Reference (ToR) based on the information provided in the Form 1 and information collected from the proposed project site visit and issued ToR to the proponent vide TOR File No.10632 and TOR Identification No. TO24B0108TN5229773N, dated.22/04/2024 for the preparation of an EIA report.

1.4 POST ENVIRONMENT CLEARANCE MONITORING

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

1.5 TRANSFERABILITY OF ENVIRONMENTAL CLEARANCE

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

1.6 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	M/s. K.P.R Granites
Address	No.2/223, Avvai Nagar, Noolahalli Post, Pennagaram Taluk, Dharmapuri – 636 813
Status	Proprietor

1.7 BRIEF DESCRIPTION OF THE PROJECT

The proposed project deals with excavation of multi-colour granite which is primarily used in construction projects. The method adopted for multi-colour granite excavation is open

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

Table 1.3 Details of the Project

Name of the Quarry	M/s. K.P.R Granites, Multi-Colour granite		
S.F.No.	1121/6 and 1125/3		
Land Type	Patta land		
Extent	1.97.0 ha		
Proposed Depth for 5 years	30m BGL		
Toposheet No	57-H/15		
Latitude between	12°25'50.32737"N to 12°25'56.56272"N		
Longitude between	77°49'54.82843"E to 77°50'0.97534"E		
Highest Elevation	919 m ASML		
Topography	Elevated Topography		
Geological Reserves	Multi Colour Granite 35 % Recovery	Granite Waste 65%	Top Soil
	301033	559060	16910
	Mineable Reserves	99072	183992	12685
Proposed production for 5 years	23997	44565	4809
Method of Mining	It is an Eco – friendly quarry operation, no blasting is proposed. Diamond wire saw cutting method is adopted by the applicant.		
Machinery proposed	Jack Hammer		4
	Compressor		2
	Tippers		2
Proposed manpower deployment	27		
Project cost	Rs. 92,26,870/-		
CER cost	Rs. 10,00,000/-		
Proposed Water Requirement	3.3 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 **March – May 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 INTRODUCTION

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

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

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

2.1 DESCRIPTION OF THE PROJECT

The proponent M/s. K.P.R Granites, Multi-Colour Granite is involved in the undertaking of establishment, construction, development, and closure of open cast 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 granite. Therefore, the proponent had applied for quarry lease on 31.10.2019 to extract granite and produce dimension stones. The precise area communication letter was issued by Industries (MME.2) Department, Secretariat Chennai Rc.no.1379/MME.2/2021-1, dated.03.10.2023. Based on the precise area communication letter, mining plan was prepared. The mining plan thus prepared was approved by Director of Geology and Mining, Chennai (Rc.No.582/MM4/2021, dated:13.12.2023). 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 project area is Irudukottai Village, Denkanikottai Taluk, Krishnagiri District as shown in Figure 2.2. The area is located between a latitude of $12^{\circ}25'50.32737''\text{N}$ to $12^{\circ}25'56.56272''\text{N}$ and a longitude of $77^{\circ}49'54.82843''\text{E}$ to $77^{\circ}50'0.97534''\text{E}$. Accessibility details to the proposed project site have been given in Table 2.1.

Table 2.1 Site Connectivity to the Project Area

Nearest Road	Village Road	0.80 km	W
	Village Road	0.46 km	E
Nearest Railway Station	Periya Nagathunai	16.4 km	NE
Nearest Medical Facility	Hanumanthapuram	1.65 km	NE
Nearest Town	Denkanikottai	10.8 km	NW
Nearest Airport	Hosur	25.0 km	NW
Nearest Port	Chennai	277.2 km	NE
Nearest Village	Irudukottai	2.44 km	NW
	Namrelli	1.6 km	NE
	Tottikuppam	0.82 km	SE
	Belalam	1.73 km	SW

2.3 LEASEHOLD AREA

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

Corner Coordinates

The extent of the proposed project site is **1.97.0 ha**. The boundary corner coordinates are given in Table 2.2 and the location of 21 boundary corners are shown in Figure 2.4.

Table 2.2 Corner Coordinates of Proposed Project

Pillar ID	Latitude	Longitude	Pillar ID	Latitude	Longitude
1	12° 25' 56.56272" N	77° 49' 58.45854" E	12	12° 25' 51.01679" N	77° 49' 55.42350" E
2	12° 25' 54.94993" N	77° 49' 58.6666" E	13	12° 25' 51.98740" N	77° 49' 55.27373" E
3	12° 25' 53.34672" N	77° 49' 58.87342" E	14	12° 25' 52.08113" N	77° 49' 55.01982" E
4	12° 25' 52.54321" N	77° 49' 58.97717" E	15	12° 25' 52.57532" N	77° 49' 55.02696" E
5	12° 25' 52.52513" N	77° 50' 0.62982" E	16	12° 25' 52.57695" N	77° 49' 54.82843" E
6	12° 25' 52.52136" N	77° 50' 0.97534" E	17	12° 25' 54.11923" N	77° 49' 55.37963" E
7	12° 25' 51.18111" N	77° 50' 0.05233" E	18	12° 25' 54.88406" N	77° 49' 55.65302" E
8	12° 25' 50.70648" N	77° 49' 59.72542" E	19	12° 25' 54.79641" N	77° 49' 56.09407" E
9	12° 25' 50.57342" N	77° 49' 58.07621" E	20	12° 25' 56.21800" N	77° 49' 56.91321" E
10	12° 25' 50.4405" N	77° 49' 56.42712" E	21	12° 25' 56.42053" N	77° 49' 57.02994" E
11	12° 25' 50.32737" N	77° 49' 55.02329" E	---	---	---

Source: Approved Mining plan

2.4 GEOLOGY

The lease area geologically occurs on Grey Hornblende Biotite Gnesis. Also, the lease area geomorphologically occurs Pediment Pediplain Complex.

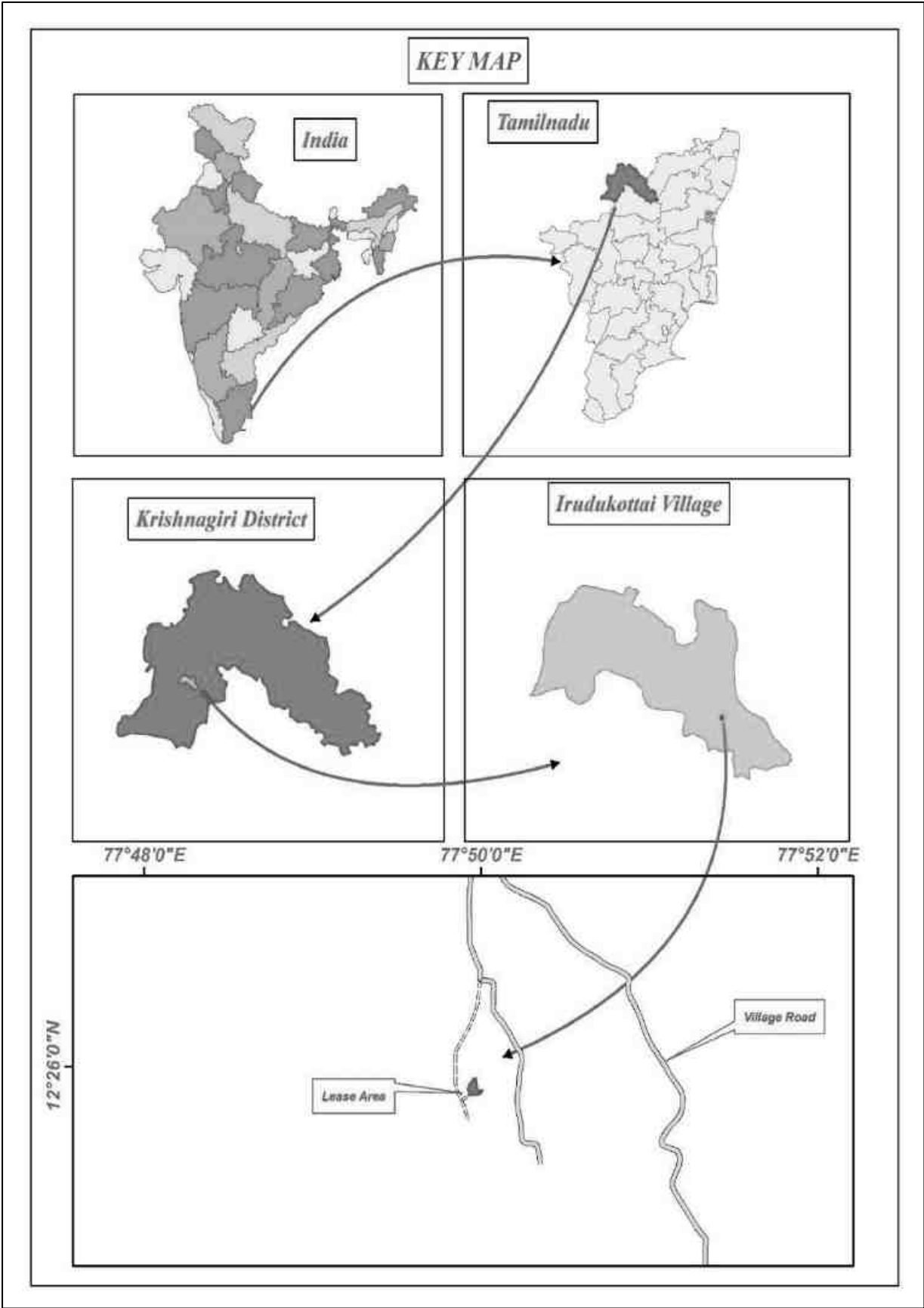


Figure 2.2 Key Map Showing Location of Project Site



<p>APPLICANT MR. K.P.R GRANITES, No.222, AVVAI NAGAR, NOORAHALLI POST, PENNAGARAM TALUK, DHARMAPURI DISTRICT - 836 011.</p>	<p>PLAT NO-1</p>	<p>ROUTE MAP</p>								
<p>LOCATION EXTENT : 1.37 Hect. S.P.NO : 111/0 & 112/0 VILLAGE : BRUDUKOTTAI TALUK : DENKANIKOTTAI DISTRICT : KRISHNAGIRI STATE : TAMIL NADU</p>	<p>INDEX</p> <table border="0"> <tr> <td>QUARRY LEASE AREA</td> <td></td> </tr> <tr> <td>APPROACH ROAD</td> <td></td> </tr> <tr> <td>VILLAGE ROAD</td> <td></td> </tr> <tr> <td>CART ROAD</td> <td></td> </tr> </table> <p><i>U. Prabhakaran</i></p>	QUARRY LEASE AREA		APPROACH ROAD		VILLAGE ROAD		CART ROAD		<p>Prepared By:</p> <p>I DO HEREBY CERTIFY THAT THE PLATD HAS BEEN CHECKED BY ME AND IS CORRECT TO THE BEST OF MY KNOWLEDGE</p> <p></p> <p>S. S. SRINIVASAN, P.O., DISTRICT ENGINEER (QUALIFIED PERSON) KRISHNAGIRI DISTRICT</p>
QUARRY LEASE AREA										
APPROACH ROAD										
VILLAGE ROAD										
CART ROAD										

Figure 2.3 Site Connectivity of the Lease Area

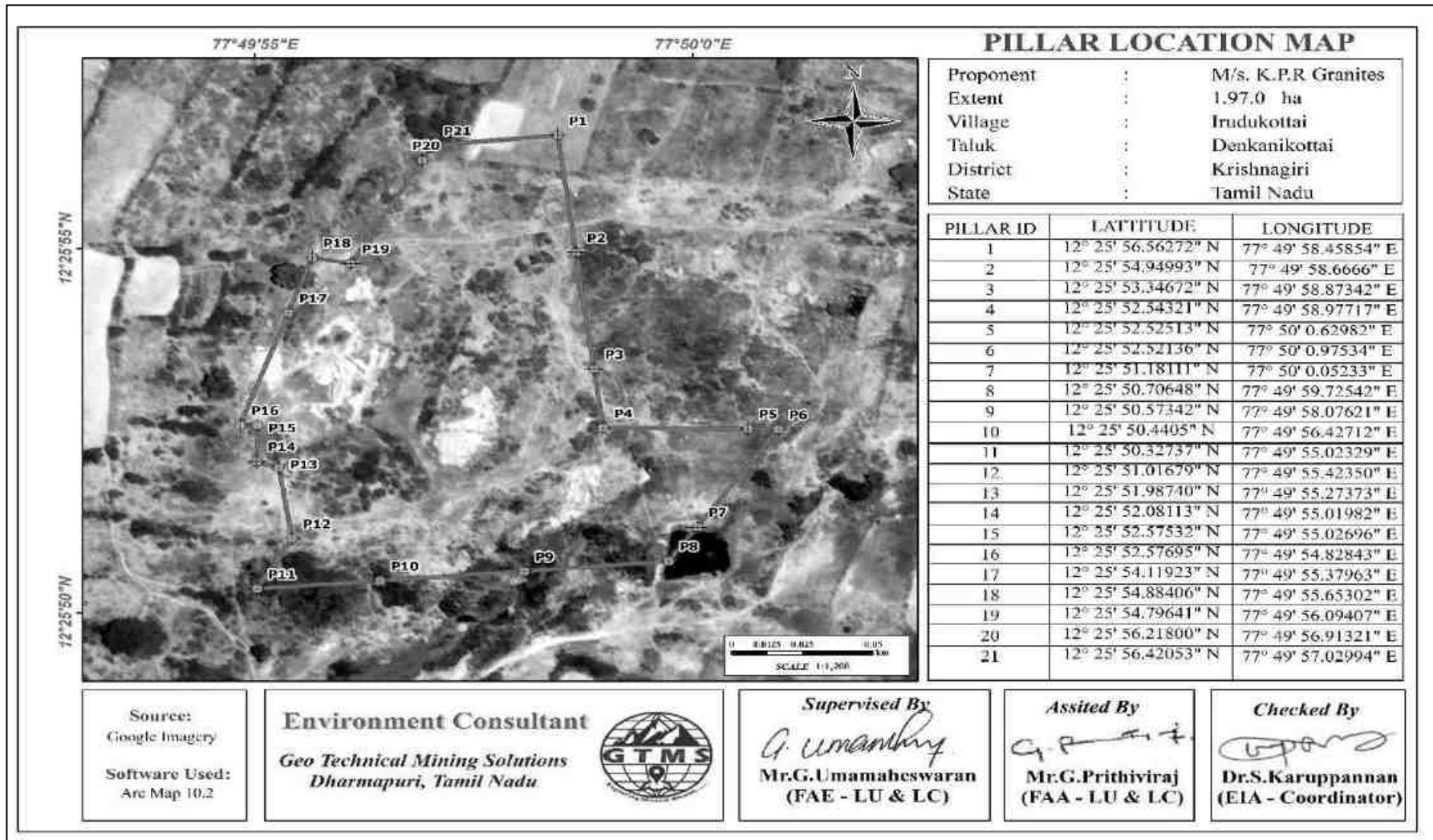


Figure 2.4 Google Earth Image Showing Lease Area with Pillar

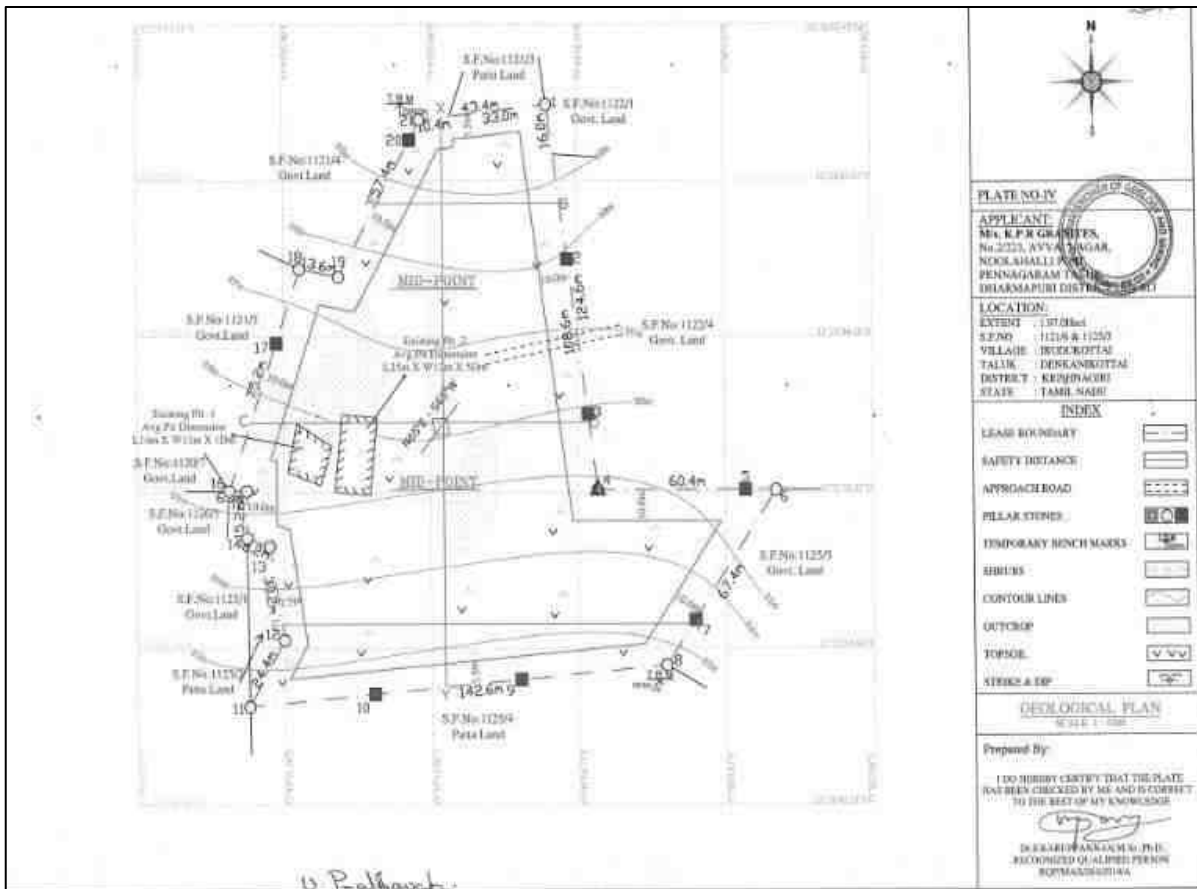
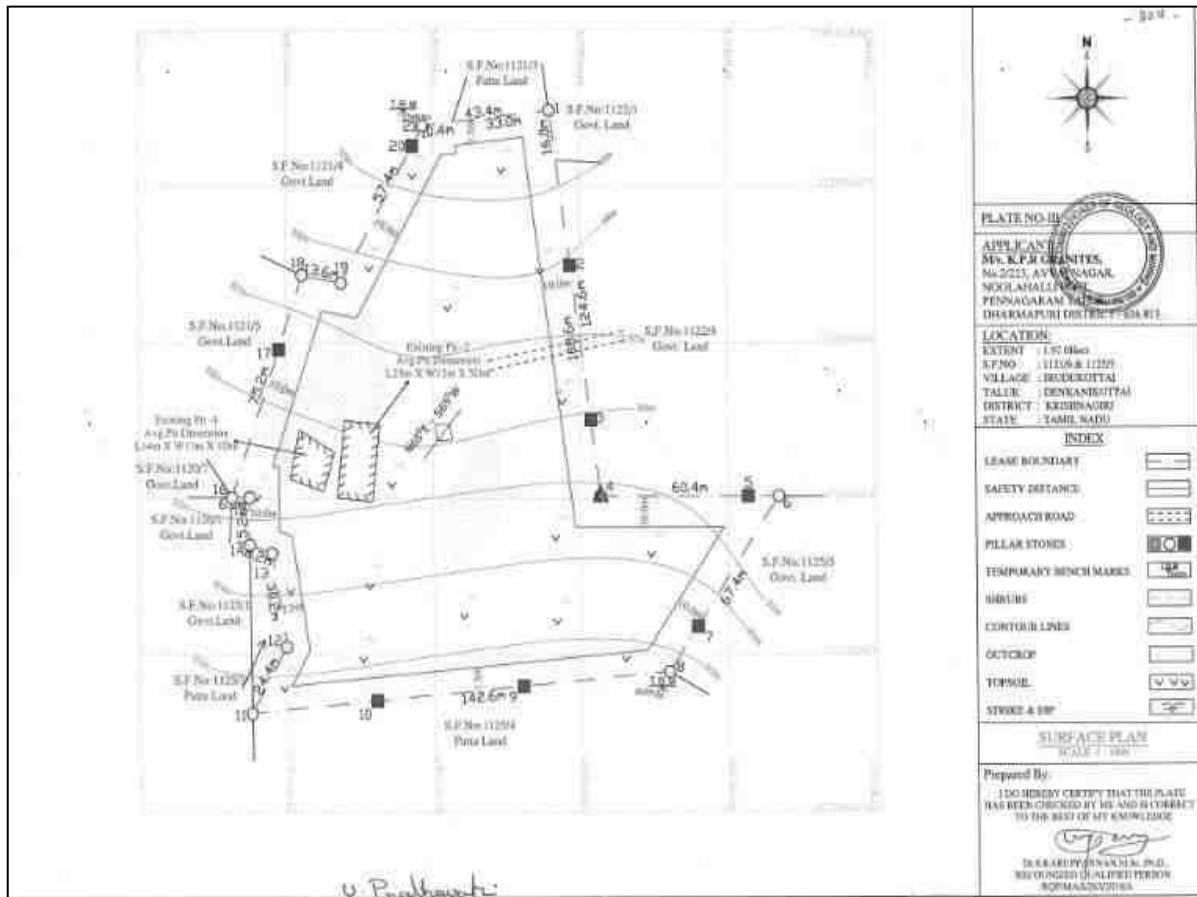


Figure 2.5 Surface & Geological Plan

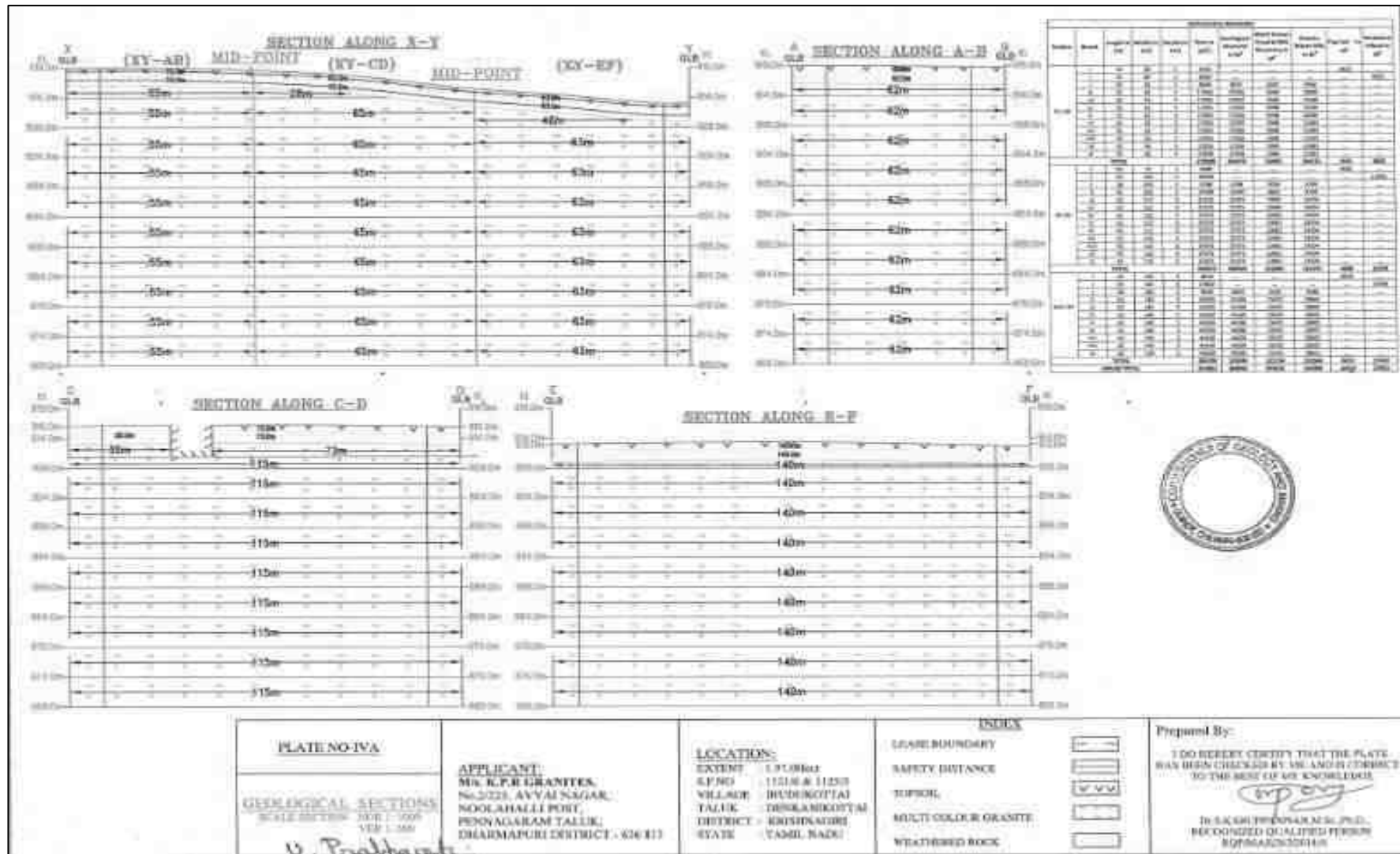


Figure 2.6 Geological Sections

2.5 RESOURCES AND RESERVES

The estimated geological resources and mineable reserves of the proposed project is provided in Table 2.3.

Table 2.3 Estimated Resources and Reserves of the Project

Description	ROM in (m ³)	Multi Granite Waste @ 35 % Recovery(m ³)	Granite @ 65% Waste(m ³)	Top Soil (m ³)	Weathered Rock (m ³)
Geological Resources	914853	301033	559060	16910	37850
Mineable Reserves	323127	99072	183992	12685	27378

Year-Wise Production

On the basis of year-wise development plan and its sections, as shown in Figures 2.7 year-wise production details are given in Table 2.4.

Table 2.4 Year wise Production Details

Year	ROM in m ³	Multi Granite Waste 35% Recovery(m ³)	Granite 65% Waste(m ³)	Top Soil (m ³)	Weathered Rock (m ³)
I	29051	4591	8527	4809	11124
II	13694	4793	8901	---	---
III	14335	5017	9318	---	---
IV	13655	4779	8876	---	---
V	13760	4816	8944	---	---
Total	84495	23997	44565	4809	11124

Source: Approved Mining plans

2.6 MINING METHOD

The mining operation is opencast semi-mechanized method adopted on single shift basis only. Under the regulation 106 of the Metalliferous Mines Regulations, 1961 in all open cost workings in hard rock, the benches and sides should be properly benched and sloped. The bench height should not exceed 5m and the bench width should not less than the bench height. The slope of the benches should not exceed 45° from horizontal. The multi-colour granite is proposed to quarry at 5m bench height & width conventional open cast method.

Drill hole is of diameter 32mm, depth and inclination of drill hole is generally drilled vertically in an alignment, however in primary cutting in the absence of sheet joints to bottom level, horizontal holes also are drilled. The spacing will be about 0.1m to 0.3m from hole to hole and burden goes up to 1.6m for the splitting of the rock. The intrusive body will be tackled

with latest technology by deploying diamond wire saw cutting for obtaining the good recovery factor of sizeable blocks.

Blasting pattern:

It is an Eco-friendly quarry operation, no blasting is proposed, Diamond wire saw cutting method is adopted by the applicant. Now a day, the splitting within the sheet rock is affected by diamond wire-sawing, which largely reduces the use of explosives in granite mining. Besides, chemical powder called as “Rock breaking Powder” [Ca (OH)2] are also used for splitting. Many adverse effects of blasting are avoided and hence diamond wire cutting will substantially increase the recovery. Since primary cutting comprising splitting from the sheet rock is affected by diamond wire-sawing there will not be any drilling or blasting involved. Hence, there will not any adverse effects and vibration due to this type of mining operation.

Magnitude of Operation

Based on the results of estimated production for the 5 years as shown in Table 2.5, details about the size of operation have been provided.

Table 2.5 Operational Details for Proposed Project

	Colour Granite Recovery @ 35% in m³	Granite Waste @ 65% in m³
Quantity of Material to be Quarried out in five years	23997	44565
Number of working days/Annum	270	270
Production of /Day (m ³)	18	33
No. of Lorry Loads	3	6

Extent of Mechanization

To achieve the above-mentioned production, various machineries are proposed for the quarrying operation, as given in Table 2.6.

Table 2.6 Machinery Details

Drilling Equipment					
Type	No. of Unit	Dia. of Hole (mm)	Size capacity	Make	Motive Power
Compressor	2	-	-	--	Diesel
Jack Hammer	4	32	-	--	Compressor Air
Haulage & Transport Equipment					
Tipper	2	--	--	--	Diesel

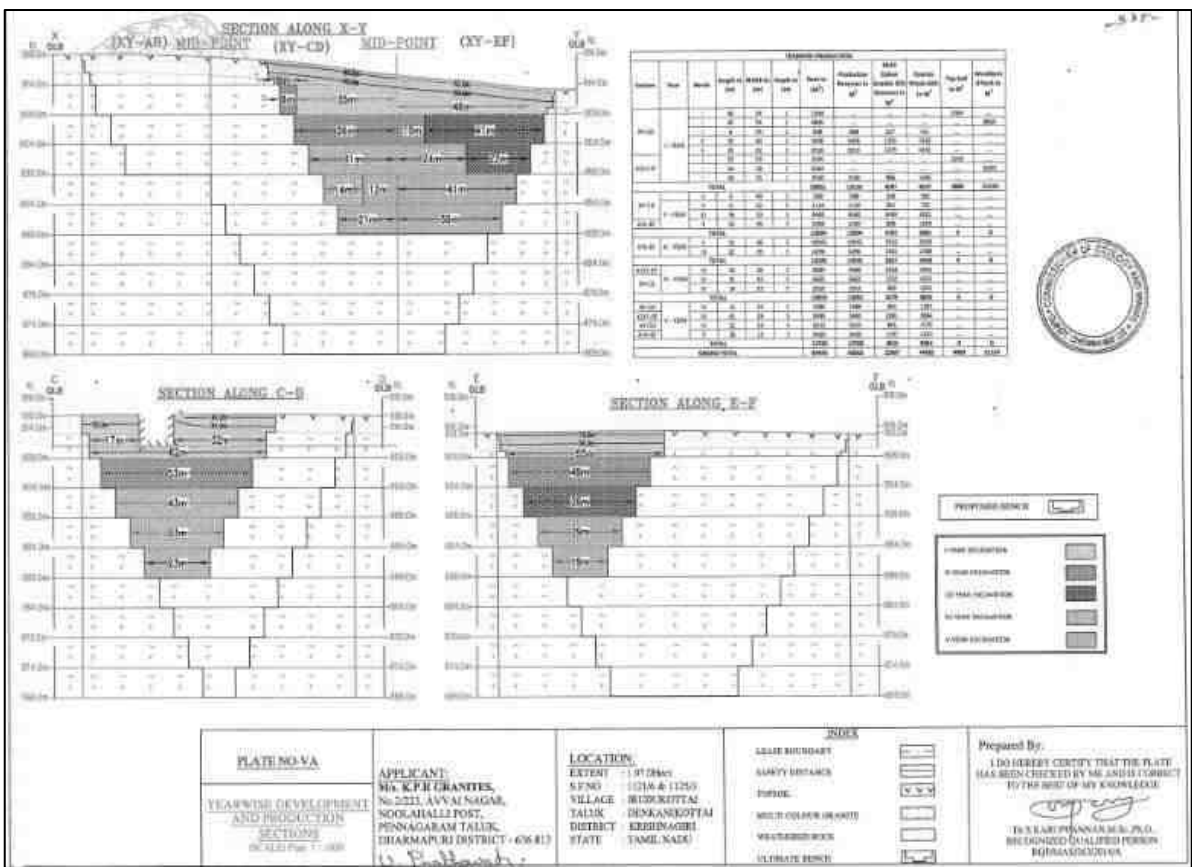
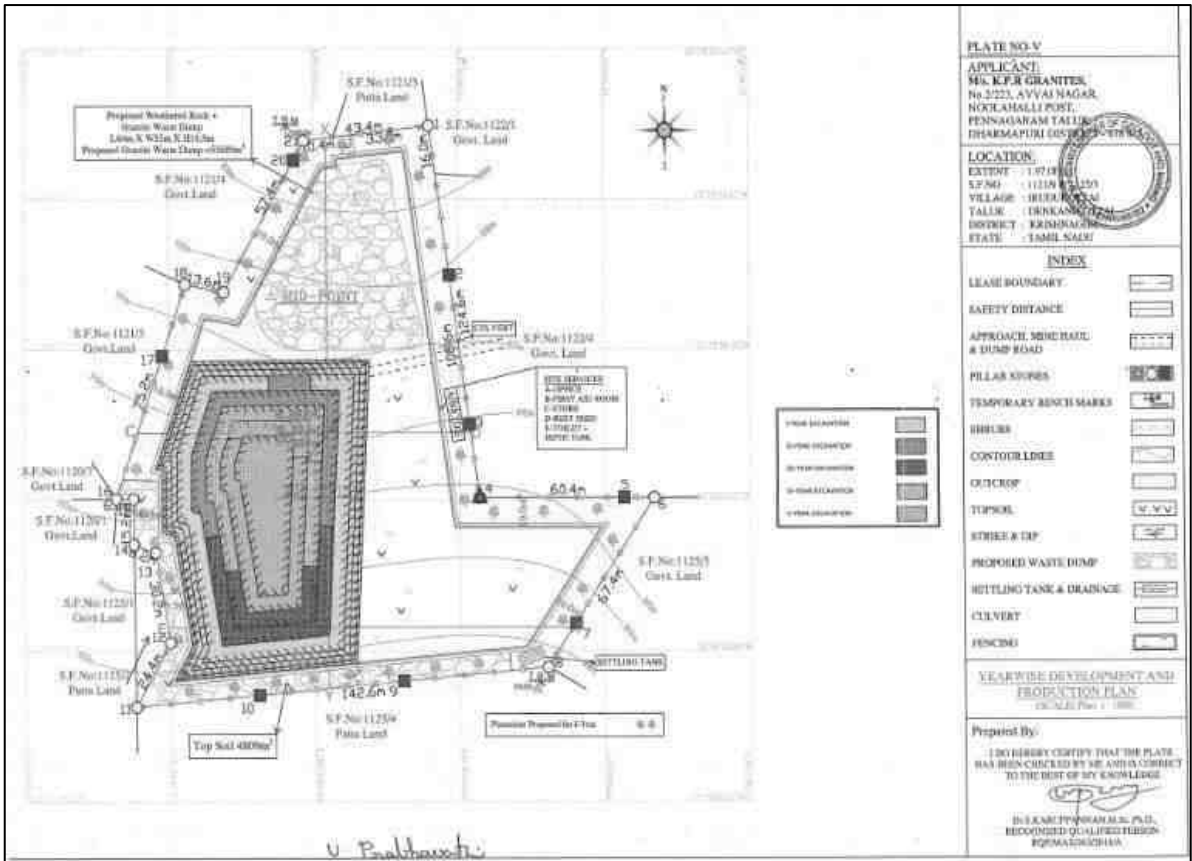


Figure 2.7 Year-Wise Development Production Plan & Sections

Stacking of Granite Rejects and Disposal of Waste

The multi-colour granite rejects (up to 65%) and weathered rock are 55689m³ (44565m³ + 11124m³) will be removed and dumped in the Northern side of the lease area average dimensions of (L64m X W55m X H 16.0m) for the period of five years. The topsoil is 4809m³ will be removed and stacked for earth bund in the lease hold area to prevent inherent entry of cattle's and human as per rules 106, Metalliferous Mines Regulations, 1961. If multi-colour granite may be un sold it will be kept within the lease boundary.

Progressive Quarry closure plan

The progressive quarry closure plan of the proposed project showing present, and future land use statistics is provided in Table 2.7. According to data shown in the table, at the end of the quarry life, about 0.66.64ha of land would have been utilized for quarrying, 0.26.80ha of land for waste dump, 0.03.00ha for infrastructures, 0.07.00ha for roads, 0.39.80ha for green belt development, and the remaining 0.47.86ha would have been left as unutilized area.

Table 2.7 Land use data at present, during scheme of mining, and at the end of mine life

Description	Present Land Use Area (ha)	Land Use Area at the end of mine life (ha)
Area under quarry	0.04.82	0.66.64
Infrastructure	Nil	0.03.00
Roads	Ni	0.07.00
Green Belt	Ni	0.39.80
Waste Dump	Ni	0.26.80
Drainage & Settling Tank	Ni	0.05.90
Unutilized Area	1.92.18	0.47.86
Total	1.97.00	1.97.00

Conceptual Mining Plan

On the basis of conceptual plan and its sections, as shown in Figures 2.9, the ultimate pit dimension of the quarry is 65m in length, 123m in width and 45 m in depth.

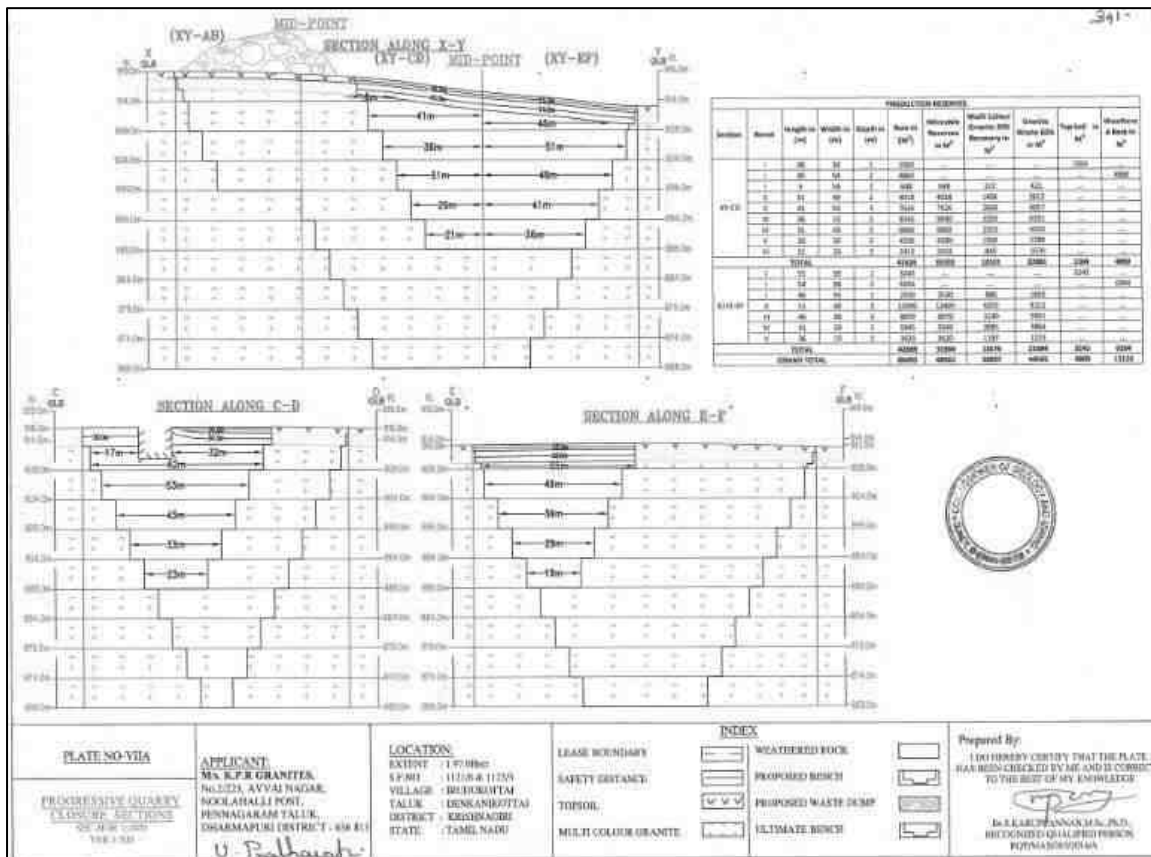
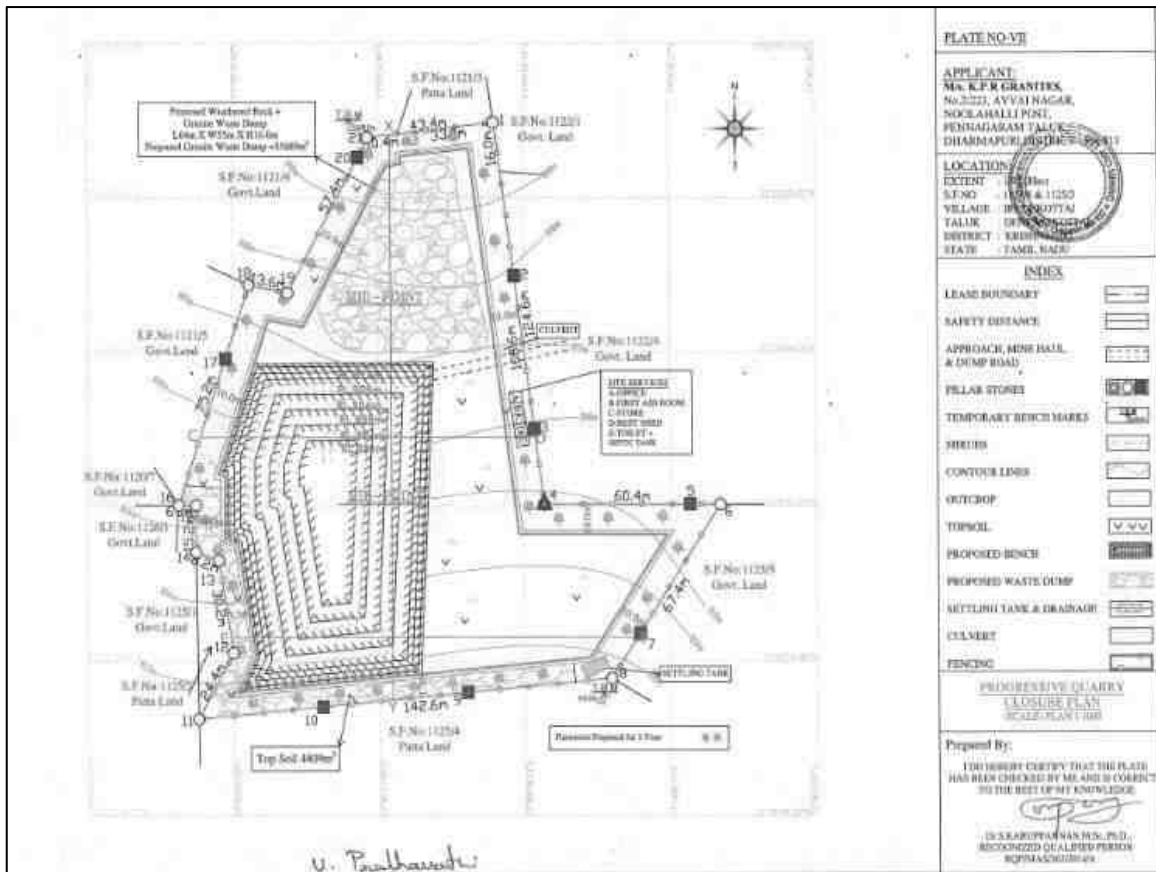


Figure 2.8 Progressive Quarry Closure Plan & Sections

Mine closure

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, as shown in Figures 2.8 for the scheme period, the progressive mine closure cost is given in Table 2.8.

Table 2.8 Progressive Mine Closure Budget

Activity	Capital Cost
394 plants inside the lease area	78800
591 plants outside the lease area	177300
Wire Fencing	394000
Garland Drain	19700
Total	669800

Source: Environment Management Plan

Project Requirement

The project requires water, power, fuel, and other infrastructures as discussed below:

i) Water Requirement

Detail of water requirement in 3.3 KLD is given in Table 2.9.

Table 2.9 Water Requirement for the Project

Purpose	Quantity Required (KLD)	Source
Domestic & Drinking	1.3	Water for domestic, dust suppression, and green belt development purposes will be sourced from existing bore wells and drinking water from approved water vendors.
Dust Suppression	1.0	
Green Belt	1.0	
Total	3.3	

Source: Prefeasibility Report

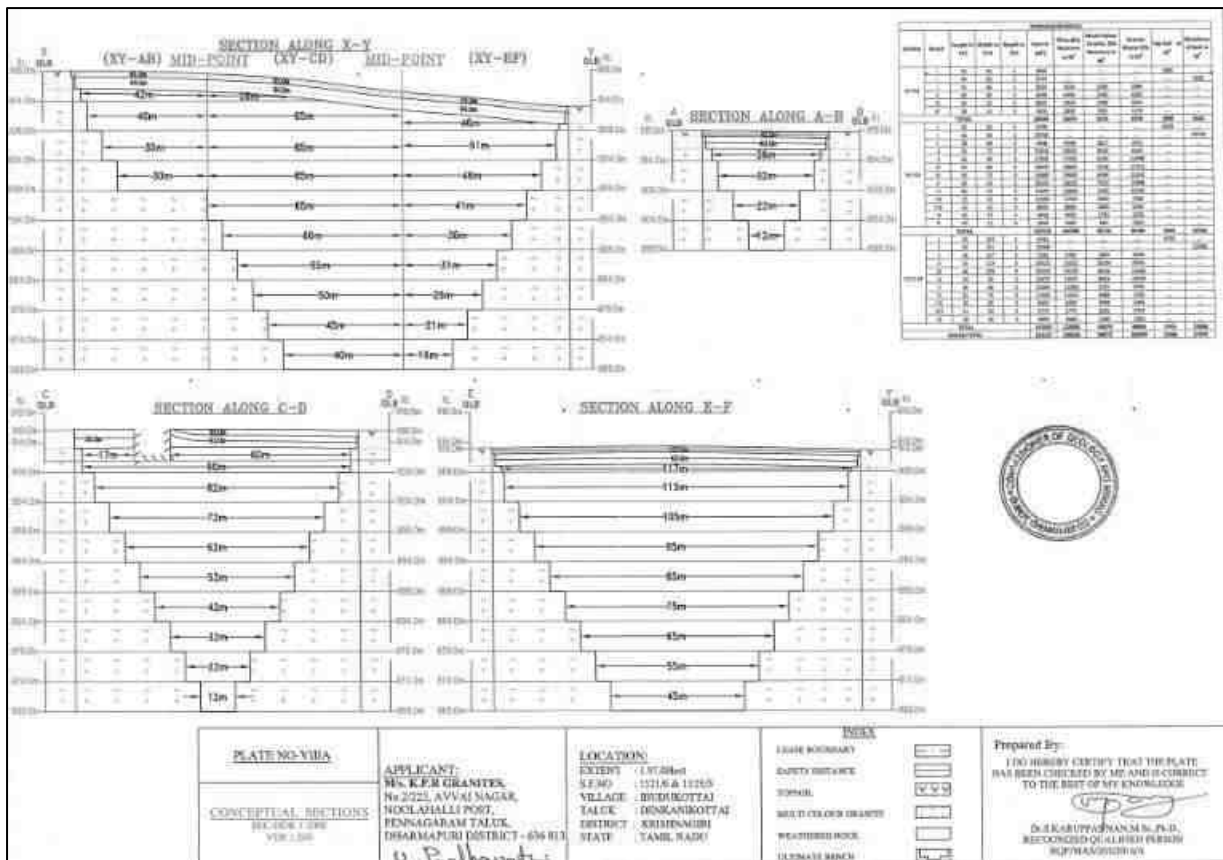
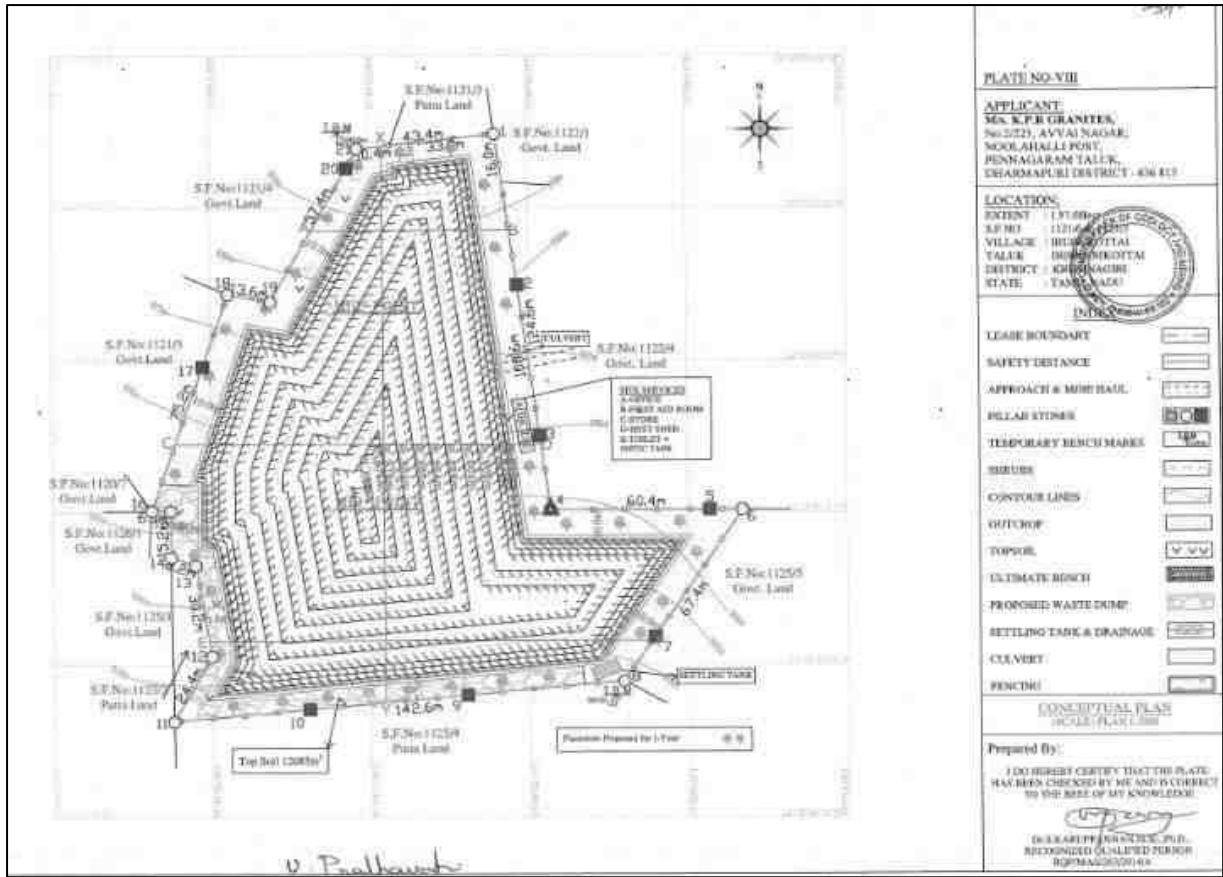


Figure 2.9 Conceptual Plan & Sections

ii) Energy Requirement

The electricity from high tension power supply is utilized for diamond wire saw cutting machine, disc double blade cutting machine, air compressor, derrick crane and pumps for de-watering and is also used for mines office and lighting purpose

In addition to electricity, around 3,30,171 litres of HSD are used for total diesel consumption for Excavator, Compressor and Tipper. It will be brought to the site from nearby diesel pumps. Details on the estimation of fuel requirements are provided in Table 2.10.

Table 2.10 Fuel Requirement Details

Fuel Requirement for Excavator					
Details	Multi Colour Granite Recovery @35% (23997m³)	Granite Waste @65% (44565m³)	Weathered Rock (11124m³)	Top Soil 4809m³	Total Diesel (litre)
Average Rate of Fuel Consumption (l/hr)	16	16	16	10	---
Working Capacity (m ³ /hr)	20	20	20	60	---
Time Required (hours)	1200	2228	556	80	---
Total Diesel Consumption for 5 years (litre)	19198	35652	8899	802	64551
Fuel Requirement for Tipper					
Average Rate of Fuel Consumption/Trip (litre)	20	20	20	--	---
Carrying Capacity in m ³	6	6	6	--	---
Number of Trips / days	3	6	1	--	---
Number of Trips / 5 years	4000	7428	1854	--	---
Total Diesel Consumption for 5 years (litre)	79990	148550	37080	--	265620
Total Diesel Consumption by Excavator and Tipper					3,30,171

iii) Employment 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 2.11.

Table 2.11 Employment Potential for the proposed project

S. No.	Category	Role	Nos.
1	Highly Skilled	Quarry Manager	1
		Mines Foreman	---
		Geologist	1
		Accountant cum & admin	1
2	Skilled	Earth moving operator	---
		Driver	2
		Mechanic	1
		Blaster/Mat	---
3	Semi-Skilled	Helpers/Greasers	1
4	Unskilled	Musdoor / Labours	19
		Cleaners	---
		Attendant's	1
Total			27

Source: Approved Mining Plan

iv) Infrastructure Requirement

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. 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.

v) Capital Requirement

The summary of capital required for the project is provided in Table 2.12.

Table 2.12 Capital Requirement Details

S. No.	Description	Cost (Rs.)
1	Fixed Asset Cost	21,98,8700/-
2	Machinery Cost	30,00,000/-
3	Expenditure Cost	40,28,000/-
Total Project Cost		92,26,870/-

Source: Mining plan report

2.7 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 2.13.

Table 2.13 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						
3	Consent to operate						Project establishment period.
							Production starting period.
Time line may vary; subjected to rules and regulations /& other unforeseen circumstances							

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

CHAPTER III
DESCRIPTION OF THE ENVIRONMENT

3.0 GENERAL

This chapter presents a regional background to the baseline data at the very onset, which will help in better appreciation of micro-level field data, generated on several environmental and ecological attributes of the study area. The baseline status of the project environment is described section wise for better understanding of the broad-spectrum conditions. The baseline environment quality represents the background environmental scenario of various environmental components such as land, water, air, noise, biological and socio-economic status of the study area. Field monitoring studies to evaluate the base line status of the project site were carried out covering **March through May, 2024** with CPCB guidelines. Environmental baseline data were collected by an NABL accredited and MoEF notified **Greenlink Analytical and Research Laboratory (India) Private 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	6 (1 core & 5 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	6 (2 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/auto matic weather station	1	Site specific primary data & secondary data from IMD Station
*Ambient Air Quality	PM ₁₀ , PM _{2.5} SO ₂ , NO _x , and Fugitive dust	24 hours, twice a week	6 (1 core & 5 buffer)	IS 5182 Part 1-23 National Ambient Air Quality Standards, CPCB
*Noise Levels	Ambient noise	Hourly observation for 24 hours per location	6 (1 core & 5 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 Quadrat & Transect Study Secondary Data – Forest Working Plan
Socio Economic Aspects	Socio-economic characteristics, population statistics and existing infrastructure in the study area	Site visit & Census Handbook, 2011	Study area	Primary Survey, census handbook & need based assessments.

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

3.1 LAND ENVIRONMENT

3.1.1 Geology and Geomorphology

Study area is mainly composed of biotite hornblende genesis and grey hornblende biotite genesis, as shown in Figure 3.1.

Among the geomorphic units, shallow weathered/buried pediplain and pediment dominate the study area, as shown in Figure 3.2. The lease area occurs in shallow weathered/buried pediplain terrain.

3.1.2 Land Use/ Land Cover

Land Use and Land Cover (LU/LC) map, as shown in Figure 3.3 was prepared using Sentinel II image for the study area of 5 km radius. 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 12.83 ha of which lease area of 1.87.0 ha contributes only about 0.02%. This small percentage of mining activities shall not have any significant impact on the land environment.

Table 3.2 LULC Statistics of the Study Area

S. No	Classification	Extent (ha)	Area (%)
1	Barren Rocky/stony waste	219.32	2.87
2	Crop Land	3357.04	43.99
3	Dense Forest	238.65	3.13
4	Land with or without scrub	1308.64	17.15
5	Mining / Industrial lands	12.83	0.17
6	Plantations	2482.33	32.53
7	Settlements	11.87	0.16
Total		7630.67	100.0

Source: Sentinel II Satellite Imagery

3.1.3 Topography

The applied lease area exhibits an elevated topography, which is elevation difference of 15 m. The highest elevation observed in lease area is 474 m AMSL, whereas the lowest elevation is 459 m AMSL.

3.1.4 Drainage Pattern

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

3.1.5 Seismic Sensitivity

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

3.1.6 Soil Environment

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

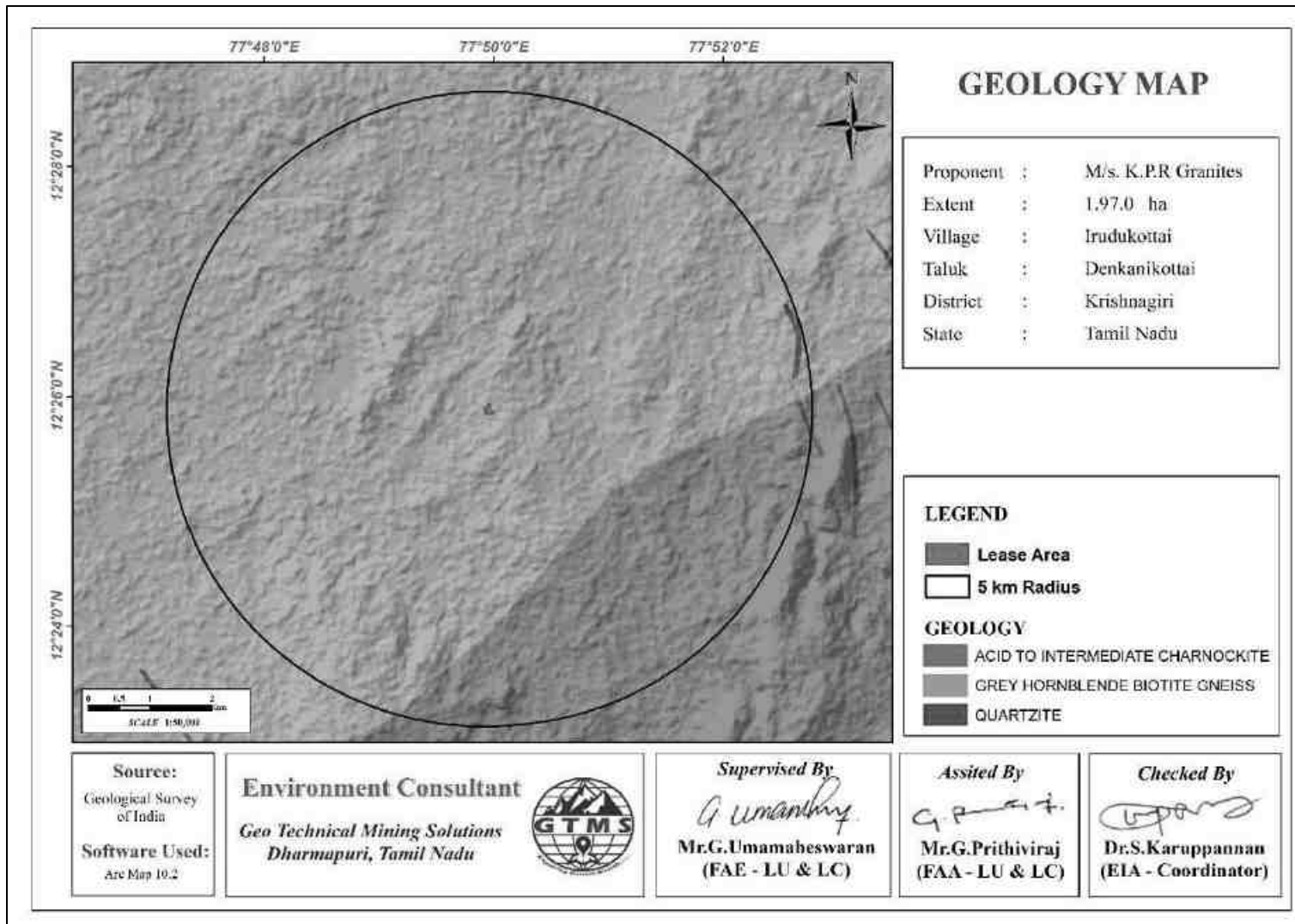


Figure 3.1 Geology Map of 5 km Radius from the Proposed Project Site

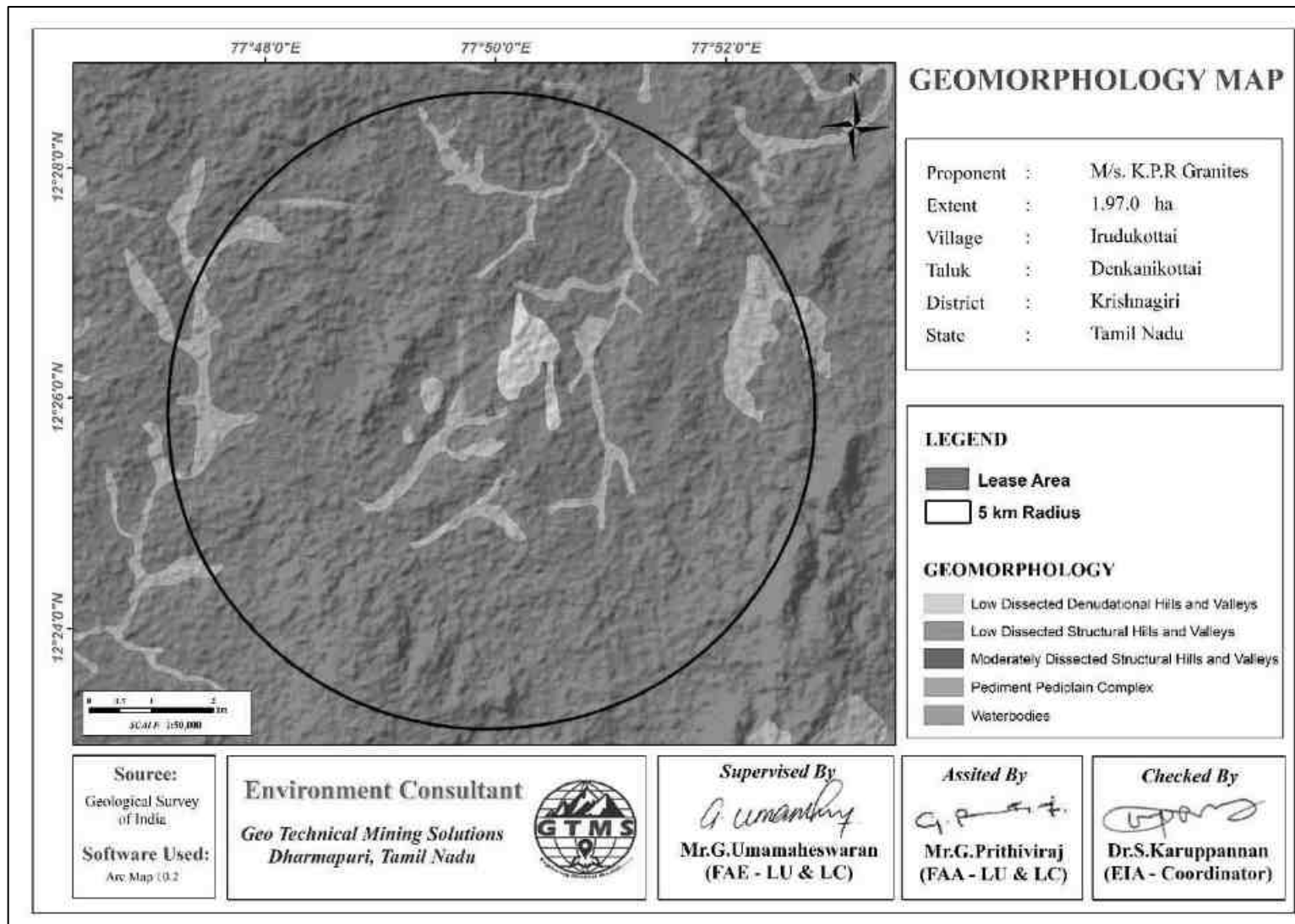


Figure 3.2 Geomorphology Map of 5 km Radius from the Proposed Project Site

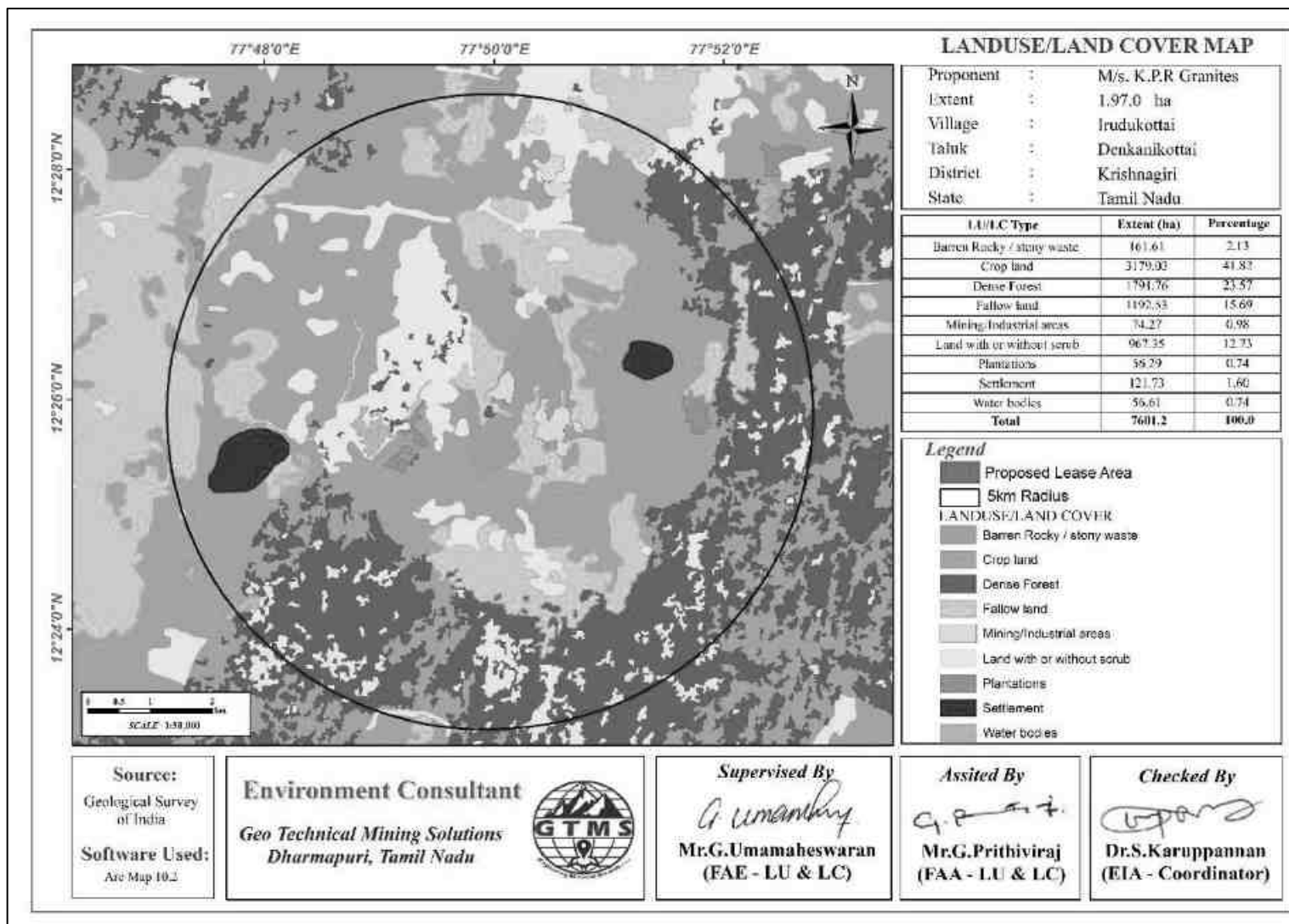


Figure 3.3 LULC Map of 5 km Radius from the Proposed Project Site

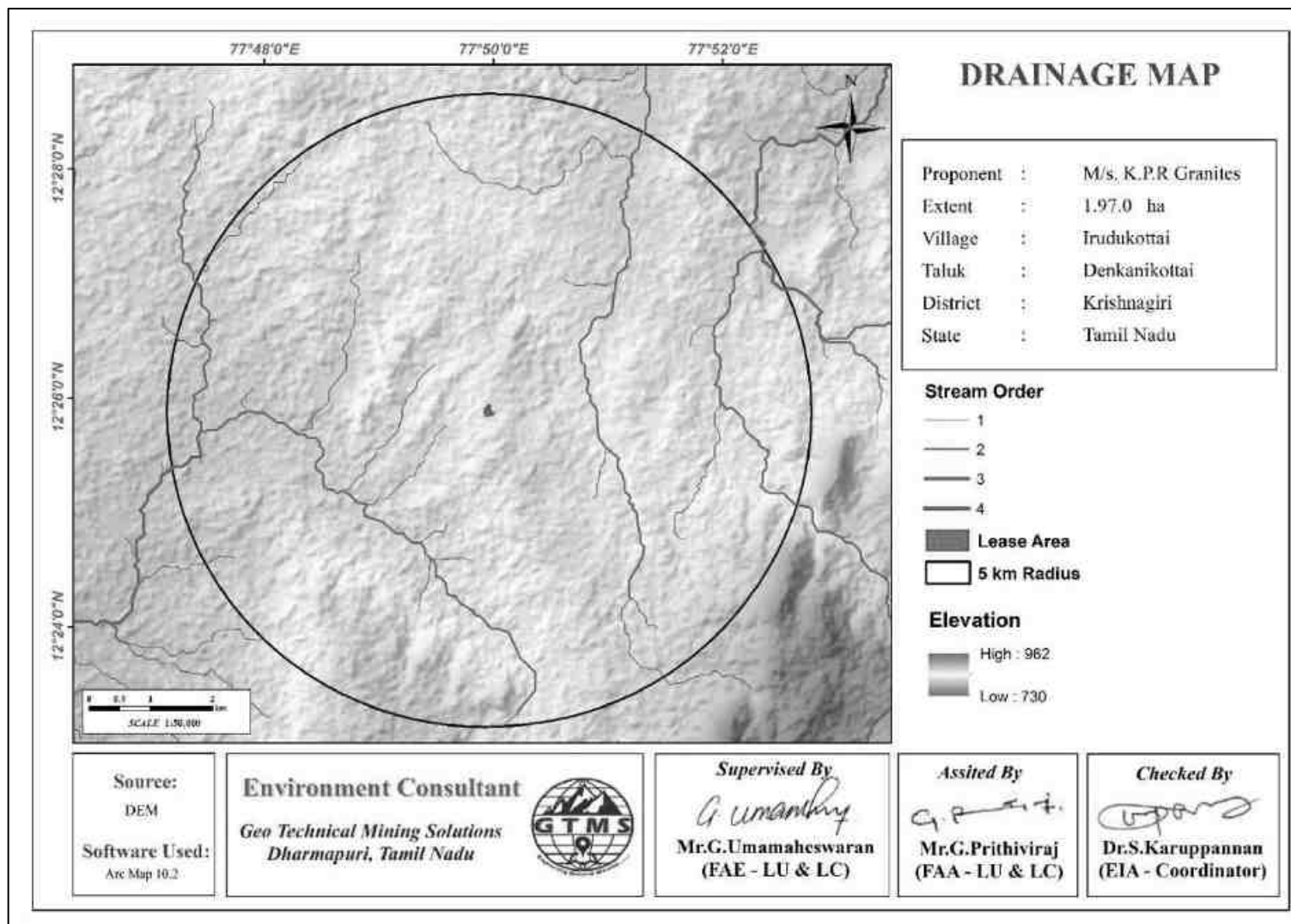


Figure 3.4 Drainage Map of 5 km Radius from the Proposed Project Site Showing Dendritic Pattern

3.1.6.1 Methodology

6 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 3.6. The samples thus collected were analysed for physical and chemical characteristics as per the standard methods prescribed in “Soil Chemical Analysis (M.L. Jackson, 1967) & Department of Agriculture, Cooperation & Farmers Welfare, Ministry of Agriculture & Farmers Welfare, Government of India”. The physical and chemical characteristic results of soil samples are provided in Table 3.4.

Table 3.3 Soil Sampling Locations

Location ID	Monitoring Locations	Distance & Direction	Coordinates
S1	Core	----	12°25'53.72"N, 77°50'3.89"E
S2	Thottikuppam	1.06 SE	12°25'23.54"N, 77°50'21.42"E
S3	Namaleri	2.12 NE	12°26'27.51"N, 77°51'1.18"E
S4	Bikkanapalli	4.33 NWW	12°26'23.01"N, 77°47'35.07"E
S5	Santhanapalli	4.35 NW	12°28'13.12"N, 77°49'21.64"E
S6	Melur	3.48 SE	12°24'14.23"N, 77°50'59.90"E

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

3.1.6.2 Results and Discussion

Physical Characteristics & Chemical Characteristics

The soil samples in the study area show loamy textures varying between silty clay loam, silty loam and sandy loam. pH of the soil varies from 6.4 to 7.9 indicating slightly acidic to slightly alkaline nature. Electrical conductivity of the soil varies from 43.85 to 133.2 $\mu\text{s}/\text{cm}$. Potassium ranges between 1077 and 3056 %, Calcium ranges between 4455 and 21085 mg/kg. Organic matter content ranges between 0.17 and 0.71%.

Soil erosion

Soil erosion map shows that:

- ❖ Soil erosion is moderate in the proposed lease area
- ❖ Medium soil erosion is in Southeast side of the lease area. Showing in Figure 3.5 Soil erosion map.

