

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

**Environmental Clearance under EIA Notification – 2006**

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

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

**CLUSTER EXTENT = 11.20.0 hectares**

**ROUGHSTONE AND GRAVEL QUARRY**

**At**

**Vettamangalam West Village, Pugalur Taluk, Karur District,**

**Tamil Nadu State**

ToR Letter No. SEIAA-TN/F.No.9797/SEAC/ToR-1469/2023 Dated:31.05.2023.

**NAME AND ADDRESS OF THE PROPOSED PROJECT PROPONENT**

<b>Name and Address</b>	<b>Extent &amp; S.F.No.</b>
M/s.Thirumalai Blue Metals No.538/4, Pulankad, Kuppam Post, Pugalur Taluk, Karur District-639111.	2.97.0 ha & S.F.No.1238/2 (Part)

**ENVIRONMENTAL CONSULTANT**

**GEO TECHNICAL MINING SOLUTIONS**

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

Valid till: Dec 31, 2023



**ENVIRONMENTAL LAB**

**Excellence Laboratory**

**October through December, 2022**

## **TERMS OF REFERENCE (ToR) COMPLIANCE**

**ToR issued vide Lr No. SEIAA-TN/F.No.9797/SEAC/ToR-1469/2023 dated 31.05.2023**

**for M/s. Thirumalai Blue Metals Rough stone & gravel Quarry**

<b>REMARKS FROM SEAC</b>		
1	The PP shall prepare and to submit the Modified Mining Plan with the revised production & development approved by the concerned AD (Mines) which is oriented to accommodate the restriction of the ultimate depth of mining from 55m to 50m considering the safety and environmental issues at the time of EIA appraisal.	The details of the modified mining plan is attached in the Annexure III.
2	The original letter of approval obtained for the modified Mining Plan prepared for the mine shall be furnished during the EIA appraisal.	The modified mining plan and approved mining plan letter is attached in the Annexure III.
3	PP shall furnish the registered consent document obtained from the pattadhars for mine lease area.	The consent document of the mine lease area is attached in the Annexure III
4	In the case of proposal 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 carry out a 'Slope Stability Assessment' studies for the existing conditions of the quarry wall by involving any of the reputed Research and Academic Institutions- CSIR-Central Institute of Mining & Fuel Research (CIMFR) / Dhanbad, NIRM – Bengaluru, IIT-Madras, NIT Surathkal- Dept of Mining Engg and Anna	The details regarding will be given in the final EIA report.

	University Chennai-CEG Campus, Chennai. The above studies shall spell out the 'Action Plan' for carrying out the realignment of the benches and quarrying operations in a safe & sustainable manner in the proposed quarry lease.	
5	The structures within the radius of 50 m, 100 m, 200 m, 300 m shall be enumerated with details such as dwelling houses with number of occupants, whether it belongs to the owner or not, places of worship, industries, factories, sheds etc.	The report about the structures within the radius of 50 m, 100 m, 200 m, 300 m will be attached with final EIA report.
6	The PP shall carry out all the required activities as stipulated in the certified compliance for the previous EC obtained and it shall be enumerated with photo & video evidences during the time of EIA appraisal.	The details regarding certified compliance will be given in the final EIA report.
7	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.68-91.
8	The proponent shall furnish photographs of adequate fencing, green belt along the periphery including replantation of existing trees & safety distance between the adjacent quarries & water bodies nearby provided as per the approved mining plan.	Photographs showing green belt, fencing will be included in the p.192.

9	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.	Slope stability report will be included in final EIA report.
10	The PP shall furnish the affidavit stating that the blasting operation in the proposed quarry is carried out by the statutory competent person as per the MMR 1961 such as blaster, mining mate, mine foreman, II/I Class mines manager appointed by the proponent.	The affidavit for blasting has been enclosed in the Annexure III
11	The PP shall present a conceptual design for carrying out only controlled blasting operation involving line drilling and muffle blasting in the proposed quarry such that the blast-induced ground vibrations are controlled as well as no fly rock travel beyond 30 m from the blast site.	A conceptual design of blasting has been given in Section 2.6 under Chapter II, pp.20-28.



12	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 document containing video and photographic evidences will be submitted in the final EIA report.
13	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?	The documents are enclosed in the mining plan, Annexure III.
	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.	
14	All corner coordinates of the mine lease area. superimposed on a High-Resolution Imagery/Toposheet, topographic sheet, geomorphology, lithology and geology of		All corner coordinates of the mine lease area have been superimposed on a high-resolution Google Earth Image, as shown in

	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).	Figure 2.3, under Chapter II, p-13.
15	The PP shall carry out Drone video survey covering the cluster, green belt, fencing etc.,	Drone video coverage will be submitted in the final EIA report.
16	The PP shall furnish the revised manpower including the statutory & competent persons as required under-the provisions of the MMR 1961 for the proposed quarry based on the volume of rock handled & area of excavation.	Details of manpower required for this project have been given in Table 2.14 under Chapter II, p.28.
17	The proponent shall furnish photographs of adequate fencing, green belt along the periphery including replantation of existing trees & safety distance between the adjacent quarries & water bodies nearby provided as per the approved mining plan.	Photographs of adequate fencing, green belt of the project is included in the Section 4.6 under Chapter IV, pp.120-127.
18	The Project Proponent shall provide the details of mineral reserves and mineable reserves, planned production capacity, proposed working methodology with justifications, the anticipated impacts of the mining operations on the surrounding environment and the remedial measures for the same.	The mineral reserves of the project have been discussed in Section 2.5 under Chapter II, pp.16-19 The anticipated impact of mining on land, air, noise, water, soil, biology, and socio economy is discussed under Chapter IV, pp.102-131.
19	The Project Proponent shall provide the Organization chart indicating the appointment of various statutory officials and other competent persons to be	Employment details of the proposed project are provided in Table 2.14 under Chapter II, p.28.

	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.	
20	The Project Proponent shall conduct the hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) along with the collected water level data for both monsoon and non-monsoon seasons from the PWD/ TWAD so as to assess the impacts on the wells due to mining activity. Based on actual monitored data, it may clearly – be shown whether working will intersect groundwater, Necessary data and documentation in this regard may be provided.	Detailed hydrogeological study was carried out. The results have been discussed Section 3.2 under Chapter III, pp.40-52.
21	The proponent shall furnish the baseline data for the environmental and ecological parameters with regard to surface water/ground water quality, air quality, soil quality & flora/fauna including traffic/vehicular movement study.	The baseline data were collected for the environmental components including land, soil, water, air, noise, biology, socio-economy, and traffic and the results have been discussed under Chapter III, pp. 34-101.
22	The Proponent shall carry out the Cumulative impact study due to mining operations carried out in the quarry specifically with reference to the specific	Results of cumulative impact study due to mining operations are given in Section 7.4 under Chapter VII, pp.145-146.

	environment in terms of soil health, biodiversity, air pollution, water pollution, climate change and flood control & health impacts. Accordingly, the Environment Management plan should be prepared keeping the concerned quarry and the surrounding habitations in the mind.	
23	Rain water harvesting management with recharging details along with water balance (both monsoon & non-monsoon) be submitted.	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.
24	Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.	Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features has been discussed in Section 3.1, pp.30-39 under Chapter III. The details of surrounding sensitive ecological features are provided in Table 3.40 under Chapter III, p.99.  Land use plan of the project area showing pre-operational, operational and post-operational phases are discussed in Table 2.8 under Chapter II, p.23.
25	Details of the land for storage of Overburden/Waste Dumps (or) Rejects outside the mine lease. such as extent of	Not Applicable.  No dumps have been proposed outside the lease area.

	land area, distance from mine lease' its land use, R&R issues. If any, should be provided.	
26	Proximity to Areas declared as 'Critically Polluted' (or) the Project areas which attracts the court restrictions for mining operations, should also be indicated and where so required' clearance certifications from the prescribed Authorities, such as the TNPCB (or) Dept. of Geology and Mining should be secured and furnished to the effect that the proposed mining activities could be considered.	Not Applicable.  This project area is involved in the production of rough stone and gravel materials as per the approved mine plan.
27	Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.	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.
28	Impact on local transport infrastructure due to the Project should be indicated.	Impact on local traffic due to the project is within the permissible limit. Details are provided in Section 3.7, pp.96-98.
29	A tree survey study shall be carried out (nos., name of the species, age, diameter etc,) both within the mining lease applied area & 300m buffer zone and its management during mining activity.	A detailed tree survey was carried out within 300 m radius and the results have been discussed in Section 3.5 under Chapter III, pp.68-91.
30	A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-	A progressive mine closure plan has been attached with the approved mining plan report in Annexure III. The budget details

	specific.	for the progressive mine closure plan are shown in Table 2.9 under Chapter II, p.23.
31	Public Hearing points raised and commitments of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project and to be submitted to SEIAA/SEAC with regard to the Office Memorandum of MoEF & CC accordingly.	The comments made in public hearing meeting will be updated in the final EIA report after public hearing meeting.
32	The Public hearing advertisement shall be published in one major National daily and one most circulated vernacular daily.	Details of advertisement will be updated in the final EIA report.
33	The PP shall produce/display the EIA report, Executive summary and other related information with respect to public hearing in Tamil Language also.	The Tamil version of EIA report, executive summary and other related information will be incorporated in this report.
34	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.
35	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	A detailed Greenbelt Development Plan dealing with carbon sequestration has been provided in Section 4.6 under Chapter IV, pp.120-127.

	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.	
36	Taller/one year old saplings raised in appropriate size of bags; preferably eco-friendly bags should be planted as per the advice of local forest authorities/botanist/Horticulturist with regard to site specific choices. The proponent shall earmark the greenbelt area with GPS coordinates all along the boundary of the project site with at least 3 meters wide and in between blocks in an organized manner	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. Saplings used for greenbelt development have been shown in Section 4.6 under Chapter IV, pp.120-127.
37	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.	The details about disaster management Plan have been provided in Section 7.3 under Chapter VII, pp.141-144.
38	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.	The details about risk assessment and management plan have been provided in Section 7.2 under Chapter VII, pp.138-140.
39	Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement	Occupational health impacts of the project and preventive measures have been discussed in detail in Section 4.8 under Chapter IV, pp.128 & 129.

	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.	
40	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.153 & 154.
41	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 16 people directly and 8 people indirectly as discussed in Section 8.1 and 8.2 under Chapter VIII, p.152.
42	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.
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.152-154.
44	If any quarrying operation were carried	CCR will be submitted during appraisal of



	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.	final EIA.
45	The PP shall prepare the EMP for entire life of mine and also furnish the sworn affidavit stating to abide the EMP for the entire life of mine.	A detailed EMP is provided in Table 10.9 & 10.10 under Chapter X, pp.167-173
46	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.
<b>Discussion by SEIAA and the Remarks:</b>		
	The subject was placed in the 624 <sup>th</sup> Authority meeting held on 31.05.2023. The Authority noted that the subject was appraised in the 377 <sup>th</sup> SEAC meeting held on 10.05.2023. After detailed discussions, the Authority accepts the recommendation of SEAC and decided to grant Terms of Reference (ToR) along with Public Hearing under cluster for undertaking the combined Environment Impact Assessment Study and preparation of separate Environment Management Plan subject to the conditions as recommended by SEAC & normal conditions and conditions in Annexure 'B' of this minutes in addition to the following conditions.	
1	The PP shall prepare and to submit the Modified Mining Plan with the revised production & development approved by	The modified mining plan is attached in the Annexure III.

	the concerned AD (Mines) which is oriented to accommodate the restriction of the ultimate depth of mining from 55m to 45m considering the safety and environmental issues, at the time of EIA appraisal.	
<b>Annexure 'B'</b>		
	<b>Cluster Management Committee</b>	
1	Cluster Management Committee shall be framed which must include all the proponents in the cluster as members including the existing as well as proposed quarry.	A cluster management committee including all the proponents of the rough stone quarrying projects within the cluster of 500 m radius will be constituted for the effective implementation of green belt development plan, water sprinkling, blasting, etc.
2	The members must coordinate among themselves for the effective implementation of EMP as committed including Green Belt Development Water sprinkling, tree plantation, blasting etc.,	The members of the cluster management committee will be instructed to carry out EMP in coordination.
3	The List of members of the committee formed shall be submitted to AD/Mines before the execution of mining lease and the same shall be updated every year to the AD/Mines.	The list of members of the committee formed will be submitted to AD/Mines before the execution of mining lease.
4	Detailed Operational Plan must be submitted which must include the blasting frequency with respect to the nearby quarry situated in the cluster, the usage of haul roads by the individual quarry in the form of route map and network.	All the information has been discussed in Section 2.6 & 2.7 under Chapter II, pp.20-28.
5	The committee shall deliberate on risk	It will be informed to the committee.

	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.	The cluster management will be advised 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	The committee will submit the fire safety and evacuation plan as discussed in Section

	fire accidents.	7.3 under Chapter VII, pp.141-144.
<b>Impact Study of mining</b>		
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.
<b>Agriculture &amp; Agro-Biodiversity</b>		
13	Impact on surrounding agricultural fields around the proposed mining area.	As the proposed lease area is dominantly surrounded by mining land, barren land, and fallow land, the impact on the surrounding agricultural fields if present will be low.

		With proper mitigation measures, the project will be carried out to reduce the impact further to the level of negligence.
14	Impact on soil flora & vegetation around the project site.	Impact of the project on the ecology and biodiversity has been discussed in Section 4.2 and Section 4.6 under Chapter IV, pp.103-104 and pp.120 - 127
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.68-91. Details about transplantation of plants have been provided in Section 4.6 under Chapter IV, pp.120-127.
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.68-91and measures have been provided in Section 4.6 under Chapter IV, pp.120-127.
17	Action should specifically suggest for sustainable management of the area and restoration of ecosystem for flow of goods and services.	The FAE of ecology and biodiversity has advised the project proponent that replantation work, particularly for the project area where plants of 4 years old exist should be carried out in the vacant areas available.
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.102 & 103.
<b>Forests</b>		

19	The project proponent shall study on impact of mining on Reserve forests free ranging wildlife.	The impacts of the proposed project on the surrounding environment have discussed in Chapter IV, pp.102-131.
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.120-127
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.120-127
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 3.40 under Chapter III, p.99.

#### **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	A detailed hydrogeological study was carried out. The results have been discussed in Section 3.2 under Chapter III, pp.40-52.
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	provided, covering the entire mine lease period.	
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.104 & 105.
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.	A detailed study was carried out regarding the impact of mining on the environment. The results have been included in Chapter IV, pp.102-131.
26	The project proponent shall study impact on fish habitats and the food WEB/food chain in the water body and Reservoir.	As there are no water bodies near to the proposed project site during study period, a study about the impact of mining on fish habitats was not conducted.
27	The project proponent shall study and furnish the details on potential fragmentation impact on natural environment, by the activities.	The impacts of the proposed project on the surrounding environment have discussed in Chapter IV, pp. 102-131.
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.120-127
29.	The Terms of Reference should specifically study impact on soil health, soil erosion, the soil physical, chemical components.	The impact of mining on soil environment has been discussed in Section 4.2 under Chapter IV, pp.103-104.
30	The Environmental Impact Assessment should study on wetlands, water bodies,	The impacts on water bodies, streams, lakes have been discussed in Section 4.3 under

	rivers streams, lakes and farmer sites.	Chapter IV, pp.104 & 105.
<b>Energy</b>		
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. 102-131.
<b>Climate Change</b>		
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.	Greenbelt development plan as discussed in Section 4.6 under Chapter IV, pp.120-127, has been designed to reduce the impact of carbon emission on the environment.
33	The Environmental Impact Assessment should study impact on climate change, temperature rise, pollution and above soil & below soil carbon stock.	The information will be included in the final EIA report.
<b>Mine Closure Plan</b>		
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 mine closure are shown in Table 2.9 under Chapter II, p.23.
<b>EMP</b>		
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.156-173.



36	The Environmental Impact Assessment should hold detailed study on EMP with budget for green belt development and mine closure plan including disaster management plan.	A detailed Environment Management plan has been given in Tables 10.9 & 10.10 under Chapter X, pp.167-173.
<b>Risk Assessment</b>		
37	To furnish risk assessment and management plan including anticipated vulnerabilities during operational and post operational phases of Mining.	The risk assessment and management plan for this project has been provided in Section 7.2 under Chapter VII, pp.138-140.
<b>Disaster Management Plan</b>		
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.	A detailed Environment Management Plan has been given under Chapter X, pp.156-173.
<b>Others</b>		
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 provided 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 response to comments will be given in final EIA report.
41	The project proponent shall study and furnish the possible pollution due to plastic and microplastic on the environment. The ecological risks and impacts of plastic & microplastics on aquatic environment and fresh water systems due to activities, contemplated during mining may be investigated and reported.	The matter on plastic waste management has been given in Section 7.5 under Chapter VII, pp.148 – 149.
<b>STANDARD TERMS OF REFERENCE</b>		
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 patta land. A copy of the ownership document has been enclosed along with the approved mining plan in Annexure III
3.	All documents including approved mine	The following will approve mine plan, EIA

	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.	and public hearing will submitted in the final EIA report.
4.	All corner coordinates of the mine lease area, superimposed on a High-Resolution Imagery/ toposheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).	All corner coordinates of the mine lease area have been superimposed on a high-resolution Google Earth Image, as shown in Figure 2.4, 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.	The baseline data sampling locations for all the environmental components are shown in Survey of India Toposheet under Chapter III
6.	Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority.	The lease applied 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	The proponent has framed Environmental Policy and the same has been discussed in Section 10.1 under Chapter X, pp.156 & 157.

	<p>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.</p>	
8.	<p>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.</p>	<p>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<sup>0</sup> 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.</p>
9.	<p>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</p>	<p>All the data contained in the EIA report such as waste generation etc., is for the life of the mine / lease period.</p>

	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.	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.30-39. Land use plan of the project area showing pre-operational, operational and post-operational phases are discussed in Table 2.8 under Chapter II, p.23.
11.	Details of the land for any over burden dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given	Not Applicable. There is no waste anticipated during this quarry operation. The entire quarried out rough stone will be transported to the need customers. Hence, no dumps are proposed outside the lease area.
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	Not Applicable. There is no forest land involved within the proposed project area and the proposed project area is a patta land.

	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.	Not Applicable.  There are neither forests nor forest dwellers/forest dependent communities in the mine lease area. There is no forest impacted families (PF) or people (PP). Thus, the rights of Traditional Forest Dwellers will not be compromised on account of the project.
14.	Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.	Not Applicable.  The project doesn't attract Recognition of Forest Rights Act, 2006 as there are neither forests nor forest dwellers / forest dependent communities in the mine lease area. There shall be no forest impacted families (PF) or people (PP). Thus, the rights of Traditional Forest Dwellers will not be compromised on account of the project.
15.	The vegetation in the RF / PF areas in the study area, with necessary details, should be given.	There are no reserved forest in 10km radius.
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.	A study was done on wildlife within the study area, as shown in Section 3.5 under Chapter III, pp.68-91. The impact on wild life has been discussed in Section 4.6 under Chapter IV, pp.120-127
17.	Location of National Parks, Sanctuaries,	Information regarding the same has been

	<p>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</p>	<p>given in Table 3.40 under Chapter III, p.99.</p>
18.	<p>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.</p>	<p>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.68-91. 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.</p>

19.	Proximity to Areas declared as 'Critically Polluted' or the Project areas likely to come under the 'Aravalli Range', (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Department should be secured and furnished to the effect that the proposed mining activities could be considered.	Not Applicable.  Project area / Study area is not declared in 'Critically Polluted' Area and does not come under 'Aravalli Range.
20.	Similarly, for coastal Projects, A CRZ map duly authenticated by one of the authorized agencies demarcating LTL. HTL, CRZ area, location of the mine lease w.r.t CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority).	Not Applicable  The project doesn't attract the C.R.Z. Notification, 2018.
21.	R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need-based sample survey, family-wise, should be undertaken to assess their requirements, and action programmes prepared and	Not Applicable.  There are no approved habitations within a radius of 300 meters. Therefore, R&R plan / compensation details for the Project Affected People (PAP) is not anticipated.



	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.	Baseline data were collected for the period of October –December 2022, as per CPCB notification and MoEF & CC Guidelines. Primary baseline data and the results have been included in Sections 3.1-3.7 under Chapter III, pp. 30-98.
23.	Air quality modelling should be carried	Air quality modelling for prediction of

	<p>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>incremental GLCs of pollutants was carried out using AERMOD view. The model results have been given in Section 4.4 under the Chapter IV, pp.105-115.</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 2.11 under Chapter II, p.27.</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.</p> <p>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.</p>
26.	<p>Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the</p>	<p>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</p>

	Project, if any, should be provided.	<p>suppression.</p> <p>The mine closure plan will be prepared for converting the excavated pit into rain water harvesting structure and serve as water reservoir for the project village during draught season.</p>
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 were conducted and the results have been discussed in Section 4.3, under the Chapter IV, pp. 104 & 105.
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.	<p>Not Applicable.</p> <p>The ground water table is found at the depth of 60 m below ground level. The ultimate depth of quarry is 45 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.40-52.</p>
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	<p>Not Applicable.</p> <p>There are no streams, seasonal or other water bodies passing within the project area. Therefore, no modification or diversion of</p>

	hydrology should be brought out.	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 161 m AMSL. Ultimate depth of the mine is 45 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.	A detailed Greenbelt Development Plan has been provided in Tables 4.14 and 4.15 in Section 4.6 under Chapter IV, pp.120-127.
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,	Traffic density survey was carried out to analyse the impact of transportation in the study area as per IRC guidelines 1961 and it is inferred that there is no significant impact due to the proposed transportation from the project area. Details have been provided in

	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.	Section 3.7 under Chapter III, pp.96-98.
33.	Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.	Infrastructure & other facilities will be provided to the mine workers after the grant of quarry lease and the same has been discussed in Section 2.6 under Chapter II, p.20-28.
34.	Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report.	Progressive mine closure plan has been prepared for this project and is given in Section 2.6 under Chapter II, p.20-28.
35.	Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.	Occupational health impacts of the project and preventive measures have been explained in detail in Section 4.8 under Chapter IV, pp.128 & 129.
36.	Public health implications of the Project and related activities for the population in	No public health implications are anticipated due to this project. Details of

	the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.	CSR and CER activities have been discussed in Sections 8.6 and 8.7 under Chapter VIII, pp.153 & 154.
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 16 people directly and 8 people indirectly, as discussed in Section 8.1 under Chapter VIII, p.152.
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.	Detailed environment management plan for the project to mitigate the anticipated impacts has been provided under Chapter X, pp.156-173.
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 details will be updated in the final EIA report after public hearing meeting.
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	Project Cost is Rs. 66,54,500/- In order to implement the environmental

	towards implementation of EMP should be clearly spelt out.	protection measures, an amount of Rs.4501591 as capital cost and recurring cost as Rs.2239552 as recurring cost/annum is proposed considering present market price considering present market scenario for the proposed project. After the adjustment of 5% inflation per year, the overall EMP cost for 5 years will be Rs.16977509, as shown in Tables 10.9 & 10.10 under Chapter X, pp.167-173.
42	A Disaster management Plan shall be prepared and included in the EIA/EMP Report.	The details have been provided in Section 7.2 under Chapter VII, pp.138-140.
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 have been discussed under Chapter VIII, pp.152-154.
44.	Besides the above, the below mentioned general points are also to be followed:	
a)	Executive Summary of the EIA/EMP Report	Executive summary has been enclosed as a separate booklet.
b)	All documents to be properly referenced with index and continuous page numbering.	All the documents have been properly referenced with index and continuous page numbering.
c)	Where data are presented in the Report especially in Tables, the period in which the data were collected and the sources should be indicated.	List of tables and source of the data collected have been mentioned.
d)	Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF & CC/NABL	Original Baseline monitoring reports will be submitted in the final EIA report during appraisal.

	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 enclosed along with final EIA/EMP 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:	The certified compliance report will be provided in the final EIA report.



	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.	All the plans related to mining have been included along with the approved mining plan report in Annexure.

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

In compliance with ToR obtained vide Letter No. SEIAA-TN/F.No.9797/SEAC/ToR-1469/2022 dated 31.05.2023, this EIA report has been prepared for the project proponent, M/s.Thirumalai Blue Metals applied for rough stone and gravel quarry lease in the Patta land falling in S.F.No.1238/2 (Part) over an extent of 2.97.0 ha in Vettamangalam West Village, Pugalur Taluk, Karur District and Tamil Nadu. This EIA report takes into account the rough stone and gravel quarries within the cluster of 500 m radius from the periphery of the proposed project site. The cluster contains two proposed projects, known as P1 and P2 and one existing project known as E1 and one expired project EX1. All the projects mentioned above have been taken for cluster extent calculation as per MoEF & CC Notification S.O. 2269(E) Dated 1<sup>st</sup> July 2016. The total extent of all the quarries is 11.20.0 ha, also known as the cluster extent. The quarries involved in the calculation of cluster extent are shown in Figure 1.1.

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

<b>Proposed Quarries</b>					
<b>Code</b>	<b>Name of the Owner</b>	<b>S.F. No</b>	<b>Village</b>	<b>Extent (ha)</b>	<b>Status</b>
<b>P1</b>	M/s.Thirumalai Blue Metals	1238/2 (Part)	Vettamangalam West	2.97.0	Proposed Area
<b>P2</b>	Tvl.New Star Blue Metals	553/2 (Part)	Kuppam	1.62.0	Applied Area
<b>Existing Quarry</b>					
<b>E1</b>	Thiru.C.Chinnusamy	551/1 (Part)	Kuppam	2.00.0	21.02.2018 to 20.02.2023
<b>Expired Quarries</b>					
<b>EX1</b>	Tvl. New Star Blue Metals	533/1 534/1 550/C3	Kuppam	4.61.0	02.12.2016 to 01.12.2021
	<b>Total Cluster Extent</b>			<b>11.20.0</b>	<b>---</b>

**Source:***DD Letter - Rc.No.424/Mines/2021, Dated:01.02.2023.*

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

**1.1 PURPOSE OF THE REPORT**

The purpose of the report is to study baseline environmental conditions in and around the proposed project area for the period of **October-December 2022** according to the provisions of MoEF & CC Office Memorandum dated 29.08.2017 and MoEF & CC Notification, S.O. 996 (E) dated 10.04.2015, to analyse impacts and provide mitigation measures.

**1.2 ENVIRONMENTAL CLEARANCE**

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

### ***Screening***

Screening is the first stage of the EIA process. In this stage, the State level Expert Appraisal Committee (SEAC) examined the application of EC made by the proponent in Form 1 through online (Proposal No. SIA/TN/ MIN/ 417026/2022, dated 04.02.2023) 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 06.02.2023.

### ***Scoping***

The proposal was placed in the 377<sup>th</sup> meeting of SEAC on 10.05.2023. 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.



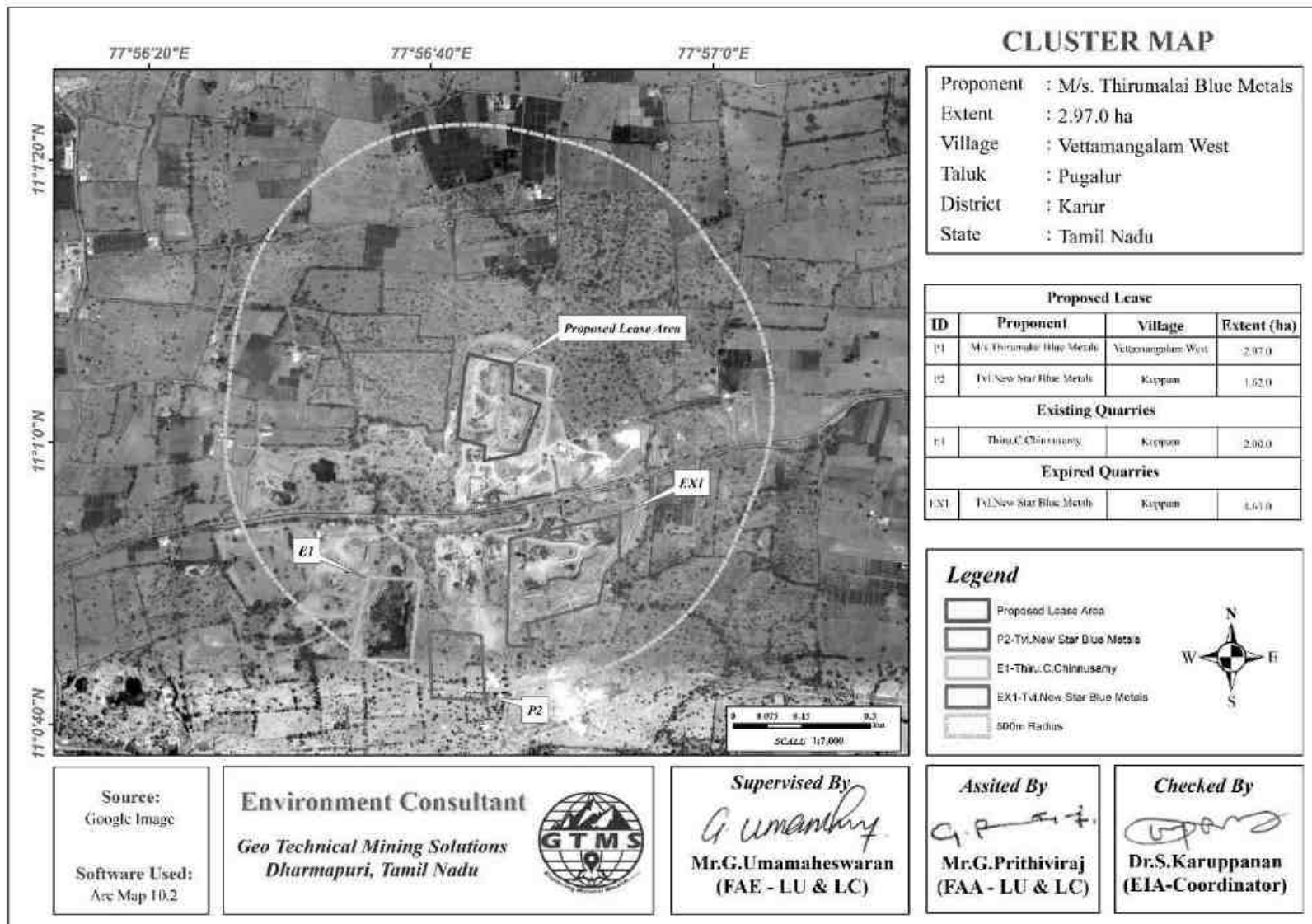


Figure 1.1 Location of the proposed, existing and expired rough stone quarries and gravel in the cluster of 500m radius

### **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.9797/SEAC/ToR-1469/2023 Dated :31.05.2023 for the preparation of an EIA report.**

### **1.4 POST ENVIRONMENT CLEARANCE MONITORING**

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

After obtaining EC, the project proponent will submit a half-yearly compliance report of stipulated environmental clearance terms and conditions to MoEF & CC Regional Office & SEIAA on 1<sup>st</sup> June and 1<sup>st</sup> 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)
- ❖ Summary & Conclusion
- ❖ Disclosure of Consultants engaged.

## 1.7 IDENTIFICATION OF THE PROJECT PROPONENT

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

**Table 1.2 Details of Project Proponent**

Name of the Project Proponent	M/s.Thirumalai Blue Metals
Address	No.538/4, Pulankad, Kupam Post, Pugalur Taluk, Karur-639 111
Status	Proprietor

## 1.8 BRIEF DESCRIPTION OF THE PROJECT

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

**Table 1.3 Salient Features of the Proposed Project**

Name of the Quarry	M/s.Thirumalai Blue Metals Rough Stone and Gravel Quarry	
Type of Land	Patta Land	
Extent	2.97.0 Ha	
S.F.No	1238/2 (Part)	
Toposheet No	58-E/16	
Latitude	11°0'58.68"N to 11°1'6.25"N	
Longitude	77°56'41.88"E to 77°56'47.75"E	
Highest Elevation	161 m AMSL	
Ultimate depth of Mining	45 m BGL	
Geological Resources	Rough Stone in m <sup>3</sup>	Gravel in m <sup>3</sup>
	1260527	6256
Mineable Reserves	Rough Stone in m <sup>3</sup>	Gravel in m <sup>3</sup>

	364115	3428
Proposed reserves for five years	Rough Stone in m <sup>3</sup>	Gravel in m <sup>3</sup> /1 year
	364115	3428
Method of Mining	Open-Cast Semi Mechanized mining	
Topography	Undulated Topography	
Machinery proposed	Jack Hammer	3
	Compressor	1
	Tipper	7
	Excavator	1
Blasting Method	The quarrying operation is proposed to carried out by open cost, using jack hammer drilling will be adopted to release the rough stone and nonel blasting is proposed in this lease area.	
Proposed Manpower Deployment	16 Nos	
Project Cost	Rs.66,54,500/-	
CER Cost	Rs. 5,00,000/-	
Proposed Water Requirement	5.0 KLD	

## 1.9 SCOPE OF THE STUDY

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

## 1.10 REFERENCES

The report has been prepared using the following references:

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

## **CHAPTER II**

### **PROJECT DESCRIPTION**

#### **2.0 GENERAL INTRODUCTION**

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

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

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

#### **2.1 DESCRIPTION OF THE PROJECT**

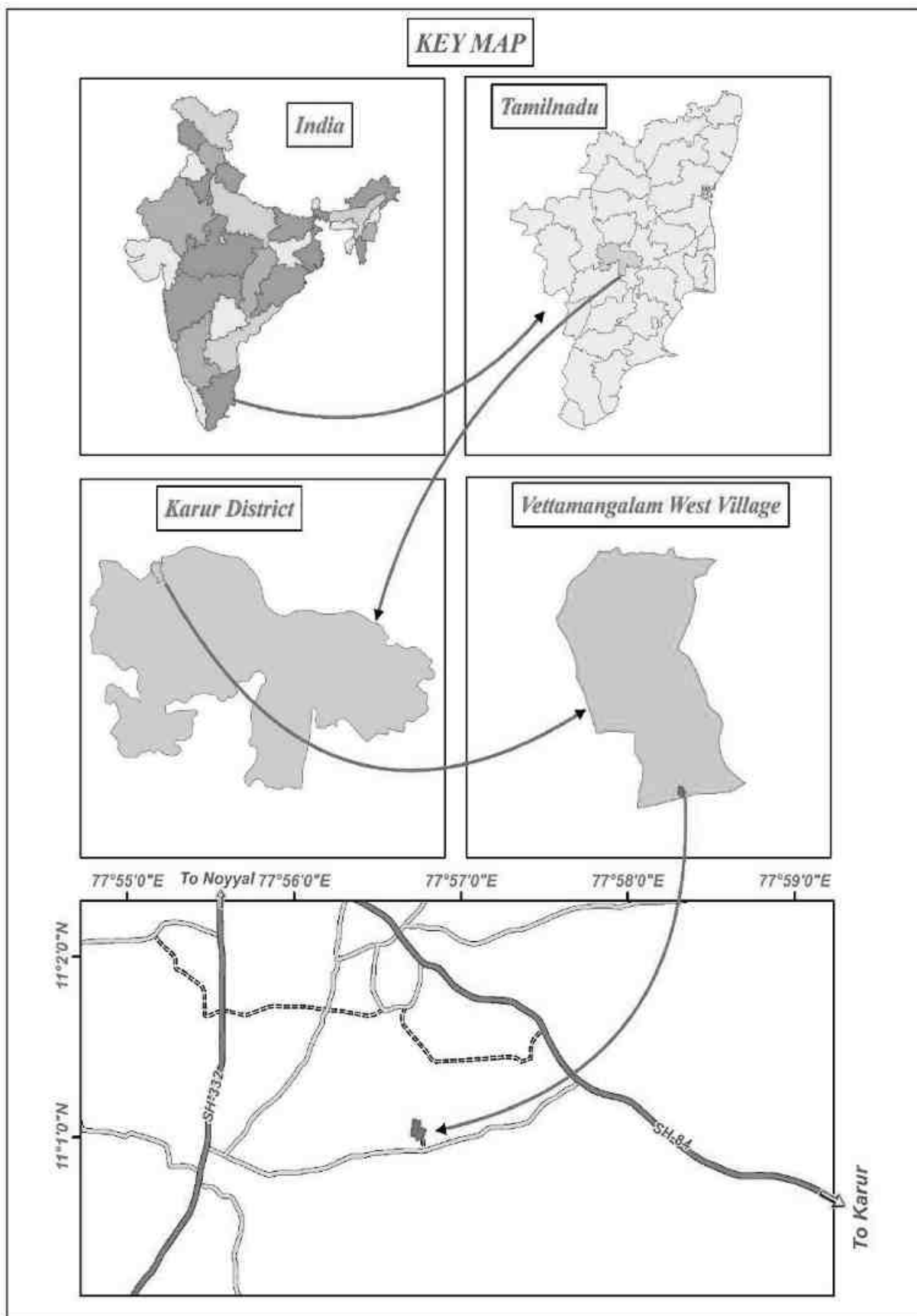
The proponent, **M/s. Thirumalai Blue Metals** is involved in the undertaking of establishment, construction, development, and closure of opencast mines. He, through the exploration phase, identified the proposed project site as the one that has a great potential of producing an economically viable quantity of rough stone and gravel. Therefore, the proponent had applied for quarry lease on 15.10.2015 to extract rough stone and gravel. The precise area communication letter was issued by Department of Geology and Mining, Karur vide Rc.No.424/Mines/2021, dated:12.01.2023. Based on the precise area communication letter, mining plan was prepared. The mining plan thus prepared was approved by Deputy Director Department of Geology and Mining, Karur Rc.No.424/Mines/2021, dated:31.01.2023. 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 quarry project is located in Vettamangalam West Village, Pugalur Taluk, Karur District, as shown in Figure 2.2. The area lies between Latitudes from  $11^{\circ}0'58.68''\text{N}$  to  $11^{\circ}1'6.25''\text{N}$  and Longitudes from  $77^{\circ}56'41.88''\text{E}$  to  $77^{\circ}56'47.75''\text{E}$ . The maximum altitude of the project area is 161m AMSL. Accessibility details to the proposed project site have been given in Table 2.1.



**Figure 2.2 Key Map Showing Location of the Project Site**



**Table 2.1 Site Connectivity to the Project Area**

Nearest Roadways	SH-84 Erode - Karur	1.46 km NE
Nearest Town	K. Paramathy	7.45 km SW
Nearest Railway Station	Noyyal	4.76 km NW
Nearest Airport	Tiruchirappalli	86.0 km E
Nearest Seaport	Tuticorin	250.0 km S

## 2.3 LEASEHOLD AREA

- ❖ The extent of the proposed project site is 2.97.0 ha.
- ❖ The proposed project is site specific.
- ❖ There is no mineral beneficiation or processing proposed inside the project area.
- ❖ There is no forest land involved in the proposed area and is devoid of major vegetation and trees.

### 2.3.1 Corner Coordinates

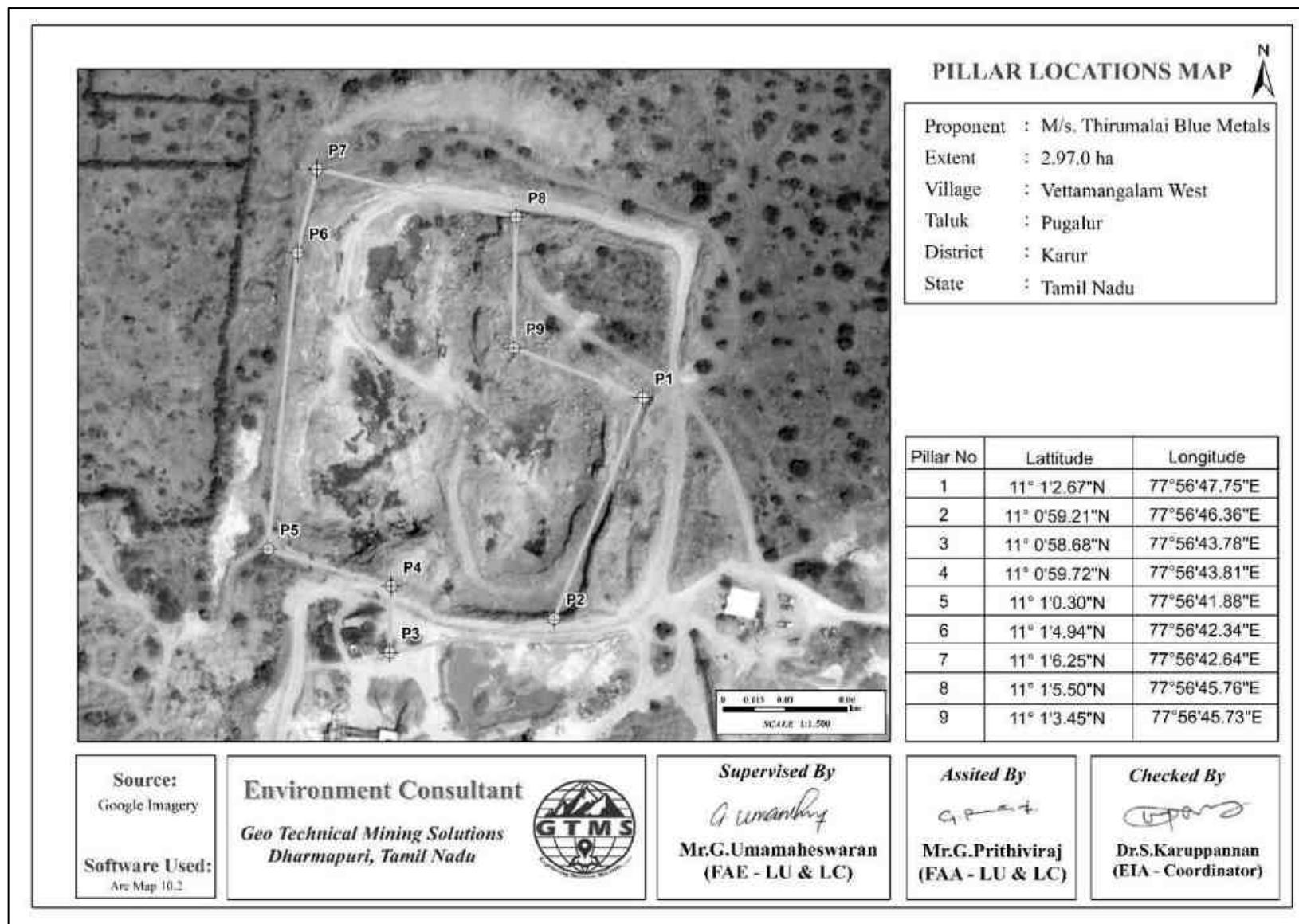
The boundary corner geographic coordinates are given in Table 2.2 and the proposed project site with boundary coordinates has been shown in Figure 2.3.

**Table 2.2 Corner Coordinates of Proposed Project**

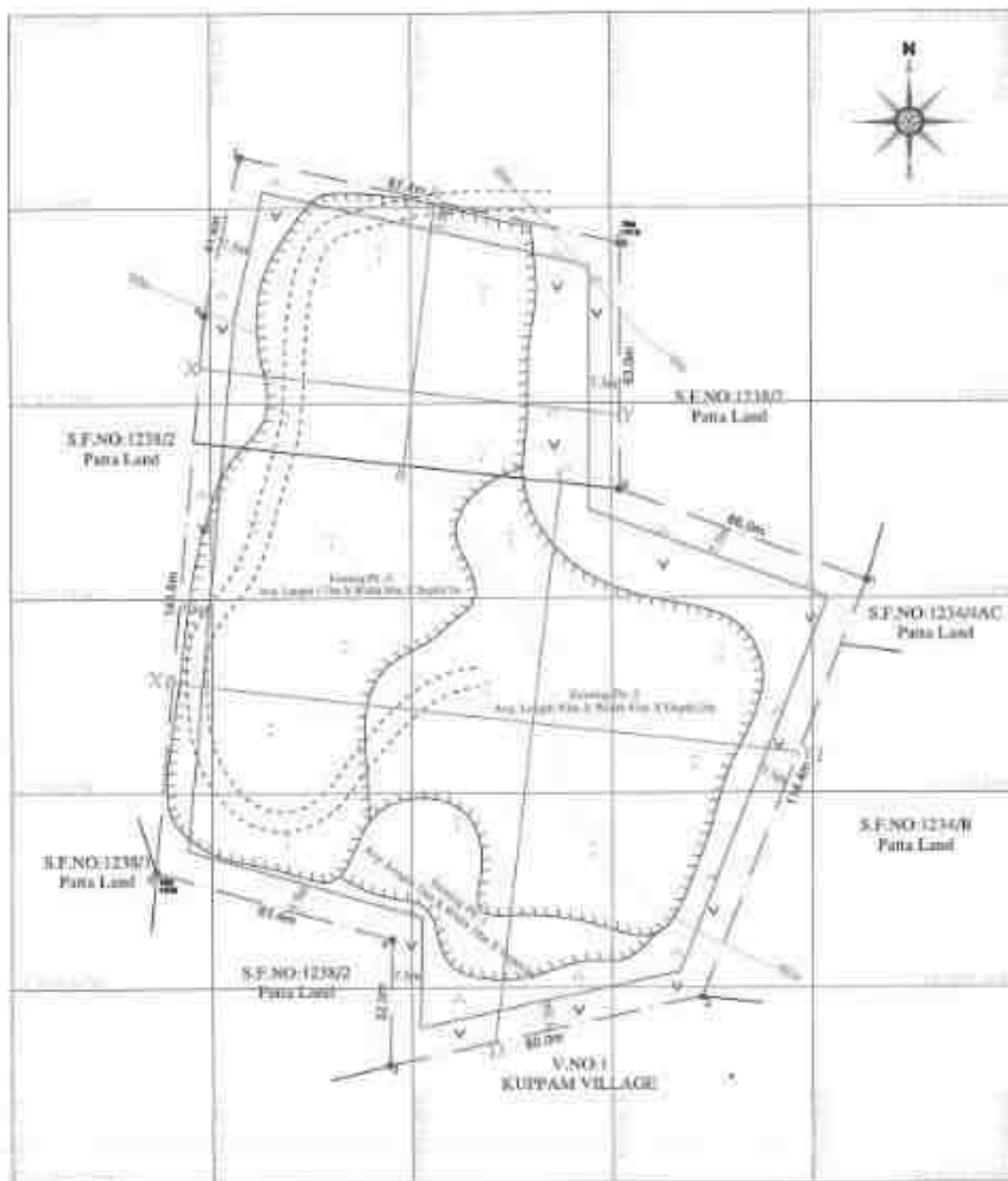
Pillar ID	Latitude	Longitude
1	11°1'2.67"N	77°56'47.75"E
2	11°0'59.21"N	77°56'46.36"E
3	11°0'58.68"N	77°56'43.78"E
4	11°0'59.72"N	77°56'43.81"E
5	11°1'0.30"N	77°56'41.88"E
6	11°1'4.94"N	77°56'42.34"E
7	11°1'6.25"N	77°56'42.64"E
8	11°1'5.50"N	77°56'45.76"E
9	11°1'3.45"N	77°56'45.73"E

## 2.4 GEOLOGY

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

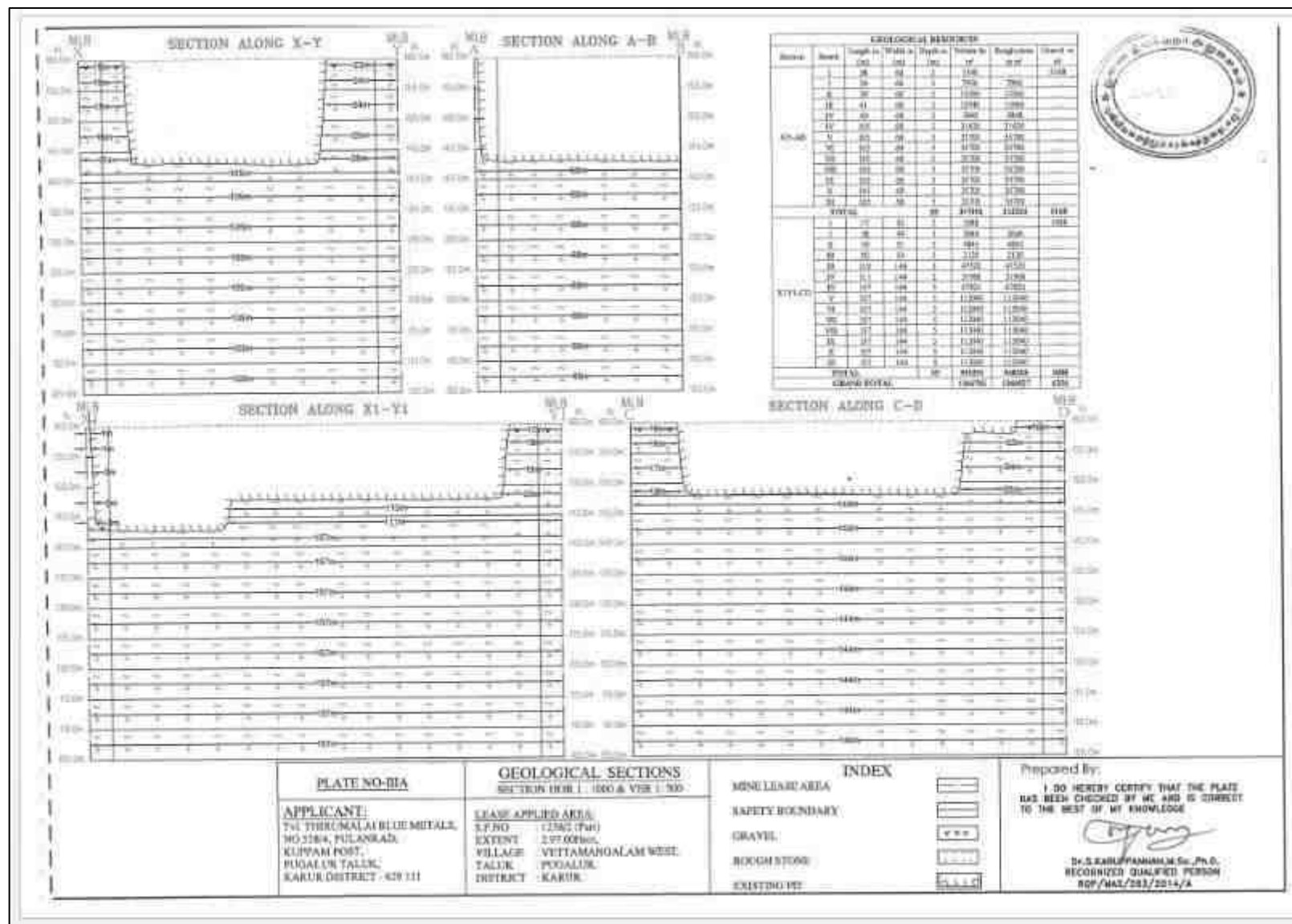


**Figure 2.3 Google Earth Image Showing Lease Area with Pillars**



<b>PLATE NO-II</b>			<b>SURFACE &amp; GEOLOGICAL PLAN</b> SCALE: 1:1000																				
<b>APPLICANT:</b> M. THIRUMALAI REDDI METAIN, NO 58/A, PULANKAD, KUPPAM POST, PUGALUR TALUK, KARUR DISTRICT - 639 111  <b>LEASE APPLIED AREA:</b> S.F. NO. : 1238/2 (Part) EXTENT : 2.0700 Hect. VILLAGE : VETTAMANGALAM WEST, TALUK : PUGALUR, DISTRICT : KARUR.	<b>INDEX</b> <table> <tr> <td>MINE LEASE AREA</td><td></td><td>SHRUBS</td><td></td></tr> <tr> <td>SAFETY DISTANCE</td><td></td><td>GRAVEL</td><td></td></tr> <tr> <td>MINE HAUL ROAD</td><td></td><td>ROUGH STONE</td><td></td></tr> <tr> <td>TEMPORARY BENCH MARK</td><td></td><td>PELLE STONE</td><td></td></tr> <tr> <td>CONTOUR LINE</td><td></td><td>EXISTING PIT</td><td></td></tr> </table>		MINE LEASE AREA		SHRUBS		SAFETY DISTANCE		GRAVEL		MINE HAUL ROAD		ROUGH STONE		TEMPORARY BENCH MARK		PELLE STONE		CONTOUR LINE		EXISTING PIT		Prepared By: I DO HEREBY CERTIFY THAT THE WORK HAS BEEN CHECKED BY ME AND IS CORRECT TO THE BEST OF MY KNOWLEDGE  D. S. KARUPPANARUM S. P. D. RECOGNIZED SURVEYOR PERSON RGP/MRS/2002/14/A
MINE LEASE AREA		SHRUBS																					
SAFETY DISTANCE		GRAVEL																					
MINE HAUL ROAD		ROUGH STONE																					
TEMPORARY BENCH MARK		PELLE STONE																					
CONTOUR LINE		EXISTING PIT																					

Figure 2.4 Surface and Geological Plan



## 2.5 QUANTITY OF RESERVES

The Resources and Reserves of Rough Stone were calculated based on cross-section method by plotting sections to cover the maximum lease area for the proposed project. Based on the availability of geological resources, the mineable reserves are calculated by considering excavation system of bench formation and leaving essential safety distance of 7.5 m and 10m safety distance as per precise area communication letter and deducting the locked-up reserves during bench formation (also called as Bench Loss). The mineable reserves are calculated up to the depth of 45 m considering there is no waste / overburden / side burden (100% Recovery anticipated) for the proposed project. The plate used for reserve estimation has been shown in Figure 2.4 and 2.5 and results of geological resources and reserves have been shown in Table 2.3.

**Table 2.3 Estimated Resources and Reserves of the Project**

Resource Type	Rough Stone in m <sup>3</sup>	Gravel in m <sup>3</sup> /years
Geological Resource in m <sup>3</sup>	1260527	6256
Mineable Reserves in m <sup>3</sup>	364115	3428
Proposed production for 5 years m <sup>3</sup>	364115	3428

Based on the year wise development and production plan and sections, the year wise production results have been given in Table 2.4 & Figure 2.7 and Figure 2.8.

**Table 2.4 Year-Wise Production Details**

Year	Rough Stone in (m <sup>3</sup> )	Gravel in (m <sup>3</sup> )/ years
I	110467	3428
II	78568	--
III	63370	--
IV	80590	--
V	31120	--
<b>Total</b>	<b>364115</b>	<b>3428</b>

*Source: Approved Mining Plan & To*



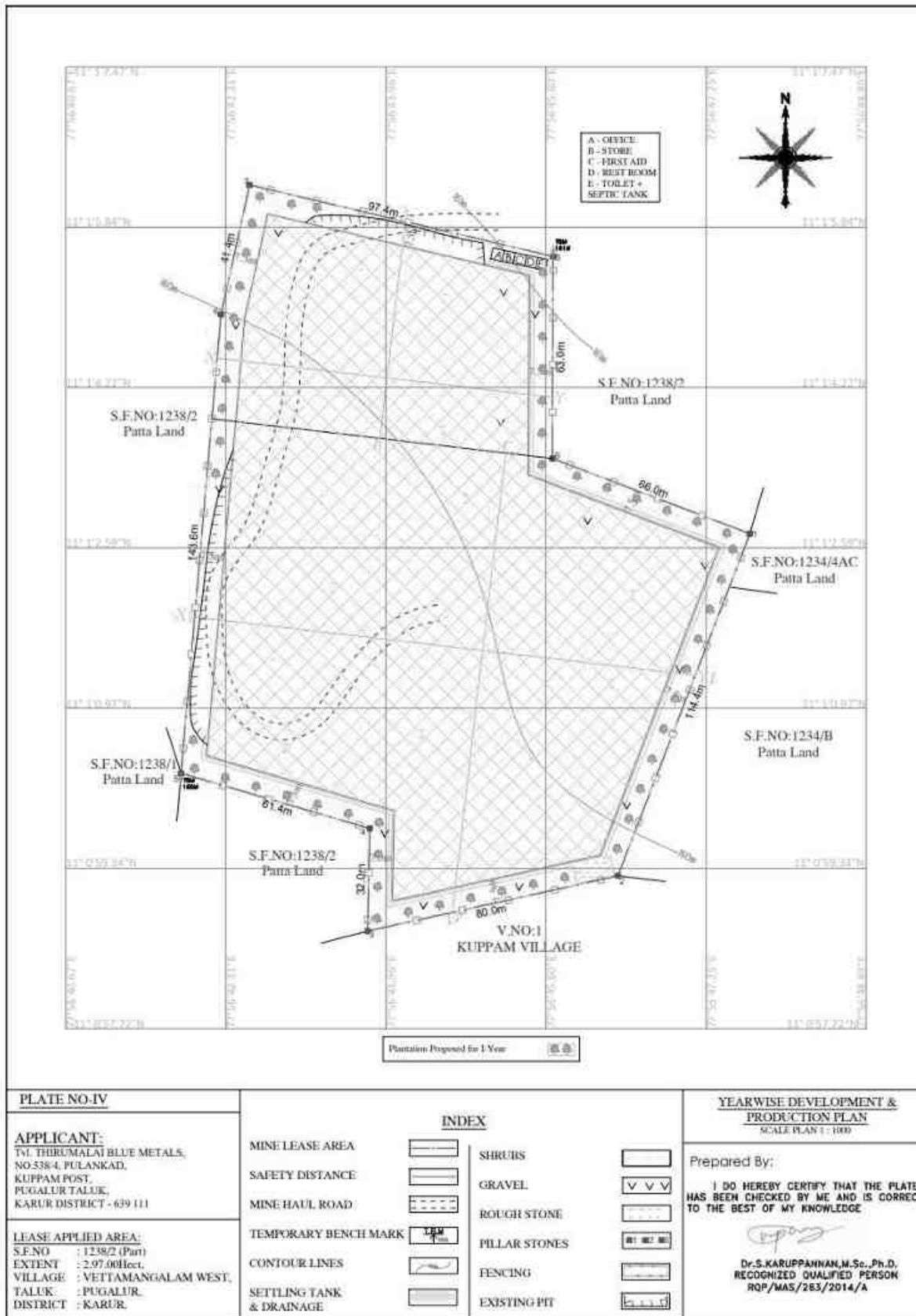


Figure 2.7 Yearwise Development and Production Plan

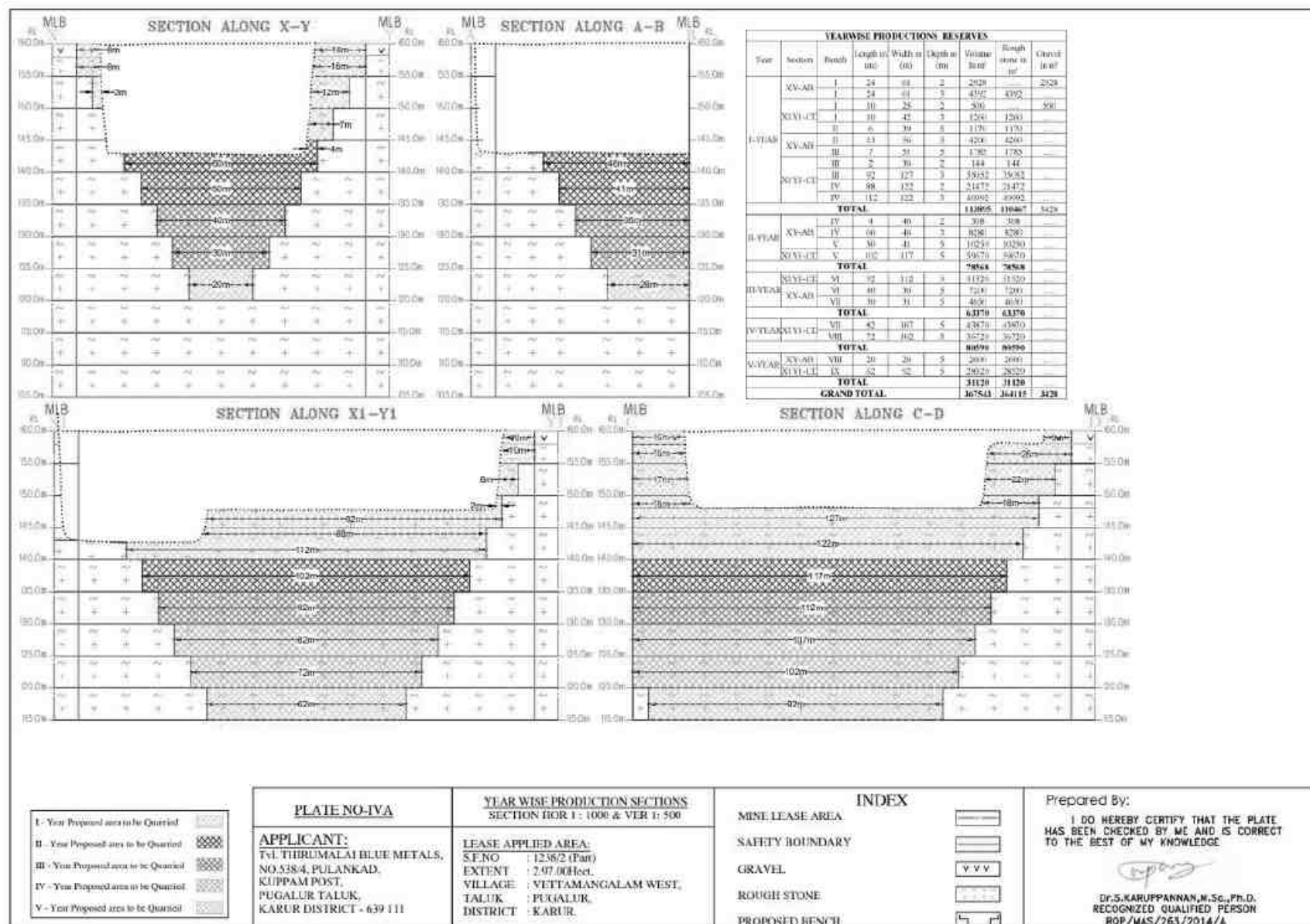


Figure 2.8 Year wise Development and Production Sections



## **2.6 MINING METHOD**

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

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

### **Rules of Thumb for Blast Design**

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

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

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

**Rule 2: Generally, select the densest explosive possible.**

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

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

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

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

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

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

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

**Rule 6: Stemming should be equal to the burden.**

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

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

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

**Table 2.5 Conceptual Blasting Design**

Blasthole Diameter (D) in mm	32
Burden (B) in m	1.5
Spacing (S) in m	1.30
Subdrill in m	0.45
Charge length (C) in m	0.64
Stemming	1.5
Hole Length (L) in m	2.6
Bench Height (BH) in m	2.1
Mass of explosive/hole in g	400
Stemming material size in mm	3.2
Burden stiffness ratio	1.43
Blast volume/hole in m <sup>3</sup>	4.16
Production of rough stone/day in m <sup>3</sup>	270

Number of blastholes/day	65
Blasthole pattern	Staggered / Rectangular
Mass of explosive /day in kg	26.0
Powder factor in kg/m <sup>3</sup>	0.10
Loading density	0.63
Type of explosives	Slurry
Diameter of packaging in mm	25
Initiation system	NONEL
Fly rock distance in m	19

### 2.6.1 Magnitude of Operation

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

**Table 2.6 Operational Details for Proposed Project**

	<b>Rough Stone</b>	<b>Gravel/ 1year</b>
Proposed production for 5 years	364115	3428
Number of Working Days /Annum	270	270
Production of /Day (m <sup>3</sup> )	270	13
No. of Lorry Loads	45	2

### 2.6.2 Extent of Mechanization

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

**Table 2.7 Machinery Details**

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

### 2.6.3 Progressive Quarry Closure Plan

The progressive quarry closure plan of the proposed project shows past, present, and future land use statistics. According to the land use results, as shown in Table 2.8 At Present about 1.85.5 ha of land is used for quarrying; about 0.37.0 ha of land is unutilized; about 0.62.5 of land is used for green belt and 0.05.0 will be used for roads and 0.02.0 will be used for infrastructure.

**Table 2.8 Land use data at present and end of mine life quarry details**

Description	Present Area (ha)	Area at the end of life of quarry (ha)
Area under quarry	1.86.5	1.85.5
Infrastructure	Nil	0.02.0
Roads	0.03.0	0.05.0
Green Belt & Dump	Nil	0.62.5
Drainage & Settling Tank	Nil	0.05.0
Unutilized area	1.07.5	0.37.0
<b>Total</b>	<b>2.97.0</b>	<b>2.97.0</b>

**2.6.4 Progressive Quarry Closure Budget**

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

**Table 2.9 Mine Closure Budget**

Activity	Capital Cost	Recurring Cost/Annum
594 plants inside the lease area	118800	17820
891 plants outside the lease area	267300	26730
Wire Fencing	594000	29700
Renovation of Garland Drain	29700	14850
<b>Total</b>	<b>1009800</b>	<b>89100</b>

*Source: Environment Management Plan*

**2.6.5 Conceptual Mining Plan**

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

**Table 2.10 Ultimate Pit Dimension**

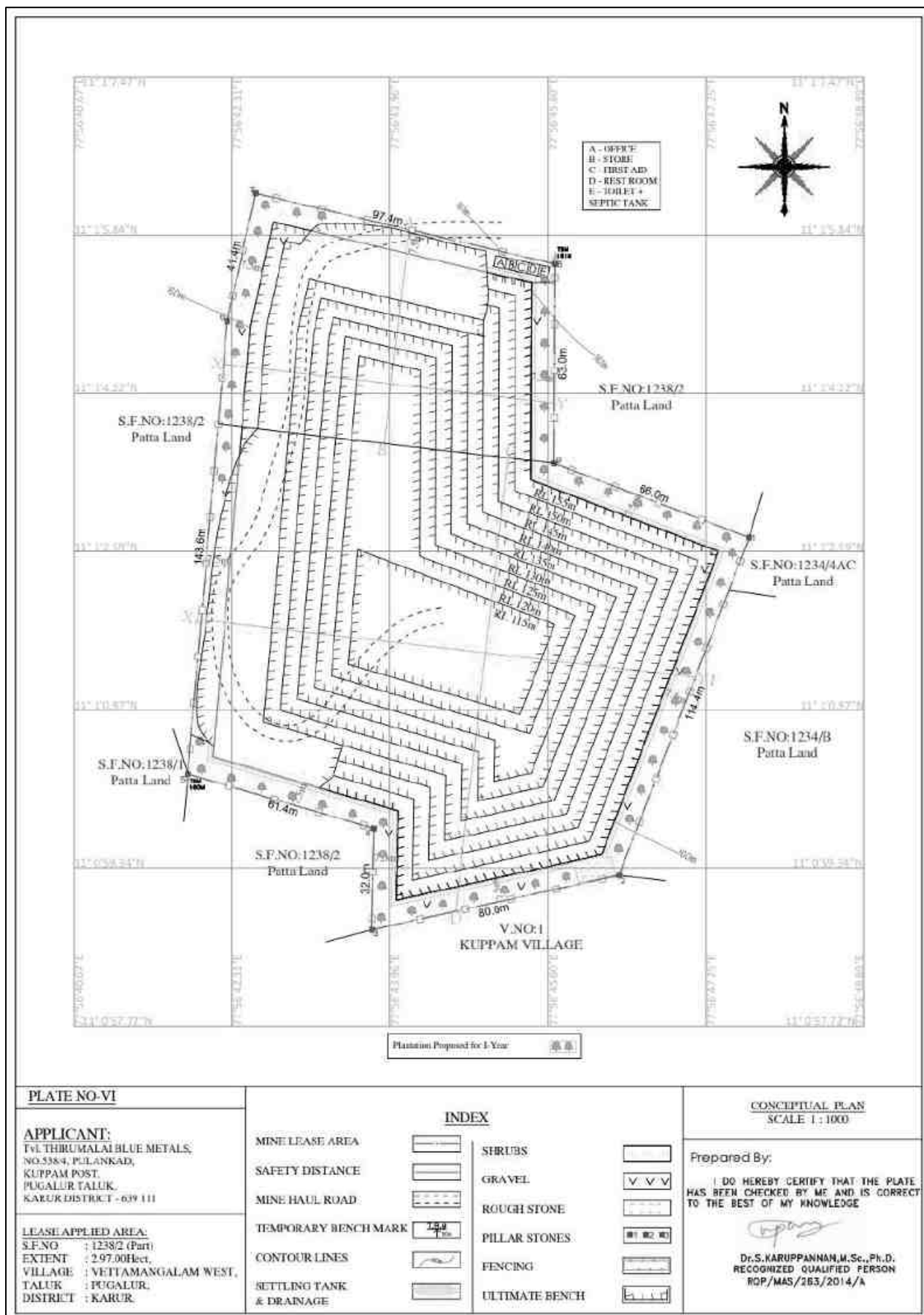
Pit	Length (m)	Width (m) (Max)	Depth(m)
I	112	127	45

*Source: Approved Mining Plan & ToR*

**2.6.6 Infrastructures**

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





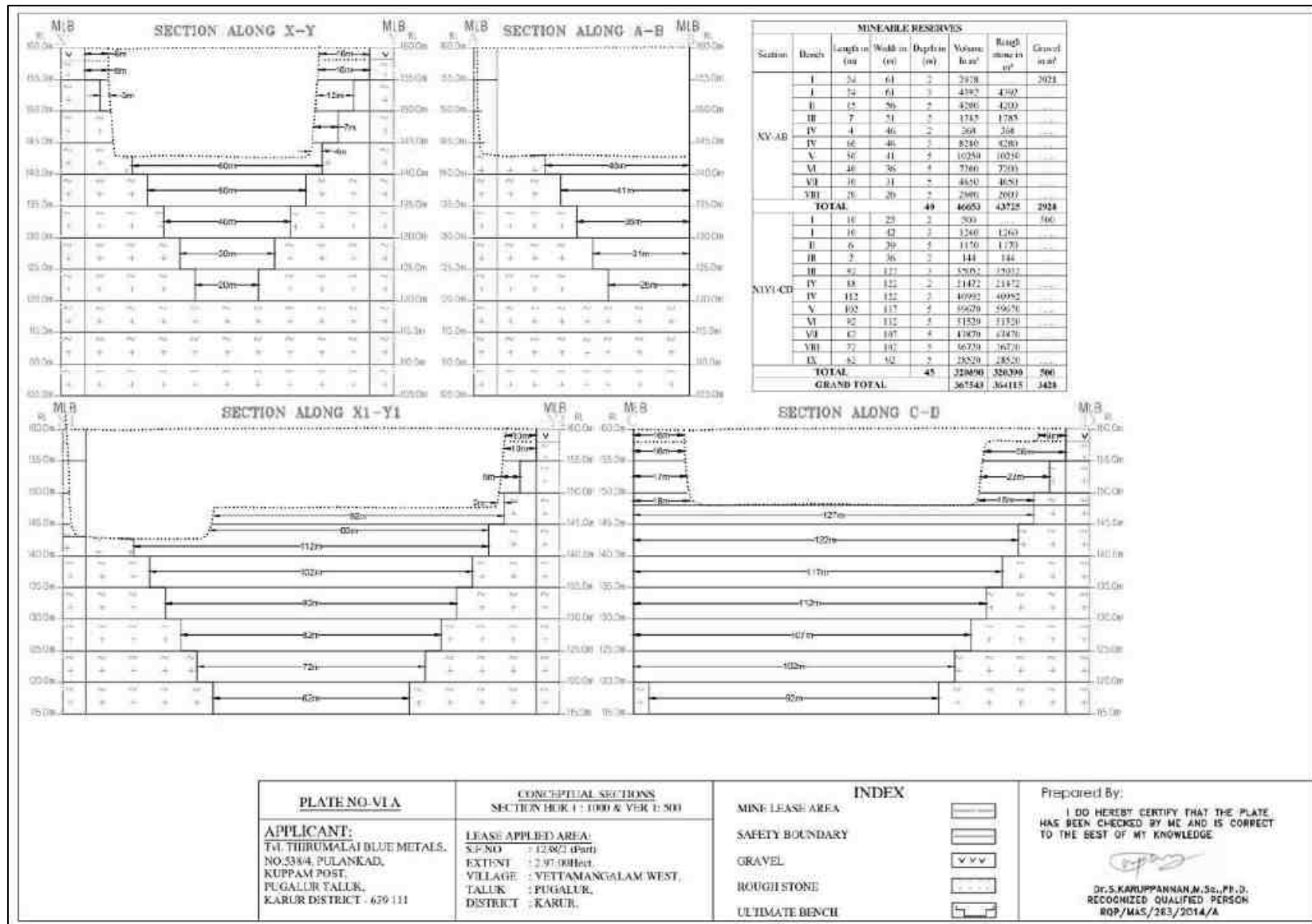


Figure 2.11 Conceptual Sections

### 2.6.6.1 Other Infrastructure Requirement

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

### 2.6.7 Water Requirement

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

**Table 2.11 Water Requirement for the Project**

Purpose	Quantity	Source
Dust Suppression	1.5 KLD	Existing bore wells nearby the lease area
Green Belt development	1.5 KLD	Existing bore wells nearby the lease area
Drinking & Domestic	2.0 KLD	Existing bore wells and approved water vendors
<b>Total</b>	<b>5.0 KLD</b>	

*Source: Prefeasibility Report*

### 2.6.8 Energy Requirement

High speed Diesel (HSD) will be used for quarrying machineries. As per the data shown in Table 2.12, Around 1552107 litres of HSD will be used for rough stone and gravel extraction during this 5 years plan period. The diesel will be brought to the site from nearby diesel pumps.

**Table 2.12 Fuel Requirement Details**

<b>Fuel Requirement for Excavator</b>			
Details	Rough Stone (364115 m <sup>3</sup> )	Gravel (3428 m <sup>3</sup> )	Total Diesel (litre)
Average Rate of Fuel Consumption (l/hr)	16	10	---
Working Capacity (m <sup>3</sup> /hr)	20	60	---
Time Required (hours)	18206	57	---
Total Diesel Consumption for 5 years (litre)	291292	571	<b>291863</b>
<b>Fuel Requirement for Compressor</b>			
Average Rate of Fuel Consumption/hole (litre)	0.4	---	---
Number of Drillholes/day	65	---	---
Total Diesel Consumption for 5 years (litre)	35100	---	<b>35100</b>
<b>Fuel Requirement for Tipper</b>			
Average Rate of Fuel Consumption/Trip (litre)	20	20	---
Carrying Capacity in m <sup>3</sup>	6	6	---
Number of Trips / days	45	0	---
Number of Trips / 5 years	60686	571	---
Total Diesel Consumption for 5 years (litre)	1213717	11427	<b>1225143</b>
<b>Total Diesel Consumption by Excavator, Compressor and Tipper</b>			<b>1552107</b>



## 2.6.9 Capital Requirement

The project proponent will invest **Rs. 66,54,500/-** to the project. The breakup summary of the investment has been given in Table 2.13.

**Table 2.13 Capital Requirement Details**

S. No.	Description	Cost (Rs.)
1	Fixed Asset Cost	14,00,000/-
2	Machinery cost	30,00,000/-
3	EMP Cost	22,54,500/-
<b>Total Project Cost</b>		<b>66,54,500/-</b>

*Source: Approved Mining Plan*

## 2.7 MANPOWER REQUIREMENT

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

**Table 2.14 Employment Potential for the proposed project**

S. No.	Category	Role	Nos.
1.	Highly Skilled	Mines Manager	1
		Mine Engineer	1
		Mine Geologist	1
		Blaster	1
2.	Unskilled	Musdoor/ Labours	12
<b>Total</b>			<b>16</b>

*Source: Prefeasibility Report*

## 2.8 PROJECT IMPLEMENTATION SCHEDULE

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

**Table 2.15 Expected Time Schedule**

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

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

## CHAPTER III

### DESCRIPTION OF THE ENVIRONMENT

#### 3.0 GENERAL

This chapter presents a regional background to the baseline data at the very onset, which will help in better appreciation of micro-level field data, generated on several environmental and ecological attributes of the study area. The baseline status of the project environment is described section wise for better understanding of the broad-spectrum conditions. The baseline environment quality represents the background environmental scenario of various environmental components such as land, water, air, noise, biological and socio-economic status of the study area. Field monitoring studies to evaluate the base line status of the project site were carried out covering **October through December, 2022** 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	9 (1 in core & 8 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	10 (1 surface water & 9 ground water)	IS 10500& CPCB Standards
Meteorology	Wind speed Wind direction Temperature Cloud cover Dry bulb temperature Rainfall	1 hourly continuous mechanical/automatic weather station	1	Site specific primary data & secondary data from IMD Station
*Ambient Air Quality	PM <sub>10</sub> PM <sub>2.5</sub> SO <sub>2</sub> NO <sub>x</sub> Fugitive dust	24 hours, twice a week (February to April 2022.)	11 (1 core & 10 buffer)	IS 5182 Part 1-23 National Ambient Air Quality Standards, CPCB
*Noise Levels	Ambient noise	Hourly observation for 24 hours per location	13 (1 core & 12 buffer zone)	IS 9989 As per CPCB Guidelines
Ecology	Existing flora and fauna	Through field visit during the study period	Study area	Primary Survey by Quadrate & Transect Study Secondary Data – Forest Working Plan
Socio Economic Aspects	Socio-economic characteristics, Population statistics and existing infrastructure in the study area	Site visit & Census Handbook, 2011	Study area	Primary Survey, census handbook & need based assessments.

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

### 3.1 LAND ENVIRONMENT

#### 3.1.1 Geology and Geomorphology

Study area is mainly composed of migmatite and active fluvial soil, as shown in Figure 3.1. The lease area occurs in migmatite terrain.

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.

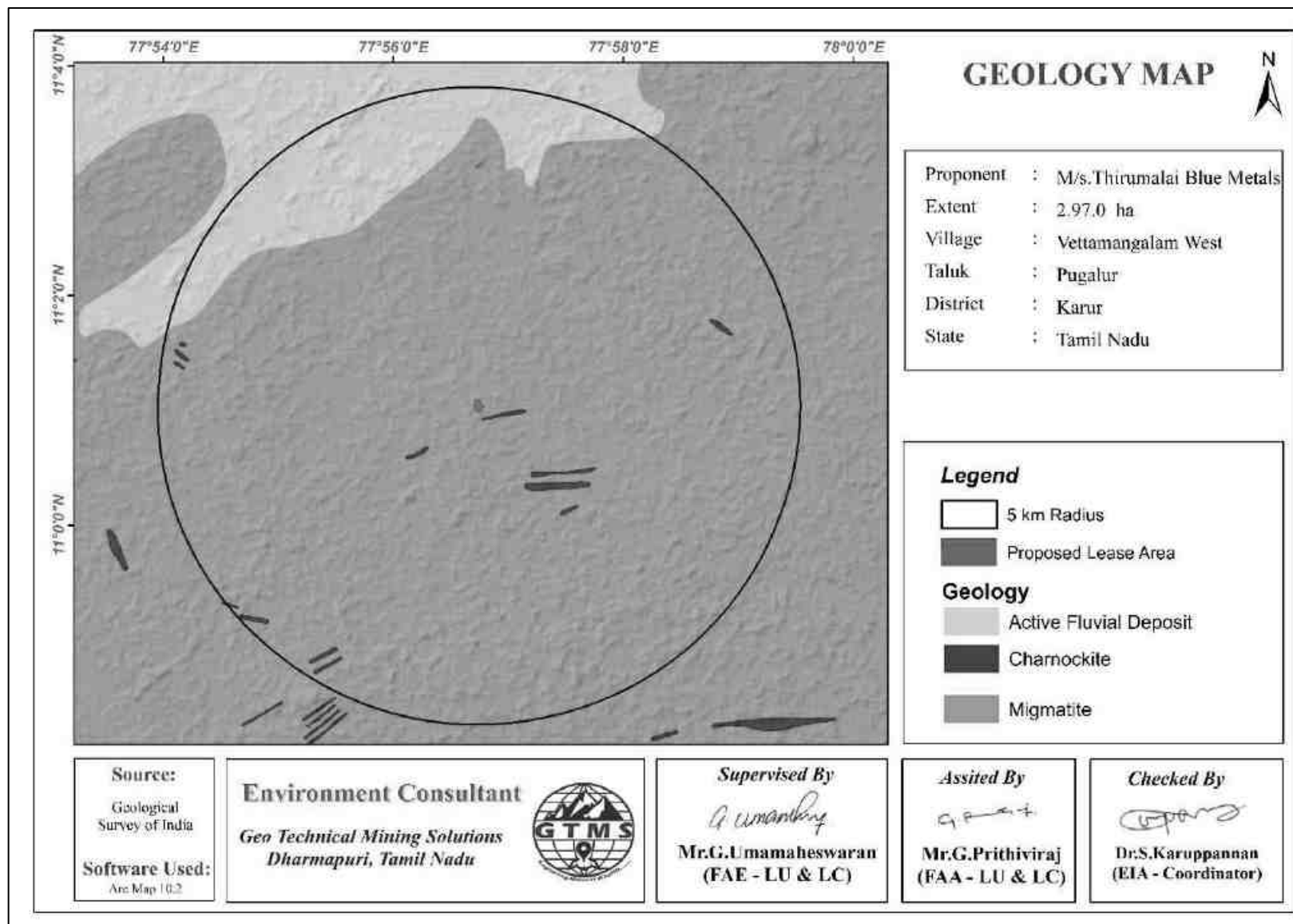


Figure 3.1 Geology Map of 5 km Radius from Proposed Project Site

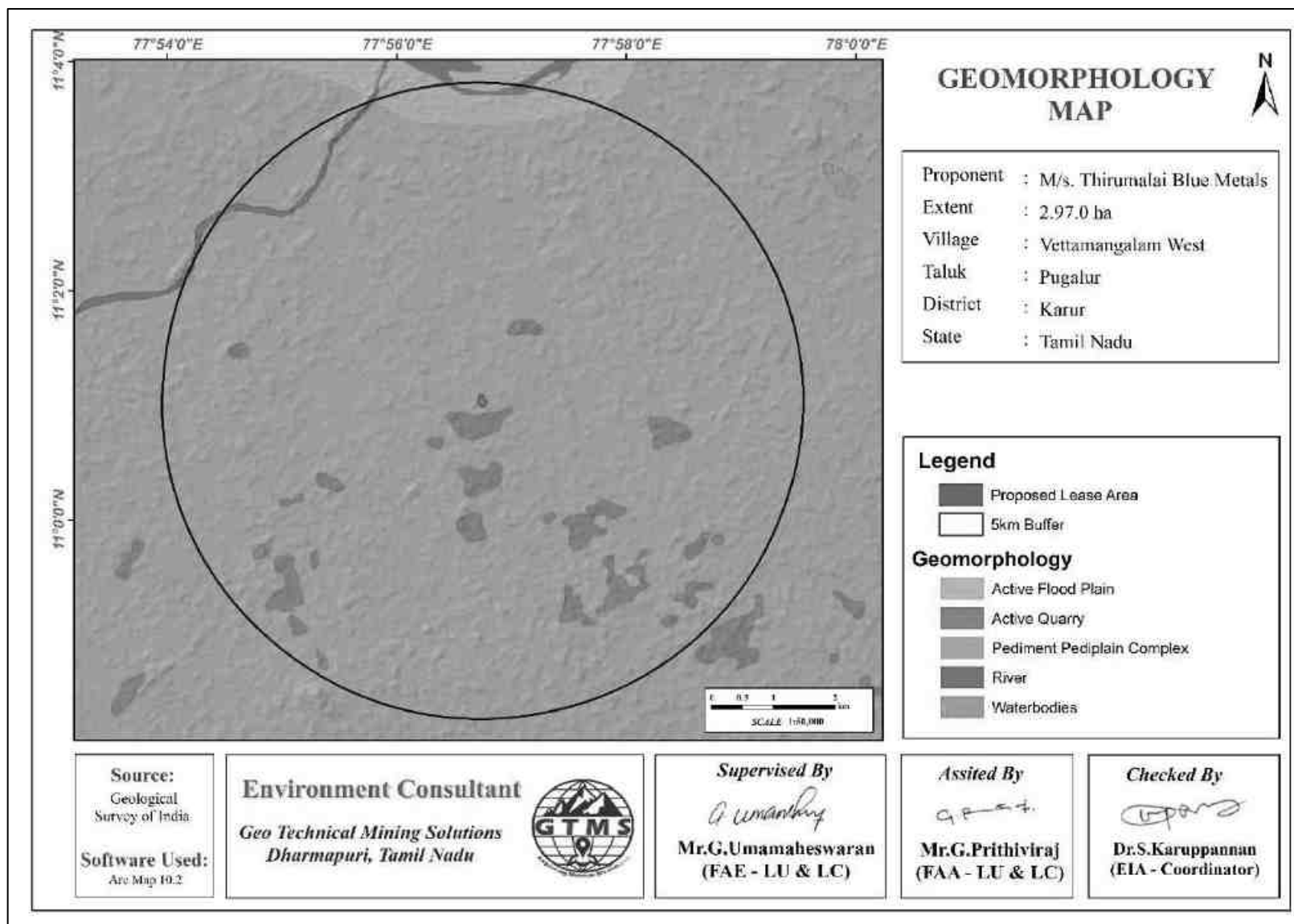


Figure 3.2 Geomorphology Map of 5 km Radius from Proposed Project Site

### 3.1.2 Land Use/ Land Cover

Land Use and Land Cover (LULC) map, as shown in Figure 3.3 was prepared using Sentinel II image for the study area of 5 km radius to provide a baseline status of the study area covering 5 km radius around the proposed mine site. Totally, 8 LULCs were mapped. The areal extent of each LULC is provided in Table 3.2. Of the total area, mining area covers only 152.46 ha accounting for 1.98 %, of which lease area of 2.97 ha contributes only about 0.03%. This small percentage of mining activities shall not have any significant impact on the land environment.

