

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

Environmental Clearance under EIA Notification – 2006

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

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

CLUSTER EXTENT = 8.78.50hectares

At

Jagadevipalayam Village, Bargur Taluk,

Krishnagiri District, Tamil Nadu State

ToR Lr. No. SEIAA-TN/F.No.10214/SEAC/ToR-1559/2023 dated 27.09.2023

NAME AND ADDRESS OF THE PROPOSED PROJECT PROPONENT

Name and Address	Extent & S.F.No.	Mineral Production
Tmt.M.Sadhana No.2/A2, 3rd Cross, Gopalakrishna Colony, Krishnagiri District - 635 001	1.87.0 Ha & 366 (Part)	Granite 20% - 14031m³ Granite Waste @ 80% -56123 m³

ENVIRONMENTAL CONSULTANT

GEO TECHNICAL MINING SOLUTIONS



No: 1/213-B, Ground Floor, Natesan Complex
Oddapatti, Collectorate Post office,
Dharmapuri-636705. Tamil Nadu.
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NABET ACC. NO: NABET/EIA/2124/SA 0184

Valid till: April,02,2024

ENVIRONMENTAL LAB

EXCELLENCE LABORATORY

No.23/93, 5th Street Ram Nagar, S.S.Colony,

Madurai, Tamil Nadu

NABL Certificate Number: TC-6932, Valid Until : 19.03.2024

Baseline Study Period – October 2023 through December 2023

TERMS OF REFERENCE (ToR) COMPLIANCE

ToR issued vide Letter No. SEIAA-TN/F.No.10214/SEAC/ToR-1559/2023 dated

27.09.2023

SPECIFIC CONDITIONS		
1	The PP shall furnish ownership details of all survey numbers in EIA report.	The ownership details and detailed land survey numbers is given in the approved mining plan book in the Annexure III.
2	The PP shall submit the ‘Action Plan’ on the issues raised during the Public Hearing with budgetary provisions for the same.	The comments made in public hearing meeting will be submitted during final EIA report.
3	The PP shall submit the action plan for the controlled blasting measures so as to reduce the impacts due to the blasting operation in the proposed quarries within 1km of the proposed quarry.	It is an Eco-friendly quarry operation; no blasting is proposed.
4	The PP shall submit a ‘Conceptual Mining Plan’ indicating the ramp from the surface to the pit bottom keeping the benches intact for the dimension as stipulated in the Approved Mining Plan.	The Conceptual Mining Plan indicating the benches is shown in the approved mining plan in Annexure III.
5	The PP shall enumerate the structures located within 500m radius of the proposed quarry with classifying the nature of buildings/structures & its age, number of occupants and their profession, distance of its existing location to the proposed quarry.	Details of the structures within 500m radius with nature of buildings/structures & its age, number of occupants is shown in the figure 3.31 under Chapter III, p.101.
6	In the case of existing/operating mines, a letter obtained from the concerned AD (Mines) shall be submitted and it shall be submitted and it shall include the following:	
	i	Original pit dimension
	ii	Quantity achieved Vs EC Approved Quantity
	iii	Balance Quantity as per Mineable Reserve calculated

	iv	Mined out Depth as on date Vs EC permitted depth	As it is a fresh quarry, the conditions are not applicable.
	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 6m height and ultimate depth of not exceeding 50m.	
7		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	VAO certificate is attached in the Annexure IV.
8		The proponent is requested to carry out a survey and enumerate on the structures located within the radius of (i) 50m, (ii) 100m, (iii) 200m and (iv) 300m (v) 500m shall be enumerated with the details such as dwelling houses with number of occupants, whether it belongs to the owner (or) not, places of worship, industries, factories, sheds, etc with indicating the owner of the building, nature of construction, age of the building, number of residents, their profession and income, etc.	There are no structures such as dwelling houses, places of worship, industries, factories, sheds, etc. within the radius of 300m from the proposed project area. VAO certificate is attached in the Annexure IV.
9		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 1km of the proposed quarry.	Detailed hydrogeological study was carried out. The results have been discussed Section 3.2 under Chapter III, pp.41-54.

10	The proponent shall carry out Bio diversity study through reputed Institution and the same shall be included in EIA Report.	Details regarding Bio diversity is given in the Section 3.5 under Chapter III, pp.69-95.
11	The DFO letter stating that the proximity distance of reserve Forests, Protected Areas, Sanctuaries, Tiger reserve etc, upto a radius of 25km from the proposed site.	DFO letter is attached in the Annexure III.
12	In the case of proposed lease in an existing (or old) quarry where the benches are not formed (or) partially formed as per the approved Mining plan, the project proponent (PP) shall prepare and submit an 'Slope Stability Action plan' for carrying out the realignment of the benches in the proposed quarry lease after it is approved by the concerned Asst. Director and mining during the time of appraisal for obtaining the EC.	As it is a fresh lease area, the Slope Stability report is not required.
13	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 30m below ground level.	As it is a fresh lease quarry, the conditions are not applicable.
14	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.	It is an Eco-friendly quarry operation; no blasting is proposed.
15	The PP shall present a conceptual design for carrying out only controlled blasting	A conceptual design of blasting has been given in Section 2.6 under Chapter II,

	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.	pp.17-28.
16	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 Lesse has two granite mines in Kondappanayanapalli village, Bargur Taluk, Krishnagiri District. The lease period granted for 20 years by the DGM, TN. 1.The EC Granted for Grey Granite in S.F.No. 133/7(P), etc over an extent of 2.35.0Ha, vide, Lr.No. SEIAA/TN/F.No.7263/EC. No.5288/2022, Dated.05.09.2022. 2. The EC Granted for Grey Granite quarry project over an Extent of 1.46.0Ha in S.F.Nos. 133/2A (P) and 133/2B1A(P) vide,Lr.No.SEIAA/ TN/F.No.7264/ EC.No.5292/2022, Dated.05.09.2022.
17	If the proponent has already carried out the mining activity in the proposed mining lease area after 15.01.2016, then the proponent shall furnish the following details from AD/DD, mines.	
	a	What was the period of the operation and stoppage of the earlier mines with last work permit issued by the AD/DD mines?
	b	Quantity of minerals mined out.
	c.	Highest production achieved in any one year
	d.	Detail of approved depth of mining.
	e.	Actual depth of the mining achieved earlier.
	f.	Name of the person already mined in that leases area.
	g.	If EC and CTO already obtained, the copy of the same shall be submitted.
	h.	Whether the mining was carried out as per the approved mine plan (or EC if issued) with stipulated benches.
	As it is a new quarry, the conditions are not applicable.	
20	All corner coordinates of the mine lease area. superimposed on a High-Resolution	All corner coordinates of the mine lease area have been superimposed on a high-

	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).	resolution Google Earth Image, as shown in Figure 2.4, under Chapter II, p.13.
21	The PP shall carry out Drone video survey covering the cluster, green belt, fencing etc.,	Drone video showing fencing and greenbelt development will be submitted in the final EIA report.
22	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.	<ul style="list-style-type: none"> • There are no any water bodies around the lease area. • The safety distance of the lease boundary between the adjacent quarries is provided in the Approved mining plan book. • The photography of greenbelt and fencing will be submitted in the final EIA Report. • The details about replantation and number of trees to planted is discussed in the Section 4.6 under Chapter IV, pp.119-126.
23	The Project Proponent shall provide the details of mineral reserves and mineable reserves, planned production capacity, proposed working methodology with justifications, the anticipated impacts of the mining operations on the surrounding environment and the remedial measures for the same.	The mineral reserves of the project have been discussed in Section 2.5 under Chapter II, pp.17. The anticipated impact of mining on land, air, noise, water, soil, biology, and socio economy is discussed under Chapter IV, pp.105-130.
24	The Project Proponent shall provide the Organization chart indicating the	Details of manpower required for this project have been given in Table 2.11

	<p>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.</p>	<p>under Chapter II, p.28.</p>
25	<p>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.</p>	<p>Detailed hydrogeological study was carried out. The results have been discussed Section 3.2 under Chapter III, pp.41-54.</p>
26	<p>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>The baseline data were collected for the environmental components including land, soil, water, air, noise, biology, socio-economy, and traffic and the results have been discussed under Chapter III, pp. 30-104.</p>
27	<p>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,</p>	<p>Results of cumulative impact study due to mining operations are given in Section 7.3 under Chapter VII, pp.145-148.</p>

	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.	
28	Rain water harvesting management with recharging details along with water balance (both monsoon & non-monsoon) be submitted.	Water for dust suppression, greenbelt development and domestic use will be sourced from accumulated rainwater/seepage water in mine pits and purchased from local water vendors through water tankers on daily requirement basis. Drinking water will be sourced from the approved water vendors. The details of the rain water harvesting management plan is shown in the Annexure V.
29	Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.	Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features has been discussed in Section 3.1 under Chapter III, pp.31-40. The details of surrounding sensitive ecological features have been provided in Table 3.43 under Chapter III, p.102. Land use plan of the project area showing pre-operational, operational and post-operational phases are discussed in Table 2.7 under Chapter II, p.21.
30	Details of the land for storage of Overburden/Waste Dumps (or) Rejects	This condition is not applicable to this project because no dumps have been

	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.	proposed outside the lease area.
31	Proximity to Areas declared as 'Critically Polluted' (or) the Project areas which attracts the court restrictions for mining operations, should also be indicated and where so required' clearance certifications from the prescribed Authorities, such as the TNPCB (or) Dept. of Geology and Mining should be secured and furnished to the effect that the proposed mining activities could be considered.	This condition is not applicable to this project because this project is not located in proximity to the areas of areas declared as 'Critically Polluted' (or) the project areas which attracts the court restrictions for mining operations.
32	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.	Water for dust suppression, greenbelt development and domestic use will be sourced from accumulated rainwater/seepage water in mine pits and purchased from local water vendors through water tankers on daily requirement basis. Drinking water will be sourced from the approved water vendors. Details of the rain water harvesting management plan is shown in the Annexure V.
33	Impact on local transport infrastructure due to the Project should be indicated.	Details regarding the impact of the project on traffic are given in Section 3.7 under Chapter III, pp.98-99.
34	A tree survey study shall be carried out (nos., name of the species, age, diameter etc.) both within the mining lease applied area & 300m buffer zone and its management during mining activity.	A detailed tree survey was carried out within 300 m radius and the results have been discussed in Section 3.5 under Chapter III, pp.69-95.
35	A detailed mine closure plan for the proposed project shall be included in	A progressive mine closure plan has been attached with the approved mining

	EIA/EMP report which should be site-specific.	plan report in Annexure III. The budget details for the progressive mine closure plan are shown in Table 2.8 under Chapter II, p.24.
36	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.
37	The purpose of green belt around the project is to capture the fugitive emissions, carbon sequestration and to attenuate the noise generated, in addition to improving the aesthetics A wide range of indigenous plant species should be planted as given in the appendix-I in consultation with the DFO, State Agriculture University and local school/college authorities. The plant species with dense/moderate canopy of native origin should be chosen. Species of small/medium/tall trees alternating with shrubs should be planted in a mixed manner.	A detailed greenbelt development plan has been provided in Section 4.6 under Chapter IV, pp.119-126.
38	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.

39	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 7.2 under Chapter VII, pp.141-145.
40	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 7.1 under Chapter VII, pp.137-140.
41	Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.	Occupational health impacts of the project and preventive measures have been discussed in detail in Section 4.8 under Chapter IV, pp.127 & 129.
42	Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.	No public health implications are anticipated due to this project. Details of CSR and CER activities have been discussed in Sections 8.6 and 8.7 under Chapter VIII, pp.152 & 153.
43	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 22 people directly as discussed in Section 8.1 under Chapter VIII, p.151.

44	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.
45	Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.	Benefits of the project details have been given under Chapter VIII, pp.151-153.
46	If any quarrying operation were carried out in the proposed quarrying site for which now the EC is sought, the Project Proponent shall furnish the detailed compliance to EC conditions given in the previous EC with the site photographs which shall duly be certified by MoEF & CC, Regional Office, Chennai (or) the concerned DEE/TNPCB.	It is fresh lease area and the condition is not applicable.
47	The PP Shall prepare the EMP for the entire life/lease period of mine and also Furnish the sworn affidavit stating to Abide the EMP for the entire life of mine.	A detailed environment management plan has been prepared following the suggestion made by SEAC, as shown in Chapter X, pp.155-175. The sworn affidavit stating to abide the EMP for the entire life of mine will be submitted along with Presentation.
48	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.

	<p>The proposal was placed in the 658th Authority meeting held on 26.09.2023 & 27.09.203 The authority noted that this proposal was placed for appraisal in 407th meeting of SEAC held on 07.09.2023, the committee has furnished its recommendations for granting ToR with public hearing subject to the conditions stated therein. After detailed discussions, the Authority accepts the recommendation of SEAC and decided to grant Terms of Reference (ToR) along with Public Hearing under cluster for undertaking the combined Environment Impact Assessment Study and preparation of separate Environment Management Plan subject to the conditions recommended by SEAC & normal conditions in addition to the following conditions mentioned in ‘Annexure B’ of this minute.</p>	
	Annexure ‘B’	
	Cluster Management Committee	
1	Cluster Management Committee shall be framed which must include all the proponents in the cluster as members including the existing as well as proposed quarry.	A cluster management committee including all the proponents of the colour granite quarrying projects within the cluster of 500 m radius will be constituted for the effective implementation of green belt development plan, water sprinkling, blasting, etc.
2	The members must coordinate among themselves for the effective implementation of EMP as committed including Green Belt Development Water sprinkling, tree plantation, blasting etc.,	The members of the cluster management committee will be instructed to carry out EMP in coordination.
3	The List of members of the committee formed shall be submitted to AD/Mines before the execution of mining lease and the same shall be updated every year to the AD/Mines.	The list of members of the committee formed will be submitted to AD/Mines before the execution of mining lease.
4	Detailed Operational Plan must be submitted which must include the blasting frequency with respect to the nearby quarry situated in the cluster, the usage of haul roads by the individual quarry in the form of route map and network.	All the information has been discussed in Section 2.6 & 2.7 under Chapter II, pp.17-29.

5	The committee shall deliberate on risk management plan pertaining to the cluster in a holistic manner especially during natural calamities like intense rain and the mitigation measures considering the inundation of the cluster and evacuation plan.	It will be informed to the committee.
6	The Cluster Management Committee shall form Environmental Policy to practice sustainable mining in a scientific and systematic manner in accordance with the law. The role played by the committee in implementing the environmental policy devised shall be given in detail.	It will be advised to the cluster management committee to practice sustainable mining in a scientific and systematic manner in accordance with the law. The role played by the committee in implementing the environmental policy devised will be given in detail.
7	The committee shall furnish action plan regarding the restoration strategy with respect to the individual quarry falling under the cluster in a holistic manner.	A proper action plan regarding the restoration will be followed by the committee.
8	The committee shall 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 7.2 under Chapter VII, pp.141-145.

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, pp.31-40 & pp.69-95.
b	Climate change leading to Droughts, Floods etc.	Climatic condition of the proposed project area has been discussed in Section 3.3 under Chapter III, pp.54-65.
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, pp.119-126.
d	Possibilities of water contamination and impact on aquatic ecosystem health.	Possibilities of both surface and ground water contamination have been discussed in Section 4.3 under Chapter IV, pp.106 & 107. The impact on aquatic species has been discussed in Section 4.6 under Chapter IV, pp.119-126.
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 0.83 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 are given in the Table 3.4 under Chapter III, p.40.
Agriculture & Agro-Biodiversity			
13		Impact on surrounding agricultural fields around the proposed mining area.	There shall be negligible air emissions or effluents from the project site. During loading the truck, dust generation will be likely. This shall be a temporary effect and not anticipated to affect the surrounding vegetation significantly, as shown in Section 4.6 under Chapter IV, pp.119-126.
14		Impact on soil flora & vegetation around the project site.	The details on flora have been provided in Section 3.5 under Chapter III, pp.69-95. 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 shall be given 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, pp.69-95. Details about transplantation of plants have been provided in Section 4.6 under Chapter IV, pp.119-126.
16		The Environmental Impact Assessment should study the biodiversity, the natural ecosystem, the soil micro flora, fauna and soil seed banks and suggest measures to maintain the natural Ecosystem.	The ecological details have been provided in Section 3.5 under Chapter III, pp.69-95 and measures have been provided in Section 4.6 under Chapter IV, pp.119-126.
17		Action should specifically suggest for sustainable management of the area and	All the essential environmental protective measures will be followed by

	restoration of ecosystem for flow of goods and services.	the proponent to manage the surrounding environment and restore the ecosystem, as discussed in Chapter IV, pp.105-130.
18	The project proponent shall study and furnish the impact of project on plantations in adjoining patta lands, Horticulture, Agriculture and livestock.	The impact of project on the land environment has been discussed in Section 4.1 under Chapter IV, pp.105-106.
Forests		
19	The project proponent shall study on impact of mining on Reserve forests free ranging wildlife.	The project proponent shall do barbed wire fencing work and develop a green belt around the lease area to prevent wildlife from entering the site.
20	The Environmental Impact Assessment should study impact on forest, vegetation, endemic, vulnerable and endangered indigenous flora and fauna.	The impacts of the project on ecology and biodiversity have been discussed in Section 4.6 under Chapter IV, pp.119-126.
21	The Environmental Impact Assessment should study impact on standing trees and the existing trees should be numbered and action suggested for protection.	The impacts of the project on standing trees and the existing trees have been discussed in Section 4.6 under Chapter IV, pp.119-126.
22	The Environmental Impact Assessment should study impact on protected areas, Reserve Forests, National parks, corridors and wildlife pathways, near project site.	There are no protected areas, National Parks, Corridors and Wildlife pathways near project site. The list of environmentally sensitive areas within 10 km radius has been provided in Table 3.43 under Chapter III, p.102.
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	Detailed hydrogeological study was carried out. The results have been discussed Section 3.2 under Chapter III, pp.41-54.

	<p>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>	
24	Erosion control measures.	Garland drainage structures will be constructed around the lease area to control the erosion, as discussed in Section 4.3 under Chapter IV, pp.106 & 108.
25	Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area on the nearby villages, waterbodies/rivers & any ecological fragile areas.	The matter has been discussed under Chapter IV, pp.105-130.
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 3.5.1 under Chapter 3, pp.70-86.
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, pp105-130.
28	The project proponent shall study and furnish the impact on aquatic plants and animals in water bodies and possible scars on the landscape, damages to nearby caves, heritage site, and archaeological sits possible land form changes visual and aesthetic impacts.	The impact of the proposed project on aquatic plants and animals in water bodies has been discussed in Section 4.6 under Chapter IV, pp.119-126.
29.	The Terms of Reference should	The impact of mining on soil

	specifically study impact on soil health, soil erosion, the soil physical, chemical components.	environment has been discussed in Section 4.2 under Chapter IV, pp.106.
30	The Environmental Impact Assessment should study on wetlands, water bodies, rivers streams, lakes and farmer sites.	The impacts on water bodies, streams, lakes have been discussed in Section 4.3 under Chapter IV, pp.106 - 108.
Energy		
31	The measures taken to control Noise, Air, water, Dust control and steps adopted to efficiently utilise the Energy shall be furnished.	The measures taken to control noise, air, water, and dust have been given under Chapter IV, pp. 105-130.
Climate Change		
32	The Environmental Impact Assessment shall study in detail the carbon emission and also suggest the measures to mitigate carbon emission including development of carbon sinks and temperature reduction including control of other emission and climate mitigation activities.	The carbon emission and the measures to mitigate carbon emission have been discussed in Section 4.6 under Chapter IV, pp. 119-126.
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, pp. 105-130.
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 2.9a under Chapter II, p.24.
EMP		

35	Detailed Environment Management plan along with adaptation, mitigation & remedial strategies covering the entire mine lease period as per precise area communication order issued.	A detailed Environment Management plan has been given under Chapter X, pp.155-175.
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 10.10 & 10.11 under Chapter X, pp.167-175.
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 7.1 under Chapter VII, pp.137-140.
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 7.2 under Chapter VII, pp.141-145.
Others		
39.	The project proponent shall furnish VAO certificate with reference to 300 m radius regard to approved habitations, schools, Archaeological sites, structures, railway lines, roads, water bodies such as streams, odai, vaari, canal, river, lake pond, tank etc.	The VAO certificate of 300 m radius is enclosed 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 public consultation will be submitted in the final EIA report.
41	The project proponent shall study and furnish the possible pollution due to plastic and microplastic on the environment. The ecological risks and impacts of plastic & microplastics on aquatic environment and fresh water systems due to activities, contemplated during mining may be investigated and reported.	The matter on plastic waste management has been given in Section 7.4 under Chapter VII, p.148 & 149.
STANDARD TERMS OF REFERENCE		
1.	Year-wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification 1994 came into force, w.r.t. the highest production achieved prior to 1994.	Not applicable. This is not a violation category project. This proposal falls under B1 category.
2.	A copy of the document in support of the fact that the proponent is the rightful lessee of the mine should be given.	The proposed site for quarrying is a Government Poramboke land. A copy of the document showing that the proponent is the rightful lessee has been enclosed along with the approved mining plan in Annexure III.
3.	All documents including approved mine plan, EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee.	All the documents are in the name of the lessee.
4.	All corner coordinates of the mine lease	All corner coordinates of the mine lease

	area, superimposed on a High-Resolution Imagery/ toposheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).	area have been superimposed on a high-resolution Google Earth Image, as shown in Figure 2.4, under Chapter II, p.13.
5.	Information should be provided in Survey of India Toposheet in 1:50,000 scale indicating geological map of the area, geomorphology of land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics.	Toposheets of Survey of India have been used for showing sampling locations of air, soil, water, and noise, as shown in Chapter III, pp.30-104.
6.	Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority.	The lease area was inspected by the officers of Department of Geology along with revenue officials and found that the land is fit for quarrying under the policy of State Government.
7.	It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating process/ procedures to bring into focus any infringement/ deviation/ violation of the environmental or forest norms/conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The	The proponent has framed Environmental Policy and the same has been discussed in Section 10.1 under Chapter X, p.155 & 156.

	system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large, may also be detailed in the EIA Report.	
8.	Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided.	It is an opencast quarrying operation proposed to operate in Manual method. The rough stone formation is a hard, compact and homogeneous body. The height and width of the bench will be maintained as 5m with 90 ⁰ bench angles. Quarrying activities will be carried out under the supervision of Competent Persons like Mines Manager, Mines Foreman and Mining Mate. Necessary permissions will be obtained from DGMS after obtaining Environmental Clearance.
9.	The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc., should be for the life of the mine / lease period.	The study area considered for this study is of 5 km radius for air, soil, water, and noise level sample collections, while the study area is 10 km radius for ecology and biodiversity studies and all data contained in the EIA report such as waste generation etc., is for the life of the mine / lease period.
10.	Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass	Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features has been discussed in Section 3.1, under Chapter III, pp.31-40. The

	preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.	details of surrounding sensitive ecological features have been provided in Table 3.43 under Chapter III, p.102. Land use plan of the project area showing pre-operational, operational and post-operational phases are discussed in Table 2.7 under Chapter II, p.21.
11.	Details of the land for any over burden dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given	It is not applicable as no dumps have been proposed outside the lease area. The entire quarried out rough stone will be transported to the needy customers.
12.	Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.	It is not applicable as there is no forest land involved within the proposed project area. The details have been discussed in Table 3.43 under Chapter III, p.102.
13.	Status of forestry clearance for the broken-up area and virgin forestland involved in the Project including deposition of net present value (NPV) and compensatory afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.	It is not applicable as the proposed project area does not involve any forest land.

14.	Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.	Not Applicable. The project doesn't attract Recognition of Forest Rights Act, 2006 as there are neither forests nor forest dwellers / forest dependent communities in the mine lease area. There shall be no forest impacted families (PF) or people (PP). Thus, the rights of Traditional Forest Dwellers will not be compromised on account of the project.
15.	The vegetation in the RF / PF areas in the study area, with necessary details, should be given.	The vegetation in the RF/PF areas in the study area has been discussed Section 3.5.1, under Chapter III, pp.70-86.
16.	A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly, detailed mitigative measures required, should be worked out with cost implications and submitted.	There is no any wildlife/protected area within 10 km radius from the periphery of the project area. Information regarding the same has been given in Table 3.43 under Chapter III, p.102.
17.	Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves/(existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from	There are No National Parks, Biosphere Reserves, Wildlife Corridors, and Tiger/Elephant Reserves within 10 km radius from the periphery of the project area. Information regarding the same has been given in Table 3.43 under Chapter III, p.102.

	the Standing Committee of National Board of Wildlife and copy furnished	
18.	A detailed biological study of the study area [core zone and buffer zone (10 KM radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled-I fauna found in the study area, the necessary plan along with budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost.	A detailed biological study was carried out in both core and buffer zones and the results have been discussed in Section 3.5 under Chapter III, pp.69-95.
19.	Proximity to Areas declared as 'Critically Polluted' or the Project areas likely to come under the 'Aravalli Range', (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Department should be secured and furnished to the effect that the proposed mining activities could be considered.	Not Applicable. Project area / Study area is not declared in 'Critically Polluted' Area and does not come under 'Aravalli Range.
20.	Similarly, for coastal Projects, A CRZ map duly authenticated by one of the authorized agencies demarcating LTL, HTL, CRZ area, location of the mine lease w.r.t CRZ, coastal features such as mangroves, if any, should	Not Applicable The project doesn't attract the C.R.Z. Notification, 2018.

	be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority).	
21.	R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need-based sample survey, family-wise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be clearly brought out whether the village(s) located in the mine lease area will be shifted or not. The issues relating to shifting of village(s) including their R&R and socio-economic aspects should be discussed in the Report.	Not Applicable. There are no approved habitations of SCs/STs and other weaker sections in the lease area. Therefore, R&R Plan / Compensation Plan for the Project Affected People (PAP) are not provided.
22.	One season (non-monsoon) [i.e., March-May (Summer Season); October-December (post monsoon season); December-February (winter season)] primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-	Baseline data were collected for the period of March-May 2023 as per CPCB notification and MoEF & CC Guidelines. Primary baseline data and the results have been included in Sections 3.1-3.8 under Chapter III, pp. 31-104.

	<p>meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM10, particularly for free silica, should be given.</p>	
23.	<p>Air quality modelling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of mineral. The details of the model used and input parameters used for modelling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.</p>	<p>Air quality modelling for prediction of incremental GLCs of pollutants was carried out using AERMOD view 11.2.0. The model results have been given in Section 4.4 under the Chapter IV, pp.108-169.</p>
24.	<p>The water requirement for the project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the project should be indicated.</p>	<p>The water requirement for the project, its availability and source have been provided in Table 2.9 under Chapter II, p.24.</p>
25.	<p>Necessary clearance from the competent Authority for drawl of requisite quantity of water for the project should be provided.</p>	<p>Not Applicable. Water for dust suppression, greenbelt development and domestic use will be sourced from accumulated</p>

		rainwater/seepage water in mine pits and purchased from local water vendors through water tankers on daily requirement basis. Drinking water will be sourced from the approved water vendors.
26.	Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.	Part of the working pit will be allowed to collect rain water during the spell of rain. The water thus collected will be used for greenbelt development and dust suppression. The mine closure plan has been prepared for converting the excavated pit into rain water harvesting structure and serve as water reservoir for the project village during draught season.
27.	Impact of the Project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided.	Impact studies and mitigation measures of water environment including surface water and ground water have been discussed in Section 4.3 under Chapter IV, pp. 106 & 108.
28.	Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. The Report inter-alia, shall include details of the aquifers present and impact of mining activities on these aquifers. Necessary permission from Central Ground Water Authority for working below	Not Applicable. The ground water table is found at the depth of 60 m below ground level. The ultimate depth of quarry is 30 m BGL. Therefore, the mining activity will not intersect the ground water table. Data regarding the occurrence of groundwater table have been provided in Section 3.2 under Chapter III, pp.41-54.

	ground water and for pumping of ground water should also be obtained and copy furnished.	
29.	Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion proposed, if any, and the impact of the same on the hydrology should be brought out.	Not Applicable. There are no streams, seasonal or other water bodies passing within the project area. Therefore, no modification or diversion of water bodies is anticipated.
30.	Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and BGL. A schematic diagram may also be provided for the same.	The highest elevation of the project area is 474 m AMSL. Ultimate depth of the mine is 30 m BGL. Depth to the water level in the area is 60 m BGL.
31.	A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution.	Greenbelt development plan has been given in Section 4.6 under Chapter IV, pp.119-126.
32.	Impact on local transport infrastructure due	Traffic density survey was carried out to

	<p>to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those outside the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as State Government) should be covered. Project Proponent shall conduct Impact of Transportation study as per Indian Road Congress Guidelines.</p>	<p>analyse the impact of transportation in the study area as per IRC guidelines 1961 and it is inferred that there is no significant impact due to the proposed transportation from the project area. Details have been provided in Section 3.7 under Chapter III, p.98 & 99.</p>
33.	<p>Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.</p>	<p>Infrastructure & other facilities will be provided to the mine workers after the grant of quarry lease and the same has been discussed in Section 2.6.under Chapter II, pp.17-28.</p>
34.	<p>Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report.</p>	<p>Progressive mine closure plan has been prepared for this project and is given in Section 2.6 under Chapter II, p.17-28.</p>
35.	<p>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>Occupational health impacts of the project and preventive measures have been explained in detail in Section 4.8 under Chapter IV, pp.127 & 129.</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.	No public health implications are anticipated due to this project. Details of CSR and CER activities have been discussed in Sections 8.6 and 8.7 under Chapter VIII, pp.152 & 153.
37.	Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.	No negative impact on socio-economic environment of the study area is anticipated and this project shall benefit the socio-economic environment by offering employment for 22 people directly as discussed in Section 8.1 under Chapter VIII, p.151.
38.	Detailed environmental management plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project.	A detailed Environment Management Plan has been prepared and provided in Tables 10.10 & 10.11 under Chapter X, pp.167-175.
39.	Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project.	The outcome of public hearing will be submitted in the final EIA report.
40.	Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.	No litigation is pending in any court against this project.
41	The cost of the Project (capital cost and recurring cost) as well as the cost towards	Project Cost is Rs.3,00,70,000/- CER Cost is Rs. 6,00,000/-

	implementation of EMP should be clearly spelt out.	In order to implement the environmental protection measures, an amount of Rs.7759172 as capital cost and Rs.1144880 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.6389765 and the overall EMP cost for 5 years will be Rs.14148937 as shown in Tables 10.9 & 10.10 under Chapter X, pp.155-175.
42	A disaster management Plan shall be prepared and included in the EIA/EMP Report.	The disaster management plan for this project has been provided in Section 7.2 under Chapter VII, pp.141-145.
43.	Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.	Benefits of the project details have been given under Chapter VIII, pp.151-153.
44.	Besides the above, the below mentioned general points are also to be followed:	
a)	Executive Summary of the EIA/EMP Report	Executive summary has been enclosed as a separate booklet.
b)	All documents to be properly referenced with index and continuous page numbering.	All the documents have been properly referenced with index and continuous page numbering.
c)	Where data are presented in the Report especially in Tables, the period in which the data were collected and the sources should be indicated.	List of tables and source of the data collected have been mentioned.
d)	Project Proponent shall enclose all the analysis/testing reports of water, air, soil,	Original Baseline monitoring report will be submitted during final EIA report.

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

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

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CHAPTER I

INTRODUCTION

1.0 PREAMBLE

Environmental Impact Assessment (EIA) study is a process used to identify the environmental, social and economic impacts of a project prior to decision-making. EIA systematically examines both beneficial and adverse consequences of the proposed project and ensure that these impacts are considered during the project designing. According to the Ministry of Environment and Forests, Govt. of India, EIA notification S.O. 1533(E) of 14th September 2006 and its subsequent amendments as per Gazette Notification S.O. 3977 (E) of 14th August 2018, all the mining projects are broadly classified into two categories, i.e., category A and category B, based on the spatial extent of the projects. The category B projects are further divided 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 Letter No. SEIAA-TN/F.No.10214/SEAC/ToR-1559/2023 dated 27.09.2023. This EIA report is prepared for the project proponent, Tmt.M.Sadhana applied for Colour Granite quarry lease in the Poramboke land falling in S.F.No. 366 (Part) over an extent of 1.87.0 ha in Jagadevipalayam Village, Bargur Taluk, Krishnagiri District and Tamil Nadu. Considering cumulative load of all the colour granite quarry projects including two proposed quarries and two 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 8.78.5 ha. 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 **October-December 2023** according to the provisions of MoEF & CC Office Memorandum dated 29.08.2017 and MoEF & CC Notification, S.O. 996 (E) dated 10.04.2015.

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	Tmt.M.Sadhana	366 (Part)	Jagadevipalayam	1.87.0	Proposed Area
P2	M/s. Pranita Granites	10 (Part)	Pasinayanapalli	3.46.0	Mining Plan forwarded to CGM
Existing Quarry					
E1	Thiru.K.Sekaran	367/1N1, 362/2N2 (P), 367/201 (P)	Jagadevipalayam	1.10.5	13.07.2012 to 12.07.2032
E2	Thiru.V.Venu	5	Jagadevipalayam	2.35.0	16.12.2015 to 15.12.2035
Expired Quarry					

Total Cluster Extent				8.78.5	---

Source:

DD Letter – Rc.No.1049/2020/Mines dated 22.05.2023

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

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

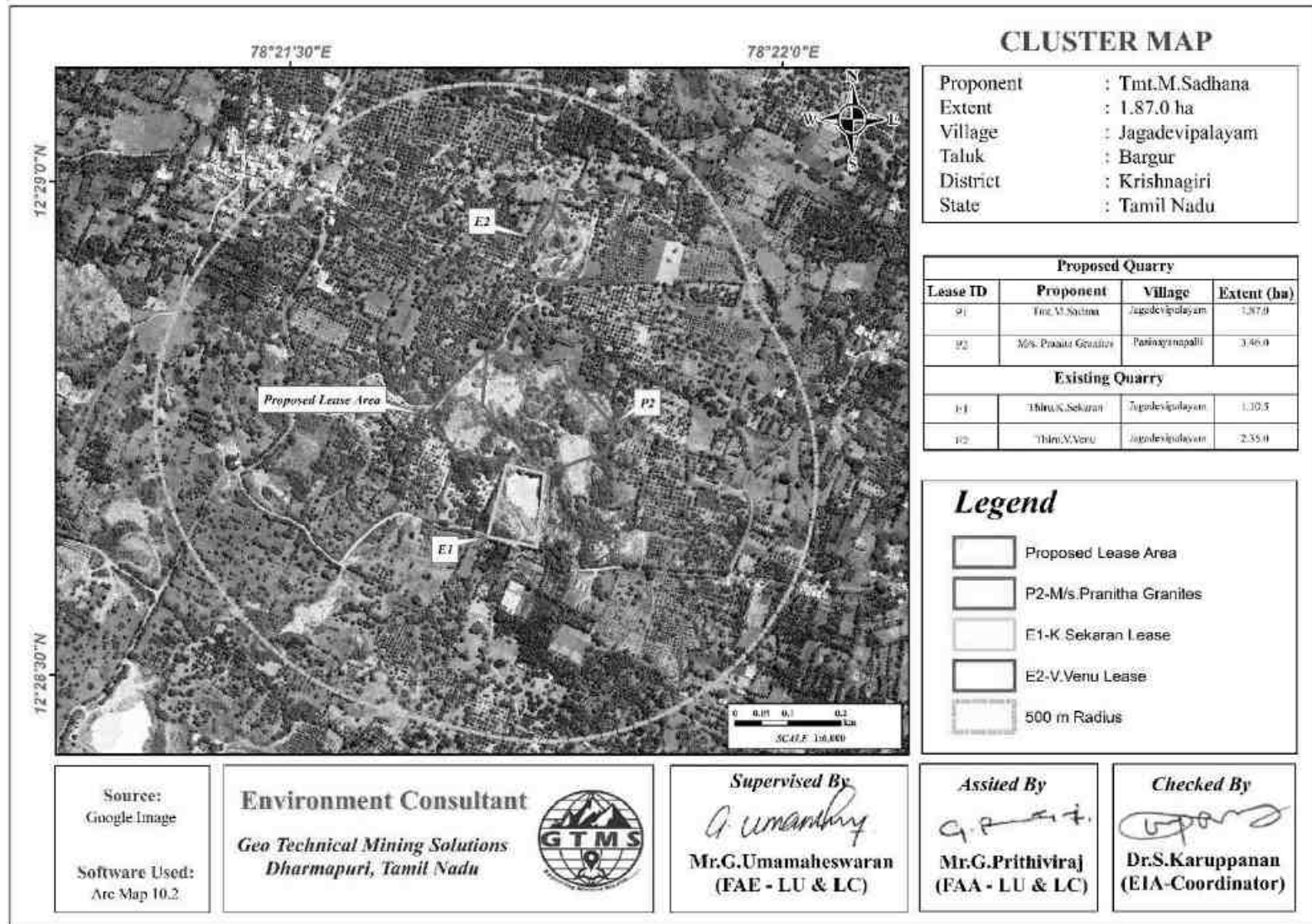


Figure 1.1 Location of Proposed and Existing Quarries in the Cluster of 500 m Radius

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/435951/2023 dated:08.07.2023) 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 17.07.2023.

Scoping

The proposal was placed in the 407th meeting of SEAC on 07.09.2023. Based on the presentation and documents furnished by the project proponent, SEAC decided to recommend the proposal for the grant of Terms of Reference (ToR) and the recommendation for ToR is subjected to the outcome of the Honourable NGT, Principal Bench, New Delhi (O.A No.186 of 2016 (M.A.No.350/2016) and O.A. No.200/2016 and O.A.No.580/2016 (M.A.No.1182/2016) and O.A.No.102/2017 and O.A.No.404/2016 (M.A.No. 758/2016, M.A.No.920/2016, M.A.No.1122/2016, M.A.No.12/2017 & M.A. No. 843/2017) and O.A.No.405/2016 and O.A.No.520 of 2016 (M.A.No. 981/2016, M.A.No.982/2016 & M.A.No.384/2017).

Public Consultation

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

Appraisal

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

1.3 TERMS OF REFERENCE (ToR)

The SEAC framed a comprehensive Terms of Reference (ToR) based on the information provided in the Form 1 and information collected from the proposed project site visit and issued ToR to the proponent vide Letter No. SEIAA-TN/F.No.10214/SEAC/ToR-1559/2023 dated 27.09.2023. for the preparation of an EIA report.

1.4 POST ENVIRONMENT CLEARANCE MONITORING

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

1.5 TRANSFERABILITY OF ENVIRONMENTAL CLEARANCE

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

1.6 GENERIC STRUCTURE OF EIA DOCUMENT

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

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

1.7 IDENTIFICATION OF THE PROJECT PROPONENT

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

Table 1.2 Details of Project Proponent

Name of the Project Proponent	Tmt.M.Sadhana
Address	No.2/A2, 3rd Cross, Gopalakrishna Colony, Krishnagiri District – 635 001
Status	Proprietor

1.8 BRIEF DESCRIPTION OF THE PROJECT

The proposed project deals with excavation of colour granite which is primarily used in construction projects. The method adopted for 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 Jagadevipalayam Village, Bargur 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	Tmt.M.Sadhana Colour granite		
S.F.No.	366 (Part)		
Land Type	Government land		
Extent	1.87.0 ha		
Proposed Depth for 5 years	30m (15m AGL+ 15m BGL)		
Toposheet No	57 L/07		
Latitude between	12°28'42.19792"N to 12°28'49.68820"N		
Longitude between	78°21'38.32342"E to 78°21'45.51566"E		
Highest Elevation	474 m ASML		
Topography	Elevated Topography		
Geological Reserves	Granite 20%	Granite 80%	Top Soil
	129823	519290	3145
Mineable Reserves	Granite 20%	Granite 80%	Top Soil
	45062	180246	1560
Proposed production for 5 years	Granite 20%	Granite 80%	Top Soil
	14031	56123	1560
Method of Mining	The quarrying operation is carried out by Open cast semi mechanized mining method with 5.0 m vertical bench with a bench width of 5.0 m.		

Machinery proposed	Jack Hammer	4
	Compressor	2
	Tippers	2
	Excavator	1
Proposed manpower deployment	22	
Project cost	Rs. 3,00,70,000/-	
CER cost	Rs 6,00,000/-	
Proposed Water Requirement	3.3 KLD	

Source: Approved mining plan book

1.9 SCOPE OF THE STUDY

The main scope of the EIA study is to quantify the cumulative impact of the quarries in the cluster on the study area and formulate the effective mitigation measures for each individual lease. A detailed account of the emission sources, emissions control equipment, background air quality levels, meteorological measurements, dispersion model and all other aspects of pollution like effluent discharge, and dust generation has been provided in this report. The baseline monitoring study has been carried out during the period of **October-December 2023** for various environmental components such as land, soil, air, water, noise, ecology, etc. to assess the anticipated impacts of the cluster quarry projects on the environment and suggest suitable mitigation measures for likely adverse impacts due to the proposed project. The sampling methodologies for the various environmental parameters required for the study, frequency of sampling, method of sample analysis, etc., are given in Table 3.1 in chapter III.

1.10 REFERENCES

The report has been prepared using the following references:

- ❖ Guidance Manual of Environmental Impact Assessment for Mining of Minerals, Ministry of Environment and Forests, February, 2010
- ❖ EIA Notification, 14th September, 2006
- ❖ Terms of Reference (ToR) issued by SEIAA
- ❖ Approved Mining Plan of this project
- ❖ In addition, other relevant standards for individual activities such as sampling and testing of environmental attributes.

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 Tmt.M.Sadhana Colour Granites 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 07.11.2020 to extract granite and produce dimension stones. The precise area communication letter was issued by Industries (MME.2) Department, Secretariat Chennai Rc.no.901/MME.2/2021-1, dated.26.02.2021. 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.6943/MM4/2020, dated:12.05.2023). 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 Jagadevipalayam Village, Bargur Taluk, Krishnagiri District as shown in Figure 2.2. The area is located between a latitude of $12^{\circ}28'42.19792''\text{N}$ to $12^{\circ}28'49.68820''\text{N}$ and a longitude of $78^{\circ}21'38.32342''\text{E}$ to $78^{\circ}21'45.51566''\text{E}$. Accessibility details to the proposed project site have been given in Table 2.1.

Table 2.1 Site Connectivity to the Project Area

Nearest Roadways	NH – 77 Krishnagiri - Uthangarai	2.59 km	SW
Nearest Railway Station	Kakankarai	17.6 km	SE
Nearest Town	Bargur	7.2 km	N
Nearest Airport	Salem	82.8 km	S
Nearest Port	Chennai	220.4 km	NE
Nearest Village	Bagimanur	0.52 km	NW
	Kappalvadi	2.5 km	NE
	Thogarapalli	2.9 km	S
	Jagadevipalayam	3.23 km	W

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 **1.87.0 ha**. The boundary corner coordinates are given in Table 2.2 and the location of 6 boundary corners are shown in Figure 2.4.

Table 2.2 Corner Coordinates of Proposed Project

Pillar ID	Latitude	Longitude
1	12°28'49.68820"N	78°21'42.02501"E
2	12°28'46.43263"N	78°21'41.69574"E
3	12°28'42.19792"N	78°21'45.51566"E
4	12°28'43.54916"N	78°21'40.12823"E
5	12°28'45.77887"N	78°21'38.32342"E
6	12°28'47.66583"N	78°21'39.92715"E

Source: Approved Mining plan

2.4 GEOLOGY

The lease area geologically occurs on Biotite Hornblende Gneiss. Also, the lease area geomorphologically occurs pediment pediplain complex

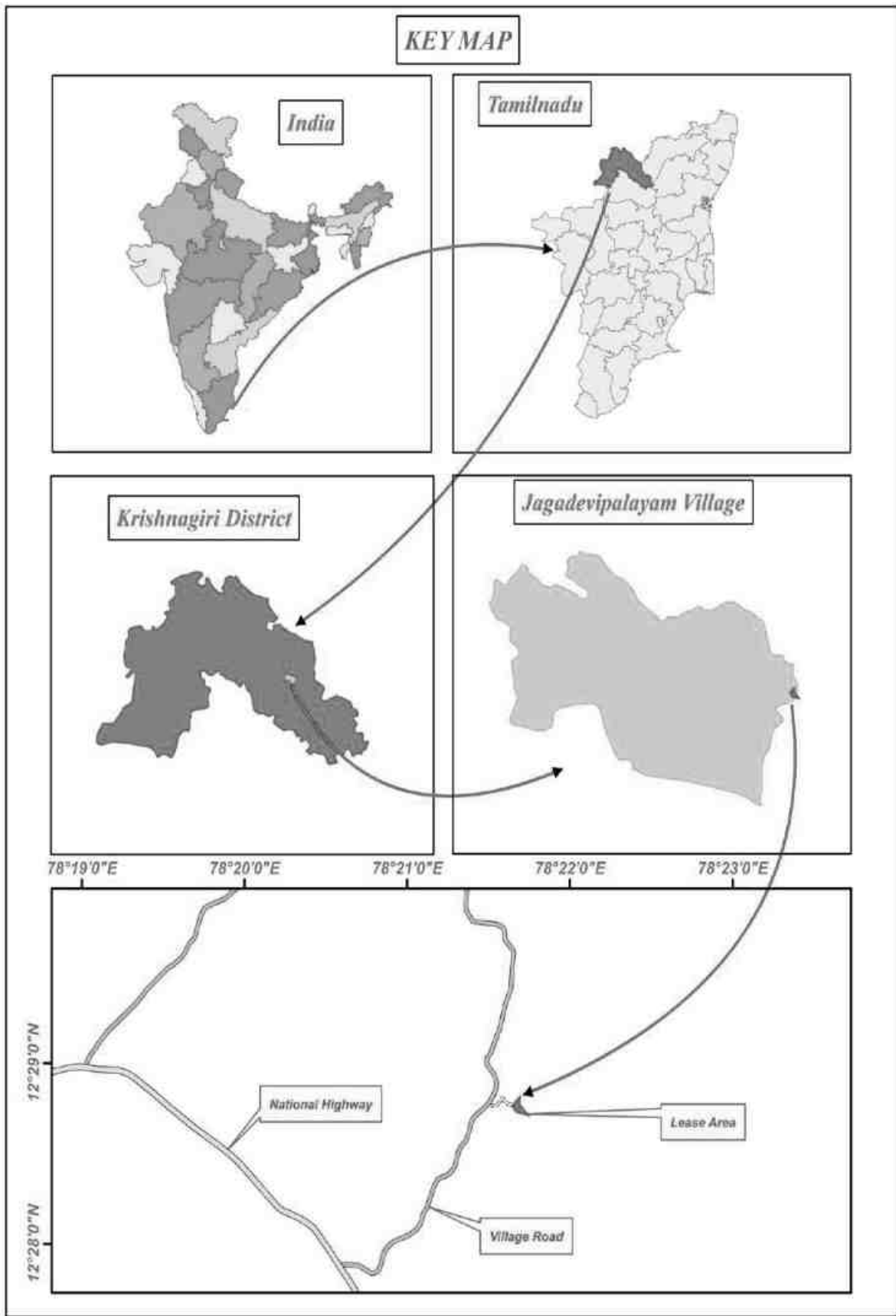


Figure 2.2 Key Map Showing Location of Project Site



Figure 2.3 Site Connectivity of the Lease Area

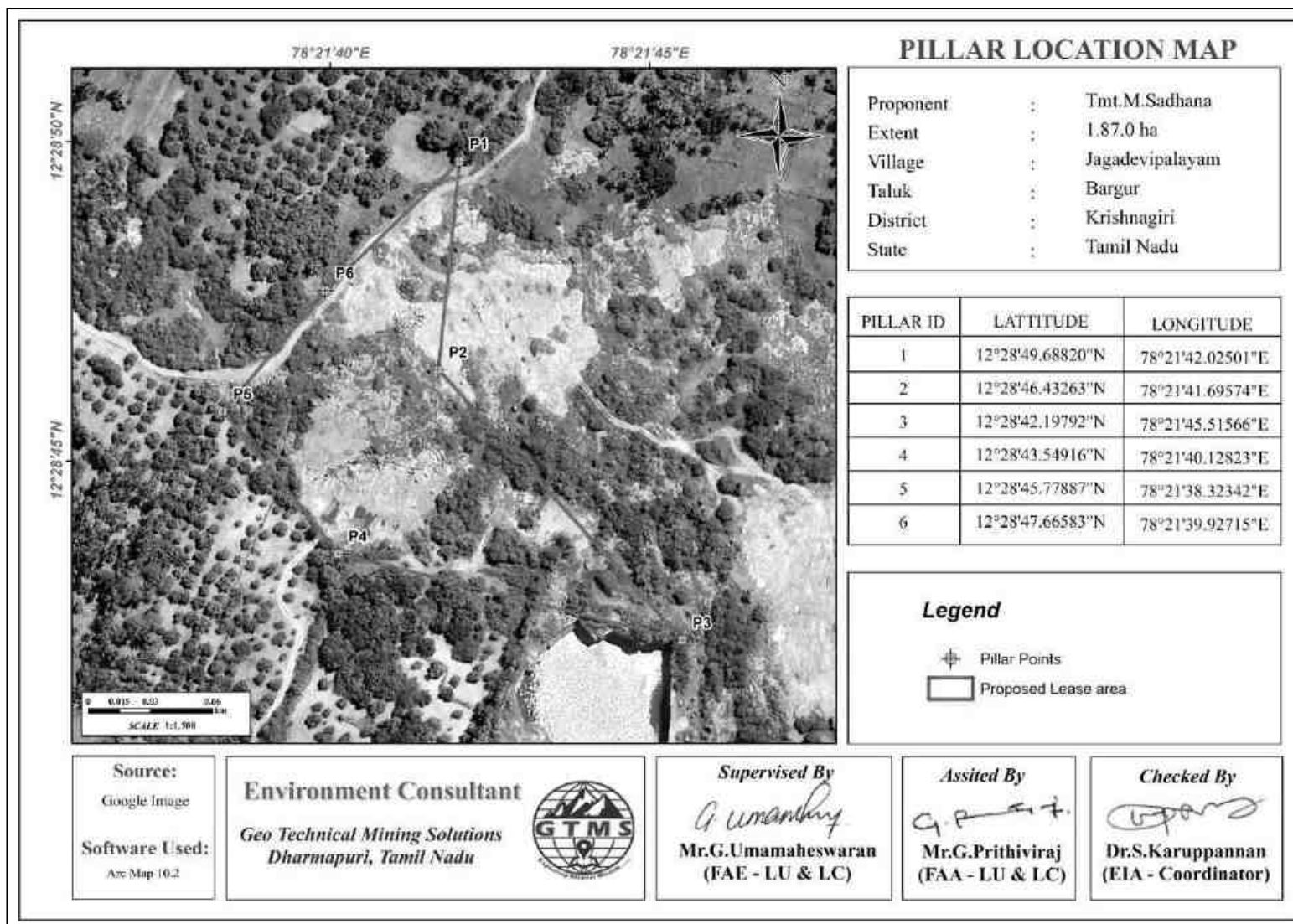


Figure 2.4 Google Earth Image Showing Lease Area with Pillar

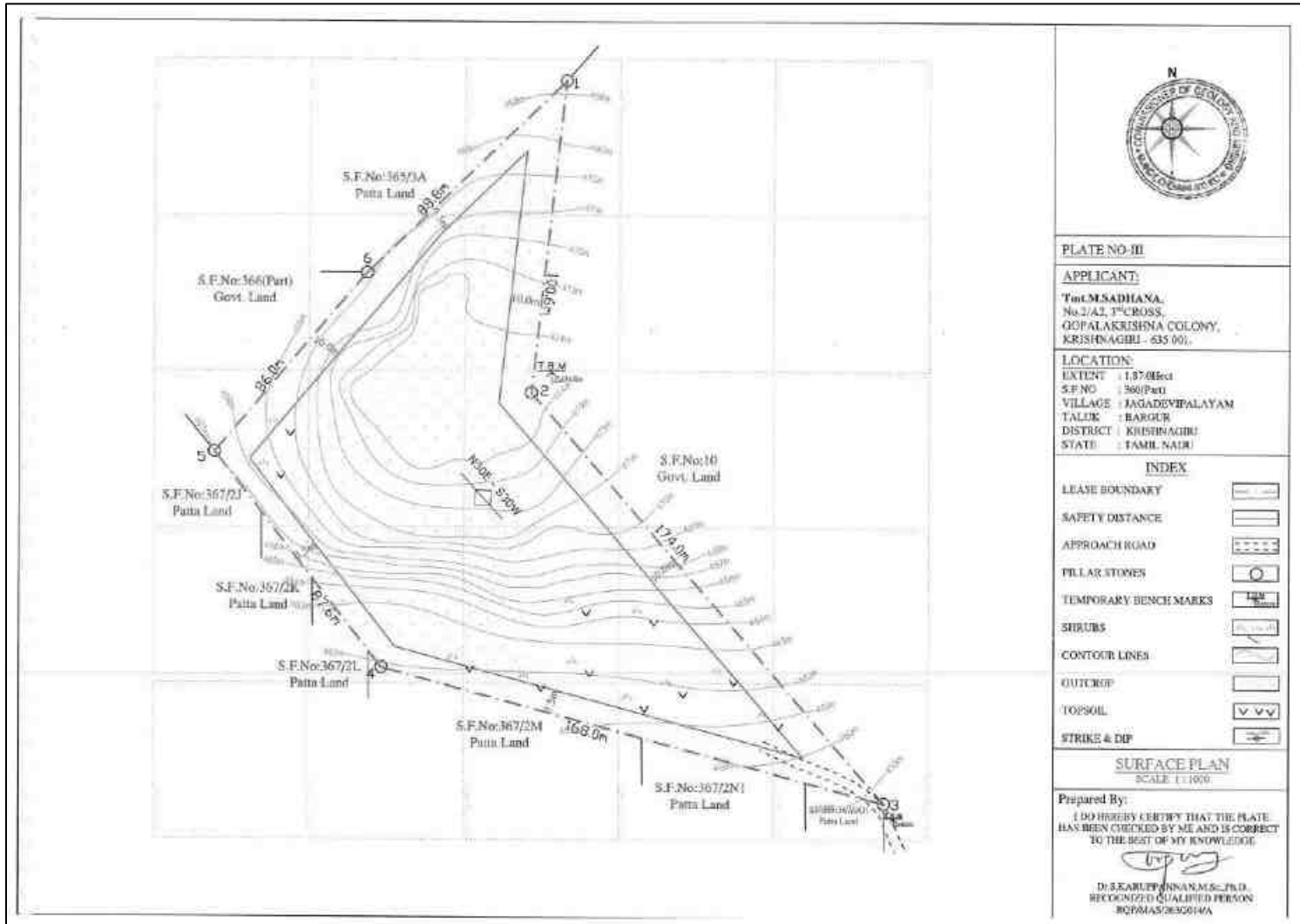


Figure 2.5 Surface Plan

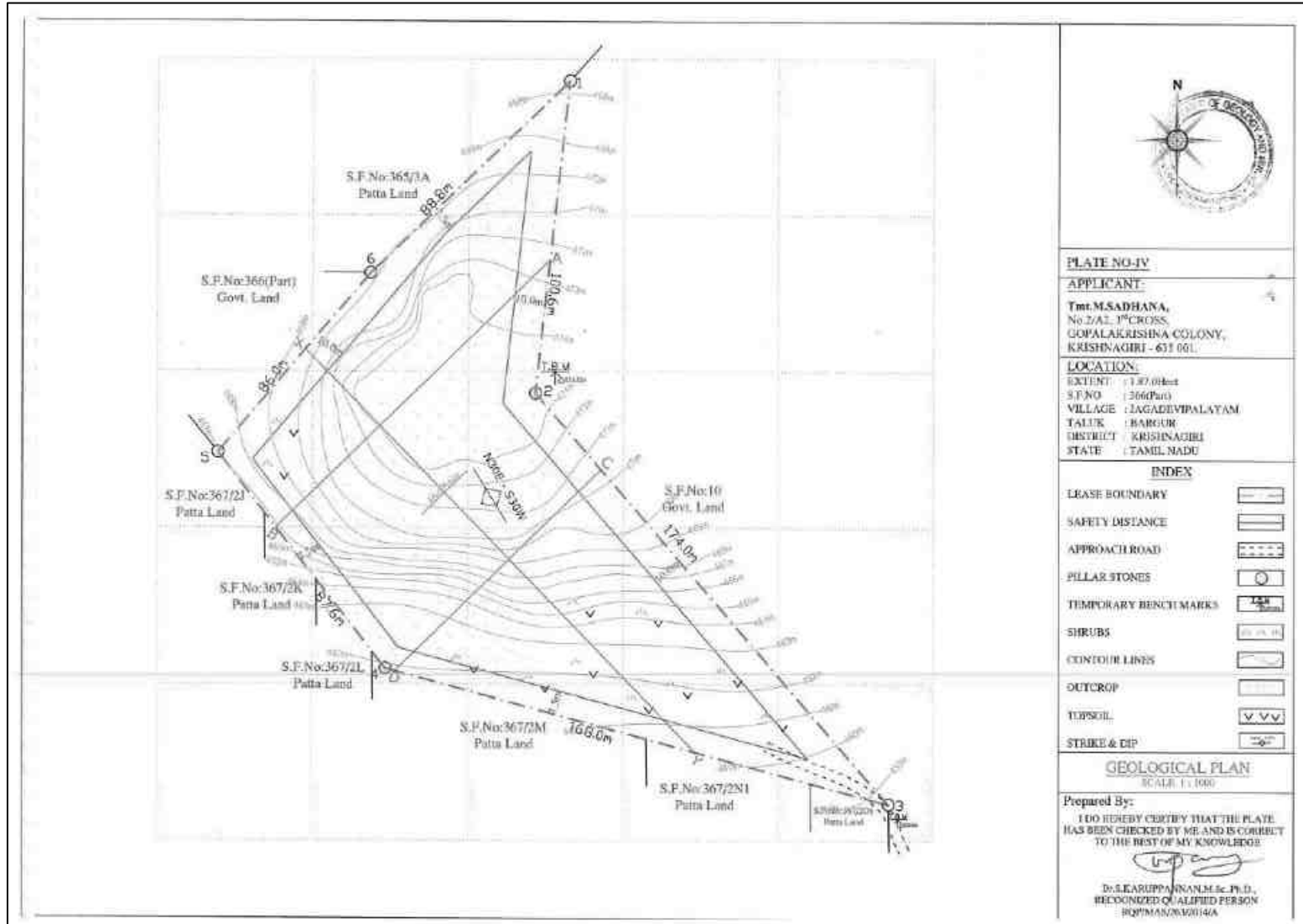


Figure 2.6 Geological Plan

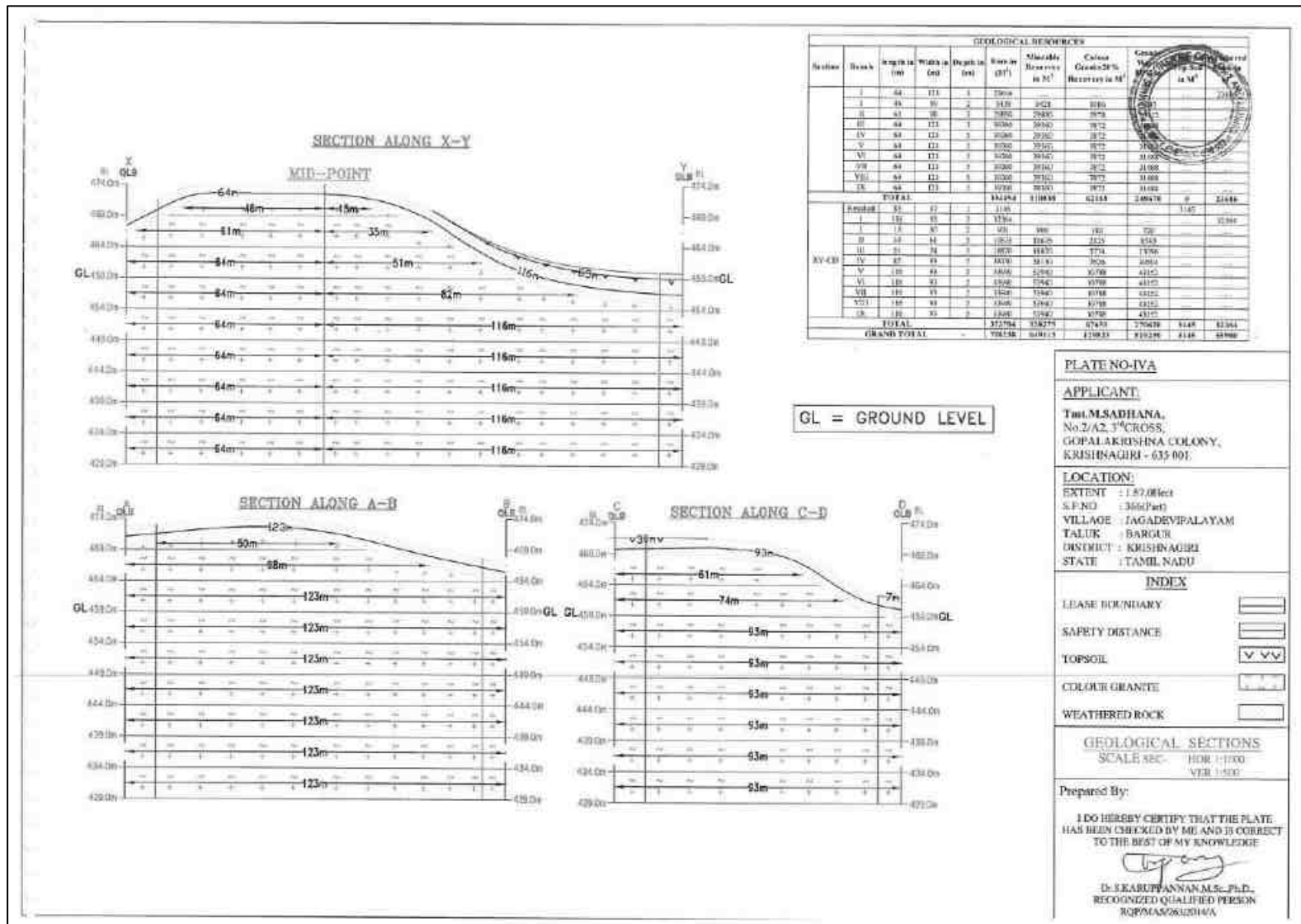


Figure 2.7 Geological Sections

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)	Granite Waste @ 80 % (m ³)	Colour Granite @ 20% Recovery(m ³)	Top Soil (m ³)	Weathered Rock (m ³)
Geological Resources	708238	519290	129823	3145	55980
Mineable Reserves	268892	180246	45062	1560	42024

Year-Wise Production

On the basis of year-wise development plan and its sections, as shown in Figures 2.8 & 2.8a, year-wise production details are given in Table 2.4.

Table 2.4 Year wise Production Details

Year	ROM in m ³	Colour Granite @ 20% Recovery in m ³	Granite Waste @ 80 % in m ³	Topsoil in m ³	Weathered Rock in m ³
I	32244	3119	12475	---	16650
II	34840	2780	11120	1560	19380
III	15200	3040	12160	---	---
IV	13740	2748	10992	---	---
V	11720	2344	9376	---	---
Total	107744	14031	56123	1560	36030

Source: Approved Mining plans

2.6 MINING METHOD

The quarrying operation is proposed to be carried out by opencast semi-mechanized mining method with the bench height and width of 5m each. The open cast mining method offers several benefits to the proponent when compared to the more complex underground mining methods. The most important benefits include relatively smaller capital and operating costs, lesser safety hazards, ease of use for mass production, small closure costs, no restrictions on the use of heavy machinery if required, and easy drainage of subsurface water. Moreover, it provides a reasonable return on investments to the proponent and contributes to the growth of

the local economy. A part of the profits generated from such mining practices will be used for the development of the local community infrastructures, social services, and capacity building. Excavator, eco-friendly diamond wire saw cutting will be used in this method. In addition, drilling and blasting activities are inevitable in any quarry operations. In this project, shallow drilling with spacing of 0.1-0.3 m, burden of 1.6 m, and the depth of 5m is proposed. After drilling, expanding chemicals like calcium carbide powder will be used for splitting the required size of dimensional stone blocks. In this project primary (deep hole drill) blasting is not practiced. Some of the important aspects of mining are discussed below.

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 @ 20 % in m³	Granite Waste @ 80 % in m³
Quantity of Material to be Quarried out in five years	14031	56123
Number of working days/Annum	270	270
Production of /Day (m ³)	10	41
No. of Lorry Loads	2	7

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	-	-	--	Compressor Air
Jack Hammer	4	32	-	--	--
Diamond wire saw machine	2	--	--	--	--
Line drilling machinery	1	--	--	--	--
Loading Equipment					
Excavator	1	-	--	--	Diesel/ Electrical
Haulage & Transport Equipment					
Tipper	2	--	--	--	Diesel

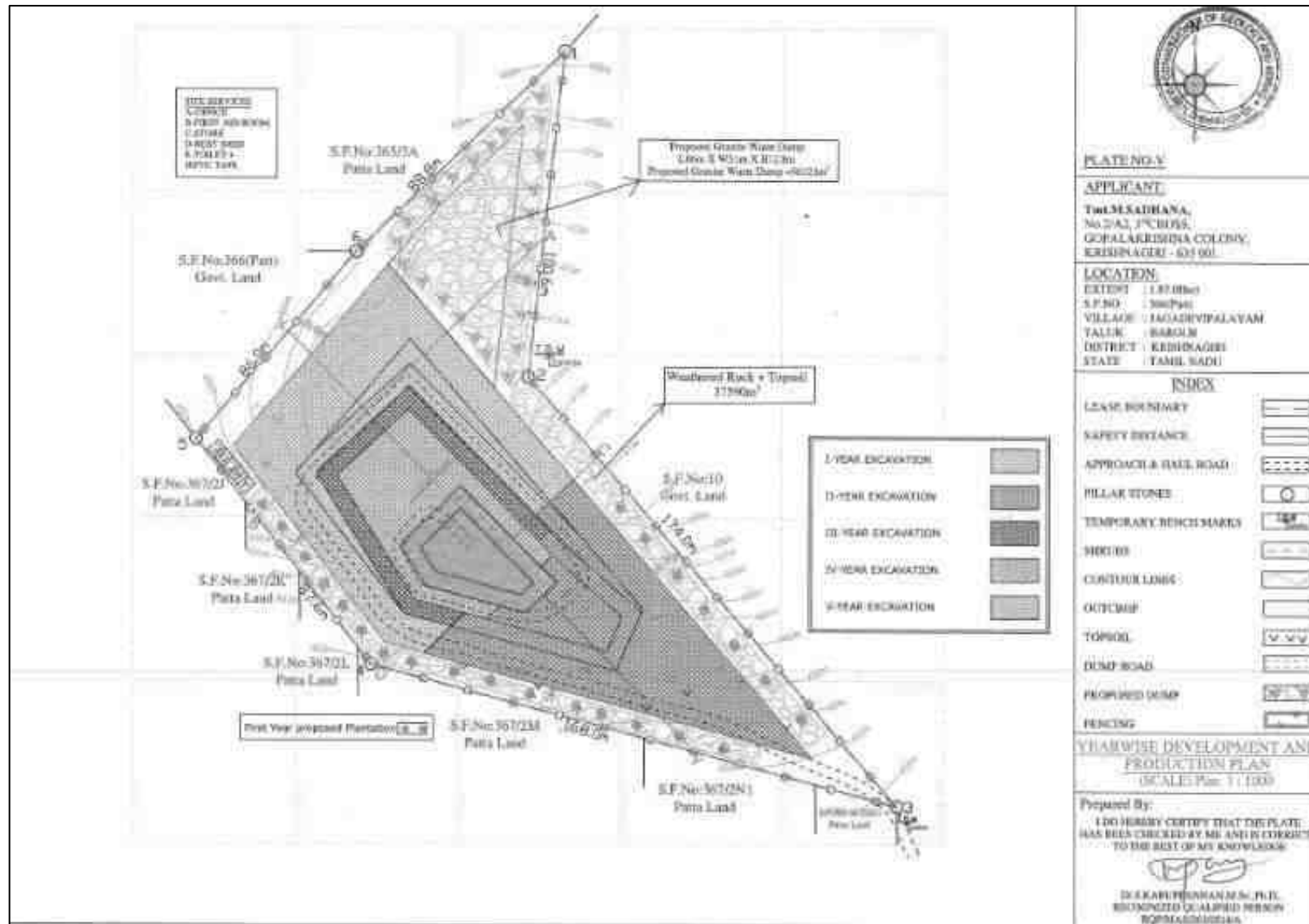


Figure 2.8 Year-Wise Development Production Plan

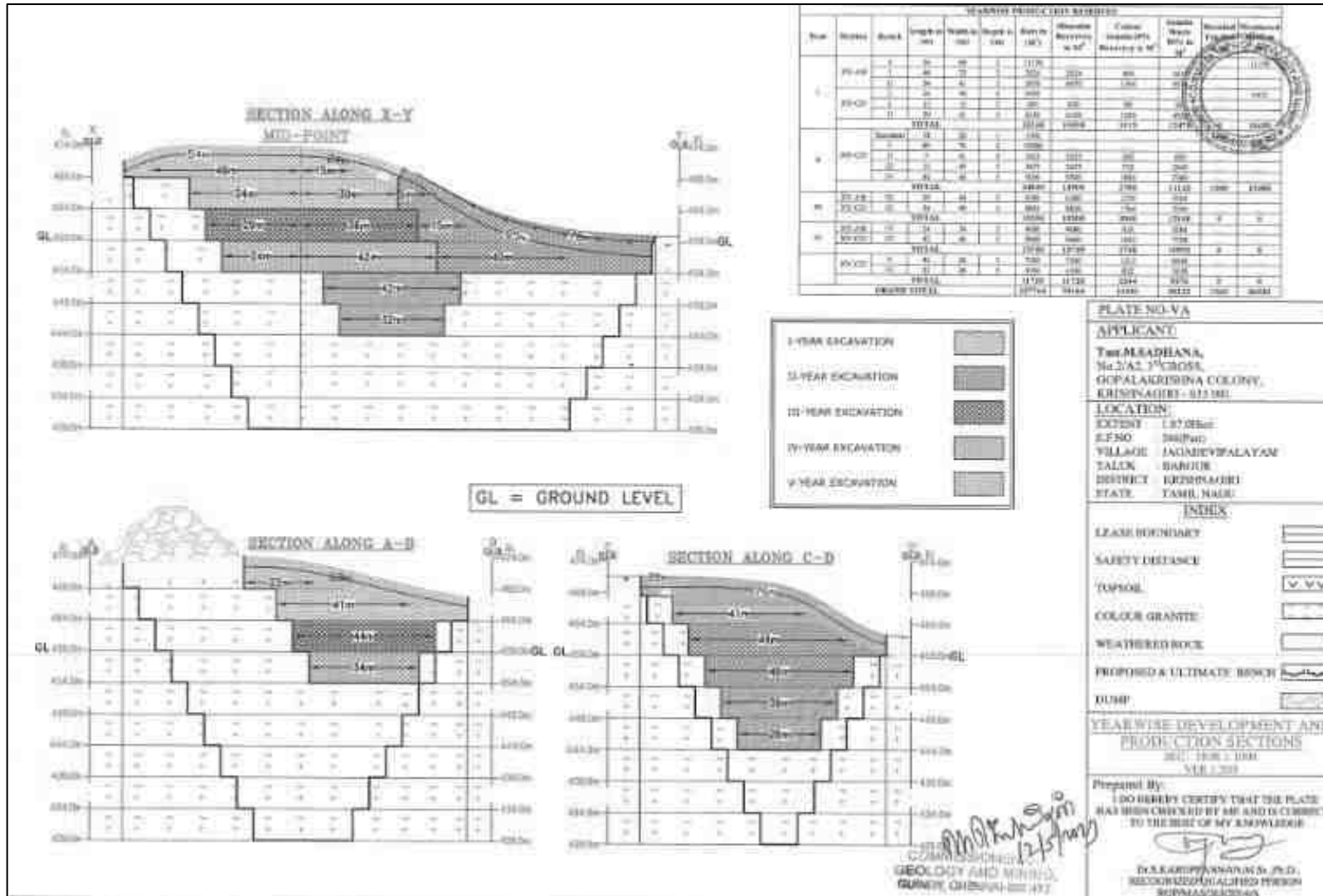


Figure 2.8a Year-Wise Development Production Sections

Stacking of Granite Rejects and Disposal of Waste

There is generation of topsoil is about 1560 m³ for the during this five-year mining plan period. The top soil will be preserved all along the safety barrier and utilized for construction of bund and afforestation purpose. The total waste to be produced during this mining scheme period is around 92153 m³ (Granite waste). The same will be temporarily dumped on the northern side with dimensions of 86 m (L) x 51m (W) x 12.8 m (H). Dumps are properly terraced systematically by multi-level dumping. As and when there is accumulation of waste, the same is loaded into the tipper by loading machines and dumped in the respective places earmarked for the purpose.

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 1.04.00 ha of land would have been utilized for quarrying, 0.43.86 ha of land for waste dump, 0.02.00 ha for infrastructures, 0.04.0 ha for roads, 0.30.00 ha for green belt development, and the remaining 0.03.14 ha 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	Nil	1.04.00
Infrastructure	Nil	0.02.00
Roads	Nil	0.04.00
Unutilized	1.87.0	0.03.14
Waste Dump	Nil	0.43.86
Green Belt + Topsoil + Weathered Rock	Nil	0.30.00
Total	1.87.0	1.87.0

Conceptual Mining Plan

On the basis of conceptual plan and its sections, as shown in Figures 2.10 and 2.10a, the ultimate pit dimension of the quarry is 109 m in length, 106 m in width, and 45 m in depth.

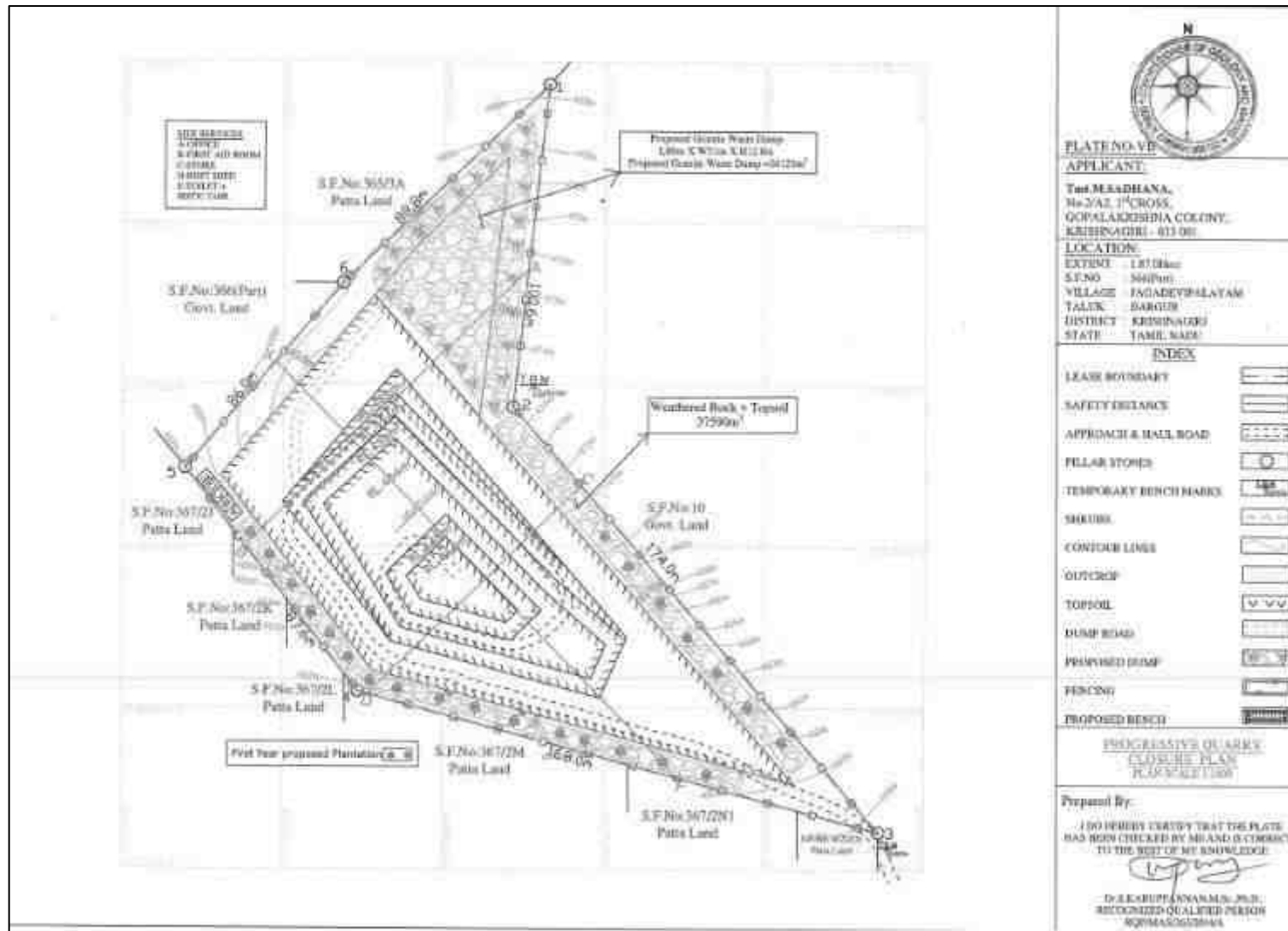


Figure 2.9 Progressive Quarry Closure Plan

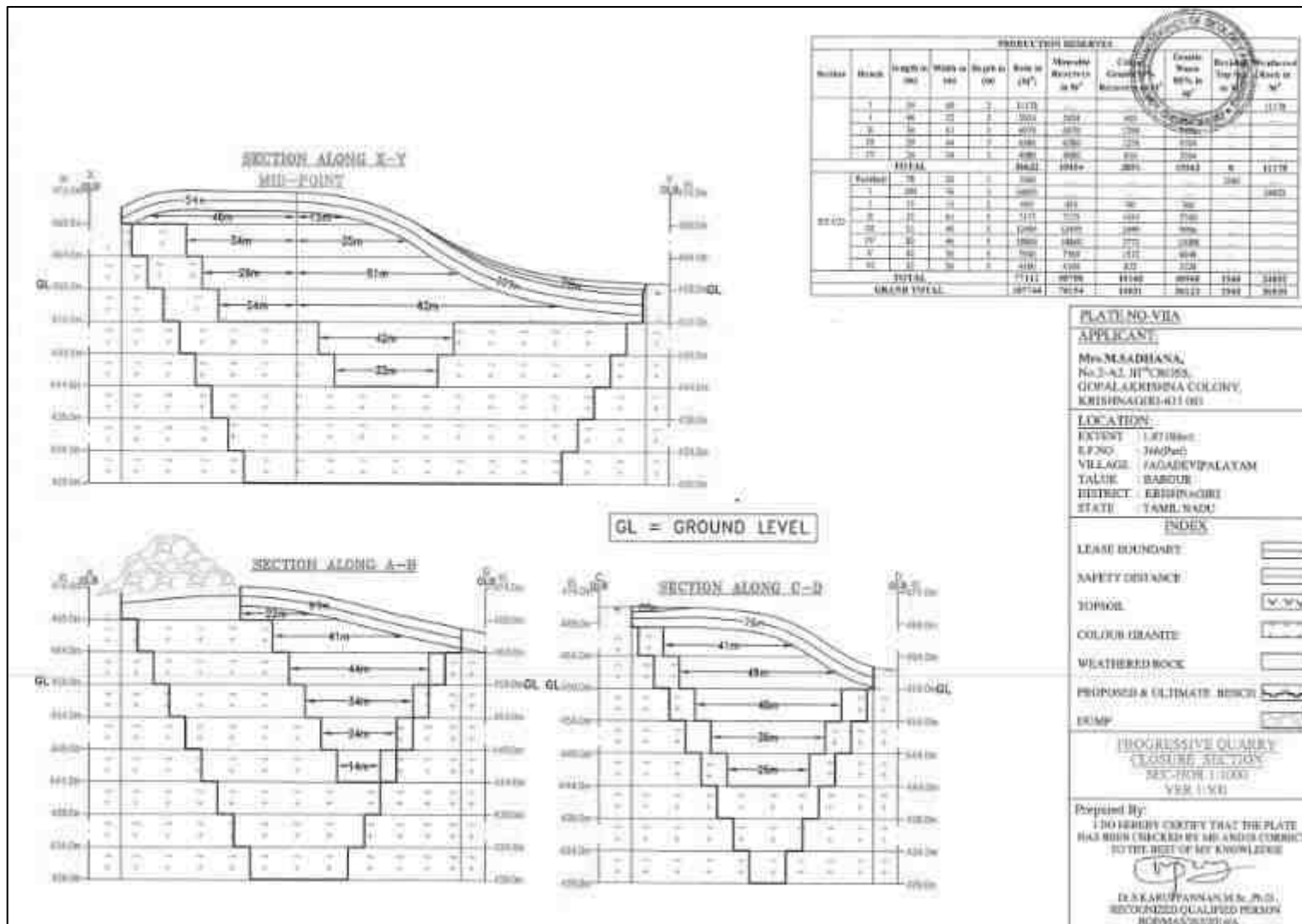


Figure 2.9a Progressive Quarry Closure Sections

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 2.9 and 2.9a 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	Recurring Cost/Annum
374 plants inside the lease area	74800	11220
561 plants outside the lease area	168300	16830
Wire Fencing	374000	18700
Garland Drain	18700	9350
Total	6,35,800	56,100

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

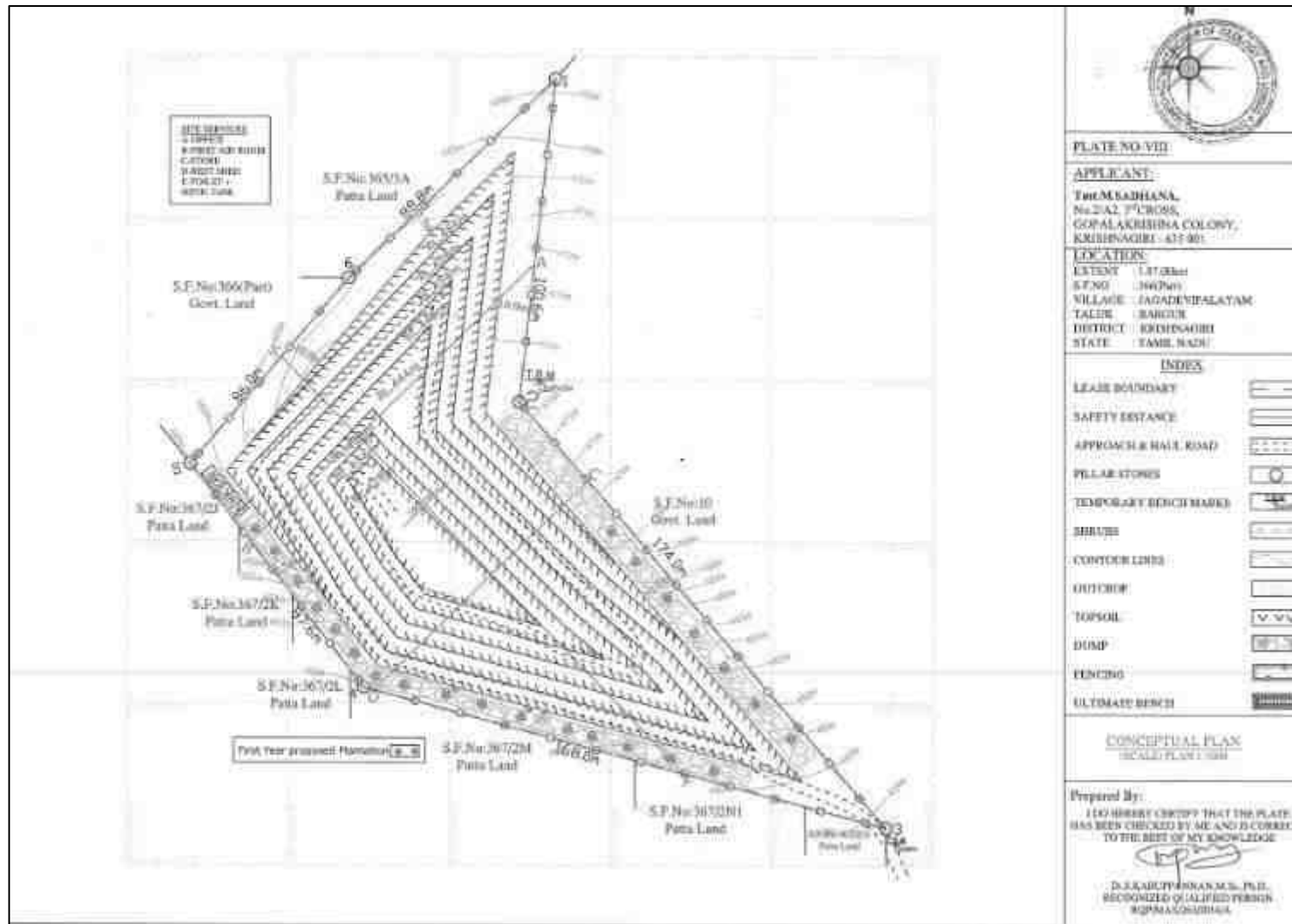


Figure 2.10 Conceptual Plan

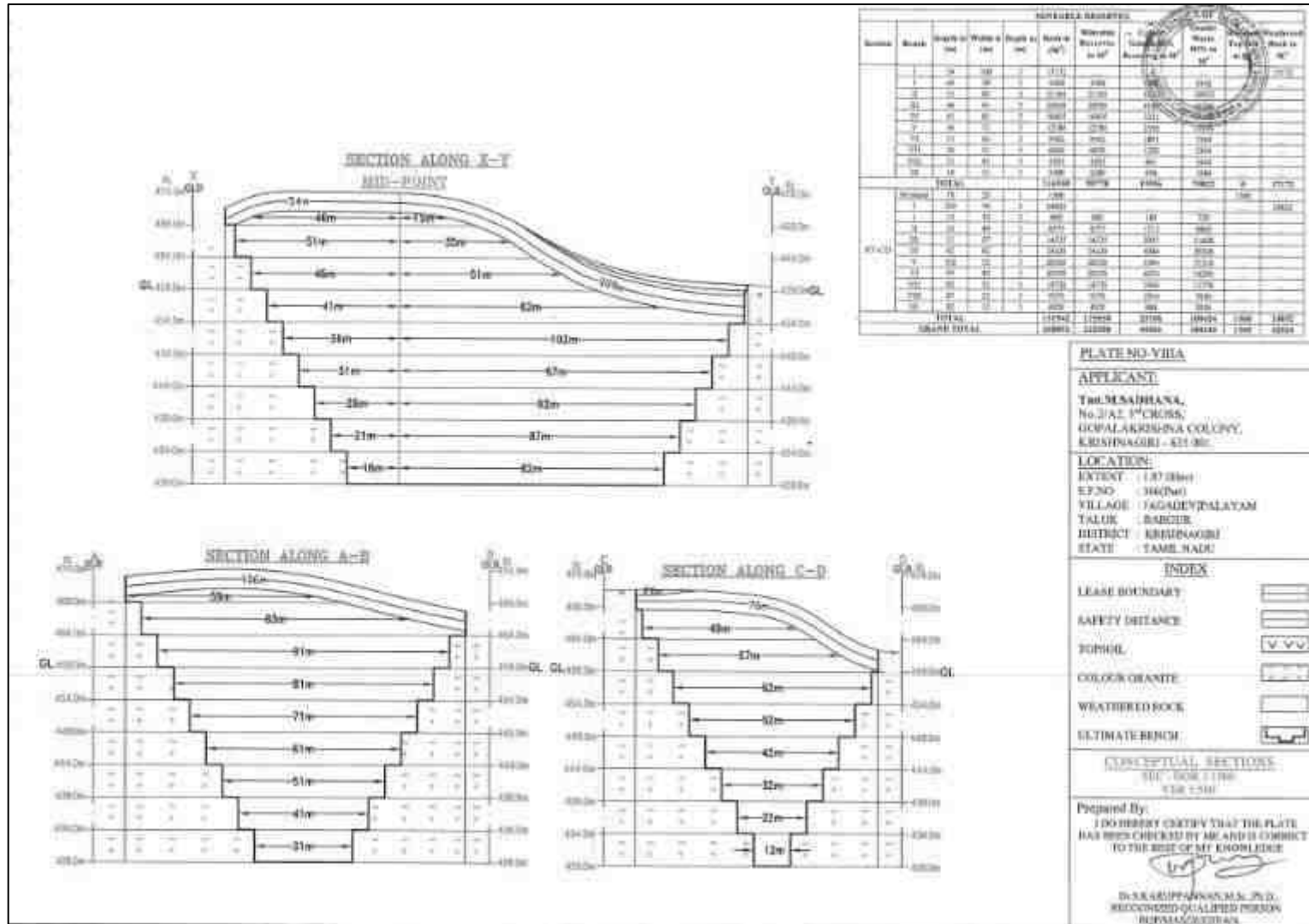


Figure 2.10a Conceptual Sections

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 4,39,154 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	Colour Granite Recovery @20% (14031m³)	Granite Waste @80% (56123 m³)	Weathered Rock (36030m³)	Top Soil 1560m³	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)	702	2806	1802	26	---
Total Diesel Consumption for 5 years (litre)	11225	44898	28824	260	85,207
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	2	7	4	--	---
Number of Trips / 5 years	2339	9354	6005	--	---
Total Diesel Consumption for 5 years (litre)	46770	187077	120100	--	3,53,947
Total Diesel Consumption by Excavator, Compressor and Tipper					4,39,154

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 Forman	1
		Mechanical Engineer	1
		Accountant cum & admin	1
2	Skilled	Earth moving operator	1
		Line Drilling Operator	1
		Wire Saw Operator	2
		Driver	1
3	Semi-Skilled	Helpers/Greasers	1
4	Unskilled	Cutter	4
		Musdoor / Labours	8
Total			22

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	2,42,20,000/-
2	Machinery Cost	25,00,000/-
3	Expenditure Cost	33,50,000/-
Total Project Cost		3,00,70,000/-

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 **October through December, 2023** with CPCB guidelines. Environmental baseline data were collected by an NABL accredited and MoEF notified **Excellence Laboratory** for the environmental attributes including soil, water, air, and noise and by FAEs for ecology and biodiversity, traffic, and socio-economy.