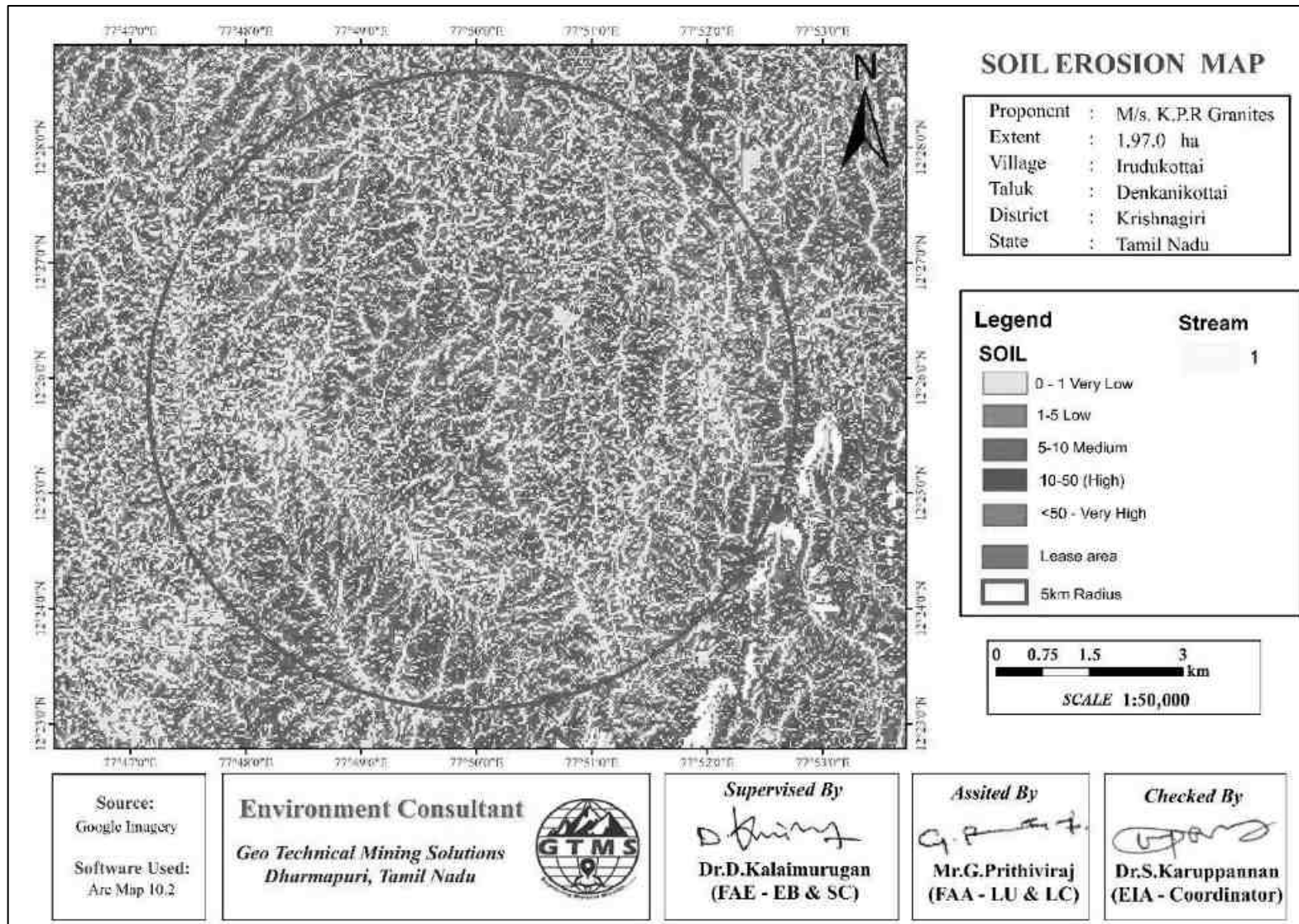


Figure 3.5 Soil Erosion Map within 5 km Radius around the Proposed Project Site

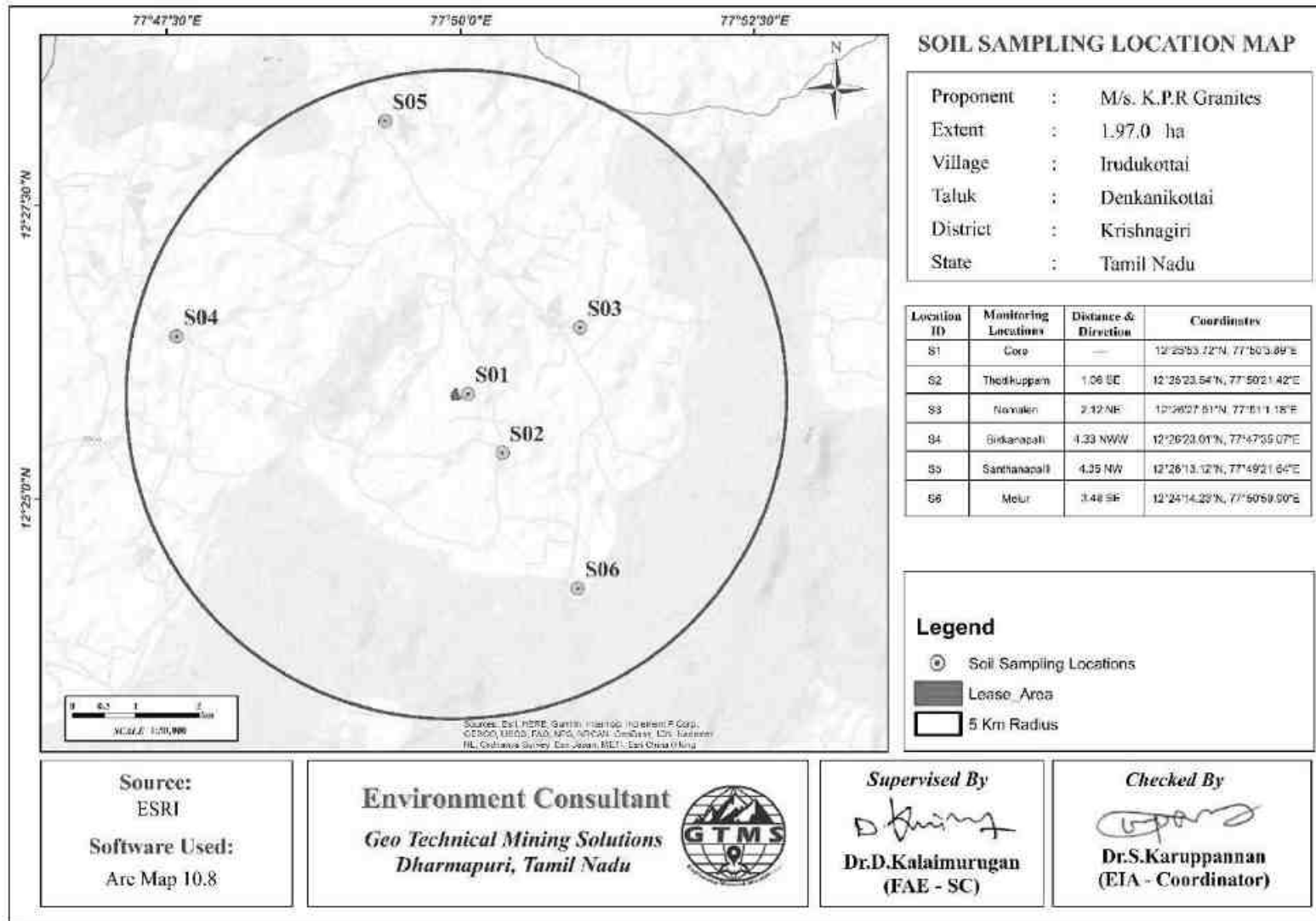


Figure 3.6 Map Showing Soil Sampling Locations within 5 km Radius around the Proposed Project Site

Table 3.4 Soil Quality of the Study Area

S. No	Name of the Test	Units	S1 Core	S2 Thottikuppam	S3 Namaleri	S4 Bikkanapalli	S5 Santhanapalli	S6 Melur
1	pH value @ 25°C	---	7.1	7.2	7.4	7.9	6.4	6.9
2	Specific Electrical Conductivity@25°C	µS/Cm	72.17	133.2	129.9	119.2	43.85	97.24
3	Moisture @ 150°C	%	17.36	16.84	17.52	19.58	21.54	18.49
4	Total Organic Carbon	%	0.41	0.1	0.06	0.14	0.07	0.11
5	Available Calcium as Ca	mg/kg	11302	21085	11623	7508	4455	14112
6	Available Magnesium as Mg	mg/kg	9500	10229	9518	9464	4799	7432
7	Available Nitrogen	kg/ha	236	260	198	174	208	148
9	Available Potassium	kg/ha	1171	1077	1628	3056	1334	2095
10	Available Phosphorous	kg/ha	46.3	23	141.6	258	6.3	66.6
12	Zinc as Zn	ppm	23.5	25	13.9	60.7	16	19.4
13	Copper as Cu	ppm	39.7	30.9	37.7	37.5	12.6	35
14	Total Organic Matter	%	0.71	0.17	0.5	0.24	0.12	0.19
15	Total Iron as Fe	ppm	34306	38087	22816	26768	41581	29918
16	Nickel	mg/kg	BDL [DL 0.1]	BDL [DL 0.1]	BDL [DL 0.1]	BDL [DL 0.1]	BDL [DL 0.1]	BDL [DL.0.1]
17	Lead	mg/kg	1.5	1.21	1.59	5.7	1.03	2.02
18	Bulk Density	kg/m3.	1328	1122	1406	1233	1458	1135
19	Porosity	%	31	38	42	34	32	38
20	Texture	-	Silt Loam	Clay Loam	Clay Loam	Silt Loam	Silt Clay Loam	Silt Loam
21	Sand	%	19.9	20.4	21.2	35.3	19.4	21.4
22	Silt	%	71.9	72.2	70.7	57.9	72.8	69.4
23	Clay	%	8.2	7.4	8.1	6.8	7.8	9.2

Source: Sampling Results by Greenlink Analytical and Research Laboratory (India) Private Ltd, in association with GTMS

3.2 WATER ENVIRONMENT

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

Table 3.5 Water Sampling Locations

Location ID	Monitoring Locations	Distance & Direction	Coordinates
SW1	Namaleri Lake	1.94 NE	12°26'29.53"N, 77°50'53.10"E
SW2	Thippasandiram Lake	4.48 NE	12°28'10.94"N, 77°50'55.88"E
BW1	Thottikuppam	1.00 SE	12°25'26.58"N, 77°50'21.59"E
BW2	Melur	3.26 SE	12°24'20.56"N, 77°50'56.65"E
BW3	Santhanapalli	4.29 NNW	12°28'11.09"N, 77°49'19.63"E
OW1	Bikkanapallis	4.62 NWW	12°26'30.09"N, 77°47'26.60"E

Source: On-site monitoring/sampling Greenlink Analytical and Research Laboratory (India) Private Ltd, in association with GTMS.

3.2.1 Surface Water Resources and Quality

Namaleri Lake and Thippasandiram Lake are the two prominent surface water resources present in the study area. These are ephemeral in nature, which convey water only after rainfall events. Three surface water samples, known as SW1 and SW2 were collected from the three surface water bodies to assess the baseline water quality. Table 3.6 summarizes surface water quality data of the three samples.

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

3.2.2 Ground Water Resources and Quality

Groundwater in the study area occurs in the Peninsular Gneiss and Charnockite Gneiss. The movement of the groundwater is controlled by the intensity of weathering and fracturing of crystalline rocks. Dug wells and bore wells are the most common ground water abstraction structures in the area. However, in dry season, people in the study area heavily rely on bore wells for their domestic and agriculture purpose.

Five groundwater samples, known as BW1, BW2, BW3 and OW1 were collected from open well and bore well and analysed for physico-chemical conditions, heavy metals and

bacteriological contents in order to assess baseline quality of ground water. Ground water sampling locations and their distance and direction from the lease area are provided in Table 3.5 and the spatial occurrence of water sampling locations is shown in Figure 3.7. Table 3.6 summarizes ground water quality data of the four samples.

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

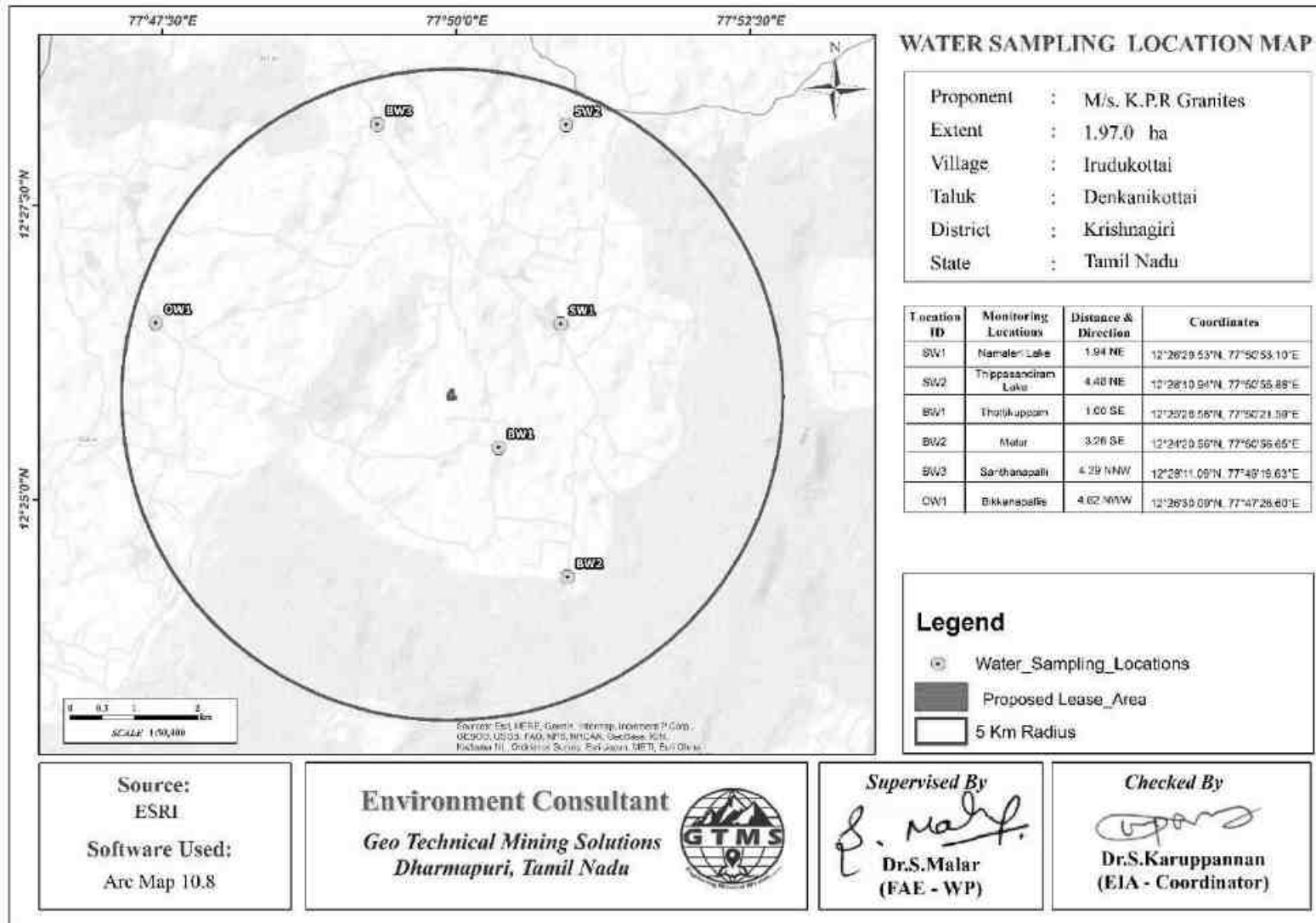


Figure 3.7 Toposheet showing water sampling locations within 5 km radius around the proposed project site

Table 3.6 Water Quality Result

S. No.	Parameters	Units	Results					
			SW1	SW2	BW1	BW2	BW3	OW1
1	Colour	CU	<1.0	5	<1.0	<1.0	<1.0	<1.0
2	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
3	Taste	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Turbidity	NTU	1	0.5	<0.1	<0.1	<0.1	<0.1
5	pH value @ 25°C	-	6.9	7.0	7.3	7.1	7.8	7.2
6	EC @ 25°C	µS/cm	189	310	1456	1756	1078	987
7	TDS	mg/l	104	176	1144	896	1023	352
8	Total Alkalinity (CaCO ₃)	mg/l	145	176	215	316	319	278
9	Chloride (Cl)	mg /l	63	134	178	179	201	95
10	TH (CaCO ₃)	mg/l	210	250	429	533	426	375
11	Calcium (Ca)	mg/l	54	78	176	132	174	110
12	Magnesium (Mg)	mg/l	19	21	24	17	43	21
13	Sulphates (SO ₄)	mg/l	29	35	76	79	92	38
14	Nitrate (NO ₃)	mg/l	11.4	21.3	6.9	7.9	8.3	14.3
15	Total Iron as Fe	mg/l	0.9	1.27	0.67	1.25	1.18	1.37
16	Fluoride (F)	mg/l	<0.1	<0.1	0.9	1.2	1.1	0.85
17	Arsenic (As)	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
18	Copper (Cu)	mg/l	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
19	Zinc as Zn	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
20	Cadmium as Cd	mg/l	BDL	BDL	BDL	BDL	BDL	BDL
21	Lead (Pb)	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
22	Mineral Oil	mg/l	BDL	BDL	BDL	BDL	BDL	BDL
23	E-Coli	CFU/ml	Present	Present	Absent	Absent	Absent	Absent
24	Coliform	CFU/ml	Present	Present	Absent	Absent	Absent	Absent

Source: Sampling Results by Greenlink Analytical and Research Laboratory (India) Private Ltd, in association with GTMS

3.2.3 Hydrogeological Studies

Rainfall

Rainfall data for the study area were collected for the period of 1981-2022 (POWER | Data Access Viewer (nasa.gov)). Long term monthly average rainfall was estimated from the data of 1981-2022 and compared with the monthly rainfall for the year 2022, shown in Figure 3.8. The Figure 3.8 shows that monthly rainfall in 2022 is generally high in the months of May, August and October, when compared to the long term monthly average rainfall.

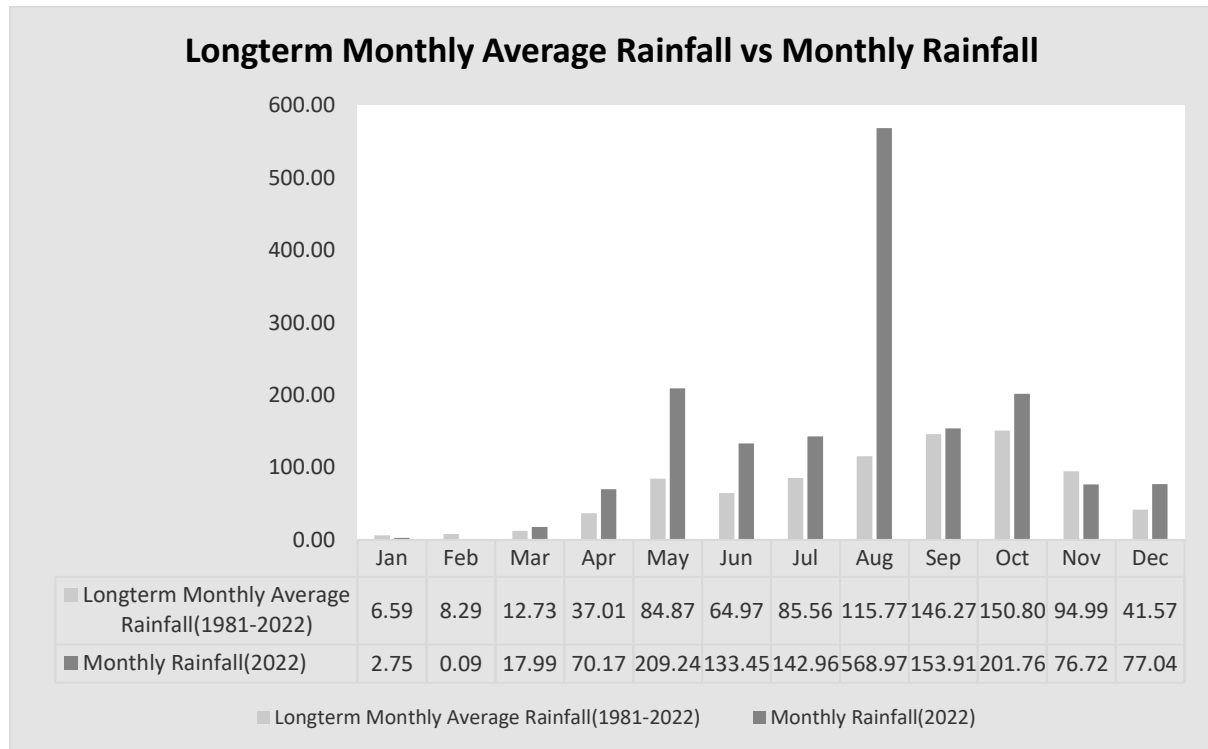


Figure 3.8 Long-term monthly average rainfall vs monthly rainfall

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

3.2.3.1 Groundwater Levels and Flow Direction

Data regarding depth to groundwater levels are essential to infer the direction of groundwater movement within the study area. Knowledge of groundwater flow direction is must in choosing location for background groundwater quality monitoring well and in locating recharge and discharge areas. Therefore, data regarding groundwater elevations were collected from 9 open wells and 9 bore wells at various locations within 2 km radius around the proposed project sites for the period from March through May, 2024 (Pre-Monsoon Season) and from October through December, 2023 (Post Monsoon Season).

The open well water level data thus collected onsite are provided in Tables 3.7 and 3.8. According to the data, average depths to the static water table in open wells range from 21.80 to 24.57 m BGL in pre monsoon and 17.93 to 18.90 m BGL in post monsoon. The bore well data thus collected onsite are provided in Tables 3.9 and 3.10. The average depths to static potentiometric surface in bore wells for the period of October through December 2023 (Post-Monsoon Season) vary from 77.80 to 79.10 m and from 83.07 to 80.43 m for the period of March through May, 2024 (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 3.9 -3.10, it is understood that most of the open well groundwater for the post- and pre-monsoon seasons flows towards the open well number 9 located in SE direction of the proposed project site. The groundwater flow maps in Figure 3.10-3.11 show that most of the bore well groundwater for the post- and pre-monsoon seasons flow towards the bore well number 8. It is located in East 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	20.8	21.5	23.4	21.90	12°25'59.74"N	77°49'39.62"E
OW02	21.2	22.2	23.2	22.20	12°25'43.04"N	77°50'15.39"E
OW03	20.9	21.4	23.1	21.80	12°25'47.71"N	77°49'50.51"E
OW04	21.2	22.1	22.4	21.90	12°26'18.65"N	77°50'46.22"E
OW05	20.4	21.9	23.1	21.80	12°25'18.23"N	77°50'1.16"E
OW06	21.1	21.8	23.2	22.03	12°25'44.04"N	77°49'8.81"E
OW07	20.5	26.1	27.1	24.57	12°26'16.77"N	77°49'33.01"E
OW08	20.8	25.2	27.4	24.47	12°26'32.50"N	77°50'32.44"E
OW09	21.30	24.8	27	24.37	12°25'11.30"N	77°49'8.07"E

Source: Onsite monitoring data

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

Station ID	Depth to Static Water Table BGL (m)				Latitude	Longitude
	Oct-2023	Nov-2023	Dec-2023	Average		
OW01	19.5	17.8	16.5	17.93	12°25'59.74"N	77°49'39.62"E
OW02	19.6	17.4	16.8	17.93	12°25'43.04"N	77°50'15.39"E
OW03	20.1	19.2	17.1	18.80	12°25'47.71"N	77°49'50.51"E
OW04	19.9	18.5	16.8	18.40	12°26'18.65"N	77°50'46.22"E
OW05	20.1	19.4	17.2	18.90	12°25'18.23"N	77°50'1.16"E
OW06	20.2	19.2	16.5	18.63	12°25'44.04"N	77°49'8.81"E
OW07	19.5	19.6	16.8	18.63	12°26'16.77"N	77°49'33.01"E
OW08	20.4	19.4	16.4	18.73	12°26'32.50"N	77°50'32.44"E
OW09	20.60	18.8	17.2	18.87	12°25'11.30"N	77°49'8.07"E

Source: Onsite monitoring data

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

Station ID	Depth to Static Potentiometric Surface BGL(m)				Latitude	Longitude
	Mar-2024	Apr-2024	May- 2024	Average		
BW01	75.3	77.9	80.8	78.00	12°25'59.40"N	77°49'52.68"E
BW02	75.2	78.2	81.3	78.23	12°25'53.31"N	77°49'41.75"E
BW03	74.5	77.4	82.5	78.13	12°25'42.55"N	77°49'55.67"E
BW04	74.6	77.2	83.5	78.43	12°25'29.15"N	77°50'19.38"E
BW05	74.8	77.6	82.2	78.20	12°25'23.38"N	77°49'53.00"E
BW06	74.6	77.3	81.6	77.83	12°25'21.97"N	77°49'9.03"E
BW07	75.2	78.4	82.5	78.70	12°25'48.38"N	77°49'24.84"E
BW08	75.4	78.6	83.3	79.10	12°26'32.65"N	77°49'32.24"E
BW09	74.2	78.4	80.8	77.80	12°25'57.20"N	77°50'35.51"E

Source: Onsite monitoring data

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

Station ID	Depth to Static Potentiometric Surface BGL(m)				Latitude	Longitude
	Oct-2023	Nov-2023	Dec-2023	Average		
BW01	84.2	81.6	78.2	81.33	12°25'59.40"N	77°49'52.68"E
BW02	85.1	82.2	78.1	81.80	12°25'53.31"N	77°49'41.75"E
BW03	84.2	81.2	77.1	80.83	12°25'42.55"N	77°49'55.67"E
BW04	82.9	88.8	77.5	83.07	12°25'29.15"N	77°50'19.38"E
BW05	84.4	81.6	77.6	81.20	12°25'23.38"N	77°49'53.00"E
BW06	85.1	81.5	77.5	81.37	12°25'21.97"N	77°49'9.03"E
BW07	83.6	81.6	77.9	81.03	12°25'48.38"N	77°49'24.84"E
BW08	84.5	81.8	78.1	81.47	12°26'32.65"N	77°49'32.24"E
BW09	84.2	79.6	77.5	80.43	12°25'57.20"N	77°50'35.51"E

Source: Onsite monitoring data

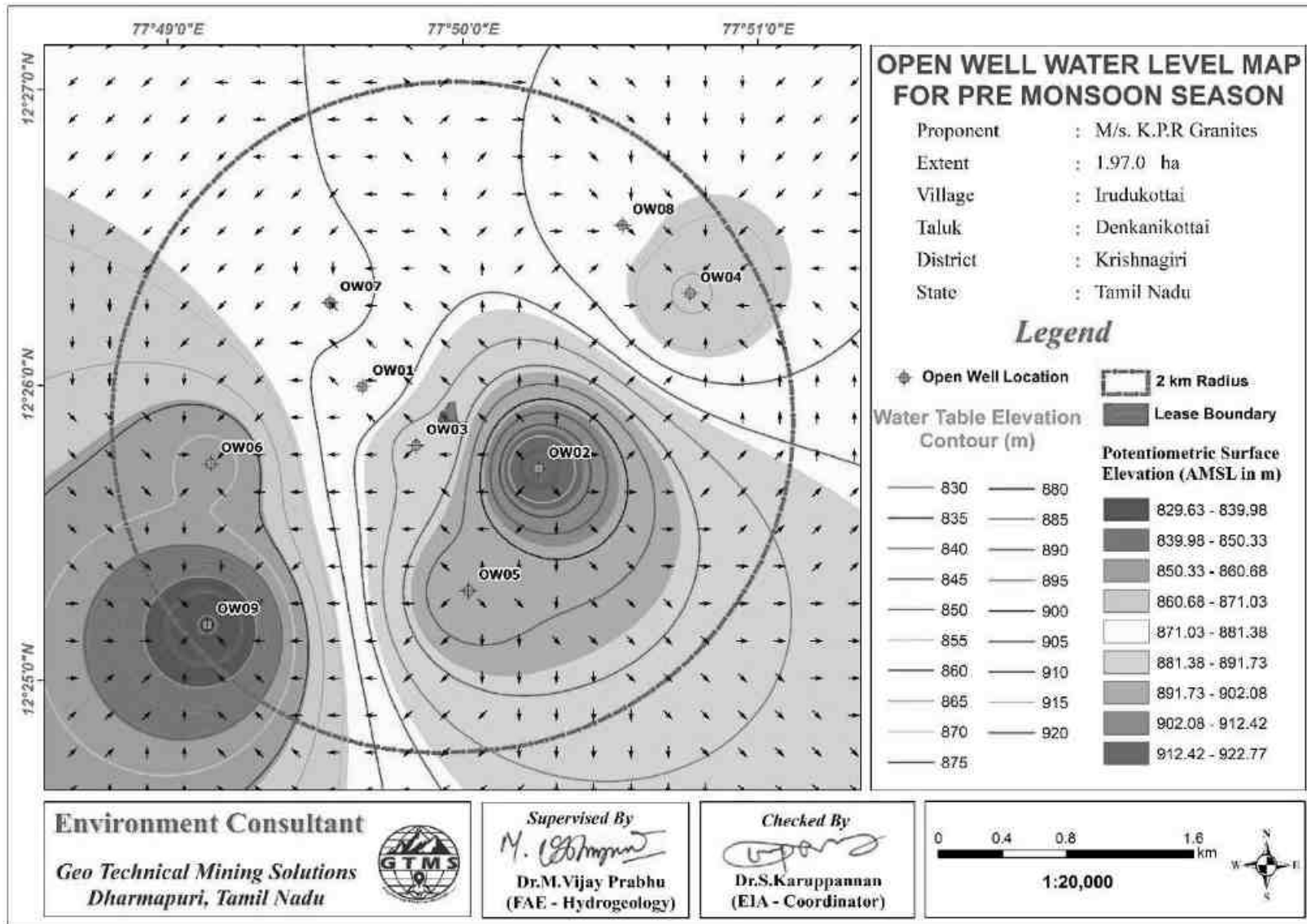


Figure 3.9 Open well Static Groundwater Elevation Map Showing Direction of Groundwater Flow during Pre-Monsoon Season

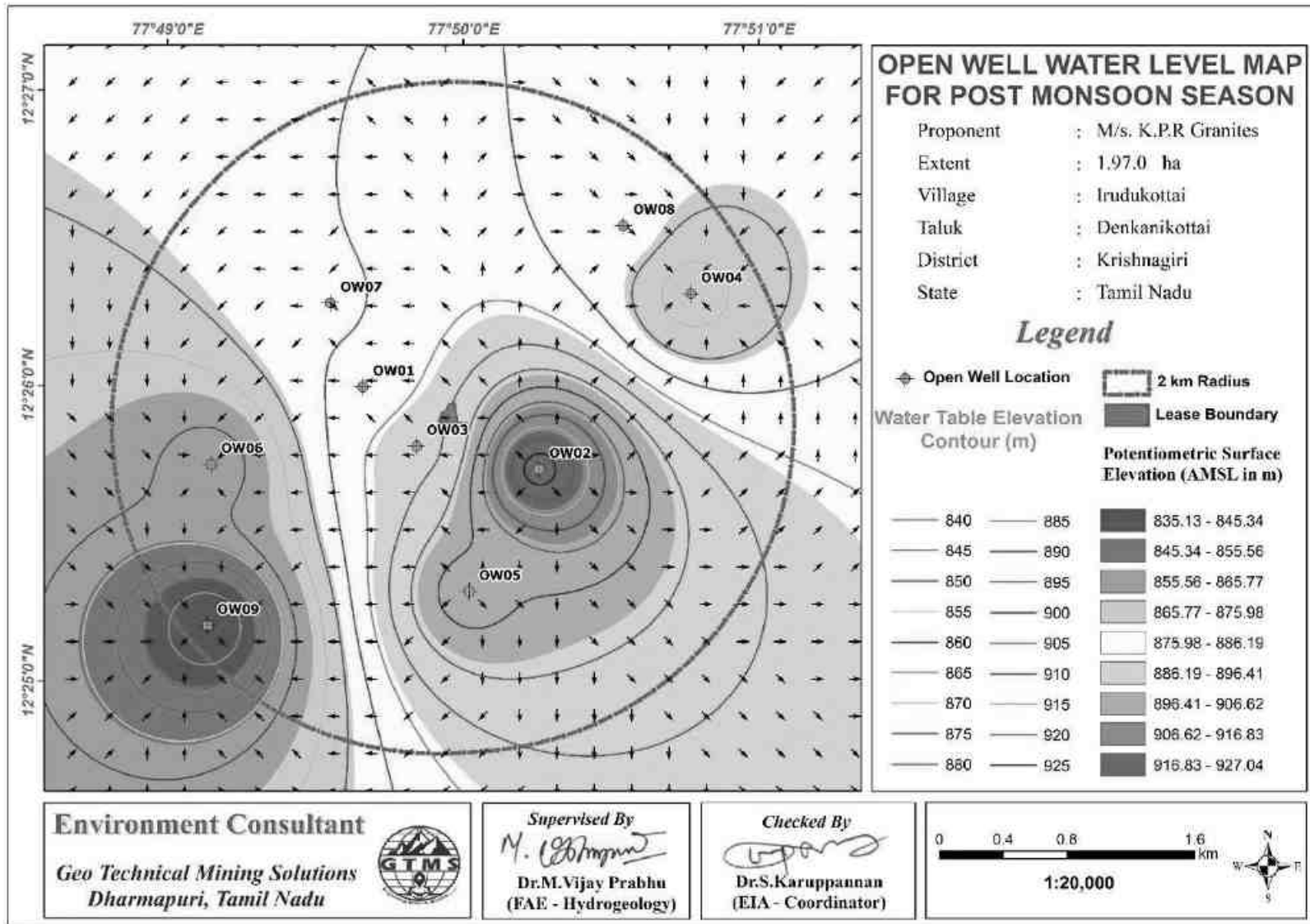


Figure 3.10 Open well Static Groundwater Elevation Map Showing Direction of Groundwater Flow during Post-Monsoon Season

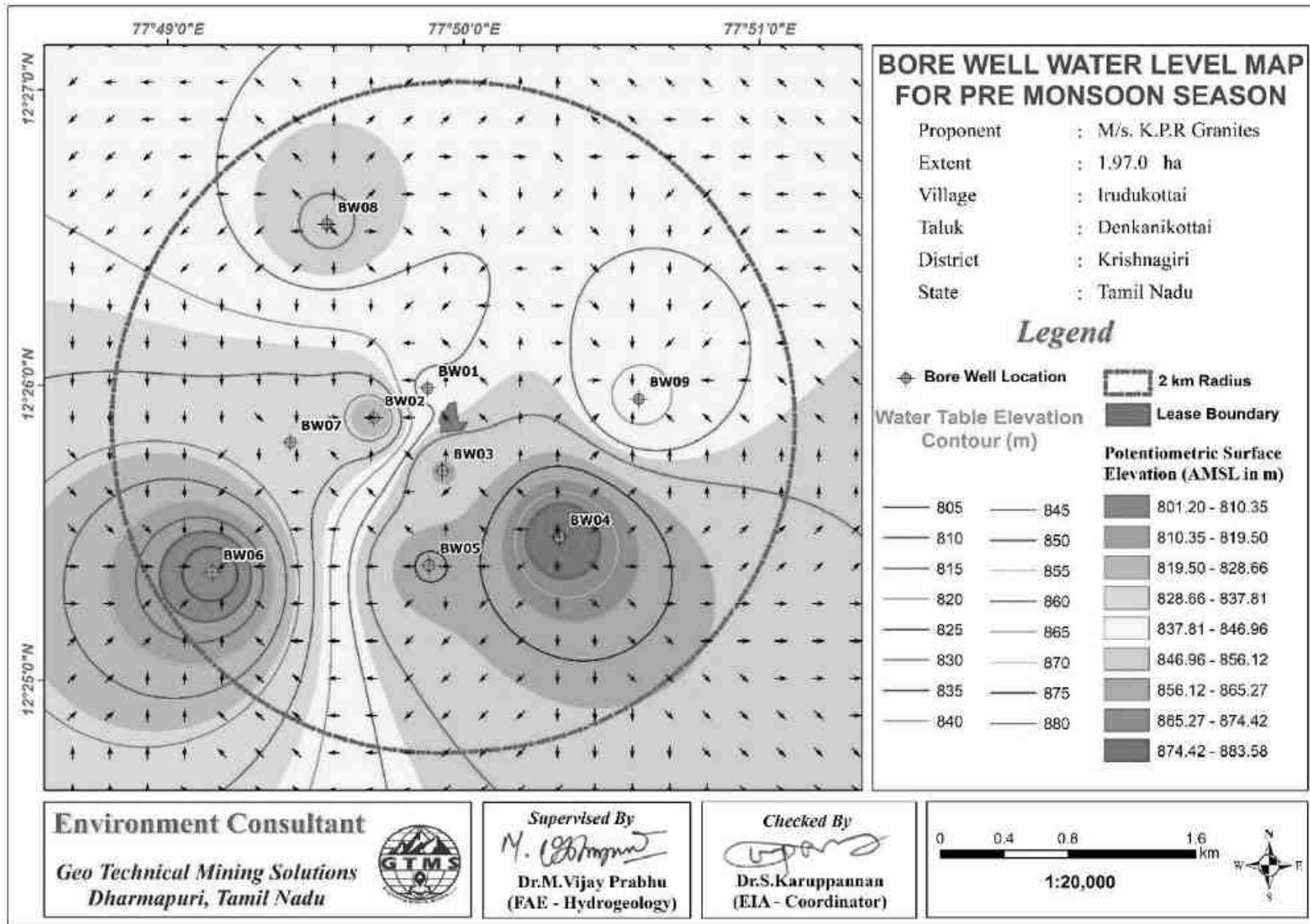


Figure 3.11 Borewell Static Groundwater Elevation Map Showing Direction of Groundwater Flow during Pre-Monsoon Season

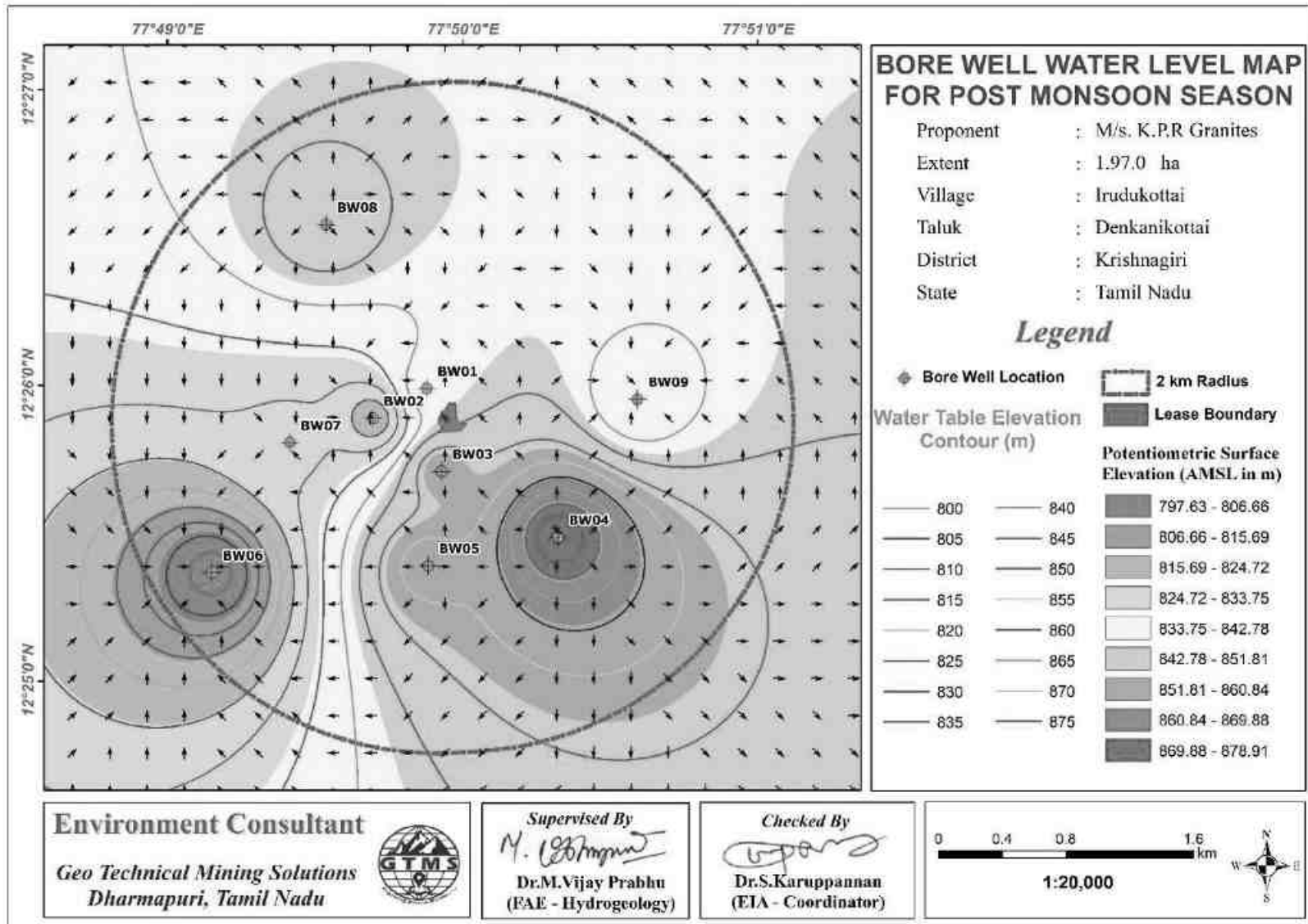


Figure 3.12 Borewell Static Groundwater Elevation Map Showing Direction of Groundwater Flow during Post-Monsoon Season

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 3.13.

Table 3.11 Vertical Electrical Sounding Data

Location Coordinates - 12°25'53.72"N, 77°50'3.89"E					
S. No.	AB/2 (m)	MN/2 (m)	Geometrical Factor (G)	Resistance in Ω	Apparent Resistivity in Ωm
1	5	2	16.5	8.016	132.26
2	10	2	75.43	2.578	194.48
3	15	5	62.86	4.699	295.38
4	20	5	117.86	3.345	394.22
5	25	5	188.58	2.683	505.96
6	25	10	82.5	6.061	500.05
7	30	10	125.72	4.288	539.12
8	35	10	176.79	4.117	727.76
9	40	10	235.73	3.722	877.48
10	45	10	302.51	3.583	1083.91
11	50	20	165.01	7.270	1199.65
12	60	20	251.44	3.167	796.42
13	70	20	353.59	3.535	1249.9
14	80	20	471.45	2.739	1291.12
15	90	20	605.03	2.573	1556.68
16	100	20	754.32	2.380	1795.32

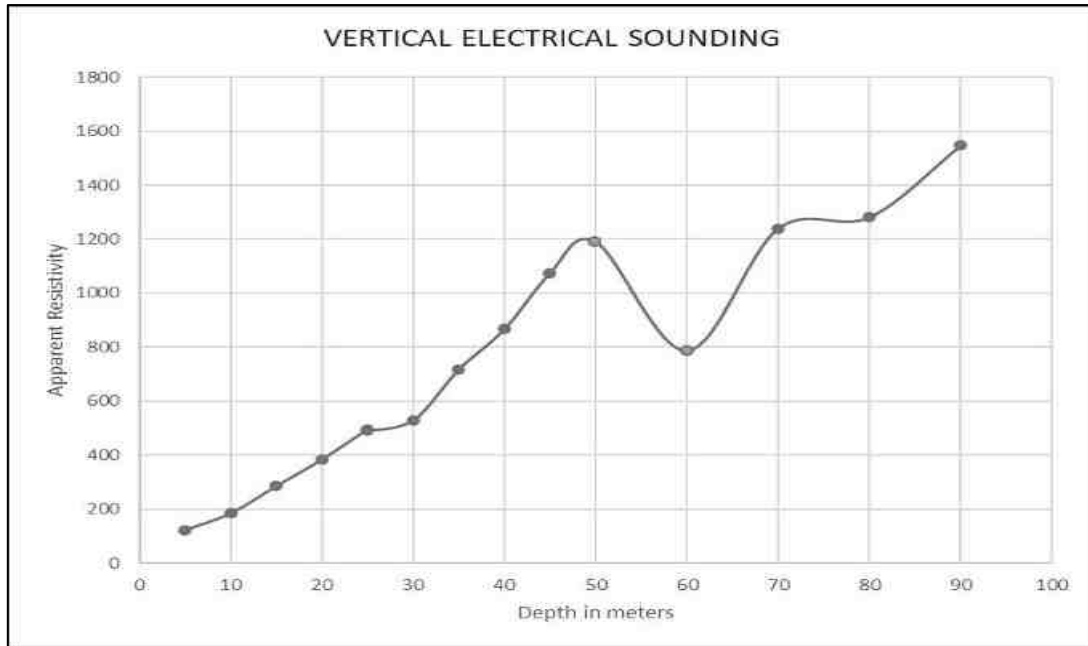


Figure 3.13 Graph Showing Occurrence of Water Bearing Fracture Zones at the Depth of 60 m Below Ground Level in the Proposed Project Area

The rock formation of low resistivity values indicates occurrence of water at the depth of about 60 m below ground level. The maximum depth proposed for the proposed project is 30m (30 m 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 3 m above the ground level as there are no obstructions facilitating flow of wind, wind speed, wind direction, humidity and temperature. Meteorological data obtained from the onsite monitoring station are provided in Table 3.12.

According to the onsite data, the temperature in March, 2024 varied from 17.78 to 38.79⁰C with the average of 28.07⁰ C; in April, 2024 from 20.38 to 41.62⁰C with the average of 30.79⁰ C; and in May, 2024 from 21.20 to 42.51⁰C with the average of 28.77⁰C. In March, 2024, relative humidity ranged from 12.38 to 100 % with the average of 43.93%; in April,

2024, from 12.19 to 98.06 % with the average of 43.11%; and in May,2024, from 19.44 to 96.38 % with the average of 64.25%. The wind speed in March, 2024 varied from 0.06 to 6.83 m/s with the average of 3.33 m/s; in April, 2024 from 0.12 to 7.49m/s with the average of 3.67 m/s; and in May,2024 from 0.12 to 9.15 m/s with the average of 3.10m/s. In March,2024, wind direction varied from 2.33 to 312.14 with the average of 126.79⁰; in April, 2024, from 67.26 to 320.19⁰ with the average of 131.42⁰; and in May,2024, from 9.27to 358.03⁰ with the average of 184.68⁰. In March,2024, surface pressure varied from 93.60 to 94.69kPa with the average of 94.13kPa; in April, 2024, from 93.33 to 94.33kPa with the average of 93.84 kPa; and in May,2024, from 93.01 to 94.19 kPa with the average of 93.62 kPa

Table 3.12 Onsite Meteorological Data

S. No.	Parameters		MARCH,2024	APRIL,2024	MAY,2024
1	Temperature (°C)	Min	17.48	20.38	21.20
		Max	38.79	41.62	42.51
		Avg	28.07	30.79	28.77
2	Relative Humidity (%)	Min	12.38	12.19	19.44
		Max	100.00	98.06	96.38
		Avg	43.93	43.11	64.25
3	Wind Speed (m/s)	Min	0.06	0.12	0.12
		Max	6.83	7.49	9.15
		Avg	3.33	3.67	3.10
4	Wind Direction (degree)	Min	2.33	67.26	9.27
		Max	312.14	320.19	358.03
		Avg	126.79	131.42	184.68
5	Surface Pressure(kPa)	Min	93.60	93.33	93.01
		Max	94.69	94.33	94.19
		Avg	94.13	93.84	93.62

Source: Sampling Results by **Greenlink Analytical and Research Laboratory (India) Private 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 March through May of the years from 2020 to 2023 and the seasonal wind rose for the study period of March through May 2024. The wind rose diagrams thus produced are shown in Figures 3.14-3.14a. Figure 3.15 reveals that:

- ❖ The measured average wind velocity during the study period is 3.36m/s.
- ❖ Predominant wind was dominant in the directions ranging from Southeast to Northwest.

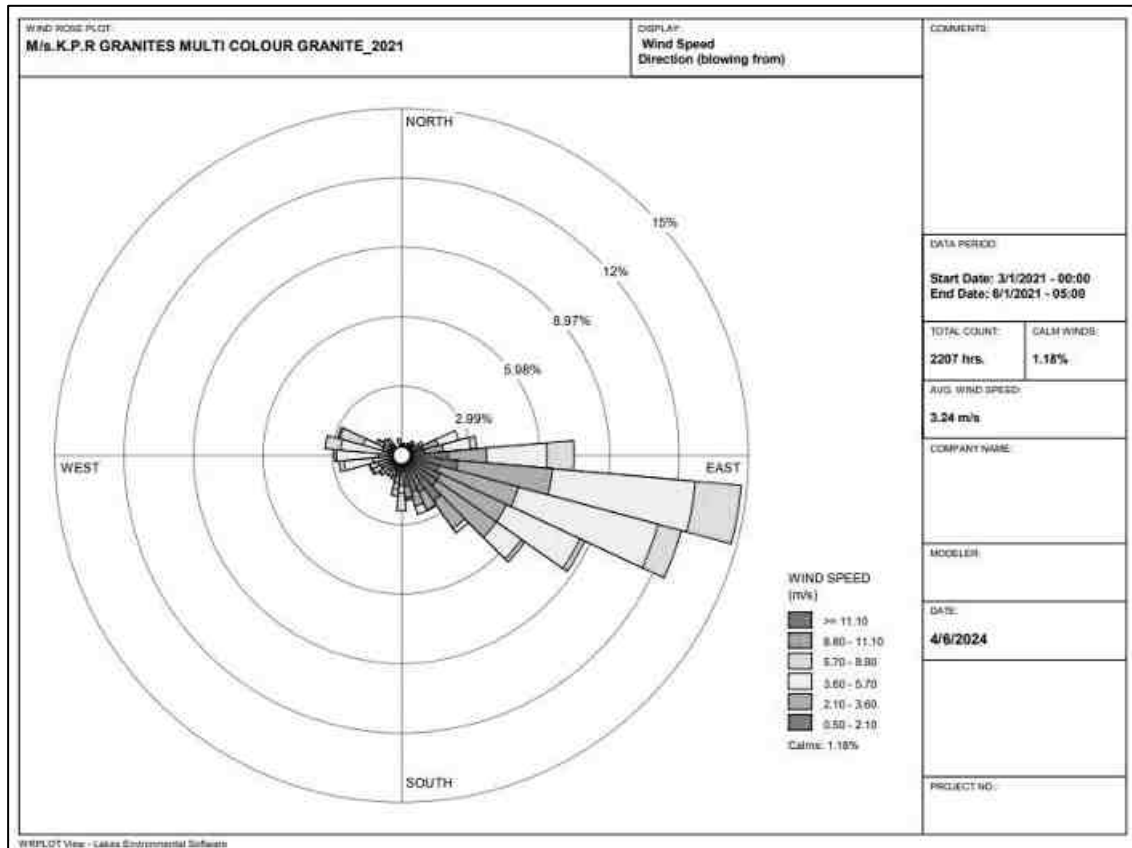
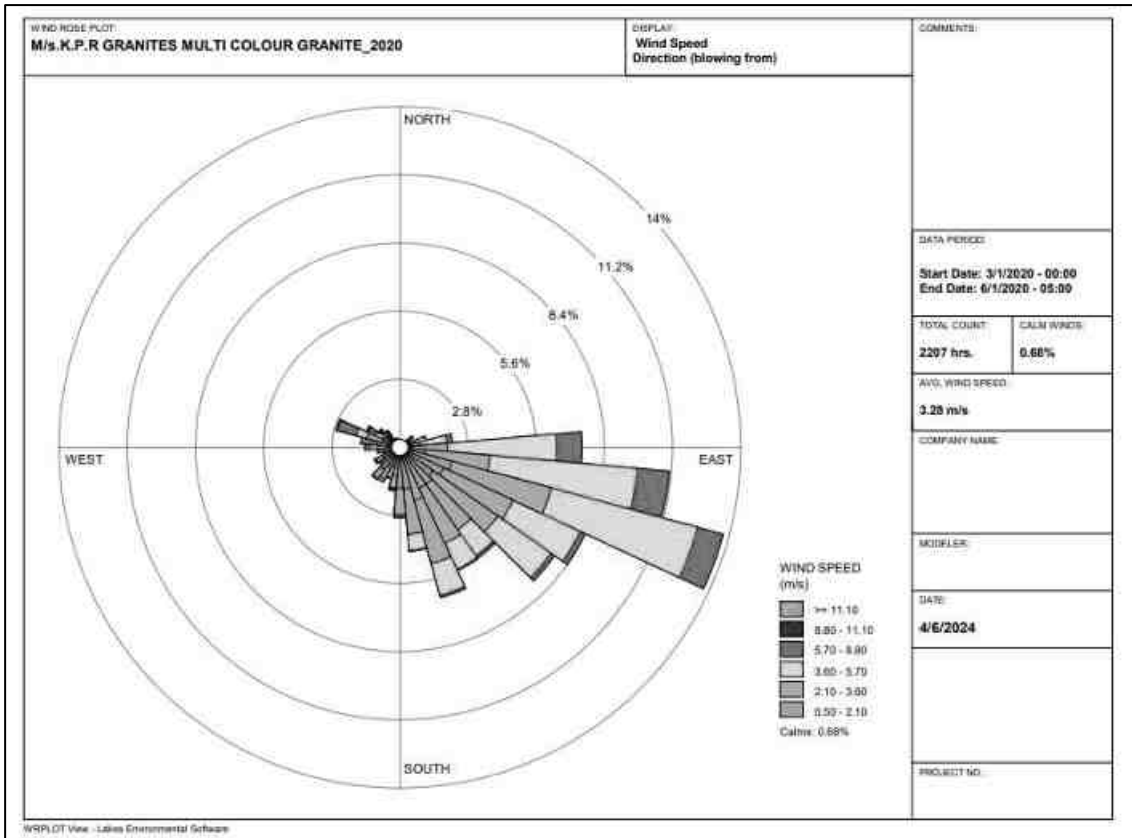


Figure 3.14 Windrose Diagram for 2020 and 2021 (March to May)

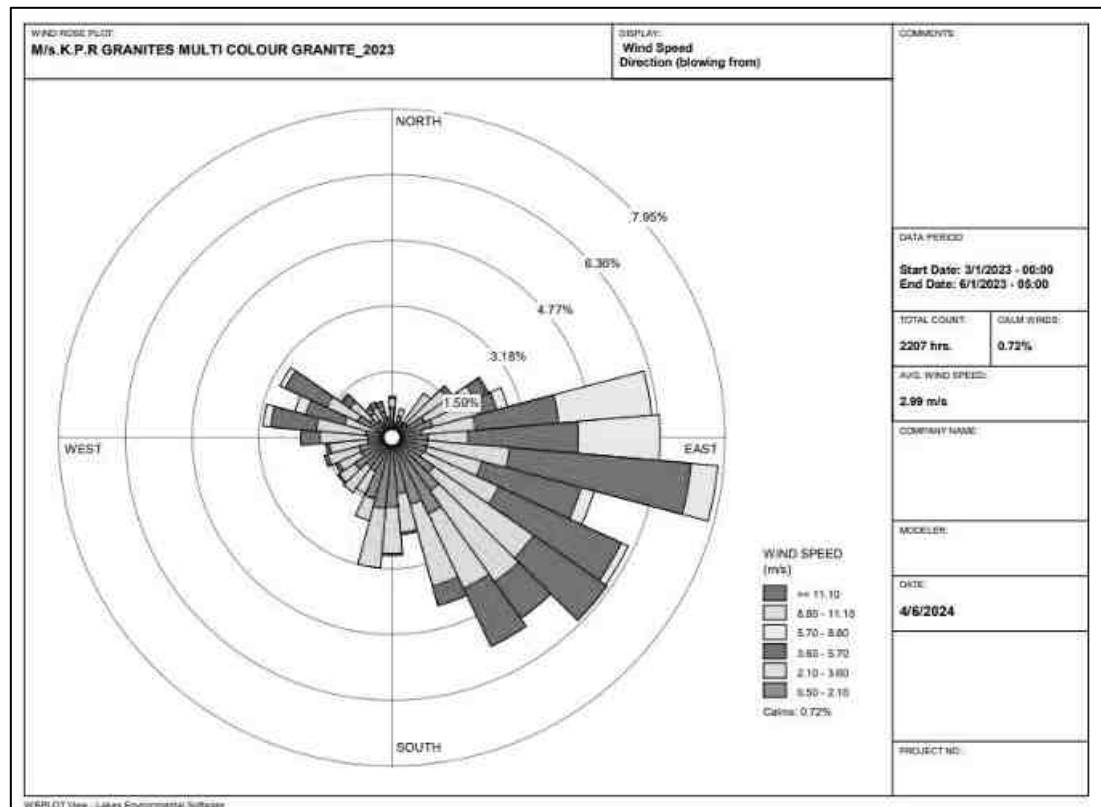
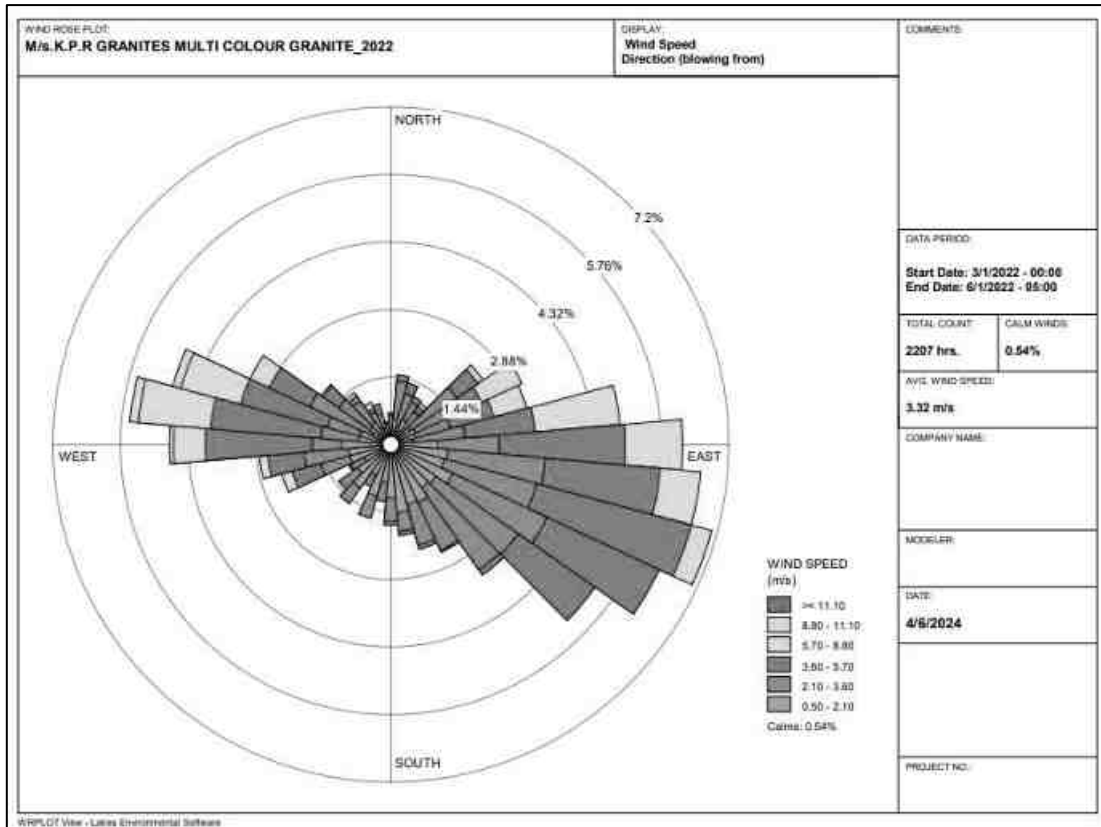


Figure 3.14(a) Windrose Diagram for 2022 and 2023 (March to May)

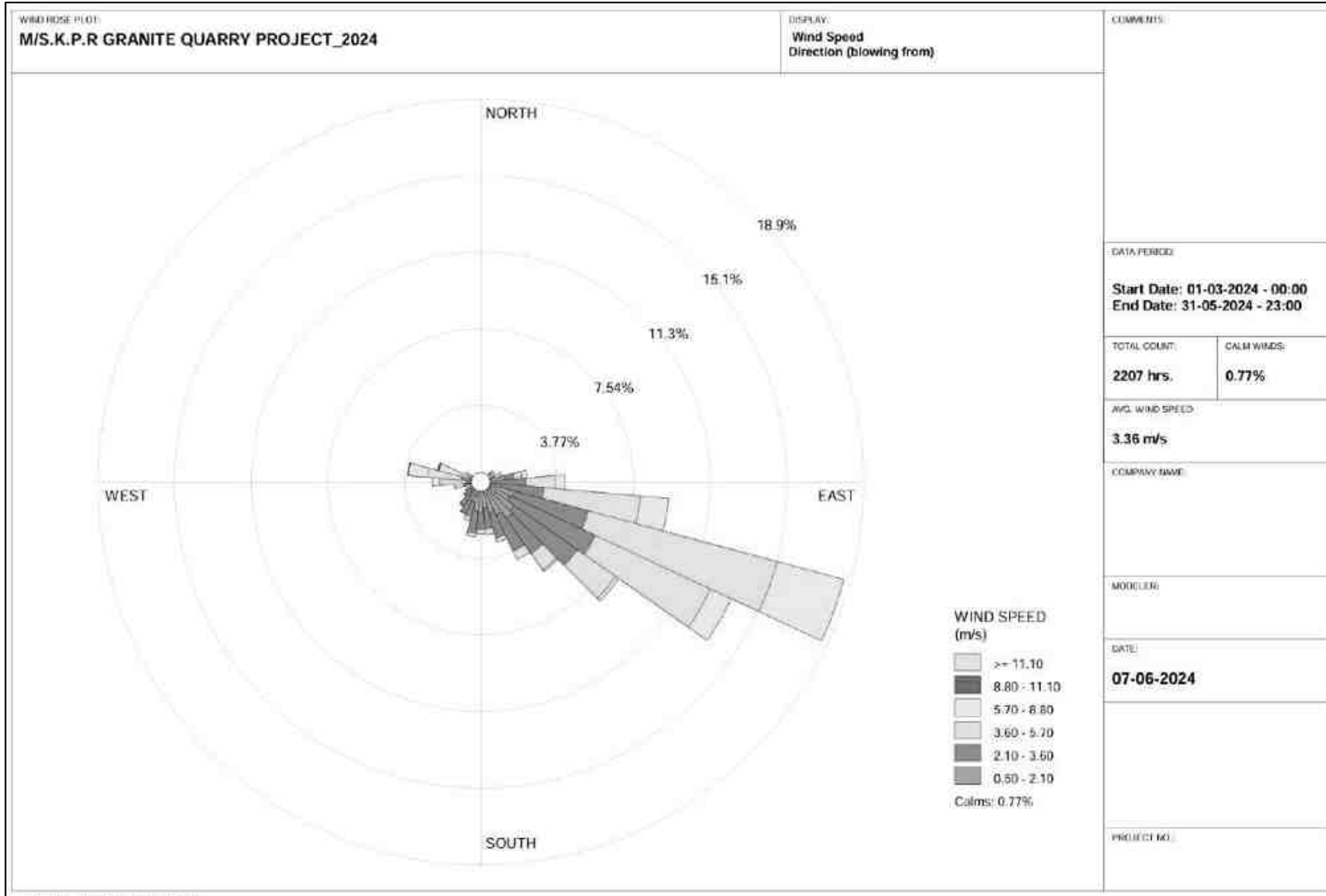


Figure 3.15 Onsite Windrose Diagram

3.3.2 Ambient Air Quality Study

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

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

Table 3.13 Methodology and Instrument Used for AAQ Analysis

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

Source: Sampling Results by **Greenlink Analytical and Research Laboratory (India) Private Ltd**, in association with GTMS

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 ₂ (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 10 ^o .0	60.0 10 ^o .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 Six (6) locations, adopting a continuous 24 hourly (3 shift of 8-hour) schedule for the period March-May, 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 PM₁₀, PM_{2.5}, sulphur dioxide (SO₂) and nitrogen dioxide (NO_x). The sampling locations are shown in Figure 3.16 and average concentrations of air pollutants are summarized in Tables 3.15.

Table 3.15 Ambient Air Quality (AAQ) Monitoring Locations

S. No	Location Code	Monitoring Locations	Distance (km)	Direction	Coordinates	
					Lat	Long
1	AAQ1	Core	--	--	12°25'56.08"N	77°49'57.56"E
2	AAQ2	Thottikuppam	0.90	SE	12°25'28.31"N	77°50'19.03"E
3	AAQ3	Javanachandram	2.81	SE	12°24'40.28"N	77°50'59.21"E
4	AAQ4	Bikkanapally	4.16	WNW	12°26'20.72"N	77°47'40.32"E
5	AAQ5	Giriyapalli	5.48	NW	12°27'58.50"N	77°47'44.77"E
6	AAQ6	Santhanapalli	4.96	N	12°28'37.19"N	77°49'40.32"E

Source: Sampling Results by **Greenlink Analytical and Research Laboratory (India) Private Ltd**, in association with GTMS

Results

As per the monitoring data, PM_{2.5} ranges from 13.4 $\mu\text{g}/\text{m}^3$ to 15.8 $\mu\text{g}/\text{m}^3$; PM₁₀ from 35.7 $\mu\text{g}/\text{m}^3$ to 42.2 $\mu\text{g}/\text{m}^3$; SO₂ from 2.4 $\mu\text{g}/\text{m}^3$ to 4.2 $\mu\text{g}/\text{m}^3$; NO_x from 6.7 $\mu\text{g}/\text{m}^3$ to 11.5 $\mu\text{g}/\text{m}^3$. The concentration levels of the pollutants fall within the acceptable limits of NAAQS prescribed by CPCB.

