

# DRAFT ENVIRONMENTAL IMPACT ASSESSMENT & ENVIRONMENT MANAGEMENT PLAN

FOR OBTAINING

**Environmental Clearance under EIA Notification – 2006  
Schedule Sl. No. 1 (a) (i): Mining Project**

**“B1” CATEGORY (Cluster) – MINOR MINERAL – CLUSTER –**

**PATTA LAND - FRESH QUARRY**




**THIRU A.VEERARAGAVAN ROUGH STONE AND GRAVEL QUARRY**

**Extent – 2.42.63 Ha**

**Project Proponent**

**Thiru A.Veeraragavan,**

S/o. Anandavelu,  
No. 225, Mettu Street,  
Eraiyr Village, Vanur Taluk,  
Viluppuram District – 604 304.

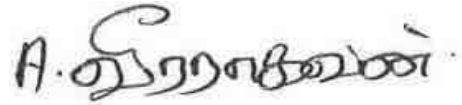
PROJECT LOCATION	PROPOSED PRODUCTION
S.F.No. 75/1, 75/4, 75/5, 75/6 and 76/3B2, Eraiyr Village, Vanur Taluk, Viluppuram District	<b>Reserves:</b> 1,56,265 m <sup>3</sup> of Rough stone & 31,334 m <sup>3</sup> of Gravel  Peak Production = 35,195m <sup>3</sup> of Rough Stone, 12,334 m <sup>3</sup> of Gravel  Proposed Depth = 32m bgl
<b>ToR obtained vide Lr No. SEIAA-TN/F.No.10444/SEAC/ToR-1626/2023 Dated: 12.12.2023</b>	
<b>Environmental Consultant</b> GEO EXPLORATION AND MINING SOLUTIONS  Old No. 260-B, New No. 17, Advaitha Ashram Road, Alagapuram, Salem – 636 004, Tamil Nadu, India <b>Accredited for sector 1 Cat ‘A’, sector 31 &amp; 38 Cat ‘B’</b> Certificate No : NABET/EIA/2225/RA 0276 Phone: 0427-2431989, Email: infogeoexploration@gmail.com   Web: www.gemssalem.com	<b>Laboratory</b> EHS 360 LABS PRIVATE LIMITED, 10/2 Ground floor, 50 <sup>th</sup> street, 7 <sup>th</sup> Avenue, Ashok Nagar, Chennai – 600 083.
<b><u>Baseline Monitoring Period</u></b> <b>December 2023 to February 2024</b>	
<b>MAY 2024</b>	

## UNDERTAKING

I A. Veeraragavan given undertaking that this EIA & EMP report prepared for our Rough stone and Gravel quarry situated in S.F. No 75/1, 75/4, 75/5, 75/6 and 76/3B2, over an extent of 2.42.63 Ha in Eraiyur Village, Vanur Taluk and Viluppuram District based on the ToR issued by the State Level Environmental Impact Assessment Authority (SEIAA), Tamil Nadu vide Letter No Lr No. SEIAA-TN/F.No.10444/SEAC/ToR-1626/2023 Dated: 12.12.2023

I hereby assured that the Data's submitted and information given by me is true and correct to the best of my knowledge.

Signature of the Project Proponent



A. Veeraragavan

Place : Viluppuram

Dated :

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## **DECLARATION**

I Dr. M.Ifthikhar Ahmed – EIA Co Ordinator declare that the EIA & EMP report for the Rough stone and Gravel quarry in S.F.No 75/1, 75/4, 75/5, 75/6 and 76/3B2 over an extent of 2.42.63 Ha in Eraiyur Village, Vanur Taluk and Villupuram District has been prepared by Geo Exploration and Mining Solutions, Salem, Tamil Nadu.

The Data's provided in the EIA report are true and correct to the best of my knowledge.

Signature of the EIA Co Ordinator



**Dr. M. Ifthikhar Ahmed**

**Managing Partner**

**M/s. Geo Exploration and Mining Solutions**

Place : Salem

Dated :

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For easy representation of Proposed and Existing, Expired and Abandoned Quarries in the Cluster are given unique codes and identifies and studied in this EIA/ EMP Report.

<b>PROPOSED QUARRIES</b>					
<b>CODE</b>	<b>Name of the Owner</b>	<b>Village</b>	<b>S.F. Nos</b>	<b>Extent in Ha</b>	<b>Status</b>
<b>P1</b>	<b>Thiru.A.Veeraragavan</b> S/o,Ananthavelu, mettu theru, vanur taluk,viluppuram District	Eraiyur	75/1, 75/4, 75/5, 75/6 and 76/3B2	2.42.63	Lr No. SEIAA-TN /F.No. 10444 /ToR-1626 /2023 Dated: 12.12.2023.
<b>P2</b>	Thiru.K.Anandavelu, S/o,Kesavan,No.225, Mettu street,Eraiyur Village,Vanur Taluk, Viluppuram District	Eraiyur	76/2, 76/3A &76/6	2.18.0	-
<b>TOTAL EXTENT</b>				<b>4.60.63</b>	
<b>EXISTING QUARRIES</b>					
<b>CODE</b>	<b>Name of the Owner</b>	<b>Village</b>	<b>S.F. Nos</b>	<b>Extent in Ha</b>	<b>Status</b>
E-1	<b>T.Vasudevan,</b> S/o, Thangavel, Eraiyur Village, Vanur Taluk, Viluppuram District.	Eraiyur	80/3,80/4,81/1, 81/3,81/4,81/5, 81/6,94/1A,94/ 2,94/3	4.83.5	15.02.2019 to 14.02.2024
E-2	E.Jayasankar S/o, Elumalai, No.198, Vinayakar,Koil street,Eraiyur Village, Vanur Taluk, Viluppuram District.	Eraiyur	93/4,93/5,94/1 B,94/4	3.37.5	15.02.2019 to 14.02.2024
<b>TOTAL EXTENT</b>				<b>8.21.0</b>	
<b>TOTAL CLUSTER EXTENT</b>				<b>12.81.63</b>	

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



## TERMS OF REFERENCE (ToR) COMPLIANCE

<b>Lr No.SEIAA-TN/F.No.10444/SEAC/ToR-1626/2023 Dated: 12.12.2023</b>		
1	The Proponent shall justify the selection of the site for carrying out the stone quarrying with the total volume arrived for the excavation & production adequate details such as lithology of the deposit, reserve estimation, place for waste dump/mined mineral storage, end-use of mined materials, identified potential customers/end-users and travel path.	The proposed is fit for quarry because already two existing quarries in proposed site. The details of lithology and reserve in chapter-2
2	The proponent is requested to carry out a survey and enumerate on the structures located within the radius of (i) 50 m, (ii) 100 m, (iii) 200 m and (iv) 300 m (v) 500m with details such as dwelling houses with number of occupants, whether it belongs to the owner (or) not, places of worship, industries, factories, sheds, etc with indicating the owner of the building, nature of construction, age of the building, number of residents, their profession and income, etc.	There are no structures within 300m radius of the proposed project.
3	The PP shall submit a detailed hydrological report indicating the impact of proposed quarrying operations on the waterbodies like lake, water tanks, etc located within 1 km of the proposed quarry.	The details of hydrological report in chapter-3
4	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.	The Barbed Wire fencing has been erected all around the boundary. The Photographs is attached in chapter-2
5	The PP shall carry out a detailed hydrogeological study to spell out the water management plan for the proposed site.	The details in chapter-3
6	The Proponent shall carry out Bio diversity study through Department of Ecology and Environmental Sciences, Pondicherry University and the same shall be included in EIA Report	Detailed in chapter-3 ecology environment in the draft EIA report.
7	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.	The details of EMP in chapter-10.
<b>ANNEXURE-I</b>		
1	The PP shall furnish the letter obtained from the AD (Mines) indicating the existing pit dimensions and pit conditions showing the details on mine having worked during the earlier lease period.	It is a fresh quarry
2	The PP shall furnish DFO letter stating that the proximity distance of Reserve Forests, Protected Areas, Sanctuaries, Tiger reserve etc., up to a radius of 25 km from the proposed site.	Melkondai R.F – 10.65 Km South west DFO letter will be obtained and attached in the Final EIA/EMP report annexure
3	The PP shall provide individual notice regarding the Public Hearing to the nearby house owners located in the vicinity of the project site.	The notice will be circulated to the local village people.
4	The Proponent shall justify the selection of the site for carrying out the stone quarrying with the total volume arrived for the excavation & production adequate details such as lithology of the deposit, reserve estimation, place for waste dump/mined mineral storage, end-use of mined materials, identified potential customers/end-users and travel path.	The proposed is fit for quarry because already two existing quarries in proposed site. The details of lithology and reserve in chapter-2
5	The PP shall also justify the selection of mining methodology (conventional or non-conventional) adopting blasting techniques/non-explosive techniques with proper ground reality & laboratory testing.	Th Non- Conventional method is proposed. The NONEL blasting with proper competent persons like mine manager, mate, foreman and Blaster.

6	The proponent shall submit the "Blast Design Parameters for controlling the vibration and fly rock from the quarry blasting" considering the existence of sensitive structures including habitations within 500 m from the lease boundary.	
7	The PP shall justify the estimation of HEMM population for excavation and transportation in the proposed quarries with proper calculation methodology adopted.	The Details of machinery in chapter-2
8	The PP shall enumerate the environmental settings situated within a radial distance of 1 km such rivers/water bodies/reserve forests/ grazing land/existence of the hospitals and educational institutions/structures.	The details in chapter-1
9	The PP shall provide the details of the anticipated impacts of the mining operations on the surrounding environment and the remedial measures for the same.	The details of the impacts and remedial measures in chapter-4.
10	The proponent is requested to carry out a survey and enumerate on the structures located within the radius of (i) 50 m, (ii) 100 m, (iii) 200 m and (iv) 300 m (v) 500m with details such as dwelling houses with number of occupants, whether it belongs to the owner (or) not, places of worship, industries, factories, sheds, etc with indicating the owner of the building, nature of construction, age of the building, number of residents, their profession and income, etc.	There are no structures within 300m radius of the proposed project.
11	The PP shall submit a 'Slope Stability Action Plan' for the proposed quarry where the proposed depth exceeds 30 m and it shall cover the aspects of stability of quarry walls including the access ramp keeping the benches intact.	The slope stability report will be taken when the proposed project attain depth 30m bgl.
12	If the blasting operation is to be carried out, the PP shall present a conceptual design for carrying out the NONEL initiation based controlled blasting operation including the line drilling & muffle blasting techniques and a Simulation Model indicating the anticipated Blast-induced Ground Vibration levels in the proposed quarry as stipulated by the DGMS Circular No.7 of 1997, during the EIA Proposal.	It is a fresh quarry
13	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.	Affidavit will be submitted in the Final EIA/EMP report
14	The PP shall give an affidavit stating that no contractual persons provided by the explosive suppliers will be employed for carrying out the blasting operations in the proposed quarries	Noted and agreed
15	The PP shall also give an affidavit that no highly sensitive structure such as fire-cracker manufacturing units, Gas godown/explosive Magazine, LPG Bottling Units, etc are located within a radial distance of 300 m from the lease boundary of the proposed quarry.	There are no structures within 300m radius of proposed project.
16	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 20 m from the blast site.	
17	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.	There is no other quarry is operated by the proponent

18	The PP shall provide the environmental mitigation measures implemented for the crusher(s) located within the mining lease.	There are no crushers with in the radius of 300m radius.
19	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.	It is a fresh quarry
20	If any quarrying operations were carried out in the proposed quarrying site for which now the EC is sought, the Project Proponent shall furnish the detailed compliance to EC conditions given in the previous EC with the site photographs which shall duly be certified by MoEF & CC, Regional Office, Chennai (or) the concerned DEE/TNPCB.	It is a fresh quarry
21	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).	Satellite imagery of the project area along with boundary coordinates is given in the Chapter No 2, Figure No.2.7, Table no. 2.2. Geomorphology of the area is given in Chapter No 2, Figure No.2.8 Land use pattern of the project area is tabulated in the Chapter No.2. Table no 2.3 Land use pattern of the Study area is tabulated in the Chapter No.3, Table no 3.3 Page no.52
22	The PP shall carry out Drone video survey covering the cluster, Green belt, fencing etc.,	Drone video for this cluster will be taken and it will be submitted in the Final EIA/EMP report.
23	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.	The Barbed Wire fencing has been erected all around the boundary. The Photographs is attached in chapter-2
24	The Project Proponent shall provide the Organization chart indicating the appoint sent 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.	Discussed about Organization chart in Chapter-6
25	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.	The hydro-geological study was conducted to evaluate the possible impact on the ground water table. No significant impacts are anticipated on the water bodies around the project area. Details are discussed under Chapter No.3.

26	The proponent shall furnish the baseline data for the environmental and ecological parameters with regard to surface water/ground water quality, air quality, soil quality & flora/fauna including traffic/vehicular movement study.	Baseline Data were collected for One Season (Post Monsoon) Dec 2023 to Feb 2024 as per CPCB Notification and MoEF & CC Guidelines. Details in Chapter No. 3.
27	The Proponent shall carry out the Cumulative impact study due to mining operations carried out in the quarry specifically with reference to the specific environment in terms of soil health, biodiversity, air pollution, water pollution, climate change and flood control & health impacts. Accordingly, the Environment Management plan should be prepared keeping the concerned quarry and the surrounding habitations in the mind.	Cumulative impact study has been carried out covering proposed and existing quarries in the cluster and results related to air pollution, water pollution, & health impacts have been given in chapter No. 7, Pg. No 151, Based on the results, environmental management plan has been prepared and given in Chapter No. 10.
28	Rain water harvesting management with recharging details along with water balance (both monsoon & non-monsoon) be submitted.	Discussed in Chapter No.-3
29	Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.	Land use and land cover of the study area is discussed in Chapter No. 3. Land use plan of the project area showing pre-operational, operational and post-operational phases are discussed in Chapter No. 2, Table No 2.3.
30	Details of the land for storage of Overburden/Waste Dumps (or) Rejects outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be provided.	Not applicable
31	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.	Not Applicable. Project area / Study area is not declared in 'Critically Polluted' Area and does not come under 'Aravalli Range.
32	If the Village Road / State highway/National highway are located within a radial distance of 500 m from the lease boundary of the quarry proposal, the PP shall carry out traffic studies to indicate impact on local transport infrastructure due to the Project and mitigation measures	There are no Village Road / State highway/National highway are located within a radial distance of 500 m from the lease boundary of the quarry The traffic study has been carried out in chapter-2.
33	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.	There are no trees present in the target mining area and few trees present in the safety barrier. It is proposed to plant 1210 trees along boundary and nearby village roads. There are few trees in buffer zone of 300 m from the proposed lease area and it shall not be cut down or have any impact due to the mining activities and project proponent ensures to carrying out activities like watering for preserving the green cover around 300 m from proposed project site.
34	A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific.	Mine closure plan is detailed in Chapter:4.
35	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.	Noted and agreed

36	The Public hearing advertisement shall be published in one major National daily and one most circulated vernacular daily.	Noted and agreed
37	The PP shall produce/display the EIA report, Executive summary and other related information with respect to public hearing in Tamil Language also.	The Draft EIA, Executive summary prepared in Tamil language and submitted to TNPCB.
38	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 Flora and Fauna Study will be carried out along with educating local School students by the Functional Area Experts in Ecology and Biodiversity
39	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.	Species are proposed to plant in the safety barrier as mentioned in the ToR appendix. Proposed species are given in the Chapter No 4
40	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 plantation activities carried out in the project site as per the ToR condition It is a fresh lease . Around 1210 trees are proposed to plant
41	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.	Disaster management Plan details in Chapter-7
42	A Risk Assessment and Management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.	A Risk Assessment and management Plan Chapter- 7
43	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 chapter- 10
44	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 anticipated due to this project. Details of CER and CSR are discussed under Chapter 8.
45	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 on the Study Area is anticipated and this project shall benefit the Socio-Economic Environment by ways of employment for 20 people directly and 50 people indirectly.
46	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 against the Project Proponent
47	Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall	Project benefit is given in the Chapter No.8

	clearly indicate environmental, social, economic, employment potential, etc.	
48	If any quarrying operations were carried out in the proposed quarrying site for which now the EC is sought, the Project Proponent shall furnish the detailed compliance to EC conditions given in the previous EC with the site photographs which shall duly be certified by MoEF & CC, Regional Office, Chennai (or) the concerned DEE/TNPCB.	It is a Fresh lease
49	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.	The EMP has been prepared for the 5 years and the details are given in the Chapter No. 10
50	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.	Noted and agreed
<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.	Cluster Management Committee has been constituted initially with 4 quarries.
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 information will be shared to the cluster management committee during the monthly meeting.
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 Chapter No.2.
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.	The risk management plan and disaster management plan will be followed as per the EIA report.
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.	Environmental policy is described in the EIA report Chapter No. 6 and the same will be followed.
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.	Proper action plan regarding the restoration will be followed by the committee.
8	The committee shall furnish the Emergency Management plan within the cluster.	The committee will submit the emergency management plan to the respective authority in the stipulated time period.
9	The committee shall deliberate on the health of the workers/staff involved in the mining as well as the health of the public.	The information on the health of the workers and the local people will be updated periodically.
10	The committee shall furnish an action plan to achieve sustainable development goals with reference to water, sanitation & safety.	A proper action plan with reference to water, sanitation & safety will be devised and submitted by the committee to the respective authority.

11	The committee shall furnish the fire safety and evacuation plan in the case of fire accidents.	The fire safety and evacuation plan will be carried out by as per the respective quarry mines managers.
<b><u>Impact study of mining</u></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.	Details of Soil health is given in Chapter No 3 and biodiversity is given in Chapter No 3. The project will not cause any significant changes in the climate Climatic changes and GHG are described in Chapter No 4. Details of water contamination and impact on aquatic ecosystem is given in Chapter No 4. Hydrothermal/ Geothermal effects due to destruction in the environment, Bio geochemical process and sediment geo chemistry given in the Chapter No 7.
<b><u>Agriculture &amp; Agro-Biodiversity</u></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.	The vegetation details have been provided in chapter III. There is no schedule I species of animals observed within study area as per Wildlife Protection Act, 1972 and no species falls in vulnerable, endangered or threatened category as per IUCN. There is no endangered red list species found in the study area.
15	Details of type of vegetations including no. of trees & shrubs within the proposed mining area and. If so, transplantation of such vegetations all along the boundary of the proposed mining area shall committed mentioned in EMP.	The vegetation details have been provided in chapter III. 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
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.	Details are discussed in Chapter No.3
17	Action should specifically suggest for sustainable management of the area and restoration of ecosystem for flow of goods and services.	The Eco System of the area will be retained during the mining operation by the way of planting trees in the boundary barrier and un utilized areas. After completion of mining operation, the quarried-out pit will be facilitated to collect the rainwater to pit act as temporary reservoir
18	The project proponent shall study and furnish the impact of project on plantations in adjoining patta lands, Horticulture, Agriculture and livestock.	The project area is bounded by Existing quarries on the South side and North side barren land. Budgetary allocation given in the Chapter No. 10.

<b>Forests</b>		
19	The project proponent shall detailed study on impact of mining on Reserve forests free ranging wildlife.	There is no Reserve Forest within 1km radius from the project area. The mining operation will not cause any significant impact to the Reserve Forest and Wild life Sanctuaries
20	The Environmental Impact Assessment should study impact on forest, vegetation, endemic, vulnerable and endangered indigenous flora and fauna	There is no forest/wildlife within 10km radius, chapter 3 details of Ecology and Biodiversity, and 4 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.	Details are discussed in the Chapter No.3
22	The Environmental Impact Assessment should study impact on protected areas, Reserve Forests, National Parks, Corridors and Wildlife pathways, near project site.	Anticipated Environment Impact and Mitigation measures are detailed in Chapter No.4
<b><u>Water Environment</u></b>		
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, onds 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.	There are 7 open wells and 6 bore wells within the radius of 1km from the project area, Hydrogeological study has been conducted by the resistivity method
24	Erosion Control measures.	Details discussed in the chapter No.4
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.	Details in Chapter 3
26	The project proponent shall study impact on fish habitats and the food WEB/ food chain in the water body and Reservoir.	Food webs describe who eats whom in an ecological community. Made of interconnected food chains, food webs help us understand how changes to ecosystems — say, removing a top predator or adding nutrients — affect many different species, both directly and indirectly. Whereas in this proposed project is for quarrying of Rough Stone and Gravel and is on a hard batholith formation where no diversion of any water bodies is proposed of there is no intersection of ground water table anticipated.
27	The project proponent shall study and furnish the details on potential fragmentation impact on natural environment, by the activities.	Details are given in the Chapter No 4.
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.	Details in Chapter 4 impact of bio diversity.
29	The Terms of Reference should specifically study impact on soil health, soil erosion, the soil physical. chemical components and microbial components.	Details of impact on soil environment is detailed in Chapter No.4
30	The Environmental Impact Assessment should study on wetlands, water bodies, rivers streams, lakes and farmer sites.	Melkondai Reserve Forest – 10.64 km SW There is, National Parks, Eco sensitive areas, Wild life sanctuaries within the radius of 10km. An ecological survey of the study area was conducted particularly with reference to the listing of species and assessment of the existing



		baseline ecological (terrestrial) condition in the study area. Ecological Environment is discussed under Chapter 3
<b><u>Energy</u></b>		
31	The measures taken to control Noise, Air, Water, Dust Control and steps adopted to efficiently utilise the Energy shall be furnished.	Detailed discussed in chapter 4
<b><u>Climate Change</u></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.	<p>A greenhouse gas (GHG) is a gas that absorbs and emits radiant energy within the thermal infrared range, causing the greenhouse effect. The primary greenhouse gases in Earth's atmosphere are carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), and ozone (O<sub>3</sub>)</p> <p>Carbon dioxide (CO<sub>2</sub>): Carbon dioxide enters the atmosphere through burning fossil fuels (coal, natural gas, and oil), solid waste, trees and other biological materials. Carbon dioxide is removed from the atmosphere (or "sequestered") when it is absorbed by plants as part of the biological carbon cycle.</p> <p>Methane (CH<sub>4</sub>): Methane is emitted during the production and transport of coal, natural gas, and oil. Methane emissions also result from livestock and other agricultural practices, land use and by the decay of organic waste in municipal solid waste landfills.</p> <p>Nitrous oxide (N<sub>2</sub>O): Nitrous oxide is emitted during agricultural, land use, and industrial activities; combustion of fossil fuels and solid waste; as well as during treatment of wastewater</p>
33	The Environmental impact Assessment should study impact on climate change, temperature rise, pollution and above soil & below soil carbon stock.	Detailed discussed in chapter 3.
<b><u>Mine Closure Plan</u></b>		
34	Detailed Mine Closure Plan covering the entire mine lease period as per precise area communication order issued.	Progressive Mine closure plan has been prepared considering the entire lease period in the mining plan and the same has been approved.
<b><u>EMP</u></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.	Detailed discussed in chapter 10.
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.	Detailed discussed in chapter 10.
<b><u>Risk Assessment</u></b>		
37	To furnish risk assessment and management plan including anticipated vulnerabilities during operational and post operational phases of Mining.	A Risk Assessment and management Plan Chapter- 7

<b><u>Disaster Management Plan</u></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/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.	Disaster management Plan details in Chapter-7
<b>Others</b>		
39	The project proponent shall furnish VAC) 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.	Letter obtained from the VAO regarding surface features within 300m radius and given in slide no.61.
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 issues raised during public hearing is addressed in chapter No.7
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.	Plastic waste management in the project area detailed in Chapter No.7.
<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.	<b>Not applicable.</b> 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 applied land for quarrying is a Patta Land. Document is enclosed along with Approved Mining Plan as Annexure Volume 1.
3	All documents including approved mine plan, EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee.	<b>Noted &amp; agreed.</b>
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).	Map showing – Project area is with adjacent quarries details is enclosed in Figure No1.1 Project area boundary coordinates superimposed on Toposheet – Figure No. 1.1A Toposheet of the project area covering 10km radius – Figure No. 1.2 Geology map of the project area covering 10km radius - Figure No. 2.11
5	Information should be provided in Survey of India Toposheet in 1:50,000 scale indicating geological map of the area, geomorphology of land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics.	<b>Map showing –</b> Geology map of the project area covering 10km radius - Figure No. 2.11 Geomorphological features are incorporated in the Toposheet map covering 10km radius around the project area Figure No. 2.12
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;	The applied area was inspected by the officers of Department of Geology along with revenue

	land diversion for mining should have approval from State land use board or the concerned authority.	officials and found that the land is fit for quarrying under the policy of State Government.
7	It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating process/procedures to bring into focus any infringement/deviation/ violation of the environmental or forest norms/conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large, may also be detailed in the EIA Report.	The proponent has framed their Environmental Policy and the same is discussed in the Chapter No 10.1.
8	Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided.	It is an opencast quarrying operation proposed to operate in Mechanized 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.
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.	<b>Noted &amp; agreed.</b> The study area considered for this study is 10 km radius and all data contained in the EIA report such as waste generation etc., is for the Life of the Mine / lease period.
10	Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.	Land use and land cover of the study area is discussed in Chapter No. 3. Land use plan of the project area showing pre-operational, operational and post-operational phases are discussed in Chapter No. 2, Table No 2.3
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	<b>Not Applicable.</b> There is no waste anticipated during this quarry operation. The entire quarried out rough stone will be transported to the needy customers. No Dumps is proposed outside the lease area.
12	A Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.	<b>Not Applicable.</b> There is no Forest Land involved in the proposed project area. The proposed project area is a Patta land. Approved Mining Plan is enclosed as Annexure Volume 1.

13	Status of forestry clearance for the broken up area and virgin forestland involved in the Project including deposition of net present value (NPV) and compensatory afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.	<b>Not Applicable.</b> The proposed project area does not involve any Forest Land.
14	Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.	<b>Not Applicable.</b> The project doesn't attract Recognition of Forest Rights Act, 2006.
15	The vegetation in the RF / PF areas in the study area, with necessary details, should be given.	No Reserve Forest within the Study Area.
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.	<b>Not Applicable.</b> There are No National Parks, Biosphere Reserves, Wildlife Corridors, and Tiger/Elephant Reserves within 10 km Radius from the periphery of the project area.
17	Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves/(existing as well as proposed), if any, within 10 KM of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished	<b>Not Applicable.</b> There are no National Parks, Biosphere Reserves, Wildlife Corridors, and Tiger/Elephant Reserves within 10 km Radius from the periphery of the project area.
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.	Detailed biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] was carried out and discussed under Chapter No. 3. 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.
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.	<b>Not Applicable.</b> 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).	<b>Not Applicable.</b> The project doesn't attract The C. R. Z. Notification, 2018.