Study Area

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

Table 3.1 Monitoring Attributes and Frequency of Monitoring

Attribute	Parameters	Frequency of Monitoring	No. of Locations	Protocol
Land Use/ Land Cover	Land-use Pattern within 5 km radius of the study area	Once during the study period	Study Area	Satellite Imagery & Primary Survey
*Soil	Physico- Chemical characteristics	Once during the study period	7 (1 nearby core & 6 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	8 (3 surface water & 5 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.

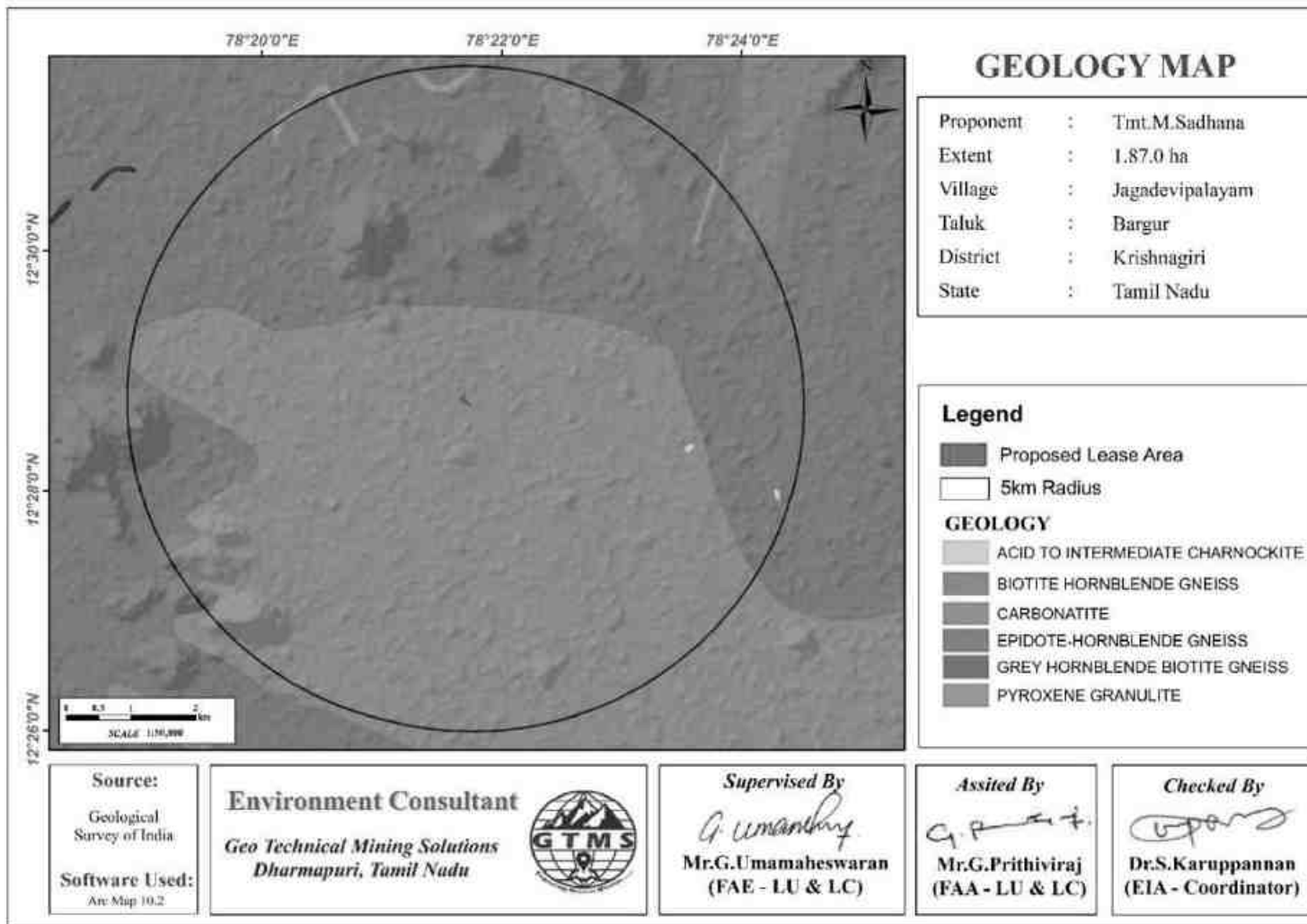


Figure 3.1 Geology Map of 5 km Radius from the Proposed Project Site

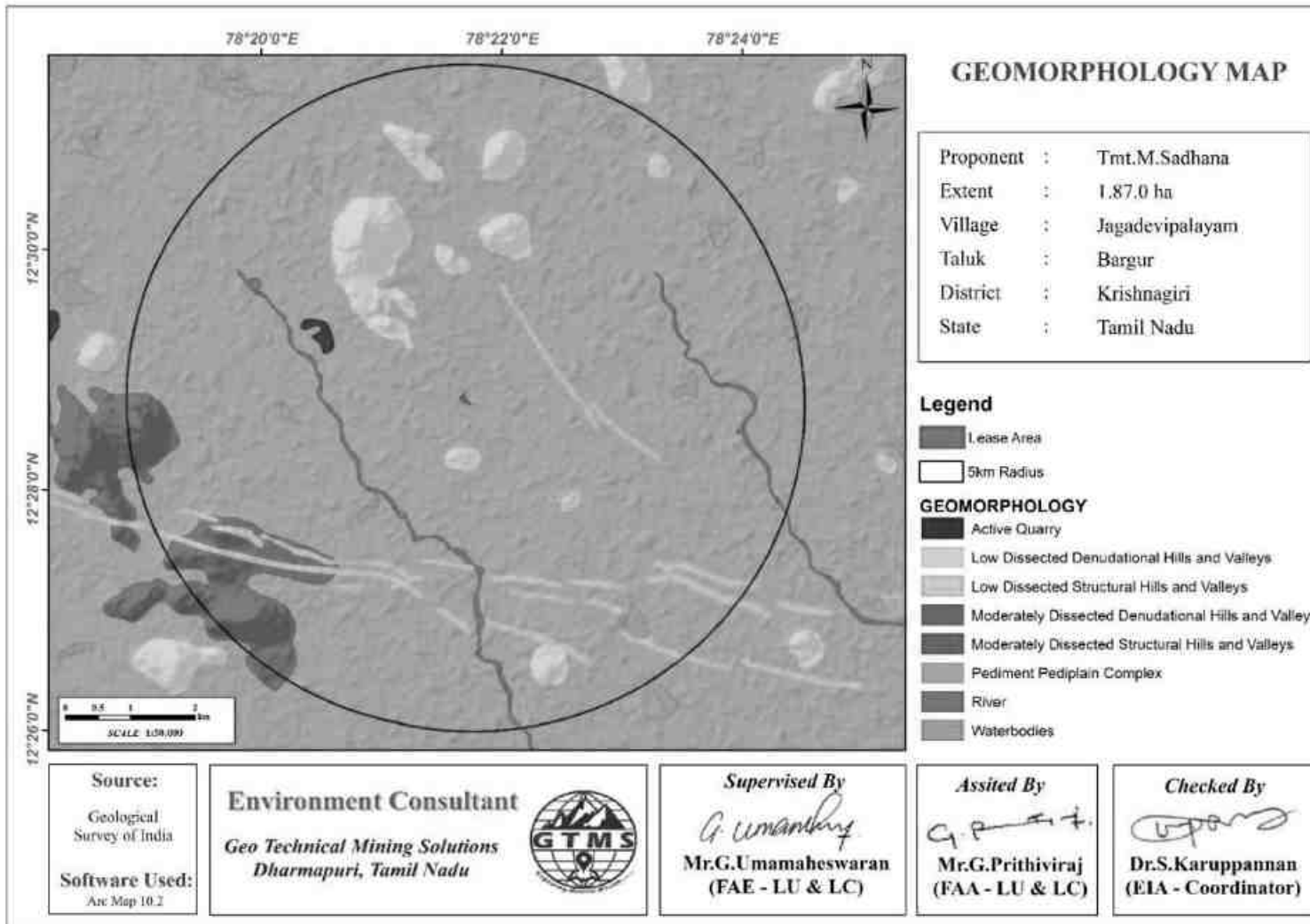


Figure 3.2 Geomorphology Map of 5 km Radius from the Proposed Project Site

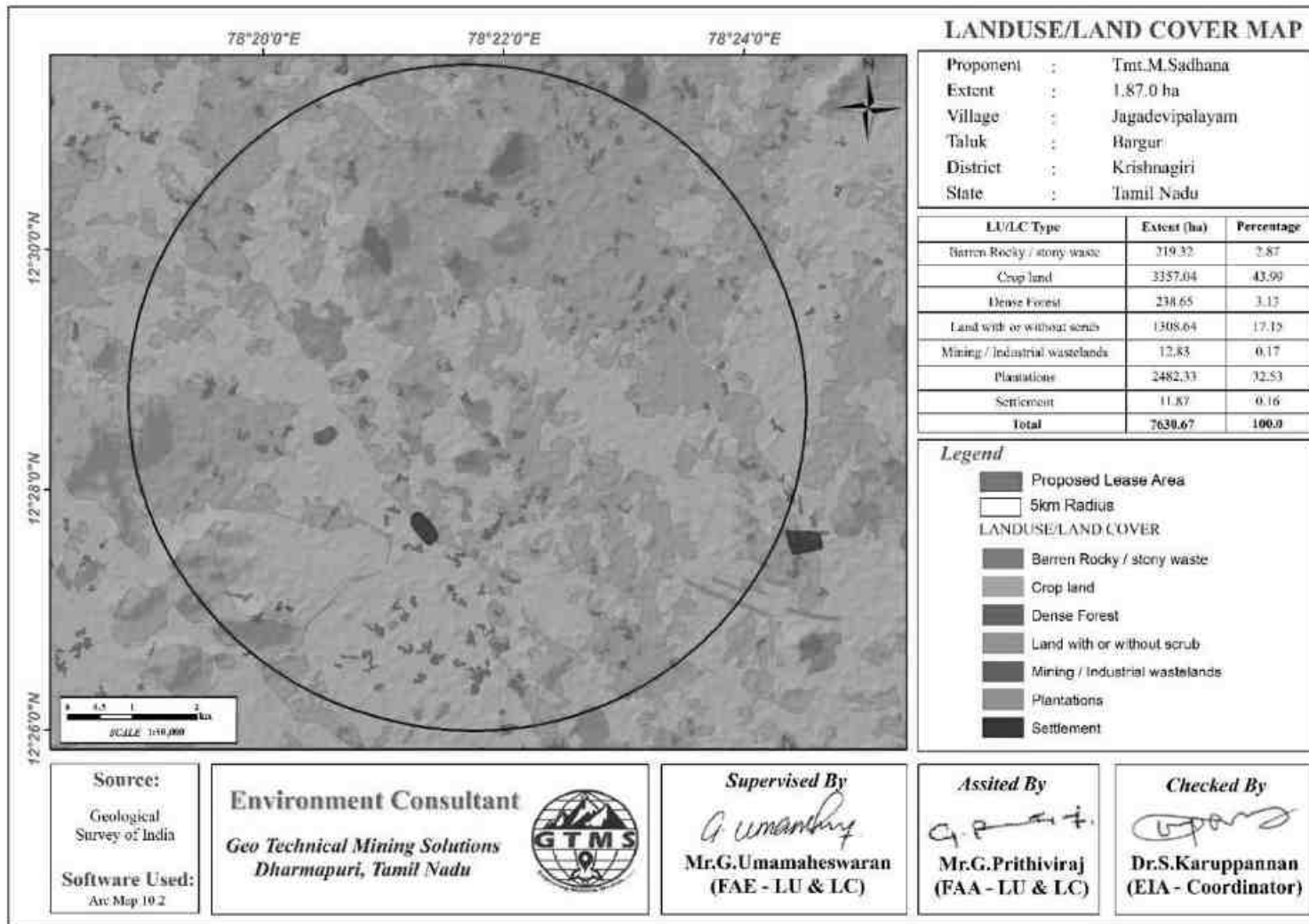


Figure 3.3 LULC Map of 5 km Radius from the Proposed Project Site

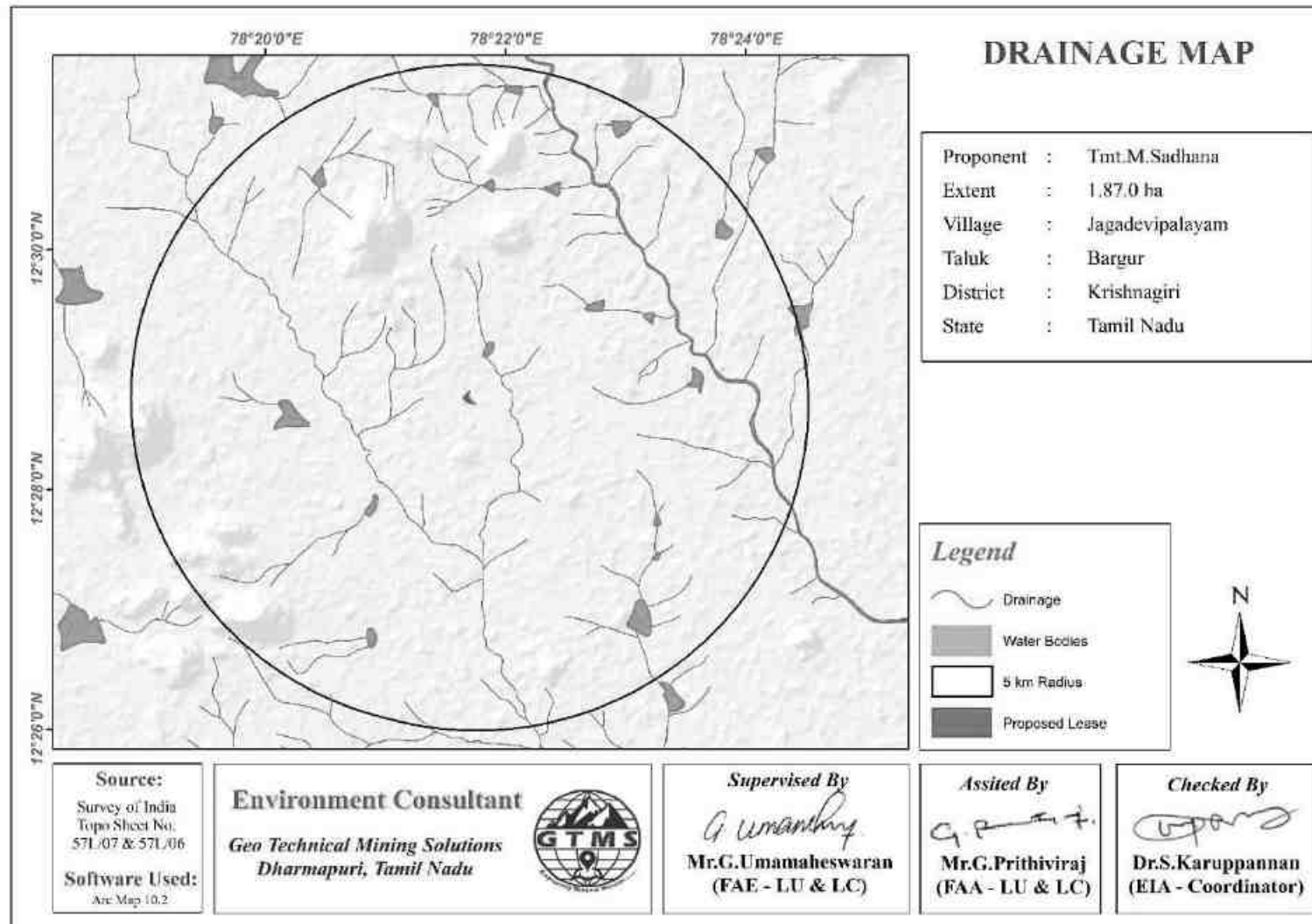


Figure 3.4 Drainage Map of 5 km Radius from the Proposed Project Site Showing Dendritic Pattern

3.1.6.1 Methodology

7 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

S. No.	Sampling ID	Location	Distance	Direction	Coordinates
1	S01	Sadhana Core	--	--	12°28'43.32"N, 78°21'42.18"E
2	S02	Pranitha Core	0.03	NE	12°28'49.38"N, 78°21'42.90"E
3	S03	Bagimanoor	0.50	NNW	12°29'1.68"N, 78°21'30.90"E
4	S04	Battlapalli	3.52	SE	12°27'48.06"N, 78°23'28.20"E
5	S05	Mallapadi	3.94	NNE	12°30'50.40"N, 78°22'26.16"E
6	S06	Vedarkottai	3.19	W	12°28'31.38"N, 78°19'53.82"E
7	S07	Thogarapalli	4.74	SSW	12°26'18.72"N, 78°20'47.82"E

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

3.1.6.2 Results and Discussion

Physical Characteristics

The soil samples in the study area show loamy textures varying between silty clay loam, silty loam and sandy loam. pH of the soil varies from 6.2 to 7.8 indicating slightly acidic to slightly alkaline nature. Electrical conductivity of the soil varies from 45 to 560 $\mu\text{s}/\text{cm}$ Water Content ranges between 1.2 and 5.9%.

Chemical Characteristics

Nitrogen ranges between 0.8 and 1.4 mg/kg. Phosphate ranges between 0.03 and 0.09%. Potassium ranges between 0.018 and 0.055% Calcium ranges between <1.0 and <1.0 mg/kg. Organic matter content ranges between 3.1 and 9.4 %.

Soil erosion

Soil erosion map shows that:

- ❖ Soil erosion is moderate in the proposed lease area
- ❖ Low to moderate soil erosion is in South side of the lease area. Showing in Figure 3.5

Soil erosion map

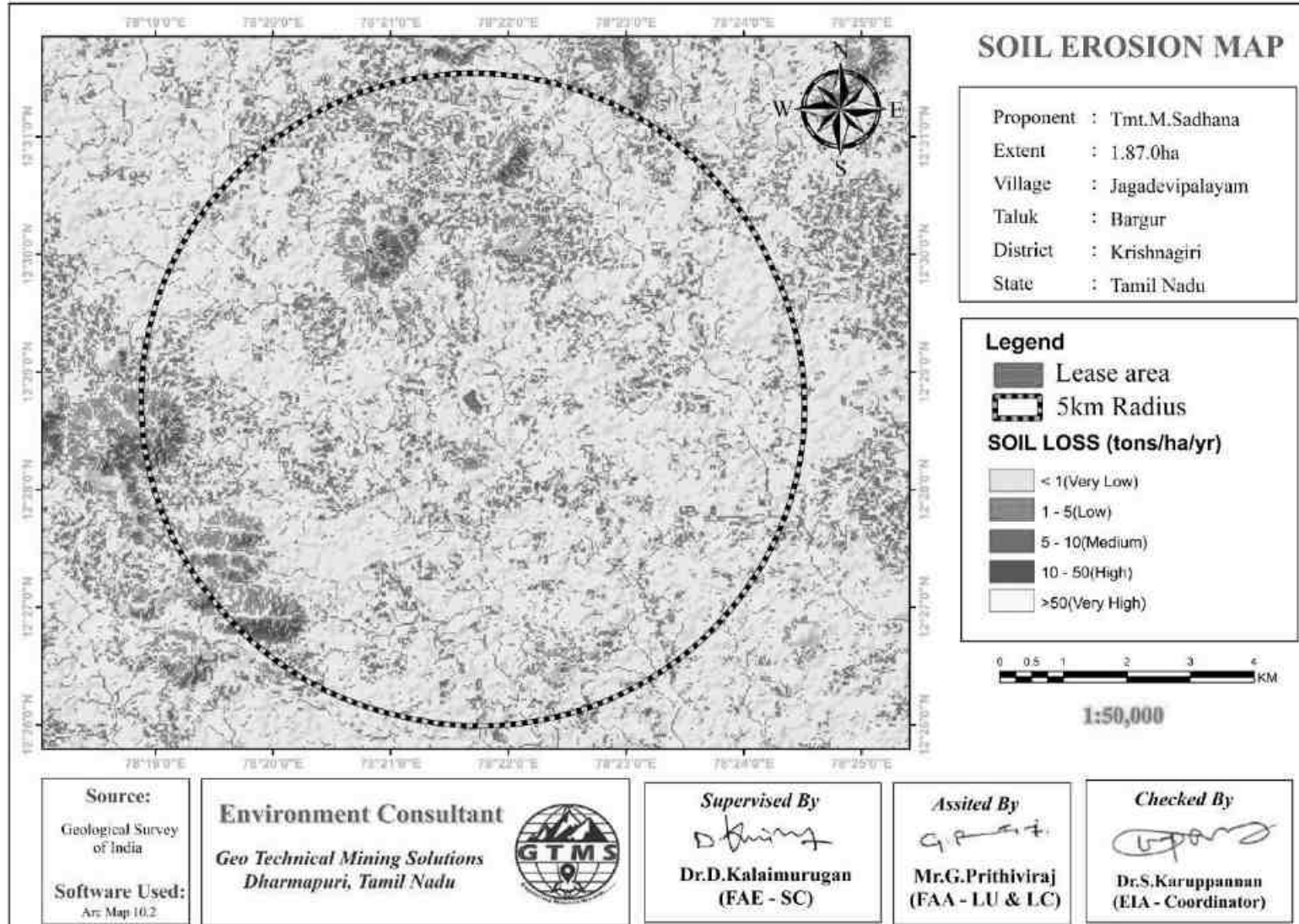


Figure 3.5 Soil Erosion Map within 5 km Radius around the Proposed Project Site

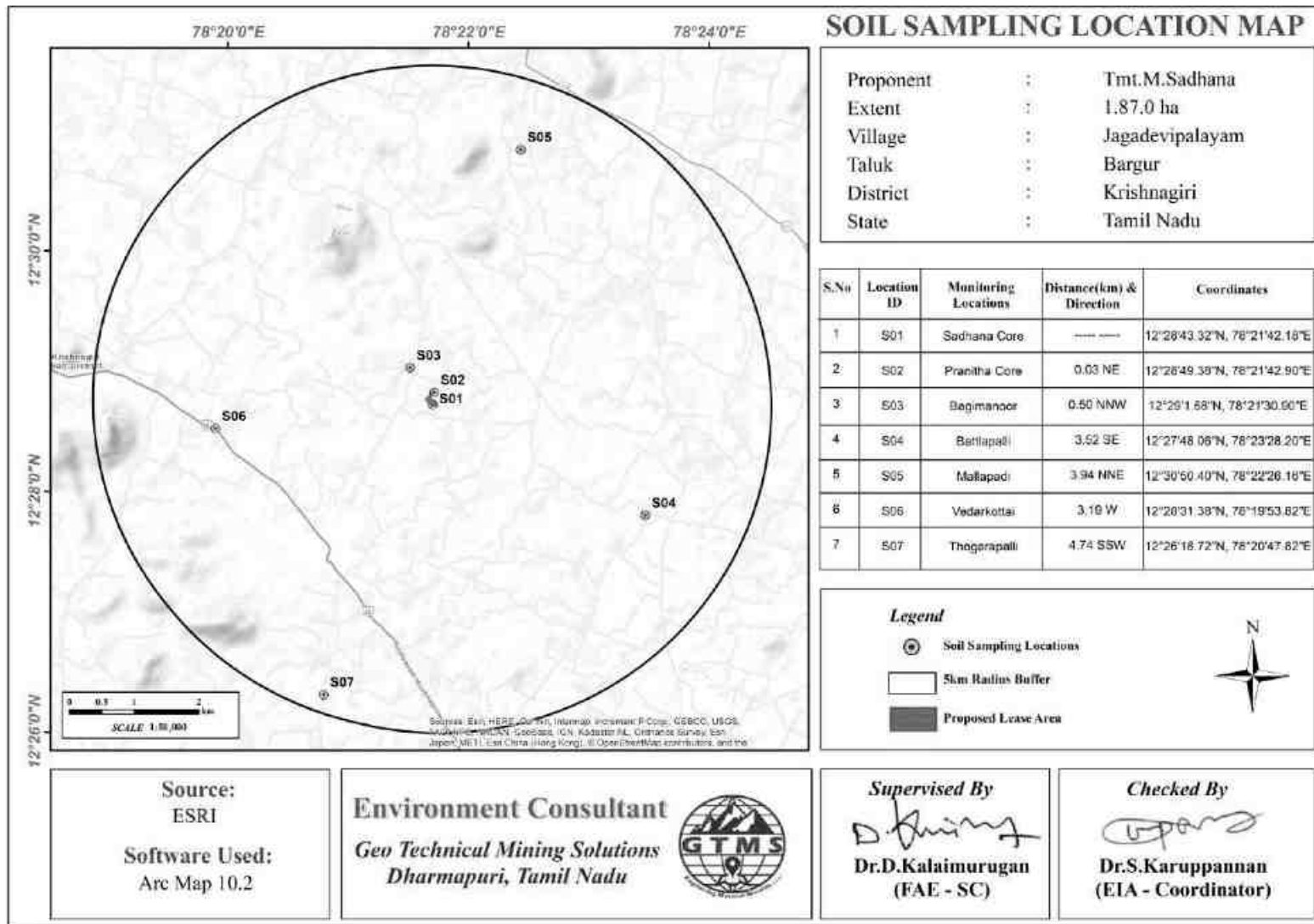


Figure 3.6 Toposheet Showing Soil Sampling Locations within 5 km Radius around the Proposed Project Site

Table 3.4 Soil Quality of the Study Area

S. No	Name of the Test	Units	S1 Sadhana Core	Minimum	Maximum	Average
1	Arsenic	mg/Kg	<0.1	<0.1	<0.1	<0.1
2	Cadmium (as Cd)	mg/Kg	<1.0	<1.0	<1.0	<1.0
3	Cation Exchange Capacity	meq%	<1.0	<1.0	0.27	0.15
4	Chromium (as Cr)	mg/Kg	<2.0	<2.0	42	22.3
5	Copper (as Cu)	mg/Kg	7.9	3.3	13	8.2
6	Lead (as Pb)	mg/Kg	<1.0	<1.0	<1.0	<1.0
7	Manganese. (as Mn)	mg/Kg	57	26	120	87
8	Nickel (asNi)	mg/Kg	<1.0	<1.0	16	7.5
9	Nitrogen (as N)	%	1.3	0.8	1.4	1.117
10	Organic Matter @ 155°C	%	2.4	3.1	9.4	5.833
11	pH value @ 25°C	---	6.2	6.2	7.8	7.11
12	Phosphate (as P)	%	0.07	0.03	0.09	0.068
13	Potassium (as K)	%	0.030	0.018	0.055	0.034
14	Sodium (as Na)	---	0.007	0.006	0.024	0.014
15	Specific Electrical Conductivity@25°C	µS/Cm	66	45	560	208.000
16	Water Content @110°C	%	0.2	1.2	5.9	3.167
17	Zinc (as Zn)	mg/Kg	45	20	100	57.167
18	Bulk density	g/cm ³	2.6	1.7	3.6	2.7
19	Texture*	---	Sandy Clay Loam	Sandy Clay Loam		
20	Sand	%	63.50	10.12	65.4	45.353
21	Clay	%	28.30	16.8	45.2	31.733
22	Silt	%	8.20	6.2	49.8	22.913

Source: Sampling Results by **Excellence Laboratory (P) Limited**, in association with GTMS

3.2 WATER ENVIRONMENT

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

Table 3.5 Water Sampling Locations

S. No.	Sampling ID	Location	Distance	Direction	Coordinates
1	SW1	Mattur River	2.16	SSW	12°27'37.76"N, 78°21'17.14"E
2	SW2	Bargur River	3.50	E	12°29'7.16"N, 78°23'36.46"E
3	SW3	Kumaranganapalli Lake	4.52	NE	12°30'13.48"N, 78°23'45.11"E
4	BW1	Vedarkottai	3.45	W	12°28'27.41"N, 78°19'47.16"E
5	BW2	Nearby Core	0.30	S	12°28'33.84"N, 78°21'39.12"E
6	OW1	Verupanakuppam	4.75	NW	12°29'51.58"N, 78°19'15.87"E
7	OW2	Venkatapuram	4.52	N	12°31'15.93"N, 78°21'26.56"E
8	OW3	Thogarapalli	3.99	SSW	12°26'41.54"N, 78°20'54.90"E

Source: On-site monitoring/sampling by Excellence Laboratory (P) Limited, in association with GTMS.

3.2.1 Surface Water Resources and Quality

Mattur River, Bargur River and Kumaranganapalli Lakes are the three 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, SW2 and SW3 were collected from the three surface water bodies to assess the baseline water quality. Table 3.6a summarizes surface water quality data of the three samples.

Results for surface water samples in the Table 3.6a 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, OW1, OW2 and OW3 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*b* summarizes ground water quality data of the five samples.

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

3.2.3 Hydrogeological Studies

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

3.2.3.1 Groundwater Levels and Flow Direction

Data regarding depth to groundwater levels are essential to infer the direction of groundwater movement within the study area. Knowledge of groundwater flow direction is must in choosing location for background groundwater quality monitoring well and in locating recharge and discharge areas. Therefore, data regarding groundwater elevations were collected from 9 open wells and 9 bore wells at various locations within 2 km radius around the proposed project sites for the period from March through May, 2023 (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 12.7 to 14.5 m BGL in pre monsoon and 11.4 to 13.5 m BGL in post monsoon. The bore well data thus collected onsite are provided in Tables 3.9 and 3.10. The average depths to static potentiometric surface in bore wells for the period of October through December 2023 (Post-Monsoon Season) vary from 72.3 to 76.6 m and from 74.6 to 77.8 m for the period of March through May, 2023 (Pre-Monsoon Season). Data on the depths to static water table and potentiometric surface were used to draw contour lines connecting groundwater elevation (also known as equipotential hydraulic head) to determine the groundwater flow direction perpendicular to the contour lines.

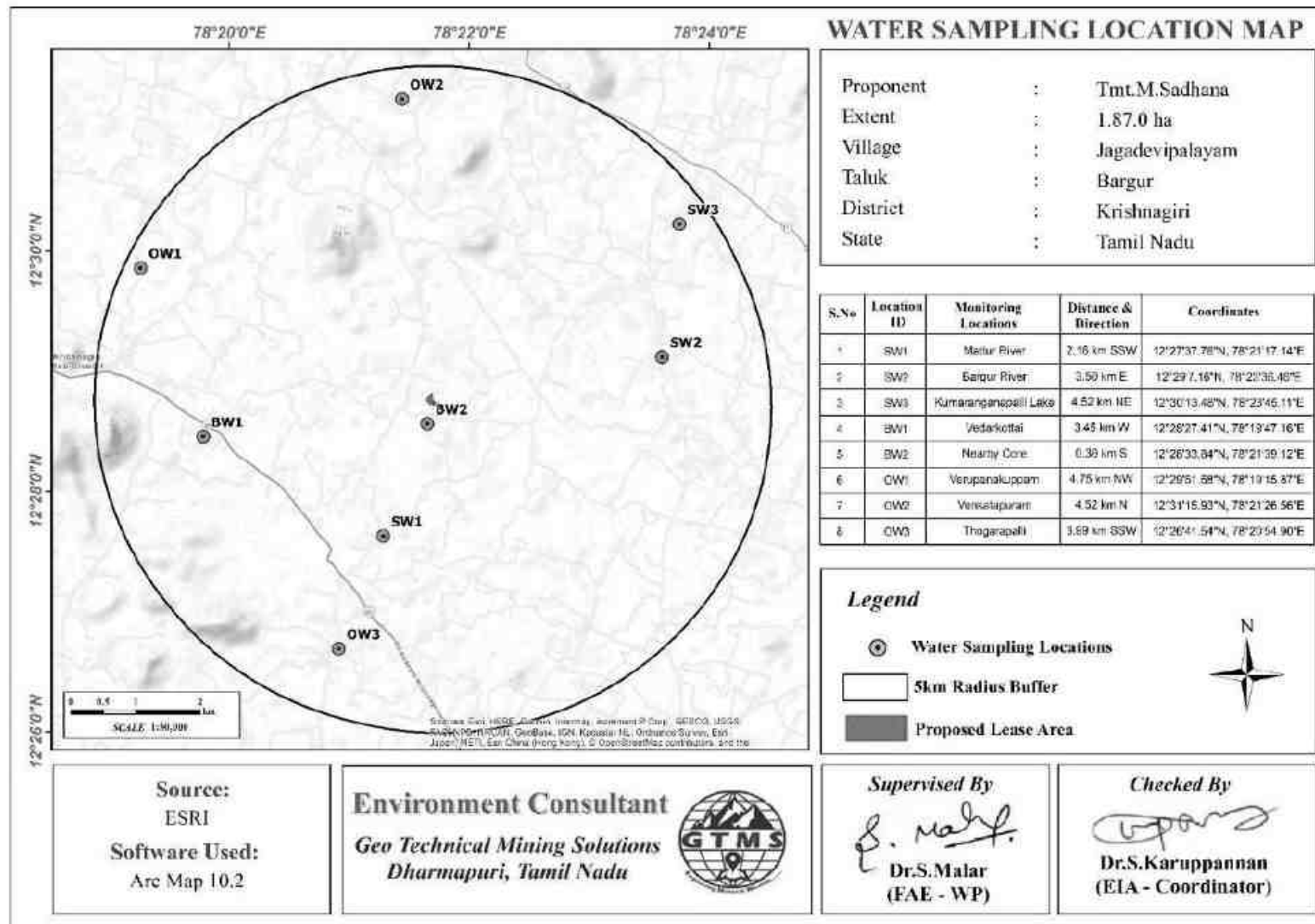


Figure 3.7 Toposheet showing water sampling locations within 5 km radius around the proposed project site

Table 3.6a Surface Water Quality Results

S.No.	Parameters	Units	Result			10500:2012 (Acceptable)	IS:2296-1982 Standards For Class A
			Minimum	Maximum	Average		
1	Barium (Ba)	mg /l	<0.1	<0.1	<0.1	0.5	1
2	Boron (B)	mg /l	<0.1	<0.1	<0.1	0.5	-
3	Calcium (Ca)	mg /l	41	79	53.75	75	80.10
4	Chloride (Cl)	mg /l	63	134	94	250	250
5	Colour	CU	2	5	3.5	5	10
6	Copper (Cu)	mg/l	<0.02	<0.02	<0.02	0.05	1.5
7	Fluoride (F)	mg/l	<0.1	<0.1	<0.1	1.0	1.5
8	Free Residual Chlorine (RFC)	mg/l	<0.1	<0.1	<0.1	0.2	-
9	Iron (Fe)	mg/l	<0.05	<0.05	<0.05	0.3	0.3
10	Lead (Pb)	mg/l	<0.01	<0.01	<0.01	0.01	0.1
11	Magnesium (Mg)	mg/l	19	33	24.8	30	24.28
12	Mercury (Hg)	mg/l	<0.001	<0.001	<0.001	0.001	0.001
13	Nitrate (NO ₃)	mg/l	1.8	4.5	3.04	45	20
14	Odour	--	Agreeable	Agreeable	Agreeable	Agreeable	Unobjectionable
15	pH value @ 25°C	--	6.9	7.1	7	6.5-8.5	6.5-8.5
16	Phenolic Compounds	mg/l	<0.001	<0.001	<0.001	0.001	0.002
17	EC @ 25°C	mg/l	789	981	882.2	-	-
18	Sulphates (SO ₄)	mg/l	29	39	34.2	200	400
19	Total Alkalinity	mg/l	143	193	169.6	200	
20	Arsenic (As)	mg/l	<0.005	<0.005	<0.005	0.01	0.05
21	Chromium (Cr)	mg/l	<0.05	<0.05	<0.05	0.05	0.05
22	TDS	mg/l	571	1215	836.6	500	500
23	TH (CaCO ₃)	mg/l	513	638	573.6	200	300
24	Turbidity	NTU	211	250	233.4	1	5
25	Zinc (Zn)	mg/l	8.3	19	14.32	5	15
26	Total Silica (SiO ₂)	mg/l	0.5	1	0.8	0.1	0.5
27	Coliforms Bacteria	MPN	Present	Present	Present	Shall not be detectable in any 100 ml sample	50
28	E.Coli	MPN	Present	Present	Present	Shall not be detectable in any 100 ml sample	-

Source: Sampling Results by **Excellence Laboratory (P) Limited**, in association with GTMS

Table 3.6b Ground Water Quality Results

S.No.	Parameters	Units	Result			10500:2012 (Acceptable)	10500:2012 (Permissible)
			Minimum	Maximum	Average		
1	Barium (Ba)	mg /l	<0.1	<0.1	<0.1	0.5	No relaxation
2	Boron (B)	mg /l	<0.1	<0.1	<0.1	0.5	1.0
3	Calcium (Ca)	mg /l	110	175	142.4	75	200
4	Chloride (Cl)	mg /l	95	202	153.4	250	1000
5	Colour	CU	<1.0	<1.0	<1.0	5	15
6	Copper (Cu)	mg/l	<0.02	<0.02	<0.02	0.05	1.5
7	Fluoride (F)	mg/l	0.23	1.2	0.8	1.0	1.5
8	Free Residual Chlorine (RFC)	mg/l	<0.1	<0.1	<0.1	0.2	1.0
9	Iron (Fe)	mg/l	<0.05	<0.05	<0.05	0.3	No relaxation
10	Lead (Pb)	mg/l	<0.01	<0.01	<0.01	0.01	No relaxation
11	Magnesium (Mg)	mg/l	5.8	49	24.51	30	100
12	Mercury (Hg)	mg/l	<0.001	<0.001	<0.001	0.001	No relaxation
13	Nitrate (NO ₃)	mg/l	4	6.8	5.53	45	No relaxation
14	Odour	--	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
15	pH value @ 25°C	--	7.1	7.8	7.34	6.5-8.5	No relaxation
16	Phenolic Compounds	mg/l	<0.001	<0.001	<0.001	0.001	0.002
17	EC @ 25°C	mg/l	987	1756	1295.71	-	-
18	Sulphates (SO ₄)	mg/l	38	92	66.57	200	400
19	Total Alkalinity	mg/l	215	318	272.57	200	600
20	Arsenic (As)	mg/l	<0.005	<0.005	<0.005	0.01	0.05
21	Chromium (Cr)	mg/l	<0.05	<0.05	<0.05	0.05	No relaxation
22	TDS	mg/l	642	1144	882	500	2000
23	TH (CaCO ₃)	mg/l	326	533	429.14	200	600
24	Total Silica (SiO ₂)	mg/l	18	33	25.57	-	1
25	Turbidity	NTU	<0.1	<0.1	<0.1	5	15
26	Zinc (Zn)	mg/l	<0.01	<0.01	<0.01	0.1	0.3
27	Coliforms Bacteria	MPN	Present	Present	Present	Shall not be detectable in any 100 ml sample	Shall not be detectable in any 100 ml sample
28	E. Coli	MPN	Absent	Absent	Absent	Shall not be detectable in any 100 ml sample	Shall not be detectable in any 100 ml sample

Source: Sampling Results by *Excellence Laboratory (P) Limited*, in association with GTMS

Table 3.7a Weighted Arithmetic Water Quality Index (WAWQI) Method for ground water (Brown et al., 1972)

S. No.	Water Quality Index (WQI)					WQI Range	Classification	Grading
	BW1	BW2	OW1	OW2	OW3			
1		24.44		20.13	21.56	0 – 25	Excellent	A
2	29.56		37.10			25 – 50	Good	B
3						50 – 75	Poor	C
4						75 – 100	Very Poor	D
5						> 100	Unsuitable	E

Table 3.7b Weighted Arithmetic Water Quality Index as per WAWQI Method for surface water (Brown et al., 1972)

S. No.	Water Quality Index (WQI)			WQI Range	Classification	Grading
	SW1	SW2	SW3			
1	19.63	20.01	19.98	0 – 25	Excellent	A
2				25 – 50	Good	B
3				50 – 75	Poor	C
4				75 – 100	Very Poor	D
5				> 100	Unsuitable	E

The WQI is a unique digital rating expression that expresses overall water quality status viz: excellent, good, poor, very poor and unsuitable based on various water quality parameters. It is used as an important tool to compare the quality of groundwater and their management in a particular region. The WQI of the ground water, as shown Table 3.7a indicates that three groundwater samples is of excellent quality and two groundwater samples is of good quality. The WQI of ground water samples fall under excellent and good quality indicating their suitability for drinking, domestic and agriculture purpose. The WQI of the surface water, as shown in Table 3.7b shows that all the three surface water samples fall under excellent quality indicating their suitability for drinking, domestic and agriculture purpose.

From the maps of open well groundwater flow direction shown in Figures 3.8 -3.9, it is understood that most of the open well groundwater for the post- and pre-monsoon seasons flows towards the open well number 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 3.8 Pre-Monsoon Water Level of Open Wells within 2 km Radius

Station ID	Depth to Static Water Table BGL (m)				Latitude	Longitude
	Mar-2023	Apr-2023	May- 2023	Average		
DW01	19	20	21	20.00	12°29'6.50"N	78°21'27.85"E
DW02	20	21	22	21.00	12°28'48.78"N	78°21'23.42"E
DW03	18	19	21	19.00	12°28'40.56"N	78°21'32.98"E
DW04	17	18	19	18.00	12°28'28.57"N	78°21'49.57"E
DW05	20	21	22	21.00	12°28'56.65"N	78°22'10.77"E
DW06	16	17	18	17.00	12°29'5.04"N	78°21'46.23"E
DW07	18	19	20	19.00	12°29'24.89"N	78°21'56.38"E
DW08	17	18	19	18.00	12°28'4.18"N	78°22'10.86"E
DW09	19	20	21	20.00	12°28'0.68"N	78°21'14.67"E

Source: Onsite monitoring data

Table 3.9 Post-Monsoon Water Level of Open Wells within 2 km Radius

Station ID	Depth to Static Water Table BGL (m)				Latitude	Longitude
	Oct-2023	Nov-2023	Dec-2023	Average		
DW01	15	16	17	20.00	12°29'6.50"N	78°21'27.85"E
DW02	13	14	15	21.00	12°28'48.78"N	78°21'23.42"E
DW03	16	17	18	19.00	12°28'40.56"N	78°21'32.98"E
DW04	13	14	15	18.00	12°28'28.57"N	78°21'49.57"E
DW05	12	13	14	21.00	12°28'56.65"N	78°22'10.77"E
DW06	14	15	16	17.00	12°29'5.04"N	78°21'46.23"E
DW07	13	14	15	19.00	12°29'24.89"N	78°21'56.38"E
DW08	12	13	14	18.00	12°28'4.18"N	78°22'10.86"E
DW09	11	12	13	20.00	12°28'0.68"N	78°21'14.67"E

Source: Onsite monitoring data

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

Station ID	Depth to Static Potentiometric Surface BGL(m)				Latitude	Longitude
	Mar-2023	Apr-2023	May- 2023	Average		
BW01	57	58	60	58.00	12°28'49.18"N	78°22'3.63"E
BW02	58	60	61	59.00	12°28'23.99"N	78°22'12.07"E
BW03	59	60	61	60.00	12°27'58.57"N	78°21'51.96"E
BW04	58	59	60	59.00	12°27'52.78"N	78°21'20.19"E
BW05	56	59	61	58.00	12°28'36.29"N	78°21'5.43"E
BW06	56	57	59	57.00	12°29'8.57"N	78°21'9.02"E
BW07	57	59	61	59.00	12°29'25.81"N	78°22'16.41"E
BW08	59	60	61	60.00	12°28'47.04"N	78°22'31.94"E
BW09	56	57	58	57.00	12°28'26.94"N	78°21'35.36"E

Source: Onsite monitoring data

Table 3.11 Post-Monsoon Water Level of Bore Wells within 2 km Radius

Station ID	Depth to Static Potentiometric Surface BGL(m)				Latitude	Longitude
	Oct-2023	Nov-2023	Dec-2023	Average		
BW01	47	49	50	48	12°28'49.18"N	78°22'3.63"E
BW02	48	50	51	49	12°28'23.99"N	78°22'12.07"E
BW03	50	51	53	51	12°27'58.57"N	78°21'51.96"E
BW04	52	53	54	53	12°27'52.78"N	78°21'20.19"E
BW05	51	52	53	52	12°28'36.29"N	78°21'5.43"E
BW06	49	51	52	51	12°29'8.57"N	78°21'9.02"E
BW07	48	49	51	49	12°29'25.81"N	78°22'16.41"E
BW08	50	51	51	50	12°28'47.04"N	78°22'31.94"E
BW09	45	47	48	47	12°28'26.94"N	78°21'35.36"E

Source: Onsite monitoring data

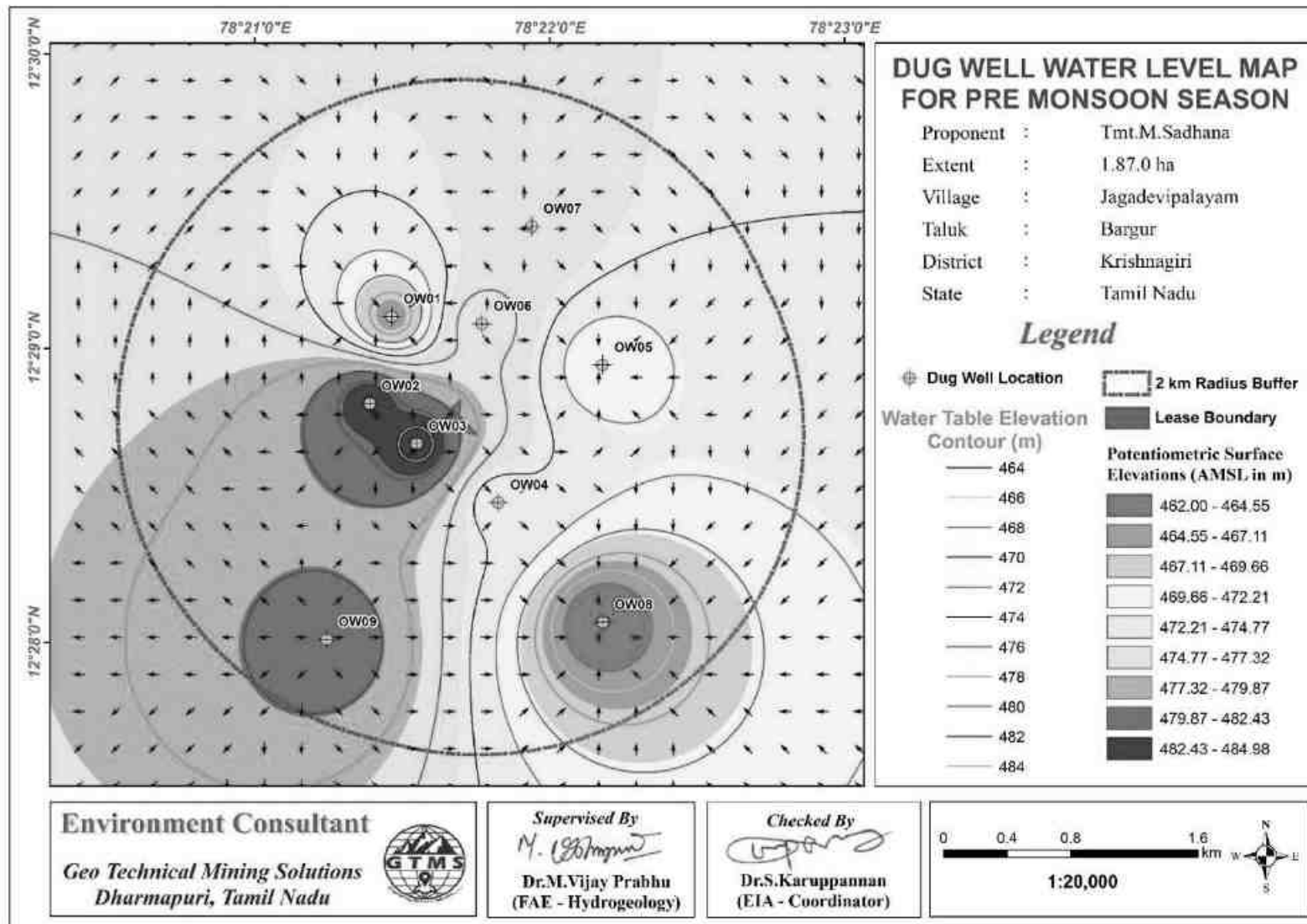


Figure 3.8 Open well Static Groundwater Elevation Map Showing Direction of Groundwater Flow during Pre-Monsoon Season

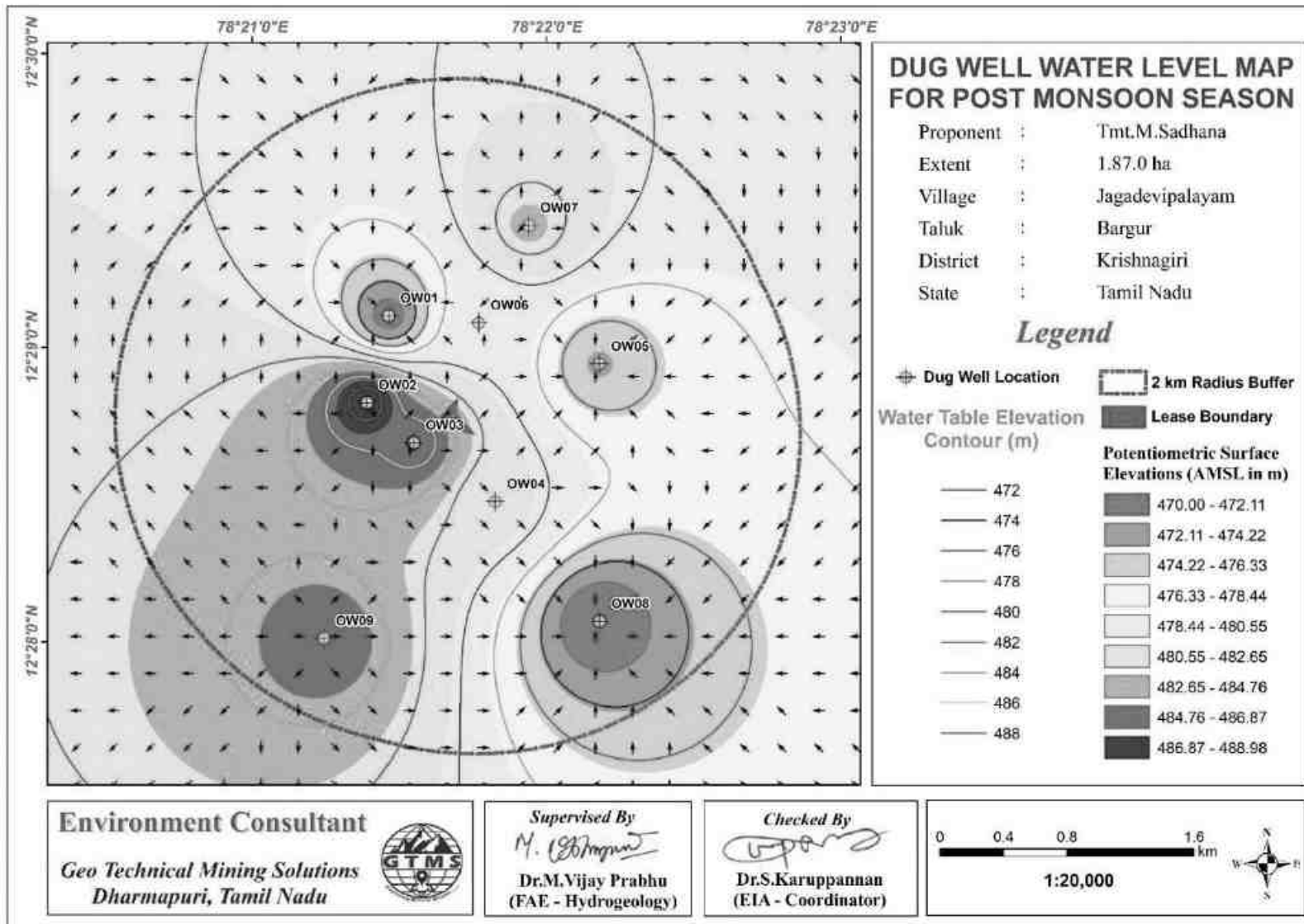


Figure 3.9 Open well Static Groundwater Elevation Map Showing Direction of Groundwater Flow during Post-Monsoon Season

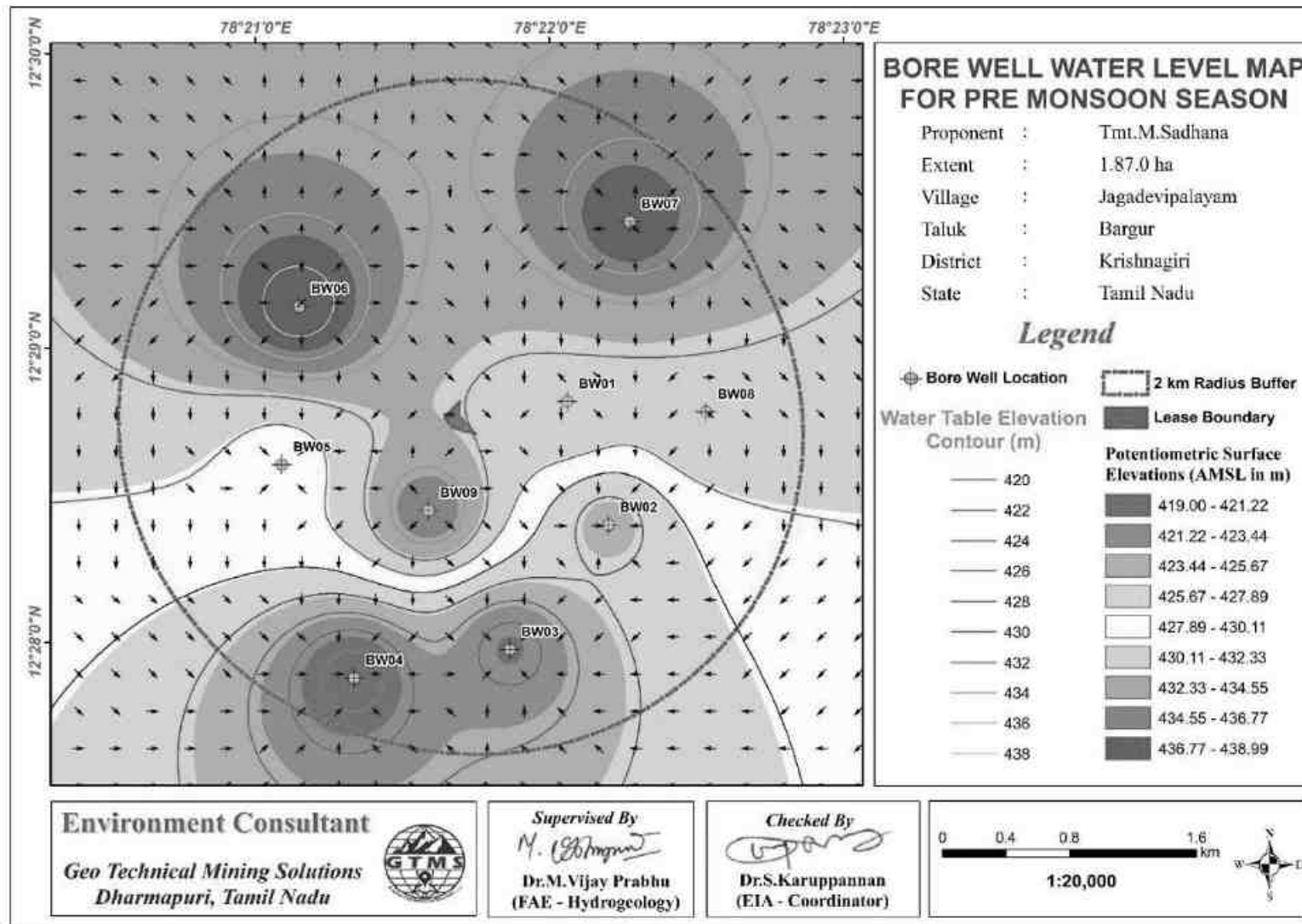


Figure 3.10 Borewell Static Groundwater Elevation Map Showing Direction of Groundwater Flow during Pre-Monsoon Season

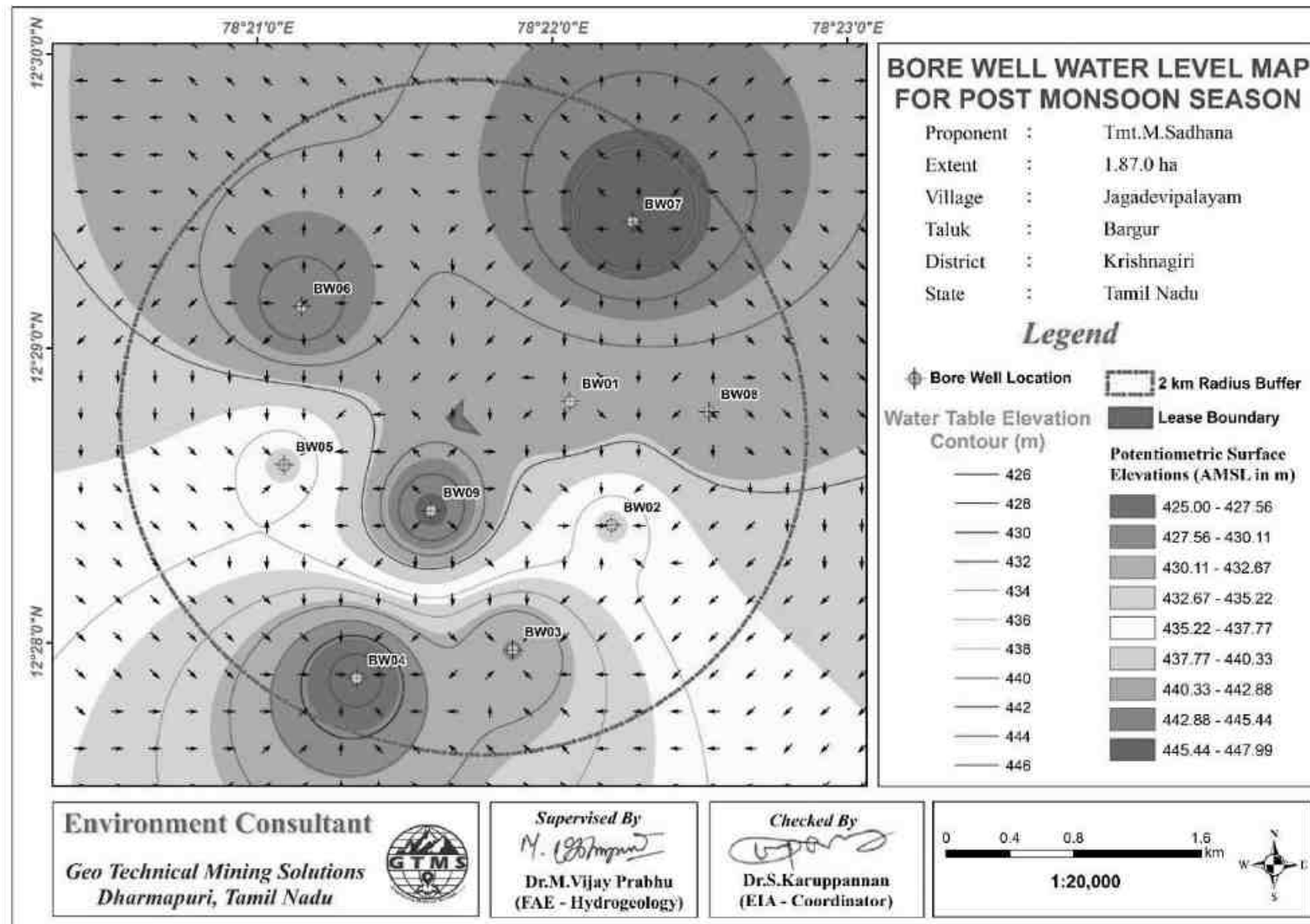


Figure 3.11 Borewell Static Groundwater Elevation Map Showing Direction of Groundwater Flow during Post-Monsoon Season

3.2.3.2 Electrical Resistivity Investigation

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

Result

The Geophysical VES data obtained from the project site have been shown in Table 3.12. The field data obtained from a detailed geophysical investigation were plotted using excel spreadsheet for interpretation. The plot for the purpose of interpretation has been shown in Figure 3.10.

Table 3.12 Vertical Electrical Sounding Data

Location Coordinates - 12°28'43.23"N 78°21'42.42"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

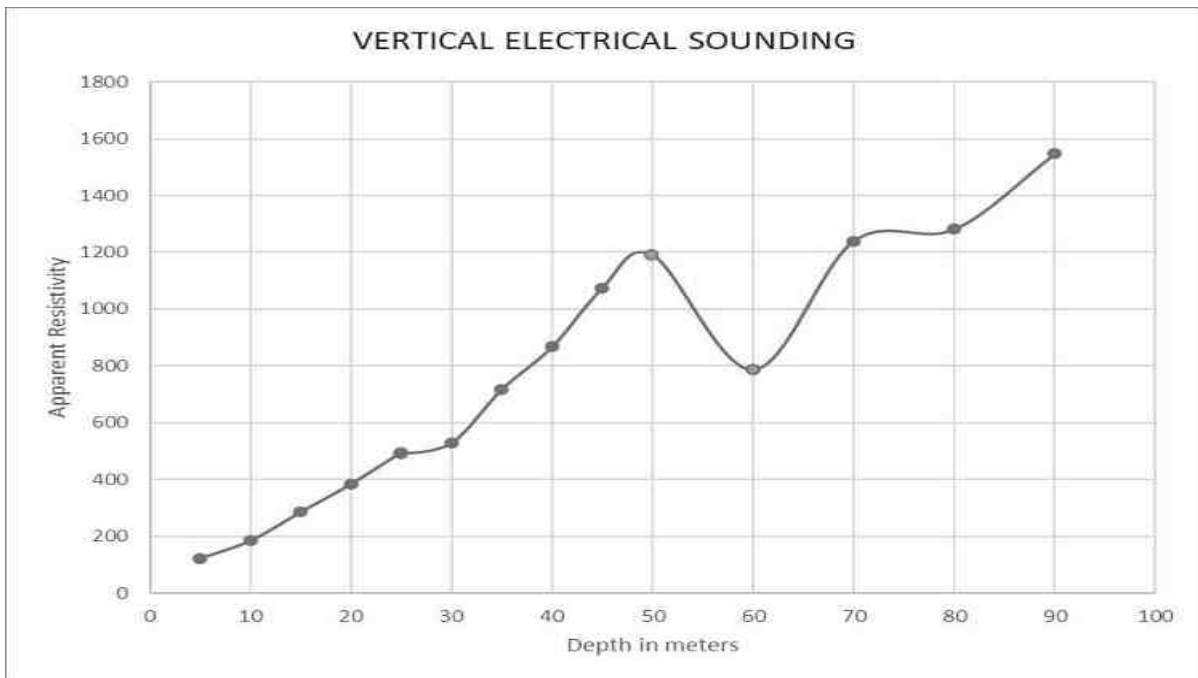


Figure 3.12 Graph Showing Occurrence of Water Bearing Fracture Zones at the Depth of 60 m Below Ground Level in the Proposed Project Area

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 (15m AGL + 15m 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 3.13.

According to the onsite data, the temperature in October, 2023 varied from 15.33 to 30.28⁰C with the average of 23.83⁰ C; in November, 2023 from 12.49 to 29.24⁰C with the average of 22.0⁰ C; and in December, 2023 from 14.02 to 27.78⁰C with the average of 21.06⁰C.

In October, 2023, relative humidity ranged from 40.81 to 100 % with the average of 81.67%; in November, 2023, from 49.19 to 100 % with the average of 88.20 %; and in December,2023, from 42.94 to 100 % with the average of 85.88%. The wind speed in October, 2023 varied from 0.52 to 7.68 m/s with the average of 2.56 m/s; in November, 2023 from 0.65 to 6.40 m/s with the average of 2.68 m/s; and in December, 2023 from 0.15 to 8.42 m/s with the average of 3.39 m/s. In October,2023, wind direction varied from 1.07 to 359.60 with the average of 125.55⁰; in November, 2023, from 0.22 to 359.81⁰ with the average of 90.53⁰; and in December, 2023, from 0.76 to 357.83⁰ with the average of 89.92⁰. In October,2023, surface pressure varied from 93.58 to 94.47kPa with the average of 94.08 kPa; in November, 2023, from 93.66 to 94.52kPa with the average of 94.09 kPa; and in December, 2023, from 92.96 to 94.80 kPa with the average of 94.05 kPa

Table 3.13 Onsite Meteorological Data

S. No.	Parameters		Oct, 2023	Nov,2023	Dec,2023
1	Temperature (°C)	Min	15.33	12.49	14.02
		Max	30.28	29.24	27.78
		Avg	23.83	22.00	21.06
2	Relative Humidity (%)	Min	40.81	49.19	42.94
		Max	100.00	100.00	100.00
		Avg	81.67	86.63	85.88
3	Wind Speed (m/s)	Min	0.52	0.65	0.15
		Max	7.68	6.40	8.42
		Avg	2.56	2.68	3.39
4	Wind Direction (degree)	Min	1.07	0.22	0.76
		Max	359.60	359.81	357.83
		Avg	125.55	90.53	89.92
5	Surface Pressure(kPa)	Min	93.58	93.66	92.96
		Max	94.47	94.52	94.80
		Avg	94.08	94.09	94.05

Source: On-site monitoring/sampling by **Excellence Laboratory (P) Limited** in association with GTMS

Rainfall

Rainfall data for the study area were collected for the period of 1981-2021 (POWER | Data Access Viewer (nasa.gov)). Long term monthly average rainfall was estimated from the data of 1981-2022 and compared with the monthly rainfall for the year 2022, shown in Figure 3.13. The Figure 3.13 shows that monthly rainfall in 2022 is generally high in the months of May, August, September and October, when compared to the long term monthly average rainfall.

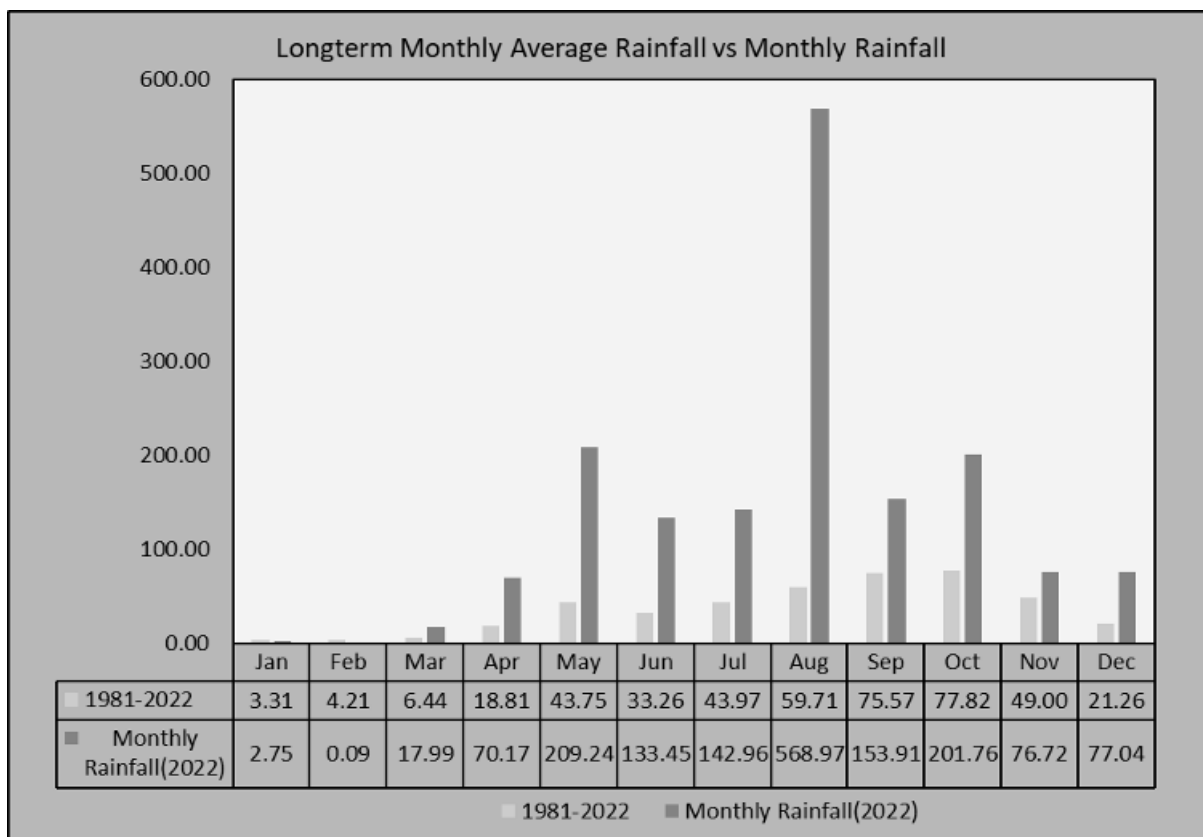


Figure 3.13 Long-term monthly average rainfall vs monthly rainfall

3.3.1.2 Wind Pattern

Wind pattern will largely influence the dispersion pattern of air pollutants and noise from the proposed project site. Analysis of wind pattern requires hourly site-specific data of wind speed and direction. Two types of wind rose were generated: historical seasonal wind rose for the period of October through December of the years from 2018 to 2021 and the seasonal wind rose for the study period of October through December 2022. The wind rose diagrams thus produced are shown in Figures 3.14-3.14a. Figure 3.15 reveals that:

- ❖ The measured average wind velocity during the study period is 2.88m/s.
- ❖ Predominant wind was dominant in the directions ranging from East to West.

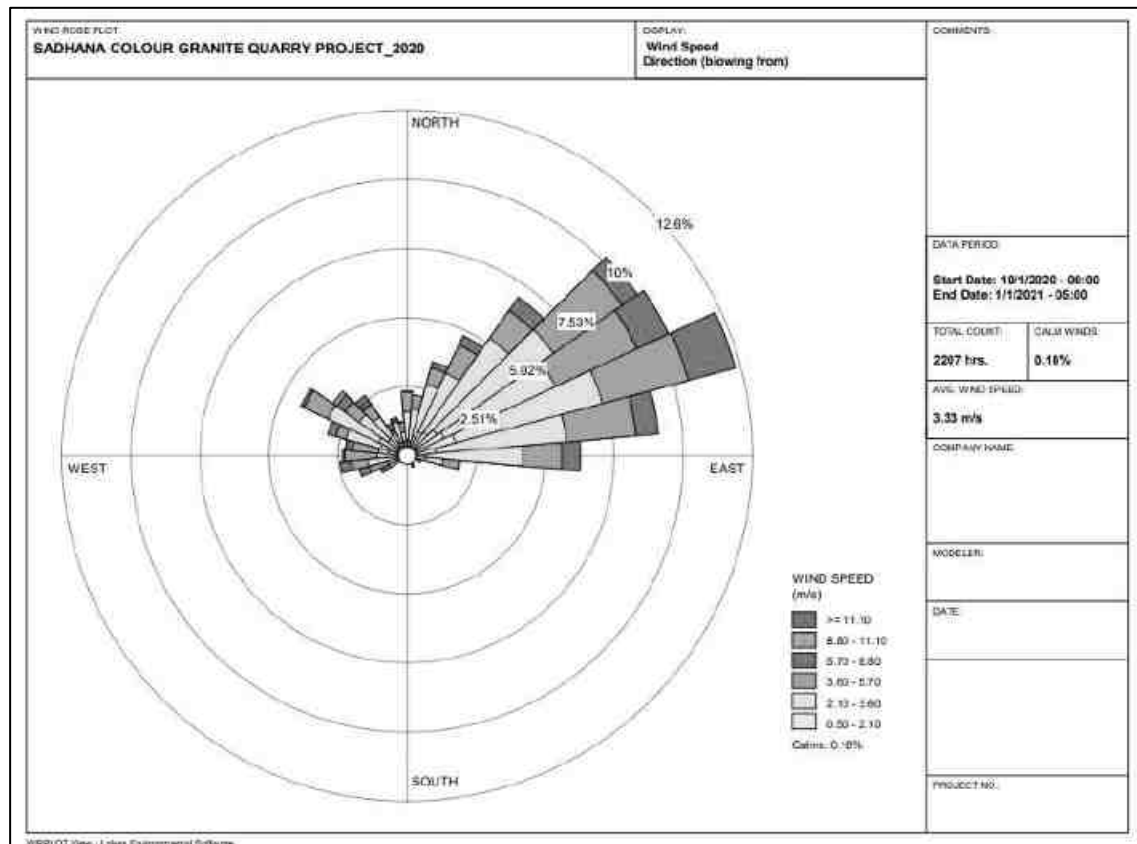
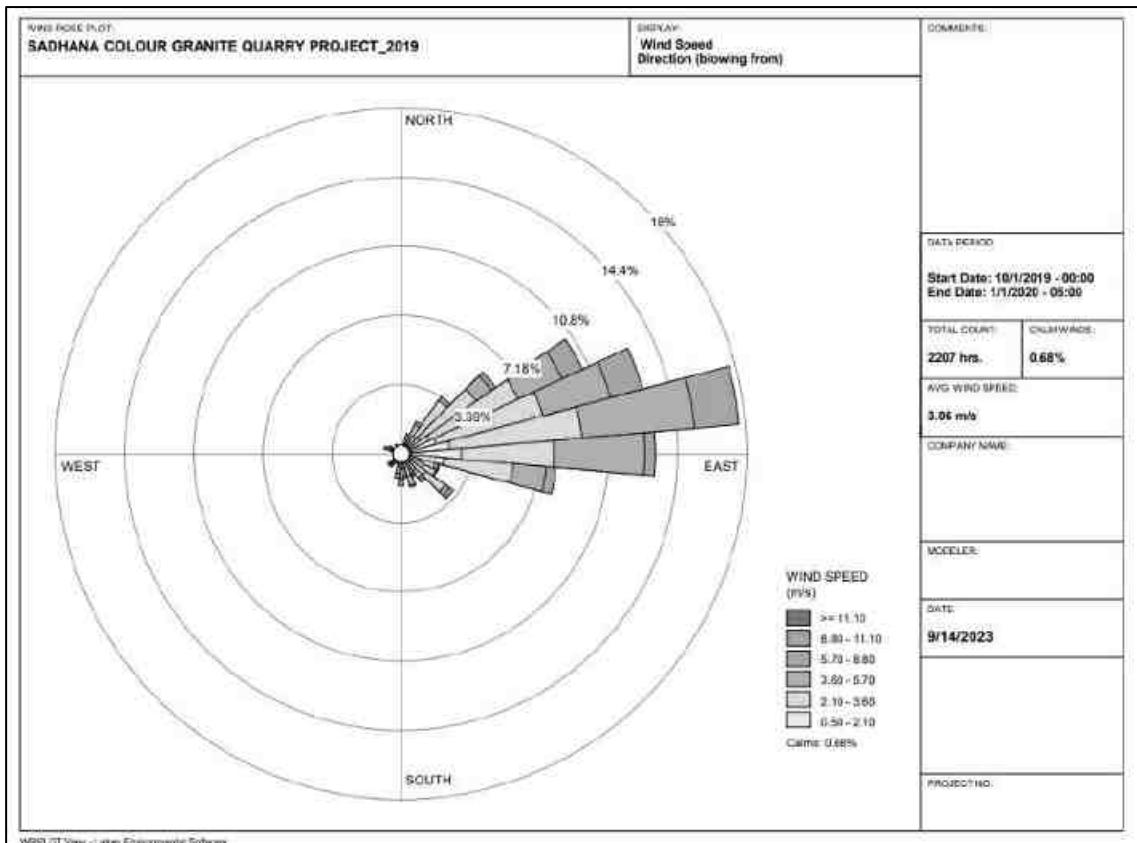


Figure 3.14 Windrose Diagram for 2019 and 2020 (October to December)

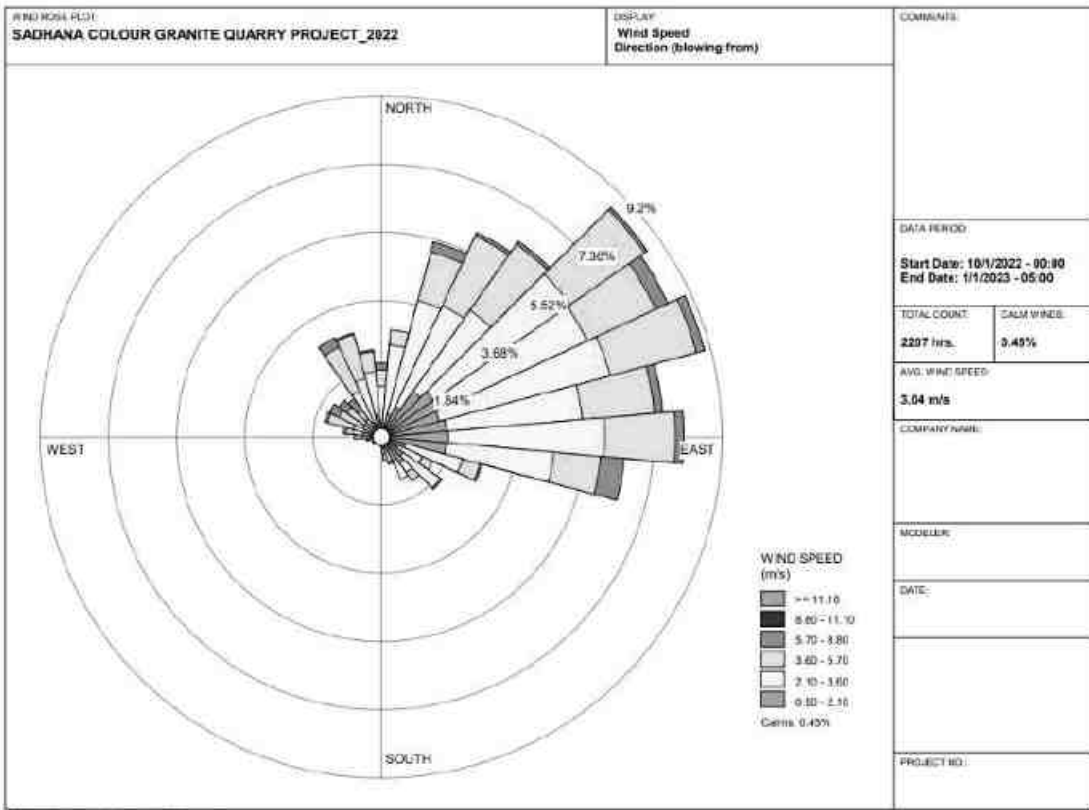
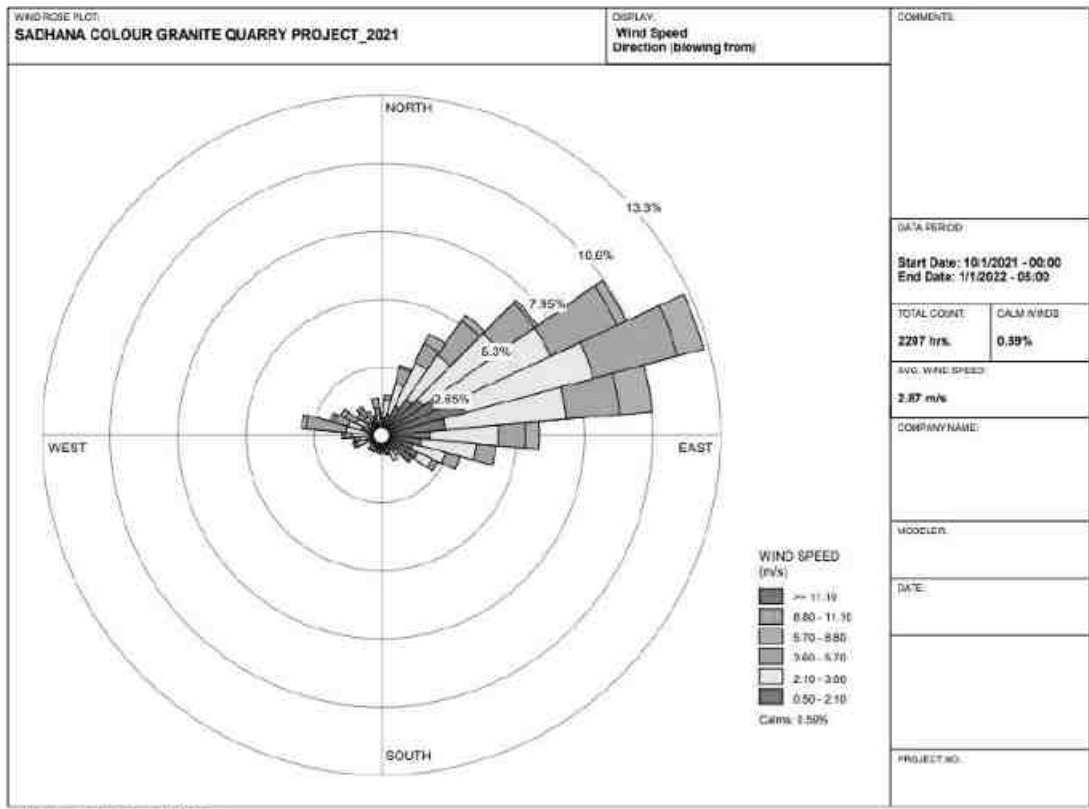


Figure 3.14(a) Windrose Diagram for 2020 and 2021 (October to December)

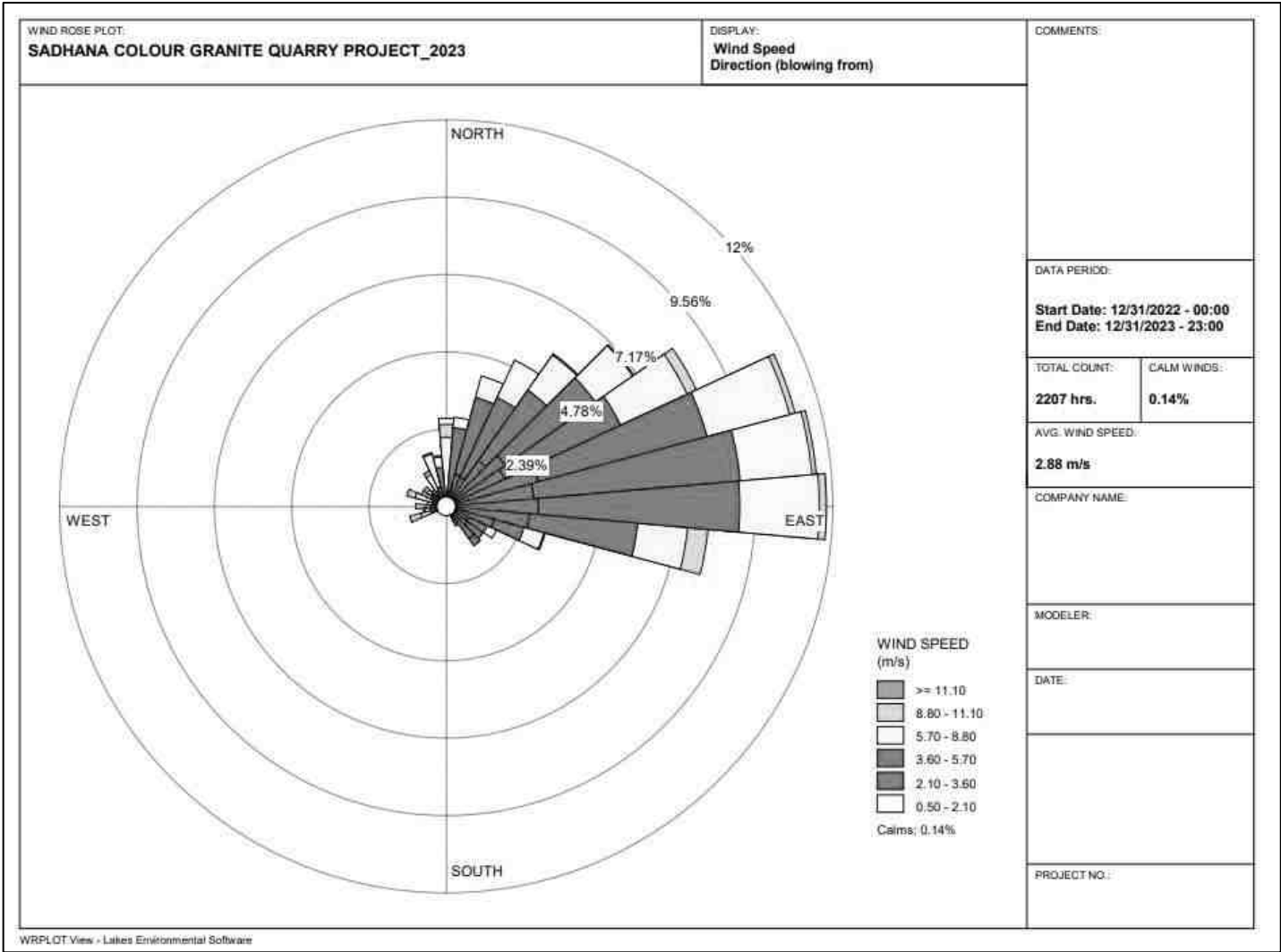


Figure 3.15 Onsite Windrose Diagram

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 3.14 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 Methodology based on *Excellence Laboratory (P) Limited* & CPCB Notification

Table 3.15 National Ambient Air Quality Standards

S. No.	Pollutant	Time Weighted Average	Concentration in ambient air	
			Industrial, Residential, Rural & other areas	Ecologically Sensitive area (Notified by Central Govt.)
1	SO 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 October-December, 2023 as per the CPCB, MoEF guidelines and notifications.