**Table 3.2 LULC Statistics of the Study Area**

S. No.	Classification	Area (ha)	Area (%)
1	Crop land	6610.44	85.91
2	Dense Forest	96.30	1.25
3	Fallow land	31.96	0.42
4	Land with or without scrub	23.80	0.31
5	Mining / Industrial wastelands	152.46	1.98
6	Plantations	686.20	8.92
7	Settlement	5.29	0.07
8	Water bodies	88.46	1.15
<b>Total</b>		<b>7694.92</b>	<b>100</b>

*Source: Sentinel II Satellite Imagery*

### 3.1.3 Topography

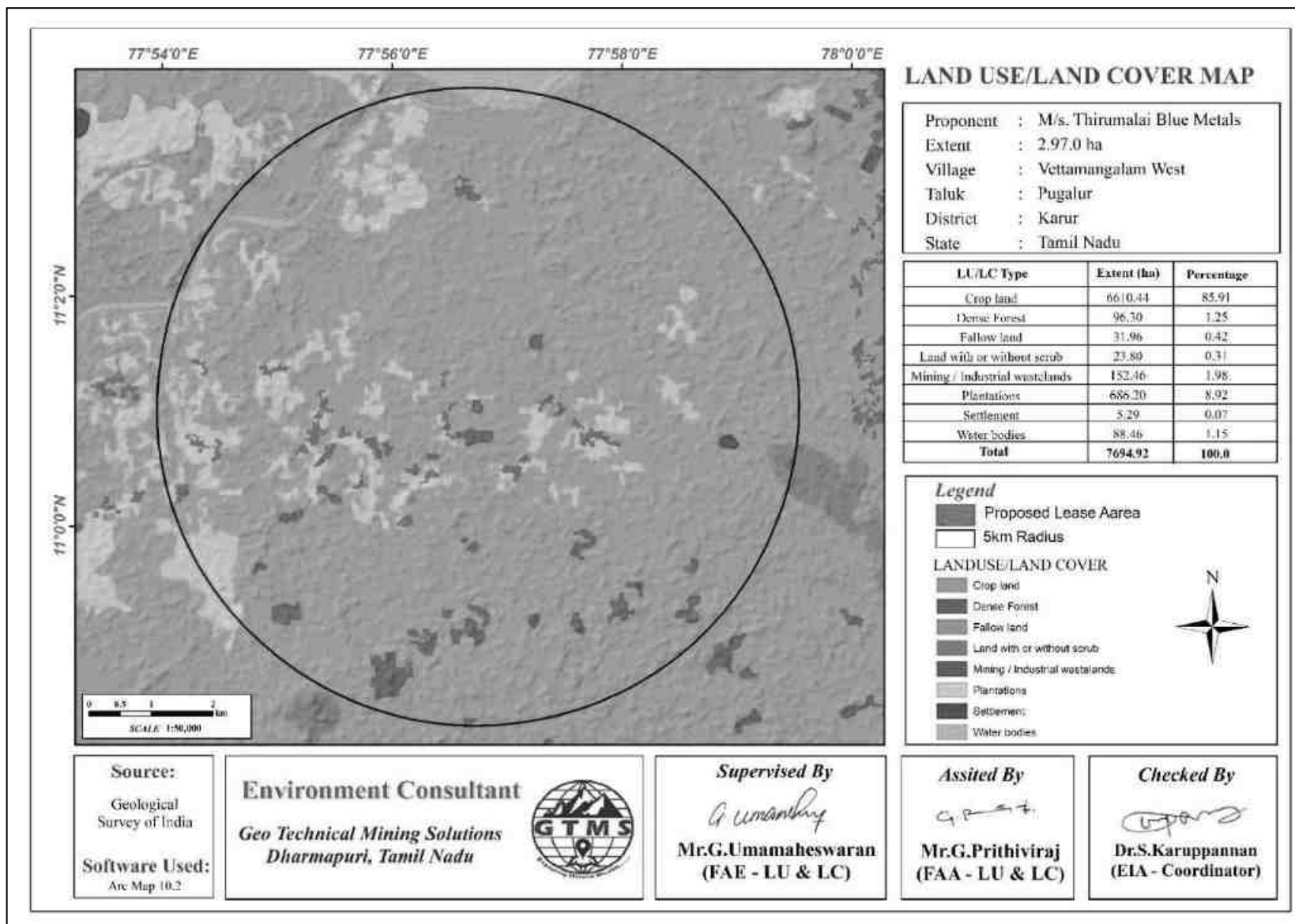
The proposed lease area is located in a flat terrain with an altitude range of 181-185 m AMSL, showing relief of 4 m.

### 3.1.4 Drainage Pattern

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

### 3.1.5 Seismic Sensitivity

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



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

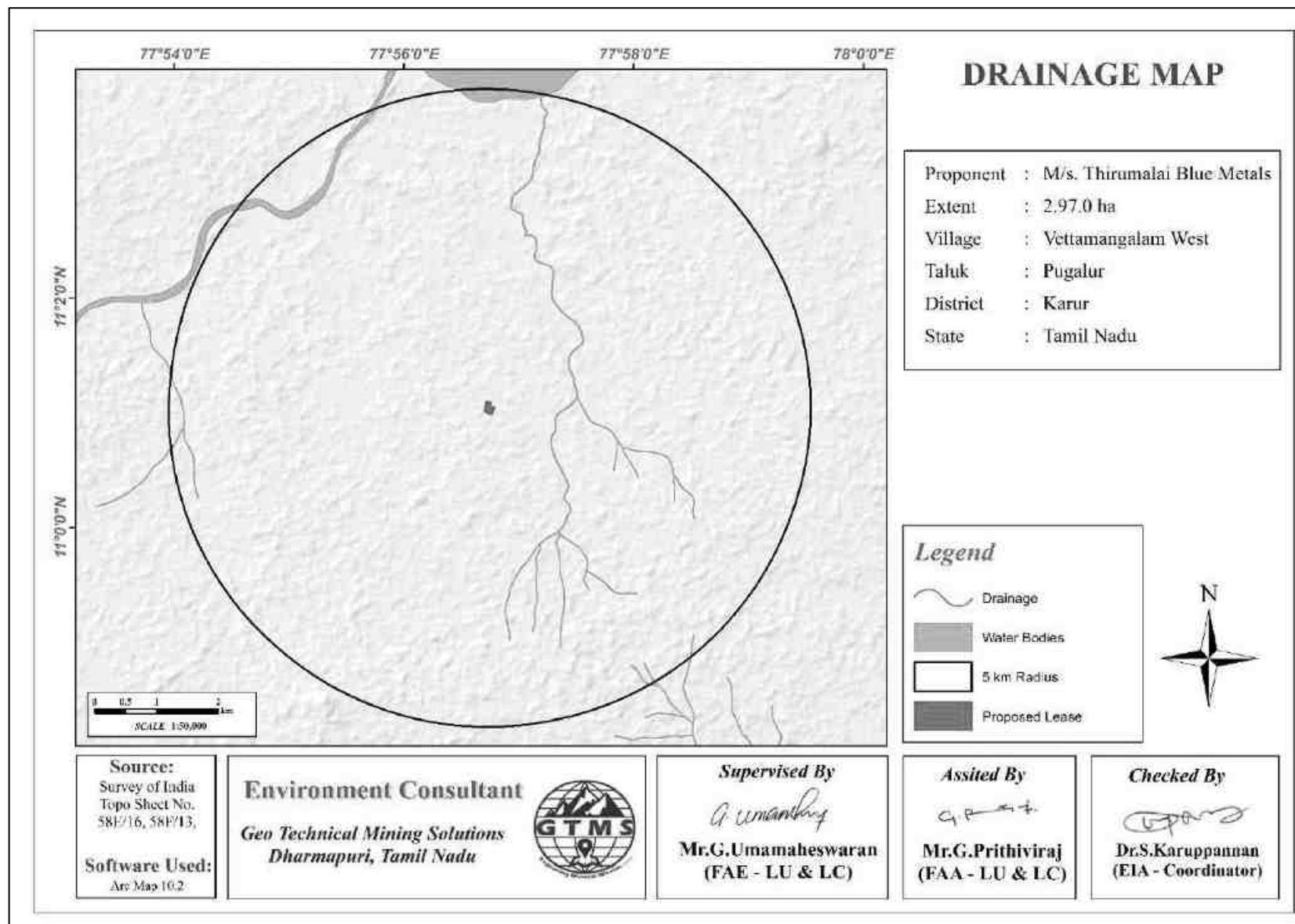


Figure 3.4 Drainage Map of 5 km Radius from Proposed Project Site



### 3.1.6 Soil

Composite soil samples were collected from 9 locations of the study area to determine the baseline soil characteristics of the soil. The locations were selected for soil sampling based on soil types, vegetative cover, and industrial & residential activities including infrastructure facilities. Soil samples were collected up to 90 cm depth, filled in polythene bags, coded and sent to laboratory for analysis. The locations of the sampling sites are shown in Table 3.3 and Figure 3.5. The samples thus collected were analysed for physical and chemical characteristics. The physical and chemical characteristic results of soil samples are provided in Table 3.4.

**Table 3.3 Soil Sampling Locations**

S. No.	Sampling ID	Location	Distance (km)	Direction	Coordinates
1	S01	Core	----	----	11°1'5.53"N,77°56'42.87"E
2	S02	Near Rani Lease	0.67	SW	11°0'41.88"N,77°56'29.60"E
3	S03	New star blue metals	0.46	S	11°0'43.99"N,77°56'40.41"E
4	S04	Amaravathi Lease	1.46	S	11°0'11.59"N,77°56'35.92"E
5	S05	Vetamangalam	1.95	N	11°2'7.90"N,77°56'27.47"E
6	S06	Uppupalaiyam	2.11	SE	11° 0'40.39"N,77°57'52.96"E
7	S07	Valipuram	4.33	SSE	10°58'56.01"N,77°57'55.53"E
8	S08	Kuppam	2.41	W	11°0'45.84"N,77°55'23.83"E
9	S09	Munnur	3.84	SW	10°59'43.70"N,77°55'2.59"E

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

#### **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 6.5 to 7.6 indicating slightly acidic to slightly alkaline nature. Electrical conductivity of the soil varies from 143 to 247  $\mu\text{S}/\text{cm}$ . Bulk density ranges between 1.2 and 3.8  $\text{g}/\text{cm}^3$

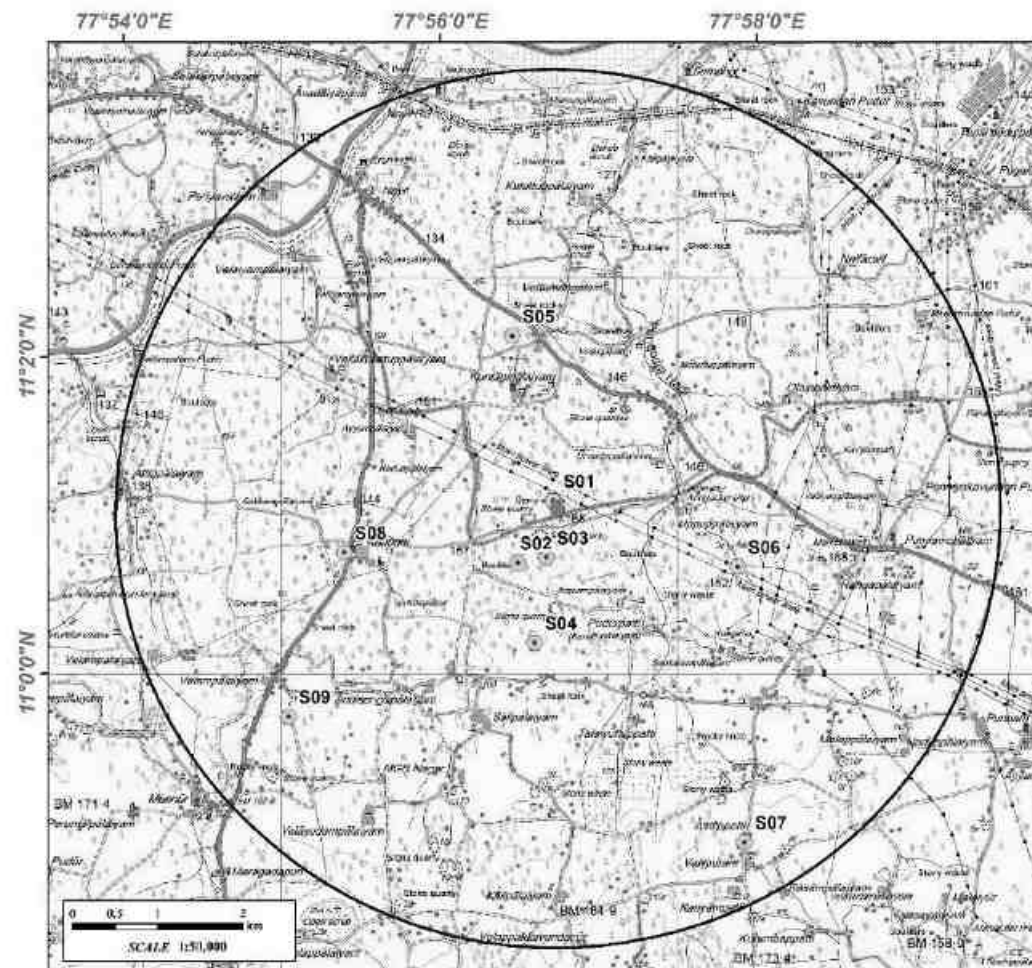
#### **Chemical Characteristics**

Nitrogen ranges between 0.04 and 1.1 %. Phosphate ranges between 0.14 and 3.8 %. Potassium ranges between 0.12 and 0.26 %. Chlorides ranges between 115 and 390  $\text{mg}/\text{kg}$ . Organic matter content ranges between 0.35 and 2.0 %.

#### **Soil Erosion**

Soil erosion map shows that:

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



## SOIL SAMPLING LOCATION MAP

Proponent : M/s. Thirumalai Blue Metals  
 Extent : 2.97.0 ha  
 Village : Vettamangalam West  
 Taluk : Pugalur  
 District : Karur  
 State : Tamil Nadu

S.No	Location ID	Monitoring Locations	Distance(km) & Direction	Coordinates
1	S01	Core	— —	11°15.53'N, 77°56'42.87"E
2	S02	Near Rani Lease	0.67 SW	11°0'41.88"N, 77°55'29.60"E
3	S03	New star blue metals	0.46 S	11°0'43.99"N, 77°58'40.41"E
4	S04	Amaravathi Lease	1.48 S	11°0'11.59"N, 77°58'35.92"E
5	S05	Vettamangalam	1.95 N	11°27'50"N, 77°58'27.47"E
6	S06	Uppupalayam	2.11 SE	11°0'40.39"N, 77°57'52.96"E
7	S07	Velipuram	4.23 SSE	10°58'56.01"N, 77°57'55.53"E
8	S08	Kuppam	2.41 SW	11°0'45.84"N, 77°55'23.63"E
9	S09	Munnur	3.84 SW	10°59'43.70"N, 77°55'2.59"E

### Legend

- Soil Sampling Locations
- 5km Radius Buffer
- Proposed Lease Area



Source: Survey of India  
 Topo Sheet No.  
 58E/16, 58F/13,  
 Software Used: Arc Map 10.2

**Environment Consultant**  
 Geo Technical Mining Solutions  
 Dharmapuri, Tamil Nadu



Supervised By  
  
 Dr.D.Kalaimurugan  
 (FAE - SC)

Checked By  
  
 Dr.S.Karuppannan  
 (EIA - Coordinator)

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

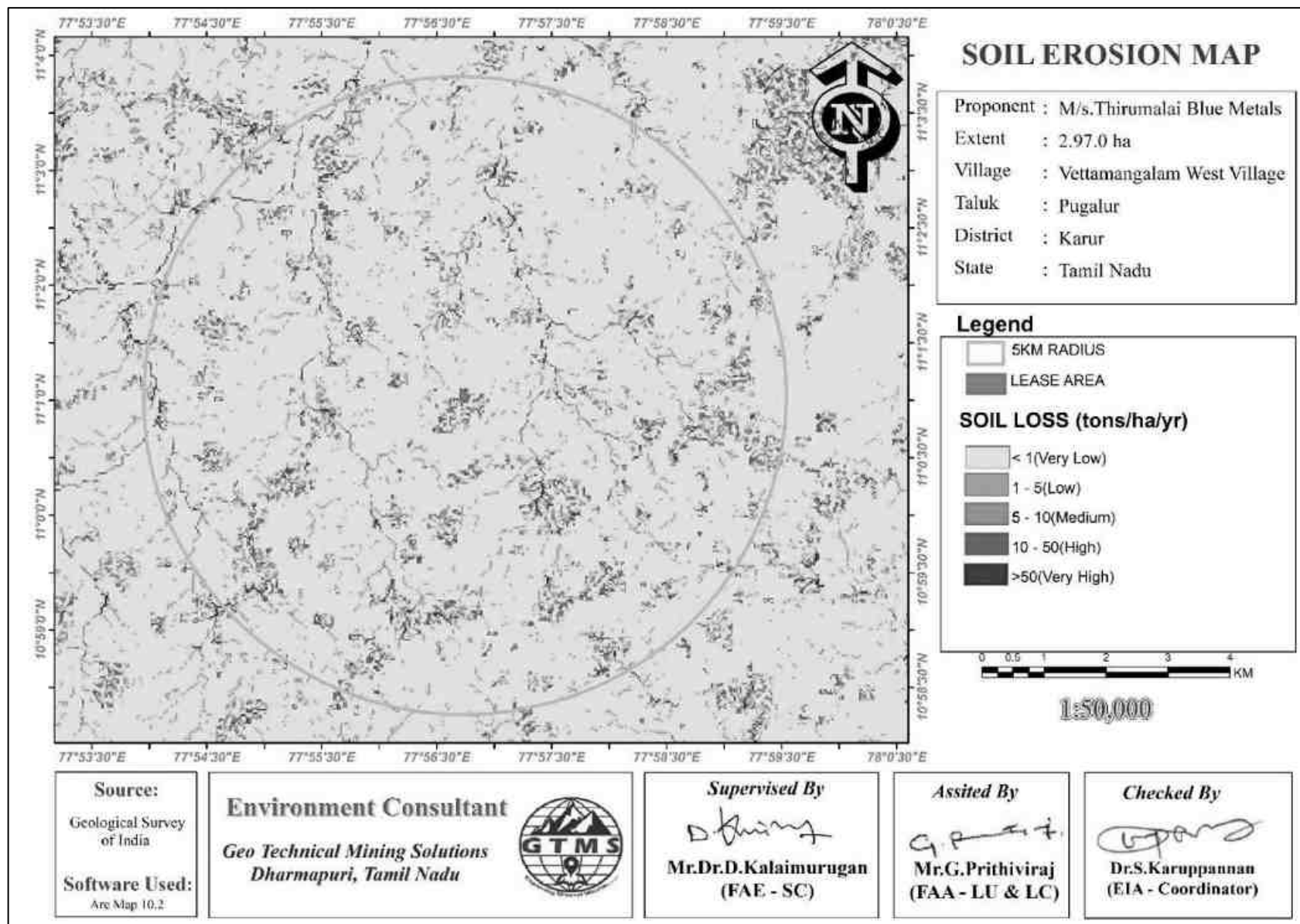


Figure 3.6 Soil Erosion Map within 5 km Radius around Proposed Project Site

**Table 3.4 Soil Quality of the Study Area**

S.No.	Parameters	Units	Core zone	Buffer Zone		
				Minimum	Maximum	Average
1	Bulk Density	g/cm <sup>3</sup>	2.6	1.2	3.8	2.1
2	Cadmium (Cd)	mg/kg	<1.0	<1.0	<1.0	<1.0
3	CEC	meq%	15.0	14	38	22.5
4	Chromium (Cr)	mg/kg	<2.0	<2.0	<2.0	<2.0
5	Copper (Cu)	mg/kg	24	1.3	10	5.28
6	Iron (Fe)	mg/kg	19254	5345	37397	17508
7	Lead (Pb)	mg/kg	<1.0	<1.0	<1.0	<1.0
8	Manganese (Mn)	mg/kg	<2.0	<2.0	<2.0	<2.0
9	Nitrogen (N)	%	1.2	0.04	1.1	0.92
10	Organic Matter @ 155°C	%	1.5	0.35	2.0	0.97
11	pH value @ 25°C	--	7.4	6.5	7.6	7.18
12	Phosphate (P)	%	2.3	0.14	3.8	1.81
13	Potassium (K)	%	0.08	0.12	0.26	0.20
14	EC @ 25°C	µS/Cm	294	143	247	189
15	Total Carbon	%	0.93	2.0	11.3	4.23
16	Sulphates (SO <sub>4</sub> )	%	0.03	0.15	0.28	0.18
17	Zinc (Zn)	mg/kg	35	14	33	22.87
18	Boron (B)	mg/kg	76	0.31	0.75	0.48
19	Calcium (Ca)	mg/kg	<1.0	<1.0	<1.0	<1.0
20	Chlorides (Cl)	mg/kg	546	115	390	264.87
21	Magnesium (Mg)	mg/kg	<1.0	<1.0	<1.0	<1.0
22	Texture	-	Sandy Clay Loam			
23	Sandy	%	62.20	25.5	68.3	56.72
24	Clay	%	23.20	13.8	28.5	17.76
25	Silty	%	14.60	4.3	57.2	25.52

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 (km)	Direction	Coordinates
1	BW01	Karattupalaiyam	1.36	S	11°0'14.66"N,77°56'39.17"E
2	BW02	Arasampalaiyam	0.50	E	11°0'42.51"N,77°56'45.26"E
3	BW03	MGR Nagar	4.22	SSW	10°58'50.44"N,77°55'53.77"E
4	BW04	Vedirimattam Pudur	5.00	NW	11°02'3.05"N,77°54'80.38"E
5	BW05	Punnamchatram	3.73	W	11°0'50.37"N,77°58'49.79"E
6	BW06	Kalipalaiyam	3.85	NE	11°2'59.51"N,77°57'38.63"E
7	BW07	Vallipuram	4.46	SE	10°58'52.44"N,77°57'57.82"E
8	OW01	Arasampalaiyam	1.08	NW	11° 0'31.10"N,77°56'11.47"E
9	OW02	Kuntanipalaiyam	1.78	NNW	11°1'55.41"N,77°56'11.47"E
10	SW01	Velaiyampalaiyam	4.16	NW	11°2'42.24"N,77°55'6.12"E

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

#### 3.2.1 Surface Water Resources and Quality

Noyyal River is the prominent surface water resources present in the study area. This River was ephemeral in nature, which convey water only after rainfall events. The proposed project area is located 4.16 km NW of Noyyal River (Velaiyampalaiyam), as shown in Table 3.5 and Figure 3.7. One surface water sample, known as SW1 were collected from the Noyyal River to assess the baseline water quality. Table 3.6 summarizes surface water quality data of the collected sample.

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

#### 3.2.2 Ground Water Resources and Quality

Groundwater in the study area occurs in the crystalline rocks of Archaean age and recent alluvium. The movement of the groundwater is controlled by the intensity of weathering and fracturing of crystalline rocks. Dug wells and bore wells are the most common ground water

abstraction structures in the area. However, in dry season, people in the study area heavily rely on bore wells for their domestic and agriculture purpose.

Nine groundwater samples, known as BW01, BW02, BW03, BW04, BW05, BW06, BW07, OW01 and OW02 collected from bore wells and open wells were analysed for physico-chemical conditions, heavy metals and bacteriological contents in order to assess baseline quality of ground water. Ground water sampling locations and their distance and direction from the lease area are provided in Table 3.5 and the spatial occurrence of water sampling locations is shown in Figure 3.7. Table 3.6 summarizes ground water quality data of the nine samples.

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

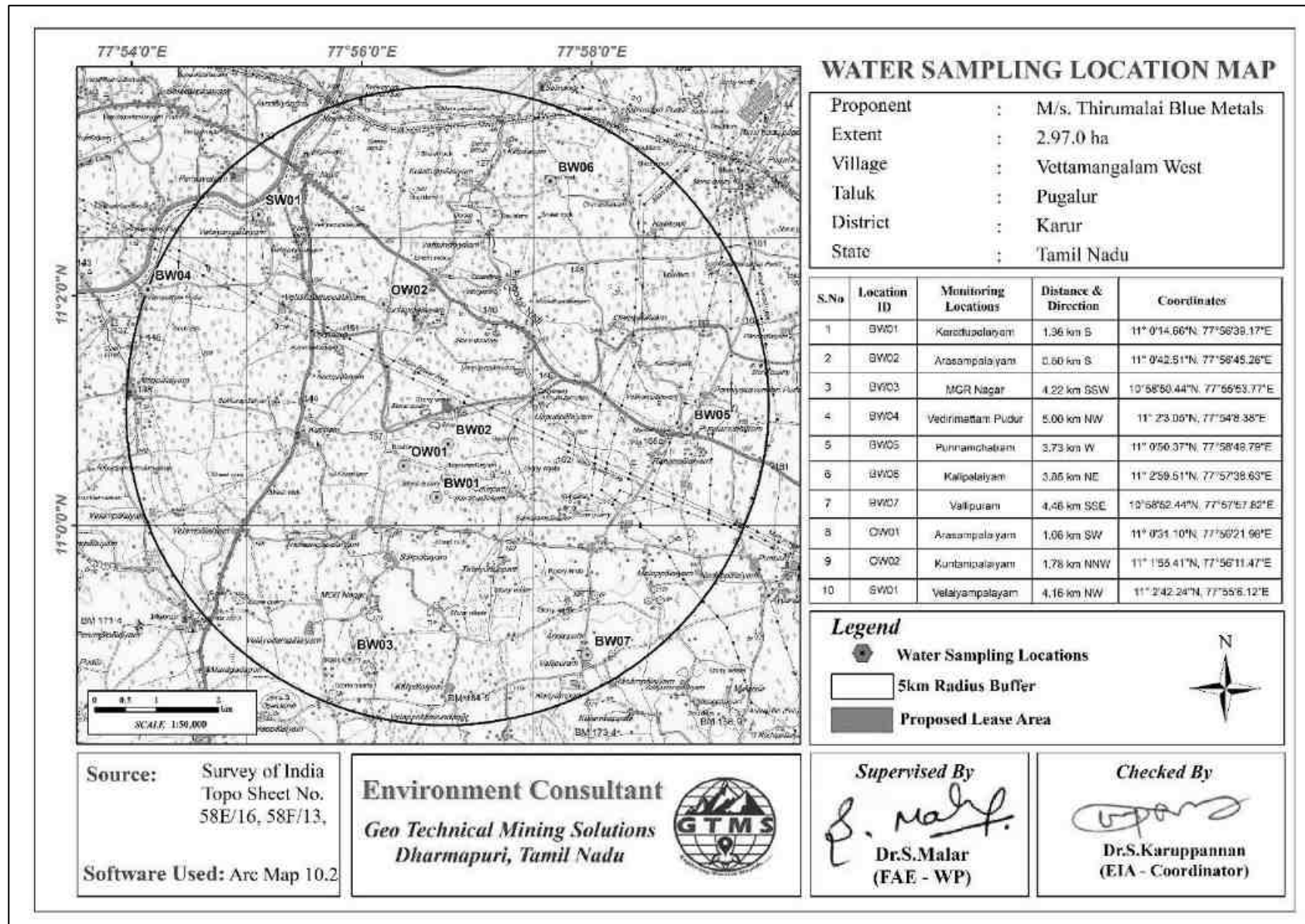
### **3.2.3 Hydrogeological Studies**

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 2022 (Pre-Monsoon Season) and from October through December, 2022 (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 20.6 to 23.5 m BGL in pre monsoon and 11.5 to 16.3 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 2022 (Post-Monsoon Season) vary from 63.8 to 67.6 m and from 62.3 to 65.8 m for the period of March through May, 2022 (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 Proposed Project Site**

**Table 3.6 Ground and Surface Water Quality Result**

S. No.	Parameters	Units	Results				
			Minimum	Maximum	Average	SW01	Max. Permissible limits (IS: 10500:2012)
1	Coliforms Bacteria	MPN	Present	Absent	Absent	Present	Absent
2	E.Coli	MPN	Absent	Absent	Absent	Absent	Absent
3	Aluminium (Al)	mg /l	<0.02	<0.02	<0.02	<0.02	0.2
4	Ammonia (NH <sub>3</sub> )	mg /l	<0.1	<0.1	<0.1	<0.1	0.5
5	Anionic Detergents	mg /l	<0.01	<0.01	<0.01	<0.01	1.0
6	Barium (Ba)	mg /l	<0.1	<0.1	<0.1	<0.1	0.7
7	Boron (B)	mg /l	<0.1	<0.1	<0.1	<0.1	1.0
8	Cadmium (Cd)	mg /l	<0.003	<0.003	<0.003	<0.003	0.003
9	Calcium (Ca)	mg /l	58	146	106.11	134	200
10	Chloride (Cl)	mg /l	150	297	218.89	442	1000
11	Colour	Hazen	<1.0	<1.0	<1.0	30	15
12	Copper (Cu)	mg/l	<0.02	<0.02	<0.02	<0.02	1.5
13	Cyanide (CN)	mg/l	<0.02	<0.02	<0.02	<0.01	0.05
14	Fluoride (F)	mg/l	0.19	1.2	0.71	1.1	1.5
15	Free Residual Chlorine (RFC)	mg/l	<0.1	<0.1	<0.1	<0.1	Min 1.0
16	Iron (Fe)	mg/l	<0.05	0.05	<0.05	<0.05	1.0
17	Lead (Pb)	mg/l	<0.01	<0.01	<0.01	<0.01	0.01
18	Magnesium (Mg)	mg/l	14	88	47.56	58	100
19	Manganese (Mn)	mg/l	<0.01	<0.01	<0.01	<0.01	0.3



20	Mercury (Hg)	mg/l	<0.001	<0.001	<0.001	0.001	0.001
21	Molybdenum	mg/l	<0.05	<0.05	<0.05	<0.05	0.07
22	Nitrate (NO <sub>3</sub> )	mg/l	1.9	14	6.70	2.1	45
23	Odour	--	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
24	pH value @ 25°C	--	7.7	6.7	7.12	7.2	6.5-8.5
25	Phenolic Compounds	mg/l	<0.001	<0.001	<0.001	<0.001	0.002
26	Selenium (Se)	mg/l	<0.01	<0.01	<0.01	<0.01	0.01
27	EC @ 25°C	mg/l	1043	3570	1850.89	2440	NA
28	Sulphates (SO <sub>4</sub> )	mg/l	69	210	137.78	344	400
29	Sulphide (H <sub>2</sub> S)	mg/l	<0.05	<0.05	<0.05	<0.05	0.05
30	Total Alkalinity	mg/l	185	615	349.33	467	600
31	Arsenic (As)	mg/l	<0.005	<0.005	<0.005	<0.005	0.01
32	Chromium (Cr)	mg/l	<0.05	<0.05	<0.05	<0.05	0.05
33	TDS	mg/l	560	1880	1050.11	1580	2000
34	TH (CaCO <sub>3</sub> )	mg/l	204	1022	482.00	571	600
35	TSS @ 105°C	mg/l	<5.0	<5.0	<5.0	<5.0	NA
36	Turbidity	NTU	<0.01	1.1	<0.01	3.0	5.0
37	Zinc (Zn)	mg/l	<0.05	<0.05	<0.05	<0.05	15

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

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 3 located in western direction of the proposed project site. The groundwater flow maps in Figures 3.10-3.11 show that most of the bore well groundwater for the post- and pre-monsoon seasons flow towards the bore well number 9. It is located in north direction of the proposed project site. On the basis of the groundwater flow information, both open wells and bore wells mentioned above can be chosen for water quality monitoring purpose as the wells may get easily affected by the contaminants resulting from the mining activities of the sites in future.

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

Station ID	Depth to Static Water Table BGL (m)				Latitude	Longitude
	Mar-2022	Apr-2022	May-2022	Average		
DW01	21.5	22.7	23.0	22.4	11° 0'32.45"N	77°56'15.88"E
DW02	22.0	23.5	24.6	23.3	11° 0'6.43"N	77°56'3.20"E
DW03	21.0	22.5	23.5	22.3	11° 1'5.46"N	77°56'31.22"E
DW04	20.5	21.0	22.5	21.3	11° 1'20.56"N	77°56'38.90"E
DW05	22.5	23.7	24.5	23.5	11° 1'9.31"N	77°55'54.57"E
DW06	20.5	21.7	22.5	21.5	11° 0'32.94"N	77°56'57.09"E
DW07	22.0	23.5	24.7	23.4	11° 0'39.89"N	77°57'14.82"E
DW08	19.5	20.5	21.8	20.6	11° 0'6.95"N	77°56'55.96"E
DW09	21.5	22.7	23.5	22.5	11° 0'34.82"N	77°55'44.25"E

Source: Onsite monitoring data

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

Station ID	Depth to Static Water Table BGL(m)				Latitude	Longitude
	Oct-2022	Nov-2022	Dec-2022	Average		
DW01	10.4	11.9	12.5	11.6	11° 0'32.45"N	77°56'15.88"E
DW02	11.0	12.5	13.4	12.3	11° 0'6.43"N	77°56'3.20"E
DW03	10.5	11.5	12.7	11.5	11° 1'5.46"N	77°56'31.22"E
DW04	12.0	13.5	14.5	13.3	11° 1'20.56"N	77°56'38.90"E
DW05	11.5	12.4	13.7	12.5	11° 1'9.31"N	77°55'54.57"E
DW06	13.0	14.5	15.5	14.3	11° 0'32.94"N	77°56'57.09"E
DW07	14.0	15.5	16.5	15.3	11° 0'39.89"N	77°57'14.82"E
DW08	15.0	16.5	17.5	16.3	11° 0'6.95"N	77°56'55.96"E
DW09	14.0	15.5	16.5	15.3	11° 0'34.82"N	77°55'44.25"E

Source: Onsite monitoring data

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

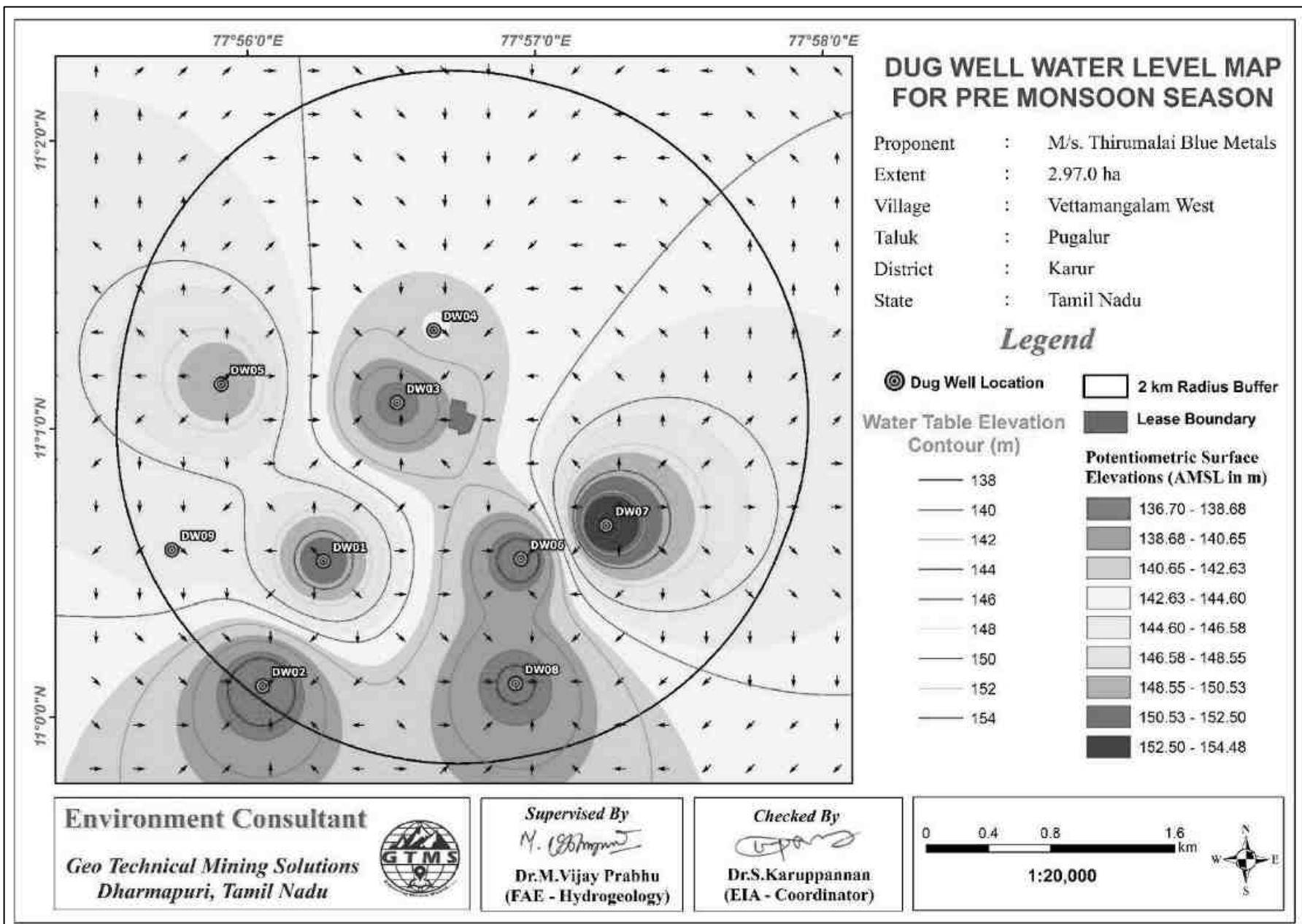
<b>Station ID</b>	<b>Depth to Static Potentiometric Surface BGL(m)</b>				<b>Latitude</b>	<b>Longitude</b>
	<b>Mar- 2022</b>	<b>Apr- 2022</b>	<b>May- 2022</b>	<b>Average</b>		
BW01	62.0	63.5	64.5	63.3	11° 0'37.43"N	77°56'47.13"E
BW02	61.0	62.5	63.5	62.3	11° 0'24.89"N	77°57'24.02"E
BW03	63.0	64.0	65.5	64.1	11° 0'37.83"N	77°56'16.07"E
BW04	64.5	66.0	67.0	65.8	11° 0'7.10"N	77°55'42.38"E
BW05	64.0	64.5	66.5	65	11° 0'28.51"N	77°55'47.14"E
BW06	63.0	64.5	66.0	64.5	11° 0'50.33"N	77°56'2.82"E
BW07	61.0	62.5	63.5	62.3	11° 1'24.10"N	77°56'11.59"E
BW08	62.0	63.5	66.0	63.8	11° 0'0.72"N	77°56'48.56"E
BW09	62.5	64.0	65.5	64	11° 1'14.53"N	77°56'48.43"E

Source: Onsite monitoring data

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

<b>Station ID</b>	<b>Depth to Static Potentiometric Surface BGL(m)</b>				<b>Latitude</b>	<b>Longitude</b>
	<b>Oct- 2022</b>	<b>Nov- 2022</b>	<b>Dec- 2022</b>	<b>Average</b>		
BW01	64.0	65.5	66.5	65.3	11° 0'37.43"N	77°56'47.13"E
BW02	63.5	64.0	65.5	64.3	11° 0'24.89"N	77°57'24.02"E
BW03	65.0	66.5	67.5	66.3	11° 0'37.83"N	77°56'16.07"E
BW04	66.5	67.5	69.0	67.6	11° 0'7.10"N	77°55'42.38"E
BW05	66.0	67.5	68.5	67.3	11° 0'28.51"N	77°55'47.14"E
BW06	64.0	65.5	66.5	65.3	11° 0'50.33"N	77°56'2.82"E
BW07	62.0	63.5	66.0	63.8	11° 1'24.10"N	77°56'11.59"E
BW08	65.0	66.5	67.5	66.3	11° 0'0.72"N	77°56'48.56"E
BW09	63.5	65.0	67.5	65.3	11° 1'14.53"N	77°56'48.43"E

Source: Onsite monitoring data



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

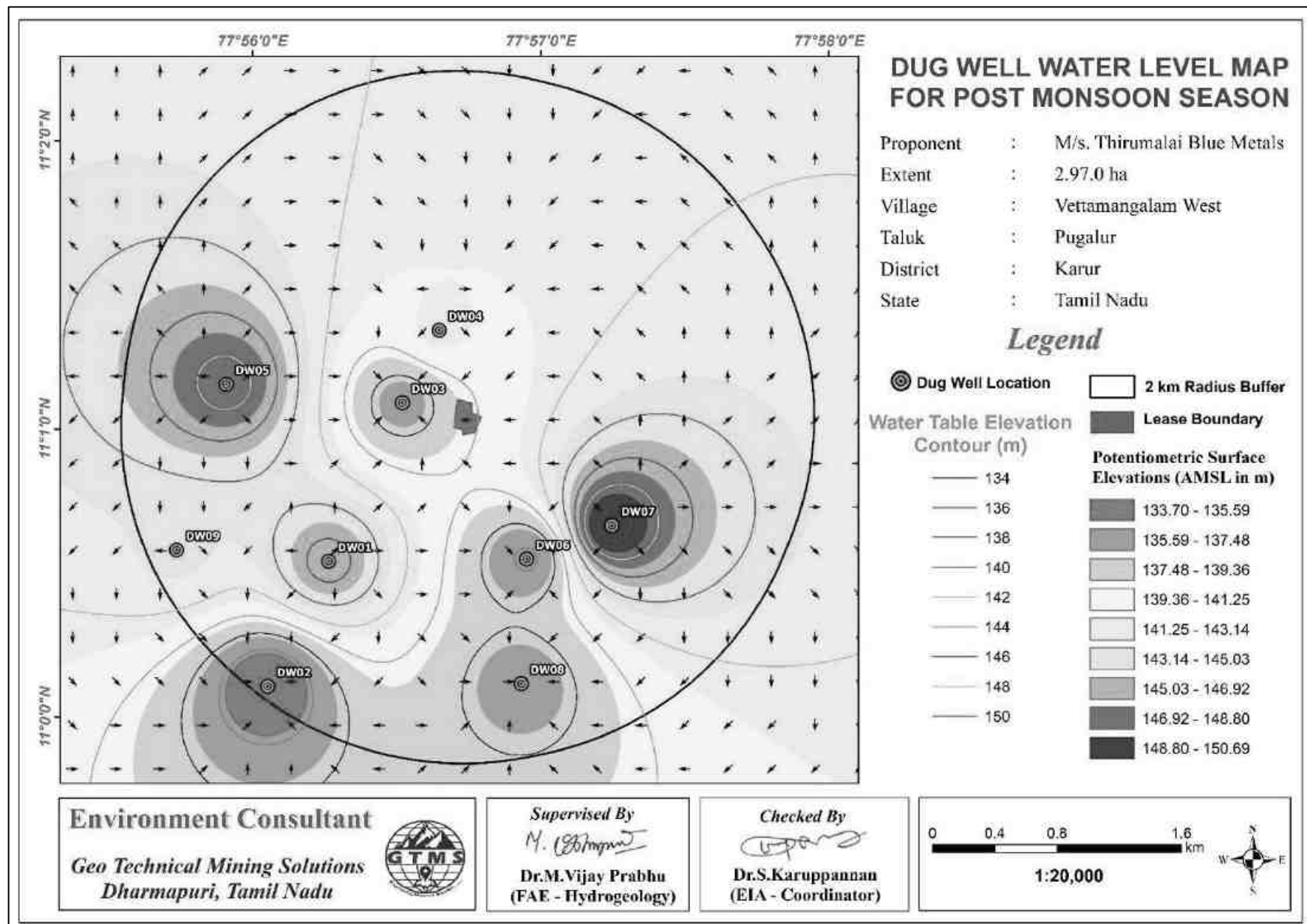


Figure 3.9 Open Well Static Groundwater Elevation Map Showing Direction of Groundwater Flow During Post-Monsoon Season

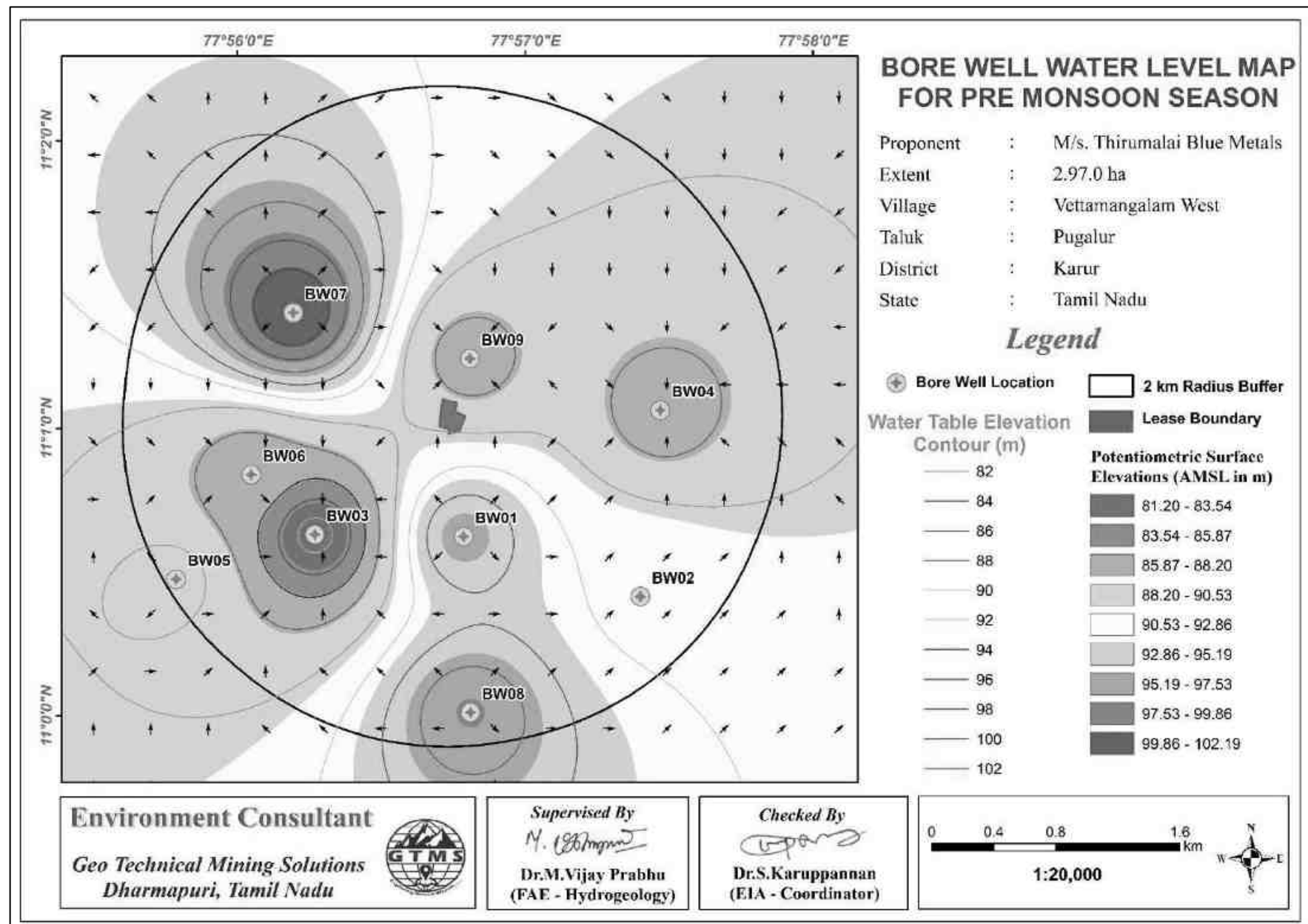


Figure 3.10 Borewell Static Groundwater Elevation Map Showing Direction of Groundwater Flow During Pre-Monsoon Season

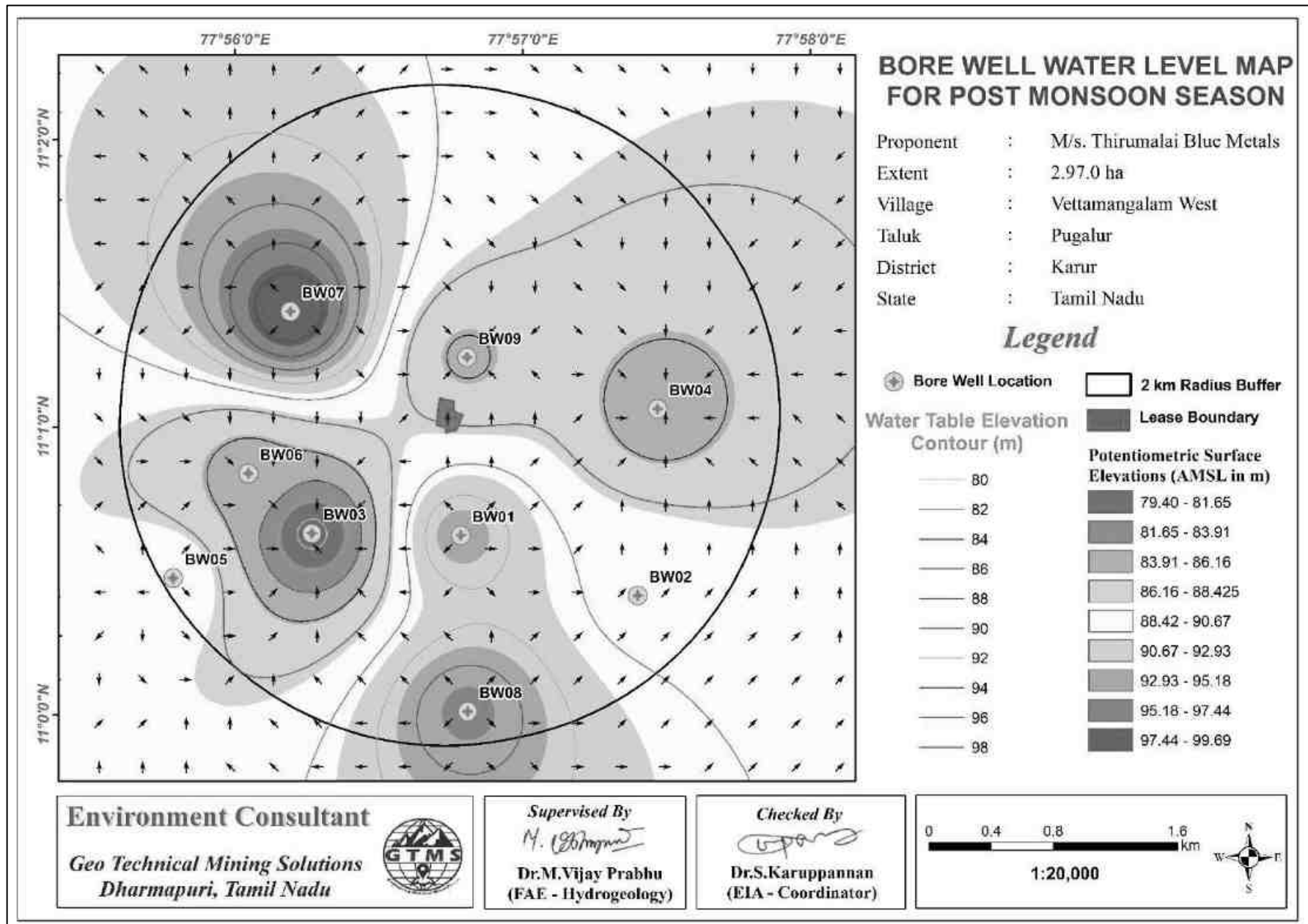


Figure 3.11 Borewell Static Groundwater Elevation Map Showing Direction of Groundwater Flow During Post-Monsoon Season

### 3.2.3.2 Electrical Resistivity Investigation

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

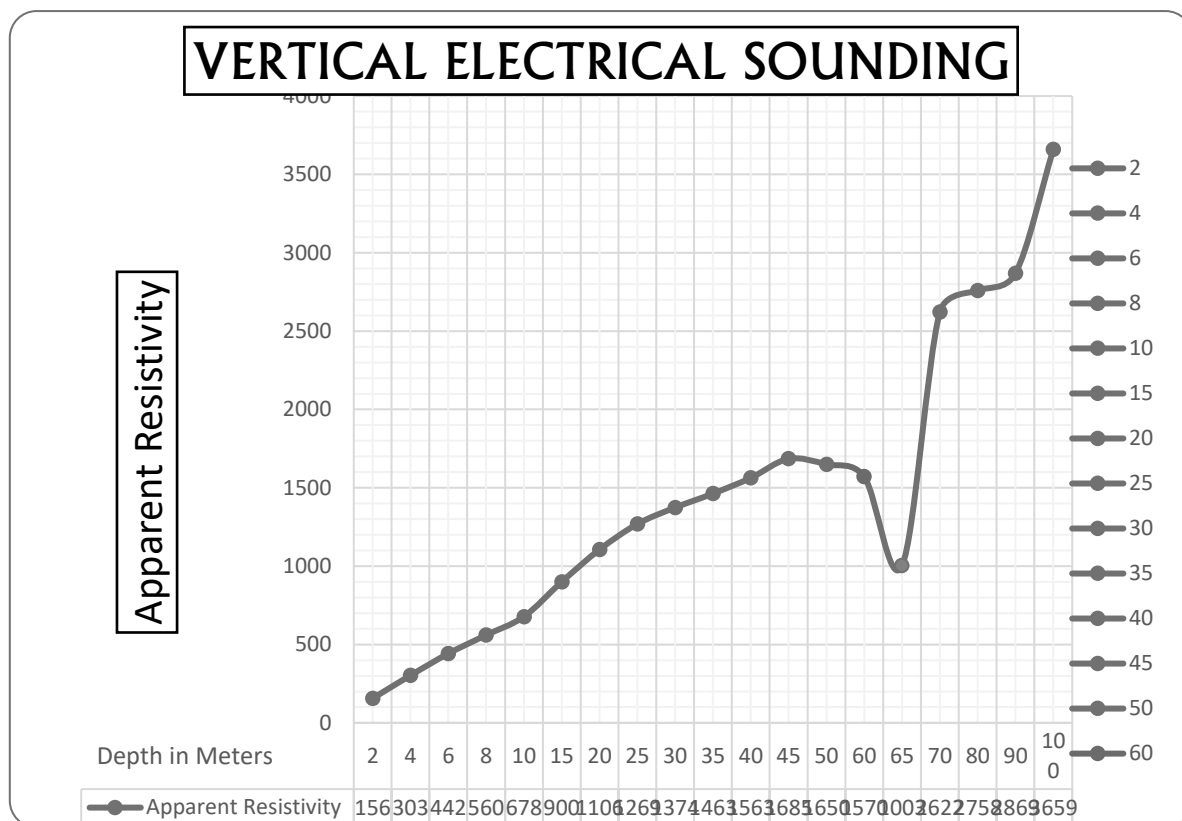
#### **Result**

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

**Table 3.11 Vertical Electrical Sounding Data**

Location Coordinates - 11° 0'44.46"N 77°56'40.43"E					
S. No.	AB/2 (m)	MN/2 (m)	Geometrical Factor (G)	Resistance in $\Omega$	Apparent Resistivity in $\Omega m$
1	2	2	11.78	13.248	156.06
2	4	2	49.46	6.127	303.04
3	6	5	112.26	3.937	441.97
4	8	5	200.18	2.798	560.10
5	10	5	75.36	8.997	678.01
6	15	10	173.49	5.188	900.07
7	20	10	310.86	3.558	1106.04
8	25	10	487.49	2.603	1268.94
9	30	10	274.75	5.001	1374.02
10	35	10	376.8	3.883	1463.11
11	40	10	494.55	3.16	1562.78
12	45	10	628	2.683	1684.92
13	50	10	777.15	1.943	1510.00
14	65	20	453.6	2.213	1003.82
15	70	20	989.1	2.651	2622.10
16	80	20	1256	2.196	2758.18
17	90	20	1554.3	1.846	2869.24
18	100	20	1653.6	2.213	3659.42





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

The rock formation of low resistivity values indicates occurrence of water at the depth of about 65 m below ground level. The maximum depth proposed for the proposed project is 45 m below ground level. Therefore, the mining operation will not affect the aquifer throughout the entire mine life period.

### 3.3 AIR ENVIRONMENT

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

#### 3.3.1 Meteorology

##### 3.3.1.1 Climatic Variables

A temporary meteorological station was installed at the project sites by covering cluster quarries. The station was installed at a height of 3 m above the ground level as there are no obstructions facilitating flow of wind, wind speed, wind direction, humidity and temperature. Meteorological data obtained from the onsite monitoring station are provided in Table 3.12.

According to the onsite data, the temperature in October, 2022 varied from 15.90 to 31.32<sup>0</sup> C with the average of 24.74<sup>0</sup> C; in November, 2022 from 14.61 to 31.16<sup>0</sup> C with the average of 24.40<sup>0</sup> C; and in December, 2022 from 14.0 to 30.82<sup>0</sup> C with the average of 23.74<sup>0</sup>C. In October, 2022, relative humidity ranged from 51.35 to 100 % with the average of 85.10%; in November, 2022, from 51.35 to 100 % with the average of 85.10 %; and in December, 2022, from 51.42 to 100 % with the average of 85.65 %. The wind speed in October, 2022 varied from 0.06 to 6.48 m/s with the average of 2.53 m/s; in November, 2022 from 0.02 to 6.55 m/s with the average of 2.69 m/s; and in December, 2022 from 0.04 to 6.65 m/s with the average of 2.55 m/s. In October,2022, wind direction varied from 0.07 to 359.70<sup>0</sup> with the average of 161.47<sup>0</sup>; in November, 2022, from 0.00 to 359.63<sup>0</sup> with the average of 145.59<sup>0</sup>; and in December, 2022, from 1.50 to 359.62<sup>0</sup> with the average of 110.36<sup>0</sup>. In October,2022, surface pressure varied from 96.94 to 99.60 kPa with the average of 98.58 kPa; in November, 2022, from 95.68 to 99.86 kPa with the average of 98.64 kPa; and in December, 2022, from 98.02 to 99.56 kPa with the average of 98.84 kPa.

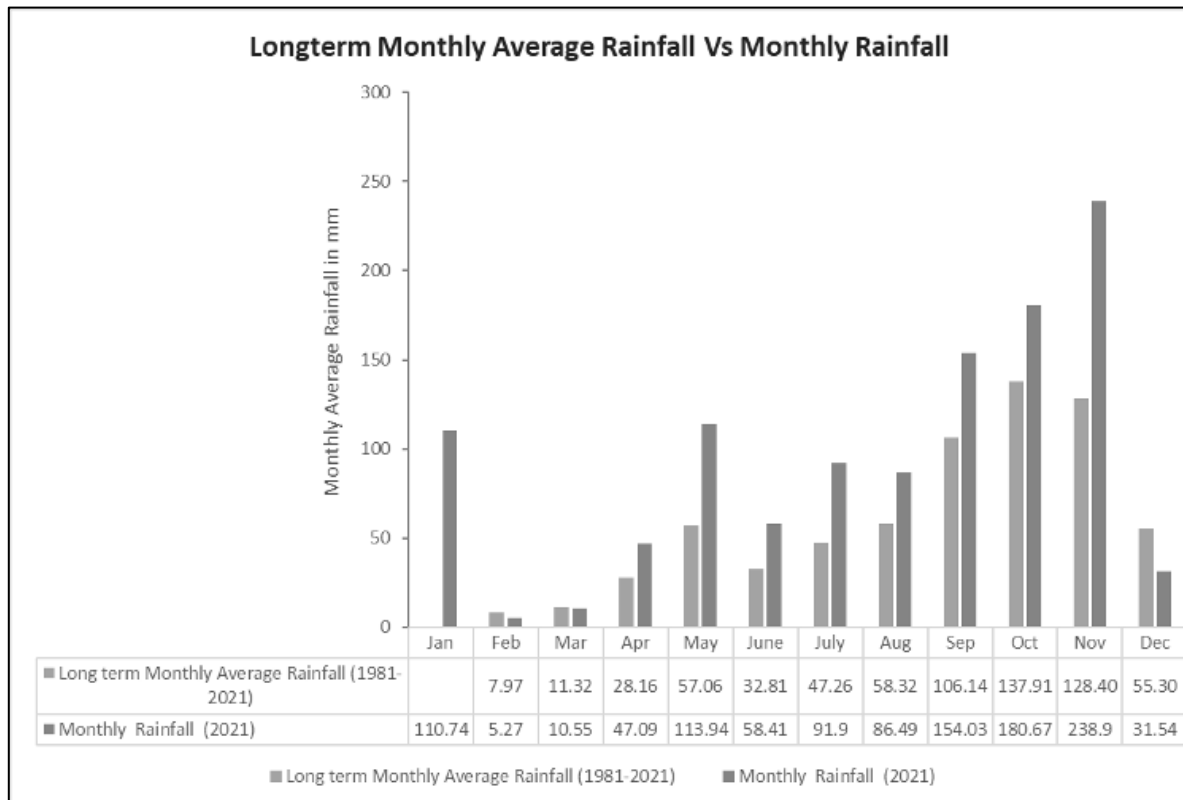
**Table 3.12 Onsite Meteorological Data**

S. No.	Parameters		OCT, 2022	NOV, 2022	DEC, 2022
1	Temperature ( <sup>0</sup> C)	Min	15.90	14.61	14.00
		Max	31.32	31.16	30.82
		Avg	24.74	24.40	23.74
2	Relative Humidity (%)	Min	49.20	51.35	51.42
		Max	100.00	100.00	100.00
		Avg	85.80	85.10	85.65
3	Wind Speed (m/s)	Min	0.06	0.02	0.04
		Max	6.48	6.55	6.65
		Avg	2.53	2.69	2.55
4	Wind Direction (degree)	Min	0.70	0.00	1.50
		Max	359.70	359.63	359.62
		Avg	161.47	145.59	110.36
5	Surface Pressure(kPa)	Min	96.94	95.68	98.02
		Max	99.60	99.86	99.56
		Avg	98.58	98.64	98.84

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 1981-2021 and compared with the monthly rainfall for the year 2021, shown in Figure 3.10. The Figure 3.13 shows that rainfall is generally high in the months of September through November in every year. Particularly, rainfall in September through November of 2021 is higher than the previous years.



**Figure 3.13 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 2.54 m/s.
- ❖ Predominant wind was dominant in the directions ranging from northeast to southwest.

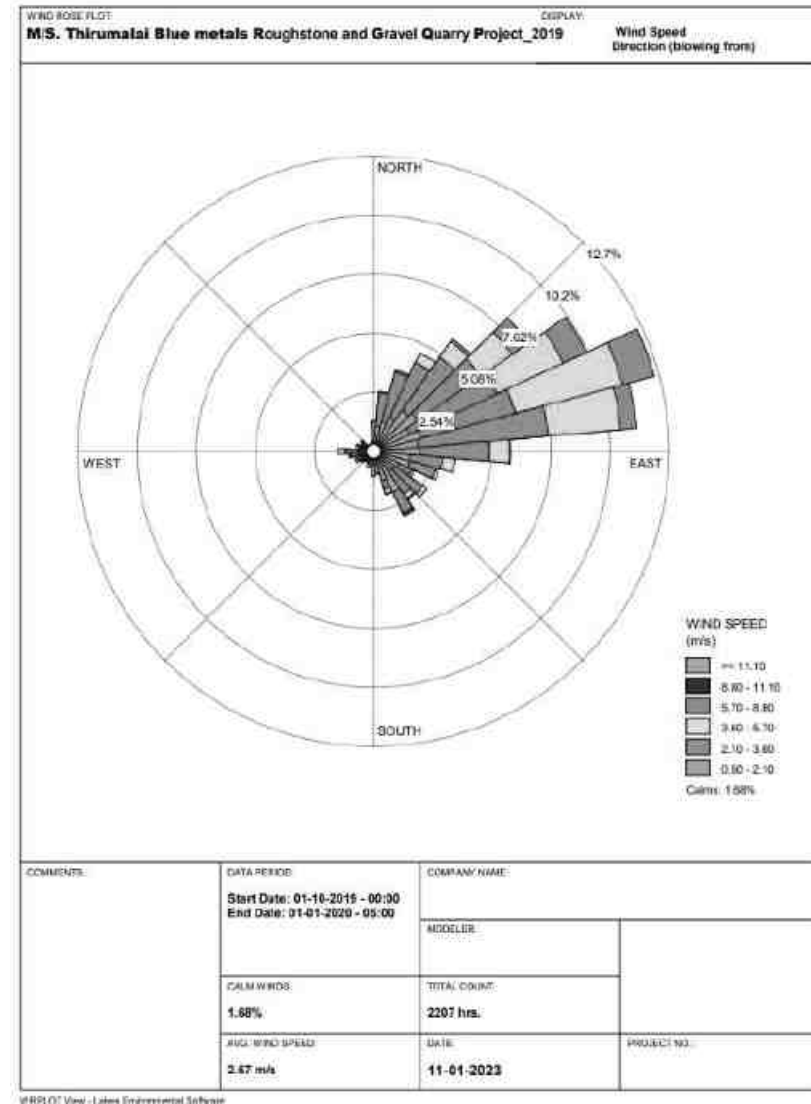
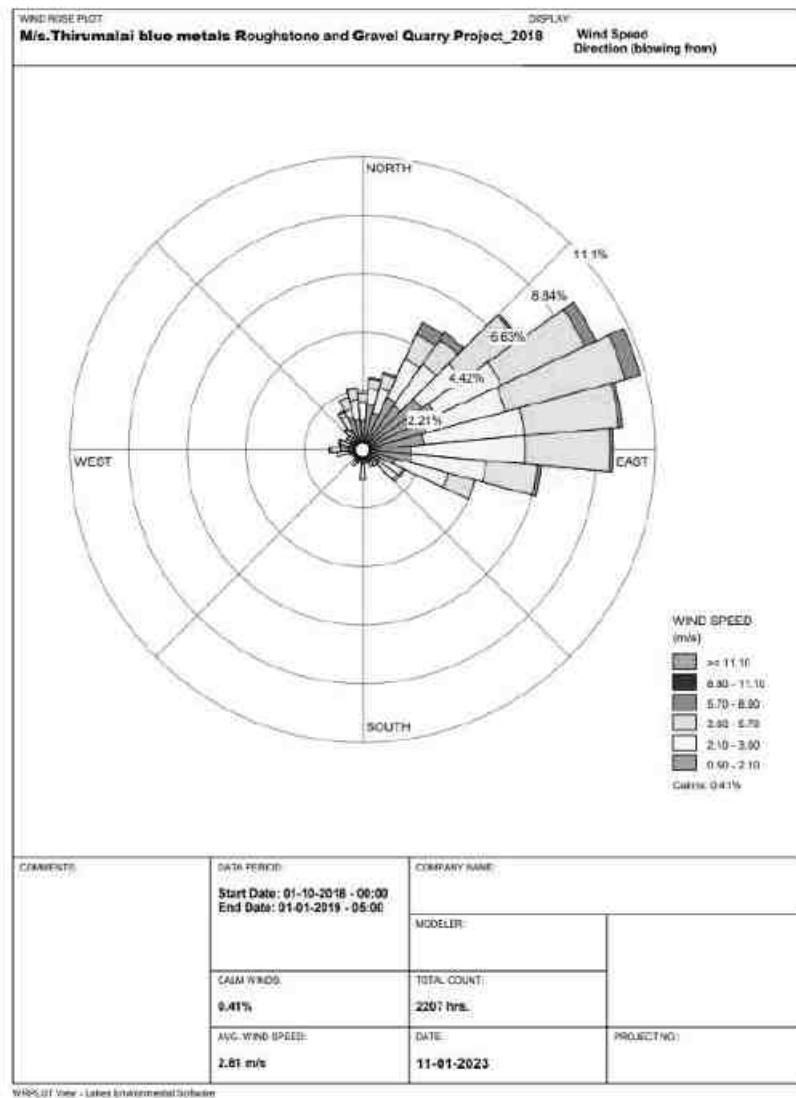


Figure 3.14 Windrose Diagram for 2018 and 2019 (October to December)

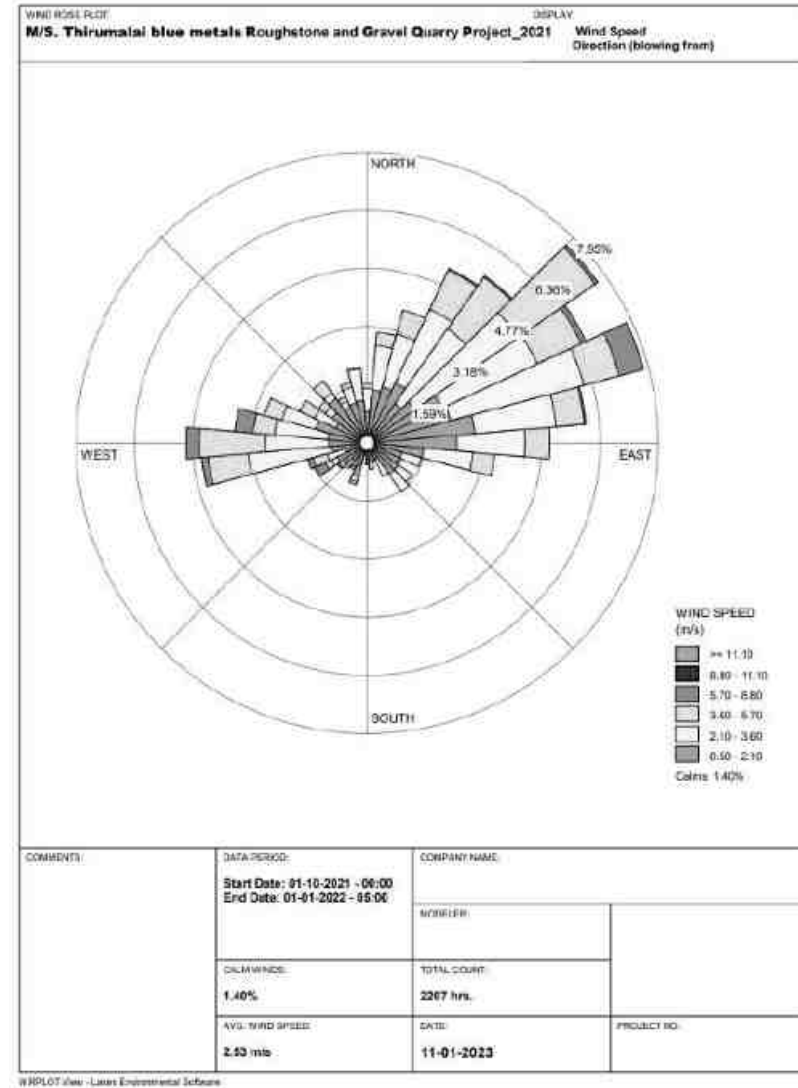
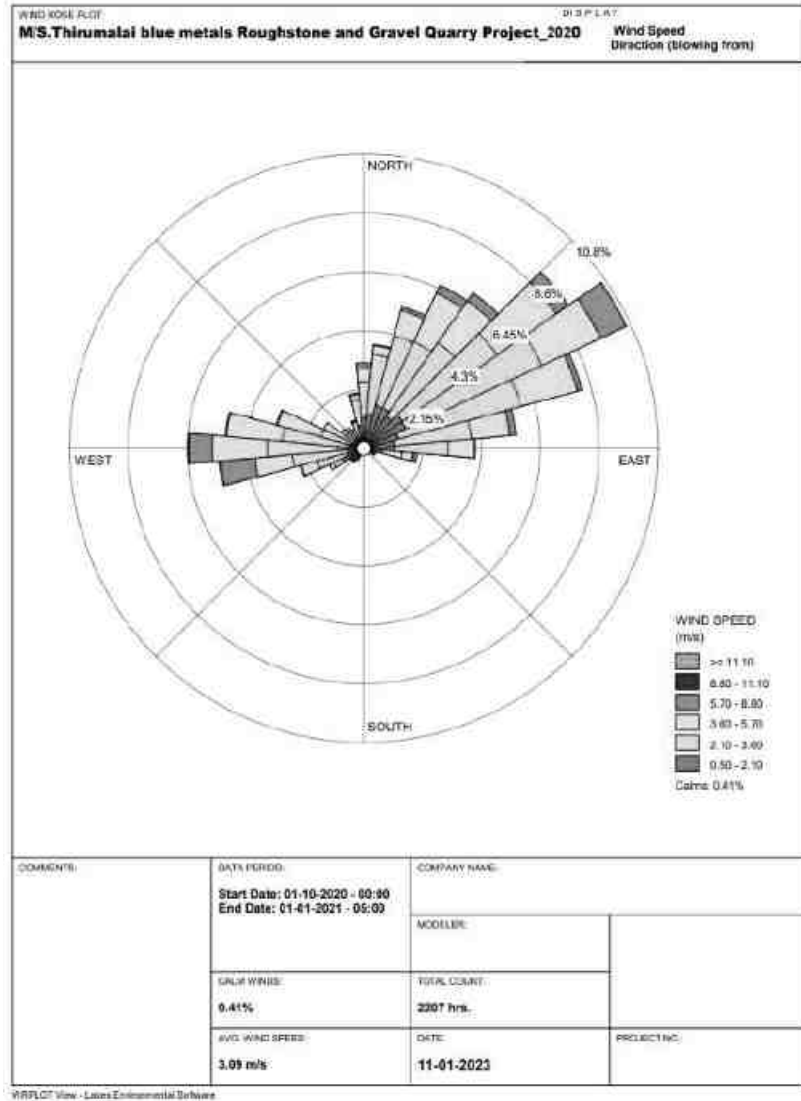
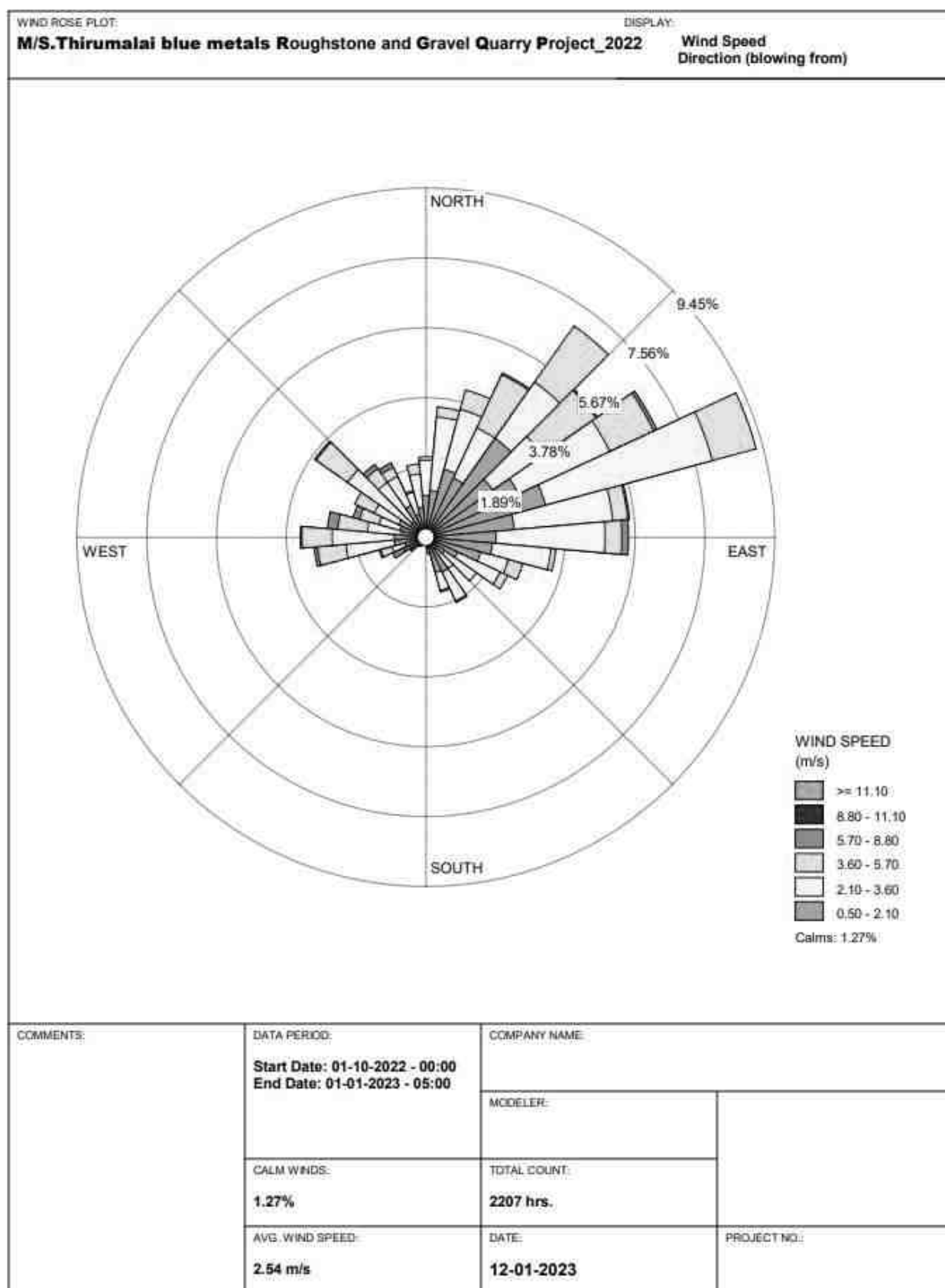


Figure 3.14a Windrose Diagram for 2020 and 2021 (October to December)



WRPLOT View - Lakes Environmental Software

**Figure 3.15 Onsite Wind Rose Diagram**

### 3.3.2 Ambient Air Quality Study

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

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

**Table 3.13 Methodology and Instrument Used for AAQ Analysis**

Parameter	Method	Instrument
PM <sub>2.5</sub>	Gravimetric method Beta attenuation method	Fine Particulate Sampler
PM <sub>10</sub>	Gravimetric method Beta attenuation method	Respirable Dust Sampler
SO <sub>2</sub>	IS-5182 Part II (Improved West & Gaeke method)	Respirable Dust Sampler with gaseous attachment
NO <sub>x</sub>	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 3.14 National Ambient Air Quality Standards**

S. No.	Pollutant	Time Weighted Average	Concentration in ambient air	
			Industrial, Residential, Rural & other areas	Ecologically Sensitive area (Notified by Central Govt.)
1	SO <sub>2</sub> (µg/m <sup>3</sup> )	Annual Avg.* 24 hours**	50.0 80.0	20.0 80.0
2	NO <sub>x</sub> (µg/m <sup>3</sup> )	Annual Avg. 24 hours	40.0 80.0	30.0 80.0
3	PM <sub>10</sub> (µg/m <sup>3</sup> )	Annual Avg. 24 hours	60.0 10° .0	60.0 10° .0
4	PM <sub>2.5</sub> (µg/m <sup>3</sup> )	Annual Avg. 24 hours	40.0 60.0	40.0 60.0

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

## Methodology

Ambient air quality monitoring was carried out with a frequency of two samples per week at Eleven (11) locations, adopting a continuous 24 hourly (3 shift of 8-hour) schedule for the period October-December, 2022 as per the CPCB, MoEF guidelines and notifications.

It was ensured that the equipment was placed preferably at a height of at least  $3 \pm 0.5\text{m}$  above the ground level at each monitoring station for negating the effects of wind-blown ground dust. The equipment was placed at 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  $\text{PM}_{2.5}$ ,  $\text{PM}_{10}$ , sulphur dioxide ( $\text{SO}_2$ ) and nitrogen dioxide ( $\text{NO}_x$ ). The sampling locations are shown in Figure 3.16 and average concentrations of air pollutants are summarized in Tables 3.15 and are shown in Figures 3.17-3.21.

**Table 3.15 Ambient Air Quality (AAQ) Monitoring Locations**

S. No.	Location Code	Monitoring Locations	Distance (km)	Direction	Coordinates
1	AAQ1	Between NTC and Rani Leases	0.75	SW	11° 0'41.49"N, 77°56'26.24"E
2	AAQ2	New star lease	0.48	S	11° 00'43.39"N, 77°56'41.17"E
3	AAQ3	Amaravathi Lease	1.36	S	11° 00'14.81"N, 77°56'38.02"E
4	AAQ4	Andisangilipalayam	2.06	SSW	11° 00'02.46"N, 77°56'06.69"E
5	AAQ5	Velampalayam	4.89	SW	11° 00'3.65"N, 77°54'11.26"E
6	AAQ6	Athipalayam	5.0	SW	11° 1'13.29"N, 77°53'57.51"E
7	AAQ7	Munnur	4.72	WSW	10°59'7.06"N, 77°54'39.06"E
8	AAQ8	Punna chatram	3.65	ENE	11° 0'48.65"N, 77°58'47.07"E
9	AAQ9	Karudayampalayam	4.75	SSE	10°58'09.04"N, 77°57'14.40"E
10	AAQ10	Kunthanipalayam	1.30	NNW	11° 1'46.52"N, 77°56'29.26"E
11	AAQ11	Near core	0.09	E	11°00'59.55"N, 77°56'49.13"E

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

## Results

As per the monitoring data,  $\text{PM}_{2.5}$  ranges from  $22.7 \mu\text{g}/\text{m}^3$  to  $17.4 \mu\text{g}/\text{m}^3$ ;  $\text{PM}_{10}$  from  $42.1 \mu\text{g}/\text{m}^3$  to  $36.6 \mu\text{g}/\text{m}^3$ ;  $\text{SO}_2$  from  $10.5 \mu\text{g}/\text{m}^3$  to  $7.1 \mu\text{g}/\text{m}^3$ ;  $\text{NO}_2$  from  $20.3 \mu\text{g}/\text{m}^3$  to  $14.4 \mu\text{g}/\text{m}^3$ . The concentration levels of the pollutants fall within the acceptable limits of NAAQS prescribed by CPCB.