21	R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need based sample survey, family-wise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be clearly brought out whether the village(s) located in the mine lease area will be shifted or not. The issues relating to shifting of village(s) including their R&R and socio-economic aspects should be discussed in the Report.	<p><b>Not Applicable.</b></p> <p>There are no approved habitations within a radius of 300 meters.</p> <p>Therefore, R&amp;R Plan / Compensation details for the Project Affected People (PAP) is not anticipated and Not Applicable for this project.</p>
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.	<p>Baseline Data were collected for Summer Season (Dec 2023-Feb 2024) as per CPCB Notification and MoEF &amp; CC Guidelines. Details in Chapter No. 3.</p>
23	Air quality modelling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of mineral. The details of the model used and input parameters used for modelling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.	<p>Air Quality Modelling for prediction of incremental GLC's of pollutant was carried out using AERMOD Model. Details in Chapter No. 4,</p>
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.	<p>Total Water Requirement for this project is given in the chapter No 2, Table No 2.13.</p>
25	Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.	<p>Water for dust suppression, greenbelt development and domestic use will be obtained from accumulated rainwater/seepage water in mine pits.</p> <p>Drinking water will be sourced from the approved water vendors, No 2, Table No 2.13.</p>
26	Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.	<p>The rain water collected in the pits after spell of rain will be used for greenbelt development and dust suppression.</p>
27	Impact of the Project on the water quality, both surface and groundwater, should be assessed and	<p>Impact Studies and Mitigation Measures of Water Quality discussed in Chapter No. 4.</p>

	necessary safeguard measures, if any required, should be provided.	
28	Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. The Report inter-alia, shall include details of the aquifers present and impact of mining activities on these aquifers. Necessary permission from Central Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished.	<p>The ground water table is at 56m below ground level.</p> <p>The ultimate depth of this projects is 32m from the general ground profile.</p> <p>Maximum depth is proposed in this EIA project is 32m.</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 hydrology should be brought out.	<p>Highest elevation of the project area is 82m AMSL</p> <p>Ultimate depth of the mine is 32m AMSL</p> <p>Water level in the area is 56m BGL</p>
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.	Progressive greenbelt development plan has been prepared and discussed along with Recommended Species details are given in the Chapter 4, Table No.4.9
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.	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 much significant impact due to the proposed transportation from the project area. Details in Chapter 2.
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.	Infrastructure & other facilities will be provided to the Mine Workers after the grant of quarry lease and the same has been discussed in the Chapter No.2. .
33	Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.	Discussed in chapter No 2.
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.	Details in Chapter 10.
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	Details in Chapter 10.

	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.	Details in Chapter 4,
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.	Environment Management Plan Chapter 10.
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.	The outcome of public hearing will be updated in the final EIA/EMP report
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.	No litigation is pending in any court against this 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.	The proposed capital cost for Environmental Monitoring Programme is Rs 3,80,000/- and the recurring cost is Rs 76,000/- per annum. Details in Chapter 6 .
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.	Details in Chapter 10.
42	A Disaster management Plan shall be prepared and included in the EIA/EMP Report.	Details in Chapter 7.
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.	Details in Chapter.8.
44	<b>Besides the above, the below mentioned general points are also to be followed: -</b>	
A	Executive Summary of the EIA/EMP Report	Encloses as separate volume
B	All documents to be properly referenced with index and continuous page numbering.	All the documents are 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 are given properly.
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	Baseline monitoring reports are enclosed with mining plan
E	Where the documents provided are in a language other than English, an English translation should be provided.	Not Applicable.
F	The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted.	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,	Instructions issued by MoEF & CC O.M. No. J-11013/41/2006-IA. II (I) Dated: 4th August, 2009 are followed.

	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	Noted & agreed.
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.	Not applicable.
J	The EIA report should also include (i) surface plan of the area indicating contours of main topographic features, drainage and mining area, (ii) geological maps and sections and (iii) sections of the mine pit and external dumps, if any, clearly showing the land features of the adjoining area.	Surface Plan – Figure No. 2.2. Geological Plan – Figure No 2.9. Working Plan – Figure No 2.9. Closure Plan – Figure No.2.10.



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## 1.INTRODUCTION

### 1.0 PREAMBLE

#### Project History: -

The project proponent Thiru A.Veeraragavan applied for Rough Stone and Gravel Quarry over an extent of 2.42.63 Ha in S.F.No 75/1,75/4,75/5,75/6 & 76/3B2, Eraiyur Village, Vanur Taluk, Viluppuram District.

- Proponent applied for Rough stone and Gravel quarry lease on 15.06.2022
- Precise area communication letter was issued by the District Collector vide RC. No. A/G&M/253/2022 Dated 17.07.2023
- The Mining plan has been prepared by the Qualified person and got approval vide Letter RC. No. A/G&M/253/2022 Dated 03.08.2023
- The Mining plan has been approved for the quantity of 1,56,265m<sup>3</sup> of Rough stone, 31,334m<sup>3</sup> Gravel up to the depth of 32m bgl for the period of five years.

As per the EIA Notification, 2006 and subsequent amendments and OM The proposal falls in the B1 Category (Cluster quarries - 2 proposal and 2 Existing quarries forming Cluster Category {Total Extent of the Cluster is 12.81.63 Ha}- Cluster area calculated as per MoEF & CC Notification S.O. 2269(E) Dated 1<sup>st</sup> July 2016).

- Proponent applied for Terms of Reference vide Proposal No. SIA/TN/MIN/446038/2023 Dated 27.09.2023 and the ToR Was Granted vide Letter No.SEIAA-TN/F.No.10444/ToR-1626/2023 Dated: 12.12.2023

Based on the ToR Baseline Monitoring study has been carried out for one season ie., **Dec 2023 to Feb 2024** and this EIA and EMP report is prepared for considering cumulative impacts arising out of these projects, the Cumulative Environmental Impact Assessment study is undertaken, which is followed by preparation of a detailed Environmental Management Plan (EMP) to minimize those adverse impacts.

Environmental Impact Assessment (EIA) is the management tool to ensure the sustainable development and it is a process, used to identify the environmental, social and economic impacts of a project prior to decision-making. It is a decision-making tool, which guides the decision makers in taking appropriate decisions for any project. EIA systematically examines both beneficial and adverse consequences of the project and ensures that these impacts are taken into account during the project designing. It also reduces conflicts by promoting community participation, information, decision makers, and helps in developing the base for environmentally sound project.

### 1.1 PURPOSE OF THE REPORT

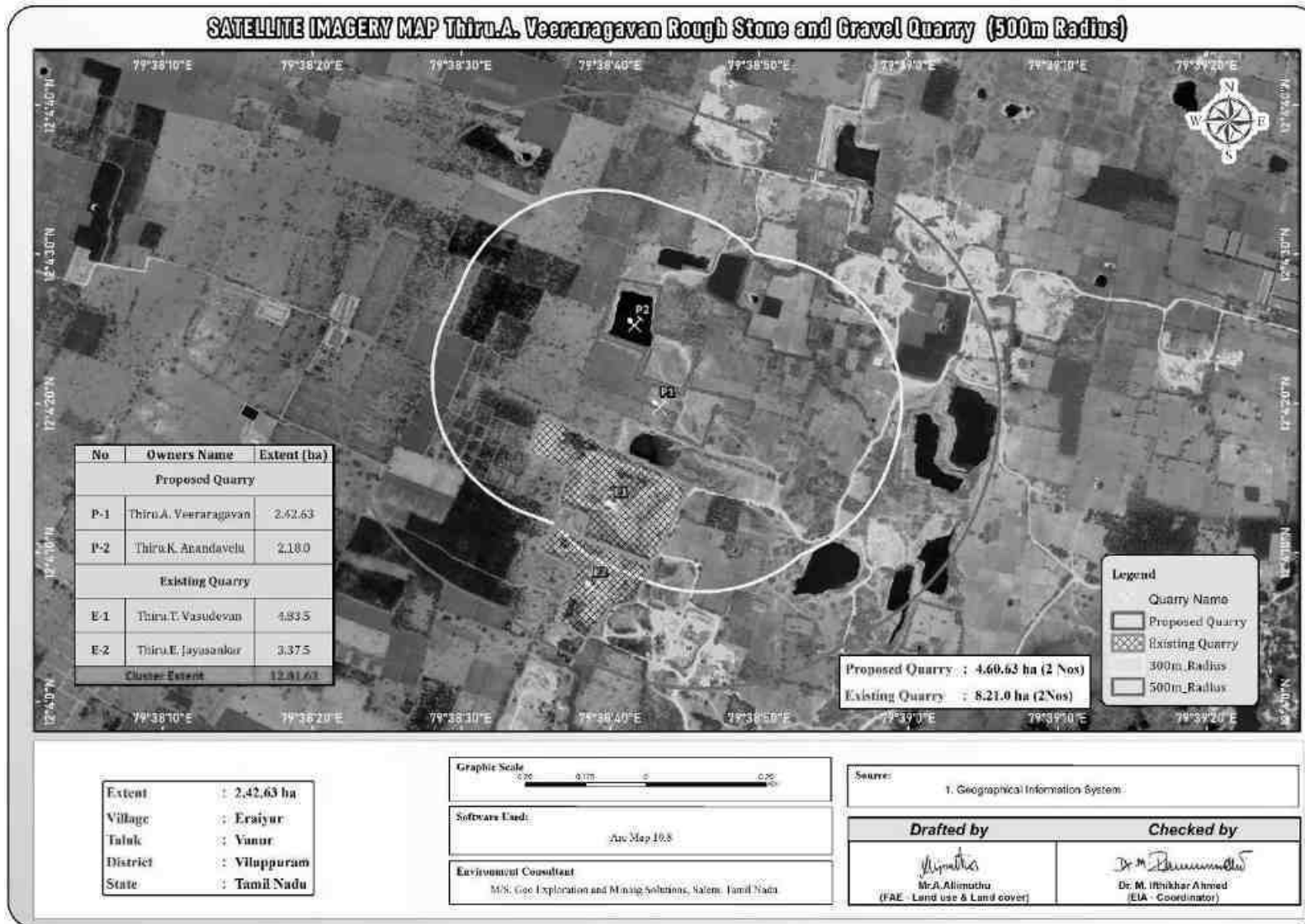
The Ministry of Environment and Forests, Govt. of India, through its EIA notification S.O. 1533(E) of 14<sup>th</sup> September 2006 and its subsequent amendments as per Gazette Notification S.O. 1889 of 20<sup>th</sup> April 2022, Mining Projects are classified under two categories i.e. A (> 250 Ha) and B ( $\leq$  250 Ha), and Schematic Presentation of Requirements on Environmental Clearance of Minor Minerals including cluster situation in Appendix–XI.

Now, as per 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 clarified the requirement for EIA, EMP and therefore, Public Consultation for all areas from 5 to 25 ha falling in Category B1 and appraised by SEAC/ SEIAA as well as for cluster situation.

The proposed projects are categorized under category “B1” Activity 1(a) (mining lease area in cluster situation) and will be considered at SEIAA – TN after conducting Public Hearing and Submission of EIA/EMP Report for Grant of Environmental Clearance.

**“Draft EIA report prepared on the basis of ToR Issued for carrying out public hearing for the grant of Environmental Clearance from SEIAA, Tamil Nadu”**

FIGURE 1.1 SATELLITE IMAGERY CLUSTER QUARRIES



## 1.2 IDENTIFICATION OF PROJECT AND PROJECT PROPONENTS

### 1.2.1 Identification of Project Proponent

**TABLE 1.1: DETAILS OF PROJECT PROPONENT**

<b>Name of the Project Proponent</b>	Thiru. A. Veeraragavan Rough Stone and Gravel Quarry
<b>Address</b>	S/o. Anandavelu, No. 225, Mettu Street, Eraiyur Village, Vanur Taluk, Viluppuram District – 604 304.
<b>Mobile</b>	+91 63838 07635
<b>Email</b>	ganesanappadurai04@gmail.com
<b>Status</b>	Individual

### 1.2.2 Identification of Project

**TABLE 1.2: SALIENT FEATURES OF THE PROPOSED PROJECT**

Name of the Project	Thiru. A. Veeraragavan Rough Stone and Gravel Quarry	
S.F. No.	75/1, 75/4, 75/5, 75/6 and 76/3B2	
Extent	2.42.63 ha	
Village, Taluk and District	Eraiyur Village, Vanur Taluk, Viluppuram District.	
Land Type	It is a patta lands, registered in the name of 1. Thiru A.Ganesan, 2.Thriu.D.Radhakrishnan vide patta Nos.5558,5511 & 5506. The applicant has obtained consent from the pattadhars for the period of fifteen years from 06.06.2022 to 05.06.2037.	
Toposheet No	57 P/12	
Latitude between	12° 04' 17.1389"N to 12° 04' 24.5551"N	
Longitude between	79° 38' 37.9720"E to 79° 38' 49.6101"E	
Elevation of the area	82m AMSL	
Lease period	10 Years	
Mining Plan period	5 years	
Proposed Depth of Mining	32m bgl (2m Gravel + 30m Rough stone)	
Geological Resources	Rough Stone in m <sup>3</sup>	Gravel m <sup>3</sup>
	7,27,890	48,526
Mineable Reserves	1,56,265	31,334
Year wise Production	1,56,265	31,334
Peak Production	35,195	12,334
Ultimate Pit Dimension	311 m (L) x 89m (W) x 32m(D) bgl	
Water Level in the region	56 m bgl	
Method of Mining	Opencast Mechanized Mining Method involving drilling and Controlled blasting using Slurry Explosives	
Topography	The lease applied area is flat terrain. The area has gentle sloping towards North eastern side and altitude of the area is 82m above from Mean Sea level. The area is covered by 2m thickness of Gravel and followed by Massive Charnockite which is clearly inferred from the surface outcrops & nearby existing quarry pit.	
Machinery proposed	Jack Hammer	4 Nos
	Compressor	1 No
	Excavator with Bucket and Rock Breaker	1 No
	Tippers	2 Nos
Blasting Method	Controlled Blasting Method by shot hole drilling and small dia of 25mm slurry explosive are proposed to be used for shattering and heaving effect for removal and winning of Rough Stone. No deep hole drilling is proposed.	

Proposed Manpower Deployment	20 Nos	
Project Cost	Rs. 62,36,000/-	
EMP Cost	Rs. 3,80,000/-	
Total Project cost	Rs. 66,16,000/-	
CER Cost	Rs. 5,00,000/-	
Nearby Water Bodies	Odai	140m East
	Tank	270m NE
	Tank	750m SE
	Konnamangalam Lake	1.8km west
	Tank	2km NW
	Sangarabarani River	4.8km South
	Veedur Reservoir	5.5km SW
Greenbelt Development Plan	Proposed to plant 1210 Nos of trees considering 500 Nos of trees/ Ha criteria The plantation will be developed around the project site and nearby village roads	
Proposed Water Requirement	1.5 KLD	
Nearest Habitation	1.1km – South East	
Nearest Reserve Forest	Melkondai – 10.64 km – South West (Source - TNGIS)	
Nearest Wild Life Sanctuary	Oussudu Lake Birds Sanctuary -15km-South East	

Source: Approved Mining & Land Documents.

### 1.3 BRIEF DESCRIPTION OF THE PROJECT

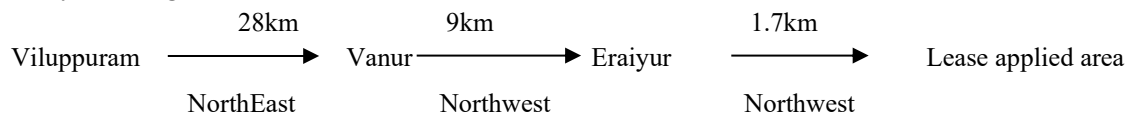
#### 1.3.1 Nature and Size of the Project

The quarrying operation is proposed to be carried out by Opencast Mechanized Mining method with 5.0m bench height and 5.0m bench width by deploying Jack Hammer Drilling & Slurry Explosive during blasting. Hydraulic Excavator and tippers are used for Loading and transportation. Rock Breakers are deployed to avoid secondary blasting.

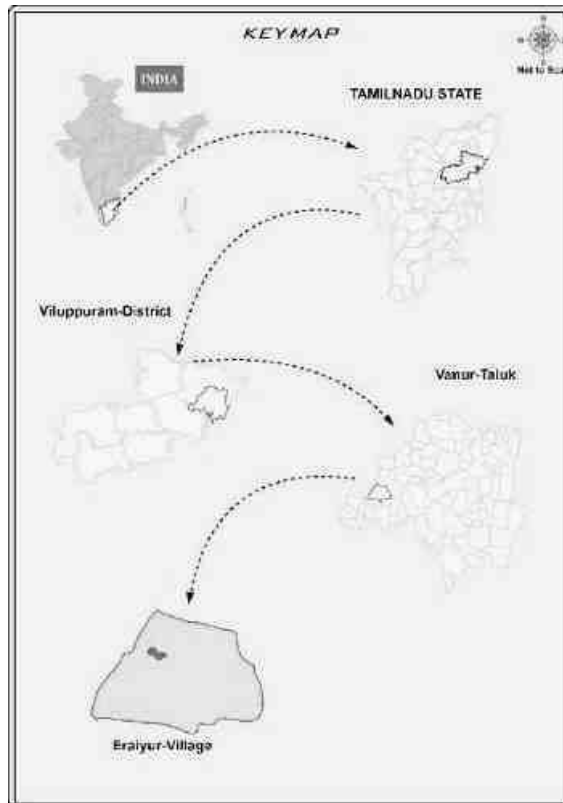
The peak production of Rough stone is 35,195m<sup>3</sup> maximum in a year (117m<sup>3</sup> per day/ 10 Tippers per day considering 12m<sup>3</sup> per load). The depth of the mining is 32m bgl.

#### 1.3.2 Location of the Project

- The project site is located in Eraiyur Village, Vanur Taluk and Viluppuram District.
- 23km Northeast of Viluppuram town, 13km Northwest of vanur and 1.7km Northwest side of Eraiyur Village.

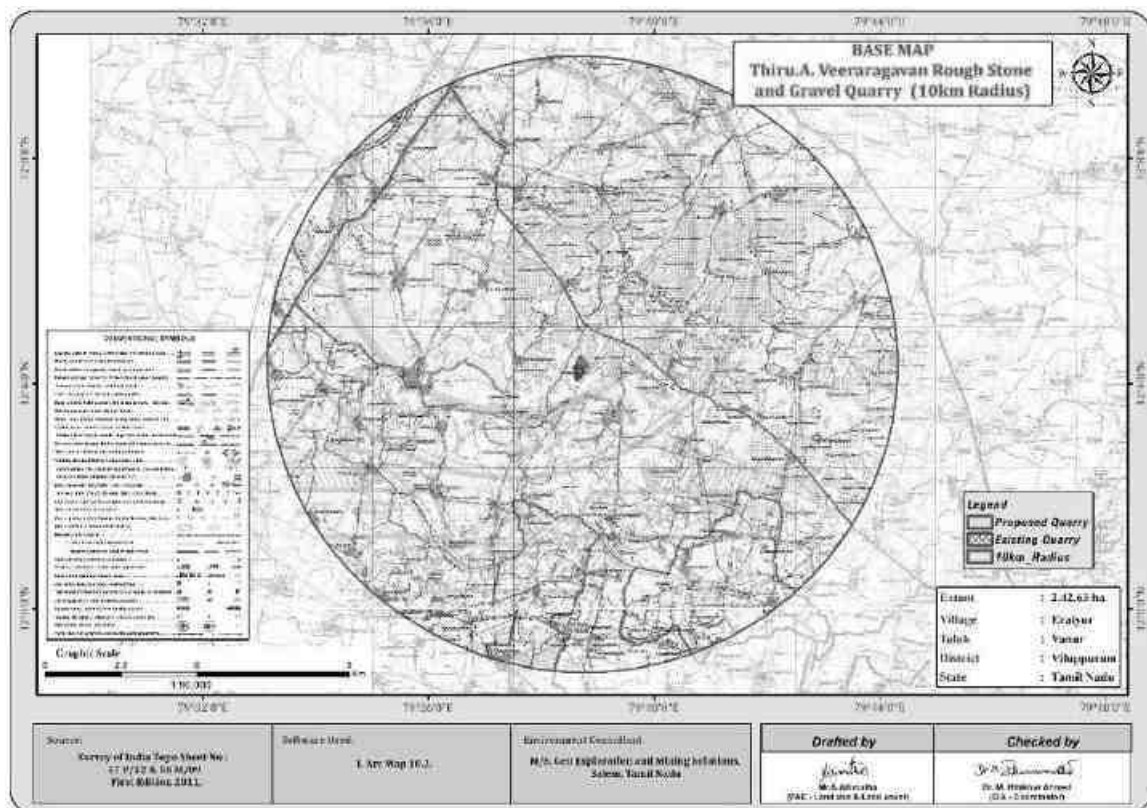


**FIGURE 1.2 LOCATION MAP OF THE PROJECT SITE**

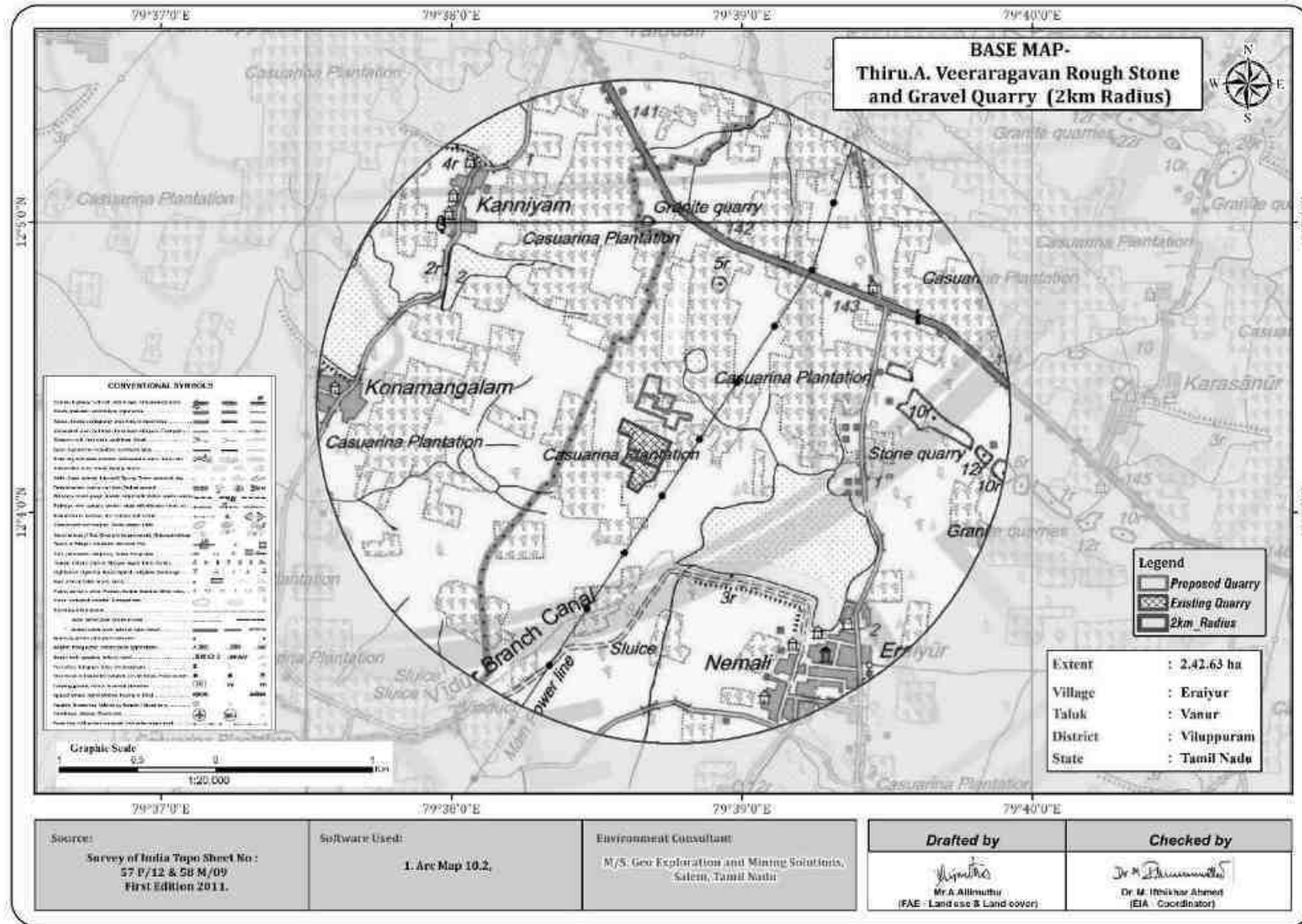


Source: Survey of India Toposheet 58-A/15 & 16

**FIGURE 1.3: TOPOSHEET MAP OF THE STUDY AREA 10 KM RADIUS**



**FIGURE 1.4: TOPOSHEET MAP OF THE STUDY AREA 2KM RADIUS**



## 1.4 ENVIRONMENTAL CLEARANCE

The Environmental Clearance process for the project will comprise of four stages. These stages in sequential order are given below: -

- Screening,
- Scoping
- Public consultation &
- Appraisal

### SCREENING –

- The proponent applied for Rough Stone and Gravel Quarry Lease Dated: 15.06.2022.
- Precise Area Communication Letter was issued by the District Collector, Viluppuram vide RC.No. A/G&M/253/2022 Dated 17.07.2023
- The Mining Plan was prepared by Recognized Qualified Person and approved by Assistant Director, Geology and Mining, Viluppuram District, vide RC.No. A/G&M/253/2022 Dated 03.08.2023
- The proposed project falls under “B1” Category as per 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
- Proponent applied for ToR for Environmental Clearance vide online Proposal No. SIA/TN/MIN/446038/2023. dated: 27.09.2023.