It was ensured that the equipment was placed preferably at a height of at least 3 ± 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 3.16.

Table 3.16 Ambient Air Quality (AAQ) Monitoring Locations

S. No	Location Code	Monitoring Locations	Distance (km)	Direction	Coordinates	
					Lat	Long
1	AAQ1	Core	--	--	12°28'47.86"N	78°21'41.71"E
2	AAQ2	Kondappanayakempalli	1.08	N	12°29'24.55"N	78°21'37.59"E
3	AAQ3	Jagadevi	2.70	SW	12°28'5.55"N	78°20'19.27"E
4	AAQ4	Jagadevi	4.46	NW	12°29'16.08"N	78°19'13.86"E
5	AAQ5	Billakottai	3.71	SSW	12°26'42.99"N	78°21'29.60"E
6	AAQ6	Sakilinatham	3.72	NE	12°29'49.26"N	78°23'29.08"E

Source: On-site monitoring/sampling by **Excellence Laboratory (P) Limited** in association with GTMS

Results

As per the monitoring data, PM_{2.5} ranges from 15.5 µg/m³ to 21.5 µg/m³; PM₁₀ from 35.7 µg/m³ to 43.5µg/m³; SO₂ from 11.9 µg/m³ to 16.2 µg/m³; NO₂ from 15.9 µg/m³ to 22.3 g/m³. The concentration levels of the pollutants fall within the acceptable limits of NAAQS prescribed by CPCB.

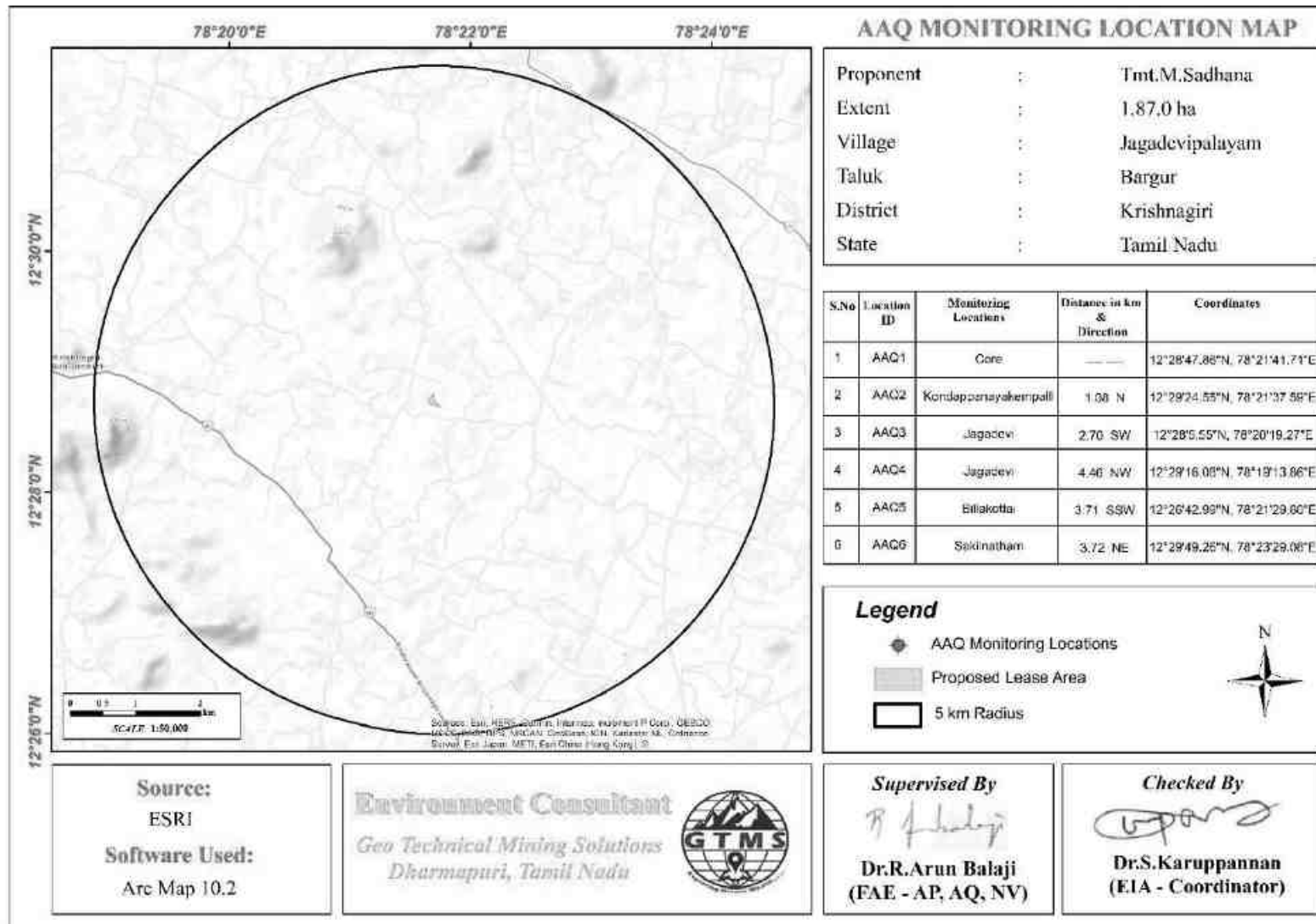


Figure 3.16 Ambient Air Quality Monitoring Station Locations around 5 km Radius from the Proposed Project Site

Table 3.17 Summary of AAQ Result

PM _{2.5}					PM ₁₀			
Station ID	Max	Min	Mean	98 th Percentile	Max	Min	Mean	98 th Percentile
AAQ1	20.0	14.1	17.2	19.8	44.2	33.2	38.5	44.1
AAQ2	17.8	11.9	15.0	17.6	42.8	33.6	39.1	42.8
AAQ3	23.1	17.5	19.8	21.5	43.8	38.6	41.3	43.8
AAQ4	23.2	18.9	21.3	23.0	44.7	39.4	41.8	44.6
AAQ5	23.4	16.6	20.3	23.4	47.4	39.6	42.5	46.6
AAQ6	21.6	14.2	17.4	21.5	37.9	29.7	34.1	37.9
SO ₂					NO ₂			
AAQ1	14.5	8.6	11.7	14.3	20.1	14.2	17.3	19.9
AAQ2	13.8	9.4	11.0	13.4	21.3	14.7	17.0	20.8
AAQ3	19.4	15.0	16.9	18.1	24.5	20.1	22.0	24.3
AAQ4	18.5	15.4	17.0	18.5	24.3	17.8	21.3	24.0
AAQ5	19.0	15.9	17.5	19.0	24.2	17.1	20.3	24.2
AAQ6	12.2	7.3	9.4	11.8	19.4	11.6	15.8	19.3

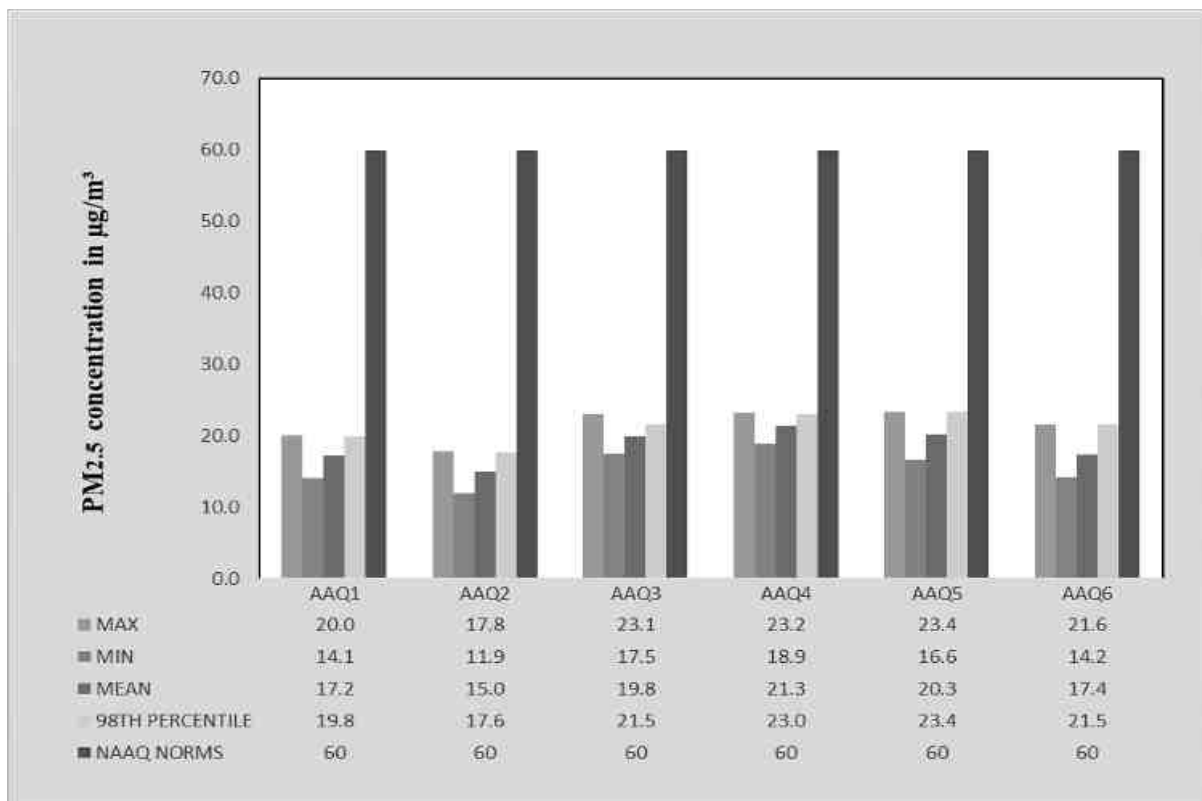


Figure 3.17 Bar Chart Showing Maximum, Minimum, and Average Concentrations of PM_{2.5} Measured from 6 Air Quality Monitoring Stations within 5 km Radius

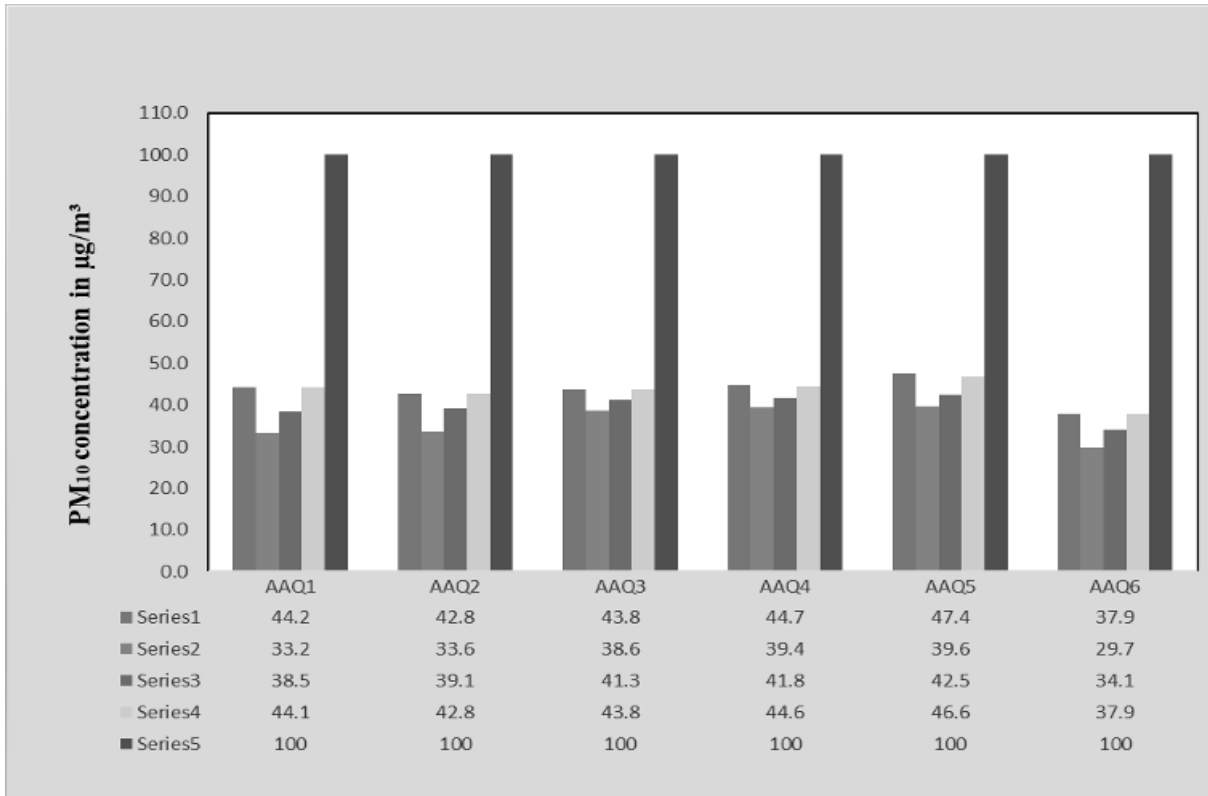


Figure 3.18 Bar Chart Showing Maximum, Minimum, and Average Concentrations of PM₁₀ Measured from 6 Air Quality Monitoring Stations within 5 km Radius

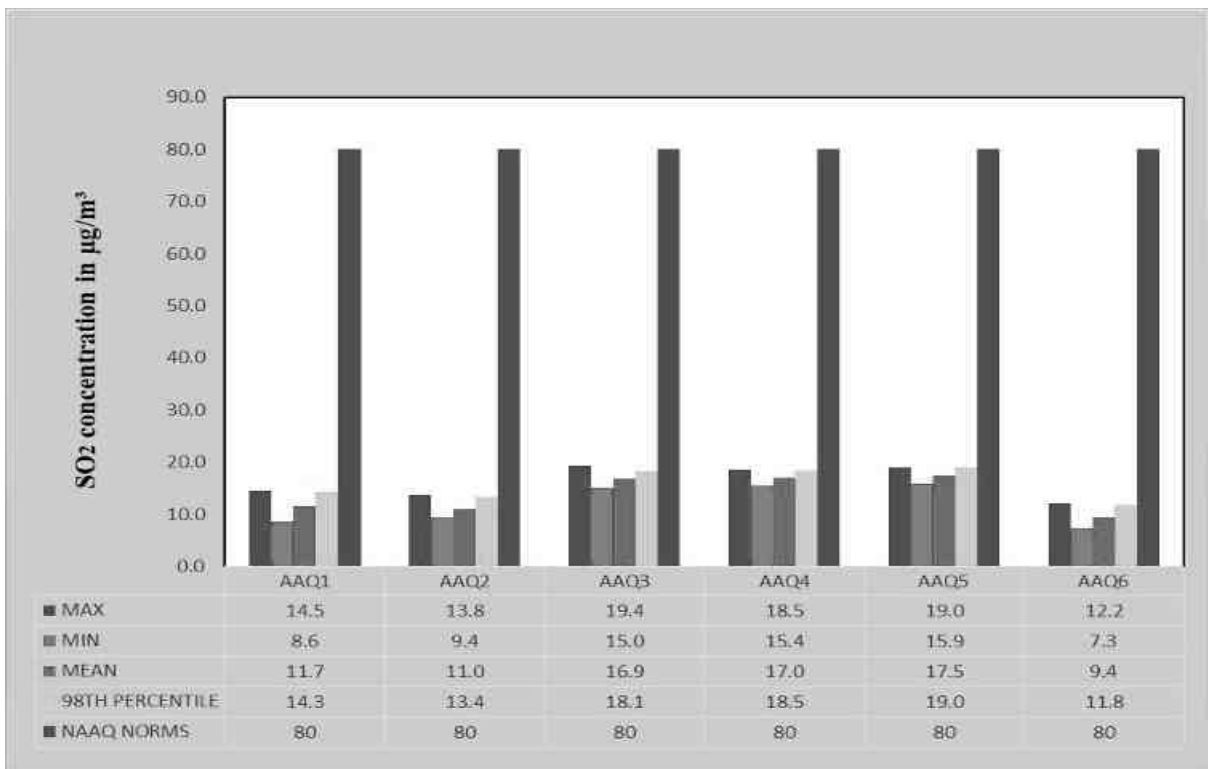


Figure 3.19 Bar Chart Showing Maximum, Minimum, and Average Concentrations of SO₂ Measured from 6 Air Quality Monitoring Stations within 5 km Radius

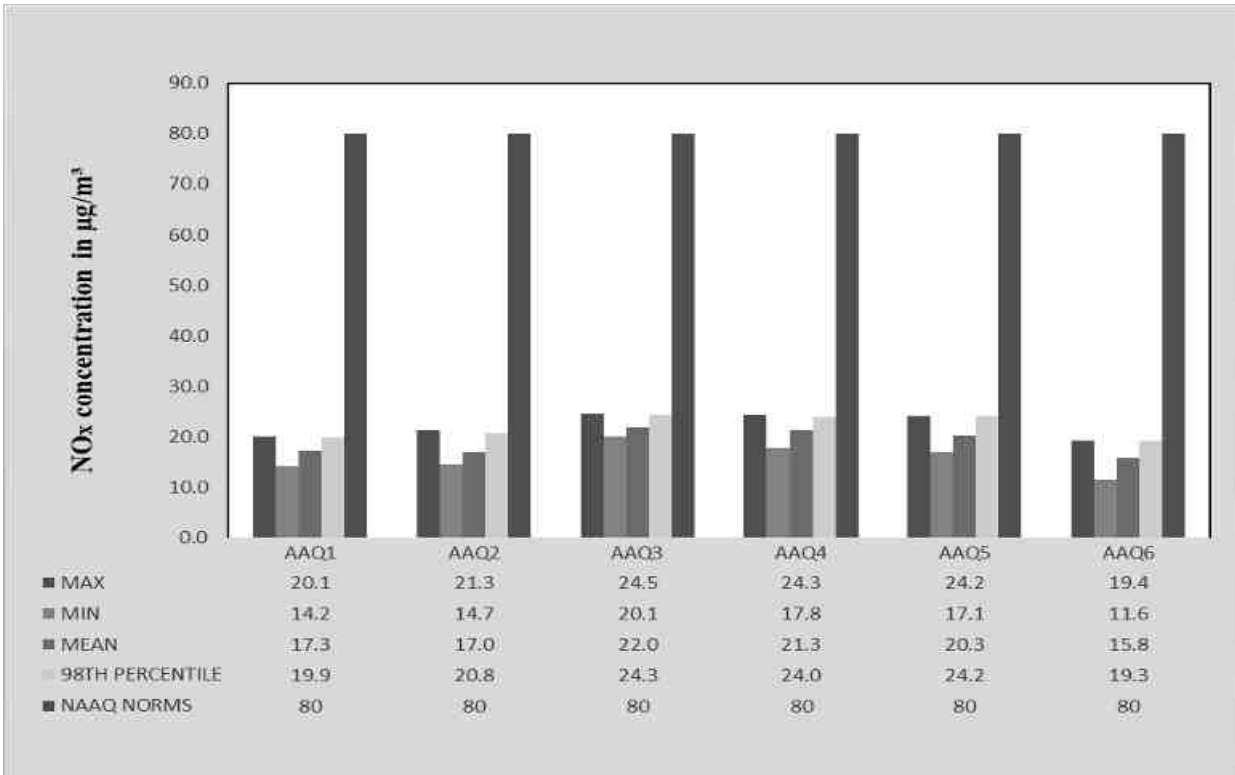


Figure 3.20 Bar Chart Showing Maximum, Minimum, And Average Concentrations of NO_x Measured from 6 Air Quality Monitoring Stations within 5 km Radius

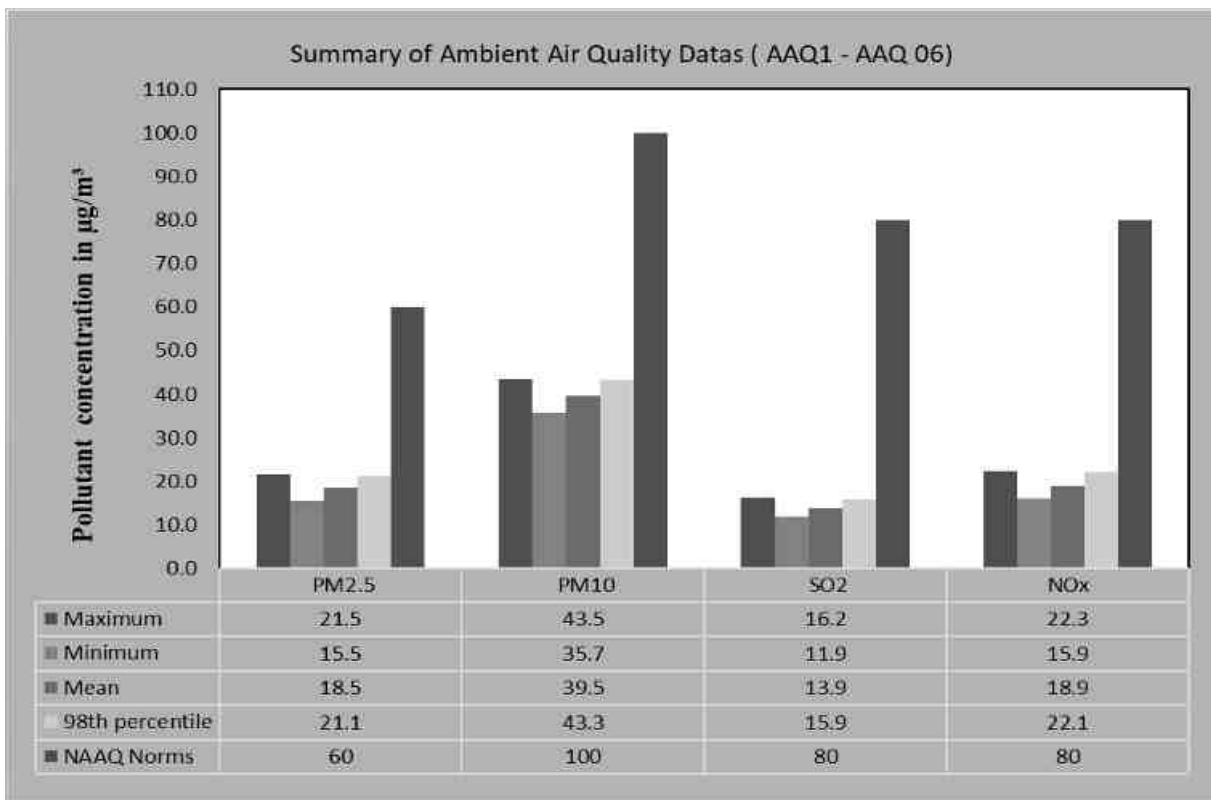


Figure 3.21 Bar Chart Showing Maximum, Minimum, and Average Concentrations of Pollutants in the Atmosphere within 5 km Radius

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 3.18 and spatial occurrence of the locations are shown in Figure 3.24.

Table 3.18 Noise Monitoring Locations

S. No	Location Code	Monitoring Locations	Distance in km	Direction	Coordinates	
					Lat	Long
1	N1	Core	--	--	12°28'49.12"N	78°21'41.94"E
2	N2	Bagimanoor	0.42	N	12°28'59.10"N	78°21'32.05"E
3	N3	Jagadevi	2.70	SW	12°28'6.44"N	78°20'20.15"E
4	N4	Jagadevi	4.46	NW	12°29'13.02"N	78°19'12.19"E
5	N5	Billakottai	3.71	SSW	12°26'39.66"N	78°21'26.82"E
6	N6	Sakilnatham	3.72	NE	12°29'46.12"N	78°23'31.06"E

Source: On-site monitoring/sampling by *Excellence Laboratory (P) Limited* in association with GTMS

Table 3.19 Ambient Noise Quality Result

Station ID	Location	Environmental setting	Average day noise level(dB(A))	Average night noise level (dB(A))	Day time (6.00 AM – 10.00 PM)	Night time (10.00 PM – 6.00 AM)
					Standard (Leq in dB(A))	
N1	Core	Industrial area	37.3	35.8	75	70
N2	Bagimanoor	Residential area	43.2	39.9	55	45
N3	Jagadevi		45.6	42.2	55	45
N4	Jagadevi		45.8	43.3	55	45
N5	Billakottai		45.4	41.4	55	45
N6	Sakilnatham		39.5	35.9	55	45

Source: On-site monitoring/sampling by *Excellence Laboratory (P) Limited* in association with GTMS

The Table 3.19 shows that noise level in core zone was 37.3dB (A) Leq during day time and 35.8 dB (A) Leq during night time. Noise levels recorded in buffer zone during day time varied from 39.5 to 45.8 dB (A) Leq and during night time from 35.9 to 43.3 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.

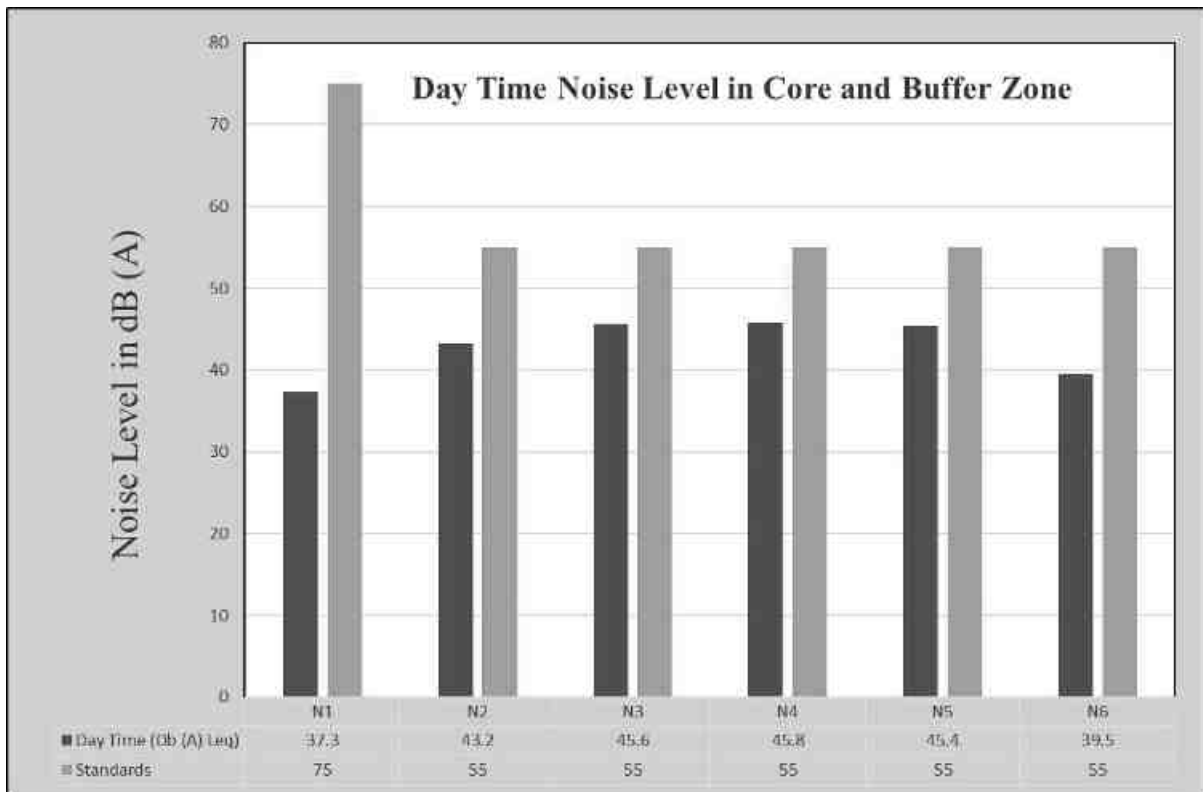


Figure 3.22 Bar Chart Showing Day Time Noise Levels Measured in Core and Buffer Zones

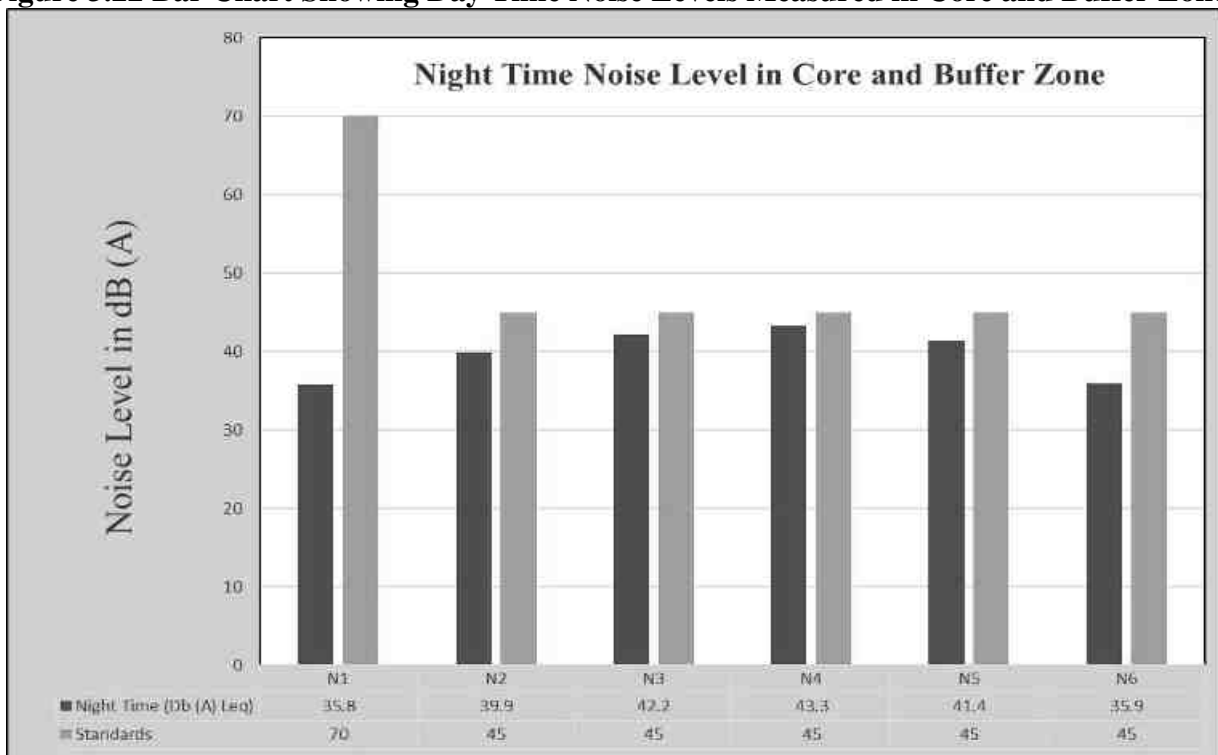


Figure 3.23 Bar Chart Showing Night Time Noise Levels Measured in Core and Buffer Zones

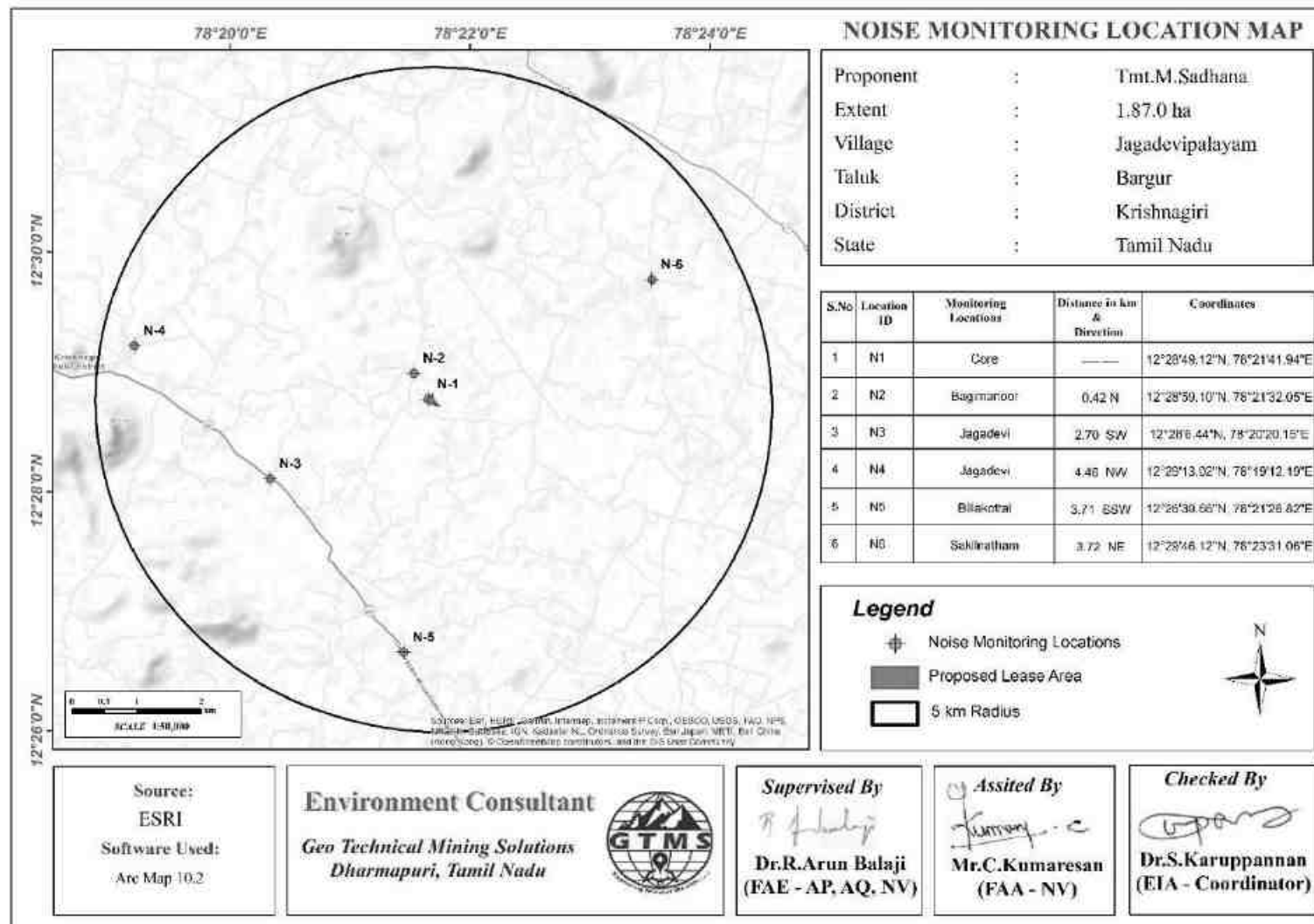


Figure 3.24 Noise Level Monitoring Station Locations around 5 km Radius from the Proposed Project Site

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

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

Shannon – Wiener Index, Evenness and Richness

Biodiversity index is a quantitative measure that reflects how many different types of species, there are in a dataset, and simultaneously takes into account how evenly the basic entities (such as individuals) are distributed among those types of species. The value of biodiversity index increases both when the number of types increases and when evenness increases. For a given number of type of species, the value of a biodiversity index is maximized when all type of species is equally abundant. The corresponding formulas are given in Table 3.21.

Table 3.21 Calculation of Species Diversity by Shannon – Wiener Index, Evenness and Richness

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

3.5.1 Flora

Flora study was conducted using the above said methodology to inventory the existing terrestrial plants in both core and buffer zones. Details of plants have been described in the succeeding sections. Photographs showing various species are provided in Figure 3.28.

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 3.22.

Table 3.22 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

From buffer zone it 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 3.23-3.25 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 3.26-3.28 and Figure 3.27.

Table 3.23 Flora in 300-meter radius

S. No	Local Name	Scientific name	Family name	Total No. of species	Total of Quadrants with species	Total No. of Quadrants	Density	Frequency (%)	Abundance	Relative Density	Relative Frequency	IVI	IUCN Conservation Status
Tree													
1	Velikathan maram	<i>Prosopis juliflora</i>	Fabaceae	7	6	8	0.9	75.0	1.2	10.6	10.7	21.3	Not Listed
2	Pongam oiltree	<i>Pongamia pin nata</i>	Fabaceae	6	5	8	0.8	62.5	1.2	9.1	8.9	18.0	Not Listed
3	Panai maram	<i>Borassus flabellifer</i>	Arecaceae	8	7	8	1.0	87.5	1.1	12.1	12.5	24.6	Not Listed
4	Nochi	<i>Vitex negundo</i>	Lamiaceae	6	5	8	0.8	62.5	1.2	9.1	8.9	18.0	Not Listed
5	Nuna maram	<i>Morinda citrifolia</i>	Rubiaceae	5	4	8	0.6	50.0	1.3	7.6	7.1	14.7	Not Listed
6	Vembu	<i>Azadirachta indica</i>	Meliaceae	7	6	8	0.9	75.0	1.2	10.6	10.7	21.3	Not Listed
7	Manga maram	<i>Mangifera indica</i>	Anacardiaceae	8	7	8	1.0	87.5	1.1	12.1	12.5	24.6	Not Listed
8	Thennai maram	<i>Cocos nucifera</i>	Arecaceae	5	4	8	0.6	50.0	1.3	7.6	7.1	14.7	Not Listed
9	Wetpalai maram	<i>Wrightia tinctoria</i>	Apocynaceae	6	5	8	0.8	62.5	1.2	9.1	8.9	18.0	Not Listed
10	Unjai maram	<i>Albizia amara</i>	Fabaceae	8	7	8	1.0	87.5	1.1	12.1	12.5	24.6	Not Listed
Shrubs													
1	Unichedi	<i>Lantana camara</i>	Verbenaceae	7	6	8	0.9	75.0	1.2	14.9	15.0	29.9	Not Listed
2	Sundaika	<i>Solanum torvum</i>	Solanaceae	8	7	8	1.0	87.5	1.1	17.0	17.5	34.5	Not Listed
3	Erukku	<i>Calotropis gigantea</i>	apocynaceae	6	5	8	0.8	62.5	1.2	12.8	12.5	25.3	Not Listed
4	Avarai	<i>Senna auriculata</i>	Fabaceae	7	6	8	0.9	75.0	1.2	14.9	15.0	29.9	Not Listed
5	Sappathikalli	<i>Cereus pterogonus</i>	Cactus	8	7	8	1.0	87.5	1.1	17.0	17.5	34.5	Not Listed
6	Kattamanaku	<i>Jatropha gossypifolia L</i>	Euphorbiaceae	5	4	8	0.6	50.0	1.3	10.6	10.0	20.6	Not Listed

7	Karunochi	<i>Vitex negundo</i>	Lamiaceae	6	5	8	0.8	62.5	1.2	12.8	12.5	25.3	Not Listed
Herbs, Climbers & Grass													
1	Thumbai	<i>Leucas aspera</i>	Lamiaceae	7	6	8	0.9	75.0	1.2	5.0	5.0	10.0	Not Listed
2	Kantang kathrikai	<i>Solanum virginianum</i>	Solanaceae	6	5	8	0.8	62.5	1.2	4.3	4.2	8.5	Not Listed
3	Arugampul	<i>Cynodon dactylon</i>	Poaceae	8	7	8	1.0	87.5	1.1	5.7	5.9	11.6	Not Listed
4	Poolai poondu	<i>Aerva lanata</i>	Amaranthaceae	7	6	8	0.9	75.0	1.2	5.0	5.0	10.0	Not Listed
5	Korai	<i>Cyperus rotundus</i>	Cyperaceae	5	4	8	0.6	50.0	1.3	3.6	3.4	6.9	Not Listed
6	Nerunji	<i>Tribulus terrestris</i>	Zygophyllales	8	7	8	1.0	87.5	1.1	5.7	5.9	11.6	Not Listed
7	Nayuruvi	<i>Achyranthes aspera</i>	Amaranthaceae	7	6	8	0.9	75.0	1.2	5.0	5.0	10.0	Not Listed
8	Thottalchinungi	<i>Mimosa pudica</i>	Mimosaceae	6	5	8	0.8	62.5	1.2	4.3	4.2	8.5	Not Listed
9	Anachundaikai	<i>Solanum violaceum</i> <i>Ortega</i>	Solanaceae	5	4	8	0.6	50.0	1.3	3.6	3.4	6.9	Not Listed
10	Kombumul	<i>Acanthospermum</i> <i>hispidum</i>	Asteraceae	6	5	8	0.8	62.5	1.2	4.3	4.2	8.5	Not Listed
11	Ponnangani	<i>Alternanthera pungens</i>	Amaranthaceae	7	6	8	0.9	75.0	1.2	5.0	5.0	10.0	Not Listed
12	wild thulasi	<i>Hyptis suaveolens (L.)</i>	Lamiaceae	8	7	8	1.0	87.5	1.1	5.7	5.9	11.6	Not Listed
13	Gopuram Tangi	<i>Andrographis echiioides</i>	Acanthaceae	7	6	8	0.9	75.0	1.2	5.0	5.0	10.0	Not Listed
14	Amman Paccharisi	<i>Euphorbia hirta</i>	Euphorbiaceae	6	5	8	0.8	62.5	1.2	4.3	4.2	8.5	Not Listed
15	Paca poondu	<i>Pavonia gallaensis</i>	Malvaceae	5	4	8	0.6	50.0	1.3	3.6	3.4	6.9	Not Listed
16	Perandai	<i>Cissus quadrangularis</i>	Vitaceae	8	7	8	1.0	87.5	1.1	5.7	5.9	11.6	Not Listed
17	Vishnukrandai	<i>Evolvulus alsinoides</i>	Convolvulaceae	7	6	8	0.9	75.0	1.2	5.0	5.0	10.0	Not Listed
18	Musumusukkai	<i>Mukia maderaspatana</i>	Cucurbitaceae	6	5	8	0.8	62.5	1.2	4.3	4.2	8.5	Not Listed
19	Sirupunaikkali	<i>Passiflora foetida</i>	Passifloraceae	7	6	8	0.9	75.0	1.2	5.0	5.0	10.0	Not Listed
20	Nagathali	<i>Opuntia dillenii</i>	Cactaceae	8	7	8	1.0	87.5	1.1	5.7	5.9	11.6	Not Listed
21	Agave	<i>Agave sisalana</i>	Asparagaceae	6	5	8	0.8	62.5	1.2	4.3	4.2	8.5	Not Listed

Table 3.24 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>	7	0.11	-2.24	-0.24
2	Pongam oiltree	<i>Pongamia pin nata</i>	6	0.09	-2.40	-0.22
3	Panai maram	<i>Borassus flabellifer</i>	8	0.12	-2.11	-0.26
4	Nochi	<i>Vitex negundo</i>	6	0.09	-2.40	-0.22
5	Nuna maram	<i>Morinda citrifolia</i>	5	0.08	-2.58	-0.20
6	Vembu	<i>Azadirachta indica</i>	7	0.11	-2.24	-0.24
7	Manga maram	<i>Mangifera indica</i>	8	0.12	-2.11	-0.26
8	Thennai maram	<i>Cocos nucifera</i>	5	0.08	-2.58	-0.20
9	Wetpalai maram	<i>Wrightia tinctoria</i>	6	0.09	-2.40	-0.22
10	Unjai maram	<i>Albizia amara</i>	8	0.12	-2.11	-0.26
H (Shannon Diversity Index) =2.29						
Shrubs						
1	Unichedi	<i>Lantana camara</i>	7	0.15	-1.90	-0.28
2	Sundaika	<i>Solanum torvum</i>	8	0.17	-1.77	-0.30
3	Erukku	<i>Calotropis gigantea</i>	6	0.13	-2.06	-0.26
4	Avarai	<i>Senna auriculata</i>	7	0.15	-1.90	-0.28
5	Sappathikalli	<i>Cereus pterogonus</i>	8	0.17	-1.77	-0.30
6	Kattamanaku	<i>Jatropha gossypifolia L</i>	5	0.11	-2.24	-0.24
7	Karunochi	<i>Vitex negundo</i>	6	0.13	-2.06	-0.26
H (Shannon Diversity Index) =1.93						
HERBS						
1	Thumbai	<i>Leucas aspera</i>	7	0.05	-3.00	-0.15
2	Kantang kathrikai	<i>Solanum virginianum</i>	6	0.04	-3.15	-0.13
3	Arugampul	<i>Cynodon dactylon</i>	8	0.06	-2.86	-0.16
4	Poolai poondu	<i>Aerva lanata</i>	7	0.05	-3.00	-0.15
5	Korai	<i>Cyperus rotundus</i>	5	0.04	-3.33	-0.12
6	Nerunji	<i>Tribulus terrestris</i>	8	0.06	-2.86	-0.16
7	Nayuruvi	<i>Achyranthes aspera</i>	7	0.05	-3.00	-0.15
8	Thottalchinungi	<i>Mimosa pudica</i>	6	0.04	-3.15	-0.13
9	Anachundaikai	<i>Solanum violaceum Ortega</i>	5	0.04	-3.33	-0.12

10	Kombumul	<i>Acanthospermum hispidum</i>	6	0.04	-3.15	-0.13
11	Ponnangani	<i>Alternanthera pungens</i>	7	0.05	-3.00	-0.15
12	wild thulasi	<i>Hyptis suaveolens (L.)</i>	8	0.06	-2.86	-0.16
13	Gopuram Tangi	<i>Andrographis echiioides</i>	7	0.05	-3.00	-0.15
14	Amman Paccharisi	<i>Euphorbia hirta</i>	6	0.04	-3.15	-0.13
15	Paca poondu	<i>Pavonia gallaensis</i>	5	0.04	-3.33	-0.12
16	Perandai	<i>Cissus quadrangularis</i>	8	0.06	-2.86	-0.16
17	Vishnukrandai	<i>Evolvulus alsinoides</i>	7	0.05	-3.00	-0.15
18	Musumusukkai	<i>Mukia maderaspatana</i>	6	0.04	-3.15	-0.13
19	Sirupunaikkali	<i>Passiflora foetida</i>	7	0.05	-3.00	-0.15
20	Nagathali	<i>Opuntia dillenii</i>	8	0.06	-2.86	-0.16
21	Agave	<i>Agave sisalana</i>	6	0.04	-3.15	-0.13
H (Shannon Diversity Index) =3.03						

Table 3.25 Species Richness (Index) in 300 m Radius

Details	H	H max	Evenness	Species Richness
Tree	2.29	2.30	0.99	2.15
Shrubs	1.93	1.95	0.99	1.56
Herbs	3.03	3.04	1.00	4.05

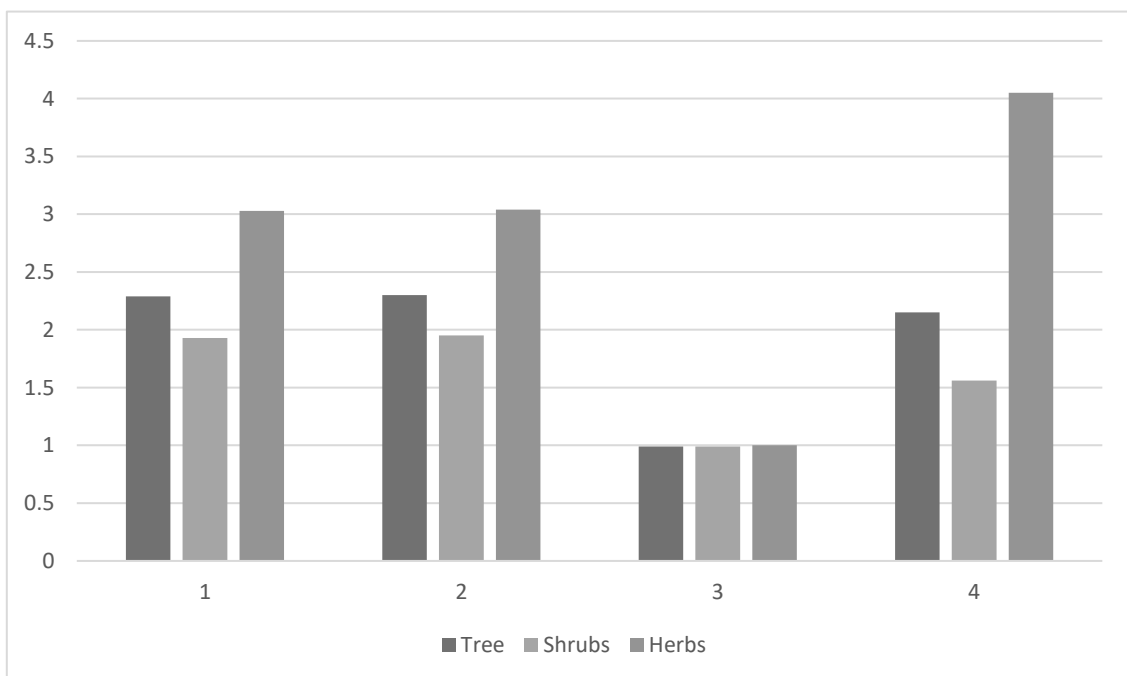


Figure. 3.26 Species Richness (Index) in 300-meter radius

Table 3.26 Flora in Buffer Zone

S. No	Local Name	Scientific name	Family name	Total No. of species	Total of Quadrants with species	Total No. of Quadrants	Density	Frequency (%)	Abundance	Relative Density	Relative Frequency	IVI	IUCN Conservation Status
Tree													
1	Vembu	<i>Azadirachta indica</i>	Meliaceae	6	5	10	0.6	50.0	1.2	2.8	2.7	0.6	Not Listed
2	Pongam oiltree	<i>Pongamia pinnata</i>	Fabaceae	7	6	10	0.7	60.0	1.2	3.2	3.2	0.7	Not Listed
3	Karuvelam	<i>Acacia nilotica</i>	Mimosaceae	8	7	10	0.8	70.0	1.1	3.7	3.7	0.8	Not Listed
4	Thennai maram	<i>Cocos nucifera</i>	Arecaceae	5	4	10	0.5	40.0	1.3	2.3	2.1	0.5	Not Listed
5	Arasanmaram	<i>Ficus religiosa</i>	Moraceae	4	3	10	0.4	30.0	1.3	1.8	1.6	0.4	Not Listed
6	Puliyamaram	<i>Tamarindus indica</i>	Legumes	7	6	10	0.7	60.0	1.2	3.2	3.2	0.7	Not Listed
7	Punnai	<i>Calophyllum inophyllum</i>	Calophyllaceae	8	7	10	0.8	70.0	1.1	3.7	3.7	0.8	Not Listed
8	Athi	<i>Ficus recemosa</i>	Moraceae	7	6	10	0.7	60.0	1.2	3.2	3.2	0.7	Not Listed
9	Vazhaimaram	<i>Musa</i>	Musaceae	6	5	10	0.6	50.0	1.2	2.8	2.7	0.6	Not Listed
10	Kadukka puli	<i>Terminalia chebula</i>	Combretaceae	5	4	10	0.5	40.0	1.3	2.3	2.1	0.5	Not Listed
11	Nettilinkam	<i>Polylathia longifolia</i>	Annonaceae	7	6	10	0.7	60.0	1.2	3.2	3.2	0.7	Not Listed
12	Perumungil	<i>Bambusa bambos</i>	Poaceae	8	7	10	0.8	70.0	1.1	3.7	3.7	0.8	Not Listed
13	Sapota	<i>Manilkara zapota</i>	Sapotaceae	9	8	10	0.9	80.0	1.1	4.1	4.3	0.9	Not Listed
14	Eucalyptus	<i>Eucalyptus globules</i>	Myrtaceae	6	5	10	0.6	50.0	1.2	2.8	2.7	0.6	Not Listed

15	Navalmaram	<i>Sygygium cumini</i>	Myrtaceae	7	6	10	0.7	60.0	1.2	3.2	3.2	0.7	Not Listed
16	Ezhumuchai maram	<i>Citrus lemon</i>	Rutaceae	8	7	10	0.8	70.0	1.1	3.7	3.7	0.8	Not Listed
17	Alamaram	<i>Ficus benghalensis</i>	Moraceae	6	5	10	0.6	50.0	1.2	2.8	2.7	0.6	Not Listed
18	Panai maram	<i>Borassus flabellifer</i>	Arecaceae	5	4	10	0.5	40.0	1.3	2.3	2.1	0.5	Not Listed
19	Manga	<i>Mangifera indica</i>	Anacardiaceae	9	8	10	0.9	80.0	1.1	4.1	4.3	0.9	Not Listed
20	Thekku	<i>Tectona grandis</i>	Verbenaceae	7	6	10	0.7	60.0	1.2	3.2	3.2	0.7	Not Listed
21	Nelli	<i>Emblica officinalis</i>	Phyllanthaceae	6	5	10	0.6	50.0	1.2	2.8	2.7	0.6	Not Listed
22	Nettilinkam	<i>Polylathia longifolia</i>	Annonaceae	8	7	10	0.8	70.0	1.1	3.7	3.7	0.8	Not Listed
23	Vellai Karuvelam	<i>Vachellia nilotica</i>	Fabaceae	7	6	10	0.7	60.0	1.2	3.2	3.2	0.7	Not Listed
24	Palamaram	<i>Artocarpus heterophyllus</i>	Moraceae	6	5	10	0.6	50.0	1.2	2.8	2.7	0.6	Not Listed
25	Vadanarayani	<i>Delonix elata</i>	Fabaceae	7	6	10	0.7	60.0	1.2	3.2	3.2	0.7	Not Listed
26	Marudaani	<i>Lawsonia inermis</i>	Lythraceae	9	8	10	0.9	80.0	1.1	4.1	4.3	0.9	Not Listed
27	Pappali maram	<i>Carica papaya L</i>	Caricaceae	8	7	10	0.8	70.0	1.1	3.7	3.7	0.8	Not Listed
28	Nuna maram	<i>Morinda citrifolia</i>	Rubiaceae	6	5	10	0.6	50.0	1.2	2.8	2.7	0.6	Not Listed
29	Koyya	<i>Psidium guajava</i>	Myrtaceae	10	9	10	1.0	90.0	1.1	4.6	4.8	1.0	Not Listed
30	Seethapazham	<i>Annona reticulata</i>	Annonaceae	9	8	10	0.9	80.0	1.1	4.1	4.3	0.9	Not Listed
31	Moonghil	<i>Bambusa bambo</i>	Poaceae	7	6	10	0.7	60.0	1.2	3.2	3.2	0.7	Not Listed
Shrubs													
1	Avarai	<i>Senna auriculata</i>	Fabaceae	8	7	10	0.8	70.0	1.1	9.5	9.6	19.1	Not Listed
2	Sundaika	<i>Solanum torvum</i>	Solanaceae	9	8	10	0.9	80.0	1.1	10.7	11.0	21.7	Not Listed
3	Arali	<i>Nerium indicum</i>	Apocynaceae	7	6	10	0.7	60.0	1.2	8.3	8.2	16.6	Not Listed
4	Idlipoo	<i>xoracoc cineo</i>	Rubiaceae	6	5	10	0.6	50.0	1.2	7.1	6.8	14.0	Not Listed
5	Neermulli	<i>Hydrophila auriculata</i>	Acanthaceae	7	6	10	0.7	60.0	1.2	8.3	8.2	16.6	Not Listed
6	Icham	<i>Phoenix pusilla</i>	Arecaceae	8	7	10	0.8	70.0	1.1	9.5	9.6	19.1	Not Listed

7	Chaturakalli	<i>Euphorbia antiquorum</i>	Euphorbiaceae	9	8	10	0.9	80.0	1.1	10.7	11.0	21.7	Not Listed
8	Kattamanakku	<i>Jatropha curcas</i>	Euphorbiaceae	6	5	10	0.6	50.0	1.2	7.1	6.8	14.0	Not Listed
9	Thuthi	<i>Abutilon indicum</i>	Meliaceae	7	6	10	0.7	60.0	1.2	8.3	8.2	16.6	Not Listed
10	Chemparuthi	<i>Hibiscu rosa-sinensis</i>	Malvaceae	9	8	10	0.9	80.0	1.1	10.7	11.0	21.7	Not Listed
11	Erukku	<i>Calotropis gigantea</i>	Apocynaceae	8	7	10	0.8	70.0	1.1	9.5	9.6	19.1	Not Listed
Herbs, Climber, Creeper, Grass & Cactus													
1	Thumbai	<i>Leucas aspera</i>	Lamiaceae	9	8	12	0.8	66.7	1.1	3.1	3.1	6.2	Not Listed
2	Parttiniyam	<i>Parthenium</i>	Asteraceae	7	6	12	0.6	50.0	1.2	2.4	2.4	4.8	Not Listed
3	Thoiya keerai	<i>Digeria muricata</i>	Amarantheceae	8	7	12	0.7	58.3	1.1	2.7	2.8	5.5	Not Listed
4	Pulliyari	<i>Oxalis corniculata</i>	Oxalidaceae	6	5	12	0.5	41.7	1.2	2.1	2.0	4.0	Not Listed
5	Mukuratthai	<i>Boerhavia diffusa</i>	Nyctaginaceae	5	4	12	0.4	33.3	1.3	1.7	1.6	3.3	Not Listed
6	Thulasi	<i>Ocimum tenuiflorum</i>	Lamiaceae	10	9	12	0.8	75.0	1.1	3.4	3.5	7.0	Not Listed
7	Arugampul	<i>Cynodon dactylon</i>	Poaceae	11	10	12	0.9	83.3	1.1	3.8	3.9	7.7	Not Listed
8	Manjal	<i>Curcuma longa</i>	Zingiberaceae	9	8	12	0.8	66.7	1.1	3.1	3.1	6.2	Not Listed
9	Manathakkali	<i>Solanumnigrum</i>	Solanaceae	7	6	12	0.6	50.0	1.2	2.4	2.4	4.8	Not Listed
10	Nai kadugu	<i>Celome viscosa</i>	Capparidaceae	6	5	12	0.5	41.7	1.2	2.1	2.0	4.0	Not Listed
11	Koraikkilangu	<i>Cyperus articulates</i>	Cyperaceae	8	7	12	0.7	58.3	1.1	2.7	2.8	5.5	Not Listed
12	Karisilanganni	<i>Eclipta prostrata</i>	Asteraceae	9	8	12	0.8	66.7	1.1	3.1	3.1	6.2	Not Listed
13	Korai	<i>Cyperus rotundus</i>	Cyperaceae	7	6	12	0.6	50.0	1.2	2.4	2.4	4.8	Not Listed
14	Kunnakora	<i>Cyperus compressus</i>	Cyperaceae	6	5	12	0.5	41.7	1.2	2.1	2.0	4.0	Not Listed
15	Mukurattai	<i>Boerhavia diffusa</i>	Nyctaginaceae	8	7	12	0.7	58.3	1.1	2.7	2.8	5.5	Not Listed
16	Kovai	<i>Coccinia grandis</i>	Cucurbitaceae	9	8	12	0.8	66.7	1.1	3.1	3.1	6.2	Not Listed
17	Perandai	<i>Cissus quadrangularis</i>	Vitaceae	10	9	12	0.8	75.0	1.1	3.4	3.5	7.0	Not Listed
18	Mudakkotan	<i>Cardiospermum helicacabum</i>	Sapindaceae	6	5	12	0.5	41.7	1.2	2.1	2.0	4.0	Not Listed

19	Sangupoo	<i>Clitoriaternatia</i>	Fabaceae	7	6	12	0.6	50.0	1.2	2.4	2.4	4.8	Not Listed
20	Malli	<i>Jasminum augustifolium</i>	Oleaceae	5	4	12	0.4	33.3	1.3	1.7	1.6	3.3	Not Listed
21	Vallikeerai	<i>Ipomoea aquatica</i>	Convolvulaceae	8	7	12	0.7	58.3	1.1	2.7	2.8	5.5	Not Listed
22	Siru puladi	<i>Desmodium triflorum</i>	Fabaceae	9	8	12	0.8	66.7	1.1	3.1	3.1	6.2	Not Listed
23	Sithrapaalavi	<i>Euphorbia prostrata</i>	Euphorbiaceae	7	6	12	0.6	50.0	1.2	2.4	2.4	4.8	Not Listed
24	mookuthi poondu	<i>Wedelia trilobata</i>	Asteraceae	8	7	12	0.7	58.3	1.1	2.7	2.8	5.5	Not Listed
25	Pullu	<i>Eragrostis ferruginea</i>	Poaceae	11	10	12	0.9	83.3	1.1	3.8	3.9	7.7	Not Listed
26	Chevvarakupul	<i>Chloris barbata</i>	Amaranthaceae	9	8	12	0.8	66.7	1.1	3.1	3.1	6.2	Not Listed
27	Nagathali	<i>Opuntia dillenii</i>	Nagathali	8	7	12	0.7	58.3	1.1	2.7	2.8	5.5	Not Listed
28	Nayuruvi	<i>Achyranthes aspera</i>	Amaranthaceae	7	6	12	0.6	50.0	1.2	2.4	2.4	4.8	Not Listed
29	Veetukaayapoondu	<i>Tridax procumbens</i>	Asteraceae	6	5	12	0.5	41.7	1.2	2.1	2.0	4.0	Not Listed
30	Kaattu piral	<i>Hibiscus hispidissimus</i>	Malvaceae	5	4	12	0.4	33.3	1.3	1.7	1.6	3.3	Not Listed
31	Kuppaimeni	<i>Acalypha indica</i>	Euphorbiaceae	9	8	12	0.8	66.7	1.1	3.1	3.1	6.2	Not Listed
32	Karisilanganni	<i>Eclipta prostata</i>	Asteraceae	8	7	12	0.7	58.3	1.1	2.7	2.8	5.5	Not Listed
33	Korai	<i>Cyperus rotundus</i>	Cyperaceae	7	6	12	0.6	50.0	1.2	2.4	2.4	4.8	Not Listed
34	Kumattikkirai	<i>Allmania nodiflora</i>	Amaranthaceae	6	5	12	0.5	41.7	1.2	2.1	2.0	4.0	Not Listed
35	Kunnakora	<i>Cyperus compressus</i>	Cyperaceae	7	6	12	0.6	50.0	1.2	2.4	2.4	4.8	Not Listed
36	Keelaneeli	<i>Phyllanthus niruri</i>	Phyllanthaceae	8	7	12	0.7	58.3	1.1	2.7	2.8	5.5	Not Listed
37	Kanamvazhalai	<i>Commelina benghalensis</i>	Commelinaceae	9	8	12	0.8	66.7	1.1	3.1	3.1	6.2	Not Listed
38	Thottalchinungi	<i>Mimosa pudica</i>	Mimosaceae	7	6	12	0.6	50.0	1.2	2.4	2.4	4.8	Not Listed

Table 3.27 Calculation of Species Diversity in Buffer Zone

S. No	Common name	Scientific name	No. of Species	Pi	In (Pi)	Pi x in (Pi)
Tree						
1	Vembu	<i>Azadirachta indica</i>	6	0.03	-3.59	-0.10
2	Pongam oiltree	<i>Pongamia pinnata</i>	7	0.03	-3.44	-0.11
3	Karuvelam	<i>Acacia nilotica</i>	8	0.04	-3.31	-0.12
4	Thennai maram	<i>Cocos nucifera</i>	5	0.02	-3.78	-0.09
5	Arasanmaram	<i>Ficus religiosa</i>	4	0.02	-4.00	-0.07
6	Puliyamaram	<i>Tamarindus indica</i>	7	0.03	-3.44	-0.11
7	Punnai	<i>Calophyllu inophyllum</i>	8	0.04	-3.31	-0.12
8	Athi	<i>Ficus recemosa</i>	7	0.03	-3.44	-0.11
9	Vazhaimaram	<i>Musa</i>	6	0.03	-3.59	-0.10
10	Kadukka puli	<i>Terminalia chebula</i>	5	0.02	-3.78	-0.09
11	Nettilinkam	<i>Polylathia longifolia</i>	7	0.03	-3.44	-0.11
12	Perumungil	<i>Bambusa bambos</i>	8	0.04	-3.31	-0.12
13	Sapota	<i>Manilkara zapota</i>	9	0.04	-3.19	-0.13
14	Eucalyptus	<i>Eucalyptus globules</i>	6	0.03	-3.59	-0.10
15	Navalmaram	<i>Sygygium cumini</i>	7	0.03	-3.44	-0.11
16	Ezhumuchai maram	<i>Citrus lemon</i>	8	0.04	-3.31	-0.12
17	Alamaram	<i>Ficus benghalensis</i>	6	0.03	-3.59	-0.10
18	Panai maram	<i>Borassus flabellifer</i>	5	0.02	-3.78	-0.09
19	Manga	<i>Mangifera indica</i>	9	0.04	-3.19	-0.13
20	Thekku	<i>Tectona grandis</i>	7	0.03	-3.44	-0.11
21	Nelli	<i>Emblica officinalis</i>	6	0.03	-3.59	-0.10
22	Nettilinkam	<i>Polylathia longifolia</i>	8	0.04	-3.31	-0.12
23	Vellai Karuvelam	<i>Vachellia nilotica</i>	7	0.03	-3.44	-0.11
24	Palamaram	<i>Artocarpus heterophyllus</i>	6	0.03	-3.59	-0.10
25	Vadanarayani	<i>Delonix elata</i>	7	0.03	-3.44	-0.11
26	Marudaani	<i>Lawsonia inermis</i>	9	0.04	-3.19	-0.13
27	Pappali maram	<i>Carica papaya L</i>	8	0.04	-3.31	-0.12
28	Nuna maram	<i>Morinda citrifolia</i>	6	0.03	-3.59	-0.10
29	Koyya	<i>Psidium guajava</i>	10	0.05	-3.08	-0.14
30	Seethapazham	<i>Annona reticulata</i>	9	0.04	-3.19	-0.13
31	Moonghil	<i>Bambusa bambo</i>	7	0.03	-3.44	-0.11
H (Shannon Diversity Index) =3.41						
Shrubs						
1	Avarai	<i>Senna auriculata</i>	8	0.10	-2.35	-0.22
2	Sundaika	<i>Solanum torvum</i>	9	0.11	-2.23	-0.24
3	Arali	<i>Nerium indicum</i>	7	0.08	-2.48	-0.21
4	Idlipoo	<i>xoracoc cineia</i>	6	0.07	-2.64	-0.19

5	Neermulli	<i>Hydrophila auriculata</i>	7	0.08	-2.48	-0.21
6	Icham	<i>Phoenix pusilla</i>	8	0.10	-2.35	-0.22
7	Chaturakalli	<i>Euphorbia antiquorum</i>	9	0.11	-2.23	-0.24
8	Kattamanakku	<i>Jatropha curcas</i>	6	0.07	-2.64	-0.19
9	Thuthi	<i>Abutilon indicum</i>	7	0.08	-2.48	-0.21
10	Chemparuthi	<i>Hibiscu rosa-sinensis</i>	9	0.11	-2.23	-0.24
11	Erukku	<i>Calotropis gigantea</i>	8	0.10	-2.35	-0.22
H (Shannon Diversity Index) =2.39						
Herbs, Climber, Creeper, Grass & Cactus						
1	Thumbai	<i>Leucas aspera</i>	9	0.03	-3.48	-0.11
2	Parttiniyam	<i>Parthenium</i>	7	0.02	-3.73	-0.09
3	Thoiya keerai	<i>Digeria muricata</i>	8	0.03	-3.60	-0.10
4	Pulliyari	<i>Oxalis corniculata</i>	6	0.02	-3.88	-0.08
5	Mukuratthai	<i>Boerhavia diffusa</i>	5	0.02	-4.07	-0.07
6	Thulasi	<i>Ocimum tenuiflorum</i>	10	0.03	-3.37	-0.12
7	Arugampul	<i>Cynodon dactylon</i>	11	0.04	-3.28	-0.12
8	Manjal	<i>Curcuma longa</i>	9	0.03	-3.48	-0.11
9	Manathakkali	<i>Solanumnigrum</i>	7	0.02	-3.73	-0.09
10	Nai kadugu	<i>Celome viscosa</i>	6	0.02	-3.88	-0.08
11	Koraikkilangu	<i>Cyperus articulates</i>	8	0.03	-3.60	-0.10
12	Karisilanganni	<i>Eclipta prostata</i>	9	0.03	-3.48	-0.11
13	Korai	<i>Cyperus rotundus</i>	7	0.02	-3.73	-0.09
14	Kunnakora	<i>Cyperus compressus</i>	6	0.02	-3.88	-0.08
15	Mukurattai	<i>Boerhavia diffusa</i>	8	0.03	-3.60	-0.10
16	Kovai	<i>Coccinia grandis</i>	9	0.03	-3.48	-0.11
17	Perandai	<i>Cissus quadrangularis</i>	10	0.03	-3.37	-0.12
18	Mudakkotan	<i>Cardiospermum helicacabum</i>	6	0.02	-3.88	-0.08
19	Sangupoo	<i>Clitoriaternatia</i>	7	0.02	-3.73	-0.09
20	Malli	<i>Jasminum augustifolium</i>	5	0.02	-4.07	-0.07
21	Vallikeerai	<i>Ipomoea aquatica</i>	8	0.03	-3.60	-0.10
22	Siru puladi	<i>Desmodium triflorum</i>	9	0.03	-3.48	-0.11
23	Sithrapaalavi	<i>Euphorbia prostrata</i>	7	0.02	-3.73	-0.09
24	mookuthi poondu	<i>Wedelia trilobata</i>	8	0.03	-3.60	-0.10
25	Pullu	<i>Eragrostis ferruginea</i>	11	0.04	-3.28	-0.12
26	Chevvarakupul	<i>Chloris barbata</i>	9	0.03	-3.48	-0.11
27	Nagathali	<i>Opuntia dillenii</i>	8	0.03	-3.60	-0.10
28	Nayuruvi	<i>Achyranthes aspera</i>	7	0.02	-3.73	-0.09
29	Veetukaayapoondu	<i>Tridax procumbens</i>	6	0.02	-3.88	-0.08
30	Kaattu piral	<i>Hibiscus hispidissimus</i>	5	0.02	-4.07	-0.07
31	Kuppaimeni	<i>Acalypha indica</i>	9	0.03	-3.48	-0.11
32	Karisilanganni	<i>Eclipta prostata</i>	8	0.03	-3.60	-0.10

33	Korai	<i>Cyperus rotundus</i>	7	0.02	-3.73	-0.09
34	Kumattikkirai	<i>Allmania nodiflora</i>	6	0.02	-3.88	-0.08
35	Kunnakora	<i>Cyperus compressus</i>	7	0.02	-3.73	-0.09
36	Keelaneeli	<i>Phyllanthus niruri</i>	8	0.03	-3.60	-0.10
37	Kanamvazhalai	<i>Commelina benghalensis</i>	9	0.03	-3.48	-0.11
38	Thottalchinungi	<i>Mimosa pudica</i>	7	0.02	-3.73	-0.09
H (Shannon Diversity Index) =3.62						

Table 3.28 Species Richness (Index) in Buffer Zone

Details	H	H max	Evenness	Species Richness
Tree	3.41	3.43	0.99	5.57
Shrubs	2.39	2.40	1.00	2.26
Herbs	3.62	3.64	0.99	6.52

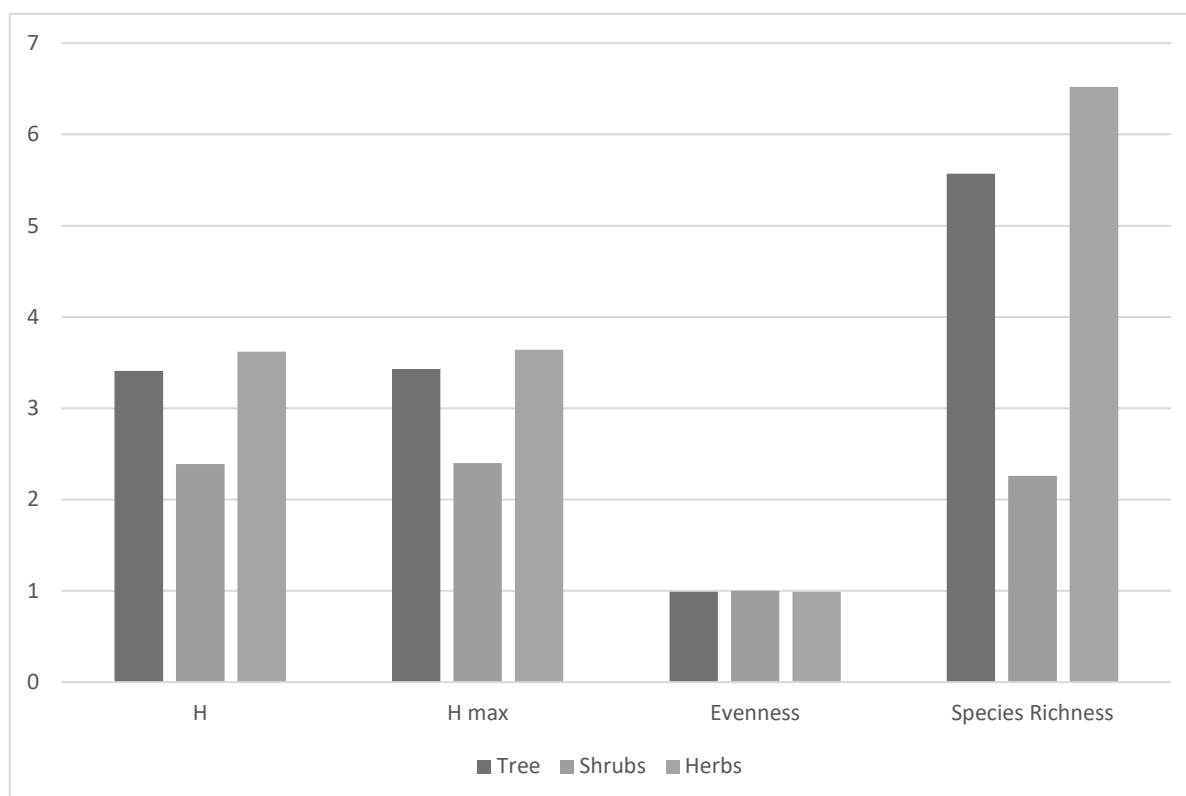


Figure. 3.27 Species Richness (Index) in 300-meter radius



Prosopis juliflora



Senna siamea



Croton bonplandianus



Wrightia tinctoria



Cissus quadrangularis



Agave sisalana



Stachytarpheta jamaicensis



Tephrosia purpurea



Sida cordifolia L



Hyptis suaveolens



sida acuta



Lantana camara



Albizia amara



Leucas aspera



Azadirachta indica



Annona squamosa



Mangifera indica



Opuntia

Figure 3.28 Flora in Core and Buffer Area

Aquatic Vegetation

The field survey for assessing the aquatic vegetation was also undertaken during the study period. The list of aquatic plants observed in the study area is given in Table 3.29.

Table 3.29 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 3.44

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 3.30 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 Jagadevipayam 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. 3.31.

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. 3.34. data collation in secondary data.

Table 3.31 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 3.32 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	Plaina 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>Eudynamis scolopaceus</i>	Cuculidae	LC
25	Asian green bee- Eater	<i>Merops orientails</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	Commen sandpiper	<i>Actitis hypoleucos</i>	Scolopacidae	LC
44	Striated heron	<i>Butorides striata</i>	Ardeidae	LC
45	Laughine dove	<i>Spilopelia senegalensis</i>	Columbidae	LC
46	Red vented bulbul	<i>Pycnonotus cafer</i>	Pycnonotidae	LC

47	Black winked 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>	Bufoidea	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. 3.33 and Figure 3.29 Agricultural land in the study area.

Table 3.33 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

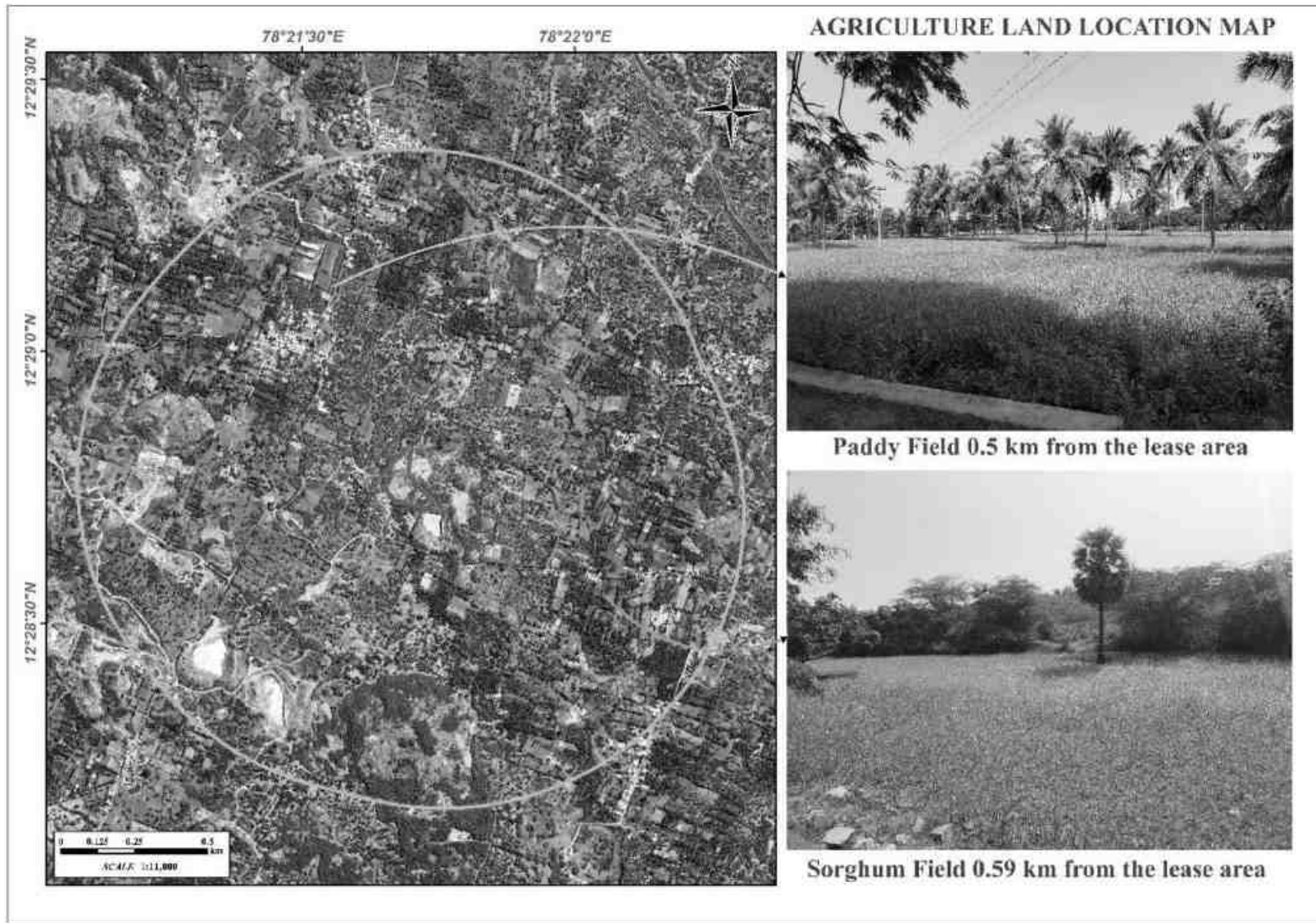
Horticulture includes cultivation of fruits, vegetables, nuts, seeds, herbs, sprouts, mushrooms, algae, flowers, seaweeds and non-food crops such as grass and ornamental trees and plants. It also includes plant conservation, landscape restoration, landscape and garden design.