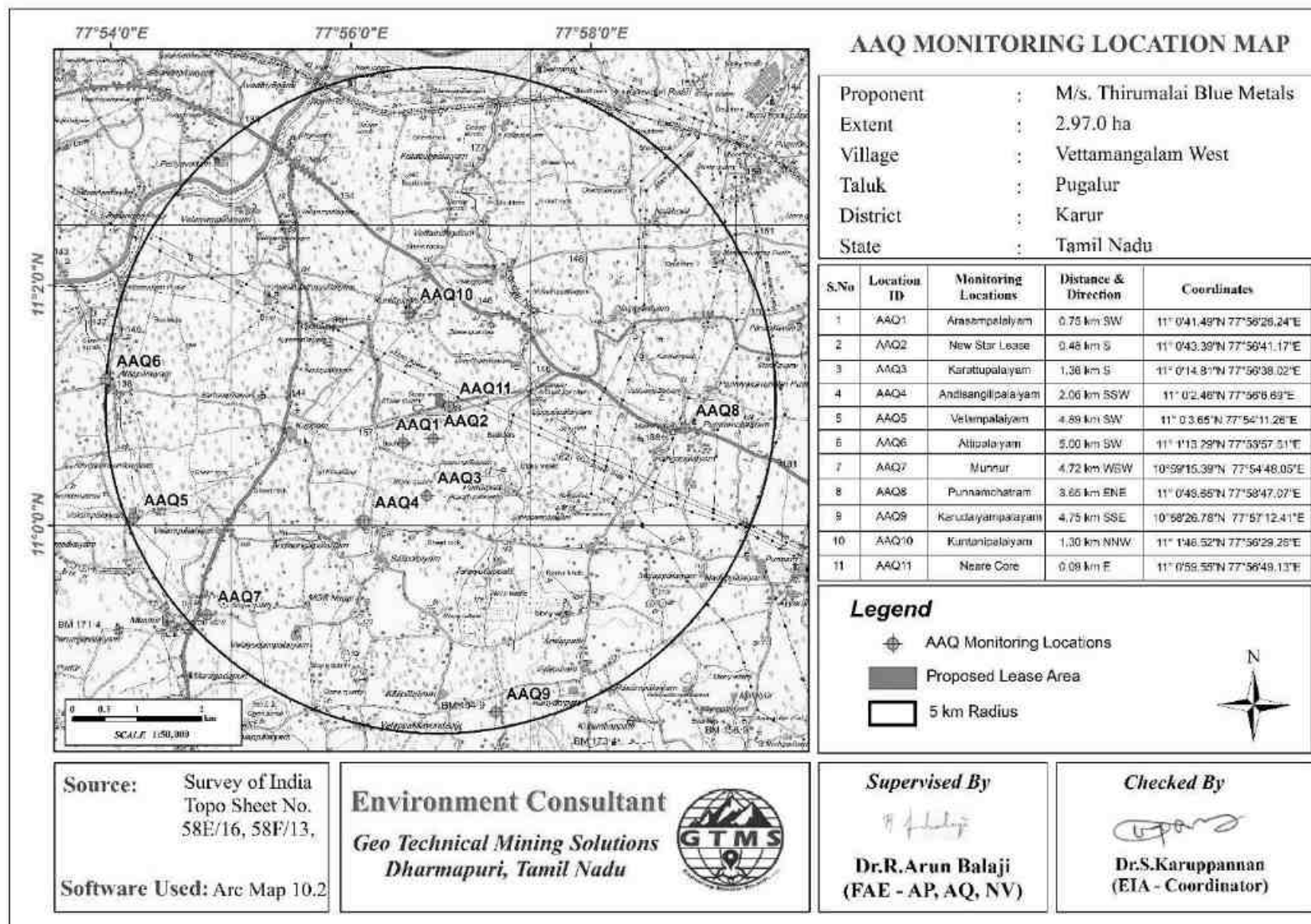
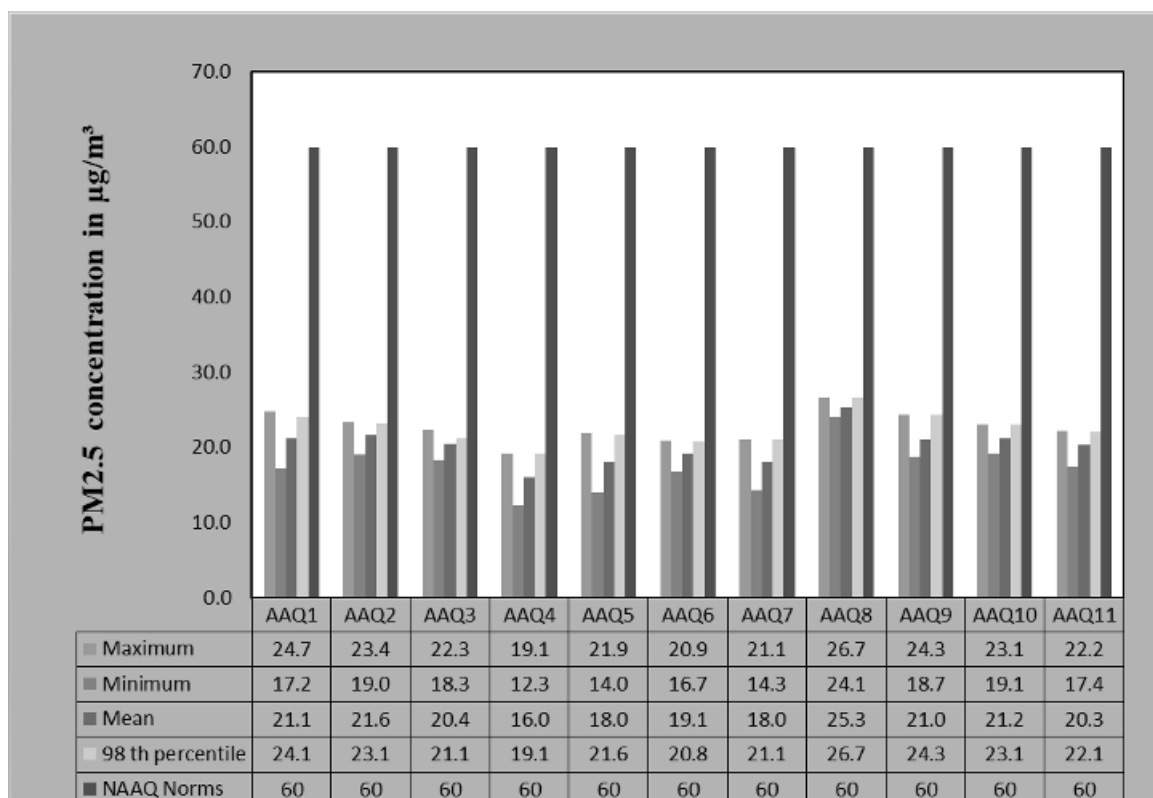


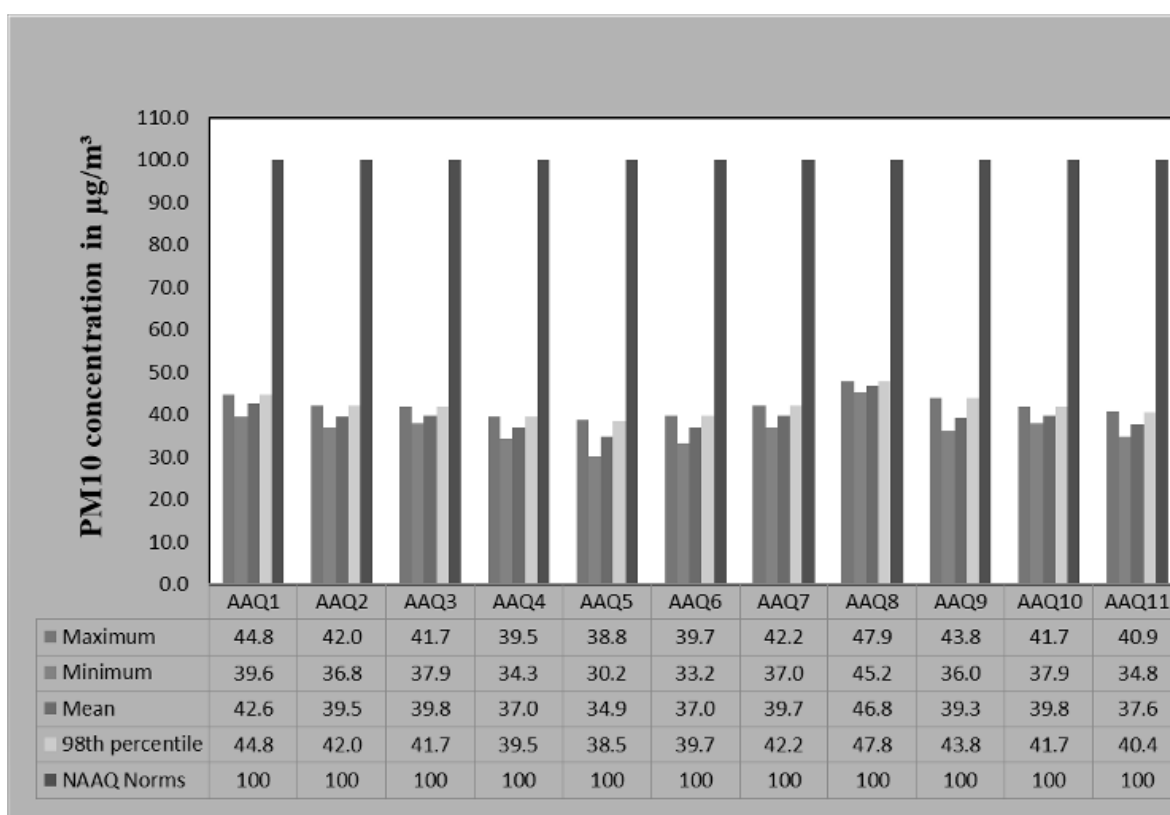
Figure 3.16 Toposheet Showing Ambient Air Quality Monitoring Station Locations Around 5 km Radius from Proposed Project Site

**Table 3.16 Summary of AAQ Result**

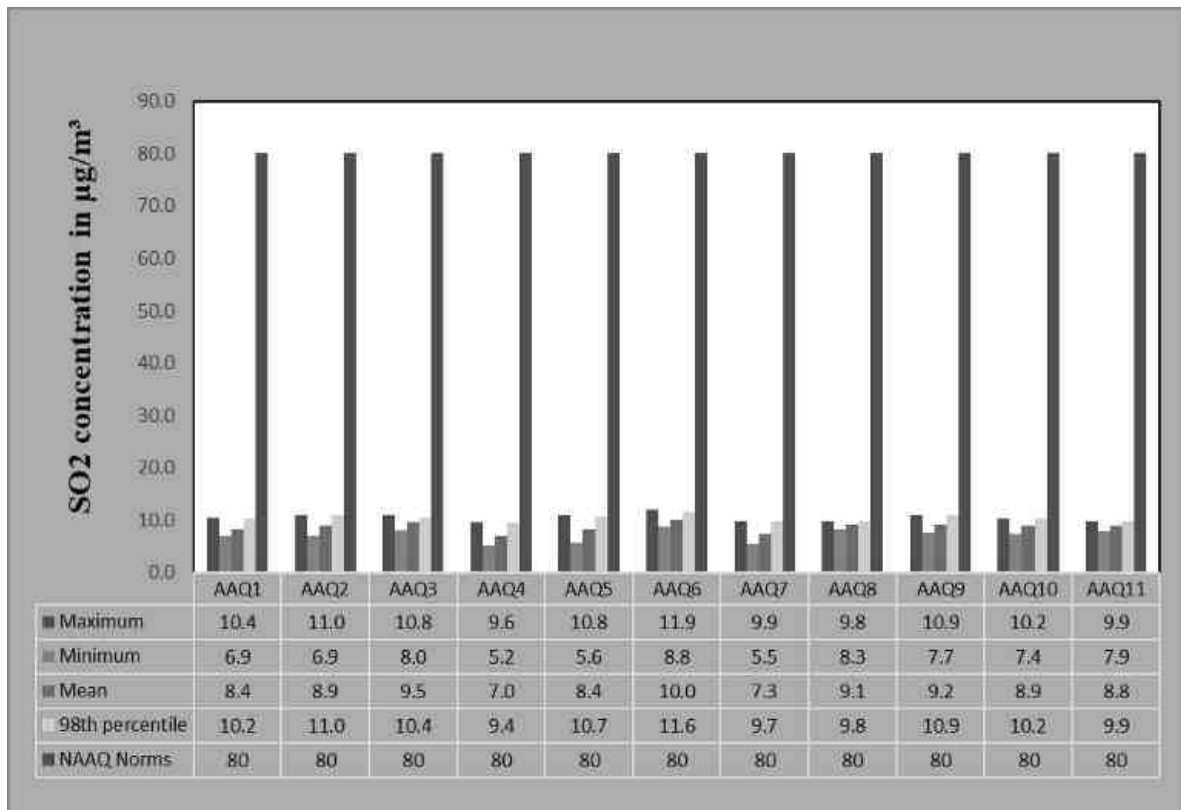
<b>PM<sub>2.5</sub></b>					<b>PM<sub>10</sub></b>			
<b>Station ID</b>	<b>Max</b>	<b>Min</b>	<b>Mean</b>	<b>98<sup>th</sup> Percentile</b>	<b>Max</b>	<b>Min</b>	<b>Mean</b>	<b>98<sup>th</sup> Percentile</b>
AAQ1	24.7	17.2	21.1	24.1	44.8	39.6	42.6	44.8
AAQ2	23.4	19	21.6	23.1	42	36.8	39.5	42.0
AAQ3	22.3	18.3	20.4	21.1	41.7	37.9	39.8	41.7
AAQ4	19.1	12.3	16.0	19.1	39.5	34.3	37.0	39.5
AAQ5	21.9	14	18.0	21.6	38.8	30.2	34.9	38.5
AAQ6	20.9	16.7	19.1	20.8	39.7	33.2	37.0	39.7
AAQ7	21.1	14.3	18.0	21.1	42.2	37	39.7	42.2
AAQ8	26.7	24.1	25.3	26.7	47.9	45.2	46.8	47.8
AAQ9	24.3	18.7	21.0	24.3	43.8	36	39.3	43.8
AAQ10	23.1	19.1	21.2	23.1	41.7	37.9	39.8	41.7
AAQ11	22.2	17.4	20.3	22.1	40.9	34.8	37.6	40.4
<b>SO<sub>2</sub></b>					<b>NO<sub>x</sub></b>			
AAQ1	10.4	6.9	8.4	10.2	18.7	12.2	16.3	18.6
AAQ2	11	6.9	8.9	11.0	20.1	14.2	16.9	19.9
AAQ3	10.8	8	9.5	10.4	20	13.5	16.6	19.6
AAQ4	9.6	5.2	7.0	9.4	15.1	8.6	11.0	14.4
AAQ5	10.8	5.6	8.4	10.7	20.6	12.8	17.0	20.5
AAQ6	11.9	8.8	10.0	11.6	21.8	17.3	19.1	21.8
AAQ7	9.9	5.5	7.3	9.7	18.1	11.6	14.0	15.7
AAQ8	9.8	8.3	9.1	9.8	27.6	25.3	26.6	27.6
AAQ9	10.9	7.7	9.2	10.9	22.1	15	18.2	22.1
AAQ10	10.2	7.4	8.9	10.2	19.4	12.9	16.0	19.0
AAQ11	9.9	7.9	8.8	9.9	19.3	15.2	16.5	18.8



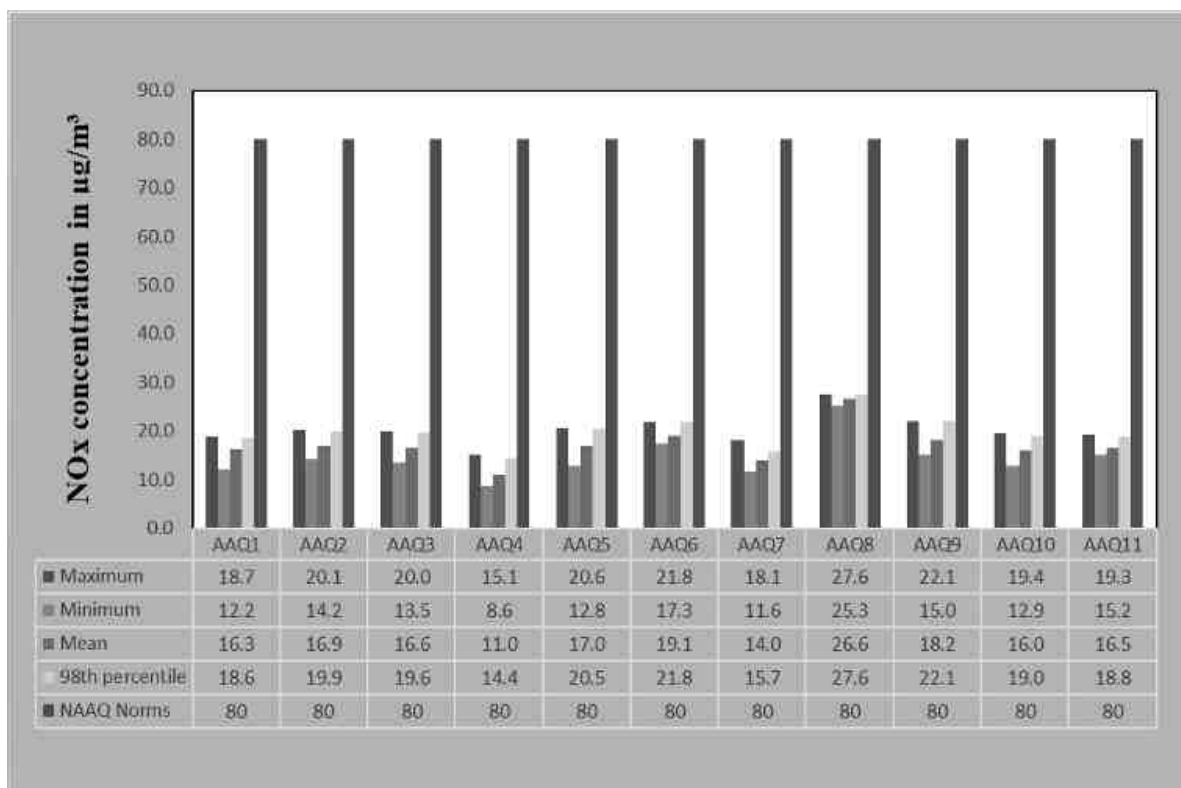
**Figure 3.17 Bar Chart Showing Maximum, Minimum, and Average Concentrations of PM<sub>2.5</sub> Measured from 11 Air Quality Monitoring Stations within 5 km Radius**



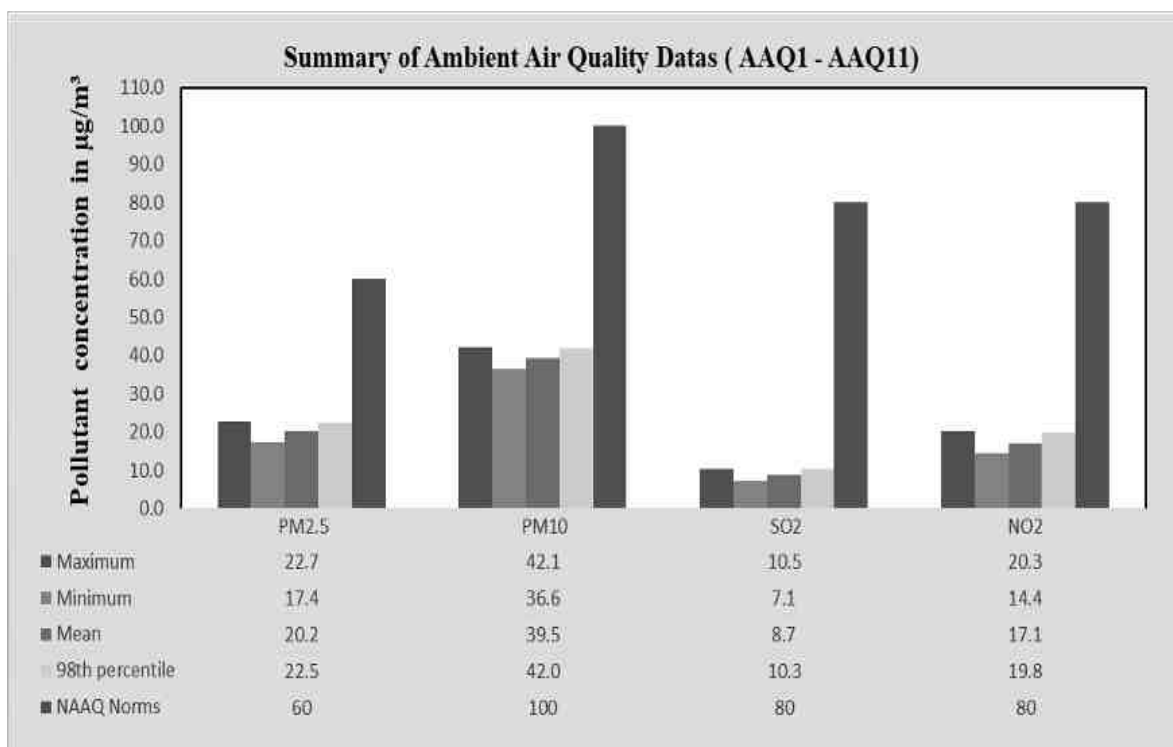
**Figure 3.18 Bar Chart Showing Maximum, Minimum, and Average Concentrations of PM<sub>10</sub> Measured from 11 Air Quality Monitoring Stations within 5 km Radius**



**Figure 3.19 Bar Chart Showing Maximum, Minimum, and Average Concentrations of SO<sub>2</sub> Measured from 11 Air Quality Monitoring Stations within 5 km Radius**



**Figure 3.20 Bar Chart Showing Maximum, Minimum, and Average Concentrations of NO<sub>x</sub> Measured from 11 Air Quality Monitoring Stations within 5km Radius**



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

### 3.4 NOISE ENVIRONMENT

The vehicular movement on road and mining activities is the major sources of noise in the study area. The main objective of noise monitoring in the study area is to establish the baseline noise level, which will in turn be used to assess the impact of the total noise expected to be generated during the project operations around the project site. In order to assess the ambient noise levels within the study area, noise monitoring was carried out at Thirteen (13) locations covering commercial, residential, rural areas within the radius of 5 km. Details of noise monitoring locations are provided in Table 3.17 and spatial occurrence of the locations are shown in Figure 3.22.

**Table 3.17 Noise Monitoring Locations**

S. No	Location Code	Monitoring Locations	Distance in km	Direction	Coordinates
1	N1	Between NTC and Rani Leases	0.71	SW	11° 0'41.52"N, 77°56'28.14"E
2	N2	New star lease	0.48	S	11° 0'42.76"N, 77°56'41.52"E
3	N3	Amaravathi Lease	1.36	S	11° 0'13.89"N, 77°56'36.49"E
4	N4	Kuppam	2.06	SW	11° 0'41.35"N, 77°55'36.27"E
5	N5	Puthurpatti	1.23	SSE	11° 0'24.93"N, 77°57'07.40"E

6	N6	Andisangilipalayam	2.10	SSW	11° 00'0.11"N, 77°56'08.14"E
7	N7	Velampalayam	4.93	WSW	11° 00'4.03"N, 77°54'09.66"E
8	N8	Athipalayam	4.95	W	11° 1'12.49"N, 77°53'59.34"E
9	N9	Munnur	4.97	SW	10°59'10.74"N,77°54'40.96"E
10	N10	Punna chatram	3.65	ENE	11° 0'48.65"N 77°58'47.07"E
11	N11	Karudayampalayam	4.92	SSE	10°58'07.55"N 77°57'14.55"E
12	N12	Kunthanipalayam	1.36	NNW	11° 1'48.61"N, 77°56'29.50"E
13	N13	Near Core	0.04	E	11°0'59.55"N, 77°56'47.83"E

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

**Table 3.18 Ambient Noise Quality Result**

Station ID	Location	Environmental setting	Average day noise level (dB(A))	Average night noise level (dB(A))	Day time (6.00 AM – 10.00 PM)	Night time (10.00 PM – 6.00 AM)
					Standard (L <sub>eq</sub> in dB (A))	
N1	Between NTC and Rani Leases	Industrial Area	41.7	34.7	75	70
N2	New Star Blue Lease		40.3	34.5	75	70
N3	Amaravathi Lease		40.0	33.9	75	70
N4	Kuppam	Residential Area	35.4	30.6	55	45
N5	Puthurpatti		32.6	29.8	55	45
N6	Andisangilipalayam		36.2	30.8	55	45
N7	Velampalayam		40.3	33.9	55	45
N8	Athipalayam		40.8	35.0	55	45
N9	Munnur		40.8	33.8	55	45
N10	Punna chatram		42.2	37.4	55	45
N11	Karudayampalayam		41.2	32.4	55	45
N12	Kunthanipalayam		41.7	36.6	55	45
N13	Near core	Industrial Area	40.8	34.8	75	70

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

The Table 3.18 shows that noise level in core zone was 40.8 dB (A) Leq during day time and 34.8 dB(A) Leq during night time. Noise levels recorded in buffer zone during day time varied from 32.6 to 42.2dB (A) Leq and during night time from 29.8 to 37.4dB (A) Leq. Thus, the noise level for industrial and residential area meets the requirements of CPCB. The results are also depicted below in Figures 3.23 and 3.24.

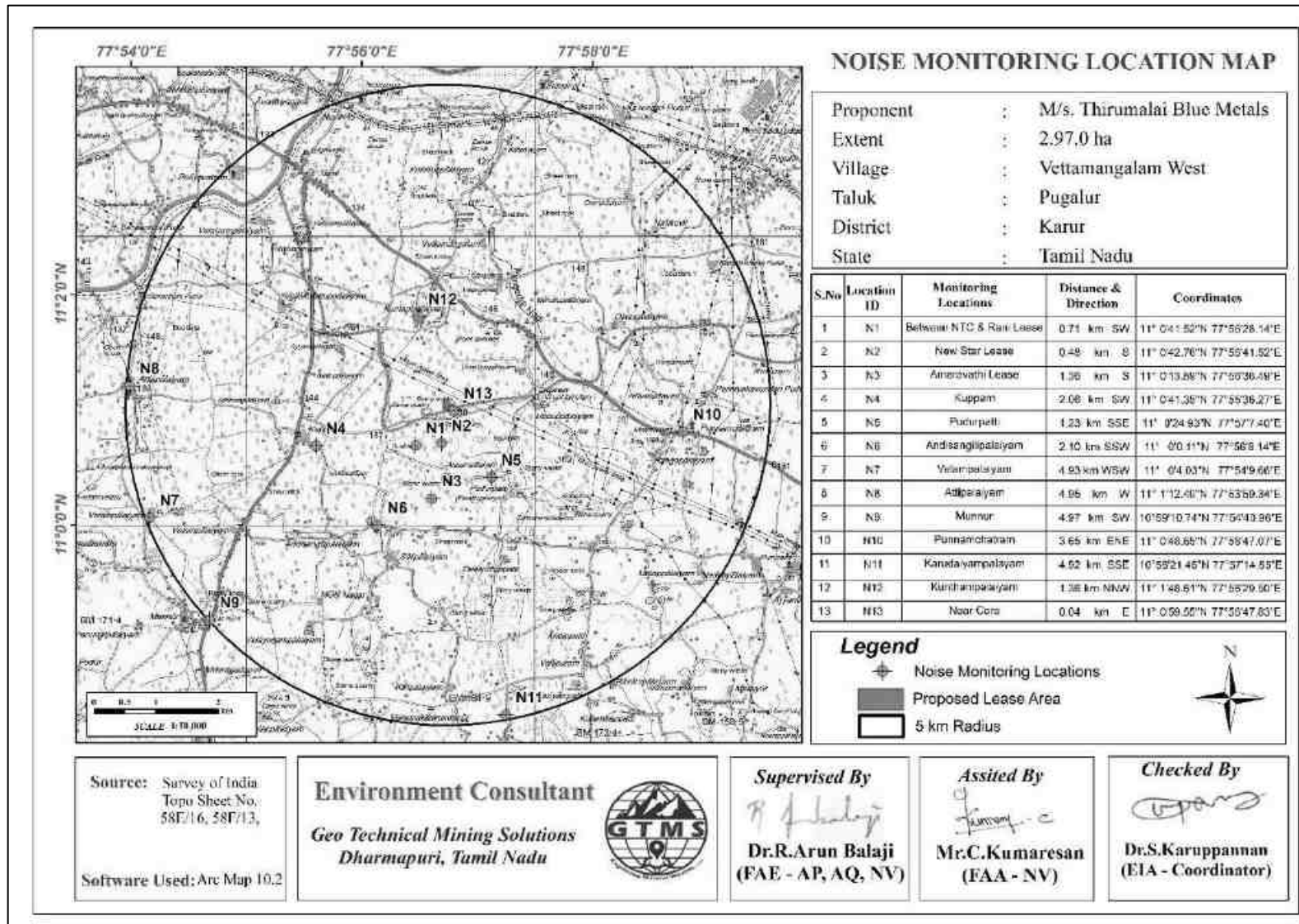
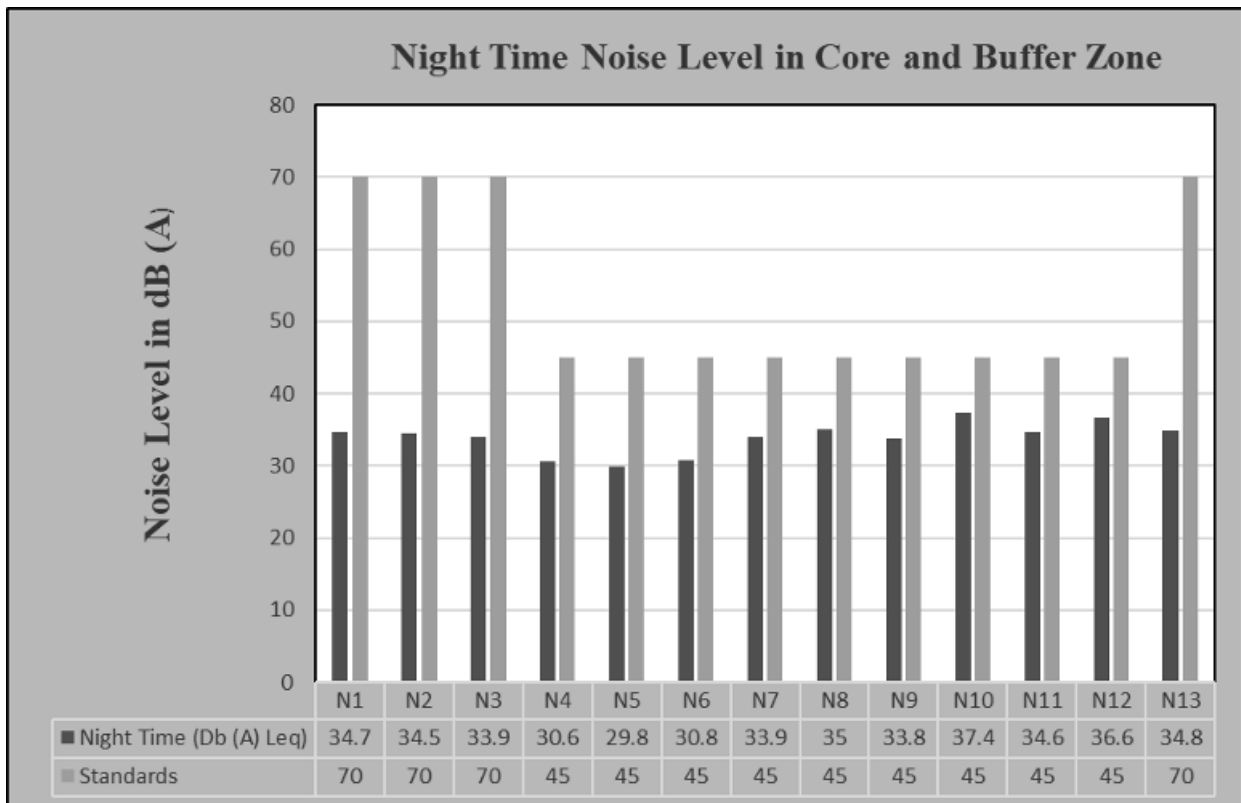
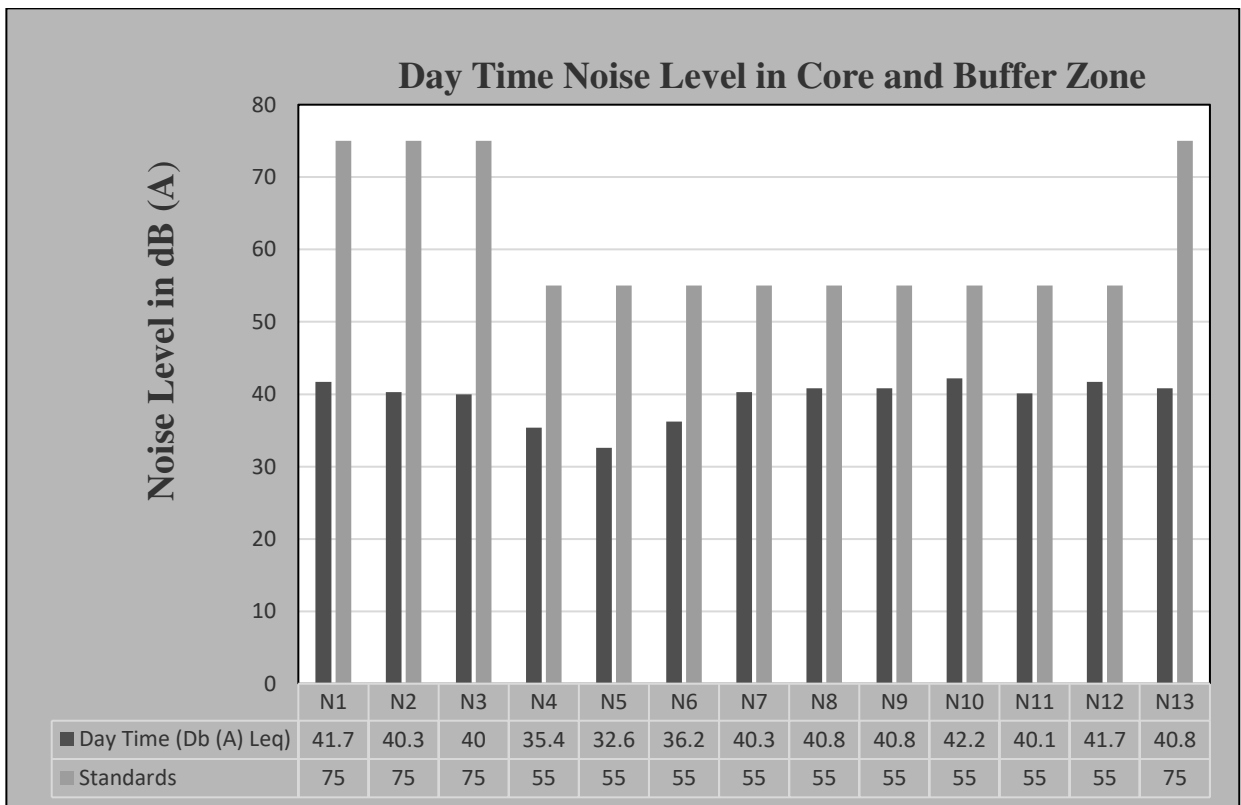


Figure 3.22 Toposheet Showing Noise Level Monitoring Station Locations around 5 km Radius from Proposed Project Site



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



**Figure 3.24 Bar Chart Showing Night Time Noise Levels Measured in Core and Buffer Zones**



### 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.



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

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

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

***Shannon – Wiener Index, Evenness and Richness***

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

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

Description	Formula
Species diversity – Shannon – Wien Index	$H = \sum [(p_i) * \ln(p_i)]$ Where $p_i$ : Proportion of total sample represented by species i: number of individuals of species i/ total number samples
Evenness	$H/H_{\max}$ $H_{\max} = \ln(s) = \text{maximum diversity possible}$ $S = \text{No. of species}$
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.

#### ***Crop Patterns in Pugalur taluk***

The principal crops of the district are paddy, millets, pulses, oilseeds, sugarcane and banana. In uplands millets like sorghum, Pearl millet pulses such as red gram, horse gram oilseeds such as groundnut, gingelly and sunflower are grown both under irrigated and rain fed conditions. Mention in Table 3.21

Table 3.21 ***Crop Patterns in Pugalur taluk***

<b>Agricultural plants</b>	<b>Horticultural plants</b>
<i>Oryza sativa</i>	<i>Musa. species</i>
<i>Saccharum officinarum L.</i>	<i>Mangifera indica</i>
<i>Sesamum indicum</i>	<i>Arachis hypogaea</i>
<i>Pennisetum glaucum</i>	<i>Moringa olerifera</i>
<i>Sorghum bicolor</i>	<i>Jasminum officinale</i>

#### ***Flora in mine lease area (core zone)***

There are no trees in inside the quarry lease area.

#### ***The Flora in lease area and 300 m radius (buffer zone)***

There is no agricultural land nearby. It contains a total of 34 species belonging to 21 families have been recorded from the buffer zone. 6 Trees (17%), 6 Shrubs (17%) and 22 Herbs and Climbers, Creeper, Grass & Cactus (64%) were identified. Details of flora with the scientific name details and of diversity species Rich ness index were mentioned in Table 3.22-3.24 and figure 3.26. There is no threat to the Flora species in 300-meter radius.

#### ***Flora in 10 km radius buffer zone***

Similar type of environment also in buffer area but with more flora diversity compare than core zone area. It contains a total of 75 species belonging to 38 families have been recorded from the buffer zone. The floral varieties among them 35 Trees (49%), 15 Shrubs (24%) Herbs and Climbers, Creeper, Grass & Cactus, 25 (33%) were identified. Details of flora with the scientific name details of diversity species Rich ness index were mentioned in Table 3.26-3.27 and Figure 3.26.

Table 3.22 Flora in 300-meter radius

S. No	Local Name	Scientific name	Family name	Total No. of species	Total of Quadrants with species	Total No. of Quadrants	Density	Frequency (%)	Abundance	Relative Density	Relative Frequency	IVI	IUCN Conservation Status
<b>Trees</b>													
1	Karuvealan	<i>Prosopis juliflora</i>	Fabaceae	4	3	5	0.8	60.0	1.3	16.7	16.7	33.3	Not Listed
2	Palm tree	<i>Borassus flabellifer</i>	Fabaceae	3	2	5	0.6	40.0	1.5	12.5	11.1	23.6	Not Listed
3	Vembu	<i>Azadirachta indica</i>	Meliaceae	5	4	5	1.0	80.0	1.3	20.8	22.2	43.1	Not Listed
4	Vealli vealan	<i>Vachellia leucophloea</i>	Babesiae	3	2	5	0.6	40.0	1.5	12.5	11.1	23.6	Not Listed
5	Unjai maram	<i>Albizia amara</i>	Fabaceae	4	3	5	0.8	60.0	1.3	16.7	16.7	33.3	Not Listed
6	Vetpalai	<i>Wrightia tinctoria</i>	Apocynaceae	5	4	5	1.0	80.0	1.3	20.8	22.2	43.1	Not Listed
<b>Shrubs</b>													
1	Erukku	<i>Calotropis gigantea</i>	Apocynaceae	8	7	10	0.8	70.0	1.1	16.7	16.7	33.3	Not Listed
2	Uumaththai	<i>Datura metel</i>	Solanaceae	9	8	10	0.9	80.0	1.1	18.8	19.0	37.8	Not Listed
3	Thuthi	<i>Abutilon indicum</i>	Meliaceae	7	6	10	0.7	60.0	1.2	14.6	14.3	28.9	Not Listed
4	Avarai	<i>Senna auriculata</i>	Fabaceae	9	8	10	0.9	80.0	1.1	18.8	19.0	37.8	Not Listed
5	Unichadi	<i>Lantana camara</i>	Verbenaceae	8	7	10	0.8	70.0	1.1	16.7	16.7	33.3	Not Listed
6	Suraimullu	<i>Zizyphus Oenoplia</i>	Rhamnaceae	7	6	10	0.7	60.0	1.2	14.6	14.3	28.9	Not Listed
<b>Herbs</b>													

1	Nayuruvi	<i>Achyranthes aspera</i>	Amaranthaceae	6	5	15	0.4	33.3	1.2	3.7	3.5	7.2	Not Listed
2	Nearunji mull	<i>Tribulus zeyheri</i> Sond	Zygophyllaceae	7	6	15	0.5	40.0	1.2	4.3	4.3	8.5	Not Listed
3	Pill	<i>Cenchrus ciliaris</i>	Poaceae	8	7	15	0.5	46.7	1.1	4.9	5.0	9.9	Not Listed
4	pulapoo	<i>Aerva lanata</i>	Amaranthaceae	6	5	15	0.4	33.3	1.2	3.7	3.5	7.2	Not Listed
5	kapok bush	<i>Aerva javani</i>	Amaranthaceae	7	6	15	0.5	40.0	1.2	4.3	4.3	8.5	Not Listed
6	Rail poondu	<i>Croton bonplandianus</i>	Euphorbiaceae	8	7	15	0.5	46.7	1.1	4.9	5.0	9.9	Not Listed
7	Yanai neariji	<i>pedalium murex</i>	Pedaliaceae	6	5	15	0.4	33.3	1.2	3.7	3.5	7.2	Not Listed
8	Perandai	<i>Cissus quadrangularis</i>	Vitaceae	9	8	15	0.6	53.3	1.1	5.5	5.7	11.2	Not Listed
9	Thumbai chadi	<i>Leucas aspera</i>	Lamiaceae	7	6	15	0.5	40.0	1.2	4.3	4.3	8.5	Not Listed
10	Umathai	<i>Datura metel</i>	Solanaceae	8	7	15	0.5	46.7	1.1	4.9	5.0	9.9	Not Listed
11	Sethamutti	<i>Sida cordata</i>	Malvaceae	9	8	15	0.6	53.3	1.1	5.5	5.7	11.2	Not Listed
12	Annanm	<i>Iva annua</i>	Asteraceae	6	5	15	0.4	33.3	1.2	3.7	3.5	7.2	Not Listed
13	Kolunji	<i>Tephrosia purpurea</i>	Fabaceae	8	7	15	0.5	46.7	1.1	4.9	5.0	9.9	Not Listed
14	Nayuruvi	<i>Achyranthes aspera</i>	Amaranthaceae	7	6	15	0.5	40.0	1.2	4.3	4.3	8.5	Not Listed
15	Ishappukol Vitai	<i>Plantago coronopus</i>	Plantaginaceae	6	5	15	0.4	33.3	1.2	3.7	3.5	7.2	Not Listed
16	vealiparuthi	<i>Pergularia daemia</i>	Apocynaceae	7	6	15	0.5	40.0	1.2	4.3	4.3	8.5	Not Listed
17	Seppu nerinji	<i>Indigofera linnaei</i> Ali	Fabaceae	8	7	15	0.5	46.7	1.1	4.9	5.0	9.9	Not Listed
18	Sapathikalli	<i>Opuntia ficus-indica</i>	Cactaceae	9	8	15	0.6	53.3	1.1	5.5	5.7	11.2	Not Listed
19	Pal kodi	<i>Cynanchum viminalis</i>	Apocynaceae	7	6	15	0.5	40.0	1.2	4.3	4.3	8.5	Not Listed
20	Ila perandai	<i>Cissus rotundifolia</i>	Vitaceae	9	8	15	0.6	53.3	1.1	5.5	5.7	11.2	Not Listed
21	Katralai	<i>Aloe vera</i>	Asphodelaceae	7	6	15	0.5	40.0	1.2	4.3	4.3	8.5	Not Listed
22	Seammulli	<i>Barleria prionitis</i>	Acanthaceae	8	7	15	0.5	46.7	1.1	4.9	5.0	9.9	Not Listed

**Table 3.23 Calculation of Species Diversity in 300-meter radius**

S. No	Common name	Scientific name	No. of Species	Pi	In (Pi)	Pi x in (Pi)
<b>Trees</b>						
1	Karuvealan	<i>Prosopis juliflora</i>	4	0.17	-1.79	-0.30
2	Palm tree	<i>Borassus flabellifer</i>	3	0.13	-2.08	-0.26
3	Vembu	<i>Azadirachta indica</i>	5	0.21	-1.57	-0.33
4	Vealli vealan	<i>Vachellia leucophloea</i>	3	0.13	-2.08	-0.26
5	Unjai maram	<i>Albizia amara</i>	4	0.17	-1.79	-0.30
6	Vetpalai	<i>Wrightia tinctoria</i>	5	0.21	-1.57	-0.33
H (Shannon Diversity Index) =1.77						
<b>Shrubs</b>						
1	Erukku	<i>Calotropis gigantea</i>	8	0.17	-1.79	-0.30
2	Uumaththai	<i>Datura metel</i>	9	0.19	-1.67	-0.31
3	Thuthi	<i>Abutilon indicum</i>	7	0.15	-1.93	-0.28
4	Avarai	<i>Senna auriculata</i>	9	0.19	-1.67	-0.31
5	Unichadi	<i>Lantana camara</i>	8	0.17	-1.79	-0.30
6	Suraimullu	<i>Zizyphus Oenoplia</i>	7	0.15	-1.93	-0.28
H (Shannon Diversity Index) =1.79						
<b>Herbs</b>						
1	Nayuruv	<i>Achyranthes aspera</i>	6	0.04	-3.30	-0.12
2	Nearunji mull	<i>Tribulus zeyheri Sond</i>	7	0.04	-3.15	-0.14
3	Pill	<i>Cenchrus ciliaris</i>	8	0.05	-3.01	-0.15
4	pulapoo	<i>Aerva lanata</i>	6	0.04	-3.30	-0.12
5	kapok bush	<i>Aerva javani</i>	7	0.04	-3.15	-0.14
6	Rail poondu	<i>Croton bonplandianus</i>	8	0.05	-3.01	-0.15

7	mookuthi poondu	<i>pedalium murex</i>	6	0.04	-3.30	-0.12
8	Perandai	<i>Cissus quadrangularis</i>	9	0.06	-2.90	-0.16
9	Thumbai chadi	<i>Leucas aspera</i>	7	0.04	-3.15	-0.14
10	Umathai	<i>Datura metel</i>	8	0.05	-3.01	-0.15
11	Sethamutti	<i>Sida cordata</i>	9	0.06	-2.90	-0.16
12	Annanm	<i>Iva annua</i>	6	0.04	-3.30	-0.12
13	Kolunji	<i>Tephrosia purpurea</i>	8	0.05	-3.01	-0.15
14	Nayuruvi	<i>Achyranthes aspera</i>	7	0.04	-3.15	-0.14
15	Ishappukol Vitai	<i>Plantago coronopus</i>	6	0.04	-3.30	-0.12
16	Vealiparuthi	<i>Pergularia daemia</i>	7	0.04	-3.15	-0.14
17	Seppu nerinji	<i>Indigofera linnaei</i> <i>Ali</i>	8	0.05	-3.01	-0.15
18	Sapathikalli	<i>Opuntia ficus-indica</i>	9	0.06	-2.90	-0.16
19	Pal kodi	<i>Cynanchum viminalis</i>	7	0.04	-3.15	-0.14
20	Ilia perandai	<i>Cissus rotundifolia</i>	9	0.06	-2.90	-0.16
21	Katralai	<i>Aloe vera</i>	7	0.04	-3.15	-0.14
22	Seammulli	<i>Barleria prionitis</i>	8	0.05	-3.01	-0.15
<b>H (Shannon Diversity Index) =3.08</b>						

**Table 3.24 Species Richness (Index) in 300 m radius**

Details	H	H max	Evenness	Species Richness
<b>Trees</b>	1.77	1.79	0.99	1.57
<b>Shrubs</b>	1.79	1.79	1.00	1.29
<b>Herbs</b>	3.08	3.09	1.00	4.12

Table 3.25 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
<b>TREES</b>													
1	Vembu	<i>Azadirachta indica</i>	Meliaceae	4	3	10	0.4	30.0	1.3	2.6	2.5	5.1	Not Listed
2	Thekku	<i>Tectona grandis</i>	Verbenaceae	5	4	10	0.5	40.0	1.3	3.2	3.4	6.6	Not Listed
3	Pongam oiltree	<i>Pongamia pinnata</i>	Fabaceae	3	2	10	0.3	20.0	1.5	1.9	1.7	3.6	Not Listed
4	Thennai maram	<i>Cocos nucifera</i>	Arecaceae	4	3	10	0.4	30.0	1.3	2.6	2.5	5.1	Not Listed
5	Manga	<i>Mangifera indica</i>	Anacardiaceae	5	4	10	0.5	40.0	1.3	3.2	3.4	6.6	Not Listed
6	Puliyamaram	<i>Tamarindus indica</i>	Legumes	4	3	10	0.4	30.0	1.3	2.6	2.5	5.1	Not Listed
7	Vadanarayani	<i>Delonix elata</i>	Fabaceae	3	2	10	0.3	20.0	1.5	1.9	1.7	3.6	Not Listed
8	Thenpazham	<i>Muntingia calabura</i>	Tiliaceae	4	3	10	0.4	30.0	1.3	2.6	2.5	5.1	Not Listed
9	Punnai	<i>Calophyllum inophyllum</i>	Calophyllaceae	3	2	10	0.3	20.0	1.5	1.9	1.7	3.6	Not Listed
10	Ilanthai	<i>Ziziphus jujubha</i>	Rhamnaceae	4	3	10	0.4	30.0	1.3	2.6	2.5	5.1	Not Listed



11	Karuvelam	<i>Acacia nilotica</i>	Mimosaceae	5	4	10	0.5	40.0	1.3	3.2	3.4	6.6	Not Listed
12	Nettilinkam	<i>Polylathia longifolia</i>	Annonaceae	4	3	10	0.4	30.0	1.3	2.6	2.5	5.1	Not Listed
13	Arai nelli	<i>Phyllanthus acidus</i>	Euphorbiaceae	5	4	10	0.5	40.0	1.3	3.2	3.4	6.6	Not Listed
14	Panai maram	<i>Borassus flabellifer</i>	Arecaceae	4	3	10	0.4	30.0	1.3	2.6	2.5	5.1	Not Listed
15	Sapota	<i>Manilkara zapota</i>	Sapotaceae	6	5	10	0.6	50.0	1.2	3.9	4.2	8.1	Not Listed
16	Navalmaram	<i>Sygygium cumini</i>	Myrtaceae	5	4	10	0.5	40.0	1.3	3.2	3.4	6.6	Not Listed
17	Alamaram	<i>Ficus benghalensis</i>	Moraceae	3	2	10	0.3	20.0	1.5	1.9	1.7	3.6	Not Listed
18	Vazhaimaram	<i>Musa</i>	Musaceae	4	3	10	0.4	30.0	1.3	2.6	2.5	5.1	Not Listed
19	Karuvelam maram	<i>Vachellia nilotica</i>	Fabaceae	5	4	10	0.5	40.0	1.3	3.2	3.4	6.6	Not Listed
20	Nelli	<i>Embllica officinalis</i>	Phyllanthaceae	4	3	10	0.4	30.0	1.3	2.6	2.5	5.1	Not Listed
21	Eucalyptus	<i>Eucalyptus globules</i>	Myrtaceae	5	4	10	0.5	40.0	1.3	3.2	3.4	6.6	Not Listed
22	Maramalli	<i>Millingtonia hortensis</i>	Bignoniaceae	4	3	10	0.4	30.0	1.3	2.6	2.5	5.1	Not Listed
23	Kuduka puli	<i>Pithecellobium dulce</i>	Mimosaceae	3	2	10	0.3	20.0	1.5	1.9	1.7	3.6	Not Listed
24	Karungali	<i>Acacia sundra</i>	Legumes	5	4	10	0.5	40.0	1.3	3.2	3.4	6.6	Not Listed
25	Nochi	<i>Vitex negundo</i>	Lamiaceae	4	3	10	0.4	30.0	1.3	2.6	2.5	5.1	Not Listed
26	Karimurungai	<i>Moringa olefera</i>	Moraginaceae	6	5	10	0.6	50.0	1.2	3.9	4.2	8.1	Not Listed
27	Pappali maram	<i>Carica papaya L</i>	Caricaceae	5	4	10	0.5	40.0	1.3	3.2	3.4	6.6	Not Listed
28	Poovarasu	<i>Thespesia populnea</i>	Malvaceae	4	3	10	0.4	30.0	1.3	2.6	2.5	5.1	Not Listed
29	Arasanmaram	<i>Ficus religiosa</i>	Moraceae	3	2	10	0.3	20.0	1.5	1.9	1.7	3.6	Not Listed

30	Vilvam	<i>Aegle marmelos</i>	Rutaceae	4	3	10	0.4	30.0	1.3	2.6	2.5	5.1	Not Listed
31	Nuna maram	<i>Morinda citrifolia</i>	Rubiaceae	5	4	10	0.5	40.0	1.3	3.2	3.4	6.6	Not Listed
32	Nettilingam	<i>Polyalthia longifolia</i>	Annonaceae	4	3	10	0.4	30.0	1.3	2.6	2.5	5.1	Not Listed
33	Koyya	<i>Psidium guajava</i>	Myrtaceae	6	5	10	0.6	50.0	1.2	3.9	4.2	8.1	Not Listed
34	Seethapazham	<i>Annona reticulata</i>	Annonaceae	7	6	10	0.7	60.0	1.2	4.5	5.0	9.6	Not Listed
35	Savukku	<i>Casuarina L.</i>	Casuarinaceae	5	4	10	0.5	40.0	1.3	3.2	3.4	6.6	Not Listed
<b>SHRUBS</b>													
1	Avarai	<i>Senna auriculata</i>	Fabaceae	9	8	15	0.6	53.3	1.1	7.7	7.8	15.5	Not Listed
2	Sundaika	<i>Solanum torvum</i>	Solanaceae	8	7	15	0.5	46.7	1.1	6.8	6.9	13.7	Not Listed
3	Puramuttai	<i>Chrozophora rottleri</i>	Euphorbiaceae	6	5	15	0.4	33.3	1.2	5.1	4.9	10.0	Not Listed
4	Arali	<i>Nerium indicum</i>	Apocynaceae	8	7	15	0.5	46.7	1.1	6.8	6.9	13.7	Not Listed
5	Seemaigaththi	<i>Cassia alata</i>	Caesalpinaceae	7	6	15	0.5	40.0	1.2	6.0	5.9	11.9	Not Listed
6	Chemparuthi	<i>Hibiscu rosa-sinensis</i>	Malvaceae	9	8	15	0.6	53.3	1.1	7.7	7.8	15.5	Not Listed
7	Kattamanakku	<i>Jatropha curcas</i>	Euphorbiaceae	7	6	15	0.5	40.0	1.2	6.0	5.9	11.9	Not Listed
8	Chaturakalli	<i>Euphorbia antiquorum</i>	Euphorbiaceae	8	7	15	0.5	46.7	1.1	6.8	6.9	13.7	Not Listed
9	Idlipoo	<i>xoracoc cineia</i>	Rubiaceae	9	8	15	0.6	53.3	1.1	7.7	7.8	15.5	Not Listed
10	Thuthi	<i>Abutilon indicum</i>	Meliaceae	8	7	15	0.5	46.7	1.1	6.8	6.9	13.7	Not Listed
11	Nithyakalyani	<i>Cathranthus roseus</i>	Apocynaceae	6	5	15	0.4	33.3	1.2	5.1	4.9	10.0	Not Listed

12	Uumaththai	<i>Datura metel</i>	Solanaceae	7	6	15	0.5	40.0	1.2	6.0	5.9	11.9	Not Listed
13	Kundumani	<i>Abrus precatorius</i>	Fabaceae	8	7	15	0.5	46.7	1.1	6.8	6.9	13.7	Not Listed
14	Erukku	<i>Calotropis gigantea</i>	Apocynaceae	9	8	15	0.6	53.3	1.1	7.7	7.8	15.5	Not Listed
15	Neermulli	<i>Hydrophila auriculata</i>	Acanthaceae	8	7	15	0.5	46.7	1.1	6.8	6.9	13.7	Not Listed
<b>Herbs, Climber, Creeper &amp; Grasses</b>													
1	Nayuruv	<i>Achyranthes aspera</i>	Amaranthaceae	6	5	25	0.2	20.0	1.2	3.1	3.0	6.1	Not Listed
2	Veetukaayapoondur	<i>Tridax procumbens</i>	Asteraceae	7	6	25	0.3	24.0	1.2	3.6	3.6	7.2	Not Listed
3	Mukkirattai	<i>Boerhaavia diffusa</i>	Nyctaginaceae	8	7	25	0.3	28.0	1.1	4.1	4.1	8.3	Not Listed
4	Kuppaimeni	<i>Acalypha indica</i>	Euphorbiaceae	9	8	25	0.4	32.0	1.1	4.6	4.7	9.4	Not Listed
5	Karisilanganni	<i>Eclipta prostrata</i>	Asteraceae	7	6	25	0.3	24.0	1.2	3.6	3.6	7.2	Not Listed
6	Korai	<i>Cyperus rotundus</i>	Cyperaceae	6	5	25	0.2	20.0	1.2	3.1	3.0	6.1	Not Listed
7	Thumbai	<i>Leucas aspera</i>	Lamiaceae	7	6	25	0.3	24.0	1.2	3.6	3.6	7.2	Not Listed
8	Nai kadugu	<i>Celome viscosa</i>	Capparidaceae	6	5	25	0.2	20.0	1.2	3.1	3.0	6.1	Not Listed
9	Partiniyam	<i>Parthenium hysterophorus</i>	Asteraceae	7	6	25	0.3	24.0	1.2	3.6	3.6	7.2	Not Listed
10	Thulasi	<i>Ocimum tenuiflorum</i>	Lamiaceae	10	9	25	0.4	36.0	1.1	5.2	5.3	10.5	Not Listed
11	Arugampul	<i>Cynodon dactylon</i>	Poaceae	11	10	25	0.4	40.0	1.1	5.7	5.9	11.6	Not Listed
12	Thoiya keerai	<i>Digeria muricata</i>	Amaranthaceae	8	7	25	0.3	28.0	1.1	4.1	4.1	8.3	Not Listed
13	Kovai	<i>Coccinia grandis</i>	Cucurbitaceae	9	8	25	0.4	32.0	1.1	4.6	4.7	9.4	Not Listed

14	Perandai	<i>Cissus quadrangularis</i>	Vitaceae	10	9	25	0.4	36.0	1.1	5.2	5.3	10.5	Not Listed
15	Mudakkotan	<i>Cardiospermum helicacabum</i>	Sapindaceae	7	6	25	0.3	24.0	1.2	3.6	3.6	7.2	Not Listed
16	Karkakartum	<i>Clitoria ternatea</i>	Fabaceae	8	7	25	0.3	28.0	1.1	4.1	4.1	8.3	Not Listed
17	Kovakkai	<i>Trichosanthes dioica</i>	Cucurbitaceae	9	8	25	0.4	32.0	1.1	4.6	4.7	9.4	Not Listed
18	Sangupoo	<i>Clitoriaternatia</i>	Fabaceae	8	7	25	0.3	28.0	1.1	4.1	4.1	8.3	Not Listed
19	Siru puladi	<i>Desmodium triflorum</i>	Fabaceae	7	6	25	0.3	24.0	1.2	3.6	3.6	7.2	Not Listed
20	Sithrapaalavi	<i>Euphorbia prostrata</i>	Euphorbiaceae	6	5	25	0.2	20.0	1.2	3.1	3.0	6.1	Not Listed
21	Thumattikai	<i>Cucumis callosus</i>	Cucurbitaceae	8	7	25	0.3	28.0	1.1	4.1	4.1	8.3	Not Listed
22	mookuthi poondu	<i>Wedelia trilobata</i>	Asteraceae	6	5	25	0.2	20.0	1.2	3.1	3.0	6.1	Not Listed
23	Kattu kanchippul	<i>Apluda mutica</i>	Poaceae	8	7	25	0.3	28.0	1.1	4.1	4.1	8.3	Not Listed
24	Musthakasu	<i>Kyllinga brevifolia</i>	Cyperaceae	9	8	25	0.4	32.0	1.1	4.6	4.7	9.4	Not Listed
25	Nagathali	<i>Opuntia dillenii</i>	Cactaceae	7	6	25	0.3	24.0	1.2	3.6	3.6	7.2	Not Listed

**Table 3.26 Calculation of Species Diversity in buffer Zone**

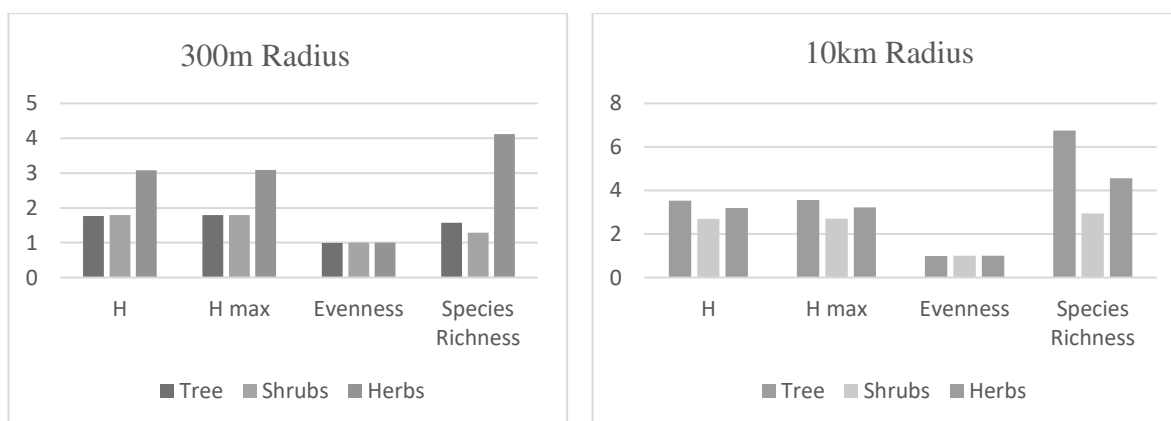
S. No	Common name	Scientific name	No. of Species	Pi	In (Pi)	Pi x in (Pi)
<b>Trees</b>						
1	Vembu	<i>Azadirachta indica</i>	4	0.03	-3.65	-0.09
2	Thekku	<i>Tectona grandis</i>	5	0.03	-3.43	-0.11
3	Pongam oiltree	<i>Pongamia pinnata</i>	3	0.02	-3.94	-0.08
4	Thennai maram	<i>Cocos nucifera</i>	4	0.03	-3.65	-0.09
5	Manga	<i>Mangifera indica</i>	5	0.03	-3.43	-0.11
6	Puliyamaram	<i>Tamarindus indica</i>	4	0.03	-3.65	-0.09
7	Vadanarayani	<i>Delonix elata</i>	3	0.02	-3.94	-0.08
8	Thenpazham	<i>Muntingia calabura</i>	4	0.03	-3.65	-0.09
9	Punnai	<i>Calophyllu inophyllum</i>	3	0.02	-3.94	-0.08
10	Ilanthai	<i>Ziziphus jujubha</i>	4	0.03	-3.65	-0.09
11	Karuvelam	<i>Acacia nilotica</i>	5	0.03	-3.43	-0.11
12	Nettilinkam	<i>Polylathia longifolia</i>	4	0.03	-3.65	-0.09
13	Arai nelli	<i>Phyllanthus acidus</i>	5	0.03	-3.43	-0.11
14	Panai maram	<i>Borassus flabellifer</i>	4	0.03	-3.65	-0.09
15	Sapota	<i>Manilkara zapota</i>	6	0.04	-3.25	-0.13
16	Navalmaram	<i>Sygygium cumini</i>	5	0.03	-3.43	-0.11
17	Alamaram	<i>Ficus benghalensis</i>	3	0.02	-3.94	-0.08
18	Vazhaimaram	<i>Musa</i>	4	0.03	-3.65	-0.09
19	Karuvelam maram	<i>Vachellia nilotica</i>	5	0.03	-3.43	-0.11
20	Nelli	<i>Emblica officinalis</i>	4	0.03	-3.65	-0.09
21	Eucalyptus	<i>Eucalyptus globules</i>	5	0.03	-3.43	-0.11
22	Maramalli	<i>Millingtonia hortensis</i>	4	0.03	-3.65	-0.09
23	Kuduka puli	<i>Pithecellobium dulce</i>	3	0.02	-3.94	-0.08
24	Karungali	<i>Acacia sundra</i>	5	0.03	-3.43	-0.11
25	Nochi	<i>Vitex negundo</i>	4	0.03	-3.65	-0.09
26	Karimurungai	<i>Moringa olefera</i>	6	0.04	-3.25	-0.13
27	Pappali maram	<i>Carica papaya L</i>	5	0.03	-3.43	-0.11
28	Poovarasu	<i>Thespesia populnea</i>	4	0.03	-3.65	-0.09
29	Arasanmaram	<i>Ficus religiosa</i>	3	0.02	-3.94	-0.08

30	Vilvam	<i>Aegle marmelos</i>	4	0.03	-3.65	-0.09
31	Nuna maram	<i>Morinda citrifolia</i>	5	0.03	-3.43	-0.11
32	Nettilingam	<i>Polyalthia longifolia</i>	4	0.03	-3.65	-0.09
33	Koyya	<i>Psidium guajava</i>	6	0.04	-3.25	-0.13
34	Seethapazham	<i>Annona reticulata</i>	7	0.05	-3.09	-0.14
35	Savukku	<i>Casuarina L.</i>	5	0.03	-3.43	-0.11
H (Shannon Diversity Index) =3.53						
<b>Shrubs</b>						
1	Avarai	<i>Senna auriculata</i>	9	0.08	-2.56	-0.20
2	Sundaika	<i>Solanum torvum</i>	8	0.07	-2.68	-0.18
3	Puramuttai	<i>Chrozophora rottleri</i>	6	0.05	-2.97	-0.15
4	Arali	<i>Nerium indicum</i>	8	0.07	-2.68	-0.18
5	Seemaigaththi	<i>Cassia alata</i>	7	0.06	-2.82	-0.17
6	Chemparuthi	<i>Hibiscu rosa-sinensis</i>	9	0.08	-2.56	-0.20
7	Kattamanakku	<i>Jatropha curcas</i>	7	0.06	-2.82	-0.17
8	Chaturakalli	<i>Euphorbia antiquorum</i>	8	0.07	-2.68	-0.18
9	Idlipoo	<i>xoracoc cineo</i>	9	0.08	-2.56	-0.20
10	Thuthi	<i>Abutilon indicum</i>	8	0.07	-2.68	-0.18
11	Nithyakalyani	<i>Cathranthus roseus</i>	6	0.05	-2.97	-0.15
12	Uumaththai	<i>Datura metel</i>	7	0.06	-2.82	-0.17
13	Kundumani	<i>Abrus precatorius</i>	8	0.07	-2.68	-0.18
14	Erukku	<i>Calotropis gigantea</i>	9	0.08	-2.56	-0.20
15	Neermulli	<i>Hydrophila auriculata</i>	8	0.07	-2.68	-0.18
H (Shannon Diversity Index) =2.70						
<b>Herbs,Climber,Creeper &amp; Grasses</b>						
1	Nayuruv	<i>Achyranthes aspera</i>	6	0.03	-3.48	-0.11
2	Veetukaayapoondur	<i>Tridax procumbens</i>	7	0.04	-3.32	-0.12
3	Mukkirattai	<i>Boerhaavia diffusa</i>	8	0.04	-3.19	-0.13
4	Kuppaimeni	<i>Acalypha indica</i>	9	0.05	-3.07	-0.14
5	Karisilanganni	<i>Eclipta prostrata</i>	7	0.04	-3.32	-0.12
6	Korai	<i>Cyperus rotundus</i>	6	0.03	-3.48	-0.11
7	Thumbai	<i>Leucas aspera</i>	7	0.04	-3.32	-0.12
8	Nai kadugu	<i>Celome viscosa</i>	6	0.03	-3.48	-0.11
9	Partiniyam	<i>Parthenium hysterophorus</i>	7	0.04	-3.32	-0.12

10	Thulasi	<i>Ocimum tenuiflorum</i>	10	0.05	-2.97	-0.15
11	Arugampul	<i>Cynodon dactylon</i>	11	0.06	-2.87	-0.16
12	Thoiya keera	<i>Digeria muricata</i>	8	0.04	-3.19	-0.13
13	Kovai	<i>Coccinia grandis</i>	9	0.05	-3.07	-0.14
14	Perandai	<i>Cissus quadrangularis</i>	10	0.05	-2.97	-0.15
15	Mudakkotan	<i>Cardiospermum helicacabum</i>	7	0.04	-3.32	-0.12
16	Karkakartum	<i>Clitoria ternatea</i>	8	0.04	-3.19	-0.13
17	Kovakkai	<i>Trichosanthes dioica</i>	9	0.05	-3.07	-0.14
18	Sangupoo	<i>Clitoriaternatia</i>	8	0.04	-3.19	-0.13
19	Siru puladi	<i>Desmodium triflorum</i>	7	0.04	-3.32	-0.12
20	Sithrapaalavi	<i>Euphorbia prostrata</i>	6	0.03	-3.48	-0.11
21	Thumattikai	<i>Cucumis callosus</i>	8	0.04	-3.19	-0.13
22	mookuthi poondu	<i>Wedelia trilobata</i>	6	0.03	-3.48	-0.11
23	Kattu kanchippul	<i>Apluda mutica</i>	8	0.04	-3.19	-0.13
24	Musthakasu	<i>Kyllinga brevifolia</i>	9	0.05	-3.07	-0.14
25	Nagathali	<i>Opuntia dillenii</i>	7	0.04	-3.32	-0.12
H (Shannon Diversity Index) =3.20						

**Table 3.27 Species Richness (Index) in Buffer Zone**

Details	H	H max	Evenness	Species Richness
<b>Trees</b>	3.53	3.56	0.99	6.75
<b>Shrubs</b>	2.70	2.71	1.00	2.94
<b>Herbs</b>	3.20	3.22	1.00	4.56



**Figure 3.26 Floral diversity species Richness (Index) in buffer zone and 300 m radius**



*Peltophorum pteocarpum*



*Thespesia populnea*



*Cardiospermum grandiflorum*



*Leucas aspera*



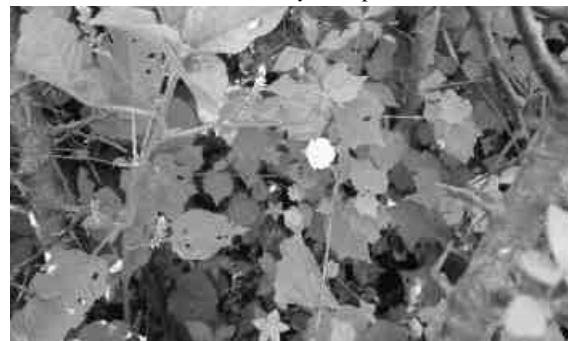
*Cocos nucifera*



*Parthenium hysterophorus*



*Calotropis gigantea*



*Sida cordata*





*Conocarpus lancifolius*



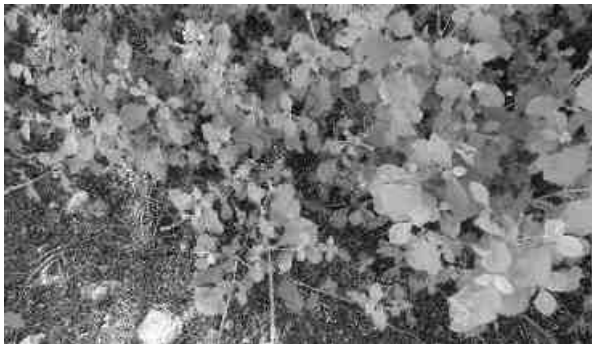
*Azadirachta indica*



*Tephrosia purpurea*



*Convolvulus equitans*



*Achyranthes aspera*



*Prosopis juliflora*



*Pergularia daemia*



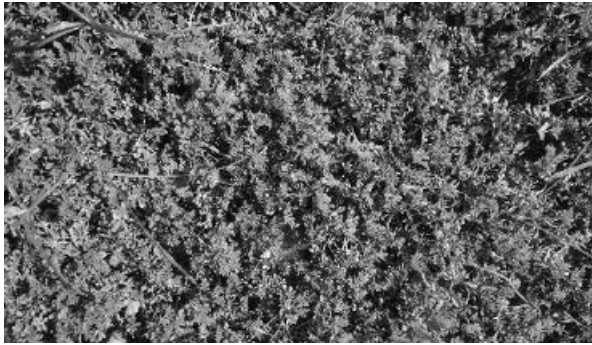
*Plantago coronopus*



*Cenchrus polystachios*



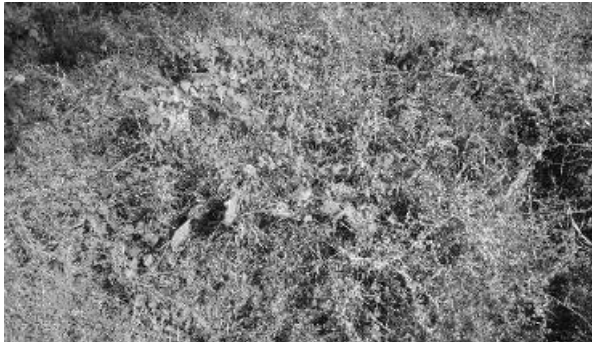
*Vachellia leucophloea*



*Indigofera linnaei* Ali



*Pedalium murex*



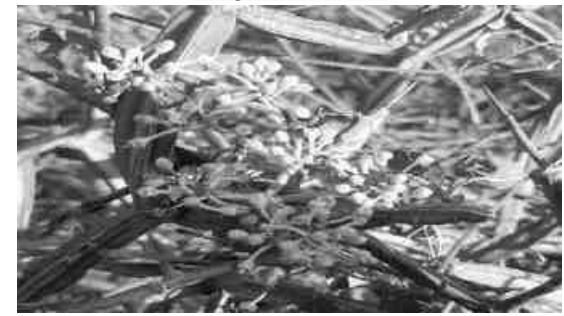
*Opuntia ficus-indica*



*Wrightia tinctoria*



*Cynanchum viminalis*



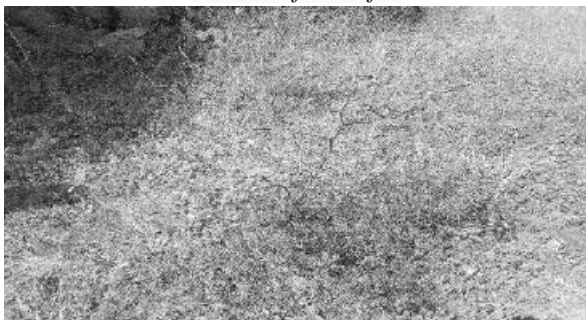
*Cissus rotundifolia*



*Borassus flabellifer*



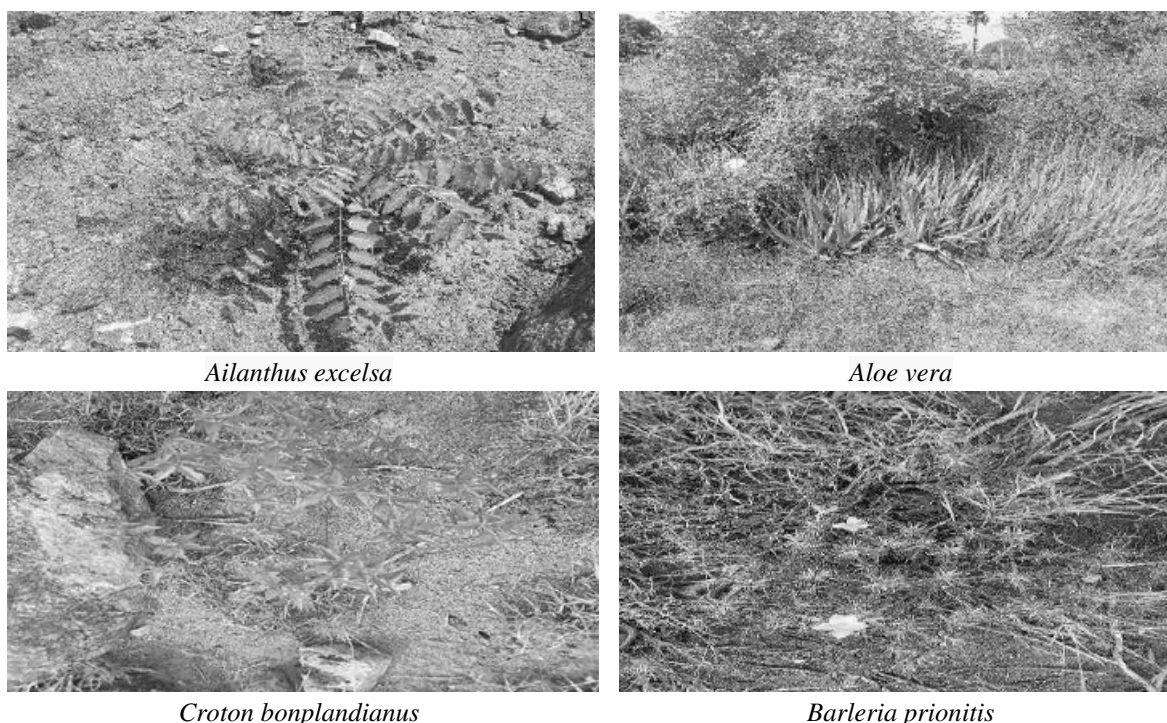
*Casuarina*



*Zizyphus Oenoplia*



*Eucalyptus obliqua*



**Figure 3.27 Flora photos 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 3.28

**Table 3.28 Aquatic Vegetation**

S.No.	Scientific name	Common Name	IUCN Red List of Threatened Species
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

\*LC- Least Concern, NA-Not yet assessed

### ***Forest Vegetation***

There are no biosphere reserves or wildlife sanctuaries or Reserve Forest, National parks or Important Bird Areas (IBAs) migratory routes of fauna on 10km radius. The area under study (Mine lease area and the 10 Km buffer zone) is not ecologically sensitive.

### ***Endangered and endemic species as per the IUCN Red List***

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

### 3.5.2 Fauna

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

#### *Survey Methodology*

**Table 3.29 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*

The 21 varieties of species observed in the core zone. Among them numbers of Insects 8 (41%), Reptiles 3 (14%), Mammals 1 (4%) and Avian 9 (41%). A total of 21 species belonging to 15 families have been recorded from the core mining lease area. Number of species decreases towards the mining area this might be due the lack of vegetation. None of these species are threatened or endemic. There is no Schedule I species and eight species are under schedule IV according to Indian wild life Act 1972. A total eight species of birds were sighted in the mining lease area. There are no critically endangered, endangered, vulnerable and endemic species were observed. Details of fauna in core zone with the scientific name were mentioned in Table. 3.30.

#### *Fauna in Buffer Zone*

A total of 47 species belonging to 34 families were recorded in the buffer zone. Based on habitat classification the majority of species were Birds 18 (38%), followed by Insects 15 (32%), Reptiles 7 (15%), 4 Mammals (8%) and amphibians 3 (6%). There are 4 schedule II species and 24 schedule IV species according to Indian wild life Act 1972. There are no critically endangered, vulnerable and endemic species observed. List of fauna in the buffer zone is provided in Table 3.31.

**Table 3.30 Fauna in Core Zone**

Sl. No	Common name/English Name	Family Name	Scientific Name	Schedule list wildlife Protection act 1972	IUCN Red List data
<b>INSECTS</b>					
1	Common Tiger	Nymphalidae	<i>Danaus genutia</i>	NL	NL
2	Red-veined darter	Libellulidae	<i>Sympetrum fonscolombii</i>	NL	LC
3	Grasshopper	Acrididae	<i>Hieroglyphus sp</i>	NL	LC
4	Blue tiger	Nymphalidae	<i>Tirumala limniace</i>	Schedule IV	LC
5	Stick insect	Lonchodidae	<i>carausius morosus</i>	NL	LC
6	Mottled emigrant	Peridae	<i>Catopsilia pyranthe</i>	NL	LC
7	Striped tiger	Nymphalidae	<i>Danaus plexippus</i>	Schedule IV	LC
8	Acraea violae	Nymphalidae	<i>Acraea violae</i>	NL	LC
<b>REPTILES</b>					
1	Garden lizard	Agamidae	<i>Calotes versicolor</i>	NL	LC
2	Common house gecko	Gekkonidae	<i>Hemidactylus frenatus</i>	NL	LC
3	Fan-Throated Lizard	Agamidae	<i>Sitanaponticeriana</i>	NL	LC
<b>MAMMALS</b>					
1	Indian Field Mouse	Muridae	<i>Mus booduga</i>	Schedule IV	NL
<b>AVES</b>					
1	Asian green bee-eater	Meropidae	<i>Meropsorientalis</i>	NL	LC
2	Koel	Cuculidae	<i>Eudynamys</i>	Schedule IV	LC
3	Common myna	Sturnidae	<i>Acridotheres tristis</i>	NL	LC
4	Cattle egret	Ardeidae	<i>Bubulcus ibis</i>	NL	LC
5	House crow	Corvidae	<i>Corvus splendens</i>	NL	LC
6	Koel	Cuculidae	<i>Eudynamys scolopaceus</i>	Schedule IV	LC
7	Crow Pheasant	Cuculidae	<i>Centropus sinensis</i>	Schedule IV	LC
8	Indian pond heron	Ardeidae	<i>Ardeola grayii</i>	Schedule IV	LC
9	Grey drongo	Dicruridae	<i>Dicrurus leucophaeus</i>	Schedule IV	LC

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

Table 3.31 Fauna in Buffer Zone

S. No.	Common Name/English Name	Family Name	Scientific Name	Schedule List Wildlife Protection Act 1972	IUCN Red List Data
<b>INSECTS</b>					
1	Blue tiger	Nymphalidae	<i>Tirumala limniace</i>	Schedule IV	LC
2	Milkweed butterfly	Nymphalidae	<i>Danainae</i>	NL	LC
3	Tawny coster	Nymphalidae	<i>Danaus chrysippus</i>	Schedule IV	LC
4	Indian honey bee	Apidae	<i>Apis cerana</i>	Schedule IV	LC
5	Grasshopper	Acrididae	<i>Hieroglyphus sp</i>	NL	LC
6	Red-veined darter	Libellulidae	<i>Sympetrum fonscolombii</i>	NL	LC
7	Lime butterfly	Papilionidae	<i>Papilio demoleus</i>	Schedule IV	LC
8	Ant	Formicidae	<i>Camponotus Vicinus</i>	NL	NL
9	Dragonfly	Gomphidae	<i>Ceratogomphus pictus</i>	Schedule IV	LC
10	Common Tiger	Nymphalidae	<i>Danaus genutia</i>	Schedule IV	LC
11	Common Indian crow	Nymphalidae	<i>Euploea core</i>	Schedule IV	LC
12	Praying mantis	Mantidae	<i>mantis religiosa</i>	NL	NL
13	Striped tiger	Nymphalidae	<i>Danaus plexippus</i>	Schedule IV	LC
14	Lesser grass blue	Lycaenidae	<i>Zizina otis indica</i>	Schedule IV	LC
15	Jewel beetle	Buprestidae	<i>Eurythyrea austriaca</i>	Schedule IV	NA
<b>REPTILES</b>					
16	Garden lizard	Agamidae	<i>Calotes versicolor</i>	NL	LC
17	Common house gecko	Gekkonidae	<i>Hemidactylus frenatus</i>	NL	LC
18	Indian chameleon	Chamaeleonidae	<i>Chamaeleo zeylanicus</i>	Sch II (Part I)	LC
19	Olive keelback water snake	Natricidae	<i>Atretium schistosum</i>	Sch II (Part II)	LC
20	Brahminy skink	Scincidae	<i>Eutropis carinata</i>	NL	LC
21	Rat snake	Colubridae	<i>Ptyas mucosa</i>	Sch II (Part II)	LC
22	Common skink	Scincidae	<i>Mabuya carinatus</i>	NL	LC
<b>MAMMALS</b>					

23	Indian palm squirrel	Sciuridae	<i>Funambulus palmarum</i>	Schedule IV	LC
24	Indian hare	Leporidae	<i>Lepus nigricollis</i>	Schedule IV	LC
25	Indian Field Mouse	Muridae	<i>Mus booduga</i>	Schedule IV	LC
26	Asian Small Mongoose	Herpestidae	<i>Herpestes javanicus</i>	Schedule (Part II)	LC
<b>AVES</b>					
27	Indian pond heron	Ardeidae	<i>Ardeola grayii</i>	Schedule IV	LC
28	Black drongo	Dicruridae	<i>Dicrurus macrocercus</i>	Schedule IV	LC
29	Asian green bee-eater	Meropidae	<i>Meropsorientalis</i>	NL	LC
30	Red-breasted parakeet	Psittaculidae	<i>Psittacula alexandri</i>	NL	LC
31	Common Coot	Rallidae	<i>Fulica atra</i>	Schedule IV	LC
32	Common myna	Sturnidae	<i>Acridotheres tristis</i>	NL	LC
33	Shikra	Accipitridae	<i>Accipiter badius</i>	NL	LC
34	Koel	Cuculidae	<i>Eudynamys</i>	Schedule IV	LC
35	Common Quail	Phasianidae	<i>Coturnix coturnix</i>	Schedule IV	LC
36	Red-vented Bulbul	Pycnonotidae	<i>Pycnonotuscafer</i>	Schedule IV	LC
37	Brahminy starling	Sturnidae	<i>Sturnia pagodarum</i>	Schedule IV	LC
38	Indian golden oriole	Oriolidae	<i>Oriolus kundoo</i>	Schedule IV	LC
39	Rose-ringed parakeet	Psittaculidae	<i>Psittacula krameria</i>	NL	LC
40	Common quail	Phasianidae	<i>Coturnix coturnix</i>	Schedule IV	LC
41	White-breasted waterhen	Rallidae	<i>Amaurornis phoenicurus</i>	NL	LC
42	Two-tailed Sparrow	Dicruridae	<i>Dicrurus macrocercus</i>	Schedule IV	LC
43	Grey Francolin	Phasianidae	<i>Francolinus pondicerianus</i>	Schedule IV	LC
44	House crow	Corvidae	<i>Corvussplendens</i>	NL	LC
<b>AMPHIBIANS</b>					
45	Indian Burrowing frog	Dicroglossidae	<i>Sphaerotheca breviceps</i>	Schedule IV	LC
46	Green Pond Frog	Ranidae	<i>Rana hexadactyla</i>	Schedule IV	LC
47	Tiger Frog	Chordata	<i>Hoplobatrachus tigerinus</i> ( <i>Rana tigerina</i> )	Schedule IV	LC

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



## **Results**

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

### **3.6 SOCIO ECONOMICS ENVIRONMENT**

#### **3.6.1 Introduction**

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 11 villages. Vettamangalam West is the village in which the proposed project site is located, the summary of population facts for the village is exclusively provided in Table 3.32 and for other 23 villages in Tables 3.33-3.35.

**Table 3.32 Vettamangalam West Village Population Fact**

<b>Vettamangalam West</b>	
Number of Households	1827
Population	5882
Male Population	2887
Female Population	2995
Children Population	420
Sex-ratio	1037
Literacy	3953
Male Literacy	2225
Female Literacy	1728
Scheduled Tribes (ST) %	3
Scheduled Caste (SC) %	816
Total Workers	3541
Main Worker	3455
Marginal Worker	86

<https://www.census2011.co.in/data/village/635547-vettamangalam-tamil-nadu.html>

**Table 3.33 Population and Literacy Data of Study Area**

	<b>No of Households</b>	<b>Total Population Person</b>	<b>Total Population Male</b>	<b>Total Population Female</b>	<b>Literates Population Person</b>	<b>Literates Population Male</b>	<b>Literates Population Female</b>	<b>Illiterate Persons</b>	<b>Illiterate Male</b>	<b>Illiterate Female</b>
Athipalayam	730	2062	1014	1048	1271	757	514	791	257	534
Avudayaparai	347	1045	514	531	751	404	347	294	110	184
Devakiammapuram	53	176	90	86	118	65	53	58	25	33
Karudayampalayam	577	2347	1211	1136	1614	977	637	733	234	499
Kombupalayam	614	1932	973	959	1371	766	605	561	207	354
Kuppam	1120	3503	1697	1806	1947	1143	804	1556	554	1002
Munnur	826	2582	1289	1293	1649	980	669	933	309	624
Pavithiram	1799	5881	2862	3019	3738	2165	1573	2143	697	1446
Punnam	1452	5446	2839	2607	3679	2208	1471	1767	631	1136
Vettamangalam (west)	1827	5882	2887	2995	3953	2225	1728	1929	662	1267
Vettamangalam (East)	807	2657	1310	1347	1521	900	621	1136	410	726

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

	<b>Private Primary School</b>	<b>Govt Vocational Training School/ITI</b>	<b>Primary Health Centre</b>	<b>Tap Water Untreated</b>	<b>River/Canal</b>	<b>Is the Area Covered under Total Sanitation Campaign</b>	<b>Telephone</b>	<b>Public Bus Service</b>	<b>Gravel (kutcha) Roads</b>	<b>Commercial Bank</b>	<b>Agricultural Credit Societies</b>	<b>Self - Help Group</b>	<b>Nutritional Centres-Anganwadi Centre</b>	<b>Community Centre with/without TV</b>	<b>Power Supply for Domestic Use</b>
Athipalayam	2	0	0	1	2	1	1	2	1	2	2	1	1	1	1
Avudayararai	2	0	0	1	2	2	1	2	1	2	2	1	1	1	1
Devakiammapuram	2	0	0	2	1	2	1	2	1	2	2	2	2	2	1
Karudayampalayam	2	0	0	1	2	1	1	1	1	2	2	1	1	1	1
Kombupalayam	1	0	0	1	2	1	1	1	1	2	2	1	1	1	1
Kuppam	2	0	0	1	2	1	1	1	1	2	2	1	1	1	1
Munnur	2	0	0	1	2	1	1	1	1	2	2	1	1	2	1
Pavithiram	1	0	0	1	1	2	1	1	1	2	2	1	1	1	1
Punnam	1	0	1	1	1	2	1	1	1	2	1	1	1	1	1
Vettamangalam (west)	2	0	0	1	1	1	1	1	1	1	1	1	1	1	1
Vettamangalam (East)	2	0	1	1	1	1	1	1	1	2	1	1	1	1	1

**Table 3.35 Workers' Profile of Study Area**

<b>Village</b>	<b>Total Worker Population Person</b>	<b>Total Worker Population Male</b>	<b>Total Worker Population Female</b>	<b>Main Working Population Person</b>	<b>Main Working Population Male</b>	<b>Main Working Population Female</b>	<b>Main Cultivator Population Person</b>	<b>Main Agricultural Labourers Population Person</b>	<b>Main Other Workers Population Person</b>	<b>Non-Working Population Person</b>
Athipalayam	1372	713	659	1309	701	608	442	551	281	690
Avudayaparai	621	328	293	619	327	292	39	477	103	424
Devakiammapuram	106	62	44	104	61	43	42	31	26	70
Karudayampalayam	1176	646	530	847	501	346	301	265	251	1171
Kombupalayam	945	598	347	902	566	336	138	369	366	987
Kuppam	2246	1198	1048	1941	1049	892	822	529	565	1257
Munnur	1577	882	695	1434	805	629	420	638	355	1005
Pavithiram	3293	1875	1418	2879	1682	1197	747	829	1242	2588
Punnam	2718	1531	1187	2665	1504	1161	731	632	1269	2728
Vettamangalam (west)	3541	1966	1575	3455	1920	1535	1268	1410	729	2341
Vettamangalam (East)	1609	894	715	1593	886	707	419	940	210	1048

### **3.6.7 Recommendation and Suggestion**

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

### **3.6.8 Summary & Conclusion**

The socio-economic study in the study area gives a clear picture of its population, average household size, literacy rate and sex ratio etc. It is also found that a part of population is suffering from a lack of permanent job to run their day-to-day life. Their expectation is to earn some income for their sustainability on a long-term basis.

The proposed project will aim to provide preferential employment to the local people there by improving the employment opportunity in the area and in turn the social standards will improve.

### **3.7 TRAFFIC DENSITY**

The traffic survey conducted based on the transportation route of material, the Rough Stone and gravel is proposed to be transported mainly through Village Road and Karur to Noyyal (SH-84) and Erode to Paramathi to Noyyal Road (SH-332) as shown in Table 3.36 and in Figure 3.28. Traffic density measurements were made continuously for 24 hours by visual observation and counting of vehicles under three categories, viz., Heavy motor vehicles, light motor vehicles and two/three wheelers. As traffic densities on the roads are high, two skilled persons were deployed simultaneously at each station. During each shift one person on either direction for counting the traffic. At the end of each hour, fresh counting and recording was undertaken. Direction for counting the traffic. At the end of each hour, fresh counting and recording was undertaken.

**Table 3.36 Traffic Survey Locations**

Station Code	Road Name	Distance and Direction	Type of Road
TS1	Village Road	0.09 Km-S	Village Road
TS2	Karur to Noyyal (SH-84)	1.73 Km-NE	Karur to Noyyal (SH-84)
TS3	Paramathi to Noyyal Road (SH-332)	2.22 km-W	Paramathi to Noyyal Road (SH-332)

Source: On-site monitoring by GTMS FAE & TM

**Table 3.37 Existing Traffic Volume**

Station code	HMV		LMV		2/3 Wheelers		Total PCU
	No	PCU	No	PCU	No	PCU	
TS1	62	186	35	35	80	40	261
TS2	95	285	52	52	94	47	384
TS3	90	270	60	60	105	53	383

Source: On-site monitoring by GTMS FAE & TM

\* PCU conversion factor: HMV (Trucks and Bus) = 3, LMV (Car, Jeep and Auto) = 1 and 2/3 Wheelers = 0.5

**Table 3.38 Rough Stone Transportation Requirement**

Transportation of Rough and Gravel per day		
Capacity of trucks	No. of Trips per day	Volume in PCU
15 tonnes	47	141

Source: Approved Mining Plan

**Table 3.39 Summary of Traffic Volume**

Route	Existing traffic volume in PCU	Incremental traffic due to the project	Total traffic volume	Hourly Capacity in PCU as per IRC – 1960 guidelines
Village Road	261	141	402	1200
Karur to Noyyal (SH-84)	384	141	525	1200
Paramathi to Noyyal Road (SH-332)	383	141	524	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.