### SCOPING:

- The proposal was placed in 423<sup>th</sup> SEAC meeting held on 15.11.2023 and the committee recommended for issue of ToR.
- The proposal was considered in 678<sup>th</sup> SEIAA meeting held on 11.12.2023 & 12.12.2023 and issued ToR vide Lr No. SEIAA-TN/F.No.10444/SEAC/ToR-1626/2023 Dated: 12.12.2023

### 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.

### APPRAISAL –

Appraisal is the detailed scrutiny by the State Expert Appraisal Committee (SEAC) of the application and other documents like the final EIA & EMP Report, outcome of the Public Consultations including Public Hearing Proceedings, submitted by the proponent to the regulatory authority concerned for grant of environmental clearance.

## 1.5 TERMS OF REFERENCE (ToR)

The ToR was issued by the SEIAA vide Lr No. SEIAA-TN/F.No.10444/SEAC/ToR-1626/2023 Dated: 12.12.2023. The Details of the ToR Compliance is given in the Page No.

## 1.6 POST ENVIRONMENT CLEARANCE MONITORING

The proponent shall submit a half-yearly compliance report in respect of stipulated Environmental Clearance terms and conditions to MoEF & CC Regional Office & SEIAA after grant of EC on 1<sup>st</sup> June and 1<sup>st</sup> December of each calendar year as per MoEF & CC Notification S.O. 5845 (E) Dated: 26.11.2018.

## 1.7 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.

## 1.8 THE SCOPE OF THE STUDY

The main scope of the EIA study is to quantify the cumulative impact in the study area due to cluster quarries and formulate the effective mitigation measures. 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, Dust generation etc., have been discussed in this report. The baseline monitoring study has been carried out during the Winter season (Dec 2023 to Feb 2024) for various environmental components so as 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.

**TABLE 1.3: ENVIRONMENT ATTRIBUTES**

Sl.No.	Attributes	Parameters	Source and Frequency
1	Ambient Air Quality	PM <sub>10</sub> , PM <sub>2.5</sub> , SO <sub>2</sub> , NO <sub>2</sub>	Continuous 24-hourly samples twice a week for three months at 7 locations (1 Core & 6 Buffer)
2	Meteorology	Wind speed and direction, temperature, relative humidity and rainfall	Near project site continuous for three months with hourly recording and from secondary sources of IMD station
3	Water quality	Physical, Chemical and Bacteriological parameters	Grab samples were collected at 6 locations – 2 Surface water and 4 Ground water samples; once during study period.
4	Ecology	Existing terrestrial and aquatic flora and fauna within 10 km radius circle.	Limited primary survey and secondary data was collected from the Forest department.
5	Noise levels	Noise levels in dB(A)	7 locations – data monitored once for 24 hours during EIA study
6	Soil Characteristics	Physical and Chemical Parameters	Once at 6 locations during study period
7	Land use	Existing land use for different categories	Based on Survey of India topographical sheet and satellite imagery and primary survey.
8	Socio-Economic Aspects	Socio-economic and demographic characteristics, worker characteristics	Based on primary survey and secondary sources data like census of India 2011.



9	Hydrology	Drainage pattern of the area, nature of streams, aquifer characteristics, recharge and discharge areas	Based on data collected from secondary sources as well as hydro-geology study report prepared.
10	Risk assessment and Disaster Management Plan	Identify areas where disaster can occur by fires and explosions and release of toxic substances	Based on the findings of Risk analysis done for the risk associated with mining.

Source: Field Monitoring Data

### 1.8.1 Regulatory Compliance & Applicable Laws/Regulations for all Proposed Quarries

- Application for Quarrying Lease as per Tamil Nadu Minor Mineral Concession Rules, 1959.
- Obtained Precise Area Communication Letter as per Tamil Nadu Minor Mineral Concession Rules, 1959 for Preparation of Mining Plan and obtaining Environmental Clearance.
- The Mining Plan has been approved under Rule 41 & 42 as amended of Tamil Nadu Minor Mineral Concession Rules, 1959.
- ToR vide Lr No. SEIAA-TN/F.No.10444/ToR-1626/2023 Dated: 12.12.2023

\*\*\*\*\*

## 2. PROJECT DESCRIPTION

### 2.0 GENERAL

The Proposed Rough Stone Quarries requires Environmental Clearance. There are 2 proposed and 2 existing quarries forming a cluster; calculated as per MoEF & CC Notification S.O. 2269(E) Dated 1<sup>st</sup> July 2016 and the total extent of cluster is 12.81.63 ha.

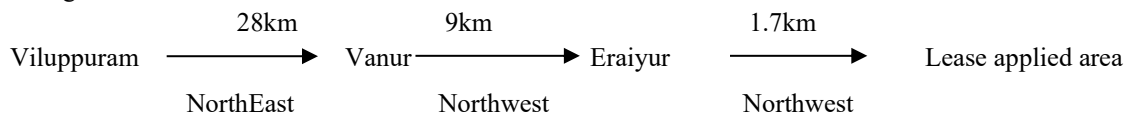
As the extent of cluster are more than 5 ha, the proposal falls under B1 Category as per the Order Dated: 04.09.2018 & 13.09.2018 passed by Hon'ble National Green Tribunal, New Delhi in O.A. No. 173 of 2018 & O.A. No, 186 of 2016 and MoEF & CC Office Memorandum F. No. L-11011/175/2018-IA-II (M) Dated: 12.12.2018, and requirement for EIA, EMP and Public Consultation for obtaining Environmental Clearance.

### 2.1 DESCRIPTION OF THE PROJECT

The proposed project is site specific and there is no additional area required for this project. There is no effluent generation/discharge from this project. Method of mining is opencast mechanized method involving splitting of rock mass of considerable volume from the parent rock mass by jackhammer drilling and blasting, hydraulic excavators are used for loading the Rough Stone from pithead to the needy crushers and rock breakers to avoid secondary blasting.

### 2.2 LOCATION OF THE PROJECT

- 23km Northeast of Viluppuram town, 13km Northwest of vanur and 1.7km Northwest side of Eraiyur Village.



**TABLE 2.1: SITE CONNECTIVITY**

Nearest Roadway	NH - 132 – Viluppuram – Tindivanam-8.4 km -West SH – 136 – Dheevanur – Vanur-1.2km-North
Nearest Village	Eraiyur – 1.62m- SE
Nearest Town	Vanur – 13.0.0km-SE
Nearest Railway Station	Perani – 10.5km-NW
Nearest Airport	Chennai – 132.0km – NE
Seaport	Chennai – 132.0km – NE

Source: Survey of India Toposheet

**TABLE 2.2: CO-ORDINATES – PROJECT BOUNDARY**

Corner Nos.	Latitude	Longitude
1	12 <sup>0</sup> 04'17.1389" N	79 <sup>0</sup> 38'46.1753" E
2	12 <sup>0</sup> 04'18.0368" N	79 <sup>0</sup> 38'43.9187" E
3	12 <sup>0</sup> 04'19.2392" N	79 <sup>0</sup> 38'44.3965" E
4	12 <sup>0</sup> 04'20.0785" N	79 <sup>0</sup> 38'42.2649" E
5	12 <sup>0</sup> 04'20.1047" N	79 <sup>0</sup> 38'42.2744" E
6	12 <sup>0</sup> 04'21.7141" N	79 <sup>0</sup> 38'37.9720" E

7	12°04'22.7677" N	79°38'38.4930" E
8	12°04'24.5551" N	79°38'39.2586" E
9	12°04'23.9082" N	79°38'41.0337" E
10	12°04'23.4989" N	79°38'42.3312" E
11	12°04'21.6875" N	79°38'41.6447" E
12	12°04'21.3413" N	79°38'42.7286" E
13	12°04'20.5999" N	79°38'44.9039" E
14	12°04'21.0812" N	79°38'45.0728" E
15	12°04'21.0420" N	79°38'45.1991" E
16	12°04'20.0828" N	79°38'49.6101" E
17	12°04'19.7712" N	79°38'49.5523" E
18	12°04'18.9910" N	79°38'49.2552" E
19	12°04'19.5964" N	79°38'47.0029" E
<b>Datum: UTM-WGS84, Zone 43 North</b>		

Source: Approved Mining Plan

**FIGURE 2.1: TOPOGRAPHICAL VIEW OF PROJECT AREA**



project site Photographs



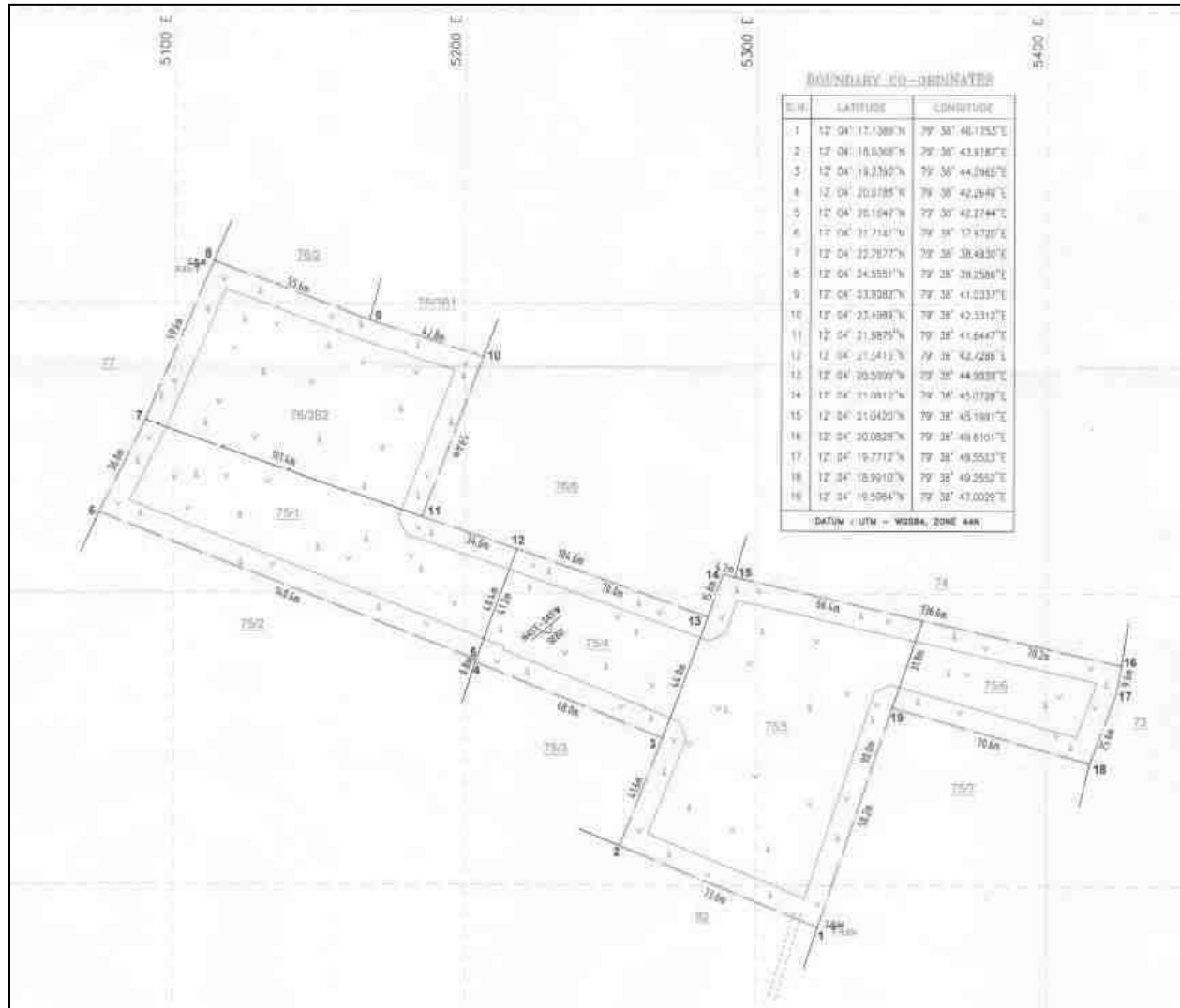
Fencing & Greenbelt at Project site

**FIGURE 2.2: GOOGLE IMAGE OF THE PROJECT AREA**

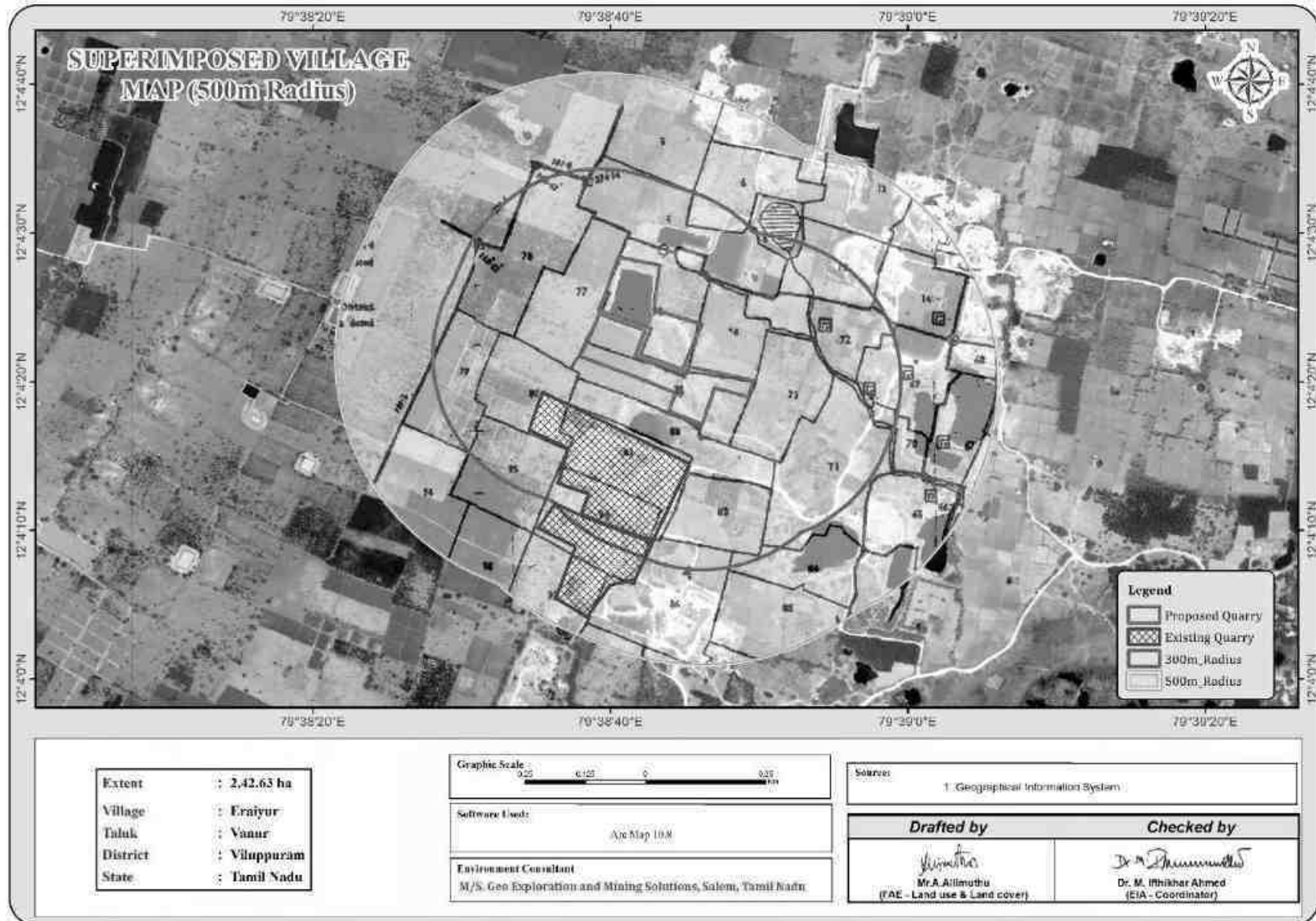


Source: Google Earth Imagery

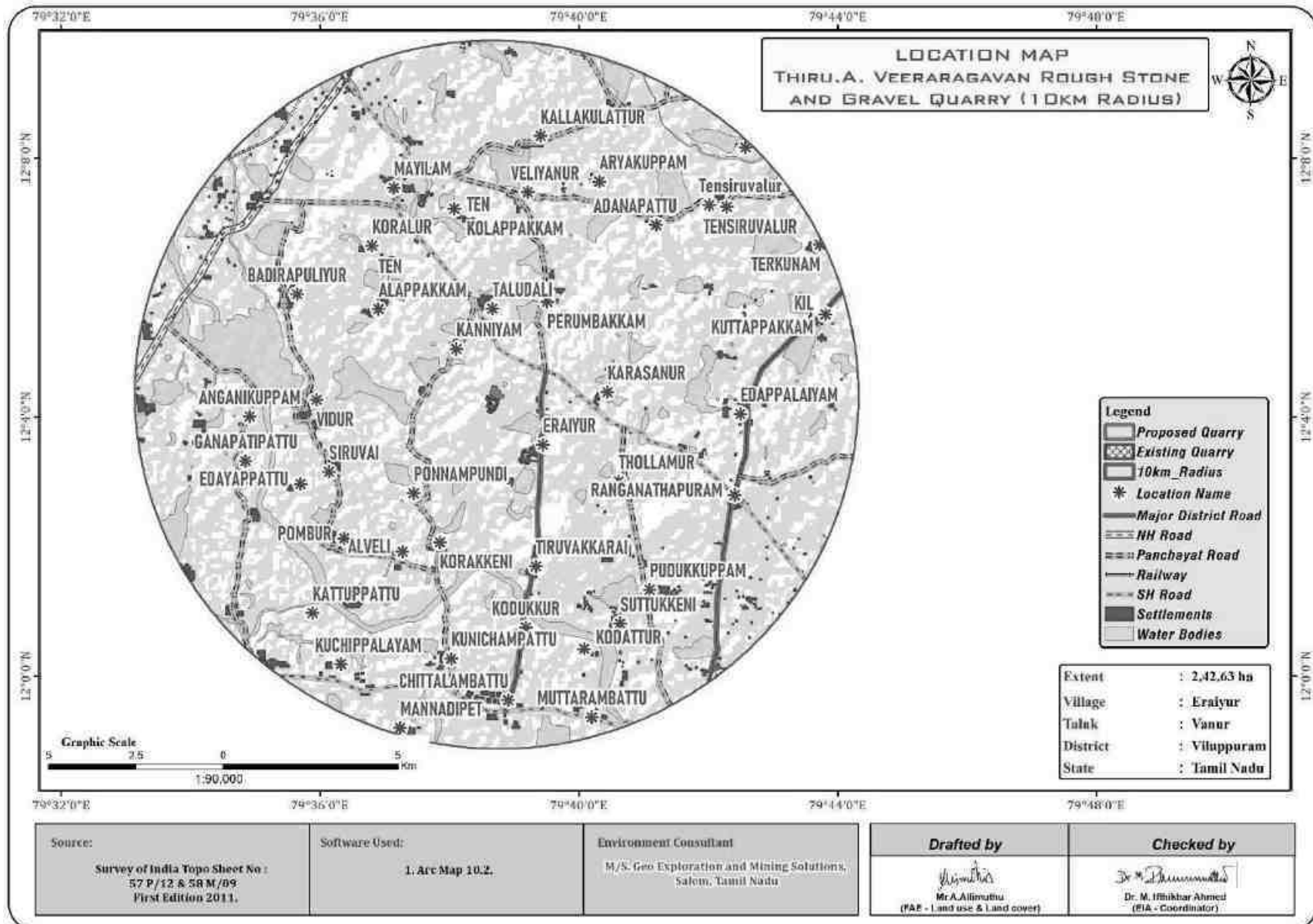
**FIGURE 2.3: QUARRY LEASE PLAN / SURFACE PLANN**



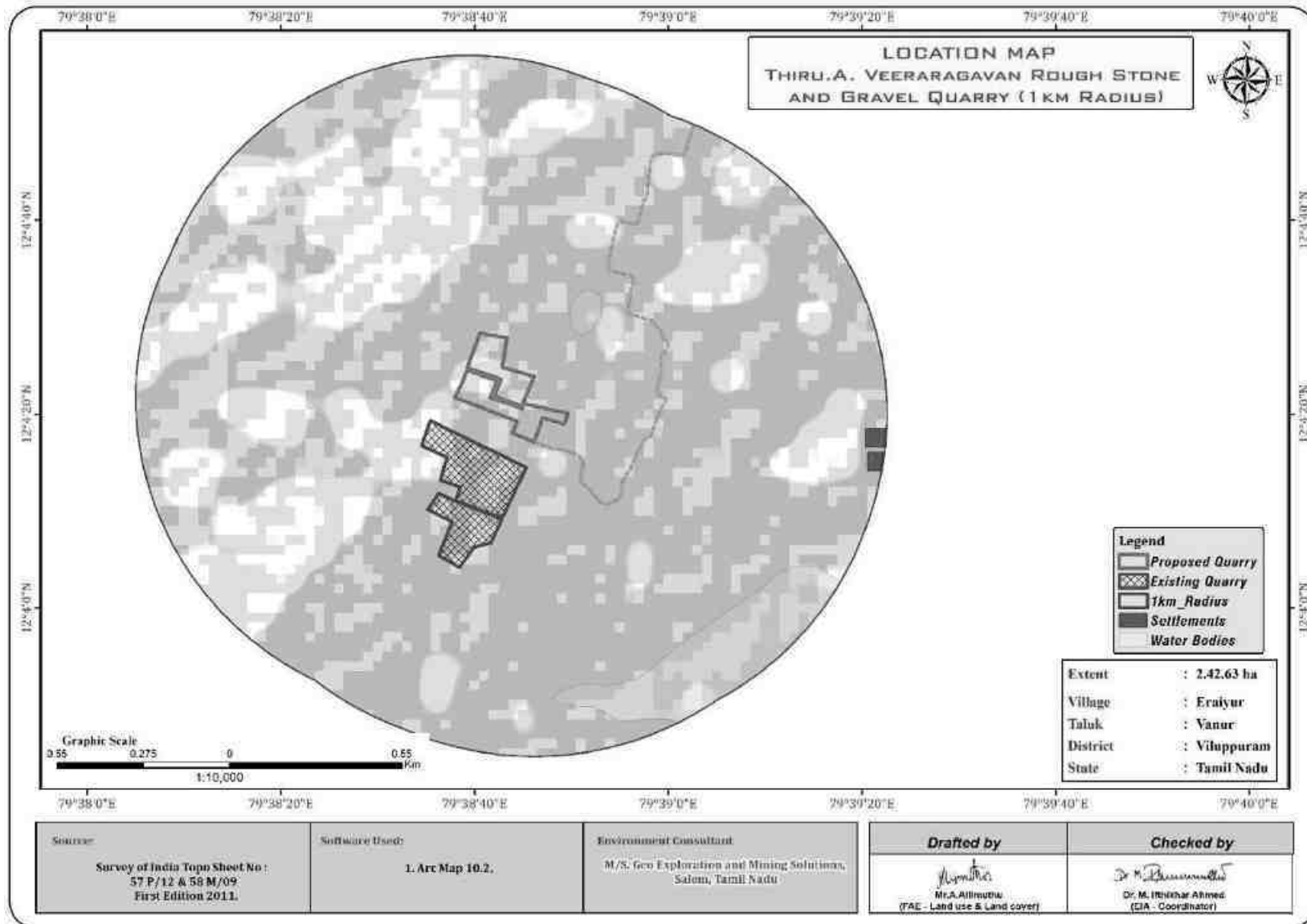
**FIGURE 2.4: VILLAGE MAP SUPERIMPOSED ON GOOGLE EARTH IMAGE**



**FIGURE 2.5: IMAGE SHOWING SURFACE FEATURES AROUND 10 KM RADIUS**



**FIGURE 2.6: IMAGE SHOWING SURFACE FEATURES AROUND 1 KM RADIUS**





### 2.2.1 Project Area

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

**TABLE 2.3: LAND USE PATTERN**

Description	Present area (Ha)	Area at the end of this quarrying period (Ha)
Area under quarrying	Nil	1.65.26
Infrastructure	Nil	0.01.0
Roads	Nil	0.03.0
Green Belt	Nil	0.71.47
Unutilized Area	2.42.63	0.01.90
<b>Grand Total</b>	<b>2.42.63</b>	<b>2.42.63</b>

Source: Approved Mining

### 2.2.2 Size or Magnitude of Operation

**TABLE 2.4: RESOURCES AND RESERVES**

PARTICULARS	DETAILS	
	Rough Stone in m <sup>3</sup>	Gravel in m <sup>3</sup>
Geological Resources	7,27,890	48,526
Mineable Reserves	1,56,265	31,334
Production for five-year plan period	1,56,265	31,334
Peak Production	35,195	12,334
Mining Plan Period / Lease Applied Period	5 Years	
Number of Working Days	300 Days	
Production per day	117	41
No of Lorry loads (12m <sup>3</sup> per load)	10	4
Total Depth of Mining	32m (2m Gravel +30m Rough stone) below ground level.	

Source: Approved mining plan.

## 2.3 GEOLOGY

### 2.3.1 Regional Geology

Villupuram District is underlain by crystalline metamorphic complex in the western parts of district and sedimentary tract in eastern side. A crystalline rock (63%) and covered by sediments (37%). On regional scale the Charnockite body N45° E-S45° W with dipping towards SE50°.

Regional stratigraphic sequence:

AGE	FORMATION
Recent	- Quaternary Formation (Gravel)
-----Unconformity-----	
Archaean	- Charnockite
	Peninsular Gneiss complex

- Charnockite Group represented by Charnockite, Pyroxene Granulite and Magnetite Quartzite
- Peninsular Gneissic Complex (II) comprising hornblende-biotite gneiss
- Peninsular Gneissic Complex (II) comprising hornblende-biotite gneiss
- Younger intrusive comprising, Nepheline-Syenite, Pink Granite, Pegmatite and Quartz veins and
- Younger intrusive comprising, Nepheline-Syenite, Pink Granite, Pegmatite and Quartz veins and
- Quaternary sediments of Kankar and soil

**Stratigraphy of the area –**

Age	Group	Lithology
Holocene		Block cotton soil/clay±gypsum
Cenozoic		Kankar/calc-tufa
Neoproterozoic	Acid intrusives	Quartz veins Pegmatite Pink Granite
	Sivamalai syenite Complex	Nepheline-syenite
	Chalk Hills (Basic Intrusives)	Pyroxenite/Dunite
Archaean – Palaeoproterozoic	Peninsular Gneissic Complex (II) PGC (II)	Pink Granite Gneiss Hornblende Biotite gneiss
Archaean	Charnockite Group	Charnockite (Unclassified) Pyroxene Granulite Banded Magnetite Quartzite

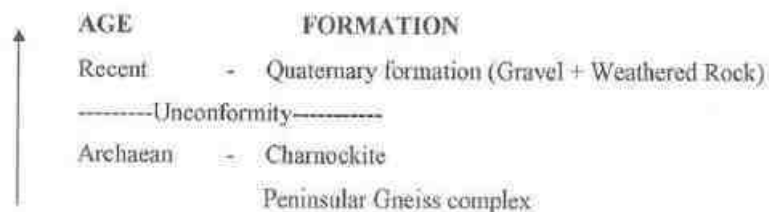
Geologically, the district is covered by rocks belonging to Archean age comprising the khondalite group, Charnockite Group, migmatite group, Sathayamangalam group, Bhavani Group and Alkali complex of Proterozoic age and Recent to Late Pleistocene rocks of Cainozoic age.