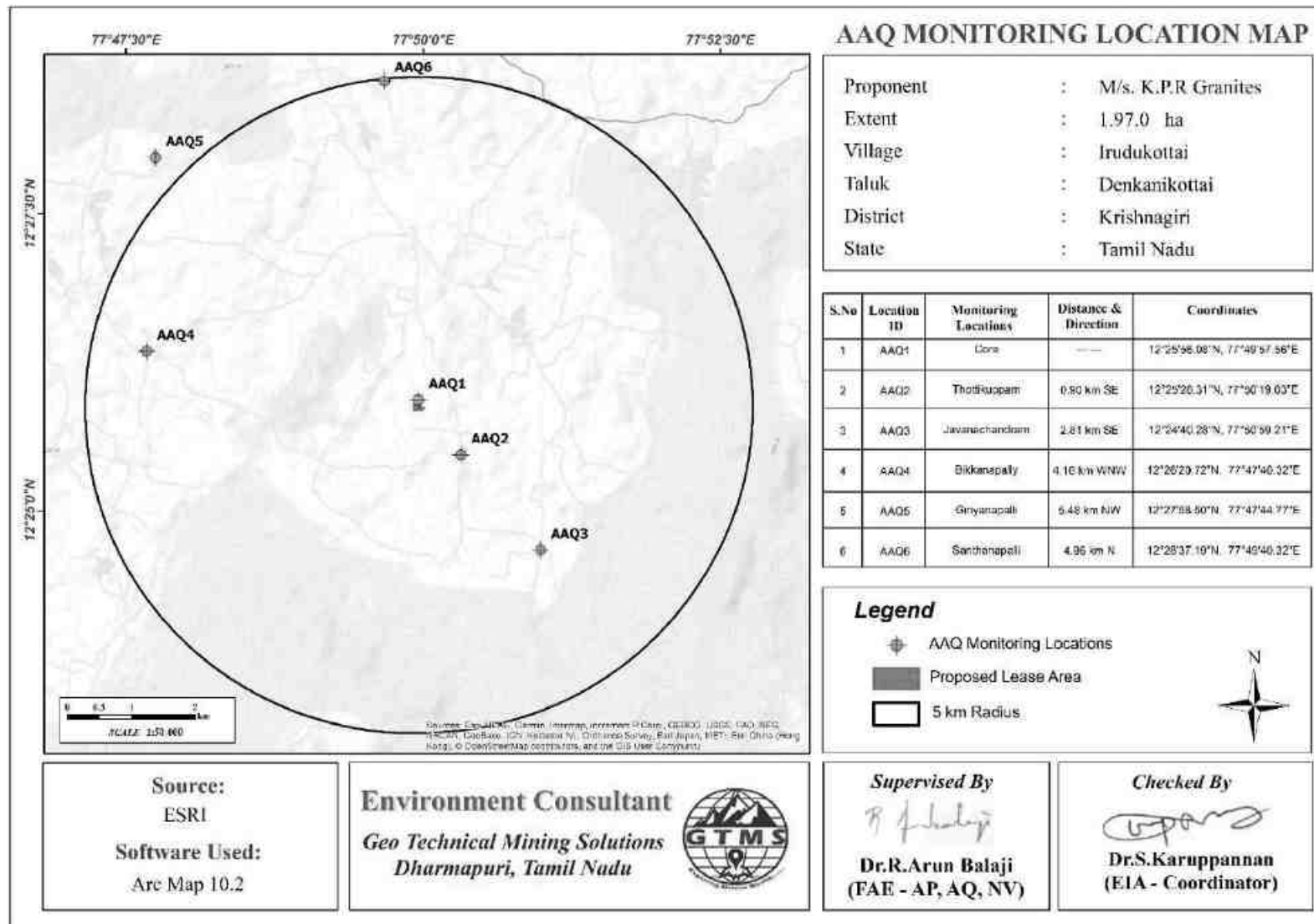


Figure 3.16 Ambient Air Quality Monitoring Station Locations around 5 km Radius from the Proposed Project Site

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	16.5	12.4	15.5	16.5	47.1	35.3	44.3	47.1
AAQ2	15.0	13.7	14.4	15.0	42.9	39.1	41.0	42.9
AAQ3	14.4	11.8	13.3	14.0	35.9	29.4	33.2	35.9
AAQ4	16.2	14.1	15.1	16.2	40.6	35.3	37.7	40.5
AAQ5	17.5	14.4	15.7	17.5	43.8	36.0	39.3	43.8
AAQ6	15.2	13.9	14.6	15.2	42.9	39.1	41.0	42.9
SO ₂					NO ₂			
AAQ1	6.1	2.6	4.1	5.9	15.3	6.5	9.5	14.7
AAQ2	3.5	2.4	3.1	3.5	8.8	6.0	7.1	8.8
AAQ3	3.7	2.2	2.8	3.6	11.8	7.0	8.2	11.5
AAQ4	3.9	2.2	3.2	3.9	10.9	6.2	8.1	10.9
AAQ5	3.5	2.1	2.7	3.4	10.9	6.5	7.6	10.6
AAQ6	4.5	3.1	3.7	4.4	11.3	7.8	8.5	11.0

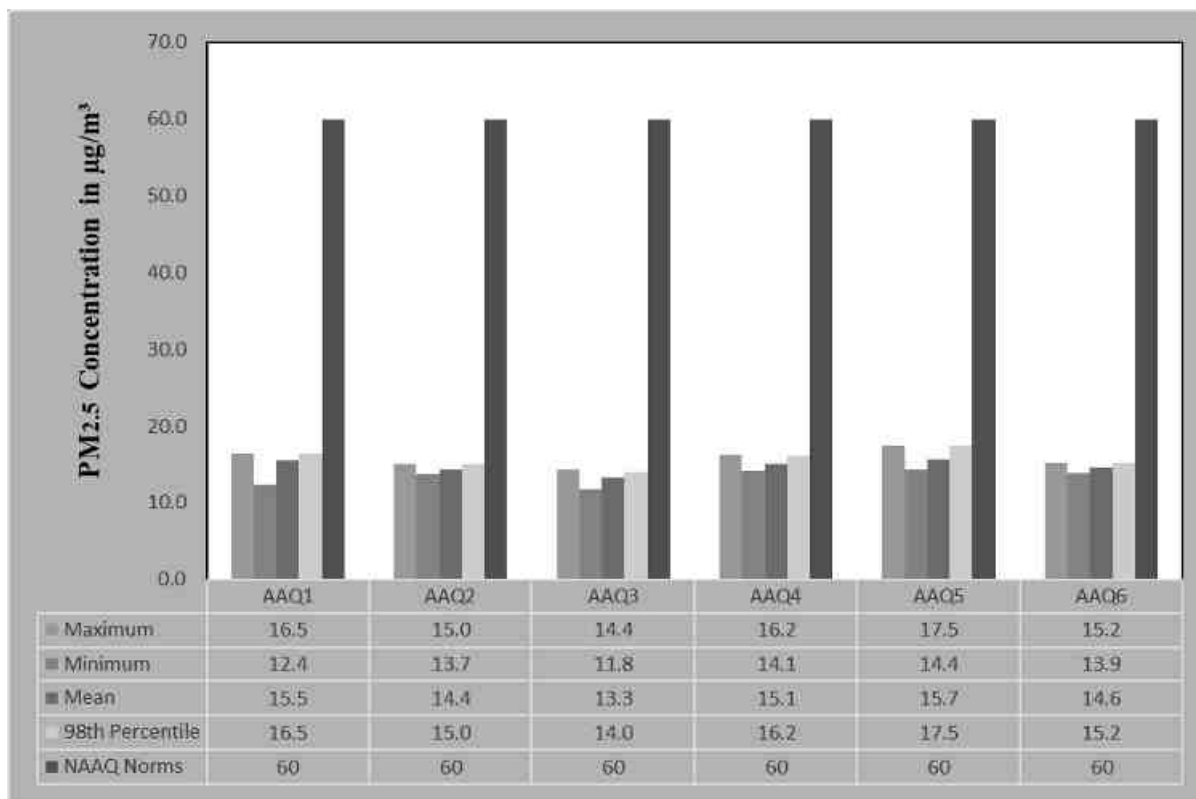


Figure 3.17 Bar Chart Showing Maximum, Minimum, and Average Concentrations of PM_{2.5} Measured from 6 Air Quality Monitoring Stations within 5 km Radius

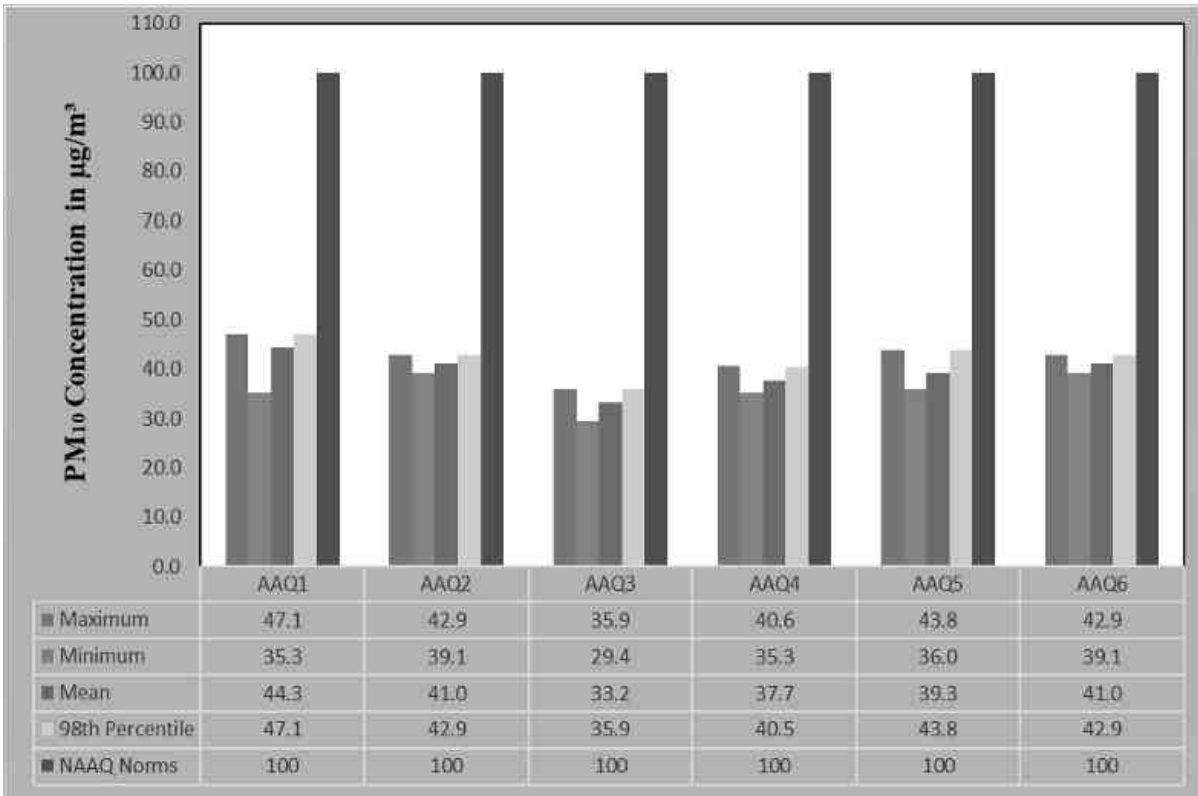


Figure 3.18 Bar Chart Showing Maximum, Minimum, and Average Concentrations of PM₁₀ Measured from 6 Air Quality Monitoring Stations within 5 km Radius

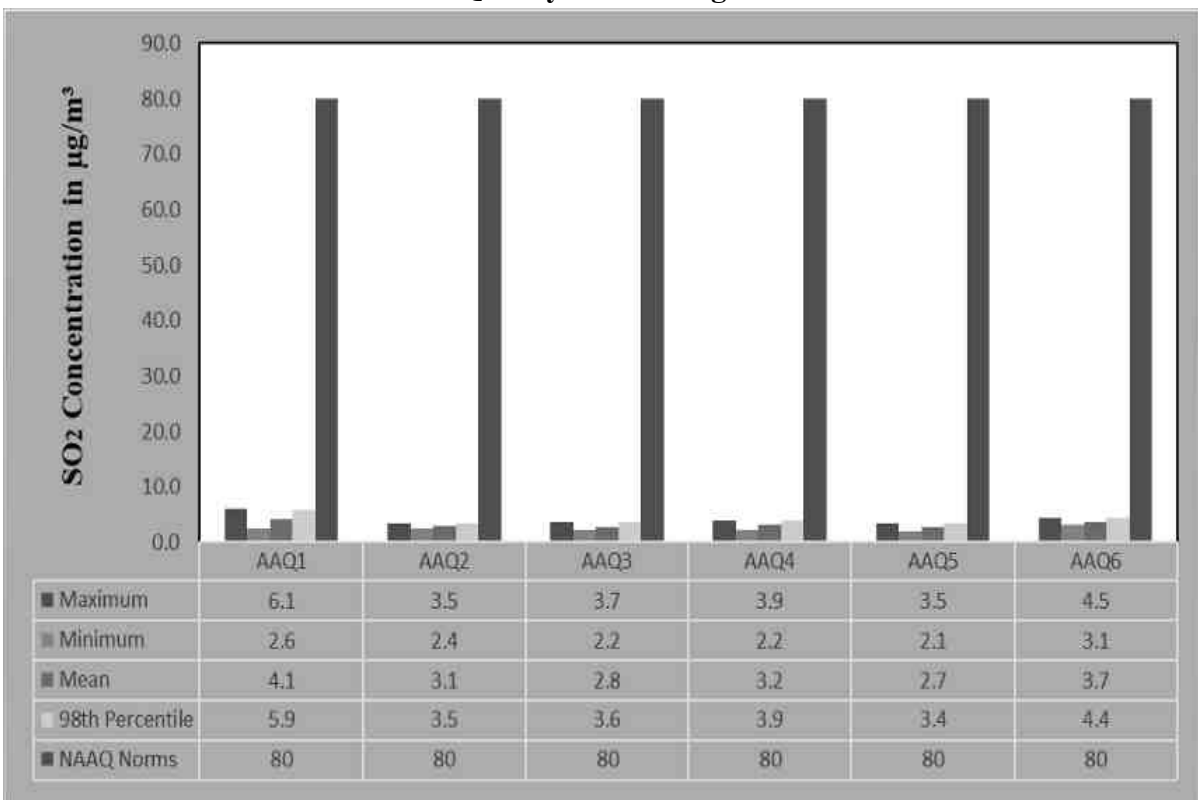


Figure 3.19 Bar Chart Showing Maximum, Minimum, and Average Concentrations of SO₂ Measured from 6 Air Quality Monitoring Stations within 5 km Radius

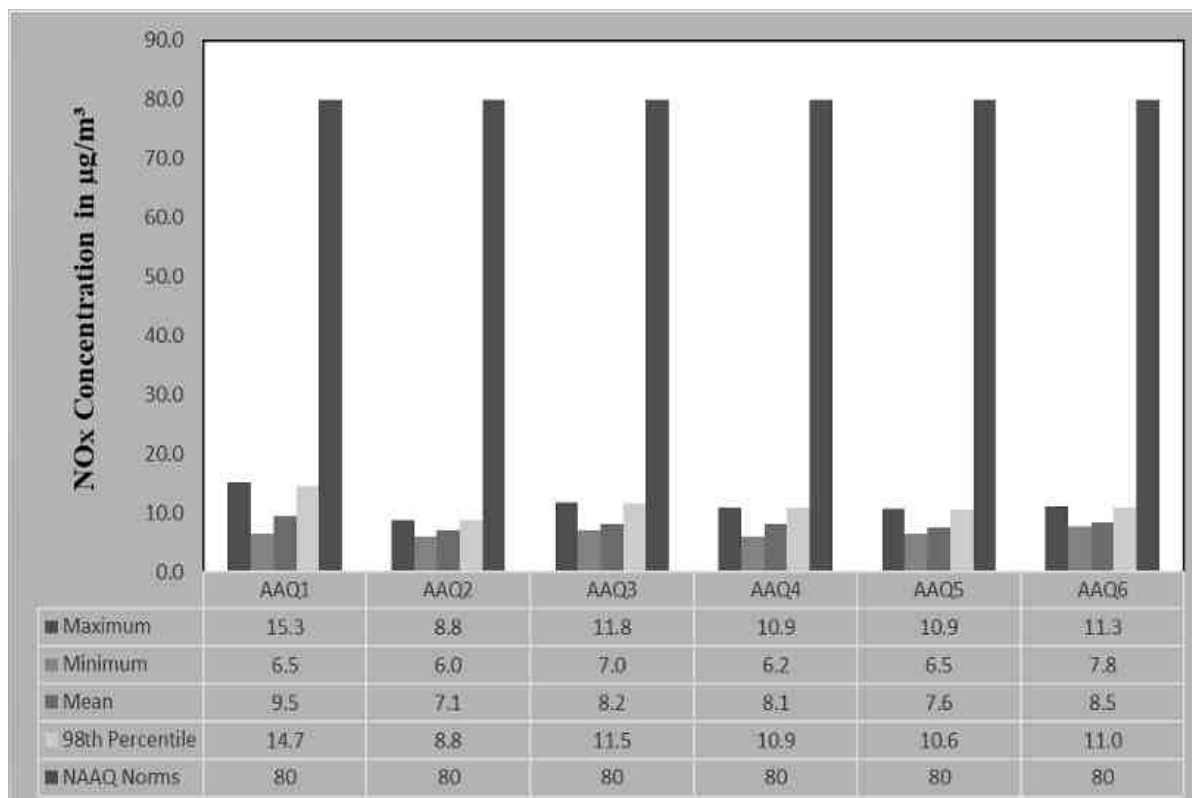


Figure 3. 20 Bar Chart Showing Maximum, Minimum, And Average Concentrations of NO_x Measured from 6 Air Quality Monitoring Stations within 5 km Radius

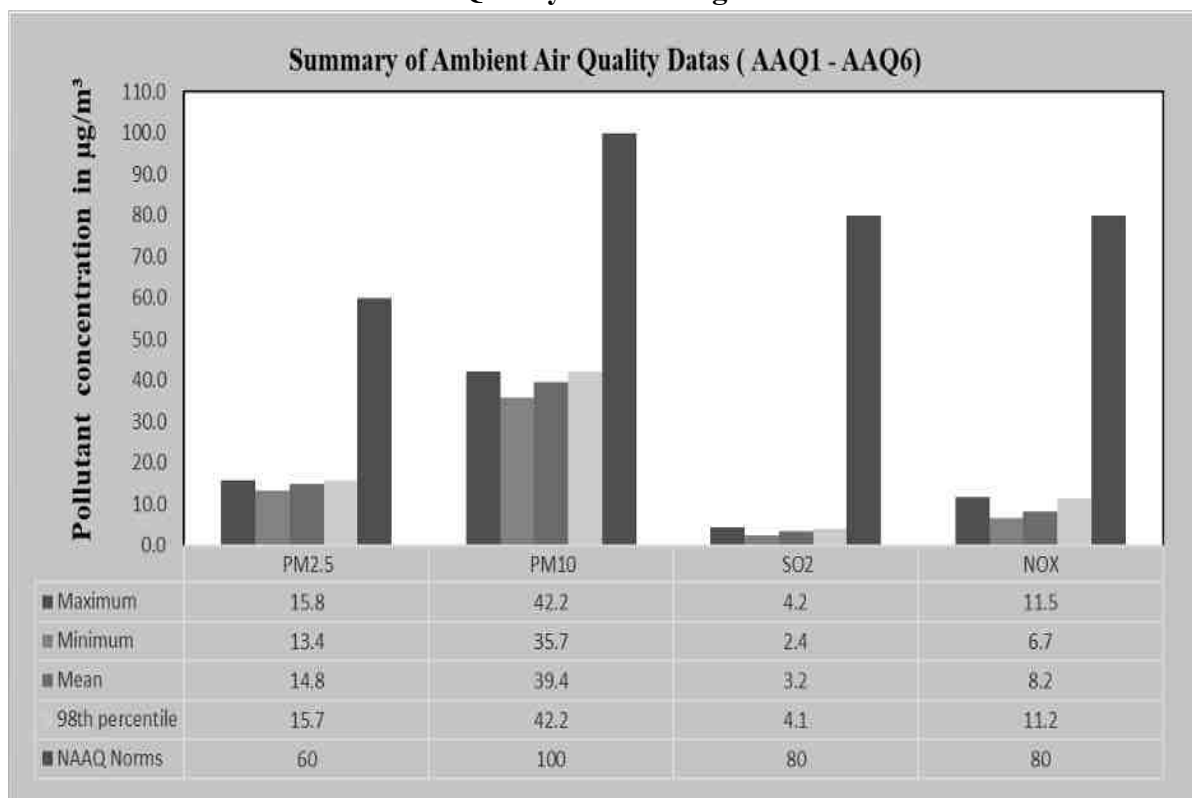


Figure 3.21 Bar Chart Showing Maximum, Minimum, and Average Concentrations of Pollutants in the Atmosphere within 5 km Radius

3.4 NOISE ENVIRONMENT

The vehicular movement on road and mining activities is the major sources of noise in the study area. The main objective of noise monitoring in the study area is to establish the baseline noise level, which will in turn be used to assess the impact of the total noise expected to be generated during the project operations around the project site. In order to assess the ambient noise levels within the study area, noise monitoring was carried out at six (6) 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 3.24.

Table 3.17 Noise Monitoring Locations

S. No	Location Code	Monitoring Locations	Distance in km	Direction	Coordinates	
					Lat	Long
1	N1	Core	--	--	12°25'55.12"N	77°49'58.55"E
2	N2	Thottikuppam	0.89	SE	12°25'30.18"N	77°50'20.67"E
3	N3	Javanachandram	2.79	SE	12°24'40.65"N	77°50'58.35"E
4	N4	Bikkanapally	4.11	WNW	12°26'19.60"N	77°47'41.83"E
5	N5	Giriyapalli	5.40	NW	12°27'55.53"N	77°47'45.33"E
6	N6	Santhanapalli	4.96	N	12°28'36.79"N	77°49'38.36"E

Source: Sampling Results by Greenlink Analytical and Research Laboratory (India) Private Ltd, in association with GTMS

Table 3.18 Ambient Noise Quality Result

Station ID	Location	Environmental setting	Average day noise level(dB(A))	Average night noise level (dB(A))	Day time (6.00 AM – 10.00 PM)	Night time (10.00 PM – 6.00 AM)
					Standard (Leqin dB(A))	
N1	Core	Industrial area	49.7	36.4	75	70
N2	Thottikuppam	Residential area	45.1	37.5	55	45
N3	Javanachandram		42.5	38.6	55	45
N4	Bikkanapally		39.0	37.2	55	45
N5	Giriyapalli		41.6	39.4	55	45
N6	Santhanapalli		40.2	38.2	55	45

Source: Sampling Results by Greenlink Analytical and Research Laboratory (India) Private Ltd, in association with GTMS

The Table 3.18 shows that noise level in core zone was 49.7dB (A) Leq during day time and 36.4dB (A) Leq during night time. Noise levels recorded in buffer zone during day time varied from 39.0 to 45.1 dB (A) Leq and during night time from 37.5 to 39.4 dB (A) Leq. Thus, the noise level for industrial and residential area meets the requirements of CPCB. The results are also depicted below in Figures 3.22 and 3.23.

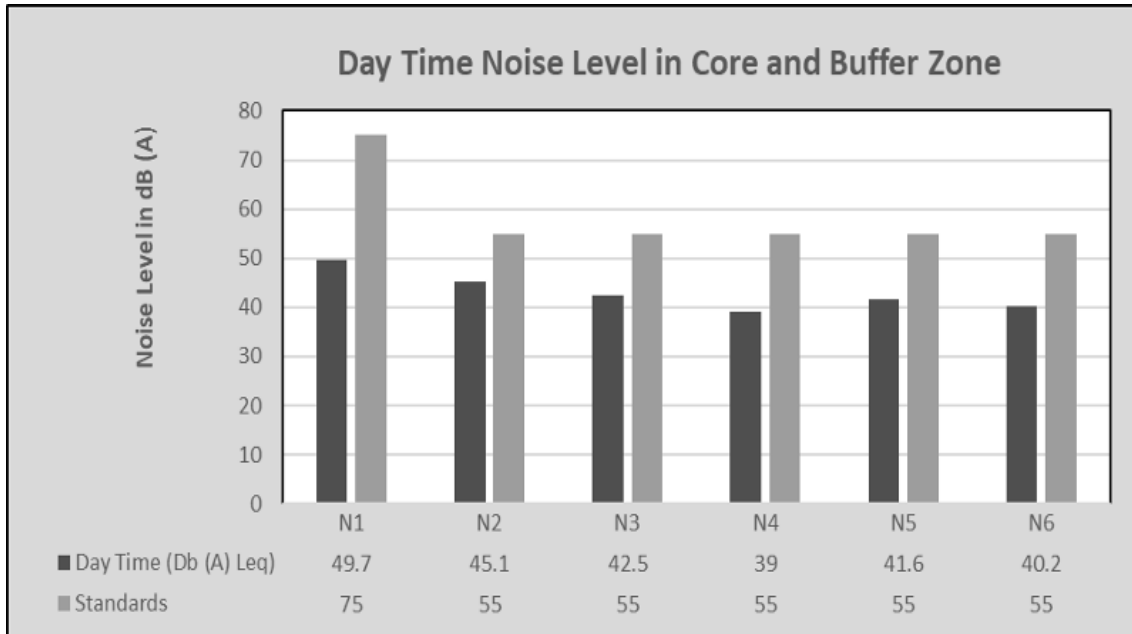


Figure 3.22 Bar Chart Showing Day Time Noise Levels Measured in Core and Buffer Zones

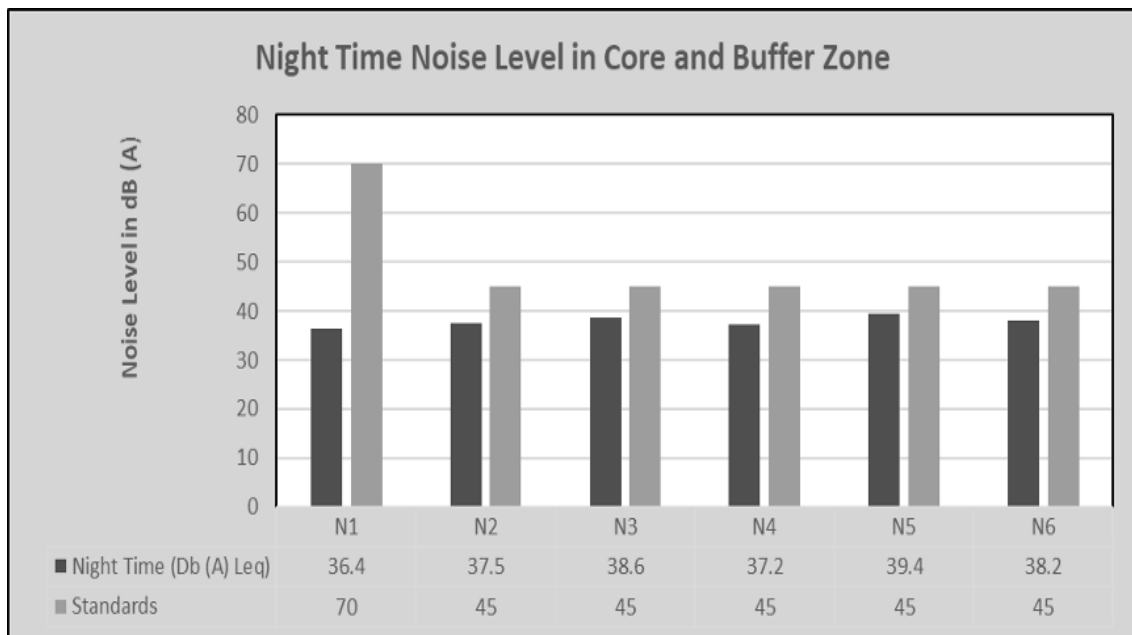


Figure 3.23 Bar Chart Showing Night Time Noise Levels Measured in Core and Buffer Zones

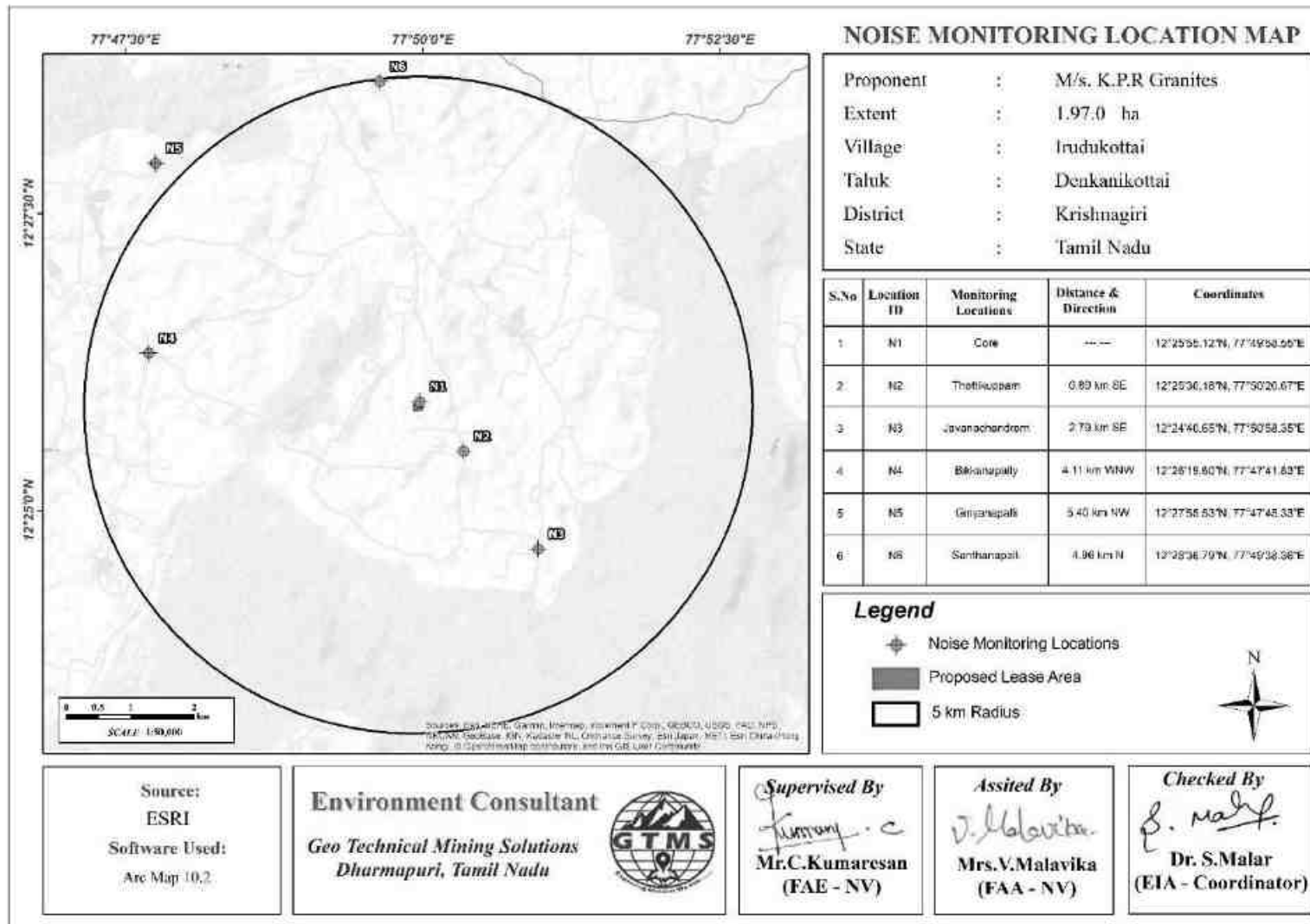


Figure 3.24 Noise Level Monitoring Station Locations around 5 km Radius from the Proposed Project Site

3.5 BIOLOGICAL ENVIRONMENT

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

Methodology

Sampling locations were selected with reference to topography, land use, vegetation pattern, etc. In this study, quadrats of 25 m × 25 m were laid down to assess trees and quadrats of 10 m × 10 m were laid down for shrubs, as shown in Figure 3.25.



Figure 3.25 Quadrates Sampling Methods of Flora

Phyto-Sociological Studies

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

Table 3.19 Calculation of Density, Frequency (%), Dominance, Relative Density, Relative Frequency, Relative Dominance & Important Value Index

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

Shannon – Wiener Index, Evenness and Richness

Biodiversity index is a quantitative measure that reflects how many different types of species, there are in a dataset, and simultaneously takes into account how evenly the basic entities (such as individuals) are distributed among those types of species. The value of biodiversity index increases both when the number of types increases and when evenness increases. For a given number of type of species, the value of a biodiversity index is maximized when all type of species is equally abundant. The corresponding formulas are given in Table 3.20.

Table 3.20 Calculation of Species Diversity by Shannon – Wiener Index, Evenness and Richness

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

3.5.1 Flora

Flora study was conducted using the above said methodology to inventory the existing terrestrial plants in both core and buffer zones. Details of plants have been described in the succeeding sections. Photographs showing various species are provided in Figure 3.26.

Flora in mine lease area (core zone)

The mine lease area contains total of 17 species belonging to 12 families have been recorded from the mine lease area. 2 trees 6 shrubs, 9 herbs were identified. It is a grassy land. There are no endangered species in mine lease area. Details of vegetation with scientific name indicated in Table 3.21.

Table 3.21 Flora in mine lease area

S.no	Local name	Scientific name	Family name	No of plants
Tree				
1	Wetpalai maram	<i>Wrightia tinctoria</i>	Fabaceae	2
2	Unjai maram	<i>Albizia amara</i>	Apocynaceae	3
Shrubs				
1	Avaram chadi	<i>Senna auriculata</i>	Fabaceae	4
2	Earuku	<i>Calotropis gigantea</i>	Apocynaceae	6
3	communist pacha	<i>Chromolaena odorata</i>	Asteraceae	12
4	Unnichadi	<i>Lantana camara</i>	Verbenaceae	8
5	Thuthi	<i>Abutilon indicum</i>	Meliaceae	7
6	Sithapalam	<i>Annona squamosa</i>	Annonaceae	1
Herbs /Climber				
1	Perandai	<i>Cissus quadrangularis</i>	Vitaceae	2
2	Thathapondu	<i>Tridax procumbens</i>	Asteraceae	12
3	Kolunji chadi	<i>Tephrosia purpurea</i>	Fabaceae	11
4	Nayuruvi	<i>Achyranthes aspera</i>	Amaranthaceae	7
5	Nearunji mull	<i>Tribulus zeyheri</i> Sond	Zygophyllaceae	10
6	Pill	<i>Cenchrus ciliaris</i>	Poaceae	12
7	Pulapoo	<i>Aerva lanata</i>	Amaranthaceae	5
8	American mint	<i>Hyptis suaveolens</i>	Lamiaceae	9
9	Tumbai	<i>Leucas aspera</i>	Lamiaceae	14

Flora within 300 m radius buffer zone

The mine lease area is containing a total of 38 species belonging to 26 families have been recorded from the buffer zone. 10 Trees, 7 Shrubs and 21 Herbs and Climbers were identified. Details of flora with the scientific name details and of diversity species Richness index were mentioned in Table 3.22-3.24 and Figure 3.26. There is no threat to the Flora species in 300 m radius.

Flora within 10 km radius buffer zone

Similar type of environment also in buffer area but with more flora diversity compare than core zone area. It contains a total of species belonging to 39 families have been recorded from the buffer zone. The floral (80) varieties among them 31 Trees, 11 Shrubs, Herbs and Climbers, Creeper, Grass & Cactus, 38 were identified. Details of flora with the scientific name details of diversity species rich ness index were mentioned in Table 3.25-3.38.

Table 3.22 Flora in 300-meter radius

S. No	Local Name	Scientific name	Family name	Total No. of species	Total of Quadrants with species	Total No. of Quadrants	Density	Frequency (%)	Abundance	Relative Density	Relative Frequency	IVI	IUCN Conservation Status
Tree													
1	Velikathan maram	<i>Prosopis juliflora</i>	Fabaceae	3	2	5	0.6	40.0	1.5	7.5	6.7	14.2	Not Listed
2	Pongam oiltree	<i>Pongamia pin nata</i>	Fabaceae	4	3	5	0.8	60.0	1.3	10.0	10.0	20.0	Not Listed
3	Panai maram	<i>Borassus flabellifer</i>	Arecaceae	5	4	5	1.0	80.0	1.3	12.5	13.3	25.8	Not Listed
4	Nochi	<i>Vitex negundo</i>	Lamiaceae	3	2	5	0.6	40.0	1.5	7.5	6.7	14.2	Not Listed
5	Nuna maram	<i>Morinda citrifolia</i>	Rubiaceae	4	3	5	0.8	60.0	1.3	10.0	10.0	20.0	Not Listed
6	Vembu	<i>Azadirachta indica</i>	Meliaceae	5	4	5	1.0	80.0	1.3	12.5	13.3	25.8	Not Listed
7	Manga maram	<i>Mangifera indica</i>	Anacardiaceae	4	3	5	0.8	60.0	1.3	10.0	10.0	20.0	Not Listed
8	Thennai maram	<i>Cocos nucifera</i>	Arecaceae	3	2	5	0.6	40.0	1.5	7.5	6.7	14.2	Not Listed
9	Wetpalai maram	<i>Wrightia tinctoria</i>	Apocynaceae	4	3	5	0.8	60.0	1.3	10.0	10.0	20.0	Not Listed
10	Unjai maram	<i>Albizia amara</i>	Fabaceae	5	4	5	1.0	80.0	1.3	12.5	13.3	25.8	Not Listed
Shrubs													
1	Unichedi	<i>Lantana camara</i>	Verbenaceae	7	6	10	0.7	60.0	1.2	12.7	12.5	25.2	Not Listed
2	Sundaika	<i>Solanum torvum</i>	Solanaceae	9	8	10	0.9	80.0	1.1	16.4	16.7	33.0	Not Listed
3	Erukku	<i>Calotropis gigantea</i>	apocynaceae	8	7	10	0.8	70.0	1.1	14.5	14.6	29.1	Not Listed
4	Avarai	<i>Senna auriculata</i>	Fabaceae	10	9	10	1.0	90.0	1.1	18.2	18.8	36.9	Not Listed
5	Sappathikalli	<i>Cereus pterogonus</i>	Cactus	6	5	10	0.6	50.0	1.2	10.9	10.4	21.3	Not Listed
6	Kattamanaku	<i>Jatropha gossypifolia L</i>	Euphorbiaceae	7	6	10	0.7	60.0	1.2	12.7	12.5	25.2	Not Listed
7	Karunochi	<i>Vitex negundo</i>	Lamiaceae	8	7	10	0.8	70.0	1.1	14.5	14.6	29.1	Not Listed
Herbs, Climbers & Grass													

1	Thumbai	<i>Leucas aspera</i>	Lamiaceae	9	8	15	0.6	53.3	1.1	5.6	5.7	11.2	Not Listed
2	Kantang kathrikai	<i>Solanum virginianum</i>	Solanaceae	7	6	15	0.5	40.0	1.2	4.3	4.3	8.6	Not Listed
3	Arugampul	<i>Cynodon dactylon</i>	Poaceae	11	10	15	0.7	66.7	1.1	6.8	7.1	13.9	Not Listed
4	Poolai poondu	<i>Aerva lanata</i>	Amaranthaceae	8	7	15	0.5	46.7	1.1	4.9	5.0	9.9	Not Listed
5	Korai	<i>Cyperus rotundus</i>	Cyperaceae	6	5	15	0.4	33.3	1.2	3.7	3.5	7.2	Not Listed
6	Nerunji	<i>Tribulus terrestris</i>	Zygophyllales	7	6	15	0.5	40.0	1.2	4.3	4.3	8.6	Not Listed
7	Nayuruvi	<i>Achyranthes aspera</i>	Amaranthaceae	8	7	15	0.5	46.7	1.1	4.9	5.0	9.9	Not Listed
8	Thottalchinungi	<i>Mimosa pudica</i>	Mimosaceae	9	8	15	0.6	53.3	1.1	5.6	5.7	11.2	Not Listed
9	Anachundaikai	<i>Solanum violaceum</i> <i>Ortega</i>	Solanaceae	6	5	15	0.4	33.3	1.2	3.7	3.5	7.2	Not Listed
10	Kombumul	<i>Acanthospermum</i> <i>hispidum</i>	Asteraceae	7	6	15	0.5	40.0	1.2	4.3	4.3	8.6	Not Listed
11	Ponnangani	<i>Alternanthera pungens</i>	Amaranthaceae	8	7	15	0.5	46.7	1.1	4.9	5.0	9.9	Not Listed
12	wild thulasi	<i>Hyptis suaveolens (L.)</i>	Lamiaceae	10	9	15	0.7	60.0	1.1	6.2	6.4	12.6	Not Listed
13	Gopuram Tangi	<i>Andrographis echiioides</i>	Acanthaceae	7	6	15	0.5	40.0	1.2	4.3	4.3	8.6	Not Listed
14	Amman Paccharisi	<i>Euphorbia hirta</i>	Euphorbiaceae	8	7	15	0.5	46.7	1.1	4.9	5.0	9.9	Not Listed
15	Paca poondu	<i>Pavonia gallaensis</i>	Malvaceae	6	5	15	0.4	33.3	1.2	3.7	3.5	7.2	Not Listed
16	Perandai	<i>Cissus quadrangularis</i>	Vitaceae	9	8	15	0.6	53.3	1.1	5.6	5.7	11.2	Not Listed
17	Vishnukrandai	<i>Evolvulus alsinoides</i>	Convolvulaceae	7	6	15	0.5	40.0	1.2	4.3	4.3	8.6	Not Listed
18	Musumusukkai	<i>Mukia maderaspatana</i>	Cucurbitaceae	8	7	15	0.5	46.7	1.1	4.9	5.0	9.9	Not Listed
19	Sirupunaikkali	<i>Passiflora foetida</i>	Passifloraceae	6	5	15	0.4	33.3	1.2	3.7	3.5	7.2	Not Listed
20	Nagathali	<i>Opuntia dillenii</i>	Cactaceae	7	6	15	0.5	40.0	1.2	4.3	4.3	8.6	Not Listed
21	Agave	<i>Agave sisalana</i>	Asparagaceae	8	7	15	0.5	46.7	1.1	4.9	5.0	9.9	Not Listed

Table 3.23 Calculation of Species Diversity in 300 m Radius

S. No	Common name	Scientific name	No. of Species	Pi	In (Pi)	Pi x in (Pi)
Tree						
1	Velikathan maram	<i>Prosopis juliflora</i>	3	0.08	-2.59	-0.19
2	Pongam oiltree	<i>Pongamia pin nata</i>	4	0.10	-2.30	-0.23
3	Panai maram	<i>Borassus flabellifer</i>	5	0.13	-2.08	-0.26
4	Nochi	<i>Vitex negundo</i>	3	0.08	-2.59	-0.19
5	Nuna maram	<i>Morinda citrifolia</i>	4	0.10	-2.30	-0.23
6	Vembu	<i>Azadirachta indica</i>	5	0.13	-2.08	-0.26
7	Manga maram	<i>Mangifera indica</i>	4	0.10	-2.30	-0.23
8	Thennai maram	<i>Cocos nucifera</i>	3	0.08	-2.59	-0.19
9	Wetpalai maram	<i>Wrightia tinctoria</i>	4	0.10	-2.30	-0.23
10	Unjai maram	<i>Albizia amara</i>	5	0.13	-2.08	-0.26
H (Shannon Diversity Index) =2.28						
Shrubs						
1	Unichedi	<i>Lantana camara</i>	7	0.13	-2.06	-0.26
2	Sundaika	<i>Solanum torvum</i>	9	0.16	-1.81	-0.30
3	Erukku	<i>Calotropis gigantea</i>	8	0.15	-1.93	-0.28
4	Avarai	<i>Senna auriculata</i>	10	0.18	-1.70	-0.31
5	Sappathikalli	<i>Cereus pterogonus</i>	6	0.11	-2.22	-0.24
6	Kattamanaku	<i>Jatropha gossypifolia L</i>	7	0.13	-2.06	-0.26
7	Karunochi	<i>Vitex negundo</i>	8	0.15	-1.93	-0.28
H (Shannon Diversity Index) =1.93						
HERBS						
1	Thumbai	<i>Leucas aspera</i>	9	0.06	-2.89	-0.16
2	Kantang kathrikai	<i>Solanum virginianum</i>	7	0.04	-3.14	-0.14
3	Arugampul	<i>Cynodon dactylon</i>	11	0.07	-2.69	-0.18
4	Poolai poondu	<i>Aerva lanata</i>	8	0.05	-3.01	-0.15
5	Korai	<i>Cyperus rotundus</i>	6	0.04	-3.30	-0.12
6	Nerunji	<i>Tribulus terrestris</i>	7	0.04	-3.14	-0.14
7	Nayuruvi	<i>Achyranthes aspera</i>	8	0.05	-3.01	-0.15
8	Thottalchinungi	<i>Mimosa pudica</i>	9	0.06	-2.89	-0.16
9	Anachundaikai	<i>Solanum violaceum</i> <i>Ortega</i>	6	0.04	-3.30	-0.12
10	Kombumul	<i>Acanthospermum hispidum</i>	7	0.04	-3.14	-0.14
11	Ponnangani	<i>Alternanthera pungens</i>	8	0.05	-3.01	-0.15
12	wild thulasi	<i>Hyptis suaveolens (L.)</i>	10	0.06	-2.79	-0.17
13	Gopuram Tangi	<i>Andrographis echiodides</i>	7	0.04	-3.14	-0.14
14	Amman Paccharisi	<i>Euphorbia hirta</i>	8	0.05	-3.01	-0.15
15	Paca poondu	<i>Pavonia gallaensis</i>	6	0.04	-3.30	-0.12

16	Perandai	<i>Cissus quadrangularis</i>	9	0.06	-2.89	-0.16
17	Vishnukrandai	<i>Evolvulus alsinoides</i>	7	0.04	-3.14	-0.14
18	Musumusukkai	<i>Mukia maderaspatana</i>	8	0.05	-3.01	-0.15
19	Sirupunaikkali	<i>Passiflora foetida</i>	6	0.04	-3.30	-0.12
20	Nagathali	<i>Opuntia dillenii</i>	7	0.04	-3.14	-0.14
21	Agave	<i>Agave sisalana</i>	8	0.05	-3.01	-0.15
H (Shannon Diversity Index) =3.03						

Table 3.24 Species Richness (Index) in 300 m Radius

Details	H	H max	Evenness	Species Richness
Tree	2.28	2.30	0.99	2.44
Shrubs	1.93	1.95	0.99	1.50
Herbs	3.03	3.04	1.00	3.93

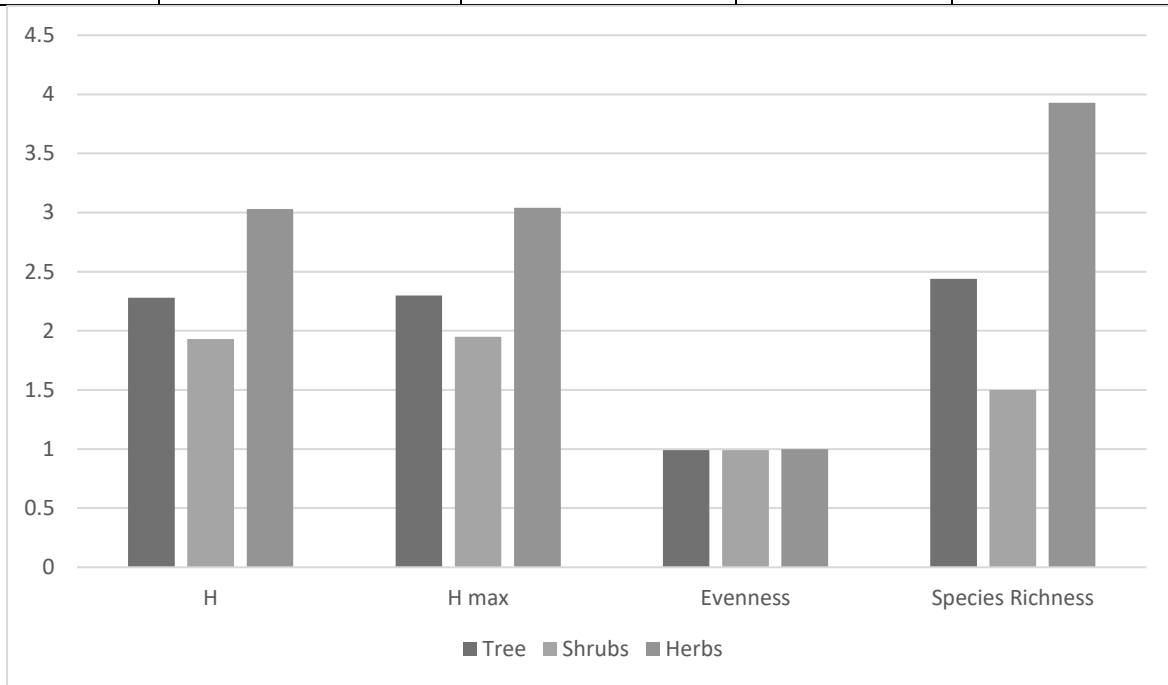


Figure 3.26 Species Richness (Index) in 300 m Radius

Table 3.25 Flora in Buffer Zone

S. No	Local Name	Scientific name	Family name
Tree			
1	Vembu	<i>Azadirachta indica</i>	Meliaceae
2	Pongam oiltree	<i>Pongamia pinnata</i>	Fabaceae
3	Karuvelam	<i>Acacia nilotica</i>	Mimosaceae
4	Thennai maram	<i>Cocos nucifera</i>	Arecaceae
5	Arasanmaram	<i>Ficus religiosa</i>	Moraceae
6	Puliyamaram	<i>Tamarindus indica</i>	Legumes
7	Punnai	<i>Calophyllum inophyllum</i>	Calophyllaceae
8	Athi	<i>Ficus recemosa</i>	Moraceae
9	Vazhaimaram	<i>Musa</i>	Musaceae
10	Kadukka puli	<i>Terminalia chebula</i>	Combretaceae

11	Nettilinkam	<i>Polylathia longifolia</i>	Annonaceae
12	Perumungil	<i>Bambusa bambos</i>	Poaceae
13	Sapota	<i>Manilkara zapota</i>	Sapotaceae
14	Eucalyptus	<i>Eucalyptus globules</i>	Myrtaceae
15	Navalmaram	<i>Sygygium cumini</i>	Myrtaceae
16	Ezhumuchai maram	<i>Citrus lemon</i>	Rutaceae
17	Alamaram	<i>Ficus benghalensis</i>	Moraceae
18	Panai maram	<i>Borassus flabellifer</i>	Arecaceae
19	Manga	<i>Mangifera indica</i>	Anacardiaceae
20	Thekku	<i>Tectona grandis</i>	Verbenaceae
21	Nelli	<i>Emblica officinalis</i>	Phyllanthaceae
22	Nettilinkam	<i>Polylathia longifolia</i>	Annonaceae
23	Vellai Karuvelam	<i>Vachellia nilotica</i>	Fabaceae
24	Palamaram	<i>Artocarpus heterophyllus</i>	Moraceae
25	Vadanarayani	<i>Delonix elata</i>	Fabaceae
26	Marudaani	<i>Lawsonia inermis</i>	Lythraceae
27	Pappali maram	<i>Carica papaya L</i>	Caricaceae
28	Nuna maram	<i>Morinda citrifolia</i>	Rubiaceae
29	Koyya	<i>Psidium guajava</i>	Myrtaceae
30	Seethapazham	<i>Annona reticulata</i>	Annonaceae
31	Moonghil	<i>Bambusa bambo</i>	Poaceae
Shrubs			
1	Avarai	<i>Senna auriculata</i>	Fabaceae
2	Sundaika	<i>Solanum torvum</i>	Solanaceae
3	Arali	<i>Nerium indicum</i>	Apocynaceae
4	Idlipoo	<i>xoracoc cineia</i>	Rubiaceae
5	Neermulli	<i>Hydrophila auriculata</i>	Acanthaceae
6	Icham	<i>Phoenix pusilla</i>	Arecaceae
7	Chaturakalli	<i>Euphorbia antiquorum</i>	Euphorbiaceae
8	Kattamanakku	<i>Jatropha curcas</i>	Euphorbiaceae
9	Thuthi	<i>Abutilon indicum</i>	Meliaceae
10	Chemparuthi	<i>Hibiscu rosa-sinensis</i>	Malvaceae
11	Erukku	<i>Calotropis gigantea</i>	Apocynaceae
Herbs, Climber, Creeper, Grass & Cactus			
1	Thumbai	<i>Leucas aspera</i>	Lamiaceae
2	Parttiniyam	<i>Parthenium</i>	Asteraceae
3	Thoiya keerai	<i>Digeria muricata</i>	Amarantheceae
4	Pulliyari	<i>Oxalis corniculata</i>	Oxalidaceae
5	Mukuratthai	<i>Boerhavia diffusa</i>	Nyctaginaceae
6	Thulasi	<i>Ocimum tenuiflorum</i>	Lamiaceae
7	Arugampul	<i>Cynodon dactylon</i>	Poaceae
8	Manjal	<i>Curcuma longa</i>	Zingiberaceae
9	Manathakkali	<i>Solanumnigrum</i>	Solanaceae
10	Nai kadugu	<i>Celome viscosa</i>	Capparidaceae
11	Koraikkilangu	<i>Cyperus articulates</i>	Cyperaceae
12	Karisilanganni	<i>Eclipta prostata</i>	Asteraceae
13	Korai	<i>Cyperus rotundus</i>	Cyperaceae
14	Kunnakora	<i>Cyperus compressus</i>	Cyperaceae

15	Mukurattai	<i>Boerhavia diffusa</i>	Nyctaginaceae
16	Kovai	<i>Coccinia grandis</i>	Cucurbitaceae
17	Perandai	<i>Cissus quadrangularis</i>	Vitaceae
18	Mudakkotan	<i>Cardiospermum helicacabum</i>	Sapindaceae
19	Sangupoo	<i>Clitoriaternatia</i>	Fabaceae
20	Malli	<i>Jasminum augustifolium</i>	Oleaceae
21	Vallikeerai	<i>Ipomoea aquatica</i>	Convolvulaceae
22	Siru puladi	<i>Desmodium triflorum</i>	Fabaceae
23	Sithrapaalavi	<i>Euphorbia prostrata</i>	Euphorbiaceae
24	mookuthi poondu	<i>Wedelia trilobata</i>	Asteraceae
25	Pullu	<i>Eragrostis ferruginea</i>	Poaceae
26	Chevvarakupul	<i>Chloris barbata</i>	Amaranthaceae
27	Nagathali	<i>Opuntia dillenii</i>	Nagathali
28	Nayuruvi	<i>Achyranthes aspera</i>	Amaranthaceae
29	Veetukaayapoondu	<i>Tridax procumbens</i>	Asteraceae
30	Kaattu piral	<i>Hibiscus hispidissimus</i>	Malvaceae
31	Kuppaimeni	<i>Acalypha indica</i>	Euphorbiaceae
32	Karisilanganni	<i>Eclipta prostrata</i>	Asteraceae
33	Korai	<i>Cyperus rotundus</i>	Cyperaceae
34	Kumattikkirai	<i>Allmania nodiflora</i>	Amaranthaceae
35	Kunnakora	<i>Cyperus compressus</i>	Cyperaceae
36	Keelaneeli	<i>Phyllanthus niruri</i>	Phyllanthaceae
37	Kanamvazhalai	<i>Commelina benghalensis</i>	Commelinaceae
38	Thottalchinungi	<i>Mimosa pudica</i>	Mimosaceae

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	IUCN Red List Status
1	<i>Eichornia crassipes</i>	Water hyacinth	NA
2	<i>Aponogeton natans</i>	Floating lace plant	NA
3	<i>Carex cruciata</i>	Cross Grass	NA
4	<i>Cynodon dactylon</i>	Scutch grass	LC
Aquatic fauna			
5	<i>Oreochromis mossambicus</i>	Jalebi	VU
6	<i>Labeo catla</i>	Catla catla	LC
7	<i>Channa striata</i>	Korava meen	LC

*LC- Least Concern, NA-Not yet assessed

The food chain in aquatic ecosystems often begins with the algae or phytoplankton producers, and then the zooplankton that feed on them. Table 3.29 lists the aquatic plants and

animals commonly found in rivers, ponds and lakes within a radius of 5 km from the quarry. Phytoplankton, zooplankton, fish and Artiola form this food chain.

Eg: Phytoplankton→zooplankton→small fish→large fish

Forest details

There are no or Biosphere Reserves or Wildlife Sanctuaries or National Parks or Bird Areas (IBAs) and faunal migration routes within 10 km radius. The area under study (mining lease area and 10 km buffer zone) is not ecologically sensitive. There is no reserve forest in 1km radius and reserve forest details mention in Table 3.40

Endangered and endemic species as per the IUCN Red List

There are no rare, endangered and endemic species found in the study area. There are no biosphere reserves or wildlife sanctuaries or National parks or Important Bird Areas (IBAs), ecologically sensitive zone in 10km radius.

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.

Fauna Methodology

Table 3.27 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 Core Zone

A total of 26 varieties of species observed in the Core zone of Irudukottai Village, among them numbers of Insects 10, Reptiles 3, Mammals 4 and Avian 9. A total of 26 species belonging to 18 families have been recorded from the core Zone. There is no schedule I and II species. A total of 10 species of bird were sighted in the study area. Details of fauna in core zone with the scientific name were mentioned in Table. 3.28.

Fauna in Buffer Zone

Taxonomically a total of 82 species belonging to 49 families have been recorded from the buffer zone area. Based on habitat classification the majority of species were Birds 50,

followed by insects 13, reptiles 11, mammals 5 and amphibians 3. A total of 50 species of bird were sighted in the buffer zone. There are no critically endangered, endangered, vulnerable and endemic species were observed. Details of fauna in buffer zone with the scientific name were mentioned in Table. 3.31. data collation in secondary data.

Table 3.28 Fauna in Core Zone

S.no	Common Name/English Name	Scientific Name	Family name	IUCN Red List data
Insects				
1	Chocolate pansy	<i>Junonia iphita</i>	Nymphalidae	NA
2	Lime swallowtail	<i>Papilio demoleus</i>	Papilionidae	NA
3	Common Mormon	<i>Papilio polytes</i>	Papilionidae	NA
4	Crimson dropwing	<i>Trithemis aurora</i>	Libellulidae	LC
5	Lemon pansy	<i>Junonia lemonias</i>	Nymphalidae	NA
6	Tawny coster	<i>Acraea terpsicore</i>	Nymphalidae	NA
7	Slender skimmer	<i>Orthetrum sabina</i>	Libellulidae	LC
8	Plaina tiger butterfly	<i>Danaus chrysippus</i>	Nymphalidae	LC
9	Mottled emigrant	<i>Catopsilia pyranthe</i>	Pieridae	LC
10	Spotted locust	<i>Aularches miliaris</i>	Pyrgomorphidae	LC
Reptiles				
1	Oriental garden lizard	<i>Calotes uersicolor</i>	Agamidae	LC
2	Fan-Throated Lizard	<i>Sitanaponticeriana</i>	Agamidae	LC
3	Common skink	<i>Mabuya carinatus</i>	Scincidae	LC
Aves				
1	Baya weaver	<i>Ploceus philippinus</i>	Ploceidae	LC
2	White – browed Wagtail	<i>Motacilla maderaspatensis</i>	Motacillidae	LC
3	Great cormorant	<i>Phalacrocorax carbo</i>	Phalacrocoracidae	LC
4	Indian robin	<i>Copsychus fulicatus</i>	Muscicapidae	LC
5	Indian Roller	<i>Coracias benghalensis</i>	Coraciidae	LC
6	Indian paradise flycatcher	<i>Terpsiphone paradisi</i>	Monarchidae	LC
7	Common myna	<i>Acridotheres tristis</i>	Sturnidae	LC
8	European bee- eater	<i>Merops apiaster</i>	Meropidae	LC
9	Black drongo	<i>Dicrurus macrocercus</i>	Dicruridae	LC
Mammals				
1	House mouse	<i>Mus musculus</i>	Muridae	LC
2	Indian hare	<i>Lepus nigricollis</i>	Leporidae	LC
3	Cow	<i>Bos taurus</i>	Bovidae	NA
4	Goat	<i>Capra hircus</i>	Bovidae	NA

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

Table 3.29 Fauna in Buffer Zone

S. No	Common Name/English Name	Scientific Name	Family name	IUCN Red List data
Insects				
1	Chocolate pansy	<i>Junonia iphita</i>	Nymphalidae	NA
2	Lime swallowtail	<i>Papilio demoleus</i>	Papilionidae	NA
3	Common Mormon	<i>Papilio polytes</i>	Papilionidae	NA
4	Crimson dropwing	<i>Trithemis aurora</i>	Libellulidae	LC
5	Lemon pansy	<i>Junonia lemonias</i>	Libellulidae	NA
6	Tawny coster	<i>Acraea terpsicore</i>	Nymphalidae	NA
7	Slender skimmer	<i>Orthetrum sabina</i>	Libellulidae	LC
8	Plains tiger butterfly	<i>Danaus chrysippus</i>	Nymphalidae	LC
9	Danaid eggfly	<i>Hypolimnas misippus</i>	Nymphalidae	LC
10	Bark blue tiger butterfly	<i>Tirumala septentrionis</i>	Nymphalidae	NA
11	Mottled emigrant	<i>Catopsilia pyranthe</i>	Pieridae	NA
12	Spotted locust	<i>Aularches miliaris</i>	Pyrgomorphidae	NA
13	Ditgh jewel	<i>Brachythemis contaminata</i>	Libellulidae	LC
Reptiles				
1	Oriental garden lizard	<i>Calotes uersicolor</i>	Agamidae	NA
2	Fan-Throated Lizard	<i>Sitanaponticeriana</i>	Agamidae	NA
3	Common skink	<i>Mabuya carinatus</i>	Scincidae	NA
4	Buff striped keelback	<i>Amphiesma stolatum</i>	Colubridae	LC
5	Common bronzeback tree snake	<i>Dendrelaphis tristis</i>	Colubridae	LC
6	Common krait	<i>Bungarus caeruleus</i>	Elapidae	LC
7	Russells wolf snake	<i>Lycodon fasilatus</i>	Colubridae	LC
8	Brahminy blindsnake	<i>Indotyphlope braminus</i>	Typhlopidae	LC
9	Rock dragon	<i>Psammophilus dorsalis</i>	Agamidae	LC
10	Indian vine snake	<i>Ahaetulla oxyrhynca</i>	Colubridae	NA
11	Blotched house gecko	<i>Hemidactylus triedrus</i>	Gekkonidae	LC
Aves				
1	Baya weaver	<i>Ploceus philippinus</i>	Ploceidae	LC
2	White – browed Wagtail	<i>Motacilla maderaspatensis</i>	Motacillidae	LC
3	Great cormorant	<i>Phalacrocorax carbo</i>	Phalacrocoracidae	LC
4	Indian robin	<i>Copsychus fulicatus</i>	Muscicapidae	LC
5	Indian Roller	<i>Coracias benghalensis</i>	Coraciidae	LC
6	Indian paradise flycatcher	<i>Terpsiphone paradisi</i>	Monarchidae	LC
7	Red junglefowl	<i>Gallus gallus</i>	Phasianidae	LC
8	Common myna	<i>Acridotheres tristis</i>	Sturnidae	LC
9	European bee- eater	<i>Merops apiaster</i>	Meropidae	LC
10	Black drongo	<i>Dicrurus macrocercus</i>	Dicruridae	LC
11	Black – winged stilt	<i>Himantopus Himantopus</i>	Recurvirostridae	LC

12	Crested serpent eagle	<i>Spilornis cheela</i>	Accipitridae	LC
13	Brahminy kite	<i>Haliastur indus</i>	Accipitridae	LC
14	Spotted owlet	<i>Athene brama</i>	Strigidae	LC
15	Black rumped flameback	<i>Dinopium benghalense</i>	Picidae	LC
16	White -browed bulbul	<i>Pycnonotus luteolus</i>	Pycnonotidae	LC
17	House sparrow	<i>Passer domesticus</i>	Passeridae	LC
18	Grey heron	<i>Ardea cinerea</i>	Ardeidae	LC
19	Indian peafowl	<i>Pavo cristatus</i>	Phasianidae	LC
20	Rose -ringed parakeet	<i>Psittacula krameri</i>	Psittaculidae	LC
21	Scaly – breasted munia	<i>Lonchura punctulata</i>	Estrildidae	LC
22	White -throated kingfisher	<i>Halcyon smyrnensis</i>	Alcedinidae	LC
23	House crow	<i>Corvus splendens</i>	Corvidae	LC
24	Asian koel	<i>Eudynamys scolopaceus</i>	Cuculidae	LC
25	Asian green bee- Eater	<i>Merops orientalis</i>	Meropidae	LC
26	Little cormorant	<i>Microcarbo niger</i>	Microcarbo	LC
27	Painted stork	<i>Mycteria leucocephala</i>	Ciconiidae	NT
28	Shikra	<i>Accipiter badius</i>	Accipitridae	LC
29	Indian robin	<i>Copsychus fulicatus</i>	Muscicapidae	LC
30	Indian roller	<i>Coracias benghalensis</i>	Coraciidae	LC
31	Indian paradise flycatcher	<i>Terpsiphone paradisi</i>	Monarchidae	LC
32	Yellow – billed babbler	<i>Argya affinis</i>	Leiothrichidae	LC
33	Ashy – crowned sparrow lark	<i>Eremopterix griseus</i>	Alaudidae	LC
34	Small pratincole	<i>Glareola lactea</i>	Glareolidae	LC
35	Great egret	<i>Ardea alba</i>	Ardeidae	LC
36	Rock pigeon	<i>Columba livia</i>	Columbidae	LC
37	Eurasian collared – dove	<i>Streptopelia decaocto</i>	Columbidae	LC
38	Eurasian coot	<i>Fulica atra</i>	Rallidae	LC
39	Northern shoveler	<i>Spatula clypeata</i>	Anatidae	LC
40	Black kite	<i>Milvus migrans</i>	Accipitridae	LC
41	Red junglefowl	<i>Gallus gallus</i>	Phasianidae	LC
42	Common kingfisher	<i>Alcedo atthis</i>	Alcedo atthis	LC
43	Common sandpiper	<i>Actitis hypoleucos</i>	Scolopacidae	LC
44	Striated heron	<i>Butorides striata</i>	Ardeidae	LC
45	Laughing dove	<i>Spilopelia senegalensis</i>	Columbidae	LC
46	Red vented bulbul	<i>Pycnonotus cafer</i>	Pycnonotidae	LC
47	Black winged kite	<i>Elanus caeruleus</i>	Accipitridae	LC
48	Common tailorbird	<i>Orthotomus sutorius</i>	Cisticolidae	LC
49	Indian pond -heron	<i>Ardeola grayii</i>	Ardeidae	LC
50	Greater racket tailed drongo	<i>Dicrurus paradiseus</i>	Dicruridae	LC

Mammals				
1	House mouse	<i>Mus musculus</i>	Muridae	LC
2	Indian hare	<i>Lepus nigricollis</i>	Leporidae	LC
3	Jungle cat	<i>Felis chaus</i>	Felidae	LC
4	Cow	<i>Bos taurus</i>	Bovidae	NA
5	Goat	<i>Capra hircus</i>	Bovidae	NA
Amphibians				
1	Asian common toad	<i>Duttaphrynus melanostictus</i>	Bufonidae	LC
2	Chunam tree frog	<i>Polypedates maculatus</i>	Rhacophoridae	LC
3	Common skittering frog	<i>Euphlyctis cyanophlyctis</i>	Dicroglossidae	LC

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

3.5.3 Agriculture & Horticulture in Krishnagiri district

Krishnagiri district is one of the potential districts for cultivation of agricultural and horticultural crops. Total cultivated area of 224767 Hectares, out of which 180902 Ha Net cultivated area against the 5,14,325 Ha. of total geographical area. The total normal area cultivated under all crops is 224767 Hectares out of which 73046 Ha is under irrigated and 151720 ha area under rained crops. The major agricultural crops in the district are grown Paddy, Ragi, Redgram, Cowpea, Maize, Cumbu, Groundnut, Horsegram and minor millets. The major cultivated area of agricultural crops occupied by rained agriculture. The total number of 2,81,733 famers engaged in agriculture out of which 213023 are Marginal farmers (76%), 45970 are small farmers (16%), remaining 4615 farmers (8%) are medium and large farmers. Details of major field crops and horticulture within 1 km radius are given below.

Major Agricultural Crops

Major horticulture crops cultivated in this district are fruit crops like mango, banana, Sapota and guava, vegetables like tomato, brinjal, chillies, onion and turmeric. Details of major field crops and horticulture in 1km radius is given in Table. 3.30. Agricultural land in the study area.

Table 3.30 Major Crops in 1km radius

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

Major Horticulture Crops

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

Horticulture

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

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

S. No	Common Name	Scientific Name	Family
Major Horticultural Crops			
1	Banana	<i>Musa</i>	Musaceae
2	Mango	<i>Mangifera indica</i>	Anacardiaceae
4	Guava	<i>Psidium guajava</i>	Myrtaceae
5	Sapota	<i>Manilkara zapota</i>	Sapotaceae
6	Lemon	<i>Citrus × limon</i>	Rutaceae
7	Papaya	<i>Carica papaya</i>	Caricaceae
Vegetables			
8	Onion	<i>Allium cepa</i>	Amaryllidaceae
9	Tapioca	<i>Manihot esculenta</i>	Spurges
10	Brinjal	<i>Solanum melongena</i>	Nightshade
11	Tomato	<i>Solanum lycopersicum</i>	Nightshade
12	Bottle Gourd	<i>Lagenaria siceraria</i>	Cucurbits
13	Veandai kai	<i>Abelmoschus esculentus</i>	Mallows
14	Moringa	<i>Moringa oleifera</i>	Moringaceae
15	Mullangi	<i>Raphanus sativus</i>	Brassicaceae
Flowers			
18	Jasmine	<i>Jasminum</i>	Jasminaceae
20	Sambanthi poo	<i>Crysanthimum</i>	Asteraceae
21	Rose & Jathi	<i>Rosa</i>	Rosaceae
23	Tuberose	<i>Polianthes tuberosa</i>	Asparagus
Spices and Condiments			
24	Chillies	<i>Capsicum frutescens</i>	Solanaceae
25	Turmeric	<i>Curcuma longa</i>	Zingiberaceae
26	Tamarind	<i>Tamarindus indica</i>	Legumes
27	Curry leaf	<i>Murraya koenigii</i>	Rutaceae

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

An essential part of environmental study is socio-economic environment incorporating various facts related to socio-economic conditions in the area, which deals with the total environment. Socio economic study includes demographic structure of the area, provision of basic amenities viz., housing, education, health and medical services, occupation, water supply, sanitation, communication, transportation, prevailing diseases pattern as well as feature of aesthetic significance such as temples, historical monuments etc. at the baseline level. This would help in visualizing and predicting the possible impact depending upon the nature and magnitude of the project. Socio-economic study of an area provides a good opportunity to assess the socio-economic condition and possibly makes a change in living and social standards of the particular area benefitted due to the project.

3.6.1 Objectives of the Study

The main objectives of the study are as follows:

- ❖ To know the current socio-economic condition in the region to cover the sub sectors education, health, sanitation, and water & food security.
- ❖ To recommend practical strategic interventions in the sector.
- ❖ To help in providing better living standards.
- ❖ To understand skill sets and plan for employment opportunities which shall be created.

3.6.2 Scope of Work

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

3.6.3 Socio-Economic Status of Study area

The study area covers 5 villages including Bilalam, Hanumanthapuram, Kolatti, Santhanapalli. Irudukottai is the village in which the proposed project site is located, the summary of population facts for the village is exclusively provided in Table 3.32 and for other 4 villages in Tables 3.32 - 3.35

Table 3.32 Irudukottai, Village Population Facts

Irudukottai Village	
Number of Households	1190
Population	5563
Male Population	2914
Female Population	2649
Children Population	685
Sex-ratio	909
Literacy	54.04%
Male Literacy	61.34%
Female Literacy	45.96%
Scheduled Tribes (ST) %	29
Scheduled Caste (SC) %	821
Total Workers	2862
Main Worker	2242
Marginal Worker	620

Table 3.33 Population and Literacy Data of Study Area

Village	No of Households	Total Population Person	Total Population Male	Total Population Female	Literates Population Person	Literates Population Male	Literates Population Female	Illiterate Persons	Illiterate Male	Illiterate Female
Bilalam	154	774	414	360	256	174	82	518	240	278
Hanumanthapuram	1125	5241	2712	2529	2667	1578	1089	2574	1134	1440
Kolatti	500	2223	1118	1105	1238	698	540	985	420	565
Santhanapalli	1433	6545	3417	3128	3400	1974	1426	3145	1443	1702

Table 3.34 Details on Educational Facilities, Water, and Drainage & Health Facilities

Village	Private Primary School (Numbers)	Govt. Vocational Training School/ITI (Numbers)	Primary Health Centre (Numbers)	Tap Water Untreated	River/Canal	Is the Area Covered under Total Sanitation Campaign (TSC)?	Telephone (landlines)	Public Bus Service	Gravel (kutcha) Roads	Commercial Bank	Agricultural Credit Societies	Self - Help Group (SHG)	Nutritional Centres-Anganwadi Centre	Community Centre with/without TV	Power Supply for Domestic Use
Bilalam	0	0	0	1	2	2	2	2	1	2	2	1	1	1	1
Hanumanthapuram	0	0	1	1	1	2	2	1	1	2	2	1	1	1	1
Kolatti	0	0	0	1	2	1	1	1	1	2	2	1	1	1	1
Santhanapalli	0	0	0	1	2	2	1	1	1	2	2	1	1	1	1

Table 3.35 Workers' Profile of Study Area

Village	Total Worker Population Person	Total Worker Population Male	Total Worker Population Female	Main Working Population Person	Main Working Population Male	Main Working Population Female	Main Cultivator Population Person	Main Agricultural Labourers Population Person	Main Other Workers Population Person	Non-Working Population Person
Bilalam	423	223	200	333	173	160	184	15	123	351
Hanumanthapuram	2983	1653	1330	2694	1497	1197	1011	1367	299	2258
Kolatti	1035	721	314	960	687	273	713	18	214	1188
Santhanapalli	3697	2158	1539	3330	2032	1298	1426	1340	528	2848

3.6.4 Recommendation and Suggestion

- ❖ Awareness program should be conducted to make the population aware of education and to get a better livelihood.
- ❖ Vocational training programme should be organized to make the people self - employed, particularly for women and unemployed youth.
- ❖ Based on qualification and skills local community may be preferred. Long term and short-term employments should be generated.
- ❖ Health care centre and ambulance facility should be provided to the population to get easy access to medical facilities. Apart from that, as these areas are prone to various diseases a hospital with modern facilities should be opened on a priority basis in a central place to provide better health facilities to the villagers around the project.
- ❖ While developing an Action Plan, it is very important to identify the population who falls under the marginalized and vulnerable groups. Therefore, that special attention can be given to these groups with special provisions while making action plans.

3.6.5 Summary & Conclusion

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

3.7 TRAFFIC DENSITY

The traffic survey conducted based on the transportation route of material, the Colour Granite is proposed to be transported mainly through Village Rode and Denkanikottai to Bettamugilalam village road as shown in Table 3.36-3.49 and in Figure 3.30. and 500-meter radius residential map shown in Figure 3.27. 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 3.36 Traffic Survey Locations

Station Code	Road Name	Distance and Direction	Type of Road
TS1	Village Rode	0.43 Km E	Village Road
TS2	Denkanikottai to Bettamugilalam	2.02 km SE	Denkanikottai to Bettamugilalam

Source: On-site monitoring by GTMS FAE & TM

Table 3.37 Existing Traffic Volume

Station code	HMV		LMV		2/3 Wheelers		Total PCU
	No	PCU	No	PCU	No	PCU	
TS1	16	48	28	28	45	23	99
TS2	115	345	47	47	88	44	436

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 3.38 Multi Colour Granite Transportation Requirement

Transportation of Multi Colour Granite per day		
Capacity of trucks	No. of Trips per day	Volume in PCU
15 tonnes	2	6

Source: Approved Mining Plan

Table 3.39 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	99	6	105	1200
Uthangarai – Krishnagri NH77	436	6	442	1500

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

- o 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.

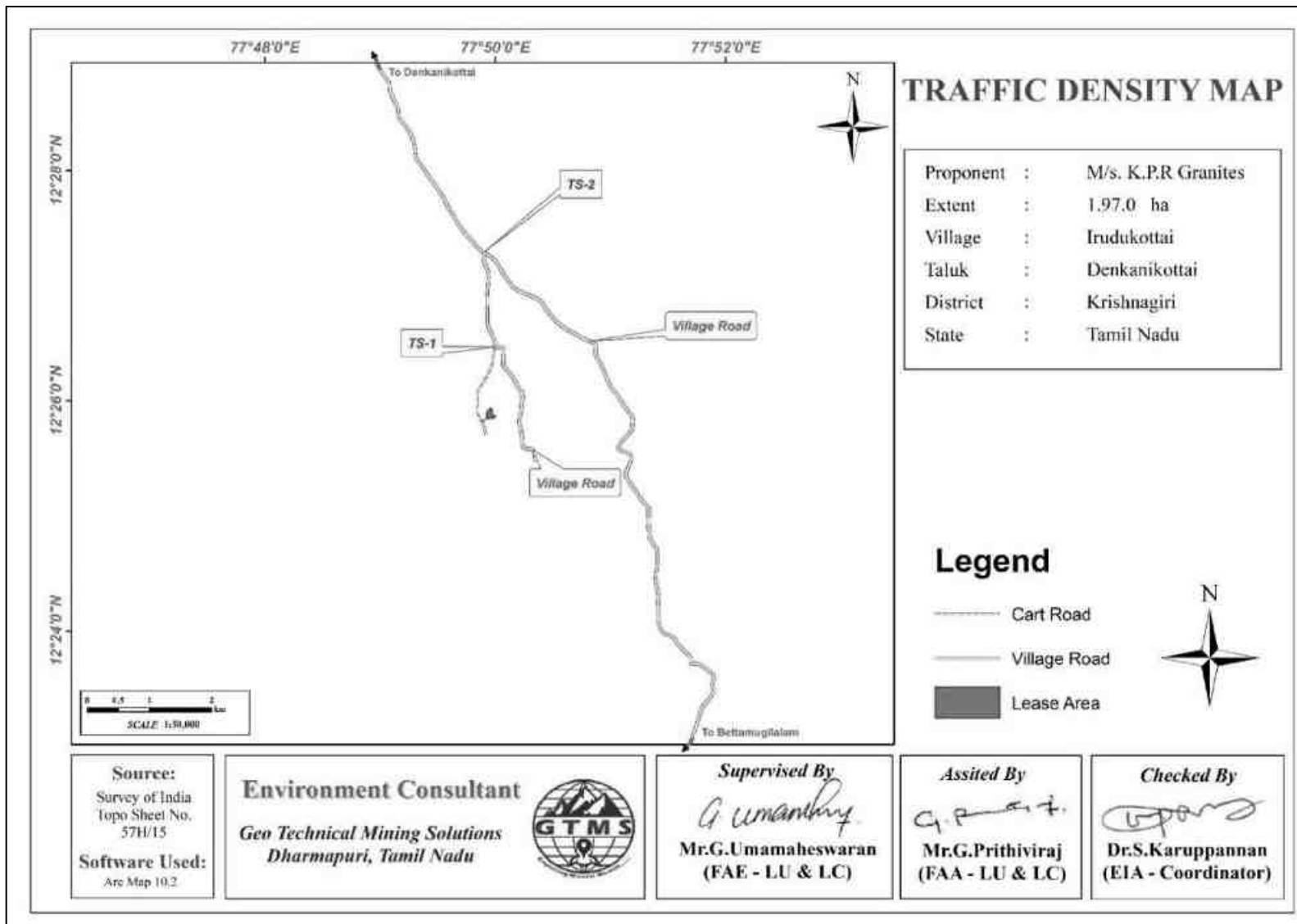


Figure 3.27 Traffic Density Map

3.8 SITE SPECIFIC FEATURES

There are no Wildlife Sanctuaries, National Park within the project area to 10km radius. There is no Protected Forest area within 10 km radius from the proposed project area. Therefore, there will be no need of acquisition/diversion of forest land. The details related to the environment sensitivity around the proposed mine lease area i.e., 10 km radius and the nearby water bodies are given in the Table 3.40.

Table 3.40 Details of Environmentally Sensitive Ecological Features in the Study Area

S. No	Sensitive Ecological Features	Name	Areal Distance in km from cluster
1	National Park / Wild life Sanctuaries	Cauvery wildlife sanctuary	2.82km-SE
2	Reserve Forest	Kolatti R.F	2.94km-SW
		Aiyur Ext-I R.F	3.0km-NE
		Aiyur Ext-II R.F	6.60km-NE
		Panai R.F	8.25km-SW
		Noganur R.F	4.07km -NW
		Denkanikotta R.F	6.64km- N
		Udedurgam R.F	6.87km-NE
		Manchi R.F	11.71km-SW
		Tholuvabetta R.F	4.86km-South
		Marandahalli R.F	7.95km-SE
		Jawalgiri R.F	19.24km-West
3	Lakes/Reservoirs/ Dams/Streams/Rivers	Nemrelli lake	1.45km-NE
4	Tiger Reserve/Elephant Reserve/ Biosphere Reserve	None	Nil within 10 km radius
5	Critically Polluted Areas	None	Nil within 10 km radius
6	Mangroves	None	Nil within 10 km radius
7	Mountains/Hills	None	Nil within 10 km radius
8	Notified Archaeological Sites	None	Nil within 10 km radius
9	Industries/ Thermal Power Plants	None	Nil within 10 km radius
10	Defence Installation	None	Nil within 10km radius

Source: Survey of India Toposheet.

CHAPTER IV

ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

4.0 GENERAL

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

4.1 LAND ENVIRONMENT

4.1.1 Anticipated Impact

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

4.1.2 Common Mitigation Measures from Proposed Project

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

4.2 SOIL ENVIRONMENT

4.2.1 Anticipated Impact on Soil Environment

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

4.2.2 Common Mitigation Measures from proposed project

- ❖ Construction of garland drains, settling pits, and check dams to prevent runoff and siltation
- ❖ Run-off diversion – Garland drains will be constructed around the project boundary to prevent surface flows from entering the quarry works areas and will be discharged into the settling tanks to reduce suspended sediment loads before runoff is discharged from the quarry site.
- ❖ Retain existing or re-plant the vegetation will be retained at the site wherever possible.