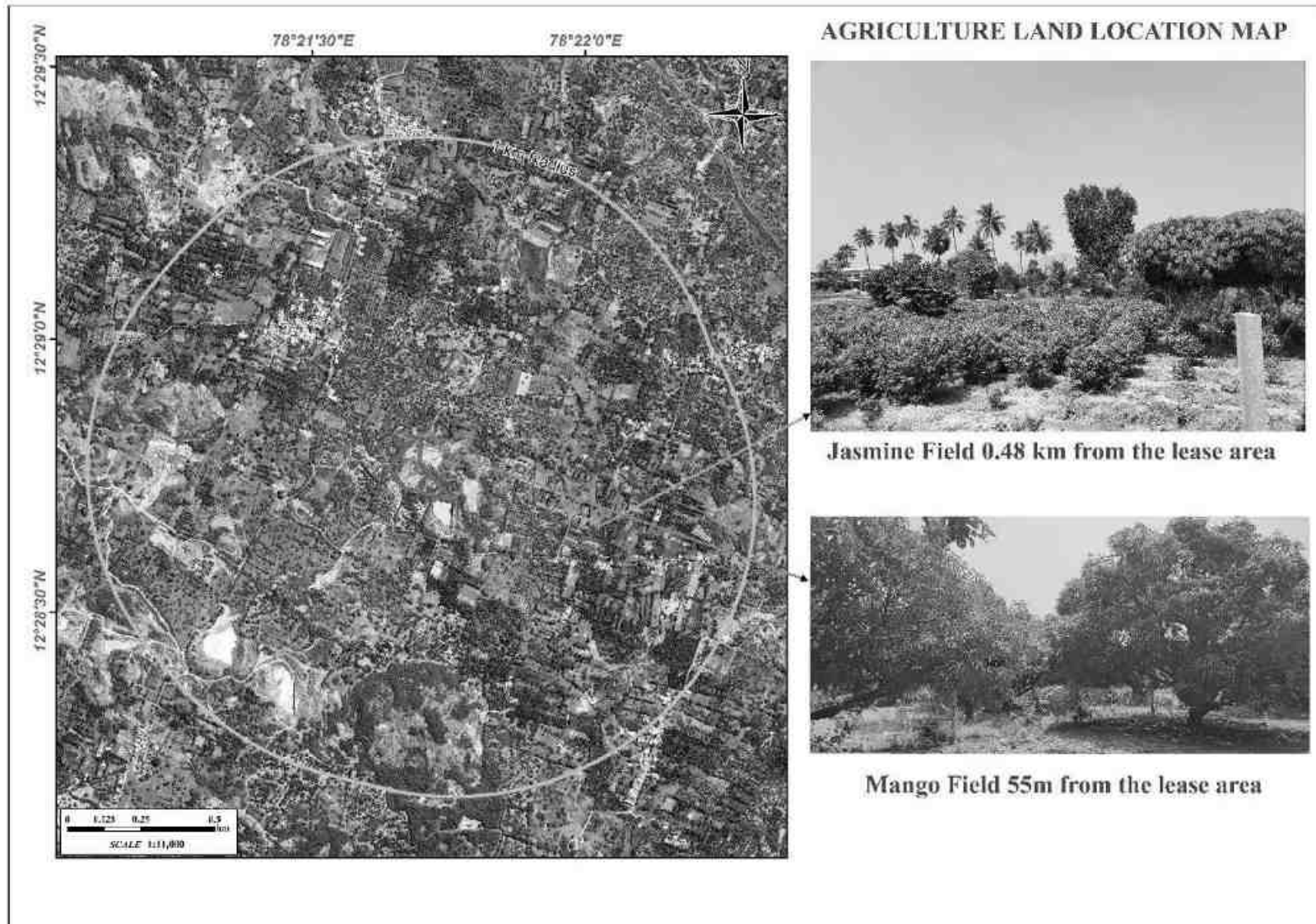
Horticulture

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 3.34.

Table 3.34 Major Field Crops & Horticulture cultivation in 1km radius.

Sl.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





AGRICULTURE LAND LOCATION MAP



Jasmine Field 0.48 km from the lease area



Mango Field 55m from the lease area

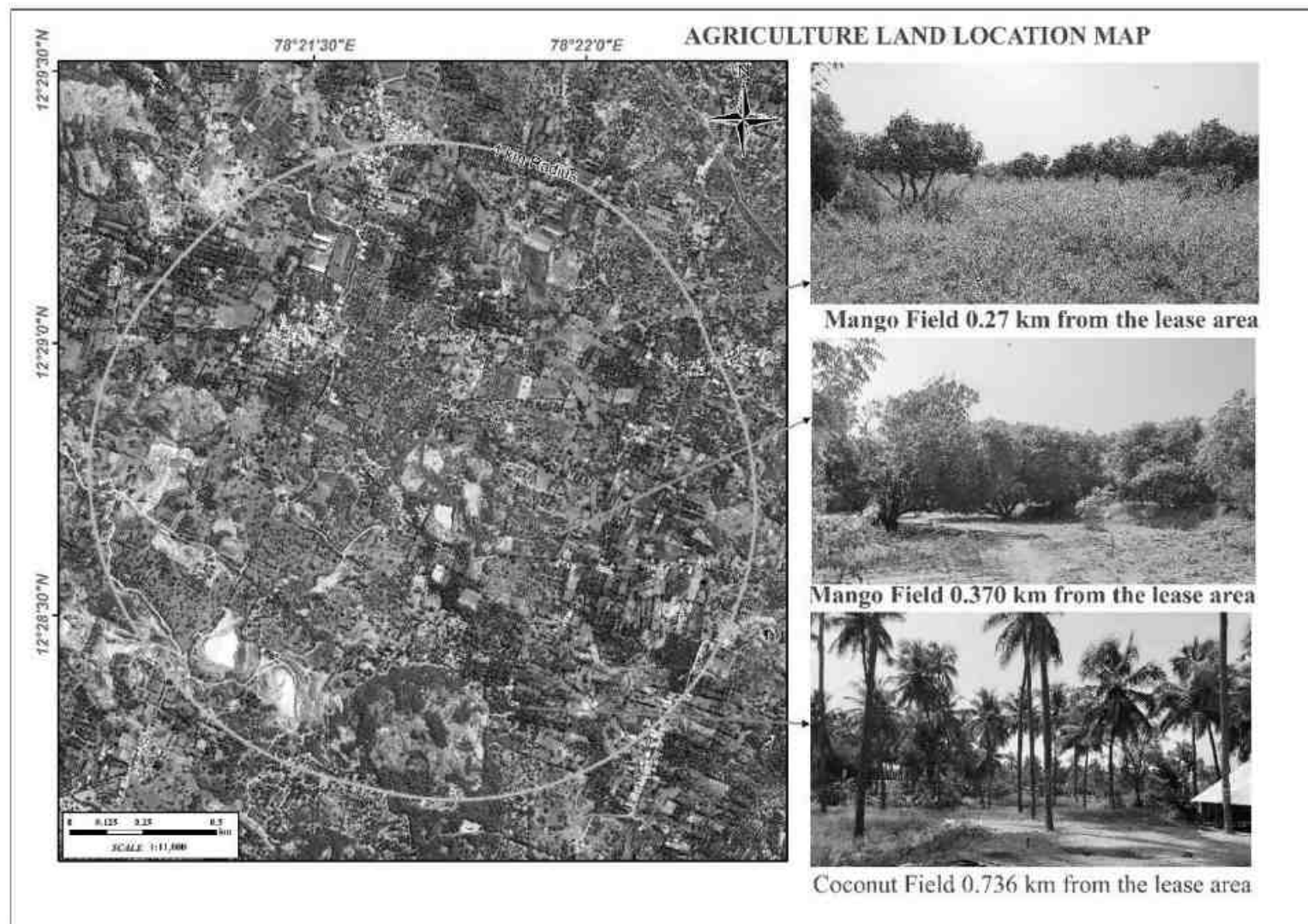


Figure 3.29 Agricultural land in the study area

Results

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

3.6 SOCIO ECONOMIC ENVIRONMENT

Socio-economic study is an essential part of environmental study. It is a measure of an individual's or family's or group of people's economic and social position based on education, income, health, and occupation. Socio-economic most important determinant of livelihoods as levels of knowledge, skill and income conditions which mean for their living. People from one income group to another consumption power is also differ among income groups of population This will help in visualizing and predicting the possible impact depending upon the nature and magnitude of the project It is expected that the socio-economic status of the area will substantially improve because of this proposed project. As the proposed project will provide direct and indirect employment and improve the infrastructural facilities in that area, thus leading to the improvement of their standard of living.

3.6.1 Objectives of the Study

The main objectives of the study are as follows:

- To study the demographic conditions by level of income of sample population in the study area.
- To analyses the level of education among different income groups of population.
- To investigate the housing situation by level of income of the sample population in the study unit

3.6.2 Scope of Work

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

3.6.3 Socio-Economic Status of Study area

The study area covers 9 villages including Mallapadi, Achamangalam, Kondappanayakempalli, Jagadevipalayam, Batlapalli, Ikondamkothapalli, Guttur, Kannandahalli, Mahadevagollahalli. Jagadevipalayam is the village in which the proposed project site is located, the summary of population facts for the village is exclusively provided in Table 3.35 and for other 8 villages in Tables 3.36 - 3.38.

Table 3.35 Jagadevipalayam, Village Population Facts

Jagadevipalayam	
Number of Households	974
Population	6,747
Male Population	2150(51.45%)
Female Population	2029(48.55%)
Children Population	452
Sex-ratio	944
Literacy	75.07%
Male Literacy	76%
Female Literacy	58.5%
Scheduled Tribes (ST) %	0
Scheduled Caste (SC) %	14.62%
Total Workers	2,720
Main Worker	2,093
Marginal Worker	627

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

Table 3.36 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
Mallapadi	1840	7707	3902	3805	5084	2846	2238	2623	1056	1567
Achamangalam	974	4179	2150	2029	2821	1634	1187	1358	516	842
Kondappanayakempalli	846	3653	1903	1750	2312	1331	981	1341	572	769
Jagadevipalayam	1607	6747	3398	3349	4474	2464	2010	2273	934	1339
Batlapalli	1199	5036	2625	2411	3156	1797	1359	1880	828	1052
Ikondamkothapalli.	977	3964	1982	1982	2484	1376	1108	1480	606	874
Guttur	1175	4996	2562	2434	3269	1808	1461	1727	754	973
Kannandahalli	2055	8562	4485	4077	5690	3273	2417	2872	1212	1660
Mahadevagollahalli	1395	5855	3015	2840	3477	2028	1449	2378	987	1391

Table 3.37 Details on Educational Facilities, Water, and Drainage & Health Facilities

Village	Private Primary School (Numbers)	Govt Vocational Training School/ITI	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
Mallapadi	2	0	0	1	2	2	1	2	1	2	1	2	1	2	1
Achamangalam	2	0	0	1	2	2	1	1	1	2	1	1	1	1	1
Kondeppanayanapalli	2	0	0	1	2	1	1	1	1	2	2	1	1	1	1
Jagadevipalayam	2	0	1	1	2	1	1	1	1	1	1	1	1	1	1
Batlapalli	2	0	0	1	2	2	2	1	1	2	2	2	1	1	1
Ikondamkothapalli	2	0	0	1	2	2	1	1	1	2	2	1	1	1	1
Guttur	2	0	0	1	2	2	1	1	1	2	2	1	1	1	1
Kannandahalli	2	0	1	1	2	1	1	1	1	1	1	1	1	1	1
Mahadevagollahalli	2	0	0	1	2	2	1	1	1	2	2	1	1	1	1

Table 3.38 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
Mallapadi	3208	2226	982	3015	2130	885	423	936	1604	4499
Achamangalam	2157	1310	847	1688	1140	548	403	637	634	2022
Kondappanayakempalli	1666	1121	545	1445	936	509	222	701	512	1987
Jagadevipalayam	2720	1911	809	2093	1566	527	253	755	1033	4027
Batlapalli	2311	1487	824	1893	1372	521	219	836	718	2725
Ikondamkothapalli.	1985	1179	806	1670	1008	662	283	879	499	1979
Guttur	2566	1531	1035	2011	1246	765	245	1366	376	2430
Kannandahalli	3877	2599	1278	2723	1935	788	391	936	1360	4685
Mahadevagollahalli	2899	1810	1089	2491	1642	849	512	1106	825	2956

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 Uthangarai to Krishnagiri NH-77 road as shown in Table 3.39-3.42 and in Figure 3.30. and 500-meter radius residential map shown in Figure 3.31. 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 3.39 Traffic Survey Locations

Station Code	Road Name	Distance and Direction	Type of Road
TS1	Village Rode	0.24 Km W	Village Road
TS2	Uthangarai – Krishnagri NH77	2.59 km SW	Uthangarai – Krishnagri NH77

Source: On-site monitoring by GTMS FAE & TM

Table 3.40 Existing Traffic Volume

Station code	HMV		LMV		2/3 Wheelers		Total PCU
	No	PCU	No	PCU	No	PCU	
TS1	18	54	30	30	60	30	114
TS2	117	351	50	50	98	49	450

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 3.41 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 3.42 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 Rode	114	6	120	1200
Uthangarai – Krishnagri NH77	450	6	456	1500

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

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

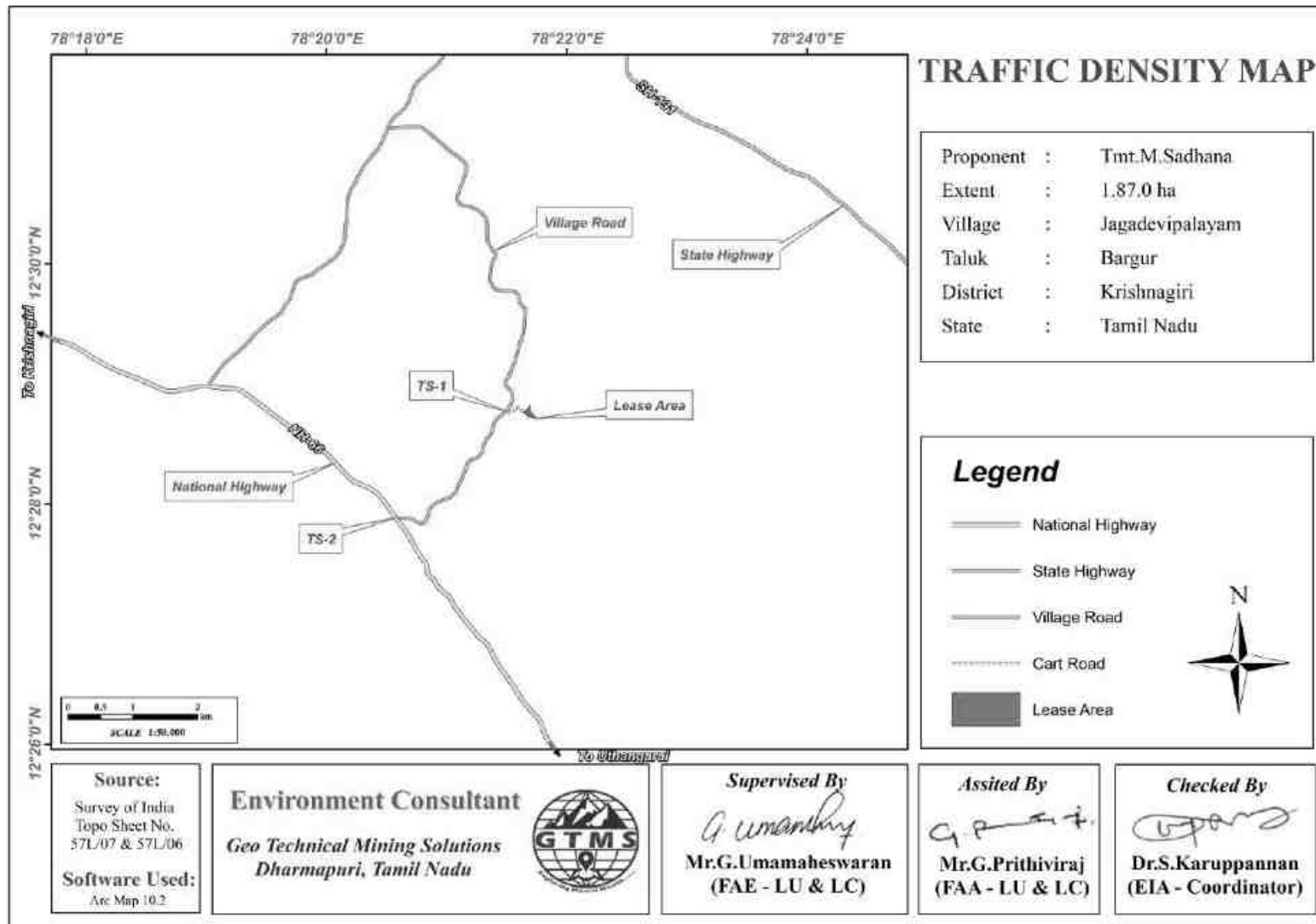


Figure 3.30 Traffic Density Map

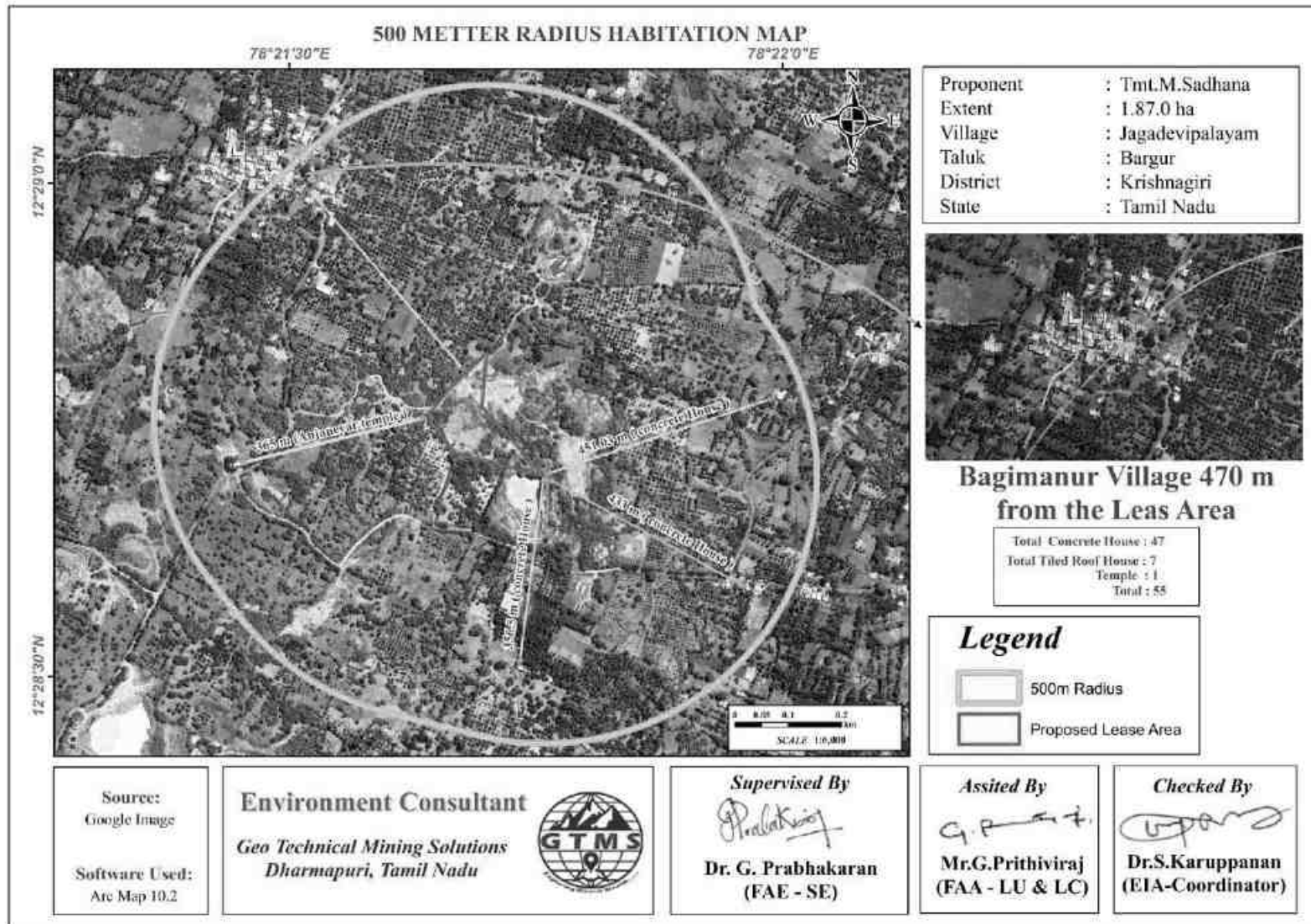


Figure 3.31 500 Metter Radius Habitation Map

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 3.43. Field photographs of baseline data collection are shown in Figure 3.32.

Table 3.43 Details of Environmentally Sensitive Ecological Features in the Study Area

S. No	Sensitive Ecological Features	Name	Areal Distance in km from cluster
1	National Park / Wild life Sanctuaries	None	Nil within 10 km radius
2	Reserve Forest	Togarappalli R.F	2.35km -SW
		Bargur R.F	6.50km-North
		Nandhibanda R.F	7.57km-NE
		Varatanapalli R.F	8.24km-NW
		Baleguli II R.F	9.18km-SW
3	Lakes/Reservoirs/ Dams/Streams/Rivers	Lake	0.63km North
		Mattur River	1.68km SW
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





Figure 3.32 Field Photographs Showing Baseline Data Collection

CHAPTER IV

ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

4.0 GENERAL

Environmental impacts both direct and indirect on various environmental attributes due to proposed mining activity will be created in the surrounding environment, during the operational and post-operational phases. The occurrence of mineral deposits, being site specific, their exploitation, often, does not allow for any choice except adoption of eco-friendly operation. The methods are required to be selected in such a manner, so as to maintain environmental equilibrium ensuring sustainable development. In order to maintain the environmental commensuration with the mining operation, it is essential to undertake studies on the existing environmental scenario and assess the impact on different environmental components. This would help in formulating suitable management plans sustainable resource extraction. The following parameters are of significance in the Environmental Impact Assessment and are being discussed in detail: land, soil, water, air, noise, biological and socio-economic environments. Based on the baseline environmental status at the project site, the environmental factors that are likely to be affected (Impacts) are identified, quantified and assessed.

4.1 LAND ENVIRONMENT

4.1.1 Anticipated Impact

The proposed project would result in:

- ❖ Destruction of unique geological resources to the extent of about 225308 m³ of coloured granite, 42024 m³ of weathered rock and 1560 m³ of topsoil in the five years.
- ❖ Substantial change to topographic features or significant change in surface relief
- ❖ Permanent or temporary change on land use and land cover.
- ❖ Problems to agricultural land and human habitations due to dust, and noise caused by movement of heavy vehicles
- ❖ Soil erosion and sediment deposition in the nearby water bodies due to earthworks during the rainy season
- ❖ Siltation of water course due to wash off from the exposed working area

4.1.2 Common Mitigation measures for the proposed Project

In order to minimize the adverse effects, the following control measures will be implemented:

- ❖ After completion of the quarrying operation, the land will be partially backfilled with dumped material and part of the area will be allowed to collect rainwater which will act as temporary reservoir
- ❖ Topsoil will be utilized for greenbelt development in the safety barrier to prevent noise and sound propagation to the nearby lands
- ❖ Garland drains will be constructed all around the quarry pit and check dams will be constructed at suitable locations in lower elevations to prevent soil erosion due to surface runoff during rainfall and also to collect the storm water within the proposed area
- ❖ Barbed wire fencing will be reconstructed 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 Impact on Soil Environment

- ❖ The proposed project would cause loss of about 1560 m³ of topsoil from the lease area in the five years. The topsoil removal will affect the soil structure and its productivity even if it is stockpiled and reused after reclamation.
- ❖ As the proposed project produces solid waste in the form of granite waste and weathered rock, the topsoil in the site allocated for dumps will be removed. As there is neither a toxic effluent nor solid waste from the mine, quality of soil around the project area is not expected to be adversely affected.

4.2.2 Mitigation Measures for Soil Conservation

- ❖ The top soil will be preserved in the safety barrier and kept in moisture condition. The preserved topsoil will be utilized for greenbelt development in the safety barrier and utilized for plantation on the top bench
- ❖ Garland drains will be constructed around the project area to arrest any soil from the quarry area being carried away by the rainwater. This will also avoid the soil erosion and siltation in the mining pits and maintaining the stability of the benches
- ❖ Retaining wall with weep hole, garland drain will be provided around the dump areas
- ❖ Proper angle of repose will be maintained
- ❖ Grasses will be grown over the dump areas for stability.

4.3 WATER ENVIRONMENT

4.3.1 Anticipated Impact

- ❖ As the water required for the mining operations, as given in Table 2.10 is obtained from the approved water supplying agency, the project does not develop any abstraction

structures in the lease area. Therefore, no impact responsible for the water table declination is anticipated.

- ❖ Surface and ground water resources may be contaminated due to mine pit water discharge, domestic sewage, waste water from vehicle washing, washouts from surface exposure or working areas, discharge of oil & grease, and suspended solids due to waste from washing of machineries. To address this impact, some of the important mitigation measures is provided as below.

4.3.2 Common Mitigation Measures for the Proposed Project

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

- ❖ Regular monitoring (once every 6 months) and analysing the quality of water in open well, bore wells and surface water

4.4 AIR ENVIRONMENT

4.4.1 Anticipated Impact from proposed project

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

4.4.1.1 Emission Estimation

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

Table 4.1 Empirical Formula for Emission Rate from Overall Mine

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).
Overall Mine	SO ₂	Area	$E = a^{0.14} \{u / (1.83 + 0.93u)\} \{p / (0.48 + 0.57p)\} + \{b / (14.37 + 1.15b)\}$	u = Wind speed(m/s); p = Mineral production (Mt/yr); b = Overburden handling (Mm ³ /yr); a = Lease area(km ²); E = Emission rate(g/s).
Overall Mine	NO _x	Area	$E = a^{0.25} \{u / (4.3 + 32.5u)\} [1.5p + \{b / (0.06 + 0.08b)\}]$	u = Wind speed(m/s); p = Mineral production (Mt/yr); b = Overburden handling (Mm ³ /yr); a = Lease area(km ²); E = Emission rate(g/s).

The emission rate thus calculated using the empirical formula is used as one of the inputs in the AERMOD modelling. As the SPM emission calculation for overall mine is not

considering pollution control measures, one-third of the SPM value is taken for derivation of PM₁₀ keeping in mind that proper control measures are followed. It is important to note that PM₁₀ emission rate is derived from the SPM estimation in the background that PM₁₀ constitutes 52% of SPM emission. The PM₁₀, SO₂ and NO_x emission results have been given in Table 4.2.

Table 4.2 Estimated Emission Rate

Activity	Pollutant	Calculated Value (g/s)	Lease Area in m²	Calculated Value (g/s/m²)
Overall Mine	PM _{2.5}	0.0258064431	18700	1.38002E-06
Overall Mine	PM ₁₀	0.0393613063	18700	2.10488E-06
Overall Mine	SO ₂	0.1222278089	18700	6.53625E-06
Overall Mine	NO _x	0.0122618777	18700	6.55715E-07

4.4.1.2 Frame work of Computation & Model details

By using the above-mentioned inputs, Ground Level Concentrations (GLC) due to the quarrying activities have been estimated to know the incremental concentration in ambient air quality and impact in the study area. The model was used to predict the impact on the ambient air environment at each receptor at various localities within 5 km radius around the project site and the maximum incremental GLC at the project site. All the prediction models in Figures 4.1- 4.4 shows the maximum concentrations of PM_{2.5}, PM₁₀, SO₂ and NO_x, close to the proposed project site due to low to moderate wind speeds.

4.4.1.3 Modelling of Incremental Concentration

The air borne particulate matter such as PM₁₀ and PM_{2.5} generated by quarrying operation, transportation, and wind erosion of the exposed areas and emissions of sulphur dioxide (SO₂) and oxides of nitrogen (NO_x) due to excavation and loading equipment and vehicles plying on haul roads are the significant air pollutants arising from mining operation, leading to an adverse impact on the ambient air environment in and around the project area. Anticipated incremental concentration and net increase in emissions due to quarrying activities is predicted by AERMOD Software and the incremental values of the air pollutants were added to the base line data monitored at the proposed site to predict total GLC of the pollutants.

4.4.1.4 Model Results

The post project Resultant Concentrations of PM₁₀, PM_{2.5}, SO₂ & NO_x (GLC) is given in the table shown below:

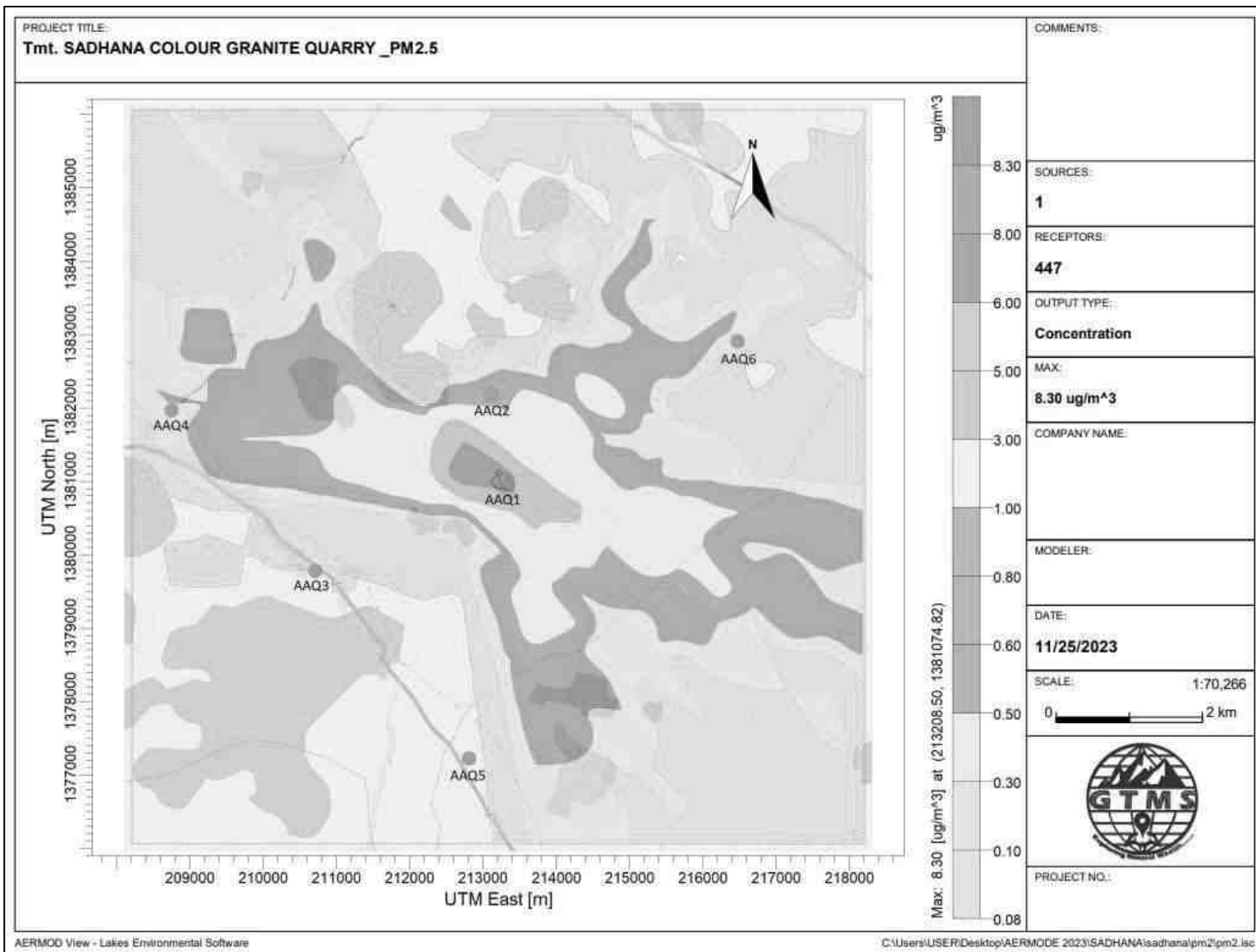


Figure 4.1 Predicted Incremental Concentration of PM_{2.5}

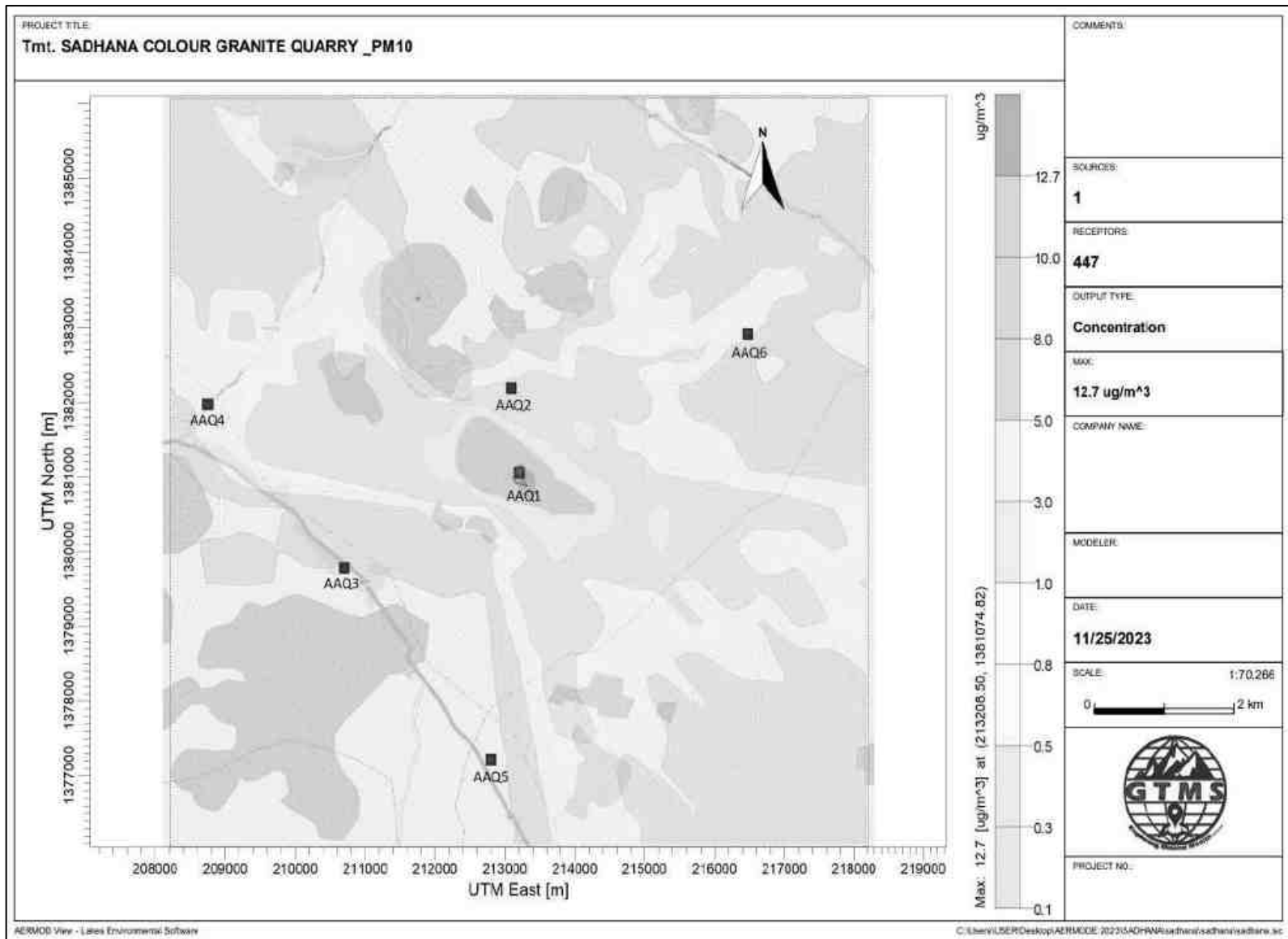


Figure 4.2 Predicted Incremental Concentration of PM₁₀

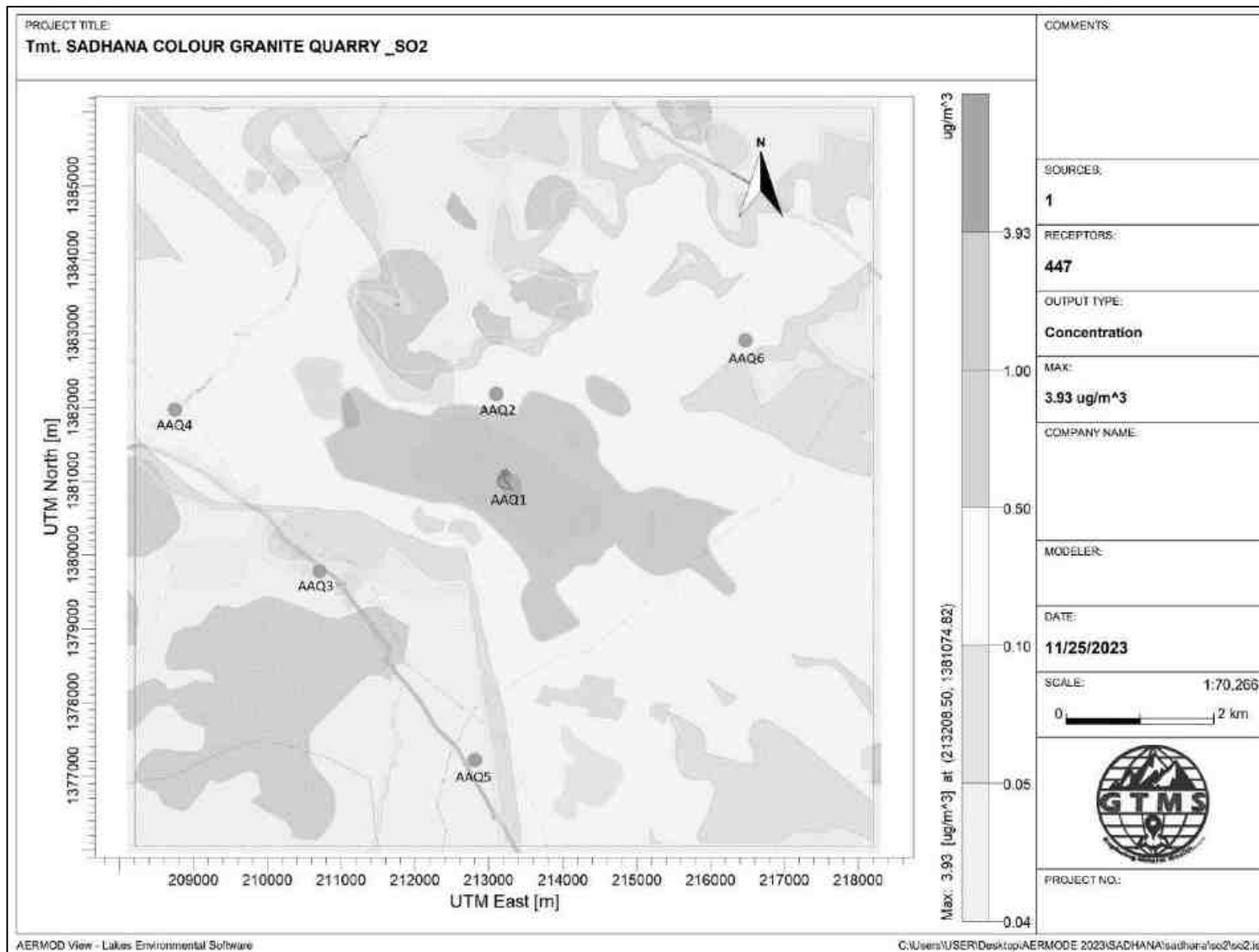


Figure 4.3 Predicted Incremental Concentration of SO₂

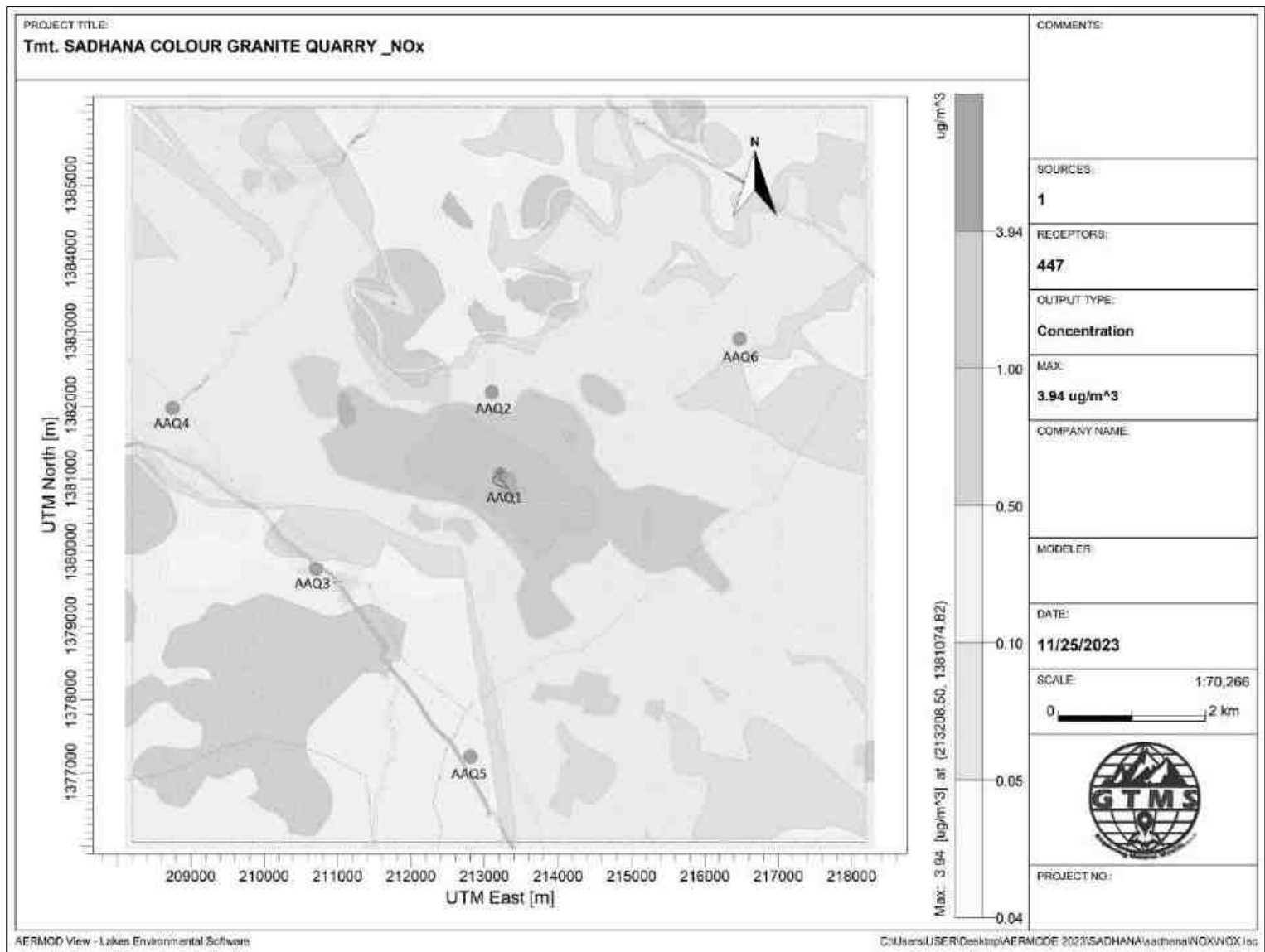


Figure 4.4 Predicted Incremental Concentration of NO_x

Table 4.3 Incremental & Resultant GLC of PM_{2.5}

Station ID	Distance to core area	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	--	--	17.2	8.3	25.5	Below standard	48.3	Not significant
AAQ2	1.08	N	15.0	1	16		6.7	
AAQ3	2.70	SW	19.8	0	19.8		0.0	
AAQ4	4.46	NW	21.3	0.5	21.8		2.3	
AAQ5	3.71	SSW	20.3	0	20.3		0.0	
AAQ6	3.72	NE	17.4	0.5	17.9		2.9	

Table 4.4 Incremental & Resultant GLC of PM₁₀

Station ID	Distance to core area	Direction	PM ₁₀ concentrations(µg/m ³)			Comparison against air quality standard (100 µg/m ³)	Magnitude of change (%)	Significance
			Baseline	Predicted	Total			
AAQ1	--	--	38.5	12.7	51.2	Below standard	33.0	Not significant
AAQ2	1.08	N	39.1	3	42.1		7.7	
AAQ3	2.70	SW	41.3	0	41.3		0.0	
AAQ4	4.46	NW	41.8	0.8	42.6		1.9	
AAQ5	3.71	SSW	42.5	0	42.5		0.0	
AAQ6	3.72	NE	34.1	0.8	34.9		2.3	

Table 4.5 Incremental & Resultant GLC of SO₂

Station ID	Distance to core area	Direction	SO ₂ concentrations(µg/m ³)			Comparison against air quality standard (80 µg/m ³)	Magnitude of change (%)	Significance
			Baseline	Predicted	Total			
AAQ1	--	--	11.7	3.93	15.63	Below standard	33.6	Not significant
AAQ2	1.08	N	11.0	0.5	11.5		4.5	
AAQ3	2.70	SW	16.9	0	16.9		0.0	
AAQ4	4.46	NW	17.0	0.5	17.5		2.9	
AAQ5	3.71	SSW	17.5	0	17.5		0.0	
AAQ6	3.72	NE	9.4	0.5	9.9		5.3	

Table 4.6 Incremental & Resultant GLC of NO_x

Station ID	Distance to core area (km)	Direction	NO _x concentrations(µg/m ³)			Comparison Against air quality standard (80 µg/m ³)	Magnitude of change (%)	Significance
			Baseline	Predicted	Total			
AAQ1	--	--	17.3	3.94	21.24	Below standard	22.8	Not significant
AAQ2	1.08	N	17.0	0.5	17.5		2.9	
AAQ3	2.70	SW	22.0	0	22		0.0	
AAQ4	4.46	NW	21.3	0.5	21.8		2.3	
AAQ5	3.71	SSW	20.3	0	20.3		0.0	
AAQ6	3.72	NE	15.8	0.5	16.3		3.2	

From the resultant of cumulative concentration i.e., background + incremental, concentration of pollutants in all the receptor locations without effective mitigation measures are still within the prescribed NAAQ limits of 100, 60, 80 and 80µg/m³ for PM₁₀, PM_{2.5}, SO₂ and NO_x, respectively. By adopting suitable mitigation measures, the pollutant levels in the atmosphere can be further being controlled.

4.4.2 Common Mitigation Measures

Drilling

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

Haul Road & Transportation

- ❖ Water will be sprinkled on haul roads, Loading Points twice a day to avoid dust generation during transportation
- ❖ Transportation of material will be carried out during day time and material will be covered with tarpaulin
- ❖ The speed of tippers plying on the haul road will be limited below 20 km/hr to avoid generation of dust.
- ❖ Main source of gaseous pollution will be from vehicle used for transportation of mineral; therefore, weekly maintenance of machines improves combustion process & makes reduction in the pollution.
- ❖ The un-metalled haul roads will be compacted weekly before being put into use.

- ❖ Over loading of tippers will be avoided to prevent spillage.
- ❖ It will be ensured that all transportation vehicles carry a valid PUC certificate.
- ❖ Grading of haul roads and service roads to clear accumulation of loose materials.

Green Belt

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

Occupational Health

- ❖ Dust mask will be provided to the workers and their use will be strictly monitored
- ❖ Annual medical check-ups, trainings and campaigns will be arranged to ensure awareness about importance of wearing dust masks among all mine workers & tipper drivers
- ❖ Ambient Air Quality Monitoring will be conducted six months once to assess effectiveness of mitigation measures proposed

4.5 NOISE ENVIRONMENT

Noise pollution is mainly due to operation like drilling & blasting (Occasionally) and plying of trucks & HEMM. These activities will not cause any problem to the inhabitants of this area because there is no human settlement in close proximity to the project area. Noise modelling has been carried out considering blasting and compressor operation (drilling) and transportation activities. Predictions have been carried out to compute the noise level at various distances around the working pit due to these major noise-generating sources.

Noise 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 model based on first principle.

$$Lp_2 = Lp_1 - 20 \log (r_2/r_1) - Ae_{1, 2}$$

Where:

Lp₁ & Lp₂ are sound levels at points located at distances r₁ & r₂ from the source.

$A_{e1,2}$ is the excess attenuation due to environmental conditions. Combined effect of all sources can be determined at various locations by logarithmic addition.

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

4.5.1 Anticipated Impact

Attenuation due to Green Belt has been taken to be 4.9 dB (A). The inputs required for the model are:

- Source data
- Receptor data
- Attenuation factor

Source data has been computed taking into account of all the machinery and activities used in the mining process. Same has been listed in Table 4.7.

Table 4.7 Activity and Noise Level Produced by Machinery

S.No.	Machinery / Activity	Impact on Environment	Noise Produced in dB(A) at 50 ft from source*
1	Jack Hammer	Yes	88
2	Compressor	No	81
3	Excavator	No	85
4	Tipper	No	84
Total Noise Produced			91.22

*50 feet from source = 15.24 meters

Source: U.S. Department of Transportation (Federal Highway Administration) – Construction Noise Handbook

The total noise to be produced by mining activity is calculated to be 91.22 dB (A). Therefore, we have considered equipment and operation noise levels (max) to be approx. 91.22 dB (A) for noise prediction modelling. The results of noise prediction modelling are shown in Table 4.8.

Table 4.8 Predicted Noise Incremental Values

Noise Monitoring Location	Distance From Project Site(m)	Baseline Noise Level (dBA)m During Day Time	Predicted Noise Level(dBA)	Total(dBA)
Core	100	37.3	39.38	41.47
Bagimanoor	420	43.2	26.91	43.30
Jagadevi	2700	45.6	10.75	45.60

Jagadevi	4460	45.8	6.39	45.80
Billakottai	3710	45.4	7.99	45.40
Sakilnatham	3720	39.5	7.97	39.50
NAAQ Standards	Industrial Day Time - 75 dB (A) & Night Time- 70 dB (A) Residential Day Time -55 dB (A) & Night Time- 45 dB (A)			

The incremental noise level is found within the range of 39.38 dB (A) in core zone and 7.97 – 18.71 dB (A) in Buffer zone. The noise level at different receptors in buffer zone is lower due to the distance involved and other topographical features adding to the noise attenuation. The resultant Noise level due to monitored values and calculated values at the receptors are based on the mathematical formula considering attenuation due to several factors including ground reflection, atmosphere, wind speed, temperature, trees, and buildings as 35.5 dB (A), the barrier effect. From the above table, it can be seen that the ambient noise levels at all the locations near habitations are within permissible limits of Residential Area (buffer zone) as per THE NOISE POLLUTION (REGULATION AND CONTROL) RULES, 2000(The Principal Rules were published in the Gazette of India, vide S.O.123(E), dated 14.2.2000 and subsequently amended vide S.O. 1046(E),dated 22.11.2000, S.O. 1088(E), dated 11.10.2002, S.O. 1569 (E), dated 19.09.2006 and S.O. 50 (E) dated 11.01.2010 under the Environment(Protection) Act, 1986.).

4.5.2 Mitigation measures for Control of Noise

The following noise mitigation measures are proposed for control of Noise

- ❖ 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 though 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 872 kg per day, 235386 kg per year and 1176932 kg over five years, as provided in Table 4.9.

Table 4.9 Carbon Released During Five Years of Multi -Colour Granite Production

	Per day	Per year	Per five years
Fuel consumption of excavator	63	17041	85207
Fuel consumption of tipper	262	70789	353947
Total fuel consumption in liters	325	87831	439154
Co ₂ emission in kg	872	235386	1176932

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 22418 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 8874 kg of the total carbon, as provided in Table 4.10.

Table 4.10 CO₂ Sequestration

CO ₂ sequestration in kg	83	22418	112088
Remaining CO ₂ not sequestered in kg	789	212969	1064845
Trees required for environmental compensation	8874		
Area required for environmental compensation in hectares	18		

Greenbelt Development

The main objective of the green belt is to provide a barrier between the source of pollution and the surrounding areas. In order to compensate the loss of vegetation cover, it is suggested to carry out afforestation program mainly inside and outside of the lease area in different phases. This habitat improvement program would ensure the faunal species to re-colonize and improve the abundance status in the core zone. Greenbelt development plan and budget required for green belt development plan are given in Tables 4.11-4.13. For greenbelt development, species are recommended, as shown in Table 4.11 on the basis of:

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

Table 4.11 Recommended Species for Greenbelt Development Plan

S. No.	Botanical Name of the Plant	Family Name	Common Name	Category	Dust Capturing Efficiency Features
1	<i>Azadirachta indica</i>	Meliaceae	Neem, Vembu	Tree	Well distinct thick at both the layer
2	<i>Tectona grandis</i>	Lamiaceae	Teak	Tree	
3	<i>Polyalthia longifolia</i>	Annonaceae	Nettilingam	Tree	Well distinct in Palisade & Spongy

4	<i>Albizia lebbeck</i>	Fabaceae	Vagai	Tree	parenchyma. Spongy parenchyma is present at lower epidermis Many vascular bundles arranged almost parallel series
5	<i>Delonix regia</i>	Fabaceae	Cemmayir-konrai	Tree	
6	<i>Bauhinia racemosa</i>	Fabaceae	Aathi	Tree	
7	<i>Cassia fistula</i>	Fabaceae	Sarakondrai	Tree	
8	<i>Aegle marmelos</i>	Rutaceae	Vilvam	Tree	
9	<i>Pongamia pinnata</i>	Fabaceae	Pungam	Tree	
10	<i>Thespesia populnea</i>	Malvaceae	Puvarasu	Tree	

Table 4.12 Greenbelt Development Plan

	No. of trees proposed for plantation	No. of trees expected to survive @ 80%	Area to be covered(m ²)
Plantation in the construction phase (3 months)	Number of plants inside the mine lease area		
	374	299	3366
	Number of plants outside the mine lease area		
	561	449	5049
Total	935	748	8415

Table 4.13 Budget for Greenbelt Development Plan

Activity	Plantation in the construction phase(3Months)	Cost	Capital Cost (Rs.)	Recurring Cost-per annum
Plantation inside the mine lease area (in safety margins)	374	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))"	74800	11220
Plantation outside the area	561	Avenue Plantation @ 300 per plant (capital) for plantation outside the lease area and @ 30 per plant maintenance (recurring)	168300	16830
Total			2,43,100	28,050

Source: EMP budget

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

4.6.3. Anticipated Impact on Fauna

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

4.6.3.2. Mitigation Measures

- ❖ Undertaking mitigative measures for conducive environment to the flora and fauna in consultation with Forest Department.
- ❖ Dust suppression system will be installed within mine and periphery of mine for proposed project
- ❖ Plantation around mine area will help in creating habitats for small faunal species and to create better environment for various fauna. Creating and developing awareness for nature and wildlife in the adjoining villages.

4.6.4. Impact on Aquatic Biodiversity

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

4.6.5. Impact Assessment on Biological Environment

A detail of impact and assessments was mentioned in Table 4.12.

Table 4.14 Ecological Impact Assessments

S. No.	Attributes	Assessment
1	Activities of the project affects the breeding/nesting sites of birds and animals	No breeding and nesting site was identified in mining lease site. The fauna sighted mostly migrated from buffer area.
2	Located near an area populated by rare or endangered species	No endangered, critically endangered, vulnerable species sighted in core mining lease area.
3	Proximity to national park/wildlife sanctuary/reserve forest /mangroves/ coastline/estuary/sea	Togarappalli R.F, 2.35 km SW Bargur R.F, 6.50km N Nandhibanda R.F,7.57km NE Varatanapalli R.F,8.24km NW Baleguli II R.F,9.18km SW Neralakotta R.F,10.29km NW No national park or eco-sensitive zone around 10km radius.
4	Proposed project restricts access to waterholes for wildlife	No
5	Proposed mining project impact surface water quality that also provide water to wildlife	No scheduled or threatened wildlife animal sighted regularly core in core area.
6	Proposed mining project increase siltation that would affect nearby biodiversity area.	Surface runoff management such as drains is constructed properly so there will be no siltation affect in nearby mining area.
7	Risk of fall/slip or cause death to wild animals due to project activities	No
8	The project release effluents into a water body that also supplies water to a wildlife	No water body near to core zone so chances of water become polluted is low.
9	Mining project effect the forest-based livelihood/ any specific forest product on which local livelihood depended	No
10	Project likely to affect migration routes	No migration route observed during monitoring period.

11	Project likely to affect flora of an area, which have medicinal value	No
12	Forestland is to be diverted, has carbon high sequestration	There was no forest land diverted.
13	The project likely to affect wetlands, Fish breeding grounds, marine ecology	Wetland was not present in near core Mining lease area. No breeding and nesting ground present in core mining area.

Table 4.15 Anticipated Impact of Ecology and Biodiversity

S. No.	Aspect Description	Likely Impacts on Ecology and Biodiversity (EB)	Impact Consequence - Probability Description / Justification	Significance	Mitigation Measures
Pre-Mining Phase					
1	Uprooting of vegetation of lease area	Site specific loss of common floral diversity (Direct impact)	Site possesses common floral (not trees) species. Clearance of these species will not result in loss of flora	Less severe	No immediate action required. However, Greenbelt /plantation will be developed in project site and in periphery of the project boundary, which will improve flora and fauna diversity of the project area.
		Site specific loss of associated faunal diversity (Partial impact)	Site supports only common species, which use wide variety of habitats of the buffer zone reserve forest area. So, there is no threat of faunal diversity.		
		-Loss of Habitat (Direct impact)	Site does not form Unique / critical habitat structure for unique flora or fauna.		
Mining Phase					

2	Excavation of mineral using machine and labours, Transportation activities will generate noise.	Site-specific disturbance to normal faunal movements at the site due to noise. (Partial impact)	Site does not form unique / critical habitat structure for unique flora or fauna.	Less severe	Mining activity should not be operated after 5PM. Excavation of dump and transportation work should stop before 7PM.
3	Vehicular Movement for transportation of materials will result in generation of dust (SPM) due to haul roads and emission of SO ₂ , NO ₂ , CO etc.	Impact on surrounding agriculture and associated fauna due to deposition of dust and Emission of CO. (Indirect impact)	Impact is less as the agricultural land far from core area.	Less severe	All vehicles will be certified for appropriate Emission levels. More plantation has been suggested Upgrade the vehicles with alternative fuel such biodiesel, methanol and biofuel around the mining area.

4.6.6 Impact on agriculture and horticulture crops in 1km Radius

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

4.6.7 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.

4.8.5 Post COVID Health Management Plan for Workers

The following Health Management plan will be strictly implemented in the Mines, Mines officials like Mines Manager and Foreman will be Act as a Controller of Health Management of the workers.

- ❖ Temperature will be checked to all the workers while arriving to work on each day
- ❖ If any persons/employees have fever of 100.4 or higher, chills, shortness of breath will be sent to Hospital and the persons will be employed after fourteen days
- ❖ All the persons inside the mine area instructed to wear fabric or disposable pleated masks covering Nose and Mouth
- ❖ Social distancing of 6 feet will be maintained all the time

- ❖ Temporary Hand washing points will be installed near the working places, workers will be initiated to Wash hands frequently with soap and water for a minimum of 20 seconds and advised to avoid touching face. This is an essential contagion-control mechanism

4.8.6 Plastic Waste Management

As per the Tamil Nadu Government Order (Ms) No. 84 Environment and Forest (EC.2) Department Dated 25.06.2018 following kind of plastics will not be used in the mines area.

- ❖ Use and throw away plastics such as carry bags, plastic bags, plastic sheets used for food wrapping, spreading, plastic plates, plastic coated tea cups and plastic tumblers will not be used in the mines.

Table 4.16 Action Plan

Action Plan	Responsibility
All the employees will be checked for plastics before entering the quarry.	Watchman
Every week or month a meeting of workers under the chairmanship of the mine manager will be held to explain the disadvantages of plastic use.	Mine Foreman & Mining Mate
They will be advised not to bring plastic materials into the mines and those who are involved in such activities will not be allowed to work on the day of the snow.	Mines Manager
The miners will be provided with areca nut plates and mugs to help reduce the use of plastics.	Mines owner

4.9 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.

4.9.1 Mine Closure criteria

The criteria involved in mine closure are discussed below:

4.9.1.1 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.

4.9.1.2 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.

4.9.1.3 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.

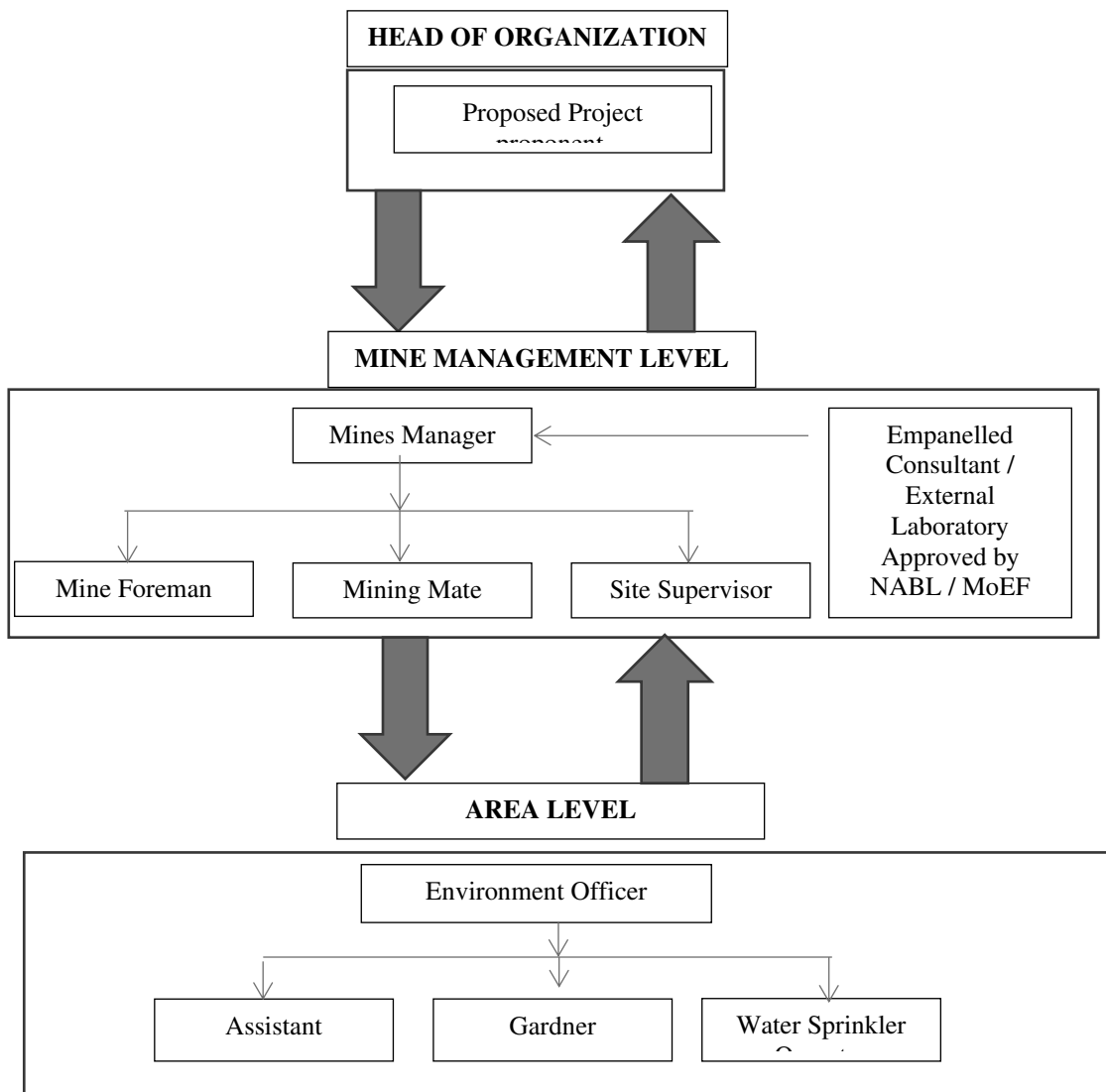


Figure 6.1 Proposed environmental monitoring chart

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 RISK ASSESSMENT FOR PROPOSED PROJECT

The methodology for the risk assessment has been based on the specific risk assessment guidance issued by the Directorate General of Mine Safety (DGMS), Dhanbad, vide Circular No.13 of 2002, dated 31st December, 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. Risk Assessment is all about prevention of accidents and to take necessary steps to prevent it from happening. Factors of risks involved due to human induced activities in connection with mining & allied activities with detailed analysis of causes and control measures for the mine is given in below 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

			<ul style="list-style-type: none"> ▪ Providing proper drainage facilities in mine and dump area. ▪ 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. Improper charging, stemming &</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.

		Blasting/ fining of blast holes Vibration due to movement of vehicles	<ul style="list-style-type: none"> ▪ SOP for Charging, Stemming & Blasting/Firing of Blast Holes will be followed by blasting crew during initial stage of operation ▪ Shots are fired during daytime only. ▪ All holes charged on any one day shall be fired on the same day. ▪ The danger zone is and will be distinctly demarcated (by means of red flags)
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.

7.2 DISASTER MANAGEMENT PLAN FOR PROPOSED PROJECT

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:

- ❖ Effect the 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

It is to optimize operational efficiency to rescue rehabilitation and render medical help and to restore normalcy. To tackle the consequences of a major emergency inside the mines or immediate vicinity of the mines, a disaster management plan must be formulated, and this planned emergency document is called “Disaster Management Plan”.

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 and the coordination among key personnel and their team has been shown in Fig 7.1.

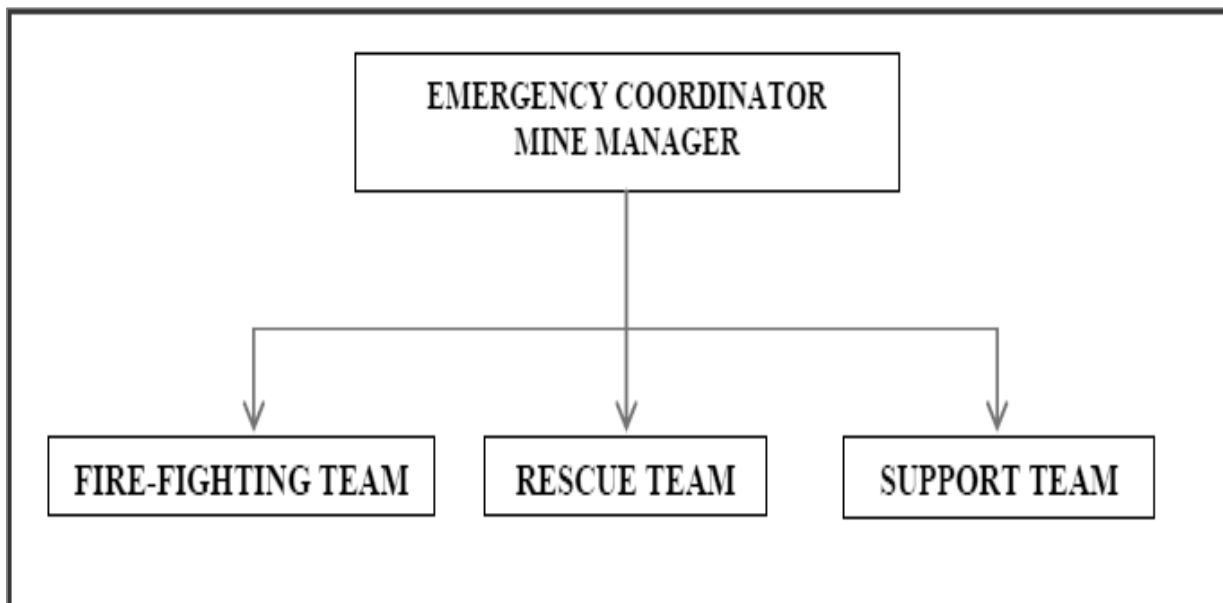


Figure 7.1 Disaster management team layout for Proposed Project

The emergency organization shall be headed by emergency coordinator who will be qualified competent mines manager. In his absence senior most people available at the mine shall be emergency coordinator till arrival of mines manager. There would be three teams for taking care of emergency situations – Fire-Fighting Team, Rescue Team and Support Team. The proposed composition of the teams is given in Table 7.2.

Table 7.2 Proposed Teams to Deal with Emergency Situation

Designation	Qualification
Fire-Fighting Team	
Team Leader	Mines Manager
Team Member	Mines Foreman
Team Member	Mining Mate
Rescue Team	
Team Leader	Mines Manager
Team Member	Environment Officer
Team Member	Mining Foreman
Support Team	
Team Leader	Mines Manager
Assistant Team Leader	Environment Officer
Team Member	Mining Mate
Security Team	Mines Foreman

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

7.2.1 Roles and responsibilities of emergency team

(a) Emergency coordinator (EC)

The emergency coordinator shall assume absolute control of site and shall be located at MECR.

(b) Incident controller (IC)

Incident controller shall be a person who shall go to the scene of emergency and supervise the action plan to overcome or contain the emergency. Shift supervisor or Environmental Officer shall assume the charge of IC.

(c) Communication and advisory team

The advisory and communication team shall consist of heads of Mining Departments i.e., Mines Manager

(d) Roll call coordinator

The Mine Foreman shall be Rollcall Coordinator. The roll call coordinator will conduct the roll call and will evacuate the mine personnel to assembly point. His prime function shall be to account for all personnel on duty.

(e) Search and rescue team

There shall be a group of people trained and equipped to carryout rescue operation of trapped personnel. The people trained in first aid and fire-fighting shall be included in search and rescue team.

(f) Emergency security controller

Emergency Security Controller shall be senior most security person located at main gate office and directing the outside agencies e.g., fire brigade, police, doctor and media men etc.,

7.2.2 Emergency control procedure

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

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

7.2.3 Proposed fire extinguishers at different locations

The following type of fire extinguishers has been proposed at strategic locations within the mine.

Table 7.3 Proposed Fire Extinguishers at Different Locations P1

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

Alarm system to be followed during disaster

On receiving the message of disaster from Site Controller, fire-fighting team, the mine control room attendant will sound siren wailing for 5 minutes. Incident controller will arrange to broadcast disaster message through public address system. On receiving the message of "Emergency Over" from Incident Controller the emergency control room attendant will give "All Clear Signal", by sounding alarm straight for 2 minutes. The features of alarm system will be explained to one and all to avoid panic or misunderstanding during disaster. In order to prevent or take care of hazard / disasters if any the following control measures have been adopted.

- ❖ All safety precautions and provisions of Metalliferous Mines Regulations (MMR), 1961 is strictly followed during all mining operations.
- ❖ Observance of all safety precautions for blasting and storage of explosives as per MMR 1961.
- ❖ Entry of unauthorized persons into mine & allied areas is completely prohibited.
- ❖ Firefighting and first-aid provisions in the mines office complex and mining area are provided.
- ❖ Provisions of all the safety appliances such as safety boot, helmets, goggles, dust masks, ear plugs and ear muffs etc. are made available to the employees and the use of same is strictly adhered to through regular monitoring.
- ❖ Training and refresher courses for all the employees working in hazardous premises.
- ❖ Working of mine, as per approved plans and regularly updating the mine plans.
- ❖ Cleaning of mine faces is regularly done.
- ❖ Checking and regular maintenance of garland drains and earthen bunds to avoid any inflow of surface water in the mine pit.

- ❖ Provision of high-capacity standby pumps with generator sets with enough quantity of diesel for emergency pumping especially during monsoon.
- ❖ Regular maintenance and testing of all mining equipment were carried out as per manufacturer's guidelines.

7.3 CUMULATIVE IMPACT STUDY

The cumulative impact 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, 2 proposed projects, known as P1&P2. are taken into consideration. The details of P1 have been given in Table 1.2 and the detail of P2 is given in the Table 7.4

Table 7.4 Salient Features of Proposed Project Site “P2”

Name of the Quarry	M/s. Pranita Granites		
Type of Land	Government Land		
Extent	3.46.0 ha		
S.F. No.	10(Part)		
Toposheet No.	57 L/07		
Maximum Elevation	467m 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 20% Recovery (m ³)	Granite Waste 80% Recovery (m ³)	Topsoil (m ³)
	320079	1280316	340
Mineable Reserves	Colour Granite 20% Recovery (m ³)	Granite Waste 80% Recovery (m ³)	Topsoil (m ³)
	110805	443220	340
Proposed production for 5 years	Colour Granite 20% Recovery (m ³)	Granite Waste 80% Recovery (m ³)	Topsoil (m ³)
	27729	110916	340
Method of Mining	Open Cast Semi Mechanized Mining		
Topography	Hilly Terrain		
Machinery proposed	Jack hammer	4	
	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 Deployment	27 persons	
Project Cost	Rs.3,80,41,500 /-	
Proposed Water Requirement	4.28 KLD	

7.3.1 Air Environment

Calculation of the cumulative production load of granite from the 2 proposed project within the cluster have been given in the Table.7.5

Table 7.5 Cumulative Production Load of Granite

Quarry	Colour Granite @20% recovery in m ³				Granite Waste @ 80% 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	14031	2806	10	2	56123	11225	41	7	36030	7206	27	4
P2	27729	5546	21	4	110916	22183	82	14	20253	4051	15	3
Total	41760	8352	31	6	167039	33408	123	21	56283	11257	42	7

The overall production of 2 quarries is of about granite recovery of 20% is 31m³ per day with a capacity of 6 trips per day, about granite waste @80% is 123m³ per day with a capacity of 21 trips and weathered rock is of 42m³ per day with a capacity of 7 trips per day.

7.3.1.1 Cumulative Impact of Air Pollutants

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

Table 7.6 Incremental and Resultant Ground Level Concentration from the two 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	
PM _{2.5}	18.5	8.3	9.8	36.6
PM ₁₀	39.5	12.7	15.2	67.4
SO ₂	13.9	3.93	4.73	22.56
NO ₂	18.9	3.94	4.74	27.58

Source: Emission Calculations

7.3.2 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 7.7 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	420	N	43.2	26.91	43.30	
Habitation Near P2	420	N	43.2	26.91	43.30	
Cumulative Noise (dB(A))					46.31	

Source: Lab Monitoring Data

The cumulative analysis of noise due to two proposed project shows that habitation near P1 will receive about 46.31dB (A), as shown in Table 7.7. The cumulative results for the habitation in consideration do not exceed the limit set by CPCB for residential areas for day time.

7.3.3 Socio Economic Environment

Socio Economic benefits of the 2 proposed projects were calculated and the results have been shown in Table 7.8 and the 2 projects together will contribute Rs.13,60,000 towards CER fund.

Table 7.8 Socio Economic Benefits from 2 Mines

Location ID	Project Cost	CER Cost
P1	Rs.3,00,70,000	Rs. 6,00,000
P2	Rs.3,80,41,500	Rs. 7,60,000
Grand Total	Rs.6,81,11,500	Rs. 13,60,000

Table 7.9 Employment Benefits from 2 Mines

Location ID	Employment
P1	22
P2	27
Grand Total	49

A total of 49 people will get direct employment due to 2 proposed mines in cluster

7.3.4 Ecological Environment

Table 7.10 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	935	8415	Neem,	748
P2	1730	15570	Pongamia, Teak,	1384
Total	2665	23985	etc.,	2132

Cumulative studies show that the two proposed projects will plant about 2665 native tree species like Neem, Teak, etc both inside and outside the lease area. It is expected that 80 % of trees, i.e., 2132 trees will survive in this green belt development program.

7.3.5 Traffic Density

The proposed project will add 34 truckloads per day, accounting for an increase of 102 PCUs to the nearby roads.

7.4 PLASTIC WASTE MANAGEMENT PLAN FOR PROPOSED PROJECT

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

7.4.1 Objective

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

A detailed action plan to manage plastic waste has been provided in Table 7.11.

Table 7.11 Action Plan to Manage Plastic Waste

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

Source: Proposed by FAEs and EC

7.5 POST COVID HEALTH MANAGEMENT PLAN FOR PROPOSED PROJECT

COVID – 19 diseases caused by SARS-CoV-2 Coronavirus is relatively a new disease, with fresh information being known on a dynamic basis about the natural history of the disease, especially in terms of post-recovery events.

After acute COVID-19 illness, recovered patients may continue to report wide variety of signs and symptoms including fatigue, body ache, cough, sore throat, difficulty in breathing, etc. As of now there is limited evidence of post-COVID sequelae and further research is required and is being actively pursued. A holistic approach is required for follow up care and well-being of all post COVID recovering patients.

7.5.1 Post-COVID Follow Up Protocol

- ❖ Continue COVID appropriate behaviour (use of mask, hand & respiratory hygiene, physical distancing).
- ❖ Drink adequate amount of warm water (if not contra-indicated).
- ❖ Make sure your workplaces are clean and hygienic
- ❖ Surfaces (e.g., desks and tables) and objects (e.g., telephones, helmet) need to be wiped with disinfectant regularly

- ❖ Put sanitizing hand rub dispensers in prominent places around the workplace. Make sure these dispensers are regularly refilled
- ❖ Display posters promoting hand-washing
- ❖ Make sure that staff, contractors and customers have access to places where they can wash their hands with soap and water
- ❖ Display posters promoting respiratory hygiene.
- ❖ Brief your employees, contractors and customers that if COVID-19 starts spreading in your community anyone with even a mild cough or low-grade fever (37.3°C or more) need to stay at home. They should also stay home (or work from home) if they have had to take simple medications, such as paracetamol/acetaminophen, ibuprofen or aspirin, which may mask symptoms of infection
- ❖ Keep communicating and promoting the message that people need to stay at home even if they have just mild symptoms of COVID-19.
- ❖ Consider whether a face-to-face meeting or event is needed. Could it be replaced by a teleconference or online event?
- ❖ Could the meeting or event be scaled down so that fewer people attend?
- ❖ Pre-order sufficient supplies and materials, including tissues and hand sanitizer for all employees. Have surgical masks available to offer anyone who develops respiratory symptoms.
- ❖ It is also suggested by the Ministry of AYUSH that the use of Chyawanprash in the morning (1 teaspoonful) with Luke warm water/milk is highly recommended (under the direction of Registered Ayurveda physician) as in the clinical practice Chyawanprash is believed to be effective in post-recovery period.
- ❖ If there is persistent dry cough / sore throat, do saline gargles and take steam inhalation. The addition of herbs/spices for gargling/steam inhalation. Cough medications, should be taken on advice of medical doctor or qualified practitioner of Ayush.
- ❖ Look for early warning signs like high grade fever, breathlessness, Sp O₂ < 95%, unexplained chest pain, new onset of confusion, focal weakness.
- ❖ Avoid smoking and consumption of alcohol.
- ❖ Communicate to your employees and contractors about the plan and make sure they are aware of what they need to do – or not do – under the plan. Emphasize key points such as the importance of staying away from work even if they have only mild symptoms or have had to take simple medications (e.g., paracetamol, ibuprofen) which may mask the symptoms
- ❖ The plan should address how to keep your business running even if a significant number of employees, contractors and suppliers cannot come to your place of business - either due to local restrictions on travel or due to illness.

CHAPTER VIII

PROJECT BENEFITS

8.0 GENERAL

The proposed project at Jagadevipalayam Village aims to produce **14031 m³** of 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 22 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 13 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 Jagadevipalayam Village, Bargur 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 Jagadevipalayam Village. CSR budget is allocated as 2.5% of the profit.

8.7 CORPORATE ENVIRONMENT RESPONSIBILITY

Allocation for Corporate Environment Responsibility (CER) shall be made as per Government of India, MoEF & CC Office Memorandum F.No.22-65/2017-IA.III dated 01.05.2018. As per para 6 (II) of the office memorandum, being a green field project & capital investment is ≤ 100 crores, the proposed project shall contribute 2% of capital investment towards CER as per directions of EAC/SEAC. However, the SEAC has suggested to allocate CER fund on the basis of the extent of the project. Therefore, **Rs. 600000** 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.600000
	Total	Rs.600000

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

8.8 SUMMARY OF PROJECT BENEFITS

The project would pay about **Rs.71198060** 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.)	
	@ 20% Granite Recovery	80% Granite Wastage
CER	600000	---
Seigniorage @ Rs.3133/m ³ of Granite recovery Rs.265/m ³ of Granite wastage	43959123	14872595
District Mineral Foundation Tax @ 10% of Seigniorage	4395912	1487259
Green Tax @ 10% of Seigniorage	4395912	1487259
Total	53350947	17847113

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, **Tmt.M.Sadhana 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.

10.2 LAND ENVIRONMENT MANAGEMENT

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

Table 10.1 Proposed Controls for Land Environment

Control	Responsibility
Design vehicle wash-down areas so that all runoff water is captured and passed through oil water separators and sediment catchment devices.	Mines Manager
Refueling to be undertaken in a safe location away from vehicle movement pathways & 100m away of any watercourse. Refueling activity to be under visual observation at all times. Drainage of refueling areas to sumps with oil/water separation.	Mine Foreman & Mining Mate
Soil and groundwater testing as required following up a particular incident of contamination.	Mines Manager
At conceptual stage, the mining pits will be converted into Rain Water Harvesting. Remaining area will be converted into greenbelt area.	Mines Manager
No external dumping i.e., outside the project area.	Mine Foreman

Garland drains with catch pits / settlement traps to be provided all around the project area to prevent run off affecting the surrounding lands.	Mines Manager
The periphery of project area will be planted with thick plantation to arrest the fugitive dust, which will also act as acoustic barrier.	Mines Manager

Source: Proposed by FAEs & EIA Coordinator

10.3 SOIL MANAGEMENT

10.3.1 Top Soil Management

About 1560 m³ of top soil will be removed and preserved all along the boundary barrier. The preserved soil will be used for the greenbelt development and bund construction. A detailed soil environment management plan has been provided in Table 10.2.

10.3.2 Overburden / Waste and Side Burden Management

It is anticipating to remove 92153 m³ of waste (Granite waste + Weathered rock) which will temporarily store at predetermined places as per mining plan.