The Charnockite Group of rocks consisting of Charnockite, pyroxene granulites and associated magnetite quartzite, the Knodalite Group comprising gametiferous – sillimanite gneiss, calc-granulite, crystalline limestone, sillimanite quartzites and associated migmatitic gneisses. The rocks are restricted to the central and southern portions of the district.

Source: District Survey Report for Minor Minerals Viluppuram District – May 2019.  
<https://viluppuram.nic.in/document/district-survey-report-rough-stone/Exploration> :

No Exploration is required, the Rough stone and Gravel formation is clearly inferred from the existing quarry pit situated on the south side.

The General Geological sequence of the area is given below:



### 2.3.2 Local Geology: -

The study area follows the regional trend and mainly comprises of Hard Rock Formation as a homogeneous formation / Batholith formation of Charnockite. The project areas are plain terrain, The project areas are covered with Gravel formation of 2m thickness; Massive Charnockite formation is found after 2m Gravel formation which is clearly inferred from the existing quarry pit.

### 2.3.3 Hydrogeology

Viluppuram district is underlain by crystalline metamorphic complex in the western part of the district and sedimentary tract in eastern side (Plate-II). The thickness of sediments exceeds 600m near southern part of the district. Groundwater occurs under phreatic and semi-confined conditions in consolidated formations, which comprises weathered and fractured granites, gneisses and charnockites whereas in unconsolidated sedimentary rocks the groundwater occurs in phreatic, semi-confined conditions in Vanur sandstone, Kadapperi kuppam formation and Turuvai limestone. The district is having rocky outcrops in major part of Kallakurichi, Sankarapuram and Tirukoilur taluks. The weathering is highly erratic and the depth of abstraction structures is controlled by the intensity of weathering and fracturing. The depth of wells varies from 6.64 to 17 m bgl and water levels in observation wells tapping shallow aquifers varied from 0.74 to 9.7 m bgl

during pre monsoon (May 2006) and it varies from 0.7 to 4.45 m bgl during post monsoon (January 2007). During pre monsoon, the depth to water levels in the range of >2 to 5 m bgl in major part of the district, in the range of >5 -10 m bgl in western and southeastern parts of the district and range of 0-2 m bgl were recorded in two isolated pockets. During post monsoon the depth to water levels range of >2 to 5 bgl exists in major part of the district, range of 0 - 2 m bgl prevails in central and northeastern parts of the district and range of >5 - 10 m bgl were recorded in two isolated pockets in the southwestern and north western parts of the district. The depth to piezometric surface ranged from 2.8 to 11.25 m bgl during Pre monsoon and 0.5 to 6.35 m bgl during post monsoon. The ground water is being developed by means of dug wells, bore wells and tube wells. The diameter of the well is in the range of 7 to 10 m and depth of dug wells range from 15 to 18 m bgl depending on the weathered thickness and joints. The dug wells yield up to 1 lps in summer months and few wells remains dry. The yield is adequate for irrigation for one or two crops in monsoon period. The yield of bore wells in favorable locations vary from <1 to 6 lps. The valley fills, intersection of lineaments, particularly, in the western part along the foot hills of Kalrayan hills are reported to have potential pockets suitable for dug wells and bore wells. The area of contact between crystalline and sedimentary formations has variable yield prospects. The cretaceous formations are very compact and yield prospects are low. The dug wells of 6 m diameter and 10 m bgl depth in sandy tracts give about 3.5 lps. The yield of tube wells in the sedimentary formation ranges from 2.4 to 37 lp.

### **2.2.2.3 Aquifer Systems:**

Occurrence and storage of groundwater depend upon three factors viz., Geology, Topography and rainfall in the form of precipitation. Apart from Geology, wide variation in topographic profile and intensity of rainfall constitutes the prime factors of groundwater recharge. Aquifers are part of the more complex hydro geological system and the behaviour of the entire system cannot be interpreted easily. In hard rock terrain the occurrence of Ground Water is limited to top weathered, fissured and fractured zone which extends to maximum 30 m on an average it is about 10-15 m in Viluppuram District.

In Sedimentary formations, the presence of primary inter granular porosity enhances the transmitting capacity of groundwater where the yield will be appreciable. The sedimentary area which occupies the eastern part of the district along the coastal tract is more favourable for groundwater recharge. Ground Water occurs both in semi confined and confined conditions. A brief description of occurrence of groundwater in each formation is furnished below.

### **2.2.2.3 Alluvial Formations**

In the river alluvium groundwater occurs under water table condition. The maximum thickness is 37 m and the average thickness of the aquifer is approximately 12 m. These formations are porous and permeable which have good water bearing zones.

### **Tertiary Cuddalore sandstone**

Tertiary formations are represented by Cuddalore Sandstone and characterised as fluvial to brackish marine deposits. Predominantly this formation is divided into Lower and Upper Cuddalore formations. In the Upper Cuddalore formations the groundwater occurs in semi confined conditions, whereas in the Lower Cuddalore the groundwater occurs in confined condition with good groundwater potential.

### **Cretaceous Formations**

Groundwater occurring in the lens shape in the sandy clay lenses and fine sand is underlain by white and black clay beds which constitute phreatic aquifer depth which ranges 10m to 15m below ground level. Phreatic aquifer in Limestone is potential due to the presence of Oolitic Limestone.

### **Hard Rock Formations**

Groundwater occurs under water table conditions but the intensity of weathering, joint, fracture and its development is much less in other type of rocks when compared to gneissic formation. The groundwater potential is low, when compared with the gneissic formations

#### **Granitic Gneiss**

Groundwater occurs under water table conditions in weathered, jointed and fractural formations. The pore space developed in the weathered mantle acts as shallow granular aquifers and forms the potential water bearing and yielding zones water table is shallow in canal and tank irrigation regions and it is somewhat deeper in other regions.

#### **Charnockite**

Groundwater occurs under water table conditions but the intensity of weathering, joint, fracture and its development is much less when compared to gneissic formations. The groundwater potential is low, when compared with the gneissic formations.

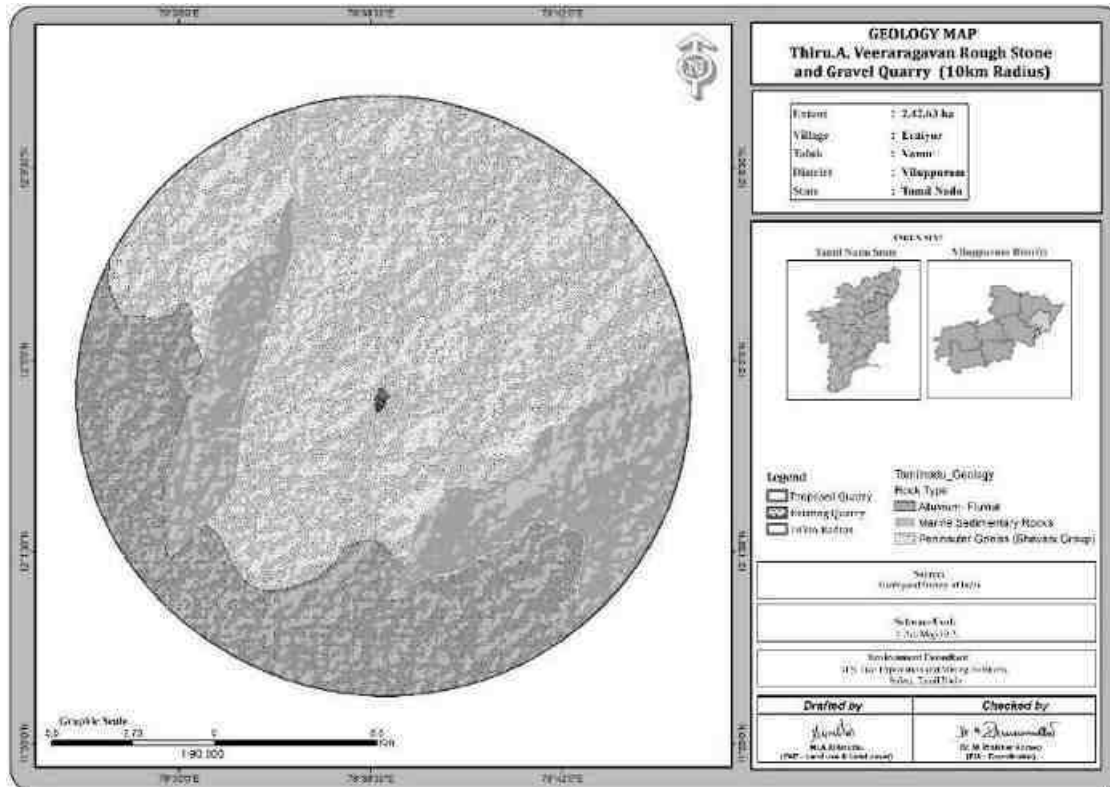
#### **Aquifer Parameters**

The transmissivity values of fractured aquifers range from  $< 1$  to  $141 \text{ m}^2/\text{day}$  and storativity varies between  $2.84 \times 10^{-5}$  and  $8.9 \times 10^{-3}$ . The transmissivity of sedimentary formation varies from 21 to  $748 \text{ m}^2/\text{day}$  and storativity is in the order of  $2.75 \times 10^{-3}$

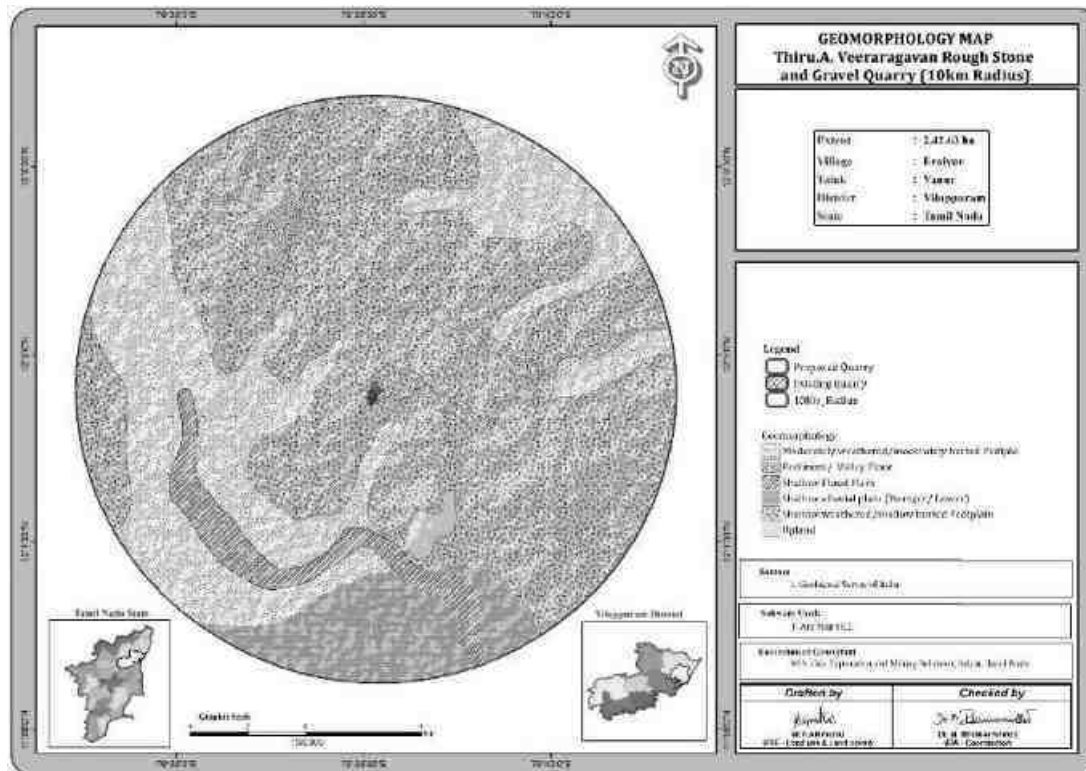
Actual Rainfall in Mm					Normal Rainfall in Mm
2017	2018	2019	2020	2021	
1066.9	727.5	906.3	1137.7	1935.2	985

<https://www.twadboard.tn.gov.in/content/villupuram>

**FIGURE 2.7: REGIONAL GEOLOGY MAP**



**FIGURE 2.8: GEOMORPHOLOGY MAP**



## 2.4 RESOURCES AND RESERVES

The Resources and Reserves of Rough Stone and Gravel were calculated based on Cross-Section Method by plotting sections to cover the maximum lease area. 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 (Safety Barrier all around the applied area) and safety distance as per precise area communication letter and deducting the locked up reserves during bench formation (Also called as Bench Loss) and the Mineable Reserves is calculated considering there is no waste / overburden / side burden (100% Recovery Anticipated).

**TABLE 2.5: RESOURCES AND RESERVES**

Description	Rough Stone m <sup>3</sup>	Gravel m <sup>3</sup>
Geological Resource in m <sup>3</sup>	7,27,890	48,526
Mineable Resource in m <sup>3</sup>	1,56,265	31,334
Year wise production for five-year plan period	1,56,265	31,334

Source: Approved Mining Plan

**TABLE 2.6: YEAR-WISE PRODUCTION PLAN**

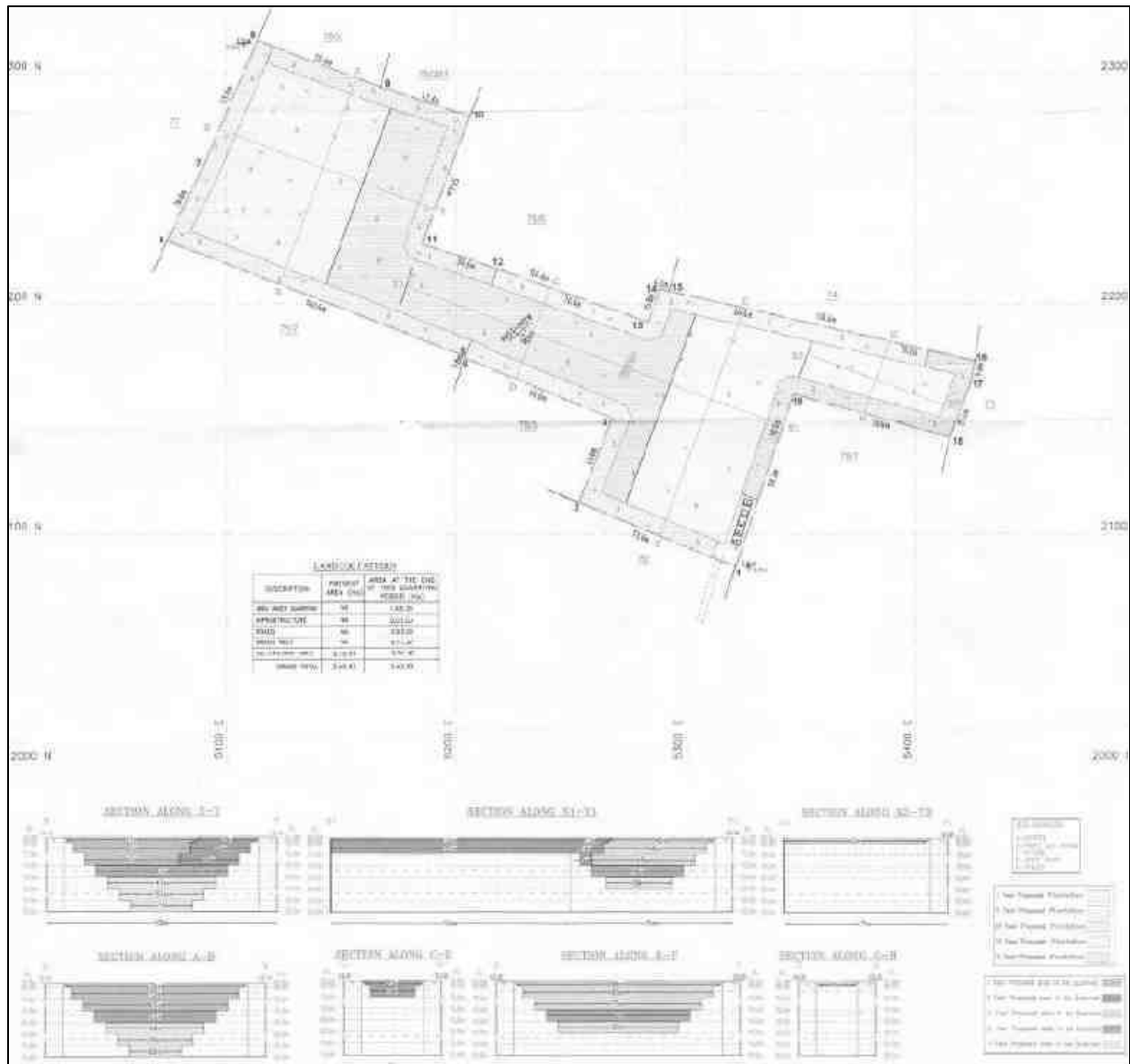
YEAR	ROUGH STONE (m <sup>3</sup> )	GRAVEL (m <sup>3</sup> )
I	31,530	9,006
II	35,195	12,334
III	35,100	9,994
IV	27,705	
V	26,735	
<b>TOTAL</b>	<b>1,56,265</b>	<b>31,334</b>

Source: Approved Mining Plan

### Disposal of Waste

The overburden in the form of Gravel formation is about 31,334m<sup>3</sup> up to depth 2m for during this period. the Gravel will be directly loaded into tippers for the filling and levelling of low-lying areas, this will be done only after obtaining permission and paying necessary seigniorage fees to the Government.

**FIGURE 2.9: TOPOGRAPHY, GEOLOGICAL, YEAR-WISE DEVELOPMENT PRODUCTION PLAN AND SECTIONS**



Source: Approved Mining Plan

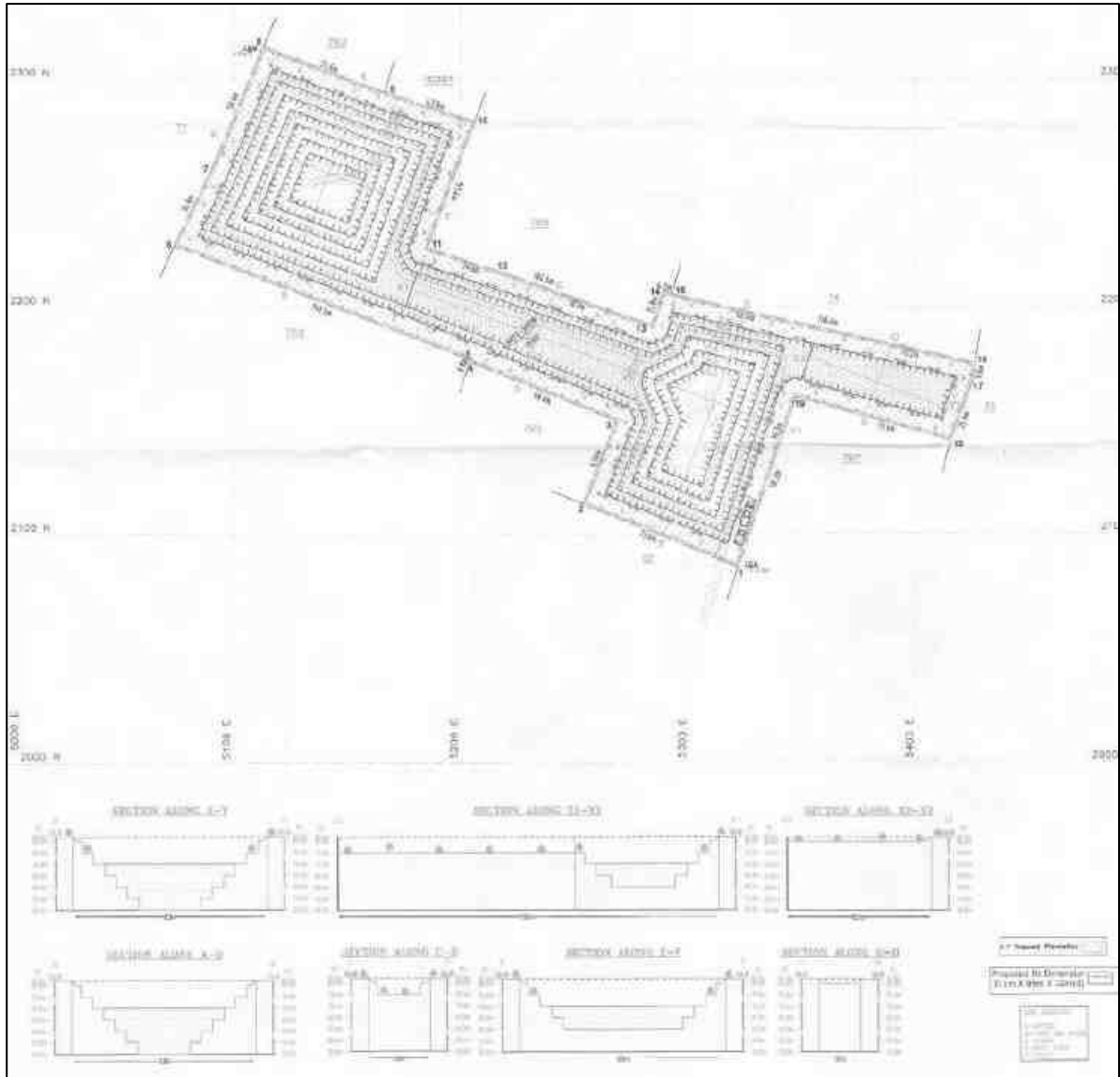
**Conceptual Mining Plan/ Final Mine Closure Plan**

The ultimate pit size is designed based on certain practical parameters such as economical depth of mining, safety zones, permissible area, etc.

**TABLE 2.7: ULTIMATE PIT DIMENSION**

Pit	Length (Max) (m)	Width (Max) (m)	Depth (Max)
I	311	89	32m bgl

Source: Approved Mining Plan

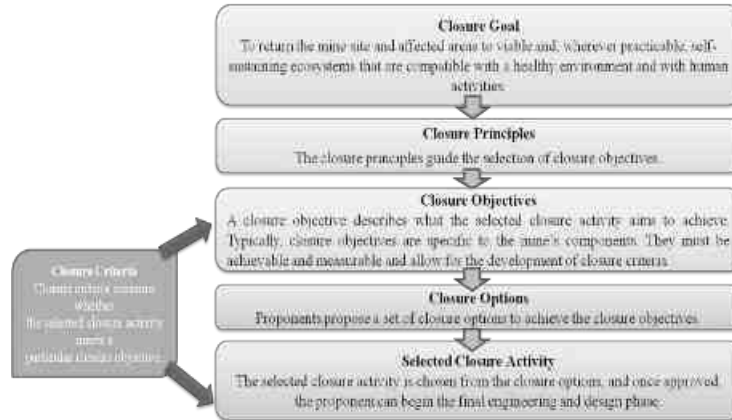
**FIGURE 2.10: CLOSURE PLAN AND SECTIONS**

Source: Approved Mining Plan

- At the end of life of mine, the excavated mine pit / void will act as artificial reservoir for collecting rain water and helps to meet out the demand or crises during drought season.
- After mine closure the greenbelt developed along the safety barrier and top benches and temporary water reservoir will enhance the ecosystem
- Mine Closure is a process of returning a disturbed site to its natural state or which prepares it for other productive uses that prevents or minimizes any adverse effects on the environment or threats to human health and safety.
- The principal closure objectives are for rehabilitated mines to be physically safe to humans and animals, geo-technically stable, geo-chemically non-polluting/ non-contaminating, and capable of sustaining an agreed post-mining land use.



## Closure Objectives –



- Access to be limited, for the safety of humans and wildlife.
- The open pit mine workings and pit boundary are physically and geo-technically stable.
- Water quality in flooded pits is safe for humans, aquatic life, and wildlife.
- Discharge of contaminated drainage has been minimized and controlled.
- Original or desired new surface drainage patterns have been established.
- For flooded pits, in-pit aquatic habitat has been established where practical and feasible.
- Emergency access and escape routes from flooded pits for humans and wildlife are in place.
- Dust levels are safe for people, vegetation, aquatic life, and wildlife.

## Closure Planning & Options Considerations in Mine Design –

- The closure of mine is well planned at the initial stage of planning & design consideration by the internal and external stake holders
- Construction of 2m height bund all along the mine pit boundary and ensure its stability all time & construction of garland drain along the natural slope to avoid sliding and collection of soil to the pit & surface runoff during rainfall
- After complete exploitation of mineral, the lowest bench foot wall side will be maintained as plain surface without any sump pits to avoid any accidents
- All the sharp edges will be dressed to smoother face before the closure of mine and ensure no loose debris on hanging wall side
- The project proponent as a part of social responsibilities assures to supply the stored mine pit water to the nearby villages after effective treatment process as per the standards of TNPCB & TWAD
- Native species will be planted in 3 row patterns on the boundary barriers and 1<sup>st</sup> bench, a full-time sentry will be appointed at the gate to prevent inherent entry of public & cattle.
- The access road to the quarry will be cut-off immediately after the closure
- The layout design shall be prepared and get approved from Department of Geology and Mining.
- The proponent is instructed to construct as per the layout approved
- Physical and chemical stability of structures left in place at the site, the natural rehabilitation of a biologically diverse, stable environment, the ultimate land use is optimized and is compatible with the surrounding area and the requirements of the local community, and taking the needs of the local community into account and minimizing the socio-economic impact of closure
- There will be a positive change in the environmental and ecology due to the mine closure

## 2.5 METHOD OF MINING

Open cast Mechanized Mining Method is proposed by formation of 5.0-meter height bench with a bench width not less than the bench height. Bench slope will be maintained as 60°.