Monitoring and maintenance – Weekly monitoring and daily maintenance of erosion control systems so that they perform as specified specially during rainy season.

4.3 WATER ENVIRONMENT

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 3.3 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.

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

4.4.1.1 Emission Estimation

Emission resulting from different mining activities is estimated using relevant empirical formulae developed by Chaulya 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

Source	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. As the SPM emission calculation for overall mine is not considering pollution control measures, one-third of the SPM value is taken for derivation of PM₁₀ keeping in mind that proper control measures are followed. It is important to note that PM₁₀ emission rate is derived from the SPM estimation in the background that PM₁₀ constitutes 52% of SPM emission. The PM₁₀ and PM_{2.5} emission results have been given in Table 4.2.

Table 4.2 Estimated Emission Rate

Activity	Pollutant	Calculated Value (g/s)	Lease Area in m²	Calculated Value (g/s/m²)
Overall Mine	PM _{2.5}	1.061369861	19700	5.38766E-05
Overall Mine	PM ₁₀	0.159205479	19700	8.0815E-06

4.4.1.2 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.

4.4.1.3 Model Results

The post project Resultant Concentrations of PM10, PM2.5 is given in the table shown below:

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-metaled 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

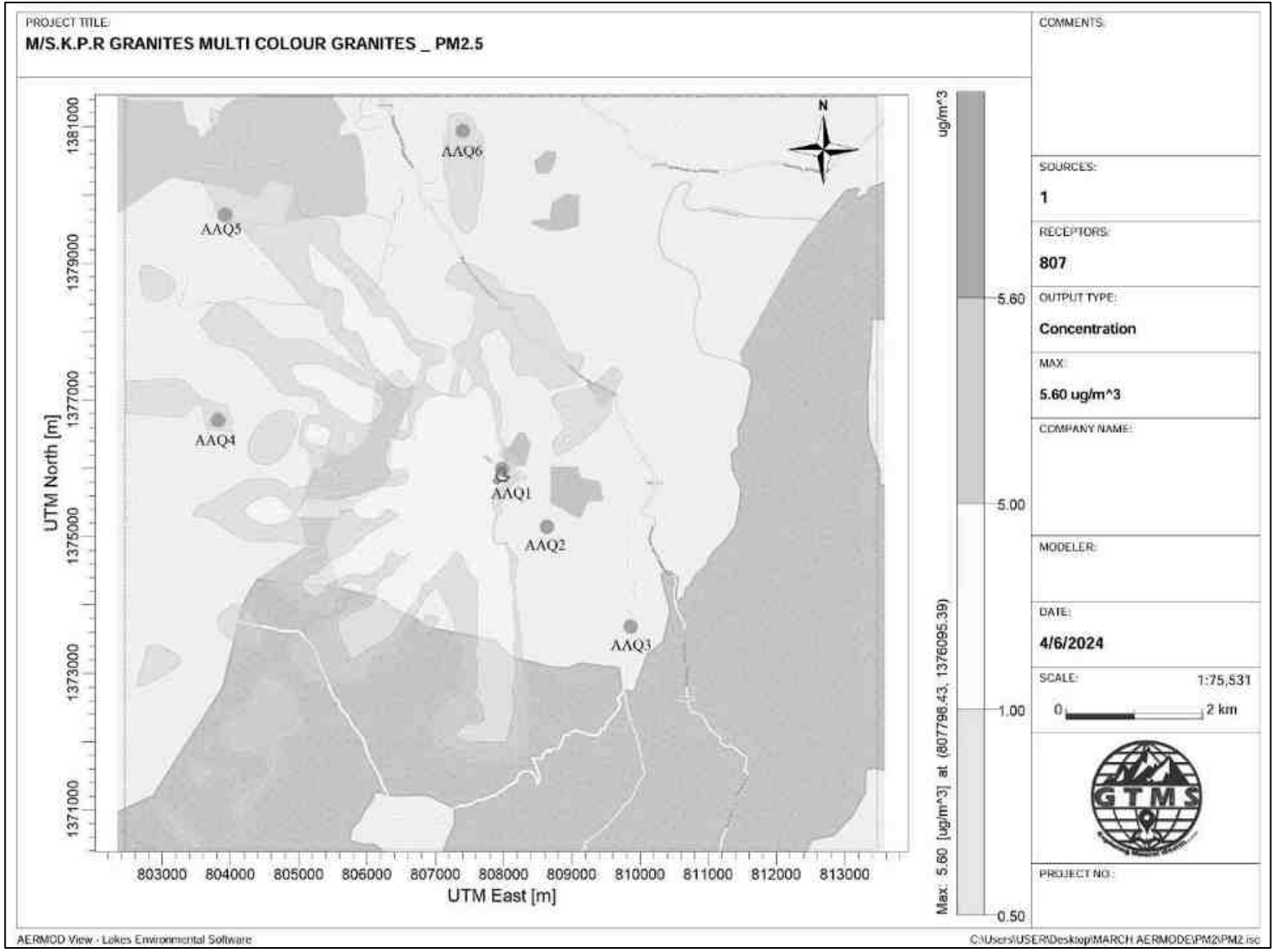


Figure 4.1 Predicted Incremental Concentration of PM_{2.5}

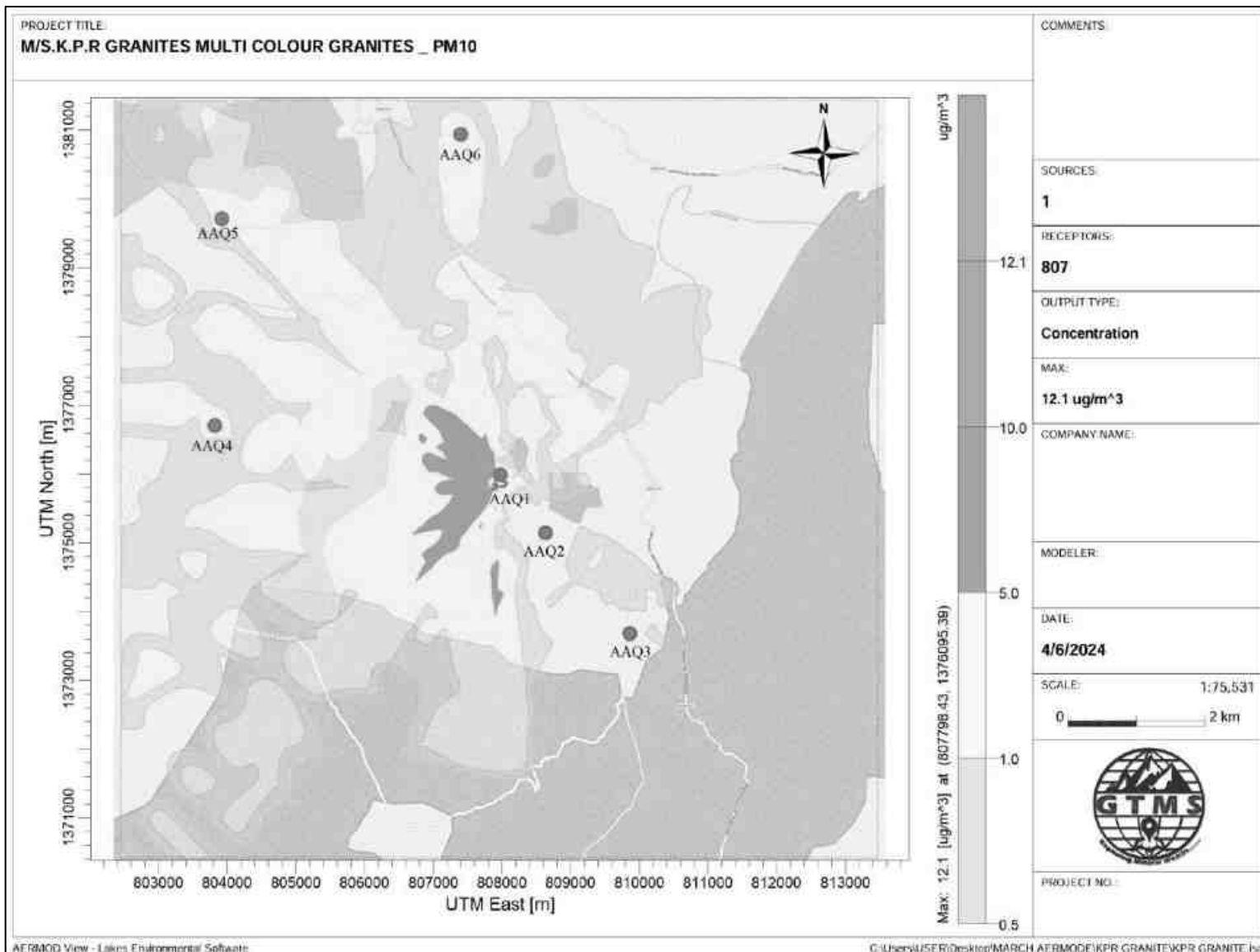


Figure 4.2 Predicted Incremental Concentration of PM₁₀

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	--	--	15.5	5.60	21.1	Below standard	36.13	Not significant
AAQ2	0.90	SE	14.4	0	14.4		0.00	
AAQ3	2.81	SE	13.3	0	13.3		0.00	
AAQ4	4.16	WNW	15.1	0.5	15.6		3.31	
AAQ5	5.48	NW	15.7	0.5	16.2		3.18	
AAQ6	4.96	N	14.6	0.5	15.1		3.42	

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	--	--	44.3	12.1	56.4	Below standard	27.31	Not significant
AAQ2	0.90	SE	41.0	0	41		0.00	
AAQ3	2.81	SE	33.2	0	33.2		0.00	
AAQ4	4.16	WNW	37.7	1	38.7		2.65	
AAQ5	5.48	NW	39.3	1	40.3		2.54	
AAQ6	4.96	N	41.0	1	42		2.44	

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

4.5 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.

$$L_{p2} = L_{p1} - 20 \log (r_2/r_1) - Ae_{1,2}$$

Where, L_{p1} & L_{p2} are sound levels at points located at distances r_1 and r_2 from the source; $Ae_{1,2}$ is the excess attenuation due to environmental conditions. Combined effect of all sources can be determined at various locations by logarithmic addition.

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

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	Jack Hammer	Yes	88
2	Compressor	No	81
3	Tipper	No	84
Total Noise Produced			90.0

*50 feet from source = 15.24 meters

The total noise to be produced by mining activity is calculated to be 90.0 dB (A). Therefore, we have considered equipment and operation noise levels (max) to be approx. 90.0 dB (A) for noise prediction modelling. The results of noise prediction modelling are shown in Table 4.6.

Table 4.6 Predicted Noise Incremental Values

Noise Monitoring Location	Distance From Project Site(m)	Baseline Noise Level (dBA)m During Day Time	Predicted Noise Level(dBA)	Total(dBA)
Core	100	49.7	38.16	49.99
Thottikuppam	890	45.1	19.17	45.11
Javanachandram	2790	42.5	9.25	42.50

Bikkanapally	4110	39.0	5.88	39.00
Giriyapalli	5400	41.6	3.51	41.60
Santhanapalli	4960	40.2	4.25	40.20
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

Major source of ground vibrations due to mining activities is blasting. In this mining project, no explosives are proposed to break the rocks. Instead, cracking powder has been

proposed for cracking the solid rock along line of drilling. Therefore, it is not necessary to calculate peak particle velocity.

4.6 ECOLOGY AND BIODIVERSITY

4.6.1 Impact on Ecology and Biodiversity

- There shall be negligible air emissions or effluents from the project site. During loading the truck, dust generation will be likely. This shall be a temporary effect and not anticipated to affect the surrounding vegetation significantly
- 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.
- A total of 17 species belonging to 12 families have been recorded from the mining lease area. 2 trees, 6 shrubs and 9 herbs were identified. The survival rate of uprooted trees is 30% Quarry so instead of one tree 10 saplings are bought and planted in 7.5 conservation zone.
- Carbon released from quarrying machineries and tippers during quarrying would be 15 kg per day, 4000 kg per year and 19999 kg over five years, as provided in Table 4.7.

Table 4.7 Carbon Released During Five Years of Multi -Colour Granite Production

	Per day	Per year	Per five years
Fuel consumption of excavator	15	4000	19999
Fuel consumption of tipper	0	0	0
Total fuel consumption in liters	59	15998	79990
CO ₂ emission in kg	74	19998	99989

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 23616 kg of carbon per year. Therefore, we recommend planting large number of trees around the quarry and near school campuses, government wasteland, roadsides etc.
- ❖ As per the greenbelt development plan as recommended by SEAC (Table 4.11), about 935 trees will be planted within three months from the beginning of mining. These trees, when

grown up would sequester carbon of about 118082 kg of the total carbon, as provided in Table 4.8

Table 4.8 CO₂ Sequestration

CO ₂ sequestration in kg	87	23616	118082
Remaining CO ₂ not sequestered in kg	111	29978	149889
Trees required for environmental compensation	1249		
Area required for environmental compensation in hectares	2		

Greenbelt Development

The main objective of the green belt is to provide a barrier between the source of pollution and the surrounding areas. In order to compensate the loss of vegetation cover, it is suggested to carry out afforestation program mainly inside and outside of the lease area in different phases. This habitat improvement program would ensure the faunal species to re-colonize and improve the abundance status in the core zone. Greenbelt development plan and budget required for green belt development plan are given in Tables 4.9-4.11. For greenbelt development, species are recommended, as shown in Table 4.9 on the basis of:

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

Table 4.9 Recommended Species for Greenbelt Development Plan

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

Table 4.10 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		
	394	315	3546
	Number of plants outside the mine lease area		
	591	473	5319
Total	985	788	8865

Table 4.11 Budget for Greenbelt Development Plan

Activity	Plantation in the construction phase(3Months)	Cost	Capital Cost (Rs.)	Recurring Cost-per annum
Plantation inside the mine lease area (in safety margins)	394	Site clearance, preparation of land, digging of pits / trenches, soil amendments, transplantation of saplings @ 200 per plant (capital) for plantation inside the lease area and @ 30 per plant maintenance (recurring))"	78800	11820
Plantation outside the area	591	Avenue Plantation @ 300 per plant (capital) for plantation outside the lease area and @ 30 per plant maintenance (recurring)	177300	17730
Total			256100	29550

Source: EMP budget





Figure 4.3 Green Belt and Fencing Photos

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

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

4.6.4. Impact on Aquatic Biodiversity

- ❖ 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.

4.6.5 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.
- ❖ It is a granite quarry, no explosives are used, there is no possibility of vibration and dust, thus there is no possibility of damage to the adjacent agricultural land.

- ❖ Quarry approach roads are sprayed with water 3 times a day to control dust. Thus, the damage to the nearby farmlands is controlled.
- ❖ A green belt will be created in 7.5m and 10m safety zone around the quarry to contain the dust from the quarry and prevent the dust from spreading to the adjacent agricultural land.
- ❖ Transportation of material will be carried out during day time and material will be covered with tarpaulin
- ❖ The speed of tippers plying on the haul road will be limited to < 20 km/hr to avoid generation of dust.

4.7 SOCIO ECONOMIC ENVIRONMENT

The socio-economic impacts of mining are many. Impacts of a mine project may be positive or Negative. The adverse impacts attribute to physical displacement due to land acquisition, which is followed by loss of livelihood, mental agony, changes in social structure, and risk to food security etc., People are also directly affected due to pollution. Social Impact Assessment (SIA) is a process of analysis, monitoring and managing the social consequences of a project. Study on Socio-economic status has already been carried out using primary socio-economic survey for generating the baseline data of Socio-economic status.

4.7.1 Anticipated Impact

From the primary Socio-economic survey & through secondary data available from established literature and census data 2011, it is found that there would be positive impact on Socio-economic condition of the nearby area. There is no habitation within 300 m of the proposed mining lease area. Therefore, no major impact is anticipated on the nearby habitation during the entire life of the mine.

4.7.2 Mitigation Measures

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

- ❖ From above details, the quarry operations will have highly beneficial positive impact in the area.

4.8 OCCUPATIONAL HEALTH AND SAFETY

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

- ❖ Respiratory hazards
- ❖ Noise
- ❖ Physical hazards
- ❖ Occupational Health Survey

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

- ❖ 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)
- ❖ 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
- ❖ Ear muffs provided will be capable of reducing sound levels at the ear to at least 85 dB(A)
- ❖ Periodic medical hearing checks will be performed on workers exposed to high noise levels

4.8.3 Physical Hazards

The following measures are proposed for control of physical hazards

- ❖ Specific personnel training on work-site safety management will be taken up;
- ❖ Work site assessment will be done by rock scaling of each surface exposed to workers to prevent accidental rock falling and / or landslide, especially after blasting activities;
- ❖ Natural barriers, temporary railing, or specific danger signals will be provided along rock benches or other pit areas where work is performed at heights more than 2m from ground level.

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

4.8.4 Occupational Health Survey

All the persons will undergo pre-employment and periodic medical examination. Employees will be monitored for occupational diseases by conducting general physical tests, audiometric tests, full chest, X-ray, lung function tests, spiro metric tests, periodic medical examination – yearly, Lung function/ Silicosis test – yearly, those who are exposed to dust and eye test.

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

4.9 Mine Waste Management

No waste is anticipated from any of the proposed quarries.

4.10 MINE CLOSURE

Mine closure plan is the most important environmental requirement in mineral mining projects. 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.

Objective of Mine closure

- ❖ 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, e.g., planning for agriculture
- ❖ Where it is desirable to get a quick growth response from the native flora during those times when moisture is not a limiting factor e.g., development of green barriers
- ❖ The Mine closure plan should be as per the approved mining plan. The mine closure is a part of approved mining plan and activities of closure shall be carried out as per the process described in mine closure plan (Annexure III).

CHAPTER V

ANALYSIS OF ALTERNATIVES (TECHNOLOGY AND SITE)

5.0 INTRODUCTION

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

5.1 FACTORS BEHIND THE SELECTION OF PROJECT SITE

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

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

5.2 ANALYSIS OF ALTERNATIVE SITE

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

5.3 FACTORS BEHIND SELECTION OF PROPOSED TECHNOLOGY

The proposed mining lease areas have following advantages:

- ❖ As the mineral deposition is homogeneous and batholith formation, 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.

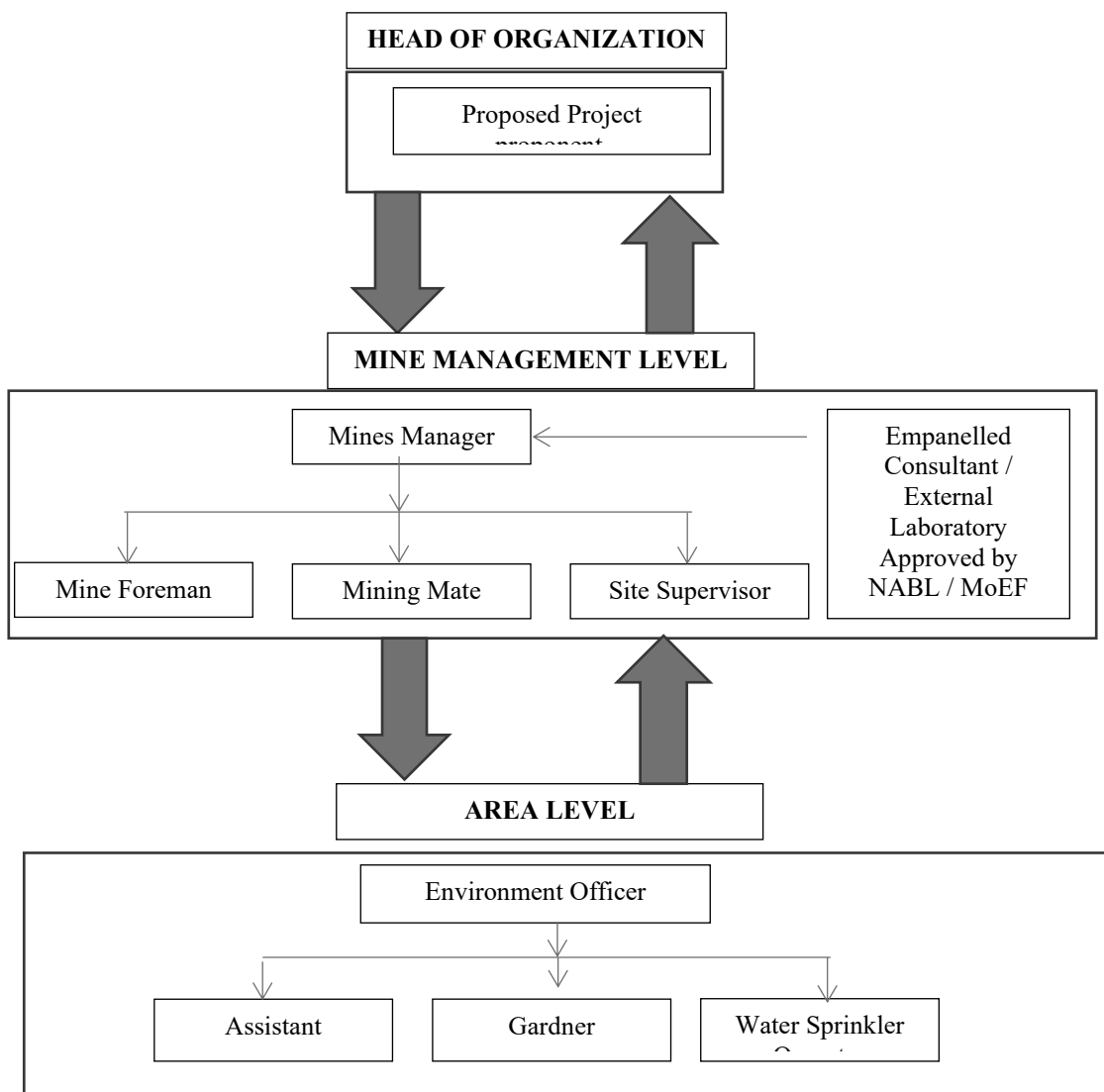


Figure 6.1 Proposed environmental monitoring chart

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

The following Additional Studies were done as per items identified by project proponent and items identified by regulatory authority. And items identified by public and other stakeholders will be incorporated after Public Hearing.

- ❖ Public Consultation
- ❖ Risk Assessment
- ❖ Disaster Management Plan
- ❖ Open Pit Slope Stability Analysis
- ❖ CAG Action Plan

7.1 PUBLIC CONSULTATION FOR PROPOSED PROJECT

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

7.2 RISK ASSESSMENT FOR PROPOSED PROJECT

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

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

Table 7.1 Risk Assessment & Control measures for Proposed Project

S. No.	Risk factors	Causes of risk	Control measures
1	Accidents due to explosives and heavy mining machineries	Improper handling and unsafe working practice	<ul style="list-style-type: none"> ▪ All safety precautions and provisions of Mine Act, 1952, Metalliferous Mines Regulation, 1961 and Mines Rules, 1955 will be strictly followed during all mining operations; ▪ Entry of unauthorized persons will be prohibited; ▪ Firefighting 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 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 guidelines.
2	OB / Waste Dump	Sliding of benches Height and slope of the benches Drainage facilities	<ul style="list-style-type: none"> ▪ Dumps benches are maintained with proper 3 m height and 37° slope to prevent slope failure and terraced. ▪ Dumping in the waste dump in layers and dozing daily. ▪ Vegetation of the top and slopes of the dump to prevent erosion and providing water drainage channels ▪ Providing proper drainage facilities in mine and dump area.

			<ul style="list-style-type: none"> ▪ Construction of retaining wall around dump area to stop sliding of material. ▪ Garland drains to be made around OB dump area
3	Drilling & Wire Saw Cutting	<p>Due to improper and unsafe practices</p> <p>Due to high pressure of compressed air, hoses may burst</p> <p>Drill Rod may break</p>	<ul style="list-style-type: none"> ▪ Safe operating procedure established for drilling (SOP) will be strictly followed. ▪ Only trained operators will be deployed. ▪ No drilling shall be commenced in an area where shots have been fired until the blaster/blasting foreman has made a thorough Examination of all places, ▪ Drill & Wire saw operator shall examine the drilling and wire saw equipment and satisfy himself ▪ Drilling & cutting operations 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 and wire saw equipment as per operator manual. ▪ All drills and wire saw unit shall be provided with wet drilling and cutting arrangement and it shall be maintained in efficient working in condition. ▪ Operator shall regularly use all the personal protective equipment.
4	Blasting	<p>Fly rock, ground vibration, Noise and dust.</p> <p>Improper charging, stemming & Blasting/fining</p>	<ul style="list-style-type: none"> ▪ The maximum charge per delay and by optimum blast hole pattern, vibrations will be controlled within the permissible limit and blast can be conducted safely. ▪ SOP for Charging, Stemming & Blasting/Firing of Blast Holes will be followed

		of blast holes Vibration due to movement of vehicles	by blasting crew during initial stage of operation <ul style="list-style-type: none"> ▪ 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)
5	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.	<ul style="list-style-type: none"> ▪ Before commencing work, drivers personally check the dumper/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
6	Natural calamities	Unexpected happenings	<ul style="list-style-type: none"> ▪ Escape Routes will be provided to prevent inundation of storm water ▪ Garland drains will be provided at the toe of dump ▪ Fire Extinguishers & Sand Buckets
7	Failure of Mine Benches and Pit Slope	Slope geometry, Geological structure	Ultimate or over all pit slope shall be below 60° and each bench height shall be 5m height.

7.3 DISASTER MANAGEMENT PLAN FOR PROPOSED PROJECT

Natural disasters like Earthquake, Landslides have not been recorded in the past history as the terrain is categorized under seismic zone II. The area is far away from the sea. Hence, the disaster due to heavy floods and tsunamis are not anticipated. The Disaster Management

Plan is aimed to ensure safety of life, protection of environment, protection of installation, restoration of production and salvage operations in this same order of priorities. The objective of the Disaster Management Plan is to make use of the combined resources of the mine and the outside services to achieve the following:

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

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

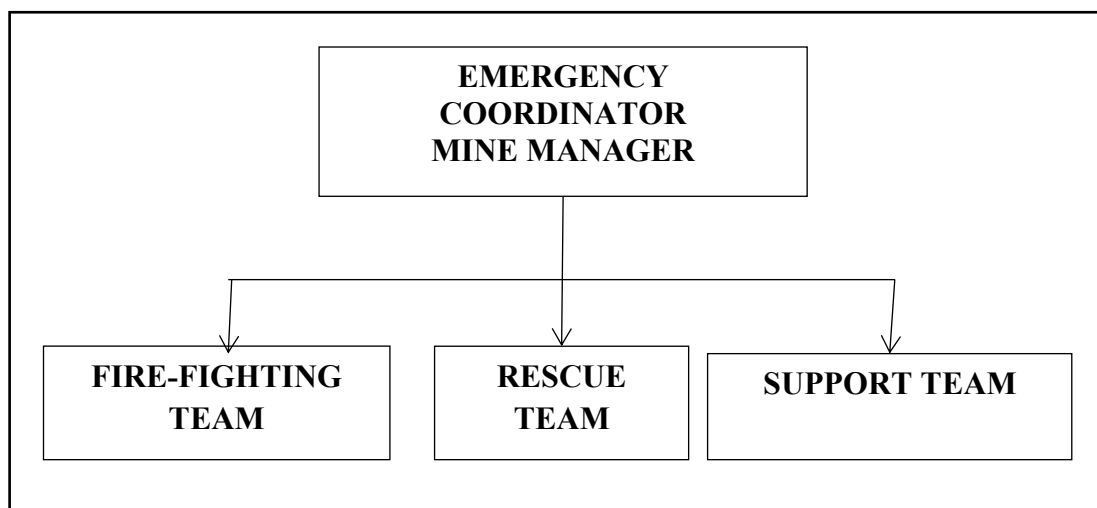


Figure 7.1 Disaster management team layout for proposed project

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

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 on air & noise environment is mainly anticipated due to drilling, excavation, movement of HEMM and transportation activities in all the quarries (proposed and existing) within the cluster. For this cumulative study, 3 proposed projects, known as P1, P2 & P3 are taken into consideration. The details of P1 have been given in Table 1.3 and the detail of P2, P3 are given in the Table 7.2, 7.3.

Table 7.2 Salient Features of Proposed Project Site “P2”

Name of the Quarry	M/s. Anbura Minerals Pvt.Ltd		
Type of Land	Patta Land		
Extent	1.93.5ha		
S.F. No.	1127/4 and 1127/5		
Toposheet No.	57-H/15		
Maximum Elevation	874m MSL		
Latitude	12°25'47.11"N to 12°25'51.65"N		
Longitude	77°49'39.55"E to 77°49'45.36"E		
Ultimate Depth of Mining	10m		
Geological Resource	Colour Granite 35% Recovery (m ³)	Granite Waste 65% Recovery (m ³)	Topsoil (m ³)
	135170	251030	38620

Mineable Reserves	Colour Granite 35% Recovery (m ³)	Granite Waste 65% Recovery (m ³)	Topsoil (m ³)
	44842	83278	24520
Proposed production for 5 years	Colour Granite 20% Recovery (m ³)	Granite Waste 80% Recovery (m ³)	Topsoil (m ³)
	8400	15600	13800
Method of Mining	Open Cast Mining		
Topography	Hilly Terrain		
Machinery proposed	Jack hammer	6	
	Compressor	2	
	Excavator	1	
	Tipper	2	
Blasting Method	Quarrying operation is carried out by splitting of rock mass of considerable volume from the parent rock mass by jackhammer, drilling and blasting.		
Proposed Manpower	35 persons		
Project Cost	Rs.2,42,45,000 /-		
Proposed Water Requirement	5.0 KLD		

Table 7.3 Salient Features of Proposed Project Site “P3”

Name of the Quarry	Tvl. Top Granites		
Type of Land	Patta Land		
Extent	2.40.46 ha		
S.F. No.	1124/5,6, 1151/5,6 and 1172/2A		
Toposheet No.	57 L/07		
Maximum Elevation	956m MSL		
Latitude	12°28'42.3501"N to 12°28'49.6385"N		
Longitude	78°21'41.4649"E to 78°21'49.6891"E		
Ultimate Depth of Mining	10m		
Geological Resource	Colour Granite 40% Recovery (m ³)	Granite Waste 60% Recovery (m ³)	Topsoil (m ³)
	199146	298719	48086
Mineable Reserves	Colour Granite 40% Recovery (m ³)	Granite Waste 60% Recovery (m ³)	Topsoil (m ³)

	43926	65889	29094
Proposed production for 5 years	Colour Granite 20% Recovery (m ³)	Granite Waste 80% Recovery (m ³)	Topsoil (m ³)
	10832	16248	6696
Method of Mining	Open Cast Semi Mechanized Mining		
Topography	Hilly Terrain		
Machinery proposed	Jack hammer	6	
	Compressor	2	
	Excavator	2	
	Tipper	2	
Blasting Method	Quarrying operation is carried out by splitting of rock mass of considerable volume from the parent rock mass by jackhammer, drilling and blasting.		
Proposed Manpower	38 persons		
Project Cost	Rs.3,04,23,000 /-		
Water Requirement	2.0 KLD		

7.4.1 Air Environment

Calculation of the cumulative production load of granite from the 3 proposed project within the cluster have been given in the Table.7.4

Table 7.4 Cumulative Production Load of Granite

Quarry	Colour Granite @35% recovery in m ³				Granite Waste @ 65% in m ³				Weathered Rock in m ³			
	5 years in m ³	Per Year in m ³	Per Day in m ³	Lorry Load Per day	5 years in m ³	Per Year in m ³	Per Day in m ³	Lorry Load Per day	5 years in m ³	Per Year in m ³	Per Day in m ³	Lorry Load Per day
P1	23997	4799	18	3	44565	8913	33	5	11124	2225	8	1
P2	8400	1680	6	1	15600	3120	11	2	13800	2760	10	2
	Colour Granite @40% recovery in m ³				Granite Waste @ 60% in m ³				Weathered Rock in m ³			
P3	10832	2166	8	1	16248	3250	12	2	6696	1339	5	1
Total	43229	8645	32	5	76413	15283	56	9	31620	6324	23	4

The overall production of 3 quarries is of about granite recovery is 32m³ per day with a capacity of 5 trips per day, about granite waste is 56m³ per day with a capacity of 9 trips and weathered rock is of 23m³ per day with a capacity of 4 trips per day.

7.4.1.1 Cumulative Impact of Air Pollutants

The results on the cumulative impact from the three proposed projects on air environment of the cluster have been provided in Table 7.5. The cumulative values resulting from the two projects for each pollutant do not exceed the permissible limits set by CPCB.

Table 7.5 Incremental and Resultant Ground Level Concentration from the three Quarry

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	
PM _{2.5}	14.80	5.6	4.6	5.8	30.8
PM ₁₀	39.40	12.1	10.4	12.6	74.5

Source: Emission Calculations

7.4.2 Noise Environment

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

Table 7.6 Predicted Noise Incremental Values from Cluster

Location ID	Distance (m)	Direction	Background Value (Day) dB(A)	Incremental Value dB(A)	Total Predicted dB(A)	Residential Area Standards dB(A)
Habitation Near P1	890	SE	45.1	19.17	45.11	
Habitation Near P2	1130	SE	45.1	17.10	45.11	
Habitation Near P2	520	SE	45.1	23.84	45.13	
Cumulative Noise (dB(A))					49.9	

Source: Lab Monitoring Data

The cumulative analysis of noise due to three proposed project shows that habitation near P1 will receive about 49.9dB (A), as shown in Table 7.6. The cumulative results for the habitation in consideration do not exceed the limit set by CPCB for residential areas for day time.

7.4.3 Socio Economic Environment

Socio Economic benefits of the three proposed projects were calculated and the results have been shown in Table 7.7 and the 3 projects together will contribute Rs.30,00,000 towards CER fund.

Table 7.7 Socio Economic Benefits from three Quarries

Location ID	Project Cost	CER Cost
P1	Rs.92,26,870	Rs. 10,00,000
P2	Rs. 2,42,45,000	Rs. 10,00,000
P3	Rs.3,08,03,000	Rs. 10,00,000
Grand Total	Rs.6,38,94,870	Rs. 30,00,000

Table 7.8 Employment Benefits from 3 Quarries

Location ID	Employment
P1	27
P2	35
P3	38
Grand Total	100

A total of 100 people will get direct employment due to three proposed mines in cluster

7.4.4 Ecological Environment

Table 7.9 Greenbelt Development Benefits

ID	No of Trees proposed to be planted	Area to be Covered(m ²)	Name of the Species	No. of Trees expected to be grown @ 80% survival rate
P1	985	8865	Neem, Pongamia, Teak, etc.,	788
P2	968	8707		774
P3	1202	10821		962
Total	3155	28393		2524

Cumulative studies show that the three proposed projects will plant about 3155 native tree species like Neem, Teak, etc both inside and outside the lease area. It is expected that 80 % of trees, i.e., 2524 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 7.10.

Table 7.10 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 Irudukottai Village aims to produce **23997m³** of multi colour granite over a period of 5 years. This will enhance the socio-economic activities in the adjoining areas and will result in the following benefits:

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

8.1 EMPLOYMENT POTENTIAL

It is proposed to provide employment to about 27 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 about 15 persons in the form of contractual jobs, business opportunities, and service facilities etc. Because of this, the economic status of the local people will improve.

8.2 SOCIO-ECONOMIC WELFARE MEASURES PROPOSED

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

8.3 IMPROVEMENT IN PHYSICAL INFRASTRUCTURE

The proposed quarry project is located in Irudukottai Village, Denkanikottai Taluk, Krishnagiri District and 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, Green fund etc.,

8.6 CORPORATE SOCIAL RESPONSIBILITY

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

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

- ❖ Health Services
- ❖ Social Development
- ❖ Infrastructure Development
- ❖ Education & Sports
- ❖ Self-Employment
- ❖ CSR Cost Estimation
- ❖ CSR activities mainly contributing to education, health, training of women self-help groups and infrastructure etc., will be taken up in the Irudukottai 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. 1000000** 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.1000000
	Total	Rs.1000000

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

8.8 SUMMARY OF PROJECT BENEFITS

The project would pay about **Rs.10,53,90,790** to the state government through various ways, as provided in Table 8.2.

Table 8.2 Project Benefits to the State Government

Particulars	Budget (Rs.)	
	@ 35% Granite Recovery	65% Granite Wastage
CER	1000000	---
Seigniorage @ Rs.3133/m ³ of Granite recovery Rs.265/m ³ of Granite wastage	75182601	11809725
District Mineral Foundation Tax @ 10% of Seigniorage	7518260	1180972
Green Tax @ 10% of Seigniorage	7518260	1180972
Total	9,12,19,121	1,41,71,669

CHAPTER IX
ENVIRONMENTAL COST BENEFIT ANALYSIS

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

CHAPTER X

ENVIRONMENTAL MANAGEMENT PLAN

10.0 GENERAL

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

10.1 ENVIRONMENTAL POLICY

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

The Proponent, **M/s. K.P.R Granites** 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.

10.9.4 Budgetary Provision for Environmental Management

Adequate budgetary provision has been made by the company for execution of Environmental Management Plan. The Table 10.1 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 (Rs.)	Recurring Cost/annum (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	19700	19700
	Fixed Water Sprinkling Arrangements + Water sprinkling by own water tankers	Fixed sprinkler installation and new water tanker cost for capital; and water sprinkling (thrice	800000	50000

		a day) cost for recurring		
	Air quality will be regularly monitored as per norms within ML area & ambient area	Yearly compliance as per CPCB norms	0	50000
	Muffle blasting – To control fly rocks during blasting	Blasting face will be covered with sand bags / steel mesh / old tyres / used conveyor belts	0	5000
	Wet drilling procedure / latest eco-friendly drill machine with separate dust extractor unit	Dust extractor @ Rs. 25,000/- per unit deployed as capital & @ Rs. 2500 per unit recurring cost for maintenance	100000	10000
	No overloading of trucks/tippers/tractors	Manual Monitoring through Security guard	0	5000
	Stone carrying trucks will be covered by tarpaulin to avoid escape of fines to the atmosphere	Monitoring if trucks will be covered by tarpaulin	0	10000
	Enforcing speed limits of 20 km/hr within ML area	Installation of speed Governors @ Rs. 5000/- per tipper/dumper deployed	10000	0
	Regular monitoring of exhaust fumes as per RTO norms	Monitoring of exhaust fumes	0	2500

	Regular sweeping and maintenance of roads for at least about 200 m from quarry entrance	Provision for 2 labours @ Rs.10,000/labour (Contractual)	0	39400
	Installing wheel wash system near exit gate of quarry	Installation + Maintenance + Supervision	50000	20000
Total Air Environment			979700	211600
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	Provision made in Operating Cost	0	0

	to reduce the PPV from blasting activity and implementing controlled blasting.			
	Proper warning system before blasting will be adopted and clearance of the area before blasting will be ensured.	Blowing Whistle by Mining Mate / Blaster / Competent Person	0	0
	Provision for portable blaster shed	Installation of portable blasting shelter	0	0
	NONEL Blasting will be practiced to control Ground vibration and fly rocks	Rs. 30/- per 6 tons of blasted material	0	0
Total Noise Environment			0	0
Water Environment	Water Management	Provision for garland drain @ Rs. 10,000/- per hectare with maintenance of Rs. 5,000/- per annum	19700	9850
Total Water Environment			19700	9850
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 Environment			30000	22000
Implementation of EC, Mining Plan & DGMS Condition	Size 6' X 5' with blue background and white letters as mentioned in MoM Appendix II by the SEAC TN	Fixed display board at the quarry entrance as permanent structure	10000	1000
Total Implementation of EC, Mining Plan			10000	1000
Occupational Health and Safety	Workers will be provided with Personal Protective Equipment	Provision of PPE @ Rs. 4000/- per employee with recurring based on wear and tear (say, @ Rs. 1000/- per employee)	108000	27000
	Health checkup for workers will be provisioned	IME & PME Health checkup @ Rs. 1000/- per employee	0	27000
	First aid facility will be provided	Provision of 2 Kits per Hectare @ Rs. 2000/-	0	7880
	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/-	394000	19700

		with Maintenance of Rs 10,000/- per annum		
	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	98500	19700
	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			640500	888280
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	78800	11820

		saplings @ 200 per plant (capital) for plantation inside the lease area and @ 30 per plant maintenance (recurring))"		
		Avenue plantation @ 300 per plant (capital) for plantation outside the lease area and @ 30 per plant maintenance (recurring)	177300	17730
Total Development of Green Belt			256100	29550
Mine Closure Activity	Closure includes 10% of the amount allotted for Greenbelt development, wire fencing, and garland drainage (Rule 27 in MCDR 2017 for Cat B mines will pay 2 lakhs per hectare or minimum amount of financial assurance of 5 lakhs)		0	66980
Green fund	G.O.(Ms). No.23, Dated: 28.09.2021	Section IVA of TNMMCR 1959 (@10% of Seigniorage Fee) (Seigniorage Fee for granite waste = Rs.3133 and for granite recovery = Rs.265)	7518260	0
Total EMP Budget			9454260	1162280 (Exclude. Mine Closure Cost)

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

Ist Year	IInd Year	IIIrd Year	IVth Year	Vth Year (Including Mine Closure Cost)	Total Recurring Cost	Total EMP Cost
1162280	1220394	1281414	1345484	1479739	6489311	15943571

In order to implement the environmental protection measures, an amount of Rs. 9454260 as capital cost and Rs. 1162280 as recurring cost/annum is proposed considering present market price considering present market scenario for the proposed project. After the adjustment of 5% inflation per year, the total recurring cost over 5 years is Rs.6489311 and the overall EMP cost for 5 years will be Rs.15943571, as shown in Table 10.2.

10.10 CONCLUSION

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

CHAPTER XI SUMMARY AND CONCLUSION

11.1 INTRODUCTION

As the proposed rough stone mining project (P1) falls within the quarry cluster of 500 m radius with the total extent of 14.20.2ha, it requires submission of EIA report for grant of Environmental Clearance (EC) after conducting public hearing. The proposed project falling in S.F.No.1121/6 and 1125/3 over the extent of 1.97.0ha is situated in the cluster falling in Irudukottai Village, Denkanikottai Taluk, Krishnagiri District, Tamil Nadu. The quarries involved in the calculation of cluster extent are three proposed quarries and five existing Quarries.

11.2 PROJECT DESCRIPTION

The proposed project area is located between Latitudes from 12°25'50.32737"N to 12°25'56.56272"N Longitudes from 77°49'54.82843"E to 77°50'0.97534"E in Irudukottai Village, Denkanikottai Taluk, Krishnagiri District, Tamil Nadu. According to the approved mining plan, about 23997m³ of multi colour granite 35% recovery and Granite waste 65% of 44565m³ will be mined up to the depth of 30m BGL in the five years. The quarrying operation is proposed to be carried out by open cast manual 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 March – May 2024 as per CPCB guidelines. The data were collected by both the FAEs and NABL accredited and MoEF notified *Greenlink Analytical and Research Laboratory (India) Private 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	Extent (ha)	Area (%)
1	Barren Rocky/stony waste	219.32	2.87
2	Crop Land	3357.04	43.99
3	Dense Forest	238.65	3.13
4	Land with or without scrub	1308.64	17.15
5	Mining / Industrial lands	12.83	0.17
6	Plantations	2482.33	32.53
7	Settlements	11.87	0.16
Total		7630.67	100.0

11.3.2 Soil Characteristics

The soil samples in the study area show loamy textures varying between silty clay loam, silty loam and sandy loam. pH of the soil varies from 6.4 to 7.9 indicating slightly acidic to slightly alkaline nature. Electrical conductivity of the soil varies from 43.85 to 133.2 $\mu\text{s}/\text{cm}$. Potassium ranges between 1077 and 3056 %, Calcium ranges between 4455 and 21085 mg/kg. Organic matter content ranges between 0.17 and 0.71%.

11.3.3 Water Environment

Groundwater in the study area occurs in the Peninsular Gneiss and Charnockite Gneiss. The movement of the groundwater is controlled by the intensity of weathering and fracturing of crystalline rocks. Dug wells and bore wells are the most common ground water abstraction structures in the area. However, in dry season, people in the study area heavily rely on bore wells for their domestic and agriculture purpose.

Five groundwater samples, known as BW1, BW2, BW3 and OW1 were collected from open well and bore well and analysed for physico-chemical conditions, heavy metals and

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, 2023 (Post Monsoon Season).

The open well water level data thus collected onsite are provided in Tables 3.7 and 3.8. According to the data, average depths to the static water table in open wells range from 21.80 to 24.57 m BGL in pre monsoon and 17.93 to 18.90 m BGL in post monsoon. The bore well data thus collected onsite are provided in Tables 3.9 and 3.10. The average depths to static potentiometric surface in bore wells for the period of October through December 2023 (Post-Monsoon Season) vary from 77.80 to 79.10 m and from 83.07 to 80.43m for the period of March through May, 2024 (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 3.9 -3.10, it is understood that most of the open well groundwater for the post- and pre-monsoon seasons flows towards the open well number 9 located in SE direction of the proposed project site. The

groundwater flow maps in Figure 3.10-3.11 show that most of the bore well groundwater for the post- and pre-monsoon seasons flow towards the bore well number 8. It is located in East 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.

11.3.4 Air Environment

As per the monitoring data, PM_{2.5} ranges from 13.4 µg/m³ to 15.8 µg/m³; PM₁₀ from 35.7 µg/m³ to 42.2µg/m³; SO₂ from 2.4µg/m³ to 4.2µg/m³; NO_x from 6.7 µg/m³ to 11.5 g/m³. The concentration levels of the pollutants fall within the acceptable limits of NAAQS prescribed by CPCB.

11.3.5 Noise Environment

Noise level in core zone was 49.7dB (A) Leq during day time and 36.4dB (A) Leq during night time. Noise levels recorded in buffer zone during day time varied from 39.0 to 45.1 dB (A) Leq and during night time from 37.5 to 39.4 dB (A) Leq. Thus, the noise level for industrial and residential area meets the requirements of CPCB.

11.3.6 Biological Environment

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

Flora in core zone

The mine lease area contains total of 17 species belonging to 12 families have been recorded from the mine lease area. 2 trees 6 shrubs, 9 herbs were identified. It is a grassy land. There are no endangered species in mine lease area. Details of vegetation with scientific name indicated in Table 3.21.

Flora in 300 m radius zone

There is no agricultural land nearby lease area. It contains a total of 34 species belonging to 21 families have been recorded from the buffer zone. 6 Trees (17%), 5 Shrubs (17%) and 22 Herbs and Climbers, Creeper, Grass & Cactus 20 (64%) were identified.

Fauna in Core Zone

A total of 26 varieties of species observed in the Core zone of Irudukottai Village, among them numbers of Insects 10, Reptiles 3, Mammals 4 and Avian 9. A total of 26 species belonging to 18 families have been recorded from the core Zone. There is no schedule I and

II species. A total of 10 species of bird were sighted in the study area. Details of fauna in core zone with the scientific name were mentioned in Table. 3.28.

Fauna in Buffer Zone

Taxonomically a total of 82 species belonging to 49 families have been recorded from the buffer zone area. Based on habitat classification the majority of species were Birds 50, followed by insects 13, reptiles 11, mammals 5 and amphibians 3. A total of 50 species of bird were sighted in the buffer zone. There are no critically endangered, endangered, vulnerable and endemic species were observed. Details of fauna in buffer zone with the scientific name were mentioned in Table. 3.31. data collation in secondary data

11.3.7 Socio Economic Environment

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

11.4 Anticipated Environmental Impacts and Mitigation Measures

11.4.1 Land Environment

Anticipated Impact

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

Mitigation Measures

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

11.4.2 Water Environment

Anticipated Impact

- Surface and ground water resources may be contaminated due to pit water discharge, domestic sewage, discharge of oil and grease bearing waste water from washing of vehicles and machineries, and washouts from surface exposure or working areas
- As the proposed project acquires 3.3 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

11.4.3 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
- 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

11.4.4 Noise Environment

Anticipated Impact

Total noise level in all the sampling areas is well below the CPCB standards for industrial and residential areas.

Mitigation Measures

- Usage of sharp drill bits while drilling which will help in reducing noise;
- Proper maintenance, oiling and greasing of machines will be done every week to reduce generation of noise;
- Provision of sound insulated chambers for the workers working on machines (HEMM) producing higher levels of noise;
- Silencers / mufflers will be installed in all machineries;
- Green Belt will be developed around the project areas 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

11.4.5 Biological Environment

Anticipated Impact

- During loading the truck, dust generation will be likely. This shall be a temporary effect and not anticipated to affect the surrounding vegetation significantly
- The Number of plants in the mining lease area is given in Chapter 3 which vegetation in the lease area may be removed during mining.
- Carbon released from quarrying machineries and tippers during quarrying would be 2337 kg per day, 631059 kg per year and 3155293 kg over five years, as provided in Table 4.11.

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 38721 kg of carbon per year. Therefore, we recommend planting large number of trees around the quarry and near school campuses, government wasteland, roadsides etc.
- As per the greenbelt development plan as recommended by SEAC (Table 4.13), about 935 trees will be planted within three months from the beginning of mining. These trees, when grown up would sequester carbon of about 118082 kg of the total carbon, as provided in Table 4.10.

11.4.6 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

11.4.7 Occupational Health

- All the persons will undergo pre-employment and periodic medical examination
- Employees will be monitored for occupational diseases by conducting medical tests: General physical tests, Audiometric tests, Full chest, X-ray, Lung function tests, 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 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 four proposed projects on air environment of the cluster do not exceed the permissible limits set by CPCB for air pollutants.

- The cumulative results of noise for the habitation in consideration do not exceed the limit set by CPCB for residential areas for day time
- PPV resulting from three proposed project is well below the permissible limit of Peak Particle Velocity of 5 mm/s
- The proposed three projects will allocate Rs. 30,00,000/- towards CER as recommended by SEAC
- The proposed three projects will directly provide jobs to 100 local people, in addition to indirect jobs.
- The proposed three projects will plant 3155 about trees in and around the lease area
- The proposed three projects will add 54 PCU per day to the nearby roads.

11.7 Project Benefits

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

- Direct employment to 22 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. 9454260 as capital cost and Rs. 1162280 as recurring cost/annum is proposed considering present market price considering present market scenario for the proposed project. After the adjustment of 5% inflation per year, the total recurring cost over 5 years is Rs.6489311 and the overall EMP cost for 5 years will be Rs.15943571, as shown in Table 10.2.

CHAPTER XII

DISCLOSURES OF CONSULTANT

The Project Proponent, **M/s.K.P.R Granites** has engaged **Geo Technical Mining Solutions**, a NABET accredited consultancy for carrying out the EIA study as per the ToR issued.

Address of the consultancy:

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

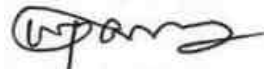
The accredited experts and associated members who were engaged in this EIA study are given below:

S.No.	Name of the expert	In house/ Empanelled	Sector	Functional Area	Category
Approved Functional Area Experts & EC					
1.	Dr.S.Karuppannan	EIA Coordinator (EC) In-house	1(a)(i)	Mining	A
2.	G. Prithiviraj	In-house, FAE	1(a)(i)	LU	B
3.	G. Umamaheswaran	In-house, FAE	1(a)(i)	GEO	B
4.	Dr.M.Vijaya Prabhu	Empanelled FAE	1(a)(i)	HG	B
5.	Dr. D.Kalaimurugan	In-house, FAE	1(a)(i)	EB	B
6.	R.Revathi	In-house, FAE	1(a)(i)	WP	B
7.	P. Venkatesh	In-house, FAE	1(a)(i)	AP	B
8.	C.Kumaresan	In-house, FAE	1(a)(i)	NV	B
9.	R. Elavarasan	In-house, FAE	1(a)(i)	SC	B
10.	Dr. G. Prabakaran	In-house, FAE	1(a)(i)	SE	B
11.	J.N. Manikandan	Empanelled FAE	1(a)(i)	RH, SHW, AP	B
12.	Dr. R. Arunbalaji	In-house, FAE	1(a)(i)	AQ,AP,NV	B

Approved Functional Area Associates					
13.	R.Srikrishna	FAA	1(a)(i)	LU	B
14.	K.Prithivi	FAA	1(a)(i)	GEO	B
15.	K.Ravichandiran	FAA	1(a)(i)	HG	B
16.	E.Kavitha	FAA	1(a)(i)	SC,EB	B
17.	M.Arunkumar	FAA	1(a)(i)	WP,HW	B
18.	P.Moorthy	FAA	1(a)(i)	AP	B
19.	P.Dhatchayini	FAA	1(a)(i)	AQ	B
20.	V.Malavika	FAA	1(a)(i)	NV,HW	B
Team Members					
21.	G. Umamaheswaran	In-house, FAE	1(a)(i)	TM for EC	B

DECLARATION BY EXPERTS CONTRIBUTING TO THE EIA & EMP

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

Signature : 

Date :

Name : **Dr. S. Karuppannan**


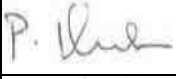

Designation : EIA Coordinator

Name of the EIA Consultant Organization : Geo Technical Mining Solutions





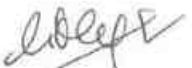
Period of Involvement : Till date

We, the FAEs and FAAs hereby declare that information furnished in this EIA/EMP report for M/s. K.P.R Granites, multicolour granite project with the extent of 1.97.0ha situated in the cluster with the extent of 14.20.2ha in Irudukottai Village, Denkanikottai Taluk, Krishnagiri District and Tamil Nadu is true and correct to the best of our knowledge.





List of Functional Area Experts Engaged in this Project





S. No.	Functional Area	Involvement	Name of the Experts	Signature
1	AP	<ul style="list-style-type: none"> ○ Identification of different sources of air pollution due to the proposed mine activity ○ Prediction of air pollution and propose mitigation measures / control measures 	J.N. Manikandan	
			P. Venkatesh	
			Dr.R. Arun Balaji	

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

8	LU	<ul style="list-style-type: none"> Construction of Land use Map Impact of project on surrounding land use Suggesting post closure sustainable land use and mitigative measures. 	G. Prithviraj	
9	NV	<ul style="list-style-type: none"> Identify impacts due to noise and vibrations Suggesting appropriate mitigation measures for EMP. 	C. Kumaresan	
10	AQ	<ul style="list-style-type: none"> Identifying different source of emissions and propose predictions of incremental GLC using AERMOD. Recommending mitigations measures for EMP 	Dr.R. Arun Balaji	
11	SC	<ul style="list-style-type: none"> Assessing the impact on soil environment and proposed mitigation measures for soil conservation 	Dr. D.Kalaimurugan	
12	SHW	<ul style="list-style-type: none"> Identify source of generation of non-hazardous solid waste and hazardous waste. Suggesting measures for minimization of generation of waste and how it can be reused or recycled. 	J.N. Manikandan	

List of Functional Area Associate Engaged in this Project

S.No.	Name	Functional Area	Involvement	Signature
1	R.Srikrishna	LU	<ul style="list-style-type: none"> Site visit with FAE Provide inputs & Assisting FAE for LU 	
	K.Prithivi	GEO	<ul style="list-style-type: none"> Field visits along with FAE Assistance to FAE in both primary and secondary data collection 	
2	K.Ravichandiran	HG	<ul style="list-style-type: none"> Site visit with FAE Provide inputs & Assisting FAE for HG 	
3	E.Kavitha	SC,EB	<ul style="list-style-type: none"> Field visits along with FAE Assistance to FAE in both primary data collection 	

4	M.Arunkumar	WP,HW	<input type="checkbox"/> Site visit with FAE <input type="checkbox"/> Assistance to FAE in collection of both primary and secondary data	
5	P.Moorthy	AP	<input type="checkbox"/> Site visit with FAE <input type="checkbox"/> Assistance to FAE in collection of both primary and secondary data	
4	P. Dhatchayini	AQ	<input type="checkbox"/> Site visit with FAE <input type="checkbox"/> Assistance to FAE in collection of both primary and secondary data	
5	V. Malavika	NV, SHW	<input type="checkbox"/> Site visit along with FAE <input type="checkbox"/> Assistance in report preparation	

DECLARATION BY THE HEAD OF THE ACCREDITED CONSULTANT ORGANIZATION

I, **Dr. S. KARUPPANNAN**, Managing Partner, **Geo Technical Mining Solutions**, hereby, confirm that the above-mentioned functional area experts and team members prepared the EIA/EMP report for M/s. K.P.R Granites, MultiColour granite quarry project with the extent of 1.97.0ha located within the cluster of 14.20.2ha in Irudukottai Village, Denkanikottai Taluk, Krishnagiri District and Tamil Nadu is true and correct to the best of my knowledge.

Signature : 

Date :

Name : **Dr. S. Karuppannan**

Designation : Managing Partner

Name of the EIA Consultant Organization : Geo Technical Mining Solutions

NABET Certificate No & Issue Date : NABET/EIA/23-26/RA 0319

Validity : Till 31.12.2026



सत्यमेव जयते

File No: 10632
Government of India
Ministry of Environment, Forest and Climate Change
(Issued by the State Environment Impact Assessment
Authority(SEIAA), TAMIL NADU)



Dated 22/04/2024



To,

V Prabavathi
KPR GRANITES
M/s. K.P.R.Granites, No.2/223, Avvai Nagar, Noolahalli-Post, Pennagaram Taluk, Dharmapuri District,
TamilNadu,,India, PENNAGARAM, DHARMAPURI, TAMIL NADU, 636813
kprgranites23@gmail.com

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

Sir/Madam,

This is in reference to your application for Grant of Terms of Reference under the provision of the EIA Notification 2006-regarding in respect of project Multi-Colour Granite Quarry over an extent of 1.97.0 Ha at S.F.Nos.1121/6 & 1125/3 of Irudukottai Village, Denkanikottai Taluk, Krishnagiri District, Tamil Nadu submitted to SEIAA-TN vide proposal number SIA/TN/MIN/458030/2024 dated 12/03/2024.

Reference:

1. Online proposal No. SIA/TN/MIN/458030/2024, Dated:09.01.2024.
2. Your application submitted for Terms of Reference dated:11.01.2024

2. The particulars of the proposal are as below :

(i) TOR Identification No.	TO24B0108TN5229773N
(ii) File No.	10632
(iii) Clearance Type	TOR
(iv) Category	B1
(v) Project/Activity Included Schedule No.	1(a) Mining of minerals
(vii) Name of Project	IRUDUKOTTAI VILLAGE MULTI-COLOUR GRANITE MINING LEASE
(viii) Name of Company/Organization	KPR GRANITES
(ix) Location of Project (District, State)	KRISHNAGIRI, TAMIL NADU
(x) Issuing Authority	SEIAA
(xii) Applicability of General Conditions	no
(xiii) Applicability of Specific Conditions	no

3. 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 SEIAA for an appraisal under the provision of EIA notification 2006 and its subsequent amendments.
4. The above-mentioned proposal has been considered by State Environment Impact Assessment Authority(SEIAA) in the meeting held on 05/04/2024. The minutes of the meeting and all the Application and documents submitted [(viz. Form-1, EIA, EMP)] are available on PARIVESH portal which can be accessed by scanning the QR Code above.
5. The State Expert Appraisal Committee (SEAC), based on the information & clarifications provided by the project proponent and after detailed deliberations recommended the proposal for grant of Terms of Reference 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).
6. 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 grant Terms of Reference for instant proposal of M/s.K.P.R.Granites under the provisions of EIA Notification, 2006 and as amended thereof.
7. The Ministry/SEIAA-TN reserves the right to stipulate additional conditions, if found necessary.
8. The Terms of Reference 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.
9. This issues with the approval of the Competent Authority.
10. The TORs 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 Secretary, Ministry of Mines, Government of India, ShastriBhawan, New Delhi.
2. The Additional Chief Secretary to Government, Environment and Forests Department, Tamil Nadu.
3. The Additional Chief Secretary to Government, Natural Resources Department, Tamil Nadu.
4. The Additional Principal Chief Conservator of Forests, Regional Office (SZ), 34, HEPC Building, 1st& 2nd Floor, Cathedral Garden Road, Nungambakkam, Chennai – 34.
5. The Chairman, Central Pollution Control Board, PariveshBhawan, CBD-Cum-Office Complex, East Arjun Nagar, New Delhi-110 032.
6. The Chairperson, TNPC Board,76, Mount Salai,Guindy, Chennai-32
7. The District Collector, Krishnagiri District.
8. The Commissioner of Geology and Mines, Guindy,Chennai-32
9. Assistant Director, Department of Geology & Mining, Krishnagiri District.
10. EI Division, Ministry of Environment & Forests, ParyavaranBhawan, New Delhi.
11. File Copy

Annexure 1

Specific Terms of Reference for (Mining Of Minerals)

1. Seac Standard Conditions

S. No	Terms of Reference
1.1	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:

S. No	Terms of Reference
	<p>(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.</p> <p>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.</p> <p>3. The PP shall submit a detailed hydrological report indicating the impact of proposed quarrying operations on the waterbodies like lake, water tanks, etc are located within 1 km of the proposed quarry.</p> <p>4. The Proponent shall carry out Bio diversity study through reputed Institution and the same shall be included in EIA Report.</p> <p>5. 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.</p> <p>6. 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.</p> <p>7. 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.</p> <p>8. 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.</p> <p>9. 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.</p> <p>10. 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.</p> <p>11. 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,</p> <p>12. What was the period of the operation and stoppage of the earlier mines with last work permit issued by the AD/DD mines?</p> <p>13. Quantity of minerals mined out.</p> <ul style="list-style-type: none"> ● 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

S. No	Terms of Reference
	<p>stipulated benches.</p> <p>14. 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).</p> <p>15. The PP shall carry out Drone video survey covering the cluster, green belt, fencing, etc.,</p> <p>16. 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.</p> <p>17. The Project Proponent shall provide the details of mineral reserves and mineable reserves, planned production capacity, proposed working methodology with justifications, the anticipated impacts of the mining operations on the surrounding environment, and the remedial measures for the same.</p> <p>18. The Project Proponent shall provide the Organization chart indicating the appointment of various statutory officials and other competent persons to be appointed as per the provisions of 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.</p> <p>19. 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.</p> <p>20. 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.</p> <p>21. 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.</p> <p>22. Rain water harvesting management with recharging details along with water balance (both monsoon & non-monsoon) be submitted.</p> <p>23. 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.</p> <p>24. 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.</p> <p>25. 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.</p> <p>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.</p> <p>27. Impact on local transport infrastructure due to the Project should be indicated.</p> <p>28. 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</p>

S. No	Terms of Reference
	<p>activity.</p> <p>29. A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific.</p> <p>30. 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.</p> <p>31. 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.</p> <p>32. 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</p> <p>33. 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.</p> <p>34. 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.</p> <p>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.</p> <p>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.</p> <p>37. 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.</p> <p>38. Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.</p> <p>39. 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.</p> <p>40. 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.</p> <p>41. 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.</p> <p>42. 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.</p>

2. Seiaa Standard Conditions

S. No	Terms of Reference
2.1	Cluster Management Committee

S. No	Terms of Reference
	<p>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.</p> <p>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.,</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>8.The committee shall furnish the Emergency Management plan within the cluster.</p> <p>9.The committee shall deliberate on the health of the workers/staff involved in the mining as well as the health of the public.</p> <p>10.The committee shall furnish an action plan to achieve sustainable development goals with reference to water, sanitation & safety.</p> <p>11.The committee shall furnish the fire safety and evacuation plan in the case of fire accidents.</p> <p>Impact study of mining</p> <p>12.Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area covering the entire mine lease period as per precise area communication order issued from reputed research institutions on the following</p> <ol style="list-style-type: none"> Soil health & soil biological, physical land chemical features . Climate change leading to Droughts, Floods etc. Pollution leading to release of Greenhouse gases (GHG), rise in Temperature, & Livelihood of the local people. Possibilities of water contamination and impact on aquatic ecosystem health. Agriculture, Forestry & Traditional practices. 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. <p>Agriculture & Agro-Biodiversity</p> <p>13.Impact on surrounding agricultural fields around the proposed mining Area.</p> <p>14.Impact on soil flora & vegetation around the project site.</p> <p>15.Details of type of vegetations including no. of trees & shrubs within the proposed mining area and. If so, transplantation of such vegetations all along the boundary of the proposed mining area shall committed mentioned in EMP.</p> <p>16.The Environmental Impact Assessment should study the biodiversity, the natural ecosystem, the soil micro flora, fauna and soil seed banks and suggest measures to maintain the natural Ecosystem.</p> <p>17.Action should specifically suggest for sustainable management of the area and restoration of ecosystem for flow of goods and services.</p> <p>18.The project proponent shall study and furnish the impact of project on plantations in adjoining patta lands, Horticulture, Agriculture and livestock.</p> <p>Forests</p> <p>19.The project proponent shall detailed study on impact of mining on Reserve forests free ranging wildlife.</p> <p>20.The Environmental Impact Assessment should study impact on forest, vegetation, endemic,</p>

S. No	Terms of Reference
	<p>vulnerable and endangered indigenous flora and fauna.</p> <p>21.The Environmental Impact Assessment should study impact on standing trees and the existing trees should be numbered and action suggested for protection.</p> <p>22.The Environmental Impact Assessment should study impact on protected areas, Reserve Forests, National Parks, Corridors and Wildlife pathways, near project site.</p> <p>Water Environment</p> <p>23.Hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) so as to assess the impacts on the nearby waterbodies due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided, covering the entire mine lease period.</p> <p>24.Erosion Control measures.</p> <p>25.Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area on the nearby Villages, Water-bodies/ Rivers, & any ecological fragile areas.</p> <p>26.The project proponent shall study impact on fish habitats and the food WEB/ food chain in the water body and Reservoir.</p> <p>27.The project proponent shall study and furnish the details on potential fragmentation impact on natural environment, by the activities.</p> <p>28.The project proponent shall study and furnish the impact on aquatic plants and animals in water bodies and possible scars on the landscape, damages to nearby caves, heritage site, and archaeological sites possible land form changes visual and aesthetic impacts.</p> <p>29.The Terms of Reference should specifically study impact on soil health, soil erosion, the soil physical, chemical components and microbial components.</p> <p>30.The Environmental Impact Assessment should study on wetlands, water bodies, rivers streams, lakes and farmer sites.</p> <p>Energy</p> <p>31.The measures taken to control Noise, Air, Water, Dust Control and steps adopted to efficiently utilise the Energy shall be furnished.</p> <p>Climate Change</p> <p>32.The Environmental Impact Assessment shall study in detail the carbon emission and also suggest the measures to mitigate carbon emission including development of carbon sinks and temperature reduction including control of other emission and climate mitigation activities.</p> <p>33.The Environmental Impact Assessment should study impact on climate change, temperature rise, pollution and above soil & below soil carbon stock.</p> <p>Mine Closure Plan</p> <p>34.Detailed Mine Closure Plan covering the entire mine lease period as per precise area communication order issued.</p> <p>EMP</p> <p>35.Detailed Environment Management Plan along with adaptation, mitigation & remedial strategies covering the entire mine lease period as per precise area communication order issued.</p> <p>36.The Environmental Impact Assessment should hold detailed study on EMP with budget for Green belt development and mine closure plan including disaster management plan.</p> <p>Risk Assessment</p> <p>37.To furnish risk assessment and management plan including anticipated vulnerabilities during operational and post operational phases of Mining.</p> <p>Disaster Management Plan</p> <p>38.To furnish disaster management plan and disaster mitigation measures in regard to all aspects to avoid/reduce vulnerability to hazards & to cope with disaster/untoward accidents in & around the proposed mine lease area due to the proposed method of mining activity & its related activities covering the entire mine lease period as per precise area communication order issued.</p> <p>Others</p>

S. No	Terms of Reference
	<p>39.The project proponent shall furnish VAO certificate with reference to 300m radius regard to approved habitations, schools, Archaeological sites, Structures, railway lines, roads, water bodies such as streams, odai, vaari, canal, channel, river, lake pond, tank etc.</p> <p>40.As per the MoEF& CC office memorandum F.No.22-65/2017-IA.III dated: 30.09.2020 and 20.10.2020 the proponent shall address the concerns raised during the public consultation and all the activities proposed shall be part of the Environment Management Plan.</p> <p>41.The project proponent shall study and furnish the possible pollution due to plastic and microplastic on the environment. The ecological risks and impacts of plastic & microplastics on aquatic environment and fresh water systems due to activities, contemplated during mining may be investigated and reported.</p>

Standard Terms of Reference for (Mining of minerals)

1.

S. No	Terms of Reference
1.1	An EIA-EMP Report shall be prepared for peak capacity (.....MTPA)operation in an ML/project area of.....ha based on the generic structure specified in Appendix III of the EIA Notification, 2006.
1.2	An EIA-EMP Report would be prepared for peak capacity operation to cover the impacts and environment management plan for the project specific activities on the environment of the region, and the environmental quality encompassing air, water, land, biotic community, etc. through collection of data and information, generation of data on impacts including prediction modeling for..... MTPA of mineral production based on approved project/Mining Plan for.....MTPA. Baseline data collection can be for any season (three months) except monsoon.
1.3	Propoer KML file with pin drop and coordinate of mine at 500-1000 m interval be provided
1.4	A Study area map of the core zone (project area) and 10 km area of the buffer zone (1: 50,000 scale) clearly delineating the major topographical features such as the land use, surface drainage pattern including rivers/streams/nullahs/canals, locations of human habitations, major constructions including railways, roads, pipelines, major industries, mines and other polluting sources. In case of ecologically sensitive areas such as Biosphere Reserves/National Parks/WL Sanctuaries/ Elephant Reserves, forests (Reserved/Protected), migratory corridors of fauna, and areas where endangered fauna and plants of medicinal and economic importance found in the 15 km study area should be given. The above details to be furnished in tabular form also
1.5	Map showing the core zone delineating the agricultural land (irrigated and un-irrigated, uncultivable land as defined in the revenue records, forest areas (as per records), along with other physical features such as water bodies, etc should be furnished.
1.6	A contour map showing the area drainage of the core zone and 25 km of the study area (where the water courses of the core zone ultimately join the major rivers/streams outside the lease/project area) should also be clearly indicated in the separate map.
1.7	Catchment area with its drainage map of 25 km area within and outside the mine shall be provided with names, details of rivers/ riverlet system and its respective order. The map should clearly indicate drainage pattern of the catchment area with basin of major rivers. Diversion of drains/ river need eloboration in form of lengthe, quantity and quality of water to be diverted

S. No	Terms of Reference																																																
1.8	(Details of mineral reserves, geological status of the study area and the seams to be worked, ultimate working depth and progressive stage-wise working scheme until the end of mine life should be provided on the basis of the approved rated capacity and calendar plans of production from the approved Mining Plan. Geological maps and sections should be included. The Progressive mine development and Conceptual Final Mine Closure Plan should also be shown in figures. Details of mine plan and mine closure plan approval of Competent Authority should be furnished for green field and expansion projects.																																																
1.9	Details of mining methods, technology, equipment to be used, etc., rationale for selection of specified technology and equipment proposed to be used vis-à-vis the potential impacts should be provided.																																																
1.10	Impact of mining on hydrology, modification of natural drainage, diversion and channeling of the existing rivers/water courses flowing through the ML and adjoining the lease/project and the impact on the existing users and impacts of mining operations thereon.																																																
1.11	A detailed Site plan of the mine showing the proposed break-up of the land for mining operations such as the quarry area, OB dumps, green belt, safety zone, buildings, infrastructure, Stockyard, township/colony (within and adjacent to the ML), undisturbed area -if any, and landscape features such as existing roads, drains/natural water bodies to be left undisturbed along with any natural drainage adjoining the lease /project areas, and modification of thereof in terms of construction of embankments/bunds, proposed diversion/re-channelling of the water courses, etc., approach roads, major haul roads, etc should be indicated.																																																
1.12	<p>Original land use (agricultural land/forestland/grazing land/wasteland/water bodies) of the area should be provided as per the tables given below. Impacts of project, if any on the land use, in particular, agricultural land/forestland/grazing land/water bodies falling within the lease/project and acquired for mining operations should be analyzed. Extent of area under surface rights and under mining rights should be specified. Area under Surface Rights</p> <table border="1"> <thead> <tr> <th>S.N</th> <th>ML/Project Land use</th> <th>Area under Surface Rights(ha)</th> <th>Area Under Mining Rights(ha)</th> <th>Area under Both (ha)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Agricultural land</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>Forest Land</td> <td></td> <td></td> <td></td> </tr> <tr> <td>3</td> <td>Grazing Land</td> <td></td> <td></td> <td></td> </tr> <tr> <td>4</td> <td>Settlements</td> <td></td> <td></td> <td></td> </tr> <tr> <td>5</td> <td>Others (specify)</td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>S.N.</th> <th>Details</th> <th>Area (ha)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Buildings</td> <td></td> </tr> <tr> <td>2</td> <td>Infrastructure</td> <td></td> </tr> <tr> <td>3</td> <td>Roads</td> <td></td> </tr> <tr> <td>4</td> <td>Others (specify)</td> <td></td> </tr> <tr> <td></td> <td>Total</td> <td></td> </tr> </tbody> </table>	S.N	ML/Project Land use	Area under Surface Rights(ha)	Area Under Mining Rights(ha)	Area under Both (ha)	1	Agricultural land				2	Forest Land				3	Grazing Land				4	Settlements				5	Others (specify)				S.N.	Details	Area (ha)	1	Buildings		2	Infrastructure		3	Roads		4	Others (specify)			Total	
S.N	ML/Project Land use	Area under Surface Rights(ha)	Area Under Mining Rights(ha)	Area under Both (ha)																																													
1	Agricultural land																																																
2	Forest Land																																																
3	Grazing Land																																																
4	Settlements																																																
5	Others (specify)																																																
S.N.	Details	Area (ha)																																															
1	Buildings																																																
2	Infrastructure																																																
3	Roads																																																
4	Others (specify)																																																
	Total																																																
1.13	Study on the existing flora and fauna in the study area (10km) should be carried out by an institution of relevant discipline. The list of flora and fauna duly authenticated separately for the core and study area and a statement clearly specifying whether the study area forms a part of the migratory																																																

S. No	Terms of Reference
	corridor of any endangered fauna should be given. If the study area has endangered flora and fauna, or if the area is occasionally visited or used as a habitat by Schedule-I species, or if the project falls within 15 km of an ecologically sensitive area, or used as a migratory corridor then a Comprehensive Conservation Plan along with the appropriate budgetary provision should be prepared and submitted with EIA-EMP Report; and comments/observation from the CWLW of the State Govt. should also be obtained and furnished.
1.14	One-season (other than monsoon) primary baseline data on environmental quality - air (PM10, PM2.5, SO _x , NO _x and heavy metals such as Hg, Pb, Cr, As, etc), noise, water (surface and groundwater), soil - along with one-season met data coinciding with the same season for AAQ collection period should be provided. The detail of NABL/ MoEF&CC certification of the respective laboratory and NABET accreditation of the consultant to be provided.
1.15	Map (1: 50, 000 scale) of the study area (core and buffer zone) showing the location of various sampling stations superimposed with location of habitats, other industries/mines, polluting sources, should be provided. The number and location of the sampling stations in both core and buffer zones should be selected on the basis of size of lease/project area, the proposed impacts in the downwind (air)/downstream (surface water)/groundwater regime (based on flow). One station should be in the upwind/upstream/non-impact/non-polluting area as a control station. The monitoring should be as per CPCB guidelines and parameters for water testing for both ground water and surface water as per ISI standards and CPCB classification wherever applicable. Observed values should be provided along with the specified standards.
1.16	For proper baseline air quality assessment, Wind rose pattern in the area should be reviewed and accordingly location of AAMSQ shall be planned by the collection of air quality data by adequate monitoring stations in the downwind areas. Monitoring location for collecting baseline data should cover overall the 10 km buffer zone i.e. dispersed in 10 km buffer area. In case of expansion, the displayed data of CAAQMS and its comparison with the monitoring data to be provided
1.17	A detailed traffic study along with presence of habitation in 100 mts distance from both side of road, the impact on the air quality with its proper measures and plan of action with timeline for widening of road. The project will increase the no. of vehicle along the road which will indirectly contribute to carbon emission so what will be the compensatory action plan should be clearly spell out in EIA/ EMP report.
1.18	The socio-economic study to conducted with actual survey report and a comparative assessment to be provided from the census data should be provided in EIA/ EMP report also occupational status & economic status of the study area and what economically project will contribute should be clearly mention. The study should also include the status of infrastructural facilities and amenities present in the study area and a comparative assessment with census data to be provided and to link it with the initialization and quantification of need based survey for CSR activities to be followed.
1.19	The Ecology and biodiversity study should also indicate the likely impact of change in forest area for surface infrastructural development or mining activity in relation to the climate change of that area and what will be the compensatory measure to be adopted by PP to minimize the impact of forest diversion.
1.20	Baseline data on the health of the population in the impact zone and measures for occupational health and safety of the personnel and manpower for the mine should be submitted.