Table 10.2 Proposed Controls for Soil Management

Control	Responsibility
backfilling process during mine closure as per mining plan	Mines Manager
The dump slopes will be planted with deep rooting shrubs, grasses and creepers for stabilizing them	Environment Officer
Garland drains are to be paved around the dump area to arrest possible wash off in the rainy seasons	Mines Manager
Surface run-off from the surface dumps via garland drains will be diverted to the mine pits	Mine Foreman & Mining Mate
The backfilled area shall be covered with the soil for green belt development	Environment Officer
Design haul roads and other access roads with drainage systems to minimize concentration of flow and erosion risk	Environment Officer
keeping records of mitigation of erosion events, to improve on management techniques	Environment Officer
The overall slope of the dump is maintained at angle of repose not exceeding 37° from horizontal	Mines Manager
The retaining wall has to be made to arrest the waste dump spills	Mines Manager
A monitoring map with information including their GPS coordinates, erosion type, intensity, and the extent of the affected	Environment Officer

area, as well as existing control measures and assessment of their performance	
Empty sediment from sediment traps Maintain, repair or upgrade garland drain system	Environment Officer
Test soils for pH, EC, chloride, exchangeable cations, particle size and water holding capacity	Mines Manager

10.4 WATER MANAGEMENT

In the proposed quarrying project, no process is involved for the effluent generation, only oil & grease from the machinery wash and domestic sewage from mines office is anticipated. The quarrying operation is proposed up to a depth of 30m (15AGL+15BGL). The water table in the area is at 60 m below ground level. Hence, the proposed project will not intersect the ground water table during entire quarry period. A detailed water environment management plan has been provided in Table 10.3.

Table 10.3 Proposed Controls for Water Environment

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

Source: Proposed by FAEs & EIA Coordinator

10.5 AIR QUALITY MANAGEMENT

The proposed quarrying activity would result in the increase of particulate matter concentrations in the ambient air. Daily water sprinkling on the haul roads, approach roads in

the vicinity will be undertaken and will be continued as there is possibility for dust generation due to truck mobility. It will be ensured that vehicles are properly maintained to comply with exhaust emission requirements. A detailed ambient air environment management plan is provided in Table 10.4.

Table 10.4 Proposed Controls for Air Environment

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

Source: Proposed by FAEs & EIA Coordinator

10.6 NOISE POLLUTION CONTROL

There will be intermittent noise levels due to vehicular movement, trucks loading, drilling and blasting and cutting activities. No mining activities are planned during night time. A detailed noise environment management plan has been provided in Table 10.5.

Table 10.5 Proposed Controls for Noise Environment

Control	Responsibility
Development of thick greenbelt all along the buffer zone (7.5 meters) of the project area to attenuate the noise and the same will be maintained	Mines Manager
Preventive maintenance of mining machinery and replacement of worn-out accessories to control noise generation	Mines Foreman
Deployment of mining equipment with an inbuilt mechanism to reduce noise	Mines Manager

Provision of earmuff / ear plugs to workers working in noise prone zones in the mines	Mining Mate
Provision of effective silencers for mining machinery and transport vehicles	Mines Manager
Provision of sound proof AC operator cabins to HEMM	Mines Manager
Sharp drill bits are used to minimize noise from drilling	Mines Foreman
Controlled blasting technologies are adopted by using delay detonators to minimize noise from blasting	Mines Manager
Annual ambient noise level monitoring is carried out in the project area and in surrounding villages to assess the impact due to the mining activities and the efficacy of the adopted noise control measures. Additional noise control measures will be adopted if required as per the observations during monitoring	Mines Manager
Reduce maximum instantaneous charge using delays while blasting	Mining Mate
Change the burden and spacing by altering the drilling pattern and/or delay layout, or altering the hole inclination	Mines Manager
Undertake noise or vibration monitoring	Mines Manager

Source: Proposed by FAEs & EIA Coordinator

10.7 GROUND VIBRATION AND FLY ROCK CONTROL

The multi-color granite quarry operation creates vibration due to the blasting and movement of heavy earth moving machineries, fly rocks due to the blasting. A detailed ground vibration management plan has been provided in Table 10.6.

Table 10.6 Proposed Controls for Ground Vibrations & Fly Rock

Control	Responsibility
Controlled blasting using delay detonators will be carried out to maintain the PPV value (below 8Hz) well within the prescribed standards of DGMS	Mines Manager
Drilling and blasting will be carried under the supervision of qualified persons	Mines Manager
Proper stemming of holes should be carried out with statutory competent qualified blaster under the supervision of statutory mines manager to avoid any anomalies during blasting	Mines Manager

Suitable spacing and burden will be maintained to avoid misfire / fly rocks	Manager Mines
Number of blast holes will be restricted to control ground vibrations	Manager Mines
Blasting will be carried out only during noon time	Mining Mate
Undertake noise or vibration monitoring	Mines Manager
ensure blast holes are adequately stemmed for the depth of the hole and stemmed with suitable angular material	Mines Foreman

Source: Proposed by FAEs & EIA Coordinator

10.8 BIOLOGICAL ENVIRONMENT MANAGEMENT

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

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

10.8.1 Green Belt Development Plan

The main objectives of the greenbelt development plan are to:

- ❖ Combat the dispersal of dust in the adjoining areas.
- ❖ Protect the erosion of the soil and conserve moisture of the soil.
- ❖ Increase the rate of recharge of ground water.

- ❖ Restore the ecology of the area, restore aesthetic beauty of the locality and meet the requirement of fodder, fuel and timber of the local community. The proposed green belt development plan is given in Table 10.7.

Table 10.7 Proposed Greenbelt Development Plan

	No. of trees proposed for plantation	No. of trees expected to survive @ 80%	Area to be covered(m²)
Plantation in the construction phase (3 months)	Number of plants inside the mine lease area		
	374	299	3366
	Number of plants outside the mine lease area		
	561	449	5049
Total	935	748	8415

Source: Proposed by FAEs & EIA Coordinator

About 935 saplings will be planted in and around the lease area with the survival rate of 80%. A well-planned green belt of trees with long canopy leaves shall be developed with dense plantations around the boundary and along the haul roads to prevent air, dust noise propagation to undesired places and efforts will be taken for the enhancement of survival rate.

10.9 OCCUPATIONAL SAFETY & HEALTH MANAGEMENT

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

10.9.1 Medical Surveillance and Examinations

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

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

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

The medical histories of all employees will be maintained in a standard format annually. Thereafter, the employees will be subject to medical examination annually. The below tests (Table 10.8) keep upgrading the database of medical history of the employees.

Table 10.8 Medical Examination Schedule

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

10.9.2 Proposed Occupational Health and Safety Measures

- ❖ The mine site will have adequate drinking water supply so that workers do not get dehydrated.
- ❖ Lightweight and loose-fitting clothes having light color will be preferred to wear.

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



Figure 10.1 Personal Protective Equipment to the Mine Workers

10.9.3 Health and Safety Training Program

The Proponents will provide special induction program along with machinery manufacturers for the operators and co-operators to run and maintain the machinery effectively and efficiently. The training program for the supervisors and office staffs will be arranged in the Group Vocational Training Centers in the State and engage Environmental Consultants to provide periodical training to all the employees to carry out the mining operation in and eco-friendly manner, as shown in Table 10.9.

Table 10.9 List of Periodical Trainings Proposed for Employees

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

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

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

10.9.4 Budgetary Provision for Environmental Management

Adequate budgetary provision has been made by the company for execution of Environmental Management Plan. The Table 10.10 gives overall investment on the environmental safeguards and recurring expenditure for successful monitoring and implementation of control measures.

Table 10.10 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	18700	18700
	Fixed Water Sprinkling Arrangements + Water sprinkling by own water tankers	Fixed sprinkler installation and new water tanker cost for capital; and water sprinkling (thrice a day) cost for recurring	800000	50000
	Air quality will be regularly monitored as per norms within ML area & ambient area	Yearly compliance as per CPCB norms	0	50000
	Muffle blasting – To control fly rocks during blasting	Blasting face will be covered with sand bags / steel mesh / old tyres / used conveyor belts	0	5000

	Wet drilling procedure / latest eco-friendly drill machine with separate dust extractor unit	Dust extractor @ Rs. 25,000/- per unit deployed as capital & @ Rs. 2500 per unit recurring cost for maintenance	100000	10000
	No overloading of trucks/tippers/tractors	Manual Monitoring through Security guard	0	5000
	Stone carrying trucks will be covered by tarpaulin to avoid escape of fines to the atmosphere	Monitoring if trucks will be covered by tarpaulin	0	10000
	Enforcing speed limits of 20 km/hr within ML area	Installation of speed Governors @ Rs. 5000/- per tipper/dumper deployed	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	37400

	Installing wheel wash system near exit gate of quarry	Installation + Maintenance + Supervision	50000	20000
Total Air Environment			978700	208600
Noise Environment	Source of noise will be transportation vehicles, and HEMM. For this, proper maintenance will be done at regular intervals.	Provision made in Operating Cost	0	0
	Oiling & greasing of Transport vehicles and HEMM at regular interval will be done.	Provision made in Operating Cost	0	0
	Adequate silencers will be provided in all the diesel engines of vehicles.	Provision made in Operating Cost	0	0
	It will be ensured that all transportation vehicles carry a fitness certificate.	Provision made in Operating Cost	0	0
	Safety tools and implementations that are required will be kept adequately near blasting site at the time of charging.	Provision made in OHS part	0	0

	Line Drilling all along the boundary to reduce the PPV from blasting activity and implementing controlled blasting.	Provision made in Operating Cost	0	0
	Proper warning system before blasting will be adopted and clearance of the area before blasting will be ensured.	Blowing Whistle by Mining Mate / Blaster / Competent Person	0	0
	Provision for portable blaster shed	Installation of portable blasting shelter	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	18700	9350
Total Water Environment			18700	9350

Waste Management	Waste management (Spent Oil, Grease etc.,)	Provision for domestic waste collection and disposal through authorized agency (capital cost, recurring cost for collection /disposal).	25000	20000
		Installation of dust bins	5000	2000
	Bio toilets will be made available outside mine lease on the land of owner itself	Provision made in Operating Cost	0	0
Total Waste Management			30000	22000
Implementation of EC, Mining Plan & DGMS Condition	Size 6' X 5' with blue background and white letters as mentioned in MoM Appendix II by the SEAC TN	Fixed display board at the quarry entrance as permanent structure	10000	1000
Total Implementation of EC & Mining			10000	1000
Occupational Health	Workers will be provided with Personal Protective Equipment	Provision of PPE @ Rs. 4000/- per employee with recurring based on	88000	22000

and Safety		wear and tear (say, @ Rs. 1000/- per employee)		
	Health checkup for workers will be provisioned	IME & PME Health checkup @ Rs. 1000/- per employee	0	22000
	First aid facility will be provided	Provision of 2 Kits per Hectare @ Rs. 2000/-	0	7480
	Mine will have safety precaution signages, boards.	Provision for signages and boards made	10000	2000
	Barbed Wire Fencing to quarry area will be provisioned.	Per Hectare fencing Cost @ Rs. 2,00,000/- with Maintenance of Rs 10,000/- per annum	374000	18700
	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	93500	18700
	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			595500	875880
Development of Green Belt	Green belt development - 500 trees per hectare (200 Inside Lease Area & 300 Outside Lease Area)	Site clearance, preparation of land, digging of pits / trenches, soil amendments, transplantation of saplings @ 200 per plant (capital) for plantation inside the lease area and @ 30 per plant maintenance (recurring))"	74800	11220
		Avenue plantation @ 300 per plant (capital) for plantation outside the lease area and @ 30 per plant maintenance (recurring)	168300	16830

Total Development of Green Belt		243100	28050
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 63580
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. 265 and for granite recovery = Rs. 3133)	5883172 0
Total EMP Budget		7759172	1144880 (Exclude. Mine Closure Cost)

Table 10.11 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
1144880	1202124	1262230	1325342	1455189	6389765	14148937

In order to implement the environmental protection measures, an amount of Rs.7759172 as capital cost and Rs.1144880 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.6389765 and the overall EMP cost for 5 years will be Rs.14148937, as shown in Table 10.11.

10.10 CONCLUSION

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

CHAPTER XI SUMMARY AND CONCLUSION

11.0 INTRODUCTION

This EIA report was prepared in compliance with ToR obtained vide Letter No. SEIAA-TN/F.No.10214/SEAC/ToR-1559/2023 dated 27.09.2023. by considering two proposed quarries and two existing quarries in a cluster with the total extent of 8.78.5 hectares in Jagadevipalayam Village, Bargur Taluk, Krishnagiri District and Tamil Nadu. Cluster area was calculated as per MoEF & CC Notification S.O. 2269(E) Dated 1st July 2016. Baseline monitoring studies were carried out during the period of October–December, 2023.

11.1 PROJECT DESCRIPTION

The proposed project deals with excavation of multi colour granite which is primarily used as flooring stone in construction projects. The method adopted for granite excavation is a mechanized open cast mining method involving formation of benches with 5 m height and 5 m width. The proposed project area is located between latitudes from 12°28'42.19792"N to 12°28'49.68820"N and longitudes from 78°21'38.32342"E to 78°21'45.51566"E in Jagadevipalayam Village, Bargur Taluk, Krishnagiri District, Tamil Nadu. The project site is a Government land with the extent of 1.87.0ha leased for the project proponent, Tmt.M.Sadhana Colour Granites. The proponent had applied for quarry lease on 07.11.2020 to extract granite and obtained the precise area communication letter issued by Industries (MME.2) Department, Secretariat Chennai Rc.no.901/MME.2/2021-1, dated.26.02.2021. 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.6943/MM4/2020, dated:12.05.2023).

According to the approved mining plan, about 14031 m³ of granite will be mined up to the depth of 30m (15m AGL + 15m BGL) in the first five years. Of the total quantity, 14031 m³ of granite is marketable and the rest is stockpiled as wastes. To achieve the estimated production, 4 jack hammers, 2 compressors, 2 diamond wire saws, 1 Line drilling machinery 1 excavator, and 2 tippers will be deployed. To operate the machineries and to extract the granite, about 22 persons will be employed. At the end of the quarry life, about 1.04.00 ha of land would have been utilized for quarrying, 0.43.86 ha of land for waste dump, 0.02.00 ha for infrastructures, 0.04.0 ha for roads, 0.30.00 ha for green belt development, and the remaining 0.03.14 ha would have been left as unutilized area.

11.2 DESCRIPTION OF THE ENVIRONMENT

The baseline monitoring studies were carried out during October through December, 2023 to assess the existing environmental conditions in the study area. For the purpose of the EIA studies, project area was considered as the core zone and area outside the project area up to 5 km radius from the periphery of the project site was considered as buffer zone. Baseline Environmental data has been collected for land, water, noise, ecology, socio-economy, and traffic.

11.2.1 Land Environment

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, eight 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%.

11.2.2 Soil Characteristics

Physical Characteristics

The soil samples in the study area show loamy textures varying between silty clay loam, silty loam and sandy loam. pH of the soil varies from 6.2 to 7.8 indicating slightly acidic to slightly alkaline nature. Electrical conductivity of the soil varies from 45 to 560 $\mu\text{s}/\text{cm}$ Water Content ranges between 1.2 and 5.9%.

Chemical Characteristics

Nitrogen ranges between 0.8 and 1.4 mg/kg. Phosphate ranges between 0.03 and 0.09%. Potassium ranges between 0.018 and 0.055% Calcium ranges between <1.0 and <1.0 mg/kg. Organic matter content ranges between 3.1 and 9.4 %.

11.2.3 Water Environment

Surface Water

Mattur River, Bargur River and Kumaranganapalli Lakes are the three 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, SW2 and SW3 were collected from the three surface water bodies to assess the baseline water quality. Table 3.6a summarizes surface water quality data of the three samples.

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

Ground Water

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

11.3 AIR ENVIRONMENT

Site Specific Meteorology

Site specific meteorology during the study period was recorded by an automated weather station. According to the onsite data, the temperature in October, 2023 varied from 15.33 to 30.28⁰C with the average of 23.83⁰ C; in November, 2023 from 12.49 to 29.24⁰C with the average of 22.0⁰ C; and in December, 2023 from 14.02 to 27.78⁰C with the average of 21.06⁰C. In October, 2023, relative humidity ranged from 40.81 to 100 % with the average of 81.67%; in November, 2023, from 49.19 to 100 % with the average of 88.20 %; and in December, 2023, from 42.94 to 100 % with the average of 85.88%. The wind speed in October, 2023 varied from 0.52 to 7.68 m/s with the average of 2.56 m/s; in November, 2023 from 0.65 to 6.40 m/s with the average of 2.68 m/s; and in December, 2023 from 0.15 to 8.42 m/s with the average of 3.39 m/s. In October, 2023, wind direction varied from 1.07 to 359.60 with the average of 125.55⁰; in November, 2023, from 0.22 to 359.81⁰ with the average of 90.53⁰; and in December, 2023, from 0.76 to 357.83⁰ with the average of 89.92⁰. In October, 2023, surface pressure varied from 93.58 to 94.47kPa with the average of 94.08 kPa; in November, 2023, from 93.66 to 94.52kPa with the average of 94.09 kPa; and in December, 2023, from 92.96 to 94.80 kPa with the average of 94.05 kPa

Ambient Air Quality Results

As per the monitoring data, PM_{2.5} ranges from 15.5 µg/m³ to 21.5 µg/m³; PM₁₀ from 35.7 µg/m³ to 43.5µg/m³; SO₂ from 11.9 µg/m³ to 16.2 µg/m³; NO₂ from 15.9 µg/m³ to 22.3 g/m³. The concentration levels of the pollutants fall within the acceptable limits of NAAQS prescribed by CPCB

11.4 NOISE ENVIRONMENT

Noise levels recorded in buffer zone during day time varied from 39.5 to 45.8 dB (A) Leq and during night time from 35.9 to 43.3 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 3.19 and 3.20.

11.5 BIOLOGICAL ENVIRONMENT

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.

11.6 SOCIO-ECONOMIC ENVIRONMENT

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

11.7 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES FOR PROPOSED PROJECT

The summary of anticipated adverse environmental impacts due to the proposed project and mitigation measures are given in Table 11.2.

Table 11.2 Anticipated Impacts & Mitigation Measures

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

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

<ul style="list-style-type: none"> ❖ Increase in the concentration of suspended particles in runoff water. ❖ Coating of vegetation leading to reduced photosynthesis, ❖ Inhibited growth, destroying of foliage, degradation of crops; ❖ Increase in health hazards due to inhalation of dust. 	<ul style="list-style-type: none"> ❖ Speed restrictions will be imposed to avoid spillage of loaded materials upon the road and to reduce wear and tear of the road. ❖ Weekly inspections of the condition of the access road by competent person employed, and immediate action will be taken to address any potholes or damage to the road surface. ❖ Dust wetting agents can be mixed with the water applied to haul roads during hot, dry weather conditions to increase the duration that the road surface remains damp. ❖ Personal Protective Equipment's will be provided to all workers ❖ All drilling rods used will have dust suppression systems fitted which injects water into the hole. ❖ Wet gunny bags will be used as a cover while drilling. ❖ The blast zone will be kept damp by the application of water from the rain gun fitted to the water tanker prior to each blast to control any fugitive dust emissions that could arise from the surface during detonation. ❖ A daily visual inspection shall be conducted by the site manager who will keep a daily log of all process operations and site activities and note any malfunctions which could lead to abnormal emissions from the quarry operations. ❖ A site speed limit of 20 km/h will be set to minimise the potential for dust generation ❖ Weekly maintenance programme to identify machinery due for maintenance, based on the number of hours it has been in operation. ❖ Air filters are renewed after every 10⁰ hours of use, unless otherwise indicated by an on-board computer system. ❖ All site machineries & tippers will be serviced and maintained 6 months once and drivers will report any defects immediately to the site manager to enable repairs to be carried out promptly.
Noise & Vibration	
<ul style="list-style-type: none"> ❖ Annoyance and deterioration of the quality of life; 	<ul style="list-style-type: none"> ❖ Usage of sharp drill bits while drilling which will help in reducing noise;

<ul style="list-style-type: none"> ❖ Propelling of rocks fragments by blasting. ❖ Shaking of buildings and people due to blasting; 	<ul style="list-style-type: none"> ❖ Secondary blasting will be totally avoided and hydraulic rock breaker will be used for breaking boulders; ❖ Proper maintenance, oiling and greasing of machines will be done every week to reduce generation of noise; ❖ Provision of sound insulated chambers for the workers working on machines (HEMM) producing higher levels of noise; ❖ Silencers / mufflers will be installed in all machineries; ❖ Green Belt/Plantation will be developed around the project area and along the haul roads. The plantation minimizes propagation of noise; ❖ Personal Protective Equipment (PPE) like ear muffs/ear plugs will be provided to the operators of HEMM and persons working near HEMM and their use will be ensured through training and awareness.
Biological Environment	
<ul style="list-style-type: none"> ❖ Direct impacts include land clearance and excavation causing destruction of flora and fauna and loss of habitats; ❖ Indirect impacts include habitat degradation due to noise, dust, and human activity. 	<ul style="list-style-type: none"> ❖ Only some common herbs, shrubs and grass will be cleared. So, there will be no impact on the biodiversity. ❖ Green belt development with suitable species will enhance the biodiversity of the project area. ❖ The core zone or buffer zone does not encompass any threatened flora or fauna species.
Socio-Economic Environment	
<ul style="list-style-type: none"> ❖ Health and safety of workers and the general public; ❖ Increase in traffic volumes and sizes of road vehicles; ❖ Economic issues, including the increase in employment opportunities; 	<ul style="list-style-type: none"> ❖ The mining activity puts negligible change in the socio-economic profile. ❖ Around 22 local workers will get employment opportunities along with periodical training to generate local skills. ❖ New patterns of indirect employment/ income will generate. ❖ Regular health check-up camp. ❖ Assistance to schools and scholarship to children will be provided.
Occupational Health & Safety	
<ul style="list-style-type: none"> ❖ Exposure to Dust ❖ Noise and Vibration Exposure ❖ Physical Hazards 	<ul style="list-style-type: none"> ❖ Provision of rest shelters for mine workers with amenities like drinking water etc.

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

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

- ❖ The mineral deposit occurs in a non-forest area.
- ❖ There is no habitation within the applied lease area; hence no R & R issues exist.
- ❖ There is no river, stream, nallas and water bodies in the or passing through the applied mine lease areas.
- ❖ Availability of skilled, semi-skilled and unskilled workers in this region.
- ❖ All the basic amenities such as medical, firefighting, education, transportation, communication and infrastructural facilities are accessible.
- ❖ Mine connectivity through road and rail is good.
- ❖ The proposed mining operations do not intersect the ground water level. Hence, no impact on ground water environment.

11.9 ENVIRONMENTAL MONITORING PROGRAM

Environmental Monitoring program will be conducted for various environmental components such as air quality, meteorology, water quality, water level monitoring, soil quality, noise level, vibration, and greenbelt as per conditions stipulated in Environmental Clearance Letter issued by SEIAA & Consent to Operate issued by TNPCB. For this

environmental monitoring program, Rs. **2,95,000** /- per annum will spent by the project proponent. The monitored data on air quality, water quality, noise levels and other environmental attributes will be periodically examined by the cluster mine management coordinator and Respective Head of Organization and submitted to Tamil Nadu State Pollution Control Board in the Compliance to CTO Conditions & environmental audit statements every year to MoEF & CC and Half-Yearly Compliance Monitoring Reports to MoEF & CC Regional Office and SEIAA.

11.10 ADDITIONAL STUDIES

Risk Analysis & Disaster Management Plan

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

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

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

Cumulative Studies

- The results on the cumulative impact of the proposed project on air environment of the cluster do not exceed the permissible limits set by CPCB for air pollutants.
- The cumulative results of noise for the habitation in consideration do not exceed the limit set by CPCB for residential areas for daytime.
- The proposed projects will allocate Rs.1360000/- towards CER as recommended by SEAC.

- The proposed projects will directly provide jobs to 49 local people, in addition to indirect jobs.
- The proposed two projects will plant about 2665 trees in and around the lease area.
- The proposed two projects will add traffic of 99 PCU per day to the nearby roads.

11.11 PROJECT BENEFITS FOR PROPOSED PROJECT

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

- ❖ Direct employment to 22 local people
- ❖ Rain water harvesting structures to augment the water availability for irrigation and plantation and ground water recharge
- ❖ Creation of community assets (infrastructure) like school buildings, village roads/ linked roads, dispensary & health Centre, community Centre, market place etc.,
- ❖ Strengthening of existing community facilities through the Community Development Programme
- ❖ Skill development & capacity building like vocational training
- ❖ Awareness program and community activities, like health camps, medical aids, sports & cultural activities, plantation etc.,
- ❖ CSR activities mainly contributing to education, health, training of women self-help groups and infrastructure etc., will be taken up in the Jagadevipalayam Village. CSR budget is allocated.
- ❖ Rs. 600000 will be allocated for CER.

11.12 ENVIRONMENT MANAGEMENT PLAN

In order to implement the environmental protection measures, an amount of Rs.7759172 as capital cost and Rs.1144880 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.6389765 and the overall EMP cost for 5 years will be Rs.14148937.

11.13 CONCLUSION

EIA study was performed as per the approved ToR. Various environmental attributes were studied relating with aspects of mining activities. The related impacts were identified and evaluated. Considering all the possible ways to mitigate the environmental concerns Environmental Management Plan was prepared and accordingly fund was allocated. The EMP

has been dynamic, flexible and subject to periodic review. CER activities were identified and for its time bound implementation, fund has been allocated.

The project will increase the revenue of the State Govt. as well as it will help in the social upliftment of the local community. The green belt development programme will help in increasing the green cover in the area. Thus, the proposed project is not likely to affect the environment or adjacent ecosystem in an adverse way.

The Mines Management will be responsible for the project review of EMP and its implementation to ensure that the EMP remains effective and appropriate. Thus, the proper steps will be taken to accomplish all the goals mentioned in the EMP and the project will bring the positive impact in the study area.

CHAPTER XII

DISCLOSURES OF CONSULTANT

The Project Proponent, **Tmt.M.Sadhana** has engaged **Geo Technical Mining Solutions**, a NABET accredited consultancy for carrying out the EIA study as per the ToR issued.

Address of the consultancy:

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

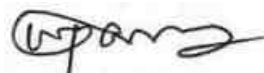
The accredited experts and associated members who were engaged in this EIA study are given below:

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

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

DECLARATION BY EXPERTS CONTRIBUTING TO THE EIA & EMP

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

Signature : 

Date :

Name : **Dr. S. Karuppannan**



Designation : EIA Coordinator

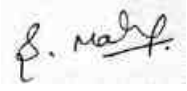





Name of the EIA Consultant Organization : Geo Technical Mining Solutions






Period of Involvement : Till date

We, the FAEs and FAAs hereby declare that information furnished in this EIA/EMP report for Tmt.M. Sadhana Colour granite project with the extent of 1.87.0 ha situated in the cluster with the extent of 8.78.5 ha in Jagadevipalayam Village, Bargur 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	

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

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

List of Functional Area Associate Engaged in this Project

S.No.	Name	Functional Area	Involvement	Signature
1	G. Prithiviraj	LU, HG	<ul style="list-style-type: none"> ○ Site visit with FAE ○ Provide inputs & Assisting FAE for LU and HG 	
2	C. Kumaresan	NV	<ul style="list-style-type: none"> ○ Assistance to FAE in both primary and secondary data collection ○ Assistance in noise prediction modelling 	
3	P. Vellaiyan	HG & GEO	<ul style="list-style-type: none"> ○ Field visits along with FAE ○ Assistance to FAE in both primary and secondary data collection 	
4	P. Dhatchayini	AQ	<ul style="list-style-type: none"> ○ Site visit with FAE ○ 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	
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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 **Tmt.M. Sadhana** Colour granite quarry project with the extent of 1.87.0 ha located within the cluster of 8.78.5 ha in Jagadevipalayam Village, Bargur 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/2124/SA 0184

Validity : Till April 02, 2024



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

STATE LEVEL ENVIRONMENT IMPACT
ASSESSMENT AUTHORITY-TAMILNADU
3rd Floor, Panagal Maaligai,
No.1, Jeenis Road, Saidapet,
Chennai - 600 015.
Phone No. 044-24359973
Fax No. 044-24359975

TERMS OF REFERENCE (ToR)

Lr No.SEIAA-TN/F.No.10214/SEAC/ToR-1559/2023 Dated:27.09.2023.

To

Tmt.M.Sadhana,
W/o. Madhaiyan
No.2/A2, 3rd Cross,
Gopalakrishna Colony,
Krishnagiri Taluk,
Krishnagiri District-635001

Sir / Madam,

Sub: SEIAA, Tamil Nadu – Terms of Reference with public Hearing (ToR) for the Proposed Colour Granite Quarry over an extent of 1.87.0Ha at SF.No.366 (Part) of Jagadevipalayam Village, Bargur Taluk, Krishnagiri District, Tamil Nadu by Tmt. M. Sadhana- under project category – “B1” and Schedule S.No.1 (a) – ToR issued along with Public Hearing - preparation of EIA report – Regarding.

Ref: 1. Online proposal No.SIA/TN/MIN/435951/2023, dated:08.07.2023.
2. Your application submitted for Terms of Reference dated:17.07.2023.
4. Minutes of the 407th SEAC meeting held on 07.09.2023.
5.Minutes of the 658th SEIAA meeting held on 26.09.2023 &27.09.2023.

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

The proponent, Tmt.M.Sadhana has submitted application for Terms of Reference (ToR) in Form-I, Pre- Feasibility report for Proposed Colour Granite Quarry over an extent of 1.87.0Ha at SF.No.366 (Part) of Jagadevipalayam Village, Bargur Taluk, Krishnagiri District, Tamil Nadu.


MEMBER SECRETARY
SEIAA-TN

Discussion by SEAC and the Remarks:-

Proposed Colour Granite Quarry over an extent of 1.87.0Ha at SF.No.366 (Part) of Jagadevipalayam Village, Bargur Taluk, Krishnagiri District, Tamil Nadu by Tmt. M. Sadhana - For Terms of Reference.

(SIA/TN/MIN/435951/2023, Dated: 08.07.2023)

The proposal was placed in the 407th SEAC Meeting held on 07.09.2023. The details of the project furnished by the proponent are given on the website (parivesh.nic.in).


The SEAC noted the following:

1. The Project Proponent, Tmt.M.Sadhana has applied for Terms of Reference for the Proposed Colour Granite Quarry over an extent of 1.87.0Ha at SF.No. 366 (Part) of Jagadevipalayam Village, Bargur Taluk, Krishnagiri District,Tamil Nadu.
2. The project/activity is covered under Category "B1" of Item 1(a) " Mining of mineral of the Schedule to the EIA Notification, 2006.
3. As per the mining plan the lease period is for 20 years. The mining plan is for the period of Five years & the production should not exceed 1,07,744m³ of ROM, 14,031m³ of Colour Granite @ 20% Recovery, 56,123m³ of Granite Waste @ 80%, 1560m³ of Topsoil & 36,030m³ of Weathered Rock with an ultimate depth of mining is 30m (15m AGL + 15m BGL) The annual peak production is 34,840m³ of ROM (2nd Year) , 3119m³ Colour Granite @ 20% Recovery (1st Year) , 12,475m³ of Granite Waste @ 80% (1st Year), 1560m³ of Topsoil (2nd Year) & 19380m³ of Weathered Rock (2nd year).

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

1. The PP shall furnish ownership details of all survey numbers in EIA report.
2. The PP shall submit the 'Action Plan' on the issues raised during the Public Hearing with budgetary provisions for the same.
3. The PP shall submit the action plan for the controlled blasting measures so as to reduce the impacts due to the blasting operation in the proposed quarries within 1 km of the proposed quarry.
4. The PP shall submit a 'Conceptual Mining Plan' indicating the accessible ramp from the

- surface to the pit bottom keeping the benches intact for the dimension as stipulated in the Approved Mining Plan.
5. The PP shall enumerate the structures located within 500 m radius of the proposed quarry with classifying the nature of buildings/structures & its age, number of occupants and their profession, distance of its existing location to the proposed quarry.
 6. In the case of existing/operating mines, a letter obtained from the concerned AD (Mines) shall be submitted and it shall include the following:
 - (i) Original pit dimension
 - (ii) Quantity achieved Vs EC Approved Quantity
 - (iii) Balance Quantity as per Mineable Reserve calculated.
 - (iv) Mined out Depth as on date Vs EC Permitted depth
 - (v) Details of illegal/illicit mining
 - (vi) Violation in the quarry during the past working.
 - (vii) Quantity of material mined out outside the mine lease area
 - (viii) Condition of Safety zone/benches
 - (ix) Revised/Modified Mining Plan showing the benches of not exceeding 6 m height and ultimate depth of not exceeding 50m.
 7. 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.
 8. The proponent is requested to carry out a survey and enumerate on the structures located within the radius of (i) 50 m, (ii) 100 m, (iii) 200 m and (iv) 300 m (v) 500m shall be enumerated with details such as dwelling houses with number of occupants, whether it belongs to the owner (or) not, places of worship, industries, factories, sheds, etc with indicating the owner of the building, nature of construction, age of the building, number of residents, their profession and income, etc.
 9. 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.
 10. The Proponent shall carry out Bio diversity study through reputed Institution and the same shall be included in EIA Report.
 11. 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.


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12. 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.
13. 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.
14. 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.
15. 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.
16. 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.
17. 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,
18. What was the period of the operation and stoppage of the earlier mines with last work permit issued by the AD/DD mines?
19. Quantity of minerals mined out.
 - Highest production achieved in any one year
 - Detail of approved depth of mining.
 - Actual depth of the mining achieved earlier.
 - Name of the person already mined in that leases area.
 - If EC and CTO already obtained, the copy of the same shall be submitted.

- Whether the mining was carried out as per the approved mine plan (or EC if issued) with stipulated benches.
20. 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).
 21. The PP shall carry out Drone video survey covering the cluster, green belt, fencing, etc.,
 22. 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.
 23. 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.
 24. 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.
 25. 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.
 26. 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.
 27. 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.


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Accordingly, the Environment Management plan should be prepared keeping the concerned quarry and the surrounding habitations in the mind.

28. Rain water harvesting management with recharging details along with water balance (both monsoon & non-monsoon) be submitted.
29. 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.
30. 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.
31. 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.
32. 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.
33. Impact on local transport infrastructure due to the Project should be indicated.
34. A tree survey study shall be carried out (nos., name of the species, age, diameter etc.,) both within the mining lease applied area & 300m buffer zone and its management during mining activity.
35. A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific.
36. 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.
37. 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.
38. 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
 39. 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.
 40. 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.
 41. 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.
 42. 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.
 43. 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.
 44. Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.
 45. 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.
 46. 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.


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47. 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.
48. Concealing any factual information or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this Terms of Conditions besides attracting penal provisions in the Environment (Protection) Act, 1986.

Appendix - I
List of Native Trees Suggested for Planting

No	Scientific Name	Tamil Name	Tamil Name
1	<i>Aegle marmelos</i>	Vilvam	வில்வம்
2	<i>Adenaanthera pavonina</i>	Manjadi	மஞ்சாடி
3	<i>Albizia lebbek</i>	Vaagai	ஆனைக்குன்றிமணி
4	<i>Albizia amara</i>	Usil	வாகை
5	<i>Bauhinia purpurea</i>	Mantharai	உசில்
6	<i>Bauhinia racemosa</i>	Aathu	மந்தாரை
7	<i>Bauhinia tomentos</i>	Iruvathi	ஆத்தி
8	<i>Buchanania axillaris</i>	Kattuma	இருவாத்தி
9	<i>Borassus flabellifer</i>	Panai	காட்டுமர
10	<i>Butea monosperma</i>	Murukkamaram	பனை
11	<i>Bobax ceiba</i>	Ilavu, Sevvilavu	முருக்கமரம்
12	<i>Calophyllum inophyllum</i>	Punnai	இலவு
13	<i>Cassia fistula</i>	Sarakondrai	புள்ளை
14	<i>Cassia roxburghii</i>	Sengondrai	சரக்கொன்றை
15	<i>Chloroxylon sweetenia</i>	Purasamaram	செங்கொன்றை
16	<i>Cochlospermum religiosum</i>	Kongu, Manjallavu	பரசு மரம்
17	<i>Cordia dichotoma</i>	Naruvuli	கோங்கு, மஞ்சள்
18	<i>Creteva adansonii</i>	Mavalingum	இலவு
19	<i>Dillenia indica</i>	Uva, Uzha	நருவுளி
20	<i>Dilemia pentagyna</i>	SiruUva, Sitruzha	மாவிலங்கம்
21	<i>Diospyro sevenum</i>	Karungali	உசா
22	<i>Diospyro schloroxylon</i>	Vagarai	சிறு உசா
23	<i>Ficus amplissima</i>	Kalltchi	கருங்காலி
24	<i>Hibiscus tiliaceou</i>	Aatrupoovarasu	வாகை
25	<i>Hardwickia binata</i>	Aacha	கல் இச்சி
26	<i>Holoptelia integrifolia</i>	Aayili	ஆறிநுப்புவரசு
27	<i>Lannea coromandelica</i>	Odhiam	ஆச்சா
28	<i>Lagerstroemia speciosa</i>	Foo Marudhu	ஆயா மரம், ஆயில்
29	<i>Lepisanthus tetraphylla</i>	Neikottaimaram	ஓதியம்
30	<i>Limonia acidissima</i>	Vila maram	பூ மருகு
31	<i>Litsea glutinos</i>	Poinpattai	நெய் கொட்டை மரம்
32	<i>Madhuca longifolia</i>	Illupai	விலா மரம்
33	<i>Manilkara hexandra</i>	UlakkaiPaalai	அரம்பா பிச்சிப்பட்டை
34	<i>Mimusops elengi</i>	Magizhamaram	இலுப்பை
35	<i>Mitragyia parvifolia</i>	Kadambu	உலக்கை பாலை
36	<i>Morinda pubescens</i>	Nuna	மகிழ்மரம்
37	<i>Morinda citrifolia</i>	Vellai Nuna	கடம்பு
38	<i>Phoenix sylvestre</i>	Eachai	நுணா
39	<i>Pongamia pinnat</i>	Pungan	வேள்கை நுணா
			சச்சமரம்
			பங்கம்

40	<i>Premna mollissima</i>	Munnai	முன்னை
41	<i>Premna serratifolia</i>	Narumunna	நறு முன்னை
42	<i>Premna tomentosa</i>	Malaipoovarasu	மலை பூவரசு
43	<i>Prosopis cinerea</i>	Vanni maram	வன்னி மரம்
44	<i>Pterocarpus marsupium</i>	Vengai	வேங்கை
45	<i>Pterospermum canescens</i>	Verunagu, Tada	வேண்ணாங்கு
46	<i>Pterospermum xylocarpum</i>	Polavu	பூவடி
47	<i>Putranjiva roxburghii</i>	Karipala	கரிபாலா
48	<i>Salvadora persica</i>	Ugaa Maram	ஊகா மரம்
49	<i>Sapindus emarginatus</i>	Maripungan, Soapukai	மணிப்பூங்கை சோப்புக்காய்
50	<i>Saraca asoca</i>	Asoca	சுரோகா
51	<i>Streblus asper</i>	Piray maram	பிராய் மரம்
52	<i>Strychnos nuxvomica</i>	Yetti	எட்டி
53	<i>Strychnos potatorum</i>	Therthang Kottu	தேத்தாங் கோட்டை
54	<i>Syzygium cumini</i>	Naval	நாவல்
55	<i>Terminalia belleric</i>	Thandri	தாண்ட்ரி
56	<i>Terminalia arjuna</i>	Ven marudhu	வேண மருது
57	<i>Toona ciliata</i>	Sandhana vembu	சந்தன வேம்பு
58	<i>Theosposia populnea</i>	Puvarasu	பூவரசு
59	<i>Walsuratrifoliata</i>	valsura	வாலசுரா
60	<i>Wrightia tinctoria</i>	Veppalai	வேப்பாளை
61	<i>Pithecolobium dulce</i>	Kodukkapuli	கொடுக்காப்புளி

Discussion by SEIAA and the Remarks:-

The proposal was placed in the 658th Authority meeting held on 26.09.2023 & 27.09.2023. The authority noted that this proposal was placed for appraisal in 407th meeting of SEAC held on 07.09.2023, the committee has furnished its recommendations for granting ToR with Public hearing subject to the conditions stated therein. After detailed discussions, the Authority accepts the recommendation of SEAC and decided to grant **Terms of Reference (ToR) along with Public Hearing** under cluster for undertaking the combined Environment Impact Assessment Study and preparation of separate Environment Management Plan subject to the conditions as recommended by SEAC & normal conditions in addition to the conditions in '**Annexure B**' of this minute.

Annexure 'B'

Cluster Management Committee

1. Cluster Management Committee shall be framed which must include all the proponents in the cluster as members including the existing as well as proposed quarry.
2. The members must coordinate among themselves for the effective implementation of EMP as committed including Green Belt Development, Water sprinkling, tree plantation, blasting etc.,
3. The List of members of the committee formed shall be submitted to AD/Mines before the execution of mining lease and the same shall be updated every year to the AD/Mines.

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4. Detailed Operational Plan must be submitted which must include the blasting frequency with respect to the nearby quarry situated in the cluster, the usage of haul roads by the individual quarry in the form of route map and network.
5. The committee shall deliberate on risk management plan pertaining to the cluster in a holistic manner especially during natural calamities like intense rain and the mitigation measures considering the inundation of the cluster and evacuation plan.
6. The Cluster Management Committee shall form Environmental Policy to practice sustainable mining in a scientific and systematic manner in accordance with the law. The role played by the committee in implementing the environmental policy devised shall be given in detail.
7. The committee shall furnish action plan regarding the restoration strategy with respect to the individual quarry falling under the cluster in a holistic manner.
8. The committee shall furnish the Emergency Management plan within the cluster.
9. The committee shall deliberate on the health of the workers/staff involved in the mining as well as the health of the public.
10. The committee shall furnish an action plan to achieve sustainable development goals with reference to water, sanitation & safety.
11. The committee shall furnish the fire safety and evacuation plan in the case of fire accidents.

Impact study of mining

12. Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area covering the entire mine lease period as per precise area communication order issued from reputed research institutions on the following
 - a) Soil health & soil biological, physical land chemical features .
 - b) Climate change leading to Droughts, Floods etc.
 - c) Pollution leading to release of Greenhouse gases (GHG), rise in Temperature, & Livelihood of the local people.
 - d) Possibilities of water contamination and impact on aquatic ecosystem health.
 - e) Agriculture, Forestry & Traditional practices.
 - f) Hydrothermal/Geothermal effect due to destruction in the Environment.
 - g) Bio-geochemical processes and its foot prints including environmental stress.
 - h) Sediment geochemistry in the surface streams.

Agriculture & Agro-Biodiversity

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

Forests

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

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.
24. Erosion Control measures.

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

Energy

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

Climate Change

32. The Environmental Impact Assessment shall study in detail the carbon emission and also suggest the measures to mitigate carbon emission including development of carbon sinks and temperature reduction including control of other emission and climate mitigation activities.
33. The Environmental Impact Assessment should study impact on climate change, temperature rise, pollution and above soil & below soil carbon stock.

Mine Closure Plan

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

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.
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.

Risk Assessment

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

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

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.

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.

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.

A. STANDARD TERMS OF REFERENCE

- 1) Year-wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification 1994 came into force, w.r.t. the highest production achieved prior to 1994.
- 2) A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given.
- 3) All documents including approved mine plan, EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee.
- 4) All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery/ topo


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- sheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).
- 5) Information should be provided in Survey of India Topo sheet in 1:50,000 scale indicating geological map of the area, geomorphology of land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics.
 - 6) Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority.
 - 7) It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating process/procedures to bring into focus any infringement/deviation/violation of the environmental or forest norms/ conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large, may also be detailed in the EIA Report.
 - 8) Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided.
 - 9) The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc. should be for the life of the mine / lease period.
 - 10) Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.
 - 11) Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given.
 - 12) Certificate from the Competent Authority in the State Forest Department should be provided.

confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.

- 13) Status of forestry clearance for the broken up area and virgin forestland involved in the Project including deposition of Net Present Value (NPV) and Compensatory Afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.
- 14) Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.
- 15) The vegetation in the RF / PF areas in the study area, with necessary details, should be given.
- 16) A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly, detailed mitigative measures required, should be worked out with cost implications and submitted.
- 17) Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves/(existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished.
- 18) A detailed biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled-I fauna found in the study area, the necessary plan along with budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost.
- 19) Proximity to Areas declared as 'Critically Polluted' or the Project areas likely to come under the 'Aravali Range', (attracting court restrictions for mining operations), should


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- also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Department should be secured and furnished to the effect that the proposed mining activities could be considered.
- 20) Similarly, for Coastal Projects, a CRZ map duly authenticated by one of the authorized agencies demarcating LTL, HTL, CRZ area, location of the mine lease with respect to CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority).
- 21) R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need based sample survey, family-wise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be clearly brought out whether the village(s) located in the mine lease area will be shifted or not. The issues relating to shifting of village(s) including their R&R and socio-economic aspects should be discussed in the Report.
- 22) One season (non-monsoon) [i.e. March-May (Summer Season); October-December (post monsoon season) ; December-February (winter season)] primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM10, particularly for free silica, should be given.
- 23) Air quality modeling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of Vehicles for transportation of mineral. The details of the model used and input parameters used for modeling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.

- 24) The water requirement for the Project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the Project should be indicated.
- 25) Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.
- 26) Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.
- 27) Impact of the Project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided.
- 28) Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. The Report inter-alia, shall include details of the aquifers present and impact of mining activities on these aquifers. Necessary permission from Central Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished.
- 29) Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion proposed, if any, and the impact of the same on the hydrology should be brought out.
- 30) Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and bgl. A schematic diagram may also be provided for the same.
- 31) A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution.
- 32) Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those outside the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken

- by other agencies such as State Government) should be covered. Project Proponent shall conduct Impact of Transportation study as per Indian Road Congress Guidelines.
- 33) Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.
 - 34) Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report.
 - 35) Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.
 - 36) Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.
 - 37) Measures of socio economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.
 - 38) Detailed Environmental Management Plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project.
 - 39) Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project.
 - 40) Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.
 - 41) The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.
 - 42) A Disaster management Plan shall be prepared and included in the EIA/EMP Report.
 - 43) Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.
 - 44) Besides the above, the below mentioned general points are also to be followed:-
 - a) Executive Summary of the EIA/EMP Report

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

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

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

1. Project name and location (Village, District, State, Industrial Estate (if applicable)).
2. Process description in brief, specifically indicating the gaseous emission, liquid effluent and


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solid and hazardous wastes.

3. Measures for mitigating the impact on the environment and mode of discharge or disposal.
4. Capital cost of the project, estimated time of completion.
5. The proponent shall furnish the contour map of the water table detailing the number of wells located around the site and impacts on the wells due to mining activity.
6. A detailed study of the lithology of the mining lease area shall be furnished.
7. Details of village map, "A" register and FMB sketch shall be furnished.
8. Detailed mining closure plan for the proposed project approved by the Geology of Mining department shall be submitted along with EIA report.
9. Obtain a letter /certificate from the Assistant Director of Geology and Mining standing that there is no other Minerals/resources like sand in the quarrying area within the approved depth of mining and below depth of mining and the same shall be furnished in the EIA report.
10. EIA report should strictly follow the Environmental Impact Assessment Guidance Manual for Mining of Minerals published February 2010.
11. Detail plan on rehabilitation and reclamation carried out for the stabilization and restoration of the mined areas.
12. The EIA study report shall include the surrounding mining activity, if any.
13. Modeling study for Air, Water and noise shall be carried out in this field and incremental increase in the above study shall be substantiated with mitigation measures.
14. A study on the geological resources available shall be carried out and reported.
15. A specific study on agriculture & livelihood shall be carried out and reported.
16. Impact of soil erosion, soil physical chemical and biological property changes may be assumed.
17. Site selected for the project - Nature of land - Agricultural (single/double crop), barren, Govt./ private land, status of is acquisition, nearby (in 2-3 km.) water body, population, with in 10km other industries, forest , eco-sensitive zones, accessibility, (note - in case of industrial estate this information may not be necessary)
18. Baseline environmental data - air quality, surface and ground water quality, soil characteristic, flora and fauna, socio-economic condition of the nearby population
19. Identification of hazards in handling, processing and storage of hazardous material and safety system provided to mitigate the risk.
20. Likely impact of the project on air, water, land, flora-fauna and nearby population
21. Emergency preparedness plan in case of natural or in plant emergencies

22. Issues raised during public hearing (if applicable) and response given
23. CER plan with proposed expenditure.
24. Occupational Health Measures
25. Post project monitoring plan
26. The project proponent shall carry out detailed hydro geological study through intuitions/NABET Accredited agencies.
27. A detailed report on the green belt development already undertaken is to be furnished and also submit the proposal for green belt activities.
28. The proponent shall propose the suitable control measure to control the fugitive emissions during the operations of the mines.
29. A specific study should include impact on flora & fauna, disturbance to migratory pattern of animals.
30. Reserve funds should be earmarked for proper closure plan.
31. A detailed plan on plastic waste management shall be furnished. Further, the proponent should strictly comply with, Tamil Nadu Government Order (Ms) No.84 Environment and forests (EC.2) Department dated 25.06.2018 regarding ban on one time use and throw away plastics irrespective of thickness with effect from 01.01.2019 under Environment (Protection) Act, 1986. In this connection, the project proponent has to furnish the action plan.

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

- a. A note confirming compliance of the TOR, with cross referencing of the relevant sections / pages of the EIA report should be provided.
- b. All documents may be properly referenced with index, page numbers and continuous page numbering.
- c. Where data are presented in the report especially in tables, the period in which the data were collected and the sources should be indicated.
- d. While preparing the EIA report, the instructions for the proponents and instructions for the consultants issued by MoEF & CC vide O.M. No. J-11013/41/2006-IA.II (I) dated 4th August, 2009, which are available on the website of this Ministry should also be followed.
- e. The consultants involved in the preparation of EIA/EMP report after accreditation with Quality Council of India (QCI)/National Accreditation Board of Education and Training (NABET) would need to include a certificate in this regard in the EIA/EMP reports prepared by them and

data provided by other organization/Laboratories including their status of approvals etc. In this regard circular no F. No.J -11013/77/2004-IA-II(I) dated 2nd December, 2009, 18th March 2010, 28th May 2010, 28th June 2010, 31st December 2010 & 30th September 2011 posted on the Ministry's website <http://www.moef.nic.in/> may be referred.

- After preparing the EIA (as per the generic structure prescribed in Appendix-III of the EIA Notification, 2006) covering the above mentioned points, the proponent will take further necessary action for obtaining environmental clearance in accordance with the procedure prescribed under the EIA Notification, 2006.
- The final EIA report shall be submitted to the SEIAA, Tamil Nadu for obtaining Environmental Clearance.
- The TORs with public hearing prescribed shall be **valid for a period of three years** from the date of issue, for submission of the EIA/EMP report as per OMNo.J-11013/41/2006-IA-II(I) (part) dated 29th August, 2017.


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Copy to:

1. The Additional Chief Secretary to Government, Environment & Forests Department, Govt. of Tamil Nadu, Fort St. George, Chennai - 9
2. The Chairman, Central Pollution Control Board, Parivesh Bhavan, CBD Cum-Office Complex, East Arjun Nagar, New Delhi 110032.
3. The Member Secretary, Tamil Nadu Pollution Control Board, 76, Mount Salai, Guindy, Chennai-600 032.
4. The APCCF (C), Regional Office, MoEF & CC (SZ), 34, HEPC Building, 1st & 2nd Floor, Cathedral Garden Road, Nungambakkam, Chennai -34.
5. Monitoring Cell, IA Division, Ministry of Environment, Forests & CC, Paryavaran Bhavan, CGO Complex, New Delhi 110003
6. The District Collector, Krishnagiri District.
7. Stock File.

From
Dr. S.Vediappan, M.Sc.,Phd.,
Deputy Director,
Dept of Geology and Mining,
Krishnagiri.

To
Tmt.M.Sadhana,
No.2/A2, 3rd Cross,
Gopalakrishna Colony,
Krishnagiri.

Roc.No.1049/2020 /Mines dated: 22.05.2023.

Sir,

Sub: Mines and Minerals – Krishnagiri District – Colour Granite – Bargur Taluk – Jagadevipalayam Village - S.F.No.366 (Part) over an extent of 1.87.0 of Government land – obtained approved mining plan - Tender Cum Auction conducted – Tmt.M.Sadhana declared as highest tenderer - Details of quarries situated within 500 mts radial distance – Requested by the lessee – Details furnished - reg.

- Ref:**
1. The District Collector, Krishnagiri, Roc. No.1049/2020/Mines, dated: 03.12.2020.
 2. Mining plan approved by Commissioner of Geology and Mining letter Rc.No. 6943/MM4/2020 Dated: 12.05.2023.
 3. Tmt.M.Sadhana, letter dated: 22.05.2023.

kind attention is invited to the reference cited.

2) Tender Cum Auction conducted for Granite leases in Krishnagiri District including for quarrying Colour Granite over an extent of 1.87.0 hecets of Government lands in S.F.No.366 (Part) of Jagadevipalayam Village, Bargur Taluk, Krishnagiri district for a period of 20 years under the provisions of Rule 8 (A) of Tamil Nadu Minor Mineral Concession Rule 1959. In this connection the highest tender granted by Tmt. M. Sadhana declared as successful tenderer directed to submit approved mining plan approved and Environmental clearancve vide the Govt. letter dated: 26.02.2021

3) Accordingly, the tenderer has obtained approved Mining Plan for the 1st five years from the Commissioner of Geology and Mining, vide letter dated: 12.05.2023.

4) In this connection, the details of quarries situated within 500mts for the subject quarry requested by the tenderer vide letter dated: 22.05.2023 to furnish the same before SEIAA in orders to get Environmental Clearance.

5) As requested by the tenderer the details of quarries situated within 500m radius is furnished as follows:

I. Details of Existing quarries.

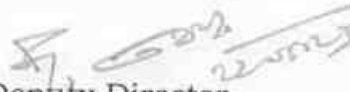
Sl No	Name of the lessee	GO.No. & Dated	Village & Taluk	S.F No.	Extent in Het	Lease period.	Last Permit Obtained
1.	Thiru. K. Sekaran, S/o. P.P.Kaverichetty, No. 25A, Red Hills road, Aishwaryam, kolathur, Krishnagiri	G.O.(3D)No. 16, Ind (MME.2) dept dated: 2.7.2012	Jagadevi palayam Village, Bargur	367/1N1, 362/2N2(P) 367/2O1 (P)	1.10.50	13.07.2012 to 12.07.2032	12.09.2018
	Thiru. V.Venu, S/o. B.C. Venkatappan, No. 80, 1 st cross, 5 th main 373/3, Krishnagiri road, Krishnagiri.	G.O.(3D)No. 42, Ind (MME.2) dept dated: 27.11.2015	Jagadevi palayam Village, Bargur	5	2.35.0	16.12.2015 to 15.12.2035	14.08.2020

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 of the lessee	GO.No. & Dated	Village & Taluk	S.F No.	Extent in Het	Lease period.
1.	Tmt.M.Sadhana, No.2/A2, 3 rd Cross, Gopalakrishna Colony, Krishnagiri.	-	Jagadevi palayam Village, Bargur	366(Part)	1.87.0	Instant Proposal (Mining plan approved)
2.	M/s. Pranita Granites, No.62/33, pilikuthi street, Gugai , Salem.	-	Pasinayanap alli, bargur	10 (part)	3.46.0	Mining Plan forwarded to CGM.


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.


22/5/23

COMMISSIONERATE OF GEOLOGY AND MINING

From

Thiru J.Jayakanthan, I.A.S.,
Commissioner of Geology and Mining,
Industrial Estate,
Guindy,
Chennai - 600 032.

To

Tmt. M.Sadhana,
No.2/A2, 3rd Cross,
Gopalakrishna Colony,
Krishnagiri District - 635 001.

Rc.No. 6943/MM4/2020 Dated 12.05.2023

Sir,

Sub: Mines and Minerals - Minor Mineral - Granite -
Krishnagiri District - Tender Cum Auction for Granite
quarries conducted under the provisions of rule 8(A) of
TNMMCR 1959 on 07.11.2020 - Colour Granite quarry
area over an extent of 1.87.0 hecets of Government land
in S.F.No.366 (Part) in Jagadevipalayam Village, Bargur
Taluk, Krishnagiri District - Precise area communicated
to the highest bidder Tmt.M.Sadhana - Draft Mining
Plan submitted for approval - forwarded by the Deputy
Director, Geology and Mining, Krishnagiri for passing
suitable orders - Approval accorded.

- Ref:
1. Krishnagiri District Gazette Extraordinary issue in
English No. 20, 38 and Tamil No.35 & 53 dated:
09.10.2020 & 29.10.2020.
 2. Application of the Tmt.M.Sadhana, No.2/A2, 3rd
Cross, Gopalakrishna Colony, Krishnagiri dated:
07.11.2020 and three others.
 3. The District Collector, Krishnagiri, Roc.
No.1049/2020/Mines, dated: 03.12.2020.
 4. The Principal Secretary to Government, Industries
(MME.2) Department, Secretariat, Chennai -
600009 Lr.No.901/ MME.2/2021-1, dated:
26.02.2021.
 5. Draft Mining Plan Submitted by Tmt.M.Sadhana,
No.2/A2, 3rd Cross, Gopalakrishna Colony,
Krishnagiri dated: 07.05.2021 at district office.
 6. Writ Petition filed by Thiru. A. Chellakumar before
Hon'ble High Court Madras in W.P.No. 16060/2020:
 7. Writ Petition filed by Thiru. R. Thamaraiselvan
before Hon'ble High Court Madras in W.P.No.
13811/2020.

8. The Deputy Director, Geology and Mining,
Krishnagiri Rc.No.1049/2020/Mines dt.5.5.2023
received on 8.5.2023.

-oOo-

Kind attention invited to the above references cited.

2) In the reference 7th cited, the applicant Tmt.M.Sadhana has submitted the mining plan for approval on 7.5.2021 at district office for the quarry lease applied for quarrying Colour Granite over an extent of 1.87.0 hect of Government land in S.F.No.366 (Part) in Jagadevipalayam village, Bargur Taluk, Krishnagiri District for a period of 20 years under rule 8-A of Tamil Nadu Minor Mineral Concession Rules, 1959.

3) The Deputy Director (G&M), Krishnagiri district in the reference 8th cited has forwarded the mining plan for first five years period submitted by applicant Tmt.M.Sadhana for approval stating the following,

- i. Tender Cum Auction was conducted in Krishnagiri District on 07.11.2020 for Colour granite quarry area situated over an extent of 1.87.0 hect of Government land in S.F.No.366 (Part) in Jagadevipalayam village, Bargur Taluk, Krishnagiri District. Tmt.M.Sadhana, had offered a highest bid/tender amount of Rs.2,30,00,000/- as one time lease amount. Hence necessary proposals had been forwarded by the District Collector to the Government through the Commissioner of Geology and Mining, Chennai for grant of Colour granite quarry lease infavour of the highest bidder Tmt.M.Sadhana over the subject area for a period of 20 years vide letter dated: 03.12.2020.
- ii. The Government after detailed examination has issued precise area vide letter dated: 26.02.2021 for the proposed grant of Colour granite quarry lease infavour of the highest bidder over an extent of 1.87.0 hect in Government land in S.F.No.366 (Part) in Jagadevipalayam village, Bargur Taluk, Krishnagiri District and directed the highest bidder Tmt.M.Sadhana to remit the balance amount of Rs. 2,05,00,000/- (Rupees Two Crore Five Lakhs only) within one month from the date of receipt of the communication after deducting the EMD of Rs. 25,00,000/-

already remitted by the applicant and directed to submit the approved mining plan and Environment Clearance.

- iii. Tmt.M.Sadhana, have stated vide letter dated:05.04.2021 that they received the communication letter from Government on 25.03.2021 and had submitted the balance amount for Rs. 2,05,00,000/- through the Challan dated: 24.03.2021 to this office and the same had been remitted to the Govt. account.
- iv. In response to the Government letter, the applicant had submitted 6 copies of draft mining plan duly prepared by the qualified person for approval on 07.05.2021 and resubmitted the mining plan on 10.05.2021 after carried out corrections with a request to grant additional time for the submission of mining plan due to covid-19 pandemic and lockdown in the entire country.
- v. The representation was forwarded by the District Collector vide letter dated: 02.07.2021 and the orders from the Government is awaited.
- vi. Further, the Commissioner of Geology and Mining, Chennai vide letter dated 05.01.2023 has instructed to forward all the pending mining plans and scheme of mining plan to commissionerate immediately for taking further action.
- vii. The draft mining plan submitted by the applicant have been verified by the Assistant Geologist (Mines) with reference to field conditions. The draft Mining Plan has been prepared by the Qualified person. The details such as Geological Reserves, Mineable Reserves, Year wise production and Development programme have been incorporated in the draft Mining Plan. The Special conditions imposed in the precise area communication are also incorporated in the draft mining plan.
- viii. The year wise production quantity mention in the mining plan is given as detailed below.

Year	Rom (m ³)	Recovery @ 20 % (m ³)	Granite Waste @ 80 % (m ³)	Top Soil/ Overburden (m ³)	Weathered Rock in (m ³)
1 st Year	32244	3119	12475	-	16650

2 nd year	34840	2780	11120	1560	19380
3 rd year	15200	3040	12160	-	-
4 th year	13740	2748	10992	-	-
5 th year	11720	2344	9376	-	-
Total	107744	14031	56123	1560	36030

ix. Further, other quarries situated within 500 mts radial distance are as follows.

Sl. No	Name of the Lessee and address	GO No & Date	Taluk & Village	S.F.No.	Extent in Hects	Period of lease
1	Tmt.M.Sadhana, No.2/A2, 3 rd Cross, Gopalakrishna Colony, Krishnagiri.	-	Jagadevi palayam Village, Bargur	366(Part)	1.87.0	Instant Proposal
2.	M/s. Pranita Granites, No.62/33, pilikuthi street, Gugai, Salem.	-	Pasinayan apalli, bargur	10 (part)	3.46.0	Mining Plan forwarded to CGM.
3.	Thiru. K. Sekaran, S/o. P.P.Kaverichetty, No. 25A, Red Hills road, Aishwaryam, kolathur, Krishnagiri	G.O.(3D)No. 16, Ind (MME.2) dept dated: 2.7.2012	Jagadevi palayam Village, Bargur	367/1N1, 362/2N2(P) 367/2O1 (P)	1.10.50	13.07.2012 to 12.07.20232
4.	Thiru. V.Venu, S/o. B.C. Venkatappan, No. 80, 1 st cross, 5 th main 373/3, Krishnagiri road, Krishnagiri.	G.O.(3D)No. 42, Ind (MME.2) dept dated: 27.11.2015	Jagadevi palayam Village, Bargur	5	2.35.0	16.12.2015 to 15.12.2035
Total					11.43.5	

x. There are no archeological monuments within 300mts radius and no Wildlife Sanctuaries within the 1.00 km radius.

xi. Finally, the Deputy Director, Geology and Mining, Krishnagiri has recommended and forwarded the six copies of Mining Plan submitted by the applicant Tmt.M.Sadhana in respect of S.F.No. 366 (P) over an extent 1.87.00 hecets of Jagadevipalayam village for passing suitable orders, subject to the condition that,

a. A safety distance of 7.5 meters should be provided to the adjacent patta lands and should not cause any hindrance to them while quarrying and transportation.

b. A safety distance of 10 meters should be provided to the Government Poramboke land in S.F.no. 366(p) on the western side of the lease area and to the

Government land in S.F.no. 10 (P) of pasinayanapalli village on the northern side of the lease area.

- xii. The Deputy Director, Geology and Mining, Krishnagiri has further stated that since the Commissioner of Geology and Mining, Chennai is the competent authority for approval of mining plan in respect of Granite as contemplated under Rule 12 of Granite Conservation and Development Rules-1999, the mining plan submitted by the applicant is recommended and forwarded to the Commissioner of Geology and Mining for passing suitable orders by granting extension of time limit for the submission of approved mining plan.

4) The mining plan is in accordance with the precise area communicated for grant of lease to the subject area. Based on the report of the Deputy Director (G&M), Krishnagiri district, the Mining plan submitted by Tmt.M.Sadhana is hereby approved subject to the following conditions in addition to the conditions stipulated in the precise area communication issued by the Government:

- i. A safety distance of 7.5 meters should be provided to the adjacent patta lands and should not cause any hindrance to them while quarrying and transportation.
- ii. A safety distance of 10 meters should be provided to the Government Poramboke land in S.F.no. 366(p) on the western side of the lease area and to the Government land in S.F.no. 10 (P) of pasinayanapalli village on the northern side of the lease area.
- iii. The applicant should obtain prior environmental clearance from the competent authority and also subject to outcome of the Hon'ble High Court order in W.P.9304/2021 dated: 19.04.2021 the case is pending before the Hon'ble High Court of Madras.

- iv. The applicant should obey the final orders if any to be passed by the Hon' ble High Court of Madras in connection with the pending writ petitions filed against the Tender Cum Action conducted for the grant of quarry leases in Govt land in respect of Granite.
- v. 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.
- vi. 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.
- vii. This mining plan including Progressive mine closure plan is approved without prejudice to any other order or direction from any court of competent jurisdiction.
- viii. 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.
- ix. 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.

- x. Granite waste materials should be dumped within the quarry lease area and should not be dumped outside the boundary of the lease area.
- xi. No hindrance should be caused to the adjacent pattadhars and public while quarrying and transportation of minerals from the subject area.
- xii. Environmental Clearance should be obtained from the authority in respect of the subject area as per rule 42 of the 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.
- xiii. The four boundaries of the applied area are fixed and the quarrying activity should be restricted within the area granted on lease.
- xiv. The applicant 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 2mts with a distance between two pillars shall not be more than 3mts.
 - The applicant 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 to the Deputy Director (G&M), Krishnagiri.
- xv. Barbed wire fencing or Compound wall should be erected all along the boundary of the lease granted area.
- xvi. The applicant should use mild explosives during quarrying.
- xvii. The applicant should ensure that while starting the quarry work, all the quarry workers working under their control are registered in the Labour Welfare Board and also enrolled in the ongoing insurance scheme.

- xviii. The conditions mentioned in G.O. (Ms) No.79, Industries (MMC.1) Department, dated 06.04.2015 should be complied with.
- xix. The applicant should comply with the conditions stipulated in the Government of India, Ministry of Mines order No.11/02/2020, dated 14.01.2020 issued as per the orders of the Hon'ble Supreme Court of India dated 08.01.2020 that, "the mining leaseholders shall after ceasing mining operations, undertake re-grassing the mining area and any other area which may have been disturbed due to this mining activities and restore the land to a condition which is fit for growth of fodders, flora and fauna etc."
- xx. The applicant shall submit scheme of mining, mine closure plan and other statutory requirements within the time stipulated for submission of the above, as per rules.
- xxi. If any violation is found during quarrying operation, the penal provisions of the Tamil Nadu Minor Mineral Concession Rules, 1959 and other rules and act in force will attract.
- xxii. As per rule 12 (v) of the Mineral (other than Atomic and Hydro Carbons Energy Minerals) Concession Rules, 2016, the applicant shall at his own expense, erect, maintain and keep in repair all boundary pillars.
- xxiii. Quarrying activity should be carried out from 07.00 AM to 05.00 PM only.
- xxiv. A Green belt should be constructed to prevent sound and air pollution due to the proposed quarrying activity by planting at least 500 seedlings of Neem and Pungan all around the area.

- xxv. The applicant may use mild explosives during quarrying, and storing of explosives if required, by obtaining valid licence under Explosive Act and Rules.
- xxvi. 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.
- xxvii. Child labour should not be engaged in the quarry works and the quarry workers should be enrolled in the insurance scheme through the Labour Department.
- xxviii. The applicant 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 through the empanelled agencies.
- xxix. The applicant should follow the mining method during the quarrying operation as mentioned in the mining plan.

Encl: Two copies of Approved Mining Plan


Commissioner of Geology and Mining
12/5/20

Copy Submitted to:

The Additional Chief Secretary
to Government,
Industries, Investment Promotion
and Commerce Department,
Secretariat,
Chennai-600009.

Copy to

1. The District Collector,
Krishnagiri District.

MINING PLAN

FOR

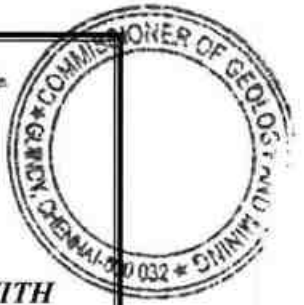
**JAGADEVIPALAYAM VILLAGE COLOUR GRANITE MINING LEASE WITH
PROGRESSIVE QUARRY CLOSURE PLAN**

Government Land/Opencast, Semi-Mechanized Mining/Non-Forest/Non-Captive 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 : BARGUR
VILLAGE : JAGADEVIPALAYAM
S.F.NO'S : 366 (Part)
EXTENT : 1.87.0 HECTARES

ADDRESS OF THE APPLICANT

Tmt.M.Sadhana
No.2/A2, 3rd Cross,
Gopalakrishna Colony,
Krishnagiri District – 635 001

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





CONTENTS

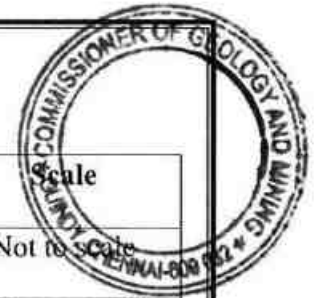
Sl. No.	Description	Page No.
-	Certificates	5-8
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ANNEXURES

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1.	Copy of Tender Gazette notification	I
2.	Copy of principal secretary to Government of Tamil Nadu communication letter	II
3.	Copy of FMB (Field Measurement book)	III
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7.	Photo copy of the applied lease area	VII
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LIST OF PLATES



Sl. No.	Description	Plate No.	Scale
1	Key map	I	Not to scale
2	Location plan	I-A	Not to scale
3	Toposheet map	I-B	1:1,00,000
4.	Satellite image for 1km radius	I-C	1: 10000
5	Environmental and land use plan for 1km Radius	I-D	1: 10000
6	Lease plan	II	1:1000
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10	Year wise development and Production plan	V	1:1000
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12	Quarry layout and Land use pattern plan	VI	1:1000
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14	Progressive quarry closure sections	VIIA	Sections HOR 1:1000 VER 1:500
15	Conceptual plan	VIII	1:1000
16	Conceptual sections	VIIIA	Sections HOR 1:1000 VER 1:500

Tmt.M.Sadhana,

No.2/A2, 3rd Cross,

Gopalakrishna Colony,

Krishnagiri District – 635 001



CONSENT LETTER FROM THE APPLICANT

The Mining Plan in respect of Colour granite quarry lease in S.F.No's. 366 (Part) of Government Poramboke land, over an extent of 1.87.0hectares in Jagadevipalayam Village, Bargur 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: Krishnagiri, TN

Date:

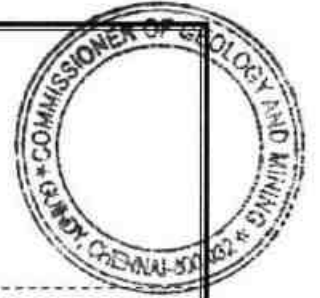
M.Sadhana
Signature of the applicant
(M.Sadhana)

Tmt.M.Sadhana,

No.2/A2, 3rd Cross,

Gopalakrishna Colony,

Krishnagiri District – 635 001



DECLARATION

The mining plan in respect of Colour granite quarry lease in S.F.No's. 366 (Part) of Government Poramboke land, over an extent of 1.87.0hectares in Jagadevipalayam Village, Bargur 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: Krishnagiri, TN

Date:

M. Sadhana
Signature of the applicant
(M.Sadhana)

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

RQP/MAS/263/2014/A

GEO TECHNICAL MINING SOLUTIONS

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Oddapatti, Collectorate Post office, Dharmapuri-636705

Ph: +91 9443937841, 7010076633

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

Website: www.gtmsind.com



CERTIFICATE

This is to certify that, the provisions of under rule *12 & 13 of Granite Conservation and Development Rules, 1999* have been observed in the Mining Plan in respect of Colour granite quarry lease in S.F.No's. 366 (Part) of Government Poramboke land, over an extent of 1.87.0hectares in Jagadevipalayam Village, Bargur Taluk, Krishnagiri District, Tamil Nadu State prepared to **Tmt.M.Sadhana**, Krishnagiri -635 001, 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:

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 - 636705.

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



CERTIFICATE

I certified that the preparation of the mining plan in respect of Colour granite quarry lease in S.F.No's. 366 (Part) of Government Poramboke land, over an extent of 1.87.0hectares in Jagadevipalayam Village, Bargur Taluk, Krishnagiri District, Tamil Nadu State prepared to **Tmt.M.Sadhana**, Krishnagiri -635 001, 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**", **Bangalore -560 034**. The standards prescribed by DGMS with respect to mines health will be strictly implemented.

Place: Dharmapuri, TN

Date:

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.

MINING PLAN

FOR

*JAGADEVIPALAYAM VILLAGE COLOUR GRANITE MINING LEASE WITH
PROGRESSIVE QUARRY CLOSURE PLAN*

Government Land /Opencast-Semi Mechanized Mining/Non-Forest/Non-Captive 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)



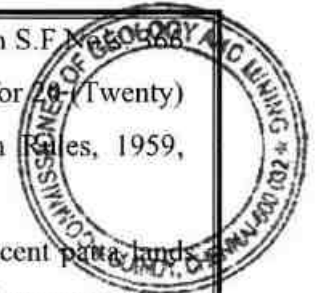
INTRODUCTORY NOTES:

1. **Introduction:** The Mining plan with progressive quarry closure plan is prepared for Tmt.M.Sadhana, residing at No.2/A2, 3rd Cross, Gopalakrishna Colony, Krishnagiri District-635 001 and filed with application for new proposal has requested to grant the quarrying lease for Colour granite in S.F.No's. 366 (Part), over an extent of 1.87.0hectares of Jagadevipalayam Village, Bargur Taluk, Krishnagiri District, Tamil Nadu State. Special publication Rc.No.90/2017 (Mines) dated 09.10.2020 for eligible Govt Poramboke land quarry lease through tender cum action published in the Krishnagiri district gazette notification English No: 20 and Tamil No.35 dated 09.10.2020. On behalf of District Collector, the special officer appointed by district collector had conducted the tender opening dated on 02.11.2020 and the auction held on 07.11.2020, Tmt.M.Sadhana of Krishnagiri district has requested the highest bid amount.

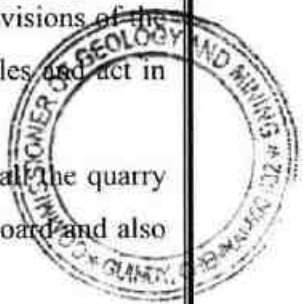
The proposal of the District Collector, Krishnagiri forwarded to the Commissioner of Geology and mining dated 03.12.2020. In this connection the Commissioner of Geology and mining, Chennai has filed the proposal on 22.01.2021 and 08.02.2021.

2. **Letter of Principal Secretary of Tamil Nadu:** The Principal Secretary to Government of TamilNadu has directed to the applicant Tmt.M.Sadhana through his precise area communication letter Rc.No.901/MME.2/2021-1, Dated 26.02.2021, to furnish approved mining plan through the Commissioner of Geology and Mining within a period of 3 months as per 8-A of the TamilNadu Minor Mineral Concession Rules, 1959 and to produce Environmental Clearance obtained from competent authority for the quarrying lease Colour granite at Tamil Nadu

State, Krishnagiri District, Bargur Taluk, Jagadevipalayam Village in S.F.No.366 (Part) over an extent of 1.87 0hectares has grant of quarrying lease for (Twenty) years under rule 8-A of Tamil Nadu Minor Mineral Concession Rules, 1959, subject to the following conditions: -



- 1) A safety distance of 7.5 meters should be provided to the adjacent patta lands and should not cause any hindrance to them while quarrying and transportation.
- 2) A safety distance of 10 meters should be provided to the Government Poramboke land in S.F.No.366 (P) on the western side of the lease area and to the Government land in S.F.No.10(P) of Pasinayanapalli village on the Northern side of the lease area.
- 3) All conditions stipulated in the District Gazette Extra ordinary notification English No.20 and Tamil No.35 dated 09.10.2020 should be adhered by the Tender applicant.
- 4) Environmental clearance should be obtained from the state Level Environmental Impact Assessment Authority before grant of quarry lease as per rule 42 of the Tamil Nadu Minor Mineral Concession Rules, 1959.
- 5) The applicant 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 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.
- 6) 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.
- 7) As per Rule 12(V) of minerals (other than Atomic & Hydrocarbons Energy Minerals) concession Rules, 2016, the applicant shall at her own expenses erect, maintain and keep in repair all the boundary pillars.
- 8) The applicant should use mild explosives during quarrying.
- 9) Child Labourers should not be engaged in quarry works.

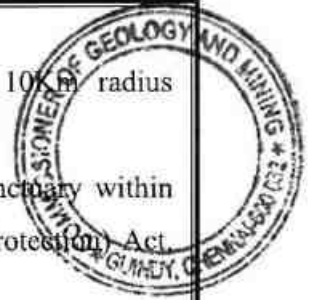
- 
- 10) If any violation is found during quarrying operation, the penal provisions of the Tamil Nadu Minor Mineral Concession Rules, 1959 and other rules and act in force will attract.
- 11) The applicant should ensure that while starting the quarry work, all the quarry workers under her control are registered in the Labour Welfare Board and also enrolled in the ongoing insurance scheme.
- 12) The District Collector, Krishnagiri shall obtain a sworn-in-affidavit from the applicant containing the above conditions before execution of lease deed and also ensure that the instructions issued in Government letter No.12789/MMB2/2002-7, Industries Department, dated 09.01.2003 are complied with.
- 13) The grant of quarry lease to the applicant in the applied area will be based on the judgement of Hon'ble High court of Madras in W.P.No.18317 of 2020 and W.P.No.16060/2020 and W.M.P.No.19999 of 2020.
3. **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 Principal Secretary of Tamil Nadu letter No. 901/MME.2/2021-1, Dated 26.02.2021.
4. **Geological Resources and Mineable Reserves:** Geological resource of colour granite is estimated as **6491133m³** including the resources of safety zone and block in benches. Of which, Colour granite is **129823m³** in recovery of 20% and granites rejects of **519290m³** (Refer Plate No's.IV & IVA). Mineable reserves of Colour granite are estimated is **225308m³** by deducting the reserve safety zone, block in benches from the total Geological resources. of which, Colour granite is **45062m³** on recovery of 20% and granites rejects of **180246m³** up to a depth of 45m which is 15m (R.L.474-459m) above ground level and 30m (R.L.459-429m) below ground level (Refer Plate No's.VIII & VIIIA).
5. **Proposed Production Schedule:** Total proposed production of Colour granite is **70154m³**. Of which Colour granite is **14031m³** in recovery of 20% and rejects of granites is **56123m³** of 80% up to a depth of 30m which is 15m (R.L.474-459m) above ground level and 15m (R.L.459-444m) below ground level (Refer Plate No's.V & VA) for the first 5 years plan period. Average production will be **2806m³** of Colour granite per year.

6. Environmental sensitivity of the proposed lease area: -

- i) Interstate Boundary:** No interstate boundary within around 10Kms radius periphery of proposed lease area.
- ii) Wildlife Protection Act, 1972:** There is no wild life animal sanctuary within radius of 10Kms from the project site area under the Wildlife (Protection) Act, 1972.
- iii) Indian Reserve Forest Act, 1980:** There is no reserve forest within 1km radius. The nearest reserve forest is Thogarapalli RF is situated about 2.35km away from the southwestern side and Bargur RF is situated about 6.50km away from northern side respectively.
- 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.

7) 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 disturb 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.
- viii)** Any other conditions stipulated by other Statutory/Government authorities will be complied

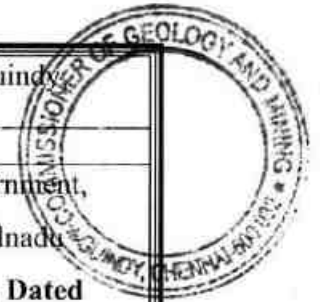


1.0 GENERAL:

a.	Name of the applicant	Tmt.M.Sadhana
	Applicant address	No.2/A2, 3rd Cross, Gopalakrishna Colony,
	District	Krishnagiri
	State	TamilNadu
	Pin code	635 001
	Phone	+91 9994882044
	Fax	---
	Gram	---
	Telex	---
	E-mail	spnkgranites22@gmail.com
Status of the applicant		
	Private individual	Private individual
	Cooperative Association	---
	Private company	---
	Public Company	---
	Public Sector Undertaking	---
	Joint Sector Undertaking	---
	Other (pl. specify)	---
c.	Mineral(s) Which are occurring in the area and which the applicant intends to mine	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 8-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, 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
	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



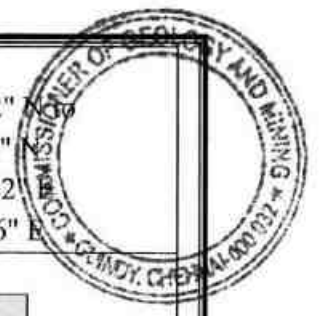
Address	Thiru. Ve.Ka. Industrial Estate, Guindy Chennai-600032
Phone	----
g. Reference No. and date of consent letter from the state government	The Principal Secretary to Government, Industries- Government of Tamilnadu Letter. No. 901/MME.2/2021-1, Dated 26.02.2021



2.0 LOCATION AND ACCESSIBILITY:

a.	Details of the Area:	: Refer plate no: IA & IB
	District & State	: Krishnagiri, Tamil Nadu
	Taluk	: Bargur
	Village	: Jagadevipalayam
	Khasra No./ Plot No./ Block Range/Felling Series etc. :	: 366 (Part)
	Lease area (hectares)	: 1.87.0hectares
	Whether the area is recorded to be in forest (please specify whether protected, reserved etc)	: The proposed lease area is recorded as Govt Poramboke land. Copy of 'A' register is enclosed. (Ref. Annexure No: V)
	Ownership / Occupancy	: Govt of Tamilnadu (Ref. Annexure No: V).
	Existence of Public Road / Railway line if any nearby and approximate distance	: <ul style="list-style-type: none"> ✓ Exploited materials shall be transported through the village approach road is situated on the southeast side. ✓ There is no SH road situated around 5km radius. ✓ NH-77 road situated about 2.59km radius away from the southwest side which is connecting Krishnagiri - Uthangarai ✓ No Railway line is found around 5km radius.

Toposheet No. with latitude and longitude	: Toposheet No. 57 L/07 Latitude: 12° 28' 42.19792" N 12° 28' 49.68820" N longitude: 78° 21' 38.32342" E 78° 21' 45.51566" E																					
DGPS Geo-Coordinates of the lease boundary:																						
<table border="1"> <thead> <tr> <th>Pillar ID</th> <th>Latitude</th> <th>Longitude</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>12° 28' 49.68820" N</td> <td>78° 21' 42.02501" E</td> </tr> <tr> <td>2</td> <td>12° 28' 46.43263" N</td> <td>78° 21' 41.69574" E</td> </tr> <tr> <td>3</td> <td>12° 28' 42.19792" N</td> <td>78° 21' 45.51566" E</td> </tr> <tr> <td>4</td> <td>12° 28' 43.54916" N</td> <td>78° 21' 40.12823" E</td> </tr> <tr> <td>5</td> <td>12° 28' 45.77887" N</td> <td>78° 21' 38.32342" E</td> </tr> <tr> <td>6</td> <td>12° 28' 47.66583" N</td> <td>78° 21' 39.92715" E</td> </tr> </tbody> </table>		Pillar ID	Latitude	Longitude	1	12° 28' 49.68820" N	78° 21' 42.02501" E	2	12° 28' 46.43263" N	78° 21' 41.69574" E	3	12° 28' 42.19792" N	78° 21' 45.51566" E	4	12° 28' 43.54916" N	78° 21' 40.12823" E	5	12° 28' 45.77887" N	78° 21' 38.32342" E	6	12° 28' 47.66583" N	78° 21' 39.92715" E
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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																					



i) INFRASTRUCTURE AND COMMUNICATION:

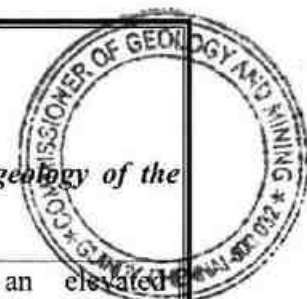
S.No	Description	Place	Distance	Direction
a.	Nearest post office	Kondapanayanapalli	1.43Km	North
b.	Nearest police station	Bargur	7.2km	North
c.	Nearest fire station	Bargur	7.37km	North
d.	Nearest medical facility	Jagadevipalayam	4.9Km	West
e.	Nearest school	Kondapanayanapalli	1.43Km	North
f.	Nearest railway station	Kakankarai	17.6km	Southeast
g.	Nearest port facility	Chennai	220.4km	Northeast
h.	Nearest airport	Salem	82.8km	South
i.	Nearest DSP office	Bargur	7.2km	North
j.	Nearest villages	Bagimanur	0.52km	NW
		Kappalvadi	2.5km	NE
		Thogarapalli	2.9km	S
		Jagadevipalayam	3.23km	W

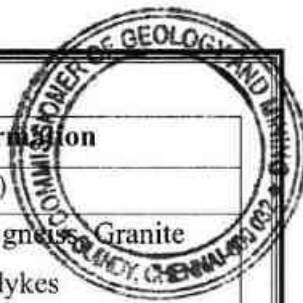
PART – A

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 15m. The highest elevation observed in lease area is 474m AMSL, whereas the lowest elevation is 459m AMSL. The slope is towards southeast and falls in Toposheet no.57-L/07.
(ii)	General Geology of the District:- <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>		





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, Granite 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 15m. The highest elevation observed in the lease area is 474m AMSL, whereas the lowest elevation is 459m AMSL. The slope is towards southeast side.