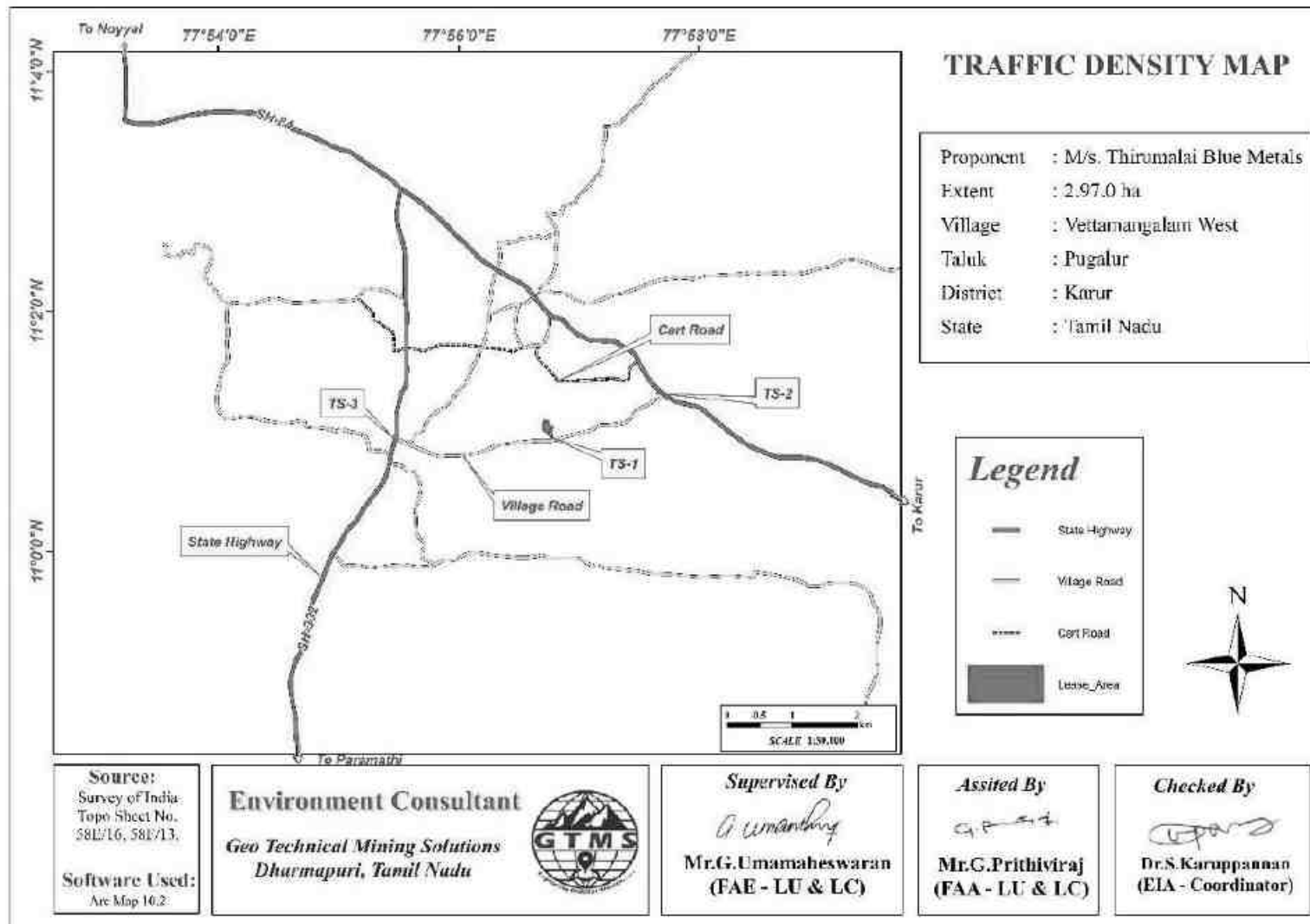


Figure 3.28 Traffic Density Map

### 3.8 SITE SPECIFIC FEATURES

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

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

S. No.	Sensitive Ecological Features	Name	Areal Distance in km
1	National Park / Wild life Sanctuaries	None	Nil within 10 km radius
		None	Nil within 10 km radius
2	Reserve Forest	Thathampalayam Reserve Forest	10.34 km SE
		Vangal Reserve Forest	18.85 km NE
3	Lakes/Reservoirs/ Dams/Streams/Rivers	Cauveri River	4.84 km N
		Noyyal River	4.17 km NW
		Amaravathi River	11.49 km SE
		Athupalayam Dam	13.67 km W
4	Tiger Reserve/Elephant Reserve/ Biosphere Reserve	None	Nil within 10 km radius
5	Critically Polluted Areas	None	Nil within 10 km radius
6	Mangroves	None	Nil within 10 km radius
7	Mountains/Hills	None	Nil within 10 km radius
8	Centrally Protected Archaeological Sites	None	Nil within 10 km radius
9	Industries/ Thermal Power Plants	TNPL	6.27 km NE
10	Defence Installation	None	Nil within 10 km radius

Source: Survey of India Toposheet







**Figure 3.29 Field Study Photographs**

## **CHAPTER IV**

### **ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES**

#### **4.0 GENERAL**

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

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

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

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

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

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

#### **4.1 LAND ENVIRONMENT**

##### **4.1.1 Anticipated Impact**

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

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

#### **4.1.2 Common Mitigation Measures from Proposed Project**

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

## **4.2 SOIL ENVIRONMENT**

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

### **4.2.1 Anticipated Impact on Soil Environment**

Following impacts are anticipated due to mining operations:

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

### **4.2.2 Common Mitigation Measures from proposed project**

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

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

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

#### **4.3 WATER ENVIRONMENT**

The total water requirement for this project will be 5.0 KLD. The water will be sourced initially from outside agencies. Later the rainwater collected in the mine pit sump will be used for this purpose. The domestic effluent to be generated from the project will be collected in septic tank with soak pits arrangements. There are no waste dumps in this quarry. Based on the available information and the geophysical investigations the study concluded that the project area is considered to have poor groundwater potential. Besides, the mining area consists of hard compact rock, no major water seepage within the mine is expected.

##### **4.3.1 Anticipated Impact**

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

- ❖ Generation of waste water from vehicle washing.
- ❖ Washouts from surface exposure or working areas
- ❖ Domestic sewage
- ❖ Disturbance to drainage course in the project area
- ❖ Mine Pit water discharge
- ❖ Increase in sediment load during monsoon in downstream of lease area
- ❖ This being a mining project, there will be no process effluent. Waste from washing of machinery may result in discharge of oil & grease, suspended solids.
- ❖ The sewage from soak pit may percolate to the ground water table and contaminate it.
- ❖ Surface drainage may be affected due to Mining
- ❖ As the proposed project acquires 5.0 KLD of water from water vendors, it will not extract water by developing abstraction structures in the lease area. Therefore, the project will not deplete aquifer beneath the lease area.

#### **4.3.2 Common Mitigation Measures for the Proposed Project**

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

#### **4.4 AIR ENVIRONMENT**

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

#### 4.4.1 Anticipated Impact from proposed project

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

#### 4.4.2 Emission Estimation

Emission resulting from different mining activities is estimated using relevant empirical formulae developed by Chauhya et al.,2001. The equations used for SPM, SO<sub>2</sub>, and NO<sub>x</sub> emission estimation have been given in Table 4.1.

**Table 4.1 Empirical Formula for Emission Rate from Overall Mine**

	Pollutant	Source Type	Empirical Equation	Parameters
Overall Mine	SPM	Area	$E = [u0.4a0.2\{9.7 + 0.01p + b/(4 + 0.3b)\}]$	u = Wind speed(m/s); p = Mineral production (Mt/yr); b = Overburden handling (Mm <sup>3</sup> /yr); a = Lease area(km <sup>2</sup> ); E = Emission rate(g/s).
Overall Mine	SO <sub>2</sub>	Area	$E = a0.14\{u/(1.83 + 0.93u)\} [ \{p/(0.48 + 0.57p)\} + \{b/(14.37 + 1.15b)\} ]$	u = Wind speed(m/s); p = Mineral production (Mt/yr); b = Overburden handling (Mm <sup>3</sup> /yr); a = Lease area(km <sup>2</sup> ); E = Emission rate(g/s).
Overall Mine	NO <sub>x</sub>	Area	$E = a0.25\{u/(4.3 + 32.5u)\} [1.5p + \{b/(0.06 + 0.08b)\}]$	u = Wind speed(m/s); p = Mineral production (Mt/yr); b = Overburden handling (Mm <sup>3</sup> /yr); a = Lease area(km <sup>2</sup> ); 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 PM<sub>10</sub> keeping in mind that proper control measures are followed. It is important to note that PM<sub>10</sub> emission rate is derived from the SPM estimation in the background that PM<sub>10</sub> constitutes 52% of SPM emission. The PM<sub>2.5</sub>, PM<sub>10</sub>, SO<sub>2</sub> and NO<sub>x</sub> emission results have been given in Table 4.2.

**Table 4.2 Estimated Emission Rate**

Activity	Pollutant	Calculated Value (g/s)	Lease Area in m <sup>2</sup>	Calculated Value (g/s/m <sup>2</sup> )
Overall Mine	PM <sub>2.5</sub>	0.03649279525	29700	1.22871E-06
Overall Mine	PM <sub>10</sub>	0.05298558053		1.78403E-06
Overall Mine	SO <sub>2</sub>	0.02548965365		8.58237E-07
Overall Mine	NO <sub>x</sub>	0.01869698564		6.29528E-07

#### 4.4.2.1 Frame work of Computation and Model Details

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

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

The model was used to predict the impact on the ambient air environment at each receptor at various localities within 10km radius around the project site and the maximum incremental GLC at the project site. All the prediction models in Figures 4.1- 4.4 shows the maximum concentrations of PM<sub>2.5</sub>, PM<sub>10</sub>, SO<sub>2</sub> and NO<sub>x</sub> close to the proposed project site due to low to moderate wind speeds.

#### 4.4.2.2 Modelling of Incremental Concentration

The air borne particulate matter such as PM<sub>10</sub> and PM<sub>2.5</sub> generated by quarrying operation, transportation, and wind erosion of the exposed areas and emissions of sulphur dioxide (SO<sub>2</sub>) and oxides of nitrogen (NO<sub>x</sub>) due to excavation and loading equipment's and vehicles plying on haul roads are the significant air pollutants arising from mining operation, leading to an adverse impact on the ambient air environment in and around the project area. Anticipated incremental concentration and net increase in emissions due to quarrying activities within 500 m around the project area is predicted by open pit source modelling using AERMOD Software and the incremental values of the air pollutants were added to the base line data monitored at the proposed site to predict total GLC of the pollutants, as shown in Tables 4.3-4.6.



#### 4.4.2.3 Model Results

The post project resultant concentrations of PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub> & NO<sub>x</sub> (GLC) is given in Tables 4.3-4.6.

**Table 4.3 Incremental & Resultant GLC of PM<sub>2.5</sub>**

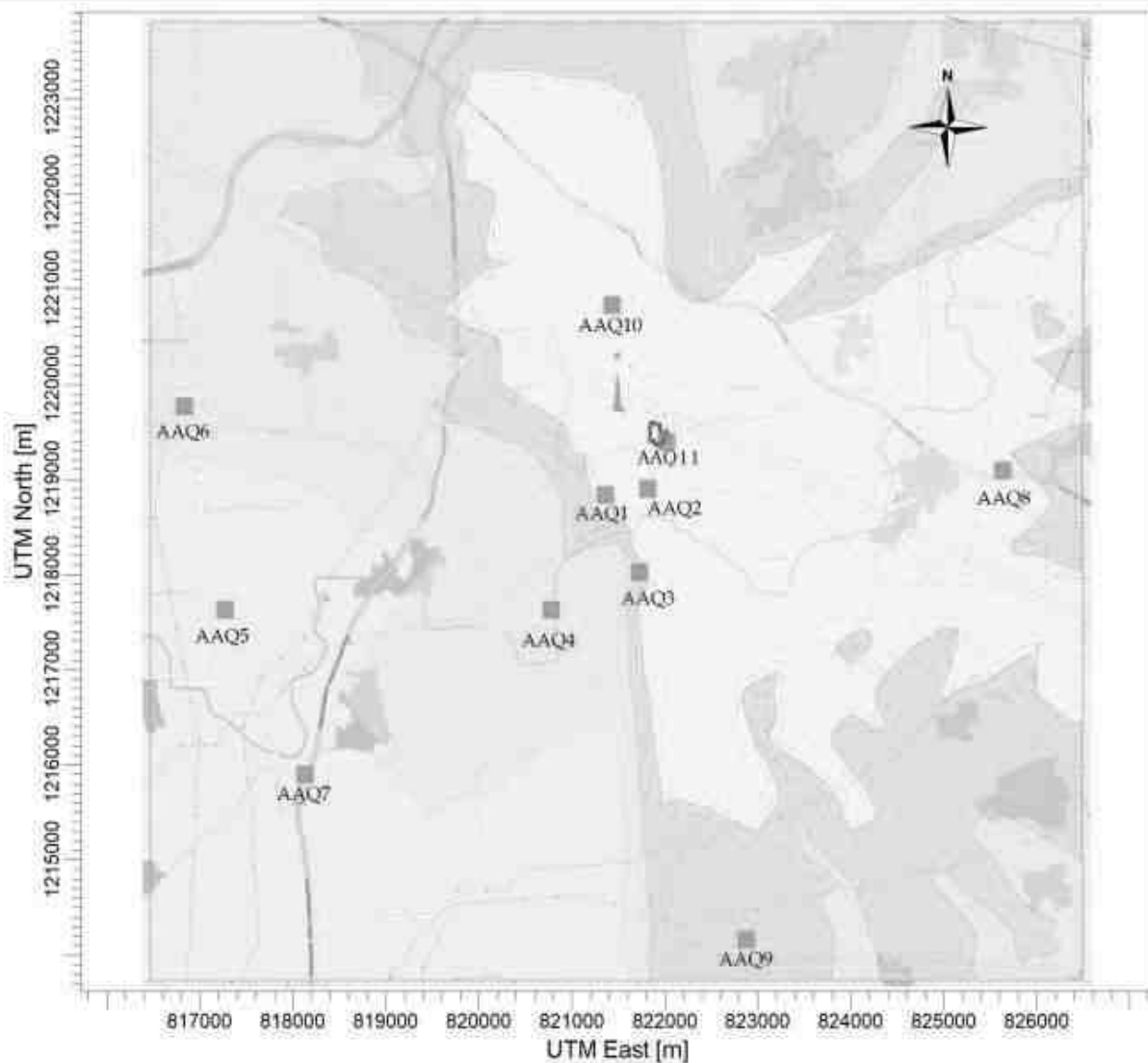
Station ID	Distance to core area(km)	Direction	PM <sub>2.5</sub> concentrations( $\mu\text{g}/\text{m}^3$ )			Comparison against air quality standard (60 $\mu\text{g}/\text{m}^3$ )	Magnitude of change (%)	Significance
			Baseline	Predicted	Total			
AAQ1	0.75	SW	21.1	1	22.1	Below standard	4.74	Not significant
AAQ2	0.48	S	21.6	1	22.6		4.63	
AAQ3	1.36	S	20.4	0.5	20.9		2.45	
AAQ4	2.06	SSW	16.0	0.1	16.1		0.63	
AAQ5	4.89	SW	18.0	0	18		0.00	
AAQ6	5.0	SW	19.1	0.1	19.2		0.52	
AAQ7	4.72	WSW	18.0	0	18		0.00	
AAQ8	3.65	ENE	25.3	1	26.3		3.95	
AAQ9	4.75	SSE	21.0	0.5	21.5		2.38	
AAQ10	1.30	NNW	21.2	1	22.2		4.72	
AAQ11	0.09	E	20.3	5.37	25.67		26.45	

**Table 4.4 Incremental & Resultant GLC of PM<sub>10</sub>**

Station ID	Distance to core area(km)	Direction	PM <sub>10</sub> concentrations( $\mu\text{g}/\text{m}^3$ )			Comparison against air quality standard (100 $\mu\text{g}/\text{m}^3$ )	Magnitude of change (%)	Significance
			Baseline	Predicted	Total			
AAQ1	0.75	SW	42.6	1	43.6	Below standard	2.35	Not significant
AAQ2	0.48	S	39.5	1	40.5		2.53	
AAQ3	1.36	S	39.8	0.5	40.3		1.26	
AAQ4	2.06	SSW	37.0	0.1	37.1		0.27	
AAQ5	4.89	SW	34.9	0	34.9		0.00	
AAQ6	5.0	SW	37.0	0.1	37.1		0.27	
AAQ7	4.72	WSW	39.7	0	39.7		0.00	
AAQ8	3.65	ENE	46.8	1	47.8		2.14	
AAQ9	4.75	SSE	39.3	1	40.3		2.54	
AAQ10	1.30	NNW	39.8	5	44.8		12.56	
AAQ11	0.09	E	37.6	7.80	45.4		20.74	

PROJECT TITLE:

M/S THIRUMALAI BLUE METALS ROUGHSTONE AND GRAVEL QUARRY PROJECT\_PM2.5



Max: 5.37 [ug/m<sup>3</sup>] at (821483.34, 1219764.99)

ug/m<sup>3</sup>



COMMENTS:	SOURCES:	COMPANY NAME:	
	1		
	RECEPTORS:	MODELER:	
	893		
	OUTPUT TYPE:	SCALE:	1:72,532
	Concentration		
	MAX:	DATE:	PROJECT NO.:
	5.37 ug/m <sup>3</sup>	5/22/2023	

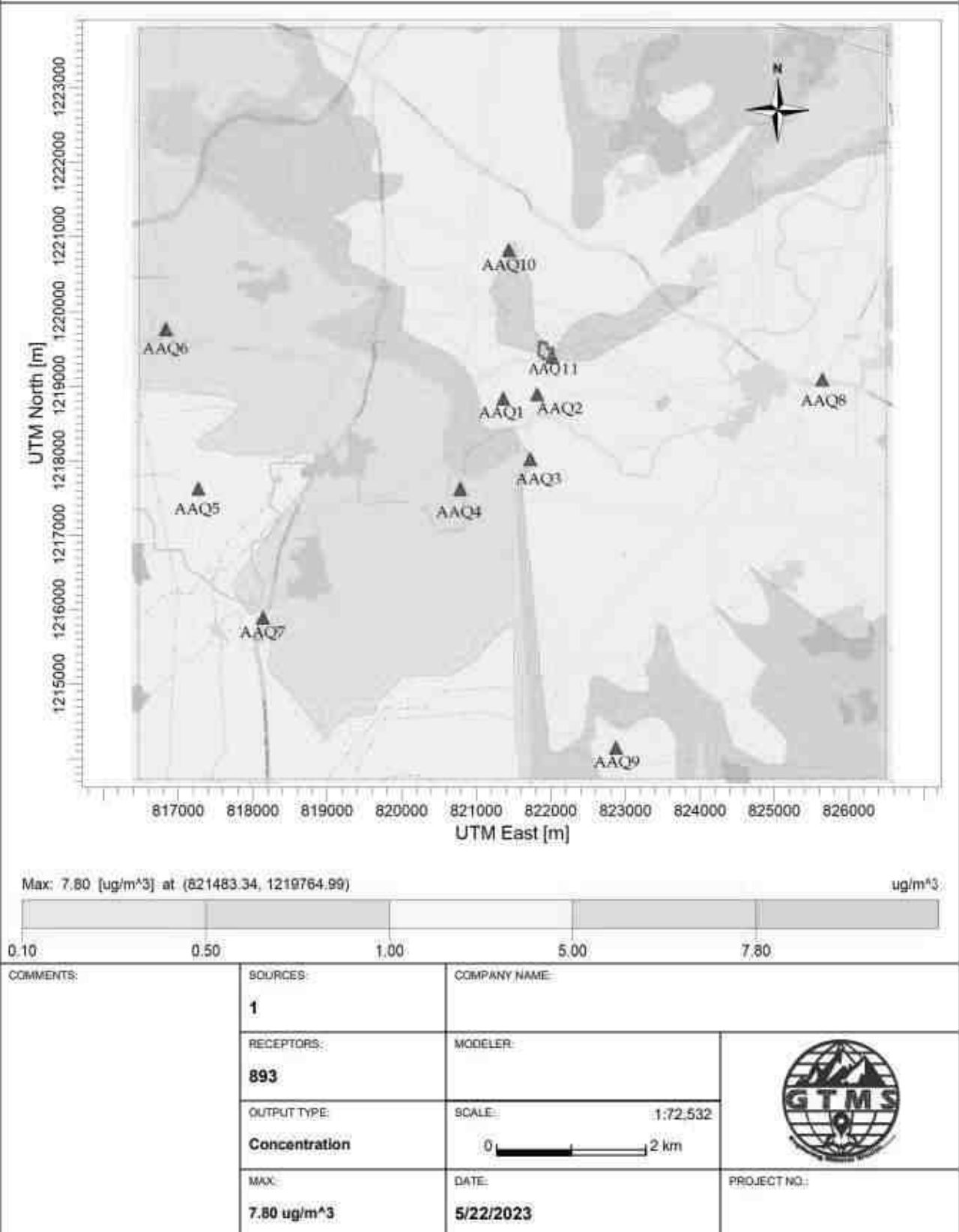
AERMOD View - Lakes Environmental Software

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Figure 4.1 Predicted Incremental Concentration of PM<sub>2.5</sub>

PROJECT TITLE:

M/S THIRUMALAI BLUE METALS ROUGHSTONE AND GRAVEL QUARRY PROJECT\_PM10



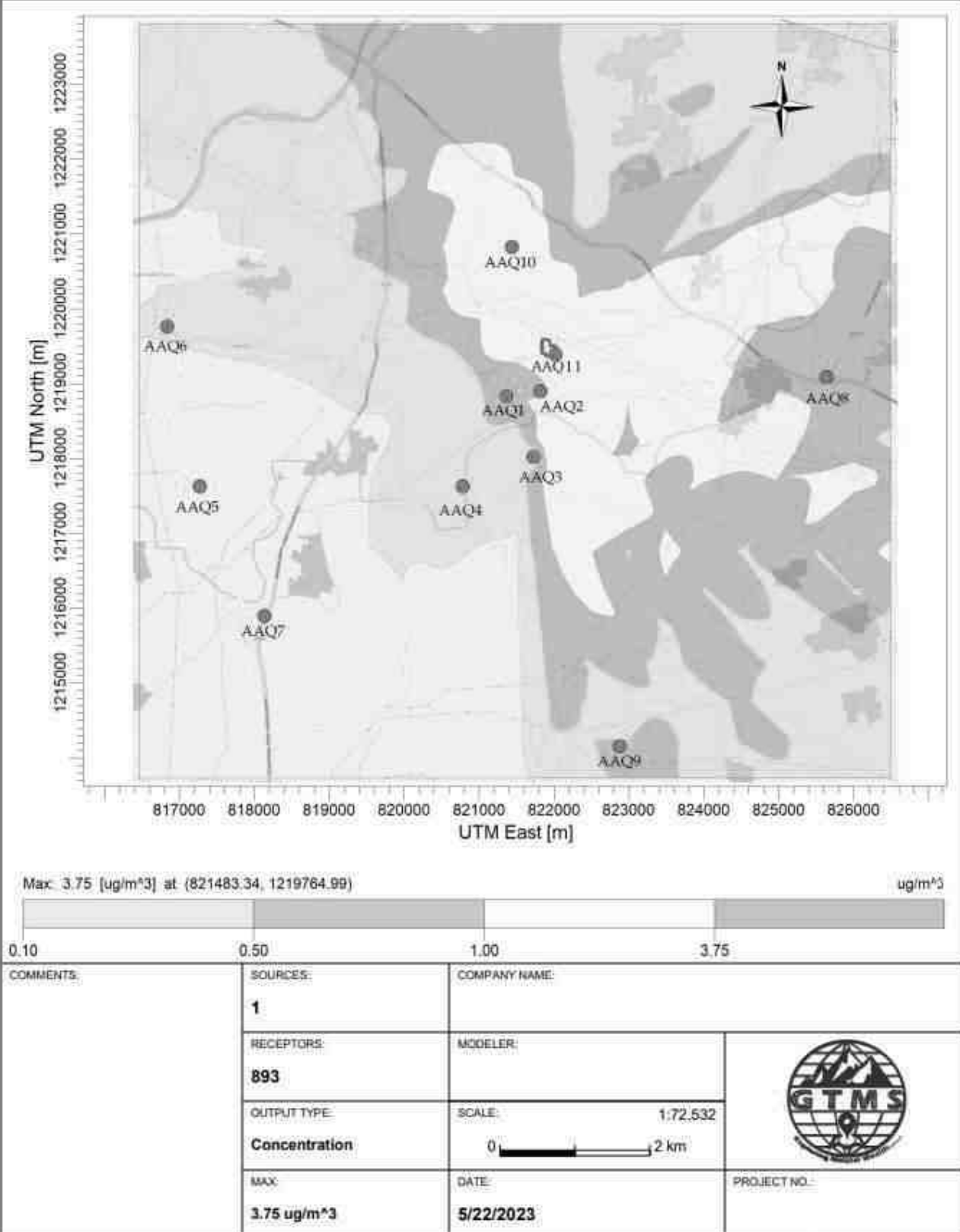
AERMOD View - Lakes Environmental Software

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Figure 4.2 Predicted Incremental Concentration of PM<sub>10</sub>

PROJECT TITLE:

M/S THIRUMALAI BLUE METALS ROUGHSTONE AND GRAVEL QUARRY PROJECT\_ SO2



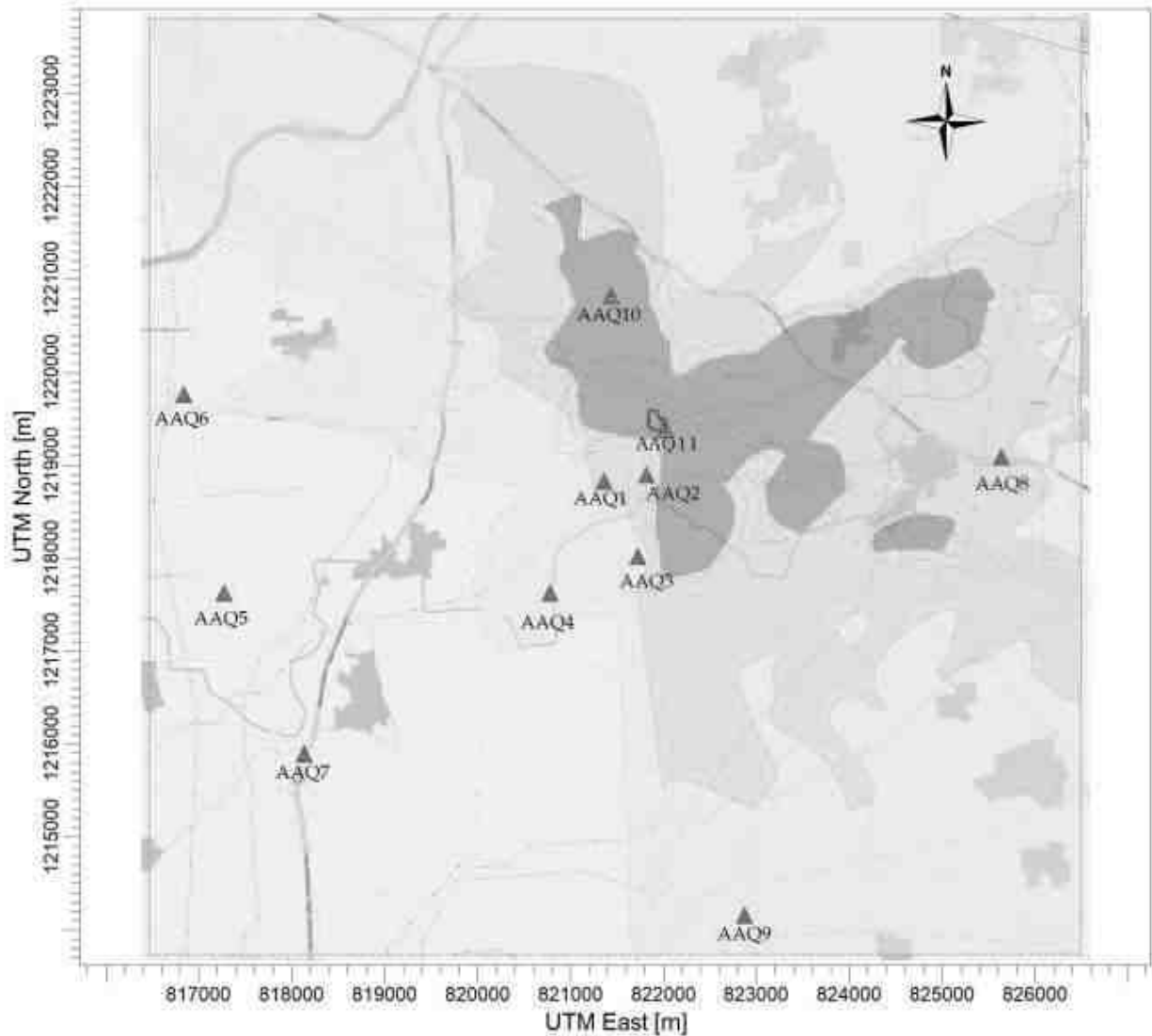
AERMOD View - Lakes Environmental Software

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Figure 4.3 Predicted Incremental Concentration of SO<sub>2</sub>

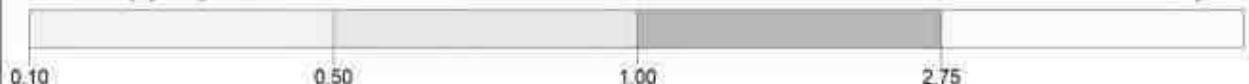
PROJECT TITLE:

M/S THIRUMALAI BLUE METALS ROUGHSTONE AND GRAVEL QUARRY PROJECT\_NOx



Max: 2.75 [ug/m<sup>3</sup>] at (821483.34, 1219764.99)

ug/m<sup>3</sup>



COMMENTS:	SOURCES:	COMPANY NAME:	
	1		
	RECEPTORS:	MODELER:	
	893		
	OUTPUT TYPE:	SCALE:	1:72,532
	Concentration		
	MAX:	DATE:	PROJECT NO.:
	2.75 ug/m <sup>3</sup>	5/22/2023	

AERMOD View - Lakes Environmental Software

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Figure 4.4 Predicted Incremental Concentration of NO<sub>x</sub>

**Table 4.5 Incremental & Resultant GLC of SO<sub>2</sub>**

Station ID	Distance to core area(km)	Direction	SO <sub>2</sub> concentrations(µg/m <sup>3</sup> )			Comparison against air quality standard (80 µg/m <sup>3</sup> )	Magnitude of change (%)	Significance
			Baseline	Predicted	Total			
AAQ1	0.75	SW	8.4	0.5	8.9	Below standard	5.95	Not significant
AAQ2	0.48	S	8.9	0.5	9.4		5.62	
AAQ3	1.36	S	9.5	0.5	10		5.26	
AAQ4	2.06	SSW	7.0	0.1	7.1		1.43	
AAQ5	4.89	SW	8.4	0	8.4		0.00	
AAQ6	5.0	SW	10.0	0.1	10.1		1.00	
AAQ7	4.72	WSW	7.3	0	7.3		0.00	
AAQ8	3.65	ENE	9.1	0.5	9.6		5.49	
AAQ9	4.75	SSE	9.2	0.5	9.7		5.43	
AAQ10	1.30	NNW	8.9	1	9.9		11.24	
AAQ11	0.09	E	8.8	3.75	12.55		42.61	

**Table 4.6 Incremental & Resultant GLC of NO<sub>x</sub>**

Station ID	Distance to core area(km)	Direction	NO <sub>x</sub> concentrations(µg/m <sup>3</sup> )			Comparison against air quality standard (80 µg/m <sup>3</sup> )	Magnitude of change (%)	Significance
			Baseline	Predicted	Total			
AAQ1	0.75	SW	16.3	0.5	16.8	Below standard	3.07	Not significant
AAQ2	0.48	S	16.9	0.5	17.4		2.96	
AAQ3	1.36	S	16.6	0.1	16.7		0.60	
AAQ4	2.06	SSW	11.0	0.1	11.1		0.91	
AAQ5	4.89	SW	17.0	0	17		0.00	
AAQ6	5.0	SW	19.1	0	19.1		0.00	
AAQ7	4.72	WSW	14.0	0	14		0.00	
AAQ8	3.65	ENE	26.6	0.5	27.1		1.88	
AAQ9	4.75	SSE	18.2	0.1	18.3		0.55	
AAQ10	1.30	NNW	16.0	1	17		6.25	
AAQ11	0.09	E	16.5	2.75	19.25		16.67	

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

#### **4.4.3 Common Mitigation Measures**

##### ***Drilling***

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

##### ***Advantages of Wet Drilling***

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

##### ***Blasting***

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

##### ***Haul Road and Transportation***

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

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

#### ***Green Belt***

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

#### ***Occupational Health***

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

### **4.5 NOISE ENVIRONMENT**

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

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

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

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

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

Where,



$L_{p1}$  &  $L_{p2}$  are sound levels at points located at distances  $r_1$  and  $r_2$  from the source

$A_{e1,2}$  is the excess attenuation due to environmental conditions.

Combined effect of all sources can be determined at various locations by logarithmic addition.

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

#### 4.5.1 Anticipated Impact

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

- Source data
- Receptor data
- Attenuation factor

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

**Table 4.7 Activity and Noise Level Produced by Machinery**

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

\*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 95.8 dB (A). Generally, most mining operations produce noise between 100-109 dB (A). We have considered equipment and operation noise levels (max) to be approx. 109 dB (A) for noise prediction modelling.

**Table 4.8 Predicted Noise Incremental Values**

Noise Monitoring Location	Distance From Project Site(m)	Baseline Noise Level (dBA)m During Day Time	Predicted Noise Level (dBA)	Total (dBA)
Between NTC and Rani Leases	710	41.7	40.13	44.00
New star lease	480	40.3	43.53	45.22
Amaravathi Lease	1360	40.0	34.49	41.08

Kuppam	2060	35.4	30.88	36.71
Puthurpatti	1230	32.6	35.36	37.21
Andisangilipalayam	2100	36.2	30.72	37.28
Velampalayam	4930	40.3	23.30	40.39
Athipalayam	4950	40.8	23.27	40.88
Munnur	4970	40.8	23.23	40.88
Punna chatram	3650	42.2	25.91	42.30
Karudayampalayam	4920	41.2	23.32	41.27
Kunthanipalayam	1360	41.7	34.49	42.46
Near Core	100	40.8	57.16	57.26
NAAQ Standards	Industrial Day Time - 75 dB (A) & Night Time- 70 dB (A) Residential Day Time -55 dB (A) & Night Time- 45 dB (A)			

The incremental noise level is found to be 57.16 dB (A) in core zone and ranges between 23.23 and 43.53dB (A) in buffer zone. The noise level at different receptors in buffer zone is lower due to the distance involved and other topographical features adding to the noise attenuation. The resultant Noise level due to monitored values and calculated values at the receptors are based on the mathematical formula considering attenuation due to several factors including ground reflection, atmosphere, wind speed, temperature, trees, and buildings as 35.5 dB (A), the barrier effect. From the above table, it can be seen that the ambient noise levels at all the locations near habitations are within permissible limits of Residential Area (buffer zone) as per THE NOISE POLLUTION (REGULATION AND CONTROL) RULES, 2000 (The Principal Rules were published in the Gazette of India, vide S.O.123(E), dated 14.2.2000 and subsequently amended vide S.O. 1046(E),dated 22.11.2000, S.O. 1088(E), dated 11.10.2002, S.O. 1569 (E), dated 19.09.2006 and S.O. 50 (E) dated 11.01.2010 under the Environment(Protection) Act, 1986.).

#### 4.5.2 Common Mitigation Measures

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

- ❖ Usage of sharp drill bits while drilling which will help in reducing noise
- ❖ Secondary blasting will be totally avoided and hydraulic rock breaker will be used for breaking boulders
- ❖ Controlled blasting with proper spacing, burden, stemming and optimum charge/delay will be maintained
- ❖ The blasting will be carried out during favourable atmospheric condition and less human activity timings by using nonelectrical initiation system

- ❖ Proper maintenance, oiling and greasing of machines will be done every week to reduce generation of noise
- ❖ Provision of sound insulated chambers for the workers working on machines (HEMM) producing higher levels of noise
- ❖ Silencers / mufflers will be installed in all machineries
- ❖ Greenbelt/Plantation will be developed around the project area and along the haul roads. The plantation minimizes propagation of noise
- ❖ Personal Protective Equipment (PPE) like ear muffs/ear plugs will be provided to the operators of HEMM and persons working near HEMM and their use will be ensured through training and awareness
- ❖ Regular medical check-up and proper training to personnel to create awareness about adverse noise level effects

#### 4.5.3 Ground Vibrations

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

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

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

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

Where,

V = peak particle velocity (mm/s)

K = site and rock factor constant (500)

Q = maximum instantaneous charge (kg)

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

R = distance from charge (m)

**Table 4.9 Predicted PPV Values due to Blasting**

Location ID	Maximum Charge in kgs	Nearest Habitation in m	PPV in mm/s	Fly rock distance in m	Air Blast	
					Pressure (kPa)	Sound Level (dB)
P1	26	1230	0.077	19	0.03	124

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

Location ID	Maximum Charge in kgs	Radial Distance in m	PPV in mm/s	Fly rock distance in m	Air Blast	
					Pressure (kPa)	Sound Level (dB)
P1	26	100	4.26	19	0.65	150
		200	1.40		0.28	143
		300	0.73		0.17	139
		400	0.46		0.12	136
		500	0.32		0.09	134

#### 4.5.3.1 Common Mitigation Measures

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

- ❖ The detonators will be connected in a predetermined sequence to ensure that only one charge is detonated at any one time and a NONEL or similar type initiation system will be used
- ❖ The detonation delay sequence shall be designed so as to ensure that firing of the holes is in the direction of free faces so as to minimise vibration effects
- ❖ Appropriate blasting techniques shall be adopted in such a way that the predicted peak particle velocity shall not exceed 0.251mm/s
- ❖ Vibration monitoring will be carried out every 6 months to check the efficacy of blasting practices.

## 4.6 ECOLOGY AND BIODIVERSITY

### 4.6.1 Impact on Ecology and Biodiversity

- There shall be negligible air emissions or effluents from the project site. During loading the truck, dust generation will be likely. This shall be a temporary effect and not anticipated to affect the surrounding vegetation significantly
- Most of the land in the buffer area is undulating terrain with crop lands, grass patches and small shrubs. Hence, there will be no effect on flora of the region.
- Carbon released from quarrying machineries and tippers during quarrying would be 3081 kg per day, 831929 kg per year and 4159646 kg over five years, as provided in Table 4.11.

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

	Per day	Per year	Per five years
Fuel consumption of excavator	216	58373	291863
Fuel consumption of compressor	26	7020	35100
Fuel consumption of tipper	908	245029	1225143
Total fuel consumption in liters	1150	310421	1552107
Co <sub>2</sub> emission in kg	3081	831929	4159646

### 4.6.2 Impact on agriculture and horticulture crops

- ❖ 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.

#### **4.6.3 Mitigation measures on flora and near agriculture Vegetations.**

- ❖ 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.
- ❖ Quarry approach roads are sprayed with water 3 times a day to control dust. Thus, the damage to the nearby farmlands is controlled.
- ❖ 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 35604 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 1485 trees will be planted within three months from the beginning of mining. These trees, when grown up would sequester carbon of about 178022 kg of the total carbon, as provided in Table 4.12.

**Table 4.12 CO<sub>2</sub> Sequestration**

CO <sub>2</sub> sequestration in kg	132	35604	178022
Remaining CO <sub>2</sub> not sequestered in kg	2949	796325	3981624
Trees required for environmental compensation	33180		
Area required for environmental compensation in hectares	66		

#### ***Greenbelt Development***

The main objective of the green belt is to provide a barrier between the source of pollution and the surrounding areas. In order to compensate the loss of vegetation cover, it is suggested to carry out afforestation program mainly inside and outside of the lease area in different phases. This habitat improvement program would ensure the faunal species to re-colonize and improve the abundance status in the core zone. Greenbelt development plan and budget required for green belt development plan are given in Tables 4.14-4.15. For greenbelt development, species are recommended, as shown in Table 4.12 on the basis of:

- ❖ Natural growth of existing species and survival rate of various species.
- ❖ Suitability of a particular plant species for a particular type of area.
- ❖ Creating of biodiversity.
- ❖ Fast growing, thick canopy copy, perennial and evergreen large leaf area.

- ❖ Efficient in absorbing pollutants without major effects of natural growth.

**Table 4.13 Recommended Species for Greenbelt Development Plan**

S. No	Botanical Name of the Plant	Family Name	Common Name	Category	Dust Capturing Efficiency Features
1	<i>Azadirachta indica</i>	Meliaceae	Neem, Vembu	Tree	Well distinct thick at both the layer Well distinct in Palisade & Spongy parenchyma. Spongy parenchyma is present at lower epidermis Many vascular bundles arranged almost parallel series
2	<i>Tectona grandis</i>	Lamiaceae	Teak	Tree	
3	<i>Polyalthia longifolia</i>	Annonaceae	Nettilingam	Tree	
4	<i>Albizia lebbek</i>	Fabaceae	Vagai	Tree	
5	<i>Delonix regia</i>	Fabaceae	Cemmayir-konrai	Tree	
6	<i>Bauhinia 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 4.14 Greenbelt Development Plan**

	No. of trees proposed for plantation	No. of trees expected to survive @ 80%	Area to be covered(m <sup>2</sup> )
Plantation in the construction phase (3 months)	Number of plants inside the mine lease area		
	594	475	5346
	Number of plants outside the mine lease area		
	891	713	8019
<b>Total</b>	<b>1485</b>	<b>1188</b>	<b>13365</b>

**Table 4.15 Budget for Greenbelt Development Plan**

Activity	Plantation in the construction phase(3Months)	Cost	Capital Cost (Rs.)	Recurring Cost-per annum
Plantation inside the mine lease area (in safety margins)	594	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))"	118800	17820
Plantation outside the area	891	Avenue Plantation @ 300 per plant (capital) for plantation outside the lease area and @ 30 per plant maintenance (recurring)	267300	26730
<b>Total</b>			<b>386100</b>	<b>44550</b>

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.







**Figure 4.5 Greenbelt development photos**

#### **4.6.4. 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.

#### **4.6.5 Measures for Protection and Conservation of Wildlife Species**

- ❖ All the preventive measures will be taken for growth & development of fauna.

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

### ***Aquatic Biodiversity***

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

**Table 4.16 Ecological Impact Assessments**

S. No	Attributes	Assessment
1	Activities of the project affects the breeding/nesting sites of birds and animals	No breeding and nesting sites were identified in the lease area.
2	Located near an area populated by rare or endangered species	No endangered, critically endangered, vulnerable species were sighted in core area.
3	Proximity to national park/wildlife sanctuary/reserve forest /mangroves/ coastline/estuary/sea	There are no national parks or eco-sensitive zones and reserve forest around 10 km radius. 1.Thathampalayam Reserve Forest 10.34 Km SE
4	Proposed project restricts access to waterholes for wildlife	No. The proposed project does not restrict access to water holes for wildlife.
5	Proposed mining project impact surface water quality that also provide water to wildlife	No scheduled or threatened wildlife animal were sighted in core area.
6	Proposed mining project increase siltation that would affect nearby biodiversity area.	Surface runoff management system will be developed properly. So, there will be no siltation in nearby mining area.
7	Risk of fall/slip or cause death to wild animals due to project activities	Barbed wire fencing will be installed around the lease area. Therefore, wild animals will not fall into the quarry pit.

8	The project release effluents into a water body that also supplies water to a wildlife	No water bodies were found close to core zone so chances of water becoming polluted will be low.
9	Mining project effect the forest-based livelihood/ any specific forest product on which local livelihood depended	No. The proposed project does not involve any forestland. Therefore, it will not affect the livelihood of people depending the forest product.
10	Project likely to affect migration routes	No migration routes were found crossing the lease area.
11	Project likely to affect flora of an area, which have medicinal value	No flora with medicinal values were found in the study area.
12	Forestland is to be diverted, has carbon high sequestration	As the proposed project does not involve any forestland, there will be no need for diversion.
13	The project likely to affect wetlands, fish breeding grounds, marine ecology	Wetland was not present in and around mining lease area. No fish breeding grounds were present in core area.

**Table 4.17 Anticipated Impact of Ecology and Biodiversity**

S. No	Aspect Description	Likely Impacts on Ecology and Biodiversity (EB)	Impact Consequence - Probability Description / Justification	Significance	Mitigation Measures
<b>Pre-Mining Phase</b>					
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
		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.		diversity of the project area.
<b>Mining Phase</b>					
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 <sub>2</sub> , NO <sub>2</sub> , CO etc.	Impact on surrounding agriculture and associated fauna due to deposition of dust and Emission of CO. (Indirect impact)	Impact is less as the agricultural land far from core area.	Less severe	All vehicles will be certified for appropriate Emission levels. More plantation has been suggested Upgrade the vehicles with alternative fuel such biodiesel, methanol and biofuel around the mining area.

## 4.7 SOCIO ECONOMIC ENVIRONMENT

### 4.7.1 Anticipated Impact from Proposed and Existing Projects

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

#### **4.7.2 Common Mitigation Measures for Proposed Project**

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

#### **4.8 OCCUPATIONAL HEALTH AND SAFETY**

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

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

##### **4.8.1 Respiratory Hazards**

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

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

##### **4.8.2 Noise**

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

- ❖ No employee will be exposed to a noise level greater than 85 dB(A) for a duration of more than 8 hours per day without hearing protection

- ❖ The use of hearing protection will be enforced actively when the equivalent sound level over 8 hours reaches 85 dB(A), the peak sound levels reach 140 dB(C), or the average maximum sound level reaches 110 dB(A)
- ❖ Ear muffs provided will be capable of reducing sound levels at the ear to at least 85 dB(A)
- ❖ Periodic medical hearing checks will be performed on workers exposed to high noise levels.

#### **4.8.3 Physical Hazards**

The following measures are proposed for control of physical hazards

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

#### **4.8.4 Occupational Health Survey**

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

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

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

### **4.9 MINE WASTE MANAGEMENT**

No waste is anticipated from any of the proposed quarries.

#### **4.10 MINE CLOSURE**

Mine closure plan is the most important environmental requirement in mining project. The mine closure plan should cover technical, environmental, social, legal and financial aspects dealing

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

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

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

#### **4.10.1 Mine Closure Criteria**

The criteria involved in mine closure are discussed below:

##### **4.10.1.1 Physical Stability**

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

##### **4.10.1.2 Chemical Stability**

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

#### **4.10.1.3 Biological Stability**

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

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

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

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



## **CHAPTER V**

### **ANALYSIS OF ALTERNATIVES (TECHNOLOGY AND SITE)**

#### **5.0 INTRODUCTION**

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

#### **5.1 FACTORS BEHIND THE SELECTION OF PROJECT SITE**

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

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

#### **5.2 ANALYSIS OF ALTERNATIVE SITE**

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

#### **5.3 FACTORS BEHIND SELECTION OF PROPOSED TECHNOLOGY**

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

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

#### **5.4 ANALYSIS OF ALTERNATIVE TECHNOLOGY**

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

## **CHAPTER VI**

### **ENVIRONMENTAL MONITORING PROGRAMME**

#### **6.0 GENERAL**

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

#### **6.1 METHODOLOGY OF MONITORING MECHANISM**

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

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

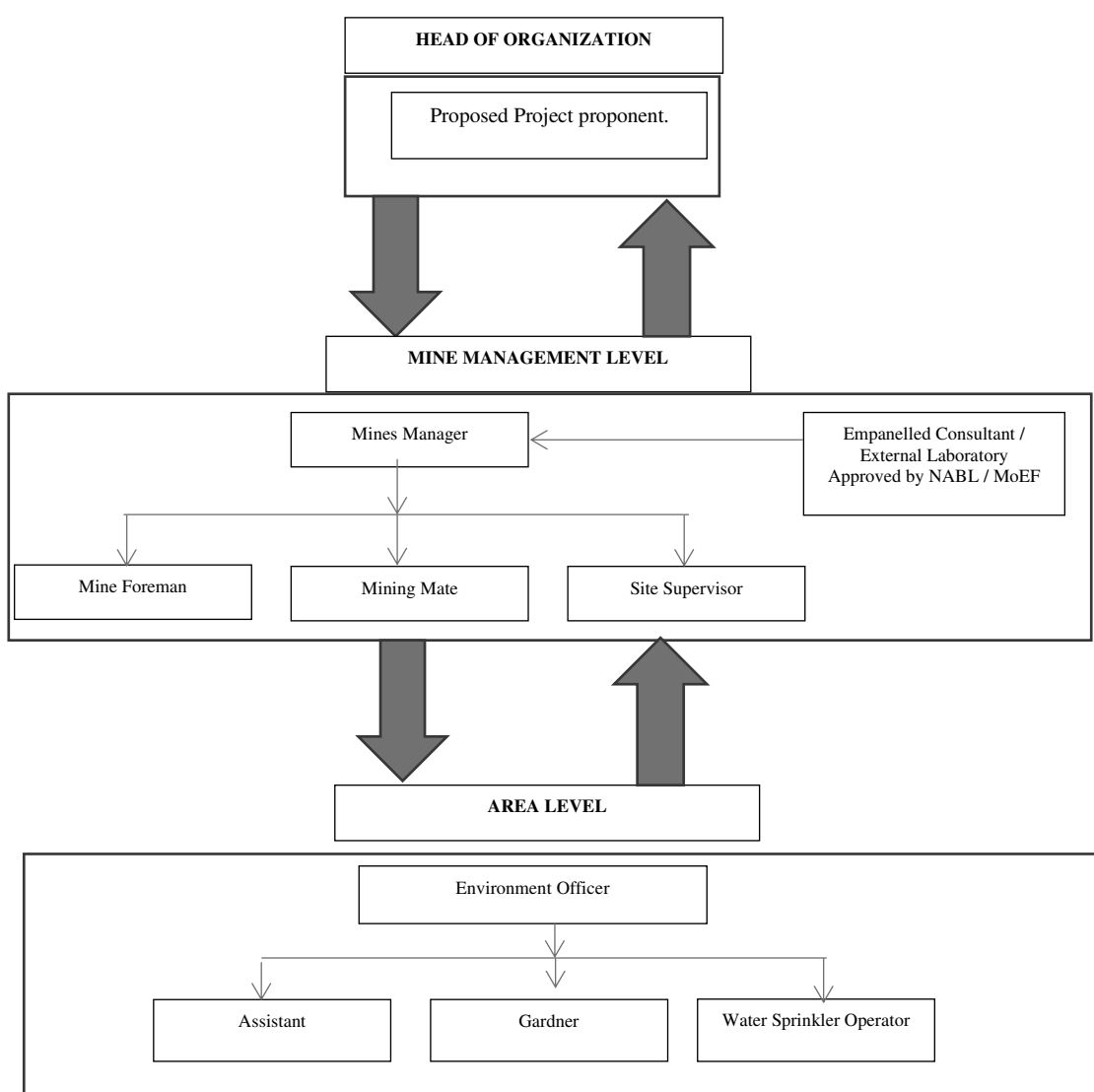
- ❖ Implementation of pollution control measures
- ❖ Monitoring programme implementation
- ❖ Post-plantation care
- ❖ To check the efficiency of pollution control measures taken
- ❖ Any other activity as may be related to environment

- ❖ Seeking expert's advice when needed.

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

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

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



**Figure 6.1 Proposed environmental monitoring chart**

## 6.2 IMPLEMENTATION SCHEDULE OF MITIGATION MEASURES

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

**Table 6.1 Implementation Schedule for Proposed Project**

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

## 6.3 MONITORING SCHEDULE AND FREQUENCY

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

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

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

- ❖ Soil quality and
- ❖ Greenbelt development

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

**Table 6.2 Proposed Monitoring Schedule Post EC for the Proposed Quarry**

S. No.	Environment Attributes	Location	Monitoring		Parameters
			Duration	Frequency	
1	Air Quality	2 Locations (1 Core & 1 Buffer)	24 hours	Once in 6 months	Fugitive Dust, PM <sub>2.5</sub> , PM <sub>10</sub> , SO <sub>2</sub> and NO <sub>x</sub> .
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/-
<b>Total</b>		-	<b>Rs 2,95,000 /-</b>

*Source: Field Data*

#### 6.5 REPORTING SCHEDULES OF MONITORED DATA

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

Periodical reports to be submitted to:

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

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

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

## **CHAPTER VII**

### **ADDITIONAL STUDIES**

#### **7.0 GENERAL**

Additional studies deal with:

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

#### **7.1 PUBLIC CONSULTATION FOR PROPOSED PROJECT**

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

#### **7.2 RISK ASSESSMENT FOR PROPOSED PROJECT**

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

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

**Table 7.1 Risk Assessment & Control Measures for Proposed Project**

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



			<ul style="list-style-type: none"> <li>✓ Periodical preventive maintenance and replacement of worn-out accessories in the compressor and drill equipment as per operator manual.</li> <li>✓ All drills unit shall be provided with wet drilling shall be maintained in efficient working in condition.</li> <li>✓ Operator shall regularly use all the personal protective equipment.</li> </ul>
3	Transportation	<p>Potential hazards and unsafe workings contributing to accident and injuries</p> <p>Overloading of material</p> <p>While reversal &amp; overtaking of vehicle</p> <p>Operator of truck leaving his cabin when it is loaded.</p>	<ul style="list-style-type: none"> <li>✓ Before commencing work, drivers personally check the truck/tipper for oil(s), fuel and water levels, tyre inflation, general cleanliness and inspect the brakes, steering system, warning devices including automatically operated audio-visual reversing alarm, rear view mirrors, side indicator lights etc., are in good condition.</li> <li>✓ Not allow any unauthorized person to ride on the vehicle nor allow any unauthorized person to operate the vehicle.</li> <li>✓ Concave mirrors should be kept at all corners</li> <li>✓ All vehicles should be fitted with reverse horn with one spotter at every tipping point</li> <li>✓ Loading according to the vehicle capacity</li> <li>✓ Periodical maintenance of vehicles as per operator manual</li> </ul>
4	Natural calamities	Unexpected happenings	<ul style="list-style-type: none"> <li>✓ Escape Routes will be provided to prevent inundation of storm water</li> <li>✓ Fire Extinguishers &amp; Sand buckets</li> </ul>
5	Failure of Mine Benches and Pit Slope	Slope geometry, Geological structure	<ul style="list-style-type: none"> <li>✓ Ultimate or over all pit slope shall be below 60° and each bench height shall be 5m.</li> </ul>

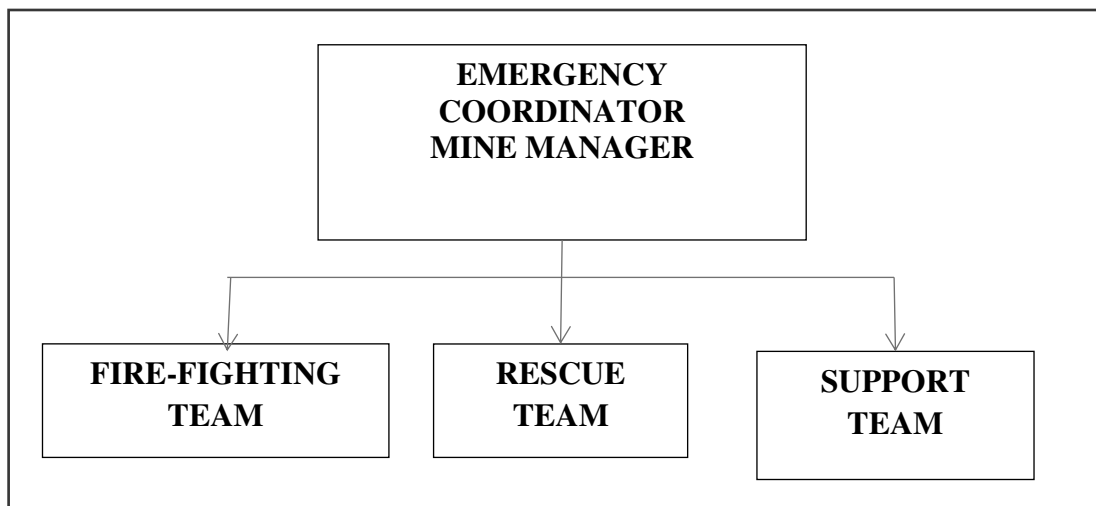
*Source: Analysed and Proposed by FAE & EC*

### 7.3 DISASTER MANAGEMENT PLAN FOR PROPOSED PROJECT

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

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

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



**Figure 7.1 Disaster management team layout for proposed project**

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

**Table 7.2 Proposed Teams for Emergency Situation**

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

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

### **7.3.1 Roles and Responsibilities of Emergency Team**

#### *(a) Emergency coordinator (EC)*

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

#### *(b) Incident controller (IC)*

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

#### *(c) Communication and advisory team*

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

*(d) Roll call coordinator*

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

*(e) Search and rescue team*

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

*(f) Emergency security controller*

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

### **7.3.2 Emergency Control Procedure**

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

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

### 7.3.3 Proposed Fire Extinguishers

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

**Table 7.3 Proposed Fire Extinguishers at Different Locations in P1**

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

### 7.3.4 Alarm System

On receiving the message of disaster from Site Controller, fire-fighting team, the mine control room attendant will sound siren wailing for 5 minutes. Incident controller will arrange to broadcast disaster message through public address system. On receiving the message of "Emergency Over" from Incident Controller the emergency control room attendant will give "All Clear Signal", by sounding alarm straight for 2 minutes.

The features of alarm system will be explained to one and all to avoid panic or misunderstanding during disaster. In order to prevent or take care of hazard / disasters if any the following control measures have been adopted.

- ❖ Fire-fighting and first-aid provisions in the mines office complex and mining area are provided.
- ❖ Provisions of all the safety appliances such as safety boot, helmets, goggles, dust masks, ear plugs and ear muffs etc. are made available to the employees and the use of same is strictly adhered to through regular monitoring.
- ❖ Training and refresher courses for all the employees working in hazardous premises.
- ❖ Working of mine, as per approved plans and regularly updating the mine plans.
- ❖ Cleaning of mine faces is regularly done.
- ❖ Checking and regular maintenance of garland drains and earthen bunds to avoid any inflow of surface water in the mine pit.
- ❖ Provision of high-capacity standby pumps with generator sets with enough quantity of diesel for emergency pumping especially during monsoon.
- ❖ Regular maintenance and testing of all mining equipment were carried out as per manufacturer's guidelines.

## 7.4 CUMULATIVE IMPACT STUDY

The Cumulative Impact is mainly anticipated due to drilling & blasting and excavation and transportation activities in all the quarries within the cluster and major impact anticipated is on Air & Noise Environment and Ground Vibrations due to blasting. For this cumulative study, 2 proposed projects, known as P1, P2 re taken into consideration. The details of P1 have been given in Table 1.2 and the details of P2 is given in Table 7.4.

**Table 7.4 Salient Features of Proposed Project Site “P2”**

Name of the Quarry	<b>M/s. New Star Blue Metals Rough Stone and Gravel Quarry</b>	
Type of Land	Patta land	
Extent	1.62.0	
S.F.No	553/2 (part)	
Toposheet No.	58-E/16	
Highest Elevation	165 AMSL	
Latitude	11°0'41.69"N to 11°0'46.62"N	
Longitude	77°56'36.90"E to 77°56'43.82"E	
Ultimate Depth of Mining	20 m BGL as per ToR	
Geological Resources	Rough stone (m <sup>3</sup> )	Gravel (m <sup>3</sup> )
	694837	32318
Mineable Reserves	234592	25088
Proposed production for 5 years	164992	25088
Method of Mining	Open cast semi mechanized mining method	
Topography	Undulated Terrain	
Machinery proposed	Jack hammer	3
	Excavator	1
	Compressor	1
	Tipper	7
Blasting Method	Controlled blasting method involving shot hole drilling and small dia. of 25 mm slurry explosives is proposed for removal of rough stone.	
Proposed Manpower Deployment	14 persons	
Project Cost	Rs. 69,05,000/-	
CER Cost	Rs. 5,00,000/-	
Proposed Water Requirement	4.0 KLD	

Source: Approved Mining Plan

#### 7.4.1 Air Environment

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

**Table 7.5 Cumulative Production Load of Rough Stone**

Proposed Production Details				
Quarry	5 Years in m <sup>3</sup>	Per Year in m <sup>3</sup>	Per Day in m <sup>3</sup>	Number of Lorry Load Per Day
P1	364115	72823	270	45
P2	164992	32998	122	20
<b>Grand Total</b>	<b>529107</b>	<b>105821</b>	<b>392</b>	<b>67</b>

**Table 7.6 Cumulative Production Load of Gravel**

Quarry	Production for 5 Years (m <sup>3</sup> )	Yearly Production (m <sup>3</sup> )	Daily Production (m <sup>3</sup> )	Number of Lorry Loads Per Day
P1	3428	3428	13	2
P2	25088	8363	31	5
<b>Grand Total</b>	<b>28516</b>	<b>11791</b>	<b>44</b>	<b>7</b>

The cumulative study shows that the overall production of rough stone from the quarry is 392 m<sup>3</sup> per day with a capacity of 67 trips of rough stone per day and that production of gravel from the two proposed quarry is 44 m<sup>3</sup> per day accounting for 7 trips/day.

##### 7.4.1.1 Cumulative Impact of Air Pollutants

The results on the cumulative impact of the 2 proposed projects on air environment of the cluster have been provided in Table 7.7. The cumulative values resulting from the 2 projects for each pollutant do not exceed the permissible limits set by CPCB.

**Table 7.7 Cumulative Impact Results from the 2 proposed projects**

Pollutants	Baseline Data (µg/m <sup>3</sup> )	Incremental Values (µg/m <sup>3</sup> )		Cumulative Value (µg/m <sup>3</sup> )
		P1	P2	
PM <sub>2.5</sub>	20.3	5.37	6.9	32.57
PM <sub>10</sub>	37.6	7.80	11.4	56.8
SO <sub>2</sub>	8.8	3.75	5.5	18.05
NO <sub>2</sub>	16.5	2.75	6.4	25.65

### 7.4.2 Noise Environment

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

**Table.7.8 Cumulative Impact of Noise from 2 Proposed Quarries on Puthurpatti Habitation**

Location ID	Distance (m)	Direction	Background Value (Day) dB(A)	Incremental Value dB(A)	Total Predicted dB(A)	Residential Area Standards dB(A)
Habitation Near P1	1230	SE	32.6	35.36	37.21	55
Habitation Near P2	890	SE	32.6	38.17	39.23	
<b>Cumulative Noise (dB (A))</b>					41.52	

*Source: Lab Monitoring Data*

The cumulative analysis of noise due to 2 proposed projects shows that habitation of Puthurpatti will receive about 41.52 dB (A), respectively. The cumulative results for all the villages in consideration do not exceed the limit set by CPCB for residential areas for day time.

### **Ground Vibrations**

Cumulative results of ground vibrations due to mining activities in the all the 3 mines have been shown in Table 7.9-7.10.

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

Location ID	Maximum Charge in kgs	Nearest Habitation in m	PPV in mm/s
P1	26	1230	0.077
P2	12	890	0.069
E1	22	880	0.119
			<b>0.265</b>

Results from the above tables 7.12 indicate that the cumulative PPV value of each habitation is well below the peak particle velocity of 8 mm/s as per Directorate General of Mines Safety for safe level criteria through Circular No. 7 dated 29/8/1997.



### 7.4.3 Socio Economic Environment

Socio Economic benefits of the proposed project were calculated and the results have been shown in Table 7.10 the project together will contribute Rs. 13559500/- towards CER fund.

**Table 7.10 Socio Economic Benefits from 2 Mines**

Location ID	Project Cost	CER Cost @ 2%
P1	Rs.66,54,500	Rs. 5,00,000
P2	Rs.69,05,000	Rs. 5,00,000
<b>Grand Total</b>	<b>Rs.13559500</b>	<b>Rs. 10,00,000</b>

**Table 7.11 Employment Benefits from 2 Mines**

Location ID	Employment
P1	16
P2	14
<b>Grand Total</b>	<b>30</b>

A total of 30 people will get employment due to 4 proposed mines in cluster

### 7.4.4 Ecological Environment

**Table 7.12 Greenbelt Development Benefits From 2 Mine**

Code	Number of Trees proposed	Area to be covered (m <sup>2</sup> )	No. of Trees expected to be grown @ 80% survival rate	Species recommended
P1	1485	13365	1188	<i>Azadirachta indica, Albizia lebbeck, Delonix regia, Tectona grandis, etc.,</i>
P2	810	7290	648	
<b>Total</b>	<b>2295</b>	<b>20655</b>	<b>1836</b>	

Cumulative studies show that the proposed project will plant about 2295 native tree species like *Azadirachta indica*, *Albizia lebbeck*, *Delonix regia*, *Tectona grandis*, etc inside and outside the lease area. It is expected that 80 % of trees, i.e., 1836 trees will survive in this green belt development program.

## 7.5 PLASTIC WASTE MANAGEMENT PLAN FOR PROPOSED PROJECT

All the Project Proponent shall comply with Tamil Nadu Government Order (Ms) No. 84 Environment and Forest (EC.2) Department Dated: 25.06.2018 regarding ban on one time

use and throw away plastics irrespective of thickness with effect from 01.01.2019 under Environment (Protection) Act, 1986.

### 7.5.1 Objective

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

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

**Table 7.13 Action Plan to Manage Plastic Waste**

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

*Source: Proposed by FAEs and EC*

## **7.6 POST COVID HEALTH MANAGEMENT PLAN FOR PROPOSED PROJECT**

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

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

### **7.6.1 Post-COVID Follow up Protocol**

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

- ❖ Pre-order sufficient supplies and materials, including tissues and hand sanitizer for all employees. Have surgical masks available to offer anyone who develops respiratory symptoms.
- ❖ It is also suggested by the Ministry of AYUSH that the use of Chyawanprash in the morning (1 teaspoonful) with Luke warm water/milk is highly recommended (under the direction of Registered Ayurveda physician) as in the clinical practice Chyawanprash is believed to be effective in post-recovery period.
- ❖ If there is persistent dry cough / sore throat, do saline gargles and take steam inhalation. The addition of herbs/spices for gargling/steam inhalation. Cough medications, should be taken on advice of medical doctor or qualified practitioner of Ayush.
- ❖ Look for early warning signs like high grade fever, breathlessness, Sp O<sub>2</sub> < 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 Vettamangalam West Village aims to produce 364115 m<sup>3</sup> of rough stone and 3428 m<sup>3</sup> of gravel over a period of 5 years. This will enhance the socio-economic activities in the adjoining areas and will result in the following benefits:

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

#### **8.1 EMPLOYMENT POTENTIAL**

It is proposed to provide employment to about 16 persons for carrying out mining operations and give preference to the local people in providing employment in this cluster. In addition, there will be an opportunity for indirect employment to the form of contractual jobs, business opportunities, and service facilities etc. Because of this, the economic status of the local people will improve.

#### **8.2 SOCIO-ECONOMIC WELFARE MEASURES PROPOSED**

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

#### **8.3 IMPROVEMENT IN PHYSICAL INFRASTRUCTURE**

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

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

#### **8.4 IMPROVEMENT IN SOCIAL INFRASTRUCTURE**

Employment is expected during civil construction period, in trade, garbage lifting, sanitation and other ancillary services, Employment in these sectors will be primarily temporary or contractual and involvement of unskilled labour will be more. A major part of the

labour force will be mainly from local villagers who are expected to engage themselves both in agriculture and mining activities. This will enhance their income and lead to overall economic growth of the area.

### **8.5 OTHER TANGIBLE BENEFITS**

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

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

### **8.6 CORPORATE SOCIAL RESPONSIBILITY**

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

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

- ❖ Health Services
- ❖ Social Development
- ❖ Infrastructure Development
- ❖ Education & Sports
- ❖ Self-Employment
- ❖ CSR Cost Estimation
- ❖ CSR activities mainly contributing to education, health, training of women self-help groups and infrastructure etc., will be taken up in the Vettamangalam West 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  $\leq 100$  crores, the proposed project shall contribute 2% of capital investment towards CER as per directions of EAC/SEAC. However, the SEAC has suggested to allocate CER fund on the basis of the extent of the project. Therefore, Rs. 5,00,000 is allocated for CER. The proposed utilization of the budget of CER activities is given in Table 8.1.

**Table 8.1 CER Action Plan**

S. No.	Activity	Budget (Rs.in Lakh)
1	The applicant Indents to involve in corporate environment responsibilities (CER) activities such as renovation of existing toilet, plantation within the school premises, donating environment related books to the nearby school library, etc.	Rs.5,00,000
	<b>Total</b>	<b>Rs.5,00,000</b>

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

## 8.8 SUMMARY OF PROJECT BENEFITS

The project would pay about **Rs. 2,64,15,091** to the state government through various ways, as provided in Table 8.2.

**Table 8.2 Project Benefits to the State Government**

Particulars	Budget for Rough stone (Rs.)	Budget for Gravel (Rs.)
CER	5,00,000	-----
Seigniorage @ Rs.59/m <sup>3</sup> of rough stone Rs.33/m <sup>3</sup> of Gravel	2,14,82,785	1,13,124
District Mineral Foundation Tax @ 10% of Seigniorage	2,14,82,79	1,13,12
Green Tax @ 10% of Seigniorage	2,14,82,79	1,13,12
<b>Total</b>	<b>2,62,79,343</b>	<b>1,35,748</b>

**CHAPTER IX**  
**ENVIRONMENTAL COST BENEFIT ANALYSIS**

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



## **CHAPTER X**

### **ENVIRONMENTAL MANAGEMENT PLAN**

#### **10.0 GENERAL**

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

#### **10.1 ENVIRONMENTAL POLICY**

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

The Proponent M/s.Thirumalai Blue Metals will:

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

##### **10.1.1 Description of the Administration and Technical Setup**

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

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

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

## 10.2 LAND ENVIRONMENT MANAGEMENT

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

**Table 10.1 Proposed Controls for Land Environment**

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

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

*Source: Proposed by FAEs & EIA Coordinator*

### **10.3 SOIL MANAGEMENT**

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

### **10.4 WATER MANAGEMENT**

In the proposed quarrying project, no process is involved for the effluent generation, only oil & grease from the machinery wash and domestic sewage from mines office is anticipated. The quarrying operation is proposed up to a depth of 45 m. The water table in the area is at 65 m below ground level. Hence, the proposed project will not intersect the ground water table during entire quarry period. A detailed water environment management plan has been provided in Table 10.2.

**Table 10.2 Proposed Controls for Water Environment**

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

*Source: Proposed by FAEs & EIA Coordinator*

## 10.5 AIR QUALITY MANAGEMENT

The proposed quarrying activity would result in the increase of particulate matter concentrations in the ambient air. Daily water sprinkling on the haul roads, approach roads in the vicinity will be undertaken and will be continued as there is possibility for dust generation due to truck mobility. It will be ensured that vehicles are properly maintained to comply with exhaust emission requirements. A detailed ambient air environment management plan is provided in Table 10.3.

**Table 10.3 Proposed Controls for Air Environment**

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

*Source: Proposed by FAEs & EIA Coordinator*

## 10.6 NOISE POLLUTION CONTROL

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

**Table 10.4 Proposed Controls for Noise Environment**

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

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

*Source: Proposed by FAEs & EIA Coordinator*

## 10.7 GROUND VIBRATION AND FLY ROCK CONTROL

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

**Table 10.5 Proposed Controls for Ground Vibrations & Fly Rock**

Control	Responsibility
Controlled blasting using delay detonators will be carried out to maintain the PPV value (below 8Hz) well within the prescribed standards of DGMS	Mines Manager
Drilling and blasting will be carried under the supervision of qualified persons	Mines Manager

Proper stemming of holes should be carried out with statutory competent qualified blaster under the supervision of statutory mines manager to avoid any anomalies during blasting	Mines Manager
Suitable spacing and burden will be maintained to avoid misfire / fly rocks	Manager Mines
Number of blast holes will be restricted to control ground vibrations	Manager Mines
Blasting will be carried out only during noon time	Mining Mate
Undertake noise or vibration monitoring	Mines Manager
ensure blast holes are adequately stemmed for the depth of the hole and stemmed with suitable angular material	Mines Foreman

*Source: Proposed by FAEs & EIA Coordinator*

## **10.8 BIOLOGICAL ENVIRONMENT MANAGEMENT**

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

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

### **10.8.1 Green Belt Development Plan**

The main objectives of the greenbelt development plan are to:

- ❖ Combat the dispersal of dust in the adjoining areas.

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

**Table 10.6 Proposed Greenbelt Development Plan**

	<b>No. of trees proposed for plantation</b>	<b>No. of trees expected to survive @ 80%</b>	<b>Area to be covered(m<sup>2</sup>)</b>
Plantation in the construction phase (3 months)	Number of plants inside the mine lease area		
	594	475	5346
	Number of plants outside the mine lease area		
	891	713	8019
<b>Total</b>	<b>1485</b>	<b>1188</b>	<b>13365</b>

*Source: Proposed by FAEs & EIA Coordinator*

About 1485 saplings will be planted in and around the lease area with the survival rate of 80%. A well-planned green belt of trees with long canopy leaves shall be developed with dense plantations around the boundary and along the haul roads to prevent air, dust noise propagation to undesired places and efforts will be taken for the enhancement of survival rate.

## **10.9 OCCUPATIONAL SAFETY & HEALTH MANAGEMENT**

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

### **10.9.1 Medical Surveillance and Examinations**

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

The health status of workers in the mine shall be regularly monitored under an occupational surveillance program. Under this program, all the employees are subjected to a detail medical

examination at the time of employment. The medical examination covers the following tests under mines act 1952.

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

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

**Table 10.7 Medical Examination Schedule**

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

### 10.9.2 Proposed Occupational Health and Safety Measures

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



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



**Figure 10.1 Personal Protective Equipment to the Mine Workers**

### 10.9.3 Health and Safety Training Program

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

**Table 10.8 List of Periodical Trainings Proposed for Employees**

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

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

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

#### **10.9.4 Budgetary Provision for Environmental Management**

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

**Table 10.9 EMP Budget for Proposed Project**

Attribute	Mitigation measures	Provision for Implementation	Capital Cost	Recurring Cost/annum
			(Rs.)	(Rs.)
<b>Air Environment</b>	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	29700	29700
	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	75000	7500

	No overloading of trucks/tippers/tractors	Manual Monitoring through Security guard	0	5000
	Stone carrying trucks will be covered by tarpaulin to avoid escape of fines to the atmosphere	Monitoring if trucks will be covered by tarpaulin	0	10000
	Enforcing speed limits of 20 km/hr within ML area	Installation of Speed Governors @ Rs. 5000/- per tipper/dumper deployed	35000	0
	Regular monitoring of exhaust fumes as per RTO norms	Monitoring of Exhaust Fumes	0	8750
	Regular sweeping and maintenance of roads for at least about 200 m from quarry entrance	Provision for 2 labours @ Rs.10,000/labour (Contractual) / hectare	0	59400
	Installing wheel wash system near exit gate of quarry	Installation + Maintenance + Supervision	50000	20000
<b>Noise Environment</b>	Source of noise will be transportation vehicles, and HEMM. For this, proper maintenance will be done at regular intervals.	Provision made in Operating Cost	0	0

	Oiling & greasing of Transport vehicles and HEMM at regular interval will be done.	Provision made in Operating Cost	0	0
	Adequate silencers will be provided in all the diesel engines of vehicles.	Provision made in Operating Cost	0	0
	It will be ensured that all transportation vehicles carry a fitness certificate.	Provision made in Operating Cost	0	0
	Safety tools and implementations that are required will be kept adequately near blasting site at the time of charging.	Provision made in OHS part	0	0
	Line Drilling all along the boundary to reduce the PPV from blasting activity and implementing controlled blasting.	Provision made in Operating Cost	0	0
	Proper warning system before blasting will be adopted and clearance of the area before blasting will be ensured.	Blowing Whistle by Mining Mate / Blaster / Competent Person	0	0
	Provision for Portable blaster shed	Installation of portable blasting shelter	50000	2000
	NONEL Blasting will be practiced to control Ground vibration and fly rocks	Rs. 30/- per 6 tons of blasted material	0	1019522

<b>Water Environment</b>	Water Management	Provision for garland drain @ Rs. 10,000/- per hectare with maintenance of Rs. 5,000/- per annum	29700	14850
<b>Waste Management</b>	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
<b>Implementation of EC, Mining Plan &amp; DGMS Condition</b>	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
<b>Occupational Health and Safety</b>	Workers will be provided with Personal Protective Equipment	Provision of PPE @ Rs. 4000/- per employee with recurring based on wear and tear (say, @ Rs. 1000/- per employee)	64000	16000
	Health checkup for workers will be provisioned	IME & PME Health checkup @ Rs. 1000/- per employee	0	16000

	First aid facility will be provided	Provision of 2 Kits per Hectare @ Rs. 2000/-	0	11880
	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	594000	29700
	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	148500	29700
	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 <sup>st</sup> Class / 2 <sup>nd</sup> 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



<b>Development of Green Belt</b>	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))"	118800	17820
		Avenue Plantation @ 300 per plant (capital) for plantation outside the lease area and @ 30 per plant maintenance (recurring)	267300	26730
<b>Mine Closure</b>	Closure includes 10% of the ammount 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	100980
	G.O.(Ms). No.23, Dated: 28.09.2021	Section IVA of TNMMCR 1959 (@10% of Seigniorage Fee) (Seigniorage Fee for Roughstone = Rs.59 and for Gravel= Rs.33)	2159591	0
<b>TOTAL</b>			<b>4501591</b>	<b>2239552</b> <b>(Excel. Mine Closure)</b>

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

<b>I<sup>st</sup> Year</b>	<b>II<sup>nd</sup> Year</b>	<b>III<sup>rd</sup> Year</b>	<b>IV<sup>th</sup> Year</b>	<b>V<sup>th</sup> Year (including Mine Closure Cost)</b>	<b>Total Recurring Cost</b>	<b>Total EMP Cost</b>
2239552	2351530	2469106	2592561	2823169	12475919	16977509

In order to implement the environmental protection measures, an amount of **Rs.4501591** as capital cost and recurring cost as **Rs.2239552** as recurring cost/annum is proposed considering present market price considering present market scenario for the proposed project. After the adjustment of 5% inflation per year, the overall EMP cost for 5 years will be **Rs. 16977509** as shown in Table 10.10.

#### **10.10 CONCLUSION**

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

## **CHAPTER XI**

### **SUMMARY AND CONCLUSION**

#### **11.0 INTRODUCTION**

This EIA report was prepared in compliance with ToR obtained vide Lr.No:SEIAA-TN/F.No.9797/SEAC/ToR-1469/2023 Dated:31.05.2023 by considering 2 proposed quarries, one existing quarry E1 and one expired project EX1 in a cluster with the total extent of 11.20.0 hectares in Vettamangalam West Village, Pugalur Taluk, Karur District and Tamil Nadu State. Cluster area was calculated as per MoEF & CC Notification S.O. 2269(E) Dated 1<sup>st</sup> July 2016. Baseline Monitoring studies were carried out during the period of October– December 2022.

#### **11.1 PROJECT DESCRIPTION**

The proposed project deals with excavation of rough stone and gravel which is primarily used in construction projects. The method adopted for rough stone and gravel excavation is an open cast semi-mechanized mining method involving drilling, blasting and formation of benches with 5 m height and 5 m width and secondary blasting. The proposed project area is located between latitudes from 11°00'58.68"N to 11°01'06.25"N and from longitudes from 77°56'41.88"E to 77°56'47.75"E in Vettamangalam West Village, Pugalur Taluk, and Karur District. The project site is a Patta land with the extent of 11.20.0 ha owned by the project proponent. The proponent had applied for quarry lease on 28.09.2021 to extract rough stone and gravel and obtained the precise area communication letter issued by Department of Geology and Mining, Karur vide Rc.No.424/Mines/2021, dated:12.01.2023. Based on the precise area communication letter, mining plan was prepared. The mining plan thus prepared was approved by Deputy Director of Geology and Mining, Karur Rc.No.424/Mines/2021, dated: 31.01.2023.

According to the approved mining plan, about 400555 m<sup>3</sup> of rough stone and about 3428 m<sup>3</sup> of gravel will be mined up to the depth of 55 m BGL in the first five years. However, the SEAC advised to restrict the ultimate depth to 45 m BGL considering safety point of view. Accordingly, the rough stone reserves have been adjusted to be 364115 m<sup>3</sup>. It is the quantity that has been mentioned in this EIA report.

To achieve the estimated production, 3 jack hammers, 1 compressor, 1 excavator with bucket/rock breaker, and 7 tippers will be deployed. To operate the machineries and to break the rough stone to preferred dimension, about 16 persons will be employed. At the end of the quarry life, the dimension of the ultimate pit will be 112 m\*127 m\*45 m and about 1.85.5 ha of land will have been quarried; about 0.62.5 ha of land will be used for green belt development; about 0.37.0 ha of land will be left unutilized; and 0.05.0 ha will be used for roads and 0.02.0

will be used for infrastructures. The final mine closure plan shows that about Rs. **1009800** with the annual recurring cost of **Rs. 89100** will be spent towards mine closure.

## **11.2 DESCRIPTION OF THE ENVIRONMENT**

The baseline monitoring studies were carried out during October through December, 2022 to assess the existing environmental conditions in the study area. For the purpose of the EIA studies, project area was considered as the core zone and area outside the project area up to 5 km radius from the periphery of the project site was considered as buffer zone. Baseline Environmental data has been collected for land, water, air, noise, ecology, socio-economy, and traffic.

### **11.2.1 Land Environment**

Land Use and Land Cover (LULC) map, as shown in Figure 3.3 was prepared using Sentinel II image for the study area of 5 km radius to provide a baseline status of the study area covering 5 km radius around the proposed mine site. Totally, 8 LULCs were mapped. The areal extent of each LULC is provided in Table 3.2. Of the total area, mining area covers only 152.46 ha accounting for 1.98 %, of which lease area of 2.97 ha contributes only about 0.03%. This small percentage of mining activities shall not have any significant impact on the land environment.

### **11.2.2 Soil Characteristics**

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

#### ***Physical Characteristics***

The soil samples in the study area show loamy textures varying between silty clay loam, silty loam and sandy loam. pH of the soil varies from 6.5 to 7.6 indicating slightly acidic to slightly alkaline nature. Electrical conductivity of the soil varies from 143 to 247  $\mu\text{S}/\text{cm}$ . Bulk density ranges between 1.2 and 3.8  $\text{g}/\text{cm}^3$

#### ***Chemical Characteristics***

Nitrogen ranges between 0.04 and 1.1 %. Phosphate ranges between 0.14 and 3.8 %. Potassium ranges between 0.12 and 0.26 %. Chlorides ranges between 115 and 390  $\text{mg}/\text{kg}$ . Organic matter content ranges between 0.35 and 2.0 %.

### **11.2.3 Water Environment**

#### ***Surface Water Resources***

Noyyal River is the prominent surface water resources present in the study area. This River was ephemeral in nature, which convey water only after rainfall events. The proposed

project area is located 4.16 km NW of Noyyal River (Velaiyampalaiyam), as shown in Table 3.5 and Figure 3.4. One surface water sample, known as SW1 were collected from the Noyyal River to assess the baseline water quality. Table 3.6 summarizes surface water quality data of the collected sample.

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

### ***Ground Water Resources***

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

Nine groundwater samples, known as BW01, BW02, BW03, BW04, BW05, BW06, BW07, OW01 and OW02 collected from bore wells and open wells were 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 3.4. Table 3.6 summarizes ground water quality data of the nine samples.

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

## **11.3 AIR ENVIRONMENT**

### ***Site Specific Meteorology***

Site specific meteorology during the study period was recorded by an automated weather station. According to the onsite data, the temperature in October, 2022 varied from 15.90 to 31.320 C with the average of 24.740 C; in November, 2022 from 14.61 to 31.160 C with the average of 24.400 C; and in December, 2022 from 14.0 to 30.820 C with the average of 23.740C. In October, 2022, relative humidity ranged from 51.35 to 100 % with the average of 85.10%; in November, 2022, from 51.35 to 100 % with the average of 85.10 %; and in December, 2022, from 51.42 to 100 % with the average of 85.65 %. The wind speed in October, 2022 varied from 0.06 to 6.48 m/s with the average of 2.53 m/s; in November, 2022 from 0.02 to 6.55 m/s with the average of 2.69 m/s; and in December, 2022 from 0.04 to 6.65 m/s with

the average of 2.55 m/s. In October, 2022, wind direction varied from 0.07 to 359.700 with the average of 161.470; in November, 2022, from 0.00 to 359.630 with the average of 145.590; and in December, 2022, from 1.50 to 359.620 with the average of 110.360. In October, 2022, surface pressure varied from 96.94 to 99.60 kPa with the average of 98.58 kPa; in November, 2022, from 95.68 to 99.86 kPa with the average of 98.64 kPa; and in December, 2022, from 98.02 to 99.56 kPa with the average of 98.84 kPa.

### ***Ambient Air Quality Results***

As per the monitoring data, PM<sub>2.5</sub> ranges from 22.7 µg/m<sup>3</sup> to 17.4 µg/m<sup>3</sup>; PM<sub>10</sub> from 42.1 µg/m<sup>3</sup> to 36.6 µg/m<sup>3</sup>; SO<sub>2</sub> from 10.5 µg/m<sup>3</sup> to 7.1 µg/m<sup>3</sup>; NO<sub>2</sub> from 20.3 µg/m<sup>3</sup> to 14.4 g/m<sup>3</sup>. The concentration levels of the pollutants fall within the acceptable limits of NAAQS prescribed by CPCB.

### **11.4 NOISE ENVIRONMENT**

Noise level in core zone was 40.8 dB (A) Leq during day time and 34.8 dB(A) Leq during night time. Noise levels recorded in buffer zone during day time varied from 32.6 to 42.2dB (A) Leq and during night time from 29.8 to 37.4dB (A) Leq. Thus, the noise level for industrial and residential area meets the requirements of CPCB.

### **11.5 BIOLOGICAL ENVIRONMENT**

There is no schedule I species of animals observed within study area as per Wildlife Protection Act 1972 as well as no species is in vulnerable, endangered or threatened category as per IUCN. There is no endangered red list species found in the study area. Hence this small mining operation over short period of time will not have any significant impact on the surrounding flora and fauna.