S. No	Terms of Reference
1.21	Impact of proposed project/activity on hydrological regime of the area shall be assessed and report be submitted. Hydrological studies as per GEC 2015 guidelines to be prepared and submitted
1.22	Impact of mining and water abstraction from the mine on the hydrogeology and groundwater regime within the core zone and 10 km buffer zone including long-term monitoring measures should be provided. Details of rainwater harvesting and measures for recharge of groundwater should be reflected in case there is a declining trend of groundwater availability and/or if the area falls within dark/grey zone.
1.23	Study on land subsidence including modeling for prediction, mitigation/prevention of subsidence, continuous monitoring measures, and safety issues should be carried out.
1.24	Detailed water balance should be provided. The break up of water requirement as per different activities in the mining operations, including use of water for sand stowing should be given separately. Source of water for use in mine, sanction of the Competent Authority in the State Govt. and impacts vis-à-vis the competing users should be provided.
1.25	PP shall submit design details of all Air Pollution control equipment (APCEs) to be implemented as part of Environment Management Plan vis-à-vis reduction in concentration of emission for each APCEs
1.26	PP shall propose to use LNG/CNG based mining machineries and trucks for mining operation and transportation of mineral. The measures adopted to conserve energy or use of renewable sources shall be explored
1.27	PP to evaluate the green house emission gases from the mine operation and corresponding carbon absorption plan.
1.28	Site specific Impact assessment with its mitigation measures, Risk Assessment and Disaster Preparedness and Management Plan should be provided.
1.29	Impact of choice of mining method, technology, selected use of machinery and impact on air quality, mineral transportation, handling & storage/stockyard, etc, Impact of blasting, noise and vibrations should be provided.
1.30	Impacts of mineral transportation within the mining area and outside the lease/project along with flow-chart indicating the specific areas generating fugitive emissions should be provided. Impacts of transportation, handling, transfer of mineral and waste on air quality, generation of effluents from workshop etc, management plan for maintenance of HEMM and other machinery/equipment should be given. Details of various facilities such as rest areas and canteen for workers and effluents/pollution load emanating from these activities should also be provided.
1.31	Details of various facilities to be provided to the workers in terms of parking, rest areas and canteen, and effluents/pollution load resulting from these activities should also be given.
1.32	The number and efficiency of mobile/static water jet, Fog cannon sprinkling system along the main mineral transportation road inside the mine, approach roads to the mine/stockyard/siding, and also the frequency of their use in impacting air quality should be provided.
1.33	Conceptual Final Mine Closure Plan and post mining land use and restoration of land/habitat to the

S. No	Terms of Reference
	pre- mining status should be provided. A Plan for the ecological restoration of the mined out area and post mining land use should be prepared with detailed cost provisions. Impact and management of wastes and issues of re-handling (wherever applicable) and backfilling and progressive mine closure and reclamation should be furnished.
1.34	Adequate greenbelt nearby areas, mineral stock yard and transportation area of mineral shall be provided with details of species selected and survival rate Greenbelt development should be undertaken particularly around the transport route.
1.35	Cost of EMP (capital and recurring) should be included in the project cost and for progressive and final mine closure plan.
1.36	Details of R&R. Detailed project specific R&R Plan with data on the existing socio- economic status of the population (including tribals, SC/ST, BPL families) found in the study area and broad plan for resettlement of the displaced population, site for the resettlement colony, alternate livelihood concerns/employment for the displaced people, civic and housing amenities being offered, etc and costs along with the schedule of the implementation of the R&R Plan should be given.
1.37	CSR Plan along with details of villages and specific budgetary provisions (capital and recurring) for specific activities over the life of the project should be given.
1.38	Corporate Environment Responsibility:
1.39	a) The Company must have a well laid down Environment Policy approved by the Board of Directors.
1.40	b) The Environment Policy must prescribe for standard operating process/procedures to bring into focus any infringements/deviation/violation of the environmental or forest norms/conditions.
1.41	c) The hierarchical system or Administrative Order of the company to deal with environmental issues and for ensuring compliance with the environmental clearance conditions must be furnished.
1.42	d) To have proper checks and balances, the company should have a well laid down 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.
1.43	e) Environment Management Cell and its responsibilities to be clearly spelled out in EIA/ EMP report
1.44	f) In built mechanism of self-monitoring of compliance of environmental regulations should be indicated.
1.45	Status of any litigations/ court cases filed/pending on the project should be provided.
1.46	PP shall submit clarification from DFO that mine does not falls under corridors of any National Park and Wildlife Sanctuary with certified map showing distance of nearest sanctuary.
1.47	Copy of clearances/approvals such as Forestry clearances, Mining Plan Approval, mine closer plan

S. No	Terms of Reference							
	approval. NOC from Flood and Irrigation Dept. (if req.), etc. wherever applicable.							
1.48	<p>Details on the Forest Clearance should be given as per the format given:</p> <table border="0"> <tr> <td>Total Project Area (ha)</td> <td>ML Forest land (ha)</td> <td>Total Forest land (ha)</td> <td>Date of FC</td> <td>Extent of Forest Land</td> <td>Balance area for which FC is yet to be obtained</td> <td>Status of appl For diversion of forest land</td> </tr> </table> <p>If more than one provide details of each FC</p>	Total Project Area (ha)	ML Forest land (ha)	Total Forest land (ha)	Date of FC	Extent of Forest Land	Balance area for which FC is yet to be obtained	Status of appl For diversion of forest land
Total Project Area (ha)	ML Forest land (ha)	Total Forest land (ha)	Date of FC	Extent of Forest Land	Balance area for which FC is yet to be obtained	Status of appl For diversion of forest land		
1.49	In case of expansion of the proposal, the status of the work done as per mining plan and approved mine closure plan shall be detailed in EIA/ EMP report							
1.50	Details on Public Hearing should cover the information relating to notices issued in the newspaper, proceedings/minutes of Public Hearing, the points raised by the general public and commitments made by the proponent and the time bound action proposed with budgets in suitable time frame. These details should be presented in a tabular form. If the Public Hearing is in the regional language, an authenticated English Translation of the same should be provided.							
1.51	PP shall carry out survey through drone highlighting the ground reality for atleast 10 minutes							
1.52	Detailed Chronology of the project starting from the first lease deed allotted/Block allotment/ Land acquired to its No. of renewals, CTO /CTE with details of no. renewals, previous EC(s) granted details and its compliance details, NOC details from various Govt bodies like Forest NOC(s), CGWA permissions, Power permissions, etc as per the requisites respectively to be furnished in tabular form.							
1.53	The first page of the EIA/ EMP report must mention the peak capacity production, area, detail of PP, Consultant (NABET accreditation) and Laboratory (NABL / MoEF & CC certification)							
1.54	The compliances of ToR must be properly cited with respective chapter section and page no in tabular form and also mention sequence of the respective ToR complied within the EIA-EMP report in all the chapter,s section.							

SEAC Conditions - Site Specific

1. For the existing quarry, the PP shall obtain a letter from the concerned AD (Mines) which shall stipulate the following information:
 - i. Original pit dimension of the existing quarry
 - 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 carried out, if any
 - vi. Non-compliance/Violation in the quarry during the past working.
 - vii. Quantity of material mined out outside the mine lease area (or) in the adjacent quarry/land.
 - viii. Existing condition of Safety zone/benches
 - ix. Details of any penalties levied on the PP for any violation in the quarry operation
2. The PP shall spell out the conservation measures and include the cost in the EMP considering the existence of Cauvery North Wild Life Sanctuary after consultation with concerned DFO.
3. 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.
4. The PP shall carry out Drone video survey covering the cluster, Green belt, fencing etc.,
5. The Project Proponent shall furnish the revised EMP based on the study carried out on impact of the dust & other environmental impacts due to proposed quarrying operations on the nearby agricultural lands for remaining life of the mine in the format prescribed by the SEAC considering the cluster situation.
6. The Proponent shall furnish a comprehensive plan for storing the waste blockage of granite produced from the proposed quarrying operation to ensure sustainable environment.

From

Dr.P.Jayapal,M.Sc.,Ph.D.,
Deputy Director,
Dept of Geology and Mining,
Krishnagiri.

To

M/s. K.P.R Granites,
No.2/223, Avvai Nagar,
Noolahalli Post, Pennakaram Taluk,
Dharmapuri District -636813.

Roc.No.986/2019/Mines dated: .12.2023.

Sir,

Sub: Mines and Minerals – Minor Mineral – Multi colour Granite – Krishnagiri District - Denkanikottai Taluk – Irudukottai village S.F.Nos.1121/6 (1.04.0) & 1125/3 (0.93.0) over an extent of 1.97.0 Hects of Patta lands - Quarry lease has been granted in favour of M/s. K.P.R Granites for Multi Colour granite - Mining Plan approved by the Commissioner of Geology & Mining, Krishnagiri – Applied for obtaining Environmental Clearance From SEIAA - Details of quarries situated in 500 mtrs radial distance -requested – furnished - reg.

- Ref:**
1. The District Collector, Krishnagiri proposal note file Rc. No. 986/2019/Mines under single file system dated 30.01.2023.
 2. Mining Plan approved by the Commissioner of Geology & Mining, Krishnagiri vide letter No. 582/MM4/2021 Dated: 13.12.2023.
 3. M/s. K.P.R Granites letter dated 18.12.2023.

-o0o-

Kind attention is invited to the references cited above.

2) A quarry lease has been granted in favour of M/s. K.P.R Granites for Multi Colour granite over an extent of 1.97.0 hecets of Patta lands in S.F.Nos.1121/6 (1.04.0) & 1125/3 (0.93.0) of Irudukottai Village, Denkanikottai Taluk, Krishnagiri District for a period of 20 years under the provisions of Rule 19(A) of Tamil Nadu Minor Mineral Concession Rules 1959.

U. Prabhavati.

3) The commissioner of Geology & Mining vide reference 2nd cited has accorded approval for Mining Plan in respect of the said quarry lease.

4) The applicant vide reference 3rd cited has requested the details of quarries situated within 500mts for the subject quarry for furnishing the same to SEIAA in orders to get Environmental Clearance. As requested by the applicant the details of quarries situated within 500m radius of the subject quarry lease is furnished as follows:

I. Details of Existing quarries.

Sl. No.	Name and Address of the Lessee	Village and Taluk	SF No (s).	Extent (in Hects.)	G.O No. and Date	Lease Period	Last permit date
1	M/s. K.P.R Granites, No.2/223, Avvai Nagar, Noolahalli Post, Pennakaram Taluk, Dharmapuri District,	Irudukottai, Denkanikottai Taluk	1123/4A, 4B,5A,5B, 6A, 6B 1125/6, 1123/8(P)	2.34.3	GO (3D) No. 08 Natural Resources (MME-2) Dept. Dt. 28.07.23.	16.09.2023 to 15.09.2043	--
2	Thiru R. Mahendhar, S/o Ramegowdu, Kundumaranapalli Village, Denkanikottai -Tk, Krishnagiri Dist.	Irudukottai, Denkanikottai Taluk	1105/2 (p), 1105/3 (p)	0.71.0 0.29.0 ----- 1.00.0	GO (3D) No. 16 Ind.(MME-2) Dept. Dt. 22.6.2009	27.07.2009 to 26.07.2029	29.06.2016
3	Tvl. Ramachandra Granite & Coinstruction Pvt Ltd, Varaganapalli Village, Nagamangalam - Po, Denkanikottai Taluk	Irudukottai, Denkanikottai Taluk	1104/4, 1104/5 (part), 1104/6 (part), 1104/8	1.43.0	GO (3D) No. 04 Ind. (MME2) Dept dt. 25.1.2011	28.2.2011 to 27.2.2031	Nil
4	Tvl. Mahaboob Shereef, S/o Rasool Shriff, Irudukottai Village, Denkanikottai Tk, Krishnagiri Dt.	Irudukottai, Denkanikottai Taluk	1106/1 1123/1	0.98.5 0.22.0 ----- 1.20.5	G.O. (3D) No. 23 Industries (MME.2) Department dated. 27.08.2014	08.10.2014 to 07.10.2034	30.12.2016
5	M/s. S.V.Granites	Irudukottai, Denkanikottai Taluk	1124/7(P) 1130/7(P) 1131/7, 1131/8	1.91.5	G.O. (3D) No. 11 Natural Resources (MME-2) Dept. dated. 09.10.2023	14.11.2023 to 13.11.2043	--

U. Prabhavathi

II. Details of abandoned/Old quarries.

Sl. No.	Name of the lessee	GO.No. & Dated	Village & Taluk	S.F No.	Extent in Het	Lease period.
1.	----- Nil -----					

III. Details of other Proposed/applied quarries

Sl. No.	Name and Address of the Lessee	Village and Taluk	SF No (s).	Extent (in Hects.)	Proceeding No. and Date	Lease Period
1	M/s. K.P.R Granites, No.2/223, Avvai Nagar, Noolahalli Post, Pennakaram Taluk, Dharmapuri District	Irudukottai, Denkanikottai Taluk	1121/6, 1125/3	1.97.0	Roc.No.986/2019 /Mines Dated: 28.11.2023.	Instant Proposal, Mining Plan approved.
2	M/s. Anbura Minerals Pvt.Ltd., No.53C, First Floor M.G.Road, Hosur, Krishnagiri	Irudukottai, Denkanikottai Taluk	1127/4, 1127/5,	0.96.5 0.97.0 ----- 1.93.5	G.O. (3D) No. 13 Natural Resources (MME-2) Dept. dated. 08.11.2023	Execution under processing
3	Tvl. Top Granites, Old No. 7, New No. 16, First Floor, First Street, North Gopalapuram, Chennai - 600 086	Irudukottai Denkanikottai	1124/5,6 1151/5,6 & 1172/2A	2.40.40	Roc.No. 1133/2021/Mines Dated: 05.08.2021.	Mining plan approved.

Deputy Director,
Dept of Geology and Mining,
Krishnagiri.

Copy to :-

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

U. Prathapade

COMMISSIONERATE OF GEOLOGY AND MINING

From
Tmt. Pooja Kulkarni, I.A.S.
Commissioner,
Department of Geology and Mining,
Guindy, Chennai-32.

To
M/s.K.P.R Granites,
No.2/223, Avvai Nagar,
Noolahalli Post,
Pennagaram Taluk,
Dharmapuri-636 813.

Rc. No.582/MM4/2021, dated: 13.12.2023

Sir,

Sub:

Mines and Minerals - Minor Mineral - Multi Colour Granite - Krishnagiri district - Denkanikottai taluk - Irudhukottai village - over an extent of 1.97.0 ha of patta lands - S.F.Nos.1121/6 (1.04.0) and 1125/3 (0.93.0) -Quarry lease application preferred by M/s.K.P.R Granites, Krishnagiri - Precise area communicated by the Government - Mining Plan submitted by M/s.K.P.R Granites, Krishnagiri - Recommended by the Deputy Director (G&M), Krishnagiri - Approval accorded.

- Ref:
1. The Commissioner of Geology and Mining original file No. Rc.No.582/MM4/2021 dated 06.04.2023 forwarded under single file system.
 2. The Government letter No. 1379/MME.2/2021-1 dated 03.10.2023.
 3. Draft Mining plan submitted by M/s.K.P.R Granites, Krishnagiri dated.26.10.2023.
 4. The Deputy Director of Geology and Mining, Krishnagiri letter Rc.No.986/2019 (Mines), dated 28.11.2023.

Kind attention is invited to the above references cited

2) A quarry lease application preferred by M/s.K.P.R Granites, Krishnagiri for quarrying black granite over an extent of 1.97.0 ha of patta lands in S.F.Nos.1121/6 (1.04.0) and 1125/3 (0.93.0) of Irudhukottai village, Denkanikottai taluk, Krishnagiri district was forwarded to the Government by the Commissioner of Geology and Mining vide reference 1st cited for grant of quarry lease under rule 19-A of TNMMCR, 1959. Now, the Government vide letter dated 03.10.2023 have communicated the precise area to an extent of 1.97.0 ha and requested the applicant firm to submit

U. Prabhavathi

the approved mining plan through the Commissioner of Geology and Mining and to produce environmental clearance obtained from the competent authority for the subject area within a period of 3 months for grant of quarry lease.

3) Accordingly, the mining plan submitted by M/s.K.P.R Granites, Krishnagiri has been forwarded and recommended by the Deputy Director, (G&M), Krishnagiri vide reference 4th for the subject area for approval.

4) On Scrutinizing the mining plan submitted by M/s.K.P.R Granites, Krishnagiri and the report of the Deputy Director (G&M), Krishnagiri, the following are submitted.

- i. The Deputy Director (G&M), Krishnagiri has reported that the draft mining plan has been prepared by the Recognized Qualified Person and the details such as geological, mineable reserves, year wise production and development program have been incorporated in the draft mining plan. The special conditions imposed by the Government in the precise area communication are incorporated in the draft mining plan.
- ii. The Deputy Director (G&M), Krishnagiri has further reported that the mining plan submitted by M/s.K.P.R Granites has been verified with reference to field conditions by the Assistant Geologist(Mines) and Sub Inspector of Survey(Mines).
- iii. The proposed year wise production:

Year	ROM (cbm)	Production Reserves (m3)	Production (m ³) @ 35% Recovery	Granite Waste @ 65% cbm
1 st year	29051	13118	4591	8527
2 nd year	13694	13694	4793	8901
3 rd year	14335	14335	5017	9318
4 th year	13655	13655	4779	8876
5 th year	13760	13760	4816	8944
Total	84495	68562	23997	44565

- iv. As per the Mining plan submitted by M/s.K.P.R Granites, Krishnagiri, the ROM for the mining plan period is 84495 cbm

U165 Prabhavate

and the proposed production for the mining plan period is 24997 cbm @ 35% recovery for a depth of 30 m.

- v. As per the mining plan, with regard to the proposed, it has been proposed to dump on the northern side of the lease boundary area.
- vi. The existing pit dimensions for the quarrying conducted under the strength of the earlier lease has been demarcated with the depth contour in the appended sketch enclosed with the mining plan.

Pit Level	Length (m)	Width (m)	Depth (m)
Level I	14	13	1
Level II	25	12	5

- vii. There are no archeological monuments situated within the radial distance of 300 m from the subject area and no wild life sanctuary is situated within 1 km radius which satisfies rule 36(1-A) of amended Tamil Nadu Minor Mineral Concession Rules, 1959.
- viii. The Deputy Director (G&M), Krishnagiri has recommended and forwarded the mining plan submitted by M/s.K.P.R Granites, Krishnagiri for quarrying Black colour granite over an extent of 1.97.0 ha in S.F.Nos.1121/6 (1.04.0) and 1125/3 (0.93.0) of Irudhukottai village, Denkanikottai taluk, Krishnagiri district to the Commissioner of Geology and Mining, Chennai for approval.

4) The mining plan submitted by M/s.K.P.R Granites, Krishnagiri and report of the Deputy Director (G&M), Krishnagiri have been examined with reference to the provisions of Rule 12, 13 and 15 of Granite Conservation and Development Rules, 1999 read with G.O.(Ms). No. 87, Industries (MMC.1), Department dated: 22.02.2001. Based on the recommendation of the Deputy Director (G&M), Krishnagiri the mining plan submitted by M/s.K.P.R Granites, Krishnagiri is hereby approved subject to the following

U. Prabhavathi

conditions in addition to the conditions stipulated in the precise area communication issued by the Government.

- i. This 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. The approval of the mining plan does not in any way imply the approval of the Government in terms of any other provisions of the Mines and Minerals (Development and Regulation) Act 1957, or any other connected laws including Forest (Conservation) Act, 1980, Forest Conservation Rules, 1981, Environment Protection Act, 1980, Indian Explosives Act, 1884 (Central Act IV of 1884) and the rules made there under and the Tamil Nadu Minor Mineral Concession Rules, 1959.
- iii. This mining plan including progressive mine closure plan is approved without prejudice to any other order or direction from any court of competent jurisdiction.
- iv. Provisions of the Mines Act, 1952 and the Rules and Regulations made there under including submission of notice of opening, appointment of manager and other statutory officials as required under Mines Act, 1952 shall be complied with.
- v. Provisions made under Mines and Minerals (Development & Regulation) Act, 1957, MMDR Amendment Act, 2015 and Granite conservation and Development Rules, 1999 made there under shall be complied with.
- vi. Relaxation to be obtained under Rule 106(2)(b) of Metalliferous Mines Regulations, 1961 from the Director of Mines Safety, if necessary.
- vii. If anything is found to be concealed as required by the Granite Conservation and Development Rules, 1999 and Tamil Nadu Minor Mineral Concession Rules, 1959 and proposal for rectification has not been made, the approval shall be deemed to have been withdrawn with immediate effect.

- viii. A safety distance of 7.5 meters shall be maintained for the adjacent patta lands.
- ix. A safety distance of 10 meters shall be maintained for the Government land in S.F.Nos. 1121/4, 1121/5, situated on the western side and in S.F.Nos.1122/4 and 1125/5 situated on the eastern side of the applied area and also for S.F.No.1120/7(Podugal) situated on the west.
- x. A safety distance of 10.0 meters shall be maintained for the Government land in S.F.No. 1125/1, (Pathai) situated on the southwest corner of applied area.
- xi. No blasting and transportation of materials in vehicles should be carried out from 6.00 PM to 6.00AM.
- xii. A green belt should be constructed to prevent sound and air pollution due to the proposed quarrying activity by planting at least 250 seedlings all along the boundary the area.
- xiii. No hindrance shall be caused to the adjacent Patta lands and Government poramboke lands while quarrying and transportation of granite.
- xiv. The applicant firm shall strictly adhere to the statutory and safety requirements and the applicant should ensure the periodical medical checkup to the quarry workers to safeguard them from quarry related diseases.
- xv. The waste materials generated during the course of quarrying should be dumped only within the lease hold area that is earmarked for the purpose in the mining plan as per rule 31 of GCDR, 1999.
- xvi. The applicant firm shall submit Scheme of Mining, mine closure plan and other statutory requirements within the time stipulated for submission of the above as per GCDR, 1999 rules.
- xvii. The applicant firm should fence the lease granted area with barbed wire before the execution of lease deed as follows.
- The pillar post shall be firmly grounded with concrete foundation of height not less than 2 m with a distance between two pillars shall not be more than 3mts.

U. Prabhavathi

- The applicant firm shall incorporate the DGPS readings for the entire boundary pillars of the area and the same should be clearly shown in the mining plan.
 - A soft copy of the digitized map with DGPS readings should be submitted in CD to the Deputy Director (G&M), Krishnagiri.
- xviii. The boundary stone should be fixed for the subject quarry should be fixed and the district administration / Geology and Mining Department should ensure that the quarrying operation should be restricted only within the area granted for lease.
- xix. Environment Clearance should be obtained from the competent authority in respect of the subject area as per rule 42 of Tamil Nadu Minor Mineral Concession Rules, 1959 and as per the notification of the Ministry of Environment and Forest and any other clearances if any.
- xx. As per rule 12 (v) of Mineral (other than Atomic and Hydro Carbons Energy Minerals) Concession Rules, 2016, the applicant firm shall at their own expense, erect, maintain and keep in repair all boundary pillars.
- xxi. The conditions mentioned in G.O No. 79 Industries Department dated 06.04.2015 should be complied with.
- xxii. The applicant firm may use mild explosives during quarrying, and storing of explosives if required, by obtaining valid license under explosive Acts and Rules.
- xxiii. 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.
- xxiv. Child labour should not be engaged in the quarry works and the quarry workers should be registered in the Tamil Nadu Construction Labour Welfare Board.
- xxv. The applicant firm should remit the Stamp Duty as per the approved modified mining plan during the currency of the lease period.
- xxvi. The earlier instances of irregular / illegal quarrying, if any, shall not be regularized through the approval of this document.

- xxvii. The applicant firm shall remit the penalty / cost of mineral / other dues if any as arrived by the District Collector / Deputy Director (G&M), Krishnagiri district.
- xxviii. Non adherence to any condition set-out above, the approval shall be deemed to have been withdrawn with immediate effect.
- xxix. The applicant firm should comply with the additional conditions stipulated in the Government of India, Ministry of Mines, Order No.11/02/2020, dated.14.01.2020 issued as per the Order of the Hon'ble Supreme Court of India, dated.08.01.2020 states that, "The Mining lease holders shall after ceasing mining operations, undertake re-grassing the mining area and any other area which may have been disturbed due to their mining activities and restore the land to a condition which is fit for growth of fodder, flora, fauna etc".
- xxx. The applicant firm should carry out DGPS survey and erection of RCC boundary pillars as per the norms stipulated in the EOI notification in Rc.No.2921/MM4/2019 dated.01.02.2018 and subsequent corrigendum dated 13.08.2019, using the agencies empaneled by the CGM on 01.03.2023, 08.03.2023, 17.03.2023 and 18.03.2023.

Encl: 5 Copies of Approved Mining Plan.

Sd/- Pooja Kulkarni
Commissioner of Geology and Mining
Forwarded / by Order

[Signature]
12/11/23
Additional Director

Copy to:

- 1. The Additional Chief Secretary to Government, (FAC), Natural Resources Department, 4th Floor, Secretariat, Chennai-9.
- 2. The Director of Mines Safety, 3rd Floor, Left Wing, New Additional Building, CGO Complex, Shastri Bhawan, Nungambakkam, Chennai - 06
- 3. The District Collector, Krishnagiri District.

[Signature]
12/11/23

V. Prabhavate

MINING PLAN

FOR

IRUDUKOTTAI VILLAGE MULTI-COLOUR GRANITE MINING LEASE WITH
PROGRESSIVE QUARRY CLOSURE PLAN

Patta Land/Opencast, Semi-Mechanized Mining/Non-Forest/Non-Castive use-
'B2' Category

Lease period 20 Years from the date of lease execution

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

(Prepared under rule 12 & 13 of Granite Conservation and Development Rules, 1999)



LOCATION OF THE LEASE AREA

STATE : TAMILNADU
DISTRICT : KRISHNAGIRI
TALUK : DENKANIKOTTAI
VILLAGE : IRUDUKOTTAI
S.F.NO'S : 1121/6 and 1125/3
EXTENT : 1.97.0 HECTARES

ADDRESS OF THE APPLICANT

M/s. K.P.R Granites,
No.2/223, Avvai Nagar,
Noolahalli Post,
Pennagaram Taluk,
Dharmapuri District – 636 813.

PREPARED BY

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

RQP/MAS/263/2014/A

GEO TECHNICAL MINING SOLUTIONS

(A NABET Accredited & ISO Certified Company)

No: 1/213 -B, Ground Floor, Natesan Complex,
Oddapatti, Collectorate Post office,
Dharmapuri-636705. Tamil Nadu.

Mob. : +91 9443937841, +917010076633,

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

Website: www.gtmsind.com



U. Balhewadi
171

CONTENTS



Sl. No.	Description	Page No.
-	Certificates	5-8
-	Introductory notes	
1.0	General	14
2.0	Location and Accessibility	15
<u>PART-A</u>		
3.0	Geology and Mineral reserves	18
4.0	Mining	25
5.0	Blasting	31
6.0	Mine drainage	33
7.0	Stacking of mineral rejects and disposal of waste	34
8.0	Uses of mineral	34
9.0	Others	35
10.0	Mineral processing / Beneficiations	36
<u>PART-B</u>		
11.0	Environmental management plan	38
12.0	Progressive mine closure plan	44
13.0	Financial assurance	47
14.0	Certificates	47
15.0	Plan and sections, etc	47
16.0	Any other details intend to furnish by the applicant	47
17.0	CSR Expenditure	48

ANNEXURES



Sl. No.	Description	Annexure No.
1.	Copy of principal secretary to Government of TamilNadu communication letter	I
2.	Copy of FMB (Field Measurement book)	II
3.	Copy of Combine map	III
4.	Copy of "A" register	IV
5.	Copy of computer chitta, adangal and land documents	V
6.	Photo copy of the applied lease area	VI
7.	Copy of company registration certificate and partnership deed	VII
8.	Copy of ID proof of the authorized signatory	VIII
9.	Copy of willingness letter for explosives, Blasting work & license form	IX
10.	Copy of RQP Certificate	X

U. Prabhavathi
173



LIST OF PLATES

Sl. No.	Description	Plate No.	Scale
1	Route map	I	Not to scale
2	Location plan	I-A	Not to scale
3	Toposheet map	I-B	1:1,00,000
4	Satellite image for 1km radius	I-C	1: 10000
5	Environmental and land use plan for 1km Radius	I-D	1: 10000
6	Mine Lease plan	II	1:1000
7	Surface plan	III	1:1000
8	Geological plan	IV	1:1000
9	Geological sections	IVA	<u>Sections</u> HOR 1:1000 VER 1:500
10	Year wise development and Production plan	V	1:1000
11	Year wise development and Production sections	VA	<u>Sections</u> HOR 1:1000 VER 1:500
12	Quarry layout and Land use pattern plan	VI	1:1000
13	Progressive quarry closure plan	VII	1:1000
14	Progressive quarry closure sections	VIIA	<u>Sections</u> HOR 1:1000 VER 1:500
15	Conceptual plan	VIII	1:1000
16	Conceptual sections	VIIIA	<u>Sections</u> HOR 1:1000 VER 1:500

U. Palhavadi
174

M/s. K.P.R Granites
No.2/223, Avvai Nagar,
Noolahalli Post,
Pennagaram Taluk,
Dharmapuri District - 636 813



CONSENT LETTER FROM THE APPLICANT

The Mining Plan in respect of multi-colour granite quarry lease in S.F.No's. 1121/6 and 1125/3 of Patta land, over an extent of 1.97.0hectares in Irudukottai Village, Denkanikottai Taluk, Krishnagiri District, Tamil Nadu State has been prepared by

Dr. S. KARUPPANNAN. M.Sc., Ph.D. Regn. No. RQP/MAS/263/2014/A
(Under rule 13 (1) of Granite Conservation and Development Rules, 1999)

We request "The Commissioner, Department of Geology and Mining, Guindy, Chennai-600032" to make further correspondence regarding modifications of the mining plan with the said recognized qualified person on this following address,

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

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

Place: Dharmapuri, TN

Date:

U. Prabhavathi
Signature of the applicant
(For M/s. K.P.R Granites)

U. Prabhavathi

M/s. K.P.R Granites
No.2/223, Avvai Nagar,
Noolahalli Post,
Pennagaram Taluk,
Dharmapuri District – 636 813



DECLARATION

The mining plan in respect of multi-colour granite quarry lease in S.F.No's. 1121/6 and 1125/3 of Patta land, over an extent of 1.97.0hectares in Irudukottai Village, Denkanikottai Taluk, Krishnagiri District, Tamil Nadu State have been prepared with my consultation and I have understood and agree the contents to implement in accordance with the Granite Conservation & Development Rules, 1999.

Place: Dharmapuri, TN

Date:

U. Prabhavathi
Signature of the applicant
(For M/s. K.P.R Granites)

U. Prabhavathi
176

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



CERTIFICATE

This is to certify that, the provisions of under rule *12 & 13 of Granite Conservation and Development Rules, 1999* have been observed in the Mining Plan in respect of multi-colour granite quarry lease in S.F.No's. 1121/6 and 1125/3 of Patta land, over an extent of 1.97.0hectares in Irudukottai Village, Denkanikottai Taluk, Krishnagiri District, Tamil Nadu State prepared to **M/s. K.P.R Granites**, Dharmapuri -636 813, Tamil Nadu State.

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

Place: Dharmapuri, TN

Date: 20/10/23

Signature of the Recognized Qualified Person.

Dr. S. KARUPPANNAN, M.Sc.,Ph.D.,
 RQP/MAS/263/2014/A
GEO TECHNICAL MINING SOLUTIONS
 1/213-B, Ground Floor, Natesan Complex,
 Collectorate Post Office, Oddapatti,
 Dharmapuri-636 705, Tamil Nadu, India.

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



CERTIFICATE

I certify that the preparation of the mining plan in respect of multi-colour granite quarry lease in S.F.No's. 1121/6 and 1125/3 of Patta land, over an extent of 1.97.0hectares in Irudukottai Village, Denkanikottai Taluk, Krishnagiri District, Tamil Nadu State prepared to **M/s. K.P.R Granites**, Dharmapuri-636 813, Tamil Nadu State, covers all the provisions of mines act, rules and regulations etc., made therein and if any specific permissions required the applicant should approach **"The Director General of Mines and Safety", Chennai**. The standards prescribed by DGMS with respect to mines health will be strictly implemented.

Place: Dharmapuri, TN

Date: 20/10/23

Signature of the Recognized Qualified Person.

Dr. S. KARUPPANNAN, M.Sc, Ph.D.,
 RQP/MAS/263/2014/A
GEO TECHNICAL MINING SOLUTIONS
 1/213-B, Ground Floor, Natesan Complex,
 Collectorate Post Office, Oddapatti,
 Dharmapuri-636705, Tamil Nadu, India

U. Prabhavathi

MINING PLAN

FOR

IRUDUKOTTAI VILLAGE MULTI COLOUR GRANITE MINING LEASE WITH
PROGRESSIVE QUARRY CLOSURE PLAN

Patta Land/Opencast-Semi Mechanized Mining/Non-Forest/Non-Captive Lease –
“B2” Category

Lease Period 20 Years from the date of lease execution

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



(Prepared under rule 12 & 13 of Granite Conservation and Development Rules, 1999)

INTRODUCTORY NOTES:

1. **Introduction:** The Mining plan with progressive quarry closure plan is prepared for M/s. K.P.R Granites, registered office at No.2/223, Avvai Nagar, Noolahalli Post, Pennagaram Taluk, Dharmapuri District-636 813 and filed with application for new proposal has requested to grant the quarrying lease for multi-colour granite in S.F.No's. 1121/6 and 1125/3 over an extent of 1.97.0hectares of Irudukottai Village, Denkanikottai Taluk, Krishnagiri District, Tamil Nadu State to the District Collector, Krishnagiri dated 31.10.2019 and forwarded to the Director, Department of Geology and Mining, Guindy, Chennai vide letter no.986/2019/Mines, Dated 25.09.2023.
2. **Letter of Additional Chief Secretary to Government of Tamil Nadu:** The Additional Chief Secretary to Government (FAC) of Tamilnadu has directed to the applicant M/s. K.P.R Granites through his precise area communication letter Rc.No.1379/MME.2/2021-1, Dated 03.10.2023, to furnish approved mining plan through the Commissioner of Geology and Mining within a period of 3 months as per sub-rule (13) of rule 19-A of the TamilNadu Minor Mineral Concession Rules, 1959 and to produce Environmental Clearance obtained from competent authority for the quarrying lease multi-colour granite at Tamil Nadu State, Krishnagiri District, Denkanikottai Taluk, Irudukottai Village in S.F.No's. 1121/6 and 1125/3 over an extent of 1.97.0hectares has grant of quarrying lease for 20 (Twenty) years under rule 19-A of Tamil Nadu Minor Mineral Concession Rules, 1959, subject to the following conditions: -
 - 1) A safety distance of 7.5 meters should be maintained for the adjacent Patta lands.

U. Palhanade
179

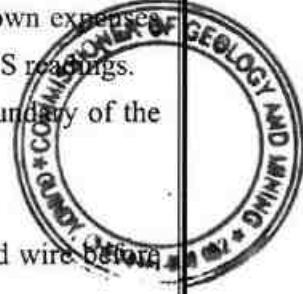
- 2) A safety distance of 10 meters shall be maintained for the Government land in S.F.Nos.1121/4, 1121/5 situated on the western side and in S.F.Nos.1122/4 and 1125/5 situated on the eastern side of the applied area and also for S.F.No.1120/7 (Podugal) situated on the west.
- 3) A safety distance of 10.0 meters shall be maintained for the Government land in S.F.No.1125/1 (Pathai) situated on the southwest corner of applied area.
- 4) As per the Hon'ble Supreme Court of India order dated 08.01.2014 in W.P.(C) No.144/2014 after ceasing quarrying operation re- grassing the quarry area and any other area which may have been disturbed due to the quarrying activities to restore the land to a condition which is fit for growth of fodder, flora, fauna etc.,
- 5) The four boundaries of the proposed area for the grant of Multi- Colour Granite quarry lease over an extent of 1.97.0 hectares in S.F.No.1121/6 (1.04.0) and 1125/3 (0.93.0) of Irudukottai Village, Denkanikottai Taluk, Krishnagiri District should be fixed and the quarrying operation should be restricted within the area granted on lease.
- 6) A green belt should be constructed to prevent sound and air pollution due to the proposed quarrying activity over an extent of 1.97.0 hectares in S.F.No.1121/6 (1.04.0) and 1125/3 (0.93.0 hectare) of Irudukottai Village, Denkanikottai Taluk, Krishnagiri District by planting atleast 500 seedlings of Neem and Pungan all around the area.
- 7) The boundary of the proposed area for multi colour granite quarry operation has to be demarcated by the Geology and Mines Department and also before issuing permit the District Administration is requested to confirm whether the mining operation is within the permitted area.
- 8) The District administration and Geology and Mining Department should ensure the conditions imposed in G.O.(Ms.) No.79, Industries Department, dated 06.04.2015.
- 9) In order to prevent illicit quarrying, when quarried material is transported necessary permits had been produced before the forest check post officials and necessary entries should be made in the register.
- 10) The quarrying operation should be restricted only in the area granted on lease.
- 11) Barbed wire fencing or compound wall should be erected all along the boundary of the lease granted area and the boundary pillars should be erected as per DGPS norms.
- 12) The waste materials generated during the course of quarrying should be dumped only within the leasehold area.
- 13) Environment Clearance should be obtained from the competent authority in respect of the subject area as per rule 42 of TNMMCR, 1959 and as per the



U. Prabhakar

notification of the Ministry of Environment and Forest and any other clearances if any.

- 14) As per rule 12 (V) of Mineral (other than Atomic and Hydro Carbons Energy Minerals) Concession Rules, 2016, the applicant firm shall at his own expenses erect, maintain and keep in repair all the boundary pillars with DGPS readings.
- 15) A green belt should be constructed by planting trees along the boundary of the area to control air and noise pollution.
- 16) No encroachment shall be made in the adjacent Government lands.
- 17) The applicant firm should fence the lease granted area with barbed wire before



the execution of lease deed as follows:-

- The pillar post shall be firmly grounded with concrete foundation of height not less than 2 meters with a distance between two pillars shall not be more than 3 meters.
- The applicant firm shall incorporate the DGPS readings for the entire boundary pillars of the area and the same should be clearly shown in the mining plan.
- A soft copy of the digitized map with DGPS readings should be submitted in CD to the Deputy Director (Geology and Mining), Krishnagiri.

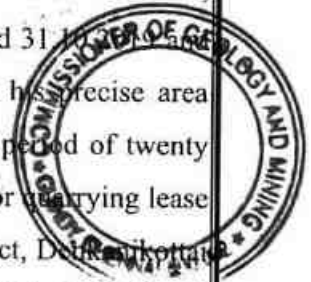
- 18) No pollution should be caused to the water bodies situated near by the applied area.
- 19) The applicant firm should carry out DGPS survey and erection of RCC boundary pillars as per the norms stipulated in the EOI notification in Rc.No.2921/MM4/2019, dated.01.02.2018 and subsequent corrigendum dated 13.08.2019 before execution of quarry lease through the empanelled agencies.
- 20) The quarry operations should be carried out with no hindrance to the special species such as plants, mammals, birds & butterflies as mentioned in the Ministry of Environment, Forest and Climate Change notification dated 01.01.2020.
- 21) In order to prevent man and animals conflict no blasting or quarrying operation should be carried out from 6.00 pm to 6.00 am.

3. **The previous lease particulars:** The proposed lease area was previously granted to quarrying of Red Multi-Coloured granite in favor of **Mr.G.Kalyankumar** by the District Collector, Dharmapuri proceedings vide Rc.666/95/(A.Mines) and G.O.3D.No.59 Industrial (E2) Department dated: 25.03.95 in S.F.No. 1125/3 (Part) & 1121/6 (Part) Dharmapuri District, Denkanikottai Taluk, Irudukottai Village, over

U. Pralhadachari

an extent of 3.00 acres. The lease was executed 28.04.1995 to 27.04.2005 for a period of 10 years

Now, proponent applied for new proposals has submitted to the District Collector, Department of Geology and Mining (DDG & M), Krishnagiri dated 31.10.2022. The Additional Chief Secretary to Government, recommended to his precise area communication letter 1379/MME.2/2022-1, Dated 03.10.2023 for period of twenty years recommended to favor of M/s. K.P.R Granites, Dharmapuri for quarrying lease Multi-colour granite quarry at Tamil Nadu State, Krishnagiri District, Dattarajukottai Taluk, Irudukottai Village in S.F.No: 1121/6 (1.04.0Hect) and 1125/3 (0.93.0Hect) over an extent of 1.97.0hectares



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

Existing pit Dimension			
Pit level	Length (m)	Width (m)	Depth(m)
Level-I	14	13	1
Level-II	25	12	5

- 4. Preparation and Submission of Mining Plan:** The Mining Plan with progressive quarry closure plan is prepared under rule 12 & 13 of Granite Conservation and Development Rules, 1999 and the conditions mentioned in the Additional Chief Secretary to Government (FAC) of Tamil Nadu letter No. 1379/MME.2/2021-1, Dated 03.10.2023.
- 5. Geological Resources and Mineable Reserves:** Geological resource of multi-colour granite is estimated as 860093m³ including the resources of safety zone and block in benches. Of which, multi-colour granite is 301033m³ in recovery of 35% and granites rejects of 559060m³ (Refer Plate No's.IV & IVA). Mineable reserves of multi-colour granite are estimated is 283064m³ by deducting the reserve safety zone, block in benches from the total Geological resources. of which, multi-colour granite is 99072m³ on recovery of 35% and granites rejects of 183992m³ up to a depth of 50m below ground level (R.L.919-869m) (Refer Plate No's.VIII & VIIIA).
- 6. Proposed Production Schedule:** Total proposed production of multi-colour granite is 68562m³. Of which multi-colour granite is 23997m³ in recovery of 35% and rejects of granites is 44565m³ of 65% up to a depth of 30m below ground level

U. Pralhavati

(R.L.919-889m) (Refer Plate No's.V & VA) for the first 5 years plan period.
Average production will be 4799m³ of multi-colour granite per year.



7. **Environmental sensitivity of the proposed lease area: -**

- i) **Interstate Boundary:** There is no Interstate Boundary within the 10km radius from the site.
- ii) **Wildlife Protection Act, 1972:** There is no wild life animal/ bird within radius of 1Km from the project site area under the Wildlife (Protection) Act, 1972. There is Cauvery wildlife sanctuary which is situated about 2.82km away from southeast side from the lease area.
- iii) **Indian Reserve Forest Act, 1980:** There is no reserve forest within 1km radius. The nearest reserved forest is Kolatti RF which is situated about 2.40km away from south side.
- iv) **CRZ Notification, 2019:** There is no sea coastal zone area found periphery of 10km radius lease area and this project site doesn't attract CRZ Notification, 2019.

8. **Environmental measures will be adopted during mining operation: -**

- i) Wet drilling method is adopted to control dust emissions. Delay detonators and shock tube initiation system for blasting will be used so as to reduce vibration and dust.
- ii) Drilling and blasting will be done only either by licensed explosive agent or by the proponent after obtaining required approvals from Competent Authorities.
- iii) The following measures are to be implemented to reduce Air Pollution during transportation of mineral
 - a. Roads will be graded to mitigate the dust emission.
 - b. Water will be sprinkled at regular interval on the main road and other service roads to suppress dust
- iv) No tree-felling will be done in the leased area, except only with the permission from competent Authority.
- v) During quarrying operation should not disturbed the nearby water bodies and agricultural activities surrounding site.
- vi) The quarrying activity in no way should disturb the Wildlife habitat, free migratory movement of the wildlife nor disturb the wildlife in any way.
- vii) Noise Control in blasting, control of fly rock missiles and vibration by doing peak particle velocity with in standard as prescribed by the DGMS and MOEF.

U. Palbhavati
183

viii) Any other conditions stipulated by other Statutory/Government authorities to be complied

1.0 GENERAL:

a.	Name of the applicant	M/s. K.P.R Granites
	Applicant address	2/223, Avvai Nagar, Noolahalli Post, Pennagaram Taluk,
	District	Dharmapuri
	State	TamilNadu
	Pin code	636 813
	Phone	---
	Fax	---
	Gram	---
	Telex	---
	E-mail	---
	Status of the applicant	
	Private individual	---
	Cooperative Association	---
	Private company	Private Firm
	Public Company	---
	Public Sector Undertaking	---
	Joint Sector Undertaking	---
	Other (pl. specify)	---
c.	Mineral(s) Which are occurring in the area and which the applicant intends to mine	Multi-colour granite
d.	Period for which the mining lease granted/renewed/proposed to be applied	Mining lease granted for the period of 20 (Twenty) years under rule 19-A of Tamil Nadu Minor Mineral Concession Rules, 1959
e.	Name of the RQP preparing the Mining Plan	Dr. S.KARUPPANNAN.M.Sc.,Ph.D.,
	Address	GEO TECHNICAL MINING SOLUTIONS (A NABET Accredited & ISO Certified Company) No: 1/213-B, Ground Floor, Natesan Complex, Oddapatti, Collectorate Post office, Dharmapuri-636705 Website: www.gtmsind.com
	Phone	+91 9443937841, 7010076633
	Fax	Nil
	e-mail	info.gtmsdpi@gmail.com
	Telex	Nil
	Registration Number	RQP/MAS/263/2014/A



U. Prabhakar

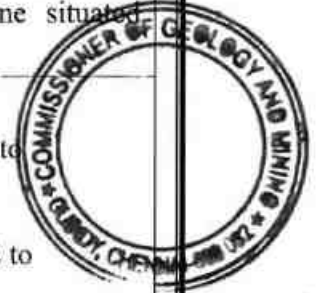
	Date of grant/renewal	16.12.2014
	Valid upto	15.12.2024
f.	Name of the prospecting agency	The Commissioner, Department of Geology and Mining
	Address	Thiru.Ve.Ka.Industrial Estate, Chandy, Chennai-600032
	Phone	-----
g.	Reference No. and date of consent letter from the state government	The Additional Chief Secretary to Government (FAC) of Tamilnadu - Letter. No.1379/MME.2/2021-1, Dated 03.10.2023.



2.0 LOCATION AND ACCESSIBILITY:

a.	Details of the Area:	: Refer plate no: IA & IB																										
	District & State	: Krishnagiri, Tamil Nadu																										
	Taluk	: Denkanikottai																										
	Village	: Irudukottai																										
	Khasra No./ Plot No./ Block Range/Felling Series etc. :																											
	<table border="1"> <thead> <tr> <th>Survey No.</th> <th>Sub division</th> <th>Total Extent in Hect</th> <th>Patta No.</th> <th>Village and Name of the Land Owner</th> <th>Mine lease Applied S.F. No.</th> <th>Mine lease Applied Area out of total area in hect.</th> </tr> </thead> <tbody> <tr> <td>1121</td> <td>6</td> <td>1.04.0</td> <td rowspan="2">8927</td> <td rowspan="2">M/s.K.P.R.Granites Managing Partner 1.Mr.P.Muthusamy 2.Mrs.K.Prabhavathi</td> <td>1121/6</td> <td>1.04.0</td> </tr> <tr> <td>1125</td> <td>3</td> <td>0.93.0</td> <td>1125/3</td> <td>0.93.0</td> </tr> <tr> <td colspan="2">Total Extent</td> <td>1.97.0</td> <td colspan="2">Total applied lease area</td> <td colspan="2">1.97.0</td> </tr> </tbody> </table>	Survey No.	Sub division	Total Extent in Hect	Patta No.	Village and Name of the Land Owner	Mine lease Applied S.F. No.	Mine lease Applied Area out of total area in hect.	1121	6	1.04.0	8927	M/s.K.P.R.Granites Managing Partner 1.Mr.P.Muthusamy 2.Mrs.K.Prabhavathi	1121/6	1.04.0	1125	3	0.93.0	1125/3	0.93.0	Total Extent		1.97.0	Total applied lease area		1.97.0		
Survey No.	Sub division	Total Extent in Hect	Patta No.	Village and Name of the Land Owner	Mine lease Applied S.F. No.	Mine lease Applied Area out of total area in hect.																						
1121	6	1.04.0	8927	M/s.K.P.R.Granites Managing Partner 1.Mr.P.Muthusamy 2.Mrs.K.Prabhavathi	1121/6	1.04.0																						
1125	3	0.93.0			1125/3	0.93.0																						
Total Extent		1.97.0	Total applied lease area		1.97.0																							
	Lease area (hectares)	: 1.97.0hectares																										
	Whether the area is recorded to be in forest (please specify whether protected, reserved etc)	: No forest is involved. This is recorded as a patta land.																										
	Ownership / Occupancy	: This is a patta land S.F.No's. 1121/6 & 1125/3 is registered in the name of M/s.K.P.R.Granites and Managing Partner 1.Mr.P.Muthusamy, 2.Mrs.K.Prabhavathi vide Patta No.8927 in Irudukottai village records. (Ref. Annex. No:V).																										
	Existence of Public Road / Railway line if any nearby and approximate distance	: ✓ Exploited granite materials will be transported through the nearby approach road is situated on the eastern side. ✓ There is no SH or NH road situated within radius of 5km.																										

U. Prabhavathi



✓ There is no railway line situated within the 5km radius.

Toposheet No. with latitude and longitude : Toposheet No. 57 H/15
 Latitude: 12°25'50.32737"N to 12°25'56.56272"N
 longitude: 77°49'54.82843"E to 77°50'0.97534"E

DGPS Geo-Coordinates of the lease boundary:

DGPS SURVEY WAS CONDUCTED IN STATIC METHOD (BASE POINT 2 HOUR DGPS POINT)

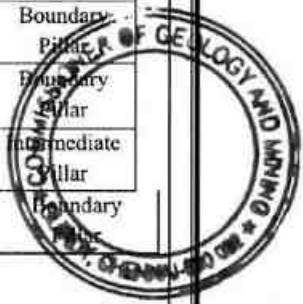
ID	Latitude (Global)	Longitude (Global)	Easting (Meter)	Northing (Meter)	Elevation (Meter)	Feature Code
BS	12° 25' 52.54321" N	77° 49' 58.97717" E	808018.886	1375882.772	915.223	Base Station + Boundary Pillar

ROVER POINTS 1 HOURS FOR BOUNDARY PILLAR AND 20 MINUTES FOR INTERMEDIATE PILLAR IN STATIC METHOD

ID	Latitude (Global)	Longitude (Global)	Easting (Meter)	Northing (Meter)	Elevation (Meter)	Feature Code
1	12° 25' 56.56272" N	77° 49' 58.45854" E	808001.896	1376006.209	919.515	Boundary Pillar
2	12° 25' 54.94993" N	77° 49' 58.6666" E	808008.713	1375956.680	918.056	Intermediate Pillar
3	12° 25' 53.34672" N	77° 49' 58.87342" E	808015.490	1375907.447	917.226	Intermediate Pillar
4	12° 25' 52.54321" N	77° 49' 58.97717" E	808018.886	1375882.772	915.223	Base Station + Boundary Pillar
5	12° 25' 52.52513" N	77° 50' 0.62982" E	808068.844	1375882.748	915.182	Intermediate Pillar
6	12° 25' 52.52136" N	77° 50' 0.97534" E	808079.286	1375882.743	915.213	Boundary Pillar
7	12° 25' 51.18111" N	77° 50' 0.05233" E	808051.828	1375841.230	914.816	Intermediate Pillar
8	12° 25' 50.70648" N	77° 49' 59.72542" E	808042.103	1375826.527	913.534	Boundary Pillar
9	12° 25' 50.57342" N	77° 49' 58.07621" E	807992.304	1375821.908	913.735	Intermediate Pillar
10	12° 25' 50.4405" N	77° 49' 56.42712" E	807942.505	1375817.290	913.659	Intermediate Pillar
11	12° 25' 50.32737" N	77° 49' 55.02329" E	807900.112	1375813.357	913.984	Boundary Pillar
12	12° 25' 51.01679" N	77° 49' 55.42350" E	807911.985	1375834.686	914.453	Boundary Pillar
13	12° 25' 51.98740" N	77° 49' 55.27373" E	807907.139	1375864.486	914.237	Boundary Pillar
14	12° 25' 52.08113" N	77° 49' 55.01982" E	807899.433	1375867.288	914.674	Boundary Pillar
15	12° 25' 52.57532" N	77° 49' 55.02696" E	807899.486	1375882.488	915.453	Boundary Pillar
16	12° 25' 52.57695" N	77° 49' 54.82843" E	807893.486	1375882.474	915.673	Boundary Pillar

U. Pralhavati
186

17	12° 25' 54.11923" N	77° 49' 55.37963" E	807909.642	1375930.078	916.428	Intermediate Pillar
18	12° 25' 54.88406" N	77° 49' 55.65302" E	807917.653	1375953.685	917.247	Boundary Pillar
19	12° 25' 54.79641" N	77° 49' 56.09407" E	807931.012	1375951.134	917.743	Boundary Pillar
20	12° 25' 56.21800" N	77° 49' 56.91321" E	807955.305	1375995.113	918.398	Intermediate Pillar
21	12° 25' 56.42053" N	77° 49' 57.02994" E	807958.765	1376001.378	919.472	Boundary Pillar
Land use pattern (Forest, Agricultural, Grazing, Barren etc.)			: It is a dry and virgin land.			
b).	<i>Attach a general location and vicinity map showing area boundaries and existing and proposed access routs. It is preferred that the area to be marked on a survey of India topographical map or a cadastral map or forest map as the case may be. However if none of these are available, the area should be shown on an accurate sketch map on scale of 1 : 5000.</i>		: Refer plate No-IA & IB			



d) INFRASTRUCTURE AND COMMUNICATION:

S.No	Description	Place	Distance	Direction
a.	Nearest post office	Bikkanapalli	4.3Km	SW
b.	Nearest police station	Denkanikottai	10.8km	NW
c.	Nearest fire station	Denkanikottai	10.2km	NW
d.	Nearest medical facility	Hanumanthapuram	1.65Km	NE
e.	Nearest school	Andevanapalli	8.77Km	NW
f.	Nearest railway station	Periya Nagathunai	16.4km	NE
g.	Nearest port facility	Chennai	277.2km	NE
h.	Nearest airport	Hosur	25.0km	NW
i.	Nearest DSP office	Denkanikottai	11.9km	NW
j.	Nearest villages	Irudukottai	2.44km	NW
		Namrelli	1.6km	NE
		Tottikuppam	0.82km	SE
		Belalam	1.73km	SW

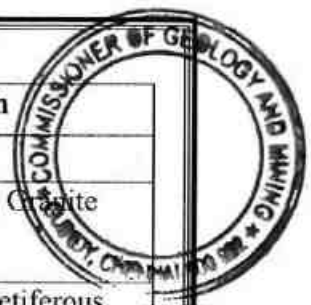
PART - A**3.0 GEOLOGY AND MINERAL RESERVES:**

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

(i)	Topography	: The applied lease area exhibits an elevated topography which is elevation difference of 6m. The highest elevation observed in North of the lease area is 919m AMSL, whereas the lowest elevation in South is 913m AMSL. The slope is towards south and falls in Toposheet no.57-H/15.
(ii)	<p>General Geology of the District:-</p> <p>The geological formations of the district belong mainly to Archaean age along with rock of Proterozoic age. The former is re-presented by Khondalite Group of rocks, Charnockite Group of rocks, Migmatites Complex, Sathyamangalam Group of rocks, while the latter is represented by Alkaline rocks. The Khondalite Group includes garnet sillimanite gneiss and quartzite which occur as small patches. The migmatite complex includes garnetiferous quartzo feldspathic gneiss and hornblends biotite gneiss, the former exposed on the western part of the district. The Sathyamangalam Group includes fuchsite quartzite, sillimanite mica schist and amphibolites. The Bhavani Group in this area includes fissile hornblende-biotite gneiss, granitoid gneiss and pink migmatite. Amphibolites with barbed ferruginous quartzite and associated quartzo-feldspathic rocks (Champion Gneiss) represent the Kolar group and are found west and southwest of Veppanapalli. Following this there are basic intrusions occurring as dykes. The Charnockite Group occupies a major part of the south-west portion of this district with small bands of garnetiferous quartzo-feldspathic gneiss, Granite gneiss and dolerite dykes. The North-East and Northern part of the district mainly consist of granite gneiss with small patches of Pink Migmatite, hornblende-biotite gneiss and dolerite dykes. The Eastern part of the district consists of Epidote-Hornblende Gneiss, Ultra Mafics, Syenite and Carbonatite. The Alkaline Complex is represented by epidote-hornblende gneiss, ultramafics, syenite and carbonatite and these are distributed in the eastern part of the district. Innumerable basic dykes and felsites, quartz, barites and pegmatite veins form part of the Alkali Complex.</p>	



U. Pralhavati



Order of superposition of the district,

Age	Group	Rock Formation
Recent to Sub recent	---	Top Soil (1-2m Thick)
Archaean to Lower Proterozoic	Kolar group	Quartzo-feldspathic gneiss, Quartzite gneiss and dolerite dykes
Archaean	Charnockite Group	Migmatites Complex, Garnetiferous quartzo feldspathic gneiss, hornblends biotite gneiss, Charnockite.
	Khondalite Group	Garnet sillimanite gneiss, Quartzite

(iii) Local / Mine Geology of the Mineral Deposit: -

a) Topography of the proposed lease area:

The applied lease area exhibits an elevated topography which is elevation difference of 6m. The highest elevation observed in north side of the lease area is 919m AMSL, whereas the lowest elevation in south side is 913m AMSL. The slope is towards south side.

The topsoil is obtained about 0-1m, 1-3m weathered rock and a multi-colour starts from 3 to 50m (R.L.919-869m) from below the ground level as respectively. The Surface plan showing elevation, outcrops, contour, accessibility road and Geological map was prepared the proposed lease area.

This Multi colour granite is commercially called as "Paradiso" and Petrologically called as "Migmatite" which is widely used for slabs, Tiles and Monuments after cutting and polishing. The area of mining lease comprised of Migmatite, a type of multi granite with light colour and good wave patterns. Massive outcrop of red multi granite is found of the lease area, partly covered by red soil concealing the outcrops. Granite on northeastern side is appeared. The rate of recovery is taken as 35% based on filed geological and structural aspects. The strike of the granite body is trending in N65°E-S65°W direction and dips vertical.

b) Mode of origin:

Multi-colour granite is an intrusive igneous rock with large grains (minerals) easily seen by the naked eye. An intrusive rock means that molten rock cooled within the crust and was never expelled as molten rock. The gradual cooling of molten rock is imperative to create the large crystals of a singular mineral that we see in granites. With time, there is differential lithification or solidifying of molten rock dependent on chemical makeup, this allows for different types of minerals to

U. Prabhavati
189



form at different periods of time and alter the final resulting granite. The size of individual grains is proportional to how slowly the molten rock was cooled. Extrusive rocks cool during a volcanic eruption and allow no time for crystallization of minerals, creating a homogenous looking rock with no discernible grains.

c) Physiography of the rocks:

Multi-colour granite is a variation of pink potassium feldspar abundant granite, where the k-feldspar takes on a redder than pinker color. Also, you can get red coloring from iron oxide in hematite grains or inclusion within feldspar, essentially the same process that makes rusted metal ruby red colored.

d) Mineral composition of rocks:

The mineral constituents are biotite, quartz, orthoclase feldspar and less plagioclase feldspar. The biotite is fine grained and other minerals are medium grained. The graphic texture and intergrowth of quartz and feldspar indicates that younger intrusive were invaded into the preexisting country rock, which preferably would have been a biotite gneiss (Peninsular Gneisses). Xenolith of schistose rock are also found along the contact of granite band. Therefore, it is clear from the regional flow structure and texture of Xenolith, the rock would be a type of **Migmatite**. Flowage structure and texture of rock indicates deep seated metamorphism at high temperature and pressure. Dimensional cutting and polishing of these type of hard and compact rocks exhibits an attractive pinkish and grey shades of background with attractive wave patterns. It is a part of peninsular gneisses migmatized by younger intrusive. It is commercially called as "Red Multi" by the buyers in view of its wave pattern of accessory minerals.

Order of superposition of the proposed lease area,

Age	Group	Rock Formation
Recent to Sub recent	----	Topsoil-Morum (3m thick)
Archaean to Lower Proterozoic	--	Migmatite (Red Multi) granite, Biotite gneiss

(iv)	Drainage Pattern	:	There are no major water bodies like rivers, pond, etc., located within a radius of 50m. The drainage is sub-dendritic in general.
------	------------------	---	--

(b) The topographic plan of the lease area prepared on a scale of 1 :1000 or 1: 2000 with contour interval of 3 to 10m depending upon the topography of the area should be taken as the base plan for preparation of geological plan. The details of exploration

U. Prabhakar

already carried out including evidences of mineral existence should be shown on the geological plan:

Topographic Plan of lease area – Plate IB prepared on a scale of 1 : 1,000
Geological Plan – Plate No. IV (1:1000 Scale)



(i) Present status:

RQP along with hydrogeologists and DGPS team of Geotechnical Mining Solutions Dharmapuri analyzed the lease area for mining plan preparation. The proposed lease area is a existing lease grant and the area exhibits outcrops well exposed on the west side and has strike of the granite body is trending in N65⁰E - S65⁰W direction with steep dip.

(ii) Surface Plan:

Surface plan showing elevation, contours, outcrops and accessibility road was prepared at the scale of 1: 1000, as shown in Plate No.III.

(iii) 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. IVA.

(c) Broadly indicate the Year wise future programme of exploration, taking into consideration the future production programme planned in next five years as in table below: -

Year	No. of boreholes	Total meterage	No. of Pits and Dimensions	No. of Trenches and Dimensions
First	N.A	---	---	N.A
Second	N.A	---	---	N.A
Third	N.A	---	---	N.A
Fourth	N.A	---	---	N.A
Fifth	N.A	---	---	N.A
Total	---	---	---	---

Since, its proved by State Geological Department, The Commissioner of Geology and Mining, Thiru.Ve.Ka. Industrial Estate,Guindy, Chennai-600032. Its massive homogeneous parent rock. Hence exploration proposal is not required to this mining project.

U. Prabhavathi

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

The geological resources were computed by cross section method with respect to the boundaries of the lease area. In this method, the lease area was divided into three sections (longitudinal and transverse) to calculate the volume of material up to the depth of (R.L.919m-869m) below the ground level. The longitudinal and transverse cross sections were assigned XY-AB, XY-CD & X1Y1-EF. Using the cross-sectional method, total reserve is estimated to be **860093m³** including the resources of safety zone, weathered rock and topsoil. Of which, multi-colour granite is **301033m³** in recovery of 35% and granites rejects of **559060m³** (Refer Plate No's. IV & IVA).

The topsoil is obtained about 0-1m, weathered rock is 1-3m thick and a multi-colour starts from 3-50m (R.L.919-869m) from the general level as respectively. (Refer plate no's. IV & IVA).

GEOLOGICAL RESOURCE										
Section	Bench	length in (m)	Width in (m)	Depth in (m)	Rom in (M ³)	Geological Resource in M ³	Multi Colour Granite 35% Recovery in M ³	Granite Waste 65% in M ³	Top Soil in M ³	Weathered Rock in M ³
XY-AB	I	55	62	1	3410	....	....	....	3410	....
	I	55	62	2	6820	....	....	....	....	6820
	I	55	62	2	6820	6820	2387	4433	....	....
	II	55	62	5	17050	17050	5968	11083	....	....
	III	55	62	5	17050	17050	5968	11083	....	....
	IV	55	62	5	17050	17050	5968	11083	....	....
	V	55	62	5	17050	17050	5968	11083	....	....
	VI	55	62	5	17050	17050	5968	11083	....	....
	VII	55	62	5	17050	17050	5968	11083	....	....
	VIII	55	62	5	17050	17050	5968	11083	....	....
	IX	55	62	5	17050	17050	5968	11083	....	....
X	55	62	5	17050	17050	5968	11083	....	....
TOTAL					170500	160270	56095	104176	....	....
XY-CD	I	65	72	I	4680	....	....	....	3410	6820
									4680	....



U. Prabhakar

U. Palharaj

	I	65	103	2	13390	....	....	....	....	13390
	I	28	103	2	5768	5768	2019	3749	....	13390
	II	65	103	2	13390	13390	4687	8704	....	....
	II	65	115	3	22425	22425	7849	14576	....	....
	III	65	115	5	37375	37375	13081	24294	....	....
	IV	65	115	5	37375	37375	13081	24294	....	....
	V	65	115	5	37375	37375	13081	24294	....	....
	VI	65	115	5	37375	37375	13081	24294	....	....
	VII	65	115	5	37375	37375	13081	24294	....	....
	VIII	65	115	5	37375	37375	13081	24294	....	....
	IX	65	115	5	37375	37375	13081	24294	....	....
	X	65	115	5	37375	37375	13081	24294	....	....
	TOTAL				358653	340583	119204	221379	4680	13390
XIV]- EF	I	63	140	1	8820	....	....	....	8820	....
	I	63	140	2	17640	....	....	....	....	17640
	I	46	140	1	6440	6440	2254	4186	....	....
	II	63	140	5	44100	44100	15435	28665	....	....
	III	63	140	5	44100	44100	15435	28665	....	....
	IV	63	140	5	44100	44100	15435	28665	....	....
	V	63	140	5	44100	44100	15435	28665	....	....
	VI	63	140	5	44100	44100	15435	28665	....	....
	VII	63	140	5	44100	44100	15435	28665	....	....
	VIII	63	140	5	44100	44100	15435	28665	....	....
	IX	63	140	5	44100	44100	15435	28665	....	....
	TOTAL				385700	359240	125734	233506	8820	17640
	GRAND TOTAL				914853	860093	301033	559060	16910	37850

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

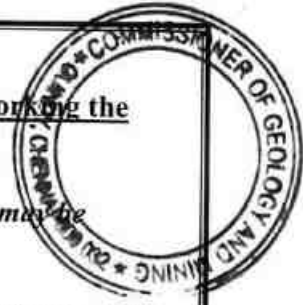
The Mineable reserves of multi-colour granite are estimated is 283064m^3 by deducting the reserve safety zone, block in benches from the total Geological resources. Of which, multi-colour granite is 99072m^3 on recovery of 35% and granites rejects of 183992m^3 to a depth of 50m below ground level (R.L.919-869m). The commercially viable multi-colour granite 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. VIII & VIIIA).



U. Prabhavathi

MINEABLE RESERVES										
Section	Bench	length in (m)	Width in (m)	Depth in (m)	Rom in (M ³)	Mineable Reserves in M ³	Multi Colour Granite 35% Recovery in M ³	Granite Waste 65% in M ³	Top Soil in M ³	Weathered Rock in M ³
XY-AB	I	45	42	1	1890	....	....	....	1890	....
	I	44	40	2	3520	....	....	....	....	3520
	I	42	36	2	3024	3024	1058	1966	....	....
	II	40	32	5	6400	6400	2240	4160	....	....
	III	35	22	5	3850	3850	1348	2503	....	....
	IV	30	12	5	1800	1800	630	1170	....	....
TOTAL					20484	15074	5276	9798	1890	3520
XY-CD	I	65	62	1	4030	....	....	....	4030	....
	I	65	83	2	10790	....	....	....	....	10790
	I	28	83	2	4648	4648	1627	3021	....	....
	II	65	77	2	10010	10010	3504	6507	....	....
	II	65	90	3	17550	17550	6143	11408	....	....
	III	65	82	5	26650	26650	9328	17323	....	....
	IV	65	72	5	23400	23400	8190	15210	....	....
	V	65	62	5	20150	20150	7053	13098	....	....
	VI	60	52	5	15600	15600	5460	10140	....	....
	VII	55	42	5	11550	11550	4043	7508	....	....
	VIII	50	32	5	8000	8000	2800	5200	....	....
IX	45	22	5	4950	4950	1733	3218	....	....
X	40	12	5	2400	2400	840	1560	....	....
TOTAL					159728	144908	50718	94190	4030	10790
XIY1-EF	I	55	123	1	6765	....	....	....	6765	....
	I	54	121	2	13068	....	....	....	....	13068
	I	46	117	1	5382	5382	1884	3498	....	....
	II	51	115	5	29325	29325	10264	19061	....	....
	III	46	105	5	24150	24150	8453	15698	....	....
	IV	41	95	5	19475	19475	6816	12659	....	....
	V	36	85	5	15300	15300	5355	9945	....	....
	VI	31	75	5	11625	11625	4069	7556	....	....
	VII	26	65	5	8450	8450	2958	5493	....	....
VIII	21	55	5	5775	5775	2021	3754	....	....
IX	16	45	5	3600	3600	1260	2340	....	....
TOTAL					142915	123082	43079	80003	6765	13068
GRAND TOTAL					323127	283064	99072	183992	12685	27378





4. 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)

It is an existing lease. Under the regulation 106 of the Metalliferous Mines Regulations, 1961 all open cost working methods of hard rock are used and it should be properly benched and sloped. The bench height should not exceed 5m and the bench width should not be 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 of multi-colour granite is **68562m³**. Of which multi-colour granite is **23997m³** in recovery of 35% and rejects of granites is **44565m³** of 65% up to a depth of 30m (R.L.919-889m) below ground level (Refer Plate No's.V & VA) for the first 5 years plan period. Average production will be **4799m³** of multi-colour granite per year.

Year	Pit No.(s)	Topsoil/ Overburden (m ³)	ROM (m ³)	Saleable multi- colour granite(m ³) @ 35%	Granite rejects(m ³) @ 65%	Weathered rock in (m ³)	Side burden (m ³)	Multi colour granite to Overburden ratio
First	I	4809	29051	4591	8527	11124	--	1: 5.32
Second	I	--	13694	4793	8901	--	--	1: 1.85
Third	I	--	14335	5017	9318	--	--	1: 1.85
Fourth	I	--	13655	4779	8876	--	--	1: 1.85
Fifth	I	--	13760	4816	8944	--	--	1: 1.85
Total	--	4809	84495	23997	44565	11124	--	1: 2.52

(c) Composite plans and Year wise sections (In case of 'A' class mines):

Not applicable. It is a "B" class mine

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

YEARWISE PRODUCTION											
Section	Year	Bench	length in (m)	Width in (m)	Depth in (m)	Rom in (M ³)	Production Reserves in M ³	Multi Colour Granite 35% Recovery in M ³	Granite Waste 65% in M ³	Top Soil in M ³	Weathered Rock in M ³
XY-CD	I - YEAR	I	46	34	1	1564	....	....	....	1564	....
		I	45	54	2	4860	....	....	....	....	4860
		I	6	54	2	648	648	227	421	....	....
		II	35	49	2	3430	3430	1201	2230	....	....
		II	35	62	3	6510	6510	2279	4232	....	....
XIYI-EF	I - YEAR	I	55	59	1	3245	....	....	....	3245	....
		I	54	58	2	6264	....	....	....	....	6264
		I	46	55	1	2530	2530	886	1645	....	....
TOTAL						29051	13118	4591	8527	4809	11124
XY-CD	II - YEAR	II	6	49	2	588	588	206	382	....	....
		II	6	62	3	1116	1116	391	725	....	....
		III	36	53	5	9540	9540	3339	6201	....	....
XIYI-EF	II - YEAR	II	10	49	5	2450	2450	858	1593	....	....
TOTAL						13694	13694	4793	8901	0	0
XIYI-EF	III - YEAR	II	41	49	5	10045	10045	3516	6529	....	....
		III	22	39	5	4290	4290	1502	2789	....	....
TOTAL						14335	14335	5017	9318	0	0
XIYI-EF	IV - YEAR	III	24	39	5	4680	4680	1638	3042	....	....
XY-CD		IV	31	43	5	6665	6665	2333	4332	....	....
		IV	14	33	5	2310	2310	809	1502	....	....
TOTAL						13655	13655	4779	8876	0	0
XY-CD	V - YEAR	IV	12	33	5	1980	1980	693	1287	....	....
XIYI-EF		IV	41	29	5	5945	5945	2081	3864	....	....
XY-CD		VI	21	23	5	2415	2415	845	1570	....	....
XIYI-EF		V	36	19	5	3420	3420	1197	2223	....	....
TOTAL						13760	13760	4816	8944	0	0
GRAND TOTAL						84495	68562	23997	44565	4809	11124

U. Palhauvoti



- 195 -

(d) Attach supporting composite plan and section showing pit layouts, dumps, stacks of sub-grade mineral, if any, etc.