The Rough Stone is a batholith formation and the splitting of rock mass of considerable volume from the parent rock mass will be carried out by deploying jackhammer drilling and Slurry Explosives will be used for blasting. Hydraulic Excavator attached with rock breaker/ bucket with tipper combination will be involved for the excavation/breaking of Rough stone after blasting. Hydraulic excavators attached with bucket unit will be deployed for loading the Rough Stone into the tippers and then the stone is transported from pithead to the nearby crushers.

It is recommended to obtain necessary statutory permission from the Department of Geology and Mining for Using Heavy Earth Moving Machineries, Blasting and appointment of Mines Manager etc.,

### 2.5.1 Drilling & Blasting Parameters

Drilling will be carried out using Jack hammer and compressor, the depth of the hole will be maximum 1.5m. Drilling & Blasting will be carried out as per parameters given below: -

Spacing	–	1.2m
Burden	–	1.0 m
Depth of hole	–	1.5 m
Charge per hole	–	0.50 – 0.75kg
Powder factor	–	6.0 tonnes/kg
Diameter of hole	–	32 mm
Peak production Capacity	=	117m <sup>3</sup> of Rough stone per day
Spacing X Burden X Depth	=	1.2m X 1.0m X 1.5m = 1.8m <sup>3</sup>
	=	1.8m <sup>3</sup> X 2.6 (Bulk Density) = 4.6Ts per hole

hence for the peak production of 117m<sup>3</sup> (189Ts) = 50 Nos of holes to be drilled per day

Explosives per hole = ½ kg hence 25 kg of Explosives will be utilized maximum considering the peak production

#### Type of Explosives to be used –

Slurry explosives (An explosive material containing substantial portions of a liquid, oxidizers, and fuel, plus a thickener), NONEL / Electric Detonator & Detonating Fuse.

#### Storage of Explosives –

No proposal for storage of explosives within the project area, the project proponent will make agreement with authorized explosives agencies for carrying out blasting activities and competent person as per DGMS guidelines will be employed for safety and supervision of overall quarrying activities.

The explosives will be sourced from the blasting agency on daily basis and the blasting will be carried out under the supervision of competent qualified Blaster and it will be ensured that there shall be no balance of explosive stock; any balance stock will be taken back by the supplier.

## 2.5.2 Extent of Mechanization

**TABLE 2.8 PROPOSED MACHINERY DEPLOYMENT**

S.NO.	TYPE	NOS	SIZE/CAPACITY	MOTIVE POWER
1	Jack hammers	4	1.2m to 2.0m	Compressed air
2	Compressor	1	400psi	Diesel Drive
3	Excavator with Bucket and Rock Breaker	1	300 HP	Diesel Drive
4	Tipppers	2	20 Tonnes	Diesel Drive

Source: Approved Mining Plan

## 2.6 GENERAL FEATURES

### 2.6.1 Existing Infrastructures

Infrastructures like Mine office, Temporary Rest shelters for workers, Latrine and Urinal Facilities will be constructed as per the Mine Rule after the grant of quarry lease in all the proposed quarries.

### 2.6.2 Drainage Pattern

There are no streams, canals or water bodies crossing within the project area. The drainage pattern of the area is dendritic – sub dendritic.

### 2.6.3 Traffic Density

The traffic survey conducted based on the transportation route of material, the Rough Stone is proposed to be transported mainly through

Traffic density measurements were performed at two locations

1. Okkilipalayam-Valanthavalam (state highway Road)
2. Thiruvakkarai District Road

Traffic density measurement was 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.

**TABLE.2.9: TRAFFIC SURVEY LOCATIONS**

Station Code	Road Name	Distance and Direction	Type of Road
TS1	Okkilipalayam-Valanthavalam	2.2 km-NW	State Highway
TS2	Thiruvakkarai District Road	1 km-East	District Road

Source: On-site monitoring by GEMS FAE & TM

**TABLE 2.10: EXISTING TRAFFIC VOLUME**

Station code	HMV		LMV		2/3 Wheelers		Total PCU
	No	PCU	No	PCU	No	PCU	
TS1	210	630	120	120	140	70	820
TS2	110	330	60	60	80	40	430

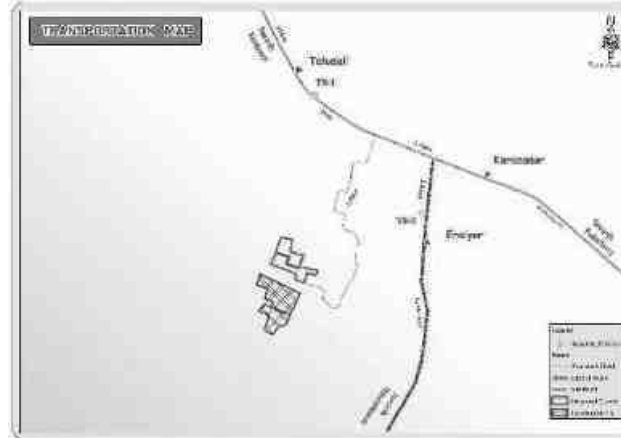
Source: On-site monitoring by GEMS FAE & TM

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

**TABLE 2.11: ROUGH STONE & GRAVEL HOURLY TRANSPORTATION REQUIREMENT**

Transportation of Rough Stone & Gravel per day		
Capacity of trucks	No. of Trips per day	Volume in PCU
20 tonnes	14	42

**FIGURE.2.11: MINERAL TRANSPORTATION ROUTE MAP**



**Proposed Transportation Route:**

1. The Rough stone will be transported to the Crusher which is located 70m East side of the project site.
2. No Major Habitation, Schools in the proposed transportation route.

**TABLE 2.12: 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
Okkilipalayam-Valanthavalam State Highway (SH- 136)	820	42	862	1500
Thiruvakkarai District Road –	430	42	472	1200

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

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

**2.6.4 Mineral Beneficiation and Processing**

There is no proposal for the mineral processing or ore beneficiation in any of the proposed project.

## 2.7 PROJECT REQUIREMENT

### 2.7.1 Water Source & Requirement

Detail of water requirements in KLD as given below:

**TABLE 2.13: WATER REQUIREMENT FOR THE PROJECT**

Purpose	Quantity	Source
Dust Suppression	0.7KLD	From the existing pit or from the water vendors
Green Belt	0.5KLD	From the existing pit or from the water vendors
Sanitation & Drinking	0.3KLD	From the existing pit or from the water vendors.
Total	<b>1.5 KLD</b>	

Source: Prefeasibility report

### 2.7.2 Power and Other Infrastructure Requirement

Power is not required for the mining operation; the mining operation will be carried out using Diesel Generator and Earth moving machineries using diesel. The quarrying activity is proposed during day time only (General Shift 8 AM – 5 PM, Lunch Break 1 PM – 2 PM). Electricity for use in office and other internal infrastructure will be obtained from TNEB by project proponent.

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

### 2.7.3 Fuel Requirement

One Excavator will excavate 25m<sup>3</sup> of Broken up Rough stone per hour and 60m<sup>3</sup> of Gravel per hour.

Peak production of Rough stone = 117m<sup>3</sup>

Peak production of Gravel = 41m<sup>3</sup>

Type of machinery	Working hours	Average Diesel consumption/ Hour	Quantity of Diesel in Ltrs
Working hours of Excavator (Aprx)	117m <sup>3</sup> /20 m <sup>3</sup> = 6 Hrs (Rough stone)	18 Ltrs	108
	41/60m <sup>3</sup> = 1-2 Hrs	18 Ltrs	18
Compressor	Working hours per day 3 Hrs	8 Ltrs	24
Tippers, Motor pumps to drain water	Occasionally		20
<b>Total Diesel Consumption</b>			<b>170</b>

The Maximum diesel consumption is around 170 Ltrs per day considering the peak production.

### 2.7.4 Project Cost

The Environmental Management plan has been prepared considering the mode of working, Safety of the employees and Monitoring periods the total Cost is 119 Lakhs.

## 2.8 EMPLOYMENT REQUIREMENT:

The following manpower's are proposed in the mining plan to carry out the day-to-day quarrying activities, the same employment is maintaining aimed at the proposed production target and also to comply with the statutory provisions of the Metalliferous mine's regulations, 1961.

**TABLE 2.14: PROPOSED MANPOWER DEPLOYMENT**

Designation	No of persons
Mines Manager/Mines Foreman	1
Mate/Blaster	1
Jack hammer operator	8
Excavator Operator	3
Labour & Helper	3
Cleaner & Co-operator	3
Security	1
<b>Total</b>	<b>20</b>

Source: Approved Mining Plan & Pre-Feasibility report.

## 2.9 PROJECT IMPLEMENTATION SCHEDULE

The mining operation will commence after the grant of Environmental Clearance, Consent to operate (CTO), Execution of Lease Deed and Obtaining permission from the DGMS (Notice of Opening).

**TABLE 2.15: EXPECTED TIME SCHEDULE**

Sl.No.	Particulars	Time Schedule (In Month)					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 Operate						
3	Execution of Lease deed						
4	Permission from DGMS						
Time line may vary; subjected to rules and regulations /& other unforeseen circumstances							

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

### 3. DESCRIPTION OF ENVIRONMENT

#### 3.0 GENERAL

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 December 2023 to February 2024 with CPCB guidelines for the following attributes –

- Land
- Water
- Air
- Noise
- Biological
- Socio-economic status

Environmental data has been collected with reference to cluster quarries by EHS 360 Lab Private Limited, – An accredited by ISO/IEC 17025:2017 (NABL).

#### Study Area

An area of 10 km radius (aerial distance) from the periphery of the cluster is considered for EIA study. The study area has been divided into two zones viz **core zone** and **buffer zone**.

- Core zone is considered as cluster area
- Buffer zone taken as 10km radius from the periphery of the Cluster. Both Core zone and Buffer zone is taken as the study area.

#### Study Period

The baseline study was conducted during the Winter season i.e., December 2023 to February 2024.

#### Study Methodology

- The project area was surveyed in detail with the help of Total Station Survey instruments and pillars were marked. The boundary coordinates were superimposed on the satellite imagery to understand the relief of the area, besides Land use pattern of the area was studied through the Bhuvan (ISRO)
- Soil samples were collected and analysed for relevant physio-chemical characteristics in order to assess the impact due to mining activities and to recommend saplings for Greenbelt development.
- Ground water samples were collected from the existing bore wells, Surface water was collected from water bodies in the buffer zone and analysed as per CPCB Guidelines.
- An onsite meteorological station was setup in cluster area, to collect data about wind speed, wind direction, temperature, relative humidity, rainfall and general weather conditions were recorded throughout the study period.
- Air quality Data's were collected by installation of Respiratory Dust Samplers (RDS) for Fugitive dust, PM<sub>10</sub> and SO<sub>2</sub>, NO<sub>x</sub> with gaseous attachments & Fine Dust Samplers (FDS) for PM<sub>2.5</sub> and other parameters as per NAAQ norms and analysed for primary air pollutants to work out the existing status of air quality.
- The Noise level measurements were also made at various locations in different intervals of time with the help of sound level meter to establish the baseline noise levels in the impact zone.
- Baseline biological studies were carried out to assess the ecology of the study area to study the existing flora and fauna pattern of the area.

- Socio-Economic survey was conducted at village and household level in the study area to understand the present socio-economic conditions and assess the extent of impact due to the proposed mining project. The sampling methodologies for the various environmental parameters required for the study, frequency of sampling, method of samples analysis, etc., are given below 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 10 km radius of the study area	Data from census handbook 2011 and from the satellite imagery	Study Area	Satellite Imagery Primary Survey
*Soil	Physio-Chemical Characteristics	Once during the study period	6 (1 core & 5 buffer zone)	IS 2720 Agriculture Handbook - Indian Council of Agriculture Research, New Delhi
*Water Quality	Physical, Chemical and Bacteriological Parameters	Once during the study period	6 (2 surface water & 4 ground water)	IS 10500& CPCB Standards
Meteorology	Wind Speed Wind Direction Temperature Cloud cover Dry bulb temperature Rainfall	1 Hourly Continuous Mechanical/Auto matic Weather Station	1	Site specific primary data& Secondary Data from IMD Station
*Ambient Air Quality	PM10 PM2.5 SO2 NOX Fugitive Dust	24 hourly twice a week (December 2023 – February 2024)	7 (2 core & 5 buffer)	IS 5182 Part 1-23 National Ambient Air Quality Standards, CPCB
*Noise Levels	Ambient Noise	Hourly observation for 24 Hours per location	7 (2 core & 5 buffer zone)	IS 9989 As per CPCB Guidelines
Ecology	Existing Flora and Fauna	Through field visit during the study period	Study Area	Primary Survey by 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.

Source: On-site monitoring/sampling by EHS 360 in association with GEMS

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



### 3.1 LAND ENVIRONMENT

The main objective of this section is to provide a baseline status of the study area covering 10km radius around the proposed mine site so that temporal changes due to the mining activities on the surroundings can be assessed in future.

#### 3.1.1 Land Use/ Land Cover

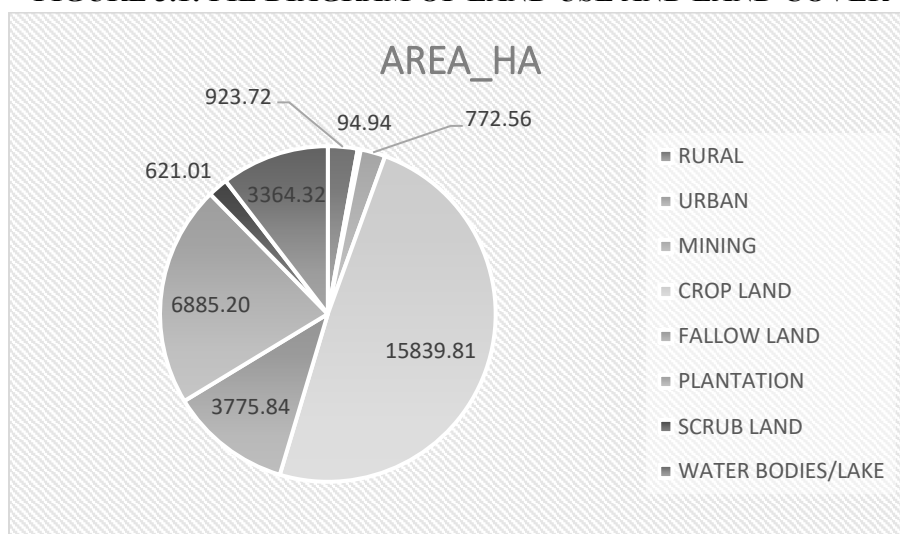
A visual interpretation technique has been adopted for land use classification based on the keys suggested in the chapter – V of the guidelines issued by NNRMS Bangalore & Level III classification with 1:50,000 scale for the preparation of land use mapping. Land use pattern of the area was studied through LISS III imagery of Bhuvan (ISRO). The 10 km radius map of study area was taken for analysis of Land use cover.

**TABLE 3.2: LAND USE / LAND COVER TABLE 10 Km RADIUS**

S. No	CLASSIFICATION	AREA in HA	AREA in %
<b>BUILTUP</b>			
1	Urban	94.94	0.29
2	Rural	923.72	2.86
3	Mining	772.56	2.39
<b>AGRICULTURAL LAND</b>			
4	Crop land	15839.81	49.07
	Fallow Land	3775.84	11.70
5	Plantation	6885.20	21.33
<b>BARREN/WASTE LANDS</b>			
6	Scrub land	621.01	1.92
<b>WETLANDS/ WATER BODIES</b>			
7	Water bodies/lake/river	3364.32	10.42
<b>TOTAL</b>		32277.40	100.00

Source: Survey of India Toposheet and Landsat Satellite Imagery

**FIGURE 3.1: PIE DIAGRAM OF LAND USE AND LAND COVER**



From the above table, pie diagram and land use map it is inferred that the majority of the land in the study area is Agriculture and fallow land (includes crop land) 82.03% followed by Built-up Lands – 31.86%, Scrub land – 1.92%, and Water bodies 10.42%.

The total mining area within the study area is 772.56 ha i.e., 2.39%. The cluster area of 12.81.63 ha contributes about 1.66% of the total mining area within the study area. This small percentage of Mining Activities shall not have any significant impact on the environment.

### **3.1.2 Topography**

The project area is almost plain terrain having gentle slope towards North-eastern side. The altitude of the area is 82m AMSL. The area is covered by 2m thickness of gravel & followed by massive charnockite which is clearly inferred from the surface outcrops.

### **3.1.3 Drainage Pattern of the Area**

The drainage pattern of the area is dendritic – sub dendritic. Drainage pattern is the pattern formed by the streams, rivers, and lakes in a particular drainage basin. They are governed by the topography of the land, whether a particular region is dominated by hard or soft rocks, and the gradient of the land. There are no streams, canals or water bodies crossing within the project area.

### **3.1.4 Seismic Sensitivity**

The proposed project site falls in the seismic Zone II, low damage risk zone as per BMTPC, Vulnerability Atlas of Seismic zone of India IS: 1893 – 2002. The project area falls in the hard rock terrain on the peninsular shield of south India which is highly stable.

### **3.1.5 Environmental Features in the Study Area**

There is no Wildlife Sanctuaries, National Park and Archaeological monuments within project area. No Protected and Reserved Forest area is involved in the project area. Therefore, there will be no need to acquisition/diversion of forest land. The details related to the environment sensitivity around the proposed mine lease area i.e. 10 km radius, are given in the below Table 3.3.

FIGURE 3.2: PHYSIOGRAPHIC MAP 10KM RADIUS

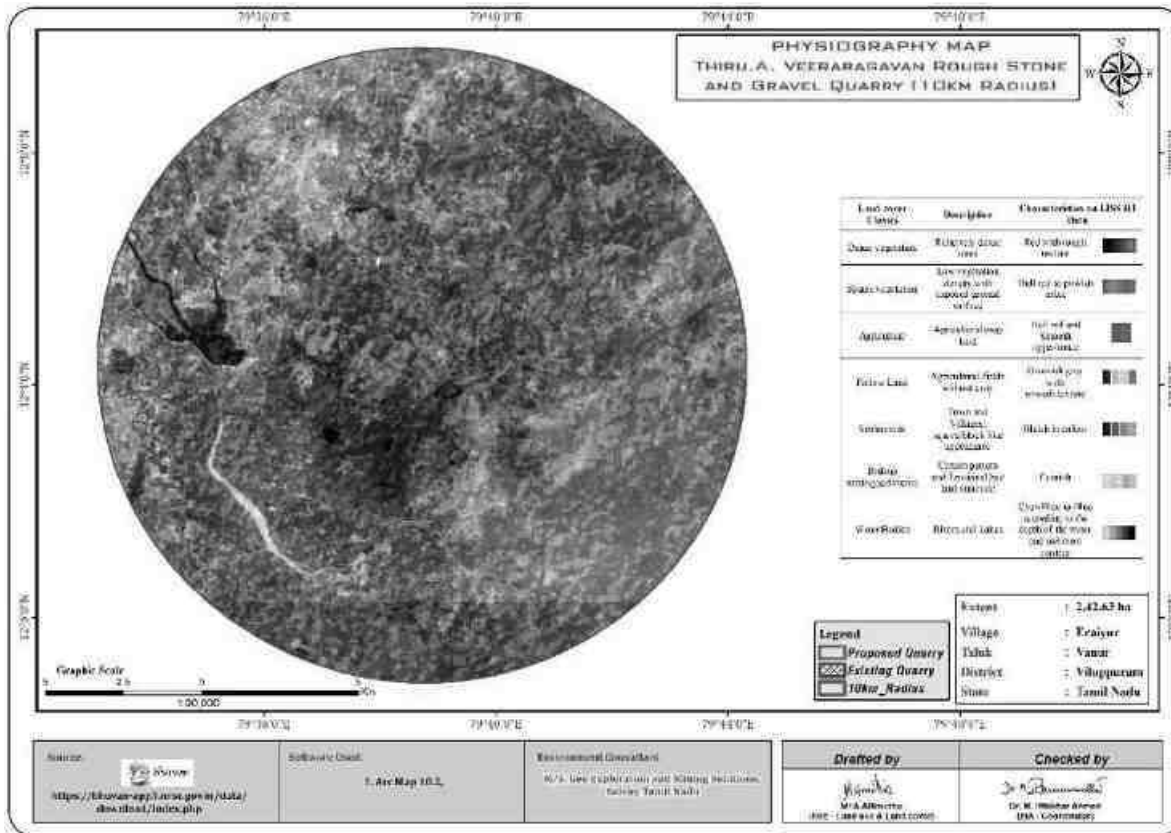
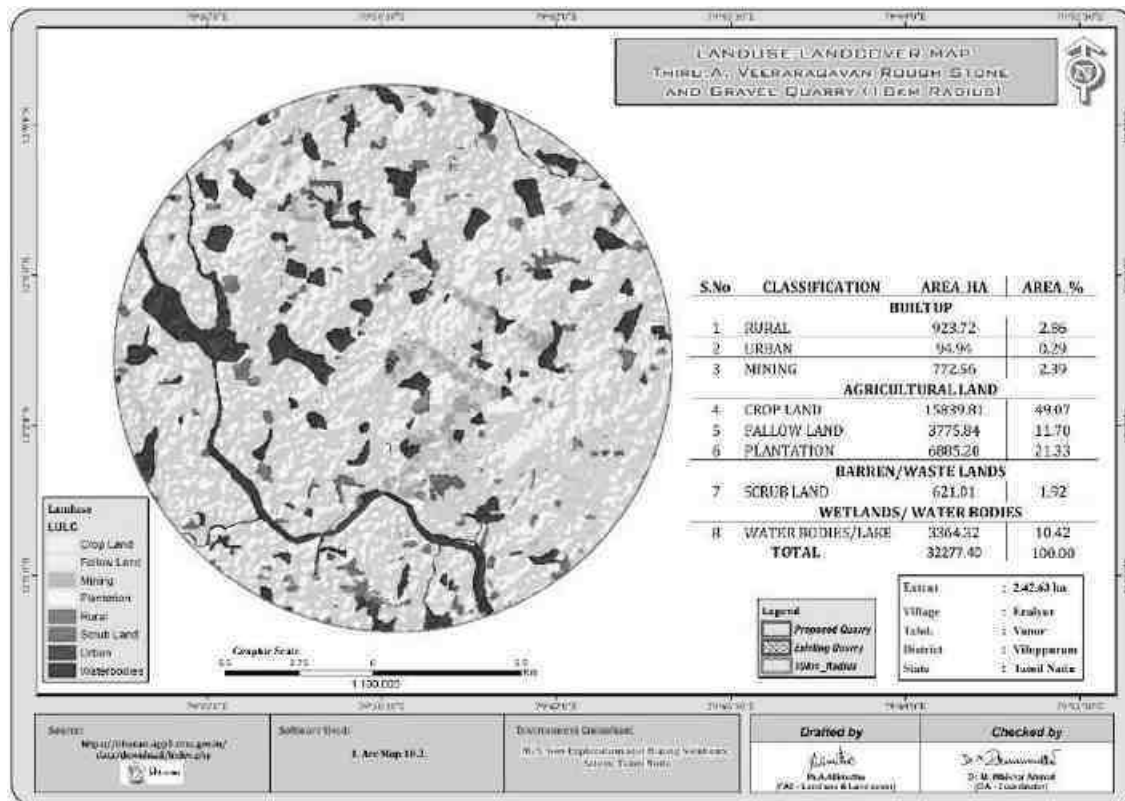


FIGURE 3.3: LAND USE LAND COVER MAP 10KM RADIUS



**TABLE 3.3: DETAILS OF ENVIRONMENT SENSITIVITY AROUND THE CLUSTER**

Sl.No	Sensitive Ecological Features	Name	Arial Distance in km from Cluster
1	National Park / Wild life Sanctuaries	Oussudu Lake Birds Sanctuary	15km-South East
2	Reserve Forest	Melkondai.	10.64 km – South West (Source - TNGIS)
3	Tiger Reserve/ Elephant Reserve/ Biosphere Reserve	None	Nil within 10Km Radius
4	Critically Polluted Areas	SIPCOT industrial Complex, Cuddalore	42.5km- South East
5	Mangroves	None	Nil within 10km Radius
6	Mountains/Hills	None	Nil within 10km Radius
7	Notified Archaeological Sites	None	Nil within 10km Radius
8	Industries/ Thermal Power Plants	None	Nil within 10km Radius
9	Defence Installation	None	Nil within 10km Radius

Source: Survey of India Toposheet

**TABLE 3.4: NEARBY WATER BODIES FROM THE PROPOSED PROJECT SITE**

Sl.No	NAME	DISTANCE & DIRECTION
1	Odai	140m East
2	Tank	270m NE
3	Tank	750m SE
4	Konnamangalam Lake	1.8km west
5	Tank	2km NW
6	Sangarabarani River	4.8km South
7	Veedur Reservoir	5.5km SW

Source: Village Cadastral Map and Field Survey

### 3.1.6 Soil Environment

Soil quality of the study area is one of the important components of the land environment. The composite soil samples were collected from the study area and analysed for different parameters. The locations of the monitoring sites are detailed in Table 3.5 and Figure 3.5.

#### The objective of the soil sampling is -

To determine the baseline soil characteristics of the study area; study the impact of proposed activity on soil characteristics and study the impact on soil more importantly agriculture production point of view.

**TABLE 3.5: SOIL SAMPLING LOCATIONS**

S. No	Location Code	Monitoring Locations	Distance & Direction	Coordinates
1	S-1	Core Zone	Project Area	12° 4'22.52"N 79°38'40.76"E
2	S-2	Eraiyr	1.5km SE	12° 3'47.01"N 79°39'29.65"E
3	S-3	Pathirapuliyur	6km NW	12° 5'44.20"N 79°35'44.12"E
4	S-4	Iveli	5.2km SW	12° 1'54.44"N 79°37'14.89"E
5	S-5	Ilavampattu	6.5km NE	12° 5'4.24"N 79°42'12.45"E
6	S-6	Veliyanur	5.5km North	12° 7'24.83"N 79°39'12.50"E

Source: On-site monitoring/sampling by EHS 360 lab in association with GEMS.

#### Methodology –

For studying soil quality, sampling locations were selected to assess the existing soil conditions in and around the project site representing various land use conditions. The samples were collected by auger boring into the soil up to 90-cm depth. Six (6) locations were selected for soil sampling on the basis of soil types, vegetative cover, industrial & residential activities including infrastructure facilities, which would accord an overall idea of the soil characteristics. The samples were analysed for physical and chemical characteristics. The samples were sent to laboratory for analysis. The samples were filled in Polythene bags, coded and sent to laboratory for analysis and the details of methodology in respect are given in below Table 3.6.