### **11.6 SOCIO-ECONOMIC ENVIRONMENT**

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

## 11.7 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES FOR PROPOSED PROJECT

The summary of anticipated adverse environmental impacts due to the proposed project and mitigation measures are given below:

**Table 11.1 Anticipated Impacts & Mitigation Measures**

Impact	Mitigation Measure
<b>Land Environment</b>	
<ul style="list-style-type: none"> <li>❖ Destruction of natural landscapes</li> <li>❖ Changes in soil characteristics</li> <li>❖ Soil erosion and slope instability</li> </ul>	<ul style="list-style-type: none"> <li>❖ Mining will be carried out as per approved mine plan in scientific and systematic way</li> <li>❖ Safety Zone or Buffer area will be maintained and will not be mined and instead plantation will be carried out in the safety zone</li> <li>❖ Barbed wire fencing will be provided all along the proposed mine boundary</li> <li>❖ At conceptual stage, the land use pattern of the quarry will be changed into Greenbelt area and temporary reservoir</li> <li>❖ Construction of garland</li> <li>❖ 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</li> </ul>
<b>Water Environment</b>	
<ul style="list-style-type: none"> <li>❖ Decrease in aquifer recharge and increase in surface runoff;</li> <li>❖ Disturbance to land drainage, overload and erosion of watercourses;</li> <li>❖ Changes to the surface over which water flows;</li> </ul>	<ul style="list-style-type: none"> <li>❖ 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</li> <li>❖ 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</li> </ul>

<ul style="list-style-type: none"> <li>❖ Changes to surface and groundwater resources quantity and quality due to stream blockage and contamination by particulate matter or waste;</li> <li>❖ Contamination of aquifers due to removal of the natural filter medium.</li> </ul>	<ul style="list-style-type: none"> <li>❖ Domestic sewage from site office &amp; urinals/latrines provided in project area will be discharged through septic tank followed by soak pit system.</li> <li>❖ Tippers &amp; 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 &amp; grease trap, only clear water will be reused for greenbelt development.</li> </ul>
<b>Air Environment</b>	
<ul style="list-style-type: none"> <li>❖ Generation of Fugitive Dust</li> <li>❖ Dust will be generated mainly during excavation, loading &amp; unloading activities.</li> <li>❖ Gaseous pollutants will be generated mostly by the traffic.</li> <li>❖ Reduction in visibility due to dust plumes.</li> <li>❖ Coating of surfaces leading to annoyance and loss of amenity.</li> <li>❖ Physical and/or chemical contamination and corrosion.</li> <li>❖ Increase in the concentration of suspended particles in runoff water.</li> <li>❖ Coating of vegetation leading to reduced photosynthesis,</li> </ul>	<ul style="list-style-type: none"> <li>❖ Haul roads will be well maintained by sprinkling water twice a day</li> <li>❖ The access road will be cleaned and brushed to ensure that mud and dust deposits do not accumulate.</li> <li>❖ 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</li> <li>❖ Speed restrictions will be imposed to avoid spillage of loaded materials upon the road and to reduce wear and tear of the road.</li> <li>❖ 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.</li> <li>❖ 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.</li> <li>❖ Personal Protective Equipment's will be provided to all workers</li> </ul>



<ul style="list-style-type: none"> <li>❖ Inhibited growth, destroying of foliage, degradation of crops;</li> <li>❖ Increase in health hazards due to inhalation of dust.</li> </ul>	<ul style="list-style-type: none"> <li>❖ All drilling rods used will have dust suppression systems fitted which injects water into the hole.</li> <li>❖ Wet gunny bags will be used as a cover while drilling.</li> <li>❖ 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.</li> <li>❖ 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.</li> <li>❖ A site speed limit of 20 km/h will be set to minimise the potential for dust generation</li> <li>❖ Weekly maintenance programme to identify machinery due for maintenance, based on the number of hours it has been in operation.</li> <li>❖ Air filters are renewed after every 10<sup>0</sup> hours of use, unless otherwise indicated by an on-board computer system.</li> <li>❖ All site machineries &amp; 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.</li> </ul>
<b>Noise &amp; Vibration</b>	
<ul style="list-style-type: none"> <li>❖ Annoyance and deterioration of the quality of life;</li> <li>❖ Propelling of rocks fragments by blasting.</li> </ul>	<ul style="list-style-type: none"> <li>❖ Usage of sharp drill bits while drilling which will help in reducing noise;</li> <li>❖ Secondary blasting will be totally avoided and hydraulic rock breaker will be used for breaking boulders;</li> </ul>

<ul style="list-style-type: none"> <li>❖ Shaking of buildings and people due to blasting;</li> </ul>	<ul style="list-style-type: none"> <li>❖ Controlled blasting with proper spacing, burden, stemming and optimum charge/delay will be maintained;</li> <li>❖ The blasting will be carried out during favourable atmospheric condition and less human activity timings by using nonelectrical initiation system;</li> <li>❖ Proper maintenance, oiling and greasing of machines will be done every week to reduce generation of noise;</li> <li>❖ Provision of sound insulated chambers for the workers working on machines (HEMM) producing higher levels of noise;</li> <li>❖ Silencers / mufflers will be installed in all machineries;</li> <li>❖ Green Belt/Plantation will be developed around the project area and along the haul roads. The plantation minimizes propagation of noise;</li> <li>❖ 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.</li> </ul>
<b>Biological Environment</b>	
<ul style="list-style-type: none"> <li>❖ Direct impacts include land clearance and excavation causing destruction of flora and fauna and loss of habitats;</li> <li>❖ Indirect impacts include habitat degradation due to noise, dust, and human activity.</li> </ul>	<ul style="list-style-type: none"> <li>❖ Only some common herbs, shrubs and grass will be cleared. So, there will be no impact on the biodiversity.</li> <li>❖ Green belt development with suitable species will enhance the biodiversity of the project area.</li> <li>❖ The core zone or buffer zone does not encompass any threatened flora or fauna species.</li> </ul>
<b>Socio-Economic Environment</b>	

<ul style="list-style-type: none"> <li>❖ Health and safety of workers and the general public;</li> <li>❖ Increase in traffic volumes and sizes of road vehicles;</li> <li>❖ Economic issues, including the increase in employment opportunities;</li> </ul>	<ul style="list-style-type: none"> <li>❖ The mining activity puts negligible change in the socio-economic profile.</li> <li>❖ Around 88 local workers will get employment opportunities along with periodical training to generate local skills.</li> <li>❖ New patterns of indirect employment/ income will generate.</li> <li>❖ Regular health check-up camp.</li> <li>❖ Assistance to schools and scholarship to children will be provided.</li> </ul>
<b>Occupational Health &amp; Safety</b>	
<ul style="list-style-type: none"> <li>❖ Exposure to Dust</li> <li>❖ Noise and Vibration Exposure</li> <li>❖ Physical Hazards</li> <li>❖ Respiratory hazards due to Dust exposure</li> </ul>	<ul style="list-style-type: none"> <li>❖ Provision of rest shelters for mine workers with amenities like drinking water etc.</li> <li>❖ All safety measures like use of safety appliances, such as dust masks, helmets, shoes, safety awareness programs, awards, posters, slogans related to safety etc.</li> <li>❖ Training of employees for use of safety appliances and first aid in vocational training centre.</li> <li>❖ Weekly maintenance and testing of all equipment as per manufacturers' guidelines.</li> <li>❖ Pre placement and Yearly Medical Examination of all workers by a medical Officer</li> <li>❖ First Aid facility will be provided at the mine site.</li> <li>❖ 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.</li> <li>❖ Working of mine as per approved mining plan and environmental plans</li> </ul>

## 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

### ***Public Consultation***

Application to the Member Secretary of the Tamil Nadu Pollution Control Board (TNPCB) to conduct Public Hearing in a systematic, time bound and transparent manner ensuring widest possible public participation at the project site or in its close proximity in the district is submitted along with this Draft EIA / EMP Report and the outcome of public hearing proceedings will be detailed in the Final EIA/EMP Report.

### ***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 31<sup>st</sup> December, and 2002. The DGMS risk assessment process is intended to identify existing and probable hazards in the work environment and all operations and assess the risk levels of those hazards in order to prioritize those that need immediate attention. Further, mechanisms responsible for these hazards are identified and their control measures set to time table are recorded along with pinpointed responsibilities.

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

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

### ***Cumulative Impact Studies***

- The results on the cumulative impact of the two proposed projects on air environment of the cluster do not exceed the permissible limits set by CPCB for air pollutants.
- The cumulative results of noise for the habitation in consideration do not exceed the limit set by CPCB for residential areas for day time.
- PPV resulting from two proposed and one existing project is well below the permissible limit of Peak Particle Velocity of 8 mm/s.
- The two proposed projects will allocate Rs.10,00,000/- towards CER as recommended by SEAC.
- The two proposed projects will directly provide jobs to about 30 local people.
- The two proposed projects will plant about 2295 saplings in and around the lease area.
- The four proposed projects will add 222 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 16 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 Vettamangalam West Village. CSR budget.
- ❖ Rs. 5,00,000 will be allocated for CER.

#### **11.12 ENVIRONMENT MANAGEMENT PLAN**

In order to implement the environmental protection measures, an amount of **Rs.4501591** as capital cost and recurring cost as **Rs.2239552** as recurring cost/annum is proposed considering present market price considering present market scenario for the proposed project. After the adjustment of 5% inflation per year, the overall EMP cost for 5 years will be **Rs.16977509**

#### **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, **M/s. Thirumalai Blue Metals** 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](mailto:info.gtmsdpi@gmail.com)  
Web: [www.gtmsind.com](http://www.gtmsind.com)  
Phone: 04342 232777.

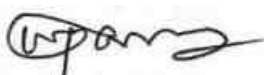
The accredited experts and associated members who were engaged in this EIA study are given below:

S.No	Name of the expert	In house/ Empanelled	Sector	Functional Area	Category
<b>Approved Functional Area Experts &amp; EC</b>					
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
<b>Approved Functional Area Associates</b>					
12.	G. Prithiviraj	FAA	1(a)(i)	LU, HG	B
13.	C. Kumaresan	FAA	1(a)(i)	NV	B

14.	P. Vellaiyan	FAA	1(a)(i)	HG, GEO	B
15.	S. Vasugi	FAA	1(a)(i)	AQ	B
16.	P. Dhatchayini	FAA	1(a)(i)	AQ	B
17.	V. Malavika	FAA	1(a)(i)	NV, SHW	B
<b>Abbreviations</b>					
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



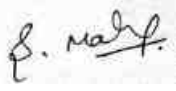


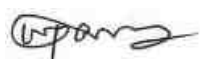



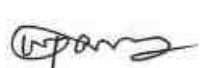

Name of the EIA Consultant Organization : Geo Technical Mining Solutions



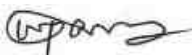





Period of Involvement : Till date



We, the FAEs and FAAs hereby declare that information furnished in this EIA/EMP report for **M/s. Thirumalai Blue Metals** rough stone and gravel quarry project with the extent of 2.97.0 ha situated in the cluster with the extent of **11.20.0** ha in Vettamangalam West Village of Pugalur Taluk, Karur District of Tamil Nadu is true and correct to the best of our knowledge.









**List of Functional Area Experts Engaged in this Project**

S. No.	Functional Area	Involvement	Name of the Experts	Signature
1	AP	○ Identification of different sources of air pollution due to the proposed mine activity	J.N. Manikandan	
		○ Prediction of air pollution and propose mitigation measures / control measures	P.Venkatesh	
2	WP	○ 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	○ Interpretation of ground water table and predict impact and propose mitigation measures. ○ Analysis and description of aquifer Characteristics	Dr.M. Vijay Prabhu	
			G. Uma Maheswaran	
			Dr.S. Karuppannan	
4	GEO	○ Field Survey for assessing the regional and local geology of the area. ○ Preparation of mineral and geological maps. ○ Geology and Geo morphological analysis/description and Stratigraphy/Lithology.	G.Gopala Krishnan	
			G.Uma Maheswaran	
			Dr.M. Vijay Prabhu	
			Dr.S. Karuppannan	
5	SE	○ 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"> <li>○ Collection of Baseline data of Flora and Fauna.</li> <li>○ Identification of species labelled as Rare, Endangered and threatened as per IUCN list.</li> <li>○ Impact of the project on flora and fauna.</li> <li>○ Suggesting species for greenbelt development.</li> </ul>	Dr.J. Rajarajeshwari	
7	RH	<ul style="list-style-type: none"> <li>○ Identification of hazards and hazardous substances</li> <li>○ Risks and consequences analysis</li> <li>○ Vulnerability assessment</li> <li>○ Preparation of Emergency Preparedness Plan</li> <li>○ Management plan for safety.</li> </ul>	J.N. Manikandan	
8	LU	<ul style="list-style-type: none"> <li>○ Construction of Land use Map</li> <li>○ Impact of project on surrounding land use</li> <li>○ Suggesting post closure sustainable land use and mitigative measures.</li> </ul>	Dr.S. Karuppannan	
			G.Uma Maheswaran	
			Dr.M. Vijay Prabhu	
9	NV	<ul style="list-style-type: none"> <li>○ Identify impacts due to noise and vibrations</li> <li>○ Suggesting appropriate mitigation measures for EMP.</li> </ul>	Dr.R. Arun Balaji	
10	AQ	<ul style="list-style-type: none"> <li>○ Identifying different source of emissions and propose predictions of incremental GLC using AERMOD.</li> <li>○ Recommending mitigations measures for EMP</li> </ul>	Dr.R. Arun Balaji	
11	SC	<ul style="list-style-type: none"> <li>○ Assessing the impact on soil environment and proposed mitigation</li> </ul>	Dr.J. Rajarajeshwari	

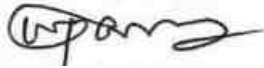
		measures for soil conservation	Dr. D.Kalaimurugan	
12	SHW	<ul style="list-style-type: none"> <li>○ Identify source of generation of non-hazardous solid waste and hazardous waste.</li> <li>○ Suggesting measures for minimization of generation of waste and how it can be reused or recycled.</li> </ul>	J.N. Manikanda	

**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"> <li>○ Site visit with FAE</li> <li>○ Provide inputs &amp; Assisting FAE for LU and HG</li> </ul>	
2	C. Kumaresan	NV	<ul style="list-style-type: none"> <li>○ Assistance to FAE in both primary and secondary data collection</li> <li>○ Assistance in noise prediction modelling</li> </ul>	
3	P. Vellaiyan	HG & GEO	<ul style="list-style-type: none"> <li>○ Field visits along with FAE</li> <li>○ Assistance to FAE in both primary and secondary data collection</li> </ul>	
4	S.Vasugi	AQ	<ul style="list-style-type: none"> <li>○ Field visits along with FAE</li> <li>○ Assistance to FAE in both primary and secondary data collection</li> </ul>	
5	P. Dhatchayini	AQ	<ul style="list-style-type: none"> <li>○ Site visit with FAE</li> <li>○ Assistance to FAE in collection of both primary and secondary data</li> </ul>	
6	V. Malavika	NV, SHW	<ul style="list-style-type: none"> <li>○ Site visit along with FAE</li> <li>○ Assistance in report preparation</li> </ul>	

**DECLARATION BY THE HEAD OF THE ACCREDITED CONSULTANT**  
**ORGANIZATION**

I, **Dr. S. KARUPPANNAN**, Managing Partner, **Geo Technical Mining Solutions**, hereby, confirm that the above-mentioned functional area experts and team members prepared the EIA/EMP report for **M/s. Thitumalai Blue Metals** rough stone and gravel quarry project with the extent of 2.97.0 ha located within the cluster of **11.20.0** ha in Vettamangalam West Village of Pugalur Taluk, Karur District of Tamil Nadu is true and correct to the best of my knowledge.

Signature	:	
Date	:	
Name	:	<b>Dr. S. Karuppannan</b>
Designation	:	Managing Partner
Name of the EIA Consultant Organization	:	Geo Technical Mining Solutions
NABET Certificate No & Issue Date	:	NABET/EIA/2124/SA 0184
Validity	:	Till 31.12.2023



GREEN BELT & FENCING PHOTOS



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

STATE LEVEL ENVIRONMENT IMPACT  
ASSESSMENT AUTHORITY-TAMILNADU  
3<sup>rd</sup> Floor, PanagalMaaligai,  
No.1, Jeenis Road, Saidapet,  
Chennai - 600 015.  
Phone No. 044-24359973  
Fax No. 044-24359975

**TERMS OF REFERENCE (ToR)**

**Lr No.SEIAA-TN/F.No.9797/SEAC/ToR-1469/2023 Dated:31.05.2023**

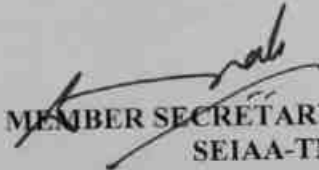

To

M/s, Thirumalai Blue Metals,  
No.538/4, Pulankad,  
Kuppam- Post,  
Pugalur Taluk,  
Karur District-639111.

Sir / Madam,

**Sub:** SEIAA, Tamil Nadu – Terms of Reference with Public Hearing (ToR) for the Proposed Rough Stone & Gravel Quarry lease over an extent of 2.97.0Ha at S.F. Nos: 1238/2(Part) of Vettamangalam West Village, Pugalur Taluk, Karur District, Tamil Nadu by M/s. Thirumalai Blue Metals -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/417026/2023 dt 04.02.2023.
  2. Your application submitted for Terms of Reference dated: 06.02.2023
  3. Minutes of the 366<sup>th</sup> Meeting of SEAC held on 30.03.2023
  4. Minutes of the 613<sup>rd</sup> meeting of Authority held on 21.04.2023.
  5. Minutes of the 377<sup>th</sup> Meeting of SEAC held on 10.05.2023
  6. Minutes of the 624<sup>th</sup> meeting of Authority held on 31.05.2023..

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

The proponent, M/s. Thirumalai Blue Metals has submitted application for ToR, in Form-I, Pre- Feasibility report for the Proposed Rough Stone & Gravel Quarry lease over an extent of 2.97.0Ha at S.F. Nos: 1238/2(Part) of Vettamangalam West Village, Pugalur Taluk, Karur District, Tamil Nadu.

**Discussion by SEAC and the Remarks:-**

Proposed Rough Stone & Gravel Quarry lease over an extent of 2.97.0Ha at S.F. Nos: 1238/2(Part) of Vettamangalam West Village, Pugalur Taluk, Karur District, Tamil Nadu by M/s. Thirumalai Blue Metals-For Terms of Reference (SIA/TN/MIN/417026/2023 dt 04.02.2023).

The proposal was placed in this 377<sup>th</sup> Meeting of SEAC held on 10.05.2023. The details of the project furnished by the proponent are available in the website (parivesh.nic.in).

**The SEAC noted the following:**

1. The Project Proponent, M/s. Thirumalai Blue Metals has applied for Terms of Reference for the Proposed Rough Stone & Gravel Quarry lease over an extent of 2.97.0Ha at S.F. Nos: 1238/2(Part) of Vettamangalam West Village, Pugalur Taluk, Karur District, Tamil Nadu.
2. The proposed quarry/activity is covered under Category "B1" of Item 1(a) "Mining Projects" of the Schedule to the EIA Notification, 2006.
3. As per the mining plan the lease period is 5 years. The mining plan is for the period of five years & production should not exceed 4,00,555 m<sup>3</sup> of Rough Stone & 3,428 m<sup>3</sup> of Gravel. The annual peak production is 1,01,467 m<sup>3</sup> of Rough Stone & 3,428 m<sup>3</sup> of Gravel. The ultimate depth is 55m BGL.
4. Earlier, EC was accorded to the proponent vide Lr.no.SEIAA-TN/F.No.4628/EC/1(a)/3767/2016 dated.26.09.2016 for the quantity of 63494 cu.m of rough stone and 8832 cu.m of Topsoil upto a depth of 17m.
5. CCR From MoEF&CC, IRO (SZ) vide E.P/12.1/2022-23/SEIAA/268/TN/271 Dt:02.03.2023.

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:

  
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1. The PP shall prepare and to submit the Modified Mining Plan with the revised production & development approved by the concerned AD(Mines) which is oriented to accommodate the restriction of the ultimate depth of mining from 55m to 50m considering the safety and environmental issues, at the time of EIA appraisal.
2. The original letter of approval obtained for the modified Mining Plan prepared for the mine shall be furnished during the EIA appraisal.
3. PP shall furnish the registered consent document obtained from the pattadhars for mine lease area.
4. 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 carry out a 'Slope Stability Assessment' studies for the existing conditions of the quarry wall by involving any of the reputed Research and Academic Institutions - CSIR-Central Institute of Mining & Fuel Research (CIMFR) / Dhanbad, NIRM - Bengaluru, IIT-Madras, NIT Surathkal - Dept of Mining Engg, and Anna University Chennai-CEG Campus, Chennai. The above studies shall spell out the 'Action Plan' for carrying out the realignment of the benches and quarrying operations in a safe & sustainable manner in the proposed quarry lease.
5. The structures within the radius of (i) 50 m, (ii) 100 m, (iii) 200 m and (iv) 300 m shall be enumerated with details such as dwelling houses with number of occupants, whether it belongs to the owner (or) not, places of worship, industries, factories, sheds, etc.
6. The PP shall carry out all the required activities as stipulated in the certified compliance for the previous EC obtained and it shall be enumerated with photo & video evidences during the time of EIA appraisal.
7. The Proponent shall carry out Bio diversity study through reputed Institution and the same shall be included in EIA Report.
8. 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.
9. 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 'Action Plan' for carrying out the realignment of the benches in the

  
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- proposed quarry lease after it is approved by the concerned Asst. Director of Geology and Mining during the time of appraisal for obtaining the EC.
10. 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.
  11. 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.
  12. 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.
  13. 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.
  14. All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery/Topo sheet, topographic sheet, geomorphology, lithology and geology of the mining lease area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).
  15. The PP shall carry out Drone video survey covering the cluster, Green belt, fencing etc.,



  
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16. The PP shall furnish the revised manpower including the statutory & competent persons as required under the provisions of the MMR 1961 for the proposed quarry based on the volume of rock handled & area of excavation.
17. The proponent shall furnish photographs of adequate fencing, green belt along the periphery including replantation of existing trees & safety distance between the adjacent quarries & water bodies nearby provided as per the approved mining plan.
18. The Project Proponent shall provide the details of mineral reserves and mineable reserves, planned production capacity, proposed working methodology with justifications, the anticipated impacts of the mining operations on the surrounding environment and the remedial measures for the same.
19. The Project Proponent shall provide the Organization chart indicating the appointment of various statutory officials and other competent persons to be appointed as per the provisions of Mines Act 1952 and the MMR, 1961 for carrying out the quarrying operations scientifically and systematically in order to ensure safety and to protect the environment.
20. The Project Proponent shall conduct the hydro-geological study considering the contour map of the water table detailing the number of 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.
21. The proponent shall furnish the baseline data for the environmental and ecological parameters with regard to surface water/ground water quality, air quality, soil quality & flora/fauna including traffic/vehicular movement study.
22. The Proponent shall carry out the Cumulative impact study due to mining operations carried out in the quarry specifically with reference to the specific environment in terms of soil health, biodiversity, air pollution, water pollution, climate change and flood control & health impacts. Accordingly, the Environment Management plan should be prepared keeping the concerned quarry and the surrounding habitations in the mind.
23. Rain water harvesting management with recharging details along with water balance (both monsoon & non-monsoon) be submitted.

  
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SEIAA-TN

24. Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.
25. Details of the land for storage of Overburden/Waste Dumps (or) Rejects outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be provided.
26. Proximity to Areas declared as 'Critically Polluted' (or) the Project areas which attracts the court restrictions for mining operations, should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the TNPCB (or) Dept. of Geology and Mining should be secured and furnished to the effect that the proposed mining activities could be considered.
27. Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.
28. Impact on local transport infrastructure due to the Project should be indicated.
29. A tree survey study shall be carried out (nos., name of the species, age, diameter etc.,) both within the mining lease applied area & 300m buffer zone and its management during mining activity.
30. A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific.
31. Public Hearing points raised and commitments of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project and to be submitted to SEIAA/SEAC with regard to the Office Memorandum of MoEF& CC accordingly.
32. The Public hearing advertisement shall be published in one major National daily and one most circulated vernacular daily.
33. The PP shall produce/display the EIA report, Executive summary and other related information with respect to public hearing in Tamil Language also.

  
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34. 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.
35. 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.
36. Taller/one year old Saplings raised in appropriate size of bags, preferably eco-friendly bags should be planted as per the advice of local forest authorities/botanist/Horticulturist with regard to site-specific choices. The proponent shall earmark the greenbelt area with GPS coordinates all along the boundary of the project site with at least 3 meters wide and in between blocks in an organized manner
37. 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.
38. 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.
39. 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.
40. 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.
41. 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.
42. Details of litigation pending against the project, if any, with direction /order passed by any

  
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Court of Law against the Project should be given.

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. 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.
45. 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.
46. 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	விவம்
2	<i>Adenanthera pavonina</i>	Manjadi	மங்காதி
3	<i>Albizia lebbek</i>	Vaagai	வாகை
4	<i>Albizia amara</i>	Udi	உதி
5	<i>Bauhinia purpurea</i>	Mantharai	மந்தரை
6	<i>Bauhinia racemosa</i>	Aathu	அது
7	<i>Bauhinia tomentosa</i>	Iruvathu	இருவது
8	<i>Buchanania axillaris</i>	Kattuma	கட்டமா
9	<i>Borassus flabellifer</i>	Panai	பனை
10	<i>Butea monosperma</i>	Murukkamaram	முருக்கமரம்
11	<i>Bebax celba</i>	Ilavu, Sevilavu	இலவு
12	<i>Calophyllum inophyllum</i>	Punai	புனை
13	<i>Cassia fistula</i>	Sarakondrai	சரகண்டரை
14	<i>Cassia roxburghii</i>	Sengondrai	செங்கண்டரை
15	<i>Chloroxylon tomentosum</i>	Purasamaram	புரசாமரம்
16	<i>Cochlospermum religiosum</i>	Kongu, Manjallavu	கொங்கு, மங்காவு
17	<i>Cordia dichotoma</i>	Naruvu	நரூவு
18	<i>Croton adansonii</i>	Mavaluguni	மாவலுணி
19	<i>Dillenia indica</i>	Uva, Usha	உவா, உஷா
20	<i>Dillenia pentagyna</i>	Siru Uva, Siru Usha	சீரு உவா, சீரு உஷா
21	<i>Diospyros ebenum</i>	Karungali	கரங்கலி
22	<i>Diospyros chloroxylon</i>	Vagana	வகாணா
23	<i>Ficus amplissima</i>	Kallitchi	கலித்தி
24	<i>Hibiscus tiliaceus</i>	Aatrupoovarapu	அத்தர்பூவரப்பு
25	<i>Hardwickia binata</i>	Aacha	அச்சா
26	<i>Holoptelia integrifolia</i>	Aayili	அயிலி
27	<i>Lamnea coromandelica</i>	Odham	ஒதம்
28	<i>Lagerstroemia speciosa</i>	Poo Marudhu	பூ மரடூ
29	<i>Lepisanthus tetraphylla</i>	Neikottaimaram	நைகோட்டைமரம்
30	<i>Limonia acidissima</i>	Vila maram	விலா மரம்
31	<i>Litsea glutinosa</i>	Pimpattai	பிம்பட்டை
32	<i>Madhuca longifolia</i>	Iluppai	இலுப்பை
33	<i>Mankara hexandra</i>	Ulagai Paala	உலகை பாலை
34	<i>Mimusops elengi</i>	Magazhamaram	மகாஜமரம்
35	<i>Mitrasacme parvifolia</i>	Kadambu	கடம்பு
36	<i>Morinda pubescens</i>	Nuna	நுனா
37	<i>Morinda citrifolia</i>	Vellai Nuna	வெலை நுனா
38	<i>Phoenix sylvestris</i>	Enchai	எஞ்சை
39	<i>Pongamia pinnat</i>	Pungam	புங்கம்


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40	<i>Prenna mollissima</i>	Muruga	முள்ளை
41	<i>Prenna serratifolia</i>	Narumunnai	நடு முள்ளை
42	<i>Prenna tomentosa</i>	Malapoovarasu	மலை புல்லை
43	<i>Prosopis cinerea</i>	Varu maram	வண்டு மரம்
44	<i>Pterocarpus marsupium</i>	Vengai	வேங்கை
45	<i>Pterospermum canescens</i>	Vernanga, Tada	வேண்டாங்கு
46	<i>Pterospermum xylocarpum</i>	Polavu	புலவு
47	<i>Putranjaya roxburghii</i>	Karpala	கற்பலா
48	<i>Salvadora persica</i>	Ugaa Maram	உகா மரம்
49	<i>Sapindus emarginatus</i>	Manipungai, Soapukai	மணிப்புங்கை சோபுகை
50	<i>Straea asoca</i>	Asoca	அசோகா
51	<i>Strickus asper</i>	Paray maram	பராய மரம்
52	<i>Strychnos nuxvomica</i>	Yethi	யேதி
53	<i>Strychnos potatorum</i>	Therthang Kottai	தேர்தங்க கொட்டை
54	<i>Syzygium cumini</i>	Naval	நாவல்
55	<i>Terminalia bellerica</i>	Thandri	தாந்தரி
56	<i>Terminalia arjuna</i>	Ven marudhu	வேன் மருது
57	<i>Tournefortia</i>	Sandhana vembu	சந்தன வேம்பு
58	<i>Thespesia populnea</i>	Puvana	புவனா
59	<i>Walsbya triflora</i>	Valura	வாலுரா
60	<i>Wrightia tinctoria</i>	Veppalai	வேப்பலை
61	<i>Withanella dulce</i>	Kodukkapuli	கொடுக்காபுலி

**Discussion by SEIAA and the Remarks:-**

The subject was placed in the 624<sup>th</sup> Authority meeting held on 31.05.2023. The Authority noted that the subject was appraised in the 377<sup>th</sup> SEAC meeting held on 10.05.2023. After detailed discussions, the Authority accepts the recommendation of SEAC and decided to grant **Terms of Reference (ToR) along with Public Hearing** under cluster for undertaking the combined Environment Impact Assessment Study and preparation of separate Environment Management Plan subject to the conditions as recommended by SEAC & normal conditions and conditions in **Annexure 'B'** of this minutes in addition to the following conditions.

1. The PP shall prepare and to submit the Modified Mining Plan with the revised production & development approved by the concerned AD(Mines) which is oriented to accommodate the restriction of the ultimate depth of mining from 55m to 45m considering the safety and environmental issues, at the time of EIA appraisal.

  
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**Annexure 'B'****Cluster Management Committee**

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

**Impact study of mining**

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

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

#### **Agriculture & Agro-Biodiversity**

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

#### **Forests**

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

  
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**Water Environment**

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

**Others**

39. The project proponent shall furnish VAO certificate with reference to 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.

  
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**A. STANDARD TERMS OF REFERENCE**

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

safeguard measures in each case should also be provided.

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

  
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Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished.

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



monsoon season) : December-February (winter season)]primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM10, particularly for free silica, should be given.

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

  
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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

  
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- the Consultants issued by MoEF&CC vide O.M. No. J-11013/41/2006-IA.II(I) dated 4th August, 2009, which are available on the website of this Ministry, should be followed.
- h) Changes, if any made in the basic scope and project parameters (as submitted in Form-I and the PFR for securing the TOR) should be brought to the attention of MoEF&CC with reasons for such changes and permission should be sought, as the ToR may also have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH again with the revised documentation.
  - i) As per the circular no. J-11011/618/2010-IA.II(I) dated 30.5.2012, certified report of the status of compliance of the conditions stipulated in the Environment Clearance for the existing operations of the project, should be obtained from the Regional Office of Ministry of Environment, Forest and Climate Change, as may be applicable.
  - j) The EIA report should also include (i) surface plan of the area indicating contours of main topographic features, drainage and mining area, (ii) geological maps and sections and (iii) sections of the mine pit and external dumps, if any, clearly showing the land features of the adjoining area.

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

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

1. Project name and location (Village, District, State, Industrial Estate (if applicable).
2. Process description in brief, specifically indicating the gaseous emission, liquid effluent and solid and hazardous wastes.
3. Measures for mitigating the impact on the environment and mode of discharge or disposal.
4. Capital cost of the project, estimated time of completion.
5. The proponent shall furnish the contour map of the water table detailing the number of wells located around the site and impacts on the wells due to mining activity.
6. A detailed study of the lithology of the mining lease area shall be furnished.
7. Details of village map, "A" register and FMB sketch shall be furnished.
8. Detailed mining closure plan for the proposed project approved by the Geology of Mining department shall be submitted along with EIA report.
9. Obtain a letter /certificate from the Assistant Director of Geology and Mining standing that

  
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- 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.

  
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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 2<sup>nd</sup> December, 2009, 18<sup>th</sup> March 2010, 28<sup>th</sup> May 2010, 28<sup>th</sup> June 2010, 31<sup>st</sup> December 2010 & 30<sup>th</sup> 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 abovementioned points, the proponent will take further necessary action for obtaining environmental clearance in accordance with the procedure prescribed under the EIA Notification, 2006.

  
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- 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 29<sup>th</sup> August, 2017.

  
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SEIAA-TN

**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. ssThe 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, 1<sup>st</sup>& 2<sup>nd</sup> 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, Karur District.
7. Stock File.

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

To  
M/s.Thirumalai Blue Metals,  
No.538/4, Pulankad,  
Kuppam Post,  
Pugalur Taluk,  
Karur District - 639 111.

Rc.No.424/Mines/2021, Dated:01.02.2023

Sir,

Sub: Mines and Minerals – Minor Mineral – Karur District – Pugalur Taluk – Vettamangalam West Village – S.F.No.1238/2(Part) Over an extant 2.97.0 hectares – Quarry lease application for Rough Stone and Gravel – Preferred by M/s.Thirumalai Blue Metals – Mining Plan approved – requested for the details of Existing/Proposed/Expired/Abandoned quarries situated within 500 mts radial distance – furnished – Regarding.

- Ref:
1. Quarry lease application for Rough stone and Gravel preferred by M/s.Thirumalai Blue Metals, No.538/4, Pulankad, Kuppam Post, Pugalur Taluk, Karur District 639 111, dated: 28.09.2021.
  2. Deputy Director, Geology and Mining, Karur Notice Rc.No.424/Mines/2021, Dated: 12.01.2023.
  3. Mining Plan submitted by M/s.Thirumalai Blue Metals, Letter dated: 25.01.2023.
  4. The Deputy Director, Geology and Mining, Karur Mining Plan approved letter Rc.No. 424/Mines/2021, Dated:31.01.2023.
  5. M/s.Thirumalai Blue Metals letter, Dated: 31.01.2023

-----  
In the reference 1<sup>st</sup> cited, M/s.Thirumalai Blue Metals have applied quarry lease for quarrying Rough stone and Gravel in S.F.No.1238/2(Part) Over an extant 2.97.0 hectares of patta land in Vettamangalam West Village, Pugalur Taluk, Karur District. The Deputy Director of Geology and Mining, Karur have issued precise area letter to the proposed lease area vide reference 2<sup>nd</sup> cited.

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

In the reference 5<sup>th</sup> cited, the applicant has requested the Deputy Director of Geology and Mining, Karur to provide the details of existing, proposed and abandoned quarries situated within 500 meter radial distance from subject area and same has been furnished as follows:-

**I. Existing Quarries: -**

Sl No.	Name of the lessee/firm it holder	Name of the Mineral	Taluk & Village	S.F.No.	Extent (hect)	Lease Period
1	Thiru.C.Chinnusamy, S/o.Chinnagounder, No.38/5, S.V.A Extension, Thiruchangode, Taluk, Namakkal District.	Rough Stone	Pugalur Taluk, Kuppam village.	551/1 (P)	2.00.0	21.2.2018 to 20.2.2023

**II. Proposed Quarries: -**

Sl No.	Name of the lessee/firm it holder	Name of the Mineral	Taluk & Village	S.F.No.	Extent (hect)	Lease Period
1	M/s.Thirumalai Blue Metals, No.538/4, Pulankad, Kuppam Post, Pugalur Taluk, Karur District	Rough Stone & Gravel	Pugalur Taluk & Vettama ngalam West village	1238/2(P)	2.97.0	Proposed Area
2	Tvl.New Star Blue Metals, S.F.No.550,553,534,535 Pulankadu, Uppupalayam, Kuppam Post, Pugalur Taluk, Karur District	Rough Stone & Gravel	Pugalur Taluk & Kuppam village	553/2 (P)	1.62.0	Applied Area

**III. Lease Expired Quarries : -**

Sl No.	Name of the lessee/firm it holder	Name of the Mineral	Taluk & Village	S.F.No.	Extent (hect)	Lease Period
	Tvl. New Star Blue Metals , S.F.No: 550,533,534,535, Poolankaradi, Kuppam Post, Aravakurichi Tlauk Karur District.	Rough Stone	Pugalur Taluk & Kuppam village	533/1 534/1 550/C3	<b>4.61.0</b>	02.12.2016 to 01.12.2021

### III. Abandoned Quarries : -

Sl No.	Name of the lessee/firm it holder	Name of the Mineral	Taluk & Village	S.F.No.	Extent (hect)	Lease Period
	L. Indirani, W/o. Loganathan, 69, Erode Main Road, Velayuthampalayam Karur.	Rough Stone	Pugalur Taluk & Kuppam village	538/1A1B	<b>0.61.0</b>	18.07.2008 to 17.07.2013

*[Signature]*  
01/02/23  
Deputy Director,  
Geology and Mining,  
Karur.

*[Signature]*  
01/02/2023



# MINING PLAN

FOR VETTAMANGALAM WEST VILLAGE ROUGH STONE AND GRAVEL MINING

## LEASE WITH PROGRESSIVE QUARRY CLOSURE PLAN

Patta- Ryotwari land/Open cast-Semi Mechanized mining/ Non- Forest/Non - Captive Use –  
“B2” Category

Lease period 5 Years from the date of lease execution

(Prepared under rule 41 (3) (i) and submitted under rule 41 (8) (i) of Tamil Nadu Minor Mineral  
Concession Rules, 1959)

### LOCATION OF THE LEASE AREA

STATE : TAMILNADU  
DISTRICT : KARUR  
TALUK : PUGALUR  
VILLAGE : VETTAMANGALAM WEST  
S.F.NO'S : 1238/2 (Part)  
EXTENT : 2.97.0 HECTARES

### ADDRESS OF THE APPLICANT

**M/s.Thirumalai Blue Metals,**

No.538/4, Pulankad,  
Kupam Post,  
Pugalur Taluk,  
Karur District – 639 111.

This Mining Plan is approved subject  
to the conditions/stipulations  
indicated in the Mining Plan approval  
Letter No: 424/mines/2021  
Dated: 31/01/2023

### PREPARED BY

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

RQP/MAS/263/2014/A

### **GEO TECHNICAL MINING SOLUTIONS**

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](mailto:info.gtmsdpi@gmail.com),

Website: [www.gtmsind.com](http://www.gtmsind.com)



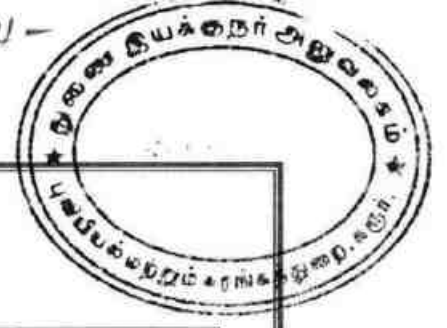




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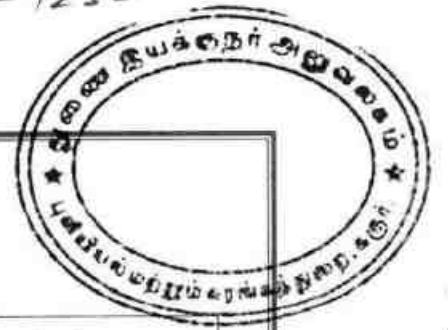
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## ANNEXURES

Sl. No.	Description	Annexure No.
1.	Copy of precise area communication letter	I
2.	Copy of previous lease particulars a. Environmental Clearance b. Proceeding Letter c. Lease execution deed d. Copy of TNPCB CTO certificate	II
3.	Copy of <b>FMB</b> (Field Measurement book)	III
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9.	Copy of Company registration and GST	IX
10.	Photocopy of the proposed lease area	X
11.	Copy of explosive willing letter, agreement from explosive license holder & explosive license	XI
12.	Copy of ID Proof of the authorized signature	XII
13.	Copy of RQP certificate	XIII

*[Handwritten signature]*

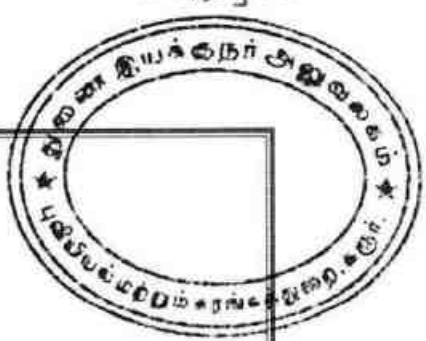


### LIST OF PLATES

S. No	Description	Plate No.	- Scale
1	Key map	I	Not to scale
2	Location plan	I-A	Not to scale
3	Toposheet map	I-B	Scale 1:1,00,000
4.	Satellite imagery map	I-C	Scale 1: 5,000
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8.	Geological sections	IIIA	<b>Section:</b> HOR 1:1000 VER 1:1000
9.	Year wise development & production plan	IV	Plan scale: 1:1000
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11.	Mine layout plan and land use pattern	V	Plan scale: 1:1000
12.	Conceptual plan	VI	Plan scale: 1:1000
13.	Conceptual sections	VIA	<b>Section:</b> HOR 1:1000 VER 1:1000

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**M/s.Thirumalai Blue Metals,**  
No.538/4, Pulankad,  
Kupam Post,  
Pugalur Taluk,  
Karur District – 639 111.

**CONSENT LETTER FROM THE APPLICANT**

The Mining Plan for rough stone and gravel quarry lease in S.F.No's: 1238/2 (Part), over an extent of 2.97.0hectares, Vettamangalam West Village, Pugalur Taluk, Karur District, Tamil Nadu State has been prepared by

**Dr. S. KARUPPANNAN. M.Sc., Ph.D. (Regn. No. RQP/MAS/263/2014/A)**

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

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

(Regn. No. RQP/MAS/263/2014/A)

**GEO TECHNICAL MINING SOLUTIONS**

(A NABET accredited & ISO certified Company)

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Ph: +91 9443937841, +91 7010076633


E-mail: [info.gtmsdpi@gmail.com](mailto:info.gtmsdpi@gmail.com),


Website: [www.gtmsind.com](http://www.gtmsind.com)

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

Place: Karur, TN

Date:

  
Signature of the applicant  
(M/s.Thirumalai Blue Metals)





M/s.Thirumalai Blue Metals,  
No.538/4, Pulankad,  
Kupam Post,  
Pugalur Taluk,  
Karur District – 639 111.

**DECLARATION**

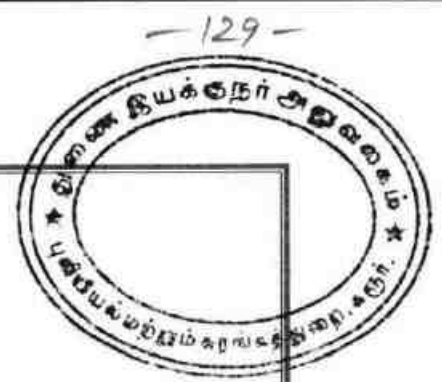
The Mining Plan of rough stone and gravel quarry lease in S.F.No's: 1238/2 (Part), over an extent of 2.97.0hectares, Vettamangalam West Village, Pugalur Taluk, Karur District, Tamil Nadu State have been prepared with my consultation and I have understood the contents and agree to implement the same in accordance with the Mining Laws.

Place: Karur, TN

Date:

  
Signature of the applicant  
(M/s.Thirumalai Blue Metals)





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

(Regn. No. RQP/MAS/263/2014/A)

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E-mail: [info.gtmsdpi@gmail.com](mailto:info.gtmsdpi@gmail.com),

Website: [www.gtmsind.com](http://www.gtmsind.com)

**CERTIFICATE**

This is to certify that the provisions of 19(1), 20 and 33 of Tamil Nadu Minor Minerals Concession Rules, 1959 have been observed in the mining plan for the grant of rough stone and gravel quarry lease in S.F.No's: 1238/2 (Part), over an extent of 2.97.0hectares, Vettamangalam West Village, Pugalur Taluk, Karur District, Tamilnadu State applied to **M/s.Thirumalai Blue Metals**, Karur District, Tamil Nadu.

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: 19/1/23

Signature of the Recognized Qualified Person

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

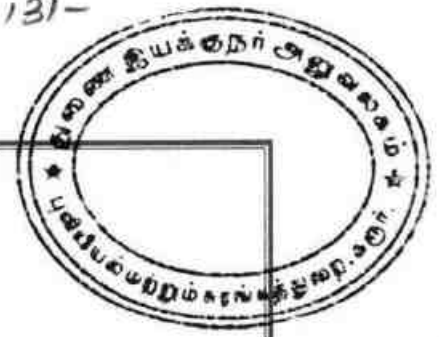
RQP/MAS/263/2014/A

**GEO TECHNICAL MINING SOLUTIONS**

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

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Dharmapuri - 636 705. Tamil Nadu, India.



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

(Regn. No. RQP/MAS/263/2014/A)

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Website: [www.gtmsind.com](http://www.gtmsind.com)

### CERTIFICATE

I certified that the preparation of Mining Plan for rough stone and gravel quarry lease in S.F.No's: 1238/2 (Part) over an extent of 2.97.0hectares, Vettamangalam West Village, Pugalur Taluk, Karur District, Tamil Nadu prepared to **M/s.Thirumalai Blue Metals**, Karur District, Tamil Nadu, covers all the provisions of Mines Act, Rules and Regulations etc. made there in and if any specific permission is required the applicant will approach "**The Director General of Mines Safety**", Chennai. The standards prescribed by DGMS regarding Mines Health will be strictly implemented.

Place: Dharmapuri, TN

Date: 19/11/23

Signature of the Recognized Qualified Person

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



# MINING PLAN

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

Patta- Ryotwari land/Open Cast-Semi Mechanized mining/ Non- Forest/Non - Captive Use –  
“B2” Category

Lease period 5 Years from the date of lease execution

(Prepared under rule 41 (3) (i) and submitted under rule 41 (8) (i) of Tamil Nadu Minor  
Mineral Concession Rules, 1959)

## INTRODUCTORY NOTES:

- 1) **Introduction:** The applicant M/s.Thirumalai Blue Metals office at No.538/4, Pulankad, Kupam Post, Pugalur Taluk, Karur District - 639111, Tamil Nadu State. The applicant was submit application on 28.09.2021 for request to the Deputy Director, Department of Geology and Mining, Karur, renewed to be continued quarrying operation for rough stone and gravel at S.F.No's: 1238/2 (Part), over an extent of 2.97.0hectares of Vettamangalam West Village, Pugalur Taluk, Karur District, Tamil Nadu State further the period of 5 years.
- 2) **Precise area communication letter particulars:** The Deputy Director, Department of Geology and Mining, Karur has directed to the applicant M/s.Thirumalai Blue Metals through his precise area communication letter Rc.No.424/Mines/2021 Dated: 12.01.2023, has recommended quarrying lease for rough stone and gravel quarry lease at Tamil Nadu State, Karur District, Pugalur Taluk, Vettamangalam West Village in S.F.No's: 1238/2 (Part), over an area of 2.97.0 hectares and should be submitted draft mining plan for approval for the period of 90 days the following conditions for a period of five (5) years under Rule 19 (1), 20 & 33 of Tamil Nadu Minor Mineral Concession Rules, 1959.
  - i) A safety distance should be left out nearby the applied area 7.5m and 10m of Patta and Poramboke lands as respectively while quarrying activities.
  - ii) Quarrying operation to be carried out with controlled blasting techniques viz, hand-hack-Hammer, Driller for drilling shot holes and use mild explosives substance for blasting the rocks.

This Mining Plan is approved subject  
to the conditions/stipulations  
indicated in the Mining Plan approval  
Letter No: 424/mines/2021  
Dated: 31/01/2023





- iii) To ensure the safety of quarry workers as per Metaliferous Mines Acts should formed wide, safe benches. Inside the quarry in safe manner vehicles come and go, do the quarry work ensuring the safety of the quarry workers.
- iv) To provide quarrying lease by the Deputy Director, Karur, approved mining plan, obtain Environmental Clearance from the competent authority of State Level Environment Impact Assessment Authority-Tamil Nadu (SEIAA) and should be submitted.

3) **The previous lease particulars:** The proposed lease area was previously granted to quarrying of rough stone and gravel in favor of **M/s.Thirumalai Blue Metals** by the District Collector, Karur proceedings vide Rc.D114/2004, dated 07.12.2004 in S.F.No. 1238/2 (Part) Karur District, Aravakurichi Taluk, Vettamangalam West Village, over an extent of 4.80.0hectares for a period of 5 years.

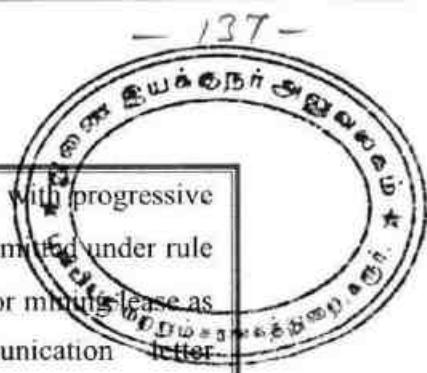
The **1<sup>st</sup> renewed application** of the same applicant for the lease application and granted vide letter Rc.No.B44/G&M/2010 in S.F.No. 1238/2 (Part) over an extent of 4.80.0Hectares. The lease was expired on 07.05.2015 for a period of 5 years.

The **2<sup>nd</sup> renewed application** of the same applicant for the lease application and granted vide letter Rc.No.299/Mines/2015, dated: 14.10.2015 in S.F.No. 1238/2 (Part) over an extent of 4.80.0Hectares. The applicant got Environmental Clearance from SEIAA-TN vide Lr.no.SEIAA/TN/F.No.4628/1(a)/EC.No.3767/2016, dated 26.09.2016. The lease was executed 14.10.2016 to 13.10.2021 for a period of 5 years.

Now, **3<sup>rd</sup> Renewal application** for new proposals has submitted to the Deputy Director, Department of Geology and Mining (DDG & M), Karur dated 28.09.2021 and the Deputy Director, recommended to his precise area communication letter Rc.No.424/Mines/2021 Dated: 12.01.2023 for period of five years recommended to favor of M/s.Thirumalai Blue Metals, Karur for quarrying lease rough stone and gravel at Tamil Nadu State, Karur District, Pugalur Taluk, Vettamangalam West Village in S.F.No: 1238/2 (Part), over an extent of 4.80.0hectares

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

Existing pit Dimension				
Pit no's	Pit level	Length (m)	Width (m)	Depth(m)
1	Level-I	74	34	2
2	Level-II	93	93	12
3	Level-III	173	60	17



- 3) **Preparation and Submission of Mining Plan:** The Mining Plan With progressive quarry closure plan has been prepared under rule 41 (3) (i) and submitted under rule 41 (8) (i) of Tamil Nadu Minor Mineral Concession Rules, 1959, for mining lease as per conditions mentioned in the precise area communication letter. **Rc.No.424/Mines/2021 Dated: 12.01.2023.**

- 4) **Geological resources and Mineable reserves:** Geological resource of estimated as **1266783m<sup>3</sup>** including the resources of safety zone, and gravel. Of which, rough stone resources of about **1260527m<sup>3</sup>** and gravel is about **6256m<sup>3</sup>**. The total mineable reserve is estimated to be **403983m<sup>3</sup>** by deducting the reserve safety zone, block in benches from the total Geological resources. Of which, rough stone is about **400555m<sup>3</sup>** and gravel is about **3428m<sup>3</sup>** up to a depth of 55m below the ground level (R.L.160m-105m) (Refer Plate No. IIIA & VIA).

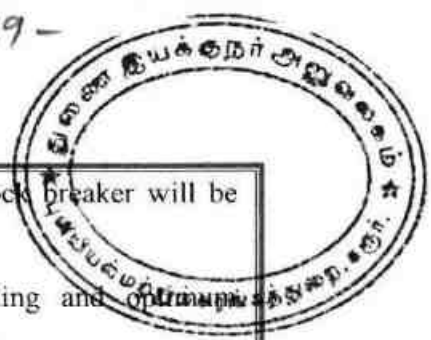
- 5) **Proposed production schedule:** Total proposed production of **403983m<sup>3</sup>**. Of which, rough stone is **400555m<sup>3</sup>** and gravel is **3428m<sup>3</sup>** up to a depth of 55m below the ground level (R.L.160m-105m) for five years plan period. Average production is **80111m<sup>3</sup>** of rough stone per year. (Refer Plate No. IVA).

- 6) **Environmental Sensitivity of the proposed lease area: -**

- i. **Interstate boundary:** There is no interstate boundary around 10Km radius periphery of proposed lease area.
- ii. **Wildlife Protection Act, 1972:** There is no wild life sanctuary within radius of 10Km from the project site area under the Wildlife (Protection) Act, 1972.
- iii. **Indian Reserve Forest Act, 1980:** No reserved forest situated within radius of 1Km periphery of the proposed site. The Nearest reserve forest is  
I.Thathampalayam R.F -10.46km - Southeast
- iv. **CRZ Notification, 1991:** There is no sea coastal zone found within radius of 10km and this project site doesn't attract CRZ Notification, 1991.

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

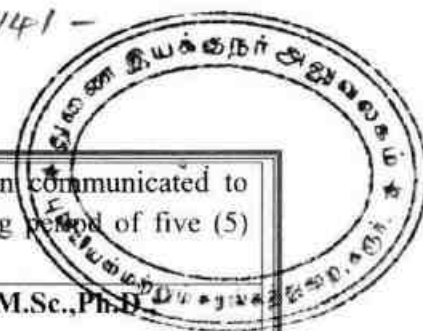
- a) Controlled blasting includes adoption of suitable explosive charge and short delay detonators, adequate stemming of holes at collar zone and restricting blasting to a particular time of the day i.e. at the time lunch hours, controlled charge per hole as well as charge per round of hole
- b) Usage of sharp drill bits while drilling which will help in reducing noise.



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

**1.0 GENERAL:**

a.	Name of the Applicant	:	<b>M/s.Thirumalai Blue Metals</b>
	Applicant address	:	No.538/4, Pulankad, Kupam Post, Pugalur Taluk,
	District	:	Karur
	State	:	Tamilnadu
	Pin code	:	639111
	Phone	:	----
	Fax	:	Nil
	Gram	:	Nil
	Telex	:	Nil
b.	Status of the Applicant	:	-----
	Private individual	:	---
	Cooperative Association	:	---
	Private company	:	Private
	Public Company	:	---
	Public Sector Undertaking	:	---
	Joint Sector Undertaking	:	---
	Other (pl. specify)	:	---
c.	Mineral(s) Which are occurring in the area and which the applicant intends to mine	:	Rough stone and gravel quarry lease



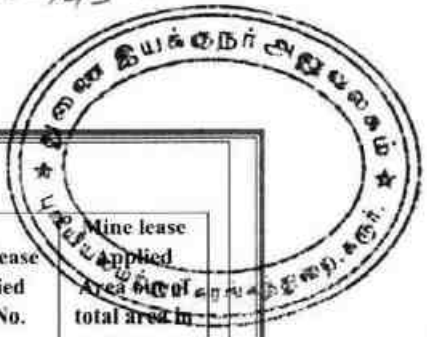
d.	Period for which the mining lease granted /renewed/ proposed to be applied	:	The precise area has been communicated to the applicant for quarrying period of five (5) years.
e.	Name of the RQP preparing the Mining Plan	:	<b>Dr. S.KARUPPANNAN.M.Sc.,Ph.D.</b>
	Address	:	<b>Geo Technical Mining Solutions</b> (A NABET Accredited & ISO certified Company) No: 1/213-B, Ground Floor, Natesan Complex, Oddapatti, Collectorate Post office, Dharmapuri-636705 Web site: <a href="http://www.gtmsind.com">www.gtmsind.com</a>
	Phone	:	+91 9443937841, 7010076633
	Fax	:	Nil
	e-mail	:	<a href="mailto:info.gtmsdpi@gmail.com">info.gtmsdpi@gmail.com</a>
	Telex	:	Nil
	Certificate Number	:	RQP/MAS/263/2014/A
	Date of grant/renewal	:	16.12.2014
	Valid upto	:	15.12.2024
f.	Name of the prospecting agency	:	<b>Geo Technical Mining Solutions</b> GSR 286(E) No:272, Ministry of Mines Notification 7th April 2022.
	Address	:	No: 1/213-B, Ground Floor, Natesan Complex, Oddapatti, Collectorate Post office, Dharmapuri-636705 Web site: <a href="http://www.gtmsind.com">www.gtmsind.com</a>
	Phone	:	+91 9443937841, 7010076633
g.	Reference No. and date of consent letter from the state government	:	The precise area communication letter was received from the Deputy Director, Department of Geology and Mining, District Collectorate, Karur Vide <b>Rc.No.424/Mines/2021 Dated: 12.01.2023.</b>

## 2.0 LOCATION AND ACCESSIBILITY:


a.	Details of the Area:	:	Refer plate no: IA & IB
	District & State	:	Karur, Tamil Nadu
	Taluk	:	Pugalur
	Village	:	Vettamangalam West

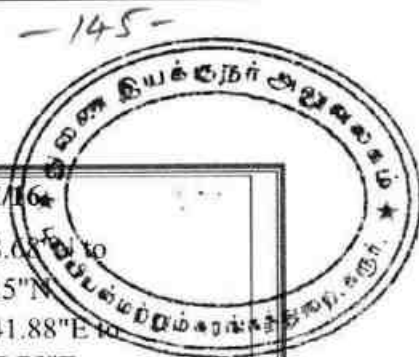
*Signature*

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Khasra No./ Plot No./ Block Range/ Felling Series etc.						
Survey No.	Sub division	Total Extent in Hect	Patta No.	Name of the Land Owner	Mine lease Applied S.F. No.	Mine lease Applied Area of total area in hect.
1238	2	5.04.0	3308	1.Mr.T.Mohanraj S/o.Thangaraj 2.Mr.R.Ramarajeskumar S/o.Ramasamy 3.Mr.K.Thangavel S/o.Kandhasamy	1238/2 (Part)	2.97.0
<b>Total Extent</b>		<b>5.04.0</b>		<b>Applied lease area extent</b>		<b>2.97.0</b>
Lease area (hectares)				: 2.97.0 Hectare		
Whether the area is recorded to be in forest (please specify whether protected, reserved, etc)				: No, forest is involved. This is recorded patta Land.		
Ownership / Occupancy				: This is a Patta land S.F.No. 1238/2 (Part) is registered in the name of 1.Mr.T.Mohanraj S/o.Thangaraj, 2.Mr.R.Ramarajeskumar S/o.Ramasamy, 3.Mr.K.Thangavel S/o.Kandhasamy vides Patta No.3308. Hence the pattadhar given consent to the applicant. (Ref. Annex. No:VI & VII).		
Existence of Public Road / Railway line if any nearby and approximate distance				: <ul style="list-style-type: none"> <li>✓ Excavated materials will be transported through the approach road on the northeast side of the lease applied area.</li> <li>✓ There is an SH-84 road are situated about 1.46km away from the northeast side which is connecting Erode – Karur Rd.</li> <li>✓ There is no NH road situated around 5km radius.</li> <li>✓ There is a railway line situated around 4.4km radius from the proposed lease area.</li> </ul>		





Toposheet No. with latitude and longitude	SOI Toposheet No. 58 E/16 Latitude : From 11°0'58.68"N to 11°1'6.25"N Longitude : From 77°56'41.88"E to 77°56'47.75"E																														
Geo-Coordinates of the lease boundary: <table border="1" style="margin: 10px auto; width: 80%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="padding: 5px;">Pillar ID</th> <th style="padding: 5px;">Latitude</th> <th style="padding: 5px;">Longitude</th> </tr> </thead> <tbody> <tr><td>1</td><td>11° 1'2.67"N</td><td>77°56'47.75"E</td></tr> <tr><td>2</td><td>11° 0'59.21"N</td><td>77°56'46.36"E</td></tr> <tr><td>3</td><td>11° 0'58.68"N</td><td>77°56'43.78"E</td></tr> <tr><td>4</td><td>11° 0'59.72"N</td><td>77°56'43.81"E</td></tr> <tr><td>5</td><td>11° 1'0.30"N</td><td>77°56'41.88"E</td></tr> <tr><td>6</td><td>11° 1'4.94"N</td><td>77°56'42.34"E</td></tr> <tr><td>7</td><td>11° 1'6.25"N</td><td>77°56'42.64"E</td></tr> <tr><td>8</td><td>11° 1'5.50"N</td><td>77°56'45.76"E</td></tr> <tr><td>9</td><td>11° 1'3.45"N</td><td>77°56'45.73"E</td></tr> </tbody> </table>		Pillar ID	Latitude	Longitude	1	11° 1'2.67"N	77°56'47.75"E	2	11° 0'59.21"N	77°56'46.36"E	3	11° 0'58.68"N	77°56'43.78"E	4	11° 0'59.72"N	77°56'43.81"E	5	11° 1'0.30"N	77°56'41.88"E	6	11° 1'4.94"N	77°56'42.34"E	7	11° 1'6.25"N	77°56'42.64"E	8	11° 1'5.50"N	77°56'45.76"E	9	11° 1'3.45"N	77°56'45.73"E
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9	11° 1'3.45"N	77°56'45.73"E																													
Land use pattern (Forest, Agricultural, Grazing, Barren etc.)	It is an existing and renewed quarry lease.																														
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																														

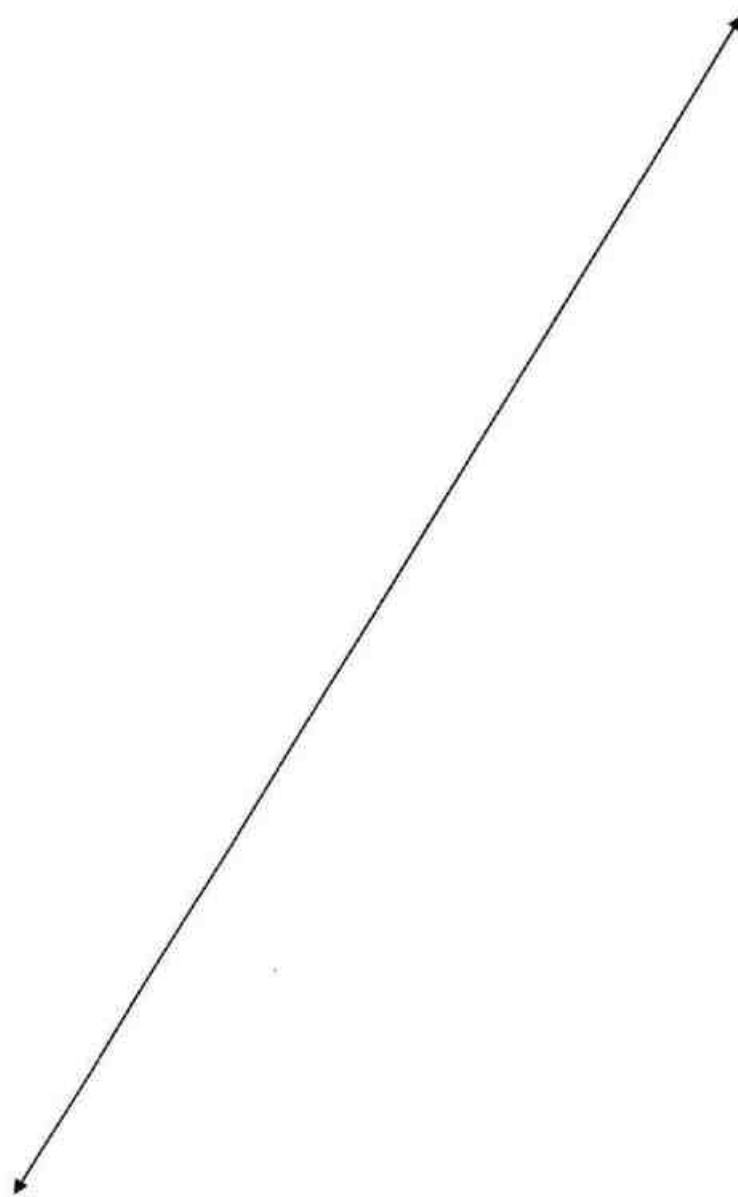
**i) INFRASTRUCTURE AND COMMUNICATION:**

S.No	Description	Place	Distance	Direction
a.	Nearest post office	Kuppam	2.35Km	West
b.	Nearest police station	K.Paramathy	7.45km	SW





c.	Nearest fire station	Karaipalayam	8.13km	NE
d.	Nearest medical facility	Punnamchatram	3.6Km	East
e.	Nearest school	Punnamchatram	3.65Km	East
f.	Nearest railway station	Noyal	4.76km	NW
g.	Nearest port facility	Tuticorin	250.0km	South
h.	Nearest airport	Tiruchirappalli	86.0km	East
i.	Nearest DSP office	Karur	13.0m	SE
j.	Nearest villages	Kunthanipalayam	1.17km	North
		Pudukkanalli	1.18km	East
		Salipalayam	2.4km	South
		Kuppam	2.06km	West



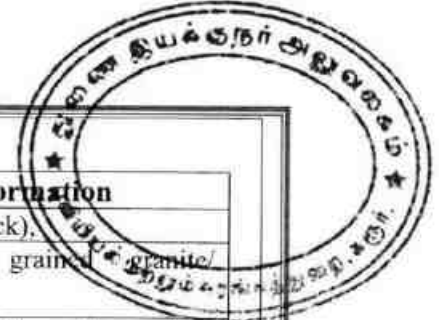
## PART – A

### 3.0 GEOLOGY AND MINERAL RESERVES:

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

(i)	Topography	: The proposed lease area exhibits flat topography which is an average altitude of about 161.5m AMSL. The proposed site shows the relief of 1m; the maximum elevation (161m) was observed in NE side of the site, while the minimum elevation (160m) was observed south side of the site. The slope is towards southern side and falls in Toposheet no. 58 E/16.
(ii)	<p><b>a) Geology of the District:</b></p> <p>The Karur district forms part of the Archean complex of peninsular gneiss. The general rock types of this area are Biotite gneiss. Karur District is blessed with good reserves of crystalline limestone known as “Palayam belt” in Varavanai, Thennilai, Gudalur etc., villages in Kulithalai Taluk and the occurrences of good quality of pegmatite veins constituting with glassy quartz and potash feldspar in lensoid patches in Nagampalli and Pungambadi areas in Aravakurichi Taluk. The major mineral such as limestone, quartz and feldspar are exploited in Karur district and utilized in the mineral-based industries.</p> <p>The Granite gneiss rocks are found to occur in K.Paramathi, Athur, Thennilai, Punnam, Godanthur South, Munnur, Punnam, Anjur villages in Karur and Aravakurichi Taluk are exploited to produce building materials and road metal (Jelly) and over burden soil appear as gray to reddish in colour called as gravel. The commercially known “Coloumbo Zubrana” the unique type in the Multi coloured granite / Granite gneiss category is occurring in Thogamalai, Naganur and Kazhugur Villages in Kulithalai Taluk. These rock type belong to minor mineral category. The arrangement of alternate layers of felsic and mafic minerals in linear pattern and exhibits wavy pattern in the rock and giving very good structure for the rock type. The well-developed gneissic pattern with linear arrangement, the rock type have attracted the granite market and found to be suitable for the exploitation of granite blocks. But in this area the banded gneissic rock has many fractures and foliation in it. So, this is not viable for dimensional</p>	





stone. **Order of superposition of the proposed lease area,**

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

(iii) Local / Mine Geology of the mineral deposit area:

**a) Topography of the proposed lease area:**

The proposed lease area exhibits flat topography which is an average altitude of about 161.5m AMSL. The proposed site shows the relief of 1m; the maximum elevation (161m) was observed in NE side of the site, while the minimum elevation (160m) was observed southern side of the site. The slope is towards southern side. The applied lease area is existing, with covered gravel and beneath the charnockite rocks found based on existing pit nearby the lease area. Surface plan preparing for contour lines, surface features and Geological mapped the applied lease area.

**b) Mode of origin:**

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

**c) Physiography of the rocks:**

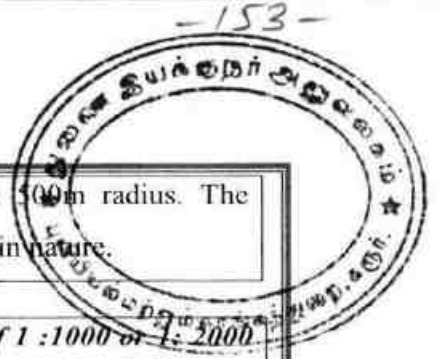
General characteristics of the rocks of this series has recorded that the rocks are in general bluish gray or darkish in colour and extremely fresh in appearance with an even grained granular structure.

**d) Chemical composition of rocks:**

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

**Order of superposition of rocks in the proposed site:**

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



(iv)	Drainage Pattern	No major river located within 500m radius. The drainage in the area is dendritic in nature.
------	------------------	---

(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:*

a. Present status	There is an existing pit was noticed by RQP with a pit level-I is L74m X W34m X D2m, pit level-II is L93m X W93m X D12m, pit level-III is L173m X W60m X D17m. The Charnockite rocks are well seen in the existing pit with covered by lateritic soil over the part of lease area.
b. Surface Plan	Surface plan showing elevation contour, rock exposure, and accessibility road was prepared at the scale of 1: 1000, as shown in Plate No.III.
(c) Geological sections should be prepared at suitable intervals on a scale of 1: 1000 / 1: 2000	Longitudinal and transverse geological cross sections were prepared at the horizontal scale of 1: 1000 and at the vertical scale of 1:1000, as shown in Plate No.IIIA.

(d) *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

No future programmed proposed in this area. Its massive homogeneous parent rock. Hence exploration proposal is not required to this mining project.

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

*Madhu*

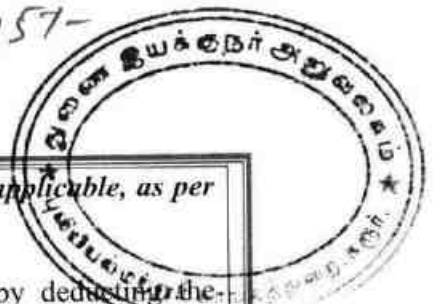


leasehold.

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 sections (longitudinal and transverse) to calculate the volume of material up to the depth of 55m below ground level. The longitudinal and transverse cross sections were assigned (XY-AB) & (XIYI-CD) as respectively. Using the cross-sectional method, total reserve is estimated to be **1266783m<sup>3</sup>** including the resources of safety zone, and gravel. Of which, rough stone is about **1260527m<sup>3</sup>** and gravel resource of about **6256m<sup>3</sup>**.

The gravel is obtained about 2m (R.L.160-158m) from the surface and a rough stone starts from 2 to 55m (R.L.158-105m) below ground level. (Refer plate no.IIIA).

GEOLOGICAL RESOURCES							
Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume In m <sup>3</sup>	Rough stone in m <sup>3</sup>	Gravel in m <sup>3</sup>
XY-AB	I	38	68	2	5168	.....	5168
	I	39	68	3	7956	7956	.....
	II	39	68	5	13260	13260	.....
	III	41	68	5	13940	13940	.....
	IV	43	68	2	5848	5848	.....
	IV	105	68	3	21420	21420	.....
	V	105	68	5	35700	35700	.....
	VI	105	68	5	35700	35700	.....
	VII	105	68	5	35700	35700	.....
	VIII	105	68	5	35700	35700	.....
	IX	105	68	5	35700	35700	.....
	X	105	68	5	35700	35700	.....
	XI	105	68	5	35700	35700	.....
TOTAL				55	317492	312324	5168
XIYI-CD	I	17	32	2	1088	.....	1088
	I	18	49	3	2646	2646	.....
	II	19	51	5	4845	4845	.....
	III	20	53	2	2120	2120	.....
	III	110	144	3	47520	47520	.....
	IV	111	144	2	31968	31968	.....
	IV	157	144	3	67824	67824	.....
	V	157	144	5	113040	113040	.....
	VI	157	144	5	113040	113040	.....
	VII	157	144	5	113040	113040	.....
	VIII	157	144	5	113040	113040	.....
	IX	157	144	5	113040	113040	.....
	X	157	144	5	113040	113040	.....
	XI	157	144	5	113040	113040	.....
TOTAL				55	949291	948203	1088
GRAND TOTAL					1266783	1260527	6256



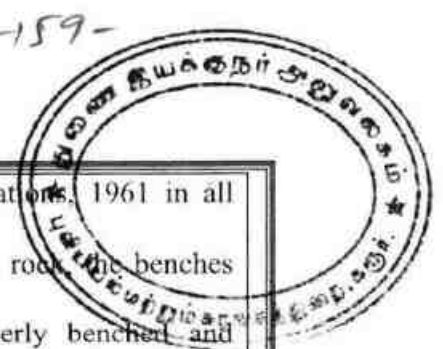
(f) *Indicate mineable reserves by slice plan / level plan method, as applicable, as per the proposed mining parameters.*

The total mineable reserve is estimated to be **403983m<sup>3</sup>** by deducting the reserve safety zone, block in benches from the total Geological resources up to a depth of 55m (R.L.160-105m) below ground level. Of which, rough stone is about **400555m<sup>3</sup>** and gravel is about **3428m<sup>3</sup>**. The commercially viable rough stone has been prepared on 1: 1000 scale and sections are prepared in a scale of 1:1000 in horizontal axis and 1:1000 as vertical axis (Refer plate no. VIA).

MINEABLE RESERVES							
Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume In m <sup>3</sup>	Rough stone in m <sup>3</sup>	Gravel in m <sup>3</sup>
XY-AB	I	24	61	2	2928	.....	2928
	I	24	61	3	4392	4392	.....
	II	15	56	5	4200	4200	.....
	III	7	51	5	1785	1785	.....
	IV	4	46	2	368	368	.....
	IV	60	46	3	8280	8280	.....
	V	50	41	5	10250	10250	.....
	VI	40	36	5	7200	7200	.....
	VII	30	31	5	4650	4650	.....
	VIII	20	26	5	2600	2600	.....
TOTAL				40	46653	43725	2928
XIY1-CD	I	10	25	2	500	.....	500
	I	10	42	3	1260	1260	.....
	II	6	39	5	1170	1170	.....
	III	2	36	2	144	144	.....
	III	92	127	3	35052	35052	.....
	IV	88	122	2	21472	21472	.....
	IV	112	122	3	40992	40992	.....
	V	102	117	5	59670	59670	.....
	VI	92	112	5	51520	51520	.....
	VII	82	107	5	43870	43870	.....
	VIII	72	102	5	36720	36720	.....
	IX	62	92	5	28520	28520	.....
	X	52	82	5	21320	21320	.....
	XI	42	72	5	15120	15120	.....
TOTAL				55	357330	356830	500
GRAND TOTAL					403983	400555	3428

#### 4.0 MINING:

a.	Briefly describe the existing / proposed method for developing / working the deposit with all design parameters.	: It is an existing grant lease. The mining operation is open-cast, semi-mechanized method are adopted and on single shift basis only. Under the regulation 106 of the
----	--	--



(Note: In case of pocket deposits, sequence of development/working may be indicated on the same plan)

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

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

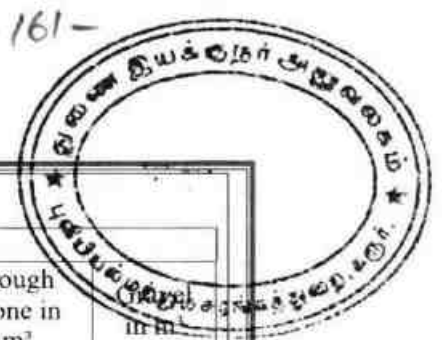
Total proposed production **403983m<sup>3</sup>**. Of which, rough stone is **400555m<sup>3</sup>** and gravel is **3428m<sup>3</sup>** up to a depth of 55m below the ground level (R.L.160m-105m) for five years plan period. Average production is **80111m<sup>3</sup>** of rough stone per year (Refer Plate No. IV).

Year	Pit No.(s)	Topsoil/Overburden (m <sup>3</sup> )	ROM (m <sup>3</sup> )	Saleable rough stone (m <sup>3</sup> ) @ 100%	Rough stone rejects(m <sup>3</sup> )	Sub grade/Weathered rock in (m <sup>3</sup> )	Saleable Gravel (m <sup>3</sup> )	Rough stone to topsoil ratio
First	I	---	113895	110467	...	....	3428	....
Second	I	---	78568	78568	...	....	....	....
Third	I	---	63370	63370	...	....	....	....
Fourth	I	---	80590	80590	...	....	....	....
Fifth	I	---	67560	67560	...	....	....	....
<b>Total</b>	<b>—</b>	<b>...</b>	<b>403983</b>	<b>400555</b>	<b>...</b>	<b>....</b>	<b>3428</b>	<b>....</b>

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

*Adi...*





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

YEARWISE PRODUCTIONS								
Year	Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume In m³	Rough stone in m³	in m
I- YEAR	XY-AB	I	24	61	2	2928	.....	2928
		I	24	61	3	4392	4392	.....
	XIYI-CD	I	10	25	2	500	.....	500
		I	10	42	3	1260	1260	.....
		II	6	39	5	1170	1170	.....
	XY-AB	II	15	56	5	4200	4200	.....
		III	7	51	5	1785	1785	.....
	XIYI-CD	III	2	36	2	144	144	.....
		III	92	127	3	35052	35052	.....
		IV	88	122	2	21472	21472	.....
		IV	112	122	3	40992	40992	.....
TOTAL						113895	110467	3428
II- YEAR	XY-AB	IV	4	46	2	368	368	.....
		IV	60	46	3	8280	8280	.....
		V	50	41	5	10250	10250	.....
	XIYI-CD	V	102	117	5	59670	59670	.....
TOTAL						78568	78568	.....
III- YEAR	XIYI-CD	VI	92	112	5	51520	51520	.....
	XY-AB	VI	40	36	5	7200	7200	.....
		VII	30	31	5	4650	4650	.....
TOTAL						63370	63370	.....
IV- YEAR	XIYI-CD	VII	82	107	5	43870	43870	.....
		VIII	72	102	5	36720	36720	.....
TOTAL						80590	80590	.....
V- YEAR	XY-AB	VIII	20	26	5	2600	2600	.....
	XIYI-CD	IX	62	92	5	28520	28520	.....
		X	52	82	5	21320	21320	.....
		XI	42	72	5	15120	15120	.....
TOTAL						67560	67560	.....
GRAND TOTAL						403983	400555	3428

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 "B<sub>2</sub>" category of mine.

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

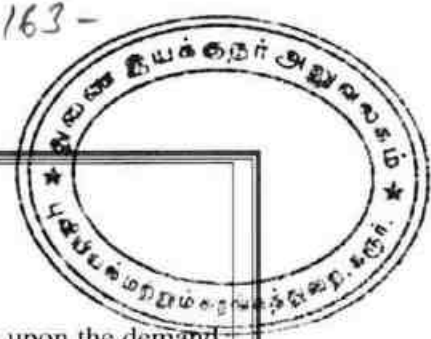
At this rate of production, the expected life of quarry is calculated as given below: -

**Rough stone:**

Mineable reserves of rough stone = 400555m<sup>3</sup>

Yearly production of rough stone = 80111m<sup>3</sup>

Monthly production of rough stone = 6676m<sup>3</sup>

**Gravel:**

Mineable reserves of gravel = 3428m<sup>3</sup>

Monthly production of gravel = 286m<sup>3</sup>

The regular working of the quarry and its production depends upon the demand from 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 up to the life of the mine (for "A" category mines) based on the geological, mining and environments considerations:*

i) Time frame of completion of mineral exploration program in leasehold area: Give broad description identified potential areas to be covered in the given time frame: : Considering the indefinite depth persistence of the rough stone and gravel deposit is proved beyond the workable limits about up to a depth of 55m below ground level (R.L.160m-105m) from the petrogenetic character of the rock as well as from the actual mining practice in the area and with the current trend of rough stone production the quarry may sustain for 5 years.

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

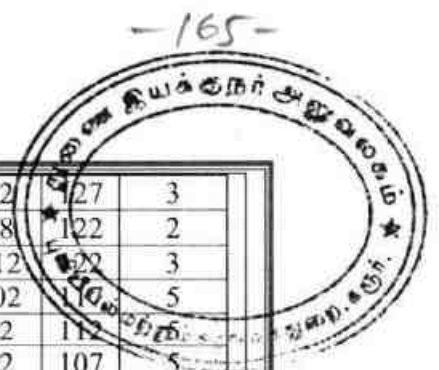
The ultimate pit limit has been determined and demarcated in the conceptual plan

ULTIMATE PIT LIMIT-(XY-AB)

Bench	Bench R.L	Period	Overburden/ Mineral	L (m)	W (m)	D (m)
I	R.L.160-158m	Five years	Gravel	24	61	2
I	R.L.158-155m		Rough stone	24	61	3
II	R.L.155-150m		Rough stone	15	56	5
III	R.L.150-145m		Rough stone	7	51	5
IV	R.L.145-140m		Rough stone	4	46	5
V	R.L.140-135m		Rough stone	50	41	5
VI	R.L.135-130m		Rough stone	40	36	5
VII	R.L.130-125m		Rough stone	30	31	5
VIII	R.L.125-120m		Rough stone	20	26	5
Total						40m

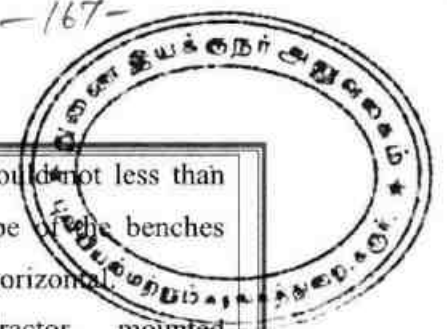
ULTIMATE PIT LIMIT-(X1Y1-CD)

Bench	Bench R.L	Period	Overburden/ Mineral	L (m)	W (m)	D (m)
I	R.L.160-158m	Five years	Gravel	10	25	2
I	R.L.158-155m		Rough stone	10	42	3
II	R.L.155-150m		Rough stone	6	39	5
III	R.L.150-148m		Rough stone	2	36	2



	III	R.L.148-145m		Rough stone	92	127	3
	IV	R.L.145-143m		Rough stone	88	122	2
	IV	R.L.143-140m		Rough stone	112	122	3
	V	R.L.140-135m		Rough stone	102	110	5
	VI	R.L.135-130m		Rough stone	92	112	5
	VII	R.L.130-125m		Rough stone	82	107	5
	VIII	R.L.125-120m		Rough stone	72	102	5
	IX	R.L.120-115m		Rough stone	62	92	5
	X	R.L.115-110m		Rough stone	52	82	5
	XI	R.L.110-105m		Rough stone	42	72	5
	Total						55m
iii)	Whether the site for disposal of waste rock or an un-saleable material have/ has been examined for adequacy of land and suitability of long-term use in the event of continuation of mining activity: -			:	The recovery of rough stone in this quarry is 100%. There is no waste rock will be proposed in this lease area.		
iv)	Whether back filling of pits after recovery of mineral up to techno-economically feasible depth envisaged. If so, describe the broad features of the proposal: -			:	As the depth of persistence of the deposit may likely to continue for further depth, it is proposed not to backfilled the quarry pit.		
v)	Whether post mining land use envisaged: -			:	At the end of mining activities over the quarry pit may be utilized fish culture or storage of rain water reservoir used for irrigation purposes.		
g.	Open cast Mines:						
	i). Describe briefly giving salient features of the mode of working (Mechanized, Semi-mechanized, manual)			:	It is an existing quarry lease. The mining operation is open-cast, semi-mechanized methods are adopted and on single shift basis only. Under the regulation 106 of the Metalliferous Mines Regulations, 1961 in all open cast workings in hard rock, the benches and sides should be properly benched and sloped. The bench height should not exceed		





		5m and the bench width should not less than the bench height. The slope of the benches should not exceed 45° from horizontal. Machineries like Tractor mounted compressor attached with Jack hammers is proposed to drilling and blasting. Excavators and tipper combination are adapted.																					
ii) Describe briefly the layout of mine workings, the layout of faces and sites for disposal of overburden /waste. A reference to the plans enclosed under 4(b) and 4(d) will suffice	:	The rough stone is proposed to quarry at 5m bench height & width conventional opencast semi mechanized quarrying operation using drilling with the help of tractor mounted compressor attached with jack hammers, nonel blasting and waste and are removal using Hydraulic excavator and loaded directly to the tippers.  Bench height = 5mts. Bench width = 5mts.																					
a. Details of topsoil/ overburden	:	There is no topsoil will be removed.																					
b. Rough stone waste and side burden waste:-	:	The recovery of rough stone in this quarry is 100%. Any other waste or side burden dumps are doesn't proposed.																					
h. <b>Underground Mines:</b>	:	Not applicable																					
i. <b>Extent of mechanization:</b> Describe briefly including the calculation for adequacy and type of machinery and equipment proposed to be used in different mining operations. <b>(1) Drilling Machines:</b> Drilling of shot holes will be carried out using tractor mounted compressor and jack hammer. Details of drilling equipment's are given below. <b>Details of drilling equipment's are given below.</b>																							
		<table><tr><th>Type</th><th>Nos</th><th>Dia of hole (mm)</th><th>Size / Capacity</th><th>Make</th><th>Motive power</th><th>H.P</th></tr><tr><td>Jack Hammer</td><td>3</td><td>32 mm</td><td>Hand held</td><td>---</td><td>Diesel</td><td>--</td></tr><tr><td>Compressor</td><td>1</td><td>---</td><td>Air</td><td>--</td><td>Diesel</td><td>--</td></tr></table>	Type	Nos	Dia of hole (mm)	Size / Capacity	Make	Motive power	H.P	Jack Hammer	3	32 mm	Hand held	---	Diesel	--	Compressor	1	---	Air	--	Diesel	--
Type	Nos	Dia of hole (mm)	Size / Capacity	Make	Motive power	H.P																	
Jack Hammer	3	32 mm	Hand held	---	Diesel	--																	
Compressor	1	---	Air	--	Diesel	--																	

**(2) Loading Equipment:**

Type	Nos	Size / Capacity	Make	Motive power	H.P.
Hydraulic Excavator	1	2.9-4.5m <sup>3</sup>	--	Diesel	

**(3) Haulage and Transport Equipment**

(a) Haulage within the mining leasehold:

Type	Nos	Size / Capacity	Make	Motive power	H.P.
Tipper	7	--	--	Diesel	--

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

The dumpers are not used in this quarry; hence it's a small B2 category quarry.

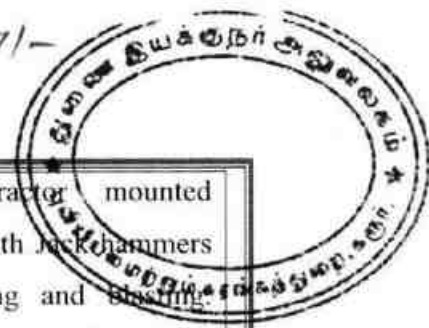
- a) Transport from mine head to the destination : Tipper will be used for transport rough stone from the mine head to needy customer.
- c. Describe briefly the transport system (please specify) : Hydraulic excavator and tippers utilized for internal transport sizeable rough stone lumps and deliver to the customer's area.
- d. Ore transported by : own trucks / hired trucks : Hired trucks for initially production purposes.
- e. Main destination to which ore is transported (giving to and from distance) : Excavated rough stone minerals directly will be used by the applicant in his own crusher for required size (i.e 1/4", 1/2", 1/3" and 1")  
The recovery of rough stone in this quarry is 100%.

f. Details of hauling / transport equipment:

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

**(4). Miscellaneous:****Describe briefly any allied operations and machineries related to the mining of the deposit not covered earlier.**

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



(B) Machineries deployed : Machineries like Tractor mounted compressor attached with Jackhammers is proposed to drilling and blasting. Hydraulic Excavators and tipper combination are adapted. (Refer Part-A-4 (i))

5. **BLASTING:**

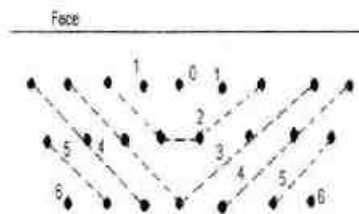
a) *Broad blasting parameters like charge per hole, blasting pattern, charge per delay, maximum number of holes blasted in a round, manner and sequence of firing, etc.*

**Blasting pattern:**

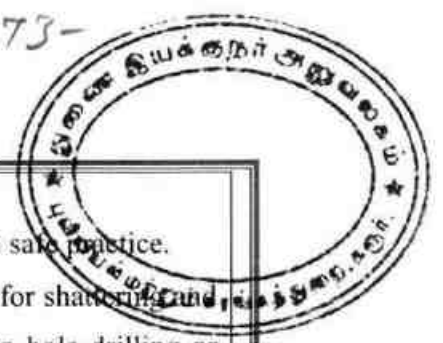
The quarrying operation is proposed to carried out by open cost, using jack hammer drilling followed by manual breaking will be adopted to release the rough stone and nonel blasting is proposed in this lease area.

Drilling and Blasting parameters are as follows,

1	Diameter of the hole	32 mm
2	Spacing between hole	1.2m
3	Burden for hole	1.0m
4	Depth of each hole	1.5m
5	Output per hole = Spacing × Burden × depth $1.2 \times 1.0 \times 1.5 = 1.8 \times 2.8$	5.04 T
6	Output per hole = $1.8 \times 2.8 = 5$ T	5 T
7	Production per annum $80111\text{m}^3 \times 2.8 = 224311$ T	224311 T
8	Total handling per day (280 working day)	801T
9	Nos. of holes per day ( $801/5.04 = 159$ )	159 holes
10	Meterage required per day ( $159 \times 5.5 = 874$ )	874meters
11	Charge per hole	0.5 kg
12	Powder factor ( $159\text{holes} \times 0.5 \text{ kg} = 79$ )	79 kg
13	Sequence of blasting = Cord relay with electric detonators / Nonel	--



Staggered method of mining



**b) Type of explosives used / to be used:**

Following explosives are recommended for efficient blasting with safe practice.