Composite plan not prepared in this proposed lease area. It is "B₂" category mine.

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

The proposed production is 306m³/month. At this rate of production, the expected life of quarry is calculated for production details are given as below: -

Mineable reserves of multi-colour granite (35%)	=	99072m ³
First five years production	=	23997m ³
Yearly production	=	4799m ³
Life of Mine (99072/4799)	=	20.6years
Remaining Mineable reserves for multi-colour	=	75075m ³

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

(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 for core program in leasehold area: Give broad description identified potential areas to be covered in the given time frame:

Consider the indefinite depth the multi-colour granite deposit is proved beyond the workable limits about a depth of below ground level (R.L.919-869m).

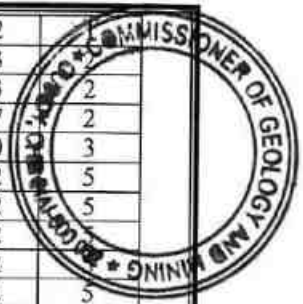
(ii) Whether ultimate pit limit has been determined and demarcated on Conceptual plan: -

The ultimate pit limit has been determined and demarcated in the conceptual plan and sections (Refer plate no's.VIII & VIIIA).

ULTIMATE PIT LIMIT-(XY-AB)						
Bench	Bench R.L	Period	Overburden/ Mineral	L (m)	W (m)	D (m)
I	R.L.919-914m	Remaining lease period	Topsoil	45	42	1
			Weathered rock	44	40	2
			Multi colour	42	36	2
II	R.L.914-909m		Multi colour	40	32	5
III	R.L.909-904m		Multi colour	35	22	5
IV	R.L.904-899m		Multi colour	30	12	5
Total						20
ULTIMATE PIT LIMIT-(XY-CD)						
Bench	Bench R.L	Period	Overburden/ Mineral	L (m)	W (m)	D (m)



U. Prabhavathi
197



I	R.L.919-914m	First 5 years	Topsoil	65	62	
			Weathered rock	65	83	
			Multi colour	28	83	2
II	R.L.914-909m		Multi colour	65	77	2
				65	90	3
III	R.L.909-904m		Multi colour	65	82	5
IV	R.L.904-899m		Multi colour	65	72	5
V	R.L.899-894m		Multi colour	65	62	
VI	R.L.894-889m		Multi colour	60	52	
VII	R.L.889-884m	Remaining lease period	Multi colour	55	42	5
VIII	R.L.884-879m		Multi colour	50	32	5
IX	R.L.879-874m		Multi colour	45	22	5
X	R.L.874-869m		Multi colour	40	12	5
			Total	50		

ULTIMATE PIT LIMIT-(X1Y1-EF)						
Bench	Bench R.L	Period	Overburden/ Mineral	L (m)	W (m)	D (m)
I	R.L.914-909m	First 5 years	Topsoil	55	123	1
			Weathered rock	54	121	2
			Multi colour	46	117	1
II	R.L.909-904m	First 5 years	Multi colour	51	115	5
III	R.L.904-899m		Multi colour	46	105	5
IV	R.L.899-894m		Multi colour	41	95	5
V	R.L.894-889m		Multi colour	36	85	5
VI	R.L.889-884m	Remaining lease period	Multi colour	31	75	5
VII	R.L.884-879m		Multi colour	26	65	5
VIII	R.L.879-874m		Multi colour	21	55	5
IX	R.L.874-869m		Multi colour	16	45	5
			Total	45		

(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 multi-colour granite rejects (up to 65%) and weathered rock are **55689m³** (44565m³ + 11124m³) will be removed and dumped in the Northern side of the lease area average dimensions of (L64m X W55m X H 16.0m) for the period of five years. The topsoil is **4809m³** will be removed and stacked for earth bund in the lease hold area to prevent inherent entry of cattle's and human as per rules 106, Metalliferous Mines Regulations, 1961. If multi-colour granite may be unsold will be keep within the lease boundary.

(iv) Whether back filling of pits after recovery of mineral upto techno-economically feasible depth envisaged. If so, describe the broad features of the proposal: -

No immediate proposal for back filling as the granite deposit is still persisting at deeper level.

(v) Whether post mining land use envisaged: -

It is a Patta land. At the end of mining activities over the quarry pit may be utilized fish culture or storage of rain water reservoir used for irrigation purposes.

g. Open Cast Mines:	
i) Describe briefly giving salient features of the mode of working (Mechanized, Semi-	: The mining operation is opencast semi-mechanized method adopted on single shift basis only. Under the regulation 106 of the

V. Prabhavate
198

<p>Mechanized, manual)</p>	<p>Metalliferous Mines Regulations, 1961 in all open cost workings in hard rock, the benches and sides should be properly benched and sloped. The bench height should not exceed 5m and the bench width should not be more than the bench height. The slope of the benches should not exceed 45° from horizontal.</p>
<p>ii) Describe briefly the layout of mine workings, the layout of faces and sites for disposal of overburden/waste. A reference to the plans enclosed under 4(b) and 4(d) will suffice</p>	<p>The multi-colour granite is proposed to quarry at 5m bench height & width conventional open cast method.</p> <ul style="list-style-type: none"> i) Drill hole diameter 32mm ii) Depth and inclination of drill hole: generally drilled vertically in an alignment, however in primary cutting in the absence of sheet joints to bottom level, horizontal holes also are drilled. iii) Spacing and burden: The spacing will be about 0.1m to 0.3m from hole to hole and burden goes up to 1.6m for the splitting of the rock. <p>The intrusive body will be tackled with latest technology by deploying diamond wire saw cutting for obtaining the good recovery factor of sizeable blocks.</p>
<p>a. Details of Topsoil/ Overburden</p>	<p>The topsoil is 4809m³ will be removed and stacked for earth bund in the lease hold area to prevent inherent entry of cattle's and human as per rules 106, Metalliferous Mines Regulations, 1961.</p>
<p>b. Multi-colour granite waste and side burden waste: -</p>	<p>The multi-colour granite rejects (up to 65%) and weathered rock are 55689m³ (44565m³ + 11124m³) will be removed and dumped in the Northern side of the lease area average dimensions of (L64m X W55m X H 16.0m)</p>



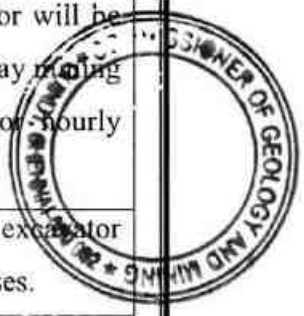
U. Prabhavate



		or the period of five years. If multi-colored granite may be unsold will be kept within the lease boundary.																		
h.	Underground Mines:	: It is an open cast quarry operation only.																		
i.	Extent of mechanization:	Being an existing quarry, opencast semi- mechanized methods of mining adopted. Deployment of drills, compressors, excavators, tipper, Diamond wire saw, and line drilling machineries are deployed depending upon the size of the quarry, rate of production, etc. There will not continue or regular work to the above machinery. Hence, most of the quarry operations engage this equipment on hire basis.																		
	Drilling and cutting equipment:																			
	a). Drilling equipment:																			
		<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>Type</th> <th>No s</th> <th>Dia of hole (mm)</th> <th>Size/Capacity</th> <th>Make</th> <th>Motive power</th> </tr> </thead> <tbody> <tr> <td>Jack Hammers</td> <td>4</td> <td>32mm</td> <td>--</td> <td>--</td> <td>Compressor Air</td> </tr> <tr> <td>Compressors</td> <td>2</td> <td>--</td> <td>--</td> <td>--</td> <td>Diesel</td> </tr> </tbody> </table>	Type	No s	Dia of hole (mm)	Size/Capacity	Make	Motive power	Jack Hammers	4	32mm	--	--	Compressor Air	Compressors	2	--	--	--	Diesel
Type	No s	Dia of hole (mm)	Size/Capacity	Make	Motive power															
Jack Hammers	4	32mm	--	--	Compressor Air															
Compressors	2	--	--	--	Diesel															
	b). Cutting equipment's: -																			
		i. Diamond wire saw machine = 2 nos ii. Line drilling machinery = 2 nos																		
	(1) Loading Equipment:																			
		<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>Type</th> <th>No</th> <th>H.P</th> <th>Size/Capacity</th> <th>Make</th> <th>Motive power</th> </tr> </thead> <tbody> <tr> <td>Excavator</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>Diesel</td> </tr> </tbody> </table>	Type	No	H.P	Size/Capacity	Make	Motive power	Excavator	--	--	--	--	Diesel						
Type	No	H.P	Size/Capacity	Make	Motive power															
Excavator	--	--	--	--	Diesel															
	(2) Haulage and Transport Equipment: -																			
	(a) Haulage within the mining leasehold:																			
		<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>Type</th> <th>Nos</th> <th>Size / Capacity</th> <th>Make</th> <th>Motive power</th> <th>H.P.</th> </tr> </thead> <tbody> <tr> <td>Tipper</td> <td>2</td> <td>--</td> <td>--</td> <td>Diesel</td> <td>--</td> </tr> </tbody> </table>	Type	Nos	Size / Capacity	Make	Motive power	H.P.	Tipper	2	--	--	Diesel	--						
Type	Nos	Size / Capacity	Make	Motive power	H.P.															
Tipper	2	--	--	Diesel	--															
	Whether the dumpers are fitted with exhaust conditioner should be indicated: The dump is not used in this quarry area, hence it's a small B2 category mine.																			
	(b) Transport from mine head to the destination	: Tipper will be used for transport.																		

V. Prabhavathi
200

c. Describe briefly the transport system (please specify)	: The hired tipper and excavator will be used for carrying out day to day mining activities on the day basis or hourly basis as per market scenario.												
d. Ore transported by: own trucks / hired trucks	: Hired tippers and hydraulic excavator for initially production purposes.												
e. Main destination to which ore is transported (giving to and from distance)	: The excavated multi-colour granite transported to needy buyers												
f. Details of hauling / transport equipment:													
<table border="1"> <thead> <tr> <th>Type</th> <th>Nos</th> <th>Size / Capacity</th> <th>Make</th> <th>Motive power</th> <th>H.P.</th> </tr> </thead> <tbody> <tr> <td>Nil</td> <td>Nil</td> <td>Nil</td> <td>Nil</td> <td>Nil</td> <td>Nil</td> </tr> </tbody> </table>		Type	Nos	Size / Capacity	Make	Motive power	H.P.	Nil	Nil	Nil	Nil	Nil	Nil
Type	Nos	Size / Capacity	Make	Motive power	H.P.								
Nil	Nil	Nil	Nil	Nil	Nil								
(3) Miscellaneous:													
Describe briefly any allied operations and machineries related to the mining of the deposit not covered earlier													
(A) Operations	: The mining operation is opencast, semi-mechanized method.												
(B) Machineries deployed	: Deployment of drills, compressors, excavators, tipper, Diamond wire saw, and line drilling machineries are deployed depending upon the size of the quarry, rate of production, etc. There will not continue or regular work to the above the machinery.												
<p>5. BLASTING:</p> <p>a) <i>Broad blasting parameters like charge per hole, blasting pattern, charge per delay, maximum number of holes blasted in a round, manner and sequence of firing, etc.</i></p> <p>Blasting pattern: It is an Eco-friendly quarry operation, no blasting is proposed, Diamond wire saw cutting method is adopted by the applicant. Now a day, the splitting within the sheet rock is affected by diamond wire-sawing, which largely reduces the use of explosives in granite mining. Besides, chemical powder called as "Rock breaking Powder" [Ca (OH)2] are also used for splitting. Many adverse effects of blasting are avoided and hence diamond wire cutting will substantially</p>													



increase the recovery. Since primary cutting comprising splitting from the sheet rock is affected by diamond wire sawing there will not be any drilling or blasting involved. Hence, there will not any adverse effects and vibration due to this type of mining operation.

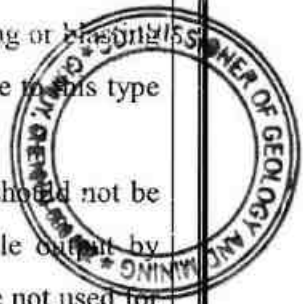
Chemical Blasting Method: The multi-colour granite operations should not be conducted with any blasting. This will totally damage the possible output by inducing cracks in the rock. For this reason, Chemical explosives are not used for this process. Instead the rock is split with help of chemical powder which is an expander of the rock. The process is as under long jack hammer holes of around 3 to 6 meters are drilled in close spacing. The spacing is generally 5 to 10mm after the entire line is drilled, it is plugged to prevent any foreign materials entering the hole, later two vertical and one bottom cut are made with slotters and wire saw machines. After these operations are complete, the holes are loaded with chemical generates a crack which is through the holes drilled. The crack is expanded any hydraulic bags are used to pull the rock.

c) Miscellaneous:-

Apart from the above, the following tools and tackles already provided by applicant in quarry leased area for quarry operations.

a) For operation:

1. Drill rods 0.4m, 0.5, 0.6m, 0.75m, 1.65m, 2.25m, 3m and 3.6m.
2. Steel alloy chains of sufficient length of 12mm, 16mm, 18mm sizes.
3. "D" Shackles to link the chain length,
4. Rubber hose of required length,
5. Hose clamps to link the compressor delivery hoses,
6. Feather and wedges of 6" and 12" sizes, utilized for splitting the block from the mother rock. This is an important tool in the operation of the quarry.
7. Crow bars,
8. Spades,
9. Sludge hammer,
10. Iron pans,
11. Pitcher hammer,
12. Chisels,
13. Consumables, such diesel. Hydraulic oil, etc



U. Balhavadh

d) Whether secondary blasting is needed, if so describe it briefly	: Not applicable
e) Storage of explosives (like capacity and type of explosive magazine)	: <ol style="list-style-type: none"> 1. The applicant is advised to engage an authorized explosives agency to carry out blasting. 2. The blasting time at a day is proposed to be 9.0 PM to 3.0 AM. 3. First aid box will be kept ready at all the time. 4. 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 70m in summer and 65m in rainy season from the ground level which was predicted by observation of adjacent bore wells around the lease area.
b) Workings expected to be _____ m. above / reach below water table by the year _____	: Ultimate mining depth is 50m below ground level. So, the present mine lease will be proposed above the water table and hence, quarrying may not affect the ground water.
c) Quantity and quality of water likely to be encountered, the pumping arrangements and places where the mine water is finally proposed to be discharged	: The ground water may not rise immediately in this type of mining. However, the rain water percolation and collection of water from the seepage will be less than 300 Lpm and it will be pumped out periodically by diesel powered centrifugal pump of 7.5 H.P. Motor. The quality of water is potable and it is not contaminated with any hazardous things.

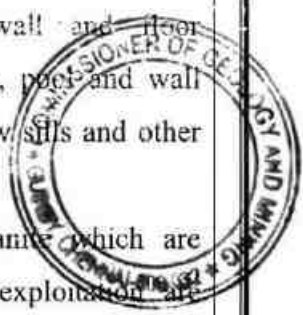


U. Pradhavadi
203

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 first five years plan period:																															
<table border="1"> <thead> <tr> <th>Year</th> <th>Topsoil (m³)</th> <th>Weathered rock (m³)</th> <th>Granite waste (m³)</th> </tr> </thead> <tbody> <tr> <td>First</td> <td>4809</td> <td>11124</td> <td>8568</td> </tr> <tr> <td>Second</td> <td>---</td> <td>---</td> <td>---</td> </tr> <tr> <td>Third</td> <td>---</td> <td>---</td> <td>---</td> </tr> <tr> <td>Fourth</td> <td>---</td> <td>---</td> <td>---</td> </tr> <tr> <td>Fifth</td> <td>---</td> <td>---</td> <td>---</td> </tr> <tr> <td>Total</td> <td>4809</td> <td>11124</td> <td>44565</td> </tr> </tbody> </table>	Year	Topsoil (m ³)	Weathered rock (m ³)	Granite waste (m ³)	First	4809	11124	8568	Second	---	---	---	Third	---	---	---	Fourth	---	---	---	Fifth	---	---	---	Total	4809	11124	44565			
Year	Topsoil (m ³)	Weathered rock (m ³)	Granite waste (m ³)																												
First	4809	11124	8568																												
Second	---	---	---																												
Third	---	---	---																												
Fourth	---	---	---																												
Fifth	---	---	---																												
Total	4809	11124	44565																												
b) Land chosen for disposal of waste with proposed justification		: The granite rejects and weathered rock will be dumped on the north side of the lease area.																													
c) Attach a note indicating the manner of disposal and configuration, sequence of buildup of dumps along with the proposals for the stacking of sub-grade ore, to be indicated Year wise.		: The multi-colour granite rejects (up to 65%) and weathered rock are 55689m³ (44565m ³ + 11124m ³) will be removed and dumped in the Northern side of the lease area average dimensions of (L64m X W55m X H 16.0m) for the period of five years. As per G.O (Ms)No.94, Industries (MME.1) Department Dated: 09.05.2022. The granite waste not capable of being sold as dimensional blocks that shall be reduced to the size equal to or less than 15cm X 10cm, so as to be used as road metal or for production of manufactured sand (M-Sand) or for any other useful purposes.																													
8. USES OF MINERAL:																															
a) Describe briefly the end-use of the mineral (sale to intermediary parties, captive consumption, export, industrial use)		: The quarried multi-colour granite blocks are used to make floors, monuments etc.																													
b) Indicate physical and chemical specifications stipulated by buyers		: The materials produced at this quarry are multi-colour granite which is used in floors, furniture, counter tops and monuments. This stone is especially good for																													



		<p>Countertops, monuments, mosaic, exterior - interior wall and floor applications, fountains, pool and wall capping, stairs, window sills and other design projects.</p> <p>The properties of granite which are normally valued for exploitation are compressive strength, tensile strength, density, p-wave velocity, etc. For marketability, other requirements like colour, texture, granularity, size, water absorption, porosity, hardness, moisture content, etc. are also essential.</p>
	<p>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.</p>	<p>: No blending process is involved in quarry. Blocks approved for export are shipped from harbor to exporter's designations</p>
<p>9. OTHERS</p>		
	<p>Describe briefly the following a) Site services</p>	<p>: Infrastructure required for such mines like office, stores, canteen, first aid station, shelter latrine and bath rooms have been provided as per the 106 Metalliferous Mines Regulations, 1961 as a welfare amenity for quarry laborers. No manual mine or stack of spares, lubricant and fuels are required to be maintained at the mine site. Approach road is available from the mine road to the site.</p>



U. Prathapar
205

b) Employment potential:

As per Mines safety under the provisions of Metalliferous Mines Regulations, 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 multi-colour granite during the five years period the same manpower will be utilize for this Mining Plan period to achieve the proposed production and to comply the provisions of the DGMS norms.



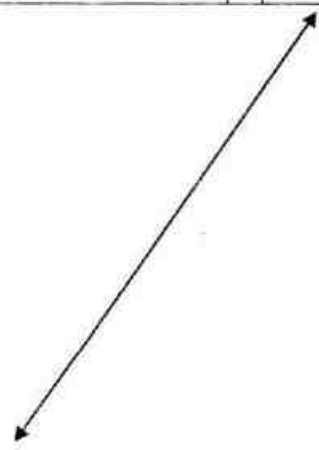
1.	Highly Skilled	Quarry Manager	1No.
		Mines Forman	---
		Geologist	1No
		Accountant cum & admin	1No.
2.	Skilled	Earth moving Operator	--
		Driver	2 Nos.
		Mechanic	1 No.
		Blaster/Mat	---
3.	Semi - skilled	Helpers, Greaser's	1 No
4.	Unskilled	Musdoor / Labours	19Nos
		Cleaners	--
		Attendant's	1No
Total =			27 Nos

10 MINERAL PROCESSING/BENEFICIATIONS:

<p>a) If processing / beneficiations of the ore or minerals mined is planned to be conducted on site or adjacent to the extraction area, briefly describe the nature of the processing /beneficiation. This should indicate size and grade of feed material and concentrate (finished marketable product), recovery rate.</p>	<p>: Excavated multi-colour granite raw blocks will be directly sale to the needy customer.</p>
<p>b) Explain the disposal method for tailings or waste from the processing plant (quantity and quality of tailings proposed to be discharged, size and capacity of tailing pond, toxic effect of such tailings, if any, with process</p>	<p>: No water will 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 will be used for drilling and spraying haul roads. Therefore, need for tailing</p>

U. Palhewadi
206

	adopted to neutralize any such effect before their disposal and dealing of excess water from the tailing dam).	dam doesn't arise. But tailing control of rain water flow during rains 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 (KLD per day) of water required for mining and processing and sources of supply of water. Disposal of water and extent of recycling.	: Drinking is 0.3KLD, utilized water is 1.0KLD, Dust suppression is 1.0KLD and Green Belt is 1.0KLD. Minimum quantity of water 3.3KLD per day has to be maintained as per the Mines Rules, 1960. It is proposed to make an own borewell for providing uninterrupted supply of RO drinking water, dust suppression and Green belt development. The sewage water to a tune of 1.0KLD generated from the mine office toilet and mine labour toilet will be diverted to the septic tank followed by soak pit.



U. P. Shewate

PART - B

11.0 ENVIRONMENTAL MANAGEMENT PLAN :

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



11.1 Existing land use pattern indicating the area already degraded due to quarrying /pitting, dumping, roads, processing plant, workshop, townships etc in a tabular form. The present land use pattern is given as below.

Sl. No.	Land Use	Present area (Hect.)
1.	Under quarrying area	0.04.82
2	Infrastructure	Nil
3	Roads	Nil
4	Green Belt	Nil
5	Waste dump	Nil
6	Drainage & Settling Tank	Nil
7	Unutilized	1.92.18
Total =		1.97.00

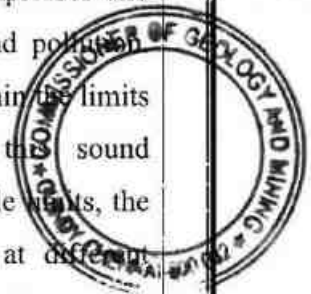
11.2 Water Regime : Water table in this area is noticed at a depth of 65m in rainy season and 70m in summer from general ground level and presently the quarrying of multi-colour granite is proposed depth of mining is 30m from below the ground level. Hence, it will not affect the ground water depletion of this area. It is proposed to make an own bore well for providing uninterrupted supply of RO drinking water, dust suppression and Green belt development.

11.3 Flora and Fauna : There is no major flora found in this area. No other valuable trees are noticed in the lease area. Further, neither flora of botanical interest nor fauna of zoological interest is noticed in this area.

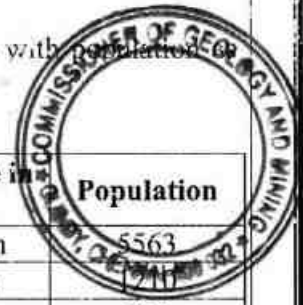
11.4 Quality of air, ambient noise level and water : Air or dust expected to be generated from drilling process, hauling roads, places of excavation etc..., will be suppressed by periodical wetting of land by water spraying.

U. Pathawade

		<p>In this quarry, the machinery operations like jack hammer drilling compressor and excavators will generate sound pollution. The sound level should be within the limits of 58dBA. To minimize the sound pollution within the permissible limits, the machinery will be operated at different places and time. The sound pollution can be reduced periodical maintenance of the mining equipment. However, periodical noise level monitoring will be carried out every six months around the quarry site.</p>
11.5	Climatic conditions	<p>The climate of Krishnagiri district is comparatively more pleasant than that of the surrounding districts due to general dryness of atmosphere and appreciable drop in temperature in the monsoon season. The year may be divided into four season namely dry season from January to March, summer season April and May, southwest monsoon season from June to Sept. and northeast monsoon season from October to December.</p> <p>During summer season (April to May) the maximum temperature is about 37°C, and the mean daily minimum temperature of about 25°C in the plains.</p> <p>The day temperature increases gradually from January onwards. The lowest temperature is reached in January when the mean daily minimum is about 19°C. However, in higher areas i.e., Hosur, Thally and Krishnagiri taluks day and night temperature are lower by about 2 to 3°C</p>



11.6	<p>Human Settlement:</p> <p>The nearest Villages are found in the buffer zone with per 2011 census.</p>	<table border="1"> <thead> <tr> <th>S.N</th> <th>Village</th> <th>Direction</th> <th>Distance in Km</th> <th>Population</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Irudukottai</td> <td>NW</td> <td>2.45km</td> <td>5563</td> </tr> <tr> <td>2</td> <td>Namreili</td> <td>NE</td> <td>1.5km</td> <td>1710</td> </tr> <tr> <td>3</td> <td>Tottikuppam</td> <td>SE</td> <td>0.81km</td> <td>721</td> </tr> <tr> <td>4</td> <td>Belalam</td> <td>SW</td> <td>1.74km</td> <td>774</td> </tr> </tbody> </table>	S.N	Village	Direction	Distance in Km	Population	1	Irudukottai	NW	2.45km	5563	2	Namreili	NE	1.5km	1710	3	Tottikuppam	SE	0.81km	721	4	Belalam	SW	1.74km	774
S.N	Village	Direction	Distance in Km	Population																							
1	Irudukottai	NW	2.45km	5563																							
2	Namreili	NE	1.5km	1710																							
3	Tottikuppam	SE	0.81km	721																							
4	Belalam	SW	1.74km	774																							
11.7	Public buildings, places of worship and monuments	: No infrastructure like residential building, places of special interest like archeological monuments, etc., are found around 300m radius.																									
11.8	Attach plans showing the locations of sampling stations	: The proposed Ambient air quality, Water quality Ambient noise level and vibration are periodically tested for every season (6 months once) around 5km radius as per the guidance of MoEF and EIA Notification 2006 and also covering DGMS norms.																									
11.9	Does area (partly or fully) fall under notified area under Water (Prevention & Control of Pollution), Act, 1974	: The proposed area not fall under notified area under Water (Prevention & Control of Pollution), Act, 1974																									

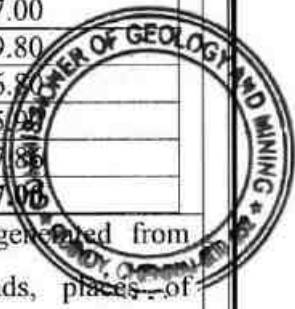


b) Attach an Environmental Impact Assessment Statement describing the impact of Mining and beneficiation on environment on the following over the next five years (and upto conceptual plan period for 'A' category mines):

i)	<p>Land area indicating the area likely to be degraded due to quarrying / pitting, dumping, roads, workshop, processing plant, township etc:</p> <p>Due to quarrying and exploitation of the multi-colour Granite, 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 shown in the tabular form:</p> <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>Under Quarrying Area</td> <td>0.66.64</td> </tr> <tr> <td>2</td> <td>Infrastructure</td> <td>0.03.00</td> </tr> </tbody> </table>	Sl. No.	Land Use	Area in use during the quarrying period (Hect)	1.	Under Quarrying Area	0.66.64	2	Infrastructure	0.03.00
Sl. No.	Land Use	Area in use during the quarrying period (Hect)								
1.	Under Quarrying Area	0.66.64								
2	Infrastructure	0.03.00								

U. Prabhavati

	3	Roads	0.07.00
	4	Green Belt	0.39.80
	5	Waste dump	0.26.80
	6	Drainage & Settling tank	0.05.00
	7	Unutilized Area	0.47.80
	Total =		1.97.00
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 multi-colour granite 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)		: It is an Eco-friendly quarry operation, no blasting is proposed, Diamond wire saw cutting method is adopted by the applicant. Now a days, the splitting within the sheet rock is affected by diamond wire-sawing, which largely reduces the use of explosives in granite mining. Besides, chemical powder called as " Rock breaking Powder " $[Ca(OH)^2]$ are also used for splitting. Many adverse effects of blasting are avoided and hence diamond wire cutting will substantially increase the recovery. Since primary cutting comprising splitting from the sheet rock is affected by diamond wire-sawing there will not be any drilling or blasting involved. Hence, there will not any adverse effects and vibration due to this type of mining operation. The maximum peak particles



U. Prathavati

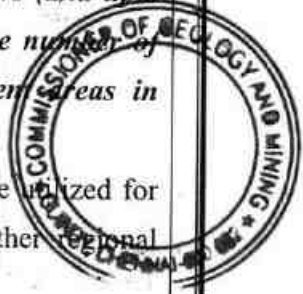
		velocity will be recoded using mini seismograph devises as per the guidance of MoEF and EIA Notification 2006 and also covering DGMS norms.
vi).	Water Regime	: No major river or any other water bodies are found around 50m radius.
vii).	Socio-Economics	: 1. To provide Employment opportunities of the nearby villagers. 2. For the cultural development of the nearby villagers.
viii).	Historical monuments etc.	: There are no historical monuments, etc found around 10km radius.



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

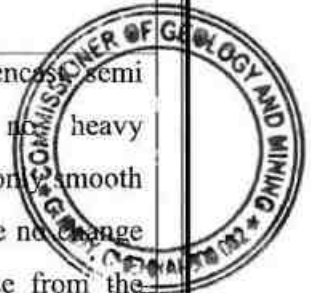
i).	Temporary storage and utilization of topsoil	: The topsoil is 4809m ³ will be removed and stacked for earth bund in the lease hold area to prevent inherent entry of cattle's and human as per rules 106, Metalliferous Mines Regulations, 1961.
ii).	Year wise proposal for reclamation of land affected by abandoned quarries and other mining activities during first five years (and upto conceptual plan period for 'A' category mines) clarifying the extent of back filling and re-contouring and / or alternative use of unfilled / partially filled excavations / road sides / slopes and mine. In case abandoned quarries/ pits are proposed to be used as reservoir, their size, water holding capacity and proposal	: The ultimate mining is proposed to an up to depth of 50m below ground level (R.L.919-869m) 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 multi-colour granite persist still at deeper level

	for utilization of such water be given.																																		
iii).	<p><i>Programme of afforestation, Year wise for the initial five years (and upto conceptual plan period for 'A' category mines) indicating the number of plants with name of species to be afforested under different areas in hectares.</i></p> <p>7.5m safety barrier, school and nearest panchayat road 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</p> <table border="1"> <thead> <tr> <th>Year</th> <th>Place</th> <th>Area in Sq.m</th> <th>No.of Plants</th> <th>Rate of survival</th> <th>Rate</th> <th>Amount in Rs</th> </tr> </thead> <tbody> <tr> <td>First</td> <td>Lease Boundary</td> <td>3980</td> <td>450</td> <td>80%</td> <td rowspan="3">@100 Rs Per sapling</td> <td>45,000/-</td> </tr> <tr> <td>Second</td> <td>Approach road and Nearby Village Road</td> <td>--</td> <td>500</td> <td>80%</td> <td>50,000/-</td> </tr> <tr> <td>Third</td> <td>Schools</td> <td>--</td> <td>300</td> <td>80%</td> <td>30,000/-</td> </tr> <tr> <td colspan="6" style="text-align: right;">Total</td> <td>1,25,000/-</td> </tr> </tbody> </table>	Year	Place	Area in Sq.m	No.of Plants	Rate of survival	Rate	Amount in Rs	First	Lease Boundary	3980	450	80%	@100 Rs Per sapling	45,000/-	Second	Approach road and Nearby Village Road	--	500	80%	50,000/-	Third	Schools	--	300	80%	30,000/-	Total						1,25,000/-	
Year	Place	Area in Sq.m	No.of Plants	Rate of survival	Rate	Amount in Rs																													
First	Lease Boundary	3980	450	80%	@100 Rs Per sapling	45,000/-																													
Second	Approach road and Nearby Village Road	--	500	80%		50,000/-																													
Third	Schools	--	300	80%		30,000/-																													
Total						1,25,000/-																													
iv).	Stabilization and vegetation of dumps along with waste dump management Year wise for the first five years (and upto conceptual plan period for 'A' category mines).	: The multi-colour granite rejects (up to 65%) and weathered rock are 55689m³ (44565m ³ + 11124m ³) will be removed and dumped in the Northern side of the lease area average dimensions of (L64m X W55m X H 16.0m) for the period of five years. The topsoil is 4809m³ will be removed and stacked for earth bund in the lease hold area to prevent inherent entry of cattle's and human as per rules 106, Metalliferous Mines Regulations, 1961. If multi-colour granite may be unsold will be keep within the lease boundary.																																	
v).	Measures to control erosion / sedimentation of water courses.	: No soil erosion takes place in this quarrying activity.																																	
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.																																	



U. Balhavad

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 B2 category open cast semi mechanized mining and no heavy machinery will 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)

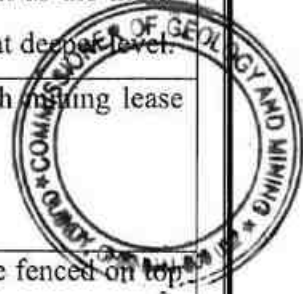
Not applicable. It is B2 category quarry

12.0 PROGRESSIVE MINE CLOSURE PLAN:

12.1	Steps proposed for phased restoration, reclamation of already mined out area.	: The present mining is proposed depth is 30m (R.L.919m-889m) below ground level. The mined-out area will be fenced on top of opencast working 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

V. Prabhavathi

			belt development at the rate of 1250 trees will be proposed. No immediate proposals for closure of pit as the multi-colour granite 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 for 20 years lease period.
12.4	Mine closure activity	:	The mined-out area will be fenced on top of opencast working with S1 fencing. Low lying areas with water logging will be used for fish culture. No immediate proposals for closure of pit as the multi-colour granite persist still at deeper level.
12.5	Safety and security	:	Safety measures implement to the prevent access to surface opening excavations will be taken as Metalliferous Mines Regulations, 1961, it is a small open cast mining method adopted. Safety provisions like helmet, goggles, safety shoes, Dust mask, Ear muffs etc have to be provided as per the circulars and amendments made for Mine labours under the guidance of DGMS being a mechanized operation.
12.6	Disaster management and Risk Assessment	:	Open cast mining method is adopted in this quarry. If the benches are made with proposed height and width 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 applicant 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	: During temporary discontinuance the working place will be fenced completely and a board of discontinuance will be changed on the main entrance of the working place. One watch man will be kept on the quarry area for security purposes also look after the survival of the plants.
12.8	Economic repercussions of closure of quarry and man power entrenchments	: During the five years mining period the employment potential will be generated, general financial status and socio-economic conditions of approx. 27 labors will be improved. During the next five-year compensations will be given as per rules.



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

A	Fixed Asset Cost:	
	1. Land Cost	: Rs. 9,78,870/-
	2. Labour Shed	: Rs. 2,50,000/-
	3. Sanitary Facility	: Rs. 2,00,000/-
	4. Fencing	: Rs. 2,70,000/-
	5. Other expenses (Security guard, bin, etc)	: Rs. 5,00,000/-
	Total	: Rs. 21,98,870/-
B	B. Machinery cost	: Rs. 30,00,000/- (Hire Basis)
C	Total Expenditure of EMP cost (for five years)	
	1. Drinking Water Facility	: Rs. 2,00,000/-
	2. Sanitary facility & Maintenance	: Rs. 1,50,000/-

U. Prabhakar
216

3. Permanent water sprinkler	:	Rs. 5,00,000/-
4. Afforestation and maintenance	:	Rs. 1,42,000/-
5. Safety Kits	:	Rs. 2,00,000/-
6. Provision of tyre washing facility	:	Rs. 1,00,000/-
7. Surface runoff management structures like garland drain, settling pond & Bund (0.05.9Hect or 590Sq.m X 400	:	Rs. 2,36,000/-
8. Blasting materials with blast mat cost	:	Rs. 20,00,000/-
9. Environment monitoring	:	Rs. 5,00,000/-
Total	:	Rs. 40,28,000/-
E Total Project Cost (A+B+C)	:	Rs. 92,26,870/-



13.0 FINANCIAL ASSURANCE:

Not applicable, it is a small B2 multi-colour granite 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 multi-colour granite economically without any wastage and to improve the environment and ecology.
- (iii) The Mining Plan with progressive quarry closure plan is prepared by incorporating the conditions stipulated in the precise area communication issued by The Additional Chief Secretary to Government (FAC) Tamil Nadu, vide letter **Rc.No.1379/MME.2/2021-1, Dated 03.10.2023.**
- (iv) Total proposed production of multi-colour granite is **68562m³**. Of which multi-colour granite is **23997m³** in recovery of 35% and rejects of granites is **44565m³** of 65% upto a depth of 30m (R.L.919-889m) below ground level (Refer Plate No's.V & VA) for the first 5 years plan period. Average production will be **4799m³** of multi-colour granite per year.

U. Prabhavathi

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 on the Ministry has notified the amendments in section 135 of the Act as well as the CSR Rules on 22nd January 2021 as circular no. CSR-05/01/2021-CSR-MC dated 25th August 2021.



Place: Dharmapuri, TN

Date: 20/10/23

Signature of the Recognized Qualified Person

Dr. S. KARUPPANNAN, M.Sc., Ph.D.
RQP/MAS/263/2014/A
GEO TECHNICAL MINING SOLUTIONS
1/213-B, Ground Floor, Natesan Complex,
Collectorate Post Office, Oddapatti,
Dharmapuri - 638 705, Tamil Nadu, India.

COMMISSIONER
GEOLOGY AND MINING
GUINDY, CHENNAI-600 032

11/12/2023

This Mining Plan is Approved
Subject to the Conditions/ Stipulation
Indicated in the Mining Plan Approval
Letter No./ 582/mmy/2021 Dated 13-12-2023



Natural Resources
(MME.2) Department,
Secretariat, Chennai-600 009

Letter No.1379/MME.2/2021-1, dated 03.10.2023



From
Thiru K. Phanindra Reddy, I.A.S.,
Additional Chief Secretary to Government (FAC)

To
M/s.K.P.R. Granites,
No.2/223, Avvai Nagar,
Noolahalli Post,
Pennagaram Taluk,
Dharmapuri District – 636 813

Sir,

Sub: Natural Resources – Mines and Minerals – Multi Colour Granite – Krishnagiri District – Denkanikottai Taluk - Irudukottai Village – Over an extent of 1.97.0 hectares of patta lands in S.F.Nos.1121/6 (1.04.0 hectares) and 1125/3 (0.93.0 hectare) – Quarry Lease Application preferred by M/s.K.P.R Granites – Precise Area Communicated – Approved mining Plan and Environmental Clearance – Called for.

- Ref: 1. Your Quarry Lease Application, dated 31.10.2019.
2. From the District Collector, Krishnagiri File Roc. No.986/2019/Mines, dated 25.09.2023.
3. From the Commissioner of Geology and Mining, File Rc.No.582/MM4/2021, dated 06.04.2023.

I am directed to invite attention to the references second and third cited wherein the District Collector, Krishnagiri and the Commissioner of Geology and Mining, Chennai have recommended and forwarded your quarry lease application for grant of quarry lease for quarrying of Multi-Colour Granite over an extent of 1.97.0 hectares of patta lands in S.F.Nos.1121/6 (1.04.0 hectares) and 1125/3 (0.93.0 hectare) of Irudukottai Village, Denkanikottai Taluk, Krishnagiri District for a period of 20 years under rule 19-A of the Tamil Nadu Minor Mineral Concession Rules, 1959.

(p.t.o)

U. Prabhavathi

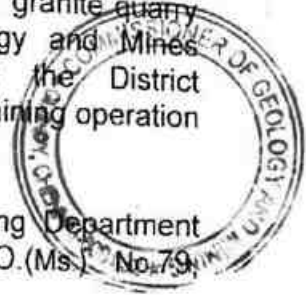
2. The Government carefully examined the recommendations of the District Collector, Krishnagiri and the Commissioner of Geology and Mining to communicate precise area for over an extent of 1.97.0 hectares of patta lands in S.F.Nos.1121/6 (1.04.0 hectares) and 1125/3 (0.93.0 hectare) of Irudukottai Village, Denkanikottai Taluk, Krishnagiri District and accordingly, the Government hereby communicate above area as precise area under sub-rule (13) of Rule 19-A of the Tamil Nadu Minor Mineral Concession Rules, 1959 for grant of lease.

3. I therefore request you to furnish the Approved Mining Plan for the above mentioned Precise Area through the Commissioner of Geology and Mining within a period of 3 months as per sub-rule (13) of Rule 19-A of the Tamil Nadu Minor Mineral Concession Rules, 1959 and to produce Environmental Clearance obtained from the competent authority for the above said area for grant of quarry lease for a period of 20 years subject to the following conditions: -

1. A safety distance of 7.5 meters shall be maintained for the adjacent patta lands.
2. A safety distance of 10 meters shall be maintained for the Government land in S.F.Nos.1121/4, 1121/5 situated on the western side and in S.F.Nos.1122/4 and 1125/5 situated on the eastern side of the applied area and also for S.F.No.1120/7 (Podugal) situated on the west.
3. A safety distance of 10.0 meters shall be maintained for the Government land in S.F.No.1125/1 (Pathai) situated on the southwest corner of applied area.
4. As per the Hon'ble Supreme Court of India order dated 08.01.2020 in W.P. (C) No.144/2014 after ceasing quarrying operation re-grassing the quarry area and any other area which may have been disturbed due to the quarrying activity and restore the land to a condition which is fit for growth of fodder, flora, fauna etc.,
5. The four boundaries of the proposed area for the grant of Multi-Colour Granite quarry lease over an extent of 1.97.0 hectares in S.F.No.1121/6 (1.04.0) and 1125/3 (0.93.0) of Irudukottai Village, Denkanikottai Taluk, Krishnagiri District should be fixed and the quarrying operation should be restricted within the area granted on lease.
6. A green belt should be constructed to prevent sound and air pollution due to the proposed quarrying activity over an extent of 1.97.0 hectares in S.F.No.1121/6 (1.04.0) and 1125/3 (0.93.0 hectare) of Irudukottai Village, Denkanikottai Taluk, Krishnagiri District by planting atleast 500 seedlings of Neem and Pungan all around the area.

U. Pralhavathi

7. The boundary of the proposed area for multi colour granite quarry operation has to be demarcated by the Geology and Mines Department and also before issuing permit the District Administration is requested to confirm whether the mining operation is within the permitted area.
8. The District administration and Geology and Mining Department should ensure the conditions imposed in G.O.(Ms) No.79 Industries Department, dated 06.04.2015.
9. In order to prevent illicit quarrying, when quarried material is transported necessary permits had been produced before the forest check post officials and necessary entries should be made in the register.
10. The quarrying operation should be restricted only in the area granted on lease.
11. Barbed wire fencing or compound wall should be erected all along the boundary of the lease granted area and the boundary pillars should be erected as per DGPS norms.
12. The waste materials generated during the course of quarrying should be dumped only within the leasehold area.
13. Environment Clearance should be obtained from the competent authority in respect of the subject area as per rule 42 of TNMMCR, 1959 and as per the notification of the Ministry of Environment and Forest and any other clearances if any.
14. As per rule 12 (V) of Mineral (other than Atomic and Hydro Carbons Energy Minerals) Concession Rules, 2016, the applicant firm shall at his own expenses erect, maintain and keep in repair all the boundary pillars with DGPS readings.
15. A green belt should be constructed by planting trees along the boundary of the area to control air and noise pollution.
16. No encroachment shall be made in the adjacent Government lands.
17. The applicant firm should fence the lease granted area with barbed wire before the execution of lease deed as follows:-
 - The pillar post shall be firmly grounded with concrete foundation of height not less than 2 meters and the distance between two pillars shall not be more than 3 meters.
 - The applicant firm shall incorporate the DGPS readings for the entire boundary pillars of the area and the same should be clearly shown in the Mining Plan.





➤ A soft copy of the digitized map with DGPS readings should be submitted in the CD form to the Assistant Director (i/c), Krishnagiri.

- 18. No pollution should be caused to the water bodies situated near by the applied area.
- 19. The applicant firm should carry out DGPS survey and erection of RCC boundary pillars as per the norms stipulated in the EOI notification in Rc.No.2921/MM4/2019, dated.01.02.2018 and subsequent corrigendum dated 13.08.2019 before execution of quarry lease through the empanelled agencies.
- 20. The quarry operations should be carried out with no hindrance to the special species such as plants, mammals, birds & butterflies as mentioned in the Ministry of Environment, Forest and Climate Change notification dated 01.01.2020.
- 21. In order to prevent man and animals conflict no blasting or quarrying operation should be carried out from 6.00 pm to 6.00 am.

4. The District Collector, Krishnagiri shall obtain a sworn-in-affidavit from the applicant / firm containing the above conditions before execution of lease deed and also ensure that the instructions issued in Government Letter No. 12789 / MMB.2 / 2002-7, Industries Department, dated 09.01.2003 are complied with. Further, the District Administration / Geology and Mining Department should ensure that the conditions imposed in G.O. (Ms) No.79, Industries (MMC.1) Department, dated 06.04.2015 and G.O.(Ms).No.295, Industries (MMC.1) Department, dated 03.11.2021 are complied.

Yours faithfully,

for Additional Chief Secretary to Government (FAC)
[Signature]
3/10/2023

Copy to:

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

The District Collector,
Krishnagiri District.

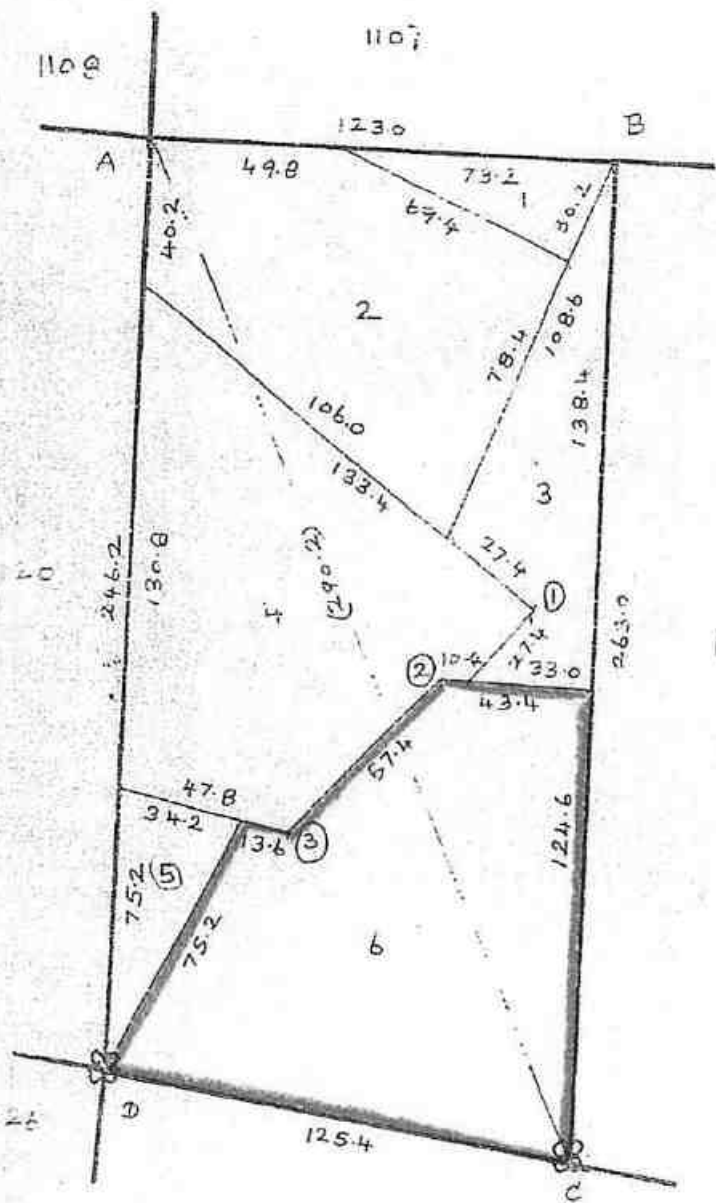
U. Prathap

249-

புல எண். 1121

கிராமம் {
எண். 41
பெயர். இடுக்காட்டு

பரப்பு: ஹெக்டேர் 3.15.0 ஏர்.



1122

1125

	C		
	263.0		
	181.0	78.4	3
	138.4	40.2	2
	119.2	16.0	1
	B		

சுயம் சிவசுந்தர அழகர்
சி. இராசசேகரன் (கிராமம்),
சென்னை.

அளவு. 16.8 = 2000.00 223

U. Prabhakar

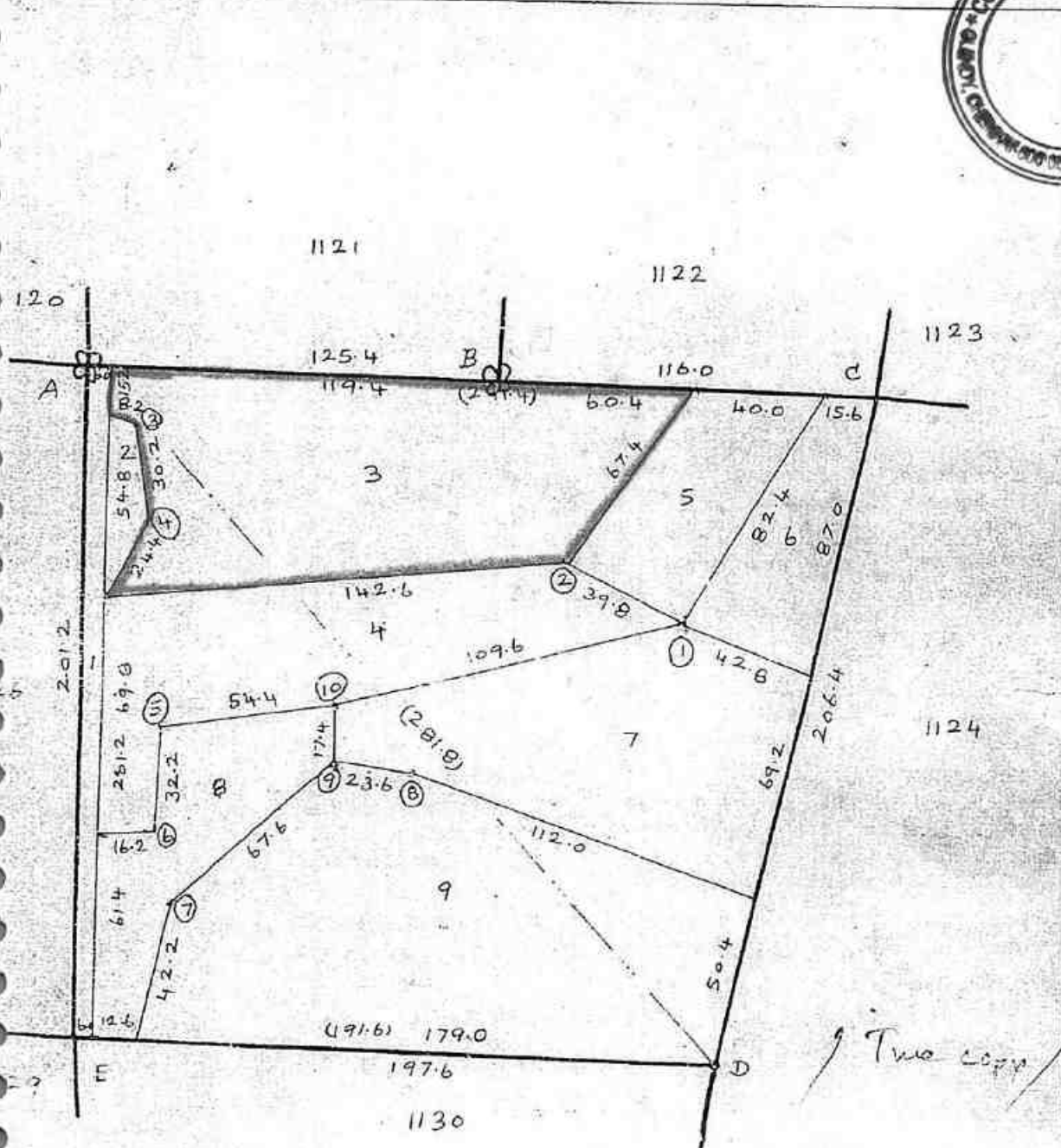
LEASE APPLIED AREA

உலகம். ௧௮ம் தீர்மானம் ௧௯௮௮

கிராமம் } பெயர். இரு திருக்கோட்டை.

4௭௭ எண். 1125

பரப்பு: ஹெக்டேர் 4 37.5 ஏர்.



Two Copy

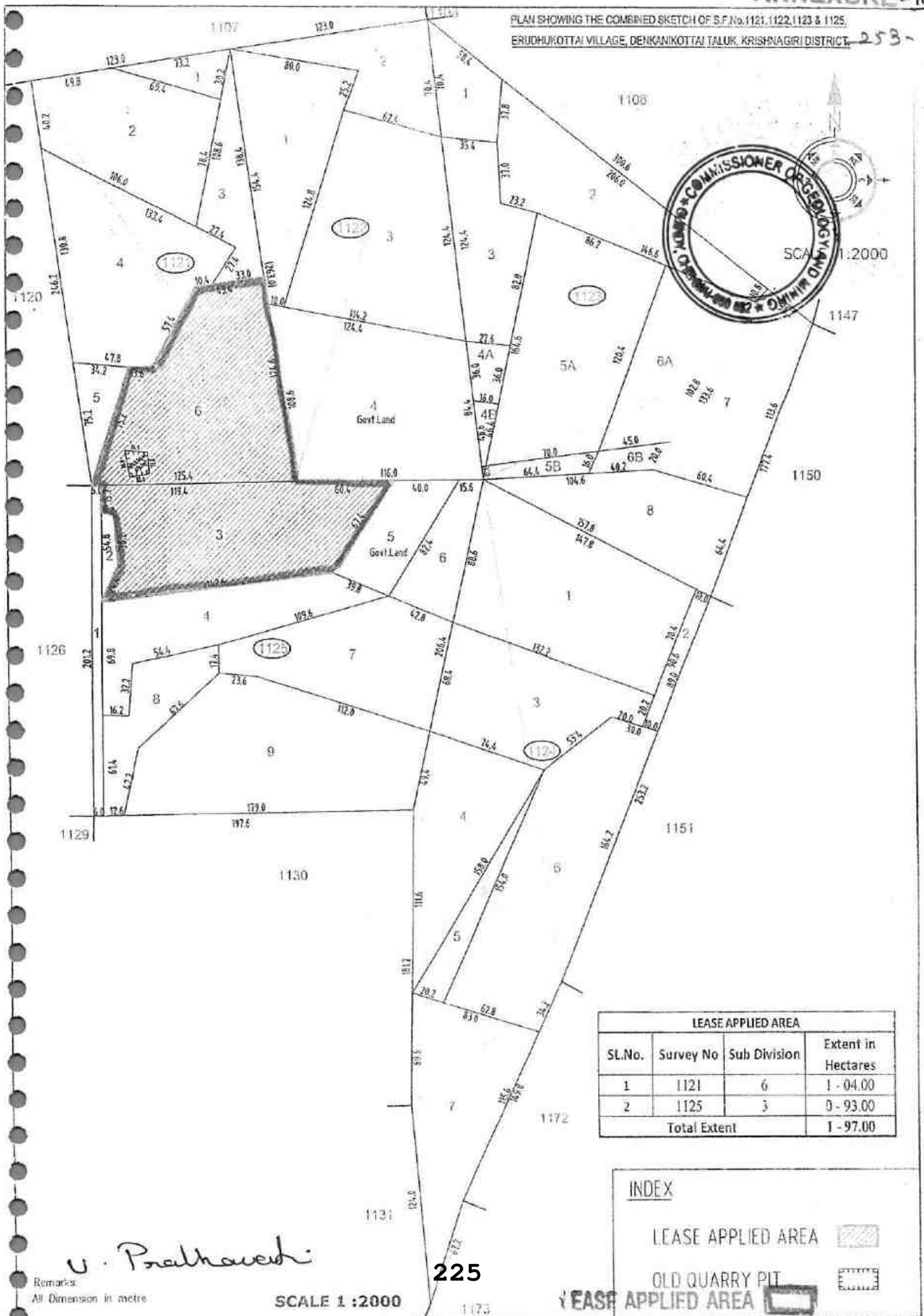
		A							
		281.8					2	54.8	94.8
10	14.0	159.0		6	22.6	139.8			C
9	25.6	145.8		5	23.4	107.6			206.4
8	10.4	127.8		4	18.2	48.2		1	42.6
		D		3	14.0	18.2			125.8
		E				A			D
		201.2				B			C
		121.2				116.0			241.4
									125.4
									A

கிராமம் திருக்கோட்டை
 1. இரு திருக்கோட்டை (கிராமம்)
 2. திருக்கோட்டை (வட்டம்)
 Line B

V. Prathaveti

PLAN SHOWING THE COMBINED SKETCH OF S.F.No.1121,1122,1123 & 1125.
ERUDHIKOTTAI VILLAGE, DENKANIKOTTAI TALUK, KRISHNAGIRI DISTRICT.

253-



LEASE APPLIED AREA			
Sl.No.	Survey No	Sub Division	Extent in Hectares
1	1121	6	1 - 04.00
2	1125	3	0 - 93.00
Total Extent			1 - 97.00

INDEX

LEASE APPLIED AREA

OLD QUARRY PIT

LEASE APPLIED AREA

U. Prathapachari

225

Remarks:
All Dimension in metre

SCALE 1 : 2000

LEASE APPLIED AREA

அ-பதிவேடு விவரங்கள்

ANNEXURE - IV

- 255 -

மாவட்டம் : கிருஷ்ணகிரி
வட்டம் : டெங்கனிகோட்டா
கிராமம் : இருதுகோட்டா

1. புல எண்	1121	9. மண் வயனமும் ரகமும்	8 - 5
2. உட்பிரிவு எண்	6	10. மண் தரம்	12
3. பழைய புல உட்பிரிவு எண்	1121	11. தீர்வை (ரூ - ஹெ)	0.62
4. பகுதி	-	12. பரப்பு (ஹெக்டேர் - ஏர்)	1 - 4.00
5. அரசு / ரயத்துவாரி	ரயத்துவாரி	13. மொத்த தீர்வை (ரூ - பை)	0.64
6. நிலத்தின் வகை	பஞ்சை	14. பட்டா எண்	8927
7. பாசன ஆதாரம்	-	15. குறிப்பு	-
8. இரு போகமா	-	16. பெயர்	K.P.R.கிராணைட்ஸ்மற்றும 2பேர்



குறிப்பு 1:



1.

மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் <http://eservices.tn.gov.in> என்ற இணைய தளத்தில் 20176 என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.

U. Prathap

அ-பதிவேடு விவரங்கள்

257-

மாவட்டம் : கிருஷ்ணகிரி

வட்டம் : டெங்கனிகோட்டா

கிராமம் : இருதுகோட்டா

1. புல எண்	1125	9. மண் வயனமும் ரகமும்	8 - 4
2. உட்பிரிவு எண்	3	10. மண் தரம்	10
3. பழைய புல உட்பிரிவு எண்	1125-3	11. தீர்வை (ரூ - ஹெ)	1.09
4. பகுதி	-	12. பரப்பு (ஹெக்டேர் - ஏர்)	0 - 93.00
5. அரசு / ரயத்துவாரி	ரயத்துவாரி	13. மொத்த தீர்வை (ரூ - பை)	1.01
6. நிலத்தின் வகை	புஞ்சை	14. பட்டா எண்	8927
7. பாசன ஆதாரம்	-	15. குறிப்பு	-
8. இரு போகமா	-	16. பெயர்	K.P.R.கிராணைட்ஸ்மற்றும 2பேர்



குறிப்பு 1:



1.

மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் <http://eservices.tn.gov.in> என்ற இணைய தளத்தில் 20176 என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.

U. Prathapathi



தமிழ்நாடு அரசு

வருவாய்த் துறை

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

மாவட்டம் : கிருஷ்ணகிரி

வட்டம் : டெங்கனிகோட்டா

வருவாய் கிராமம் : இருதுகோட்டா

பட்டா எண் : 927

உரிமையாளர்கள் பெயர்

- | | | |
|----------------------|-------|-------------------------------|
| 1. --- | --- | K.P.R.கிராண்டீஸ் |
| 2. (லேட்)பச்சியப்பன் | மகன் | நிர்வாக பங்குதாரர் முத்துசாமி |
| 3. கார்த்திகேயன் | மனைவி | நிர்வாக பங்குதாரர் பிரபாவதி |



புல எண்	உட்பிரிவு	புன்செய்		நன்செய்		மற்றவை		குறிப்புரைகள்
		பரப்பு	தீர்வை	பரப்பு	தீர்வை	பரப்பு	தீர்வை	
		ஹெக்ட - ஏர்	ரூ - பை	ஹெக்ட - ஏர்	ரூ - பை	ஹெக்ட - ஏர்	ரூ - பை	
1121	6	1 - 4.00	0.64	--	--	--	--	2019/0103/31/108572- -- -- 07-08-2019
1123	4B	0 - 4.00	0.10	--	--	--	--	2019/0103/31/108572- -419/1422 -- 07-08- 2019
1123	5B	0 - 8.00	0.10	--	--	--	--	2019/0103/31/112828- -419/1422 -- 20-08- 2019
1123	6B	0 - 7.50	0.10	--	--	--	--	2019/0103/31/108572- -419/1422 -- 07-08- 2019
1125	3	0 - 93.00	1.01	--	--	--	--	2019/0103/31/108572- -- -- 07-08-2019
		2 - 16.50	1.95					

குறிப்பு2 :



- மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் <https://eservices.tn.gov.in> என்ற இணைய தளத்தில் 31/10/041/08927/90176 என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.
- இத் தகவல்கள் 05-10-2023 அன்று 11:01:09 AM நேரத்தில் அச்சடிக்கப்பட்டது.
- கைப்பேசி கேமராவின் 2D barcode படிப்பான் மூலம் படித்து 3G/GPRS வழி இணையதளத்தில் சரிபார்க்கவும்

U. Pralhad

பக்கம் 2

429 ஆம் பக்கத்தில் **60** ஆம் பக்கத்தில் உள்ள **11** பிரிவுகளில் உள்ள **41** இடங்களைக் குறிப்பிடும் கணக்கு

பில் வரித் திட்டத்தின்படி பணக்களின் விவரம்.	சிறப்பிப்பட்டுள்ள பணக்களின் விவரம்.		சிறப்பிப்பட்டுள்ள பணக்களின் விவரம்.	முதல் பாகம்.					இரண்டாம் பாகம்.				மொத்தம்		
	பெண்	ஆண்		இரண்டாம் பாகம்	முதல் பாகம்	மொத்தம்	முதல் பாகம்	இரண்டாம் பாகம்	மொத்தம்						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
121 6			8927												
121 3	0930	141	KPR கிருமணி												

U. Pralhadani



(Signature)
 இராணுவ அலுவலர்
 41, இராணுவ பகுதி, சேலம்
 (தமிழ்நாடு)

4703/19

TP/66200680/19



தமிழ்நாடு தமில்நாடு TAMILNADU 8.7.19

T 473851

K.P.R. GRANITES,
Paavathanahalli

S.S. Murthy
S.SIDDESWARA MURTHY
L.No.3887/B1-2000
Stamp Vendor
Denkanikotta

சுத்த கிரய பத்திரம்

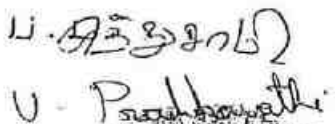
2019-ம் ஆண்டு ஜூலை மாதம் 08-ம் தேதியில் தகுமபுரி மாவட்டம், பென்னாகரம் வட்டம், பருவதனஹள்ளி கிராமம், ஓளவைநகர், கதவு எண் 2/227 என்ற முகவரியில் இயங்கிவரும் K.P.R.GRANITES-ன் நிர்வாக பங்குதாரர்களுமான லேட்.பச்சியம்பன் அவர்களின் குமாரர் திரு.முத்துசாமி (PAN NO: COJPM5306J) (CELL NO:9787957473) (1) மற்றும் திரு.கார்த்திகேயன் அவர்களின் மனைவி திருமதி.பிரபாவதி (PAN NO:COIPP5842H) (CELL NO:9655058993) (2) (எழுதிவாங்குபவர்கள்) ஆகிய உங்களுக்கு

K.P.R.GRANITES-ன் நிர்வாக பங்குதாரர்கள்

எழுதிக்கொடுப்பவர்கள்

எழுதி வாங்குபவர்கள்


A. Puthubai


U. Prabhavathi

1 புத்தகம் 2019-ம் வருடத்திய
14503-3 எண் ஆவணம் 12
தார்களை கொண்டது 1-ம் தாள்
ஆங்கிவாளர்



230
U. Prabhavathi

தருமபுரி மாவட்டம், பென்னாகரம் வட்டம், பருவதனஹள்ளி கிராமம், ஒளவைநகர், கதவு எண் 2/227 என்ற முகவரியில் வசிக்கும் திரு.முத்துசாமி அவர்களின் குமாரர் திரு.M.கார்த்திகேயன்

(PAN NO:A0YPK8193C) (CELL NO:9843495121) (1) மற்றும் திரு.அழகன்

அவர்களின் குமாரர் திரு.A.பார்த்திபன் (PAN NO:BMGPP3975C) (CELL

NO:9500240050) (2) (எழுதிக்கொடுப்பவர்கள்) ஆகிய நாங்கள், நாம் அனைவரும் சேர்ந்து

எழுதி வைத்துக்கொண்ட கிரய பத்திரம் என்னவென்றால் ஹெடியூலில் விவரம் கண்ட சொத்து

எழுதிக்கொடுக்கும் 1 லக்கமிட்ட திரு.M.கார்த்திகேயன் என்பவருக்கும் 2 லக்கமிட்ட

திரு.A.பார்த்திபன் என்பவருக்கும் தேன்கனிக்கோட்டை சார்பதிவாளர் அலுவலகத்தில் 1 புத்தகம்

பத்திர எண் 1415/2010ன்படி கூட்டு கிரய மூல்யமாயும் மற்றும் கூட்டு பட்டா எண் 2048-

ன்படி பாத்தியப்பட்டு சுவாதீனம் அனுபவம் மேற்படி சொத்தை எழுதிவாங்கும் 1,2 லக்கமிட்ட

உங்களுக்கு இன்று ரூ.10,79,370/-(எழுத்தால் பத்து இலட்சத்து எழுபத்து ஒன்பதாயிரத்து

மூன்னூற்று எழுபது ரூபாய்களுக்கு) சுத்த கிரயம் செய்து மேற்படி கிரய தொகையில்

1.ரூ.5,00,000/ஐ பென்னாகரம் கிளை, இந்தியன் வங்கி 08.07.2019ன் தேதியிட்ட

காசோலையாகவும் காசோலை எண் (CHEQUE NO:522420)ன்படியும்,

1.ரூ.5,79,370/ஐ பென்னாகரம் கிளை, இந்தியன் வங்கி 08.07.2019ன் தேதியிட்ட

காசோலையாகவும் காசோலை எண் (CHEQUE NO:522421)ன்படி, கீழ்கண்ட சாட்சிகளின்

முன்னிலையில் இன்றே நிறுவனத்தின் சார்பாக பங்குதார்களாகிய எழுதிவாங்கும் 1,2 லக்கமிட்ட

உங்களால் எழுதிக்கொடுக்கும் 1,2 லக்கமிட்ட நாங்கள் காசோலையாக பெற்றுக்கொண்டு கிரய

நிலத்தை இன்றே நிறுவனத்தின் பங்குதார்களாகிய எழுதிவாங்கும் 1,2 லக்கமிட்ட உங்களுடைய

சுவாதீனம் செய்திருக்கிறோம். இனி நிறுவனத்தின் பங்குதார்களாகிய எழுதிவாங்கும் 1,2 லக்கமிட்ட

நீங்கள் கிரய சொத்தை உங்களுடைய புத்திர பௌத்திர வம்ச பாரம் பரியமாய்சகல அக்கு

பாத்யங்களுடன் சர்வ சுதந்திரமாய் ஆண்டு அனுபவித்துக் கொள்ள வேண்டியது. கிரய சொத்தை

எழுதிக்கொடுக்கும் 1,2 லக்கமிட்ட நாங்கள் யாருக்கும் எந்த விதமான வில்லங்க பராதீனமும்

செய்யப்பட வில்லை அப்படி ஏதாவது வில்லங்கமோ தகராறோ ஏற்பட்டால் அதை எழுதிக்கொடுக்கும்

1,2 லக்கமிட்ட நாங்கள் எங்களுடைய சொந்த செலவில் பரிகாரம் செய்துகொடுக்க

கடமைப்பட்டவர்கள்.

K.P.R.GRANITES-ன் நிர்வாக பங்குதாரர்கள்

எழுதிக்கொடுப்பவர்கள்

A. Paultubay
V. Palhaver

1	புத்தகம் 2019-ம் வருடத்திய
4703	எண் ஆவணம்
12	தாட்களை கொண்டது
2	ய தாள
231	சார்பதிவாளர்
	தேன்கனிக்கோட்டை

எழுதி வாங்குபவர்கள்

Prabhavathi

இனி கிரய சொத்துக்கும் எழுதி கொடுக்கும் 1,2 லக்கமிட்ட எங்களுக்கும் எங்களுடைய இதர வாரிசு தாரர்களுக்கும் எந்த விதமான பாத்யமும் அக்கும் கிடையாது. மேற்படி எழுதிக்கொடுக்கும் 1,2 லக்கமிட்ட நாங்கள் எங்களுடைய குடும்பசெலவு நிமித்தமாக சில்லரை கடன்கள் தீர்க்கும் பொருட்டு கிரயம் செய்திருக்கிறோம். கிரய நிலத்தின் பட்டாபெற்று வனத்தின் சார்பாக எழுதிவாங்கும் 1,2 லக்கமிட்ட நிறுவனத்தின் பேருக்கு மாற்றம் செய்ய பத்திர சம்மதமும் கொடுத்திருக்கிறோம். மேற்படி சொத்தை இனி மேற்கொண்டு நிறுவனத்தின் சார்பாக எழுதிவாங்கும் 1,2 லக்கமிட்ட நீரே வரி வகைராக்களை செலுத்தி கொள்ள வேண்டியது என்று நிறுவனத்தின் சார்பாக 1,2 லக்கமிட்ட எழுதிவாங்குபவரும் மற்றும் எழுதிக்கொடுக்கும் 1,2 லக்கமிட்டவரும் நாம் அனைவரும் சேர்ந்து மனச் சம்மதத்துடன் ஒய்பி எழுதி வைத்துக்கொண்ட புஞ்சை நிலங்கள் சுத்த கிரய பத்திரம் சரி.

சொத்து விவரம்

கிருஷ்ணகிரி மாவட்டம், கிருஷ்ணகிரி பதிவு மாவட்டம், தேன்கனிக்கோட்டை சார்பதிவகத்திற்கு உட்பட்ட தேன்கனிக்கோட்டை வட்டம், இருதுகோட்டை கிராம

(1) சர்வே எண் **1121/6** புஞ்சை ஹெக் 1.04.0க்கு தீர்வை 0.64 ஏக்கரில் 2.57 செண்டு கொண்ட நிலம் பூராவும்.

(2) சர்வே எண் **1123/4** புஞ்சை ஹெக் 0.11.5க்கு தீர்வை 0.07 இதன் உட்பிரிவு எண் **1123/4B** புஞ்சை ஹெக் 0.04.0க்கு தீர்வை 0.10 ஏக்கரில் 0.10 செண்டு கொண்ட பூரா நிலத்திற்கு செக்குபந்தி விவரம்.

கிழக்கு சர்வே எண் 1123/5 நிலம்,

மேற்கு சர்வே எண் 1122,

வடக்கு சர்வே எண் 1123/3 நிலம்,

தெற்கு இன்று கிரயம் பெறும் K.P.R. Granites பங்குதாரர்களின் நிலம்,

இதன் மத்தியில் ஏக்கரில் 0.10 செண்டு கொண்ட நிலம்.

K.P.R.GRANTES-ன் நிர்வாக பங்குதாரர்கள்

எழுதிக்கொடுப்பவர்கள்

எழுதி வாங்குபவர்கள்

அ. பர்திபாஸ்

A. parthibas

U. Pralhavathi

U. Pralhavathi

U. Pralhavathi

1	பத்தகம் 2019-ம் வருடத்திய
4003	எண் அவணம் 120
232	3
தாக்களை கொடுத்தும் தாள்	

(3) சர்வே எண் **1123/5** புஞ்சை ஹெக் 1.12.5க்கு தீர்வை 0.70 (இதன் உட்பிரிவு எண் **1123/5B**) இதில்

- கிழக்கு சர்வே எண் 1123/6 நிலம்,
 - மேற்கு சர்வே எண் 1123/4 நிலம்,
 - வடக்கு இன்று கிரயம் பெறும் K.P.R. Granites பங்குதாரர்களின் நிலம்,
 - தெற்கு இன்று கிரயம் பெறும் K.P.R. Granites பங்குதாரர்களின் நிலம்,
- இதன் மத்தியில் ஏக்கரில் 0.22 செண்டு கொண்ட நிலம்.



(4) சர்வே எண் **1123/6** புஞ்சை ஹெக் 0.65.0க்கு தீர்வை 0.40 (இதன் உட்பிரிவு எண் **1123/6B**) இதில்

- கிழக்கு சர்வே எண் 1123/7 நிலம்,
 - மேற்கு சர்வே எண் 1123/5 நிலம்,
 - வடக்கு இன்று கிரயம் பெறும் K.P.R. Granites பங்குதாரர்களின் நிலம்,
 - தெற்கு இன்று கிரயம் பெறும் K.P.R. Granites பங்குதாரர்களின் நிலம்,
- இதன் மத்தியில் ஏக்கரில் 0.18 செண்டு கொண்ட நிலம்.