The topsoil is obtained about 1m, 0-3m weathered rock and a Colour starts from 3 to 45m (R.L.459 - 429m) from below the ground level as respectively. The Surface plan showing elevation, outcrops, contour, accessibility road and Geological map was prepared of the proposed lease area.

This 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 colour granite with light colour and good wave patterns. Massive outcrop of colour 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 20% based on filed geological and structural aspects. The strike of the granite body is trending in N30°E-S30°W direction and dips vertical.

b) Mode of origin:

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 form at different periods of time and alter the final resulting granite. Therefore, 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 orientation of minerals, creating a homogenous looking rock with no discernible grains.

c) Physiography of the rocks:

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 “**Colour granite**” 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 (1m thick)
Archaean to Lower Proterozoic	--	Migmatite (Red Multi) granite, Biotite gneiss

(iv)	Drainage Pattern	:	There are no water bodies like rivers, pond, etc., located within a radius of 50m. The drainage is sub-dendritic in general.
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(b) The topographic plan of the lease area prepared on a scale of 1 :1000 or 1: 2000 with contour interval of 3 to 10m depending upon the topography of the area should be taken as the base plan for preparation of geological plan. The details of exploration already carried out including evidences of mineral existence should be shown on the geological plan:

Topographic Plan of lease area – Plate IB prepared on a scale of 1:1,00,000
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 fresh lease grant and the area exhibits outcrops well exposed on the Western side and has strike of the granite body is trending in N30°E-S30°W 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.

(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 two cross sections (longitudinal and transverse) to calculate the volume of material up to the depth of 45m which is 15m (R.L.474-459m) above ground level and 30m (R.L.459-429m) below the ground level. The longitudinal and transverse cross sections were assigned XY-AB, XY-CD. Using the cross-sectional method, total reserve is estimated to be **708238m³** including the resources of safety zone, weathered rock and topsoil. Of which, colour granite is **129823m³** in recovery of 20% , granites rejects of **519290m³** and the residual topsoil & weathered rocks is **59125m³** (Refer Plate No's. IV & IVA).

The residual topsoil is obtained 1m, weathered rock is 0-3m thick from the slope of the area and a colour granite starts from 3-45m (R.L.471-429m) surface 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	Colour Granite 20% Recovery in M ³	Granite Waste 80% in M ³	Residual Top Soil in M ³	Weathered Rock in M ³
XY-AB	I	64	123	3	23616	....	....	....	....	23616
	I	46	59	2	5428	5428	1086	4342	....	....
	II	61	98	5	29890	29890	5978	23912	....	....
	III	64	123	5	39360	39360	7872	31488	....	....
	IV	64	123	5	39360	39360	7872	31488	....	....
	V	64	123	5	39360	39360	7872	31488	....	....
	VI	64	123	5	39360	39360	7872	31488	....	....
	VII	64	123	5	39360	39360	7872	31488	....	....
	VIII	64	123	5	39360	39360	7872	31488	....	....
IX	64	123	5	39360	39360	7872	31488	....	....
TOTAL					334454	310838	62168	248670	0	23616



XY-CD	Residual	85	37	1	3145	....	....	....	3145	....
	I	116	93	3	32364	....	....	....	....	32364
	I	15	30	2	900	900	180	720	....	....
	II	35	61	5	10675	10675	2135	8540	....	....
	III	51	74	5	18870	18870	3774	15096	....	....
	IV	82	93	5	38130	38130	7626	30504	....	....
	V	116	93	5	53940	53940	10788	43152	....	....
	VI	116	93	5	53940	53940	10788	43152	....	....
	VII	116	93	5	53940	53940	10788	43152	....	....
	VIII	116	93	5	53940	53940	10788	43152	....	....
LX	116	93	5	53940	53940	10788	43152	....	....
TOTAL					373784	338275	67655	270620	3145	32364
GRAND TOTAL					708238	649113	129823	519290	3145	55980

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

The Mineable reserves are estimated is **225308m³** by deducting the reserve safety zone, block in benches from the total Geological resources. Of which, colour granite is **45062m³** on recovery of 20% and granites rejects of **180246m³** up to a depth of 45m which is 15m (R.L.474-459m) above ground level and 30m below ground level (R.L.459-429m). The commercially viable 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).

MINEABLE RESERVES										
Section	Bench	length in (m)	Width in (m)	Depth in (m)	Rom in (M ³)	Mineable Reserves in M ³	Colour Granite 20% Recovery in M ³	Granite Waste 80% in M ³	Residual Top Soil in M ³	Weathered Rock in M ³
XY-AB	I	54	106	3	17172	....	....	....	....	17172
	I	46	59	2	5428	5428	1086	4342	....	....
	II	51	83	5	21165	21165	4233	16932	....	....
	III	46	91	5	20930	20930	4186	16744	....	....
	IV	41	81	5	16605	16605	3321	13284	....	....
	V	36	71	5	12780	12780	2556	10224	....	....



	VI	31	61	5	9455	9455	1891	7564	....	....
	VII	26	51	5	6630	6630	1326	5304	....	....
	VIII	21	41	5	4305	4305	861	3444	....	....
	IX	16	31	5	2480	2480	496	1984	....	....
	TOTAL				116950	99778	19956	79822	0	17172
XY-CD	Residual	78	20	1	1560	....	....	....	1560	....
	I	109	76	3	24852	....	....	....	....	24852
	I	15	30	2	900	900	180	720	....	....
	II	35	49	5	8575	8575	1715	6860	....	....
	III	51	57	5	14535	14535	2907	11628	....	....
	IV	82	62	5	25420	25420	5084	20336	....	....
	V	102	52	5	26520	26520	5304	21216	....	....
	VI	97	42	5	20370	20370	4074	16296	....	....
	VII	92	32	5	14720	14720	2944	11776	....	....
	VIII	87	22	5	9570	9570	1914	7656	....	....
	IX	82	12	5	4920	4920	984	3936	....	....
	TOTAL				151942	125530	25106	100424	1560	24852
	GRAND TOTAL				268892	225308	45062	180246	1560	42024



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 a fresh 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 colour granite is **70154m³**. Of which colour granite is **14031m³** in recovery of 20% and rejects of granites is **56123m³** of 80% up to a depth of 30m which is 15m (R.L.474-459m) above ground level and 15m below ground level (R.L.459-444m) (Refer Plate No's.V & VA) for the first 5 years plan period. Average production will be **2806m³** of colour granite per year.

Year	Pit No.(s)	Topsoil/ Overburden (m ³)	ROM (m ³)	Saleable colour granite(m ³) @ 20%	Granite rejects(m ³) @ 80%	Weathered rock in (m ³)	Side burden (m ³)	Colour granite to Overburden ratio
First	I	--	32244	3119	12475	16650	--	1:9.33
Second	I	1560	34840	2780	11120	19380	--	1: 11.53
Third	I	---	15200	3040	12160	---	---	1: 4
Fourth	I	--	13740	2748	10992	---	---	1: 4
Fifth	I	---	11720	2344	9376	---	---	1: 4
Total	---	1560	107744	14031	56123	36030	---	1: 6.67

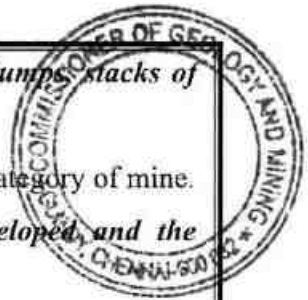
(c) *Composite plans and Year wise sections (In case of 'A' class mines):*

Not applicable. It is a "B" class mine

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

YEAR WISE PRODUCTION											
Year	Section	Bench	length in (m)	Width in (m)	Depth in (m)	Rom in (M ³)	Mineable Reserves in M ³	Colour Granite 20% Recovery in M ³	Granite Waste 80% in M ³	Residual Top Soil in M ³	Weathered Rock in M ³
I	XY-AB	I	54	69	3	11178	....	....	....	....	11178
		I	46	22	2	2024	2024	405	1619	....	....
		II	34	41	5	6970	6970	1394	5576	....	....
	XY-CD	I	24	76	3	5472	....	....	....	....	5472
		I	15	15	2	450	450	90	360	....	....
		II	30	41	5	6150	6150	1230	4920	....	....
	TOTAL						32244	15594	3119	12475	0	16650
II	XY-CD	Residual	78	20	1	1560	....	....	....	1560	....
		I	85	76	3	19380	....	....	....	....	19380
		II	5	41	5	1025	1025	205	820	....	....
		III	15	49	5	3675	3675	735	2940	....	....
		IV	40	46	5	9200	9200	1840	7360	....	....
	TOTAL						34840	13900	2780	11120	1560	19380
III	XY-AB	III	29	44	5	6380	6380	1276	5104	....	....
	XY-CD	III	36	49	5	8820	8820	1764	7056	....	....
	TOTAL						15200	15200	3040	12160	0	0
IV	XY-AB	IV	24	34	5	4080	4080	816	3264	....	....
	XY-CD	IV	42	46	5	9660	9660	1932	7728	....	....
	TOTAL						13740	13740	2748	10992	0	0
V	XY-CD	V	42	36	5	7560	7560	1512	6048	....	....
		VI	32	26	5	4160	4160	832	3328	....	....
	TOTAL						11720	11720	2344	9376	0
GRAND TOTAL						107744	70154	14031	56123	1560	36650





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

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

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

The proposed production is **234m³/month**. At this rate of production, the expected life of quarry is calculated for production details are given as below: -

Mineable reserves of Colour granite (20%)	=	45062m³
First five years production	=	14031m³
Yearly production for first five years	=	2806m³
Remaining mineable reserves for Colour granite	=	31031m³

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:*

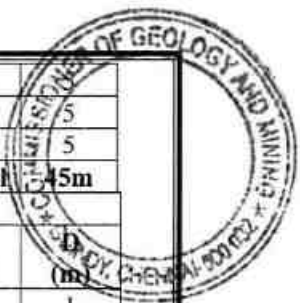
(i) *Time frame of completion of mineral exploration for core program in leasehold area: Give broad description identified potential areas to be covered in the given time frame:*

Consider the indefinite depth the colour granite deposit is proved beyond the workable limits about a depth of 45m which is 15m (R.L.474-459m) above ground level and 30m below ground level (R.L.459-429m).

(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.474-471m	First 5 years	Weathered rock	54	106	3
I	R.L.471-469m		Colour Granite	46	59	2
II	R.L.469-464m		Colour Granite	51	83	5
III	R.L.464-459m		Colour Granite	46	91	5
IV	R.L.459-454m		Colour Granite	41	81	5
V	R.L.454-449m		Colour Granite	36	71	5
VI	R.L.449-444m		Colour Granite	31	61	5



VII	R.L.444-439m	Remaining lease period	Colour Granite	26	51		
VIII	R.L.439-434m		Colour Granite	21	41	5	
IX	R.L.434-429m		Colour Granite	16	31	5	
Total						45m	
ULTIMATE PIT LIMIT-(XY-CD)							
Bench	Bench R.L	Period	Overburden/ Mineral	L (m)	W (m)	D (m)	
Residual	Slope	First 5 years	Residual Topsoil	78	20	1	
I	R.L.474-471m		Weathered rock	109	76	3	
I	R.L.471-469m		Multi colour	15	30	2	
II	R.L.469-464m		Multi colour	35	49	5	
III	R.L.464-459m		Multi colour	51	57	5	
IV	R.L.459-454m		Multi colour	82	62	5	
V	R.L.454-449m		Multi colour	102	52	5	
VI	R.L.449-444m		Multi colour	97	42	5	
VII	R.L.444-439m		Remaining lease period	Multi colour	92	32	5
VIII	R.L.439-434m			Multi colour	87	22	5
IX	R.L.434-429m	Multi colour		82	12	5	
Total						45m	

(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 Colour granite rejects (up to 80%) and weathered rock are 92153m^3 ($56123\text{m}^3 + 36030\text{m}^3$) will be removed and dumped in the Northern side of the lease area average dimensions of (L86m X W51m X H 12.8m) for the period of five years. The topsoil is 1560m^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. If Colour granite may be unsold will be keep within the lease boundary.

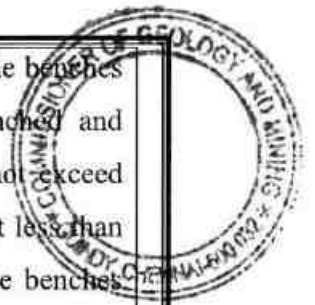
(iv) Whether back filling of pits after recovery of mineral upto techno-economically feasible depth envisaged. If so, describe the broad features of the proposal: -

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

(v) Whether post mining land use envisaged: -

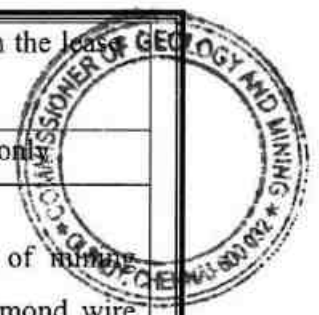
It is a Government land. At the end of mining activities over the quarry pit may be utilized for storage of rain water reservoir used for irrigation purposes.

g.	Open Cast Mines:	
	i) Describe briefly giving salient features of the mode of working (Mechanized, Semi-Mechanized, manual)	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



		<p>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.</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 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 1560m³ 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. Colour granite waste and side burden waste: -</p>	<p>The Colour granite rejects (up to 80%) and weathered rock are 92153m³ (56123m³ + 36030m³) will be removed and dumped in the northern side of the lease area average dimensions of (L86m X W51m X H 12.8m) for the period of five years. If Colour granite</p>

may be unsold will be keep within the lease boundary.



h. **Underground Mines:** : It is an open cast quarry operation only.

i. **Extent of mechanization:**

Being a fresh 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:

Type	No s	Dia of hole (mm)	Size/Capacity	Make	Motive power
Jack Hammers	4	32mm	--	--	Compressor Air
Compressors	2	--	--		Diesel/ Electrical

b). Cutting equipment's: -

- i. Diamond wire saw machine = 2 nos
- ii. Line drilling machinery = 1nos

(1) Loading Equipment:

Type	No	H.P	Size/Capacity	Make	Motive power
Excavator	1	--	--	--	Diesel

(2) Haulage and Transport Equipment: -

(a) Haulage within the mining leasehold:

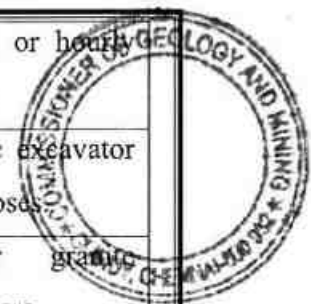
Type	Nos	Size / Capacity	Make	Motive power	H.P.
Tipper	2	--	--	Diesel	--

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.

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 Colour granite transported to Required 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.												
5.	<p>BLASTING:</p> <p><i>a) Broad blasting parameters like charge per hole, blasting pattern, charge per delay, maximum number of holes blasted in a round, manner and sequence of firing, etc.</i></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 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</p>													





involved. Hence, there will not any adverse effects and vibration due to this type of mining operation.

Chemical Blasting Method: The 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. Inserted 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:-

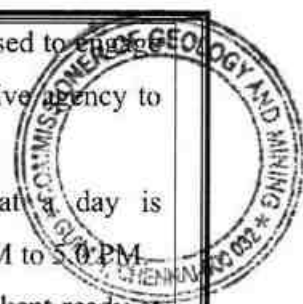
Apart from the above, the following tools and tackles already provided by applicant in quarry leased area for quarry operations.

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

d) Whether secondary blasting is needed, if so describe it briefly	:	Not applicable
--	---	----------------

<p>e) Storage of explosives (like capacity and type of explosive magazine)</p>	<p>: 1. The applicant is advised to engage an authorized explosive agency to carry out blasting.</p> <p>2. The blasting time at a day is proposed to be 4.0 PM to 5.0 PM.</p> <p>3. First aid box will be kept ready at all the time.</p> <p>4. Necessary precautionary announcement will be carried out before the blasting operation.</p>
<p>6. MINE DRAINAGE</p>	
<p>a) Likely depth of water table based on observations from nearby wells and water bodies</p>	<p>: The ground water table is reported as of 65m in summer and 60m in rainy season from the ground level which was predicted by observation of adjacent bore wells around the lease area.</p>
<p>b) Workings expected to be _____ m. above / reach below water table by the year _____.</p>	<p>: Ultimate mining depth is 30m below ground level. So, the present mine lease will be proposed above the water table and hence, quarrying may not affect the ground water.</p>
<p>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</p>	<p>: 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.</p>





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.

Year	Topsoil (m ³)	Weathered rock (m ³)	Granite waste (m ³)
First	---	16650	12475
Second	1560	19380	11120
Third	---	---	12160
Fourth	---	---	10992
Fifth	---	---	9376
Total	1560	36030	56123

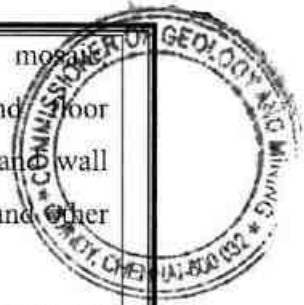
b) Land chosen for disposal of waste with proposed justification : The granite rejects and weathered rock will be dumped on the north side of the lease area.

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 Colour granite waste (up to 80%) and weathered rock are **92153m³** (56123m³ + 36030m³) will be removed and dumped in the northern side of the lease area average dimensions of (L86m X W51m X H 12.8m) 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 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 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>
<p>b) Employment potential:</p> <p>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</p>	

The production workers directly under his control and supervision.

The following man power is proposed for quarrying 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.

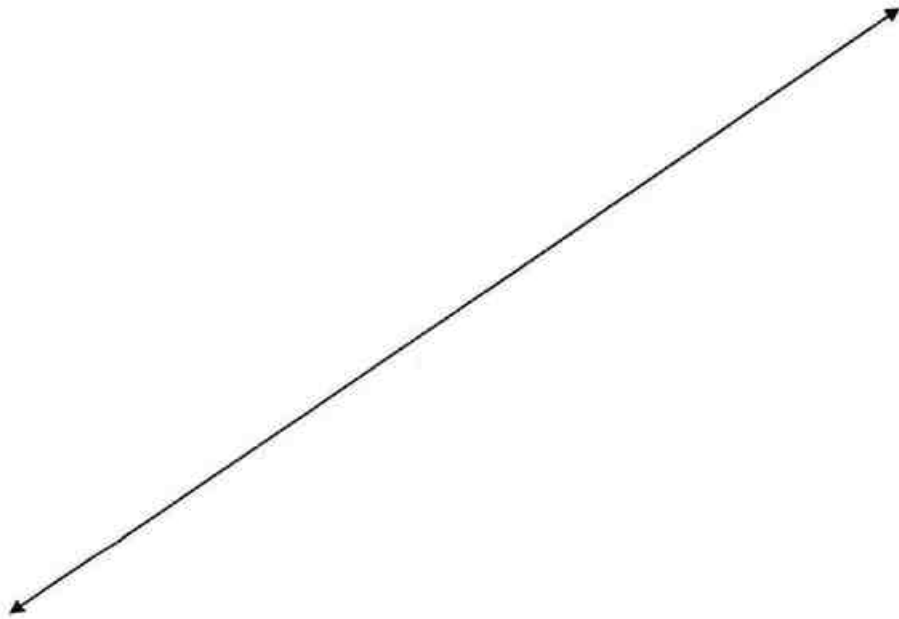


1.	Highly Skilled	Quarry Manager	1No.
		Mines Forman	1No
		Mechanical Engineer	1No
		Accountant cum & admin	1No.
2.	Skilled	Earth moving Operator	1No
		Line drilling Operator	1 Nos.
		Wire saw Operator	2 No.
		Driver	1No
3.	Semi – skilled	Helpers, Greaser's	1 No
4.	Unskilled	Cutter	4Nos
		Musdoor / Labours	8 Nos
Total =			22Nos

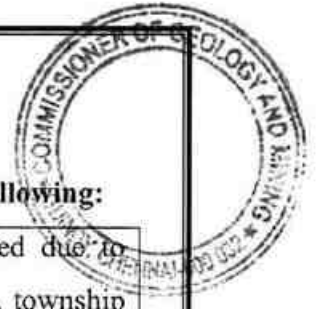
10 MINERAL PROCESSING/BENEFICIATIONS:

<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>:</p>	<p>Excavated Colour granite raw blocks will be directly sold to the required 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 adopted to neutralize any such effect before their disposal and dealing of excess water from the tailing dam).</p>	<p>:</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 dam doesn't arise. But tailing control of rain water flow during rainy season has to be done by decanting the SPM in a pit before passing the water in to natural system.</p>

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.



PART - B



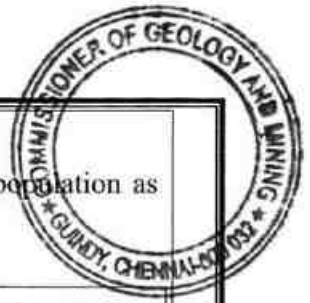
11.0 ENVIRONMENTAL MANAGEMENT PLAN :

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

11.1	Existing land use pattern indicating the area already degraded due to quarrying /pitting, dumping, roads, processing plant, workshop, township etc in a tabular form. The present land use pattern is given as below. <table border="1"> <thead> <tr> <th>Sl. No.</th> <th>Land Use</th> <th>Present area (Hect.)</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>Under quarrying area</td> <td>Nil</td> </tr> <tr> <td>2</td> <td>Infrastructure</td> <td>Nil</td> </tr> <tr> <td>3</td> <td>Roads</td> <td>Nil</td> </tr> <tr> <td>4</td> <td>Unutilized</td> <td>1.87.0</td> </tr> <tr> <td>5</td> <td>Waste dump</td> <td>Nil</td> </tr> <tr> <td>6</td> <td>Green Belt</td> <td>Nil</td> </tr> <tr> <td colspan="2" style="text-align: center;">Total =</td> <td>1.87.0</td> </tr> </tbody> </table>		Sl. No.	Land Use	Present area (Hect.)	1.	Under quarrying area	Nil	2	Infrastructure	Nil	3	Roads	Nil	4	Unutilized	1.87.0	5	Waste dump	Nil	6	Green Belt	Nil	Total =		1.87.0
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11.2	Water Regime	: Water table in this area is noticed at a depth of 60m in rainy season and 65m in summer from general ground level and presently the quarrying of 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.																								



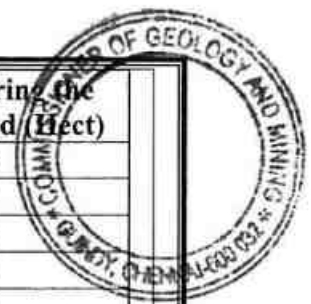
		<p>In this quarry, the machinery operations like jack hammer drilling compressor and excavators will generate sound pollution.</p> <p>The sound level should be within the limits of 58dBA. To minimize this sound pollution within the permissible limits, the machinery will be operated at different places 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>



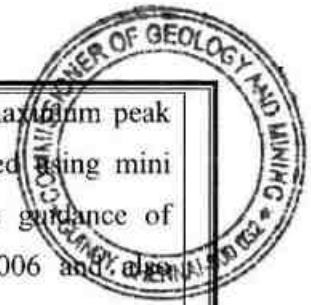
11.6	Human Settlement: The nearest Villages are found in the buffer zone with population as per 2011 census.																										
	<table border="1"> <thead> <tr> <th>S. No</th> <th>Village</th> <th>Direction</th> <th>Distance in Km</th> <th>Population</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Bagimanur</td> <td>NW</td> <td>0.52km</td> <td>1653</td> </tr> <tr> <td>2</td> <td>Kappalvadi</td> <td>NE</td> <td>2.5km</td> <td>1880</td> </tr> <tr> <td>3</td> <td>Thogarapalli</td> <td>S</td> <td>2.9km</td> <td>4179</td> </tr> <tr> <td>4</td> <td>Jagadevipalayam</td> <td>W</td> <td>3.23km</td> <td>6747</td> </tr> </tbody> </table>	S. No	Village	Direction	Distance in Km	Population	1	Bagimanur	NW	0.52km	1653	2	Kappalvadi	NE	2.5km	1880	3	Thogarapalli	S	2.9km	4179	4	Jagadevipalayam	W	3.23km	6747	
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11.7	Public buildings, places of worship and monuments :	No infrastructure like residential building, places of special interest like archeological monuments, etc., are found around 500m 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 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>
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Sl. No.	Land Use	Area in use during the quarrying period (Hect)
1.	Under Quarrying Area	1.04.00
2	Infrastructure	0.02.00
3	Roads	0.04.00
4	Waste dump	0.43.86
5	Green belt + Topsoil+ Weathered Rock	0.30.00
6	Unutilized	0.03.14
	Total =	1.87.0
ii).	Air Quality	: Air or dust expected to be generated from drilling process, hauling roads, places of excavation etc., will be suppressed by periodical wetting of land by water spraying.
iii).	Water Quality	: A water sample from the open/bore wells was tested to NABL approved lab to assess hardness, Salinity, colour, Specific gravity, etc.
iv).	Noise Levels	: Quarrying of 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, 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



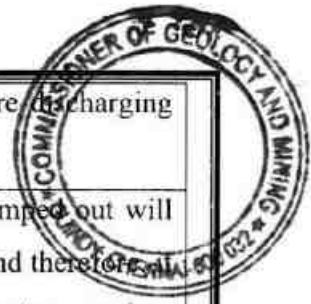
			type of mining operation. The maximum peak particles velocity will be recorded using mini seismograph devices as per the guidance of MoEF and EIA Notification 2006 and covering DGMS norms.
vi).	Water Regime	:	No major river or any other water bodies are found around 50m radius.
vii).	Socio-Economics	:	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 1560m³ 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	:	The ultimate mining is proposed to an up to depth of 45m from surface level (R.L.474-429m) 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 Colour granite persist still at deeper



	reservoir, their size, water holding capacity and proposal for utilization of such water be given.	level																																	
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>3000</td> <td>330</td> <td>80%</td> <td rowspan="3">@100 Rs Per sapling</td> <td>33,000/-</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>1,13,000/-</td> </tr> </tbody> </table>	Year	Place	Area in Sq.m	No.of Plants	Rate of survival	Rate	Amount in Rs	First	Lease Boundary	3000	330	80%	@100 Rs Per sapling	33,000/-	Second	Approach road and Nearby Village Road	--	500	80%	50,000/-	Third	Schools	--	300	80%	30,000/-	Total						1,13,000/-	
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Total						1,13,000/-																													
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 Colour granite rejects (up to 80%) and weathered rock are 92153m³ (56123m ³ + 36030m ³) will be removed and dumped in the northern side of the lease area average dimensions of (L86m X W51m X H 12.8m) for the period of five years. The topsoil is 1560m³ 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 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	: It will not be harmful and it does not																																	



	water from mine.	require any treatment before discharging into the natural courses.
vii).	Measures for minimizing adverse effects on water regime.	: There is no water to be pumped out will be very pure and portable and therefore 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 opencast, 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. Which is 15m above ground level (R.L.474-459m) and 15m (R.L.459m-444m) 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



		<p>fenced by Barbed wire fencing. Green belt development at the rate of 11300 trees will be proposed. No immediate proposals for closure of pit as the Colour granite persist still at deeper level.</p>
12.3	Mitigation measures to be undertaken for safety and restoration/ reclamation of the already mined out area	<p>: The quarry lease is a fresh mining lease for 20 years lease period.</p>
12.4	Mine closure activity	<p>: 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 rain water storage. No immediate proposals for closure of pit as the Colour granite persist still at deeper level.</p>
12.5	Safety and security	<p>: 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.</p>
12.6	Disaster management and Risk Assessment	<p>: 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</p>



		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. 22 labours 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. 2,30,00,000/-
	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. 2,42,20,000/-
B	B. Machinery cost	: Rs. 25,00,000/- (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/-
	3. Permanent water sprinkler	: Rs. 3,00,000/-

	4. Afforestation and maintenance	:	Rs. 1,50,000/-
	5. Safety Kits	:	Rs. 2,00,000/-
	6. Provision of tyre washing facility	:	Rs. 1,00,000/-
	7. Blasting materials with blast mat cost	:	Rs. 2,50,000/-
	8. Environment monitoring	:	Rs. 20,00,000/-
	Total	:	Rs. 33,50,000/-
E	Total Project Cost (A+B+C)	:	Rs. 3,00,70,000/-



13.0 FINANCIAL ASSURANCE:

Not applicable, it is a small B2 Colour granite quarry.

14.0 CERTIFICATES:

All required certificates are enclosed.

15.0 PLAN AND SECTIONS, ETC:

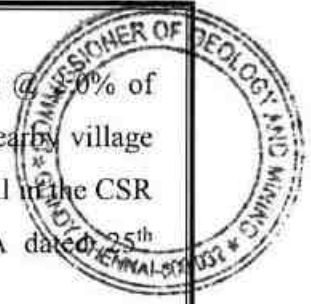
Plan and Sections are submitted along with mining plan.

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 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 Principal Secretary of Tamil Nadu, vide letter **Rc.No. 901/MME.2/2021-1, Dated 26.02.2021,**
- (iv) Total proposed production of colour granite is **70154m³**. Of which colour granite is **14031m³** in recovery of 20% and rejects of granites is **56123m³** of 80% upto a depth of 30m which is 15m (R.L.474-459m) above ground level and 15m below ground level (R.L.459-444m) (Refer Plate No's.V & VA) for the first 5 years plan period. Average production will be **2806m³** of colour granite per year.

17.0 CSR Expenditure:

CSR (Corporate Social responsibility) shall provide by the applicant @ 0% of average net profit of the company for the last three financial years to the nearby village on the Ministry has notified the amendments in section 135 of the Act as well in the CSR Rules on 22nd January 2021 as circular no. CSR-05/01/2021-CSR-MCA dated 25th August 2021.



Place: Dharmapuri, TN

Date:

Signature of the Recognized Qualified Person

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

This Mining Plan is Approved
Subject to the Conditions/ Stipulation
Indicated in the Mining Plan Approval

Letter No./ 6943/MM4/20 Dated 12/05/23.

COMMISSIONER OF
GEOLOGY AND MINING,
GUINDY, CHENNAI-600 032.



தமிழ்நாடு அரசு
2020



கிருஷ்ணகிரி மாவட்ட அரசிதழ்

சிறப்பு வெளியீடு

ஆணையின்படி வெளியிடப்பட்டது

கிருஷ்ணகிரி, அக்டோபர் 9, 2020
[சார்வரி, புரட்டாசி 23 - திருவள்ளூர் ஆண்டு 2051]

[எண் 35]

மாவட்ட ஆட்சியர் அறிவிக்கை

[ந.க.எண்.90/2017/(கனிமம்), நாள்: 09.10.2020/

[கிருஷ்ணகிரி மாவட்டத்தில் அரசு றும்போக்கு நிலங்களில் உள்ள குவாரிகளிலிருந்து கருப்பு / பல வண்ண கிராணைக் கற்கள் வெட்டி எடுத்துக் கொள்ள 1959ம் ஆண்டு தமிழ்நாடு சிறுகனிம சலுகை விதி 8(A)-ன்படி குவாரி குத்தகை உரிமம் வழங்குதல் குறித்த விண்ணப்பங்கள் வரவேற்பதற்கான அறிவிக்கை].

டெண்டர் விண்ணப்பங்கள் பெற கடைசி நாள் / நேரம் : 31/10/2020, பிற்பகல் - 4.00 மணி வரை
பொது ஏலம் நடத்துதல் மற்றும் டெண்டர் விண்ணப்பங்களை பிரித்து பரிசீலிக்கும் நாள் : 02/11/2020, முற்பகல் - 11.00 மணி முதல்

1. கிருஷ்ணகிரி மாவட்டத்தில் அரசு றும்போக்கு நிலத்தில் அமைந்துள்ள கிராணைக் குவாரிகளிலிருந்து கிராணைக் கற்கள் வெட்டி எடுக்க தமிழ்நாடு சிறு கனிம சலுகை விதிகள் 1959ல் அரசாணை எண்:103 தொழிற்(எம்.எம்.சி.1) துறை நாள்:13.07.1996 மற்றும் தமிழ்நாடு அரசிதழ் சிறப்பு வெளியீடு எண்:337 நாள்:13.07.1996-ன் பாகம் III(1)-Aல் சேர்க்கப்பட்டு பின்பு திருத்தங்கள் செய்யப்பட்ட விதி 8(அ)-ன்படி டெண்டருடன் இணைந்த பொது ஏல முறையில் குவாரி குத்தகை வழங்குதல் தொடர்பாக முடிமுத்திரையிடப்பட்ட டெண்டர் விண்ணப்பங்கள் தமிழக அரசு சார்பாக கிருஷ்ணகிரி மாவட்ட ஆட்சியரால் கிருஷ்ணகிரி மாவட்ட ஆட்சியர் அலுவலகத்தில் தரைதள அறை எண்:30ல் உள்ள புவியியல் மற்றும் சுரங்கத் துறை உதவி இயக்குநர் அலுவலக கடிக்காரத்தில் உள்ள நேர்ப்படி 31.10.2020 அன்று மாலை 4.00 மணி வரை தனி நபர்கள் (Individuals) / நிறுவனங்கள் (Companies) / பங்குதாரர் நிறுவனம் (Partnership firm) ஆகியோரிடமிருந்து வரவேற்கப்படுகிறது.
2. இந்த அறிவிக்கையின்படி விண்ணப்பிக்கப்படும் ஒப்பந்தப்புள்ளி (டெண்டர்) விண்ணப்பம் 1959 ஆம் ஆண்டு தமிழ்நாடு சிறுகனிமச் சலுகை விதிகளின் பின்இணைப்பு VI-அ-ல் குறிப்பிடப்பட்டுள்ள படிவத்தில் இருக்க வேண்டும். மாதிரி விண்ணப்பப்படிவம் இந்த மாவட்ட அரசிதழ் சிறப்பு வெளியீட்டின் இணைப்பில் பிரசுரிக்கப்பட்டுள்ளது. இணைப்பில் பிரசுரிக்கப்பட்டுள்ள படிவம் VI-அ-ன்படி பூர்த்தி செய்து அனுப்பப்படாத விண்ணப்பங்கள் மற்றும் குறிப்பிடப்பட்டுள்ள சட்டப்பூர்வமான இணைப்புகளுடன் சமர்ப்பிக்கப்படாத ஒப்பந்தப்புள்ளி (டெண்டர்) விண்ணப்பங்கள் ஏற்றுக் கொள்ளப்படமாட்டாது.
3. ஒப்பந்தப்புள்ளி விண்ணப்பம் அனுப்புவதற்கு முன்/ஏலத்தில் கலந்து கொள்வதற்கு முன் இம்மாவட்ட அரசிதழ் அறிவிக்கையுடன் இணைக்கப்பட்டுள்ள பட்டியலில் கண்ட சம்பந்தப்பட்ட குவாரியை விண்ணப்பதாரர்கள் நேரில் கனிமத்தின் தரம் மற்றும் இருப்பு ஆகியவற்றை தனது சொந்த செலவிலேயே பார்வையிட்டு கொள்ள வேண்டும். டெண்டர்/பொது ஏலம் முடிவில் கிராணைக் குவாரி குத்தகை உரிமம் ஒதுக்கீடு செய்யப்படுவது விண்ணப்பதாரர்கள் தேவையான அணுகு சாலை வசதிகளுடன் கூடிய கட்டமைப்பு வசதிகள் மற்றும் பிற வசதிகளை தங்களது சொந்த செலவில் ஏற்படுத்திக் கொள்ள வேண்டும்.



4. (அ) ஒவ்வொரு குவாரிக்கும் இந்த அரசிதழின் பிற்சேர்க்கையில் பிரசுரிக்கப்பட்டுள்ள இணைப்பு VI-ஆக காணும் மாதிரி விண்ணப்பப்படிவத்தின்படி அரசிதழில் / தினசரி நாளிதழில் வெளியிடப்பட்ட விளம்பரத்தின்படி குவாரிப்பட்டியலில் கண்டுள்ள இனங்களுக்கு தனித்தனி விண்ணப்பங்களில் கிருஷ்ணகிரி மாவட்ட ஆட்சியருக்கு முகவரியிட்டு விண்ணப்பிக்க வேண்டும். அறிவிப்பு செய்யப்பட்டுள்ள அரசிதழில் கண்டுள்ள நிபந்தனைகளின்படி குவாரிப்பட்டி செய்யப்பட்ட ஒப்பந்தப்புள்ளி (டெண்டர்) விண்ணப்பங்களை அனைத்து இணைப்புகளுடன் கவரில் வைத்து மூடி முத்திரையிட்டு மாவட்ட ஆட்சித் தலைவர் கிருஷ்ணகிரி என்ற விவாகரத்து நேரிடையான அல்லது ஒப்புகை பெறத்தக்க பதிவஞ்சல் மூலமாகவோ மாவட்ட ஆட்சியர் அலுவலக வளாக தரைதளத்தில் அறை எண்.30-ல் உள்ள புவியியல் மற்றும் சுரங்கத்துறை, உதவி இயக்குநர் அலுவலகத்தில் 2020ம் ஆண்டு அக்டோபர் திங்கள் 31-ம் நாள் மாலை 4.00 மணிக்குள் கிடைக்கும்படி அனுப்பப்பட வேண்டும். "டெண்டர் விண்ணப்பம் அடங்கிய கவரின் மீது விண்ணப்பிக்கும் குவாரியின் விவரம் மற்றும் அட்டவணையில் குறிப்பிட்டுள்ள குவாரியின் வரிசை எண் போன்றவற்றை தவறாமல் குறிப்பிட வேண்டும்". விண்ணப்பதாரரின் பெயர் மற்றும் முகவரி விவரங்களை விண்ணப்ப படிவம் அடங்கிய உறையின் மீது தெளிவாக குறிப்பிடப்பட வேண்டும்.

(ஆ) ஒப்பந்தப்புள்ளி (டெண்டர்) விண்ணப்பத்துடன் கீழ்க்கண்டவற்றை இணைத்து அனுப்ப வேண்டும்.

- (i) திருப்ப வழங்க இயலாத விண்ணப்பக் கட்டணமாக ரூ.5000/- (ரூபாய் ஐந்தாயிரம் மட்டும்)-க்கான கிருஷ்ணகிரி மாவட்ட அரசு கருவூலத்தில் செலுத்தியதற்கான கருவூல செலுத்து சீட்டு இணைக்கப்பட வேண்டும். விண்ணப்ப கட்டணமானது ஏதேனும் ஒரு தேசிய மயமாக்கப்பட்ட வங்கி / கூட்டுறவு வங்கி கிளையில் மாவட்ட ஆட்சியர் கிருஷ்ணகிரி என்ற பதவியின் பெயரில் கேட்பு வரைவோவையாகவோ (டிமாண்ட் டிராப்ட்) பெற்றும் விண்ணப்பத்துடன் இணைக்கலாம்.
- (ii) பிணை வைப்புத்தொகை (Earnest money deposit) ரூ.25,00,000/- (ரூபாய் இருபத்தைந்து இலட்சம் மட்டும்)-க்கான கேட்பு வரைவோவை மாவட்ட ஆட்சியர் கிருஷ்ணகிரி மாவட்டம் அவர்களின் பதவியின் பெயரில் பெற்று இணைக்கப்பட வேண்டும்.
- (iii) மாநிலத்தில் உள்ள மாவட்ட வாரியாக கனிம வாரியாக விண்ணப்பதாரர் / ஏலதாரர் நேரடியாகவோ அல்லது பங்குதாரராகவோ தொடர்புள்ள குவாரிகள் பற்றிய கீழ்க்கண்ட விவரங்களை ஆணை உறுதி வாக்குமூலம் (அபிடவிட்) மூலம் தெரிவிக்க வேண்டும்.
 - (1) அனுபவத்திலிருக்கும் குவாரி குத்தகை அனுமதி பற்றி விவரம்
 - (2) ஏற்கனவே விண்ணப்பித்து இதுவரை அனுமதி வழங்கப்படாத குவாரி குத்தகை அனுமதி பற்றிய விவரம்
 - (3) தற்போது உடனிகழ்வாக விண்ணப்பிக்கும் குவாரி குத்தகை அனுமதி விவரம்.
- (iv) விண்ணப்பதாரருக்கு கனிம குத்தகையுள்ள பகுதியின் மாவட்ட ஆட்சியரிடமிருந்து செல்லத்தக்க சுரங்கவரி நிலுவை இல்லா சான்றிதழ் கனிம சட்ட விதிமுறைகளில் குறிப்பிடப்பட்டுள்ள இணைப்பு VIII-ல் உள்ள படிவத்தில் ராயல்டி, சீனியரேஜ் கட்டணம், குத்தகை தொகை, முடக்கு வரி, மேற்பரப்பு வாடகை, பரப்பு வரி, அபராத தொகை அல்லது விதிமுறைகளின்படி இதர நிலுவைகள் ஆகியவை ஏதுமில்லை என்பதற்கான சான்று இணைக்கப்படவும் அல்லது குவாரி/சுரங்க உரிமம் ஏதும் தமிழ்நாடு மாநிலத்தில் இல்லை எனில் ஆணை உறுதி ஆவணமும் இணைக்கப்பட வேண்டும்.
- (v) வருமானவரி தொடர்பான கீழ்க்கண்ட விவரங்களுடன் ஆணையுறுதி வாக்குமூலத்தில் இணைக்கப்படவேண்டும்.
 - (1) நாளது வரை வருமான வரி கணக்கு தாக்கல் செய்யப்பட்ட விவரம்
 - (2) விதிக்கப்பட்ட வருமானவரி செலுத்தப்பட்டதற்கான சான்று
 - (3) வருமானவரிச் சட்டம் 1961 அல்லது மத்திய அரசால் அறிவுறுத்தப்பட்டவாறு சுய கணக்கீட்டின்படி வருமான வரி செலுத்தப்பட்ட விவரம்.

(இ) இவ்வாறு விண்ணப்பிக்கப்படும் விண்ணப்பத்தில் குத்தகை உரிமம் பெறுவதற்கு விண்ணப்பதாரரால் செலுத்தப்படவுள்ள அதிக பட்ச குவாரி குத்தகை தொகையினை குறிப்பிட்டிருக்க வேண்டும்.



(ர) அனைத்து விண்ணப்பங்களும் அரசிதழ் / விளம்பரத்தில் குறிப்பிடப்பட்டுள்ள முகவரிக்கு குறிப்பிடப்பட்ட நாள் மற்றும் நேரத்திற்குள் வந்தடைய வேண்டும்.

5. (அ) டெண்டர் விண்ணப்பங்கள் நேரடியாக அனுப்பப்படின் 1959ம் ஆண்டு தமிழ்நாடு சிறுகனிம சலுகை விதி, 1959-ல் கண்டுள்ள படிவத்தில் ஒப்புக்கேட்டு வழங்கப்படும். டெண்டர் விண்ணப்பம் பதிவஞ்சல் மூலம் அனுப்பப்படின் பெறப்பட்ட நாளிலிருந்து மூன்று தினங்களுக்குள் மேற்படி படிவத்தில் ஒப்புக்கேட்டு பதிவஞ்சலில் (ஒப்புக்கே அட்டையுடன்) அனுப்பிவைக்கப்படும். அஞ்சல் போக்குவரத்தில் ஏற்படும் தாமதம் / தவறும் விண்ணப்பங்களுக்கு / தகவல்களுக்கு மாவட்ட ஆட்சியர் எவ்வகையிலும் பொறுப்பு அல்ல.

(ஆ) செய்தித்தாள் மூலமாகவோ, மாவட்ட அரசிதழ் மூலமாகவோ, அறிவிப்பு செய்யப்படாத குவாரிகளுக்கு ஏதாவது ஒப்பந்தப்புள்ளி விண்ணப்பங்கள் கிடைக்கப் பெற்றால் அவையாவும் முதிர்ச்சி அடையாத விண்ணப்பமாக கருதப்பட்டு மாவட்ட ஆட்சியரால் உடனடியாக நிராகரிக்கப்படும். குறித்த காலக்கெடுவிற்குள் வந்து சேராத விண்ணப்பங்கள் காலவரையறை கடந்த விண்ணப்பமாக கருதப்பட்டு அவையாவும் மாவட்ட ஆட்சியரால் நிராகரிக்கப்படும். மேற்கூறப்பட்ட நிபந்தனைகளை பூர்த்தி செய்யாத ஏல / டெண்டர் விண்ணப்பங்கள் நிராகரிக்கப்படுவதுடன் ஏலம் / டெண்டரில் கலந்து கொள்ளவும் அனுமதிக்கப்படமாட்டார்கள். அவ்வாறு நிராகரிக்கப்படும் விண்ணப்பங்களுடன் வங்கி வரைவோலைகள் இருப்பின் பெறப்பட்ட ஏழு நாட்களுக்குள் விண்ணப்பம் மட்டும் நிறுத்திவைக்கப்பட்டு வங்கி வரைவோலை பதிவஞ்சல் மூலம் விண்ணப்பதாரருக்கு திரும்ப அனுப்பி வைக்கப்படும்.

பொது ஏலம் மற்றும் டெண்டர் நடைமுறைகள்

6. (அ) 1. குவாரி குத்தகை பெறுவது தொடர்பாக அறிவிப்பு / விளம்பரம் செய்யப்பட்டு டெண்டர் விண்ணப்பங்கள் கோரப்பட்ட இனங்களுக்கு வரப்பெற்ற டெண்டர் விண்ணப்பங்கள் திறக்கப்படும் முன் நடத்தப்படும் பொது ஏலத்தில் டெண்டர் விண்ணப்பதாரர்கள் மற்றும் பிணை வைப்புத்தொகை (Earnest money deposit) ரூ.25,00,000/- (ரூபாய் இருபத்தைந்து இலட்சம் மட்டும்) கேட்பு வரைவோலை மூலம் செலுத்தும் பொது ஏல விண்ணப்பதாரர்கள் விண்ணப்ப கட்டணம் மற்றும் குறிப்பிடப்பட்டுள்ள இணைப்புகளுடன் கூடிய விண்ணப்பம் சமர்ப்பித்தலுக்குப்பட்டு பொது ஏலத்தில் கலந்து கொள்ள அனுமதிக்கப்படுவர். அவ்வாறு ஏற்கனவே பிணைவைப்புத் தொகை செலுத்தி டெண்டர் மனு சமர்ப்பித்த விண்ணப்பதாரர்கள் பொது ஏலத்தில் கலந்து கொள்ள தனியே தொகை செலுத்த தேவையில்லை.

2. ஏற்கனவே டெண்டர் விண்ணப்பம் கொடுத்தவர்கள் ஏலத்தில் கலந்துகொள்ள முடியாவிடில் அவருக்குப்பதிவாக அவரால் நியமிக்கப்பட்ட நியமனதாரர் ஒரு நாள் மட்டுமே டெண்டரில் பிளிக் முன்பு விண்ணப்பதாரர் மற்றும் நியமிக்கப்பட்ட நாள் ஸ்கெட்க்குகள் சான்றுபெறப்பட்ட உறுதிமொழி ஆவணம் (அபிடவிட்) தாக்கல் செய்வதின் பேரில் ஏலத்தில் கலந்து கொள்ள அனுமதிக்கப்படுவார்கள்.

(ஆ) (i) மாவட்ட ஆட்சியர் அல்லது அவரால் அங்கீகாரம் வழங்கப்பட்டுள்ள அலுவலரால் மாவட்ட ஆட்சியர் அலுவலகத்தில் விண்ணப்பதாரர்கள் மற்றும் ஏலம் கோர வந்திருக்கும் நபர்களின் முன்னிலையில் ஒப்பந்தப்புள்ளி (டெண்டர்) விண்ணப்பங்கள் திறக்கப்படுவதற்கு முன்னர் குவாரிப் பட்டியலில் கண்டுள்ள வரிசைப்படி பொது ஏலம் நடத்தப்படும். பொது ஏலம் முடிவடைந்த பின்னர் மாவட்ட ஆட்சியர் அல்லது அவரால் அங்கீகாரம் வழங்கப்பட்டுள்ள அலுவலரால் வரப்பெற்ற அனைத்து டெண்டர் விண்ணப்பங்களும் பிரித்து ஆய்வு செய்யப்படும்

(ii) மூடி முத்திரையிட்டு வரப்பெற்ற டெண்டர் விண்ணப்பங்கள் ஆஜராகவுள்ள டெண்டர் விண்ணப்பதாரர்கள் அவரால் நியமனம் செய்யப்பட்ட நியமனதாரர் முன்னிலையில் பிரிக்கப்படும். டெண்டர் திறப்பு நாள் மற்றும் குறிப்பிட்ட நேரத்தில் டெண்டர் விண்ணப்பதாரர் அல்லது நியமனதாரர் இல்லாதிருக்கும் பட்சத்தில் அது டெண்டர் / பொது ஏல நடவடிக்கைகளை எவ்வகையிலும் கட்டுப்படுத்தாது.

(iii) டெண்டர் / பொது ஏலத்தில் மூன்றுக்கும் குறைவான டெண்டர் / பொது ஏலம் விண்ணப்பம் பெறப்படின் டெண்டர் / பொது ஏலம் நடவடிக்கைகள் ரத்து செய்யப்பட்டு ஒரு மாத காலத்திற்குள் மறு டெண்டர் நடத்த பரிந்துரை செய்யப்படும்.

(iv) குறிப்பிட்ட இனத்திற்கு பெறப்பட்ட டெண்டர் விண்ணப்பங்களின் எண்ணிக்கை விண்ணப்பதாரரின் பெயர் மற்றும் விண்ணப்பதாரால் குறிப்பிடப்பட்டுள்ள டெண்டர் தொகை விவரம் அங்கீகாரம் வழங்கப்பட்ட அலுவலரால் அறிவிக்கை செய்யப்படும். டெண்டர் நடவடிக்கைகள் முடிவு செய்யப்படும் முன் உயர்ந்த பட்ச ஏல தொகை மற்றும் டெண்டர் விண்ணப்பத்தில் குறிப்பிடப்பட்டுள்ள டெண்டர் தொகை, உயர்ந்த பட்ச தொகை குறிப்பிட்ட டெண்டர் / ஏலதாரர் விவரங்களும் அங்கீகாரம் வழங்கப்பட்ட அலுவலரால் அறிவிக்கை செய்யப்படும்.



- (v) ஏலத்தில் கோரப்பட்ட உயர்ந்தபட்ச தொகையானது ஒப்பந்தப்புள்ளி (டெண்டர்) விண்ணப்பத்தில் குறிப்பிடப்பட்டுள்ள குத்தகை (டெண்டர்) தொகையை விட குறைவாக இருந்து ஒப்பந்தப்புள்ளி (டெண்டர்) விண்ணப்பங்கள் மூலமாக கோரப்படும் குத்தகை தொகைகள் இரண்டு அல்லது அதற்கும் மேல் விண்ணப்பதாரர்களால் ஒரே மாதிரியாக குறிப்பிடப்பட்டிருந்தால் மாவட்ட ஆட்சியர் அல்லது அவரால் அங்கீகாரம் அளிக்கப்பெற்ற அலுவலர் சம்பந்தப்பட்ட விண்ணப்பதாரர்களை மட்டும் அழைத்து சம்பந்தப்பட்ட குவாரிக்கு மட்டும் மறுகேட்பு மூலம் உயர் குத்தகை தொகை பெற நடவடிக்கை எடுக்கப்படும்.
- (vi) அரசிதழில் குறிப்பிடப்பட்டுள்ள குவாரிகளுக்கு அதிக பட்ச டெண்டர் / ஏலத் தொகை உறுதி செய்து அறிவிக்கை செய்யப்பட்ட பின்னர் மீதமுள்ள டெண்டர் / ஏலதாரர்களிடமிருந்து பெறப்பட்ட பிணை வைப்புத் தொகை வருகைபுரிந்துள்ளவர்களிடம் உரிய ஒப்புகை சான்று பெற்று திரும்ப வழங்கப்படும் அல்லது ஒப்பந்தப்புள்ளி திறக்கும் சமயத்தில் ஆஜரில் இல்லாத நபருக்கு பதிவஞ்சல் மூலம் வங்கி வரவோவைகள் தளியே அனுப்பி வைக்கப்படும். உயர்ந்தபட்ச டெண்டர் / ஏலத் தொகை குறிப்பிட்ட விண்ணப்பதாரருக்கு குவாரி குத்தகை உரிமம் வழங்கப்படுவது அவரால் செலுத்தப்பட்ட பிணைவைப்புத் தொகை குத்தகை தொகையில் ஈடுசெய்து கொள்ளப்படும்.
- 7) குவாரி குத்தகை தொடர்பான ஒப்பந்தப்புள்ளி / ஏல நடவடிக்கைகள் முடிவுற்ற பின்னர் பெறப்பட்ட அனைத்து விண்ணப்பங்களும் மாவட்ட ஆட்சியரால் புவியியல் மற்றும் சுரங்கத் துறை இயக்குநர், சென்னை மூலமாக அரசுக்கு அனுப்பி வைக்கப்படும். மாவட்ட ஆட்சியரால் அனுப்பப்படும் முன்மொழிவுகள் பெறப்பட்டவுடன் இயக்குநர், புவியியல் மற்றும் சுரங்கத் துறை, சென்னை அவர்களது பரிந்துரைகளுடன் அரசுக்கு அனுப்பி வைக்கப்படும்.
- 8) (அ) (i) குவாரி குத்தகை உரிமம் வழங்குவது தொடர்பாக புவியியல் மற்றும் சுரங்கத்துறை இயக்குநரிடமிருந்து பரிந்துரைகள் பெறப்பட்டவுடன் மாநில அரசால் அதிகபட்ச ஏல கேட்புத்தொகை அல்லது உயர்ந்த பட்ச ஒப்பந்தத்தொகை குறிப்பிட்ட விண்ணப்பதாரருக்கு குவாரி குத்தகை வழங்கப்படுவது தொடர்பான அறிவிப்பாணை அல்லது தகுதியான பரப்பு குறித்த அறிவிப்பு அனுப்பிவைக்கப்படும்.
- (ii) அரசிடமிருந்து குவாரி குத்தகை வழங்குவது தொடர்பான தகுதியான பரப்பு என்பதற்கான உறுதியான கிடைக்கப்பெற்ற ஒரு மாத காலத்திற்குள் மீதமுள்ள குத்தகை தொகையினை மாவட்ட கருவூலத்தில் செலுத்தியதற்கான அச்ச சலாணை சமர்ப்பிக்க வேண்டும். 1999-ம் ஆண்டு கிராண்டை பாதுகாப்பு மற்றும் மேம்படுத்துதல் விதி 12-ல் குறிப்பிட்டுள்ளவாறு அங்கீகரிக்கப்பட்ட சுரங்க திட்டம் மூன்று மாத காலத்திற்குள் பெற்று அரசுக்கு அனுப்பிவைக்க வேண்டும்.
- (iii) அரசிடமிருந்து பெறப்பட்ட கடிதத்தில் குறிப்பிடப்பட்டுள்ள காலத்திற்குள் விண்ணப்பதாரர்களால் மீதமுள்ள குத்தகை தொகை செலுத்த தவறும் பட்சத்தில் ஏற்கனவே செலுத்தப்பட்ட தொகை பறிமுதல் செய்யப்படுவதுடன் ஏற்கனவே அனுப்பப்பட்ட அரசு கடிதமானது ரத்து செய்யப்பட்டதாக கருதப்படும். விண்ணப்பதாரர்களால் மீதமுள்ள குத்தகை தொகை உரிய காலத்திற்குள் செலுத்தப்பட்டு 1999-ம் ஆண்டு கிராண்டை பாதுகாப்பு மற்றும் மேம்படுத்துதல் விதி 12-ல் குறிப்பிட்டுள்ளவாறு அங்கீகரிக்கப்பட்ட சுரங்க திட்டம் சமர்ப்பிக்க இயலாத விண்ணப்பதாரரின் ஏற்கத்தக்க காரணம் ஏதும் இருப்பின், அங்கீகரிக்கப்பட்ட சுரங்கத் திட்டம் சமர்ப்பிக்க கால நீட்டிப்பிற்கு விண்ணப்பதாரர் விண்ணப்பிக்கலாம். அவ்வாறான விண்ணப்பம் அரசுக்கு பெறப்பட்ட உடன் விண்ணப்பதாரரால் செலுத்தப்பட்ட மீதமுள்ள குத்தகை தொகை செலுத்தப்பட்ட விவரத்தினை உறுதி செய்து குறிப்பிடப்பட்டுள்ள காரணங்கள் திருப்திகரமாக உள்ளதாக கருதப்படுவது மேலும் மூன்று மாத கால அவகாசத்திற்கு மேற்படாமல் அரசால் நீட்டித்து அனுமதிக்கப்படும். காலநீட்டிப்பு செய்யப்பட்டு அனுமதிக்கப்பட்ட காலத்திற்குள் அங்கீகரிக்கப்பட்ட சுரங்கத் திட்டம் விதிகளின்படி பெற்று சமர்ப்பிக்க தவறும் பட்சத்தில் விண்ணப்பதாரர்களால் செலுத்தப்பட்ட தொகை பறிமுதல் செய்யப்படுவதுடன் ஏற்கனவே அனுப்பப்பட்ட அரசு கடிதமானது ரத்து செய்யப்பட்டதாக கருதப்படும்.
- (iv) விண்ணப்பதாரர்கள் 1959ம் ஆண்டு தமிழ்நாடு சிறுகனிம விதி 42-ன்படி தகுதிவாய்ந்த அமைப்பிடமிருந்து பெறப்பட்ட சுற்றுச்சூழல் அனுமதி ஆணையினை மாநில அரசால் குறிப்பிடப்பட்ட காலவரையறைக்குள் பெற்று சமர்ப்பிக்கவும் வேண்டும்.
- (v) மனுதாரர் தனது குத்தகை வழங்க உத்தேசிக்கப்பட்ட பகுதிக்கு ஒரூர் மாவட்ட வள அலுவலரின் தடையின்மை சான்று பெற்று சமர்ப்பிக்க வேண்டும்.



- (vi) அரசு கடிதத்தின்படி விண்ணப்பதாரரால் 1999-ம் ஆண்டு கிராண்ட் பாதுகாப்பு மற்றும் மேம்படுத்துதல் விதி 12-ன்படி அங்கீகரிக்கப்பட்ட சுரங்கத் திட்டம் மற்றும் 1959ம் ஆண்டு தமிழ்நாடு சுகனிம சலுகை விதி 42-ன்படி தகுதிவாய்ந்த ஆணைப்பிடிமிருந்து பெறப்பட்ட சுற்றுச்சூழல் அனுமதி ஆணை மற்றும் மாவட்ட வன அலுவலரின் தடையின்மை சான்று ஆகியவை பெற்று சமர்ப்பிக்கப்பட்ட பின்னர் குவாரி குத்தகை உரிம ஆணை அரசால் வழங்கப்படும்.

- (ஆ) விண்ணப்பதாரர்களால் குறிப்பிடப்பட்டுள்ள அதிகபட்ச தொகையானது திருப்திகரமானது இல்லை என்றோ அதிக தொகை குறிப்பிட்ட விண்ணப்பதாரரின் டெண்டர் உறுதிசெய்வது கனிம வளர்ச்சிக்கு உகந்ததாக இருக்காது என அரசால் கருதப்படின குவாரி குத்தகை உரிமம் விண்ணப்பதாரருக்கு வழங்க மறுத்து உரிய காரணங்களுடன் அரசால் ஆணை அனுப்பிவைக்கப்படும்.
- (இ) அரசிடமிருந்து உறுதி ஆணை பெறப்பட்ட நாளிலிருந்து ஒருமாத காலத்திற்குள் அல்லது மாவட்ட ஆட்சியரால் மேலும் அனுமதிக்கப்படும் 30- (முப்பது) நாட்களுக்கு மிகாமல் உள்ள காலத்திற்குள் விண்ணப்பதாரரால் மாவட்ட ஆட்சியருடன் குவாரி குத்தகை ஒப்பந்த ஆவணம் நிறைவேற்றப்படும். குவாரி குத்தகை ஒப்பந்த ஆவணத்துடன் மாவட்ட ஆட்சியர் மற்றும் விண்ணப்பதாரரால் கையொப்பமிடப்பட்ட குத்தகை வழங்கப்பட்ட பரப்பின் விவரம் குறிக்கப்பட்ட வரைபடம் இணைத்து குறிப்பிடப்பட்ட நாள்/நேரத்தில் குவாரி குத்தகை ஒப்பந்த ஆவணம் நிறைவேற்றப்படும்.
- (ஈ) அரசால் குவாரி குத்தகை ஆணை விண்ணப்பதாரருக்கு வழங்கப்பட்ட பின்னர் விண்ணப்பதாரரால் குத்தகை வழங்கப்பட்ட பரப்பின் விவரம் குறிக்கப்பட்டு கையொப்பமிடப்பட்ட வரைபடம் சமர்ப்பிக்க தவறினாலோ, குத்தகை ஒப்பந்த ஆவணம் நிறைவேற்ற தேவையான முத்திரைதாட்கள் சமர்ப்பிக்க தவறினாலோ அல்லது குறிப்பிடப்பட்ட காலத்திற்குள் குத்தகை ஒப்பந்த பத்திரம் நிறைவேற்ற தவறினாலோ அரசால் வழங்கப்பட்ட குத்தகை ஆணையினை ரத்து செய்து உத்திரவிடுவதுடன் அவரால் செலுத்தப்பட்ட அனைத்து தொகையும் பறிமுதல் செய்யப்படும். அவ்வாறு ரத்து செய்யப்பட்ட குவாரி குத்தகை பகுதிக்கு இரண்டு அல்லது அதற்கும் மேற்பட்ட விண்ணப்பதாரர்கள் இருப்பின் ரத்து செய்யப்பட்ட விண்ணப்பதாரருக்கு அடுத்து அதிகபட்ச டெண்டர்/கேட்புத் தொகை குறிப்பிட்ட விண்ணப்பதாரருக்கு அரசால் மேற்கண்ட உட்குறு (அ மற்றும் ஆ)-ல் குறிப்பிடப்பட்டுள்ளவைகளுக்கு உட்பட்டு குவாரி குத்தகை உரிமம் வழங்கப்படும். அரசால் அறிவிப்பு ஆணை அனுப்பப்பட்ட அடுத்த அதிகபட்ச டெண்டர்/கேட்புத் தொகை குறிப்பிட்டவரிடமிருந்து 15 தினங்களுக்குள் சம்மதம் கடிதம் மூலம் தெரிவிக்கப்படவில்லை எனில், அக்குறிப்பிட்ட பகுதிக்கு அரசால் புதிய டெண்டர் விண்ணப்பங்கள் கோரப்படும்.

குவாரி பணி மேற்கொள்வதற்கான நிபந்தனைகள்

9. (அ) குவாரி குத்தகை வழங்கப்பட்ட காலத்திற்கு குத்தகை ஒப்பந்த ஆவணம் நிறைவேற்றப்பட்ட நாள் குவாரி குத்தகை துவக்க நாளாக இருக்கும்.
- (ஆ) குவாரி குத்தகை ஒப்பந்தம் நிறைவேற்றப்படும் முன் டெண்டர் / ஏல விண்ணப்பங்கள், அரசால் உறுதி ஆணையில் தெரிவிக்கப்பட்ட குத்தகை தொகையில் 20% தொகையினை பிணை வைப்புத் தொகையாக செலுத்த வேண்டும்.
- (இ) குவாரி குத்தகை உரிமம் தொடர்பாக செலுத்தப்படும் ஒருமுறை குத்தகை தொகையினை தவிர இவ்விதிகளின் இணைப்பு (II)ல் குறிப்பிடப்பட்டுள்ளவாறு குத்தகைதாரர்கள் அவ்வப்போது வெட்டி எடுக்கும் / உபயோகிக்கும் கனிம அளவிற்கு உரிய விகிதத்தில் கனிம வரி அல்லது முடக்குவரி இதில் எது அதிகமோ அதனை செலுத்த வேண்டும். ஒருமுறை குத்தகை தொகை மற்றும் கனிம வரி அல்லது முடக்குவரி அவற்றில் அதிகமான தொகை மற்றும் அரசால் அவ்வப்போது அறிவிக்கப்படும் இதர வரிகளையும் குத்தகைதாரர் செலுத்த வேண்டும். கனிம வரி அல்லது முடக்குவரி இவற்றுள் எது அதிகமோ அதனை செலுத்த தவறும் போது குவாரி குத்தகை உரிமம் இரத்து செய்யப்படும். குத்தகைதாரர்கள் முதல் குத்தகை ஆண்டிற்கான முடக்கு வரியினை குவாரி குத்தகை ஒப்பந்த ஆவணம் நிறைவேற்றப்படுவதற்கு முன்னரும் அடுத்து வரும் ஆண்டுகளுக்கான முடக்கு வரியினை ஒவ்வொரு ஆண்டும் குத்தகை கட்டும் துவங்கும் 30 நாட்களுக்குள்ளும் செலுத்த வேண்டும். குத்தகைதாரர்கள் குத்தகை வழங்கப்பட்ட பகுதியிலிருந்து வெட்டி எடுத்துச் செல்லும் கிராண்ட் கந்துண்டுகளுக்கு வழித்தடசான்று கோரி விண்ணப்பிக்கும் போது செலுத்தப்பட வேண்டிய கனிமவரிக்கு, குத்தகைதாரர்களால் ஏற்கனவே செலுத்தப்பட்ட முடக்குவரி உள்ள வரை ஈடு செய்து கொள்ளப்படும்.



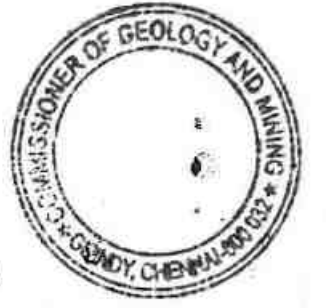
- (ஈ). குவாரி குத்தகை ஒப்பந்த ஆவணம் நிறைவேற்றப்பட்ட பின்னர் குவாரி குத்தகைக்கு விடப்பட்ட புலத்தின் எண், குவாரி குத்தகை செய்ய விடப்பட்ட பரப்பு ஆகியன குறித்து எவ்வித தாவரமும் செய்ய குத்தகை உரிமைதாரருக்கு கிடையாது.
- (உ). குவாரி குத்தகை ஒப்பந்தபத்திரத்தில் குறிப்பிடப்பட்டுள்ள நாளில் குத்தகை உரிமம் முடிவடைவதுடன் குத்தகை காலம் எவ்வகையிலும் நீட்டிக்கப்பட மாட்டாது.
- (ஊ). எந்தவொரு குத்தகைதாரரும் குவாரி குத்தகை ஒப்பந்த ஆவணம் நிறைவேற்றப்படும் முன்னர் குவாரி பகுதியில் குவாரி பணி தொடங்கக் கூடாது. குத்தகைதாரர்கள் குவாரி குத்தகை ஒப்பந்த காலம் முடிவுற்ற பின்னர் குவாரி பகுதியில் எவ்வித பணிகளும் தொடரக்கூடாது. மேற்கண்ட நிபந்தனைகளை மீறினாலோ அல்லது புறம்பாகவோ குவாரி பணி அல்லது கனிமம் எடுத்துச் செல்வது என்பது, கள்ளத்தனமாக கனிமம் வெட்டி எடுத்தல், எடுத்துச் செல்லுதல் என கருதப்பட்டு குத்தகைதாரர் மீது பிற நடவடிக்கைகளுக்கு குந்தகமின்றி சட்ட விதிகளின்படி தண்ட நடவடிக்கை மேற்கொள்ளப்படும்.
- (எ). குத்தகைதாரர் தனக்கு ஒதுக்கீடு செய்யப்பட்ட பகுதியில் மட்டும் குவாரி பணி செய்து மாவட்ட ஆட்சியர் (அ) அவரால் அங்கீகாரம் வழங்கப்பட்ட அலுவலரிடமிருந்து இசைவாணைசீட்டு மற்றும் நடைச்சீட்டு பெற்ற பின்னரே கனிமங்களை எடுத்துச் செல்ல வேண்டும்.
- (ஏ). குவாரி குத்தகை உரிமம் வழங்கப்பட்ட பகுதியில் அனுமதிக்கப்பட்ட கனிமம் மட்டுமே வெட்டி எடுக்கப்பட வேண்டும். இதர கனிமங்கள் / மதிப்பு மிக்க உலோகங்கள் ஏதேனும் கண்டறியப்படுகின்ற குவாரி பணி உடனடியாக நிறுத்தப்பட்டு மாவட்ட ஆட்சியர் / அரசுக்கு தெரியப்படுத்தப்பட வேண்டும்.
- (ஐ). குத்தகைதாரர் தனக்கு வழங்கப்பட்ட குத்தகை உரிமத்தினை 1959ம் ஆண்டு தமிழ்நாடு சிறுகனிம சலுகை விதி 36-F-ல் குறிப்பிடப்பட்டுள்ளவாறு உரிமை மாற்றம், உள் குத்தகை, அடமானம் அல்லது வேறு எந்த வகையிலும் அரசின் முன் அனுமதியின்றி குத்தகை மாற்றம் செய்யக் கூடாது.
- (ஐ). குவாரி பகுதியிலிருந்து வெட்டி எடுக்கப்பட்ட மற்றும் வெளியேற்றப்பட்ட கனிமங்களின் அளவுகள் மற்றும் இதர விவரங்கள் குறித்து சரியான கணக்குகள் குத்தகைதாரர்களால் பராமரிக்கப்பட வேண்டும். குத்தகைதாரரால், அரசு / இயக்குநர் புவியியல் மற்றும் சுரங்கத் துறை / மாவட்ட ஆட்சியர் அவர்களால் அங்கீகாரம் அளிக்கப்பட்ட அலுவலர்கள் குவாரியினை ஆய்வு செய்ய அனுமதிக்கவும், மேலும் கணக்குகள் மற்றும் பதிவேடுகளை ஆய்வு செய்து சரிபார்க்கவும் அவரால் கோரப்படும் தகவல்கள் / குவாரி பற்றிய அறிக்கைகள் (Returns) குத்தகைதாரரால் வழங்கப்பட வேண்டும்.
10. (அ) குவாரி குத்தகைதாரர்கள் குவாரி பணியினை திறம்படவும் அறிவியல் பூர்வமாகவும், தொழிலாளர்களின் பாதுகாப்பு, கனிமவள அபிவிருத்தி மற்றும் சுற்றுச்சூழல் பாதுகாப்பு ஆகியவற்றை கருத்தில் கொண்டு குவாரி பணி மேற்கொள்ள வேண்டும்.
- (ஆ) குவாரி குத்தகை வழங்கப்பட்டுள்ள பகுதிக்குள் உள்நுழையவும், மற்றும் ஆய்வு செய்யும் பணிக்காகவும், உட்கூறு (அ)-ல் குறிப்பிட்டுள்ள இதர பணிக்காகவோ மத்திய/மாநில அரசுகளால் இயற்றப்பட்ட சட்ட விதிகளை கடைபிடித்தவை கண்காணிக்கும் பொருட்டும் மாநில அரசு அல்லது இயக்குநர் புவியியல் மற்றும் சுரங்கத் துறை (அ) மாவட்ட ஆட்சியரால் அளிக்கப்பட்ட அலுவலர்களை குத்தகைதாரர் அனுமதிக்க வேண்டும்.
11. இவ்விதிகளின் கீழ் வழங்கப்படும் குவாரி குத்தகை உரிமமானது, குவாரி குத்தகை காலத்தில் குத்தகைதாரரின் திருப்திகரமான செயல்பாடுகளை பூர்த்தி செய்ததற்கு உட்பட்டும் மற்றும் 1959ம் ஆண்டு தமிழ்நாடு சிறு கனிம சலுகை விதிகளில் குறிப்பிடப்பட்டுள்ள இதர விதிகளுக்கு உட்பட்டும் 20 ஆண்டுகளுக்கு மிகாமல் குத்தகை உரிமம் புதுபிக்கப்படலாம்.

12. நிபந்தனைகள்

1. குவாரி குத்தகைக்கு விடப்படும் பகுதியின் குத்தகை காலம் விதிகளின்படி 20(இருபது) ஆண்டுகளுக்கு மட்டுமே ஆகும்.
2. அரசால் அறிவிக்கப்பட்ட அதிகப்பட்ச டெண்டர்/ ஏல கேட்புதாரர் பெயரிலேயே குவாரி குத்தகை உரிமம் வழங்கப்படும்.
3. குவாரி குத்தகை ஒப்பந்த ஆவணம் நிறைவேற்றப்படுவதற்கு முன் குவாரி தொடர்பான பணிகள் ஏதும் மேற்கொள்ளக் கூடாது.



4. நிறவேற்றப்பட்ட குவாரி குத்தகை ஒப்பந்த ஆவணம் குத்தகைதாரரின் சொந்த செலவில் பதிவு செய்து சமர்ப்பிக்கப்பட வேண்டும்.
5. குவாரி பணியின் போது அருகில் உள்ள பட்டாதாரர்களுக்கும் / பொதுமக்களுக்கும் எவ்வித இடையூறும் ஏற்படுத்தக் கூடாது.
6. குத்தகைதாரர் புல வரைப்படத்தின்படி தனக்கு ஒதுக்கீடு செய்யப்பட்ட பகுதியில் மட்டும் ஆக்கிரமிப்பு ஏதுமின்றி குவாரி பணி செய்ய வேண்டும்.
7. குத்தகைதாரர் குவாரி குத்தகை இடத்தில் குத்தகை உரிமம் குறித்த புல எண், குத்தகை வழங்கப்பட்ட ஆண்டு, குத்தகைதாரர் விவரம் மற்றும் குத்தகை காலம் போன்ற விவரங்கள் அடங்கிய பதாகையினை மாவட்ட ஆட்சியர், இயக்குநர் புவியியல் மற்றும் சுரங்கத் துறை அவர்களுக்கு திருத்தி அளிக்கும் வகையில் குத்தகை காலம் முழுவதும் நிறுவி பராமரித்து வரவேண்டும்.
8. குவாரி குத்தகை வழங்கப்பட்டுள்ள இடத்திற்கு சென்று வர பொது போக்குவரத்து சாலையிலிருந்து அணுகுபாதை வசதியினை குத்தகைதாரர் தனது சொந்த செலவில் ஏற்படுத்திக்கொள்ள வேண்டும்.
9. குத்தகைதாரர் 1957 ஆண்டு சுரங்கங்களும் கனிமங்களும் (முறைபடுத்துதல் மற்றும் மேம்படுத்துதல்) சட்டம், 1961-ம் ஆண்டு உலோகம் சார்ந்த சுரங்க வரையறை மற்றும் 1980-ம் ஆண்டு வளைபாதுகாப்பு சட்டம் 1981-ம் ஆண்டு வளைபாதுகாப்பு விதிகள், 1980-ம் ஆண்டு சுற்றுச்சூழல் பாதுகாப்பு சட்டம், 1981-ம் ஆண்டு சுற்றுச்சூழல் பாதுகாப்பு விதிகள், 1984-ம் ஆண்டு இந்திய வெடிமருந்துகள் சட்டம் (மத்திய சட்டம் IV / 1884) மற்றும் 1959ஆம் ஆண்டு தமிழ்நாடு சிறுகனிம சலுகை விதிகள் ஆகியவற்றில் கண்டுள்ள சரத்துகளுக்கு கட்டுப்பட்டவர் ஆவார்.
10. குவாரி குத்தகைக்கு வழங்கப்பட்டுள்ள பகுதியில் பணிதுவங்கும் முன்னர் குவாரி பகுதியினை சுற்றியுள்ள அனைத்து பகுதிகளிலும் சிவப்பு வண்ண கொடியுடன் கூடிய எல்லை குறிக்கும் தூண்கள் DGPS அளவு கொண்டு நிறுவப்பட்டு குத்தகை கால முழுமைக்கும் நல்ல முறையில் பராமரித்து வரவேண்டும்.
11. குவாரி குத்தகை அனுமதிக்கப்பட்டுள்ள பகுதியின் அருகிலுள்ள பட்டா நிலங்களுக்கு 7.5 மீட்டர் பாதுகாப்பு இடைவெளியும் அரசு பறம்போக்கு நிலங்களுக்கு 10 மீட்டர் பாதுகாப்பு இடைவெளியும் விட்டு குவாரி பணி மேற்கொள்ளப்பட வேண்டும்.
12. வெட்டி எடுக்கப்படும் கனிமங்களின் விவரம் குறித்த பதிவேடு முறையாக பராமரிக்கப்பட வேண்டும்.
13. குவாரி வழங்கப்பட்ட பகுதியினை ஒட்டியுள்ள பகுதியில் காணப்படும் கட்டுமானங்கள், குடியிருப்புகள், மின்/தொலைபேசி கம்பி வழித்தடங்கள், புகைவண்டி இருப்பு பாதை, நீர்வழித்தடங்கள், தேசிய நெடுஞ்சாலை மற்றும் இதர பொது உபயோக இடங்களுக்கு குறைந்த பட்சம் 50 மீட்டர் பாதுகாப்பு இடைவெளியும், அருகில் உள்ள கிராம சாலைகளுக்கு 10 மீட்டர் பாதுகாப்பு இடைவெளியும் விடப்பட்டு குத்தகை காலம் முழுமைக்கும் பராமரிக்கப்பட வேண்டும்.
14. குவாரி பகுதியில் குவாரி பணி மேற்கொள்ள துவங்கும் முன் சுரங்க மேலாளர் மற்றும் சுரங்க மேட் ஆகியோர் நியமனம் செய்யப்படுவதுடன் அவர்கள் முன்னிலையிலேயே குவாரி பணிகள் மேற்கொள்ளப்பட வேண்டும்.
15. குவாரி பணி துவங்கப்படுவது தொடர்பான அறிவிப்பு இயக்குநர், சுரங்க பாதுகாப்பு, பெங்களூரு அவர்களுக்கு அனுப்பப்பட வேண்டும்.
16. குவாரி பகுதியில் விபத்து ஏதும் ஏற்படின் அதனை உடனடியாக இயக்குநர், சுரங்க பாதுகாப்பு, பெங்களூரு மற்றும் மாவட்ட ஆட்சியர் அவர்களுக்கு தெரியபடுத்தப்படுவதுடன் குவாரி பணியில் ஏதேனும் விதிமீறல்கள் இருப்பின் அதற்கு குத்தகைதாரரே முழுபொறுப்பாவார்.
17. குத்தகைதாரரால் குவாரி பணி துவங்கும் முன்னர் தமிழ்நாடு மாசுகட்டுப்பாட்டு வாரியத்திடமிருந்து குவாரி நிறுவதல் மற்றும் இயக்குதல் தொடர்பான இசைவாணை பெற்றுக் கொள்ள வேண்டும்.
18. தமிழ்நாடு மாசுகட்டுப்பாட்டு வாரியத்தால் விதிக்கப்படும் நிபந்தனைகளை குத்தகைதாரர் தவறாது கடைபிடிக்க வேண்டும்.
19. சுற்றுச் சூழல் ஆணையம் மற்றும் தமிழ்நாடு மாசுகட்டுப்பாட்டு வாரியத்தால் வழங்கப்படும் அனுமதி ஆணைகள் உரிய காலத்தில் தவறாது பூர்த்திக்கப்பட வேண்டும்.
20. குவாரி குத்தகை வழங்கப்படும் பகுதியில் குத்தகை ஒப்பந்த பத்திரம் நிறவேற்றப்படும் முன்னர் கனிமங்கள் வெட்டி எடுக்கப்பட்டது ஏதும் கண்டறியப்பின் குத்தகை ஒப்பந்த பத்திரம் ரத்து செய்யப்படுவதுடன் குற்றவியல் நடவடிக்கைகள் மேற்கொள்ளப்படும்.



21. அரசால் வழங்கப்படும் குவாரி குத்தகை உரிம காலம் எக்காரணம் கொண்டும் நீட்டிக்கப்படமாட்டாது.
22. நடைமுறையில் உள்ள மற்றும் அரசால் அவ்வப்போது விதிக்கப்படும் விதிகளின்படி குவாரி குத்தகைதாரர் தகுந்த பாதுகாப்பு இடைவெளியுடன் மற்றும் அரசால் அறிவுறுத்தப்படும் உரிய பாதுகாப்பு நெறிமுறைகளையும் தனது சொந்த செலவில் ஏற்படுத்திக் கொள்ள வேண்டும்.