**TABLE 3.6: METHODOLOGY OF SAMPLING COLLECTION**

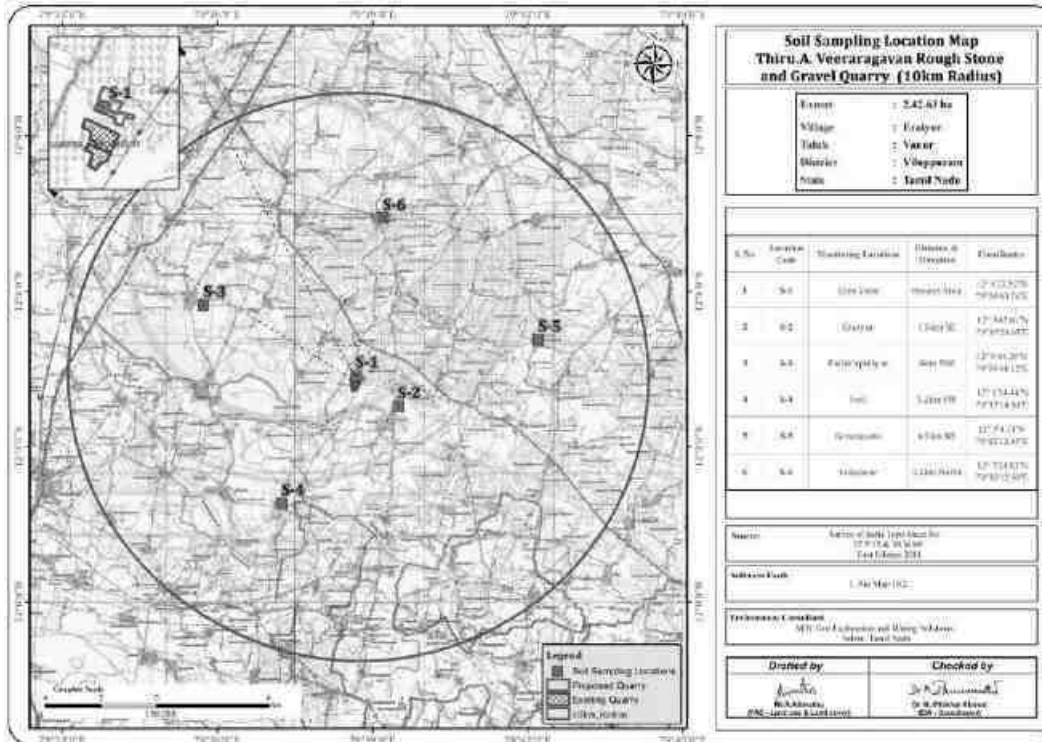
Particulars	Details
Frequency	One grab sample from each station-once during the study period
Methodology	Composite grab samples of the topsoil were collected from 3 depths, and mixed to provide a representative sample for analysis. They were stored in airtight Polythene bags and analysed at the laboratory.

Source: On-site monitoring/sampling by EHS360 Labs Private Limited in association with GEMS

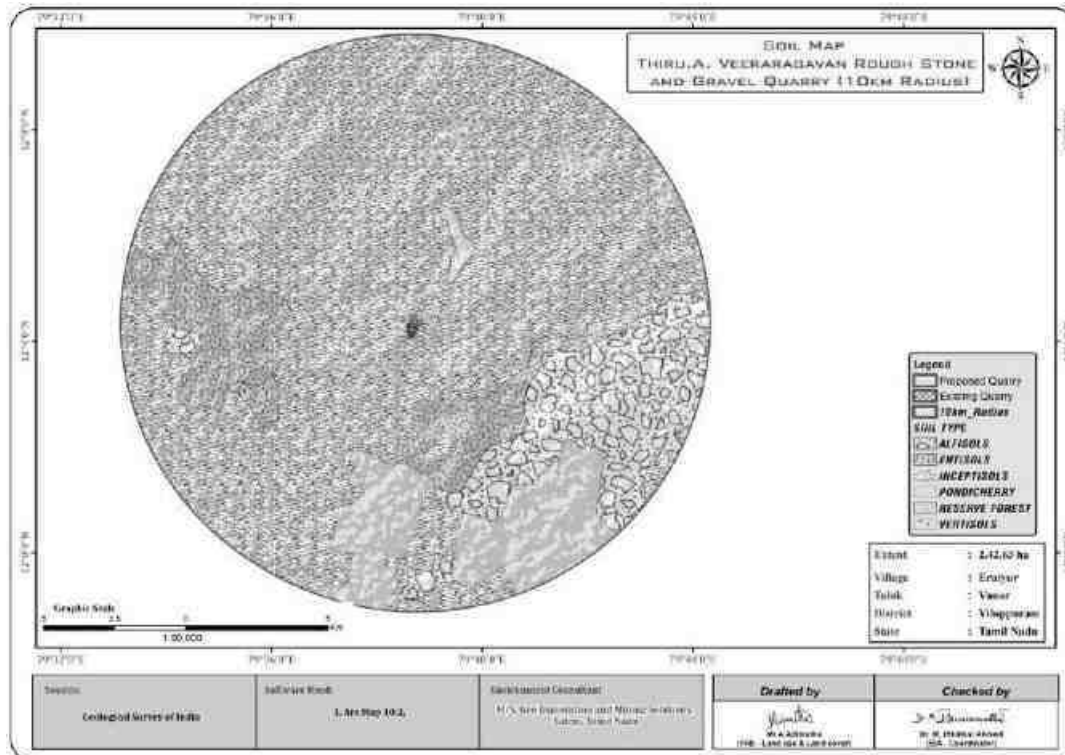
#### Soil Testing Result –

The samples were analysed as per the standard methods prescribed in “Soil Chemical Analysis (M.L. Jackson, 1967) & Department of Agriculture, Cooperation & Farmers Welfare, Ministry of Agriculture & Farmers Welfare, Government of India”. The important properties analysed for soil are bulk density, porosity, infiltration rate, pH and Organic matter, kjeldahi Nitrogen, Phosphorous and Potassium. The standard classifications of soil are presented below in Figure 3.4 and the physico-chemical characteristics of the soil & Test Results in Table 3.7.

**FIGURE 3.5: SOIL SAMPLING LOCATIONS AROUND 10 KM RADIUS**



**FIGURE 3.6: SOIL MAP**



**TABLE 3.7: SOIL QUALITY OF THE STUDY AREA**

S. No	Test Parameters	Protocols	S-1 Core Zone	S-2 Eraiyrur	S-3 Pathirapuliyr	S-4 Iveli	S-5 Ilavampattu	S-6 Okkilipalayam
01	pH @ 25°C	IS 2720 Part 26 - 1987 (Reaff:2016)	8.56	8.24	8.17	8.57	8.74	8.19
02	Conductivity @ 25°C	IS 14767 - 2000 (Reaff : 2016)	461 µmhos/cm	500 µmhos/cm	430 µmhos/cm	456 µmhos/cm	485 µmhos/cm	467 µmhos/cm
03	<b>Texture:</b>							
	Clay	Gravimetric method	31.7 %	33.4%	29.8 %	31.1%	31.6 %	30.9 %
	Sand		32.5 %	31.6 %	33.6 %	32.4 %	32.8 %	34.6 %
	Silt		35.8 %	35.0%	36.6 %	36.5 %	35.6 %	34.5 %
04	Water Holding Capacity	By Gravimetric method	47.5 %	47.6 %	49.4 %	46.3 %	46.7 %	46.14 %
05	Bulk Density	By Cylindrical method	1.02 g/cm <sup>3</sup>	1.05 g/cm <sup>3</sup>	1.01 g/cm <sup>3</sup>	0.99g/cm <sup>3</sup>	1.10 g/cm <sup>3</sup>	1.08 g/cm <sup>3</sup>
06	Porosity	By Gravimetric method	45.6 %	48.8 %	48.8 %	46.6 %	46.5 %	47.1 %
07	Calcium as Ca	USEPA 3050 B – 1996 & USEPA 6010 C - 2000	51.6 mg/kg	56.7 mg/kg	49 mg/kg	76.5 mg/kg	74.5mg/kg	64.4 mg/kg
08	Magnesium as Mg		35.5 mg/kg	41 mg/kg	35.5 mg/kg	61 mg/kg	52 mg/kg	28.6 mg/kg
09	Manganese as Mn		17mg/kg	22.4 mg/kg	25.8 mg/kg	20.5 mg/kg	27.1 mg/kg	30.2 mg/kg
10	Zinc as Zn		3.3 mg/kg	5.64 mg/kg	3.24 mg/kg	5.1 mg/kg	4.9 mg/kg	5.66 mg/kg
11	Boron as B		3.9 mg/kg	5.1 mg/kg	4.1 mg/kg	2.44 mg/kg	6.6 mg/kg	1.24 mg/kg
12	Chloride as Cl	APHA 23rd Edn 2019 4500 Cl B	60.8 mg/kg	25.6mg/kg	42.3 mg/kg	52.6 mg/kg	31.1 mg/kg	61.4 mg/kg
13	Total Soluble Sulphate as SO <sub>4</sub>	IS 2720 Part 27 : 1977 (Reaff:2015)	0.0014 %	0.0014 %	0.0025 %	0.0028 %	0.0019 %	0.0019 %
14	Potassium as K	USEPA 3050 B – 1996 & USEPA 6010 C - 2000	31.7 mg/kg	42 mg/kg	6.5 mg/kg	30 mg/kg	17 mg/kg	20.4 mg/kg
15	Total Phosphorus as P	IS 10158 : 1982 (Reaff: 2019)	4.4 mg/kg	2.2 mg/kg	2.66 mg/kg	4.4 mg/kg	3.55 mg/kg	7.26 mg/kg
16	Total Nitrogen as N	IS 14684 : 1999 (Reaff:2019)	370.5 mg/kg	425 mg/kg	417 mg/kg	425.5 mg/kg	400 mg/kg	405.9 mg/kg
17	Cadmium as Cd	USEPA 3050 B – 1996 & USEPA 6010 C - 2000	BDL (DL : 1.0 mg/kg)					
18	Total Chromium as Cr		BDL (DL : 1.0 mg/kg)					
19	Copper as Cu		BDL (DL : 1.0 mg/kg)					
20	Lead as Pb		2.7 mg/kg	1.13 mg/kg	1.6 mg/kg	2.1 mg/kg	2.01 mg/kg	1.01 mg/kg
21	Iron as Fe		3.33 mg/kg	2.12 mg/kg	1.05 mg/kg	4.5 mg/kg	8.08 mg/kg	2.26 mg/kg
22	Organic Matter	IS : 2720 Part 22: 1972 (Reaff: 2015)	1.67 %	2.62 %	2.02 %	1.91 %	1.98 %	2.10 %
23	Organic Carbon	IS : 2720 Part 22: 1972 (Reaff: 2015)	0.97%	1.52 %	1.17 %	1.11%	1.15 %	1.22 %
24	Cation Exchange Capacity	USEPA 9080 – 1986	38.21 meq/100g of soil	35.4meq/100g of soil	42.2 meq/100g of soil	43.7 meq/100g of soil	43.51meq/100g of soil	30.41 meq/100g of soil

Source: Sampling Results by EHS 360 Lab Private Limited.

**FIGURE 3.7: SOIL SAMPLE COLLECTION****Interpretation & Conclusion****Physical Characteristics –**

The physical properties of the soil samples were examined for texture, bulk density, porosity and water holding capacity. The soil texture found in the study area is Clay (29.8 % to 33.4 %) to Sandy Loam Soil and Bulk Density of Soils in the study area varied between 0.99– 1.10 g/cc. The Water Holding Capacity and Porosity of the soil samples is found to be medium i.e., ranging from 46.14 – 49.4 % and 46.5-48.8 %.

**Chemical Characteristics –**

- The nature of soil is slightly alkaline to strongly alkaline with pH range 8.17 to 8.74
- The available Nitrogen content range between 425.5 to 370.5 mg/kg
- The available Phosphorus content range between 2.2 to 7.26 mg/kg
- The available Potassium range between 17 mg/kg to 42 mg/kg

**Observation:**

The pH of the Soil indicates that the soil is Neutral and arid region and ideal for plant growth.

**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 water quality characteristics for critical parameters and evaluate the impacts on agricultural productivity, domestic community usage, recreational resources and aesthetics in the vicinity. The water samples were collected and transported as per the norms in pre-treated sampling cans to laboratory for analysis.

**WATER SAMPLING PHOTOS**



### 3.2.1 Surface Water Resources:

Sangarabarani River is the major surface water body in the study area and the rainfall over the area is moderate, the rainwater storage in open wells and trenches are in practice over the area and the stored water acts as source of drinking water for few months after rainy season.

### 3.2.2 Ground Water Resources:

Groundwater occurs in all the crystalline formations of oldest Achaeans and Recent Alluvium. The occurrence and behaviour of groundwater are controlled by rainfall, topography, geomorphology, geology, structures etc., The weathering is controlled by the intensity of weathering and fracturing. Dug wells as wells as bore wells are more common ground water abstraction structures in the area. The diameter of the dug well is in the range of 7 to 10 m and depth of dug wells range from 7.2 to 13 m bgl. The dug wells yield up to 1 lps in summer months and few wells remains dry. The yield is adequate for irrigation for one or two crops in monsoon period.

### 3.2.3 Methodology

Reconnaissance survey was undertaken and monitoring locations were finalized based on;

- Drainage pattern;
- Location of Residential areas representing different activities/likely impact areas; and
- Likely areas, which can represent baseline conditions

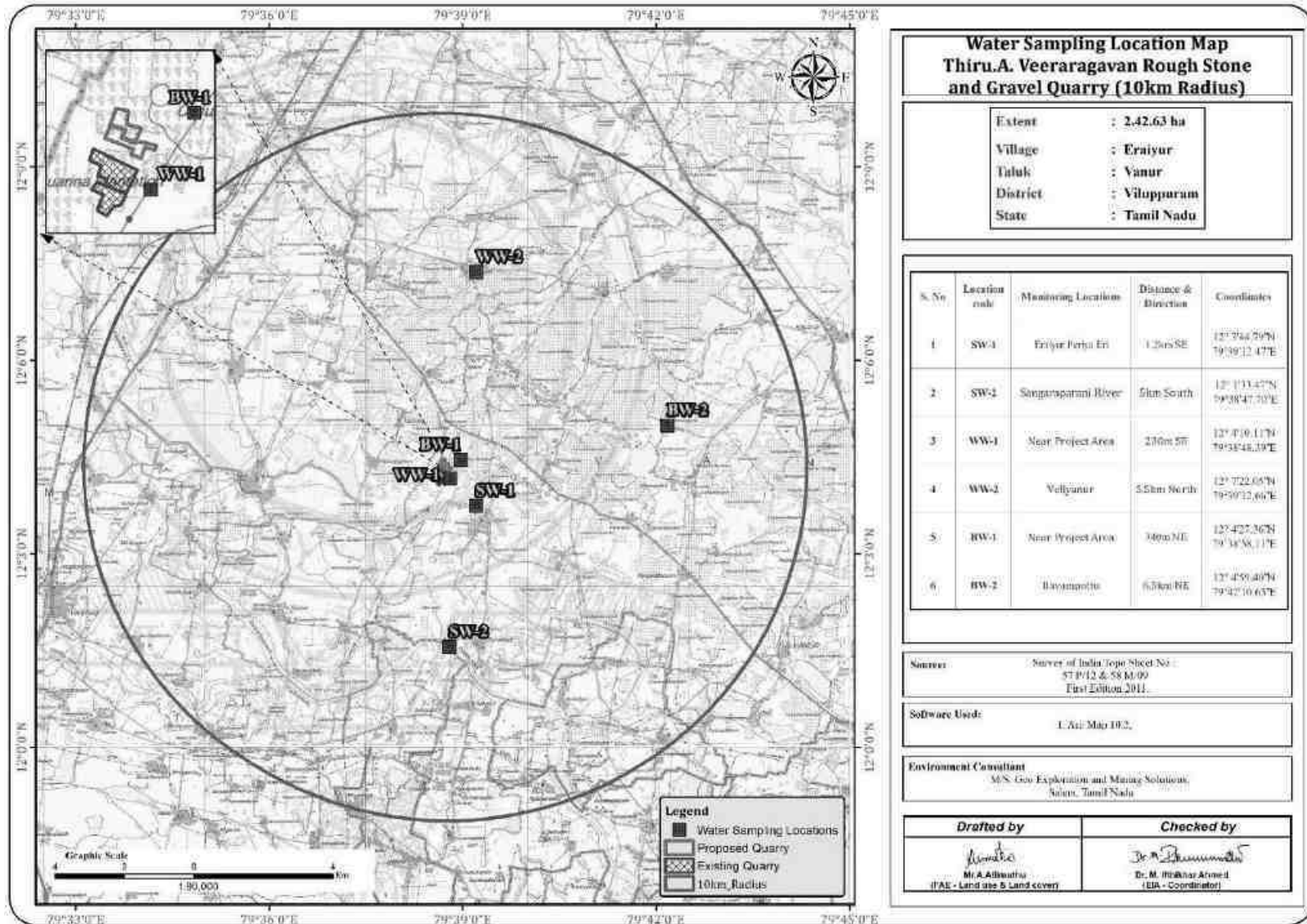
Two (2) surface water and Four (4) ground water samples were collected from the study area and were analysed for physio-chemical, heavy metals and bacteriological parameters in order to assess the effect of mining and other activities on surface and ground water. The samples were analysed as per the procedures specified by CPCB, IS-10500:2012 and 'Standard methods for the Examination of Water and Wastewater' published by American Public Health Association (APHA). The water sampling locations are given in Table 3.8 and shown as Figure 3.5.

**TABLE 3.8: WATER SAMPLING LOCATIONS**

S.NO	CODE	LOCATIONS	DISTANCE & DIRECTION	CO-ORDINATES
<b>SURFACE WATER</b>				
1	SW-1	Eraiyr Periya Eri	1.2km SE	12° 3'44.79"N 79°39'12.47"E
2	SW-2	Sangaraparani River	5km South	12° 1'33.47"N 79°38'47.70"E
<b>GROUND WATER</b>				
3	WW-1	Near Project Area	230m SE	12° 4'10.11"N 79°38'48.39"E
4	WW-2	Veliyanur	5.5km North	12° 7'22.05"N 79°39'12.66"E
5	BW-1	Near Project Area	340m NE	12° 4'27.36"N 79°38'58.11"E
6	BW-2	Ilavampattu	6.5km NE	12° 4'59.40"N 79°42'10.65"E

Source: On-site monitoring/sampling by Chennai Mettex Lab Private Limited in association with GEMS

**FIGURE 3.8: WATER SAMPLING LOCATIONS AROUND 10 KM RADIUS**



**TABLE 3.9: GROUND WATER SAMPLING RESULTS**

S.NO	Parameter	BW-1 Near Project Area	BW-2 Ilavampattu	WW-1 Near Project Area	WW-2 Veliyannur
1	Color	5 Hazen	5 Hazen	5	5 Hazen
2	Odour	Agreeable	Agreeable	Agreeable	Agreeable
3	pH@ 25°C	7.05	7.86	7.11	7.63
4	Electrical Conductivity @ 25°C	1003 µmhos/cm	1158 µmhos/cm	891 µmhos/cm	984 µmhos/cm
5	Turbidity	1.0 NTU	1 NTU	1.1 NTU	1.0 NTU
6	Total Dissolved Solids	592 mg/l	684 mg/l	526 mg/l	580 mg/l
7	Total Hardness as CaCO <sub>3</sub>	181.58 mg/l	211.10 mg/l	178.5mg/l	165.44 mg/l
8	Calcium as Ca	30.1 mg/l	35.5 mg/l	34.4 mg/l	26.1 mg/l
9	Magnesium as Mg	25.9 mg/l	29.8 mg/l	22.6 mg/l	24.4 mg/l
10	Total Alkalinity	164 mg/l	211 mg/l	170 mg/l	190 mg/l
11	Chloride as Cl <sup>-</sup>	127.1 mg/l	143 mg/l	110.1 mg/l	100.2 mg/l
12	Sulphate as SO <sub>4</sub> <sup>-</sup>	80.6 mg/l	89.1 mg/l	60 mg/l	86 mg/l
13	Iron as Fe	0.19 mg/l	0.31 mg/l	0.19 mg/l	0.15 mg/l
14	Free Residual Chlorine	BDL (DL:0.1 mg/l)	BDL (DL:0.1 mg/l)	BDL (DL:0.1 mg/l)	BDL (DL:0.1 mg/l)
15	Fluoride as F	0.22 mg/l	0.33 mg/l	0.21 mg/l	0.12 mg/l
16	Nitrates as NO <sub>3</sub>	6.94 mg/l	7.0 mg/l	3.1 mg/l	6.84 mg/l
17	Copper as Cu	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)
18	Manganese as Mn	BDL (DL:0.02 mg/l)	BDL (DL:0.02 mg/l)	BDL (DL:0.02 mg/l)	BDL (DL:0.02 mg/l)
19	Mercury as Hg	BDL (DL:0.0005 mg/l)	BDL (DL:0.0005 mg/l)	BDL (DL:0.0005 mg/l)	BDL (DL:0.0005 mg/l)
20	Cadmium as Cd	BDL (DL:0.001 mg/l)	BDL (DL:0.001 mg/l)	BDL (DL:0.001 mg/l)	BDL (DL:0.001 mg/l)
21	Selenium as Se	BDL (DL:0.005 mg/l)	BDL (DL:0.005 mg/l)	BDL (DL:0.005 mg/l)	BDL (DL:0.005 mg/l)
22	Aluminium as Al	BDL (DL:0.005 mg/l)	BDL (DL:0.005 mg/l)	BDL (DL:0.005 mg/l)	BDL (DL:0.005 mg/l)
23	Lead as Pb	BDL (DL:0.005 mg/l)	BDL (DL:0.005 mg/l)	BDL (DL:0.005 mg/l)	BDL (DL:0.005 mg/l)
24	Zinc as Zn	BDL(DL : 0.05 mg/l)	BDL(DL : 0.05 mg/l)	BDL(DL : 0.05 mg/l)	BDL(DL : 0.05 mg/l)
25	Total Chromium	BDL(DL : 0.02 mg/l)	BDL(DL : 0.02 mg/l)	BDL(DL : 0.02 mg/l)	BDL(DL : 0.02 mg/l)
26	Boron as B	BDL(DL : 0.05 mg/l)	BDL(DL : 0.05 mg/l)	BDL(DL : 0.05 mg/l)	BDL(DL : 0.05 mg/l)
27	Mineral Oil	BDL(DL : 0.01 mg/l)	BDL(DL : 0.01 mg/l)	BDL(DL : 0.01 mg/l)	BDL(DL : 0.01 mg/l)
28	Phenolic Compunds as C <sub>6</sub> H <sub>5</sub> OH	BDL (DL:0.0005 mg/l)	BDL (DL:0.0005 mg/l)	BDL (DL:0.0005 mg/l)	BDL (DL:0.0005 mg/l)
29	Anionic Detergents as	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)
30	Cynaide as CN	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)
31	Total Coliform	144 MPN/100ml	151 MPN/100ml	220 MPN/100ml	144 MPN/100ml
32	E-Coli	< 1.8 MPN/100ml	< 1.8 MPN/100ml	< 1.8 MPN/100ml	< 1.8 MPN/100ml
33	Barium as Ba	BDL(DL:0.05 mg/l)	BDL(DL:0.05 mg/l)	BDL(DL:0.05 mg/l)	BDL(DL:0.05 mg/l)
34	Ammonia (as Total	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)
35	Sulphide as H <sub>2</sub> S	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)
36	Molybdenum as Mo	BDL (DL:0.02 mg/l)	BDL (DL:0.02 mg/l)	BDL (DL:0.02 mg/l)	BDL (DL:0.02 mg/l)
37	Total Arsenic as As	BDL (DL:0.005 mg/l)	BDL (DL:0.005 mg/l)	BDL (DL:0.005 mg/l)	BDL (DL:0.005 mg/l)
38	Total Suspended Solids	BDL (DL:1.0 mg/l)	BDL (DL:1.0 mg/l)	BDL (DL:1.0 mg/l)	BDL (DL:1.0 mg/l)

\* IS: 10500:2012-Drinking Water Standards; # within the permissible limit as per the WHO Standard. The water can be used for drinking purpose in the absence of alternate sources. Note: SW- Surface water, GW – Ground water

**TABLE 3.10: SURFACE WATER SAMPLING RESULTS**

Sl. No.	Parameter	Unit	RESULT		CPCB Designated Best Use
			SW1- Eraiyyur Periya Eri	SW2- Sangaraparani River	
1	Colour	Hazen	10	5	300
2	Odour	-	Agreeable	Agreeable	Not specified
3	pH@ 25°C	-	7.91	7.19	6.5 – 8.5
4	Electrical Conductivity @ 25°C	µs/cm	1038	822	
5	Turbidity	NTU	3.2	2.4	Not specified
6	Total Dissolved Solids	mg/l	613	485	1500
7	Total Hardness as CaCO <sub>3</sub>	mg/l	183.19	126.24	Not specified
8	Calcium as Ca	mg/l	31.4	27.5	Not specified
9	Magnesium as Mg	mg/l	25.5	23.1	Not specified
10	Total Alkalinity as CaCO <sub>3</sub>	mg/l	180	130	Not specified
11	Chloride as Cl <sup>-</sup>	mg/l	143	105	600
12	Sulphate as SO <sub>4</sub> <sup>-</sup>	mg/l	70.1	45.5	400
13	Iron as Fe	mg/l	0.28	0.12	50
14	Free Residual Chlorine	mg/l	BDL (DL:0.1 mg/l)	BDL (DL:0.1)	400
15	Fluoride as F	mg/l	0.21	0.25	1.5
16	Nitrates as NO <sub>3</sub>	mg/l	8.16	5.5	50
17	Copper as Cu	mg/l	BDL (DL:0.01)		1.5
18	Manganese as Mn	mg/l	BDL (DL:0.02)		Not specified
19	Mercury as Hg	mg/l	BDL (DL:0.0005)		Not specified
20	Cadmium as Cd	mg/l	BDL (DL:0.001)		0.01
21	Selenium as Se	mg/l	BDL (DL:0.005)		Not specified
22	Aluminium as Al	mg/l	BDL (DL:0.005)		Not specified
23	Lead as Pb	mg/l	BDL (DL:0.005)		0.1
24	Zinc as Zn	mg/l	BDL(DL : 0.05)		15
25	Total Chromium	mg/l	BDL(DL : 0.02)		0.05
26	Boron as B	mg/l	BDL(DL : 0.05)		Not specified
27	Mineral Oil	mg/l	BDL(DL : 0.01)		Not specified
28	Phenolic Compounds as C <sub>6</sub> H <sub>5</sub> OH	mg/l	BDL (DL:0.0005)		0.005
29	Anionic Detergents as MBAS	mg/l	BDL (DL:0.01)		Not specified
30	Cyanide as CN	mg/l	BDL (DL:0.01)		0.05
31	Biological Oxygen Demand, 3 days @ 27°C		8.2	6.2	3
32	Chemical Oxygen Demand		44	40	Not specified
33	Dissolved Oxygen		5.5	5.2	4
34	Total Coliform	MPN/ 100ml	590 MPN/100ml	500 MPN/100ml	5000
35	E-Coli		70 MPN/100ml	122 MPN/100ml	Not specified
36	Barium as Ba	mg/l	BDL (DL:0.05)		300
37	Ammonia (as Total Ammonia-N)	mg/l	2.35	1.12	Not specified
38	Sulphide as H <sub>2</sub> S	mg/l	BDL (DL:0.01)		Not specified
39	Molybdenum as Mo	mg/l	BDL (DL:0.02)		Not specified
40	Total Arsenic as As	mg/l	BDL (DL:0.005)		0.2
41	Total Suspended Solids	mg/l	18	15.1	-

**Note :** APHA – American Public Health Association, BDL – Below Detection Limit, DL – Detection Limit, MPN – Most Probable Number.