(5) சர்வே எண் **1125/3** புஞ்சை ஹெக் 0.93.0க்கு தீர்வை 1.01 ஏக்கரில் 2.30 செண்டு கொண்ட நிலம் பூராவும் ஆக அனைத்து சர்வே எண்களும் சேர்ந்து ஏக்கரில் 5.37 செண்டு கொண்ட நிலம். மேற்கண்ட வீதம் கிரய ஆவணத்திற்கு சம்மந்தப்பட்டது.

K.P.R.GRANITES-ன் நிர்வாக பங்குதாரர்கள்

எழுதிக்கொடுப்பவர்கள்

எழுதி வாங்குபவர்கள்

A. partikasan
A. partikasan

U Prabhavathi
U Prabhavathi

U Prabhavathi

1	புத்தகம் 2019-ம் வருடத்திய
0703	எண் ஆவணம்
	தாக்களை கொண்டது ம் தாள்
233	சார்பதிவாளர்
	தேன்கனிக்கோட்டை



மேற்படி சொத்து இருதுகோட்டை கிராம பஞ்சாயத்துக்கும், கெலமங்கலம் ப.யூ. எல்லைக்கும் சம்மந்தப்பட்டது. மேற்படி சொத்து தற்கால மார்கெட் மதிப்பு ரூ.10,79,370/-பெறும்

K.P.R.GRANITES-ன் நிர்வாக அதிகாரிகள்

எழுதிக்கொடுப்பவர்கள்

எழுதி வாங்குபவர்கள்

சு. சந்திரசேகர்
A. Parthiban

U. Prabhavathi


சாட்சிகள்

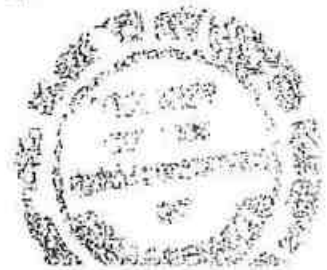
- 1 N. Srinivasulu Rao N. Narayana. D. 10/11/2019
- 2 N. Srinivasulu Rao N. Narayana. D. 10/11/2019

தயாரித்தவர்

S. Venkataraju
S. VENKATARAJU
DOCUMENT WRITER
Office No. D/26/ESGWS
DURBANIKOTTA

U. Prabhavathi

1 புத்தகம் 2019-ம் வருடத்திய
4703 எண் ஆவணம்
தாடகளை கொண்டது 5-ம் தாள்
-234
சார்பதுலாளர்
தேன்கனிக்குகோட்டை



1968-ம் வருஷத்திய சென்னை முத்திரை சட்டம் குறைந்த மதிப்பீட்டு பத்திரம்
எழுதுவதை தடுக்கும் ரூல்ஸ் 3(1) ன்படி ஸ்டேட்மென்டு

வரிசை எண்	கிராமம்	ச.எண்	விஸ்தீர்னம் ஏக்கர்/சென்ட்	இனம்	மதிப்பு
1.	இருதுகோட்டை	1121/6	2.57	பஞ்சை	Rs.5,16,570-
2.	"	1123/4B	0.10	பஞ்சை	Rs. 20,100-
3.	"	1123/5B	0.22	பஞ்சை	Rs. 44,220-
4.	"	1123/6B	0.18	பஞ்சை	Rs. 36,180-
5.	"	1125/3	2.30	பஞ்சை	Rs.4,62,300-
மொத்தமதிப்பு					Rs.10,79,370/-



K.P.R.GRANITES-ன் நிர்வாக பங்குதாரர்கள்

எழுதிக்கொடுப்பவர்

அ. பாலசுப்பிரமணியன்
A. palthibhar

எழுதி வாங்குபவர்கள்

U. Pralhawathi
U. Pralhawathi

U. Pralhawathi

1	புத்தகம் 2019-ம் வருடத்திய
1903	எண் ஆவணம்
	தாட்களை கொண்டது -- 6 -- ம் தாள்
	சார்த்தம் 235 னர்
	தேன்கலிக் கார்டை





தமிழக அரசு

வருவாய்த் துறை

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

மாவட்டம் : கிருஷ்ணகிரி

வட்டம் : டங்கனிகோட்டை

வருவாய் கிராமம் : இருதுகோட்டா

பட்டா எண்: P2048



உரிமையாளர்கள் பெயர்

1.	முத்துசாமி	மகன்	கார்த்திகேயன்
2.	அழகேசன்	மகன்	பார்த்தீபன்

புல எண்	உட்பிரிவு	நன்செய்		புன்செய்		மற்றவை	
		பரப்பு	தீர்வை	பரப்பு	தீர்வை	பரப்பு	தீர்வை
1121	6	--	--	1 - 4.00	0.64	--	--
1123	4B	--	--	0 - 4.00	0.10	--	--
1123	5B	--	--	0 - 8.00	0.10	--	--
1123	6B	--	--	0 - 7.50	0.10	--	--
1125	3	--	--	0 - 93.00	1.01	--	--
				2 - 16.50	1.95		

குறிப்பு2 :



1. மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் <http://eservices.tn.gov.in> என்ற இணைய தளத்தில் 31/10/041/02048/30184 என்ற குறிப்பு எண்ணை உள்ளிடு செய்து உறுதி செய்துகொள்ளவும்.
2. இத் தகவல்கள் 08-07-2019 அன்று 10:17:13 AM நேரத்தில் அச்சடிக்கப்பட்டது.
3. கைப்பேசி கேமராவின் 2D barcode படிப்பான் மூலம் படித்து 3G/GPRS வழி இணையதளத்தில் சரிபார்க்கவும்

A. P. Prabhakaran

V. Prabhavathi

1 புத்தகம் 2019-ம் வருடத்திய
1703 எண் ஆவணம் 12
தாக்களை கொண்டது 236-ம் தாள்

आयकर विभाग
 INCOME TAX DEPARTMENT
 भारत सरकार
 GOVT. OF INDIA
 A PARTHIBAN
 ALAGESAN
 06/06/1984
 Permanent Account Number
 BMGPP3975C
 सत्याव जयते
 A. Parthiban
 Signature



A. parthiban

आयकर विभाग
 INCOME TAX DEPARTMENT
 भारत सरकार
 GOVT. OF INDIA
 M KARTHIKEYAN
 MUTHUSAMY
 02/06/1979
 Permanent Account Number
 AOYPK8193C
 M. Karthikeyan
 Signature

M. Karthikeyan

U. Prabhavathi

1
 4-ஆகம் 2019-ம் வருடத்திய
 எண் ஆவணம் 12
 தாட்களை கொண்டது 8-ம் தாள்
 237
 சென்னை



U. Prabhavathi



P. Muthusamy

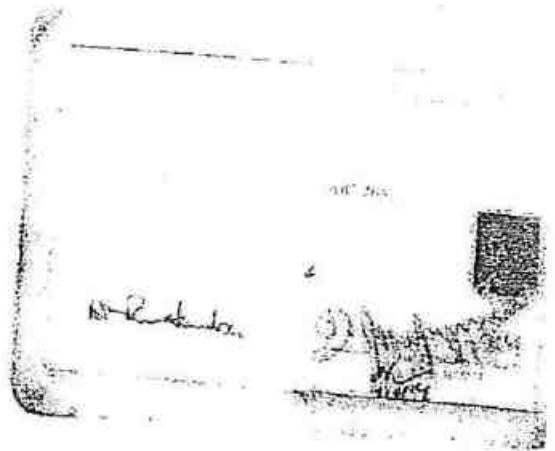
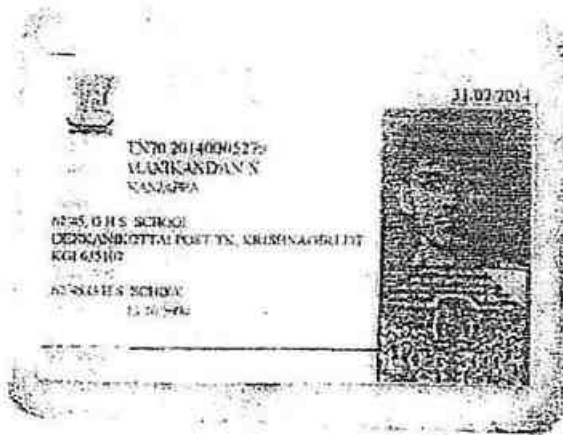
U. Prabhavathi

1 பத்தகம் 2013-ம் வருடத்திய
 4703 எண் ஆவணம்
 தாக்களை கொண்டு 9-ம் தாள்
 238





N. Srinj



K. Srinivasan

U. Prabhavathi

1	புத்தகம் 2019-ம் வருடத்திய
4703	எண் சூவலை
10	தாட்களை விகாண்டது - 10 - ம் தூள்
239	



R/தேன்கனிக்கோட்டை/புத்தகம்-1/4703/2019

1899ம் ஆண்டு இந்திய முத்திரைச் சட்டம் 42வது பிரிவின் கீழான சான்று

2019ம் ஆண்டு வரிசை எண் 3057

Door NO. 2/226, Avvai Nagar, Paruvathannahalli Village, Noolahalli post. பென்னாகரம், தர்மபுரி, தமிழ்நாடு, இந்தியா, 636873-68 வசிக்கும் திரு முத்துசாமி என்பவரிடமிருந்து ₹ 70,564/- (ரூபாய் எழுபத்தாயிரத்து ஐந்துநூற்று அறுபது நான்கு மட்டும்) இந்த ஆவணத்திற்காக இந்திய முத்திரைச் சட்டம் 41வது பிரிவின் படி குறைவாயிருந்த முத்திரைக் கட்டணம் வசூலிக்கப்பட்டது என நான் இதன் மூலம் சான்றளிக்கிறேன்.



சார்பதிவாளர் : தேன்கனிக்கோட்டை
நாள்: 08/07/2019

சார்பதிவாளர் மற்றும் இந்திய முத்திரைச் சட்டம் பிரிவு
41ன் படி ஆட்சியர்

2019 ஆம் ஆண்டு ஜூலை மாதம் 08ம் தேதி மு.ப. 11:48 மணியளவில் தேன்கனிக்கோட்டை சார்பதிவாளர் அலுவலகத்தில் தாக்கல் செய்து கட்டணம் ₹ 43,480/- செலுத்தியவர்.

இடது பெருவிரல்



M. Prabhakaran

கூடுதல் விவரங்கள் ஆவண வாசகத்தில் உள்ளபடி

எழுதிக் கொடுத்ததாக ஒப்புக் கொண்டவர்
இடது பெருவிரல்



M. Prabhakaran

கூடுதல் விவரங்கள் ஆவண வாசகத்தில் உள்ளபடி

எழுதிக் கொடுத்ததாக ஒப்புக் கொண்டவர்
இடது பெருவிரல்



A. Parthiban

கூடுதல் விவரங்கள் ஆவண வாசகத்தில் உள்ளபடி

1/2

1 புத்தகம் 2019-ல் வருடத்திய
4703 எண் ஆவணம் 12
தாக்களை கொண்டது 240 நாள்

U. Prathavesh



R/தேன்கனிக்கோட்டை/புத்தகம்-1/4703/2019

எழுதி வாங்கியதாக ஒப்புக் கொண்டவர்
இடது பெருவிரல்




[Handwritten Signature]



சுடுதல் விவரங்கள் ஆவண வாசகத்தில் உள்ளபடி

எழுதி வாங்கியதாக ஒப்புக் கொண்டவர்
இடது பெருவிரல்




U. Prabhavathi

சுடுதல் விவரங்கள் ஆவண வாசகத்தில் உள்ளபடி

- இன்னாரென்று நிரூபித்தவர்கள்
1. *[Handwritten Signature]* திரு கனில் த/பெ நாராயணசாமி பட்டாளம்மன் கோவில் தெரு, தேன்கனிக்கோட்டை, தேன்கனிக்கோட்டை, கிருஷ்ணகிரி, தமிழ்நாடு, இந்தியா, 635107
 2. *[Handwritten Signature]* திரு மணிகண்டன் த/பெ நஞ்சப்பா ஹைஸ்கூல் ரோடு, தேன்கனிக்கோட்டை, தேன்கனிக்கோட்டை, கிருஷ்ணகிரி, தமிழ்நாடு, இந்தியா, 635107

2019 ஆம் ஆண்டு ஜூலை மாதம் 8ம் நாள்

[Handwritten Signature]
சிவக்குமார் கோ
சார்பதிவாளர்
தேன்கனிக்கோட்டை

R/தேன்கனிக்கோட்டை/புத்தகம்-1/4703/2019 எண்ணாகப் பதிவு செய்யப்பட்டது

நாள்: 08/07/2019
தேன்கனிக்கோட்டை



[Handwritten Signature]
சிவக்குமார் கோ
சார்பதிவாளர்

U. Prabhavathi

1 புத்தகம் 2019-ம் வருடத்திய
4703 எண் ஆவணம் 12
தாட்களை கொண்டது 12 ம் நாள் 241
சார்பதிவாளர்



படி.வம் இ

(விதி 9 (அ) காண்க)

தொழில் கூட்டுப் பதிவு சான்று

தர்மபுரி தொழில் நிறுவனப் பதிவாளர் 1932-ஆம் ஆண்டு இந்திய தொழில் நிறுவன சட்டம் 58 (1) பிரிவில் குறிப்பிட்டிருக்கும் அறிக்கை வரப்பெற்றுக் கொண்டதை இதனால் அறிவித்துக் கொள்கிறார். இந்த அறிக்கை கோப்பில் சேர்க்கப்பட்டு தொழில் நிறுவனத்தின் பெயரான

“K.P.R.GRANITES”

என்பது தொழில் நிறுவன பதிவேட்டில் 2010 -ம் ஆண்டு 135-ஆம்

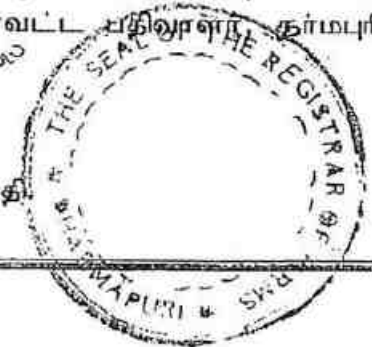
எண்ணாகப் பதிவாகியிருக்கிறது.



மாவட்ட பதிவாளர் அலுவலகம்,
தர்மபுரி.

18/11/2010
தொழில் கூட்டுப் பதிவாளர்,
மாவட்ட பதிவாளர் தர்மபுரி.

18/11/2010



2010 - ம் ஆண்டு November - மாதம் 18-ம் தேதி

V. Prabhavathi



GOVERNMENT OF TAMILNADU
COMMERCIAL TAXES DEPARTMENT
TAMIL NADU VALUE ADDED TAX ACT, 2006

FORM D
[See rule 5(1)(a)]

CERTIFICATE OF REGISTRATION

This is to certify that **K.P.R GRANITES**
whose principal place of business is situated at:

Street Name : 2723, AVVAI NAGAR, NEAR E.B. OFFICE
Town / City : PARUVATHANAHALL VILL. NOOLAHALLI PO-PENNAGARAM
Location :
State : TAMIL NADU
Pincode : 636810

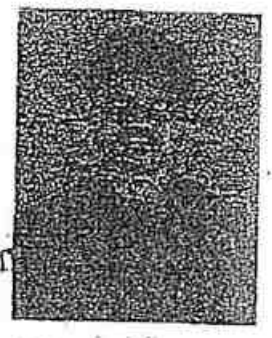
Additional place of business is situated at :-

is registered as a dealer under the Tamil Nadu Value Added Tax Act, 2006 with

Tax Payer's Identification Number (TIN) : 33423291895

with effect from 5th day of January 2011

Given under my hand and seal



Amelth
Commercial Tax Officer
PALACODE.

(Signature of Registering Authority)

Name *C. Anandaraman*
Designation *Palacode.*

Place PALACODE

Date 7/01/2011



2
09-01-11

Transaction ID : 1657263
Report generated on : 07-01-2011 / 00:00:00

V. Prabhakar



GOVERNMENT OF TAMILNADU
COMMERCIAL TAXES DEPARTMENT
FORM B
CERTIFICATE OF REGISTRATION



C.S.T Number 46537

TIN 12423291695

This is to certify that K.P.R GRANITES

whose principal place of business is situated at

Street Name 223, AVVAI NAGAR NEAR E.B OFFICE

Town/City ARIVATHANATHALI VILL NOOLAHALLI PO-PENNAGARAM

State TAMIL NADU

Pincode 6810

Commercial Tax Officer
PALACODE.



Has been registered as a dealer under sec 7(1)(2) of The Central Sales Tax Act, 1956. In The Office Of The Assistant Commercial Tax Officer

The Classes of Goods specified for the Purpose of sub-section 1 and 3 of Section 8 of the Act is/Are as Follows and the course of inter-state trade to the dealer shall be taxable at the rate

Wholly Wholesale
Mainly
Partly

(A) FOR RE-SALE

S.No	Description	Date of Effect	Commodity
1	Re-Sale	05-01-2011	POLISHED GRANITES, TILES, SLABS & MONUMENTS, 2) PLANT & MACHINERIES, TOOLS & SPARES

Additional Places of business as Detailed Below:-
(a) In The State of Registration

(b) In Other States

The Dealer Keeps Ware Houses at The Following Places With In The State of Registration

This Certificate Valid From 5th January 2011

Until Cancelled

Place PALACODE
Date 07.01.11

(Signature of Registering Authority)
Name Commercial Tax Officer (C.T.O.)
Designation Palacode.



07.01.11

U. Prabhavathi



9036
28/7/17

K.P.R Granites
pennagum

43AB 094845 /

B. இலட்சுமி
ம. எண் = எண்: 3510/B1/2000
இலங்கை, தருமபுரி - (Tk).

2010.6 இலங்கை கட்டுமான எண். 135

பெண் : 1

பெண் : இலங்கை

U. Prabhakar

FORM A.
[See Rule 5.]

REGISTER OF FIRMS.

(Maintained under section 59 of the Indian Partnership Act, 1932.)

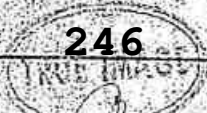
1 Serial number of firm. 135/2010
 2 Name of firm. K.P.R. Granites.
 3 Date of registration. 18.11.2010
 4 Duration of the firm. Atwill.



5	Address.	Date of change.	Remarks.
	2/223, Arvai Nagar Near BB office, Noolahalli (P.O.) Pennagaram (T.K.) Dharmapuri (D.T.)		

6 Partners:

Name of the partners.	Addresses.	Date of		Remarks.
		Joining.	Ceasing.	
1. Ulaganathan Rajagopal	4/36, Santhai Pet	9		உலகநாதன் 1/11/2010 ராஜகோபால்
	Moongi, Madu V.O. C.P.O.)	11		
	Pennagaram (T.K.)		2010	
	Dharmapuri			
2. Alagesan Parthiban	2/525 Santhai Pet	9	2	அலகேசன் 2/11/2010 பார்த்திபன்
	Ajjamahalli (P.O.)	11	12	
	Pennagaram (T.K.)	2010	2011	
	Dharmapuri (P.O.)			



V. Prabhakar

சாரி: 2
சாரி: அலகேசன்

Partners (cont.)

Regn. IV-I

Name of the partners.	Addresses.	Date of	
		Joining	Ceasing
② Muthu Samy	2/226,		25
Karthikeyan	Avvai Nagar	9	01
	Near EB Office	11	2019
	Noolahalli CPD	2010	
	Pennagaraiam		
	(Tir.)		



7 Principal place of business and changes therein :

Particulars regarding the place.	Date of change.	Remarks.
Name of the Partner	Address	Joining date
4. Karthikeyan	2/226/	29.3
V. PRABAVATHI	Avvai Nagar	24.6.14
	Near EB Office	
	Noolahalli	

8 Other places of business :

Name of the place.	Date of		Remarks.
	Opening	Ceasing	
5. சி. சி. சி. சி. சி. சி.	2-8		உ. சி. சி. : 1/17 சி. சி. சி.
சி. சி. சி. சி. சி. சி.	9		சி. சி. சி. சி. சி. சி.
	17		

உ. சி. சி. : 3


சி. சி. சி. : சி. சி. சி.



V. Prabhavathi

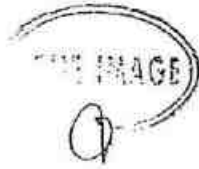
Name of firm

Regn. IV-1

Serial number of the document.	Description of the document.	Date of filing.	Signature of Registrar or Authorised Officer.
1 2010	இந்திய தொழில் நுட்ப அமைதி பிளாட்டிங் சர்க்கார் புரட்சி புரட்சி	18 11 2010	 18/11/10 Registrar திருவனந்தபுரம் தஞ்சாவூர்
1 2011	இந்திய தொழில் நுட்ப அமைதி பிளாட்டிங் சர்க்கார் புரட்சி II-A சர்க்கார் (2010-2011)	8 12 2011	18/11/10 Registrar திருவனந்தபுரம் தஞ்சாவூர்
2 2011	இந்திய தொழில் நுட்ப அமைதி பிளாட்டிங் சர்க்கார் புரட்சி II சர்க்கார் (2011)	8 12 2011	18/11/10 Registrar திருவனந்தபுரம் தஞ்சாவூர்
3 2014-15	இந்திய தொழில் நுட்ப அமைதி பிளாட்டிங் சர்க்கார் புரட்சி V சர்க்கார்	24 06 2014	Registrar திருவனந்தபுரம் தஞ்சாவூர்
1 2014	இந்திய தொழில் நுட்ப அமைதி பிளாட்டிங் சர்க்கார் புரட்சி V சர்க்கார்	24 06 14	Registrar திருவனந்தபுரம் தஞ்சாவூர்
1 2014	இந்திய தொழில் நுட்ப அமைதி பிளாட்டிங் சர்க்கார் புரட்சி V சர்க்கார்	24 06 14	Registrar திருவனந்தபுரம் தஞ்சாவூர்
1 2017	இந்திய தொழில் நுட்ப அமைதி பிளாட்டிங் சர்க்கார் புரட்சி V சர்க்கார்	28 4 17	Registrar திருவனந்தபுரம் தஞ்சாவூர்



U. Prabhakar





பக்கம் : 5
பெயர் : சிவாமி

பெயர் - பத்மாவதி
கருமணி

பெயர் குந்தியாமி }
சுவிசேஷி } MB

U. Prabhavathi.

சமூக அடையாளம்
Government of India

பெரும்புலிய தலைமை அமைப்பு
Unique Identification Authority of India

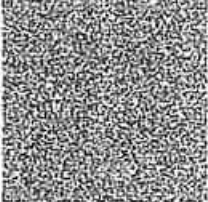
பதிவேட்டு எண்/ Enrolment No.: 2193/10519/97185

Download Date: 09/07/2020

To
முத்துசாமி பச்சியப்பன்
Muthusamy Pachiyappan
C/O Pachiyappan
2/226
Avvai Nagar
Parvathanahalli
Noolathali
Dharmapuri Tamil Nadu - 636813
9787957473

Issue Date: 06/12/2019

Signature valid



உங்கள் ஆதார் எண் / Your Aadhaar No. :
3405 2486 8323
VID : 9128 2855 3045 2364

எனது ஆதார், எனது அடையாளம்




சமூக அடையாளம்
Government of India

Download Date: 03/03/2020





முத்துசாமி பச்சியப்பன்
Muthusamy Pachiyappan
பிறந்த நாள்/DOB: 17/09/1953
ஆண்/ MALE


Issue Date: 06/12/2019

3405 2486 8323
VID : 9128 2855 3045 2364

எனது ஆதார், எனது அடையாளம்

சமூக அடையாளம்
Unique Identification Authority of India



தகவல்

- ஆதார் அடையாளத்திற்கான சான்று குடிமகனாக அல்ல
- பாதுகாப்பான QR குறியீடு/ ஆப்லைன் XML/ ஆப்லைன் அங்கீகரிக்கப்பட்ட பயன்படுத்தி அடையாளத்தை உறுதிப்பார்க்கவும்
- இது எலக்ட்ரானிக் செயல்முறை மூலம் தயாரிக்கப்பட்ட கடிதமாகும்.

INFORMATION

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

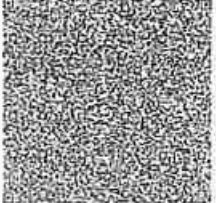
- ஆதார் ஒரு முழுவுதிரைச் செல்லுபடியாகும்.
- பல்வேறு அரசு மற்றும் அரசு ஈழா சேவைகளை எளிதில் பெற ஆதார் உதவுகிறது.
- உங்கள் மொபைல் எண் மற்றும் மின்னஞ்சல் முகவரி ஆதாரில் புதுப்பிக்கவும்.
- எல்லாப் செயலிழைய பயன்படுத்தி உங்கள் மொபைல் போனில் ஆதாரை எடுத்துக் செல்லுங்கள்.
- Aadhaar is valid throughout the country.
- Aadhaar helps you avail various Government and non-Government services easily.
- Keep your mobile number & email ID updated in Aadhaar.
- Carry Aadhaar in your smart phone – use mAadhaar App.

தகவல்
Unique Identification Authority of India

Download Date: 06/12/2019

முகவரி:
C/O பச்சியப்பன், 2/226, அவ்வை நகர்,
பருவத்தனஅள்ளி, தருமபுரி,
தமிழ்நாடு - 636813

Address:
C/O Pachiyappan, 2/226, Avvai Nagar,
Parvathanahalli, Dharmapuri,
Tamil Nadu - 636813



3405 2486 8323
VID : 9128 2855 3045 2364

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

V. Prathap

आयकर विभाग
 INCOME TAX DEPARTMENT
 P MUTHUSAMY
 PACHIAPPAN
 17/08/1953
 Permanent Account Number
 COJPM5306J
 Signature

भारत सरकार
 GOVT. OF INDIA






In case this card is lost / found, kindly inform / return to :
 Income Tax PAN Services Unit, UTHITSL
 Plot No. 3, Sector 11, CBD Belapur,
 New Mumbai - 400 614.

इस कार्ड के खाने/पाने पर कृपया सूचित करें/वापस :
 आयकर पैन सेवा यूनिट, UTHITSL
 प्लॉट नं. 3, सेक्टर 11, सी.बी.डी. बेलपुर,
 नवी मुंबई - 400 614.

U. Prabhavate.



भारत सरकार
GOVERNMENT OF INDIA



பிரபவதி கர்த்திகேயன்
Prabhavathi Karthikeyan
பிறந்த நாள்/ DOB: 07/05/1988
பாலம் / FEMALE



8941 7245 7638

எனது ஆதார், எனது அடையாளம்.



भारतीय भू-वैज्ञानिक सर्वेक्षण प्राधिकरण
भारतीय भू-वैज्ञानिक सर्वेक्षण प्राधिकरण
भारतीय भू-वैज्ञानिक सर्वेक्षण प्राधिकरण
भारतीय भू-वैज्ञानिक सर्वेक्षण प्राधिकरण



முகவரி:
கமலம் நகர்:
பார்த்திகேயன், 2/226,
அம்மை நகர் பி.என்.
நகரம், பருவநல்லூர்,
த.நாட்டி,
தமிழ்நாடு - 636813

Address:

WG Karthikeyan, 2/226, KAMALAM
NAGAR NEAR EB OFFICE,
Puravainallur, Dharmapuri,
Tamil Nadu - 636813

8941 7245 7638

MERA AADHAAR, MERI PEHACHAN

U. Prabhavathi

आयकर विभाग
INCOME TAX DEPARTMENT



भारत सरकार
GOVT. OF INDIA

U PRABHAVATHI

ULAGANATHAN

07/05/1988

Permanent Account Number

CQIPP5842H

U. Prabhavathi
Signature



*In case this card is lost / found, kindly inform
Income Tax PAN Services Unit, UTITSL,
Plot No. 3, Sector 11, CBD Belapur,
Navi Mumbai - 400 614.*

*उक्त कार्ड के खोने/पाने पर कृपया सूचित करें/सूचित करें:
आयकर पैन सेवा यूनिट, UTITSL,
प्लॉट नं: 3, सेक्टर 11, सीडीबी बेलपुर,
नवी मुंबई-400 614.*

U. Prabhavathi

आयकर विभाग
INCOME TAX DEPARTMENT



भारत सरकार
GOVT OF INDIA

KPR GRANITES

09/11/2010

Permanent Account Number

AALFK1668H

Signature

In case this card is lost/found, kindly inform/return to:
Income Tax PAN Services Unit, UT 111612,
Plot No. 3, Sector 11, CBD Belapur,
Navi Mumbai - 400 614.

इस कार्ड के खोने/पाने पर कृपया सूचित करें/वापस
आयकर सेवाएँ इकाई, यूटी 111612,
प्लॉट नं. 3, सेक्टर 11, सीडी बेलपुर,
नवी मुंबई - 400 614.



U. Prabhavati

भारत सरकार / GOVERNMENT OF INDIA
खान मंत्रालय / MINISTRY OF MINES
भारतीय खान ब्यूरो / INDIAN BUREAU OF MINES



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

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

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

उनकीपंजीयन संख्या है

His registration number is

RQP /MAS/263/2014/A

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

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

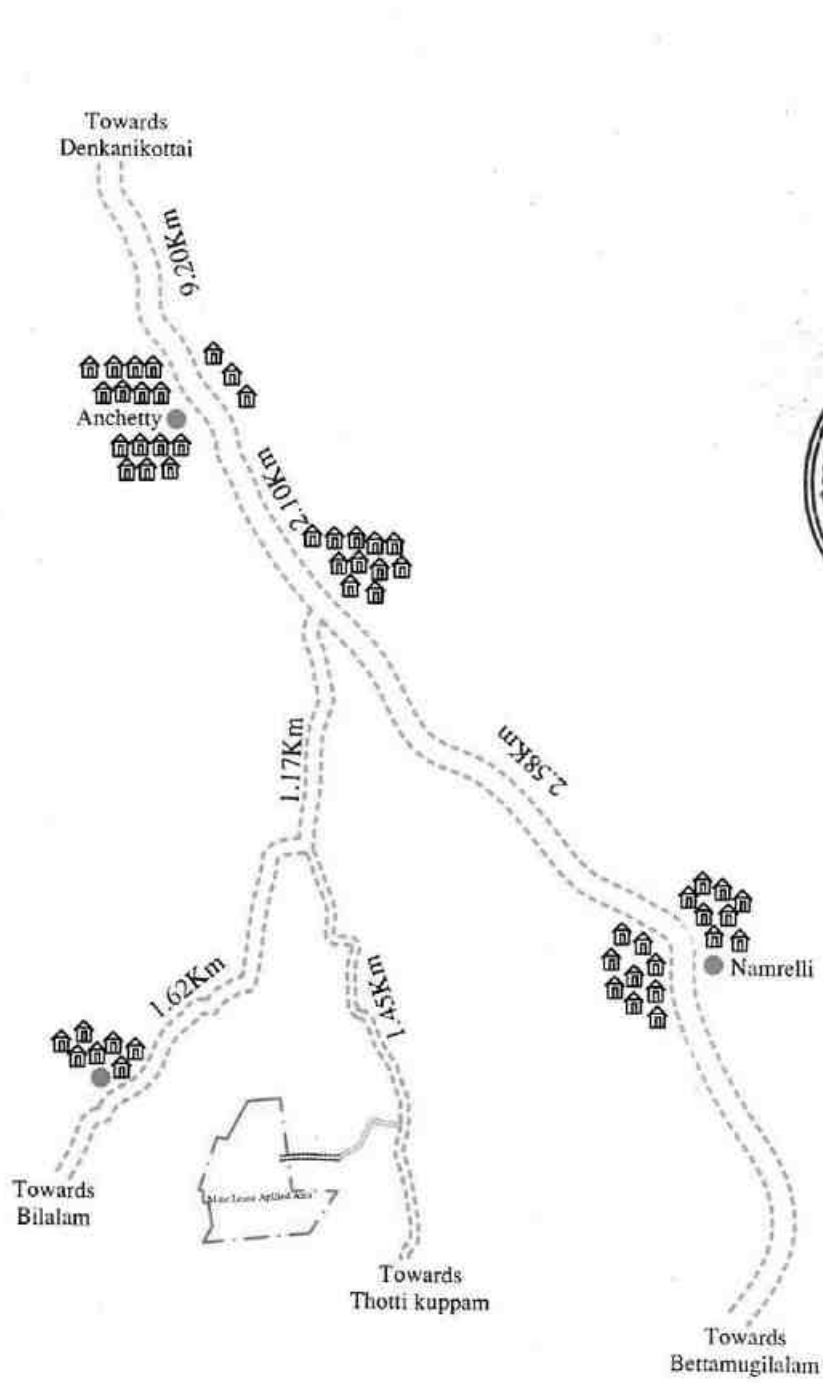
This certificate will liable to be withdrawn / cancelled in the event of furnishing the wrong information / documents in the Mining Plan submitted by him.

स्थान/ Place : Chennai

दिनांक/ Date : 16.12.2014.

U. Prathavathi

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



APPLICANT:
M/s. K.P.R GRANITES,
 No.2/223, AVVAI NAGAR,
 NOOLAHALLI POST,
 PENNAGARAM TALUK,
 DHARMAPURI DISTRICT - 636 813

LOCATION:
 EXTENT : 1.97.0Hect
 S.F.NO : 1121/6 & 1125/3
 VILLAGE : IRUDUKOTTAI
 TALUK : DENKANIKOTTAI
 DISTRICT : KRISHNAGIRI
 STATE : TAMIL NADU

PLATE NO-I

INDEX

QUARRY LEASE AREA	
APPROACH ROAD	
VILLAGE ROAD	
CART ROAD	

256
U. Prabhavathi

ROUTE MAP
 Not to Scale

Prepared By:

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

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

12°25'56.56272"N

- 317 -

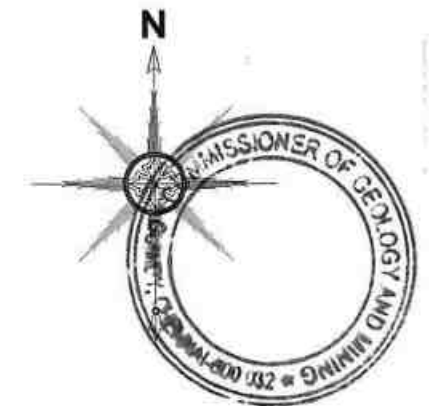


PLATE NO-IA

APPLICANT:
M/s. K.P.R GRANITES,
 No.2/223, AVVAI NAGAR,
 NOOLAHALLI POST,
 PENNAGARAM TALUK,
 DHARMAPURI DISTRICT - 636 813

LOCATION:
 EXTENT : 1.97.0Hect
 S.F.NO : 1121/6 & 1125/3
 VILLAGE : IRUDUKOTTAI
 TALUK : DENKANIKOTTAI
 DISTRICT : KRISHNAGIRI
 STATE : TAMIL NADU

INDEX

QUARRY LEASE AREA: ●
 TOPO SHEET NO : 57-H/15
 LATITUDE: 12°25'50.32737"N-12°25'56.56272"N
 LONGITUDE: 77°49'54.82843"E-77°50'0.97534"E

LOCATION PLAN

Not to Scale

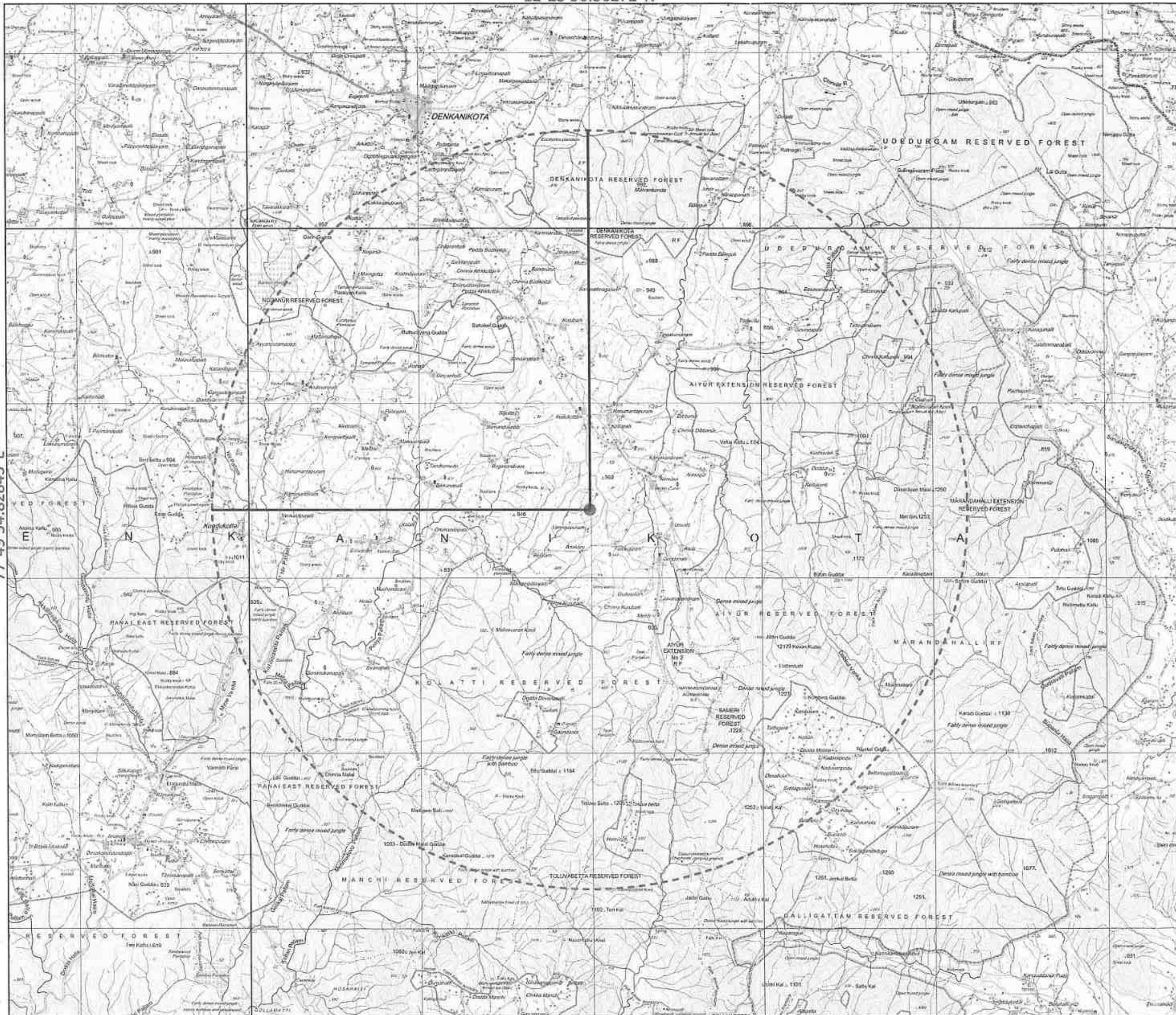
PREPARED BY :

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

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

77°49'54.82843"E

12°25'56.56272"N



77°49'54.82843"E

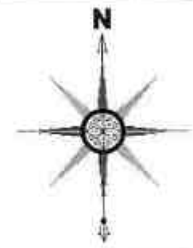


PLATE NO-IB

APPLICANT:
M/s. K.P.R GRANITES,
No.2/223, AVVAI NAGAR,
NOOLAHALLI POST,
PENNAGARAM TALUK,
DHARMAPURI DISTRICT - 636 813

LOCATION:
EXTENT : 1.97 Hect
S.F.NO : 1112/6 & 1125/3
VILLAGE : IRUDEKOTTAI
TALUK : DENKANIKOTTAI
DISTRICT : KRISHNAGIRI
STATE : TAMIL NADU

INDEX

TOPO SHEET NO : 57-H/15

LATITUDE: 12°25'50.32737"N-12°25'56.56272"N

LONGITUDE: 77°49'54.82843"E-77°50'0.97534"E

QUARRY LEASE AREA



10KM RADIUS



CONVENTIONAL SYMBOLS

Electric lines with or without poles	
Feeder lines	
Power lines	
Communication lines	
Water supply lines	
Roads	
Highways	
Trails	
Railways	
Canals	
Ditches	
Drains	
Rivers	
Streams	
Wells	
Bridges	
Buildings	
Temples	
Churches	
Mosques	
Other religious buildings	
Government buildings	
Private buildings	
Fortifications	
Plantations	
Other vegetation	
Contours	
Spot heights	
Trigonometric stations	
Great circle distances	
Other symbols	

TOPOSHEET MAP

SCALE- 1:1,00,000

PREPARED BY :

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

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

Towards
Irudhukottai 12°25'56.56272"N

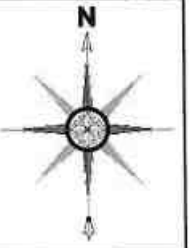


PLATE NO-ID

APPLICANT:
M/s. K.P.R GRANITES,
No.2/223, AVVAI NAGAR,
NOOLAHALLI POST,
PENNAGARAM TALUK,
DHARMAPURI DISTRICT - 636 8



LOCATION:
EXTENT : 1.97 Hect
S.F.NO : 1121/6 & 1125/3
VILLAGE : IRUDUKOTTAI
TALUK : DENKANIKOTTAI
DISTRICT : KRISHNAGIRI
STATE : TAMIL NADU

TOPO SHEET NO : 57-H/15

LATITUDE: 12°25'50.32737"N-12°25'56.56272"N

LONGITUDE: 77°49'54.82843"E-77°50'0.97534"E

INDEX

MINE LEASE AREA	
APPROACH ROAD	
CART ROAD	
VILLAGE ROAD	
100M RADIUS	
200M RADIUS	
300M RADIUS	
400M RADIUS	
500M RADIUS	
1000M RADIUS	
EXISTING PIT	
DUMP AREA	

SATELLITE IMAGE FOR 1KM
RADIUS

SCALE- 1:10000

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

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



77°49'54.82843"E

Towards
Bilalam

Towards
Gudusalur

259

Towards
Thotti kuppam

U. Prabhavathi

OCTOBER TO DECEMBER

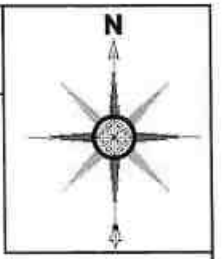


PLATE NO-ID

APPLICANT:
M/s. K.P.R GRANITES,
 No.2/223, AVVAI NAGAR,
 NOOLAHALLI POST,
 PENNAGARAM TALUK,
 DHARMAPURI DISTRICT - 636 813

LOCATION:

EXTENT : 1.97.0 Hect
 S.F.NO : 1121/6/8/125/3
 VILLAGE : IRUDHUKKOTAI
 TALUK : DENKANIKOTTAI
 DISTRICT : KRISHNAGIRI
 STATE : TAMIL NADU



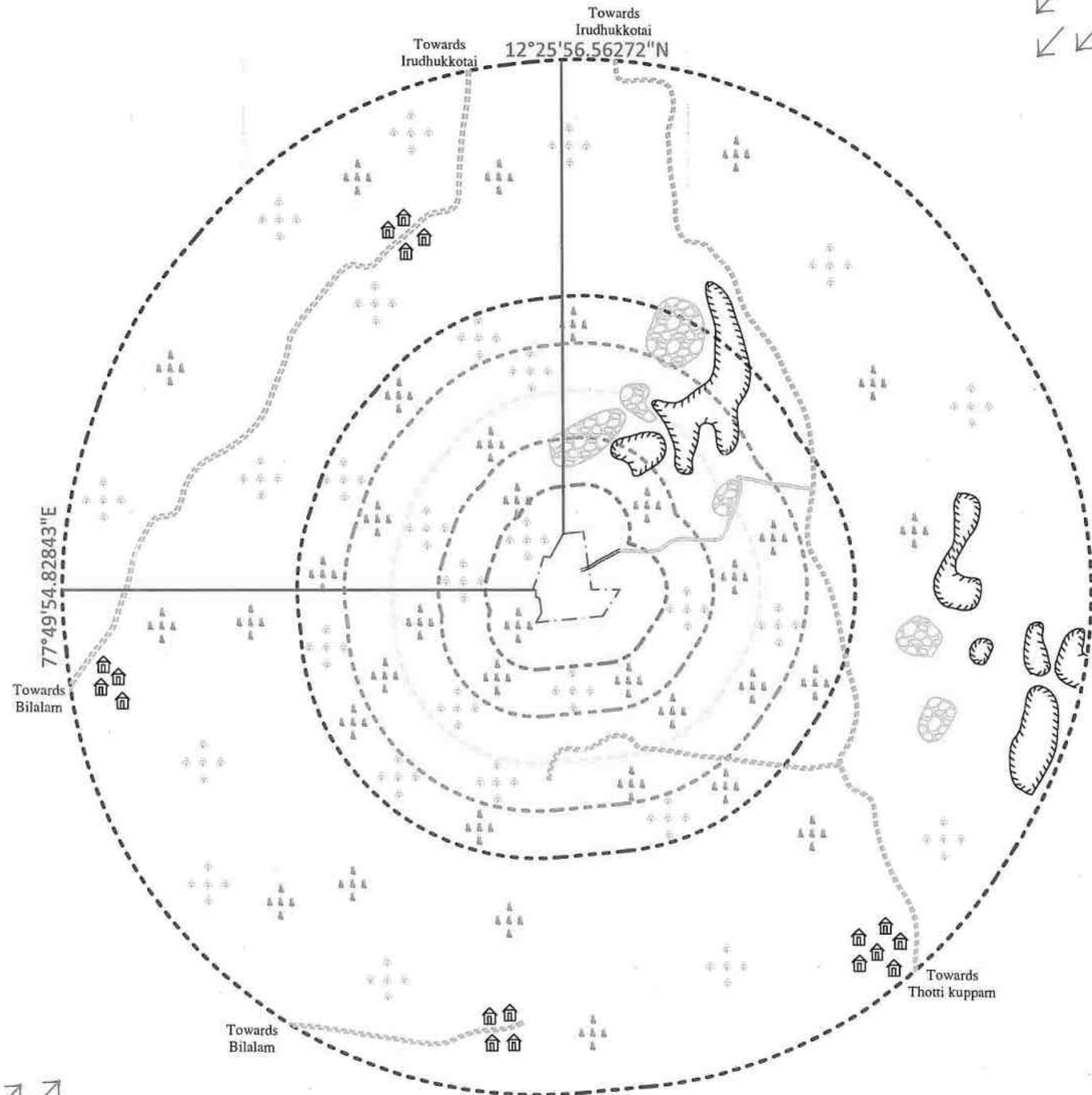
TOPO SHEET NO : 57-H/13

LATITUDE: 12°25'50.32737"N-12°25'56.56272"N

LONGITUDE: 77°49'54.82843"E-77°50'0.97534"E

INDEX

MINE LEASE AREA	
APPROACH ROAD	
CART ROAD	
VILLAGE ROAD	
100M RADIUS	
200M RADIUS	
300M RADIUS	
400M RADIUS	
500M RADIUS	
1000M RADIUS	
SHRUBS & TREES	
WIND DIRECTION	
EXISTING PIT	
DUMP AREA	
HABITATION	



JULY TO SEPTEMBER

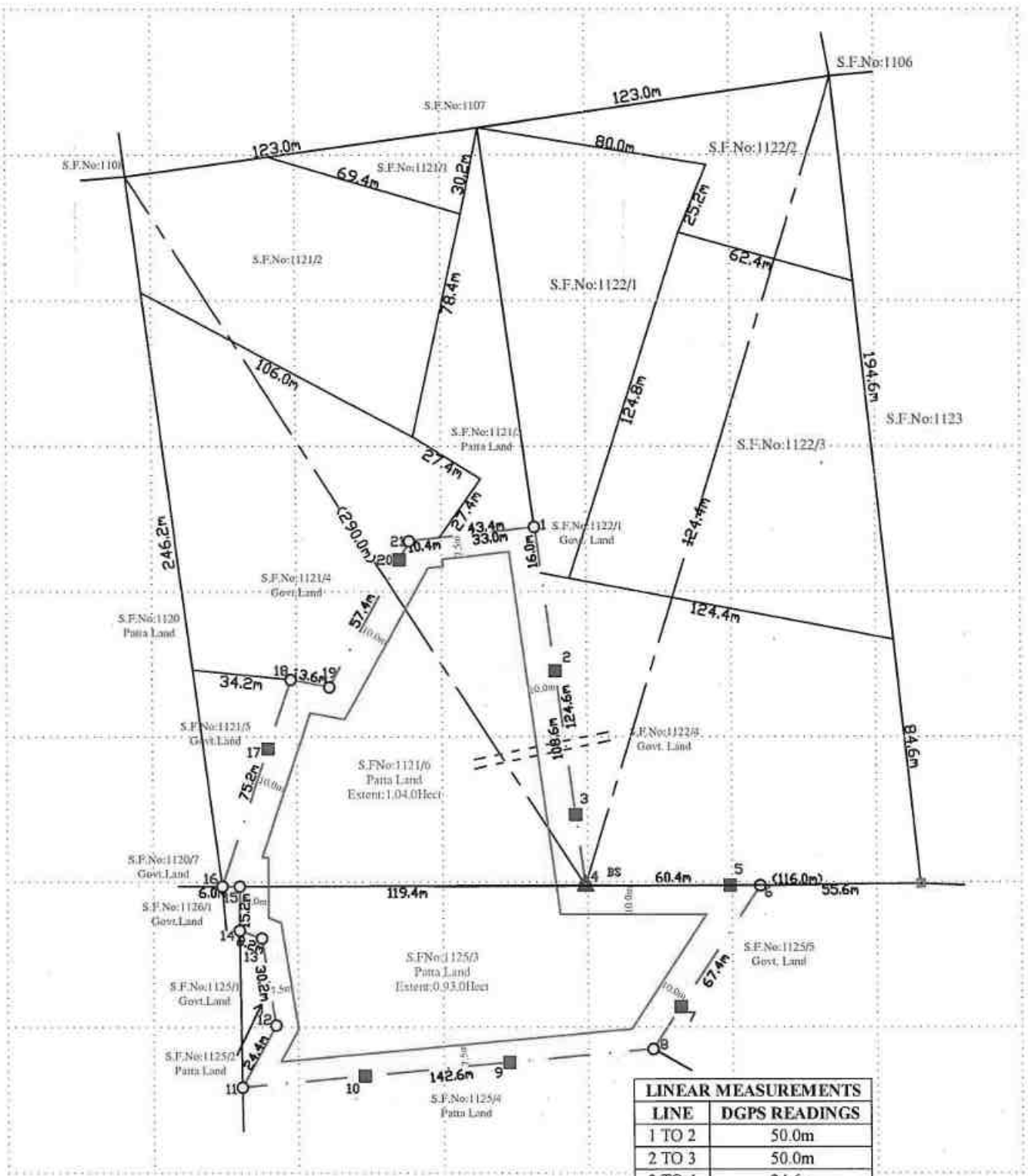
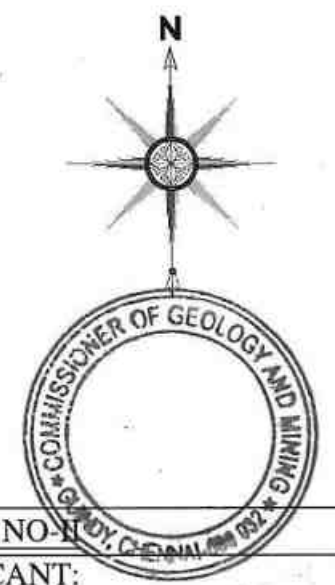
DESCRIPTION	AREA IN (%)
ROAD	05
TREES	17
BARREN LAND	40
AGRICULTURAL LAND	23
EXISTING QUARRY PIT	07
DUMP	04
HABITATIONS	04

ENVIRONMENTAL AND LAND USE PLAN FOR 1KM RADIUS
 SCALE- 1:10000

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

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

U. Prabhavathi



Extent As Per Revenue FMB - 1.97.00 Hecters
 Extent As Per DGPS Survey - 1.96.80 Hecters

BOUNDARY PILLAR = 13 Pillar
 INTERMEDIATE PILLAR = 8 Pillar
 TOTAL = 21 Pillar



LINE	DGPS READINGS
1 TO 2	50.0m
2 TO 3	50.0m
3 TO 4	24.6m
4 TO 5	50.0m
5 TO 6	10.4m
6 TO 7	50.0m
7 TO 8	17.4m
8 TO 9	50.0m
9 TO 10	50.0m
10 TO 11	42.6m
11 TO 12	24.4m
12 TO 13	30.2m
13 TO 14	8.2m
14 TO 15	15.2m
15 TO 16	6.0m
16 TO 17	50.0m
17 TO 18	25.2m
18 TO 19	13.6m
19 TO 20	50.0m
20 TO 21	7.4m
21 TO 1	43.4m

DGPS SURVEY COORDINATE SYSTEM	
Name	: World wide/UTM Datum : WGS 1984
Receiver Model	: R8s - (Base) & R8s- (Rover) Zone : 43 North
Time Zone	: Mountain Standard Time Geoid : EGM96 (Global)
Date : 21/11/2022	

- NOTE:**
1. The True North Adopted both for surveyed plan and DGPS Coordinated.
 2. The Given Measurements are in Meter.
 3. The DGPS Survey for the area is taken up by synchronising nearest survey of India Ground Control Point, (Collector Office- Krishnagiri).
 4. Base is at 42.08 Kilometers from GCP Control Point.

DGPS SURVEY WAS CONDUCTED IN STATIC METHOD (BASE POINT 2 HOUR DGPS POINT)						
ID	Latitude (Global)	Longitude (Global)	Easting (Meter)	Northing (Meter)	Elevation (Meter)	Feature Code
BS	12° 25' 52.54321" N	77° 49' 58.97717" E	808018.886	1375882.772	915.223	Base Station + Boundary Pillar
ROVER POINTS 1 HOURS FOR BOUNDARY PILLAR AND 20 MINUTES FOR INTERMEDIATE PILLAR IN STATIC						
ID	Latitude (Global)	Longitude (Global)	Easting (Meter)	Northing (Meter)	Elevation (Meter)	Feature Code
1	12° 25' 56.56272" N	77° 49' 58.45854" E	808001.896	1376006.209	919.515	Boundary Pillar
2	12° 25' 54.94993" N	77° 49' 58.6666" E	808008.713	1375956.680	918.056	Intermediate Pillar
3	12° 25' 53.34672" N	77° 49' 58.87342" E	808015.490	1375907.447	917.226	Intermediate Pillar
4	12° 25' 52.54321" N	77° 49' 58.97717" E	808018.886	1375882.772	915.223	Base Station + Boundary Pillar
5	12° 25' 52.52513" N	77° 50' 0.62982" E	808068.844	1375882.748	915.182	Intermediate Pillar
6	12° 25' 52.52136" N	77° 50' 0.97534" E	808079.286	1375882.743	915.213	Boundary Pillar
7	12° 25' 51.18111" N	77° 50' 0.05233" E	808051.828	1375841.230	914.816	Intermediate Pillar
8	12° 25' 50.70648" N	77° 49' 59.72542" E	808042.103	1375826.527	913.534	Boundary Pillar
9	12° 25' 50.57342" N	77° 49' 58.07621" E	807992.304	1375821.908	913.735	Intermediate Pillar
10	12° 25' 50.4405" N	77° 49' 56.42712" E	807942.505	1375817.290	913.659	Intermediate Pillar
11	12° 25' 50.32737" N	77° 49' 55.02329" E	807900.112	1375813.357	913.984	Boundary Pillar
12	12° 25' 51.01679" N	77° 49' 55.42350" E	807911.985	1375834.686	914.453	Boundary Pillar
13	12° 25' 51.98740" N	77° 49' 55.27373" E	807907.139	1375864.486	914.237	Boundary Pillar
14	12° 25' 52.08113" N	77° 49' 55.01982" E	807899.433	1375867.288	914.674	Boundary Pillar
15	12° 25' 52.57532" N	77° 49' 55.02696" E	807899.486	1375882.488	915.453	Boundary Pillar
16	12° 25' 52.57695" N	77° 49' 54.82843" E	807893.486	1375882.474	915.673	Boundary Pillar
17	12° 25' 54.11923" N	77° 49' 55.37963" E	807909.642	1375930.078	916.428	Intermediate Pillar
18	12° 25' 54.88406" N	77° 49' 55.65302" E	807917.653	1375953.685	917.247	Boundary Pillar
19	12° 25' 54.79641" N	77° 49' 56.09407" E	807931.012	1375951.134	917.743	Boundary Pillar
20	12° 25' 56.21800" N	77° 49' 56.91321" E	807955.305	1375995.113	918.398	Intermediate Pillar
21	12° 25' 56.42053" N	77° 49' 57.02994" E	807958.765	1376001.378	919.472	Boundary Pillar

PLATE NO: _____
 APPLICANT:
M/s. K.P.R GRANITES,
 No.2/223, AVVAI NAGAR,
 NOOLAHALLI POST,
 PENNAGARAM TALUK,
 DHARMAPURI DISTRICT - 636 813

LOCATION:
 EXTENT : 1.97.0Hect
 S.F.NO : 1121/6 & 1125/3
 VILLAGE : IRUDUKOTTAI
 TALUK : DENKANIKOTTAI
 DISTRICT : KRISHNAGIRI
 STATE : TAMIL NADU

INDEX

LEASE BOUNDARY	
SAFETY DISTANCE	
FMB BOUNDARY	
APPROACH ROAD	
BOUNDARY POINT	
INTERMEDIATE POINT	
REVENUE PILLAR & ROCK MARK	

MINE LEASE PLAN
 SCALE 1 : 2000

Prepared By:

 I DO HEREBY CERTIFY THAT THE PLATE HAS BEEN CHECKED BY ME AND IS CORRECT TO THE BEST OF MY KNOWLEDGE
 Dr.S.KARUPPANAN,M.Sc.,Ph.D.,
 RECOGNIZED QUALIFIED PERSON
 RQP/MAS/263/2014/A

U. Prabhakar

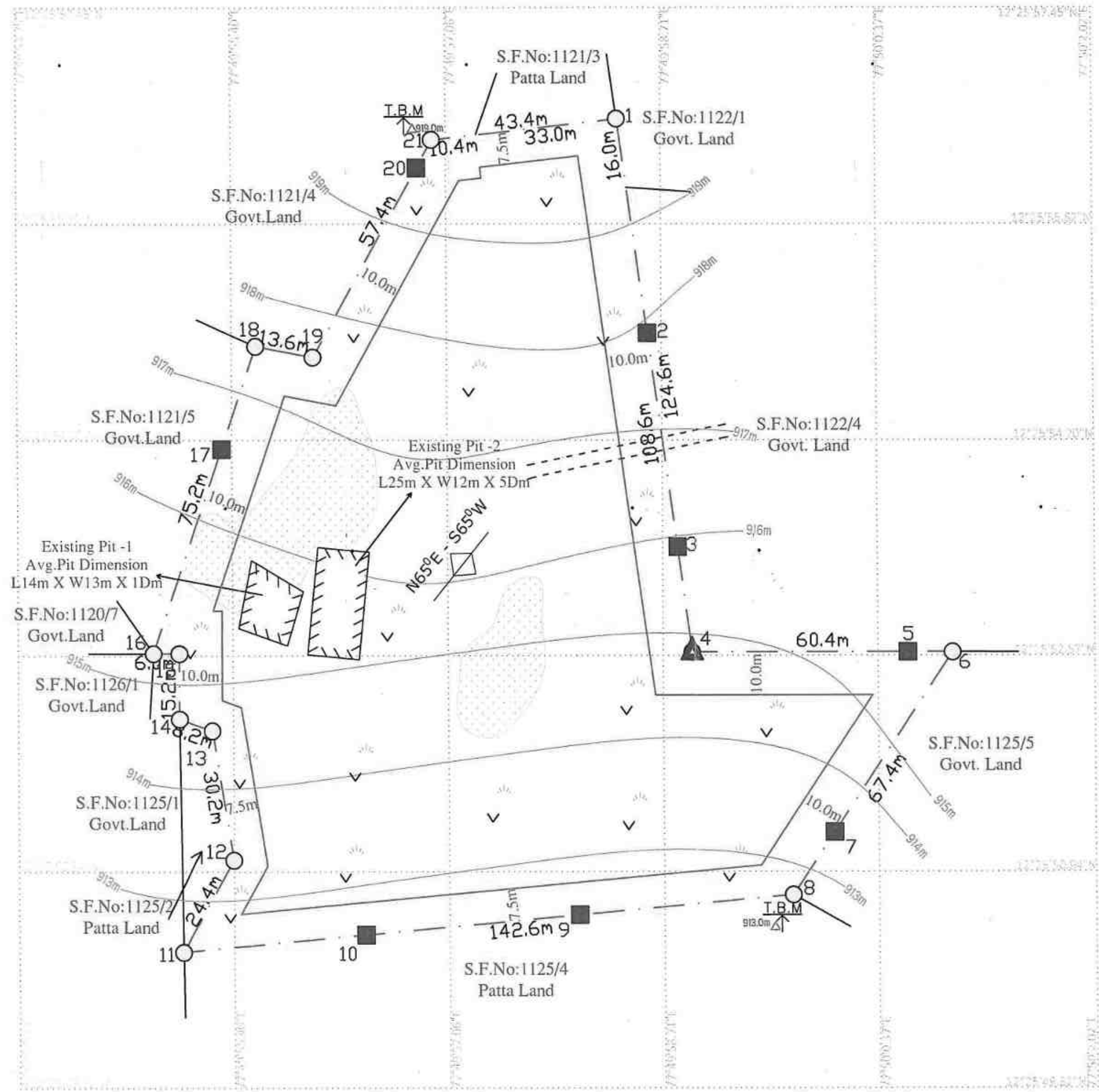
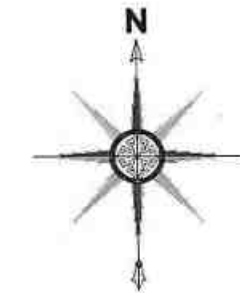


PLATE NO-III

APPLICANT
M/s. K.P.R GRANITES,
 No.2/223, AVVAI NAGAR,
 NOOLAHALLI POST,
 PENNAGARAM TALUK,
 DHARMAPURI DISTRICT - 636 813

LOCATION:
 EXTENT : 1.97.0Hect
 S.F.NO : 1121/6 & 1125/3
 VILLAGE : IRUDUKOTTAI
 TALUK : DENKANIKOTTAI
 DISTRICT : KRISHNAGIRI
 STATE : TAMIL NADU

INDEX

LEASE BOUNDARY	
SAFETY DISTANCE	
APPROACH ROAD	
PILLAR STONES	
TEMPORARY BENCH MARKS	
SHRUBS	
CONTOUR LINES	
OUTCROP	
TOPSOIL	
STRIKE & DIP	

SURFACE PLAN
 SCALE 1 : 1000

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

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

U. Prabhavathi

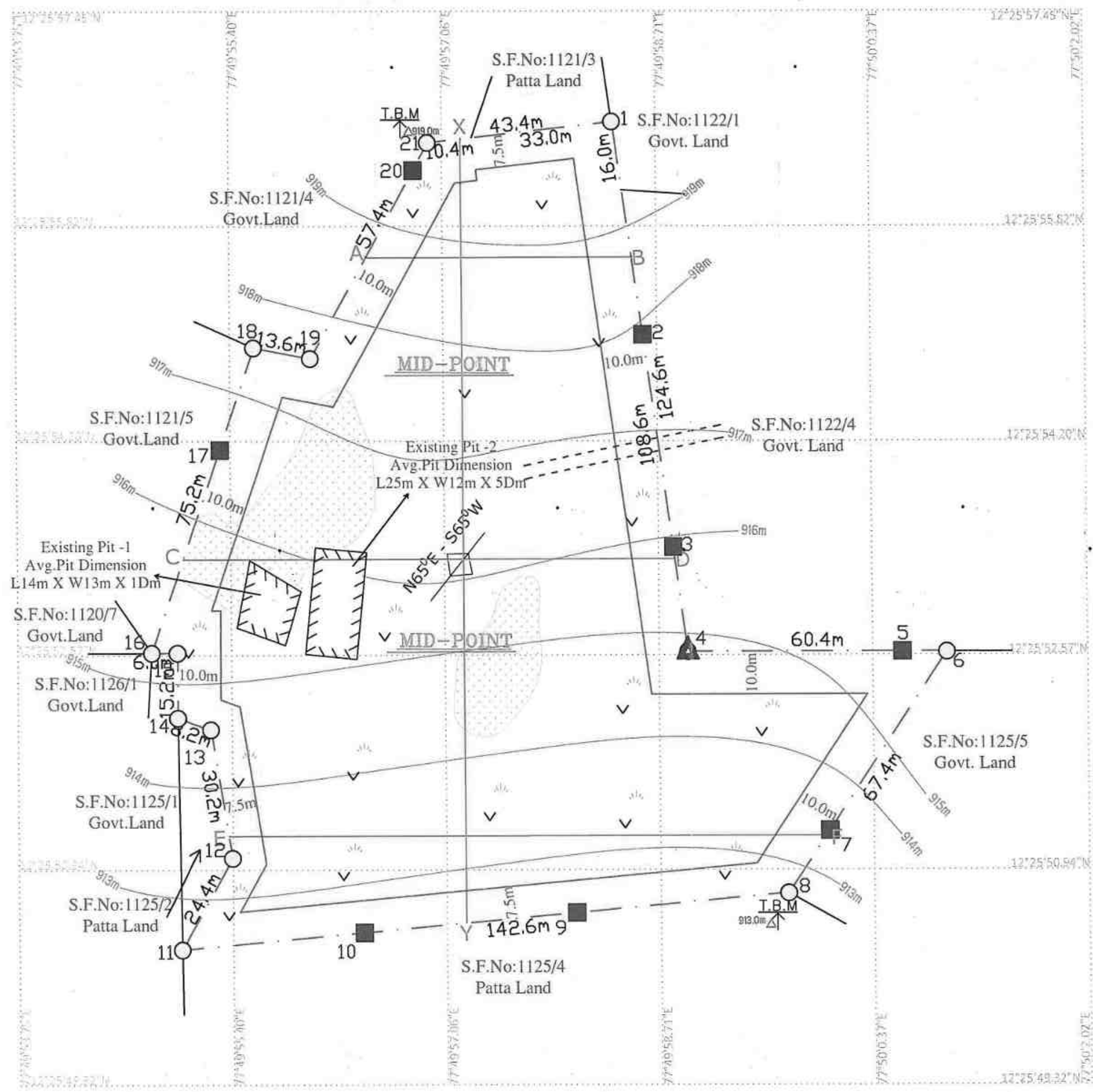
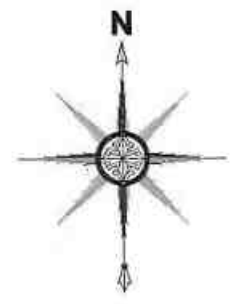


PLATE NO-IV

APPLICANT:
M/s. K.P.R GRANITES,
 No.2/223, AVVAI NAGAR,
 NOOLAHALLI POST,
 PENNAGARAM TALUK,
 DHARMAPURI DISTRICT - 636-813

LOCATION:
 EXTENT : 1.97.0Hect
 S.F.NO : 1121/6 & 1125/3
 VILLAGE : IRUDUKOTTAI
 TALUK : DENKANIKOTTAI
 DISTRICT : KRISHNAGIRI
 STATE : TAMIL NADU

INDEX

LEASE BOUNDARY	
SAFETY DISTANCE	
APPROACH ROAD	
PILLAR STONES	
TEMPORARY BENCH MARKS	
SHRUBS	
CONTOUR LINES	
OUTCROP	
TOPSOIL	
STRIKE & DIP	

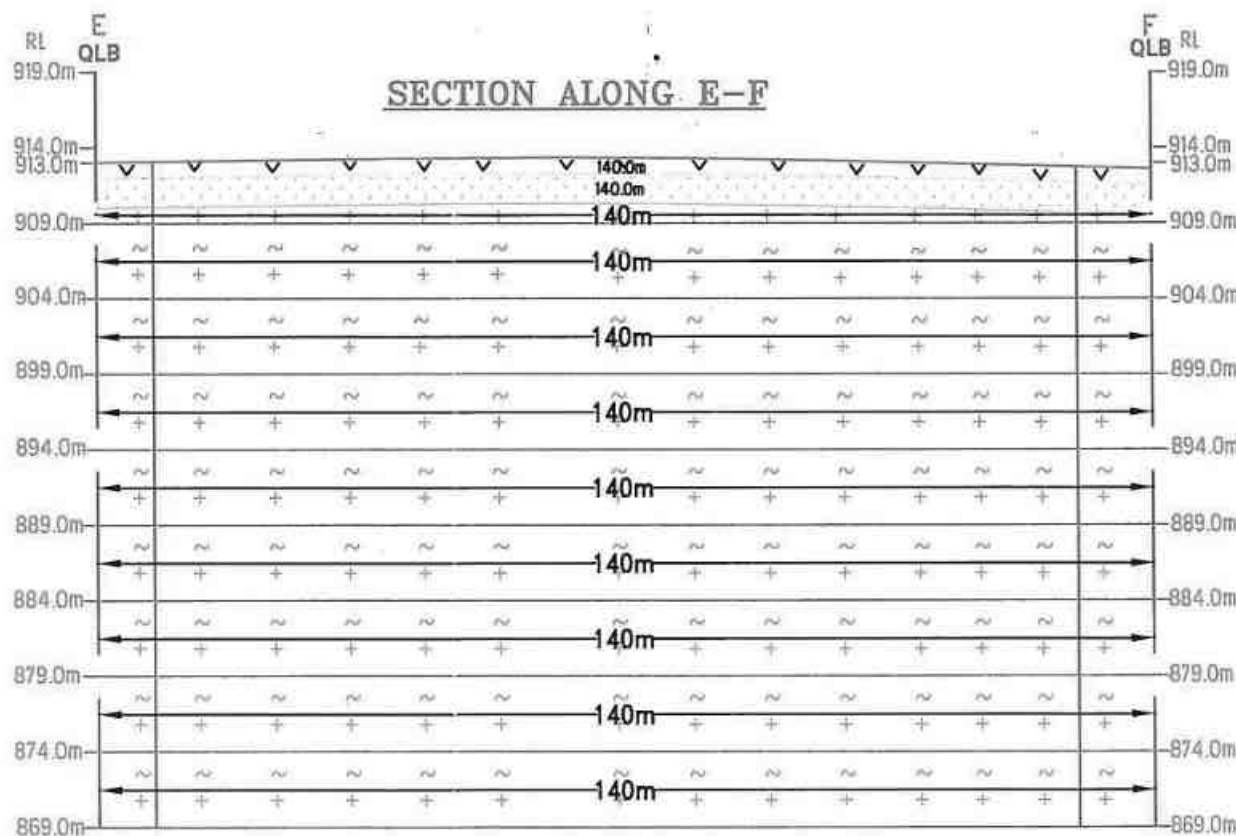
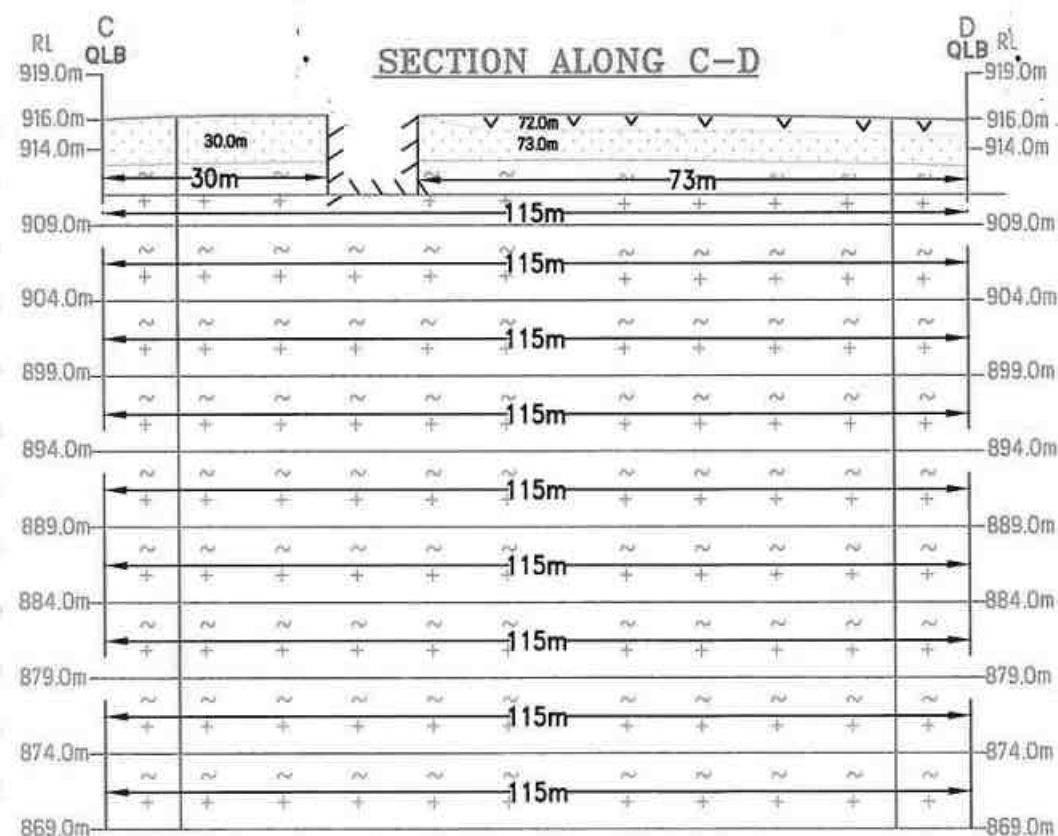
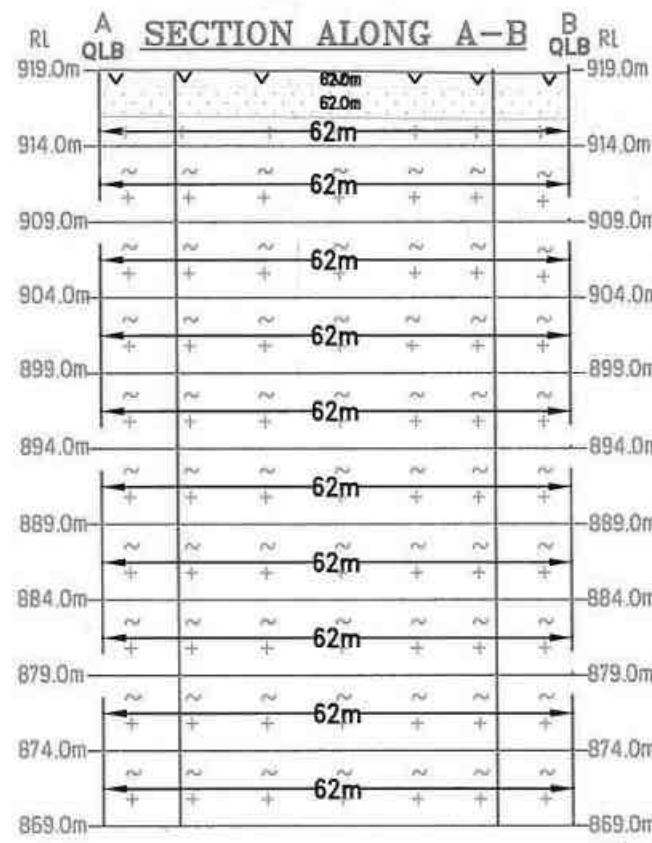
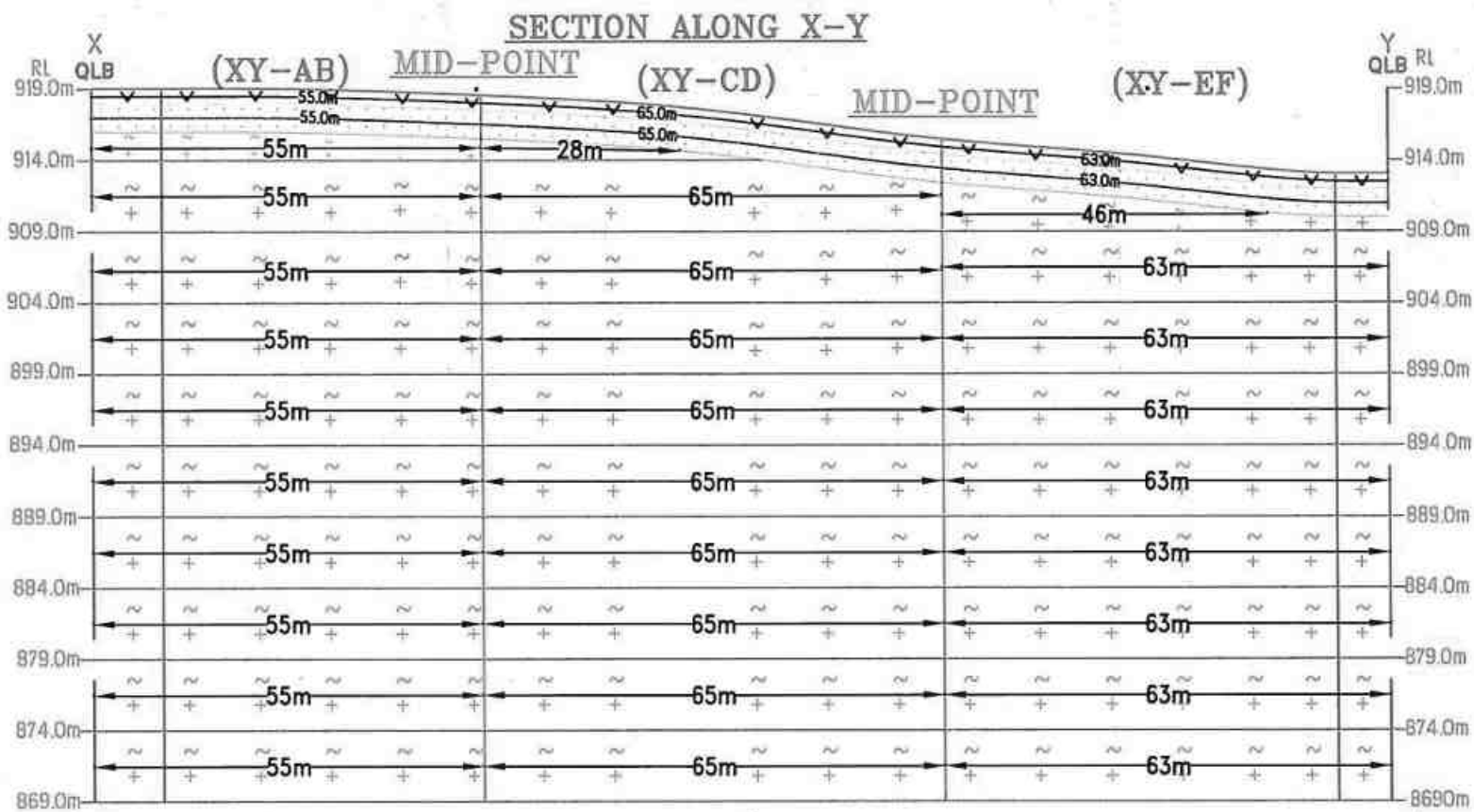
GEOLOGICAL PLAN
 SCALE 1 : 1000