13. சிறப்பு நிபந்தனைகள்

1. டெண்டர் / ஏல விண்ணப்பங்களை முழுமையாகவோ / பகுதியாகவோ, அரசு / அரசு அலுவலர்களுக்கு எவ்வித பொறுப்புகளுமின்றி ஏற்றுக் கொள்ளவோ / நிராகரிக்கவோ அரசுக்கு முழு உரிமையுண்டு.
2. டெண்டர் / ஏல கேட்புகளை ஏற்றுக் கொள்வது என்பது அரசுக்கு உரித்தானதாகும். உயர்ந்தபட்ச அல்லது எந்த ஒரு டெண்டர் / ஏல விண்ணப்பத்தையும் ஏற்றுக் கொள்ள வேண்டிய நிர்வந்தம் அரசுக்கு இல்லை.
3. டெண்டர் / பொது ஏலக் கேட்பில் கலந்து கொள்ளும் விண்ணப்பதாரர்கள் ஆணவரும் இந்திய அரசின் வருமான வரித்துறையினரால் வழங்கப்பட்ட நிரந்தர கணக்கு எண் (PAN) பெற்றிருக்க/பெற்றுக்கொள்ள வேண்டும்.
4. குவாரி குத்தகை உரிமம் உறுதி செய்யப்பட்ட டெண்டர் தொகை / ஏலதாரர் செலுத்தும் ஏல கேட்புத் தொகையில் 2% தொகையினை வருமான வரியாக உதவி இயக்குநர் அலுவலக வரி பிடித்த கணக்கு எண்: CHED05905E-ல் செலுத்தி உரிய செலுத்துச்சீட்டை புவியியல் மற்றும் சுரங்கத் துறை, உதவி இயக்குநரிடம் தாக்கல் செய்ய வேண்டும்.
5. குவாரி குத்தகை ஒப்பந்த ஆவணம் நிறைவேற்றப்பட்ட பின்னர் குத்தகைதாரர்கள் தங்களால் எடுத்துச் செல்ல வழித்தடச் சான்று கோரி விண்ணப்பிக்கும் போது மொத்த கிராண்டை கந்துண்டங்களின் அளவிற்கு செலுத்த வேண்டிய கனிம சீனியரேஜ் தொகையில் 2% தொகையினை வருமான வரியாக செலுத்த வேண்டும்.
6. வழித்தடச்சான்று கோரி விண்ணப்பிக்கும் கிராண்டை கற்களின் அளவிற்கு செலுத்தும் சீனியரேஜ் தொகையில் 10% தொகையினை கிருஷ்ணகிரி மாவட்ட கனிமவள அறக்கட்டளை நிதியாக கிருஷ்ணகிரி பாரத மாநில வங்கி கிளையின் நடப்பு கணக்கு எண். 37243080996-ல் தவறாது செலுத்த வேண்டும்.
7. மாலை 6.00 மணிக்கு மேல் காலை 6.00 மணி வரை கிராண்டை கந்துண்டங்களை எடுத்துச் செல்லக் கூடாது.
8. குத்தகைதாரர்கள் சட்டப்பூர்வமான மற்றும் தேவையான பாதுகாப்பு வழிமுறைகளை தவறாது கடைபிடிக்க வேண்டும்.
9. குவாரி பணி செய்யும் போது கிடைக்கக்கூடிய கழிவுகற்களை குவாரி குத்தகை வழங்கப்பட்ட பகுதியிலேயே கொட்டி இருப்பு வைக்க வேண்டும்.
10. மத்திய / மாநில அரசு சட்ட விதிகளின்படியும், அவ்வப்போது வெளியிடப்படும் வழிகாட்டு நெறிமுறைகளின்படியும் அங்கீகரிக்கப்பட்ட சுரங்கத் திட்டத்தின்படியே குவாரி பணி மேற்கொள்ளப்பட வேண்டும்.
11. மேற்கூறியிடப்பட்ட விதிமுறைகளின்படி குத்தகைதாரர்கள் சீராய்வு சுரங்க திட்டம் (Scheme of Mining), இறுதி சுரங்க முடிவு திட்டம் (Mine Closure Plan) மற்றும் இதர சட்டப்பூர்வமாக சமர்ப்பிக்கப்பட வேண்டிய தேவையானவற்றை குறிப்பிட்டுள்ள உரிய காலவரையரைக்குள் சமர்ப்பிக்க வேண்டும்.
12. குத்தகைதாரர்களால் 1999-ஆம் ஆண்டு கிராண்டை பாதுகாப்பு (ம) மேம்படுத்துதல் விதிகளின் படி அரையாண்டு மற்றும் ஆண்டுக்கு ஒரு முறை சமர்ப்பிக்கப்பட வேண்டிய படிவங்களான "F" (ம) "G"-ல் உரிய விவரத்தினை குறித்த காலத்திற்குள் சமர்ப்பிக்க வேண்டும்.
13. குத்தகைதாரர்கள் அரசால் குத்தகை உறுதி ஆவணத்தில் குறிப்பிடப்பட்டுள்ள நிபந்தனைகள், சுற்றுச் சூழல் ஆணையத்தால் விதிக்கப்பட்டுள்ள நிபந்தனைகள், இயக்குநர் புவியியல் மற்றும் சுரங்கத் துறை, மாவட்ட ஆட்சியர், கிருஷ்ணகிரி ஆகியோர்களால் அவ்வப்போது வழங்கப்படும் வழிகாட்டுதல்கள் / நெறிமுறைகளின்படி குவாரி பணி மேற்கொள்ள வேண்டும்.
14. அரசு அமைப்புகள் (Government Authorities) இதர சட்டப்பூர்வ அமைப்புகளால் (Statutory Authorities) விதிக்கப்படும் எந்த ஒரு நிபந்தனைகளுக்கும் குத்தகைதாரர் உடன்பட்டிருக்க வேண்டும்.

அட்டவணை

கருப்பு / பலவண்ண கிராளைட் குவாரிகள் பட்டியல்
கிருஷ்ணகிரி மாவட்டம்



வ. எண்	வட்டம்	கிராமம்	ச.எண்	குவாரி குத்தகை வழங்க உள்ள பரப்பு ஹெக்டேர்	வகைப்பாடு	கிருஷ்ணகிரி மாவட்டம்
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	பர்கூர்	பாசிநாயணப்பள்ளி	73(P)	4.25.0	பாறை	கருப்பு கிராளைட்
2	பர்கூர்	குட்டுர்	362/1(P) BIT-1	1.02.0	கல்லாங்குத்து	கருப்பு கிராளைட்
3	பர்கூர்	குட்டுர்	362/1(P) BIT-2	1.42.0	கல்லாங்குத்து	கருப்பு கிராளைட்
4	பர்கூர்	குட்டுர்	309(P)	1.64.0	கல்லாங்குத்து	கருப்பு கிராளைட்
5	பர்கூர்	குட்டுர்	397/1 & 404/1	2.80.0	தீ.ஏ.த. கல்லாங்குத்து	கருப்பு கிராளைட்
6	பர்கூர்	பாசிநாயணப்பள்ளி	10(P)	3.46.0	தீ.ஏ.த. பாறை	பலவண்ண கிராளைட்
7	பர்கூர்	மோடிசூப்பம்	121(P)	2.52.0	தீ.ஏ.த.	பலவண்ண கிராளைட்
8	பர்கூர்	குளாமலை	333(P)	1.98.0	தீ.ஏ.த.	பலவண்ண கிராளைட்
9	பர்கூர்	ஐக்கொந்தம்கொத்தப்பள்ளி	337/1 (P)	2.54.0	காடு	பலவண்ண கிராளைட்
10	பர்கூர்	புளிகுண்டா	345(P) BIT-1	1.28.0	கல்லாங்குத்து	பலவண்ண கிராளைட்
11	பர்கூர்	புளிகுண்டா	345(P) BIT-2	1.78.0	கல்லாங்குத்து	பலவண்ண கிராளைட்
12	பர்கூர்	ஐக்கதேவிபாளையம்	366(P)	1.87.0	தீ.ஏ.த. பாறை	பலவண்ண கிராளைட்
13	போச்சம்பள்ளி	நாகோஜனஹள்ளி	609A(P) BIT-1	2.92.0	தீ.ஏ.த. மலை	பலவண்ண கிராளைட்
14	போச்சம்பள்ளி	நாகோஜனஹள்ளி	609A(P) BIT-2	4.10.0	தீ.ஏ.த. மலை	பலவண்ண கிராளைட்
15	போச்சம்பள்ளி	நாகோஜனஹள்ளி	609A(P) BIT-3	3.23.0	தீ.ஏ.த. மலை	பலவண்ண கிராளைட்
16	போச்சம்பள்ளி	நாகோஜனஹள்ளி	609A(P) BIT-4	1.80.0	தீ.ஏ.த. மலை	பலவண்ண கிராளைட்
17	போச்சம்பள்ளி	நாகோஜனஹள்ளி	609A(P) BIT-5	1.54.0	தீ.ஏ.த. மலை	பலவண்ண கிராளைட்
18	தேன்கணிக் கோட்டை	இருதுகோட்டை	1160/1 (Part)	1.09.0	போடுகால்	பலவண்ண கிராளைட்

கிருஷ்ணகிரி,
09-10-2020.

வி. ஜெயசந்திர பானுரெட்டி,
மாவட்ட ஆட்சியர்,
கிருஷ்ணகிரி மாவட்டம்.

தமிழ்நாடு எழுதுபொருள் மற்றும் அச்சத்துறை ஆணையரால் சேலம் அரரினர் கிளை அச்சகத்தில் அச்சிடப்பட்டு மாவட்ட ஆட்சியரால் வெளியிடப்பட்டது.

138C/10 (ஆ) சி.வெ.35-3.



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இணைப்பு VI-அ
{ விதி எண்.8(அ)-வைப் பார்க்கவும் }

கிராண்ட் குவாரி குத்தகை உரிமத்திற்கான ஒப்பந்தப்படி எளி/ஏல விண்ணப்பம்
(மூன்று பிரதிகளில் சமர்ப்பிக்கப்பட வேண்டும்)

நாள்: திங்கள் 2020

அனுப்புநர்:

பெறுநர்

உயர்திரு. மாவட்ட ஆட்சியர் அவர்கள்,
மாவட்ட ஆட்சியரகம்,
கிருஷ்ணகிரி.

அய்யா,

I. 1959-ஆம் ஆண்டு தமிழ்நாடு சிறுவகை கனிமச் சலுகை விதிகளின், விதி எண்.8-(அ)-ன்படி நான்/நாய்கள் இந்த விண்ணப்பத்தினை மாவட்ட அரசிதழ் சிறப்பு வெளியீடு அறிவிக்கை எண்..... நாள்..... (அல்லது) செய்தித்தாள் விளம்பர நாள்-ல் உள்ள வரிசை எண்.....ல் குறிப்பிட்ட இடத்திற்கு விண்ணப்பிக்கிறேன் / விண்ணப்பிக்கின்றேன்.

1959-ஆம் ஆண்டு தமிழ்நாடு சிறுவகை கனிமச் சலுகை விதிகளின் விதி எண்.8-(அ)-ன்படிமும் மற்றும் இதர விதிகளின் படியும் குவாரி குத்தகை எனக்கு/எங்களுக்கு வழங்க வேண்டுமாய் கேட்டுக்கொள்கிறேன்/கொள்கிறோம்.

II. திரும்ப வழங்கப்படாத விண்ணப்பக் கட்டணமான தொகை ரூ.5000/- (ரூபாய் ஐந்தாயிரம் மட்டும்) கீழே குறிப்பிட்ட கணக்குகளில் சலான் மூலம் செலுத்தப்பட்டது.

"0853 Non-ferrous Mining and Metallurgical Industries-102, Mineral concession Fees rent and Royalties-AA quarries and Minerals 2705- Non -Taxation Fee-Application D.P.Code.No.0853 00 102-AA-2752".

(அல்லது)

ரூ.5000/- (ரூபாய் ஐந்தாயிரம் மட்டும்)-க்கான தேசியமயமாக்கப்பட்ட வங்கி அல்லது கூட்டுறவு வங்கியில் மாவட்ட ஆட்சியர் அவர்களின் பதவியின் பெயரில் கேட்பு வரைவோலை (Demand Draft) எடுக்கப்பட்டது.

III. தேவையான விவரங்கள் கீழே கொடுக்கப்பட்டுள்ளது:-

1. குவாரி குத்தகை வழங்க கோரிய மனு தாரரின் பெயர் மற்றும் முகவரி விவரங்கள்.



2. விண்ணப்பதாரர் தனி நபர்கள் (Individuals) /
 (அ) நிறுவனங்கள் (Companies) / பங்குதாரர்
 நிறுவனம் (Partnership firm) / இவற்றில்
 எதற்கு சொந்தமானது.
- (ஆ) விண்ணப்பதாரர் தனிநபராக இருந்தால் அன்னாரது
 பெயர், எந்த நாட்டினர் மற்றும் முகவரி.
- (இ) விண்ணப்பதாரர் /தனிப்பட்ட நிறுவனம் / பங்குதாரர்
 நிறுவனம் சொந்தமானதாக இருந்தால் அவைகளின்
 இயக்குநர்கள், பங்குதாரர்கள்/ உறுப்பினர்கள் மற்றும்
 அவர்கள் எந்த நாட்டினர் என்பது பற்றிய விவரம்
 (தக்க ஆவணச் சான்று இணைக்கப்பட வேண்டும்).
- 3 விண்ணப்ப கட்டணம் செலுத்தியதற்கான விவரங்கள்
 (அ) (சலான்) எனும் மற்றும் நாள் குறிப்பிட்டு, அசல் சலான்
 இணைக்கப்பட வேண்டும் (அல்லது) தேசிய
 மயமாக்கப்பட்ட வங்கி அல்லது கூட்டுறவு வங்கியில்
 மாவட்ட ஆட்சியர் அவர்களின் பதவியின் பெயரில்
 கேட்பு வரைவுவோலை (Demand Draft) எடுக்கப்பட
 வேண்டும் (அசல் கேட்பு வரைவுவோலை
 இணைக்கப்பட வேண்டும்) கேட்பு வரைவுவோலை
 எண். நாள்.....குறிப்பிட வேண்டும்.
- (ஆ) பிணை வைப்புத்தொகை (Earnest Money Deposit)
 செலுத்தியதற்கான விவரங்கள் (தொகை கேட்பு
 வரைவுவோலை எண். நாள் குறிப்பிட
 வேண்டும். அசல் கேட்பு வரைவுவோலை
 இணைக்கப்படவேண்டும்).
4. விண்ணப்பதாரர் தமது ஆணை உறுதி வாக்கு மூலத்தில் கீழே குறிப்பிட்டபடி தகவல்கள் கொடுக்க வேண்டும்.
- அ மனுதாரர் நானது தேதி வரை வருமானவரி விவர
 அறிக்கை சமர்ப்பித்து விட்டாரா என்பது பற்றிய விவரம்.
- ஆ விண்ணப்பதாரருக்கு விதிக்கப்பட்ட வருமான வரியை
 செலுத்தி விட்டாரா என்பது பற்றிய விவரம்.
- இ 1961-ஆம் ஆண்டு வருமானவரிச் சட்டப்படி
 சுயமதிப்பீடு செய்ததின் அடிப்படையிலும் (அல்லது)
 மத்திய அரசின் மற்ற அறிவிப்புகளின்படியும்
 வருமான வரி செலுத்தப்பட்டுள்ளதா என்பது
 பற்றிய விவரம்.
- 5 சுரங்கக் குத்தகைக்கான சுரங்க வரி
 (அ) நிலுவையின்மைச் சான்றிதழ்
 இணைக்கப்பட்டுள்ளதா?
- (ஆ) விண்ணப்பத் தேதியில் விண்ணப்பதாரர் குவாரி /
 சுரங்கக் குத்தகை ஏதும் வைத்திராவிடில் அதற்கான
 உறுதிமொழி சான்றாவணம் இணைக்கப்பட்டுள்ளதா?



6. மனுதாரர் பெயரில் தற்போது :
இயங்கிக்கொண்டிருக்கிறதா? (அல்லது) :
தொடங்க உத்தேசிக்கப்பட்டுள்ளதா என்பது பற்றிய
கிழக்கண்ட விவரம் இணைக்கப்படவேண்டும்.
- (அ) தற்போதுள்ள (அல்லது) ஆரம்பிக்கப்பட உள்ள :
.....எந்த வகையைச் சார்ந்தது பற்றிய
தகவல் (உதாரணம் 100 சதவீதம் ஏற்றுமதிக்கு
உகந்த டி.ஜி.டி.டி./
சிறுவகை).
- (ஆ) உரிமம் (Licence) மற்றும் நாள் :
.....
- (இ) முழு கொள்திறன்/
உற்பத்திதிறன் (சதுரமீட்டர்/ஆண்டு). :
.....
- (ஈ) மொத்த முதலீட்டு :
தொகை
- (உ) தொடங்கும் நாள் :
.....
- (ஊ) உற்பத்தி செய்யப்படும் பொருள்களின் வகை :
ஒவ்வொரு வகைக்கும் தனித் தனியே அளவுகள்
குறிப்பிடவேண்டும் (உதாரணம், கட்டிட கற்கள்,
நினைவுக் கற்கள், ஓடுகள் முதலியன) சதுர மீட்டர்/
ஆண்டொன்றிற்கு).
- (எ) ஒவ்வொரு வருடத்திற்கும் தேவைப்படும் :
கச்சாப்பொருள்களின் விவரம் ஆண்டு ஒன்றிற்கு
கன மீட்டரில்
- (ஏ) விரிவாக்கம் ஏதேனும் இருந்தால் அதை பற்றிய :
தகவல்கள் (தக்க ஆவணங்களுடன் சான்று
இணைக்கப்பட வேண்டும்) இது வரை உரிமம்
(Licence) பெறாவிடில் வரிசை எண்.6 (ஆ)6 (உ)
மற்றும் 6 (ஏ) தவிர மேற்கூறப்பட்ட விவரங்களை
உத்தேசிக்கப்பட்ட தொழிற்கூட திட்டம்
உள்ளவர்களும் கொடுக்க வேண்டும்.
7. மனுதாரர் குவாரி செய்ய உள்ள சிறுவகை கனிமம் :
பற்றிய விவரக்குறிப்பு
8. தேவைப்படும் குவாரி குத்தகை காலம்: :
.....
9. விண்ணப்பித்துள்ள இடத்திற்கான மொத்தப்பரப்பளவு. :
.....
10. ஒப்பந்தப்புள்ளி ஏல விண்ணப்பம் சமர்ப்பிக்கப்பட்டுள்ள :
இடங்கள் பற்றிய விவரம்.

பொருந்தாது

மாவட்ட அரசிதழ் சிறப்பு
வெளியீடு குவாரி
பட்டியல் வ.எண்.

மாவட்டம்

வட்டம்

கிராமம்

நில
அளவை
எண்.

பரப்பு
ஹெக்டேர்

5

6

11. குவாரி செய்யும் பொருட்டு குத்தகை முறையில் மேற்கண்ட இடத்தைப் பெறவேண்டிய மனுதாரர் கேட்கும் அதிகபட்ச ஒப்பந்தமுள்ளி தொகை (மேற்படி தொகையை எண்ணால் மற்றும் எழுத்தால் எழுதவும்).
12. மாநிலத்தில் உள்ள மாவட்ட வாரியாக கனிம வாரியாக விண்ணப்பதாரர் / ஏலதாரர் நேரடியாகவோ அல்லது பங்குதாரராகவோ தொடர்புள்ள குவாரிகள் பற்றிய விவரங்கள் அனுபவத்திலிருக்கும் குவாரி குத்தகை அனுமதி பற்றி விவரம், ஏற்கனவே விண்ணப்பித்து இதுவரை அனுமதி வழங்கப்படாத குவாரி குத்தகை அனுமதி பற்றிய விவரம், தற்போது உடனிகழ்வாக விண்ணப்பிக்கும் குவாரி குத்தகை அனுமதி விவரம், ஆணை உறுதி வாக்குமூலம் (அபிடவிட்) மூலம் தெரிவிக்க வேண்டும்.
13. விண்ணப்பதாரரால் சமர்ப்பிக்க விரும்பும் ஏனைய தகவல்கள் ஏதேனும் இருப்பின் அதன் விவரம்.

நான்/நாங்கள் இதன் மூலம் உறுதிப்படுத்துவது என்னவென்றால், மேற்கூறப்பட்ட அனைத்து தகவல்களும், சமர்ப்பிக்கப்பட்ட ஆவணங்கள் சரியானது என்றும், மாவட்ட வன அலுவலர், (அல்லது) மாவட்ட ஆட்சியர் (அல்லது) அரசாங்கம் கேட்கும் அனைத்து தகவல்கள் மற்றும் காப்புத் தொகையையும் சமர்ப்பிக்கின்றோம் என்று உறுதி கூறுகிறேன்/கூறுகின்றோம். குவாரி குத்தகை வழங்குவது குறித்து குவாரி பணி சம்பந்தமான அனைத்து நிபந்தனைகளையும் 1959-ஆம் ஆண்டு சிறுவகைக் கனிமச் சலுகை விதிகளில் குறிப்பிட்ட அனைத்து நிபந்தனைகள் மற்றும் சட்ட விதிகளையும் நான்/நாங்கள் நன்றாக அறிந்து கொண்டோம் என்று இதன் மூலம் தெரிவித்து உறுதி அளிக்கின்றோம்.

தங்கள் உண்மையுள்ள,

இடம்:

நாள்:

விண்ணப்பதாரர் கையொப்பம்.



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



Letter No.901/MME.2/2021 - 1, Dated 26.02.2021

From

Thiru N. Muruganandam, I.A.S.,
Principal Secretary to Government.

To

Tmt.M.Sadhana,
No.2/A2, 3rd Cross,
Gopalakrishna Colony,
Krishnagiri - 635001.

Sir,

Sub: Mines and Minerals - Minor Mineral - Colour Granite - Jagadevipalayam Village - Bargur Taluk - Krishnagiri District - S.F.No.366 (Part) - Over an extent of 1.87.0 hectares of Government Poramboke land - Highest tender amount offered by Tmt.M.Sadhana, Krishnagiri - Precise Area Communicated - Balance Lease Amount - Approved mining Plan and Environmental Clearance - Called for.

- Ref: 1. Krishnagiri District Gazette Extraordinary issue in English No.20 and Tamil No. 35 dated:09.10.2020.
2. Application of Highest Tender of Tmt. M.Sadhana, Krishnagiri on 07.11.2020.
3. Proposal of the District Collector, Krishnagiri, in file No.1049/2020 (Mines), dated 03.12.2020.
4. From the Commissioner of Geology and Mining, File Rc. No.6943/MM4/2020, dated: 22.01.2021 and 08.02.2021.

I am directed to state that in the references third and fourth cited, the District Collector, Krishnagiri and the Commissioner of Geology and Mining have recommended to declare you as Successful tenderer and to grant quarry lease for quarrying of Colour Granite over an extent of 1.87.0 hectares of Government Poramboke land in S.F.No.366 (Part) in Jagadevipalayam Village of Bargur Taluk, Krishnagiri District for a period of 20 years under rule 8-A of the Tamil Nadu Minor Mineral Concession Rules, 1959.

//p.t.o//



2. I am directed to declare you as successful tenderer to grant quarry lease for quarrying of Colour Granite over an extent of 1.87.0 hectares of Government Poramboke land in S.F.No.366 (Part) in Jagadevipalayam Village of Bargur Taluk, Krishnagiri District for a period of 20 years under rule 8-A of the Tamil Nadu Minor Mineral Concession Rules, 1959 subject to the outcome of W.P.No.18317 of 2020 and W.P.No.16060/2020 and W.M.P.No.19999 of 2020. The District Collector shall comply with the directions of the Hon'ble High Court of Madras in W.P.No.18317 of 2020 and W.P.No.16060/2020 and W.M.P.No.19999 of 2020 and undertake the activities mentioned in para 3 below strictly in compliance with the directions of the Hon'ble High Court of Madras.

3. In this connection, I am directed to request you to remit the balance lease amount of Rs.2,05,00,000/- in the District Treasury concerned and to submit the original challan to Government within a period of one month from the date of this communication and to submit the approved Mining Plan as per Rule 12 of Granite Conservation and Development Rules, 1999 through the Commissioner of Geology and Mining to Government within the period of 3 months from the date of receipt of this communication as per Rule 8-A(8)(a)(ii) of the Tamil Nadu Minor Mineral Concession Rules, 1959 and also to produce Environmental Clearance obtained from the Competent Authority for the above said area as per the conditions stipulated in the prescribed Act and Rules in addition to the following conditions:-

- 1) A safety distance of 7.5 meters should be provided to the adjacent patta lands and should not cause any hindrance to them while quarrying and transportation.
- 2) A safety distance of 10 meters should be provided to the Government Poramboke land in S.F.No.366(P) on the western side of the lease area and to the Government land in S.F.No.10(P) of Pasinayanapalli village on the Northern side of the lease area.
- 3) All conditions stipulated in the District Gazette Extra ordinary notification English No.20 and Tamil No. 35 dated 09.10.2020 should be adhered by the Tender applicant.
- 4) Environmental clearance should be obtained from the State Level Environmental Impact Assessment Authority before grant of quarry lease as per rule 42 of the Tamil Nadu Minor Mineral Concession Rules, 1959.
- 5) The applicant 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 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.
- 6) 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.
 - 7) As per Rule 12(V) of Minerals (other than Atomic & Hydrocarbons Energy Minerals) Concession Rules, 2016, the applicant shall at her own expenses erect, maintain and keep in repair all the boundary pillars.
 - 8) The applicant should use mild explosives during quarrying.
 - 9) Child Labourers should not be engaged in quarry works.
 - 10) If any violation is found during quarrying operation, the penal provisions of the Tamil Nadu Minor Mineral Concession Rules, 1959 and other rules and act in force will attract.
 - 11) The applicant should ensure that while starting the quarry work, all the quarry workers working under her control are registered in the Labour Welfare Board and also enrolled in the ongoing insurance scheme.
 - 12) The District Collector, Krishnagiri shall obtain a sworn-in-affidavit from the applicant containing the above conditions before execution of lease deed and also ensure that the instructions issued in Government Letter No.12789/MMB2/2002-7, Industries Department, Dated: 9.1.2003 are complied with.
 - 13) The grant of quarry lease to the applicant in the applied area will be based on the Judgment of Hon'ble High Court of Madras in W.P.No.18317 of 2020 and W.P.No.16060/2020 and W.M.P.No.19999 of 2020.

Yours faithfully,

[Signature]
26.2.2021

for Principal Secretary to Government

[Signature]
26/2/2021

Copy to:

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

✓ The District Collector,
Krishnagiri. (for necessary followup action)

பெரிய கிருஷ்ணா கால்

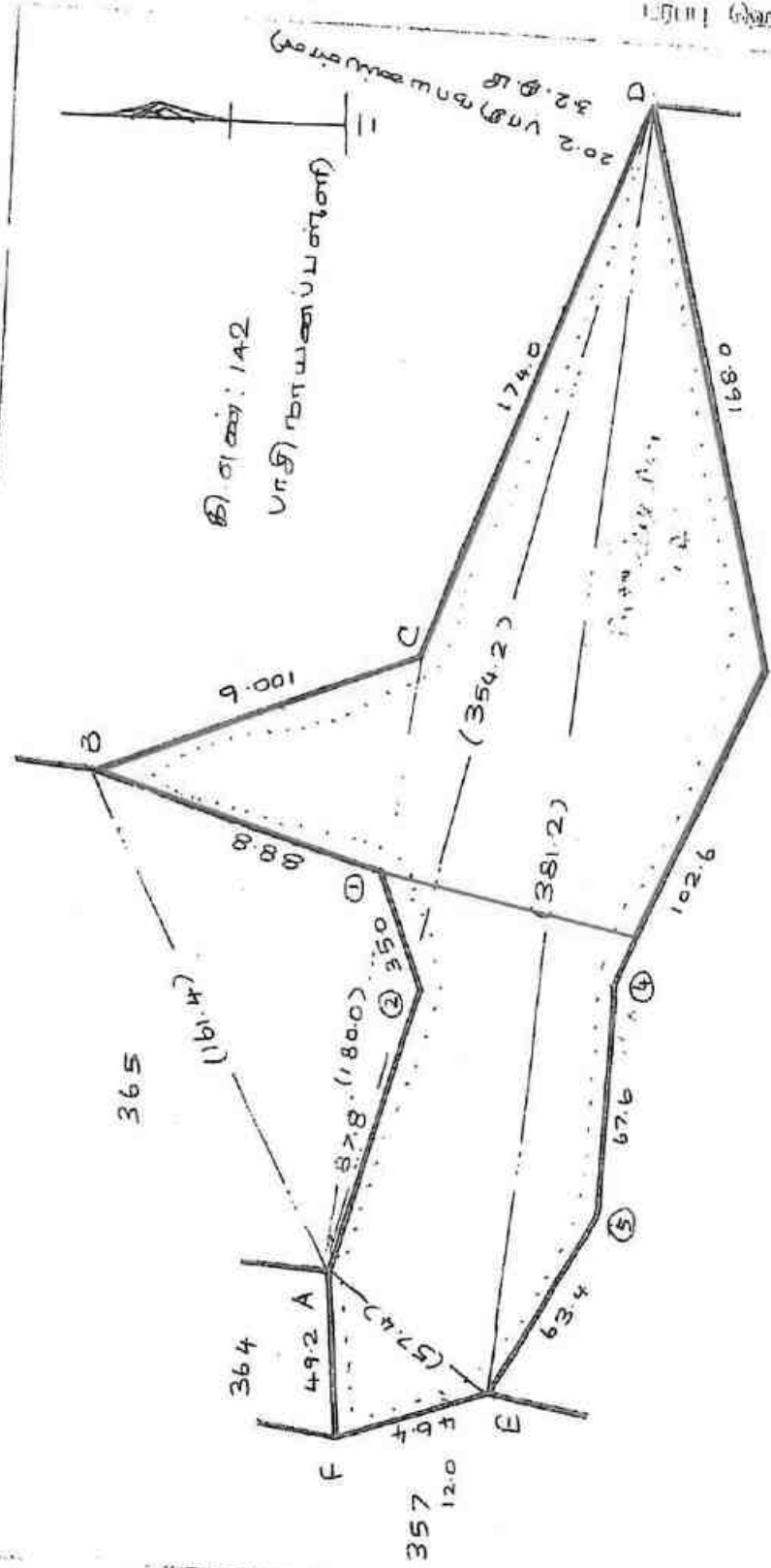
புறக்கோடு 366

சுற்றுகள்

152

202

2



367

(True Copy)

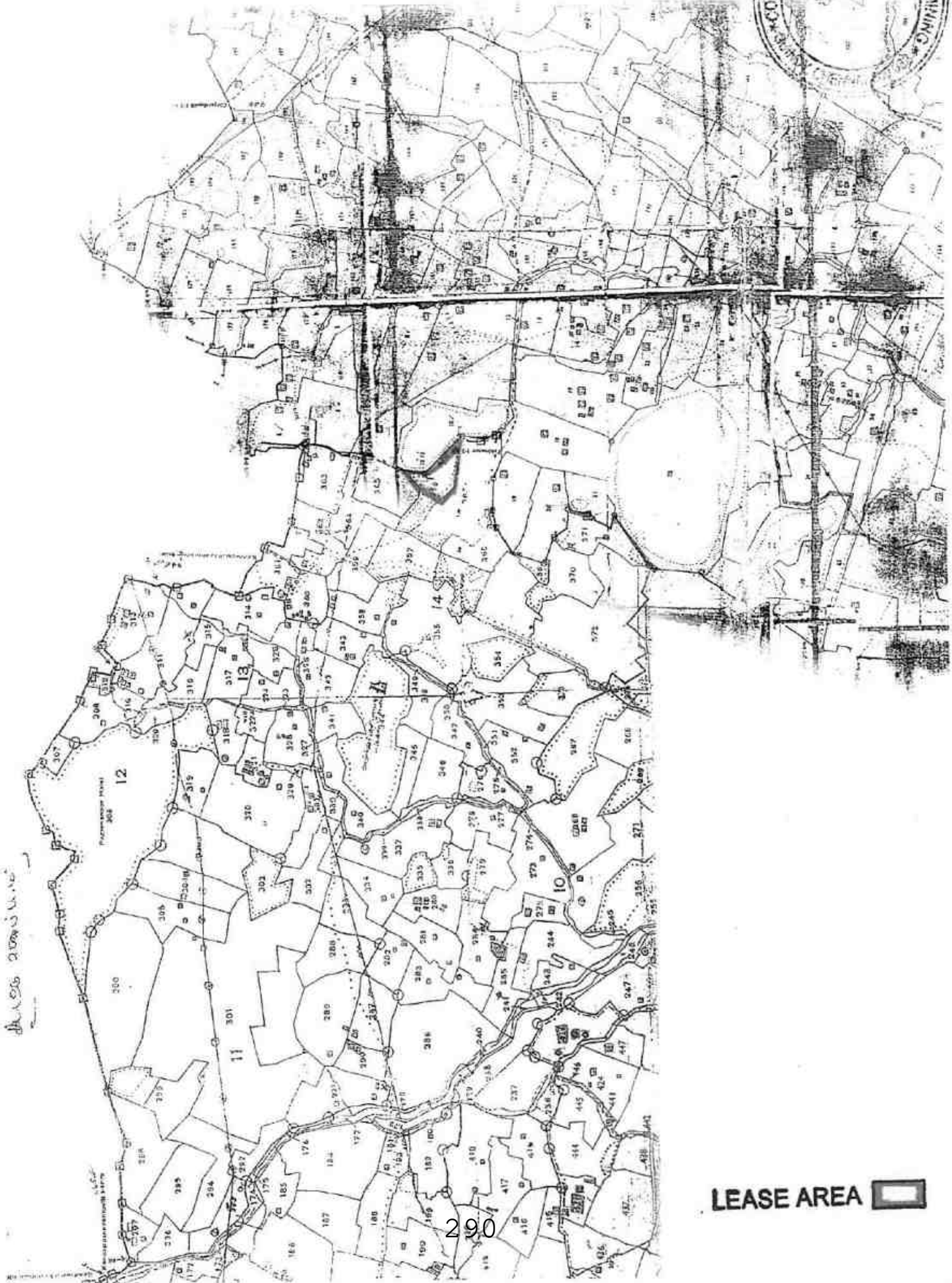
J. Ramesh

Village Administrative Officer
17, JAGADEVI PALAYAM
Bargur - Tk, Krishnagiri - Dt

	A	
	57.4	
F	38.0	26.8
	E	
	381.2	
5	26.0	324.0
4	22.2	256.4
3	54.4	159.4
	D	
	A	
	354.2	
	172.6	22.2
	A	
	161.4	
2	59.0	97.6
1	63.2	62.2
	B	

சுற்றுகள்: 152, 202, 2
19/8/85

சுற்றுகள் 1 மீ. 2000 மீ. 6



LEASE AREA

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View A-Register Extract

District Name	Krishnagiri
Taluk Name	BARGUR
Village Name	JEGADEVIPALAYAM
Survey No.	366
Subdiv No.	-
Old Survey No.	366
Part	P
Govt/Pri	Government
Soil Type(Pri-Sec)	0--
Soil Class	0
Land Type	Tharisu
Tax per Hectare	0.0
Area(Hect-Ares)	2-68.50
Total Tax	0.0
Patta No.	0
Remarks	-



வணக்கம்

வணக்கம்

தமிழ்நாடுவனத்துறை

அனுப்பதல்

பெறுதல்

சி.ரு.நி.கி. எஸ். பி.வி. இயல்
வனக்கமினி காப்பாளர்,
மத்தியி, சூதூர் - 635 110.
தொலைபேசி எண். 04344-262259.

மாவட்ட ஆட்சித் தலைவர்,
கிருஷ்ணகிரி மாவட்டம்,
கிருஷ்ணகிரி.

ந.க.எண்.5279/2019-எல் நாம் 27.11.2019
சீரமைப்பு, காத்திகை 11, திருவள்ளூர் ஆவண 2050)

அன்பு,

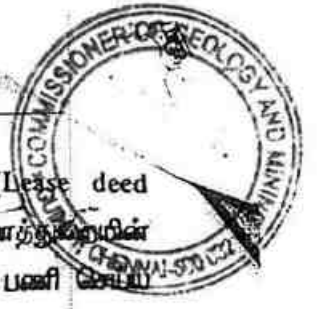
பொருள் : கனிமங்களும் குவாரிகளும் - சிறுவனையம் - கிராண்ட் கற்கள் - கிருஷ்ணகிரி மாவட்டத்தில் அரசு புறம்போக்கு நிலங்களில் உள்ள கிராண்ட் கற்கள் வெட்டியெடுக்க - பெண்டருடன் இணைந்த எலக்ட்ரானியல் குவாரி குத்தகை வழங்குதல் குறித்து வனத்துறையின் தடைமின்மைச் சான்று கோருதல் - வனத்துறை நோக்கிலான கருத்து தெரிவித்தல்-தொடர்பாக.

பார்வை : 1. மாவட்ட ஆட்சித் தலைவர், கிருஷ்ணகிரி மாவட்டம் ந.க.எண். 90/2017/கனிமம் நாள்.20.05.2019.
2. வனச்சரக அலுவலர், தேன்கனிகோட்டை சரகம் ந.க.எண்.178/2019 நாள்.13.11.2019.
3. வனச்சரக அலுவலர், கிருஷ்ணகிரி சரகம் ந.க.எண்.560/2019 நாள்.25.11.2019.

பார்வை 1-ல் கண்ட கிருஷ்ணகிரி மாவட்ட ஆட்சித் தலைவர் அவர்களது கடிதத்தில், கிருஷ்ணகிரி மாவட்டத்தில் உள்ள அரசு புறம்போக்கு நிலங்களில் கிராண்ட் கற்கள் வெட்டி எடுக்க பெண்டர் / பொது ஏலம் மூலம் குத்தகைக்கு வழங்க, வனத்துறை நோக்கிலான கருத்து மற்றும் வனத்துறையின் தடைமின்மை சான்று வழங்க வேண்டி கோட்கப்பட்டுள்ளது.

மேற்படி மனு மீது நடவடிக்கை எடுக்கும் பொருட்டு, கிருஷ்ணகிரி வனச்சரக அலுவலரால் 25.11.2019ந்தேதியும் மற்றும் தேன்கனிகோட்டை வனச்சரக அலுவலரால் 13.11.2019ந்தேதியும் சரக பணியாளர்களுடன் தடைமின்மை மேற்கொண்டு அறிக்கை சமர்ப்பித்துள்ளனர்.

கிருஷ்ணகிரி மற்றும் தேன்கனிகோட்டை வனச்சரக அலுவலர்கள் அறிக்கைகளின் அடிப்படையில், கிராண்ட் கற்கள் வெட்டி எடுக்க பெண்டர் / பொது ஏலம் மூலம் குத்தகைக்கு வழங்க அனுமதி கோரியுள்ள பகுதிகளை வனக்கமினி காப்பாளரால், சரக பணியாளர்களுடன் தடைமின்மை செய்யப்பட்டதில், கிருஷ்ணகிரி மாவட்டம் 1-ல் உள்ள குவாரிப் பகுதிகளுக்கு கிராண்ட் கற்கள் வெட்டி எடுக்க பெண்டர் / பொது ஏலம் மூலம் குத்தகைக்குவிட சீழ்க்கண்டவாறு இயல்புவசைத்தின் கருத்து தெரிவிக்கப்படுகிறது.



- i) கிராண்ட் கற்குவாரி குத்தகை வழங்க ஒப்பந்தம் செய்வதற்கு (Lease deed agreement) முன்பு ஒவ்வொரு குவாரிப் பகுதிக்கும் தனித்தனியாக வளத்துறையின் நிபந்தனை மற்றும் குறிப்புகளுடன் முன் அனுமதி பெற்றப்பின் குவாரிப் பணி செயல்பணி ஆணை (Work order) வழங்கப்பட வேண்டும்.
- ii) காவேரி வடக்கு வன உயிரின சரணாலயத்திற்கான Eco Sensitive Zone எல்லை நிர்ணயம் செய்ய பிரேரேபிக்கப்பட்டு ஆணை எதிர்நோக்கியுள்ள சூழலில், மேற்படி கிராண்ட் கற்குவாரி குத்தகை கோரும் புலங்கள் காவேரி வடக்கு வன உயிரின சரணாலய எல்லையிலிருந்து 10 கி.மீ-க்குள் அமைந்திருப்பின் தேசிய வன உயிரின வாரியத்தின் முன் அனுமதி (National Board for Wildlife) பெறப்பட வேண்டும்.
- iii) மலைதள பாதுகாப்பு பரிந்துரை குழு (Hill Area Conservation Authority)-ன்படி அறிவிக்கை செய்யப்பட்ட கிராம எல்லைக்குள் கற்குவாரி பணி செய்ய அனுமதி கோரியுள்ள புலங்கள் அமைந்திருப்பின், மலைதள பாதுகாப்பு பரிந்துரை குழு (Hill Area Conservation Authority)-ன் கீழ் முன் அனுமதி பெறப்படவேண்டும்.
- iv) கிராண்ட் கற்கள் வெட்டி எடுக்க டெண்டர் / பொது ஏலத்தில் குத்தகைக்குவிட அனுமதி கோரும் புலங்கள் வருவாய்த்துறை ஆவணங்களில் "காடு" என வகைப்படுத்தப்பட்ட புலங்களில் கற்குவாரிப் பணிசெய்ய அனுமதிக்கக் கூடாது.
- v) கிராண்ட் கற்கள் வெட்டி எடுக்க டெண்டர் / பொது ஏலத்தில் குத்தகைக்குவிட அனுமதி கோரும் புலங்கள் தமிழ்நாடு வனச்சட்டம் 1882-ன் பிரிவு 4 மற்றும் 16-ன் கீழ்காப்பு நிலம் / காப்புக்காடு என அறிவிக்கை செய்யப்பட்ட புலங்களாக இருத்தல் கூடாது.
- vi) கிராண்ட் கற்கள் வெட்டி எடுக்க டெண்டர் / பொது ஏலத்தில் குத்தகைக்குவிட அனுமதி கோரும் புலங்கள் தமிழ்நாடு வனச்சட்டம் 1882-ன் பிரிவு 26-ன் கீழ் அறிவிக்கை செய்யப்பட்ட புலங்களாக இருத்தல்கூடாது.
- vii) கிராண்ட் கற்கள் வெட்டி எடுக்க டெண்டர் / பொது ஏலத்தில் குத்தகைக்குவிட அனுமதி கோரும் புலங்கள் காப்புக்காட்டின் எல்லைக்கு அருகில் அமைந்திருப்பின், Standing Orders of the Board of Revenue- volume - 1 Section III, Sub-Section 38 (III) வருவாய் வாரிய நிலை ஆணை தொகுப்பு 1, பிரிவு 3, உட்பிரிவு 38 (III)-ன்படி காப்புக்காட்டிற்கு அருகில் உள்ள நிலத்தில் இதர பயன்பாட்டிற்கு உட்படுத்த நடவடிக்கை மேற்கொள்ளப்படும் போது காப்புக் காட்டின் எல்லையிலிருந்து குறைந்தபட்சம் 60 மீட்டர் (3 Chain) தொலைவிற்கு அப்பாற்பட்டிருக்க வேண்டும் என்ற நிபந்தனையை கடைபிடிக்கப்பட வேண்டும்.
- viii) அரசாணை (நிலை) எண்.79 தொழில் (கனிமம் 1) | துறை நாள்.06.04.2015-ல் குறிப்பிட்டுள்ள நிபந்தனைகளை மாவட்ட நிர்வாகம் / கனிம வளத்துறை கவனத்தில் கொள்ளவேண்டும்.

அட்டவணை - 1

கிராமம் கற்கள் வெட்டி எடுக்க டெண்டருடன் இணைந்த ஏலமுறை வழங்க பரிந்துரை செய்யப்படும் குவாரிப் பகுதிகள் விபரம்



Sl. No.	Taluk	Village	Survey Number	Propoed area (In Ha)
1	BARGUR	PASINAYANAPALLI	10(P) ✓	3.69.0 ✓
2	BARGUR	MODIKUPPAM	121(P) ✓	2.85.0 ✓
3	BARGUR	SHOOLAMALAI	333(P) ✓	2.00.0 ✓
4	BARGUR	IKONDAM-KOTHAPALLI	337/1(P) Bit 2	2.54.0 ✓
5	BARGUR	PULIGUNDA	345(P) BIT-1	1.67.0 ✓
6	BARGUR	PULIGUNDA	345(P) BIT-2	1.78.0 ✓
7	BARGUR	JAGADEVIPALAYAM	366(P) ✓	1.87.0 ✓
8	BARGUR	PASINAYANAPALLI	73(P) ✓	4.25.0 ✓
9	BARGUR	GUTTUR	309(P) ✓	2.50.0 ✓
10	BARGUR	GUTTUR	362/1(P) BIT-1 ✓	1.02.0 ✓
11	BARGUR	GUTTUR	362/1(P) BIT-2 ✓	1.62.0 ✓
12	BARGUR	GUTTUR	397/1 & 404/1	2.80.0 ✓
13	POCHAMPALLI	NAGOJANAHALLI	609A(P) BIT-1 ✓	2.92.0 ✓
14	POCHAMPALLI	NAGOJANAHALLI	609A(P) BIT-2	4.10.0 ✓
15	POCHAMPALLI	NAGOJANAHALLI	609A(P) BIT-3	3.23.0 ✓
16	POCHAMPALLI	NAGOJANAHALLI	609A(P) BIT-4	1.80.0 ✓
17	POCHAMPALLI	NAGOJANAHALLI	609A(P) BIT-5	1.54.0 ✓
18	DENKANIKOTTAI	IRUDHUKOTTAI	1160	3.06.0 ✓

கீழ்க்கண்ட அட்டவணை 2-ல் குறிப்பிடப்பட்டுள்ள பகுதிகளில் குவாரிப் பணி செய்ய டெண்டருடன் இணைந்த ஏலமுறையில் விடுவதை தற்போது நிறுத்திவைக்கலாம் என்பதை தெரிவித்துக்கொள்கிறேன்.

அட்டவணை - 2

கீழ்க்கண்ட பகுதிகளில் கிராமம் கற்கள் வெட்டி எடுக்க டெண்டருடன் இணைந்த ஏலமுறை விடுவதை தற்போது நிறுத்திவைக்கலாம்

Sl. No.	Taluk	Village	Survey Number	Propoed area (In Ha)
1	BARGUR	MODIKUPPAM	143/2(P)	1.60.0
2	BARGUR	IKONDAM-KOTHAPALLI	337/1(P) Bit 1	2.96.0
3	POCHAMPALLI	NAGOJANAHALLI	642(P)	1.00.0
4	UTHANGARAI	KUNNATHUR	220/1 & 220/2	1.89.0



5	DENKANIKOTTAI	HANUMANTHA-PURAM	287	1.62.0
6	DENKANIKOTTAI	HANUMANTHA-PURAM	288/4	1.73.0
7	DENKANIKOTTAI	THAVAKARAI	348(P) BIT-1	2.50.0
8	DENKANIKOTTAI	THAVAKARAI	348(P) BIT-2	2.50.0
9	DENKANIKOTTAI	THAVAKARAI	348(P) BIT-3	2.50.0

மேற்கண்ட அட்டவணை 1-ல் கண்ட இணங்களுக்கு மட்டும் டெண்டர் / பொது ஏலத்தில் குத்தகைக்குவிட மட்டுமே தடையில்லாச் சான்று தற்போது அளிக்கப்படுகிறது. ஒவ்வொரு குவாரிப் பகுதிகளுக்கும் வனத்துறையின் மூலம் தனித்தனியாக தணிக்கை மேற்கொண்டு, அதற்கேற்ப சட்ட திட்டங்களுக்கு உட்பட்டு, மாண்புமிகு உச்சநீதி மன்ற ஆணைகளை கடைபிடிக்க (Compensatory planting), மனித - வன விலங்கு மோதல்கள் மற்றும் மாசு கட்டுப்பாடு போன்றவற்றை கருத்தில் கொண்டு வனத்துறையின் கருத்துகள் மற்றும் நுபந்தனைகளை பெற ஒவ்வொரு குத்தகைக்கும் தனித்தனியாக விண்ணப்பிக்க வேண்டும் என்பதை அன்புடன் தெரிவித்துக்கொள்கிறேன்.

தங்கள் அன்புள்ள,
ஓம்/-தீபக் எஸ். பில்கி,
வனஉயிரின காப்பாளர்,
ஓசூர் வனக்கோட்டம்.

//உ.ந.உ.ப//

கண்காணிப்பாளர் 27/11/19

27/11/19

PHOTOCOPY OF THE APPLIED LEASE AREA

Field photos in respect of Colour granite quarry lease in S.F.No : 366(Part) of Government Poramboke land, over an extent of 1.87.0 hectares of Jagadevipalayam village, Bargur Taluk, Krishnagiri District, Tamil Nadu State belongs to Tmt.M.Sadhana.,



Fig.1 Photographs showing DGPS Survey of the base point



Fig.2 Photographs showing DGPS Survey of the rover unit



Fig.3 Photographs showing general view of the applied lease area



Fig.4 Photographs showing outcrops well exposed in the applied lease area



AADHAAR



Government of India

தகவல்

- ஆதார் அடையாளத்திற்கான சான்று குடியரிமைக்கு அல்ல.
- அடையாள சான்றை இணையதளம் மூலம் உறுதிப்படுத்திக் கொள்ளவும்.

INFORMATION

- Aadhaar is proof of identity, not of citizenship.
- To establish identity, authenticate online.

- ஆதார் நாடு முழுவதிலும் செல்லுபடியாகும்.
- வருங்காலத்தில் அரசு மற்றும் அரசு சாரா சேவைகளை பயன்படுத்திக் கொள்ள ஆதார் உதவிகரமாக இருக்கும்.
- Aadhaar is valid throughout the country.
- Aadhaar will be helpful in availing Government and Non-Government services in future.



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முகவரி: W/O மாதையன், டி.நா. 2A2, கோபாலகிருஷ்ண காலனி, 3RD CROSS, கிருஷ்ணகிரி, கிருஷ்ணகிரி, தமிழ்நாடு, 635001

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आधार

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பழிவு அடையாளம் / Enrollment No. : 2007/23357/13544

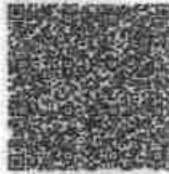
To
Sadhana Madhayan
சாதன மாதையன்
W/O: Madhayan
D NO 2A2
GOPALAKRISHNA COLONY
3RD CROSS
Krishnagiri
Krishnagiri, Krishnagiri
Tamil Nadu - 635001

28/11/2013



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உங்கள் ஆதார் எண் / Your Aadhaar No. :

9446 8765 2827

ஆதார் - சாதாரண மனிதனின் அதிகாரம்



இந்திய அரசாங்கம்

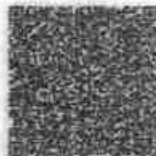
Government of India

சாதன மாதையன்
Sadhana Madhayan



பிறந்த நாள்/DOB: 15/08/1972
பாலினம் / Female

9446 8765 2827



ஆதார் - சாதாரண மனிதனின் அதிகாரம்



[Handwritten Signature]

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

श्री एस. 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.

[Handwritten Signature]
क्षेत्रीय खाननियंत्रक / Regional Controller of Mines
299 भारतीय खानब्यूरो/ Indian Bureau of Mines
चेन्नई क्षेत्र / Chennai Region

PLATE NO-I






APPLICANT:

Tmt. M.SADHANA,
No.2/A2, 3rdCROSS,
GOPALAKRISHNA COLONY,
KRISHNAGIRI - 635 001.

LOCATION:

EXTENT : 1.87.0Hect
S.F.NO : 366(Part)
VILLAGE : JAGADEVIPALAYAM
TALUK : BARGUR
DISTRICT : KRISHNAGIRI
STATE : TAMIL NADU

INDEX

- MINE LEASE AREA 
- APPROACH ROAD 
- CART ROAD 
- NH-77 ROAD 
- VILLAGE ROAD 

KEY MAP

Not to Scale

PREPARED BY :

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



Dr.S.KARUPPANATHAN
RECOGNIZED QUALIFIED PERSON
RQP/MAS/263/2014/A



LEASE APPLIED AREA

TOWARDS
KRISHNAGIRI

13.50Km

1.56Km
NH-77

10.41Km

5.75Km

TOWARDS
BATLAPALLI

TOWARDS
MATHUR

12°28'49.68820"N



78°21'38.32342"E

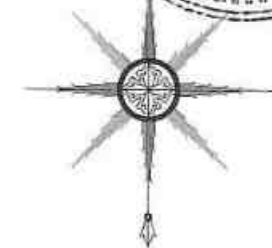


PLATE NO-IA

APPLICANT:

Tmt.M.SADHANA,
No.2/A2, 3rdCROSS,
GOPALAKRISHNA COLONY,
KRISHNAGIRI - 635 001.

LOCATION:

EXTENT : 1.87.0Hect
S.F.NO : 366(Part)
VILLAGE : JAGADEVIPALAYAM
TALUK : BARGUR
DISTRICT : KRISHNAGIRI
STATE : TAMIL NADU

INDEX

MINE LEASE AREA: ●

TOPO SHEET NO : 57-L/07

LATITUDE: 12°28'42.19792"N - 12°28'49.68820"N

LONGITUDE: 78°21'38.32342"E - 78°21'45.51566"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.KARUPPANNAN,M.Sc.,Ph.D.,
RECOGNIZED QUALIFIED PERSON
RQP/MAS/263/2014/A

TOWARDS
KONDAPPANAICKENPALLI 12°28'49.68820"N



78°21'38.32342"E

TOWARDS
BAGIMANUR

N



PLATE NO-IC

APPLICANT:

Tmt.M.SADHANA,
No.2/A2, 3rdCROSS,
GOPALAKRISHNA COLONY,
KRISHNAGIRI - 635 001.

LOCATION:

EXTENT : 1.87.0Hect
S.F.NO : 366(Part)
VILLAGE : JAGADEVIPALAYAM
TALUK : BARGUR
DISTRICT : KRISHNAGIRI
STATE : TAMIL NADU

TOPO SHEET NO : 57-L/07

LATITUDE: 12°28'42.19792"N - 12°28'49.68820"N

LONGITUDE: 78°21'38.32342"E - 78°21'45.51566"E

INDEX

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

SATELLITE IMAGE FOR 1KM
RADIUS

SCALE- 1:10000

PREPARED BY:

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

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

OCTOBER TO DECEMBER

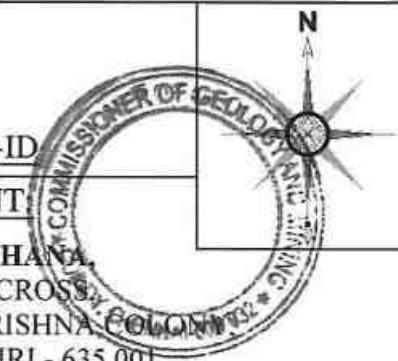
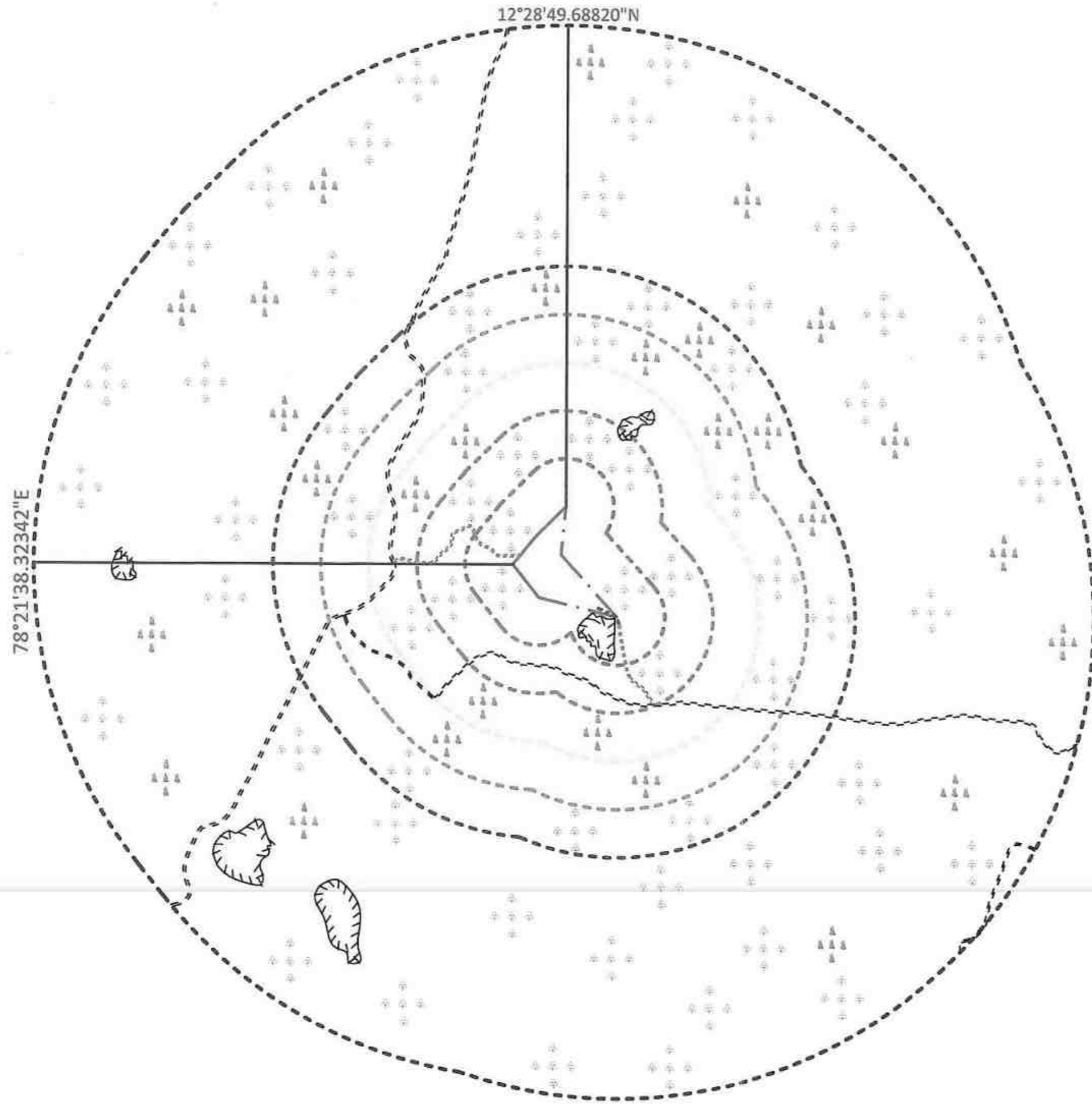


PLATE NO-ID

APPLICANT

Tmt.M.SADHANA
 No.2/A2, 3rdCROSS,
 GOPALAKRISHNA COLONY,
 KRISHNAGIRI - 635 001.

LOCATION:

EXTENT : 1.87.0Hect
 S.F.NO : 366(Part)
 VILLAGE : JAGADEVIPALAYAM
 TALUK : BARGUR
 DISTRICT : KRISHNAGIRI
 STATE : TAMIL NADU

TOPO SHEET NO : 57-L/07

LATITUDE: 12°28'42.19792"N - 12°28'49.68820"N

LONGITUDE: 78°21'38.32342"E - 78°21'45.51566"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	

DESCRIPTION	AREA IN (%)
ROAD	05
TREES	15
BARREN LAND	45
AGRICULTURAL LAND	20
HABITATION	8
EXISTING QUARRY'S	7

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

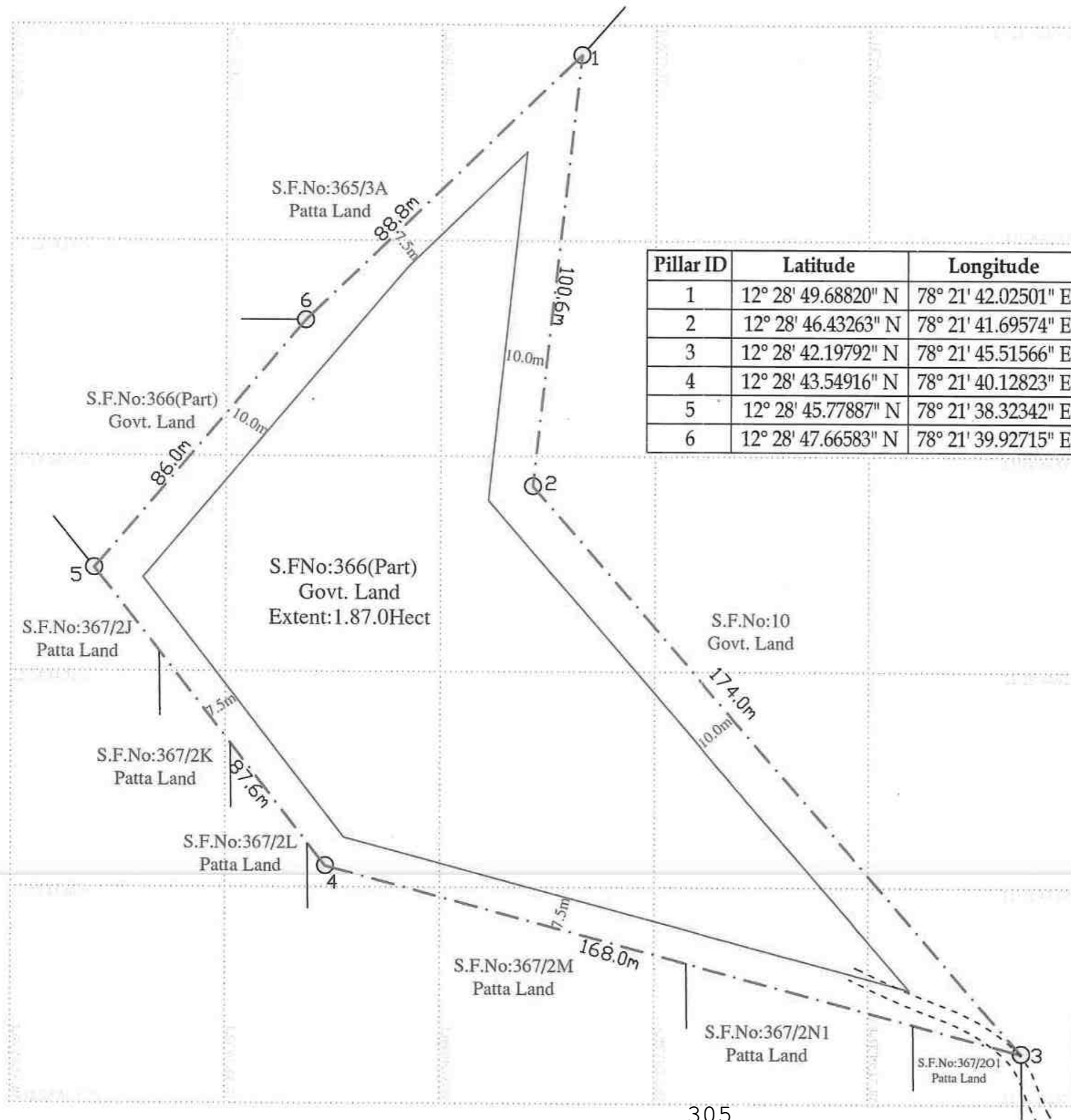
PREPARED BY:

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

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

JULY TO SEPTEMBER





Pillar ID	Latitude	Longitude
1	12° 28' 49.68820" N	78° 21' 42.02501" E
2	12° 28' 46.43263" N	78° 21' 41.69574" E
3	12° 28' 42.19792" N	78° 21' 45.51566" E
4	12° 28' 43.54916" N	78° 21' 40.12823" E
5	12° 28' 45.77887" N	78° 21' 38.32342" E
6	12° 28' 47.66583" N	78° 21' 39.92715" E

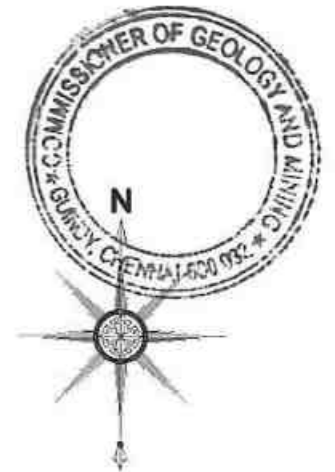


PLATE NO-II

APPLICANT:

Tmt.M.SADHANA,
 No.2/A2, 3rdCROSS,
 GOPALAKRISHNA COLONY,
 KRISHNAGIRI - 635 001.

LOCATION:

EXTENT : 1.87.0Hect
 S.F.NO : 366(Part)
 VILLAGE : JAGADEVIPALAYAM
 TALUK : BARGUR
 DISTRICT : KRISHNAGIRI
 STATE : TAMIL NADU

INDEX

- LEASE BOUNDARY
- SAFETY DISTANCE
- APPROACH ROAD
- PILLAR STONES

LEASE PLAN
 SCALE 1 : 1000

Prepared By:

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

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

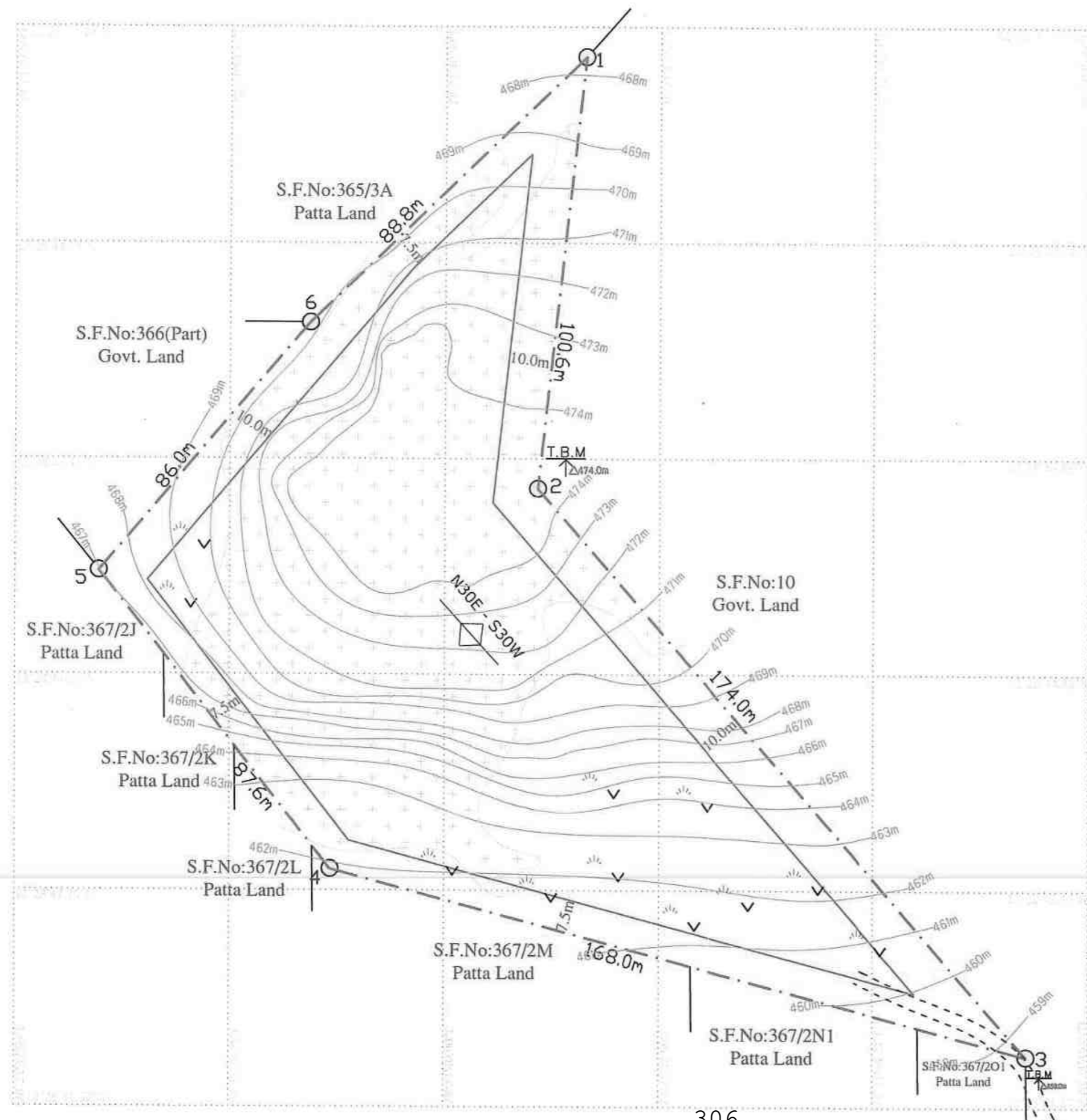


PLATE NO-III

APPLICANT:

Tmt.M.SADHANA,
 No.2/A2, 3rdCROSS,
 GOPALAKRISHNA COLONY,
 KRISHNAGIRI - 635 001.

LOCATION:

EXTENT : 1.87.0Hect
 S.F.NO : 366(Part)
 VILLAGE : JAGDEVIPALAYAM
 TALUK : BARGUR
 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:

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

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

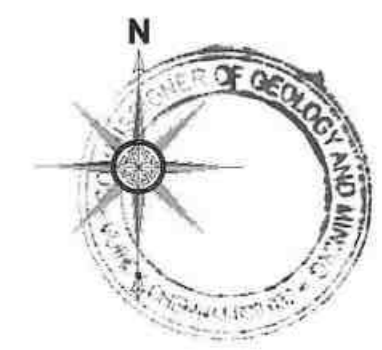
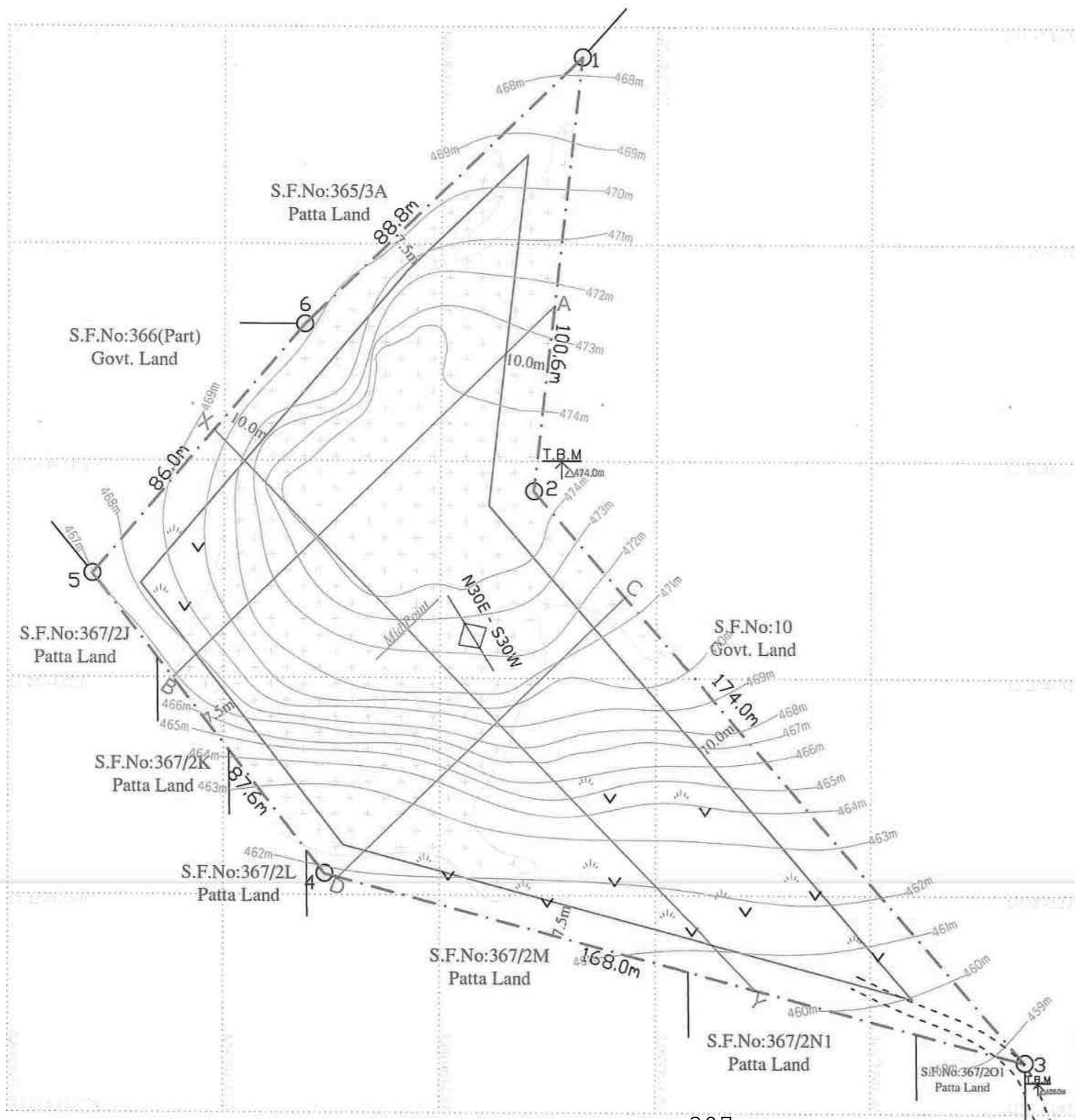


PLATE NO-IV

APPLICANT:

Tmt.M.SADHANA,
No.2/A2, 3rdCROSS,
GOPALAKRISHNA-COLONY,
KRISHNAGIRI - 635 001.

LOCATION:

EXTENT : 1.87.0Hect
S.F.NO : 366(Part)
VILLAGE : JAGDEVIPALAYAM
TALUK : BARGUR
DISTRICT : KRISHNAGIRI
STATE : TAMIL NADU

INDEX

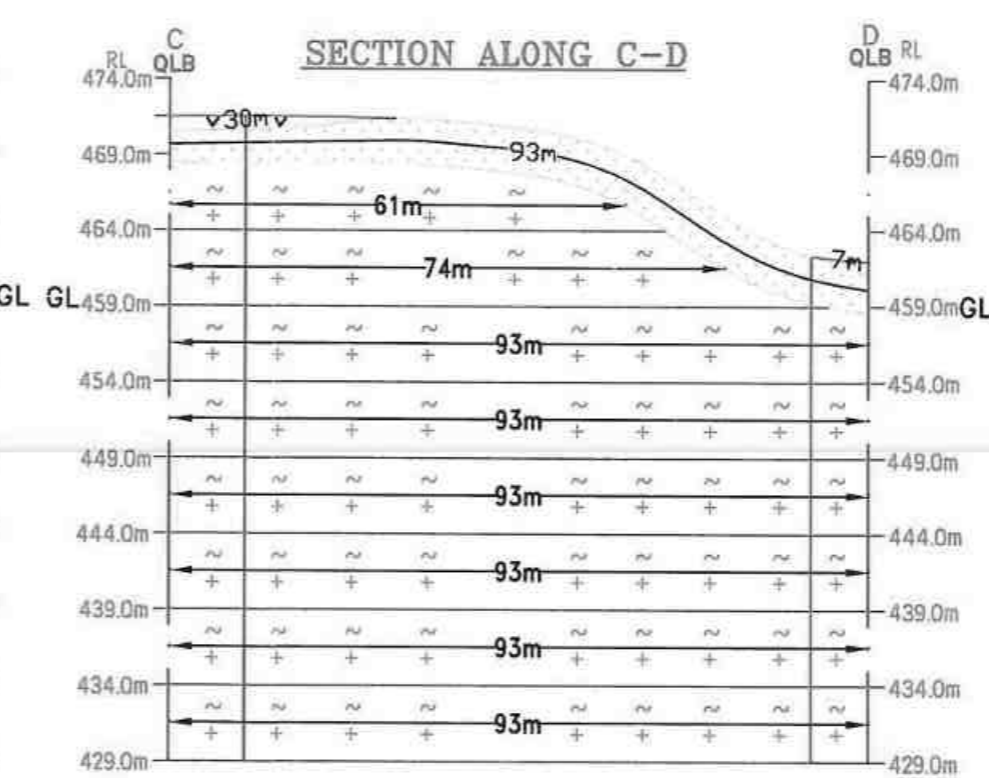
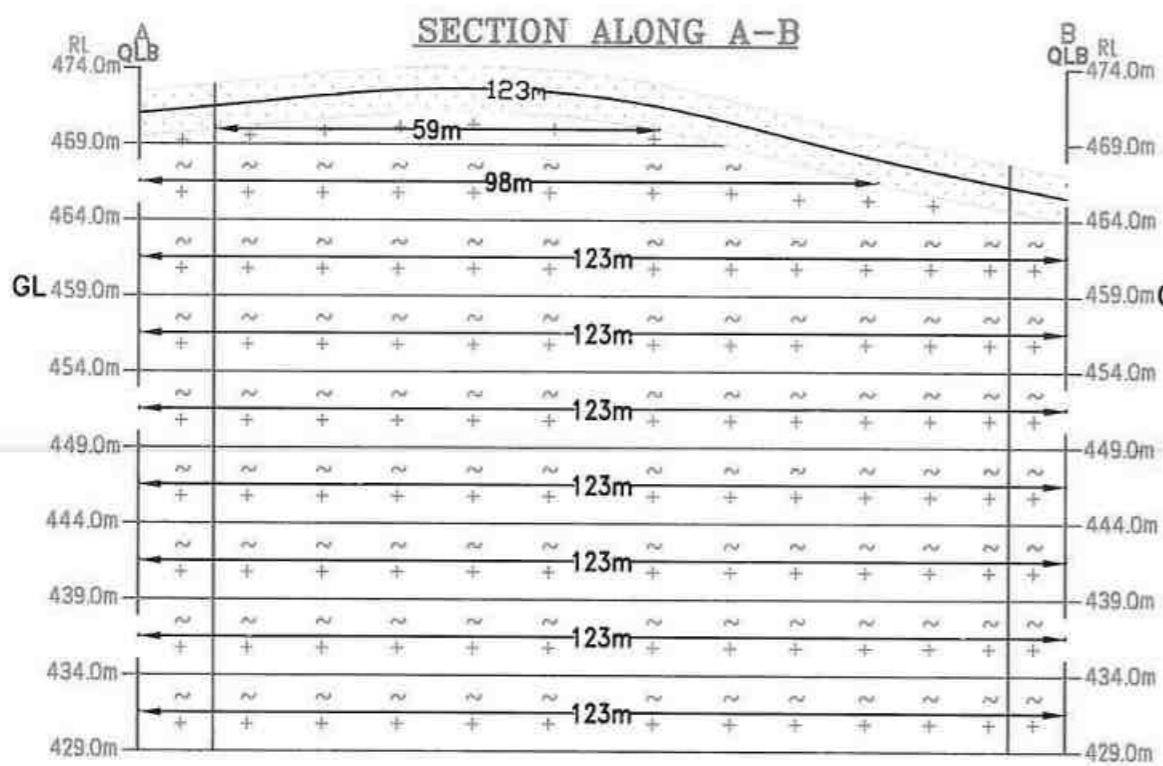
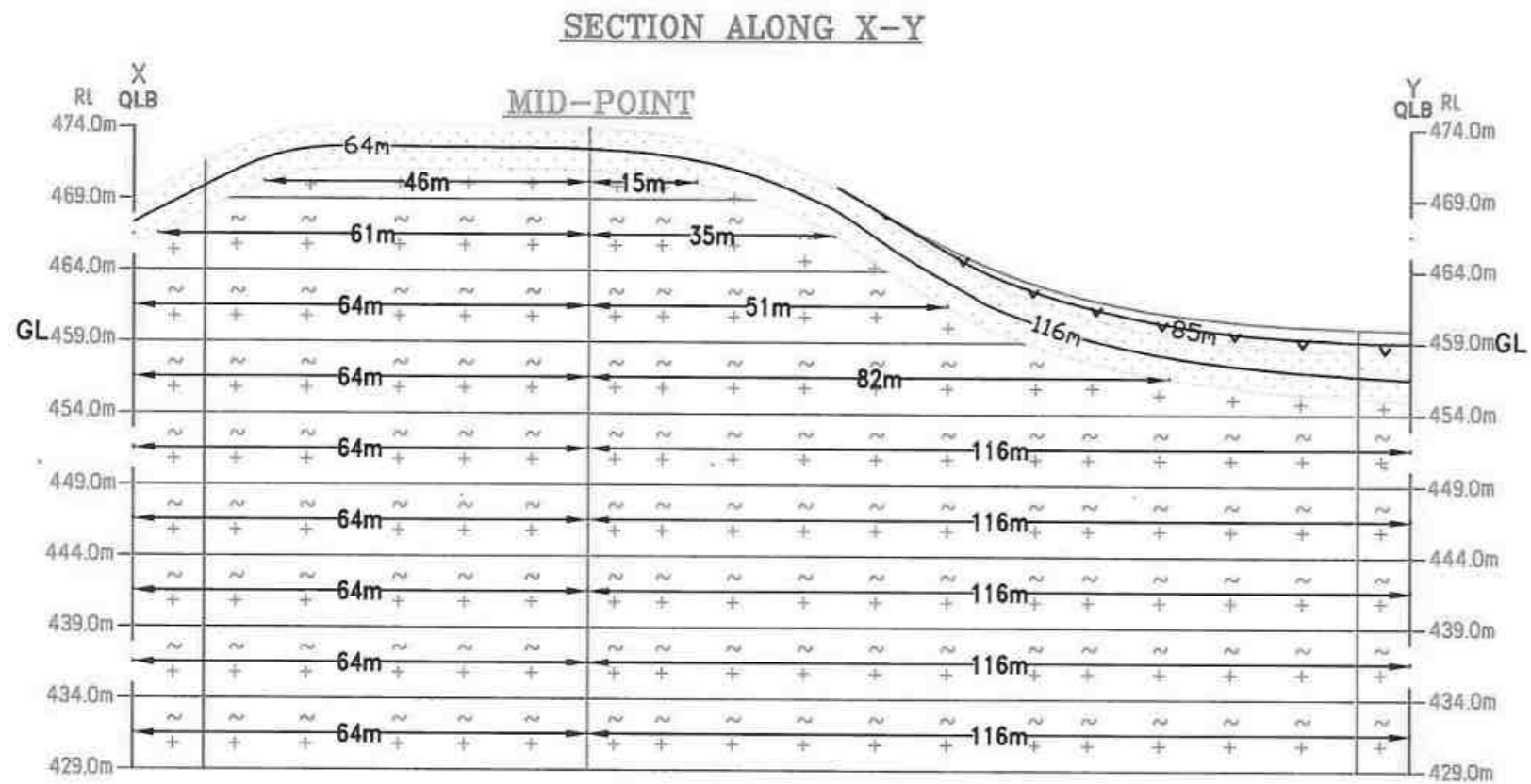
LEASE BOUNDARY	
SAFETY DISTANCE	
APPROACH ROAD	
PILLAR STONES	
TEMPORARY BENCH MARKS	
SHRUBS	
CONTOUR LINES	
OUTCROP	
TOPSOIL	
STRIKE & DIP	

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



GEOLOGICAL RESOURCES										
Section	Bench	length in (m)	Width in (m)	Depth in (m)	Rom in (M ³)	Mineable Reserves in M ³	Colour Granite 20% Recovery in M ³	Granite Waste 80% in M ³	Weathered Top Soil in M ³	Weathered Rock in M ³
	I	64	123	3	23616	.....	.....	.....	.....	23616
	II	46	59	2	5428	5428	1086	.....	.....	.....
	III	61	98	5	29890	29890	5978	.....	.....	.....
	IV	64	123	5	39360	39360	7872	.....	.....	.....
	V	64	123	5	39360	39360	7872	.....	.....	.....
	VI	64	123	5	39360	39360	7872	.....	.....	.....
	VII	64	123	5	39360	39360	7872	.....	.....	.....
	VIII	64	123	5	39360	39360	7872	.....	.....	.....
	IX	64	123	5	39360	39360	7872	.....	.....	.....
TOTAL					334454	310838	62168	248670	0	23616
XY-CD	Residual	85	37	1	3145	.....	.....	.....	.....	3145
	I	116	93	3	32364	.....	.....	.....	.....	32364
	II	15	30	2	900	900	180	720	.....	.....
	III	35	61	5	10675	10675	2135	8540	.....	.....
	IV	51	74	5	18870	18870	3774	15096	.....	.....
	V	82	93	5	38130	38130	7626	30504	.....	.....
	VI	116	93	5	53940	53940	10788	43152	.....	.....
	VII	116	93	5	53940	53940	10788	43152	.....	.....
	VIII	116	93	5	53940	53940	10788	43152	.....	.....
TOTAL					373784	338275	67655	270620	3145	32364
GRAND TOTAL					708238	649113	129823	519290	3145	55980

GL = GROUND LEVEL

PLATE NO-IVA

APPLICANT:

Tmt.M.SADHANA,
No.2/A2, 3rdCROSS,
GOPALAKRISHNA COLONY,
KRISHNAGIRI - 635 001.

LOCATION:

EXTENT : 1.87.0Hect
S.F.NO : 366(Part)
VILLAGE : JAGADEVIPALAYAM
TALUK : BARGUR
DISTRICT : KRISHNAGIRI
STATE : TAMIL NADU

INDEX

- LEASE BOUNDARY
- SAFETY DISTANCE
- TOPSOIL
- COLOUR GRANITE
- WEATHERED ROCK

GEOLOGICAL SECTIONS

SCALE SEC- HOR 1:1000
VER 1:500

Prepared By:

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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



PLATE NO-V

APPLICANT:

Tmt.M.SADHANA,
No.2/A2, 3rdCROSS,
GOPALAKRISHNA COLONY,
KRISHNAGIRI - 635 001.