### 3.2.4 Interpretation & Conclusion

#### Surface Water

The pH varied from 7.19 to 7.91 while turbidity found within the standards (Optimal pH range for sustainable aquatic life is 6.5 to 8.5 pH).

#### Total Dissolved Solids:

Total Dissolved Solids varied from 485 to 613mg/l, the TDS mainly composed of carbonates, bicarbonates, Chlorides, phosphates and nitrates of calcium, magnesium, sodium and other organic matter.

#### Other parameters:

Chloride content is 105 to 143mg/l. Nitrates varied from 5.5 to 8.16 mg/l, while sulphates varied from 45.5 to 70.1 mg/l.

#### Ground Water

The pH of the water samples collected ranged from 7.05 to 7.86 and within the acceptable limit of 6.5 to 8.5. pH, Sulphates and Chlorides of water samples from all the sources are within the limits as per the Standard. On Turbidity, the water samples meet the requirement. Total Dissolved Solids were found in the range of 526 to 684mg/l in all samples. Total hardness varied between 165.44 to 211.10 mg/l for all samples.

On Microbiological parameters, the water samples from all the locations meet the requirement. The parameters thus analysed were compared with IS 10500:2012 and are well within the prescribed limits.

### 3.2.5 Hydrology and Hydrogeological studies

The district is underlain by hard rock formation fissured and fractured crystalline rocks constitute the important aquifer systems in the district. Geophysical prospecting was carried out in that area by SSRMP-80 Instrument by qualified Geo physicist with the help of IGIS software and it was inferred that the low resistance encountered at the depth between 56m bgl. The maximum depth proposed out of proposed projects is 32m (2m Gravel + 30m Rough stone) below ground level.

#### Ground water levels and Flow Direction based on the Bore well and open well Data's

In general the ground water movement is based on the gradient ie., water moves from the highest static ground water elevation to lowest static ground water elevation point. The ground water movement is important aspect to locating the recharge and discharge areas. Therefore the data has been collected in the study area. Water level measured in the seven open well and six borewells.

The average water level in the open well is varies from = 9.1m to 11.8m bgl

The water level in the bore well is varies from = 57.5 to 59.6m bgl

Based on the water level contour map of the open well and bore well the water flow direction in the particular region is towards North side.

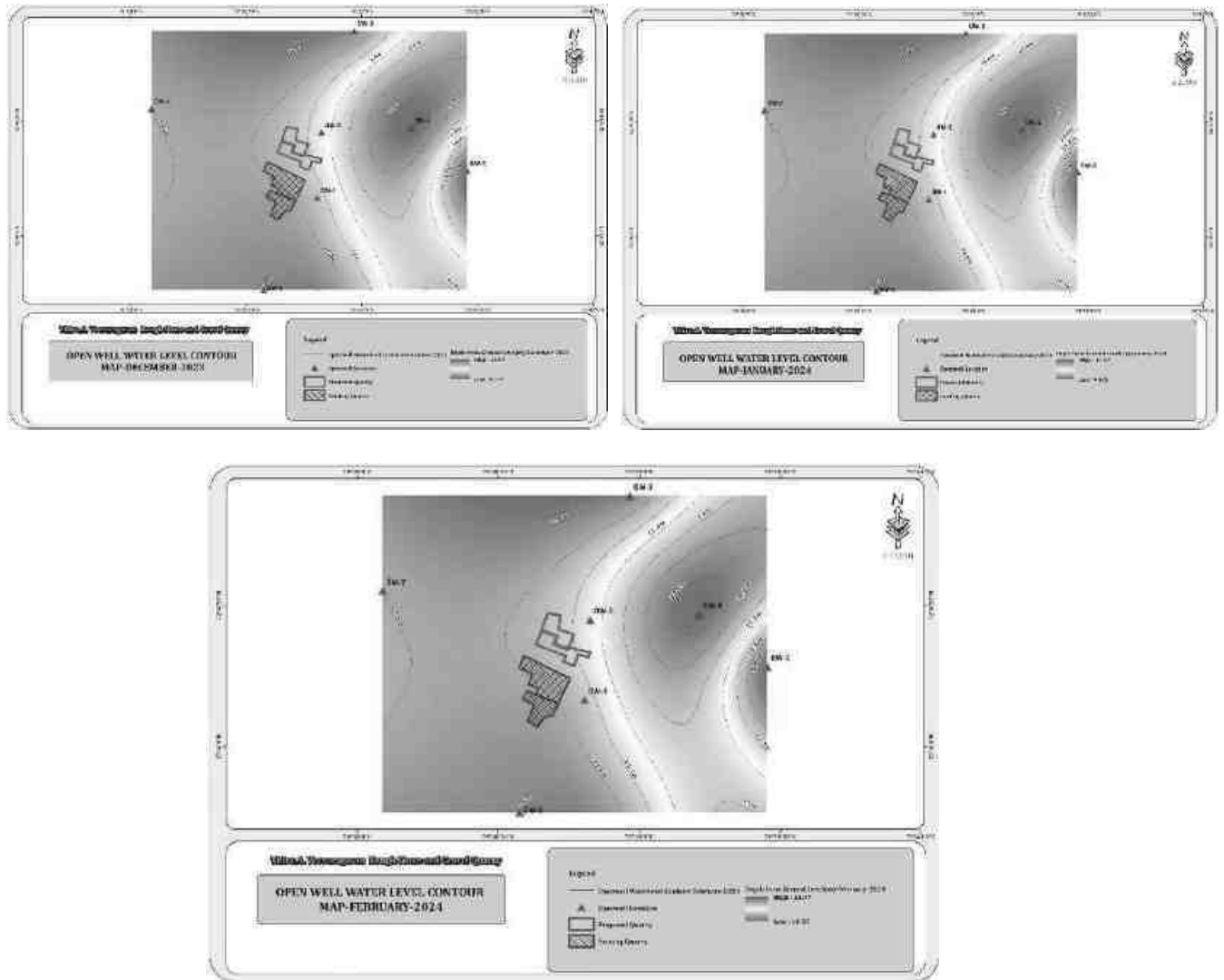
The water level in the area is above 56m hence there is no possibilities of water table intersection during the entire mine life period besides it is also inferred topographically that there are no major water bodies intersecting the project area.

**TABLE 3.11: WINTER SEASON WATER LEVEL OF OPEN WELLS 1 KM RADIUS**

S.NO	LABEL	LONGITUDE	LATITUDE	Dec-23	Jan-24	Feb-24
1	OW-1	12° 04' 09.9213" N	79° 38' 48.4105" E	10.1	10.9	11.5
2	OW-2	12° 04' 26.8845" N	79° 38' 49.6151" E	9.9	10.7	11.3
3	OW-3	12° 04' 53.2567" N	79° 38' 58.0813" E	10.4	11.2	11.8
4	OW-4	12° 04' 28.1037" N	79° 39' 12.8248" E	9.1	9.9	10.5
5	OW-5	12° 04' 16.9123" N	79° 39' 27.3325" E	10.6	11.4	12
6	OW-6	12° 03' 46.0292" N	79° 38' 34.6081" E	10.4	11.2	11.8
7	OW-7	12° 04' 33.0808" N	79° 38' 05.4673" E	10.2	11	11.6

Source: Onsite monitoring data

**FIGURE 3.9: OPEN WELL CONTOUR MAP Dec 2023- Feb 2024**

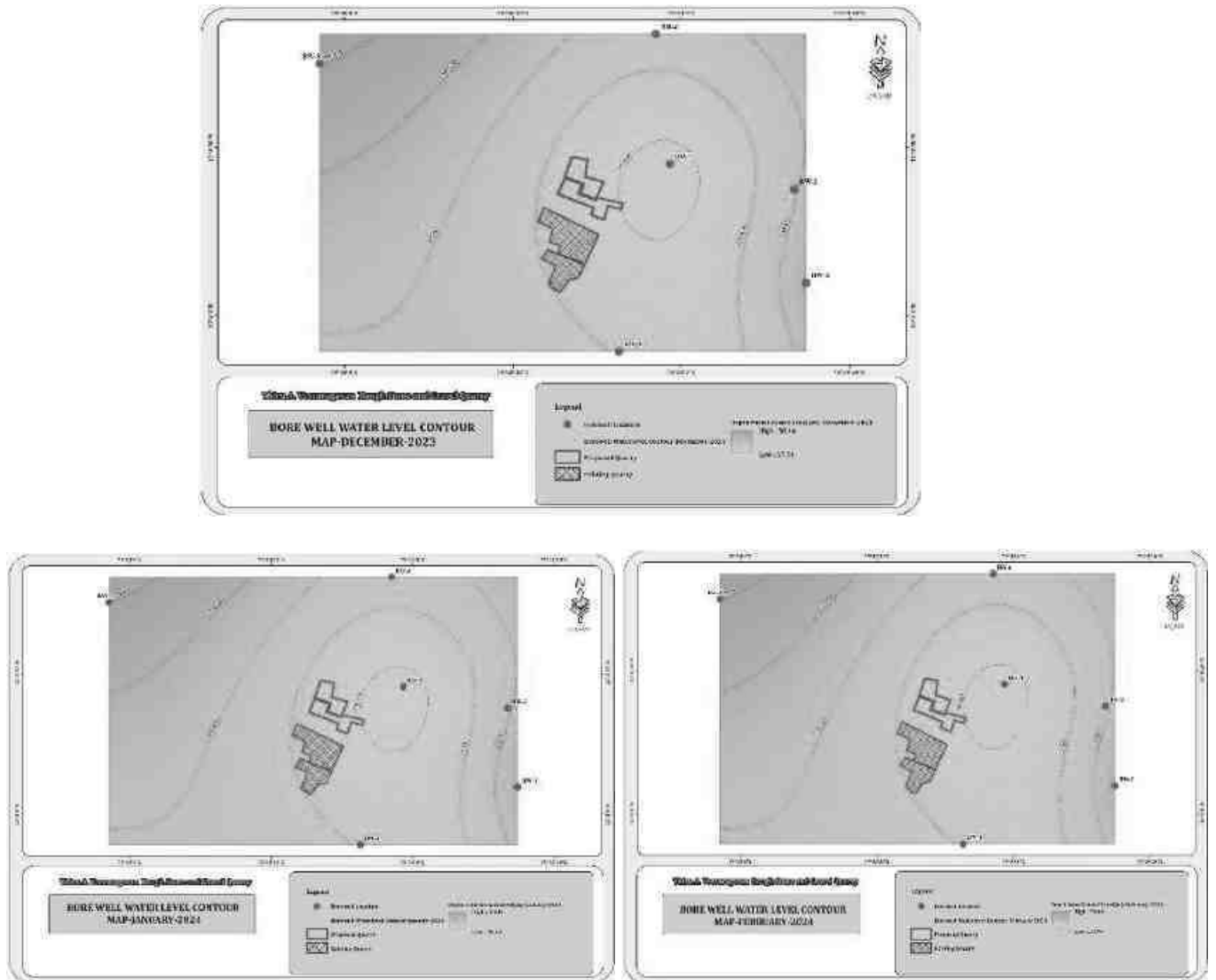


**TABLE 3.12: WINTER SEASON WATER LEVEL OF BOREWELLS 1 KM RADIUS**

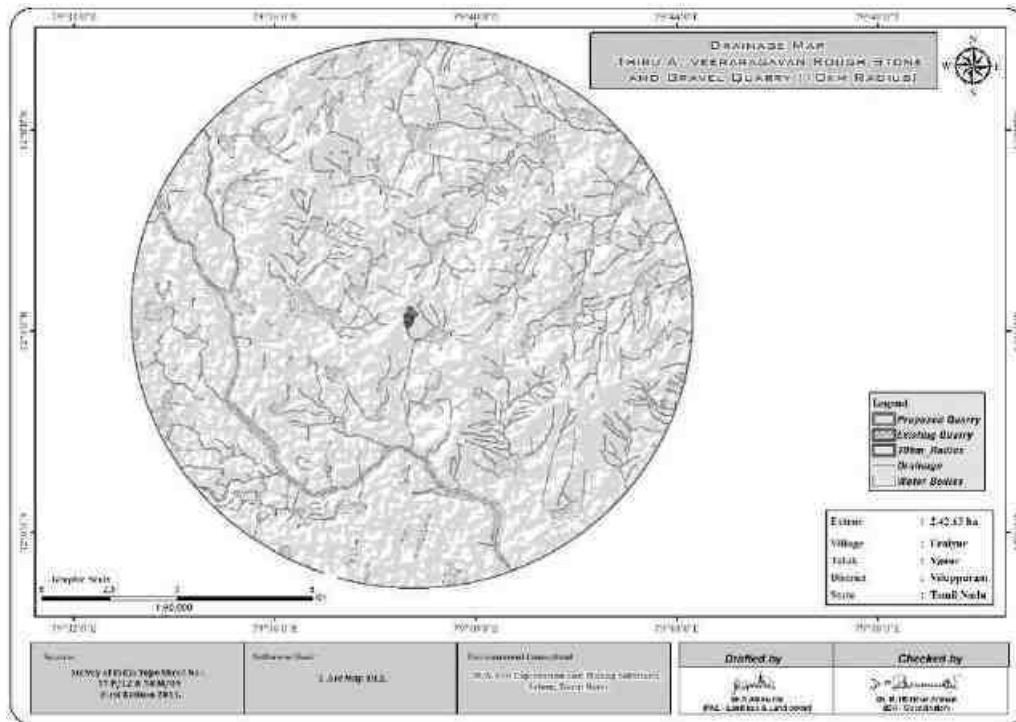
S.NO	LABEL	LONGITUDE	LATITUDE	Mar-23	Apr-23	May-23
1	BW1	12° 04' 27.0880" N	79° 38' 58.0141" E	57.5	58.1	58.7
2	BW2	12° 04' 22.5410" N	79° 39' 20.1612" E	58	58.6	59.2
3	BW3	12° 04' 05.7895" N	79° 39' 22.3612" E	58.2	58.8	59.4
4	BW4	12° 03' 53.5849" N	79° 38' 48.9224" E	57.8	58.4	59
5	BW5	12° 04' 44.9119" N	79° 37' 55.5521" E	58.4	59	59.6
6	BW6	12° 04' 50.3475" N	79° 38' 55.5163" E	57.9	58.5	59.1

Source: Onsite monitoring data

**FIGURE 3.10: BOREWELL CONTOUR MAP – Dec 2023 to Feb 2024**

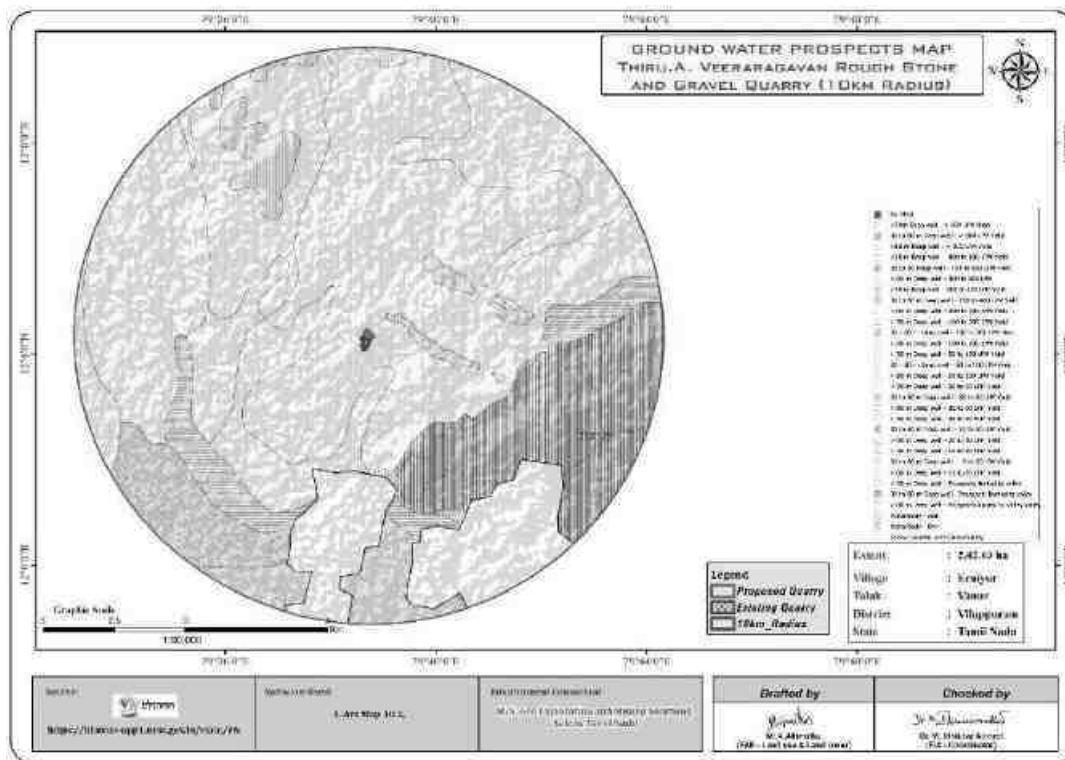


**FIGURE 3.11: DRAINAGE MAP AROUND 10 KM RADIUS FROM PROJECT SITE**



Remarks: it is inferred that the area is dendritic to sub dendritic pattern

**FIGURE 3.12: GROUND WATER PROSPECT MAP**



Remarks: Water table in the area is 30-80m as per the Bhuvan Data



## Geophysical Resistivity Survey

### 3.2.5.1 Methodology and Data Acquisition

The Geophysical Electrical Resistivity survey conducted in the area Schlumberger configuration, Vertical Electrical Sounding (VES) method. Schlumberger electrode set up was employed for making sounding measurements. Since it is least influenced by lateral in homogeneities and is capable of providing higher depth of investigation. This is four electrodes collinear set up where in the outer electrodes send current into the ground and the inner electrodes measure the potential difference.

The present study utilizes maximum current electrode separation  $AB/2$ . The data from this survey are commonly arranged and contoured in the form of Pseudo-section that gives an approximate of the subsurface resistivity. This technique is used for the inversion of Schlumberger VES data to predict the layer parameter namely layer resistivity and Geo electric layer thickness. The main goal of the present study is to search the vertical in homogeneities that is consistent with the measured data.

For a Schlumberger among the Apparent resistivity can be calculated as follows.

$$\rho_a = \frac{GAV}{I}$$

$\Delta V$  = potential difference between receiving electrodes

$G$  = Geometric Factor.

Rocks show wide variation in resistivity ranging from 10<sup>-8</sup> more than 10<sup>+14</sup> ohmmeter. On a broad classification, one can group the rocks falling in the range of 10<sup>-8</sup> to 1 ohmmeter as good conductors. 1 to 10<sup>6</sup> ohmmeter as intermediate conductors and 10<sup>6</sup> to 10<sup>12</sup> ohmmeter as more as poor conductor. The resistivity of rocks and subsurface lithology, which is mostly dependent on its porosity and the pore fluid resistivity is defined by Archie's Law,

$$\rho_r = F\rho_w = a \emptyset^m \rho_w$$

$\rho_r$  = Resistivity of Rocks

$\rho_w$  = Resistivity of water in pores of rock

$F$  = Formation Factor

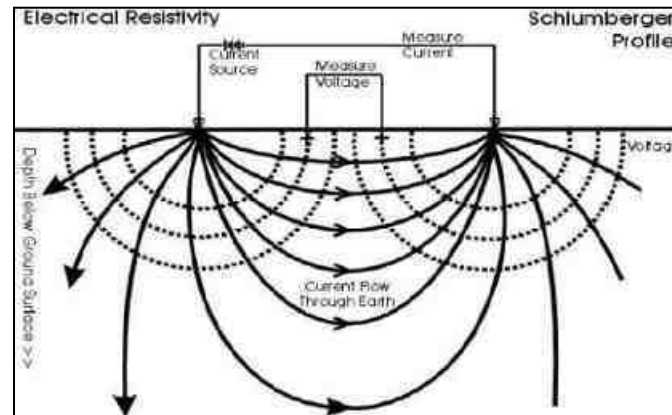
$\emptyset$  = Fractional pore volume

$A$  = Constants with values ranging from 0.5 to 2.5

### 3.2.5.2 Survey Layout

The field equipment deployed for the study is in a deep resistivity meter with a model of SSR – MP – AT. This Signal stacking Resistivity meter is a high-quality data acquisition system incorporating several innovation features for Earth resistivity. In the presence of random earth Noises the signal to noise ration can be enhanced by  $\sqrt{N}$  where  $N$  is the number of stacked readings. This SSR meter in which running averages of measurements  $[1, (1+2)/2, (1+2+3)/3 \dots (1+2\dots+16/16)]$  up to the chosen stacks are displayed and the final average is stored automatically, in memory utilizing the principles of stacking to achieve the benefit of high signals to noise ratio. Based on these above significations the signal stacking resistivity meter was used for (VES) Vertical Electric Resistivity Sounding.

## RESISTIVITY SURVEY PROFILE



Measurements of ground Resistivity is essentially done by sending a current through two electrodes called current electrodes ( $C_1$  &  $C_2$ ) and measuring the resulting potential by two other electrodes called potential electrode ( $P_1$  &  $P_2$ ). The amount of current required to be sent into the ground depends on the contact resistance at the current electrode, the ground resistivity and the depth of interest.

### 3.2.5.3 Data Presentation

It was inferred that the low resistance encountered at the depth between 56m. The maximum depth proposed out of proposed projects 32m BGL. Hence there is no possibilities of water table intersection during the entire mine life period besides it is also inferred topographically that there are no major water bodies intersecting the project area.

### 3.2.5.4 Geophysical Data Interpretation

The geophysical data was obtained to study the lateral variations, vertical in homogeneities in the sub – surface with respect to the availability of groundwater. From the interpreted data, it has inferred that the area has moderate groundwater potential in the investigated area. This small quarrying operation will not have any significant impact on the natural water bodies.

It is inferred that the existing quarries in the surrounding area reaches maximum of 45m and the water table is not intersected, only the seepage water during rainy season encountered from the upper layer and it will be used for the Greenbelt development, Dust suppression and quarrying operation.

### 3.3 AIR ENVIRONMENT

The existing ambient air quality of the area is important for evaluating the impact of mining activities on the ambient air quality.

The baseline studies on air environment include identification of specific air pollution parameters and their existing levels in ambient air. The ambient air quality with respect to the study zone of 10 km radius around the cluster forms the baseline information. The prime objective of the baseline air quality study was to establish the existing ambient air quality of the study area. These will also be useful for assessing the conformity to standards of the ambient air quality during the operation of proposed projects in cluster.

#### 3.3.1 Meteorology & Climate

Meteorology is the key to understand the Air quality. The essential relationship between meteorological condition and atmospheric dispersion involves the wind in the broadest sense. Wind fluctuations over a very wide range of time, accomplish dispersion and strongly influence other processes associated with them.

A temporary meteorological station was installed at project site by covering cluster quarries. The station was installed at a height of 3 m above the ground level in such a way that there are no obstructions facilitating flow of wind, wind speed, wind direction, humidity and temperature are recorded on hourly basis.

#### Climate

- This city has a tropical climate. In winter, there is much less rainfall in Villupuram than in summer. This climate is considered to be Aw according to the Köppen-Geiger climate classification. The average annual temperature is 28.0 °C | 82.4 °F in Villupuram. The annual rainfall is 1040 mm | 40.9 inch.
- The location Villupuram is located in a temperate zone, making it difficult to categorize the seasons. The most opportune time to visit are January, February, March, December.
- The driest month is February, with 11 mm | 0.4 inch of rainfall. With an average of 208 mm | 8.2 inch, the most precipitation falls in October.
- The warmest month of the year is May, with an average temperature of 31.9 °C | 89.4 °F. January has the lowest average temperature of the year. It is 24.0 °C | 75.2 °F.