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

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

The control blasting measures is being adopted for minimizing ground vibration and fly rock. Shallow depths jackhammer drilling and blasting is proposed to be carried out with minimum use of explosive mainly to give hearing effect in rough stone for easy excavation and to control fly rock.

**Delay detonators:**

Delay blasting permits to divide the shot to smaller charges, which are detonated in a predetermined millisecond sequence at specific time intervals.

The major advantages of delay blasting are:

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

Blasting program for the production per day

No of holes	: 159holes
Yield	: 801 tons
Total explosive required	: 79kg-Slurry explosives
Charge per hole	: 0.5kg
Blasting at day time only	: 12.0p.m-1.0p.m

d) Powder factor in ore and overburden / waste / development heading / stope	: Powder factor is proposed as 0.5kg per holes of explosives
e) Whether secondary blasting is needed, if so describe it briefly	: Irrespective of the method of primary blasting employed, it may be necessary to re-blast a proportion of the rock on the quarry floor so as to reduce it to a size suitable for handling by the excavators and rock breakers.
f) Storage of explosives (like capacity and type of explosive	: 1. The applicant is advised to engage an authorized explosive agency to

*Adica*



magazine)	carry out blasting. 2. First Aid Box will be keeping ready at all the time. 3. Necessary precautionary announcement will be carried out before the blasting operation.
<b>6. MINE DRAINAGE</b>	
a) Likely depth of water table based on observations from nearby wells and water bodies	: The ground water table is reported as of 65m in rainy season and 70m in summer from the below ground level in the adjacent bore wells of the area.
b) Workings expected to be _____ m. above / reach below water table by the year _____	: Proposed ultimate depth of mining is 55m bgl. Now, the present Mining lease will be proposed above the water table and hence, quarrying may not affect the ground water.
c) Quantity and quality of water likely to be encountered, the pumping arrangements and places where the mine water is finally proposed to be discharged	: The ground water may not rise immediately in this type of mining. However, the rain water percolation and collection of water from the seepage will be less than 300 Lpm and it will be pumped out periodically by a stand by diesel powered Centrifugal pump motivated with 7.5 H.P. Motor. The quality of water is potable and doesn't contaminate with any hazardous things.
<b>7. STACKING OF MINERAL REJECTS AND DISPOSAL OF WASTE:</b>	
(a)	Indicate briefly the nature and quantity of top soil, overburden / waste and mineral rejects likely to be generated during the next five years:  No separate of topsoil will be removed and any other waste or side burden dumps are doesn't proposed.
(b)	Land chosen for disposal of waste with proposed justification : There is no waste are proposed.



(c)	Attach a note indicating the manner of disposal and configuration, sequence of buildup of dumps along with the proposals for the stacking of sub-grade ore, to be indicated year wise.	:	There is no waste or any other mineral dumps are proposed. If rough stone may be unsold will be keep within the lease boundary.
<b>8.</b>	<b>USE OF MINERAL:</b>		
(a)	Describe briefly the end-use of the mineral (sale to intermediary parties, captive consumption, export, industrial use)	:	The excavated stone materials will be supplied to the consumers like stone pillar, sized stone, etc. For instance, aggregates are mostly used for building, roads and footpaths., etc
(b)	Indicate physical and chemical specifications stipulated by buyers	:	Basically, the materials produced at this quarry are rough stone and the same are used for building stone, sized stone materials only, so there are no chemical specifications are specified. Only physical specifications are involved.
(c)	Give details in case blending of different grades of ores is being practiced or is to be practiced at the mine to meet specifications stipulated by buyers.	:	Not blending process is involved, after blasting the rough stone will be directly loaded to the needy customer.
<b>9.</b>	<b>OTHERS</b>		
(a)	<b>Describe briefly the following</b> Site services	:	Infrastructure required for such mines like office, stores, canteen, first aid station, shelter latrine and booth rooms have been provided as per the Metalliferous Mines Regulations, 1961 as a welfare amenity for our quarry laborers.





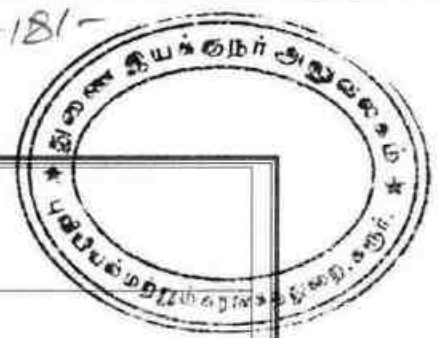
- (b) Employment potential :  
As per Mines safety under the provisions of Metalliferous Mines Regulations, 1961 and under the Mines Act, 1952, whenever the workers are employed more than 10, it is preferred to have a qualified mining mate to keep all the production workers directly under his control and supervision.

The following man power is proposed for quarrying stone material during the five years period the same manpower will be utilize for this mining plan period to achieve the proposed production and to comply the provisions of as per the MMR, 1961 norms.

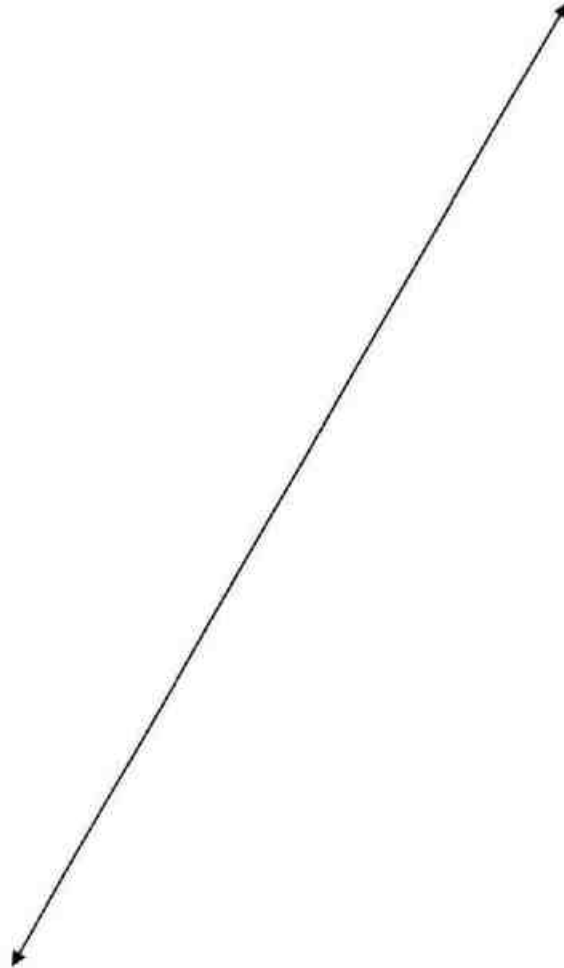
1.	Highly Skilled	Mines Manager	1No.
		Mine Engineer	1No.
		Mine Geologist	1No.
		Blaster	1No.
2.	Unskilled	Musdoor / Labours	12 No's
Total =			16 No's

**10 MINERAL PROCESSING/BENEFICIATIONS:**

- (a) If processing / beneficiations of the ore or minerals mined is planned to be conducted on site or adjacent to the extraction area, briefly describe the nature of the processing /beneficiation. This should indicate size and grade of feed material and concentrate (finished marketable product), recovery rate. : Excavated rough stone minerals directly will be used by the applicant in his own crusher for required size  $\frac{1}{2}$ ,  $\frac{3}{4}$  and  $1\frac{1}{2}$  inches Jelly which are mainly used in road and building construction purpose.  
The recovery of rough stone in this quarry is 100%.
- (b) Explain the disposal method for tailings or waste from the processing plant (quantity and quality of tailings proposed to be discharged, size and capacity of tailing pond, toxic effect of such tailings, if any, with process adopted to neutralize any such effect before their disposal and dealing of excess water from the tailing dam). : No water 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.
- (c) A flow sheet or schematic diagram of the processing procedure should be attached. : Not applicable.



(d)	Specify quantity and type of chemicals to be used in the processing plant.	: Not applicable
(e)	Specify quantity and type of chemicals to be stored on site / plant.	: Not applicable
(f)	Indicate quantity (cu.m. per day) of water required for mining and processing and sources of supply of water. Disposal of water and extent of recycling.	: Drinking is 0.5KLD, utilized water is 1.5KLD, Dust suppression is 1.5KLD and Green Belt is 1.5KLD. Minimum quantity of water 5.0KLD per day. It is proposed to make an own bore well for providing uninterrupted supply of RO drinking water, dust suppression and green belt development.  The sewage water to a tune of 0.8KLD generated from the mine office toilet and mine labour toilet will be diverted to the septic tank followed by soak pit.







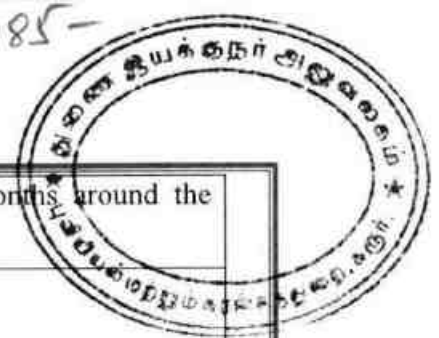
## PART – B

### 11.0 ENVIRONMENTAL MANAGEMENT PLAN :

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

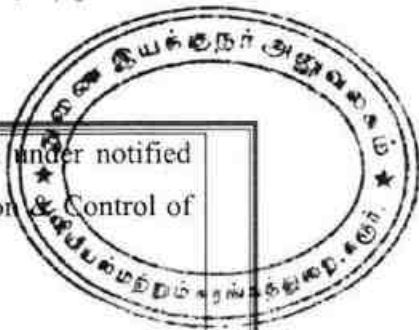
11.1	Existing land use pattern indicating the area already degraded due to quarrying /pitting, dumping, roads, processing plant, workshop, township etc in a tabular form. The present land use pattern is given as below.	<table border="1"> <thead> <tr> <th>Sl. No.</th><th>Land Use</th><th>Present area (Hect.)</th></tr> </thead> <tbody> <tr> <td>1.</td><td>Area under mining</td><td>1.86.5</td></tr> <tr> <td>2</td><td>Infrastructure</td><td>Nil</td></tr> <tr> <td>3</td><td>Road</td><td>0.03.0</td></tr> <tr> <td>4</td><td>Green belt &amp; Dump</td><td>Nil</td></tr> <tr> <td>5</td><td>Drainage &amp; Settling Tank</td><td>Nil</td></tr> <tr> <td>6</td><td>Un-utilized area</td><td>1.07.5</td></tr> <tr> <td colspan="2"><b>Grand total</b></td><td><b>2.97.0</b></td></tr> </tbody> </table>	Sl. No.	Land Use	Present area (Hect.)	1.	Area under mining	1.86.5	2	Infrastructure	Nil	3	Road	0.03.0	4	Green belt & Dump	Nil	5	Drainage & Settling Tank	Nil	6	Un-utilized area	1.07.5	<b>Grand total</b>		<b>2.97.0</b>
Sl. No.	Land Use	Present area (Hect.)																								
1.	Area under mining	1.86.5																								
2	Infrastructure	Nil																								
3	Road	0.03.0																								
4	Green belt & Dump	Nil																								
5	Drainage & Settling Tank	Nil																								
6	Un-utilized area	1.07.5																								
<b>Grand total</b>		<b>2.97.0</b>																								
11.2	Water Regime	: Water table in this area is noticed at a depth of 70m in summer and 65m in rainy season from the general ground level and presently the quarrying of rough stone is proposed up to a depth of 55m bgl. Hence, it will not affect the ground water depletion of this area. It is made own borewell for providing uninterrupted supply of RO drinking water, dust suppression and green belt development.																								
11.3	Flora and Fauna	: There is no major flora observed in this area and except acacia bushes, no other valuable trees are noticed in the lease area. Further, neither flora of botanical interest nor fauna of zoological interest is noticed in this area.																								
11.4	Quality of air, ambient noise level and water	: Air or dust expected to be generated from drilling process, hauling roads, places of excavation etc., will be suppressed by periodical wetting of land by water spraying. Quarrying of rough stone will be carried out by drilling and blasting by using low power explosives, and hence, noise will be very minimum. However, periodical noise level monitoring will be																								

*Signature*



			carried out every six months around the quarry site.																									
11.5	<p><b>Climatic conditions:</b></p> <p><b>Climate:</b></p> <p>The district receives the rain under the influence of both Southwest and Northeast monsoons. The Northeast monsoon chiefly contributes to the rainfall in the district. Most of the precipitation occurs in the form of cyclonic storms caused due to the depressions in Bay of Bengal. The Southwest monsoon rainfall is highly erratic and summer rains are negligible. The average annual rainfall over the district varies from about 620 mm to 745 mm.</p> <p><b>Rainfall:</b></p> <p>The annual rainfall normal (1970-2000) of Karur district is 742 mm.4 Projections of rainfall over Karur for the periods 2010-2040 (2020s), 2040- 2070 (2050s) and 2070-2100 (2080s) with reference to the baseline (1970-2000) indicate a general decrease of 4.0%, 3.0% and 11.0% respectively.</p>																											
11.6	<p><b>Human Settlement:</b></p> <p>The nearest villages are found in the buffer zone with population as per 2011 census.</p> <table><tr><th>S.N</th><th>Village</th><th>Direction</th><th>Distance in Kms</th><th>Population</th></tr><tr><td>1</td><td>Kunthanipalayam</td><td>North</td><td>1.17km</td><td>2250</td></tr><tr><td>2</td><td>Pudukkanalli</td><td>East</td><td>1.18km</td><td>1253</td></tr><tr><td>3</td><td>Salipalayam</td><td>South</td><td>2.4km</td><td>1450</td></tr><tr><td>4</td><td>Kuppam</td><td>West</td><td>2.06km</td><td>3113</td></tr></table>			S.N	Village	Direction	Distance in Kms	Population	1	Kunthanipalayam	North	1.17km	2250	2	Pudukkanalli	East	1.18km	1253	3	Salipalayam	South	2.4km	1450	4	Kuppam	West	2.06km	3113
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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, sanctuaries etc., are found around 10km radius.																									
11.8	Attach plans showing the locations of sampling stations	:	The proposed ambient air quality, water quality ambient noise level and vibration are periodically tested for every season (6 months once) around 5km radius as per the guidance of MoEF and EIA notification 2006 and also covering DGMS norms.																									

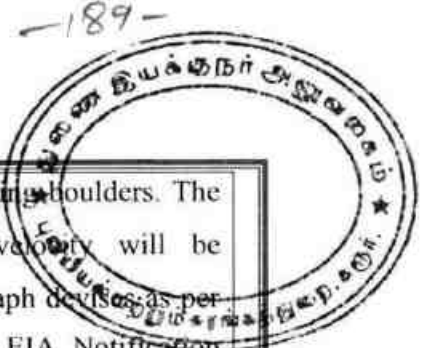
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11.9	Does area (partly or fully) fall under notified area under Water (Prevention & Control of Pollution), Act, 1974	: The proposed area not fall under notified area under water (Prevention & Control of Pollution), Act, 1974
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**b)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

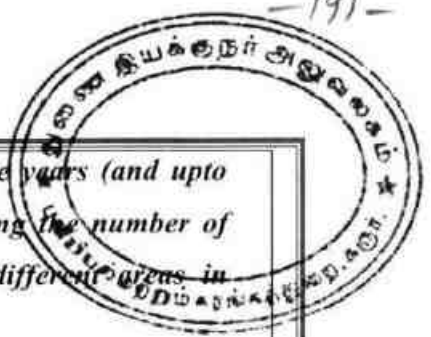
i)	<b>Land area indicating the area likely to be degraded due to quarrying / pitting, dumping, roads, workshop, processing plant, township etc:</b> Due to quarrying and exploitation of the rough stone, there will impact in the form i.e. change in the ground profile, pits, and dumps. The details of the land use pattern, during the ensuing plan period and till lease period is shown in the tabular form:																									
	<table border="1"> <thead> <tr> <th>Sl. No.</th><th>Land Use</th><th>Area in use during the quarrying period (Hect)</th></tr> </thead> <tbody> <tr> <td>1.</td><td>Area under mining</td><td>1.85.5</td></tr> <tr> <td>2</td><td>Infrastructure</td><td>0.02.0</td></tr> <tr> <td>3</td><td>Road</td><td>0.05.0</td></tr> <tr> <td>4</td><td>Green belt</td><td>0.62.5</td></tr> <tr> <td>5</td><td>Drainage &amp; Settling Tank</td><td>0.05.0</td></tr> <tr> <td>6</td><td>Un-utilized area</td><td>0.37.0</td></tr> <tr> <td colspan="2"><b>Grand total</b></td><td><b>2.97.0</b></td></tr> </tbody> </table>	Sl. No.	Land Use	Area in use during the quarrying period (Hect)	1.	Area under mining	1.85.5	2	Infrastructure	0.02.0	3	Road	0.05.0	4	Green belt	0.62.5	5	Drainage & Settling Tank	0.05.0	6	Un-utilized area	0.37.0	<b>Grand total</b>		<b>2.97.0</b>	
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ii).	Air Quality	Air or dust expected to be generated from drilling process, hauling roads, places of excavation etc., will be suppressed by periodical wetting of land by water spraying.																								
iii).	Water quality	A water sample from the open/bore wells was tested to NABL approved lab to assess hardness, Salinity, colour, Specific gravity, etc.																								
iv).	Noise levels	Quarrying of rough stone will be carried out by drilling and blasting by using low power explosives, and hence, noise will be very minimum. However, periodical noise level monitoring will be carried out every six months around the quarry site.																								
v).	Vibration levels (due to blasting)	No deep hole blasting envisaged. Small dia																								



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

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

i).	Temporary storage and utilization of topsoil	:	There is no topsoil will be removed.
ii).	Year wise proposal for reclamation of land affected by abandoned quarries and other mining activities during first five years (and upto conceptual plan period for 'A' category mines) clarifying the extent of back filling and re-contouring and / or alternative use of unfilled / partially filled excavations / road sides / slopes and mine. In case abandoned quarries/ pits are proposed to be used as reservoir, their size, water holding capacity and proposal for utilization of such water be given.	:	The present mining is proposed to an average depth of 55m bgl has been envisaged as workable depth for safe & economic mining during the lease period. The mined-out area will be fenced on top of working bench with S1 fencing. No immediate proposals for closure of pit as the rough stone persist still at deeper level.



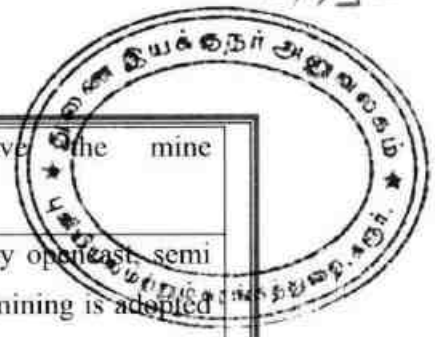
iii) *Programme of afforestation, Yearwise for the initial five years (and upto conceptual plan period for 'A' category mines) indicating the number of plants with name of species to be afforested under different areas in hectares.*

**Green Belt Development:**

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

Year	Place	Area in Sq.m	No.of Plants	Rate of survival	Rate	Amount in Rs
First	Lease Boundary	6250	695	80%	@100 Rs Per sapling	69500/-
Second	Approach road and Nearby Village Road	--	300	80%		30000/-
Third	Schools	--	300	80%		30000/-
Total						1,29,500/-

iv).	Stabilization and vegetation of dumps along with waste dump management Year wise for the first five years (and up to conceptual plan period for 'A' category mines).	:	No waste or rejects removed in this lease area.
v).	Measures to control erosion / sedimentation of water courses.	:	Not applicable. There are no major dumps are stabilized in this quarry area.
vi).	Treatment and disposal of water from mine.	:	It will not be harmful and it does not require any treatment before discharging into the natural courses.
vii).	Measures for minimizing adverse effects on water regime.	:	<p>There is no water to be pumped out will be very pure and portable and therefore, it will not affect any water regime surrounding the quarry. The worked-out pit will be protected with barbed wire and the mined-out pit will be used as storage rain water pit.</p> <p>The open pit will be used as rain water storage structure to augment groundwater</p>



		levels which improve the mine environment.
viii).	Protective measures for ground vibrations / air blast caused by blasting,	: It is a small B2 category open cast, semi mechanized method of mining is adopted 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.

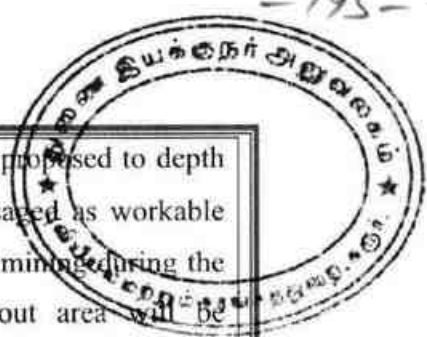
**d). Monitoring schedules for different environmental components after the commencement of mining and other related activities. (for 'A' category mines only)**

Not applicable. It is B2 category quarry

#### **12.0 PROGRESSIVE QUARRY CLOSURE PLAN:**

12.1	Steps proposed for phased restoration, reclamation of already mined out area.	: The Ultimate mining is proposed to an average depth of 55m bgl. The mined-out area will be fenced on top of working bench with S1 fencing to arrest the entry of cattle's and public in to the quarry site.
12.2	Measures to be under taken on mine closure as per Act & Rules	: Measures will be taken as per the Acts and Rules. Green belt development at the rate of 695 trees will be proposed in the quarry area. No immediate proposals for closure of pit as the rough stone persist still at deeper level.
12.3	Mitigation measures to be undertaken for safety and restoration/ reclamation of the already mined out area	: The quarry lease is an existing mining lease. No mitigation measures adopted.





12.4	Mine closure activity	:	The present mining plan is proposed to depth of 55m bgl has been envisaged as workable depth for safe & economic mining during the lease period. The mined-out area will be fenced on top of open cast working with S1 fencing. No immediate proposals for closure of pit as the rough stone persist still at deeper level.
12.5	Safety and security	:	Safety measures implement to the prevent access to surface opening excavations will be taken as Metalliferous mine regulations, 1961, it is a small open cast mining method adopted. Safety provisions like helmet, goggles, safety shoes, Dust mask, Ear muffs etc have to be provided as per the circulars and amendments made for Mine labours under the guidance of DGMS being a mechanized operation.
12.6	Disaster management and Risk Assessment	:	Open cast semi mechanized method of mining is adopted in this quarry. If the benches are made with proposed height and with no risk will be there. Even then if any minor or major accident happens the quarry staffs having First aid facilities with first aid box with all necessary medicine and stretches etc., to give first aid treatment at the site and will arrange immediately the vehicle to reach nearest hospital, if any disaster happens the lessee is capable to meet such eventualities. At the time of any accident during mining activity, proposal of first aid facility at quarry and one vehicle always ready at quarry site.
12.7	Care and maintenance during temporary discontinuance	:	A board of discontinuance will be changed on the main entrance of the working place. One watch man will be kept on the quarry area for

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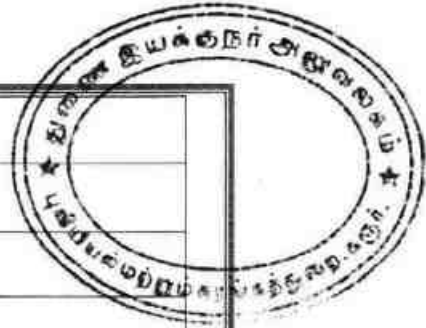
		security purposes also look after the survival of the plants.
12.8	Economic repercussions of closure of quarry and manpower entrenchments	: During the five years mining period the employment potential will be generated, general financial status and socio-economic conditions of approx. 16 labors will be improved.
12.9	Reclamation and Rehabilitation	: Land degradation is one of the major adverse impacts of open-cast mining activities and any effort to control adverse impacts would be incomplete without appropriate land reclamation strategy. After the exhaustion of entire mineable rough stone, mined out pit will be converted in fish culture or storage of rain water reservoir purposes.

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

<b>A</b>	<b>Fixed Asset Cost:</b>	
	1. Land Cost (Consent land)	: Rs. 4,00,000/-
	2. Labour Shed	Rs. 1,50,000/-
	3. Sanitary Facility	: Rs. 1,50,000/-
	4. Fencing	: Rs. 4,00,000/-
	5. Other expenses (Security guard, dust bin, etc)	: Rs. 3,00,000/-
	<b>Total</b>	<b>: Rs. 14,00,000/-</b>
<b>B</b>	<b>B. Machinery cost</b>	<b>: Rs. 30,00,000/- (Hire Basis)</b>
<b>C</b>	<b>Total Expenditure of EMP cost (for five years)</b>	
	1. Drinking Water Facility	: Rs. 1,50,000/-
	2. Sanitary facility & Maintenance	: Rs. 50,000/-
	3. Permanent water sprinkler	: Rs. 1,00,000/-

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4. Afforestation and its maintenance	:	Rs. 1,29,500/-
5. Safety Kits	:	Rs. 50,000/-
6. Provision of tyre washing facility	:	Rs. 75,000/-
7. Surface runoff management structures like garland drain, settling pond & Bund (0.05.0Hect or 500Sq.m X 400	:	Rs. 2,00,000/-
8. Blasting materials with blast mat cost	:	Rs. 10,00,000/-
9. Environment monitoring	:	Rs. 5,00,000/-
<b>Total</b>	:	<b>Rs. 22,54,500/-</b>
<b>D Total Project Cost (A+B+C)</b>	:	<b>Rs. 66,54,500/-</b>

**13.0 FINANCIAL ASSURANCE:**

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

**14.0 CERTIFICATES:**

All required certificates are enclosed.

**15.0 PLAN AND SECTIONS, ETC:**

Plan and Sections are submitted along with mining plan.

**16.0 ANY OTHER DETAILS INTEND TO FURNISH BY THE APPLICANT:**


- (i) Care and precautionary measures will be taken for the safety of workers as per Rules and Acts.
- (ii) The applicant will endeavor every attempt to quarry the rough stone economically without any wastage and to improve the environment and ecology.
- (iii) The mining plan is prepared by incorporating the conditions stipulated in the precise area communication issued by the Deputy Director of Geology and Mining, Karur vide letter **Rc.No.424/Mines/2021 Dated: 12.01.2023.**
- (iv) Total proposed production of **403983m<sup>3</sup>**. Of which, rough stone is about **400555m<sup>3</sup>** and gravel is about **3428m<sup>3</sup>** up to a depth of 55m below the ground level (R.L.160m-105m) for five years plan period. Average production is **80111m<sup>3</sup>** of rough stone per year.

**17.0 CSR Expenditure:**

CSR (Corporate Social responsibility) shall provide by the applicant @ 2.0% of average net profit of the company for the last three financial years to the nearest 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: 19/11/23



Signature of the Recognized Qualified Person

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

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

Deputy Director of Geology and Mining  
Karur District

This Mining Plan is approved subject to the conditions/stipulations indicated in the Mining Plan approval Letter No: 424/mines/2021 Dated: 31/01/2023

31/01/2023





ந.க.எண். 424/கனிமம்/2021

மாவட்ட ஆட்சியர் அலுவலகம்,  
புவியியல் மற்றும் சுரங்கத்துறை,  
கரூர்

நாள்.12.01.2023.

குறிப்பாணை

**பொருள்:** கனிமங்களும் குவாரிகளும் - கரூர் மாவட்டம் - புகளூர் வட்டம் - வேட்டமங்கலம் (மேற்கு) கிராமம் - பட்டா புல எண். 1238/2 (பகுதி) 2.97.0 ஹெக்டேர் பரப்பில் - சாதாரணகல் மற்றும் கிராவல் குவாரி குத்தகை உரிமம் வேண்டி தி/ள்.திருமலை புளமுட்டல்ஸ் என்ற நிறுவனத்தினர் விண்ணப்பம் செய்தது - உரிமம் வழங்க பரிந்துரை செய்யப்பட்டது - தகுதியான நிலப்பரப்பாக கருதி ஏற்பளிக்கப்பட்ட சுரங்க திட்டம் மற்றும் சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணைய இசைவினை பெற்று சமர்ப்பிக்கக் கோருதல் - தொடர்பாக.

- பார்வை:**
1. தி/ள்.திருமலை புளமுட்டல்ஸ், நெ.538/4, பூலான்காடு, குப்பம் அஞ்சல், புகளூர் வட்டம், கரூர் மாவட்டம் என்ற நிறுவனத்தின் விண்ணப்ப நாள்: 28.09.2021
  2. வருவாய் கோட்டாட்சியர், கரூர் அவர்களின் கடிதம் ந.க.எண். அ1/4055/2021, நாள்:31.01.2022
  3. உதவி புவியியலாளர், புவியியல் மற்றும் சுரங்கத்துறை, கரூர் என்பவரது புலத்தணிக்கை அறிக்கை நாள்:29.12.2022.
  4. அரசாணை (பல்வகை) எண். 169, தொழில் (எம்.எம்.சி-1) துறை நாள்: 04.08.2020 இணைத்து வரப்பெற்றுள்ளது. (தமிழ்நாடு அரசிதழ் சிறப்பு வெளியீடு எண். 315 நாள்: 04.08.2020).

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கரூர் மாவட்டம், புகளூர் வட்டம், வேட்டமங்கலம் (மேற்கு) கிராமம், பட்டா புல எண். 1238/2 (பகுதி) 2.97.0 ஹெக்டேர் பரப்பு நிலத்திலிருந்து ஐந்து ஆண்டுகளுக்கு சாதாரண கற்கள் மற்றும் கிராவல் வெட்டியெடுக்க கரூர் மாவட்டம், புகளூர் வட்டம், குப்பம் அஞ்சல், நெ.538/4, பூலான்காடு என்ற முகவரியில் உள்ள தி/ள்.திருமலை புளமுட்டல்ஸ் என்ற நிறுவனத்தினர் பார்வை 1-இல் கண்டுள்ளவாறு விண்ணப்பம் செய்துள்ளனர்.

மேற்படி விண்ணப்பம் தொடர்பாக, வருவாய் கோட்டாட்சியர், கரூர் மற்றும் உதவிப் புவியியலாளர், புவியியல் மற்றும் சுரங்கத்துறை, கரூர் ஆகியோர் புலத்தணிக்கை மேற்கொண்டு கரூர் மாவட்டம், புகளூர் வட்டம், வேட்டமங்கலம்

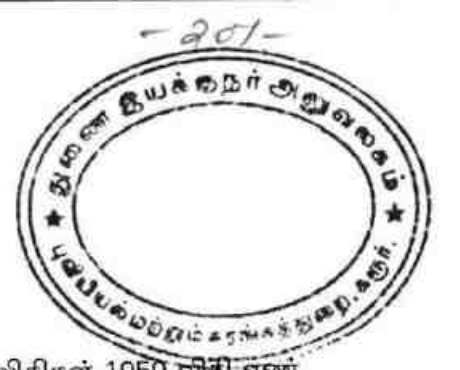
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(மேற்கு) கிராமம், பட்டா புல எண். 1238/2 (பகுதி) 2.97.0 ஹெக்டேர் பரப்பில் தமிழ்நாடு சிறு கனிமச் சலுகை விதிகளில் விதி எண்கள்.19-(1) 20 மற்றும் 33-இன் கீழ் தி/ள்.திருமலை புளூமெட்டல்ஸ் என்ற நிறுவனத்திற்கு ஐந்து ஆண்டுகளுக்கு சாதாரணக்கல் மற்றும் கிராவல் குவாரி உரிமம் வழங்க கீழ்க்கண்ட நிபந்தனைகளுக்குட்பட்டு அனுமதி வழங்கலாம் என பரிந்துரை செய்துள்ளனர்.

1. விண்ணப்ப புலத்திற்கு அருகில் உள்ள பட்டா நிலங்களுக்கு 7.5 மீட்டர் மற்றும் புறம்போக்கு நிலத்திற்கு 10 மீட்டர் பாதுகாப்பு இடைவெளி விட்டு யாதொரு சேதமுமின்றி முறையாக குவாரிப்பணி செய்ய வேண்டும்.
2. குத்தகைக்காலத்தில் கைத்துளைப்பான் கருவி கொண்டு பாறைகளை துளையிட்டும், மிதமான வெடிபொருள் பயன்படுத்தியும், பொதுமக்களுக்கோ, பொது சொத்துக்களுக்கோ யாதொரு சேதமுமின்றி விதிமுறைகளின்படி குவாரிப்பணி செய்ய வேண்டும்.
3. குவாரித் தொழிலாளர்களின் பாதுகாப்பினை உறுதி செய்ய Mettalliferous Mines, விதிகளின்படி அகலமானதும், பாதுகாப்பானதுமான Benches அமைத்து பாதுகாப்பான முறையில் குவாரிக்குள் வாகனங்கள் சென்றுவரவும் மற்றும் குவாரி தொழிலாளர்களின் பாதுகாப்பினை உறுதி செய்தும் குவாரிப்பணி செய்ய வேண்டும்.
4. குவாரி குத்தகை வழங்க ஏதுவாக துணை இயக்குநர் (சுரங்கம்) அவர்களால் ஏற்பளிக்கப்பட்ட சுரங்கத்திட்டத்தினையும், மாநில அளவிலான சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையத்தின் (SEIAA) இசைவினை பெற்று மாவட்ட நிர்வாகத்திற்கு விண்ணப்பதாரர் நிறுவனத்தினரால் சமர்ப்பிக்கப்பட வேண்டும்.

எனவே, வருவாய் கோட்டாட்சியர், கரூர் மற்றும் உதவிப் புவியியலாளர், புவியியல் மற்றும் சுரங்கத்துறை, கரூர் ஆகியோரின் பரிந்துரைகள் மற்றும் நிபந்தனைகளின் அடிப்படையில் கரூர் மாவட்டம், புகளூர் வட்டம், வேட்டமங்கலம் (மேற்கு) கிராமம், பட்டா புல எண். 1238/2 (பகுதி) 2.97.0 ஹெக்டேர் பரப்பில் 1959-ஆம் வருட தமிழ்நாடு சிறுகனிம விதிகள், விதி எண். 19(1), 20 மற்றும் 33-இன்படியும் மேலும் மேற்கண்ட நிபந்தனைகளுக்கும் உட்பட்டு 5 (ஐந்து) சாதாரணக்கற்கள் மற்றும் கிராவல் குவாரி உரிமம் தி/ள்.திருமலை புளூமெட்டல்ஸ் என்ற நிறுவனத்திற்கு அரிதியிட்ட (Precise area) நிலப்பரப்பாக கருதப்படுகிறது.



அதற்கிணங்க, தமிழ்நாடு சிறு கனிம சலுகை விதிகள்-1959 விதி எண். 41-இன்படி குவாரிப்பணி மேற்கொள்வது தொடர்பாக வரைவு சுரங்க திட்டத்தினை 90 தினங்களுக்குள் சமர்ப்பிக்குமாறு தி/ள்.திருமலை புளூமெட்டல்ஸ் நிறுவனத்தினர் கேட்டுக்கொள்ளப்படுகின்றனர். மேலும் ஏற்பளிக்கப்பட்ட சுரங்கத்திட்டத்தின் தொடர்ச்சியாக 1959-ஆம் வருடத்திய தமிழ்நாடு சிறுகனிம சலுகை விதிகள், விதி எண்.42-இன்படி சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையத்தின் இசைவினைப் பெற்று சமர்ப்பிக்கும் பட்சத்தில் மட்டுமே குவாரி உரிமம் வழங்கப்படும் என இதன் மூலம் தெரிவிக்கப்படுகிறது.

12/01/2023  
துணை இயக்குநர்,  
புவியியல் மற்றும் சுரங்கத்துறை,  
கரூர்.

பெறுநர்

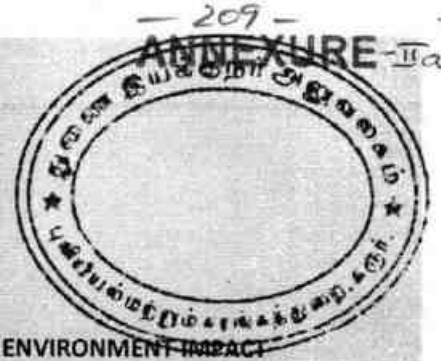
தி/ள்.திருமலை புளூமெட்டல்ஸ்,  
நெ.538/4,  
பூலான்காடு,  
குப்பம் அஞ்சல்,  
புகளூர் வட்டம்,  
கரூர் மாவட்டம்.

12/01/2023

நகல்:-

1. மாநில சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையம், சென்னை.
2. ஆணையர், புவியியல் மற்றும் சுரங்கத்துறை, கிண்டி, சென்னை.





**Dr. S. KALYANASUNDARAM ,I.F.S.(Retd.)**  
**CHAIRMAN**

**STATE LEVEL ENVIRONMENT IMPACT**  
**ASSESSMENT AUTHORITY - TAMIL NADU**  
3rd Floor, Panagal Maaligai,  
No.1 Jeenis Road, Saidapet,  
Chennai-15.  
Phone No.044-24359974  
Fax No. 044-24359975

**ENVIRONMENTAL CLEARANCE**

**Lr. No.SEIAA-TN/F.No.4628/1(a)/ EC.No: 3767/2016 dated: 26.09.2016**

To  
M/S.Thirumalai Blue Metals  
No.538/4  
Poolan Kadu  
Kuppam post  
Aravakurichi Taluk,  
Karur



Sir,

**Sub:** SEIAA-TN – Proposed **Rough Stone** quarry located at S.F.No 1238/2, Vettamangalam (West ) Village,Manmangalam Taluk, Karur District- issue of Environmental Clearance – Reg.

**Ref:** 1. Your Application for Environmental Clearance dt: 15.10.2015  
2. Minutes of the 78th SEAC held on 22.07.2016  
3. Minutes of the SEIAA meeting held on 26.09.2016

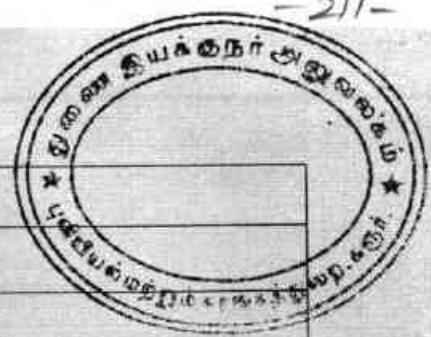
**Details of Minor Mineral Activity:-**

This has reference to your application first cited. The proposal is for obtaining environmental clearance for mining/quarrying of minor minerals based on the particulars furnished in your application as shown below.

<b>1</b>	<b>Name of Project Proponent and address</b>	M/S.Thirumalai Blue Metals No.538/4 Poolan Kadu Kuppam post Aravakurichi Taluk, Karur
<b>2</b>	<b>Location of the Proposed Activity</b>	
	Survey Number	1238/2
	Latitude and Longitude	11°00'51.90"N to 11°01'51.90"N 77°56'41.99"E to 77°56'49.04"E
	Village	Vettamangalam (West )

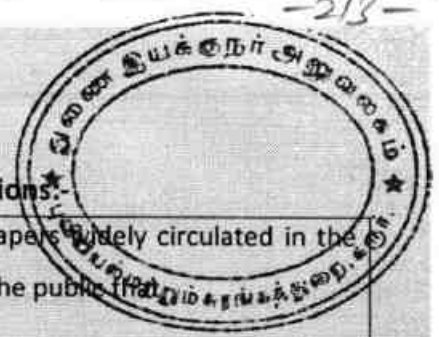
*Kalyanab*  
**CHAIRMAN**  
**SEIAA-TN**

*26/9/16*



	Taluk	Manmangalam
	District	Karur
<b>3</b>	<b>Proposed Activity</b>	
	i. Minor mineral	Rough Stone
	ii. Mining Lease Area	4.80.0 Ha
	iii. Approved quantity	63494 cu.m of Rough Stone & 8832 cu.m of Topsoil
	iv. Depth of Mining	17 m
	v. Type of mining	Opencast Semi Mechanized Method
	vi. Category(B1/B2)	B2
	vii. Precise area communication	Rc.No. 299/Mines/2015 dated 11.09.2015
	viii. Mining plan approval	Deputy Director Rc.No. 299/Mines/2015 dated 08.10.2015
	ix. Mining lease period	5 Years
<b>4</b>	<b>Whether Project area attracts any General conditions specified in the EIA notification, 2006 as amended:-</b>	Not attracted. Affidavit furnished
<b>5</b>	<b>Man Power requirement per day:</b>	18 Employees
<b>6</b>	<b>Utilities</b>	
	i. Source of Water :	Mineral water industries/Water suppliers
	ii. Quantity of Water Requirement in KLD:	
	a. Domestic	0.750KLD
	b. Industrial	} 1.750KLD
	c. Green Belt & Dust Suppression	
	iii. Power Requirement:	
	a. Domestic Purpose	TNEB
	b. Industrial Purpose	
<b>7</b>	<b>Cost</b>	
	i. Project Cost	Rs.22.50 Lakhs
	ii. EMP Cost	Rs.3.50 Lakhs
<b>8</b>	<b>Public Consultation:-</b>	Not required as per O.M. dated 24.12.2013 of MoEF, Gol.
<b>9</b>	<b>Date of Appraisal by SEAC:- Agenda No:</b>	22.07.2016 78-15
<b>10</b>	<b>Date of Review/Discussion by SEIAA and the Remarks:-</b>	The proposal was placed before the SEIAA in its 193 <sup>rd</sup> Meeting held on 26.09.2016 and the Authority after careful consideration, decided to grant environmental clearance to the said project Mining of Rough Stone subject to terms and conditions stipulated under the provisions of Environment Impact Assessment Notification, 2006 as amended.
<b>11</b>	<b>Validity:</b>	The Environmental Clearance will be coterminous with the mine lease period or limited to a maximum period of 5 Years from the date of issue whichever is earlier.

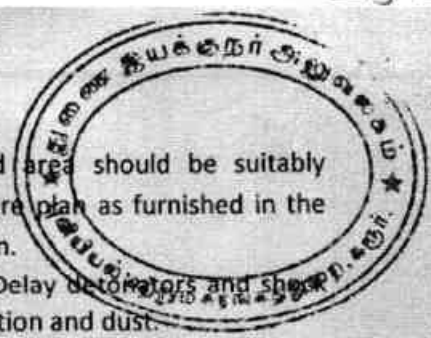




**Conditions to be Complied before commencing mining operations:-**

1. The project proponent shall advertise in at least two local newspapers widely circulated in the region, one of which shall be in the vernacular language informing the public that:
  - I. The project has been accorded Environmental Clearance.
  - II. Copies of clearance letters are available with the Tamil Nadu Pollution Control Board.
  - III. Environmental Clearance may also be seen on the website of the SEIAA.
  - IV. The advertisement should be made within 7 days from the date of receipt of the clearance letter and a copy of the same shall be forwarded to the SEIAA.
2. The applicant has to obtain land use classification as industrial use before issue/renewal of mining lease.
3. NOC from the Standing committee of the NBWL shall be obtained, if protected areas are located within 10 Km from the proposed project site.
4. The project proponent shall comply the conditions laid down in the Section V, Rule 36 of Tamil Nadu Minor Minerals Concession Rules 1959.
5. A copy of the Environment Clearance letter shall be sent by the proponent to the concerned Panchayat, Town Panchayat / Panchayat union/ Municipal Corporation, Urban Local Body and the Local NGO, if any, from whom suggestions/ representations, if any, were received while processing the proposal. The clearance letter shall also be put on the website of the proponent and also kept at the site, for the general public to see.
6. Quarry lease area should be demarcated on the ground with wire fencing to show the boundary of the lease area on all sides with red flags on every pillar shall be erected before commencement of quarrying.
7. The proponent shall ensure that First Aid Box is available at site.
8. The excavation activity shall not alter the natural drainage pattern of the area.
9. The excavated pit shall be restored by the project proponent for useful purposes.
10. The proponent shall quarry and remove only in the permitted areas as per the approved Mining Plan details.
11. The quarrying operation shall be restricted between 7AM and 5 PM.
12. The proponent shall take necessary measures to ensure that there shall not be any adverse impacts due to quarrying operation on the nearby human habitations, by way of pollution to the environment.
13. A minimum distance of 15 mts. From any civil structure shall be kept from the periphery of any excavation area.
14. Depth of quarrying shall be 2m above the ground water table /approved depth of mining whichever is lesser to be considered as a safe guard against Environmental Contamination and over exploitation of resources.

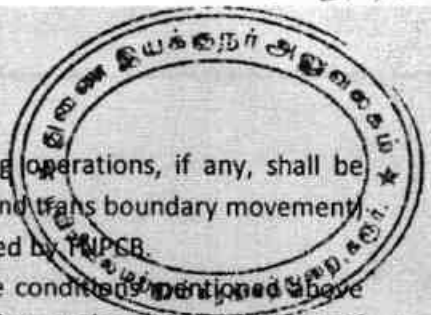




15. The mined out pits should be backfilled where warranted and area should be suitably landscaped to prevent environmental degradation. The mine closure plan as furnished in the proposal shall be strictly followed with back filling and tree plantation.
16. Wet drilling method is to be adopted to control dust emissions. Delay detonators and shock tube initiation system for blasting shall be used so as to reduce vibration and dust.
17. Drilling and blasting shall be done only either by licensed explosive agent or by the proponent after obtaining required approvals from Competent Authorities.
18. The explosives shall be stored at site as per the conditions stipulated in the permits issued by the licensing Authority.
19. Blasting shall be carried out after announcing to the public adequate through public address system to avoid any accident.
20. A study has to be conducted to assess the optimum blast parameters and blast design to keep the vibration limits less than prescribed levels and only such design and parameters should be implemented while blasting is done. Periodical monitoring of the vibration at specified location to be conducted and records kept for inspection.
21. The Proponent shall take appropriate measures to ensure that the GLC shall comply with the revised NAAQ norms notified by MoEF, GoI on 16.11.2009.
22. The following measures are to be implemented to reduce Air Pollution during transportation of mineral
  - i. Roads shall be graded to mitigate the dust emission.
  - ii. Water shall be sprinkled at regular interval on the main road and other service roads to suppress dust
23. The following measures are to be implemented to reduce Noise Pollution
  - i. Proper and regular maintenance of vehicles and other equipment
  - ii. Limiting time exposure of workers to excessive noise.
  - iii. The workers employed shall be provided with protection equipment and earmuffs etc.
  - iv. Speed of trucks entering or leaving the mine is to be limited to moderate speed of 25 kmph to prevent undue noise from empty trucks.
24. Measures should be taken to comply with the provisions laid under Noise Pollution (Regulation and Control) (Amendment) Rules, 2010, dt: 11.01.2010 issued by the MoE&F, GoI to control noise to the prescribed levels.
25. Suitable conservation measures to augment groundwater resources in the area shall be planned and implemented in consultation with Regional Director, CGWB. Suitable measures should be taken for rainwater harvesting.
26. Permission from the competent authority should be obtained for drawl of ground water, if any, required for this project.
27. Topsoil, if any, shall be stacked properly with proper slope with adequate measures and should be used for plantation purpose.
28. The following measures are to be adopted to control erosion of dumps:-
  - i. Retention/ toe walls shall be provided at the foot of the dumps.
  - ii. Worked out slopes are to be stabilized by planting appropriate shrub/ grass species on the slopes.

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 CHAIRMAN  
 SEIAA-TN



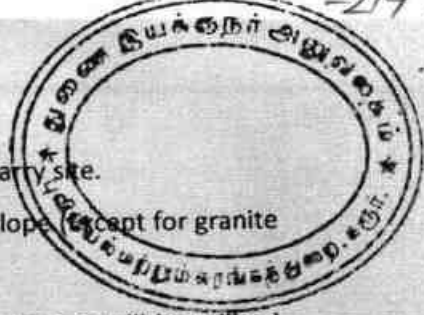
29. Waste oils, used oils generated from the EM machines, mining operations, if any, shall be disposed as per the Hazardous Wastes (Management, Handling, and trans boundary movement) Rules, 2008 and its amendments thereof to the recyclers authorized by TNPCB.
30. Concealing the factual data or failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract action under the provisions of Environment (Protection) Act, 1986.
31. Rain water harvesting to collect and utilize the entire water falling in land area should be provided.
32. Rain water getting accumulated in the quarry floor shall not be discharged directly to the nearby stream or water body. If it is to be let into the nearby water body, it has to be discharged into a silt trap on the surface within the lease area and only the overflow after allowing settling of soil be let into the nearby waterways. The silt trap should be of sufficient dimensions to catch all the silt water being pumped out during one season. The silt trap should be cleaned of all the deposited silt at the end of the season and kept ready for taking care of the silt in the next season.
33. The lease holder shall undertake adequate safeguard measures during extraction of material and ensure that due to this activity, the hydro-geological regime of the surrounding area shall not be affected. Regular monitoring of ground water level and quality shall be carried out around the mine lease area during the mining operation. If at any stage, if it is observed that the groundwater table is getting depleted due to the mining activity; necessary corrective measures shall be carried out. District Collector/mining officer shall ensure this.
34. No tree-felling shall be done in the leased area, except only with the permission from competent Authority.
35. To take up environmental monitoring of the proposed quarry site before, during and after the mining activities including vibration study data, water, air & flora/fauna environment, slurry water generated/disposed and method of disposal, involving a reputed academic Institution.
36. It shall be ensured that the total extent of nearby quarries(existing, abandoned and proposed) located within 500 meter radius from the periphery of this quarry is not exceeding 25 hectares within the mining lease period of this application.
37. It shall be ensured that there is no habitation is located within 300 meter radius from the periphery of the quarry site and also ensure that no hindrance will be caused to the people of the habitation located within 500m radius from the periphery of the quarry site
38. Ground water quality monitoring should be conducted once in 3 Months
39. Transportation of the quarried materials shall not cause any hindrance to the Village people/Existing Village road.
40. Free Silica test should be conducted and reported to TNPCB, Department of Geology and Mining and Regional Director, MoEF , GOI.
41. Air sampling at intersection point should be conducted and reported to TNPCB, Department of Geology and Mining and Regional Director, MoEF , GOI..
42. Bunds to be provided at the boundary of the project site.
43. The project proponent shall undertake plantation/afforestation work by planting the native species on all side of the lease area at the rate of 400/Ha. Suitable tall tree saplings should be planted on the bunds and other suitable areas in and around the work place.

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26/9/16

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CHAIRMAN  
SEIAA-TN



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44. At least 10 Neem trees should be planted around the boundary of the quarry site.
  45. Floor of excavated pit to be levelled and sides to be sloped with gentle slope (except for granite quarries) in the mine closure phase.
  46. The Project Proponent shall ensure a minimum of 2.5% of the annual turnover will be utilized for the CSR Activity
  47. The Project Proponent shall provide solar lighting system to the nearby villages
  48. The Project Proponent shall comply with the mining and other relevant rules and regulations where ever applicable.
  49. Rainwater shall be pumped out Via Settling Tank only
  50. Earthen bunds and barbed wire fencing around the pits with green belt all along the boundary shall be developed and maintained.
  51. As per MoEF&CC, GoI, Office Memorandum dated 30.03.2015, prior clearance from Forestry & Wild Life angle including clearance from standing committee of the National Board for Wild life as applicable shall be obtained before starting the quarrying operation, if the project site is located within 10KM from National Park and Sanctuaries.
  52. The quarrying activity shall be stopped if the entire quantity indicated in the Mining plan is quarried even before the expiry of the quarry lease period and the same shall be monitored by the District Authorities.
  53. Safety equipments to be provided to all the employees.
  54. Safety distance of 50m has to be provided in case of railway, reservoir, canal/odai
  55. The Assistant/Deputy Director, Department of Geology & mining shall ensure that the proponent has engaged the blaster with valid Blasting license/certificate obtained from the competent authority before execution of mining lease.
  56. The proponent shall furnish the Baseline data covering the Air, Water, Noise and land environment quality for the proposed quarry site before execution of mining lease.
  57. The proponent shall erect the pillars in accordance with the Rules for depicting GPS details in the earmarked boundary of the quarry site to monitor electronically before execution of mining.
  58. The Proponent shall furnish the data obtained from the Public Works Department regarding the details of Ground Water table in the quarry site.
  59. The proponent has to provide insurance protection to the workers in the case of existing mining or provide the affidavit in case of fresh lease before execution of mining lease.
  60. The proponent has to display the name board at the quarry site showing the details of Proponent, lease period, extent, etc., with respect to the existing activity before execution of mining.
  61. Heavy earth machinery equipments if utilized, after getting approval from the competent authority.
  62. The PP shall obtain NOC from the TNEB, since as HTL line is passing in the lease area.



**General Conditions:**

1. EC is given only on the factual records, documents and the commitment furnished in non judicial stamp paper by the proponent.
2. The Proponent shall obtain the Consent for Establishment from the TNPSC board before commencing the activity.
3. No change in mining technology and scope of working should be made without prior approval of the SEIAA, Tamil Nadu.
4. No change in the calendar plan including excavation, quantum of mineral (minor mineral) should be made.
5. Effective safeguard measures, such as regular water sprinkling shall be carried out in critical areas prone to air pollution and having high levels of particulate matter such as loading and unloading point and all transfer points. Extensive water sprinkling shall be carried out on haul roads. It should be ensured that the Ambient Air Quality parameters conform to the norms prescribed by the Central Pollution Control Board in this regard.
6. Effective safeguards shall be adopted against health risks on account of breeding of vectors in the water bodies created due to excavation of earth.
7. A berm shall be left from the boundary of adjoining field having a width equal to at least half the depth of proposed excavation.
8. Mineral handling area shall be provided with adequate number of high efficiency dust extraction system. Loading and unloading areas including all the transfer points should also have efficient dust control arrangements. These should be properly maintained and operated.
9. Vehicular emissions shall be kept under control and be regularly monitored. The mineral transportation shall be carried out through the covered trucks only and the vehicles carrying the mineral shall not be overloaded.
10. Access and haul roads to the quarrying area should be restored in a mutually agreeable manner where these are considered unnecessary after extraction has been completed.
11. All Personnel shall be provided with protective respiratory devices including safety shoes, Masks, gloves etc. Supervisory people should be provided with adequate training and information on safety and health aspects. Occupational health surveillance program of the workers should be undertaken periodically to observe any contractions due to exposure to dust and take corrective measures, if needed.
12. Periodical medical examination of the workers engaged in the project shall be carried out and records maintained. For the purpose, schedule of health examination of the workers should be drawn and followed accordingly. The workers shall be provided with personnel protective measures such as masks, gloves, boots etc.
13. Workers/labourers shall be provided with facilities for drinking water and sanitation facility for Female and Male separately.
14. The project proponent shall ensure that child labour is not employed in the project as per the sworn affidavit furnished.
15. The funds earmarked for environmental protection measures should be kept in separate account and should not be diverted for other purpose. Year wise expenditure should be reported to the Ministry of Environment and Forests and its Regional Office located at Chennai.

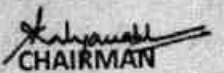
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**CHAIRMAN**  
**SEIAA-TN**





16. The Environmental Clearance does not absolve the applicant/proponent of his obligation/requirement to obtain other statutory and administrative clearances from other statutory and administrative authorities.
17. This Environmental Clearance does not imply that the other statutory / administrative clearances shall be granted to the project by the concerned authorities. Such authorities would be considering the project on merits and be taking decisions independently of the Environmental Clearance
18. The SEIAA, Tamil Nadu may alter/modify the above conditions or stipulate any further conditions in the interest of environment protection.
19. The SEIAA, Tamil Nadu may cancel the environmental clearance granted to this project under the provisions of EIA Notification, 2006, at any stage of the validity of this environmental clearance, if it is found or if it comes to the knowledge of this SEIAA,TN that the project proponent has deliberately concealed and/or submitted false or misleading information or inadequate data for obtaining the environmental clearance.
20. Failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract action under the provisions of the Environment (Protection) Act, 1986.
21. The above conditions will be enforced inter-alia, under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, the Public Liability Insurance Act, 1991, along with their amendments, draft Minor Mineral Conservation & Development Rules, 2010 framed under MMDR Act 1957, National Commission for protection of Child Right Rules, 2006 and rules made there under and also any other orders passed by the Hon'ble Supreme Court of India/Hon'ble High Court of Madras and any other Courts of Law relating to the subject matter.
22. Any other conditions stipulated by other Statutory/Government authorities shall be complied
23. Any appeal against this environmental clearance shall lie with the Hon'ble National Green Tribunal, if preferred, within a period of 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010.

  
CHAIRMAN  
SEIAA-TN

26/9/16

Copy to:

1. The Secretary, Ministry of Mines, Government of India, Shastri Bhawan, New Delhi.
2. The Principal Secretary, Environment and Forests Department, Government of Tamil Nadu, Tamil Nadu.
3. The Additional Chief Secretary, Industries Department, Government of Tamil Nadu, Tamil Nadu.
4. The Additional Principal Chief Conservator of Forests, Regional Office (SZ), 34, HEPC Building, 1<sup>st</sup> & 2<sup>nd</sup> Floor, Cathedral Garden Road, Nungambakkam, Chennai - 34.
5. The Chairman, Central Pollution Control Board, Parivesh Bhawan, CBD-Cum-Office Complex, East Arjun Nagar, New Delhi-110 032.
6. The Chairman, Tamil Nadu Pollution Control Board, 76, Mount Salai, Guindy, Chennai-32
7. The District Collector, Karur District
8. The Commissioner of Geology and Mines, Guindy, Chennai-32
9. EI Division, Ministry of Environment & Forests, Parivashan Bhawan, New Delhi.
10. Spare.



கருநா மாவட்ட ஆட்சியர் அவர்களின் செயலமுறை ஆணை  
முன்னிலை:- திரு.கு.கோவிந்தராஜ், இ.ஆ.ப.

ந.க.எண்.299/ க.உ.ம.ம. / 2015

நாள்: 14.06.2016

பொருள்: கனிமங்கலம் குவாரிகளும் - மண்மங்கலம் வட்டம் - வேட்டமங்கலம் (மேற்கு) கிராமம் - பட்டா புல எண்.1238/2 (பகுதி) 4.80.0 ஹெக்டேர் பரப்பு - சாதாரண கற்கள் வெட்டி எடுக்க 5 ஆண்டுகளுக்கு குவாரி குத்தகை உரிமம் - தி/ள்.திருமலை புளூ மெட்டல்ஸ் என்ற நிறுவனத்திற்கு உரிமம் வழங்கி உத்தரவிடப்படுகிறது.

- பார்வை:
1. தி/ள். திருமலை புளூ மெட்டல்ஸ், நெ.538/4, பூலான் காடு, குப்பம் அஞ்சல், அரவக்குறிச்சி வட்டம், கருநா மாவட்டம் என்பவரின் மனு நாள்:09.03.2015.
  2. இவ்வலுவலக இதே எண்ணிட்ட கடிதம் நாள்:09.3.2015 வருவாய் கோட்டாட்சியருக்கு முகவரியிட்டது.
  3. கருநா, வருவாய் கோட்டாட்சியர் அவர்களின் அறிக்கை ந.க.அ1/977/2015 நாள்:07.9.2015.
  4. கருநா புவியியல் மற்றும் கரங்கத்துறை உதவி புவியியலாளரின் இடப்பார்வை அறிக்கை நாள்:11.9.2015.
  5. இவ்வலுவலக இதே எண்ணிட்ட கடிதம் நாள்:11.9.2015 தலைமை பொறியாளர், பகிர்மானம், திருச்சி முகவரியிட்டது.
  6. உதவி இயக்குநர், புவியியல் மற்றும் கரங்கத்துறை, கருநா அவர்களின் ஏற்பாடுக்கப்பட்ட கரங்கத் திட்டம் நாள்:07.10.2015.
  7. தலைமை பொறியாளர், பகிர்மானம், திருச்சி கடித எண்.SL/O/TY/EA/AF/F, Doc/C.3486/15, நாள்:15.12.2015.
  8. யாழில சுற்றுச் சூழல் தாக்க மதிப்பீட்டு ஆணையம் சென்னை ஒப்புதல் ஆணை எண்: SEIAA, TN/F.No4628/1(a)/EC.No.3767/2016, நாள்:25.9.2016.

உத்தரவு:-

கருநா மாவட்டம், மண்மங்கலம் வட்டம், வேட்டமங்கலம் (மேற்கு) கிராமம், புல எண்.1238/2 (பகுதி) 4.80.0 ஹெக்டேர் பரப்பில் சாதாரண கற்கள் ஐந்து ஆண்டுகளுக்கு வெட்டிபெடுக்க தி/ள். திருமலை புளூ மெட்டல்ஸ், நெ.538/4, பூலான் காடு, குப்பம் அஞ்சல், அரவக்குறிச்சி வட்டம், கருநா மாவட்டம் என்ற நிறுவனம் குவாரி குத்தகை உரிமம் கோரி பார்வை 1ல் கண்டவாறு மனு செய்துள்ளனர்.



சில நிபந்தனைகளுக்குட்பட்டு மனுதாரருக்கு குவாரி குத்தகை உரிமம் வழங்க தடைபின்மை சான்று வழங்கப்பட்டுள்ளது.

பார்வை 8-ல் கண்ட சென்னை மாநில சுற்றுப்பற சூழ்நிலை செயல் விளைவு மதிப்பீடு குழு உறுப்பினர் செயலர் அவர்கள் கடிதத்தில் சிறப்பு நிபந்தனை எண். 4 பிரிவு (i)-ல் கண்டவாறு குவாரிப்பணி ஆரம்பிப்பதற்கு முன்பாக தமிழ்நாடு மாகாணக்குட்பாட்டு வாரியத்தின் ஒப்புதல் பெற வேண்டும் என்ற சிறப்பு நிபந்தனை உட்பட வேறாபல சிறப்பு நிபந்தனைகளுடன் மனுதாரருக்கு குவாரி குத்தகை உரிமம் வழங்கலாம் என பரிந்துரை செய்துள்ளார்.

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

மேற்கண்ட அலுவலர்களின் பரிந்துரை மற்றும் சிறுகனிம சலுகை விதிகளின் பேரில், மனுதாரருக்கு குவாரி குத்தகை உரிமம் வழங்க ஒப்புதல் தெரிவிக்கப்பட்டதன் பேரில், மனுதாரர் விதிகளின்டி காப்புத் தொகையாக ரூ.5000/-ஐ பாரத மாநில வங்கி, தாந்தோணி சலான் எண்.இல்லை, நாள்:13.10.2016ன்படி செலுத்தி அசல் சலானையும், 1959-ம் வருட தமிழ்நாடு சிறுகனிம சலுகை விதிகளின் பின் இணைப்பு V கண்டுள்ள படிவத்தில் உரிய முத்திரைத்தாளில் குத்தகை ஒப்பந்தப் பத்திரம் தயார் செய்து அளித்துள்ளார்.

எனவே, தி/ள். திருமலை புரு மெட்டில்ஸ், நெ.538/4, பூலான் காடு, குப்பம் அஞ்சல், அரவக்குறிச்சி வட்டம், கஞர் மாவட்டம் என்ற நிறுவனத்திற்கு கஞர் மாவட்டம்,மண்மங்கலம் வட்டம், வேட்டமங்கலம் (மேற்கு) கிராமம், புல எண். 1238/2 (பகுதி) 480.0 ஹெக்டேர் பரப்பில் சாதாரண கற்கள் வெட்டியெடுக்க குத்தகை ஒப்பந்தப் பத்திரம் நிறைவேற்றிய நாளில் இருந்து ஐந்து ஆண்டுகளுக்கு 1959-ம் ஆண்டு, தமிழ்நாடு சிறுகனிம சலுகை விதி 19 (1), 20 மற்றும் 33-ன்படி குத்தகை ஒப்பந்தப் பத்திரத்தில் கண்டுள்ள நிபந்தனைகள் மாநில சுற்றுச் சூழல் தாக்க மதிப்பீட்டு ஆணையத்தின் நிபந்தனைகள் மற்றும் 1959ம் வருட தமிழ்நாடு சிறுகனிம சலுகை விதிகளின் பேரிலும் குவாரி குத்தகை உரிமம் வழங்கி ஆணையிடப்படுகிறது.

நிபந்தனைகள்:-

1. குத்தகை புலத்தினை அடுத்துள்ள பட்டா நிலங்களுக்கு 7.5 மீட்டர் இடைவெளி அளித்து குவாரிப்பணி புரிய வேண்டும்.





விண்ணப்ப இடத்தில் கல்குவாரி செய்ய பொது மக்களிடமிருந்து அட்சேபணை ஏதும் உள்ளதா என்பது குறித்த "ஏ1" விளம்பரம் செய்யப்பட்டு விட்டதென இல்லையென ஒப்புதல் பெறப்பட்டுள்ளது எனவும், குவாரி செய்ய இடத்திலிருந்து 300 மீட்டர் தொலைவில் குடியிருப்புகள் ஏதும் இல்லை. 50 மீட்டர் தூரத்தில் உயர் தாழ்வழுத்த மின்கம்பிகள் செல்லவில்லை. கோவில் மகுதி, சர்ச், மயானம் மற்றும் நீரிணைகள் ஏதுமில்லை எனவும், இந்த குவாரியினுடைய நீளம் மற்றும் அகலம் அளவிடு செய்யப்பட்டு வரைபடத்தில் குறிக்கப்பட்டுள்ளது எனவும், உரிமம் கோரும் கல்குவாரி செய்யப்படும் புல எண்ணுக்கு எல்லைகள் வரையறுக்கப்பட்டு எல்லைக் கற்கள் நடப்பட்டுள்ளது எனவும், குவாரி செய்யப்படவுள்ள புலத்தில் புறம்போக்கு இடங்கள் ஏதுமில்லை எனவும், மண்மங்கலம் வட்டம், வேட்டமங்கலம் (மேற்கு) கிராமம், புல எண்.1238/2 (பகுதி)ல் 4.80.0 ஹெக்டேர் பரப்பில் அருகில் உள்ள விவசாய நிலங்களுக்கு கல்குவாரி செய்வதனால் பாதிப்பு ஏதும் இல்லாத வகையில் கல்குவாரி செய்யப்பட வேண்டும் என்ற நிபந்தனையுடன் சாதாரண கற்கள் வெட்டி எடுக்கதி/ள். திருமலை புளூ மெட்டல்ஸ் நிறுவனத்தின் பெயரிட்கல்குவாரி செய்ய அனுமதி வழங்க பரிந்துரை செய்துள்ளாய்.

5. பார்வை-4ல் கண்ட கருர், புவியியல் மற்றும் சுரங்கத்துறை, உதவி புவியியலாளரின் இடப்பார்வை அறிக்கையில், மண்மங்கலம் வட்டம், வேட்டமங்கலம் (மேற்கு)கிராமம், விண்ணப்ப புல எண்.1238/2ஆனது பட்டா எண்.3308-ன்படி தங்கராஜ் மகன் மோகன்ராஜ்-(1) ராமசாமி மகன் ராமராஜேஸ்குமார்-(2)மற்றும் கந்தசாமி மகன் தங்கவேல்-(3) ஆகியோர்கள் பெயரில் கூட்டு பட்டாவாக உள்ளது எனவும், மேற்படி பட்டாதாரர்கள் மூவரும் திருமலை புளூமெட்டல்ஸ் என்ற நிறுவனத்திற்கு அரசு அனுமதி பெற்று சாதாரண கற்கள் வெட்டி எடுக்க சம்மதக் கடிதம் கொடுத்துள்ளனர் எனவும், மேற்படி விண்ணப்ப புலத்தில் சாதாரண கற்கள் வெட்டி எடுக்க திருமலை புளூமெட்டல்ஸ் என்ற நிறுவனத்திற்கு உரிமை உள்ளது எனவும், கருர் மாவட்டம் ஆட்சித்தலைவர் அவர்களின் செயல்முறை ஆணைகள் ந.க.எண்.D114/2004நாள்:07.12.2004-ன்படி ஐந்து ஆண்டுகளும் ந.க.எண்.B.44/புமக/2010-ன்படி ஐந்து ஆண்டுகளும் ஆகமொத்தம் பத்து ஆண்டுகளுக்கு அனுமதி வழங்கப்பட்டுள்ளது எனவும், மேற்படி அனுமதி 07.05.2015-ல் காலாவதி ஆகிவிட்டது எனவும், விண்ணப்ப புலத்தில் ஏற்கனவே கல்லுடைக்கப் பட்ட பகுதி சமச்சிற்றும் கல்லுடைக்காத பகுதி சமதளமாகவும் உள்ளது எனவும், கல்லுடைக்கப்பட்ட பகுதியின் நீளம் மற்றும் அகலம் வருவாய் கோட்டாட்சியரால் அளந்தறியப்பட்டது எனவும், குவாரியின் சராசரி ஆழம் 10 மீட்டர் ஆகும் எனவும்,





எண். தேதி, புறப்படும் நேரம், செலுத்தும்படி ஆகியவற்றை முறையாகக் குறிப்பிட்டு கையொப்பம் இட்ட பின்னரே, குத்தகைதாரரை அல்லது அவரது அனுமதி பெற்ற நபரோ கொடுக்க வேண்டும். குத்தகைதாரர் குறிப்பிடுவதில் ஏதேனும் தவறுகள் இருந்தாலோ, கைவசம் பூரித்தி செய்யப்படாமல் இருந்தாலோ முறையற்ற வகையில் கமிஷன் எடுத்துச் செல்வதாகக் கருதப்பட்டு வாகனத்தை கைப்பற்றி அபராதம் விதிப்பதோடு, அதற்கு குத்தகைதாரரை பொறுப்பாக்கி கமிஷன் விதிகளின் படி மேல் நடவடிக்கை எடுக்கப்படும்.

12. இந்த ஆணையில் குத்தகை அனுமதி வழங்கப்பட்ட புலத்ததை முழுமைவாகவோ, பகுதியாகவோ எவருக்கும் உள் குத்தகைக்கு விடுவதோ அல்லது கிரையம் செய்வதோ கூடாது.
13. குத்தகைதாரர் ஒவ்வொரு நாளும் குவாரியில் இருந்து எவ்வளவு சிறுகனிமங்கள் எடுக்கப்பட்டது என்பதையும் எந்த அளவு கனிமங்கள் வாரி/வண்டி மூலம் வெளியே அனுப்பப்பட்டது என்ற விவரத்தையும் காட்டும் பதிவேட்டினைப் பராமரித்து வரவேண்டும்.
14. குத்தகைதாரர், தமக்கு குத்தகை வழங்கப்பட்ட பகுதிக்கு அருகில் உள்ள பட்டா நிலத்திற்கு எவ்வித இடைபூறும் இல்லாமல் குவாரிப் பணி செய்யப்பட வேண்டும்.
15. வண்டிப்பாதை மற்றும் நடைபாதைகளில் இருந்து 10 மீட்டர் தூரம் தள்ளி குவாரி செய்ய வேண்டும். ரோடுகள், புனைவண்டிப்பாதை, பொதுப்பணித்துறை, வாய்க்கால், பொதுமக்கள் உபயோகத்திற்கான பகுதிகள், மின்சாரம் மற்றும் தொலைபேசி கம்பி செல்லும் பகுதிகள், வழிபாட்டு இடங்கள் மற்றும் பழங்கால சின்னங்கள் உள்ள பகுதிகள் ஆகியவற்றில் இருந்து 50 மீட்டர் பாதுகாப்பு தூரம் விட்டு குவாரி செய்ய வேண்டும்.
16. குத்தகைக்கு விடப்பட்டுள்ள விஸ்தீரணத்தில் மட்டுமே குத்தகைதாரர் குவாரி செய்ய வேண்டும். அதற்கான கூடுதலான விஸ்தீரணத்தில் குவாரி செய்வது தெரியவந்தால் அபராத நடவடிக்கை மேற்கொள்வதுடன் குத்தகை இரத்து செய்ய நடவடிக்கை எடுக்கப்படும்.
17. குத்தகை நீபத்தனை மீறப்பட்டால் குத்தகை இரத்து செய்யவோ, செய்யப்பட்ட தவறுதலுக்கு அபராத நடவடிக்கை எடுத்து தண்டம் விதிக்கவோ அல்லது கிரிமினல் வழக்குத் தொடுக்க மாவட்ட ஆட்சியருக்கு அதிகாரம் உண்டு. குத்தகை ரத்து செய்யப்பட்டால் காப்புத் தொகை உட்பட அனைத்து தொகைகளும் அரசுக்கு ஆதாயமாக்கப்படும்.
18. குத்தகைதாரர் தமிழ்நாடு சிறுவகைக்கனிம சலுகை விதிகள் 1959ல் கண்டுள்ள விதிகளுக்கும் மற்றும் அரசு அவ்வப்போது அறிவிக்கும் சட்டதிட்டங்களுக்கும் உட்பட்டு குவாரிப்பணிகள் செய்ய வேண்டும்.
19. குவாரி குத்தகை உரிமம் காலாவதியான பின்பு எக்காரணத்தினால் முன்னிட்டும் மீண்டும் புதுப்பிக்கவோ அல்லது கால் நீட்டிப்போ செய்து தரப்பட மாட்டாது.
20. வெடிபொருள் சட்டம் 1934ல் தெரிவிக்கப்பட்ட சரத்துக்கள்படி குறைந்த அளவு வெடிபொருளை உபயோகித்து சுற்கள் வெளியே சிதறாமலும், சத்தம்

*Yadav*

11/09/2016



தமிழ்நாடு மின்னாடு TAMILNADU - Rs. 10000



11/09/2016

G. NARAYANATHY, S.V.  
KARUR-630 001.  
11/09/2016

**APPENDIX - V**  
(See Rule 19 (1) and 33)  
(Collr.Ref. No.299/ Mines / 2015)

**FORM OF JOINT AGREEMENT FOR QUARRYING AND CARRYING AWAY MINOR MINERALS BY LESSEE IN RYOTWARI LANDS IN WHICH THE MINERALS BELONG TO GOVERNMENT**

THIS AGREEMENT MADE the 14<sup>th</sup> day of October 2016 between Thiru.T.Mohapraj, S/o.Thangaraj, No.2, Nattukal Street, Moolimangalam Post, Karur District-(1) and Thiru.Thangavel, S/o.Kandasamy, No.125, Nallipalayam, College Road, Velur Post, Namakkal District-(2) (hereinafter referred to as "the registered holders" which expression shall where the context so admits, include their heirs, executors, administrators legal representatives and assigns) of the first part and Tvl.Thirumalai Blue Metals, No.538/4 Poolan kadu, Kuppam Post, Aravakurichi Taluk, Karur District represented by its Managing Partner Thiru.R.M.Rajeshkumar, S/o.Ramasamy, Vengamedu Post, Ram Nagar North, Andankovil (East) Village, Karur taluk & District (hereinafter referred to as "register holder / lessee" which expression shall where the context so admits shall include his heirs, executors, administrators, legal representatives and assigns) of the second part and the Governor of Tamil Nadu (hereinafter referred to as the Government which expression shall where the context so admits shall include also his successors in office and assigns) of the third part.

*Handwritten signature*

For Thirumalai Blue Metals

*Handwritten signature*  
DISTRICT COLLECTOR

KARUR



WHEREAS, the registered holders holds the lands described in the schedule hereto and intended to lease out to the lessee of the said lands for the purpose of quarrying Rough Stone in the said lands and to deposit mining waste in the said lands and has lodged with the Collector the lease and accurate map or sketch of the said lands.

AND WHEREAS, the lessee or tenant of the registered holders have made application to the Collector of District of Karur (herein after referred to as "the Collector") seeking grant of quarrying lease for quarrying Rough Stone in the said lands and to deposit mining waste in the said lands and has lodged with the Collector an accurate map or sketch of the said lands.

AND WHEREAS, the Collector acting for and on behalf of the Government has granted a quarrying lease to the lessee or tenant of the registered holders and allowed them to commence quarrying operations for Rough Stone in the said land to deposit mining waste thereon by lessee or tenant of the registered holders.

AND WHEREAS, the Collector is prepared to allow the said lessee to commence mining operations and to deposit mining waste in or on the said lands described in the

REGISTERED HOLDER

SECRETARY COLLECTOR

REGISTERED HOLDER/LESSEE



TAMILNADU 5000  
13920  
2 OCT 2016

S. RAMAMURTHY, S.V.  
KARUR-580001.  
L.No. 02/1992

...for a term of five years period from ...14...10.2016 To ...13...10.2021 upon the registered holders and the lessees entering into the agreement herein contained.

AND WHEREAS, the tenant of registered holder has deposited with the Collector, the sum of Rs.5000/- Chalan No.Nil, Dated:13.10.2016, State Bank of India, Thanthoni as security for the due performance of the covenants, agreements and provisos or damage which may be incurred by the Government by reason of any of the said lands described in the schedule hereto being rendered unfit for cultivation by the mining operations therein or by the deposit of mining waste thereon by either the registered holders or the lessees.

AND WHEREAS, the lessee has at the request of the registered holders and in consideration of such approval by the Collector of the mining operations as herein before recited agreed to join in these presents for the purpose of entering into covenants, agreements and provisos hereinafter contained as surety for the registered holders.

I, NOW THESE PRESENTS WITNESS and registered holders and the lessee do hereby jointly and severally and each of them doth individually hereby covenants and agree with the Government as follows:-

For Thirumalai Blue Metals

REGISTERED HOLDER

279

Managing Partner

District Collector, KARUR.





1377/  
12 OCT 2016

S. RAMAMURTHY, S.V.  
KARUR-639 001  
L.S.N. 601897

01. To carry on mining operations during the said term in a proper and workman like manner and to deposit mining waste on the lands described in the schedule hereto and to answer and to account at all reasonable times to Government for all acts and defaults committed by any servants, agents or workmen employed by the registered holders or lessee in carrying on such operations or in making such deposits.
02. To pay into Treasury/State Bank of India at Karur to the credit of the Government in addition to the land assessment for the time being payable in respect of the said lands seigniorage on the minerals mined at the rates prescribed by the Government from time to time.
03. To abide by the rules proscribed by the Government from time to time regarding quarrying of minor minerals.
04. To keep correct accounts in such form as the Collector shall from time to time require and direct showing the quantities and other particulars of all minerals obtained by the registered holders or the lessees from the said lands and also the number or persons employed in carrying on the said mining operations therein and prepare and maintain

REGISTERED HOLDER

*Signature*

*Signature*  
DISTRICT COLLECTOR,  
KARUR.



தமிழ்நாடு TAMILNADU ₹. 5000

12/01/2018

S. RAMAMURTHY, S.V.  
SARVODAYA SOCIETY  
12/01/2018

from time to time when so directed by the said Collector complete and correct plans of all mines and working in the said lands and to allow any officer thereunto authorized by the (Director of Geology and Mining), Tamil Nadu, from time to time and at all times to examine such accounts and any such plans and to supply and furnish when so required all such information and returns all or any of the matters aforesaid as the Government may from time to time required and direct.

05. To allow any officer authorized by the (Director of Geology and Mining), Tamil Nadu in that behalf from time to time and at all times to enter upon any part of the said lands where mining operations may be carried on for the purpose or inspecting the same.

06. To Forthwith send to the Collector a report of any accident which may occur at or in the said land and also of the discovery therein of any minerals other than Rough Stone.

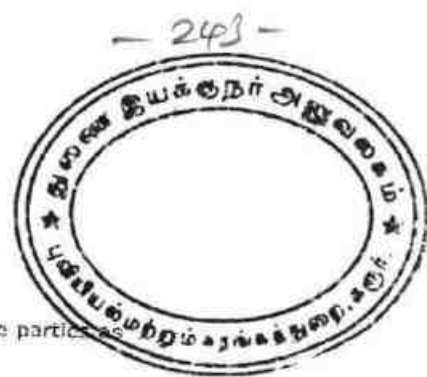
07. Not to claim any remission of assessment in respect of any of the said lands which shall be rendered unfit for surface cultivation by the carrying on of any mining operations or by the deposit of mining waste unless thirty times of the assessment thereon has been deducted under provisos 2 hereunder.

For Thirumalai Blue Metals

*[Signature]*  
DIRECTOR COLLECTOR,  
KARUR

REGISTERED ROAD

*[Handwritten signature]*

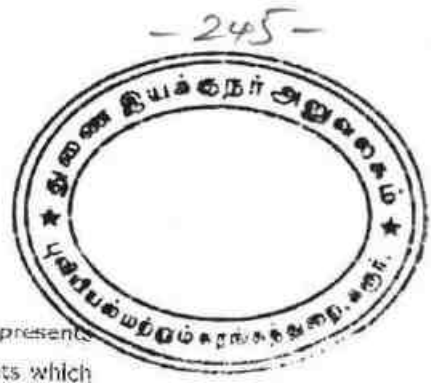


II. PROVIDED ALWAYS and it is hereby further agreed by and between the parties as follows.

01. That it shall be lawful for the registered holders or lessees as the case may be at any time to cease mining operations under these provided the registered holders or lessees shall pay the Government or the Collector the land assessment, cess and seigniorage payable by the registered holders or the lessee under these presents unto to the end of the year in which the registered holders or the lessee shall cease such mining operations and shall restore the said lands fence or fill in the abandoned pits and excavations therein if required by the Collector as next hereinafter provided and upon, the registered holders or the lessee so doing these presents shall cease and determine.

That in case the registered holders shall relinquish the whole or part of the said lands in case of the expiry or sooner determination of this agreement then and in any such case, the registered holders in the case of relinquishment and the registered holders and the lessees in other cases shall restore said lands or the area relinquished or so much thereof as the Collector shall require to be restored to a state fit for cultivation and shall securely and permanently fence or fill in all abandoned pits and excavation therein as the Collector shall require to be fenced or filled in and in case the registered holders or the lessees shall fail, or neglect any such lands with the registered holders or the lessees be required to restore to a state fit for cultivation or to so fence or fill in any such abandoned pit or excavation which the registered holders or the lessees shall be required to so fence or fill them and in any such case it shall be lawful for the Collector to so restore any such lands or as the case may be so fence or fill in any pit excavation at the expense of the registered holders lessees and to apply and said sum of Rs. 5000/- so deposited in or towards the cost of so doing and to deduct from amount of the said deposit and retain on behalf of the Government a sum equal to thirty times the assessment of the said lands which shall have been rendered unfit for cultivation. If however the amount of deposit is not sufficient to cover the cost of such restoration or fencing or filling as the case may be or to meet thirty times the assessment of the area rendered uncultivated, it shall be lawful for the Government to recover the balance by resort to Civil court.

03. That all land assessment, cesses and seignior age payable under these presents shall be recoverable under the provisions of the Tamil Nadu Revenue Recovery Act, 1864 or any subsisting statutory modification thereof, as if the same were arrear of land revenue.
04. That in the event of any breach of the registered holders of any of the conditions of these presents it shall be lawful for the Government to levy enhanced seignior age subject to the maximum of five times the normal rate or for the Collector to give



notice in writing to the registered holders of his intention to cancel these presents whereupon the same shall stand cancelled but without prejudice to any rights which the Government may have against the registered holders in respect of any antecedent claim or breach of covenant or condition.

05. That any notice to be given to registered holders may be addressed to their last known place of abode and where notice has been so addressed it shall be deemed to have been duly served for the purpose of these presents.
06. Should any question or dispute arise regarding an agreement executed in pursuance of these rules or any matter or thing connected therewith or the powers of the registered holders there under, the amount or payment of the seigniorage fee or area assessment made payable thereby, the matter in issue shall be decided by the Director of Geology and Mining. In case the registered holders/lessees are not satisfied with decision of the Director of Geology & Mining, the matter shall be referred to the State Government.
07. The registered holder shall abide by the conditions laid down in the Payment of Wages Act, 1936 (Central Act IV of 1936), the Mines Act, 1952 (Central Act XXXV of 1952) and the Explosives Act, 1884 (Central Act IV of 1884) and the rules made there under.

**நிபந்தனைகள்:-**

1. குத்தகை டலத்திலுள்ள அடுத்துள்ள பட்டா நிலங்களுக்கு 7.5 மீட்டர் இடைவெளி அளித்து குவாரிப்பணி புரிய வேண்டும்.
2. பொதுமக்களுக்கோ, பொது சொத்துக்களுக்கோ மாடுதொரு சேதமும் இன்றி பாதுகாப்பான முறையில் குவாரிப்பணி செய்ய வேண்டும்.
3. பாதுகாப்புகளின் நல்ல கருதி பாதுகாப்பான முறையில் குறைந்த அழுத்தமுள்ள வெடிபொருட்கள் பயன்படுத்தியும், கைத்தூண்டியால் கருவி கொண்டு துளையிட்டும் கிண்திவாள்களின் பாதுகாப்பினை உறுதி செய்ய பாதுகாப்பானதும், அகவமான Benches அமைத்து குவாரிப்பணி செய்ய வேண்டும்.

மேலிய கற்றுக்குழல் தாக்க மதிப்பீட்டு ஆணையத்தில் பரிந்துரை கடிதம் SEIAA.TN/F.No. 1628/11ay/ HC.No.3767/2016 நாள்:26.9.2016ல் கண்ட சிறப்பு நிபந்தனைகளை முறையாக கடைபிடித்து குவாரிப்பணி செய்வதுடன், சிறப்பு நிபந்தனை 4 (i) ல் கண்டவாறு குவாரிப் பணி ஆரம்பிப்பதற்கு முன்பாக தமிழ்நாடு மாசுக்கட்டுப்பாட்டு வாரியத்தின் தலையின்மை சான்று பெற்று அதன் பின்னரே குவாரிப்பணி துவங்க வேண்டும். மாசுக்கட்டுப்பாட்டு வாரிய தலையின்மை சான்றினை குறித்த காலங்களில் பூர்த்தி செய்ய வேண்டும்.

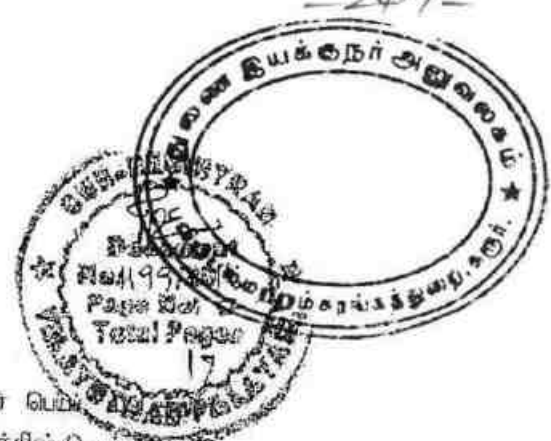
5. குத்தகைதான் தனக்கு அளிக்கப்பட்ட குத்தகை பகுதியின் எல்லைகளை தெளிவாக காட்டும் வகையில் கல் நட்பு வண்ணம் இட்டு குத்தகை காலப் முடிவானதும் மராமதிக்க வேண்டும்.

REGISTERED HOLDER

For Thirumalai Block 283

DISTRICT COLLECTOR  
KARUR.