LOCATION:

EXTENT : 1.87.0Hect
S.F.NO : 366(Part)
VILLAGE : JAGADEVIPALAYAM
TALUK : BARGUR
DISTRICT : KRISHNAGIRI
STATE : TAMIL NADU

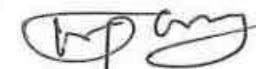
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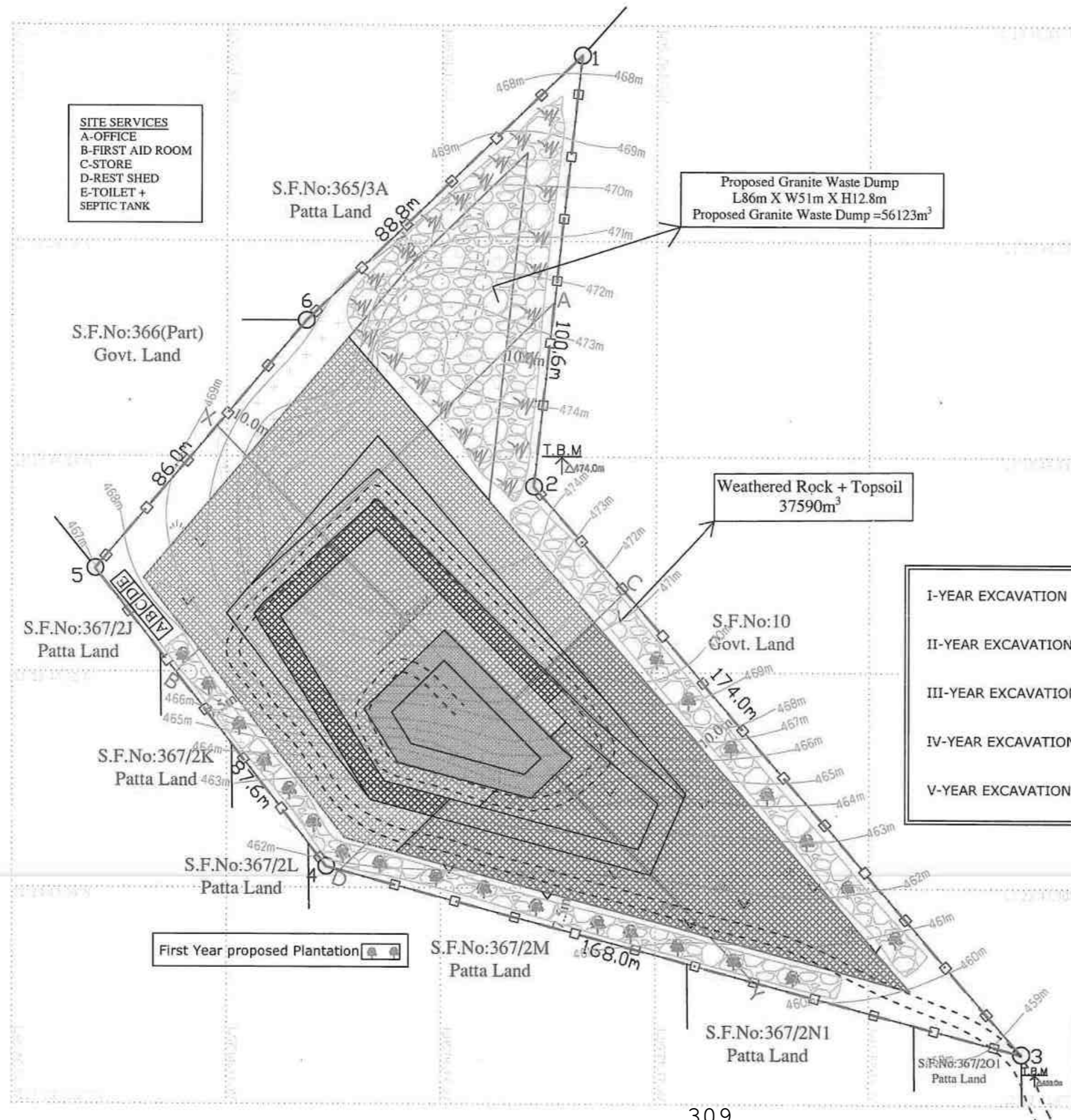
LEASE BOUNDARY	
SAFETY DISTANCE	
APPROACH & HAUL ROAD	
PILLAR STONES	
TEMPORARY BENCH MARKS	
SHRUBS	
CONTOUR LINES	
OUTCROP	
TOPSOIL	
DUMP ROAD	
PROPOSED DUMP	
FENCING	

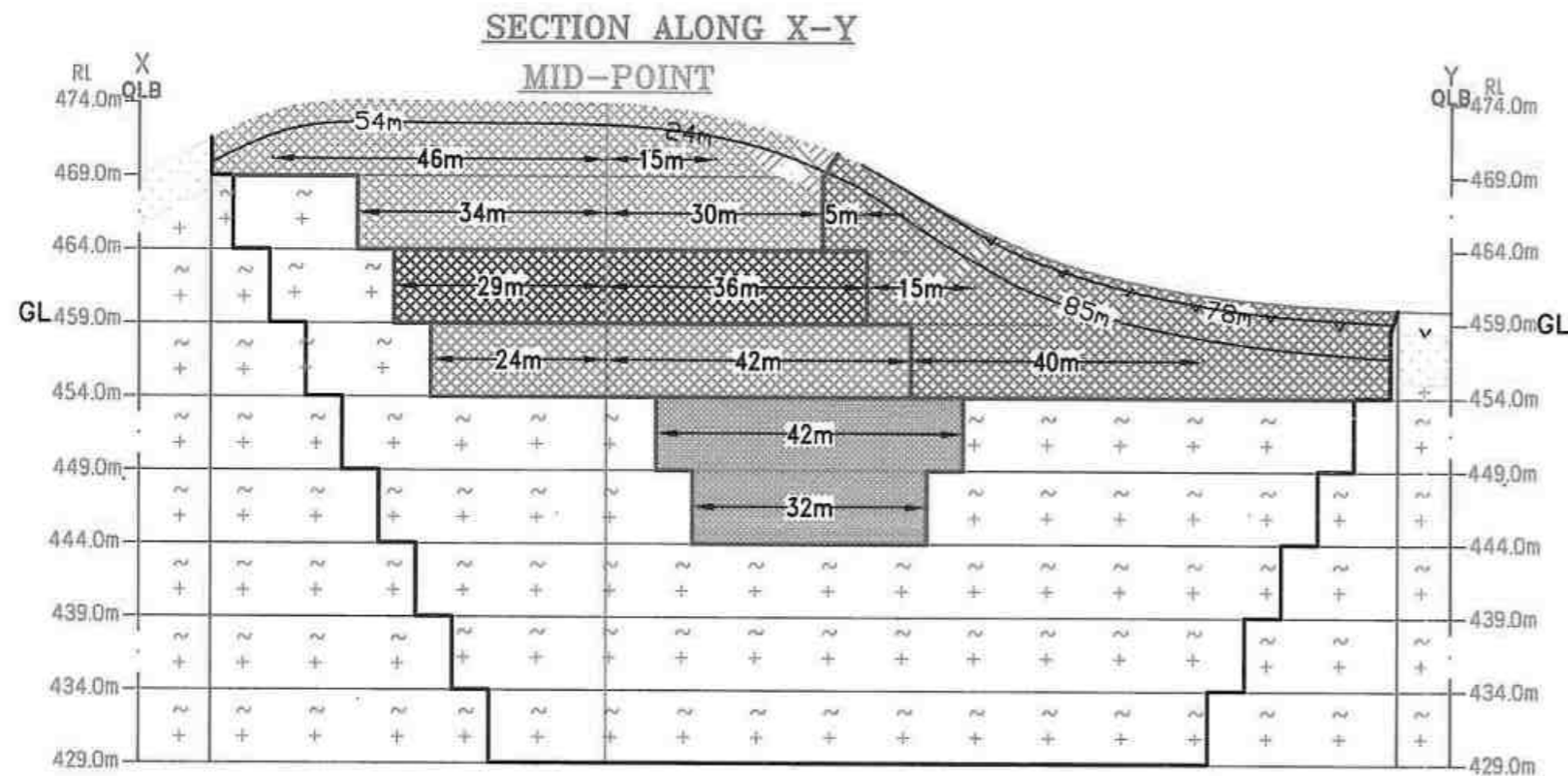
YEARWISE DEVELOPMENT AND
PRODUCTION PLAN
(SCALE) Plan 1 : 1000

Prepared By:

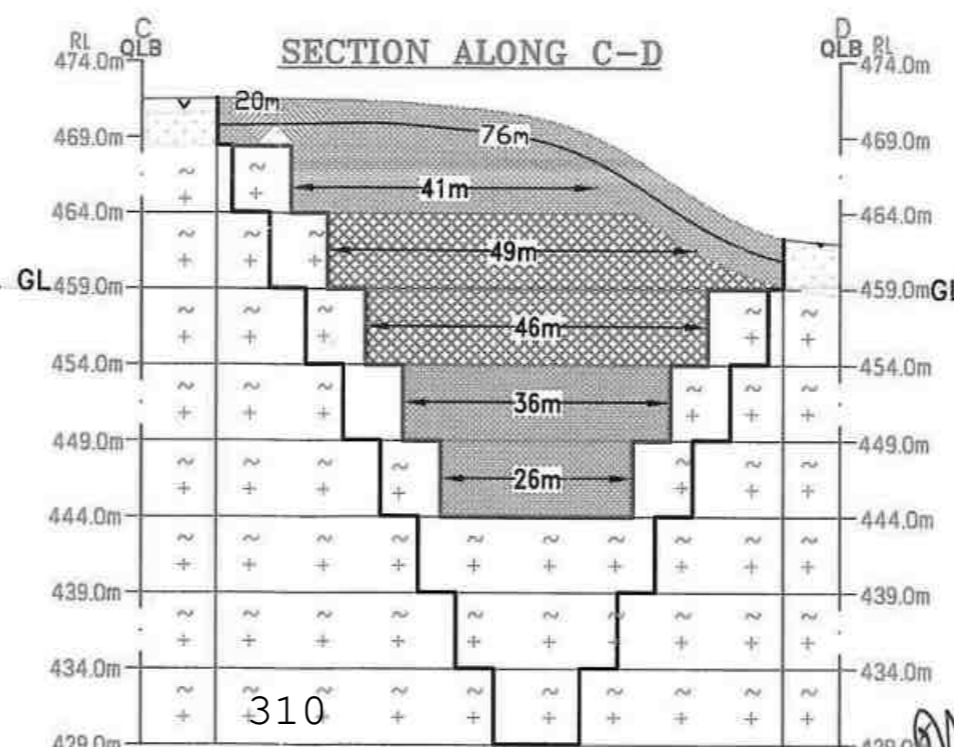
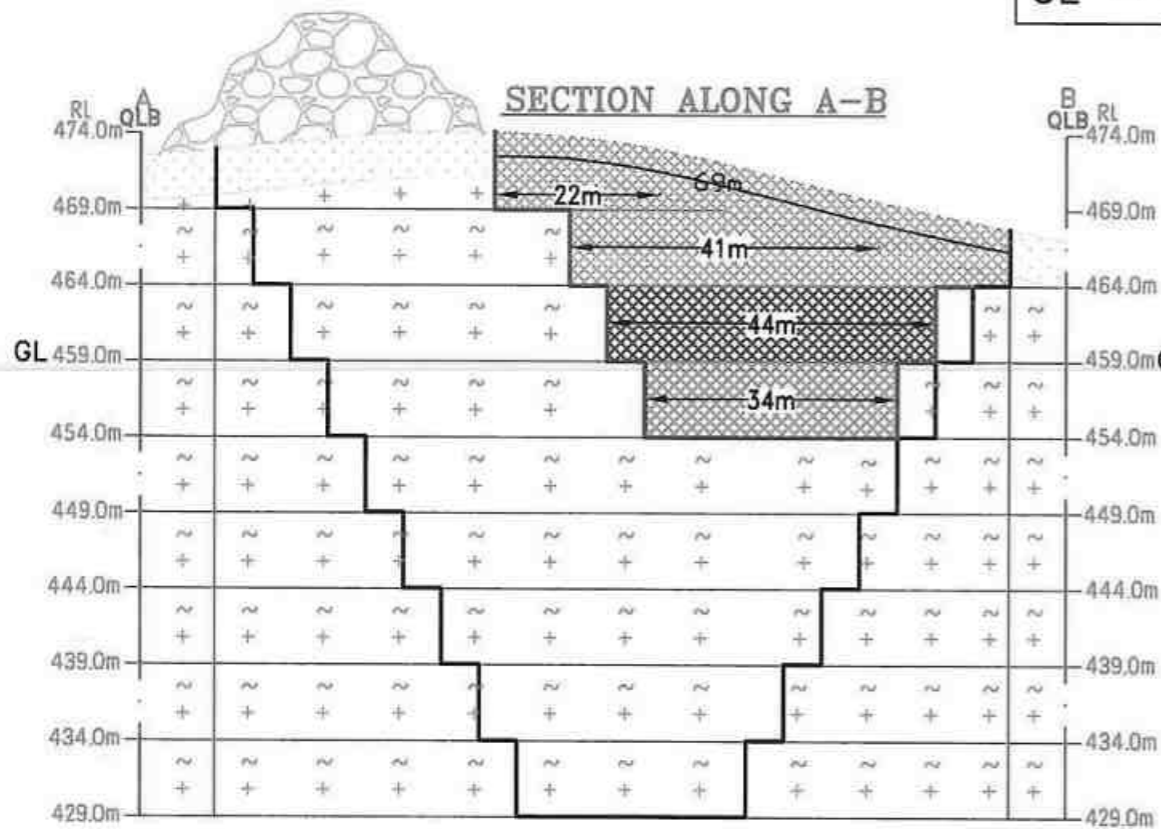
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HAS BEEN CHECKED BY ME AND IS CORRECT
TO THE BEST OF MY KNOWLEDGE


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





GL = GROUND LEVEL



310

YEARWISE PRODUCTION RESERVES												
Year	Section	Bench	length in (m)	Width in (m)	Depth in (m)	Rom in (M ³)	Mineable Reserves in M ³	Colour Granite 20% Recovery in M ³	Granite Waste 80% in M ³	Residual Top Soil in M ³	Weathered Rock in M ³	
I	XY-AB	I	54	69	3	11178	....	....	....	....	11178
		II	46	22	2	2024	2024	405	1619	....	....
	XY-CD	I	34	41	5	6970	6970	1394	5576	....	....
		II	24	76	3	5472	....	....	....	....	5472
			III	15	15	2	450	450	90	360
			IV	30	41	5	6150	6150	1230	4920
		TOTAL				32244	15594	3119	12475	0	16650	
II	XY-CD	Residual	78	20	1	1560	....	....	....	....	....
		I	85	76	3	19380	....	....	....	....	....
		II	5	41	5	1025	1025	205	820	....	....
		III	15	49	5	3675	3675	735	2940	....	....
		IV	40	46	5	9200	9200	1840	7360	....	....
		TOTAL				34840	13900	2780	11120	1560	19380	
III	XY-AB	III	29	44	5	6380	6380	1276	5104	....	....
	XY-CD	III	36	49	5	8820	8820	1764	7056	....	....
		TOTAL				15200	15200	3040	12160	0	0	
IV	XY-AB	IV	24	34	5	4080	4080	816	3264	....	....
	XY-CD	IV	42	46	5	9660	9660	1932	7728	....	....
		TOTAL				13740	13740	2748	10992	0	0	
V	XY-CD	V	42	36	5	7560	7560	1512	6048	....	....
		VI	32	26	5	4160	4160	832	3328	....	....
		TOTAL				11720	11720	2344	9376	0	0	
		GRAND TOTAL				107744	70154	14031	56123	1560	36030	

I-YEAR EXCAVATION	
II-YEAR EXCAVATION	
III-YEAR EXCAVATION	
IV-YEAR EXCAVATION	
V-YEAR EXCAVATION	

PLATE NO-VA

APPLICANT:

Tmt.M.SADHANA,
No.2/A2, 3rdCROSS,
GOPALAKRISHNA COLONY,
KRISHNAGIRI - 635 001.

LOCATION:

EXTENT : 1.87.0Hect
S.F.NO : 366(Part)
VILLAGE : JAGADEVIPALAYAM
TALUK : BARGUR
DISTRICT : KRISHNAGIRI
STATE : TAMIL NADU

INDEX

LEASE BOUNDARY	
SAFETY DISTANCE	
TOPSOIL	
COLOUR GRANITE	
WEATHERED ROCK	
PROPOSED & ULTIMATE BENCH	
DUMP	

YEARWISE DEVELOPMENT AND PRODUCTION SECTIONS

SEC- HOR 1:1000
VER 1:500

Prepared By:

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

COMMISSIONER OF
GEOLOGY AND MINING,
GUINDY, CHENNAI-600 032.



PLATE NO-VI

APPLICANT:

Tmt.M.SADHANA,
No.2/A2, 3rdCROSS,
GOPALAKRISHNA COLONY,
KRISHNAGIRI - 635 001.

LOCATION:

EXTENT : 1.87.0Hect
S.F.NO : 366(Part)
VILLAGE : JAGADEVIPALAYAM
TALUK : BARGUR
DISTRICT : KRISHNAGIRI
STATE : TAMIL NADU


INDEX

LEASE BOUNDARY	
SAFETY DISTANCE	
APPROACH & HAUL ROAD	
PILLAR STONES	
TEMPORARY BENCH MARKS	
SHRUBS	
CONTOUR LINES	
OUTCROP	
TOPSOIL	
DUMP ROAD	
PROPOSED DUMP	
FENCING	
PROPOSED BENCH	

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

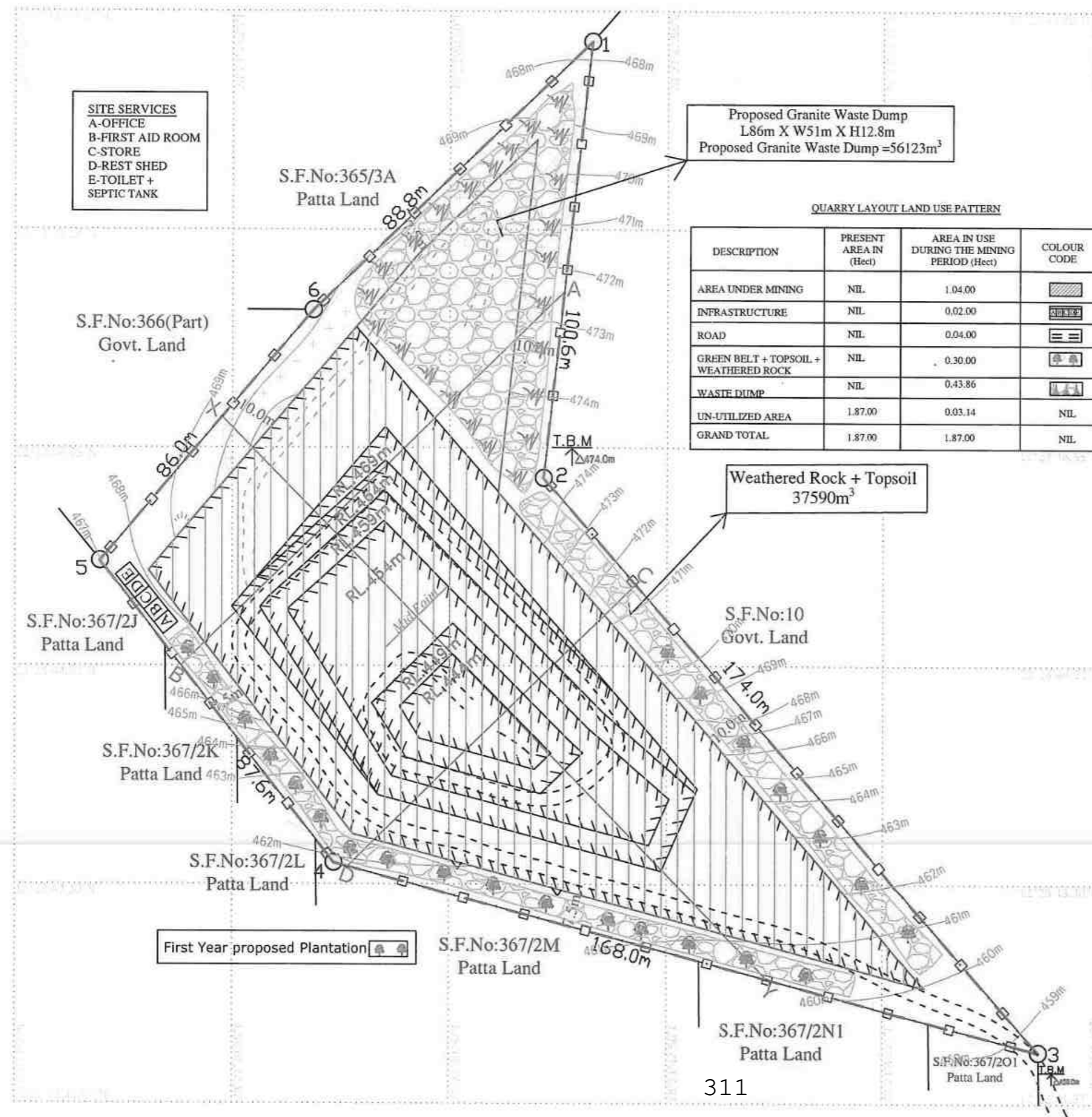




PLATE NO-VII

APPLICANT:

Tmt.M.SADHANA,
No.2/A2, 3rdCROSS,
GOPALAKRISHNA COLONY,
KRISHNAGIRI - 635 001.

LOCATION:

EXTENT : 1.87.0Hect
S.F.NO : 366(Part)
VILLAGE : JAGADEVIPALAYAM
TALUK : BARGUR
DISTRICT : KRISHNAGIRI
STATE : TAMIL NADU

INDEX

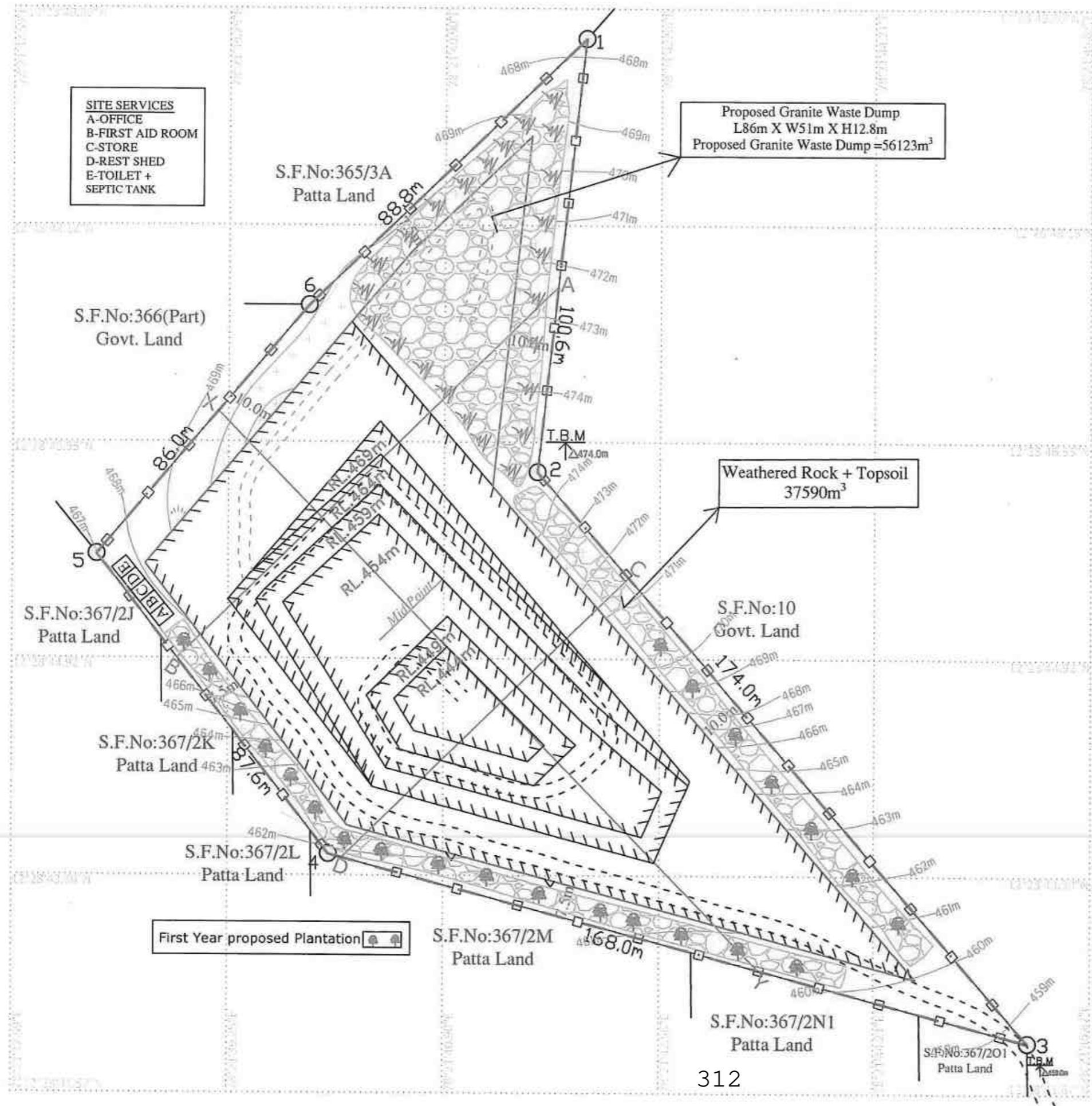
LEASE BOUNDARY	
SAFETY DISTANCE	
APPROACH & HAUL ROAD	
PILLAR STONES	
TEMPORARY BENCH MARKS	
SHRUBS	
CONTOUR LINES	
OUTCROP	
TOPSOIL	
DUMP ROAD	
PROPOSED DUMP	
FENCING	
PROPOSED BENCH	

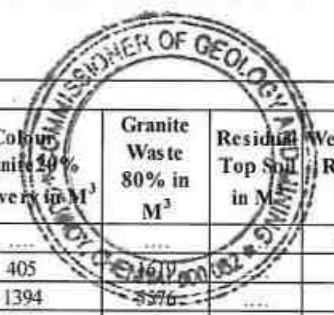
PROGRESSIVE QUARRY
CLOSURE PLAN
PLAN SCALE 1:1000

Prepared By:

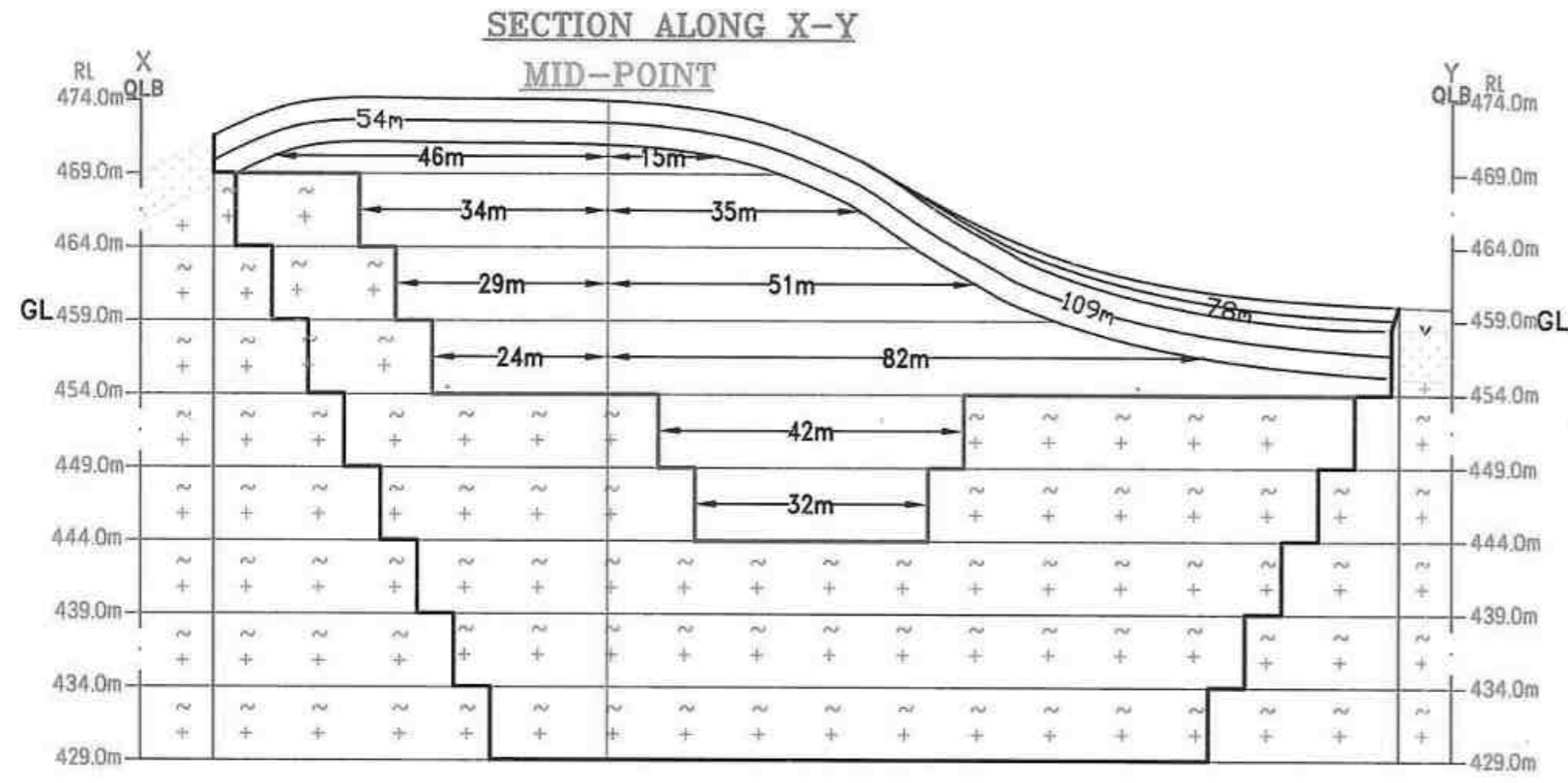
I DO HEREBY CERTIFY THAT THE PLATE
HAS BEEN CHECKED BY ME AND IS CORRECT
TO THE BEST OF MY KNOWLEDGE

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

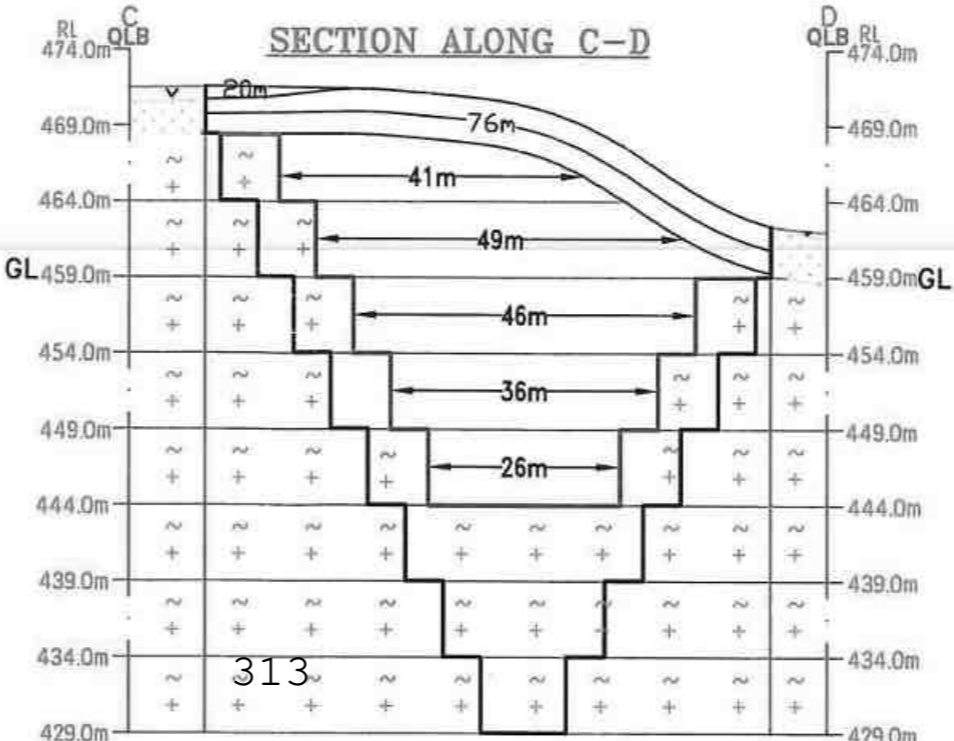
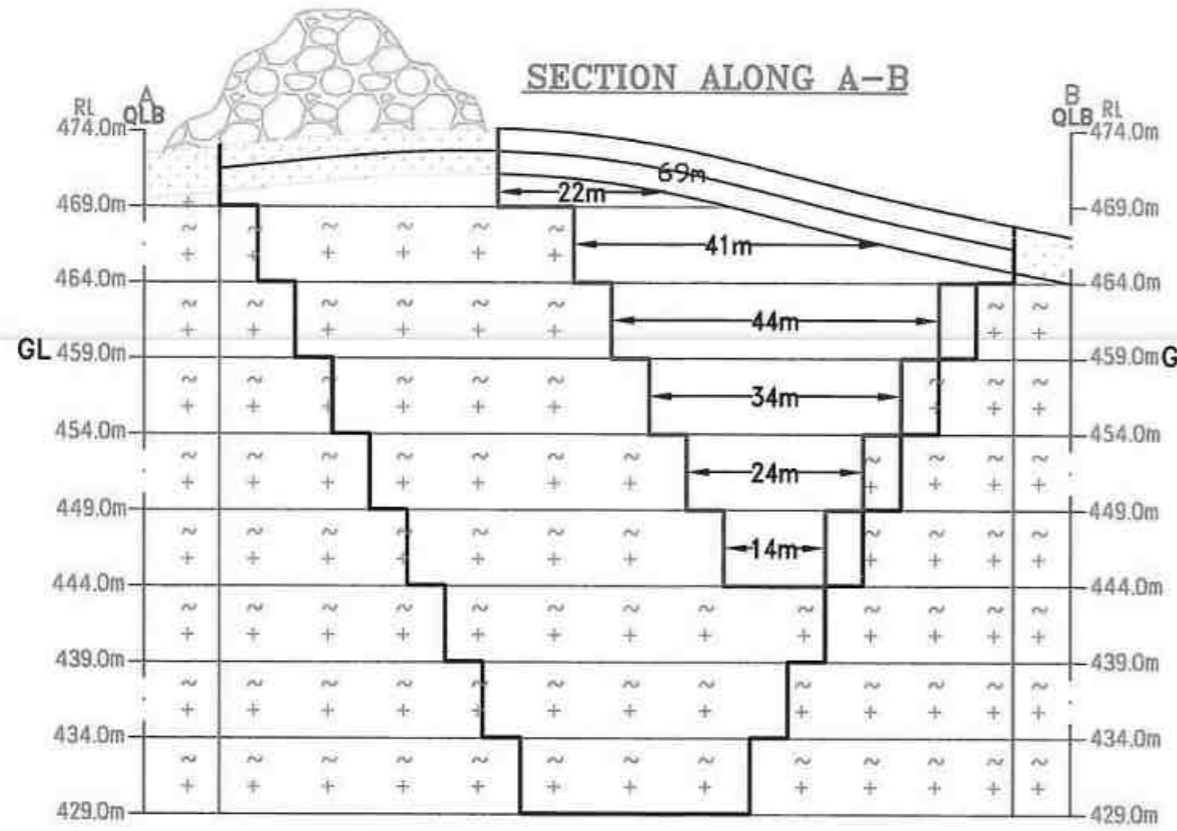




PRODUCTION RESERVES											
Section	Bench	length in (m)	Width in (m)	Depth in (m)	Rom in (M ³)	Mineable Reserves in M ³	Colour Granite 40% Recovery in M ³	Granite Waste 80% in M ³	Residual Top Soil in M ³	Weathered Rock in M ³	
	I	54	69	3	11178	....	....	....	....	11178
	I	46	22	2	2024	2024	405	....	....	....
	II	34	41	5	6970	6970	1394	5376	....	....
	III	29	44	5	6380	6380	1276	5104	....	....
	IV	24	34	5	4080	4080	816	3264	....	....
TOTAL					30632	19454	3891	15563	0	11178	
XY-CD	Residual	78	20	1	1560	....	....	....	1560	....
	I	109	76	3	24852	....	....	....	....	24852
	I	15	15	2	450	450	90	360	....	....
	II	35	41	5	7175	7175	1435	5740	....	....
	III	51	49	5	12495	12495	2499	9996	....	....
	IV	82	46	5	18860	18860	3772	15088	....	....
	V	42	36	5	7560	7560	1512	6048	....	....
VI	32	26	5	4160	4160	832	3328	....	....
TOTAL					77112	50700	10140	40560	1560	24852	
GRAND TOTAL					107744	70154	14031	56123	1560	36030	



GL = GROUND LEVEL



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PLATE NO-VIIIA
APPLICANT:
Mrs.M.SADHANA,
No.2-A2, IIIrdCROSS,
GOPALAKRISHNA COLONY,
KRISHNAGIRI-635 001.
LOCATION:
EXTENT : 1.87.0Hect
S.F.NO : 366(Part)
VILLAGE : JAGADEVIPALAYAM
TALUK : BARGUR
DISTRICT : KRISHNAGIRI
STATE : TAMIL NADU

INDEX	
LEASE BOUNDARY	
SAFETY DISTANCE	
TOPSOIL	
COLOUR GRANITE	
WEATHERED ROCK	
PROPOSED & ULTIMATE BENCH	
DUMP	

PROGRESSIVE QUARRY
CLOSURE SECTION
SEC-HOR 1:1000
VER 1:500

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

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

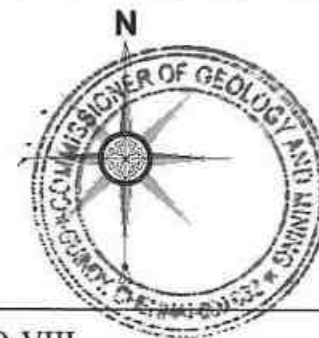


PLATE NO-VIII

APPLICANT:

Tmt.M.SADHANA,
No.2/A2, 3rdCROSS,
GOPALAKRISHNA COLONY,
KRISHNAGIRI - 635 001.

LOCATION:

EXTENT : 1.87.0Hect
S.F.NO : 366(Part)
VILLAGE : JAGDEVIPALAYAM
TALUK : BARGUR
DISTRICT : KRISHNAGIRI
STATE : TAMIL NADU

INDEX

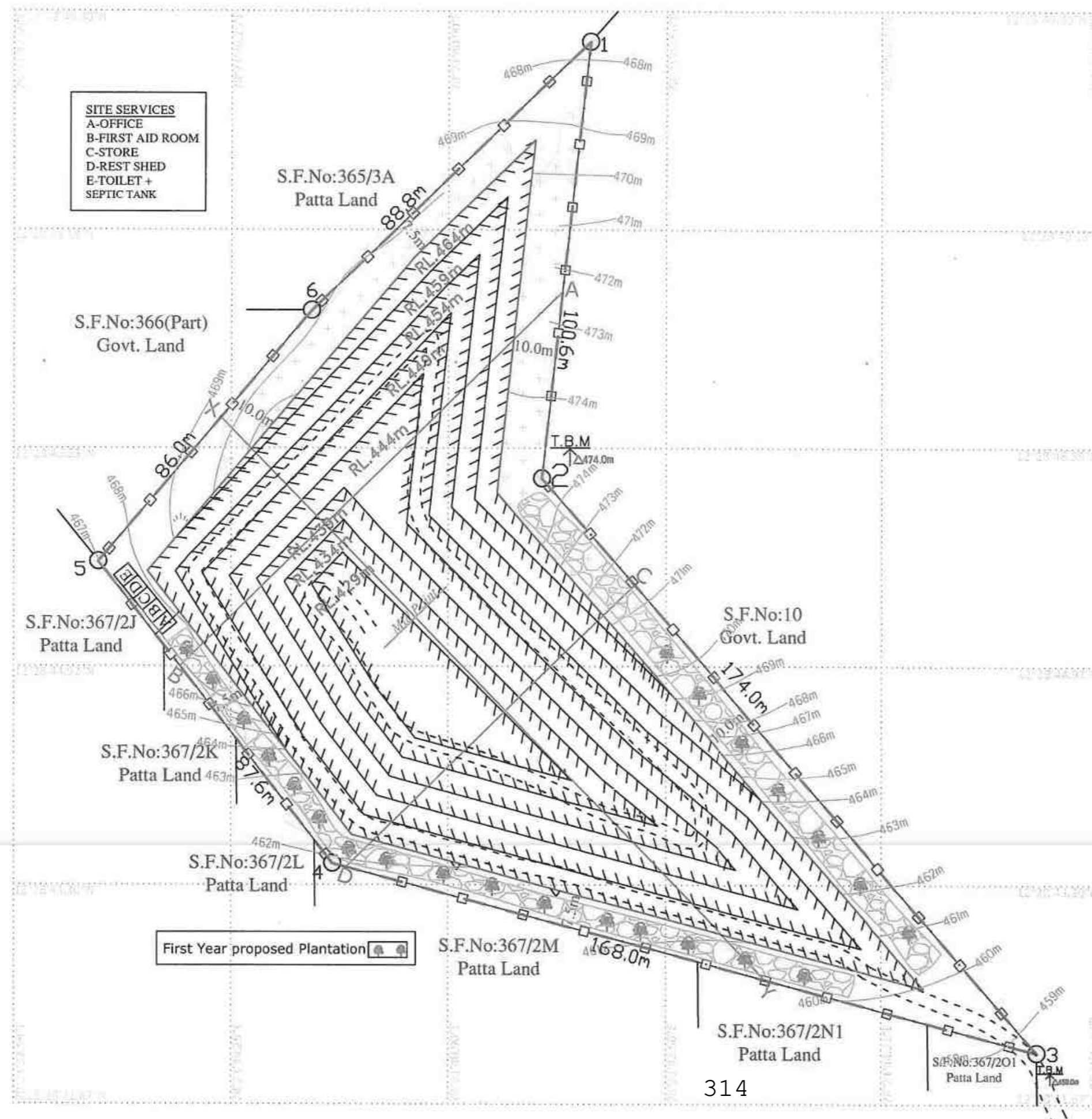
LEASE BOUNDARY	
SAFETY DISTANCE	
APPROACH & HAUL ROAD	
PILLAR STONES	
TEMPORARY BENCH MARKS	
SHRUBS	
CONTOUR LINES	
OUTCROP	
TOPSOIL	
DUMP	
FENCING	
ULTIMATE BENCH	

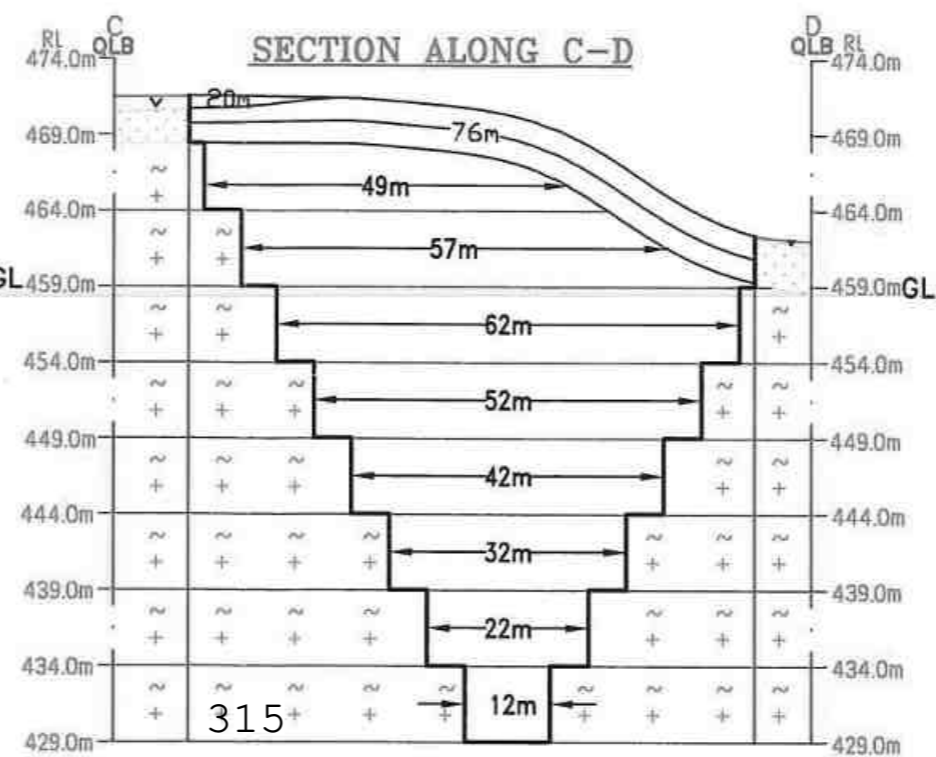
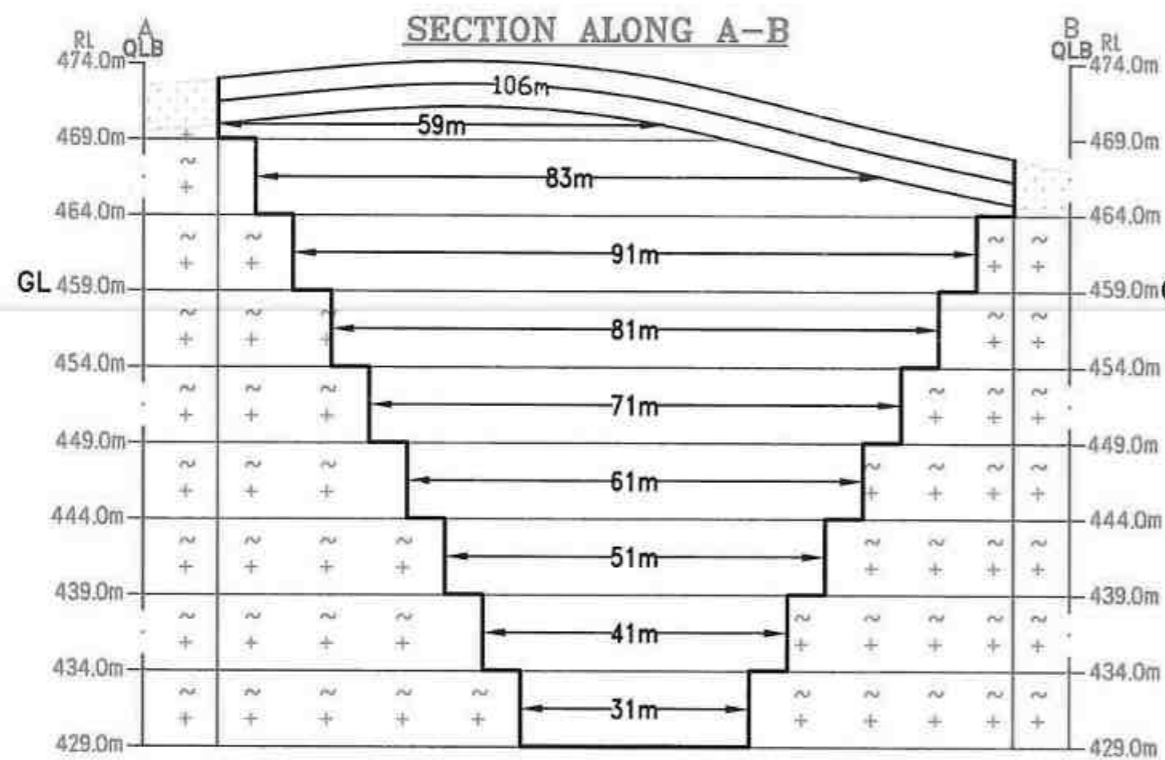
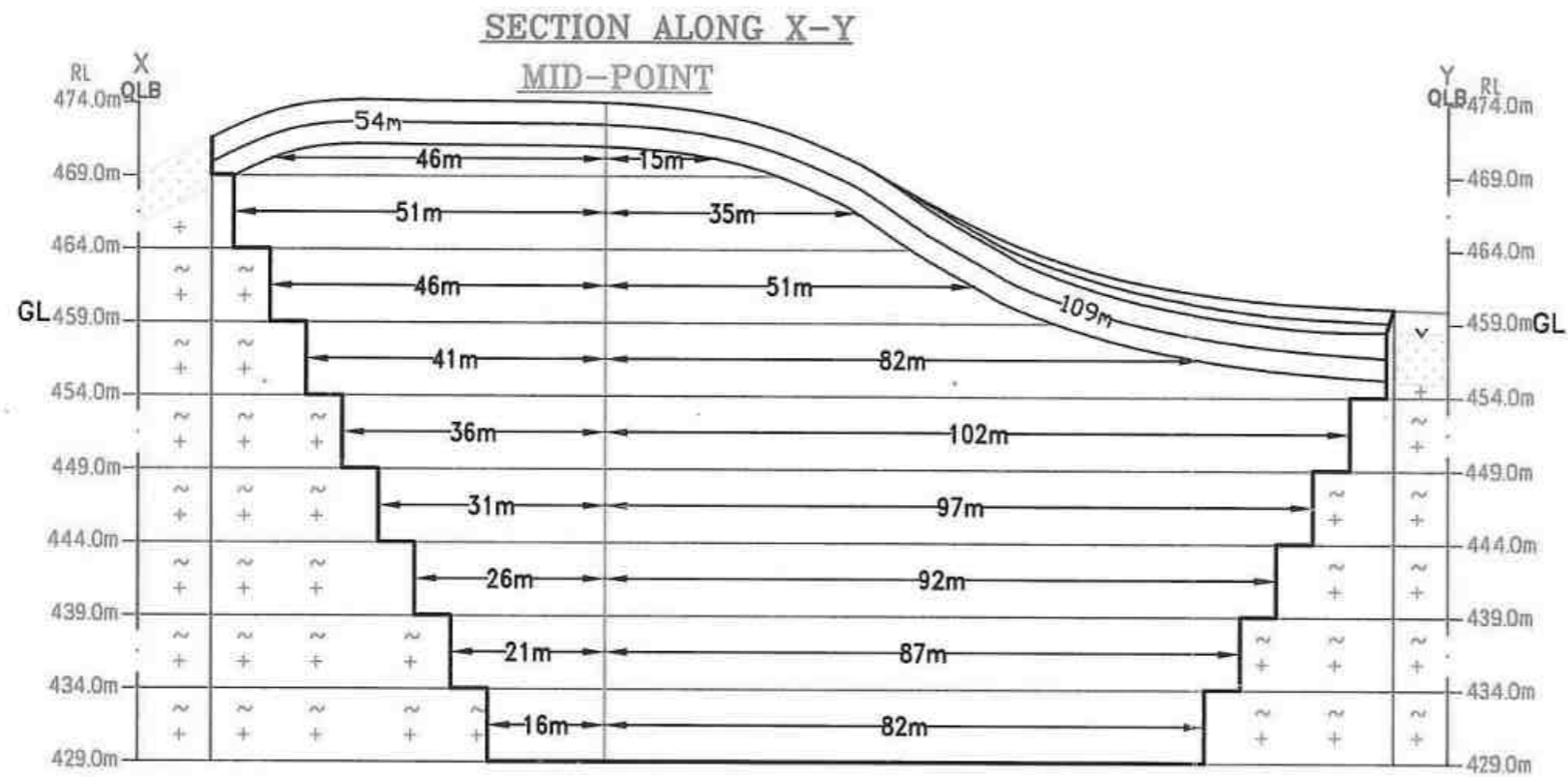
CONCEPTUAL PLAN
(SCALE) PLAN 1:1000

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)	Rom in (M ³)	Mineable Reserves in M ³	Colour Granite Recovery in M ³	Granite Waste 80% in M ³	Residual Top Soil in M ³	Weathered Rock in M ³
	I	54	106	3	17172	.....	.....	.....	.....	17172
	I	46	59	2	5428	5428	1085	4342	.....	.....
	II	51	83	5	21165	21165	4233	16932	.....	.....
	III	46	91	5	20930	20930	4186	16744	.....	.....
	IV	41	81	5	16605	16605	3321	13284	.....	.....
	V	36	71	5	12780	12780	2556	10224	.....	.....
	VI	31	61	5	9455	9455	1891	7564	.....	.....
	VII	26	51	5	6630	6630	1326	5304	.....	.....
	VIII	21	41	5	4305	4305	861	3444	.....	.....
	IX	16	31	5	2480	2480	496	1984	.....	.....
TOTAL					116950	99778	19956	79822	0	17172
XY-CD	Residual	78	20	1	1560	.....	.....	.....	1560	.....
	I	109	76	3	24852	.....	.....	.....	.....	24852
	I	15	30	2	900	900	180	720	.....	.....
	II	35	49	5	8575	8575	1715	6860	.....	.....
	III	51	57	5	14535	14535	2907	11628	.....	.....
	IV	82	62	5	25420	25420	5084	20336	.....	.....
	V	102	52	5	26520	26520	5304	21216	.....	.....
	VI	97	42	5	20370	20370	4074	16296	.....	.....
	VII	92	32	5	14720	14720	2944	11776	.....	.....
VIII	87	22	5	9570	9570	1914	7656	.....	.....
IX	82	12	5	4920	4920	984	3936	.....	.....
TOTAL					151942	125530	25106	100424	1560	24852
GRAND TOTAL					268892	225308	45062	180246	1560	42024

PLATE NO-VIIIA

APPLICANT:
Tmt.M.SADHANA,
 No.2/A2, 3rdCROSS,
 GOPALAKRISHNA COLONY,
 KRISHNAGIRI - 635 001.

LOCATION:
 EXTENT : 1.87.0Hect
 S.F.NO : 366(Part)
 VILLAGE : JAGADEVIPALAYAM
 TALUK : BARGUR
 DISTRICT : KRISHNAGIRI
 STATE : TAMIL NADU

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LEASE BOUNDARY	
SAFETY DISTANCE	
TOPSOIL	
COLOUR GRANITE	
WEATHERED ROCK	
ULTIMATE BENCH	

CONCEPTUAL SECTIONS
 SEC - HOR 1:1000
 VER 1:500

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

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

അവസരം:-

കിരീടാലയം, പാലക്കാട്, 2018

17. പാലക്കാട് മുനിസിപ്പാലിറ്റി 366(P)

21-47 (അംഗ) പദ്ധതി 1.87.00 മുനിസിപ്പാലിറ്റി

- കമ്മീഷൻ പാൻ പബ്ലിക് ക്ലിയിംഗ്: കമ്മീഷൻ

2198 മുനിസിപ്പാലിറ്റി 2018 മുനിസിപ്പാലിറ്റി

2018 മുനിസിപ്പാലിറ്റി 2018 മുനിസിപ്പാലിറ്റി

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2018 മുനിസിപ്പാലിറ്റി 2018 മുനിസിപ്പാലിറ്റി

2018 മുനിസിപ്പാലിറ്റി 2018 മുനിസിപ്പാലിറ്റി

- മുനിസിപ്പാലിറ്റി

J. Ramasheo
03/06/2023
Village Administrative Officer
17-JAGADEVIPALAYAM
Bargur-Tk, Krishnagiriri-Dt.

**RAINWATER HARVESTING AND ARTIFICIAL RECHARGE STRUCTURES PROPOSED
IN THE JAGADEVIPALAYAM VILLAGE COLOUR GRANITE PROJECT
BARGUR TALUK, KRISHNAGIRI DISTRICT, TAMILNADU**

1. INTRODUCTION

The proposed quarry project artificial recharge techniques are prepared for the project proponent, Tmt.M.Sadhana applied for colour granite quarry lease in the Government land falling in S.F.No.366 (Part) over an extent of 1.87.0 ha located in Jagadevipalayam Village, Bargur Taluk, Krishnagiri District and Tamil Nadu. The area lies between Latitudes from 12°28'42.19792"N to 12°28'49.68820"N and Longitudes from 78°21'38.32342"E to 78°21'45.51566"E. The rainwater harvesting techniques is adopted as per the as Dynamic Ground Water Resources of India (2017) of CGWB Regulations. Rainwater harvesting is a simple technique of catching and holding rainwater where its falls. Either, we can store it in tanks or we can use it to recharge groundwater depending upon the situation. The surface which directly receives the rainfall and provides water to the system is called catchment area. It can be a paved area like a terrace or courtyard of a building, or an un paved area like a lawn or open ground. A roof made of reinforced cement concrete (RCC), galvanized iron or corrugated sheets can also be used for water harvesting.

With the increase in demand of water, the water levels are bound to be affected; hence there is an urgent need to conserve the precious ground water resources by adopting rainwater harvesting & artificial recharge to ground water. This will help in maintaining the sustainability of existing tubewells & saving water for future generation. Due to increase in withdrawal of ground water from shallow aquifers than the natural recharge, the water levels in the area are being affected. In view of this there is an urgent need to conserve the precious ground water resources by artificial means adopting rainwater harvesting and artificial recharge to ground water. This will help in maintaining the sustainability of existing tubewells and also reduces the further decline in water levels of the area. In order to design best suitable artificial recharge structures, the proposal has been prepared. The management of project being environment conscious decided to adopt rain water harvesting and utilize the runoff generated due to rainfall for artificial recharge to ground water, by constructing recharge structures in the project area.

2. ESTIMATION OF RAINWATER COLLECTION AND RECHARGE:

The total water requirement for this project will be 3.3 KLD per day. The water will be sourced initially from outside agencies. Later based on the availability of rainfall conditions to collect rainwater

and design Artificial Recharge Structures like recharge pit, percolation pond, mine pit sump will be recommended to manage water management of this proposed project. There is no domestic effluent to be generated from the project. There is no major water seepage within the mine is expected as well as no waste dumps in this quarry. Based on the available information of the surrounding topography and availability of nearby area the garland drainage will be connected to settling tank and sediments will be trapped in the settling tanks and only clear water will be discharged to the green belt development and natural drainage. The geophysical investigations carryout within the lease boundary site suitability of ARS is proposed within the lease area is considered to have poor groundwater potential. The availability of water only secondary fractures in moderate quantity. Hence, ARS structures implemented to store more water in the underground to manage water needs throughout the mining operation. After complete the project the mining pit also acted recharge pit to develop water level in the surrounding area. The advantages of implementation of ARS structures is here under.

- ❖ Reduces urban flooding.
- ❖ Ease in constructing system in less time.
- ❖ Economically cheaper in construction compared to other sources, i.e. dams, diversion, etc.
- ❖ Rainwater harvesting is the ideal situation for those areas where there is inadequate groundwater supply or surface resources.
- ❖ Helps in utilizing the primary source of water and prevent the runoff from going into sewer or storm drains, thereby reducing the load on treatment plants.
- ❖ Recharging water into the aquifers which help in improving the quality of existing groundwater through dilution.

3. MAXIMUM WATER REQUIREMENT OF THE PROJECT:

Table.1. Water Requirement for the Project

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

Maximum man power requirement of the project is = 22 Nos Employee + 5 Nos of daily visitors

(As per the mining plan)

Water requirement of daily mining activity is = 3.3 KLD (Per day requirement) X 270

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(Total No. of working days) X (22 Nos Employee + 5 (No of daily visitors))
 = 891 Cu.m/annum -270 Cu.m /annum (utilized drinking purpose)
 = 621 Cu.m /annum is accessed from water vendors.

4. DETERMINATION OF RECHARGE QUANTITY:

The rooftop surface area is nothing but the catchment area which receives rainfall. Catchment areas of the different buildings are measured. This measurement was done manually with the help of reinforced fiber tape which is the simplest technique known as tape survey. As per Dynamic Ground Water Resources of India (2017) of CGWB Regulations. The colour granite quarry located at Jagadevipalayam Village, Bargur Taluk, Krishnagiri District and Tamil Nadu falls under Semi critical category, and most of the area is underlain by moderate quantity of ground water. Implementation of recharge mechanism shall ensure the balance between the discharge vis-a-vis recharge relationships of the aquifer system and improve in the ground water quality. The normal annual rainfall for the said area is 985 mm. Rain water harvesting structures proposed in the project premises by diverting the runoff that is generated from the rooftops, Paved, unpaved and green areas for recharging into the ground water system. The calculated the rooftop of all the buildings suited inside project, roads, green belt area are given in Table .2.

Table.2 Land use area category of proposed project

Description	Present Area (ha)	Area at the end of life of quarry (ha)
Area under quarry	Nil	1.04.00
Infrastructure	Nil	0.02.00
Roads	Nil	0.04.00
Unutilized	1.87.0	0.03.14
Waste Dump	Nil	0.43.86
Green Belt + Topsoil + Weathered Rock	Nil	0.30.00
Total	1.87.0	1.87.0

At Present about 1.04.00 ha of land is used for quarrying, at present 1.87.0 ha of land is unutilized, Whereas, at the end of the mine life, about 0.03.14 ha of land is unutilized; about 0.30.00 ha of land is used for green belt and 0.04.00 will be used for roads and 0.02.0 is used for infrastructure. The calculated value of recharge components is given in Table.3.

Table.3. Estimation of Quantum of runoff available through Rain water harvesting within the proposed project area

Particulars	Area (Sq.m)	Rainfall (m)	Runoff Coefficient* (Cum/Year)	Quantum of Run off available (Cu.m/Year)
1	2	3	4	5 (2*3*4)
Roof Top of building/Shed/	200	0.985	0.85	167
Road/Paved area	400	0.985	0.65	256
Open Land/Waste Dump	4700	0.985	0.20	926
Green Belt	3000	0.985	0.15	443
Total (sqm)	12068		Total Quantum of available runoff (cum/y)	1792

From the above computation, it is evident that a total quantum nearly of 1792 Cu.m/annum of rain water can be fruitfully harvested annually. The harvested rainwater from the rooftop area = 200 (Sq.m) x 0.985 (m) x 0.85 (R.Co) = 167 Cu.m/annum fully utilized for drinking and domestic purposes through storage tank.

The remaining quantity 1792 Cu.m/annum - 167 Cu.m/annum = 1625 Cu.m/annum used for recommendation of suitable recharge structures in the proposed project area.

5. IMPLEMENTATION RECHARGE STRUCTURES:

Rainwater Harvested can also be used for charging the groundwater aquifers through suitable structures like dug wells, borewells, recharge trenches and recharge pits. Various recharge structures are possible - some which promote the percolation of water through soil strata at shallower depth (e.g., recharge trenches, permeable pavements) whereas others conduct water to greater depths from where it joins the groundwater. At many locations, existing structures like dug wells, pits and tanks can be modified as recharge structures and also possible effective recharge structures constructed availability

of topography conditions need to construct any fresh structures. Some of the few commonly used recharging methods are recharging of dug wells and abandoned bore wells and availability empty land recommended percolation pond/pit, recharge troughs, recharge trenches, excess of runoff diverted in to nearest nallas and ponds in the down flow direction.

6. RAINWATER HARVESTING MEASURES

Following methods shall carry out the rainwater harvesting:

1. Roof top & paved area rainwater harvesting through existing bore wells as well as recharge pit of the proposed project area.
2. Natural groundwater recharge through adjacent to the streams / Pond etc.,

6.1. Rooftop Rainwater Runoff

The industrial roofs are of RCC finished with cement sand mortar. Most of the water can be collected with roof drains hence 85% rainwater can be available. About 15% of water is lost in evaporation etc. The water is collected through rainwater drains from rooftop. The roof should be finished to avoid percolation and should be cleaned every year before rains. The roof top rainwater & surface runoff rainwater shall be collected through existing rainwater drains.

6.2. Surface Runoff of Rainwater

The subsurface reservoirs are technically feasible alternative for storing surplus monsoon runoff. Wide spectrums of techniques are in vogue to recharge ground water reservoir. The artificial recharge techniques vary widely depending upon hydro geological studies of the area.

The maximum rate at which water can enter the soil at particular point depends upon infiltration capacity. The infiltration capacity depends upon soil type, moisture content, organic matter, vegetative cover, season, air entrapment, etc. The infiltration and percolation capacity are closely related. The infiltration takes place due to gravity but capillary force divert gravity water. The infiltration capacity of land formation is not suitable for surface percolation system hence for recharge of ground water reservoir through injection well system has been implemented. This system has improve both quality & quantity of water.

Runoff coefficient for rooftop area can be taken as 85%. Similarly, for cemented area it has been taken as 65%, for open land it can be taken as 20% and for green belt is taken as 15%.

Average runoff coefficient taken for the area is as under:

- | | |
|--|-------|
| 1. Average runoff coefficient for rooftop | = 85% |
| 2. Average runoff coefficient for Paved area | = 65% |
| 3. Average runoff coefficient for open land (alluvium) | = 20% |
| 4. Average runoff coefficient for green belt | = 15% |

7. ROOF TOP RAINWATER RUNOFF

The Industrial area has different buildings with RCC and V shaped roof to collect water from flat RCC roof drain pipes has been constructed. These drain pipes are connected to main rainwater collection pipes, provided with collection chambers. In case of V shaped roof rainwater is collected through gutters attached at the end of the roof and these gutters are connected to rainwater pipes. Total rainwater thus available is being diverted to recharge tube in storage tank through PVC pipes and passing through the filter pit. This stored water in storage tank managed throughout the year for drinking purposes and domestic purposes.

Average Rainwater Runoff Availability:

$$= A \times R_f \times A_v R_c$$

Where,

A = Roof top area 200 Sq.m.

R_f = Rainfall = 0.985 m. (Average)

Average rainwater runoff available

$$= 200 \text{ (Sq.m)} \times 0.985 \text{ (m)} \times 0.85$$

$$= \mathbf{167 \text{ Cu.m. ----- (A)}}$$

8. BLACK TOPPED ROADS AND CEMENTED AREA

The project area has approach roads from entry gate to different buildings. The said roads are 8m, 6m, and 2m wide. The project area also has parking and other cemented portion. Slope of these cemented area and roads are maintained in such a way that the available runoff should move towards the open drains and this water is to be taken to the recharge tube wells. Total road and cemented area is about 400 sq.m. Taking 65% as runoff coefficient for paved area, the availability of water has been worked out as under

Average Rainwater Runoff Available from Paved Area:

$$= A \times R_f \times A_v R_c$$

Where,

A = Total Paved area = 400 Sq.m.

R_f = Rainfall = 0.985 m. (Average)

Average rainwater runoff available

$$= 400 \text{ (Sq.m)} \times 0.981 \text{ (m)} \times 0.65$$

$$= \mathbf{256 \text{ Cu.m. ----- (B)}}$$

9. OPEN LAND

The total area of proposed project area is 8300 Sq.m. Out of which rooftop area is 200 Sq.m., paved area is 400 Sq.m. & green belt area is 3000 Sq.m. Balance open land area is 4700 Sq. m. Taking 20% as natural recharge coefficient for surrounding sandy loam area the expected recharge to underground aquifers is:

$$= 4700 \text{ (Sq.m)} \times 0.985 \text{ (m)} \times 0.20$$

$$= \mathbf{926 \text{ Cu.m. ----- (C)}}$$

10. GREEN BELT AREA

The total area of proposed project area is 12068 Sq.m. Out of which rooftop area is 200 Sq.m., paved area is 400 Sq.m. & green belt area is 2523 Sq.m. Balance open land area is 8945 Sq. m. Taking 15% as natural recharge coefficient for surrounding sandy loam area the expected recharge to underground aquifers is:

$$= 3000 \text{ (Sq.m)} \times 0.985 \text{ (m)} \times 0.15$$

$$= \mathbf{443 \text{ Cu.m. ----- (D)}}$$

Parks and gardens are abstracting huge quantity of groundwater for watering purpose and thus it should start harvesting rain water which would increase groundwater level.

11. TOTAL RAINWATER RECHARGE

$$= (B) + (C) + (D)$$

$$= 256 + 926 + 443$$

$$= \mathbf{1625 \text{ Cu.m. ----- (E)}}$$

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Availability of all types of rooftop rainwater in the proposed area is fully utilized daily usage purposes, The storage tank, one of the easiest and most effective means of harvesting rainwater, are generally not more than 12 m length x 5 m width x 4 m depth tank capacity is 240 Cu.m capacity of underground storage tank constructed reused for daily drinking purposes. During the rainy seasons this tank is filled rainwater filtered through settling tank. Artificial storage structure (drinking water storage tank) recommended for this project site is shown in Fig.1.

12. RAINWATER RECHARGE OUTSIDE THE PROPOSED LEASE AREA:

Three numbers of percolation recharge pit 10 m length x 10 m width x 4 m depth (400 x 3 = 1200 Cu.m/annum) recommended three different locations within 2 Km radius of the proposed project. Through this artificial recharge structures rainwater collected and recharged in to the ground. Rainwater collected during the rainy seasons filtered through settling tank recharged specially designed recharge structure make it layout using pebbles or brick jelly and river sand covered properly below the recharge pit. It is enable to effective recharge during the rainfall seasons. The effective recharge of the newly proposed three recharge pit capacity is 1200 Cu.m x 0.4 runoff coefficient x 4 depth =1920 Cu.m/annum of rainwater recharged in to the ground. The designed recharge pit and cross section view is shown Fig.2.

Available rainwater quantity to recharge = **1625 Cu.m/annum** -

Recharge pit Capacity is = **1920 Cu.m/annum**

295 Cu.m/annum is excess recharge capacity pit available to manage additional rainfall recharge. The recommended recharge pit in three different suitable recharge site locations and also open land/Lake/Pond recharge site of the buffer zone area is given in Table.4 and Google image Fig.3.

Table.4. Recommended recharge pit and open land/Lake outside the lease area

S.No	Name of the ARS	Latitude/Longitude	Capacity of Recharge Pit	Distance and Direction
1	Recharge Pit -I	12°28'38.12"N	10 m x 10 m x 4 m = 400 cu.m/annum	South
		78°21'41.58"E		0.16 Km
	Recharge Pit -II	12°28'39.52"N	10 m x 10 m x 4 m	Southeast

2		78°21'50.13"E	= 400 cu.m/annum	0.16 Km
3	Recharge Pit -III	12°28'45.06"N	10 m x 10 m x 4 m	East
		78°21'51.83"E	= 400 cu.m/annum	0.27 Km
Total			= 1200 cu.m/annum	-
Quantum of Recharge =1200 Cu.m x 0.4 runoff coefficient x 4 depth			= 1920 cu.m/annum	-

13. PIT WATER MANAGEMENT

This is newly proposed colour granite quarry there is no existing pit in this project. The rainwater collected from rooftop area directly stored in to the storage tank and used throughout year for the drinking and domestic purposes. The open land, green belt and other area water recharged through recharge pits during the rainfall seasons. The excess of rainwater filtered through settling tank and diverted to surrounding formers for agricultural usage.

14. OPEN LAND/LAKE/POND RECHARGE:

Mattur River, Bargur River and Kumaranganapalli Lakes are the three prominent surface water resources present in the study area. These are ephemeral in nature, which convey water only after rainfall events. As pert the surface and ground water movement towards southeastern and eastern part of the proposed project. The recharge possibility through recharge pit and open land/pond/lake. The area of the pond/Lake is located SSW, E and NE direction. Hence the excess of rainwater diverted nearby streams lakes and ponds.

15. TOTAL RECHARGE BY THE PROPOSED PROJECT:

Total extraction of groundwater 891 Cu.m/annum this water is fully utilized for drinking and domestic purposes. The total recharge through this project is 1625 Cu.m/annum - 891 Cu.m/annum (Extracted from ground) = 734 Cu.m/annum quantity recommended through recharge pit in 2Km radius of the this project area.

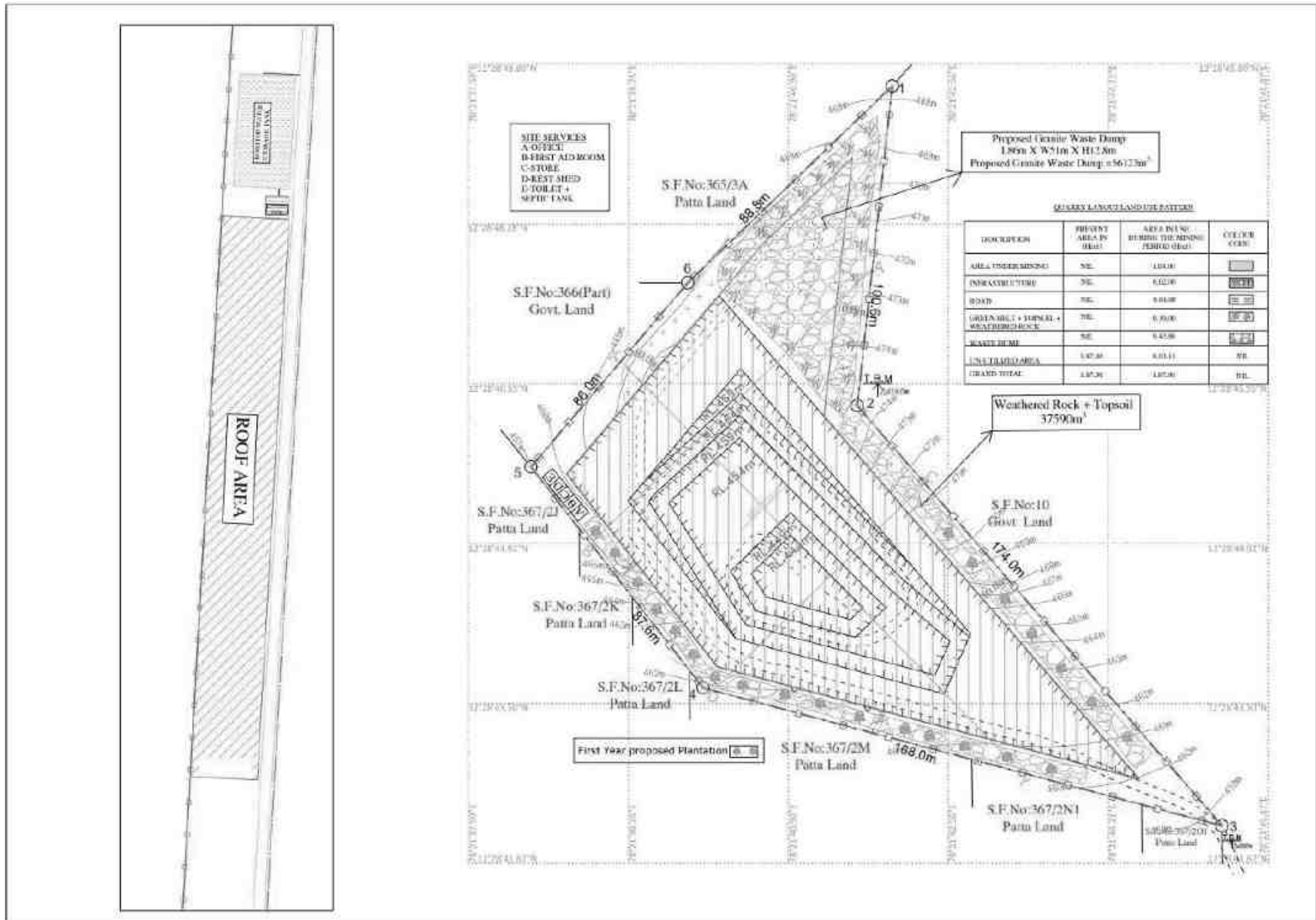


Fig.1 Artificial recharge structure (drinking water storage tank) recommended for the proposed project site.

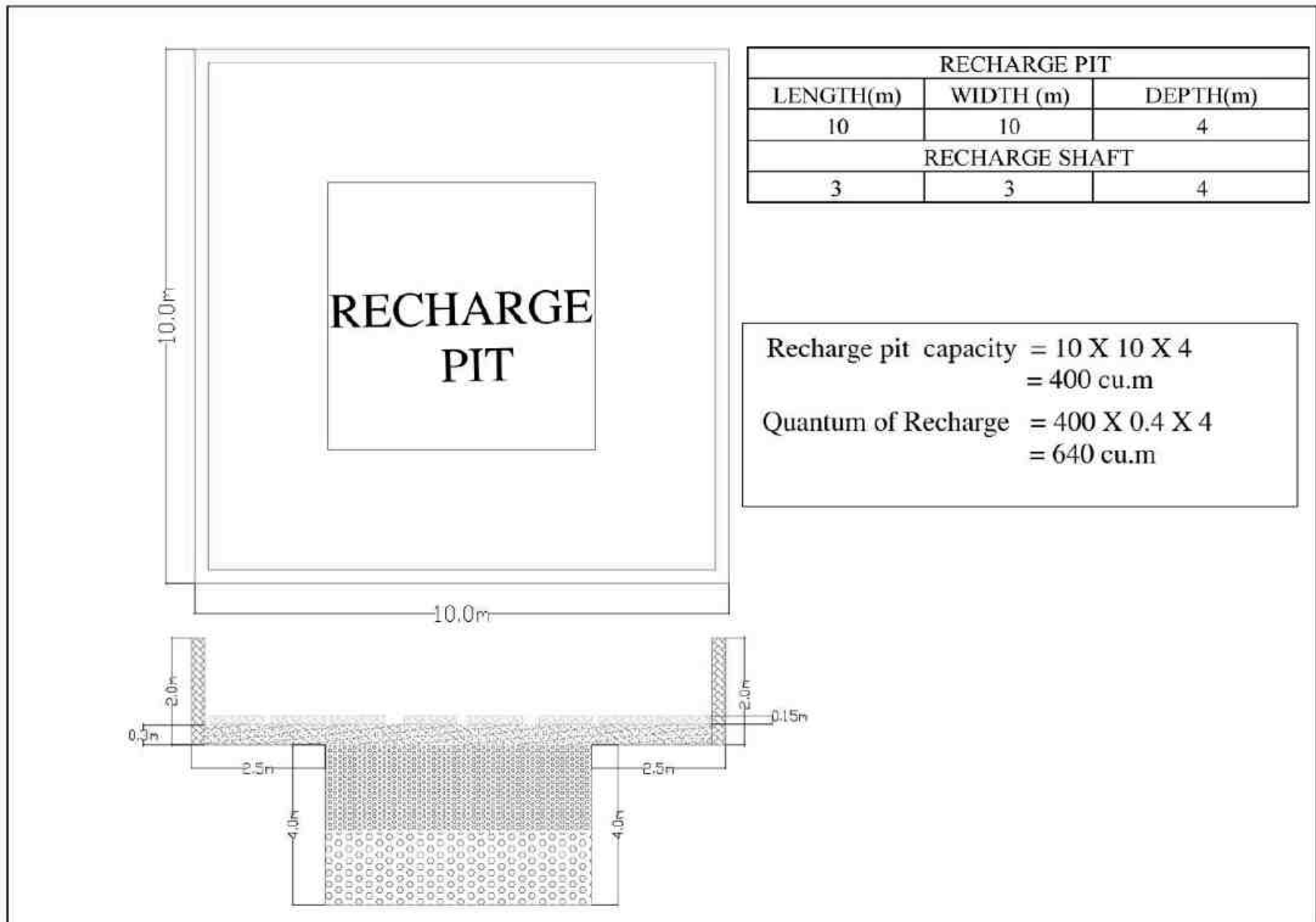


Fig.2 Recommended recharge pit dimension and cross section view of the recharge structures

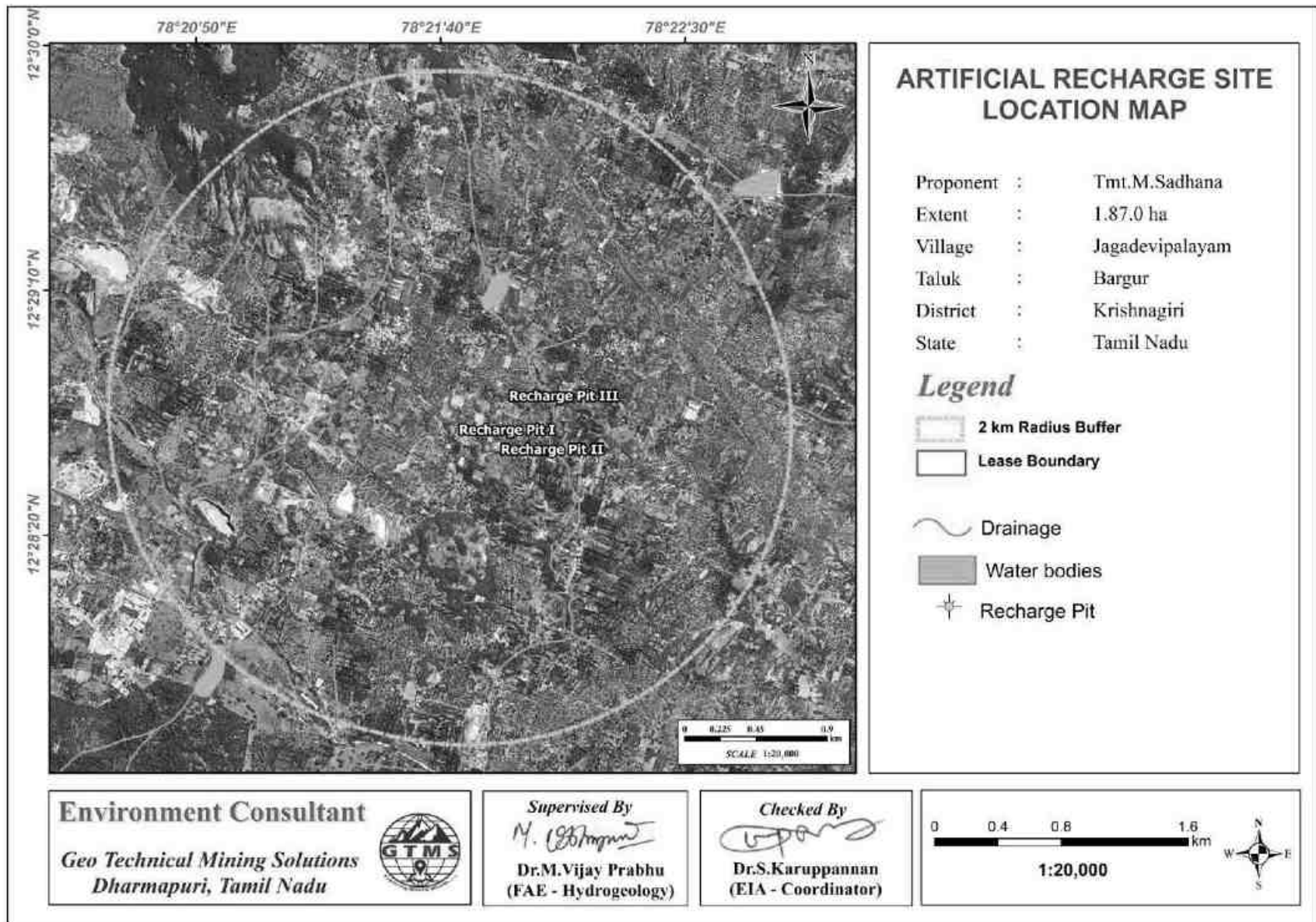


Fig.3 Google image showing recommended artificial recharge pit and open land/Lake locations around the proposed project

Conclusion:

- ❖ Ground water extraction due this proposed project is only 3.3 KLD per day of ground water. Which is negligible when compared with the draft due to irrigation or other domestic use of the buffer zone.
- ❖ The study area mainly comprises of colour granite constitutes 80 % of the total lease area. The average annual rainfall is recorded in the year 2023 is 985 mm.
- ❖ Ground water in and around the study area occurs under semi confined and confined conditions. The movement of ground water is mainly controlled by secondary fracture of intermediate to deeper level.
- ❖ Total gross dynamic reserves calculated from rooftop area, paved area and green belt area is = 891Cu.m/annum - Rain water collected 200 sq.m x 0.985 m x 0.85 is =167 Cu.m/annum of rainwater utilized drinking and domestic purpose.
- ❖ This mining activity extraction of groundwater 891 Cu.m/annum from the subsurface its is fully utilized for drinking and domestic purposes.
- ❖ Three numbers of recharge pit recommended capacity is (640 Cu.m/annum x 3=1920 Cu.m/annum - 167 Cu.m/annum used for drinking and domestic purpose) = 1625 Cu.m/annum is recommended for recharge.
- ❖ This is newly proposed colour granite quarry there is no existing pit in this area. The total recharge through this project is 1625 Cu.m/annum - 891 Cu.m/annum (Extracted from ground) = 734 Cu.m/annum excess of rainfall quantity recommended recharge pits in 2Km radius of this project area.
- ❖ Moreover, project area has implemented above said methods rainwater-harvesting measures, to mitigate any negative impact if any.



National Accreditation Board for Education and Training



Certificate of Accreditation

Geo Technical Mining Solutions

1/213B, Natesan Complex, Dharmapuri Salem Main Road, Oddapatti, Collectorate post office,
Dharmapuri, Tamil Nadu-636705

The organization is accredited as **Category-A** under the QCI-NABET Scheme for Accreditation of EIA Consultant Organization, Version 3: for preparing EIA-EMP reports in the following Sectors –

S. No	Sector Description	Sector (as per)		Cat.
		NABET	MoEFCC	
1	Mining of minerals including opencast/ underground mining	1	1 (a) (i)	B

Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in SAAC minutes dated September 13, 2022 posted on QCI-NABET website.

The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in QCI-NABET's letter of accreditation bearing no. QCI/NABET/ENV/ACO/23/2641 dated January 19, 2023. The accreditation needs to be renewed before the expiry date by Geo Technical Mining Solutions following due process of assessment.

Sr. Director, NABET
Dated: January 19, 2023

Certificate No.
NABET/EIA/2124/SA 0184

Valid up to
Dec 31, 2023

For the updated List of Accredited EIA Consultant Organizations with approved Sectors please refer to QCI-NABET website.