Prepared By:

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

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

U. Prabhavathi.



GEOLOGICAL RESOURCE										
Section	Bench	length in (m)	Width in (m)	Depth in (m)	Rem in (M ³)	Geological Resource in M ³	Multi Colour Granite 35% Recovery in M ³	Granite Waste 65% in M ³	Top Soil in M ³	Weathered Rock in M ³
XY-AB	I	55	62	1	3410	---	---	---	3410	---
	I	55	62	2	6820	---	---	---	---	6820
	I	35	62	2	6820	6820	2387	4433	---	---
	II	55	62	5	17050	17050	5968	11083	---	---
	III	55	62	5	17050	17050	5968	11083	---	---
	IV	55	62	5	17050	17050	5968	11083	---	---
	V	55	62	5	17050	17050	5968	11083	---	---
	VI	55	62	5	17050	17050	5968	11083	---	---
	VII	55	62	5	17050	17050	5968	11083	---	---
	VIII	55	62	5	17050	17050	5968	11083	---	---
TOTAL					170500	160270	56095	104176	3410	6820
XY-CD	I	65	72	1	4680	---	---	---	4680	---
	I	65	103	2	13390	---	---	---	---	13390
	I	28	103	2	5768	5768	2019	3749	---	---
	II	65	103	2	13390	13390	4687	8704	---	---
	II	65	115	3	22425	22425	7849	14576	---	---
	III	65	115	5	37375	37375	13081	24294	---	---
	IV	65	115	5	37375	37375	13081	24294	---	---
	V	65	115	5	37375	37375	13081	24294	---	---
	VI	65	115	5	37375	37375	13081	24294	---	---
	VII	65	115	5	37375	37375	13081	24294	---	---
TOTAL					358653	340583	119204	221379	4680	13390
XY-EF	I	63	140	1	8820	---	---	---	8820	---
	I	63	140	2	17640	---	---	---	---	17640
	I	46	140	1	6440	6440	2254	4186	---	---
	II	63	140	5	44100	44100	15435	28665	---	---
	III	63	140	5	44100	44100	15435	28665	---	---
	IV	63	140	5	44100	44100	15435	28665	---	---
	V	63	140	5	44100	44100	15435	28665	---	---
	VI	63	140	5	44100	44100	15435	28665	---	---
	VII	63	140	5	44100	44100	15435	28665	---	---
	VIII	63	140	5	44100	44100	15435	28665	---	---
TOTAL					385700	359240	125734	233506	8820	17640
GRAND TOTAL					914853	860093	301033	559060	16910	37850



<p>PLATE NO-IVA</p>	<p>APPLICANT: M/s. K.P.R GRANITES, No.2/223, AVVAI NAGAR, NOOLAHALLI POST, PENNAGARAM TALUK, DHARMAPURI DISTRICT - 636 813</p>	<p>LOCATION: EXTENT : 1.97.0Hect S.F.NO : 1121/6 & 1125/3 VILLAGE : IRUDUKOTTAI TALUK : DENKANIKOTTAI DISTRICT : KRISHNAGIRI 264E : TAMIL NADU</p>	<p>INDEX</p> <p>LEASE BOUNDARY </p> <p>SAFETY DISTANCE </p> <p>TOPSOIL </p> <p>MULTI COLOUR GRANITE </p> <p>WEATHERED ROCK </p>	<p>Prepared By:</p> <p>I DO HEREBY CERTIFY THAT THE PLATE HAS BEEN CHECKED BY ME AND IS CORRECT TO THE BEST OF MY KNOWLEDGE</p> <p></p> <p>Dr.S.KARUPPANNAN, M.Sc., Ph.D., RECOGNIZED QUALIFIED PERSON RQP/MAS/263/2014/A</p>
<p>GEOLOGICAL SECTIONS SCALE SECTION- HOR 1: 1000 VER 1: 500</p> <p><i>U. Prabhakar</i></p>				

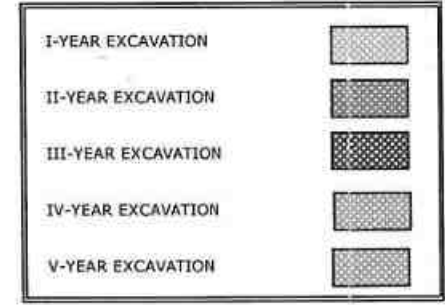
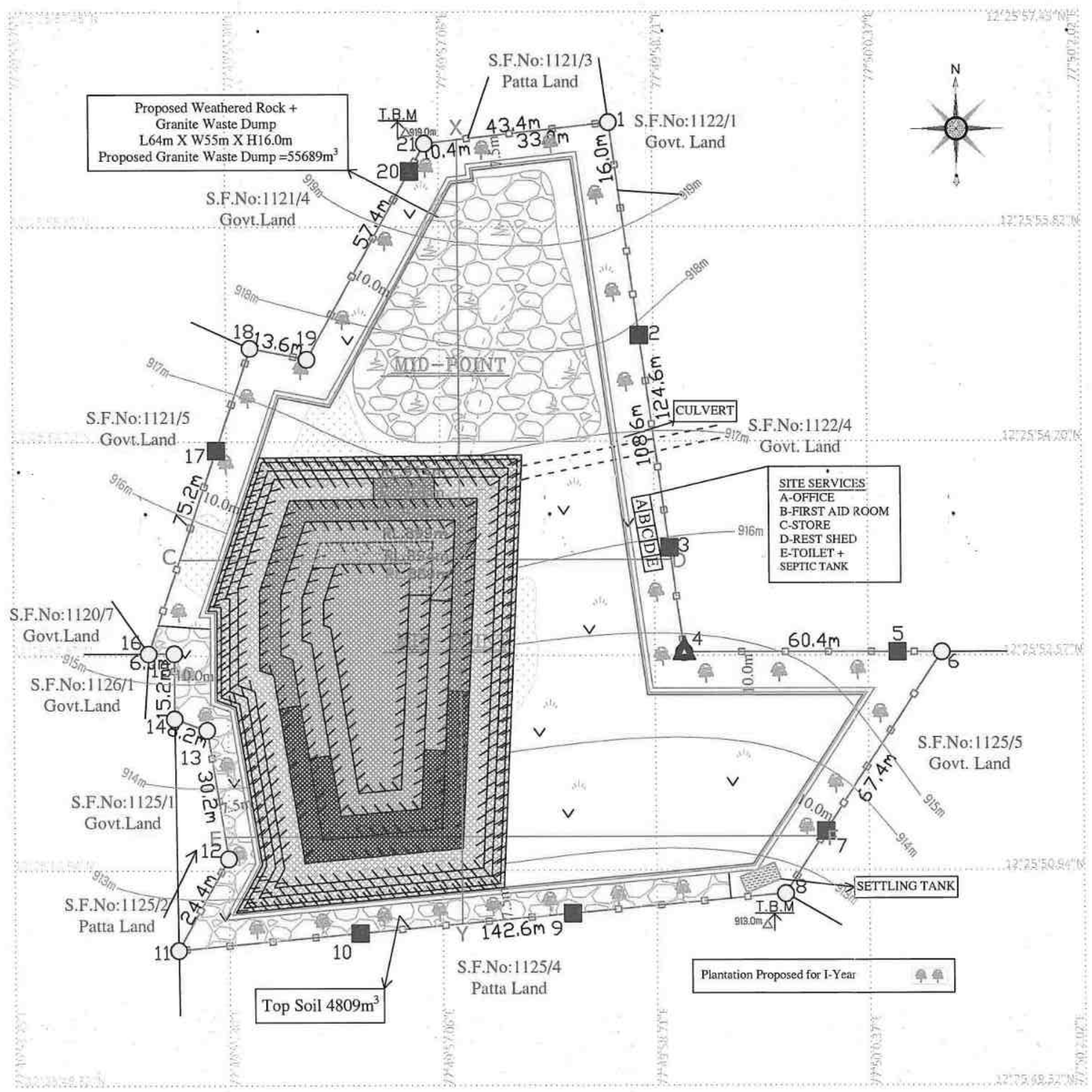
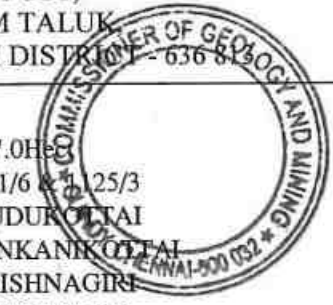


PLATE NO-V

APPLICANT:
M/s. K.P.R GRANITES,
No.2/223, AVVAI NAGAR,
NOOLAHALLI POST,
PENNAGARAM TALUK,
DHARMAPURI DISTRICT - 636 812

LOCATION:
EXTENT : 1.97.0Ha
S.F.NO : 1121/6 & 1125/3
VILLAGE : IRUDUKOTTAI
TALUK : DENKANIKOTTAI
DISTRICT : KRISHNAGIRI
STATE : TAMIL NADU



INDEX

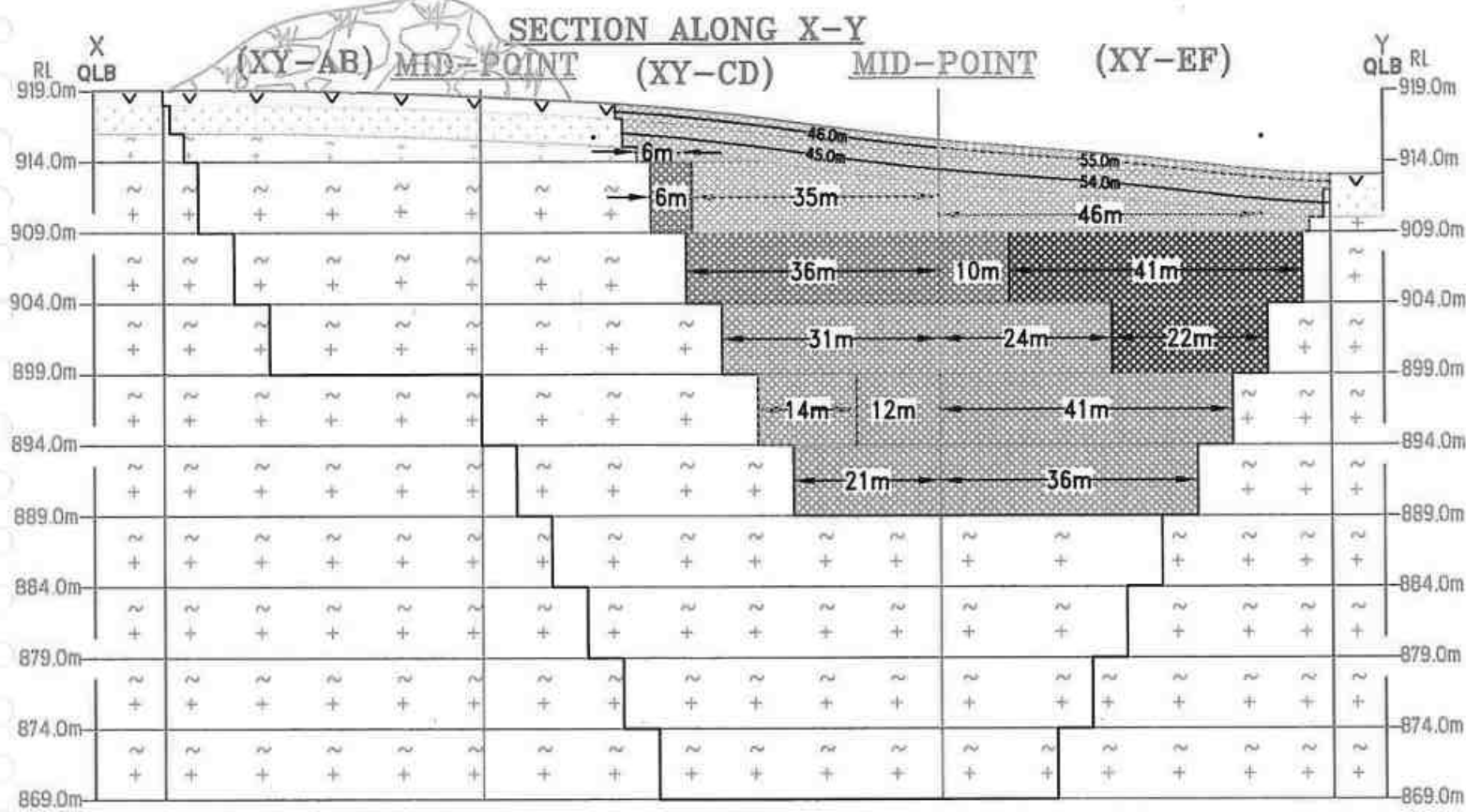
LEASE BOUNDARY	
SAFETY DISTANCE	
APPROACH, MINE HAUL & DUMP ROAD	
PILLAR STONES	
TEMPORARY BENCH MARKS	
SHRUBS	
CONTOUR LINES	
OUTCROP	
TOPSOIL	
STRIKE & DIP	
PROPOSED WASTE DUMP	
SETTLING TANK & DRAINAGE	
CULVERT	
FENCING	

YEARWISE DEVELOPMENT AND PRODUCTION PLAN
(SCALE) Plan 1 : 1000

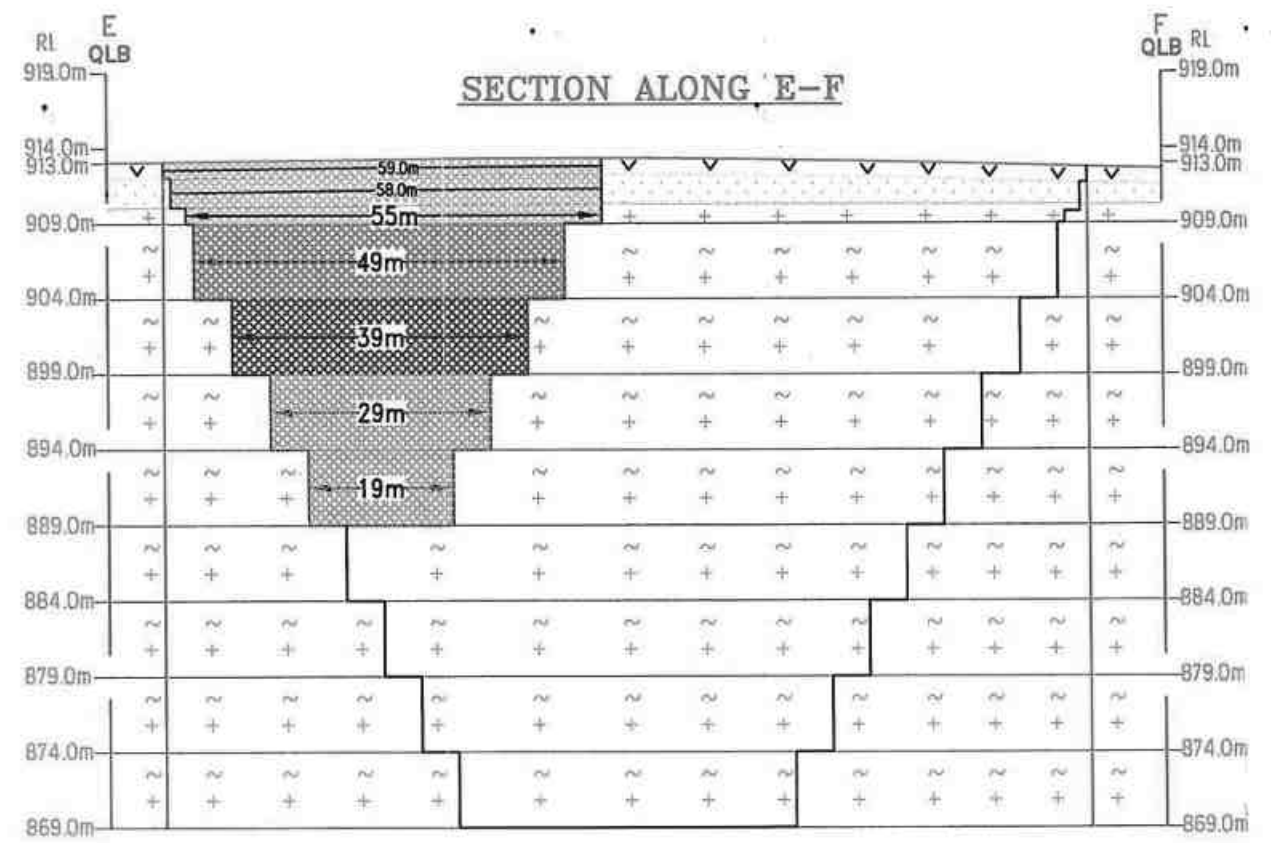
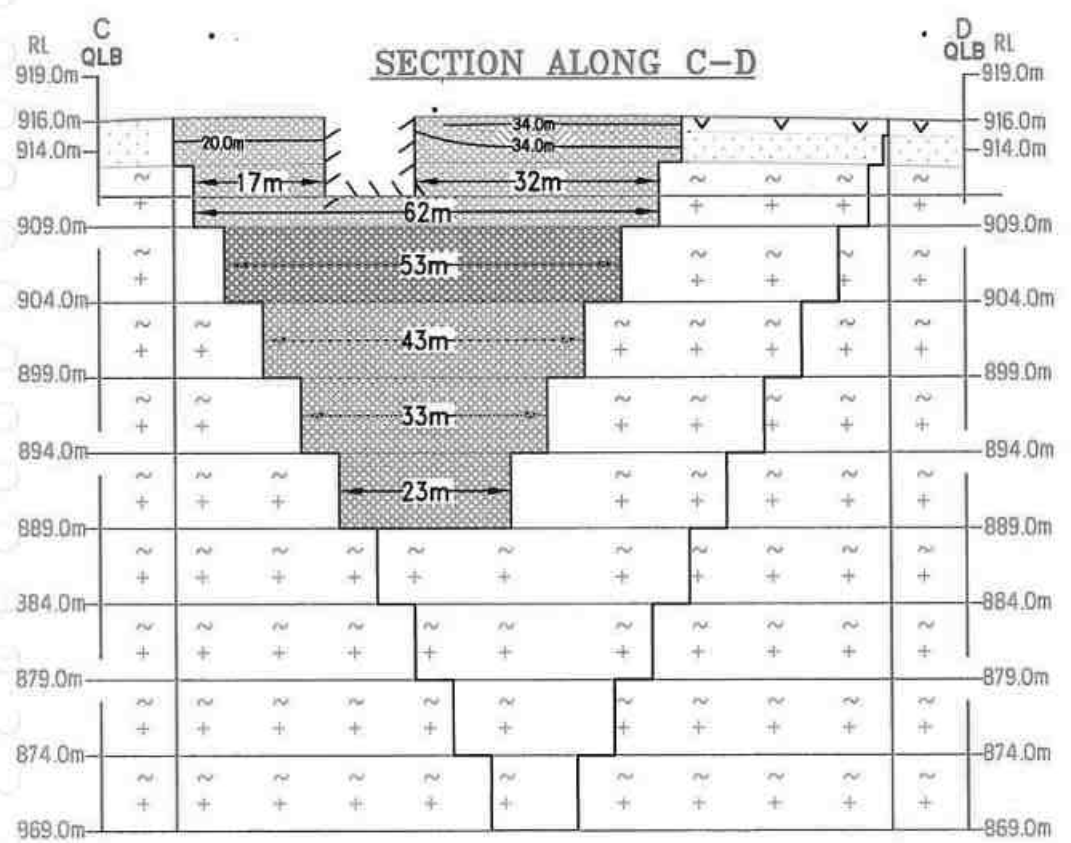
Prepared By:
I DO HEREBY CERTIFY THAT THE PLATE HAS BEEN CHECKED BY ME AND IS CORRECT TO THE BEST OF MY KNOWLEDGE

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

U. Prabhavathi



YEARWISE PRODUCTION											
Section	Year	Bench	length in (m)	Width in (m)	Depth in (m)	Rom in (M ³)	Production Reserves in M ³	Multi Colour Granite 35% Recovery in M ³	Granite Waste 65% in M ³	Top Soil in M ³	Weathered Rock in M ³
XY-CD	I - YEAR	I	46	34	1	1564	...	...	...	1564	...
		I	45	54	2	4860	...	...	...	...	4860
		I	6	54	2	648	648	227	421	...	...
		II	35	49	2	3430	3430	1201	2230	...	...
XIY1-EF	I	II	35	62	3	6510	6510	2279	4232	...	...
		I	55	59	1	3245	...	...	...	3245	...
XIY1-EF	I	I	54	58	2	6264	...	...	...	...	6264
		I	46	55	1	2530	2530	886	1645	...	...
TOTAL						29051	13118	4591	8527	4809	11124
XY-CD	II - YEAR	II	6	49	2	588	588	206	382	...	...
		II	6	62	3	1116	1116	391	725	...	...
		III	36	53	5	9540	9540	3339	6201	...	...
XIY1-EF	II	II	10	49	5	2450	2450	858	1593	...	...
		TOTAL				13694	13694	4793	8901	0	0
XIY1-EF	III - YEAR	II	41	49	5	10045	10045	3516	6529	...	...
		III	22	39	5	4290	4290	1502	2789	...	...
TOTAL						14335	14335	5017	9318	0	0
XIY1-EF	IV - YEAR	III	24	39	5	4680	4680	1638	3042	...	...
		IV	31	43	5	6665	6665	2333	4332	...	...
XY-CD	IV	IV	14	33	5	2310	2310	809	1502	...	...
		TOTAL				13655	13655	4779	8876	0	0
XY-CD	V - YEAR	IV	12	33	5	1980	1980	693	1287	...	...
		IV	41	29	5	5945	5945	2081	3864	...	...
XY-CD	V	VI	21	23	5	2415	2415	845	1570	...	...
		XIY1-EF	36	19	5	3420	3420	1197	2223	...	...
TOTAL						13760	13760	4816	8944	0	0
GRAND TOTAL						84495	68562	23997	44565	4809	11124



PROPOSED BENCH

I-YEAR EXCAVATION

II-YEAR EXCAVATION

III-YEAR EXCAVATION

IV-YEAR EXCAVATION

V-YEAR EXCAVATION

<p>PLATE NO-VA</p> <p>YEARWISE DEVELOPMENT AND PRODUCTION SECTIONS (SCALE) Plan 1 : 1000</p>	<p>APPLICANT: M/s. K.P.R GRANITES, No.2/223, AVVAI NAGAR, NOOLAHALLI POST, PENNAGARAM TALUK, DHARMAPURI DISTRICT - 636 813</p> <p><i>U. Prabhavathi</i></p>	<p>LOCATION: EXTENT : 1.97.0Hect S.F.NO : 1121/6 & 1125/3 VILLAGE : IRUDUKOTTAI TALUK : DENKANIKOTTAI DISTRICT : KRISHNAGIRI STATE : TAMIL NADU</p> <p>266</p>	<p>INDEX</p> <p>LEASE BOUNDARY </p> <p>SAFETY DISTANCE </p> <p>TOPSOIL </p> <p>MULTI COLOUR GRANITE </p> <p>WEATHERED ROCK </p> <p>ULTIMATE BENCH </p>	<p>Prepared By: I DO HEREBY CERTIFY THAT THE PLATE HAS BEEN CHECKED BY ME AND IS CORRECT TO THE BEST OF MY KNOWLEDGE</p> <p></p> <p>Dr.S.KARUPPANNAN, M.Sc., Ph.D., RECOGNIZED QUALIFIED PERSON RQP/MAS/263/2014/A</p>
--	--	--	---	---

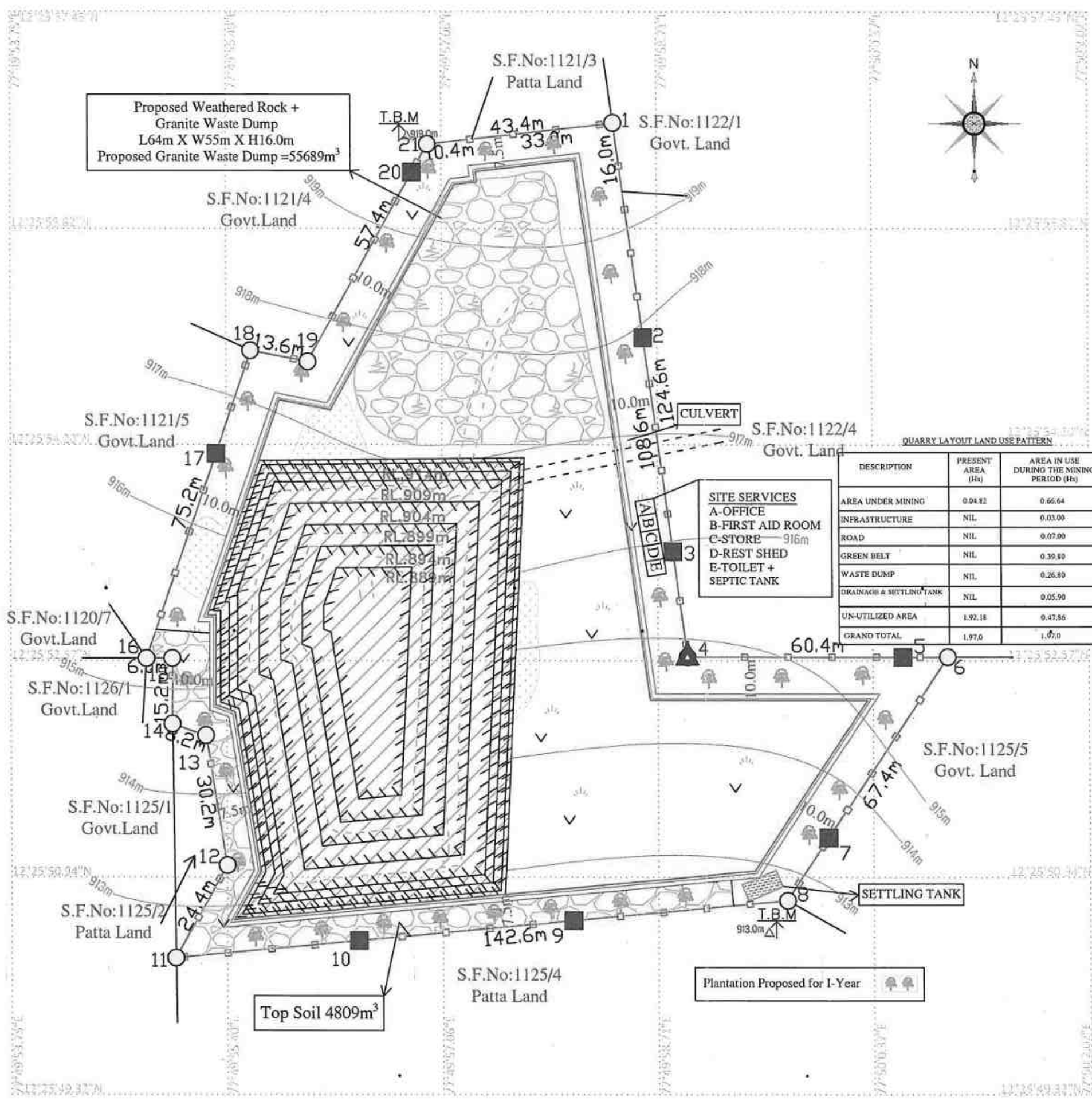


PLATE NO-VI

APPLICANT:
M/s. K.P.R GRANITES,
No.2/223, AVVAI NAGAR,
NOOLAHALLI POST,
PENNAGARAM TALUK,
DHARMAPURI DISTRICT - 636 813



LOCATION:
EXTENT : 1.97.0Hect
S.F.NO : 1121/6 & 1125/7
VILLAGE : IRUDUKOTTAI
TALUK : DENKANIKOTTAI
DISTRICT : KRISHNAGIRI
STATE : TAMIL NADU

INDEX

- LEASE BOUNDARY [Symbol]
- SAFETY DISTANCE [Symbol]
- APPROACH, MINE HAUL & DUMP ROAD [Symbol]
- PILLAR STONES [Symbol]
- TEMPORARY BENCH MARKS [Symbol]
- SHRUBS [Symbol]
- CONTOUR LINES [Symbol]
- OUTCROP [Symbol]
- TOPSOIL [Symbol]
- PROPOSED BENCH [Symbol]
- PROPOSED WASTE DUMP [Symbol]
- SETTLING TANK & DRAINAGE [Symbol]
- CULVERT [Symbol]
- FENCING [Symbol]

QUARRY LAYOUT & LAND USE PATTERN PLAN
SCALE 1 : 1000

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

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

U. Prabhavathi

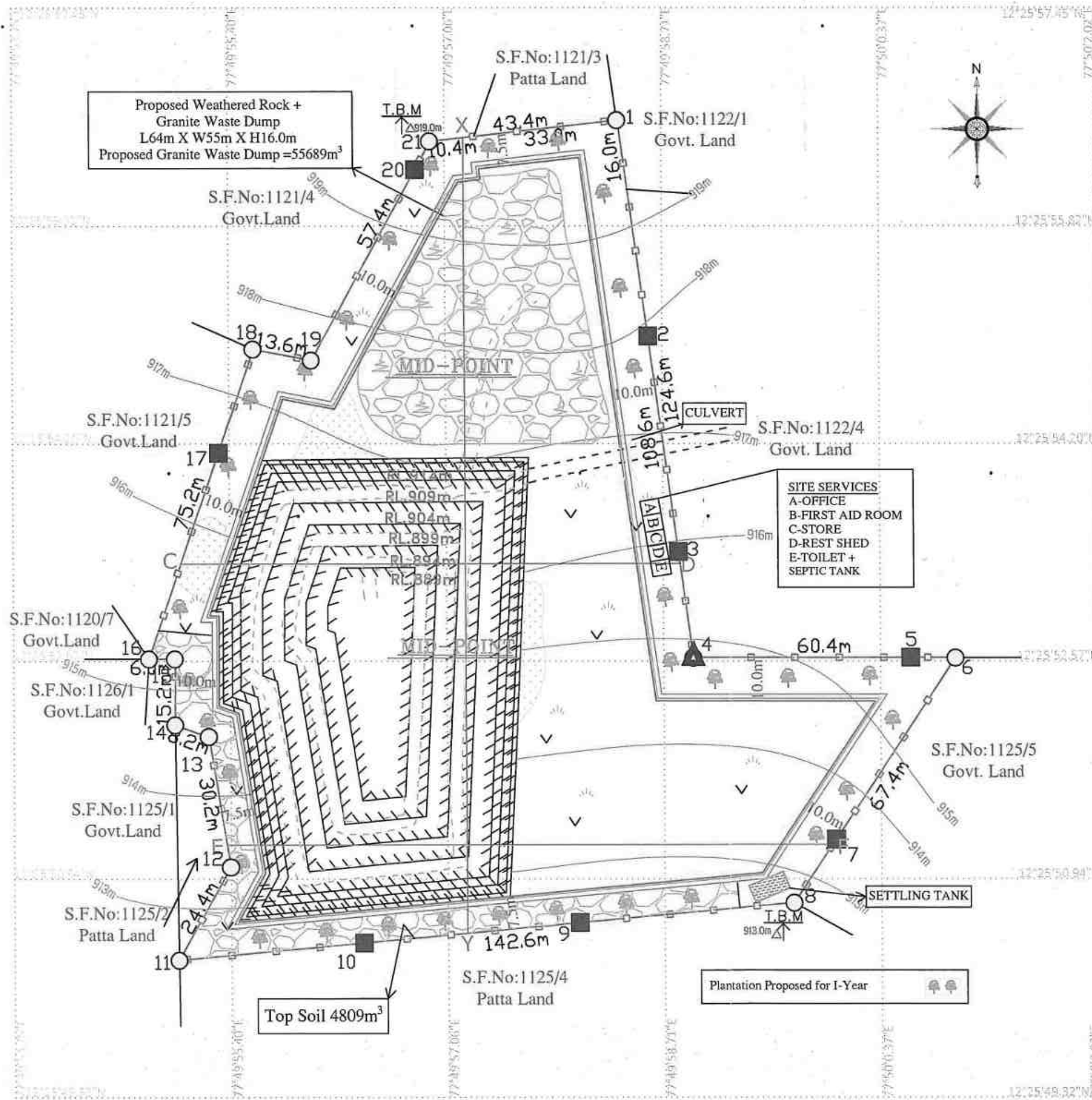


PLATE NO-VII

APPLICANT:
M/s. K.P.R GRANITES,
 No.2/223, AVVAI NAGAR,
 NOOLAHALLI POST,
 PENNAGARAM TALUK,
 DHARMAPURI DISTRICT - 636 813

LOCATION:
 EXTENT : 10.00 Hect
 S.F.NO : 1121/6 & 1125/3
 VILLAGE : IRUDUKOTTAI
 TALUK : DENKANKOTTAI
 DISTRICT : KRISHNAGIRI
 STATE : TAMIL NADU

INDEX

LEASE BOUNDARY	
SAFETY DISTANCE	
APPROACH, MINE HAUL & DUMP ROAD	
PILLAR STONES	
TEMPORARY BENCH MARKS	
SHRUBS	
CONTOUR LINES	
OUTCROP	
TOPSOIL	
PROPOSED BENCH	
PROPOSED WASTE DUMP	
SETTLING TANK & DRAINAGE	
CULVERT	
FENCING	

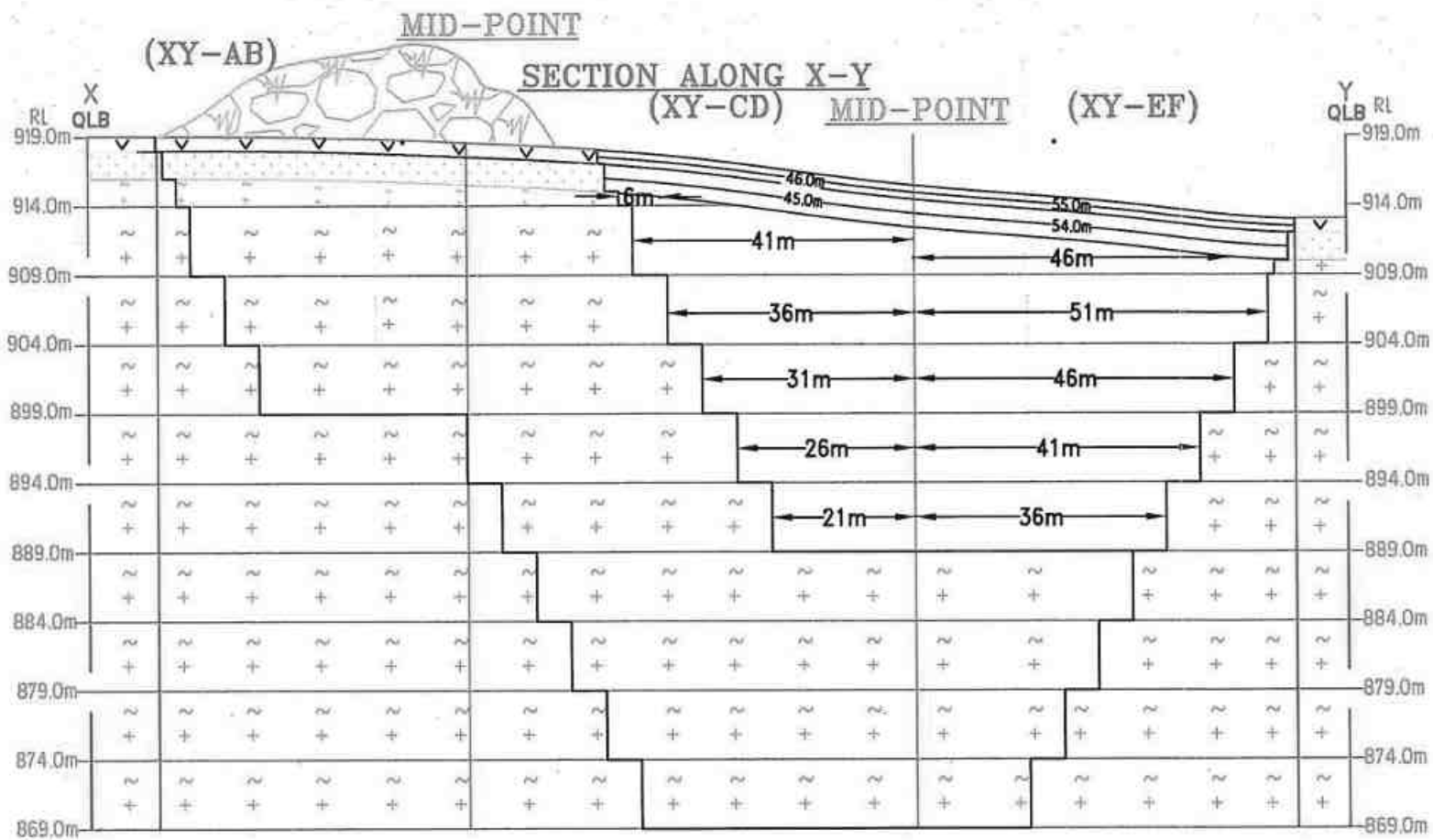
PROGRESSIVE QUARRY
 CLOSURE PLAN
 (SCALE) PLAN 1:1000

Prepared By:

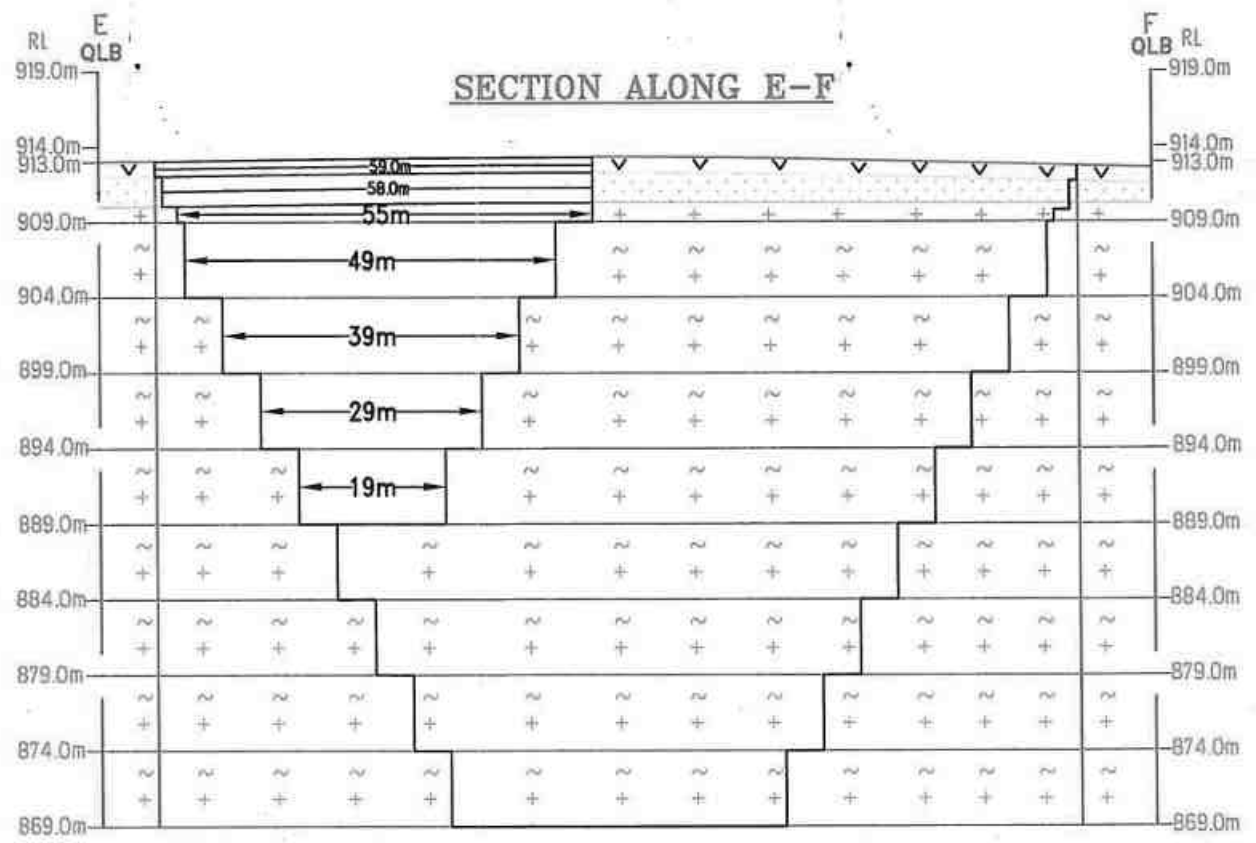
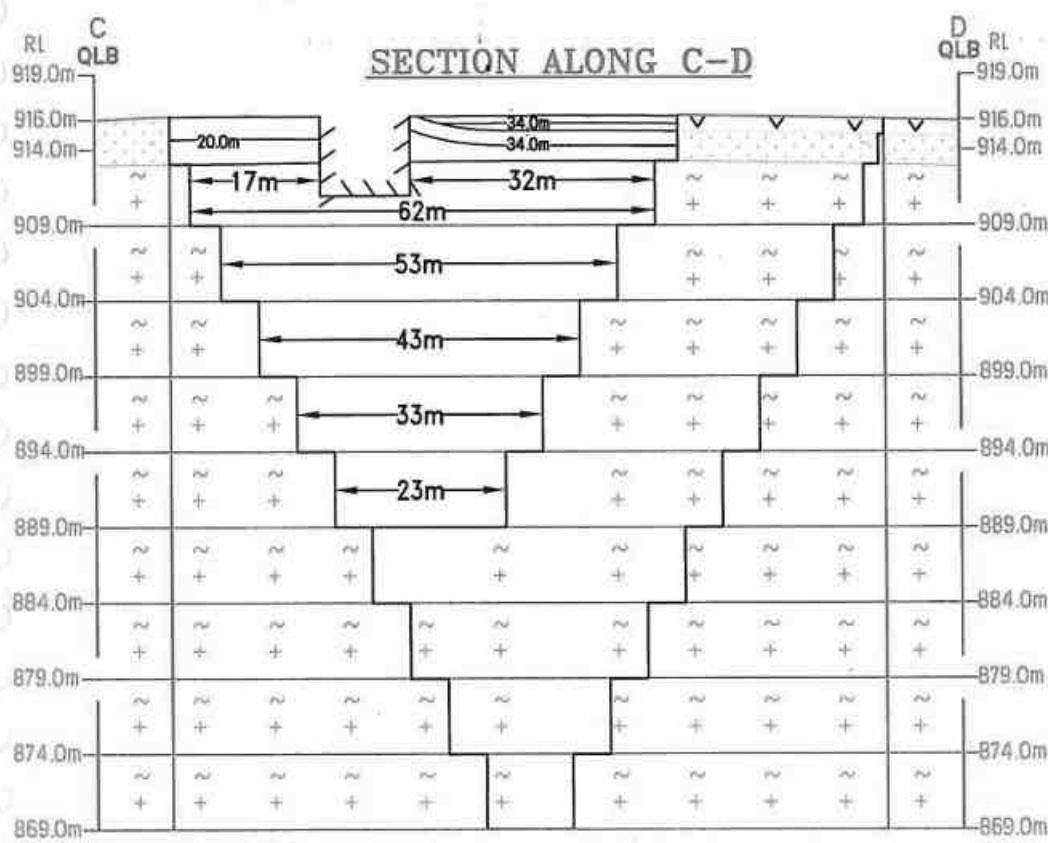
I DO HEREBY CERTIFY THAT THE PLATE
 HAS BEEN CHECKED BY ME AND IS CORRECT
 TO THE BEST OF MY KNOWLEDGE

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

U. Prathavathi



PRODUCTION RESERVES										
Section	Bench	length in (m)	Width in (m)	Depth in (m)	Rom in (M ³)	Mineable Reserves in M ³	Multi Colour Granite 35% Recovery in M ³	Granite Waste 65% in M ³	Top Soil in M ³	Weathered Rock in M ³
XY-CD	I	46	34	1	1564	....	....	....	1564	....
	I	45	54	2	4860	....	....	....	....	4860
	I	6	54	2	648	648	227	421	....	....
	II	41	49	2	4018	4018	1406	2612	....	....
	II	41	62	3	7626	7626	2669	4957	....	....
	III	36	53	5	9540	9540	3339	6201	....	....
X1Y1-EF	IV	31	43	5	6665	6665	2333	4332	....	....
	V	26	33	5	4290	4290	1502	2789	....	....
	VI	21	23	5	2415	2415	845	1570	....	....
	TOTAL	55	59	1	3245	....	....	....	3245	....
	I	54	58	2	6264	....	....	....	....	6264
X1Y1-EF	I	46	55	1	2530	2530	886	1645	....	....
	II	51	49	5	12495	12495	4373	8122	....	....
	III	46	39	5	8970	8970	3140	5831	....	....
	IV	41	29	5	5945	5945	2081	3864	....	....
	V	36	19	5	3420	3420	1197	2223	....	....
TOTAL				42869	33360	11676	21684	3245	6264	
GRAND TOTAL				84495	68562	23997	44565	4809	11124	



<p>PLATE NO-VIIA</p> <p>PROGRESSIVE QUARRY CLOSURE SECTIONS SEC-HOR 1:1000 VER 1:500</p>	<p>APPLICANT: M/s. K.P.R GRANITES, No.2/223, AVVAI NAGAR, NOOLAHALLI POST, PENNAGARAM TALUK, DHARMAPURI DISTRICT - 636 813</p> <p><i>U. Palhanati</i></p>	<p>LOCATION: EXTENT : 1.97.0Hect S.F.NO : 1121/6 & 1125/3 VILLAGE : IRUDUKOTTAI TALUK : DENKANIKOTTAI DISTRICT : KRISHNAGIRI STATE : TAMIL NADU</p>	<p>INDEX</p> <p>LEASE BOUNDARY </p> <p>SAFETY DISTANCE </p> <p>TOPSOIL </p> <p>MULTI COLOUR GRANITE </p>	<p>WEATHERED ROCK </p> <p>PROPOSED BENCH </p> <p>PROPOSED WASTE DUMP </p> <p>ULTIMATE BENCH </p>	<p>Prepared By:</p> <p>I DO HEREBY CERTIFY THAT THE PLATE HAS BEEN CHECKED BY ME AND IS CORRECT TO THE BEST OF MY KNOWLEDGE</p> <p><i>[Signature]</i></p> <p>Dr.S.KARUPPANNAN,M.Sc.,Ph.D., RECOGNIZED QUALIFIED PERSON RQP/MAS/263/2014/A</p>
--	--	--	---	--	--

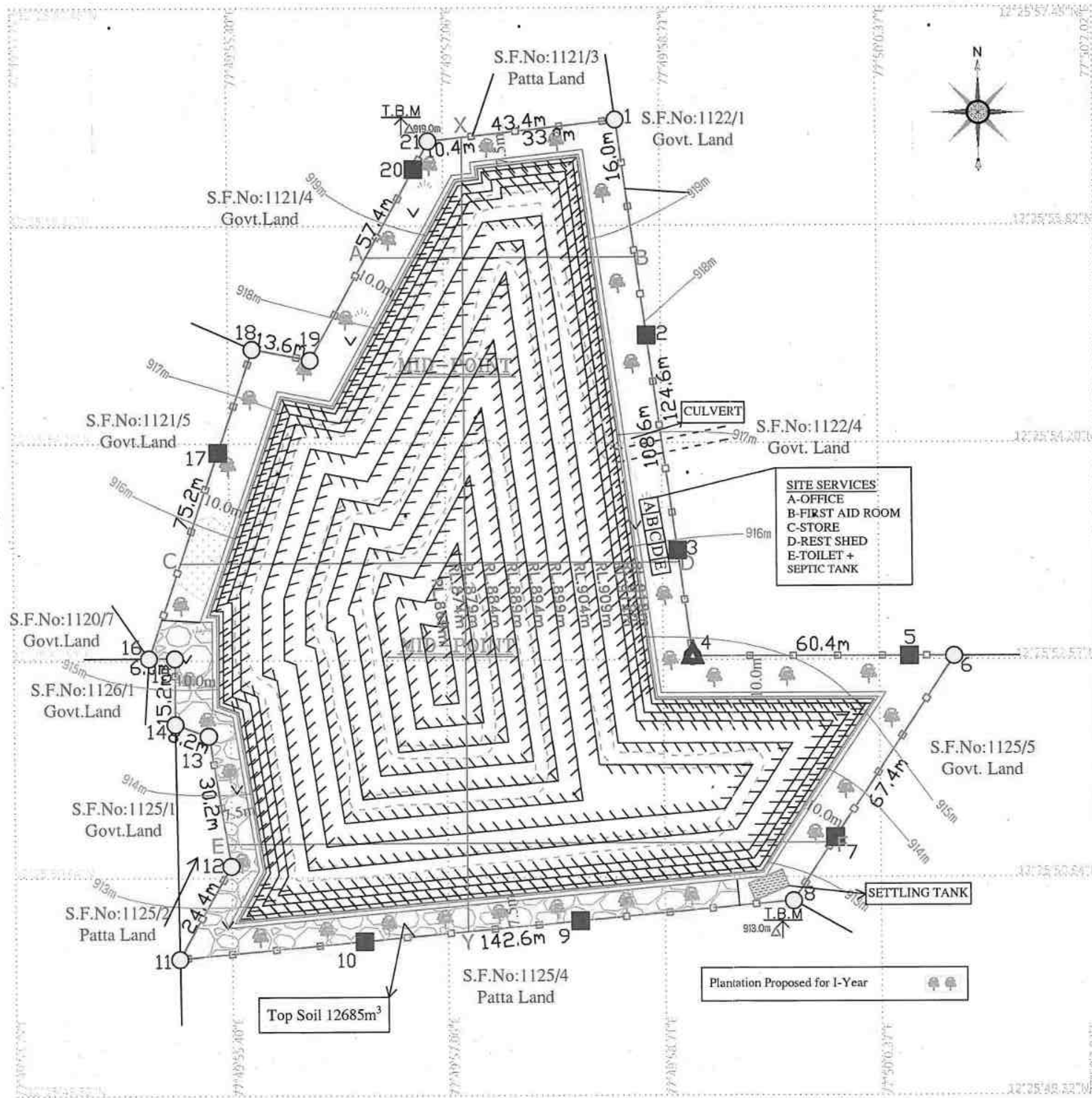


PLATE NO-VIII

APPLICANT:
M/s. K.P.R GRANITES,
 No.2/223, AVVAI NAGAR,
 NOOLAHALLI POST,
 PENNAGARAM TALUK,
 DHARMAPURI DISTRICT - 636 813

LOCATION:
 EXTENT : 1.97.0Hect
 S.F.NO : 1121/6 & 1125/3
 VILLAGE : IRUDUKOTTAI
 TALUK : DENKANIKOTTAI
 DISTRICT : KRISHNAGIRI
 STATE : TAMIL NADU



INDEX

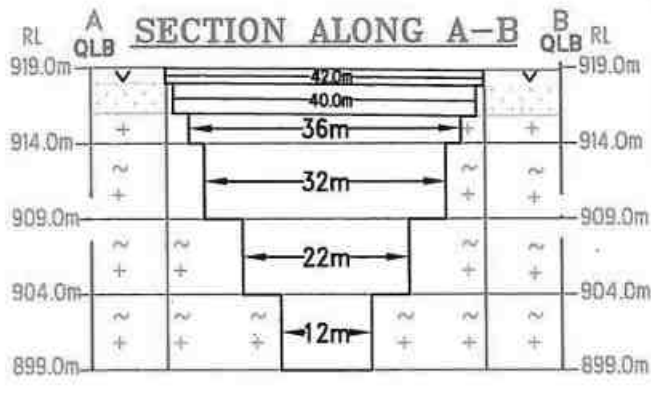
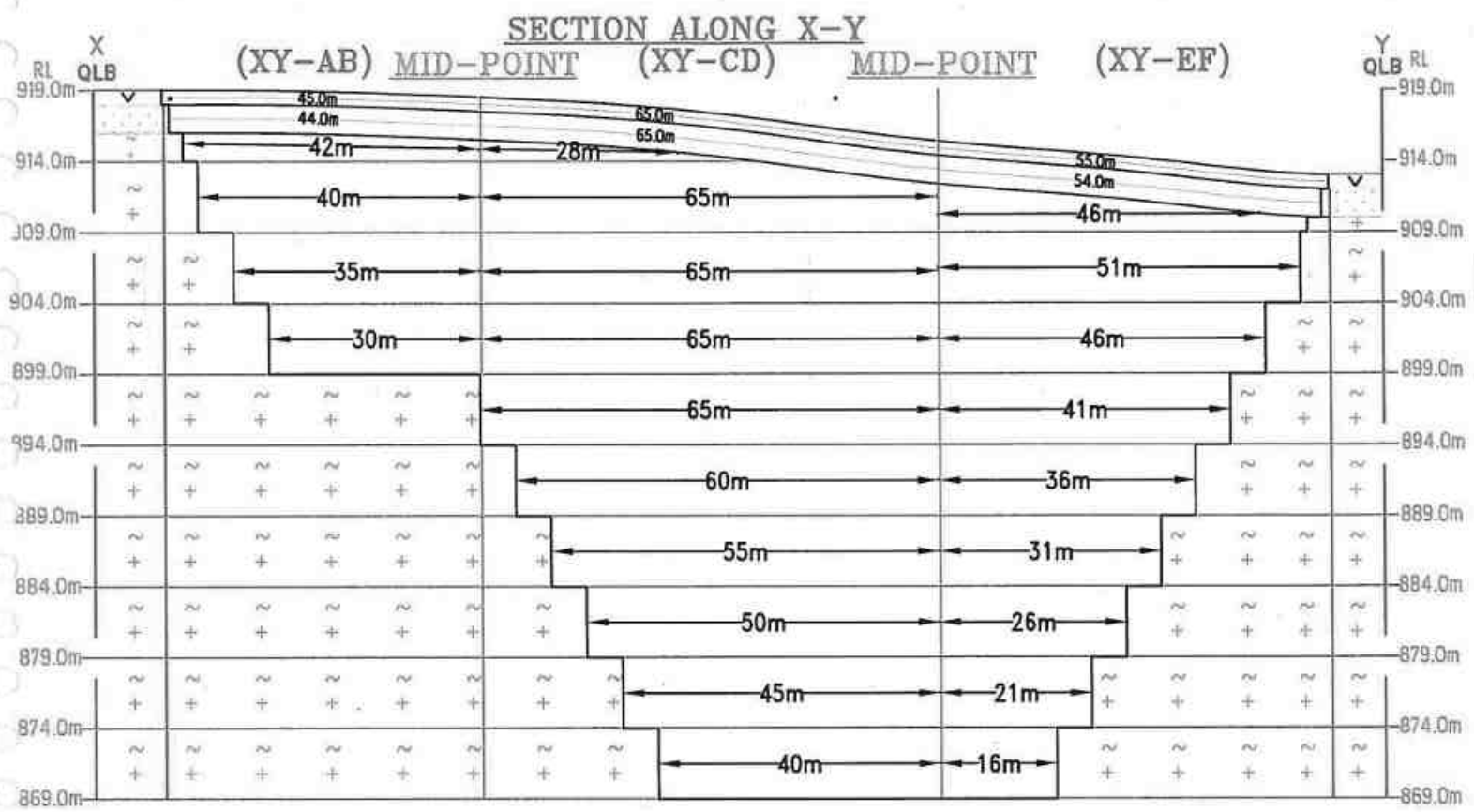
LEASE BOUNDARY	
SAFETY DISTANCE	
APPROACH & MINE HAUL	
PILLAR STONES	
TEMPORARY BENCH MARKS	
SHRUBS	
CONTOUR LINES	
OUTCROP	
TOPSOIL	
ULTIMATE BENCH	
PROPOSED WASTE DUMP	
SETTLING TANK & DRAINAGE	
CULVERT	
FENCING	

CONCEPTUAL PLAN
 (SCALE) PLAN 1:1000

Prepared By:

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

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



MINEABLE RESERVES										
Section	Bench	length in (m)	Width in (m)	Depth in (m)	Room In (M ³)	Mineable Reserves in M ³	Multi Colour Granite 35% Recovery in M ³	Granite Waste 65% in M ³	Top Soil in M ³	Weathered Rock in M ³
XY-AB	I	45	42	1	1890	---	---	---	1890	---
	I	44	40	2	3570	---	---	---	---	3570
	I	42	36	2	3024	3024	1058	1966	---	---
	II	40	32	5	6400	6400	2240	4160	---	---
XY-CD	III	35	22	5	3850	3850	1348	2503	---	---
	IV	30	12	5	1800	1800	630	1170	---	---
	TOTAL				20484	15074	5276	9798	1890	3520
	I	65	62	1	4030	---	---	---	4030	---
	I	65	83	2	10790	---	---	---	---	10790
	I	28	83	2	4648	4648	1627	3021	---	---
	II	65	77	2	10010	10010	3504	6507	---	---
	II	65	90	3	17550	17550	6143	11408	---	---
	III	63	82	5	26650	26650	9328	17323	---	---
	IV	65	72	5	23400	23400	8190	15210	---	---
V	65	62	5	20150	20150	7053	13098	---	---	
VI	60	52	5	15600	15600	5460	10140	---	---	
VII	55	42	5	11550	11550	4043	7508	---	---	
VIII	50	32	5	8000	8000	2800	5200	---	---	
IX	45	22	5	4950	4950	1733	3218	---	---	
X	40	12	5	2400	2400	840	1560	---	---	
TOTAL				159728	144908	50718	94190	4030	10790	
XIV-EF	I	55	123	1	6765	---	---	---	6765	---
	I	54	121	2	13068	---	---	---	---	13068
	I	46	117	1	5382	5382	1884	3498	---	---
	II	51	115	5	29325	29325	10264	19061	---	---
	III	46	105	5	24150	24150	8453	15698	---	---
	IV	41	95	5	19475	19475	6816	12659	---	---
	V	36	85	5	15300	15300	5355	9945	---	---
	VI	31	75	5	11625	11625	4069	7556	---	---
	VII	26	65	5	8450	8450	2958	5493	---	---
VIII	21	55	5	5775	5775	2021	3754	---	---	
IX	16	45	5	3600	3600	1260	2340	---	---	
TOTAL				142915	123082	43079	80003	6765	13068	
GRAND TOTAL				323127	283064	99072	183992	12685	27378	

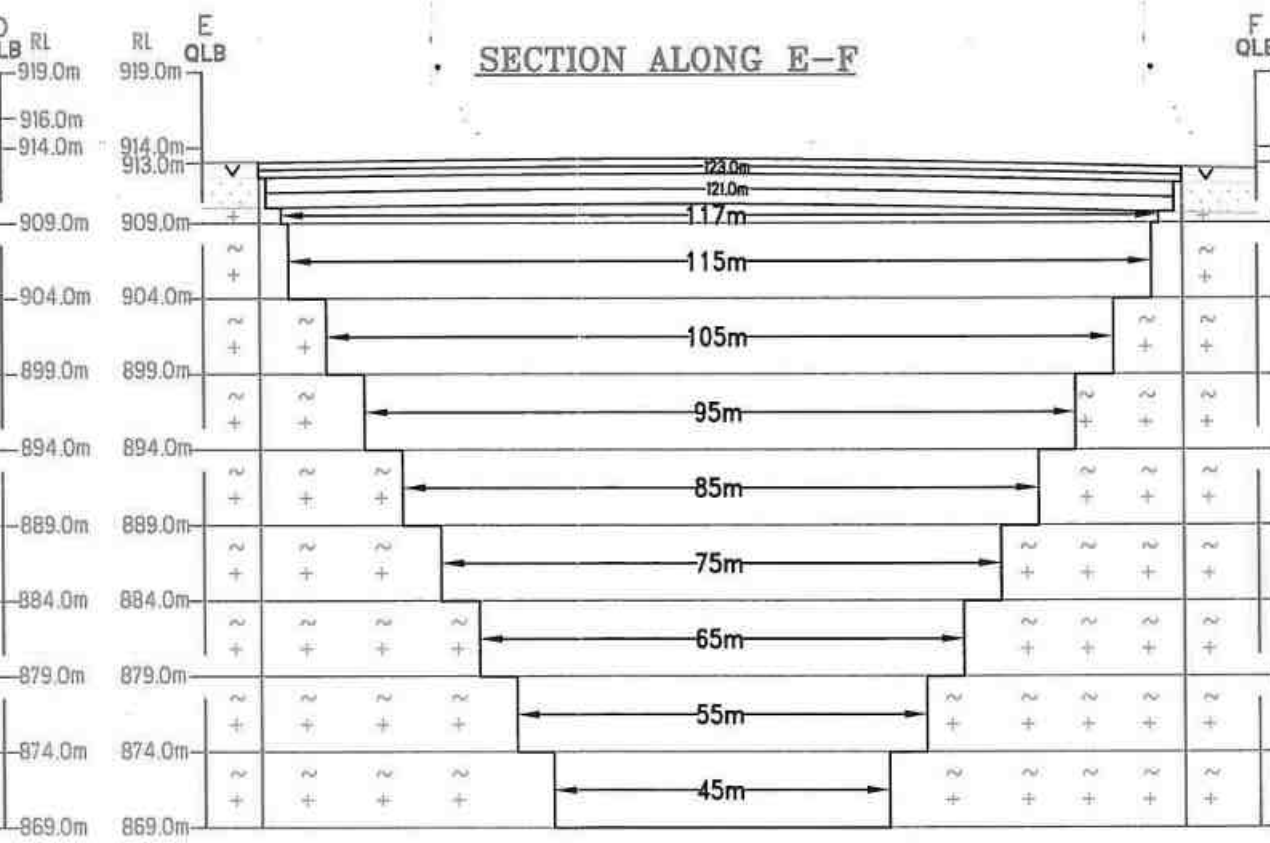
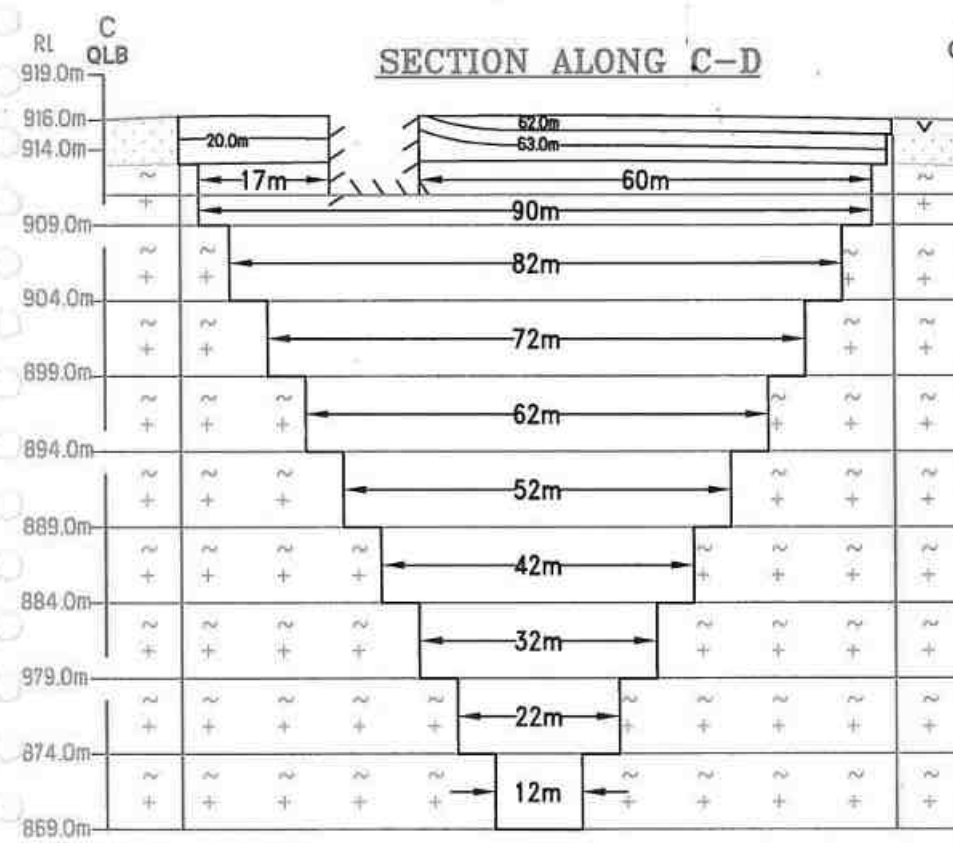


PLATE NO-VIIIA	APPLICANT: M/s. K.P.R GRANITES, No.2/223, AVVAI NAGAR, NOOLAHALLI POST, PENNAGARAM TALUK, DHARMAPURI DISTRICT - 636 813 <i>U. Palharathi</i>	LOCATION: EXTENT : 1.97.0Hect S.F.NO : 1121/6 & 1125/3 VILLAGE : IRUDUKOTTAI TALUK : DENKANIKOTTAI DISTRICT : KRISHNAGIRI STA 271 : TAMIL NADU	INDEX
CONCEPTUAL SECTIONS SEC-HOR 1:1000 VER 1:500			LEASE BOUNDARY SAFETY DISTANCE TOPSOIL MULTI COLOUR GRANITE WEATHERED ROCK ULTIMATE BENCH

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

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

From

Dr.P.Jayapal,M.Sc.,Ph.D.,
Deputy Director,
Dept of Geology and Mining,
Krishnagiri.

To

M/s. K.P.R Granites,
No.2/223, Avvai Nagar,
Noolahalli Post, Pennakaram Taluk,
Dharmapuri District -636813.

Roc.No.986/2019/Mines dated: .12.2023.

Sir,

Sub: Mines and Minerals – Minor Mineral – Multi colour Granite – Krishnagiri District - Denkanikottai Taluk – Irudukottai village S.F.Nos.1121/6 (1.04.0) & 1125/3 (0.93.0) over an extent of 1.97.0 Hects of Patta lands - Quarry lease has been granted in favour of M/s. K.P.R Granites for Multi Colour granite - Mining Plan approved by the Commissioner of Geology & Mining, Krishnagiri – Applied for obtaining Environmental Clearance From SEIAA – Quarry pit dimension details – Furnished - reg.

- Ref:**
1. The District Collector, Krishnagiri proposal note file Rc. No. 986/2019/Mines under single file system dated 30.01.2023.
 2. Mining Plan approved by the Commissioner of Geology & Mining, Krishnagiri vide letter No. 582/MM4/2021 Dated: 13.12.2023.
 3. M/s. K.P.R Granites letter dated 18.12.2023.

-oOo-

Kind attention is invited to the references cited above.

2) A quarry lease has been granted in favour of M/s. K.P.R Granites for Multi Colour granite over an extent of 1.97.0 hecets of Patta lands in S.F.Nos.1121/6 (1.04.0) & 1125/3 (0.93.0) of Irudukottai Village, Denkanikottai Taluk, Krishnagiri District for a period of 20 years under the provisions of Rule 19(A) of Tamil Nadu Minor Mineral Concession Rules 1959.

3) The commissioner of Geology & Mining vide reference 2nd cited has accorded approval for Mining Plan in respect of the said quarry lease.

U. Balhewath

4) The applicant vide reference 3rd cited has requested pit dimension of the subject quarry lease for furnishing the same to SEIAA in order to get Environmental Clearance.

5) In this connection the quarry pit dimension as per the approved Mining Plan is furnished as below.

Existing Pit Dimension			
PIT NO.	Length (m)	Width (m)	Depth in (m)
Pit - I	14	13	1
Pit - II	25	12	5

W. B. Srinivas
26/12/23

Deputy Director,
Dept of Geology and Mining,
Krishnagiri.

DM
26/12/23

Copy to :-

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

U. Prabhakar

ഭൂമിയിടവിലെ 2424 (7) ലിങ്ക്

41- ഇരുട്ടുകോട്ടൈ ഗ്രാമ പഞ്ചായത്ത്

1121/6 പ്ലാറ്റ് 1-4.00 ട്രിഗ്ല 0.64 ഓസ

1125/3 പ്ലാറ്റ് 0-93.00 ട്രിഗ്ല 1.01 ഓസ

മുൻപ്ലാറ്റ് നമ്പർ K.P.R. മൂന്നാം ഘട്ടം (2)

മുൻപ്ലാറ്റ് നമ്പർ 8927-2 കോർട്ട്

കോർട്ടിലെ മൂന്നാം ഘട്ടം. ഇതിൽ മൂന്നാം

ഘട്ടം 300 ലിങ്ക് മൂന്നാം ഘട്ടം കൂടു

മുൻപ്ലാറ്റ്, ലിങ്ക് നമ്പർ 8927-2 നമ്പർ

മുൻപ്ലാറ്റ് നമ്പർ മൂന്നാം ഘട്ടം

മുൻപ്ലാറ്റ് നമ്പർ.

Village Administrative Officer
41. IRUDUKOTTAI (Village).
DENKANIKOTTAI (Tk), Krishnagiri Dist

U. Pralhad:



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.

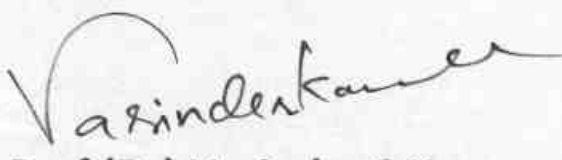
Issue Date
Feb 19, 2024

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.