6. குத்தகைதாரர் குவார்டியின் அருகே குத்தகைதாரர் பெயர், கிராமத்தின் பெயர், பெயர், புல எண், படிப்பு, குத்தகை ஆவண எண், குத்தகை காலம், கணிமத்தில் பெயர், மேன்றி விபரங்கள் குறிக்கப்பட்ட தகவல் பள்ளையை தபது சொந்த செலவில் வைத்து நன்கு பராமரிக்க வேண்டும்.
7. குவார்டிக்கு சென்றுவரும் பாதை வாதிகள் குத்தகைதாரர்கள் அவர் துள் சொந்த பொறுப்பிலேயே அமைத்துக் கொள்ள வேண்டும்.
8. குத்தகை வழங்கப்பட்ட பாறையில் குண்டுக்கல், ஜவ்வி, அரவன் கல், வேலிக்கற்கள், போன்ற சிறுசுளிமங்கள் உடைத்தெடுக்க மாட்டுவது அனுமதியுண்டு வெளிநாடுகளுக்கு ஏற்றுமதியாகும் மெருகட்டும் கனவடிவ வர்கள் வெட்டி எடுக்கக் கூடாது.
9. குவார்டியிலிருந்து கொண்டு செல்லப்படும் மேற்கண் வளை கற்களுக்கு 1952ம் ஆண்டு தமிழ்நாடு சிறுகனிம் சலுகை விதிகள் பின் இலக்கப்படி 2ல் கண்டுள்ளவாறு உரிமலரி செலுத்த வேண்டும். தூத அவ்வப்போது அறிவிக்கும் உரிமலரி மாற்றங்களுக்கு ஏற்ப எவ்வித ஆட்சேபணை இன்றி செலுத்துதல் வேண்டும்.
10. குத்தகை அனுமதி வழங்கப்பட்ட நிலத்திலிருந்து கொண்டு செல்லப்பட்ட கற்களுக்கு முறையான கணக்குகளும், குழிவாபில் பதிவேடும் முறையாக பராமரித்தல் வேண்டும். அவற்றை சம்பந்தப்பட்ட அலுவலர்கள் தனித்தனிக்கு ஆய்வுபடுத்த கோரினால் தவறாது சுரப்பிக்க வேண்டும்.
11. உதவி இயக்குநர் முயிமியல் மற்றும் சுரங்கத்துறைகள் அலுவலக முத்திரை, கையொப்ப முத்திரையுடன் கூடிய உரிய அனுப்புகச் சீட்டை வாகனங்களுக்கு கொடுக்கப்படும் போது உறுப்பினர் சீட்டில் வாகன எண், தேதி, புறப்படும் நேரம், செலுத்தாதிடம் ஆகியவற்றை முறையாகக் குறிப்பிட்டு கையொப்பம் இட்ட பின்னரே குத்தகைதாரரோ அல்லது அவரது அனுமதி பெற்ற நபரோ கொடுக்க வேண்டும். மேற்கண்டவாறு குறிப்பிடுவதில் ஏதேனும் தவறுகள் இருந்தாலோ, கவங்கள் பூர்த்தி செய்யப்படாமல் இருந்தாலோ முறையற்ற வகையில் கலியம் எடுத்துச் செல்வதாகக் கருதப்பட்டு வாகனத்தை கைப்பற்றி அபராதம் விதிப்பதோடு அதற்கு குத்தகைதாரரை பொறுப்பாக்கி கணிம விதிகளின் படி மேல் நடவடிக்கை எடுக்கப்படும்.
12. இந்த ஆவணத்தில் குத்தகை அனுமதி வழங்கப்பட்ட புலத்ததை முழுமையாகவோ, பகுதியாகவோ எவருக்கும் உள் குத்தகைக்கு விடுவதோ அல்லது கிராமம் செய்வதோ கூடாது.
13. குத்தகைதாரர் ஓய்வொரு நாளும் குவார்டியில் இருந்து எவ்வளவு சிறுகனிமங்கள் எடுக்கப்பட்டது என்பதையும் எந்த அளவு கனிமங்கள் வாரி/ வண்டி மூலம் வெளியே அனுப்பப்பட்டது என்ற விவரத்தையும் காட்டும் பதிவேட்டினைப் பராமரித்து வரவேண்டும்.
14. குத்தகைதாரர், தாக்கு குத்தகை வழங்கப்பட்ட பகுதிக்கு அருகில் உள்ள பட்டா நிலத்திற்கு எவ்வித இடைபுறம் இல்லாமல் குவார்டி பணி செய்வாட்ச வேண்டும்.
15. கணிப்பாணை மற்றும் நடைபாடுகளில் இருந்து 10 மீட்டர் தூரம் தள்ளி குவார்டி செய்ய வேண்டும். ரோடுகள், புலவெண்டிப்பாணை, பொதுப்பணித்துறை, வாய்க்கால், பொதுமக்கள் உபயோகத்திற்கான பகுதிகள், மின்னாரம் மற்றும் தொலைபேசி கம்பி செல்லும் பகுதிகள், வடிகாட்டு இடங்கள் மற்றும் பழங்கால சின்னங்கள் உள்ள பகுதிகள் ஆகியவற்றில் இருந்து 50 மீட்டர் பாதுகாப்பு தூரம் விட்டு குவார்டி செய்ய வேண்டும்.



15. குத்தகைக்கு விடப்பட்டுள்ள விஸ்தரிசனத்தில் மட்டுமே குத்தகைதாரர் குவாரி செய்ய வேண்டும். குவாரிங் கூடுதலான விஸ்தரிசனத்தில் குவாரி செய்வது தெரியவந்தால் அப்பாத நு கடிக்கை கொடுக்கப்படும். குத்தகை இரத்து செய்ய நடவடிக்கை எடுக்கப்படும்.
17. குத்தகை நிபந்தனை மீறப்பட்டால் குத்தகை இரத்து செய்யவோ, செய்யப்பட்ட கவறுகளுக்கு அப்பாத நடவடிக்கை எடுத்து தண்டம் விதிக்கவோ அல்லது கிரிமினல் வழக்குத் தொடுக்கவாவது ஆட்சியருக்கு அதிகாரம் உண்டு. குத்தகை ரத்து செய்யப்பட்டால் காப்புத் தொகை உடனே மீளப்பட்டு தொகைகளும் அரசுக்கு ஆதாயமாகப்படும்.
18. குத்தகைதாரர் தமிழ்நாடு சிறுவகைக்களிய சலுகை விதிகள் 1959ல் கண்டுள்ள விதிகளுக்கும் மற்றும் அரசு அமலப்படுத்து அறிவிக்கும் சட்ட திட்டங்களுக்கும் உட்பட்டு குவாரிப்பணிகள் செய்ய வேண்டும்.
19. குவாரி குத்தகை உரிமம் காலாவதியான பிற்பு எக்காரணத்தை முன்னிட்டும் மீளாது குவாரிங் செய்ய அல்லது கால தீட்சிப்போ செய்து தரப்பட மாட்டாது.
20. வெடிபொருள் சட்டம் 1884ல் தெரிவிக்கப்பட்ட சரத்துக்கள்படி குறைந்த அளவு வெடிபொருளை உபயோகித்து கற்கள் வெளியே செதறாமலும், சத்தம் அதிகம் ஏற்படாமலும், பொதுமக்களுக்கும், காந்தாடகளுக்கும், எவ்வித பாதிப்பும் இன்றியும் கல்குவாரி பணி செய்யப்பட வேண்டும்.
21. வெடிபொருள்கள் அரசு உரிமம் பெற்று விற்பனைதாரரிடம் மட்டுமே பெற்று வெடிப்பதற்கு உரிமம் / அங்கீகாரம் பெற்று வெடிப்பாளர்களை (Blaster / Mines matic) கொண்டு கல்குவாரியில் வெடி வைக்க வேண்டும்.
22. குத்தகை குழிவாளர்கள் எவ்வாறு வேலைக்கு அமர்த்துதல் கூடாது.
23. Any other conditions stipulated by other Statutory / Government authorities shall be complied.
24. If any illicit quarrying is found in the area in S.F.No.1238/2 (Part) of Vettamangalam (West) Village, Mannangalam Taluk, Karur District before the date of execution of lease deed this lease deed is liable to be cancelled and criminal action will be initiated.

**சிறப்பு நிபந்தனைகள்:-**

- 1) விண்ணப்ப புலத்திற்கு வடமேற்கு மூலையில்லுந்து 67 மீட்டர் தொலைவில் வடக்கு திசையில் புலத்திற்கு வெளிப்புறமாகவும் வடகிழக்கு மூலையிலிருந்து சுமார் 60 மீட்டர் தொலைவில் தெற்கில் புலத்தின் ஊடாகவும் உயர் அழுத்த டவர் லைன் செல்கிறது. இதற்கு 50 மீட்டர் பாதுகாப்பு இடைவெளிலிட்டு குவாரிப் பணி செய்ய வேண்டும்.

மேற்கூறப்பட்ட நிபந்தனைகள், சிறப்பு நிபந்தனைகள் மற்றும் கனிய சட்டம் விதிகளை மீதுள்ளது உறுதியும் தருவதில் விதிமுறைகளுக்கு உட்பட்டு குத்தகை இரத்து செய்ய நடவடிக்கை எடுக்கப்படும். மேற்கண்ட நிபந்தனைகள் ஒப்பந்தப் பத்திரத்தில் கண்டுள்ள நிபந்தனைகள், மாநில மற்றும் ஆர்டர் தாக்க மதிப்பிட்டு ஆலோசனைத்தின் நிபந்தனைகள் மற்றும் 1959-ம் ஆண்டு தமிழ்நாடு சிறுவகை சலுகை விதிகள் ஆசியலன்றின் அடிப்படையில் குத்தகைதாரர் குவாரிப் பணி புரிய வேண்டும்.

## THE SCHEDULE

- |    |                                       |                                    |
|----|---------------------------------------|------------------------------------|
| 1. | Name of the District                  | Korur                              |
| 2. | Name of the Taluk                     | Manmangalam                        |
| 3. | Name of the Village                   | Vetamangalam (West)                |
| 4. | Name of the Sub Registration District | Velayuthampalayam                  |
| 5. | Lease Period                          | 5 years (14.10.2016 to 13.10.2021) |

Survey Number	Total Extent Hects.	Area Assessment Rs.	BOUNDARIES			
			North By SF No.	East by SF No.	South by SF No.	West by SF No.
1238/2 (Part)	4.80.0	Rs.2100/- (Rs.100/- per hecst. per year)	1238/2 (Part)	1234	Kuppam Village	1238/1
<b>Total</b>	<b>4.80.0</b>					

IN WITNESS Thiru.T.Mohanraj, S/o.Thangaraj, No.2, Nattukal Street, Moolimangalam Post, Karur District-(1) and Thiru.Thangavel, S/o.Kandasamy, No.125, Nallipalayam, College Road, Velur Post, Namakkal District-(2) 'the registered holders' and Tvl.Thirumalai Blue Metals, No.538/4 Poolan kadu, Kuppan Post, Aravakurichi Taluk, Karur District represented by its Managing Partner Thiru.R.M.Rajeshkumar, S/o.Ramasamy, Vengamedu Post, Ram Nagar North, Andankovil (East) Village, Karur taluk & District 'register holder / lessee' and Thiru.G.Govindaraj I.A.S., District Collector, Karur acting for and on behalf of and by the order and direction of the Governor of Tamil Nadu have hereunto set their hands



*[Signature]*  
DISTRICT COLLECTOR.  
BARDOLAI.

For Thirumalai Blue Metals

REGISTERED HOLDER

Signed by the above named  
In the presence of

1.  $P(A, B)$  2.  $P(A, B)$  3.  $P(A, B)$  4.  $P(A, B)$  5.  $P(A, B)$  6.  $P(A, B)$  7.  $P(A, B)$  8.  $P(A, B)$  9.  $P(A, B)$  10.  $P(A, B)$  11.  $P(A, B)$  12.  $P(A, B)$  13.  $P(A, B)$  14.  $P(A, B)$  15.  $P(A, B)$  16.  $P(A, B)$  17.  $P(A, B)$  18.  $P(A, B)$  19.  $P(A, B)$  20.  $P(A, B)$  21.  $P(A, B)$  22.  $P(A, B)$  23.  $P(A, B)$  24.  $P(A, B)$  25.  $P(A, B)$  26.  $P(A, B)$  27.  $P(A, B)$  28.  $P(A, B)$  29.  $P(A, B)$  30.  $P(A, B)$  31.  $P(A, B)$  32.  $P(A, B)$  33.  $P(A, B)$  34.  $P(A, B)$  35.  $P(A, B)$  36.  $P(A, B)$  37.  $P(A, B)$  38.  $P(A, B)$  39.  $P(A, B)$  40.  $P(A, B)$  41.  $P(A, B)$  42.  $P(A, B)$  43.  $P(A, B)$  44.  $P(A, B)$  45.  $P(A, B)$  46.  $P(A, B)$  47.  $P(A, B)$  48.  $P(A, B)$  49.  $P(A, B)$  50.  $P(A, B)$  51.  $P(A, B)$  52.  $P(A, B)$  53.  $P(A, B)$  54.  $P(A, B)$  55.  $P(A, B)$  56.  $P(A, B)$  57.  $P(A, B)$  58.  $P(A, B)$  59.  $P(A, B)$  60.  $P(A, B)$  61.  $P(A, B)$  62.  $P(A, B)$  63.  $P(A, B)$  64.  $P(A, B)$  65.  $P(A, B)$  66.  $P(A, B)$  67.  $P(A, B)$  68.  $P(A, B)$  69.  $P(A, B)$  70.  $P(A, B)$  71.  $P(A, B)$  72.  $P(A, B)$  73.  $P(A, B)$  74.  $P(A, B)$  75.  $P(A, B)$  76.  $P(A, B)$  77.  $P(A, B)$  78.  $P(A, B)$  79.  $P(A, B)$  80.  $P(A, B)$  81.  $P(A, B)$  82.  $P(A, B)$  83.  $P(A, B)$  84.  $P(A, B)$  85.  $P(A, B)$  86.  $P(A, B)$  87.  $P(A, B)$  88.  $P(A, B)$  89.  $P(A, B)$  90.  $P(A, B)$  91.  $P(A, B)$  92.  $P(A, B)$  93.  $P(A, B)$  94.  $P(A, B)$  95.  $P(A, B)$  96.  $P(A, B)$  97.  $P(A, B)$  98.  $P(A, B)$  99.  $P(A, B)$  100.  $P(A, B)$

**Managing Partner**

REGISTERED HOLDER / LESSEE  
Signed by the above named  
In the presence of

286  
 (Dr. S. VEDIAPPAN)  
 ASSISTANT DIRECTOR,  
 GEOLOGY AND MINING,  
 KARUR.





-257-



Leige Area

Safety Zone

REGISTERED HOLDER

For Thirumalai Blue Metals

Nâng cấp Partner

REGISTERED HOLDER / LESSEE

DISTRICT COLLECTOR  
KARUR.

287

ASSISTANT DIRECTOR

RECEIVED AND RECORDED

17-10-2016

வட்டாட்சிப் பரவலக இணைய சேவை நில உரிமை விபரங்கள்



தமிழக அரசு

வருவாய்த் துறை

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

மாவட்டம் : கரூர்

வட்டம் : மண்மங்கலம்

வருவாய் கிராமம் : வேட்டமங்கலம் (மேற்கு)

பட்டா எண் : 3308

உரிமையாளர்கள் பெயர்

1.	தங்கராஜ்	மகன்	மோகனராஜ்
2.	ராமசாமி	மகன்	ராமராஜேஸ்குமார்
3.	சுந்தராமி	மகன்	தங்கவேல்

நன்செய்

பன்செய்

யாற்றவை

பரப்பு

தீர்வை

பரப்பு

தீர்வை

பரப்பு

தீர்வை

பல எண்

உட்பிரிவு

ஹெக்ட - ஏர்

ரூ - பை

ஹெக்ட - ஏர்

ரூ - பை

ஹெக்ட - ஏர்

ரூ - பை

1238

2

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5 - 4.00

6.97

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5 - 4.00

6.97

குறிப்பு :

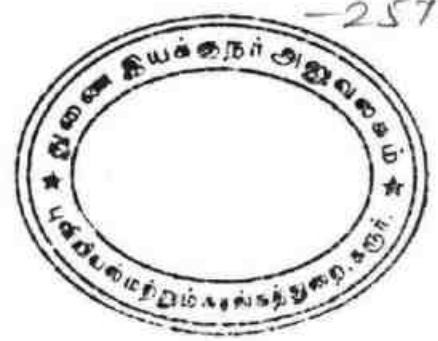


1. மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் <http://eservices.tn.gov.in> என்ற இணைய தளத்தில் 14/08/2016/83308/50244 என்ற குறிப்பு எண்ணை உள்ளிடு செய்து உறுதி செய்துகொள்ளவும்.
2. இத் தகவல்கள் 17-10-2016 அன்று 01:02:46 PM நேரத்தில் அச்சடிக்கப்பட்டது.
3. கைப்பேசி கேமராவின் 2D bar-code படப்பான் மூலம் படித்து 3G/GPRS வூதி இணையதளத்தில் சரிபார்க்கவும்.

*Handwritten signature*







From

Thiru G.Govindaraj, I.A.S.,  
District Collector,  
Karur District  
Karur

To

The Sub-Register,  
Velayuthampalayam,  
Karur.

**Re.No.299/Mines/2015, Dated : .10.2016**

Sir,

Sub: Mines and Minerals - Minor Minerals - Rough Stone  
- Karur District - Manmangalam Taluk -  
Vettamangalam (West) Village - S.F.No.1238/2 (Part)  
over an extent of 4.80.0 Hect. - Rough Stone quarry  
lease granted to Tvl.Thirumalai Blue Metals -  
Registration of lease deed Regarding.

Ref: Karur District Collector's Proceedings  
No.299/Mines/2015, Dated:14.10.2016.

\*\*\*\*\*

Tvl.Thirumalai Blue Metals, No.538/4 Poolankadu, Kuppam Post,  
Aravakurichi taluk, Karur District have been granted a lease to Quarry  
Rough stone in S.F.No.1238/2 (Part) over an extent of 4.80.0 hecets of  
Vettamangalam (West) Village, Manmangalam Taluk, Karur District for  
a period of 5 (Five) Years from **14.10.2016 to 13.10.2021**. The lease  
deed having pages from 1 to 11 is herewith sent.

- 1 Anticipated seigniorage fee for the  
entire lease period of 5 years : Rs. 28,57,230/-
2. Area Assessment @ Rs. 100/- per Hect. : Rs. 2,400/-
3. Security Deposit paid by way of Chalan : Rs. 5,000/-

The District Collector is exempted from appearing in person  
under section 88(1) of the Registration Act. I request you to register the  
lease deed and return the document through the lessee.

Encl:- Lease deed pages (1 to 11).

For Collector  
Karur.

**Copy to:-**



Tvl.Thirumalai Blue Metals, No.538/4 Poolankadu, Kuppam Post,  
Aravakurichi taluk, Karur District - (is requested to register the lease  
deed at their own expenses and return the original document).



199/2016/BK1

Presented in the Office of SUB REGISTRAR of Velayuthampalayam and fee of Rs. 20300 paid between hours of 2 and 3 on 17/10/2016 by

Left Thumb



Handwritten signature: T. U. S. V.

Additions As per the recitals of the document



Execution Admitted by

have satisfied my self as to the execution of the instrument by Thiru The District Collector Karur who is exempted from Personal Appearance under Section 88(1) of the Registration Act.

Handwritten signature and date: 17/10/2016

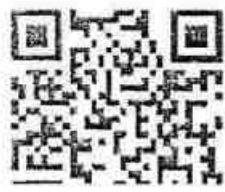
Claim Admitted by

Left Thumb



Handwritten signature: T. U. S. V.

Additions As per the recitals of the document



Handwritten signature





Claim Admitted by

Left Thumb



Additions As per the recitals of the document

Left Thumb

For Thammalai Blue Metals



Subsequent Parties

Additions As per the recitals of the document

certified by

Name : விநாயகமூர்த்தி

S/o ருல்லசாமி

கனபதிமாளையம் துர், 6  
மல்லாத்தை அஞ்சல்  
காஸ் மாவட்டம்

Name : திரீனவு

S/o குணசேகரன்

நெ.75/1, பெயாஸ் ரோடு,  
வேலாயுதம்பாளையம்  
காஸ் மாவட்டம்

17th day of October 2016

SUB REGISTRAR

Velayuthampalayam








Registered as No 1199 of 2016 of Book I

Date 17/12/2016

*[Signature]*  
SUB REGISTRAR  
Velayuthampalayam



*[Signature]*





உள்ளே தீர்மானம் எடுக்கப்பட்டது  
2012-12-20

பெயர்: MOBLANKA T  
பிள்ளை: MOBLANKA T  
பிறந்த தேதி: 20/02/1985  
பாலினம்: MALE

புகைப்படம்

பெயர்: MOBLANKA T  
பிள்ளை: MOBLANKA T  
பிறந்த தேதி: 20/02/1985  
பாலினம்: MALE

புகைப்படம்

இந்தியப் பிரஜை அடையாள அட்டை  
SECTION COMMISSIONER OF INDIA  
IDENTITY CARD  
DOB: 20/02/1985

பெயர்: MOBLANKA T  
பிள்ளை: MOBLANKA T  
பிறந்த தேதி: 20/02/1985  
பாலினம்: MALE



பெயர்: MOBLANKA T  
பிள்ளை: MOBLANKA T  
பிறந்த தேதி: 20/02/1985  
பாலினம்: MALE

புகைப்படம்

இந்தியப் பிரஜை அடையாள அட்டை  
SECTION COMMISSIONER OF INDIA  
IDENTITY CARD  
DOB: 20/02/1985

பெயர்: MOBLANKA T  
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பிறந்த தேதி: 20/02/1985  
பாலினம்: MALE

பெயர்: MOBLANKA T  
பிள்ளை: MOBLANKA T  
பிறந்த தேதி: 20/02/1985  
பாலினம்: MALE

புகைப்படம்

ஆதாரம் - சாதாரண மனிதனின் அதிகாரம்

ஆதாரம் - சாதாரண மனிதனின் அதிகாரம்



CONSENT ORDER NO. 2108238033001

DATED: 09/04/2021.

PROCEEDINGS NO.F.0560KAR/RS/DEE/TNPCB/KAR/A/2021

DATED: 09/04/2021

**SUB:** Tamil Nadu Pollution Control Board - RENEWAL OF CONSENT -M/s. THIRUMALAI BLUE METALS (QUARRY) , S.F.No. 1238/2, VETTAMANGALAM WEST village, Manmangalam Taluk and Karur District - Renewal of Consent for the operation of the plant and discharge of emissions under Section 21 of the Air (Prevention and Control of Pollution) Act, 1981 as amended in 1987 (Central Act 14 of 1981) -Issued- Reg.

**REF:** 1. CTO Proc.No.F.0560KAR/RS/DEE/TNPCB/KAR/W&A/2017 DATED: 12/01/2017.  
2. Unit's application for RCO through OCMMS on 30.3.2021.  
3. IR.No : F.0560KAR/RS/AEE/KAR/2021 dated 08/04/2021.

RENEWAL OF CONSENT is hereby granted under Section 21 of the Air (Prevention and Control of Pollution) Act, 1981 as amended in 1987 (Central Act 14 of 1981) (hereinafter referred to as "The Act") and the rules and orders made there under to

The Partner

M/s. THIRUMALAI BLUE METALS (QUARRY),  
S.F.No. 1238/2,  
VETTAMANGALAM WEST village,  
Manmangalam Taluk,  
Karur District.

Authorizing the occupier to operate the industrial plant in the Air Pollution Control Area as notified by the Government and to make discharge of emission from the stacks/chimneys.

This is subject to the provisions of the Act, the rules and the orders made there under and the terms and conditions incorporated under the Special and General conditions stipulated in the Consent Order issued earlier and subject to the special conditions annexed.

**This RENEWAL OF CONSENT is valid for the period ending October 13, 2021**

**RAVICHANDRA** Digitally signed by  
**N KANDASAMY** RAVICHANDRAN KANDASAMY  
Date: 2021.04.12 20:15:58  
+05'30'  
District Environmental Engineer,  
Tamil Nadu Pollution Control Board,  
KARUR



### SPECIAL CONDITIONS

1. This renewal of consent is valid for operating the facility for the manufacture of products (Col. 2) at the rate (Col. 3) mentioned below. Any change in the products and its quantity has to be brought to the notice of the Board and fresh consent has to be obtained.

Sl. No.	Description	Quantity	Unit
<b>Product Details</b>			
1.	Rough Stone	63494	cu.m over a period of five years
2.	Top Soil	8832	cu.m over a period of five years

2. This renewal of consent is valid for operating the facility with the below mentioned emission/noise sources along with the control measures and/or stack. Any change in the emission source/control measures/change in stack height has to be brought to the notice of the Board and fresh consent/Amendment has to be obtained.

<b>I Point source emission with stack :</b>				
Stack No.	Point Emission Source	Air pollution Control measures	Stack height from Ground Level in m	Gaseous Discharge in Nm <sup>3</sup> /hr
<b>II Fugitive/Noise emission :</b>				
Sl. No.	Fugitive or Noise Emission sources	Type of emission	Control measures	
1.	Top Soil Removal	Fugitive	Water Sprinklers	
2.	Drilling Operations	Fugitive	Water injection	
3.	Blasting	Fugitive	Good blasting practices & Water Sprinklers	
4.	Loading,unloading and hauling	Fugitive	Water Sprinklers	
5.	Blasting	Noise	Good blasting practices	

*(Signature)*



**Special Additional Conditions:**

The unit shall install the approved retrofit emission control device/equipment (at least 70% Particulate matter reduction efficiency on all DG sets with capacity of 125 KVA and above) otherwise the unit shall be shift to gas based generators within the time frame prescribed in the notification No. TNPCB/Labs/DD(L)02151/2019 dated 10.06.2020 issued by TNPCB.

**Additional Conditions:**

1. The unit shall operate all the APC measures continuously and efficiently so as to achieve the AAQ/Emission standards prescribed by the Board.
2. The unit shall adhere to Ambient Noise level standards prescribed by the Board.
3. The unit shall restrict the quarrying operations between 7 Am and 5 Pm.
4. No change in mining technology or scope of working shall be made without prior permission approval of the SEIAA, Chennai.
5. The unit shall comply with the conditions mentioned in the Environmental Clearance obtained from SEIAA vide Lr No. SEIAA-TN/F.No.4628/ 1(a)/E.C No 3767/2016 dated 26.09.2016.
6. The unit shall continue to develop green belt all along the boundary of the quarry lease area.
7. The unit shall not use "use and throwaway plastics" such as plastic sheets used for food wrapping , spreading on dining table etc., plastic plates , plastic coated tea cups, plastic tumbler , water pouches and packets, plastic straw, plastic carry bags and plastic flags irrespective of thickness, within the industry premises. Instead unit shall encourage use of eco friendly alternative such as banana leaf, arecanut palm, stainless steel, glass, porcelain plates/cups/cloth bag, jute bag etc.,

RAVICHANDRAN  
KANDASAMY

Digitally signed by  
RAVICHANDRAN KANDASAMY  
Date: 2021.04.12 20:16:20 +05'30'

**District Environmental Engineer,  
Tamil Nadu Pollution Control Board,  
KARUR**

To  
The Partner,  
M/s. THIRUMALAI BLUE METALS (QUARRY),  
No.538/4, Poolan Kadu,  
Kuppam Post,  
Aravakurichi Taluk,  
Karur.,  
Pin: 639206

**Copy to:**

1. The Commissioner, KARUR-Panchayat Union, Manmangalam Taluk, Karur District.
2. Copy submitted to the Member Secretary, Tamil Nadu Pollution Control Board, Chennai for favour of kind information.
3. Copy submitted to the JCEE-Monitoring, Tamil Nadu Pollution Control Board, Salem for favour of kind information.
4. File

*(Handwritten signature)*



CONSENT ORDER NO. 2108138033001

DATED: 09/04/2021.

PROCEEDINGS NO.F.0560KAR/RS/DEE/TNPCB/KAR/W/2021 DATED: 09/04/2021

**SUB:** Tamil Nadu Pollution Control Board - RENEWAL OF CONSENT – M/s. THIRUMALAI BLUE METALS (QUARRY) , S.F.No. 1238/2, VETTAMANGALAM WEST village, Manmangalam Taluk and Karur District - Renewal of Consent for the operation of the plant and discharge of sewage and/or trade effluent under Section 25 of the Water (Prevention and Control of Pollution) Act, 1974 as amended in 1988 (Central Act 6 of 1974) – Issued- Reg.

**REF:** 1. CTO Proc.No.F.0560KAR/RS/DEE/TNPCB/KAR/W&A/2017 DATED: 12/01/2017.  
2. Unit's application for RCO through OCMMS on 30.3.2021.  
3. IR.No : F.0560KAR/RS/AEE/KAR/2021 dated 08/04/2021.

RENEWAL OF CONSENT is hereby granted under Section 25 of the Water (Prevention and Control of Pollution) Act, 1974 as amended in 1988 (Central Act, 6 of 1974) (hereinafter referred to as "The Act") and the rules and orders made there under to

The Partner  
M/s.THIRUMALAI BLUE METALS (QUARRY),  
S.F.No. 1238/2,  
VETTAMANGALAM WEST Village ,  
Manmangalam Taluk ,  
Karur District .

Authorising the occupier to make discharge of sewage and /or trade effluent.

This is subject to the provisions of the Act, the rules and the orders made there under and the terms and conditions incorporated under the Special and General conditions stipulated in the Consent Order issued earlier and subject to the special conditions annexed.

**This RENEWAL OF CONSENT is valid for the period ending October 13, 2021**

RAVICHANDRAN  
KANDASAMY

Digitally signed by  
RAVICHANDRAN KANDASAMY:  
Date: 2021.04.12 20:17:09 +05'30'

District Environmental Engineer,  
Tamil Nadu Pollution Control Board,  
KARUR



### SPECIAL CONDITIONS

1. This renewal of consent is valid for operating the facility for the manufacture of products/byproducts (Col. 2) at the rate (Col 3) mentioned below. Any change in the product/byproduct and its quantity has to be brought to the notice of the Board and fresh consent has to be obtained.

Sl. No.	Description	Quantity	Unit
<b>Product Details</b>			
1.	Rough Stone	63494	cu.m over a period of five years
2.	Top Soil	8832	cu.m over a period of five years

2. This renewal of consent is valid for operating the facility with the below mentioned outlets for the discharge of sewage/trade effluent. Any change in the outlets and the quantity has to be brought to the notice of the Board and fresh consent has to be obtained.

Outlet No.	Description of Outlet	Maximum daily discharge in KLD	Point of disposal
<b>Effluent Type : Sewage</b>			
1.	Sewage	0.6	On Industry's Own land in its sister concern of M/s Thirumalai Blue Metals
<b>Effluent Type : Trade Effluent</b>			

*Spica*



**Additional Conditions:**

1. The unit shall not generate trade effluent at any stage of its manufacturing process.
2. The unit shall treat and dispose the sewage generated from their premises through septic tank and soak pit arrangements.
3. The unit shall restrict the quarrying operations between 7 Am and 5 Pm.
4. No change in mining technology or scope of working shall be made without prior permission approval of the SEIAA, Chennai.
5. The unit shall comply with the conditions mentioned in the Environmental Clearance obtained from SEIAA vide Lr No. SEIAA-TN/F.No.4628/ 1(a)/E.C No 3767/2016 dated 26.09.2016.

RAVICHANDRAN  
KANDASAMY

Digitally signed by  
RAVICHANDRAN KANDASAMY  
Date: 2021.04.12 20:17:42 +05'30'

**District Environmental Engineer,  
Tamil Nadu Pollution Control Board,  
KARUR**

To  
The Partner,  
M/s. THIRUMALAI BLUE METALS (QUARRY),  
No.538/4, Poolan Kadu,  
Kuppam Post,  
Aravakurichi Taluk,  
Karur.,  
Pin: 639206

**Copy to:**

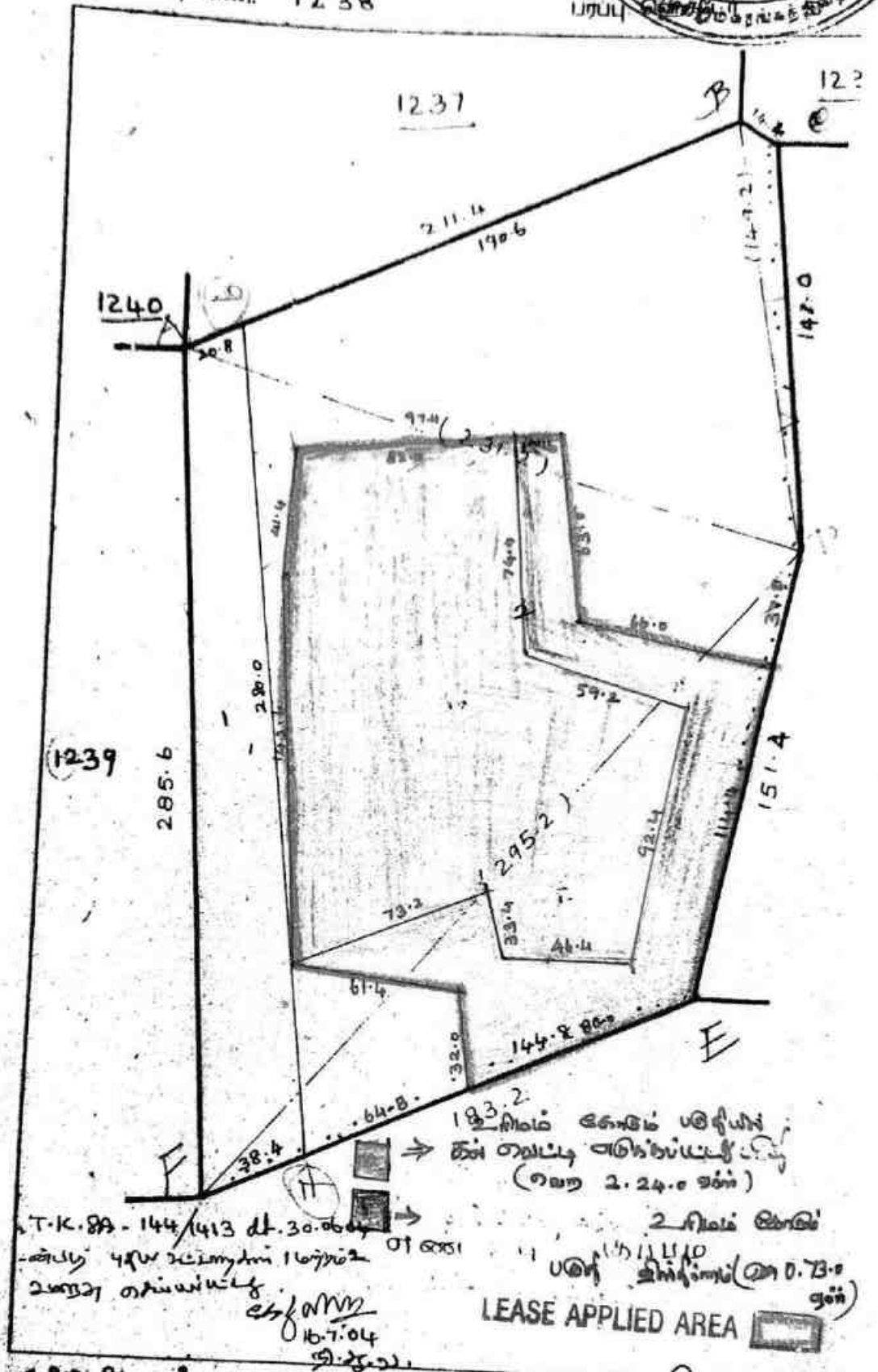
1. The Commissioner, KARUR-Panchayat Union, Manmangalam Taluk, Karur District .
2. Copy submitted to the Member Secretary, Tamil Nadu Pollution Control Board, Chennai for favour of kind information.
3. Copy submitted to the JCEE-Monitoring, Tamil Nadu Pollution Control Board, Salem for favour of kind information.
4. File

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*Handwritten signature*



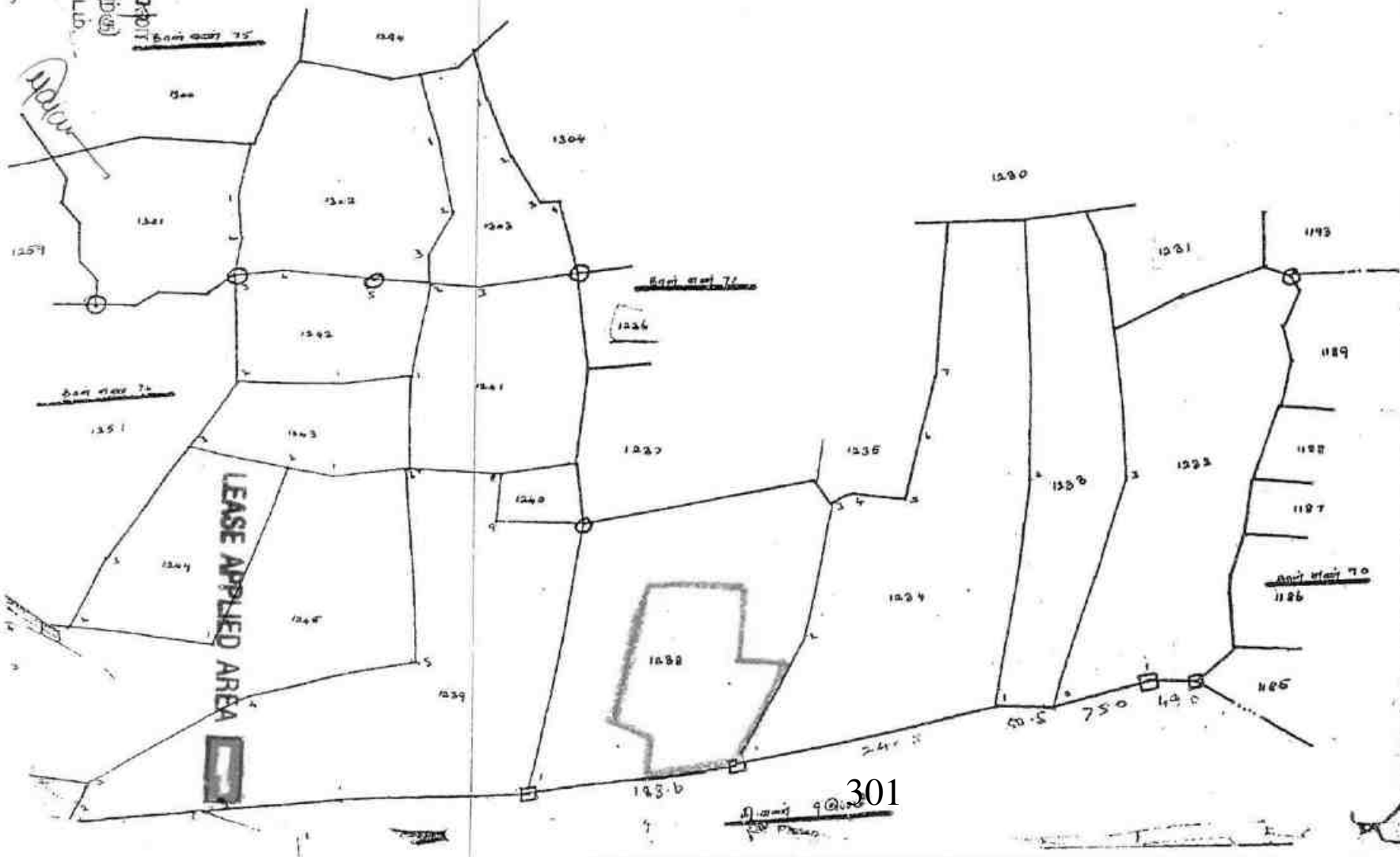
புதுப்பி



அளவு. 1 : 2000000 ஆய்வாளர் புகளார்.

உதாரணம்:

पुनः :



301



1	2	3	4	5	6	7	8	9	10	11	12
							கு. பை.	ஹெ. ஏர்ஸ்.	கு. பை.		
1235	(4)	1235-பா	ர	ய	...	8-5	7	1 09	0 20-0	0 22	1795 ரா. ராசப்பன்.
	5	-பா	ர	ய	...	8-5	7	1 09	0 34-5	0 38	1796 ரா. ராமசாமி.
									2 42-5	2 64	
1236	(A1)	1236	ர	ய	...	8-5	7	1 09	0 70-0	0 76	2332 சி. நல்லப்பன் (1). சி. மாசப்பன் (2).
	(A2)	-பா	ர	ய	...	8-5	7	1 09	0 74-0	0 80	292 வி. கந்தன்.
	(A3)	-பா	ர	ய	...	8-5	7	1 09	0 52-0	0 57	494 மு. குப்பன்.
	(A4)	-பா	ர	ய	...	8-5	7	1 09	0 12-0	0 13	286 ரா. கந்தசாமி.
	(A5)	-பா	ர	ய	...	8-5	7	1 09	0 04-0	0 06	2815 சி. நல்லப்பன் மற்றும் நான்கு பேர்களும்.*
	(B1)	-பா	ர	ய	...	8-5	7	1 09	0 74-0	0 75	2332 சி. நல்லப்பன் (1). சி. மாசப்பன் (2).
	(B2)	-பா	ர	ய	...	8-5	7	1 09	0 01-0	0 06	2815 சி. நல்லப்பன் மற்றும் நான்கு பேர்களும்.*
									2 87-0	3 13	
1237	A	1237-A	ர	ய	...	8-4	6	1 38	2 05-0	2 84	286 ரா. கந்தசாமி.
	B1	-பா	ர	ய	...	8-4	6	1 38	0 20-0	0 28	494 மு. குப்பன்.
	B2	-பா	ர	ய	...	8-4	6	1 38	0 42-0	0 58	286 ரா. கந்தசாமி.
									2 67-0	3 70	
(1238)	...	1238	ர	ய	...	8-4	6	1 38	5 85-5	8 10	2561 ப. குப்பன் கவுண்டர் (1), ப. கைலாச கவுண்டர் (2), க. குழந்தை சாமி (3).
1239	1	1239-பா	ர	ய	...	8-4	6	1 38	0 84-0	1 16	822 கு. செல்லப்ப கவுண்டர்.
	2	-பா	ர	ய	...	8-4	6	1 38	2 41-0	3 33	291 கு. கந்தசாமி கவுண்டர்.

\* விவரப்பட்டியலைப் பார்க்கவும்.

சிராம நிகல்க வு  
19A, வேட்டமங்கலம் (மேற்கு)  
புகளா-6, கனா மாவட்டம்.



1235 2A 200 0 4 ... 8-5-7 1.09 0.02.5 0.06 725.90.சிப்பிரஸ்  
 2B 200 0 47 - - 0.03.5  
 2C 200 0 4 ... 8-5-7 1.09 0.08.0 0.09 725.90.சிப்பிரஸ்  
 0.14.0 0.15

3A 300 0 4 ... 8-5-7 1.09 0.11.5 0.13 1941.90.கோயம்புரம்  
 3B 300 0 47 - - 0.05.5 Clubed with 2B  
 3C 300 0 4 ... 8-5-7 1.09 0.03.0 0.06 1941.90.கோயம்புரம்  
 0.20.0 0.19

4A 400 0 4 ... 8-5-7 1.09 0.15.0 0.17 1795.90.90சிப்பிரஸ்  
 4B 400 0 47 - - 0.05.0 Clubed with 2B  
 0.20.0 0.17  
 0.14.0 -

28,387  
48-27

28,387 Clubed with 2B Aspen T.K. 8A- 87/1404 Dt. 7.3.95  
 4B

5.5.95

1238 1238/ 1238 0 4 ... 8-4 6 1.38 0.81.5 1.13 2561.அகஸ்தாங்க  
 on  
 கவுண்டர் மெக்கர்  
 தங்கச்சை மரமாதலுக்காக  
 ஏ. சுப்பிரமணியன் கணவர்  
 குத்தினார்

-2 " 5 4 ... 8-4 6 1.38 5.04.0 9.97 5.3308. ஏ. குமாரசுந்தரன்  
 5.85.5 8.10  
 5.85.5 8.10  
 1941/1413 dt. 30/1  
 16.7.04  
 for Tahr.

1236-A1 1236 0 4 ... 8-4-6 1.38 2.75.0-3.06 3756. 16.7.04  
 A1A2/13 Ays, 82, 8. காரப்பன் மரம் 500  
 1237-B1 - 1236 - 0.4 ... 8-4-6 1.38 0.62.0 - 0.86  
 B1.82  
 2000.08.01  
 303  
 கிராம நிர்வாக அலுவலர்  
 13A, வேட்டிமங்கலம் (மேற்கு)  
 மகனா-இ, கரநர் மாவட்டம்.  
 16.7.14





தமிழக அரசு

வருவாய்த் துறை

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



மாவட்டம் : கரூர்

வட்டம் : புகளூர்

வருவாய் கிராமம் : வேட்டமங்கலம் மேற்கு

பட்டா எண் : 3308

உரிமையாளர்கள் பெயர்

- |    |          |      |                 |  |
|----|----------|------|-----------------|--|
| 1. | தங்கராஜ் | மகன் | மோகன்ராஜ்       |  |
| 2. | ராமசாமி  | மகன் | ராமராஜேஸ்குமார் |  |
| 3. | கந்தசாமி | மகன் | தங்கவேல்        |  |

புல எண்	உட்பிரிவு	புன்செய்		நன்செய்		மற்றவை		குறிப்புரைகள்
		பரப்பு	தீர்வை	பரப்பு	தீர்வை	பரப்பு	தீர்வை	
		ஹெக் - ஏர்	ரூ - பை	ஹெக் - ஏர்	ரூ - பை	ஹெக் - ஏர்	ரூ - பை	
1238	2	5 - 4.00	6.97	--	--	--	--	---- -- 01-08-2015
		5 - 4.00	6.97					

குறிப்பு2 :



- மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் <https://eservices.tn.gov.in> என்ற இணைய தளத்தில் 14/07/10A/03308/30054 என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.
- இத் தகவல்கள் 15-12-2021 அன்று 01:25:05 PM நேரத்தில் அச்சடிக்கப்பட்டது.
- கைப்பேசி கேமராவின் 2D barcode படிப்பான் மூலம் படித்து 3G/GPRS வழி இணையதளத்தில் சரிபார்க்கவும்

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142 - ஆம் பதவியில்

മുൻ

மாவட்டம்

40000

கிராமக் கணக்கு  
வட்டம் உபநிர்வாகம்

சென்னை இயக்குநர் அலுவலகம்  
புள்ளி 2  
கிராமத்தில் வருடவாரி பல்வகை  
பெரும்பாலான பருவங்களில்

पृष्ठ 2

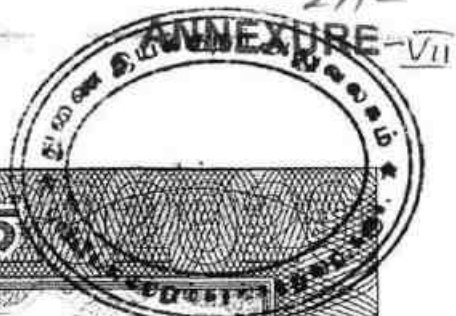
கிராமத்தில் வருடவாரி பல்வாரி

இரண்டாம் பாகம்.

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380/26-R.F. III-A-10-50,00,000 Cps.-GBP.-Mdu-7-2018.

Ураган

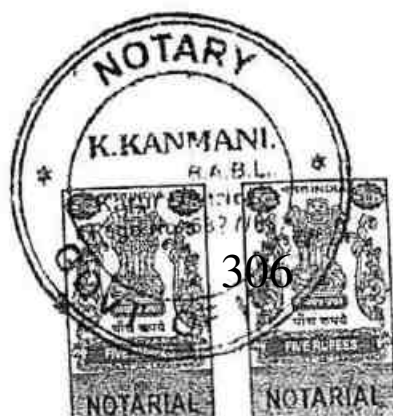


தமிழ்நாடு தமிழ்நாடு TAMIL NADU 620/- 16/9/21 94AB 515697

தினேசுக்கர் ரங்க  
சம்மதக்கடிதம்

K. SIVASAMY,  
S.V. 19-A, PNS ST.,  
L.No: 1/97, KRR,

கருநா மாவட்டம், மூலிமங்கலம் அஞ்சல், நாட்டுக்கல் தெரு, கதவு எண்.2 என்ற முகவரியில் வசிக்கும் தங்கராஜ் அவர்கள் குமாரர் T.மோகன்ராஜ்-1, கருநா மாவட்டம், கருநா வட்டம், ஆண்டாங்கோவில் கிழக்கு கிராமம், ராமநகர் வடக்கு, வெங்கமேடு அஞ்சல் என்ற முகவரியில் வசிக்கும் R.ராமசாமி அவர்கள் குமாரர் R.M.ராஜேஷ்குமார்-2, நாமக்கல் மாவட்டம், நாமக்கல் வட்டம், வேலூர் அஞ்சல், நல்லியம்பாளையம், காலேஜ் ரோடு, கதவு எண்.125 என்ற முகவரியில் வசிக்கும் கந்தசாமி அவர்கள் குமாரர் K.தங்கவேல்-3, ஆகிய நாங்கள் எழுதிக்கொடுக்கும் உறுதிமொழி பத்திரம் என்னவென்றால், கருநா மாவட்டம், மண்மங்கலம் வட்டம், வேட்டமங்கலம் மேற்கு கிராமம், புல எண்.1238/2ல் 5.4 ஹெக்டேர் (பட்டா எண்.3308) விஸ்தீர்ணமுள்ள புஞ்சை நிலம் ஷங்கர் மூவருக்கும் பாத்தியப்பட்டது. மேற்படி புல எண்.1238/2ல் 2.97.00 ஹெக்டேர் பரப்பில் கருநா மாவட்டம், புகளூர் வட்டம், குப்பம் கிராமம், பூலான்காடு, நெ.538/4 என்ற முகவரியில் இயங்கிவரும் திருமலை புளூமெட்டல்ஸ் என்ற நிறுவனத்திற்கு சாதாரண கற்கள் வெட்டியெடுக்க அரசு அனுமதி பெற்று கல்குவாரி பணி செய்வதற்கு எங்களுக்கு எவ்வித ஆட்சேபணையும் இல்லை என உறுதி அளிக்கிறோம். கல்குவாரி குத்தகை உரிமம் வழங்க எங்களுடைய முழு சம்மதத்தை தெரிவித்துக் கொள்கிறோம்.



பிரமாணதாரர்.  
T. L. V.  
[Signatures]

16/9/21  
Cell: 99944 45 37  
K. KANMANI, B.A.B.L.,  
Advocate & Notary Public  
Govt of India Regd No 6877/08  
Pudur. Andan Kovil Post  
KARUR - 639 003. T.N.





தமிழ்நாடு தமில்நாடு TAMILNADU

திருமலை புலமெட்டல்ஸ்  
குமாரன் கார்டு

2568  
1422009  
3 100/-

L 371425

K. SIVASAMY,  
S.V. 19-A, PMS ST,  
L NO: 1/97 KRR,  
KARUR.

(PARTNERSHIP DEED)

திருமலை புலமெட்டல்ஸ்

2009-ம் வருடம் பிப்ரவரி மாதம் 18 -ம் தேதிக்கு, நாமக்கல் மாவட்டம், நாமக்கல் வட்டம், வேலூர் அஞ்சல், 125, நல்லியம்பாளையம், காலேஜ்ரோடு என்ற விலாசத்தில் வசிக்கும் கந்தசாமி அவர்களின் குமாரர் க.தங்கவேல் (வயது - 38) - 1, கருர் மாவட்டம், முலிமங்கலம் அஞ்சல், 2, நாட்டுகல் தெருவில் வசிக்கும் ஆர்.தங்கராஜ் அவர்களின் குமாரர் டி.மோகன்ராஜ் (வயது - 23) - 2, கருர் மாவட்டம், கருர் வட்டம், ஆண்டாங்கோவில் கிழக்கு, ராம்நகர் வடக்கு, வெங்கமேடு அஞ்சல், மு.ராசப்பகவுண்டர் அவர்களின் குமாரர் ஆர்.ராமசாமி (வயது - 50) - 3, கருர் மாவட்டம், கருர் வட்டம், ஆண்டாங்கோவில் கிழக்கு கிராமம், ராம்நகர் வடக்கு, வெங்கமேடு அஞ்சல் என்ற விலாசத்தில் வசிக்கும் ஆர்.ராமசாமி

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தமிழ்நாடு தமிழ்நாடு TAMILNADU

திருமலை மெட்டல்ஸ்  
புதுச்சேரி கல்

2553.  
14.2.2009  
3100/

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அவர்களின் குமாரர் ராம்.ராஜேஷ்குமார் (வயது - 24) - 4 ஆகிய நாம் நான்கு பேர்களும் சேர்ந்து எழுதிக் கொண்ட கூட்டு வியாபார உடன்படிக்கை பத்திரம் என்னவென்றால்,

1) இப்பவும் நம்மில் 1 முதல் 4 வரை லக்கமிட்ட கூட்டாளிகள் நான்கு பேர்களும் சேர்ந்து 18.2.2009-ம் தேதி முதல் கொண்டு கரூர் மாவட்டம், அரக்குறிச்சி வட்டம், பூலான் காடு, குப்பம் அஞ்சல், குப்பம் கிராமம், எஸ்.எப்.538/4, என்ற இடத்தில் திருமலை புளூ மெட்டல்ஸ் (TIRUMALAI BLUE METALS) என்ற விலாசம் வைத்து கிரஷரில் ஜல்லி உடைக்கும் தொழிலை ஆரம்பித்து கூட்டாக நடத்தி வரவோமாகவும், கூட்டாளிகள் விரும்பித் தீர்மானித்தால் மேற்படி பெயரை மாற்றி அமைத்துக் கொள்ளவோ அல்லது வேறு இடங்களுக்கு மாற்றவோ செய்யலாம்.

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தமிழ்நாடு தமிழ்நாடு TAMILNADU

சுமேன் 400 ரூபாய்  
சுமேன் 400

2552  
14.2.2009  
31001

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2) இக்கூட்டின் சார்பில் இது தவிர வேறு எந்தவியாபாரம் வேண்டுமானாலும் கூட்டாளிகள் அனைவரும் விரும்பித் தீர்மானித்தால் இதே பெயரிலேயே இதே விலாசத்திலேயே செய்து வரலாம்.

3) இக்கூட்டின் அபிவிருத்தியை முன்னிட்டு நம் கூட்டாளிகள் அனைவரும் உள்ளூரிலும், வெளியூர்களிலும் கிளைகள் துவக்கி நடத்தி வரலாம்.

4) இக்கூட்டு வியாபார உடன்படிக்கைப் பத்திரத்தின் ஷரத்துக்கள் 18 -ம் தேதி முதல் அமுலுக்கு வந்ததாகக் கருத வேண்டியது.

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5) இக்கூட்டு வியாபாரத்திற்கு நம் கூட்டாளிகள் 4 பேர்களும் கீழ்க்கண்டபடி முதலீட்டுத் தொகையை போட்டுள்ளோம்.

க. தங்கவேல்	- 30% -	90,000
டி. மோகன்ராஜ்	- 30% -	90,000
ஆர். ராமசாமி	- 20% -	60,000
ராம். ராஜேஷ்குமார்	- 20% -	60,000

கூட்டாளிகள் விரும்பித் தீர்மானித்தால் மேற்படி முதலீட்டுத் தொகைகளை கூட்டியோ அல்லது குறைத்தோ வைத்துக் கொள்ளலாம். கூட்டின் அபிவிருத்தியை முன்னிட்டு நம் கூட்டாளிகள் யார் வேண்டுமானாலும் இக்கூட்டு நிறுவனத்திற்கு கடன் கொடுக்கலாம். அவ்வித கடன்களை கூட்டாளிகளின் கடன் அல்லது டெபாசிட் கணக்குகளிலும், கூட்டாளிகளின் இதர கணக்குகளிலும் வரவு வைத்துக் கொள்ளலாம். மேற்படி முதலீடு அல்லது கடன் அல்லது டெபாசிட் கணக்குகளில் பற்று நீக்கி வரவாக உள்ள தொகைகளுக்கு கூட்டாளிகள் வருடம் ஒன்றுக்கு 12% வட்டி போட்டு பொதுவில் செலவு எழுதிக் கொள்ள வேண்டியது.

6) நமது இக்கூட்டு வியாபாரத்தின் நோக்கமானது நாம் தற்சமயம் மேற்படி பாராவில் விவரமாக சொல்லப்பட்டிருக்கும் மூலதனத்தைக் கொண்டும், வெளிநபர்களிடமிருந்து டெபாசிட் வாங்கியும் பாங்குகளில் கரண்ட் அக்கவுண்ட், மற்றும் ஓவர் டிராப்ட் ஓ.சி.சி. கணக்குகள் வைத்து வரவு செலவு செய்தும் கீழ்க்கண்டவற்றை செய்து வருவது ஆகும்.

கிரஷர் கருங்கல் ஜல்லி உற்பத்தி செய்து விற்றல், கருங்கல் ஜல்லி வாங்கி விற்றல், கருங்கல், கருங்கற்கள் உடைத்து விற்றல், கருங்கற்கள் வாங்கி விற்றல், கட்டிடம் கட்ட மற்றும் ரோடு போட உதவும் ஜல்லி வகையராக்கள் சம்மந்தப்பட்ட இதர தொழில்கள் செய்தல்.

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7) இந்த கூட்டு வியாபாரத்திற்காக நம்மில் 1&4லக்கமிட்ட க.தங்கவேல் ராம்.ராஜேஸ்குமார் ஆகியவர்களை நிர்வாகக் கூட்டாளியாக நியமித்துள்ளோம். மேற்படி நிர்வாகக் கூட்டாளிக்கு மாதம் ஒன்றுக்கு ரூ.2,000/- சம்பளமாகவும் வருடம் இரண்டு மாத போனசும் வழங்கப்படும். மேற்படி சம்பளம் மற்றும் போனஸ் தொகைகளை அவ்வப்போது அமுலில் உள்ள வருமானவரி சட்ட ஷரத்து 49 (பி)ன்படி கூட்டியோ, அல்லது குறைத்தோ கொடுக்கலாம்.

8) இந்த கூட்டு வியாபாரத்திற்காக நிர்வாகக் கூட்டாளியாக நியமிக்கப்பட்டுள்ள 1, 4 லக்கமிட்ட க.தங்கவேல், ராம்.ராஜேஷ்குமார் ஆகியோர்களுக்கு கீழ்க்கண்ட அதிகாரங்கள் வழங்கப்படுகிறது.

அ) வெளி நபர்களிடம் ரொக்கமாக கடன்கள் மற்றும் டெபாசிட்டுக்கள் வாங்க நேரிட்டால் அப்படி வாங்கும் கடன்கள் மற்றும் டெபாசிட் தொகைகளை இக்கூட்டு விலாசத்தின் பெயரிலேயே வாங்கி இக்கூட்டு நிறுவனத்தின் கணக்குகளில் உடனுக்குடன் வரவு வைத்துக் கொள்ள அதிகாரம் வழங்கப்படுகிறது.

ஆ) இக்கூட்டு நிறுவனத்தின் சார்பாக புரோ நோட்டுக்கள், கேரண்டிகள் மற்றும் கவுண்டர் கேரண்டிகளில் கையொப்பமிட்டு கடன்கள் வாங்கவும் அவைகளை செட்டில் செய்யவும், டெபாசிட் ரசீதுகளை திரும்பப் பெற்றுக் கொண்டு அவைகளை டிஸ்சார்ஜ் செய்து கணக்கு தீர்க்கவும் அதிகாரம் வழங்கப்படுகிறது.

இ) இக்கூட்டு நிறுவனத்தின் சார்பாக பேங்குகளில் கரண்ட் அக்கவுண்ட், ஓவர் டிராப்ட் கணக்கு ஆகியவைகளை துவக்கவும், செக்கு மற்றும் சம்மந்தப்பட்ட டாக்குமெண்டுகளில் கையொப்பம் இட்டு செவ்வனே அவைகளை ஆப்ரேட் செய்யவும் அதிகாரம் வழங்கப்படுகிறது.

ஈ) இக்கூட்டு வியாபாரத்தின் சார்பாக வரும் ரிஜிஸ்டர் தபால்கள், தந்திகள், மணி ஆர்டர்கள், பதிவு பார்சல்கள், கூரியர் தபால்கள், நோட்டீசுகள் லாரி மற்றும் ரயில்வே பில்கள் இன்குரன்ஸ் சம்மந்தப்பட்ட தபால்கள் மற்றும் இதர தபால்களை கையொப்பமிட்டு பெறவும் இதற்குண்டான தகுந்த பதில்களை எழுதவும் அதிகாரம் வழங்கப்படுகிறது.

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உ) இக்கூட்டு நிறுவனத்தின் சார்பாக வரும் சகலவிதமான செலவுகள், டிராப்டுகள், மற்றும் பில்ஸ்கள் போன்றவற்றில் கையொப்பமிட்டு அனைத்து நேரங்களிலும் பேங்கில் வரவு செலவு செய்ய அதிகாரம் வழங்கப்படுகிறது.

ஊ) இக்கூட்டு நிறுவனத்தின் பெயரில் அதன் வியாபார சம்மந்தமாக ஒப்பந்தங்கள் செய்யவும், வழக்கு வியாஜியங்களில் கையொப்பமிட்டு அவைகளை நடத்தவும், வருமானவரி அலுவலகத்திற்கு கணக்குகள் ஒப்படைக்கவும் அதிகாரம் வழங்கப்படுகிறது.

எ) இந்நிறுவனத்தின் பெயரில் ஏதேனும் கோர்ட் நடவடிக்கைகள் ஏற்பட்டால் அல்லது தேவைப்பட்டால் அவ்வித விவகாரங்களை கவனிக்கவும், கேஸ் நடத்தவும், கேஸ் செட்டில் செய்து கொள்ளவும், அப்பீல் செய்யவும் அதிகாரம் வழங்கப்படுகிறது.

ஏ) இந்நிறுவனத்திற்கு தேவையான பணியாட்களை நியமனம் செய்யவும் அவர்களுக்கு ஊதியம் நிர்ணயம் செய்யவும் மற்ற பங்குதாரர்களை கலந்து ஆலோசித்து முடிவெடுக்கவும் நிறுவனத்தின் அனைத்து கணக்குகளையும் பேணிப் பராமரிக்கவும் அதிகாரம் வழங்கப்படுகிறது.

ஐ) இந்நிறுவனத்தின் அன்றாட இதர முக்கிய பணிகளையும் கவனிக்க எல்லாவிதமான அதிகாரங்களும் வழங்கப்படுகிறது.

ஒ) மேற்படி ஷரத்து 6-ல் உள்ள நோக்கங்களுக்காக அனைத்து வேலைகளையும், பேப்பர்கள், பைல்கள் மற்றும் டாக்குமெண்டுகளில் கையொப்பம் இட்டு செவ்வனே நடத்தி வரவேண்டியது.

9) இக்கூட்டின் கணக்குகளை பிரதி வருடம் மார்ச் மாதக்கடைசியிலோ அல்லது கூட்டாளிகள் விரும்பித் தீர்மானிக்கும் இதர காலங்களிலோ இக்கூட்டின் கணக்கை முடித்து கூட்டு வியாபாரம் சம்மந்தப்பட்ட சகலவிதமான செலவுகளும் மேலும் கூட்டாளிகள் விரும்பித் தீர்மானித்து பொதுவில் எழுதக்கூடிய உழைக்கும் கூட்டாளிகள் சம்பளம், போனஸ் மற்றும் கூட்டாளிகளின் முதலீடு, கடன்கள் நடப்புக் கணக்குக்கு

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Pudur, Anden Kovil Post,  
KARUR - 639 008, T.N.

1. [Signature]

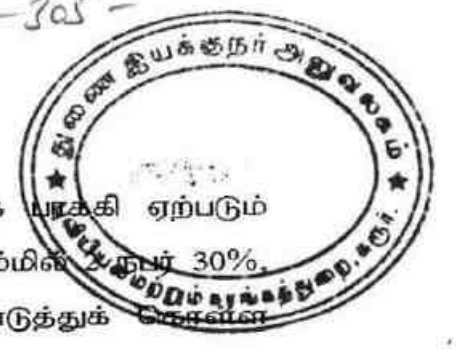
2. [Signature]

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4. [Signature]

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உண்டான வட்டி போன்ற சகலவிதமான செலவுகளும் போக யாக்கி ஏற்படும் இலாபலோபத்தை நம் கூட்டாளிகளான நம்மில் 1 நபர் 30%, நம்மில் 2 நபர் 30%, நம்மில் 3 நபர் 20%, நம்மில் 4 நபர் 20% மாக பிரித்து எடுத்துக் கொள்ள வேண்டியது.

- க. தங்கவேல் - 30%
- டி. மோகன்ராஜ் - 30%
- ஆர். ராமசாமி - 20%
- ராம். ராஜேஷ்குமார் - 20%
- ஆக மொத்தம் - 100%

10) நம்மில் யார் வேண்டுமானாலும் தனியாகவோ அல்லது வேறு நபர்களுடன் கூட்டு சேர்ந்தோ வேறு எந்த வியாபாரம் வேண்டுமானாலும் செய்து வரலாம். ஆனால் அப்படி அவர்கள் செய்து வரும் வியாபாரத்திற்கும், இக்கூட்டு நிறுவனத்திற்கும் யாதொரு பாத்தியமும், சம்மந்தமும், பின் தொடர்ச்சியும் கிடையாது.

11). நம்மில் யாரேனும் இக்கூட்டில் இருந்து வில விரும்பினால் அவர் மற்ற கூட்டாளிகளுக்கு ஒரு மாத தவணை கண்டு எழுத்து மூலம் ஒரு நோட்டீஸ் கொடுக்க வேண்டியது. பின் அந்த தேதி வரையில் இக்கூட்டின் கணக்கை முடித்தோ அல்லது உத்தேசமாக இலாபலோபத்தை நிர்ணயம் செய்தோ விலகும் அல்லது விலக்கப்படும் கூட்டாளிக்கு அவர் கணக்குப்படி சேரவேண்டிய தொகையை கொடுத்துவிட்டோ அல்லது கொடுக்கத்தகுந்த ஏற்பாடுகளை செய்து விட்டோ மற்ற கூட்டாளிகள் தாமாகவோ அல்லது வேறு நபர்களை சேர்த்துக் கொண்டோ இக்கூட்டு வியாபாரத்தை மேற்படி இடத்தில் மேற்படி பெயரில் தொடர்ந்து நடத்தி வரலாம்.

12). நம்மில் யாரேனும் இக்கூட்டில் இருந்து விலகினாலும் அல்லது விலக்கப்பட்டாலும் அல்லது யாரேனும் காலமாகிவிட்டாலும் இக்கூட்டு கலைந்ததாகக் கருதப்பட மாட்டாது.

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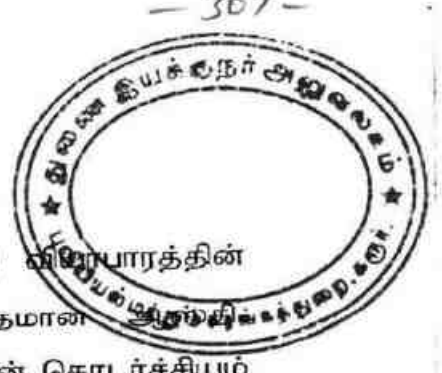
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 KARUR - 639 006. T.N.

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- 13). விலகும் அல்லது விலக்கப்படும் கூட்டாளிக்கு இக்கூட்டு வியாபாரத்தின் (GOODWILL) தளவாட சாமான்கள் மற்றும்முள்ள சகலவிதமான ஆதாரங்களும் பொறுப்புகளில் யாதொரு விதமான சம்பந்தமும், பாத்தியமும், பின் தொடர்ச்சியும் கிடையாது. அவர் தன் முதலீடு மற்றும் இதர கணக்கில் வரவாக உள்ள தொகையை மட்டும் பெற்றுக் கொண்டு விலகிக் கொள்ள வேண்டியது.
- 14). நம்மில் யாரேனும் இக்கூட்டின் வளர்ச்சிக்குத் தடையாகவோ அல்லது இக்கூட்டிற்கு விரோதமாகவோ நடந்து கொண்டால் மற்ற மெஜாரிட்டி கூட்டாளிகள் விரும்பினால் மேற்படி கூட்டாளியை இக்கூட்டில் இருந்து விலக்கி விடலாம்.
- 15). இக்கூட்டு வியாபார உடன்படிக்கைப் பத்திரத்தின் ஷரத்துக்களை தேவைப்பட்டால் திருத்தி அமைக்கவோ அல்லது மாற்றி அமைக்கவோ செய்யலாம். அதற்கு ஒரு பத்திரம் எழுதிக் கொண்டு அதனை இதன் துணைப்பத்திரமாக (CODICIL) பாவித்து அதன்படி நடந்து கொள்ள வேண்டியது.
- 16). இக்கூட்டு வியாபாரத்திற்கு நம் கூட்டாளிகள் அனைவரும் விரும்பும் காலம் வரையில் அதாவது பார்ட்னர்சிப் அட்வில்லாக (PARTNERSHIP ATWILL) தொடர்ந்து வடந்து வரவேண்டியது.
- 17). இக்கூட்டு நிறுவனம் சம்மந்தமாக ஏதேனும் அபிப்ராயபேதம் ஏற்பட்டால் நாம் அதை ஐந்து நடுவர்களைக் கொண்ட ஒரு பஞ்சாயத்து நிறுவி அவர்களில் பெரும்பான்மையோரின் தீர்ப்புப்படி ஒத்துப்போ வேண்டியது.
- 18). நம் கூட்டாளிகள் யாரும் இக்கூட்டில் தமக்குள்ளை பங்கை பிறருக்கு மாற்றவோ, அடமானம் வைக்கவோ மற்றும் விற்கவோ உரிமையில்லை.
- 19). இக்கூட்டு நிறுவனத்தின் சார்பாக கூட்டாளி அல்லாத மற்ற பிற நபர்களுக்கு பொது அதிகாரம் (GENERAL POWER OF ATTORNEY) வழங்க வேண்டி வந்தால் அவ்வதிகாரத்தை அனைத்து கூட்டாளிகளின் ஏகோபித்த சம்மதத்தின் பேரில் முறைப்படி கையொப்பமிட்டு வழங்கலாம்.

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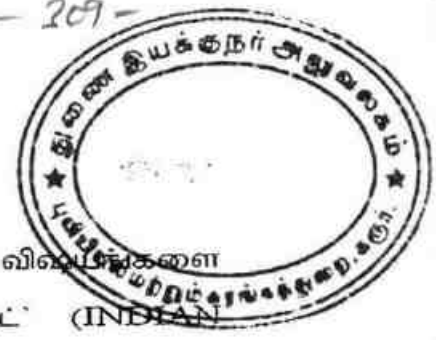
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Call 9904777777  
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 Pudur, Andan Road, KARUR - 630 006, T.N.

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20). நம் கூட்டாளிகள் அனைவரும் இதில் கண்டிராத மற்ற விஷயங்களை பொறுத்தமட்டில் 1932-ம் வருட 'இந்தியன் பார்ட்னர்சிப் ஆக்ட்' (INDIAN PARTNERSHIP ACT, 1932)-ஐ அனுசரித்து நடந்து கொள்ள வேண்டியது.

இப்படிக்கு நாம் நால்வரும் சேர்ந்து எழுதிக் கொண்ட கூட்டு வியாபார உடன்படிக்கை பத்திரம்.

1. *[Signature]*

3. *[Signature]*

2. *[Signature]*

4. *[Signature]*

சாட்சிகள்:-

K. Rajinikanth 3/0 K. Kandasamy, Azhuvathu palayam, Vettanar Guelam (Po),  
(K. Rajendran) Karur 639116

J. Ramani 3/0 D. Jayamani, No. 63, Boyaraimada Street, Thalavayalaya,  
(J. Ramani Thani) Karur 7kA

ATTESTED

*[Signature]*  
Call: 99944 45789  
K. KANNAMANI, B.A.B.L.,  
Advocate & Notary Public,  
Govt. Of India - Regd No. 6277/08,  
Pudur, Andan Kovil Post,  
KARUR - 639 008. T.N.



*[Signature]*





Regn. IV-2A1,00,006-18-4-2002-G.B.P. Pakt.



படிவம் -இ

[விதி 9 (அ) காண்க.]

தொழிற் கூட்டுப் பதிவு அறிவிப்பு

கீழ்க் தொழில் நிறுவனப் பதிவாளர், 1923 ஆம் ஆண்டு இந்தியக் கூட்டு வாணிபச் சட்டம், 58(1) பிரிவில் குறிப்பிட்டிருக்கும் அறிக்கை வரப்பெற்றுக் கொண்டதை இதனால் அறிவித்துக்கொள்கிறார். அந்த அறிக்கை கோப்பில்சேர்க்கப்பட்டு தொழில் நிறுவனத்தின் பெயரான---

TIRUMALAI BLUE METALS

என்பது தொழில் நிறுவனப் பதிவேட்டில் 20-09-ஆம் ஆண்டு 364-எண்ணாகப் பதிவாயிருக்கிறது.



தொழிற் கூட்டுப் பதிவாளர்.

09-09-ஆம் ஆண்டு திங்கள் நாள்.



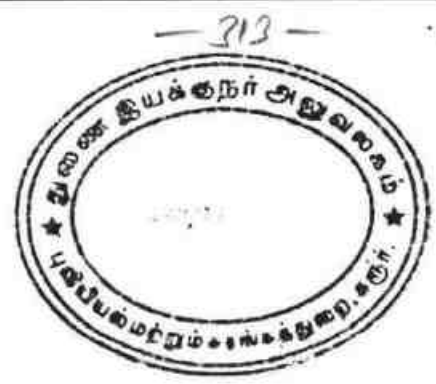
ATTESTED

Coll: 98944  
K. KANIMANI, B.A.B.L.,  
Notary Public,  
Regd No. 6877/08,  
Kovil Pond,  
635 008, T.N.





Government of India  
Form GST REG-06  
[See Rule 10(1)]



### Registration Certificate

Registration Number : 33AAGFT7408R1ZL

1.	Legal Name	THIRUMALAI BLUE METALS		
2.	Trade Name, if any	THIRUMALAI BLUE METALS		
3.	Constitution of Business	Partnership		
4.	Address of Principal Place of Business	538/4, PULANKAD, KUPPAM POST, ARAVAKURICHI TALUK, KARUR, Karur, Tamil Nadu, 639111		
5.	Date of Liability	01/07/2017		
6.	Period of Validity	From	01/07/2017	To NA
7.	Type of Registration	Regular 		
8.	Particulars of Approving Authority			
Signature		Validity unknown Digitally signed by: GOODS AND SERVICES TAX NETWORK 1 Date: 2018.08.02 08:21:49 IST		
Name				
Designation				
Jurisdictional Office				
9.	Date of issue of Certificate	02/08/2018		
Note: The registration certificate is required to be prominently displayed at all places of business in the State.				

This is a system generated digitally signed Registration Certificate issued based on the deemed approval of application on 01/07/2017.

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Call: 98944 45789  
K. KANNAN, B.A.B.L.,  
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Govt. Office - Regd No. 0877/08,  
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KARUR - 639 008, T.N.

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GSTIN 33AAGFT7408R1ZL  
Legal Name THIRUMALAI BLUE METALS  
Trade Name, if any THIRUMALAI BLUE METALS

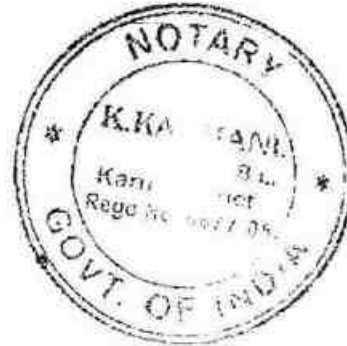


**Details of Additional Places of Business**

Total Number of Additional Places of Business in the State 0

**ATTESTED**

  
Cell: 99844 45799  
**K. KANMANI, B.A.B.L.,**  
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KARUR - 639 008, T.N.







GSTIN

33AAGFT7408R1ZL

Legal Name

THIRUMALAI BLUE METALS

Trade Name, if any

THIRUMALAI BLUE METALS

**Details of Managing / Authorized Partners**

1



Name

KANDASAMY THANGAVEL

Designation/Status

MANAGING PARTNER

Resident of State

Tamil Nadu

2



Name

THANGARAJ MOHANRAJ

Designation/Status

MANAGING PARTNER

Resident of State

Tamil Nadu

3



Name

RAMASAMY RAJESH KUMAR

Designation/Status

WORKING PARTNER

Resident of State

Tamil Nadu

4



Name

RASAPPAN RAMASAMY

Designation/Status

WORKING PARTNER

Resident of State

Tamil Nadu

**ATTESTED**

Call: 99844 45769  
**K. KANMANI, B.A.B.L.,**  
 Advocate & Notary Public,  
 Govt. Chindla - Regd No. 0877/08,  
 Madhav, Andan Kovil Post,  
 KARUR - 639 008, T.N.



- 319 -  
SIGNATURE - X

PHOTOCOPY OF THE APPLIED LEASE AREA

Field photos in respect of rough stone and Gravel quarry lease in S.F.No: 1258/2(Part) - Patta  
land - over an extent of 2.97.0 hectares - Vettamangalam (West) Village - Pugalur Taluk

Karur District - Tamil Nadu State belongs to **M/s. Thirumalai Blue Metals.**



*Adi*



தமிழ்நாடு தமிழ்நாடு TAMIL NADU 10AC 776080  
 9 NOV. 2022 Sivakuru Explosives  
 S.RAMAMURTHY, S.V  
 L.No:05/1992  
 KARUR.

### DEED OF AGREEMENT

The agreement is entered into at **KARUR** on this day of 20.01.2023 between **Tvl.THIRUMALAI BLUE METALS, No.538/4, Poolan Kadu, Kuppam Post, Pugalur TK, Karur Dt.** herein after referred as part of the first party and **M/s.SIVAKURU EXPLOSIVES, KARUR TO ERODE MAIN ROAD, PUNNAMCHATARAM POST, PUGALUR (TK) KARUR** doing explosives blasting contract by having valid license by no **E/SC/TN/22/431 (E 28779)** 31.03.2024 IN FORM LE-3 of Explosives rules 2008, herein after referred to as part of the second party.

The party of the first part is granted valid Mining Lease from department of Geology and Mining, Government of Tamil Nadu for mining Quartz/Quartzite/Feldspar S.F.No 1238/2

For SIVAKURU EXPLOSIVES

For Tvl.THIRUMALAI BLUE METALS

For SIVAKURU EXPLOSIVES  
*V.P.M.T*  
 PARTNER.

For Thirumalai Blue Metals  
*[Signature]*  
 Managing Partner





Whereas the party of the first part going to start mining operation in the above site and wants blasting to be done at the above quarry site to excavate minerals. The party of the Second part accepted to operate blasting operations/work at site on agreement basis as follows.

The Party of the first part will allot the Blasting operations in the above said site to the party of the second part who is responsible for the blasting operations and will make his own arrangements for the explosives, transportation of explosives to the site and exploding equipment's required for the work.

The entire blasting operations in the above quarry shall be done under the direct supervision of a qualified mine manager of party of the first part and shall be done by a qualified/valid short firer/blaster certificate holder of the party of the second part. The possession and handling of blasting equipment shall be by the party of the second part and under takes the responsibility for the blasting work entrusted.

The party of the second part to take all safety precautions in handling and transportation of explosives at the site and ensure safety before, during and after blasting operations as per the rules and regulations. The party of the 2<sup>nd</sup> part not responsible for the blasting work under taken without the second part and other areas said above.

Payment will be made periodically by the part of the 1<sup>st</sup> part for the quantity of explosives used and consumed and hours and time of the exploding equipment put in to use. Calculations will be made and settlement will be arrived at every month the rates for of explosives, transportation cost and other charges for blasting works. This agreement is made for all blasting work done in the above said site only.

This agreement is valid for one year from the date of execution and is terminable earlier by mutual consent of both parties with a month's notice.

Second Party

First Party

For SIVAKURU EXPLOSIVES

For Tvl. THIRUMALAI BLUE METALS

For SIVAKURU EXPLOSIVES

For Thirumalai Blue Metals

*N. P. M. T.*  
PARTNER.

*[Signature]*  
Managing Partner

PLACE:

WITNESS:

1. *P. W. J.* D/o S. Prasanth. P. Tho Hakuichi
2. *C. V. D. Iyer* S/o S. CHENNYAPPA  
*YEN COVEDO*

*[Signature]*



आयकर विभाग  
INCOME TAX DEPARTMENT  
THIRUMALAI BLUE METALS  
18/02/2009  
Permanent Account Number  
AAGFT7408R  
Signature

भारत सरकार  
GOVT. OF INDIA




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

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

*Handwritten signature*





आयकर विभाग  
INCOME TAX DEPARTMENT



भारत सरकार  
GOVT. OF INDIA

R M RAJESH KUMAR

RAMASAMY

20/02/1985

Permanent Account Number

AEGPB3106R

Signature



इस कार्ड के खोने / पाने पर कृपया सूचित करें / लौटाने :  
आयकर पैन सेवा इकाई, एन एस डी एल  
पहली मंजिल, टाइम्स टॉवर, कमला मिल्स कंपाउंड,  
एस. बी. मार्ग, लोअर परेल, मुम्बई - 400 013.

If this card is lost / someone's lost card is found,  
please inform / return to :  
Income Tax PAN Services Unit, NSDL  
1st Floor, Times Tower,  
Kamala Mills Compound,  
S. B. Marg, Lower Parel, Mumbai - 400 013.  
Tel: 91-22-2499 4660, Fax: 91-22-2495 0664,  
e-mail: tininfo@nsdl.co.in



*[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. करुप्पन्नण, मॉगनीकाडू, मुत्तमंपट्टी पोस्ट, बोम्मीडी वर्यो, ओमलूर तालुक, सेलम डीस्टीक्ट, 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), Bommididi (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.

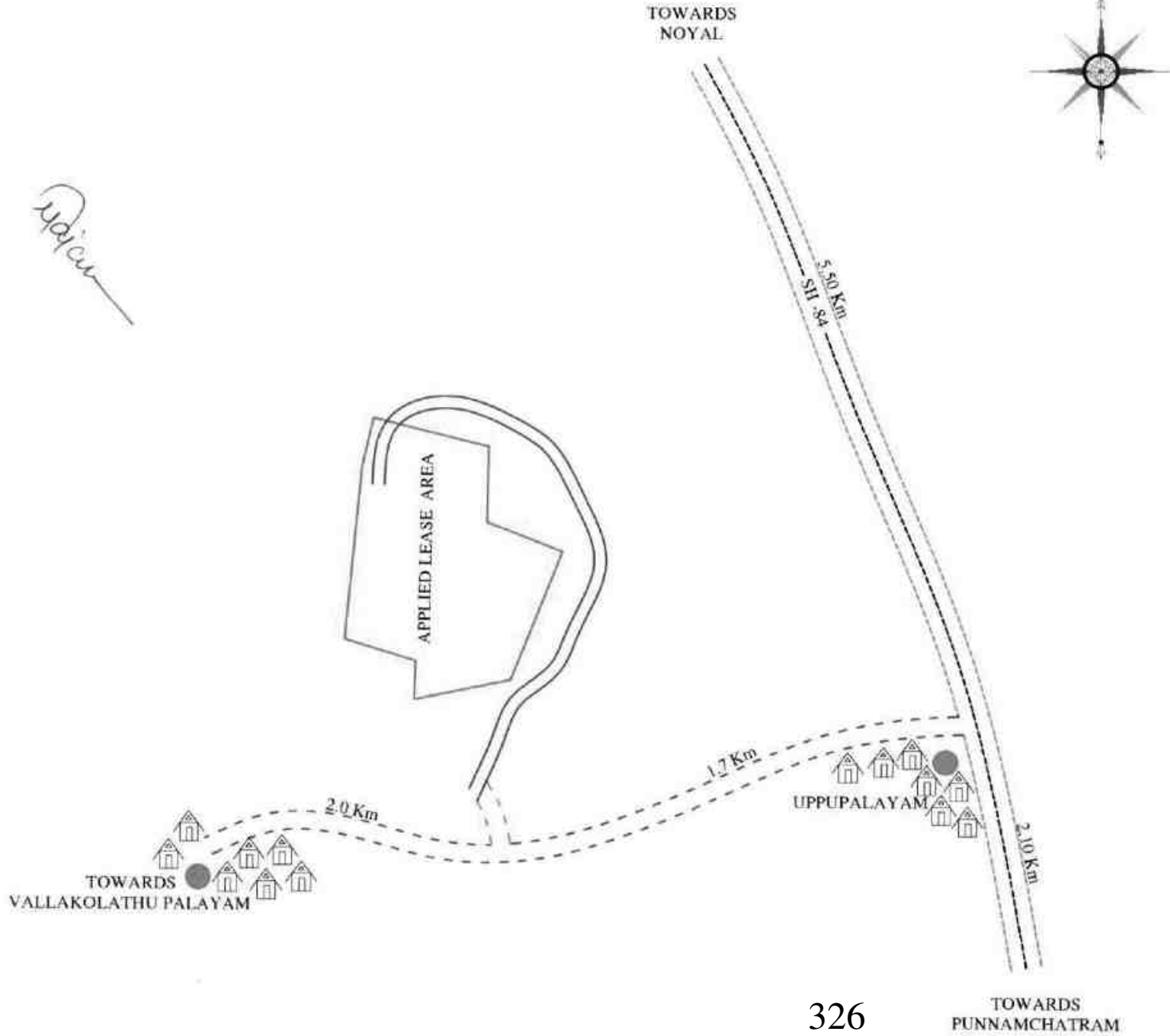
स्थान/ Place : Chennai

दिनांक/ Date : 16.12.2014.

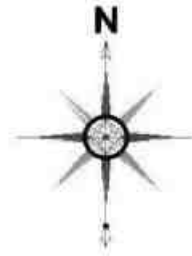
*[Signature]*

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

*Map*



326



### PLATE NO-I

#### APPLICANT:

M/s. THIRUMALAI BLUE METALS  
No: 538/4, POOLAN KAADU,  
KUPPAM POST,  
PUGALUR TALUK,  
KARUR DISTRICT.

#### LEASE APPLIED AREA:

S.F.NO : 1238/2(PART),  
EXTENT : 2.97.0 Hect,  
VILLAGE : VETTAMANGALAM (WEST)  
TALUK : PUGALUR,  
DISTRICT : KARUR.

### INDEX

MINE LEASE AREA



APPROACH ROAD



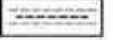
CART ROAD



VILLAGE ROAD



SH - 84 ROAD



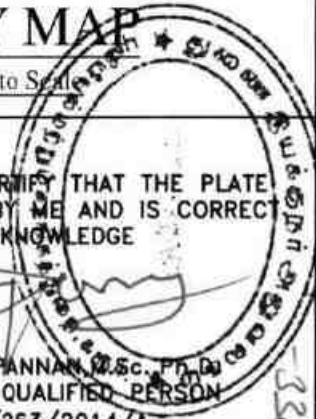
### KEY MAP

Not to Scale

Prepared By:

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

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



11°1'6.25"N

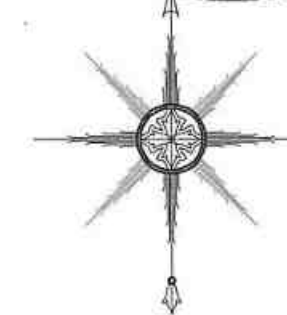


PLATE NO-IA

APPLICANT:

M/s. THIRUMALAI BLUE METALS  
No: 538/4, POOLAN KAADU,  
KUPPAM POST,  
PUGALUR TALUK,  
KARUR DISTRICT.

LEASE APPLIED AREA:

S.F.NO : 1238/2(PART),  
EXTENT : 2.97.0 Hect,  
VILLAGE : VETAMANGALAM (WEST)  
TALUK : PUGALUR,  
DISTRICT : KARUR.

INDEX

MINE LEASE AREA: ●

TOPO SHEET NO : 58-E/16

LATITUDE : 11° 0'58.68"N to 11° 1'6.25"N

LONGITUDE: 77°56'41.88"E to 77°56'47.75"E

LOCATION PLAN  
NOT TO SCALE

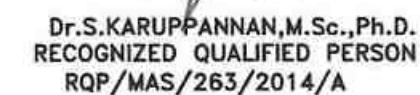
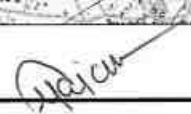
Prepared By:

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



77°56'41.88"E





11°1'6.25"N

77°56'41.88"E



329

-337-

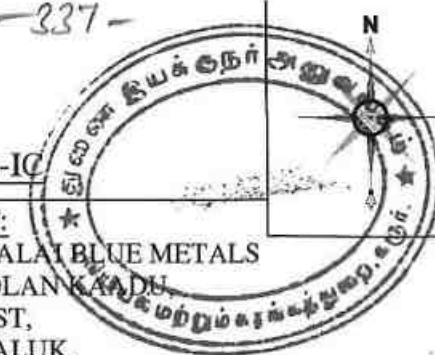


PLATE NO-IC

APPLICANT:  
M/s. THIRUMALAI BLUE METALS  
No: 538/4, POOLANKKADU,  
KUPPAM POST,  
PUGALUR TALUK,  
KARUR DISTRICT.

LEASE APPLIED AREA:

S.F.NO : 1238/2(PART),  
EXTENT : 2.97.0 Hect,  
VILLAGE : VETTAMANGALAM (WEST),  
TALUK : PUGALUR,  
DISTRICT : KARUR.

# INDEX

MINE LEASE AREA	
SAFETY DISTANCE	
APPROACH ROAD	
CART ROAD	
VILLAGE ROAD	
100m RADIUS	
200m RADIUS	
300m RADIUS	
400m RADIUS	
500m RADIUS	
WIND DIRECTION	
SHRUBS & TREES	
HABITATIONS	

TOPO SHEET NO : 58-E/16

LATITUDE : 11° 0'58.68"N to 11° 1'6.25"N

LONGITUDE: 77°56'41.88"E to 77°56'47.75"E

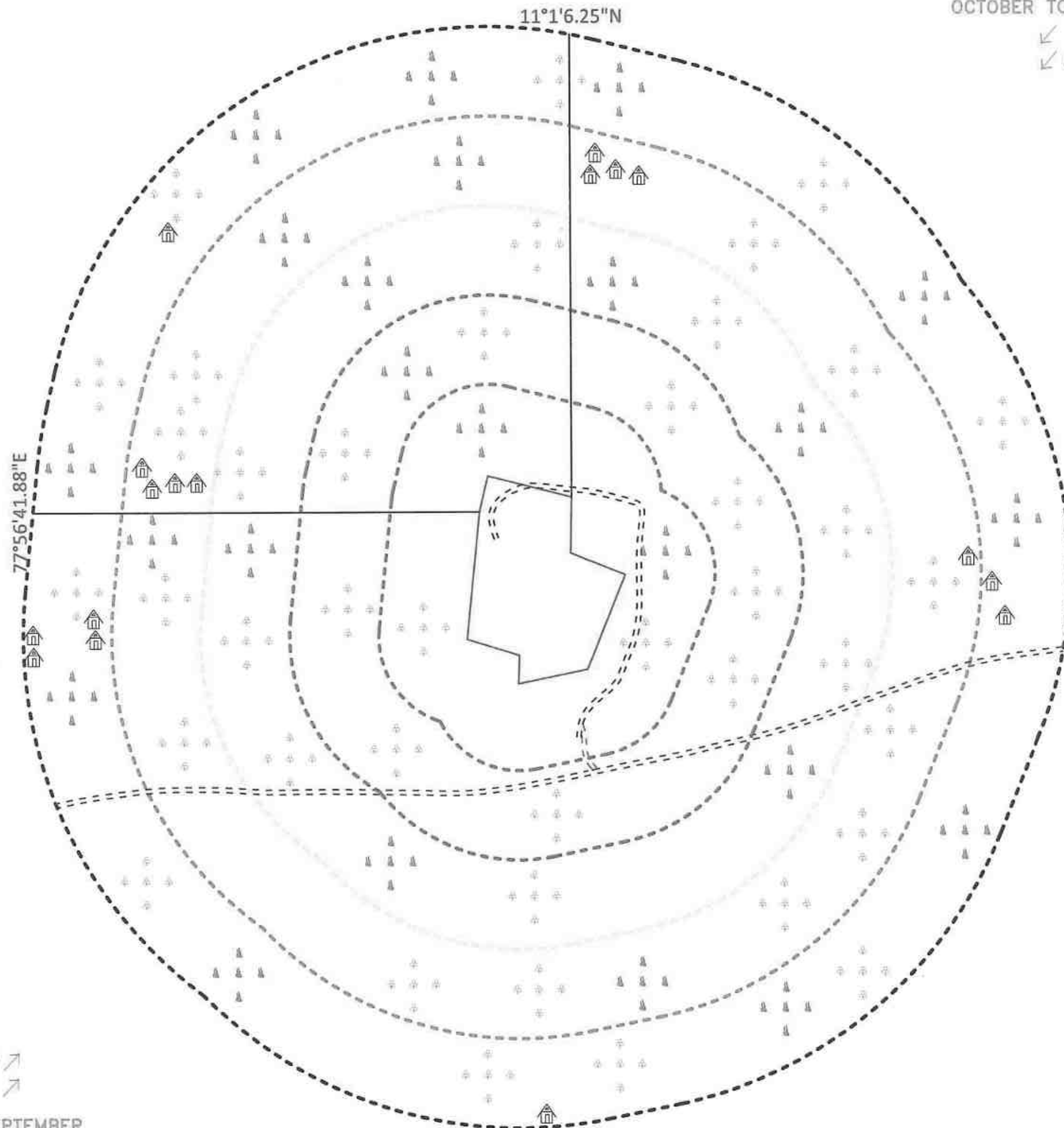
SATELITE IMAGERY MAP

SCALE- 1:5000

Prepared By:

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TO THE BEST OF MY KNOWLEDGE

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



JULY TO SEPTEMBER

OCTOBER TO DECEMBER

330

-339-

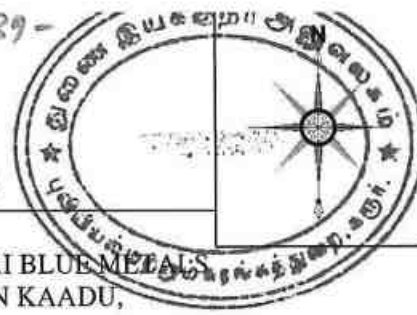


PLATE NO-ID

APPLICANT:

M/s. THIRUMALAI BLUE METALS  
No: 538/4, POOLAN KAADU,  
KUPPAM POST,  
PUGALUR TALUK,  
KARUR DISTRICT.

LEASE APPLIED AREA:

S.F.NO : 1238/2(PART),  
EXTENT : 2.97.0 Hect,  
VILLAGE : VETTAMANGALAM (WEST),  
TALUK : PUGALUR,  
DISTRICT : KARUR.

# INDEX

MINE LEASE AREA	
SAFETY DISTANCE	
APPROACH ROAD	
CART ROAD	
VILLAGE ROAD	
100m RADIUS	
200m RADIUS	
300m RADIUS	
400m RADIUS	
500m RADIUS	
WIND DIRECTION	
SHRUBS & TREES	
HABITATIONS	

TOPO SHEET NO : 58-E/16

LATITUDE : 11° 0'58.68"N to 11° 1'6.25"N

LONGITUDE: 77°56'41.88"E to 77°56'47.75"E

## ENVIRONMENTAL PLAN

SCALE- 1:5000

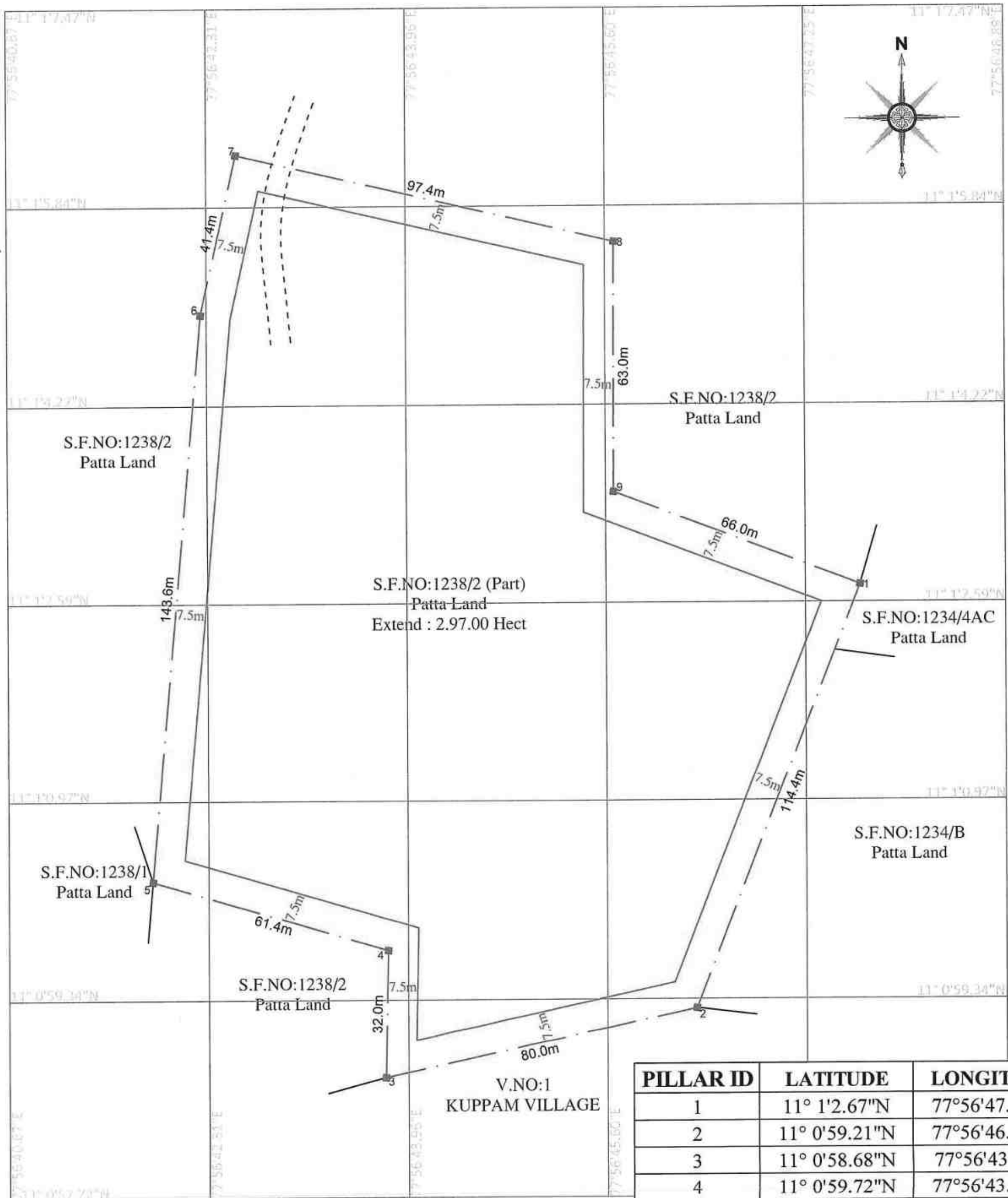
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TO THE BEST OF MY KNOWLEDGE

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RECOGNIZED QUALIFIED PERSON  
RQP/MAS/263/2014/A



upicw

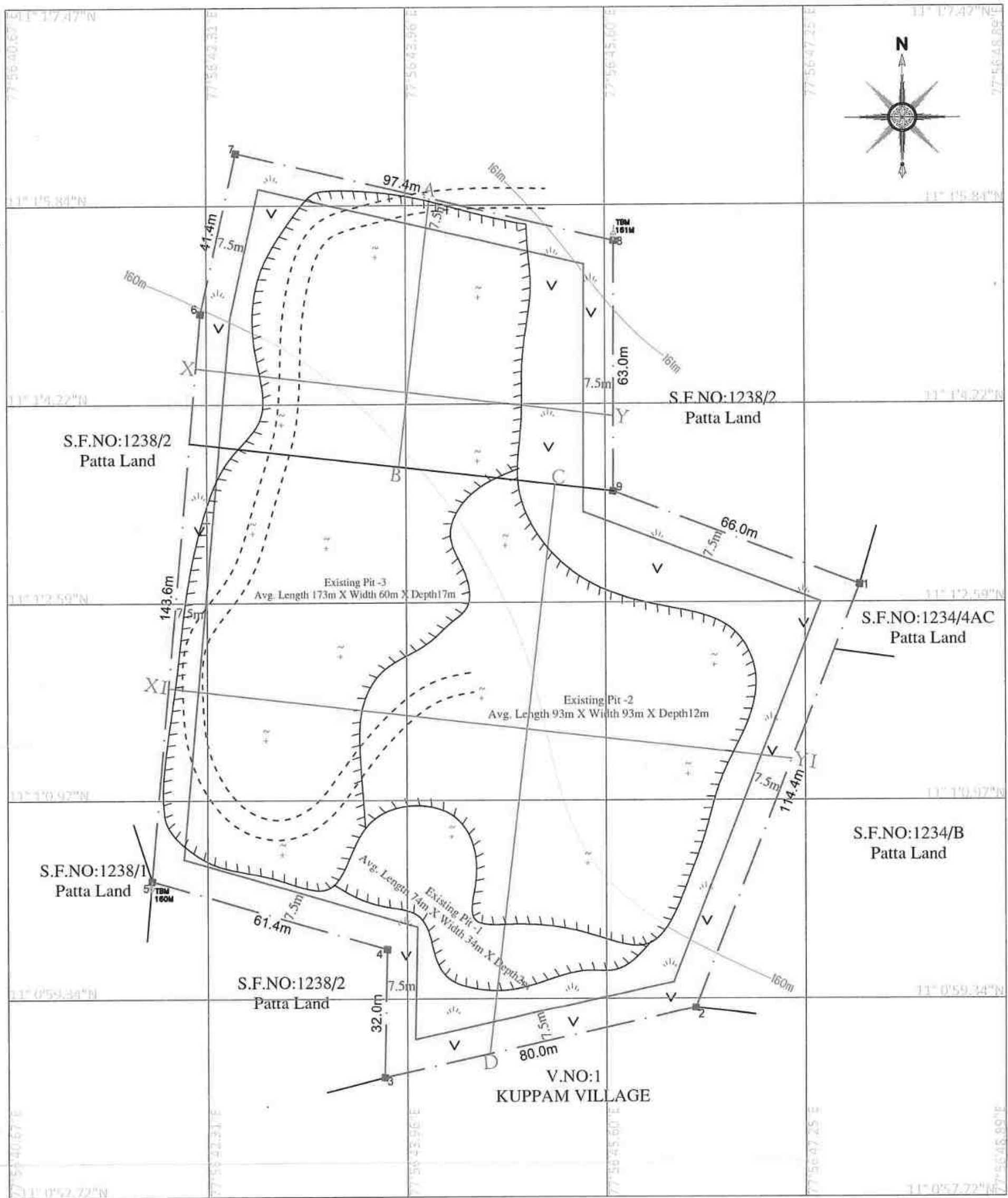


PILLAR ID	LATITUDE	LONGITUDE
1	11° 1'2.67"N	77°56'47.75"E
2	11° 0'59.21"N	77°56'46.36"E
3	11° 0'58.68"N	77°56'43.78"E
4	11° 0'59.72"N	77°56'43.81"E
5	11° 1'0.30"N	77°56'41.88"E
6	11° 1'4.94"N	77°56'42.34"E
7	11° 1'6.25"N	77°56'42.64"E
8	11° 1'5.50"N	77°56'45.76"E
9	11° 1'3.45"N	77°56'45.73"E

<b>PLATE NO-II</b>		<b>MINE LEASE PLAN</b> SCALE 1: 1000		<b>INDEX</b>		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
<b>APPLICANT:</b> Tvl. THIRUMALAI BLUE METALS, NO.538/4, PULANKAD, KUPPAM POST, PUGALUR TALUK, KARUR DISTRICT - 639 111		<b>LEASE APPLIED AREA:</b> S.F.NO : 1238/2 (Part) EXTENT : 2.97.00Hect, VILLAGE : VETTAMANGALAM WEST, TALUK : PUGALUR, DISTRICT : KARUR.		MINE LEASE AREA SAFETY BOUNDARY APPROACH ROAD 331 PILLAR STONES		



Indic



### PLATE NO-III

#### APPLICANT:

Tvl. THIRUMALAI BLUE METALS,  
NO.538/4, PULANKAD,  
KUPPAM POST,  
PUGALUR TALUK,  
KARUR DISTRICT - 639 111

#### LEASE APPLIED AREA:

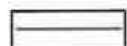
S.F.NO : 1238/2 (Part)  
EXTENT : 2.97.00Hect,  
VILLAGE : VETTAMANGALAM WEST,  
TALUK : PUGALUR,  
DISTRICT : KARUR.

#### INDEX

MINE LEASE AREA



SAFETY DISTANCE



MINE HAUL ROAD



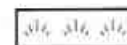
TEMPORARY BENCH MARK



CONTOUR LINES



SHRUBS



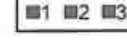
GRAVEL



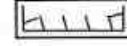
ROUGH STONE



PILLAR STONES



EXISTING PIT



### SURFACE & GEOLOGICAL PLAN SCALE 1 : 1000

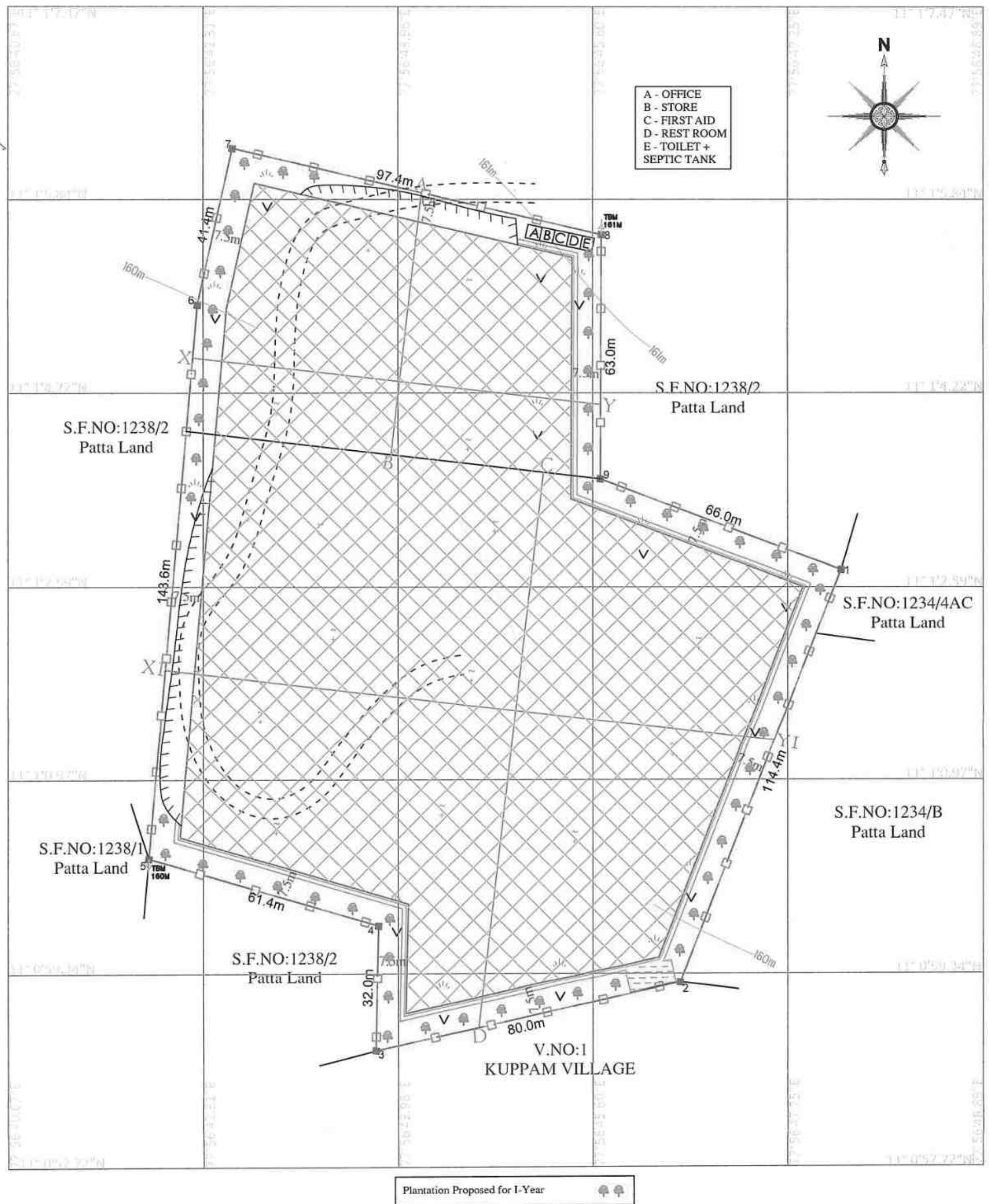
Prepared By:

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TO THE BEST OF MY KNOWLEDGE

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



updown



**PLATE NO-IV**

**APPLICANT:**

Tvl. THIRUMALAI BLUE METALS,  
NO.538/4, PULANKAD,  
KUPPAM POST,  
PUGALUR TALUK,  
KARUR DISTRICT - 639 111

**LEASE APPLIED AREA:**

S.F.NO : 1238/2 (Part)  
EXTENT : 2.97.00Hect,  
VILLAGE : VETTAMANGALAM WEST,  
TALUK : PUGALUR,  
DISTRICT : KARUR.

**INDEX**

MINE LEASE AREA



SAFETY DISTANCE



MINE HAUL ROAD



TEMPORARY BENCH MARK



CONTOUR LINES



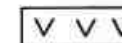
SETTLING TANK  
& DRAINAGE



SHRUBS



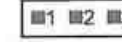
GRAVEL



ROUGH STONE



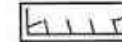
PILLAR STONES



FENCING



EXISTING PIT



**YEARWISE DEVELOPMENT &  
PRODUCTION PLAN**

SCALE PLAN 1 : 1000

Prepared By:

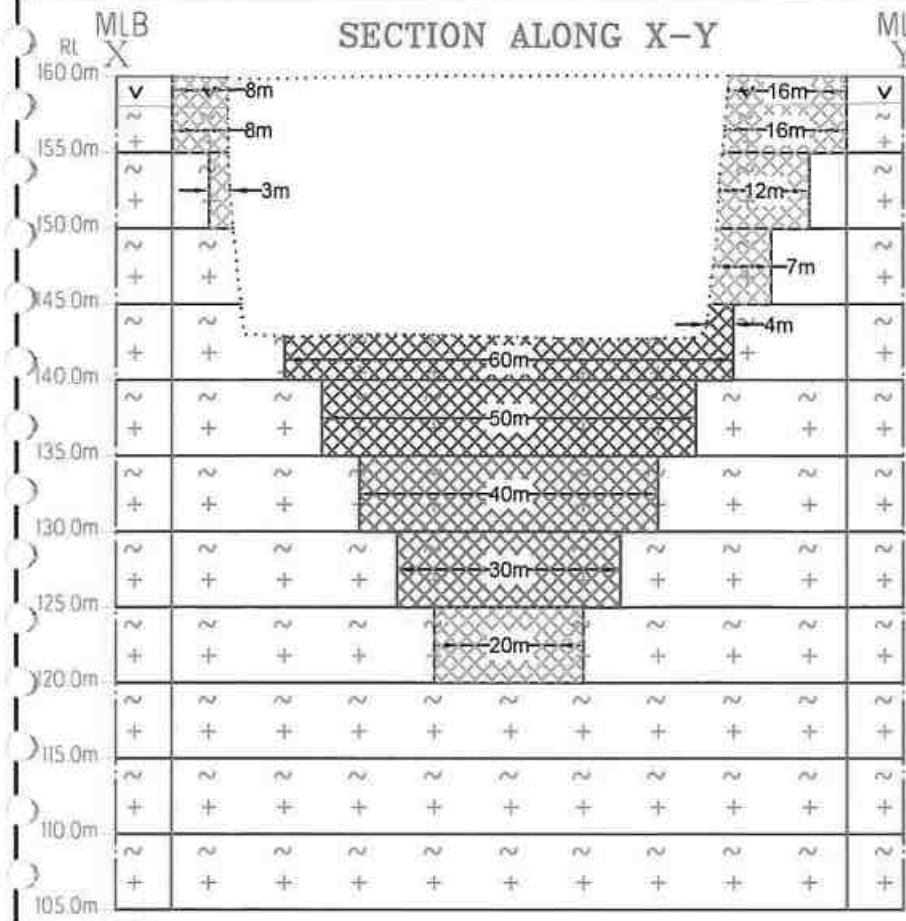
I DO HEREBY CERTIFY THAT THE PLATE  
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TO THE BEST OF MY KNOWLEDGE

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

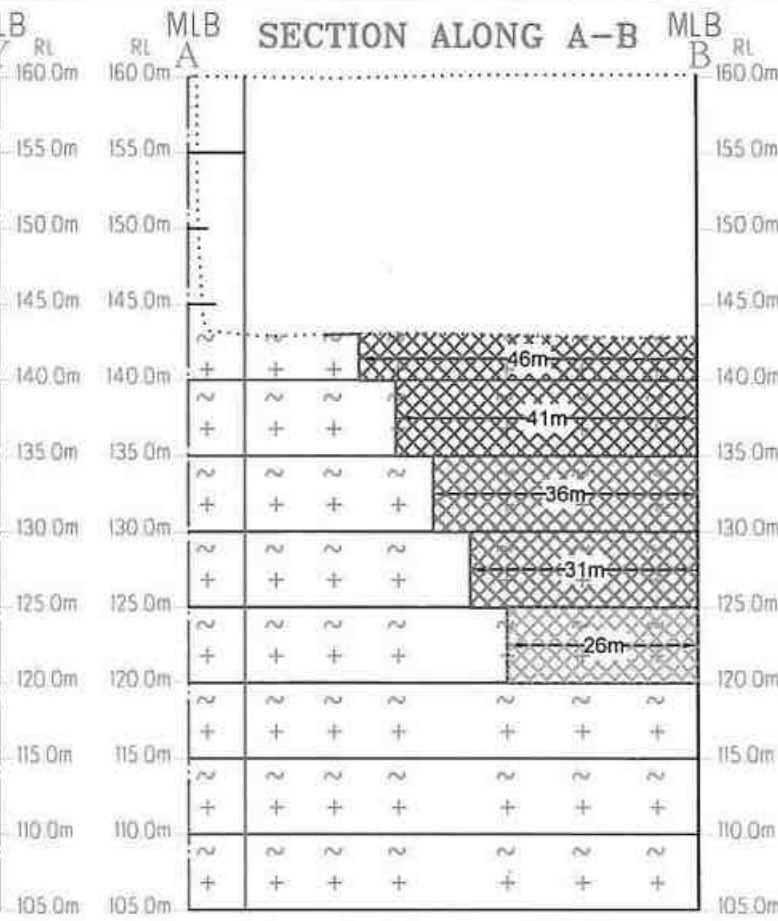




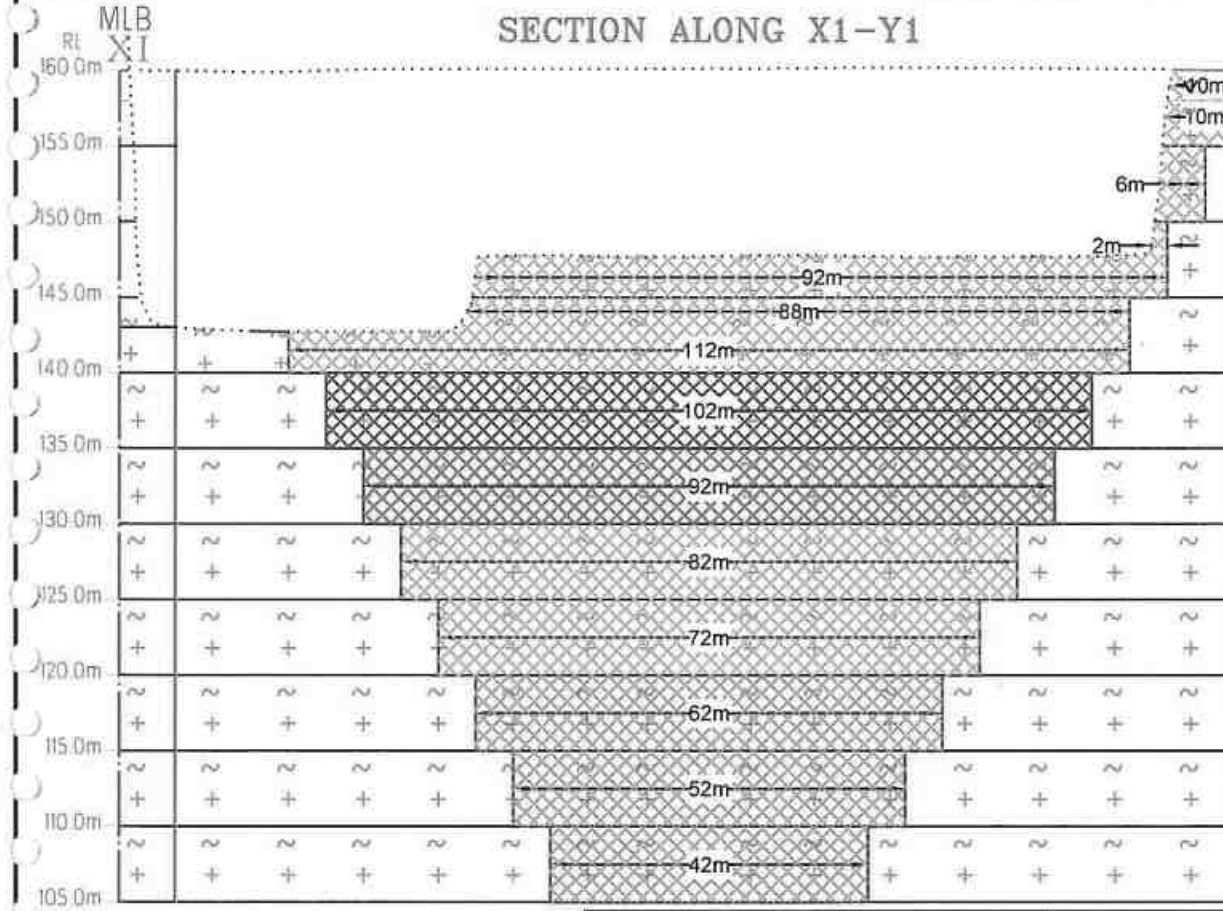
### SECTION ALONG X-Y



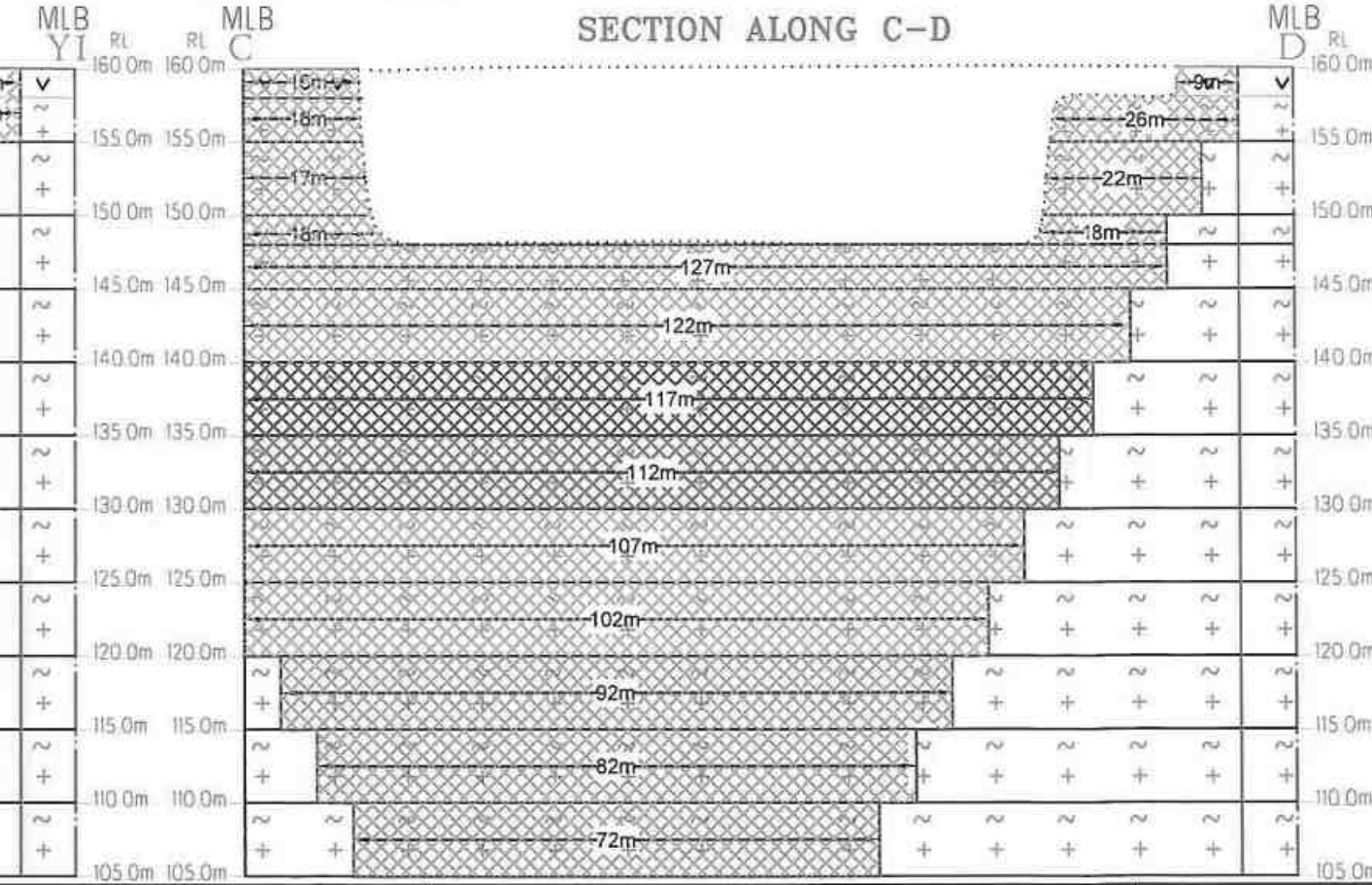
### SECTION ALONG A-B



### SECTION ALONG X1-Y1



### SECTION ALONG C-D



YEARWISE PRODUCTIONS RESERVES								
Year	Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume In m <sup>3</sup>	Rough stone in m <sup>3</sup>	Gravel in m <sup>3</sup>
I-YEAR	XY-AB	I	24	61	2	2928	.....	2928
		I	24	61	3	4392	4392	.....
	X1Y1-CD	I	10	25	2	500	.....	500
		I	10	42	3	1260	1260	.....
	XY-AB	II	6	39	5	1170	1170	.....
		II	15	56	5	4200	4200	.....
	X1Y1-CD	III	7	51	5	1785	1785	.....
		III	2	36	2	144	144	.....
		III	92	127	3	35052	35052	.....
		IV	88	122	2	21472	21472	.....
TOTAL						113895	110467	3428
II-YEAR	XY-AB	IV	4	46	2	368	368	.....
		IV	60	46	3	8280	8280	.....
		V	50	41	5	10250	10250	.....
	X1Y1-CD	V	102	117	5	59670	59670	.....
TOTAL						78568	78568	.....
III-YEAR	X1Y1-CD	VI	92	112	5	51520	51520	.....
		VI	40	36	5	7200	7200	.....
	XY-AB	VII	30	31	5	4650	4650	.....
TOTAL						63370	63370	.....
IV-YEAR	X1Y1-CD	VII	82	107	5	43870	43870	.....
		VIII	72	102	5	36720	36720	.....
TOTAL						80590	80590	.....
V-YEAR	XY-AB	VIII	20	26	5	2600	2600	.....
		IX	62	92	5	28520	28520	.....
	X1Y1-CD	X	52	82	5	21320	21320	.....
		XI	42	72	5	15120	15120	.....
TOTAL						67560	67560	.....
GRAND TOTAL						403983	400555	3428

- I - Year Proposed area to be Quarried
- II - Year Proposed area to be Quarried
- III - Year Proposed area to be Quarried
- IV - Year Proposed area to be Quarried
- V - Year Proposed area to be Quarried

#### PLATE NO-IVA

**APPLICANT:**  
Tvl. THIRUMALAI BLUE METALS,  
NO.538/4, PULANKAD,  
KUPPAM POST,  
PUGALUR TALUK,  
KARUR DISTRICT - 639 111

#### YEAR WISE PRODUCTION SECTIONS SECTION HOR 1 : 1000 & VER 1: 500

**LEASE APPLIED AREA:**  
S.F.NO : 1238/2 (Part)  
EXTENT : 2.97.00Hect,  
VILLAGE : VETTAMANGALAM WEST,  
TALUK : PUGALUR,  
DISTRICT : KARUR.

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#### INDEX

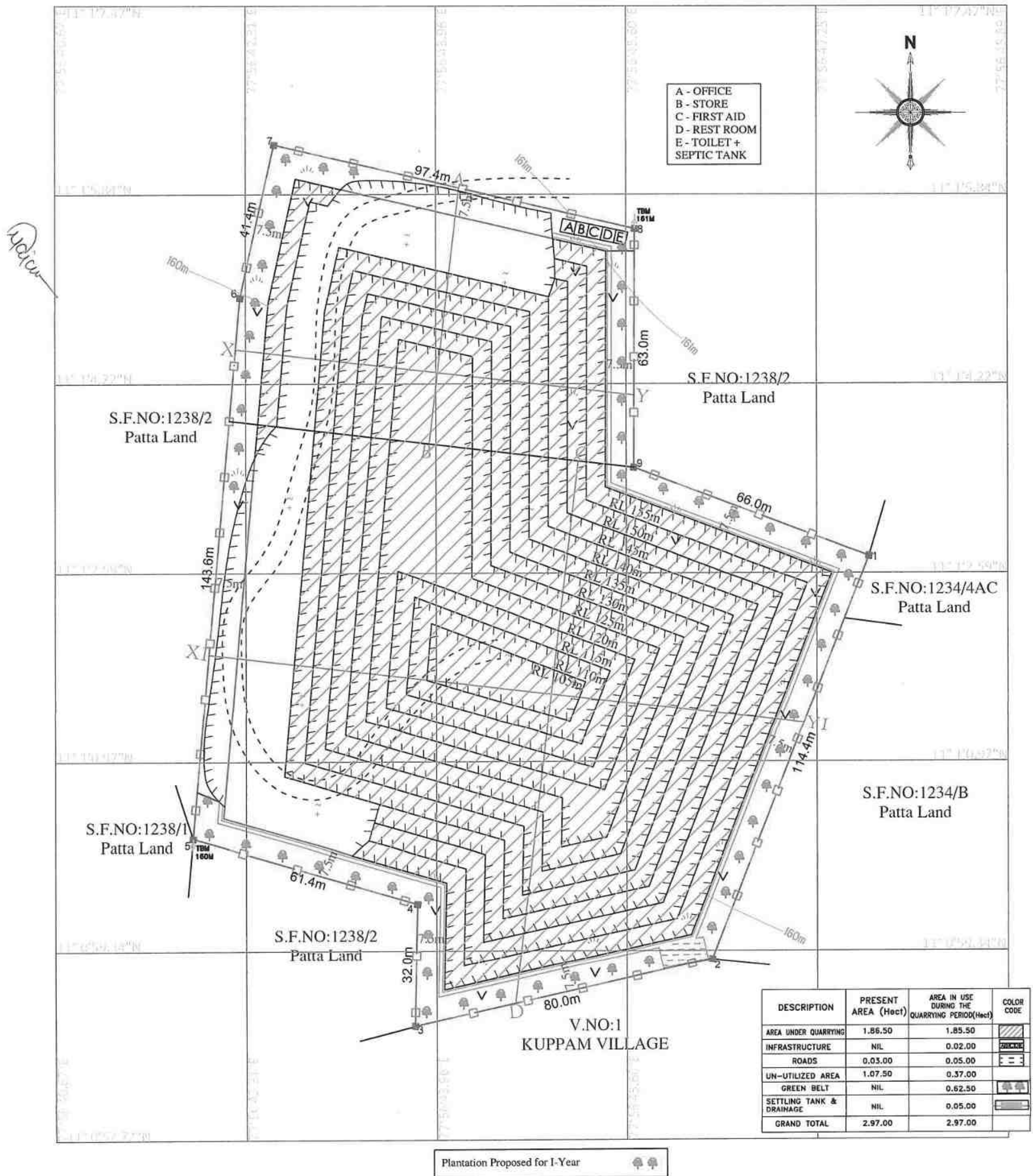
- MINE LEASE AREA
- SAFETY BOUNDARY
- GRAVEL
- ROUGH STONE
- PROPOSED BENCH

#### Prepared By:

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

*[Signature]*

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



#### PLATE NO-V

##### APPLICANT:

Tvl. THIRUMALAI BLUE METALS,  
NO.538/4, PULANKAD,  
KUPPAM POST,  
PUGALUR TALUK,  
KARUR DISTRICT - 639 111

##### LEASE APPLIED AREA:

S.F.NO : 1238/2 (Part)  
EXTENT : 2.97.00Hect,  
VILLAGE : VETTAMANGALAM WEST,  
TALUK : PUGALUR,  
DISTRICT : KARUR.

#### INDEX

MINE LEASE AREA



SAFETY DISTANCE



MINE HAUL ROAD



TEMPORARY BENCH MARK



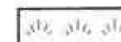
CONTOUR LINES



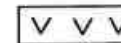
SETTLING TANK & DRAINAGE



SHRUBS



GRAVEL



ROUGH STONE



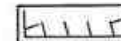
PILLAR STONES



FENCING



PROPOSED BENCH



#### MINE LAYOUT PLAN AND LAND USE PATTERN SCALE 1 : 1000

Prepared By:

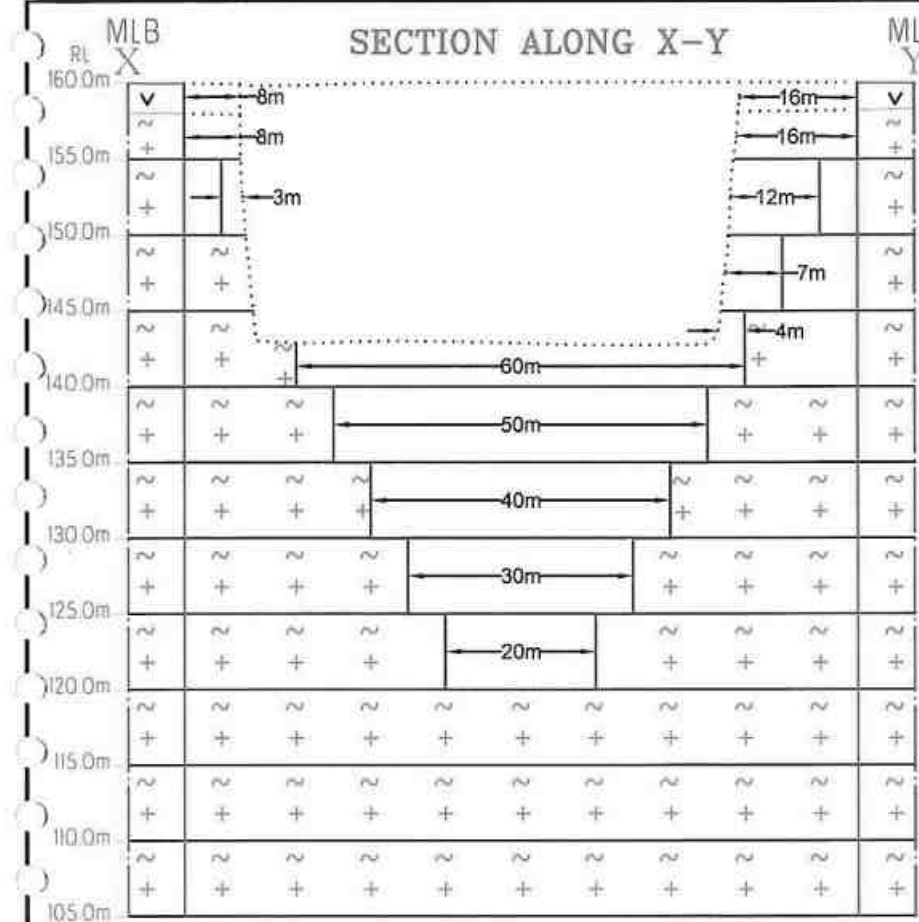
I DO HEREBY CERTIFY THAT THE REATE  
HAS BEEN CHECKED BY ME AND IS CORRECT  
TO THE BEST OF MY KNOWLEDGE

Dr.S.KARUPPANNAN,M.Sc.,Ph.D  
RECOGNIZED QUALIFIED PERSON  
RQP/MAS/203/2014/A

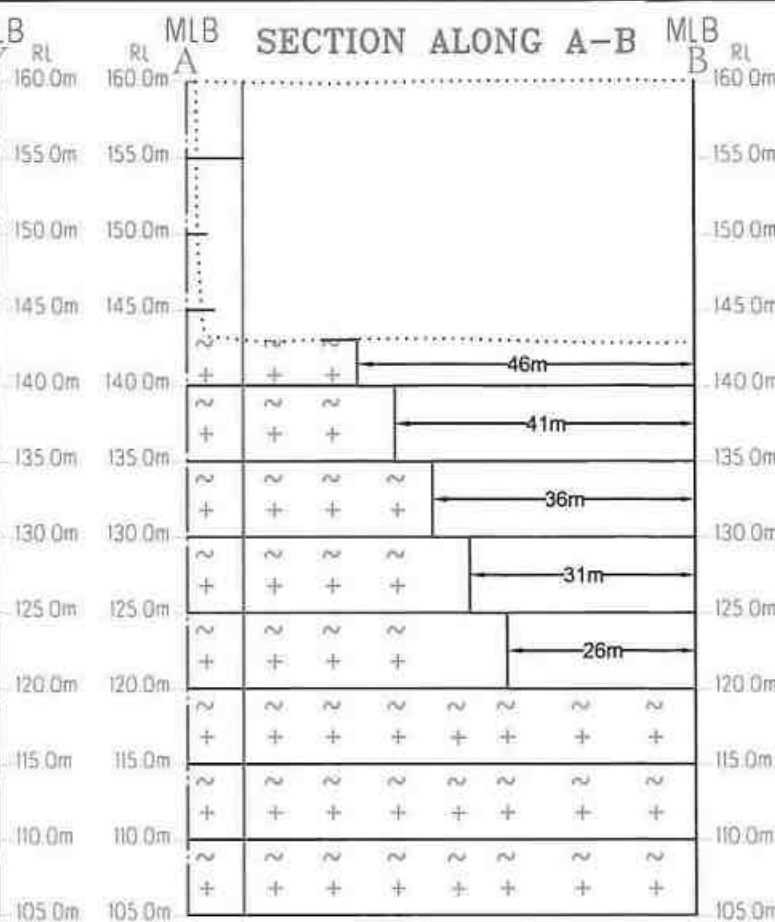




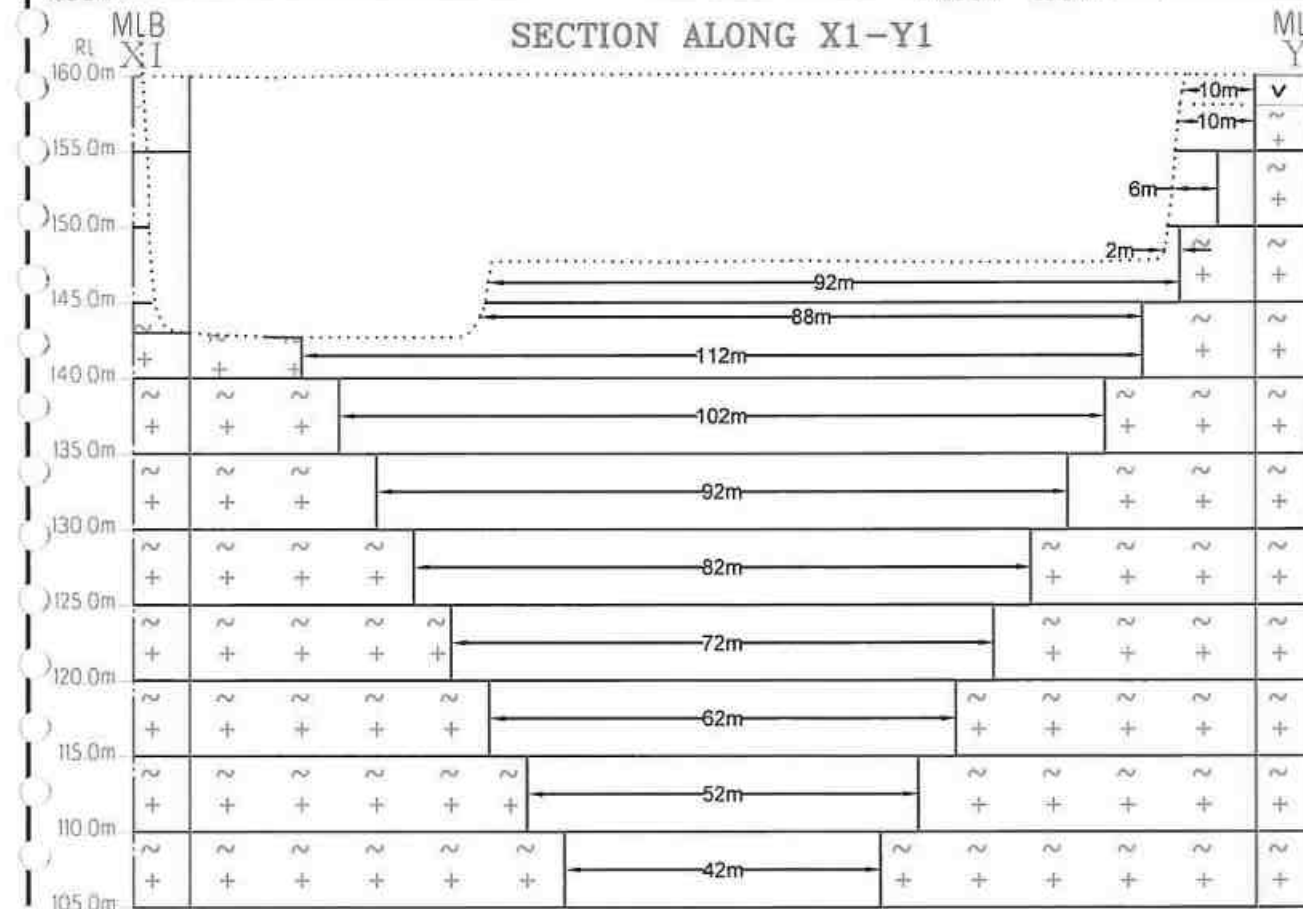
# SECTION ALONG X-Y



# SECTION ALONG A-B



# SECTION ALONG X1-Y1



MINEABLE RESERVES							
Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume In m³	Rough stone in m³	Gravel in m³
XY-AB	I	24	61	2	2928	.....	2928
	I	24	61	3	4392	4392	.....
	II	15	56	5	4200	4200	.....
	III	7	51	5	1785	1785	.....
	IV	4	46	2	368	368	.....
	IV	60	46	3	8280	8280	.....
	V	50	41	5	10250	10250	.....
	VI	40	36	5	7200	7200	.....
	VII	30	31	5	4650	4650	.....
	VIII	20	26	5	2600	2600	.....
TOTAL				40	46653	43725	2928
X1Y1-CD	I	10	25	2	500	.....	500
	I	10	42	3	1260	1260	.....
	II	6	39	5	1170	1170	.....
	III	2	36	2	144	144	.....
	III	92	127	3	35052	35052	.....
	IV	88	122	2	21472	21472	.....
	IV	112	122	3	40992	40992	.....
	V	102	117	5	59670	59670	.....
	VI	92	112	5	51520	51520	.....
	VII	82	107	5	43870	43870	.....
	VIII	72	102	5	36720	36720	.....
	IX	62	92	5	28520	28520	.....
	X	52	82	5	21320	21320	.....
	XI	42	72	5	15120	15120	.....
TOTAL				55	357330	356830	500
GRANDTOTAL					403983	400555	3428

# SECTION ALONG C-D

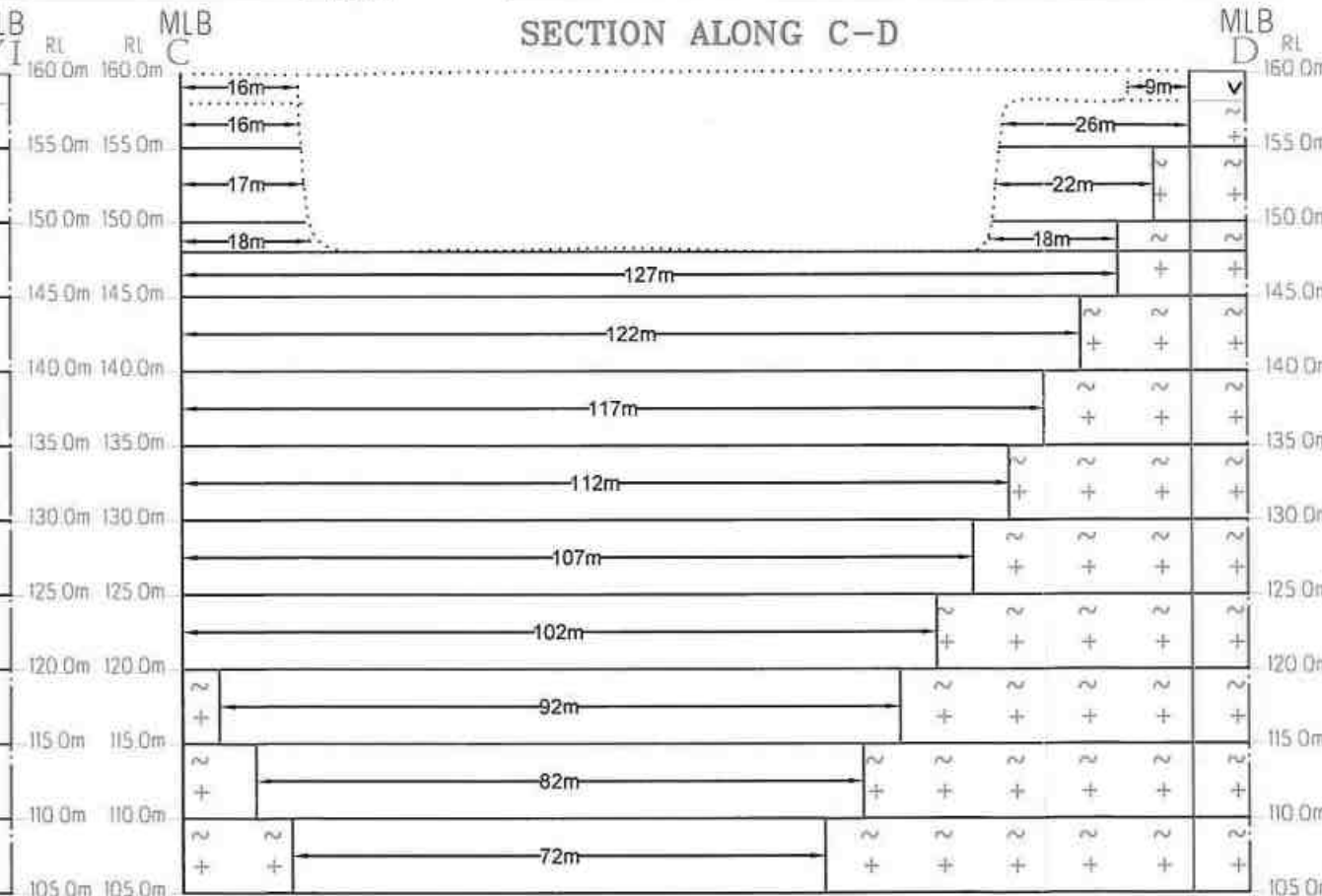


PLATE NO-VI A

CONCEPTUAL SECTIONS  
SECTION HOR 1 : 1000 & VER 1 : 500

APPLICANT:

Tvl. THIRUMALAI BLUE METALS,  
NO.538/4, PULANKAD,  
KUPPAM POST,  
PUGALUR TALUK,  
KARUR DISTRICT - 639 111

LEASE APPLIED AREA:

S.F.NO : 1238/2 (Part)  
EXTENT : 2.97.00Hect,  
VILLAGE : VETTAMANGALAM,  
TALUK : PUGALUR,  
DISTRICT : KARUR.

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MINE LEASE AREA

SAFETY BOUNDARY

GRAVEL

ROUGH STONE

ULTIMATE BENCH

Prepared By:

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

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

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

To  
M/s.Thirumalai Blue Metals,  
No.538/4, Pulankad,  
Kuppam Post,  
Pugalur Taluk,  
Karur District - 639 111.

**Rc.No.424/Mines/2021, Dated: 31.01.2023**

Sir,

Sub: Mines and Minerals – Minor Mineral – Karur District – Pugalur Taluk – Vettamangalam West Village – S.F.No.1238/2(Part) Over an extant 2.97.0 hectares – Quarry lease application for Rough Stone and Gravel – Preferred by M/s.Thirumalai Blue Metals – Precise area communicated – mining plan submitted for approval – Approved – Regarding.

- Ref:
1. Quarry lease application for Rough stone and Gravel preferred by M/s.Thirumalai Blue Metals, No.538/4, Pulankad, Kuppam Post, Pugalur Taluk, Karur District 639 111, dated: 28.09.2021.
  2. Order of the Hon'ble Supreme Court of India in I.A.Nos.12-13/2011 in SLP (C) No.19628-19629/2009, dt: 27.02.2012.
  3. Government of India, Ministry of Environment and Forest Office Memorandum, Dated:18.05.2012.
  4. The Chairman, State Level Environment Impact Assessment Authority, Tamil Nadu D.O.Lr.No.SEIAA-TN/Minor Minerals/2012, Dated: 17.09.2012.
  5. The Commissioner of Geology and Mining, Chennai letter Rc.No.3868/LC/2012, dt: 19.11.2012.
  6. Deputy Director, Geology and Mining, Karur Notice Rc.No.424/Mines/2021, Dated: 12.01.2023.
  7. Mining Plan submitted by M/s.Thirumalai Blue Metals letter, Dated: 25.01.2023.

\*\*\*\*\*

M/s.Thirumalai Blue Metals applied for quarry lease to quarry Rough Stone and Gravel vide in the reference 1<sup>st</sup> cited and Precise area communicated to the applicant firm regarding to submit the mining plan for approval as per rule 41 and also submit the Environmental Clearance as per Rule 42 of Tamil Nadu Minor Mineral Concession Rules -1959.



Accordingly M/s.Thirumalai Blue Metals have submitted three copies of draft mining plan for approval in respect of Rough stone and Gravel quarry lease applied areas, over an extent of 2.97.0 hectares of patta land in S.F.No.1238/2(Part) of Vettamangalam West Village, Pugalur Taluk, Karur District in the reference 7<sup>th</sup> cited.

The above submitted mining plan for the grant of Rough stone and Gravel quarry lease in S.F.No.1238/2(Part) Over an extant 2.97.0 hectares of patta land in Vettamangalam West Village, Pugalur Taluk, Karur District has been examined in detail.

As per the guidelines/ instructions issued by the Commissioner of Geology and Mining, Chennai vide letter Rc.No.3868/LC/2012, date: 19.11.2012., the mining plan submitted by the applicant firm is hereby approved, subject to the following conditions:


- (I) The mining plan is approved without prejudice to any other Law applicable to the quarry lease from time to time whether such laws are made by the Central Government, State Government or any other authority.
- (II) This approval of the mining plan does not in any way imply the approval of the Government in terms or any other provisions of the Mines and Minerals (Development and Regulation) Act, 1957, or any other connected laws including Forest (Conservation) Act, 1980, Forest Conservation Rules, 1981, Environment Protection Act, 1980, Explosives Act, 1884 (Central Act IV of 1884) Minor Mineral Concession and Development Rules, 2010 and the Rules made there under and the Tamil Nadu Minor Mineral Concession Rules, 1959.
- (III) The mining plan is approved without prejudice to any other order or direction from any court of competent jurisdiction.
- (IV) As per the Deputy Director, Geology and Mining, Karur notice in Rc.No.424/Mines/2021, Dated:12.01.2023 the following conditions are incorporated in the Mining Plan plates.

1. விண்ணப்ப புலத்திற்கு அருகில் உள்ள பட்டா நிலங்களுக்கு 7.5 மீட்டர் மற்றும் புறம்போக்கு நிலத்திற்கு 10 மீட்டர் பாதுகாப்பு இடைவெளி விட்டு யாதொரு சேதமுமின்றி முறையாக குவாரிப்பணி செய்ய வேண்டும்.
2. குத்தகைக்காலத்தில் கைத்துளைப்பான் கருவி கொண்டு பாறைகளை துளையிட்டும், மிதமான வெடிபொருள் பயன்படுத்தியும், பொதுமக்களுக்கோ, பொது சொத்துக்களுக்கோ யாதொரு சேதமுமின்றி விதிமுறைகளின்படி குவாரிப்பணி செய்ய வேண்டும்.
3. குவாரித் தொழிலாளர்களின் பாதுகாப்பினை உறுதி செய்ய Mettalliferrous Mines, விதிகளின்படி அகலமானதும், பாதுகாப்பானதுமான Benches அமைத்து பாதுகாப்பான முறையில் குவாரிக்குள் வாகனங்கள் சென்றுவரவும் மற்றும் குவாரி தொழிலாளர்களின் பாதுகாப்பினை உறுதி செய்தும் குவாரிப்பணி செய்ய வேண்டும்.
4. குவாரி குத்தகை வழங்க ஏதுவாக துணை இயக்குநர் (சுரங்கம்) அவர்களால் ஏற்பளிக்கப்பட்ட சுரங்கத்திட்டத்தினையும், மாநில அளவிலான சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையத்தின் (SEIAA) அனுமதி பெற்று மாவட்ட நிர்வாகத்திற்கு விண்ணப்பதாரரால் சமர்ப்பிக்கப்பட வேண்டும்.

(V) Quarrying shall be done as per the approved Mining Plan and that the mining plan is approved without prejudice to any other law applicable to the quarry lease from time to time whether such laws are made by the Central Government, State Government or any other authority.

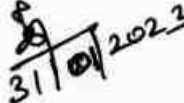
(VI) If anything is found to be concealed as required by the Mines Act in the contents of the Mining Plan and the proposal for rectification has not been made, the approval shall be deemed to have been withdrawn with immediate effect.

Encl: Two copies of Approved Mining Plan.

  
 Deputy Director,  
 Geology and Mining,  
 Karur.

**Copy to:**

Dr.S.Karuppannan, M.Sc., Ph.D,  
 RQP/MAS/263/2014/A,  
 GEO Technical Mining Solutions,  
 No.1/213-B Ground Floor,  
 Natesan Complex, Oddapatti,  
 Collectorate Post Office,  
 Dharmapuri - 636 705

  
 31/01/2023



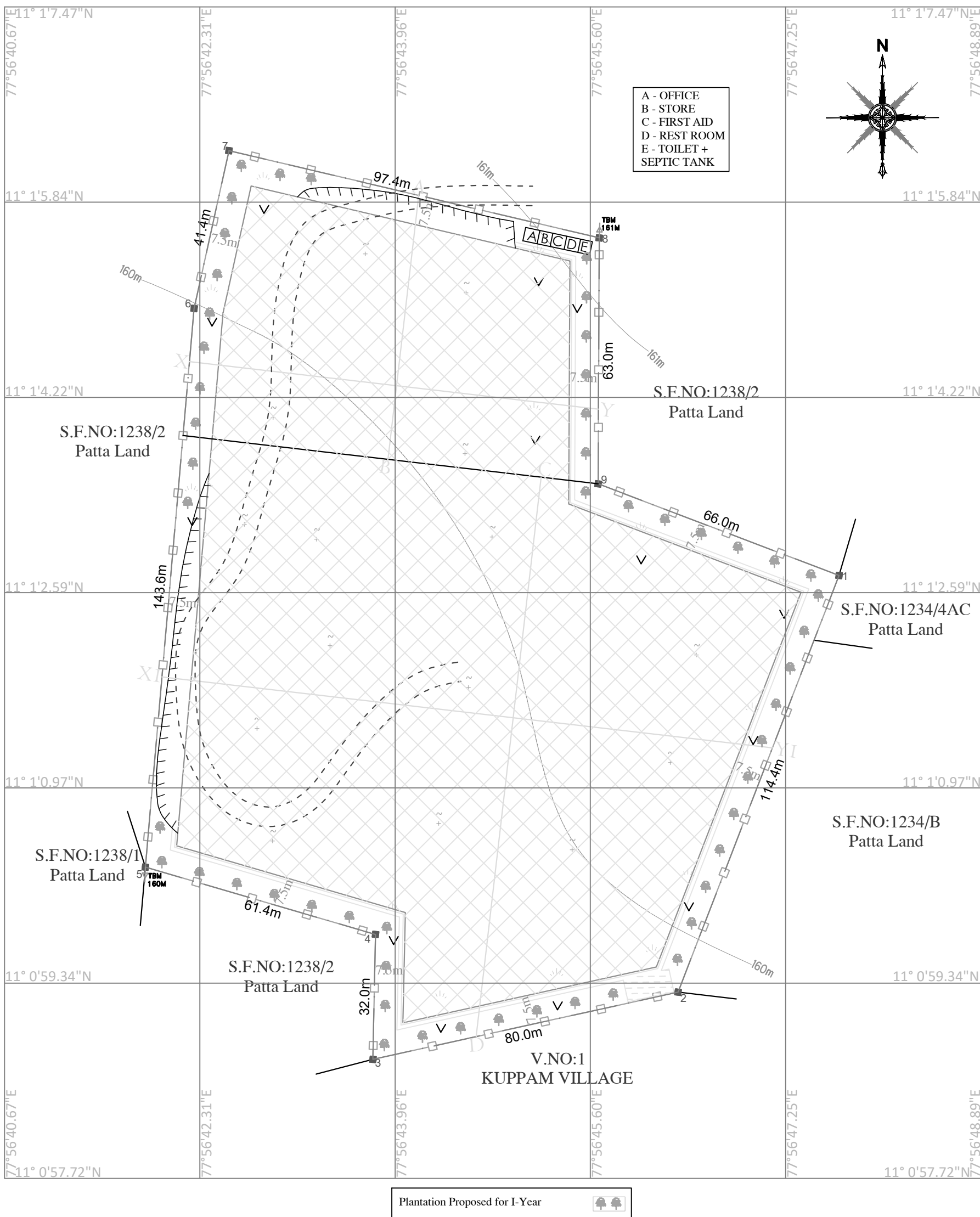


PLATE NO-IV

APPLICANT:  
Tvl. THIRUMALAI BLUE METALS,  
NO.538/4, PULANKAD,  
KUPPAM POST,  
PUGALUR TALUK,  
KARUR DISTRICT - 639 111

LEASE APPLIED AREA:  
S.F.NO : 1238/2 (Part)  
EXTENT : 2.97.00Hect,  
VILLAGE : VETTAMANGALAM WEST,  
TALUK : PUGALUR,  
DISTRICT : KARUR.

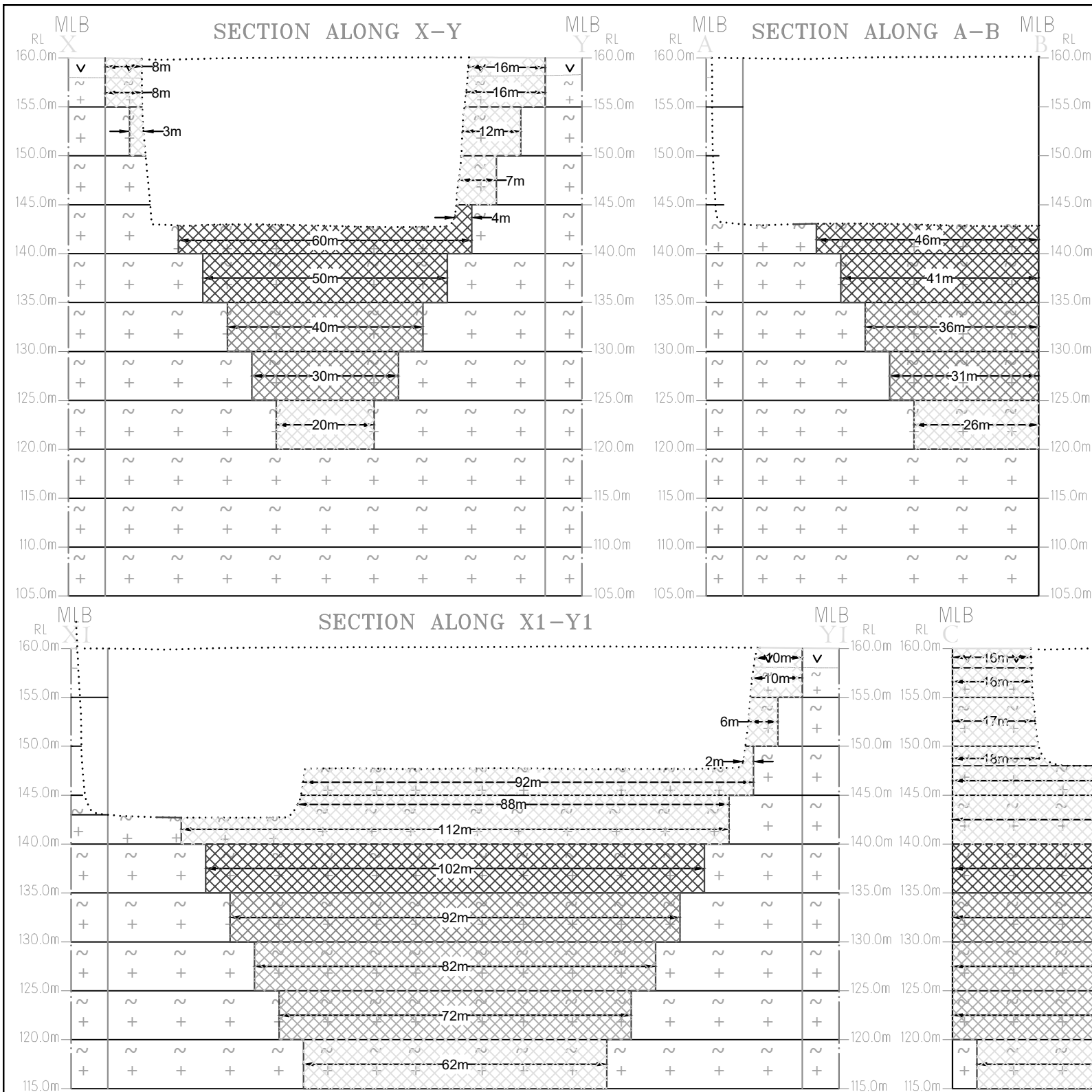
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MINE HAUL ROAD		ROUGH STONE	
TEMPORARY BENCH MARK		PILLAR STONES	
CONTOUR LINES		FENCING	
SETTLING TANK & DRAINAGE		EXISTING PIT	

YEARWISE DEVELOPMENT &  
PRODUCTION PLAN  
SCALE PLAN 1 : 1000

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

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



YEARWISE PRODUCTIONS RESERVES								
Year	Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume in m <sup>3</sup>	Rough stone in m <sup>3</sup>	Gravel in m <sup>3</sup>
I-YEAR	XY-AB	I	24	61	2	2928		2928
		I	24	61	3	4392	4392	
		I	10	25	2	500		500
	X1Y1-C1	I	10	42	3	1260	1260	
		II	6	39	5	1170	1170	
	XY-AB	II	15	56	5	4200	4200	
		III	7	51	5	1785	1785	
		III	2	36	2	144	144	
	X1Y1-C1	III	92	127	3	35052	35052	
		IV	88	122	2	21472	21472	
II-YEAR	TOTAL						113895	110467
	XY-AB	IV	4	46	2	368	368	
		IV	60	46	3	8280	8280	
		V	50	41	5	10250	10250	
	X1Y1-C1	V	102	117	5	59670	59670	
III-YEAR	TOTAL						78568	78568
	X1Y1-C1	VI	92	112	5	51520	51520	
		VI	40	36	5	7200	7200	
		VII	30	31	5	4650	4650	
IV-YEAR	TOTAL						63370	63370
	X1Y1-C1	VII	82	107	5	43870	43870	
		VIII	72	102	5	36720	36720	
	TOTAL						80590	80590
V-YEAR	XY-AB	VIII	20	26	5	2600	2600	
		IX	62	92	5	28520	28520	
	TOTAL						31120	31120
GRAND TOTAL						367543	364115	3428

- I - Year Proposed area to be Quarried
- II - Year Proposed area to be Quarried
- III - Year Proposed area to be Quarried
- IV - Year Proposed area to be Quarried
- V - Year Proposed area to be Quarried

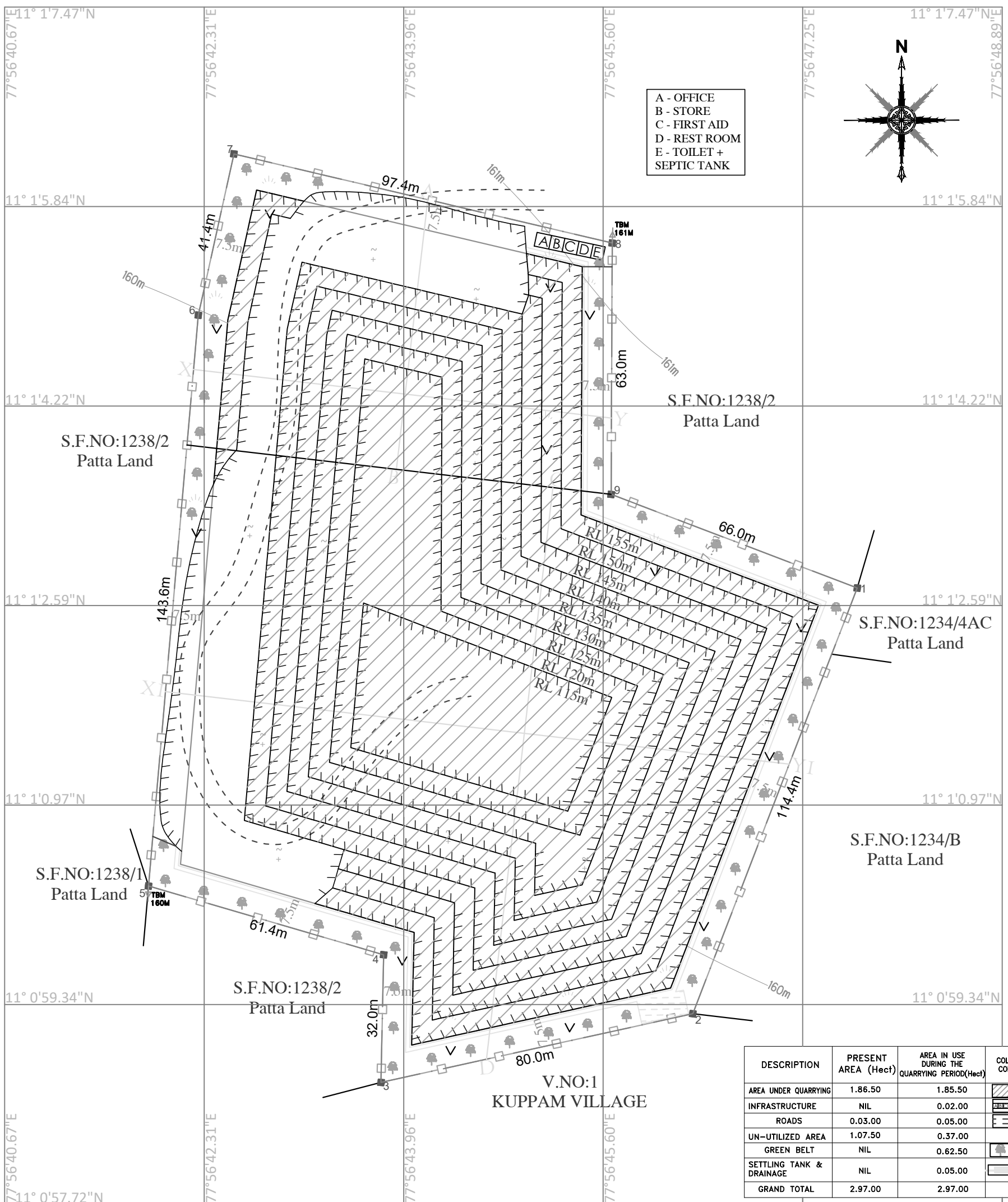
PLATE NO-IVA	YEAR WISE PRODUCTION SECTIONS SECTION HOR 1 : 1000 & VER 1: 500
APPLICANT: Tvl. THIRUMALAI BLUE METALS, NO.538/4, PULANKAD, KUPPAM POST, PUGALUR TALUK, KARUR DISTRICT - 639 111	LEASE APPLIED AREA: S.F.NO : 1238/2 (Part) EXTENT : 2.97.00Hect, VILLAGE : VETTAMANGALAM WEST, TALUK : PUGALUR, DISTRICT : KARUR.

INDEX	
MINE LEASE AREA	
SAFETY BOUNDARY	
GRAVEL	V V V
ROUGH STONE	+ + + +
PROPOSED BENCH	

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



DESCRIPTION	PRESENT AREA (Hect)	AREA IN USE DURING THE QUARRYING PERIOD(Hect)	COLOR CODE
AREA UNDER QUARRYING	1.86.50	1.85.50	
INFRASTRUCTURE	NIL	0.02.00	
ROADS	0.03.00	0.05.00	
UN-UTILIZED AREA	1.07.50	0.37.00	
GREEN BELT	NIL	0.62.50	
SETTLING TANK & DRAINAGE	NIL	0.05.00	
GRAND TOTAL	2.97.00	2.97.00	

Plantation Proposed for I-Year

**PLATE NO-V**

**APPLICANT:**  
Tvl. THIRUMALAI BLUE METALS,  
NO.538/4, PULANKAD,  
KUPPAM POST,  
PUGALUR TALUK,  
KARUR DISTRICT - 639 111

**LEASE APPLIED AREA:**  
S.F.NO : 1238/2 (Part)  
EXTENT : 2.97.00Hect,  
VILLAGE : VETTAMANGALAM WEST,  
TALUK : PUGALUR,  
DISTRICT : KARUR.

**INDEX**

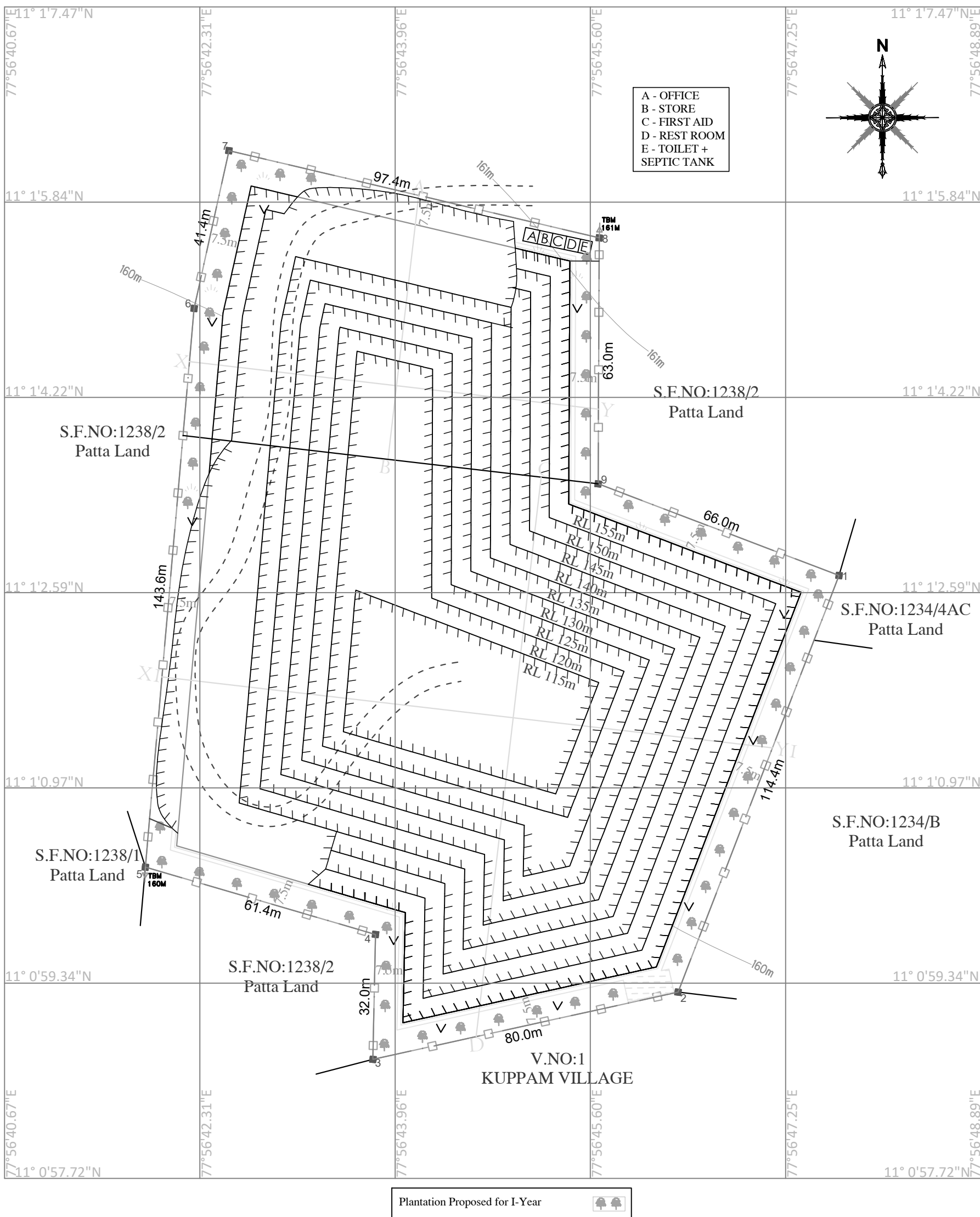
MINE LEASE AREA		SHRUBS	
SAFETY DISTANCE		GRAVEL	
MINE HAUL ROAD		ROUGH STONE	
TEMPORARY BENCH MARK		PILLAR STONES	
CONTOUR LINES		FENCING	
SETTLING TANK & DRAINAGE		PROPOSED BENCH	

**MINE LAYOUT PLAN AND LAND USE PATTERN**  
SCALE 1 : 1000

Prepared By:

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

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



Plantation Proposed for I-Year

PLATE NO-VI

APPLICANT:  
Tvl. THIRUMALAI BLUE METALS,  
NO.538/4, PULANKAD,  
KUPPAM POST,  
PUGALUR TALUK,  
KARUR DISTRICT - 639 111

LEASE APPLIED AREA:  
S.F.NO : 1238/2 (Part)  
EXTENT : 2.97.00Hect,  
VILLAGE : VETTAMANGALAM WEST,  
TALUK : PUGALUR,  
DISTRICT : KARUR.

INDEX

MINE LEASE AREA		SHRUBS	
SAFETY DISTANCE		GRAVEL	
MINE HAUL ROAD		ROUGH STONE	
TEMPORARY BENCH MARK		PILLAR STONES	
CONTOUR LINES		FENCING	
SETTLING TANK & DRAINAGE		ULTIMATE BENCH	

CONCEPTUAL PLAN  
SCALE 1 : 1000

Prepared By:  
I DO HEREBY CERTIFY THAT THE PLATE  
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TO THE BEST OF MY KNOWLEDGE

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







பொருள் : கனிமம் - கல்குவாரி - கரூர் மாவட்டம், புகளூர் வட்டம், வேட்டமங்கலம் (மேற்கு) கிராமத்தில் உள்ள கல்குவாரிக்கும் காப்புக்காடு பகுதிக்கும் இடைப்பட்ட தூர விபரங்களை தெரிவித்தல் - தொடர்பாக.

பார்வை : 1. திருமலை புளூ மெட்டல்ஸ், வேட்டமங்கலம் (மேற்கு), பூலான்காடு, புகளூர் வட்டம், கரூர் கடித எண்.இல்லை நாள்.27.01.2023.  
2. வனச்சரக அலுவலர், கரூர் வனச்சரகம் கடித எண். இல்லை நாள்.31.01.2023

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பார்வை 1-ல் காணும் கடிதத்தில் கரூர் மாவட்டம், புகளூர் வட்டம், வேட்டமங்கலம் (மேற்கு) கிராமத்தில் புல எண்கள்.1238/2 (பகுதி) 2.97.0 எக்டேர் பரப்பளவில் திருமலை புளூ மெட்டல்ஸ் என்ற நிறுவனத்தின் சாதாரண கல்குவாரியை அமைக்க மாநில சுற்றுச்சூழல் ஆணையத்திற்கு விண்ணப்பித்துள்ளதால், மேற்படி கல்குவாரியின் புலத்திலிருந்து 25 கி.மீ சுற்றளவுக்குள் உள்ள காப்புக்காடுகளின் விபரங்களை தெரிவிக்குமாறும் கோரப்பட்டுள்ளது என்றும், எனவே மேற்படி கல்குவாரி நடைபெறவுள்ள இடத்திற்கும் அருகிலுள்ள காப்புக்காட்டிற்கும் இடையேயுள்ள தூரத்தினை தெரிவிக்குமாறு கோரப்பட்டுள்ளது.

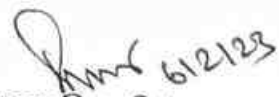
அதன்படி மேற்படி இடமானது கரூர் வனச்சரக அலுவலரால் களத்தணிக்கை செய்யப்பட்டு பார்வை 2-ல் கண்டவாறு சமர்ப்பித்த அறிக்கையின் படி கரூர் மாவட்டம், புகளூர் வட்டம், வேட்டமங்கலம் (மேற்கு) கிராமத்தில் புல எண்கள். 1238/2 (பகுதி) 2.97.0 எக்டேர் பரப்பளவில் திருமலை புளூ மெட்டல்ஸ் என்ற நிறுவனத்தின் மூலம் அமைக்கப்படவுள்ள கல்குவாரியிலிருந்து 10.20 கிலோமீட்டர் தூரத்தில் தாதம்பாளையம் காப்புக்காடு அமைந்துள்ளது என்றும் மேலும் கல்குவாரி அமைந்துள்ள புலத்திலிருந்து 25 கி.மீ சுற்றளவுக்குள் பாதுகாக்கப்பட்ட வனப்பகுதி மற்றும் சுற்றுச்சூழல் உணர்திறன் பகுதி ஏதுமில்லை என தெரிவிக்கப்படுகிறது.

ஒம்/- வி.ஏ.சரவணன்,  
மாவட்ட வன அலுவலர்,  
கரூர் வனக்கோட்டம்,  
கரூர்.

பெறுநர்

திருமலை புளூ மெட்டல்ஸ்,  
535/4, பூலான் காடு,  
குப்பம் அஞ்சல்,  
புகளூர் வட்டம்,  
கரூர் மாவட்டம்.

// உ.ந.உ.ப //

 6/2/23  
வரைதொழில் அலுவலர்.



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#### Geo Technical Mining Solutions

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S. No	Sector Description	Sector (as per)		Cat.
		NABET	MoEFCC	
1	Mining of minerals including opencast/ underground mining.	1	1 (a) (i)	B

**Note:** Names of approved EIA Coordinators and Functional Area Experts are mentioned in SAAC minutes dated September 13, 2022 posted on QCI-NABET website.

The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in QCI-NABET's letter of accreditation bearing no. QCI/NABET/ENV/ACO/23/2641 dated January 19, 2023. The accreditation needs to be renewed before the expiry date by Geo Technical Mining Solutions following due process of assessment.

Sr. Director, NABET  
Dated: January 19, 2023

Certificate No.  
NABET/EIA/2124/SA 0184

Valid up to  
Dec 31, 2023

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