<https://en.climate-data.org/asia/india/tamil-nadu/villupuram-34141/>

## Rainfall

**TABLE 3.13: RAINFALL DATA**

Actual Rainfall in mm					Normal Rainfall in mm
2017	2018	2019	2020	2021	
1066.9	727.5	906.3	1137.7	1935.2	985

Source: <https://www.twadboard.tn.gov.in/content/Villupuram>

**TABLE 3.14: METEOROLOGICAL DATA RECORDED AT SITE**

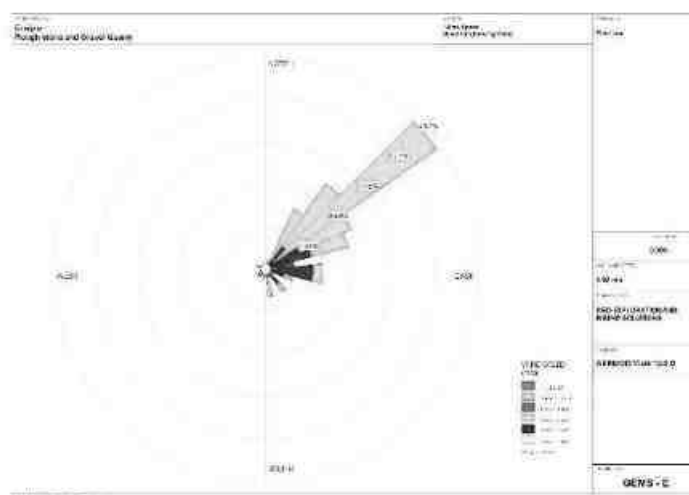
S. No	Parameters		Dec-2023	Jan-2024	Feb 2024
1	Temperature ( $^{\circ}$ C)	Max	27.26	26.62	29.65
		Min	23.09	24.15	25.74
		Avg.	25.17	25.38	27.69
2	Relative Humidity (%)	Avg.	85.53	76.15	69.56
3	Wind Speed (m/s)	Max	5.45	6.09	4.71
		Min	1.84	2.01	2.45
		Avg.	3.64	4.05	3.58
4	Cloud Cover (OKTAS)		0-8	0-8	0-8
5	Wind direction		NE, NNE	NE, ENE	ENE, NE

Source: On-site monitoring/sampling by EHS 360 lab in association with GEMS

### Correlation between Secondary and Primary Data

The average rain fall over the period of five years is 985mm. The meteorological data collected at the site is almost similar to that of secondary data collected from IMD Villupuram. A comparison of site data generated during the three months with that of IMD, Villupuram. Wind rose diagram of the study site is depicted in Figure. 3.13 Predominant downwind direction of the area during study season is -South East to North East.

**FIGURE 3.13: WINDROSE DIAGRAM**



In the abstract of collected data wind rose were drawn on presented in figure No.3.14 during the monitoring period in the study area

1. Predominant winds were from NE, E, SSE
2. Wind velocity readings were recorded between 0.50 to 8.80m/s

3. Calm conditions prevail of about 0 % of the monitoring period
4. Temperature readings ranging from 23.09 to 29.65 °C
5. Relative humidity ranging from 69.56 to 85.53 %
6. The monitoring was carried out continuously for three months.

### 3.3.2 Methodology and Objective

The prime objective of the ambient air quality study is to assess the existing air quality of study area and its conformity to NAAQS. The observed sources of air pollution in the study area are industrial, traffic and domestic activities. The baseline status of the ambient air quality has been established 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; etc.,

### 3.3.3 Sampling and Analytical Techniques

**TABLE 3.15: METHODOLOGY AND INSTRUMENT USED FOR AAQ ANALYSIS**

Parameter	Method	Instrument
PM2.5	Gravimetric Method Beta attenuation Method	Fine Particulate Sampler Make – Thermo Environmental Instruments – TEI 121
PM10	Gravimetric Method Beta attenuation Method	Respirable Dust Sampler Make –Thermo Environmental Instruments – TEI 108
SO2	IS-5182 Part II (Improved West & Gaeke method)	Respirable Dust Sampler with gaseous attachment
NOx	IS-5182 Part II (Jacob & Hochheiser modified method)	Respirable Dust Sampler with gaseous attachment
Free Silica	NIOSH – 7601	Visible Spectrophotometry

Source: Sampling Methodology followed by EHS 360 lab & CPCB Notification

**TABLE 3.16: NATIONAL AMBIENT AIR QUALITY STANDARDS**

Sl.No.	Pollutant	Time Weighted Average	Concentration in ambient air	
			Industrial, Residential, Rural & other areas	Ecologically Sensitive area (Notified by Central Govt.)
1	Sulphur Dioxide ( $\mu\text{g}/\text{m}^3$ )	Annual Avg.* 24 hours**	50.0 80.0	20.0 80.0
2	Nitrogen Dioxide ( $\mu\text{g}/\text{m}^3$ )	Annual Avg. 24 hours	40.0 80.0	30.0 80.0
3	Particulate matter (size less than $10\mu\text{m}$ ) PM10 ( $\mu\text{g}/\text{m}^3$ )	Annual Avg. 24 hours	60.0 100.0	60.0 100.0
4	Particulate matter (size less than $2.5\mu\text{m}$ ) PM2.5 ( $\mu\text{g}/\text{m}^3$ )	Annual Avg. 24 hours	40.0 60.0	40.0 60.0

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

\*Annual Arithmetic mean of minimum 104 measurements in a year taken twice a Week 24 hourly at uniform interval,

\*\* 24 hourly / 8 hourly or 1 hourly monitored Value as applicable shall be complied with 98 % of the time in a year. However, 2% of the time, they may exceed the limits but not on two consecutive days of monitoring.

### 3.3.4 Frequency & Parameters for Sampling

Ambient air quality monitoring has been carried out with a frequency of two samples per week at eight (8) locations, adopting a continuous 24 hourly (3 shift of 8-hour) schedule for the period Dec 2023 – Feb 2024. The baseline data of ambient air has been generated for PM<sub>10</sub>, PM<sub>2.5</sub>, Sulphur Dioxide (SO<sub>2</sub>) & Nitrogen Dioxide (NO<sub>2</sub>) Monitoring has been carried out as per the CPCB, MoEF guidelines and notifications.

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 open space free from trees and vegetation which otherwise act as a sink of pollutants resulting in lower levels in monitoring results.

### 3.3.5 Ambient Air Quality Monitoring Stations

Seven (7) monitoring stations were set up in the study area as depicted in Figure 3.15 for assessment of the existing ambient air quality. Details of the sampling locations are as per given below.

**TABLE 3.17: AMBIENT AIR QUALITY (AAQ) MONITORING LOCATIONS**

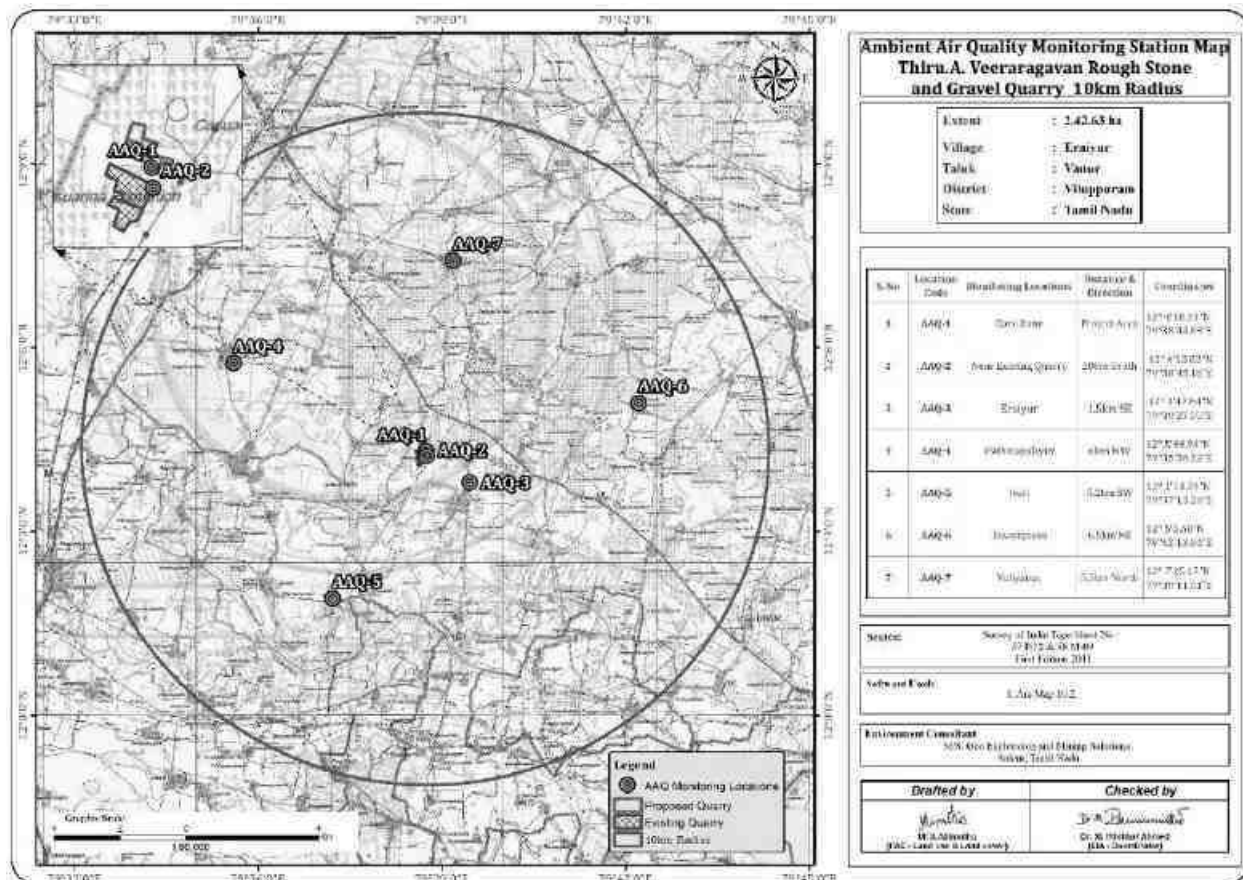
S. No	Location Code	Monitoring Locations	Distance & Direction	Coordinates
1	AAQ-1	Core Zone	Project Area	12° 4'18.33"N 79°38'44.83"E
2	AAQ-2	Near Existing Quarry	100m South	12° 4'13.82"N 79°38'45.18"E
3	AAQ-3	Eraiyyur	1.5km SE	12° 3'47.84"N 79°39'27.55"E
4	AAQ-4	Pathirapuliyyur	6km NW	12° 5'44.96"N 79°35'36.32"E
5	AAQ-5	Iveli	5.2km SW	12° 1'54.39"N 79°37'13.24"E
6	AAQ-6	Ilavampattu	6.5km NE	12° 5'5.60"N 79°42'13.04"E
7	AAQ-7	Veliyanur	5.5km North	12° 7'25.17"N 79°39'11.51"E

Source: On-site monitoring/sampling by EHS 360 lab in association with GEMS.

**FIGURE 3.14: AIR QUALITY MONITORING PHOTOGRAPHS**



**FIGURE 3.15: AMBIENT AIR QUALITY LOCATIONS AROUND 10 KM RADIUS**



**TABLE 3.18: SUMMARY OF AAQ 1 to AAQ 8**

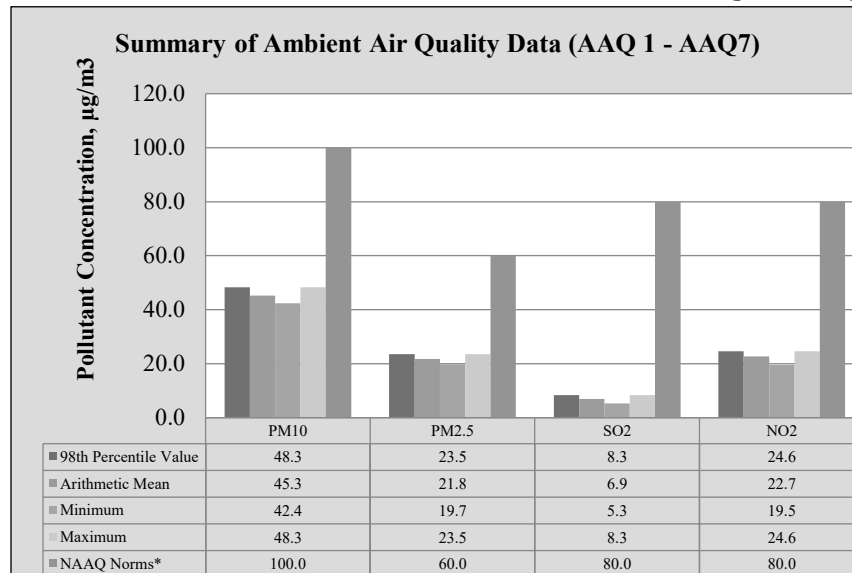
<b>PM10</b>	AAQ1 Core zone	AAQ2 Near Existing Quarry	AAQ3 Eraiyr	AAQ4 Pathirapuliyur	AAQ5 Iveli	AAQ6 Ilavampattu	AAQ7 Veliyanur
Arithmetic Mean	45.6	44.4	43.3	44.3	45.4	44.0	46.0
Minimum	44.2	42.1	41.0	43.1	40.3	42.0	43.2
Maximum	46.3	46.9	45.6	46.3	48.1	45.8	48.5
<b>NAAQ Norms</b>	100.0	100.0	100.0	100.0	100.0	100.0	100.0
<b>PM2.5</b>	AAQ1	AAQ2	AAQ3	AAQ4	AAQ5	AAQ6	AAQ7
Arithmetic Mean	21.4	21.5	20.7	22.4	22.2	21.8	19.5
Minimum	20.1	20.0	20.0	0.0	20.0	20.1	18.0
Maximum	22.8	22.5	22.3	0.0	23.6	23.0	21.5
<b>NAAQ Norms</b>	60.0	60.0	60.0	60.0	60.0	60.0	60.0
<b>SO2</b>	AAQ1	AAQ2	AAQ3	AAQ4	AAQ5	AAQ6	AAQ7
Arithmetic Mean	6.7	6.7	6.2	6.5	6.6	6.3	7.3
Minimum	5.4	5.2	5.0	5.2	4.6	5.0	6.0
Maximum	8.2	7.6	7.8	7.6	7.6	7.5	8.4
<b>NAAQ Norms</b>	80.0	80.0	80.0	80.0	80.0	80.0	80.0
<b>NO2</b>	AAQ1	AAQ2	AAQ3	AAQ4	AAQ5	AAQ6	AAQ7
Arithmetic Mean	23.5	22.5	23.3	22.7	20.7	22.3	20.6
Minimum	22.1	21.3	21.3	21.0	18.8	20.0	18.0
Maximum	24.5	23.5	24.8	24.5	24.0	23.7	22.6
<b>NAAQ Norms</b>	80.0	80.0	80.0	80.0	80.0	80.0	80.0



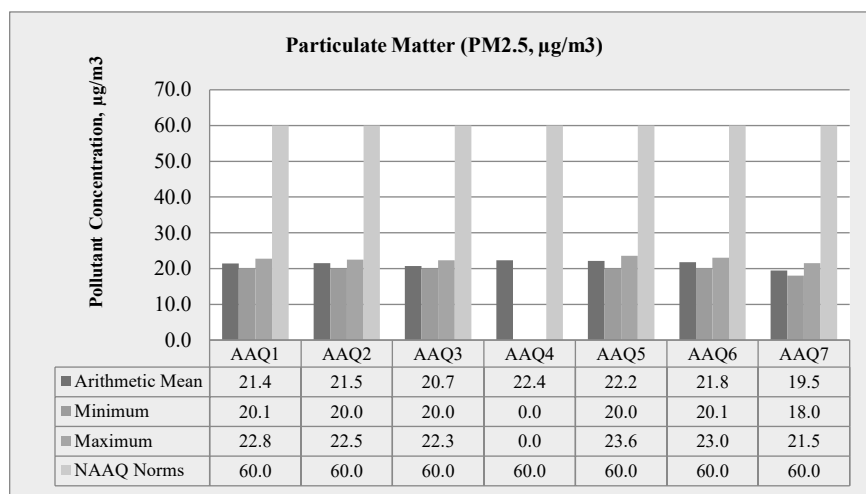
**TABLE 3.19: ABSTRACT OF AMBIENT AIR QUALITY DATA**

1	Parameter	PM10	PM2.5	SO <sub>2</sub>	NO <sub>2</sub>
2	No. of Observations	260	260	260	260
3	98 <sup>th</sup> Percentile Value	48.3	23.5	8.3	24.6
4	Arithmetic Mean	45.3	21.8	6.9	22.7
5	Geometric Mean	45.2	21.7	6.8	22.6
6	Standard Deviation	2.0	1.3	0.9	1.6
7	Minimum	42.4	19.7	5.3	19.5
8	Maximum	48.3	23.5	8.3	24.6
9	<b>NAAQ Norms*</b>	<b>100.0</b>	<b>60.0</b>	<b>80.0</b>	<b>80.0</b>
	% Values exceeding Norms*	0.0	0.0	0.0	0.0

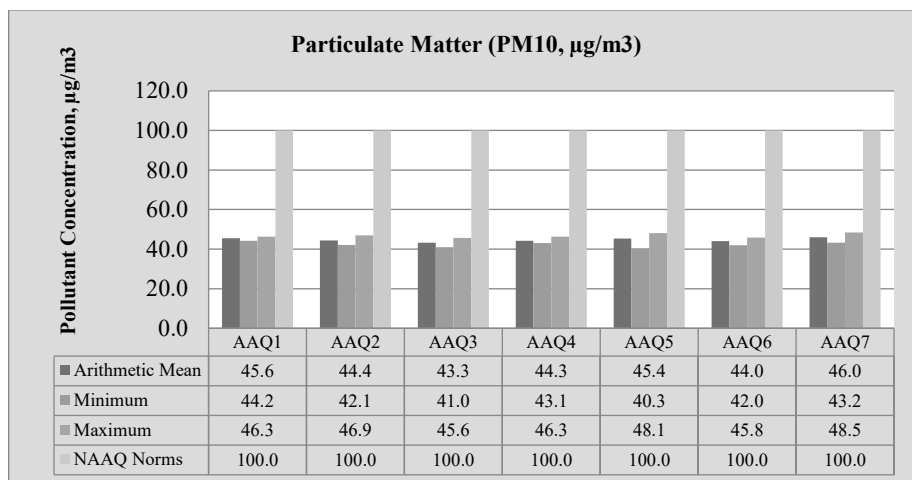
**FIGURE 3.16: BAR DIAGRAM OF SUMMARY OF AAQ 1 – AAQ7**



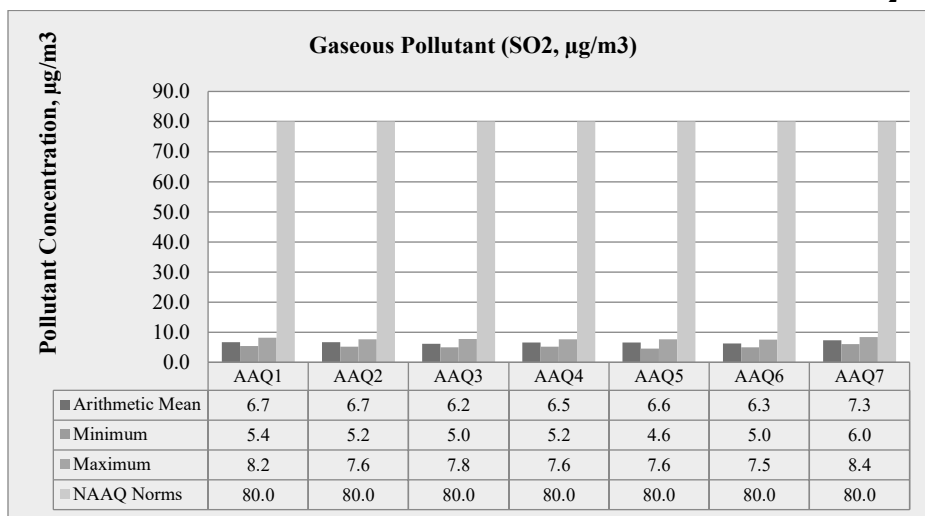
**FIGURE 3.17: BAR DIAGRAM OF PARTICULATE MATTER PM<sub>2.5</sub>**



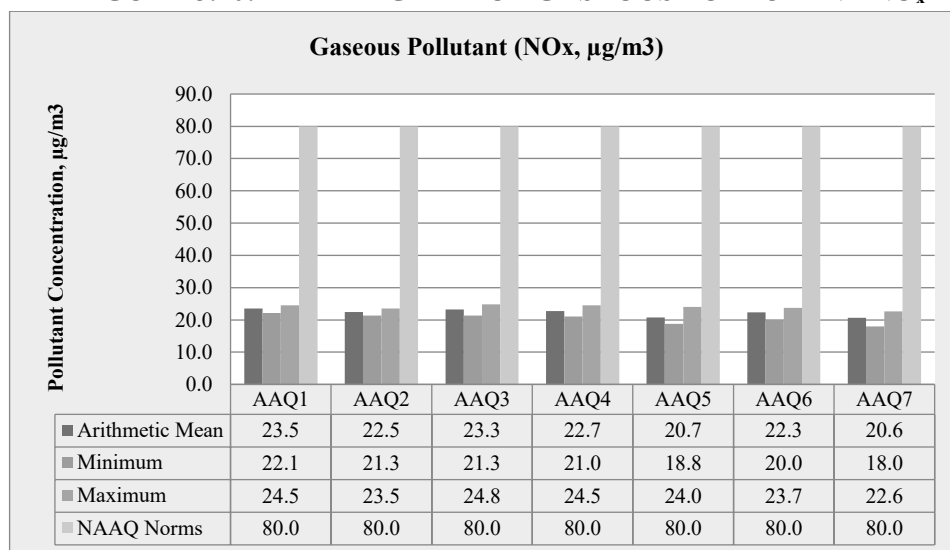
**FIGURE 3.18: BAR DIAGRAM OF PARTICULATE MATTER PM<sub>10</sub>**



**FIGURE 3.19: BAR DIAGRAM OF GASEOUS POLLUTANT SO<sub>2</sub>**



**FIGURE 3.20: BAR DIAGRAM OF GASEOUS POLLUTANT NO<sub>x</sub>**



### 3.3.6 Interpretations & Conclusion

As per monitoring data, PM<sub>10</sub> ranges from 40.3 µg/m<sup>3</sup> to 48.5 µg/m<sup>3</sup>, PM<sub>2.5</sub> data ranges from 18 µg/m<sup>3</sup> to 23.6 µg/m<sup>3</sup>, SO<sub>2</sub> ranges from 4.6µg/m<sup>3</sup> to 8.4 µg/m<sup>3</sup> and NO<sub>2</sub> data ranges from 18.0 µg/m<sup>3</sup> to 24.8 µg/m<sup>3</sup>. The concentration levels of the above criteria pollutants were observed to be well within the limits of NAAQS prescribed by CPCB.

## 3.4 NOISE ENVIRONMENT

The vehicular movement on road and mining activities is the major sources of noise in study area, the environmental assessment of noise from the mining activity and vehicular traffic can be undertaken by taking into consideration various factors like potential damage to hearing, physiological responses, and annoyance and general community responses. The main objective of noise monitoring in the study area is to establish the baseline noise level and assess the impact of the total noise expected to be generated during the project operations around the project site.

### 3.4.1 Identification of Sampling Locations

In order to assess the ambient noise levels within the study area, noise monitoring was carried out at Seven (7) locations. The noise level measurement was carried out at each ambient air quality station. The main aim of the noise level monitoring is

- To assess the ambient Noise level in the study area
- Type of noise pollution generated in the core zone
- To predict the temporal changes in the ambient noise level in the area

The noise level monitoring locations were carried out by covering commercial, residential, rural areas within the radius of 10km. A noise monitoring methodology was chosen such that it best suited the purpose and objectives of the study.

**TABLE 3.21: DETAILS OF SURFACE NOISE MONITORING LOCATIONS**

S. No	Location Code	Monitoring Locations	Distance & Direction	Coordinates
1	N1	Core Zone	Project Area	12° 4'21.89"N 79°38'38.45"E
2	N2	Near Existing Quarry	100m South	12° 4'9.82"N 79°38'43.35"E
3	N3	Eraiyyur	1.5km SE	12° 3'47.39"N 79°39'27.68"E
4	N4	Pathirapuliyur	6km NW	12° 5'45.20"N 79°35'35.75"E
5	N5	Iveli	5.2km SW	12° 1'55.12"N 79°37'13.62"E
6	N6	Ilavampattu	6.5km NE	12° 5'0.83"N 79°42'12.46"E
7	N7	Veliyanur	5.5km North	12° 7'25.81"N 79°39'11.33"E

Source: On-site monitoring/sampling by EHS 360 lab in association with GEMS.

### 3.4.2 Method of Monitoring

Digital Sound Level Meter was used for the study. All reading was taken on the 'A-Weighting' frequency network, at a height of 1.5 meters from ground level. The sound level meter does not give a steady and consistent reading and it is quite difficult to assess the actual sound level over the entire monitoring period. To mitigate this shortcoming, the Continuous Equivalent Sound level, indicated by Leq, is used. Equivalent sound level, 'Leq', can

be obtained from variable sound pressure level, 'L', over a time period by using following equation. The equivalent noise level is defined mathematically as,

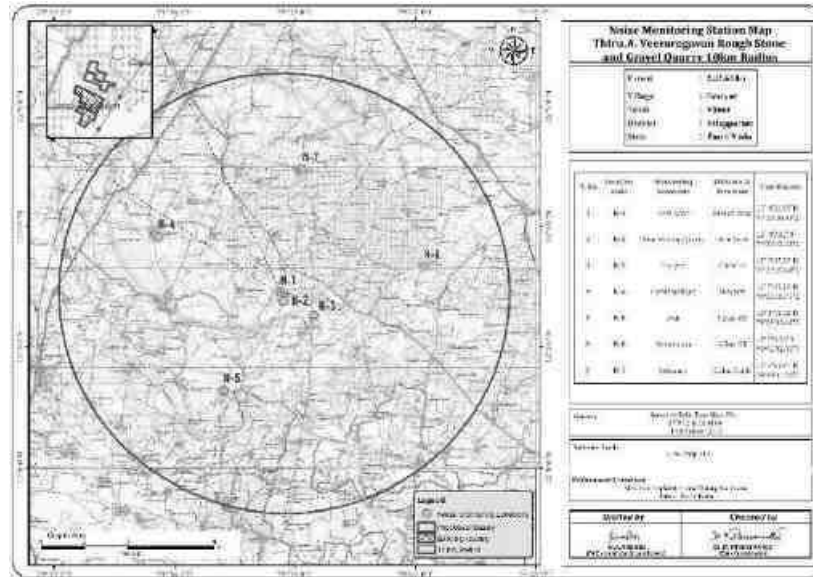
$$Leq = 10 \text{ Log } L / T \sum (10L_n/10)$$

Where L = Sound pressure level at function of time dB (A)

T = Time interval of observation

Measured noise levels, displayed as a function of time, is useful for describing the acoustical climate of the community. Noise levels recorded at each station with a time interval of about 60minutes are computed for equivalent noise levels. Equivalent noise level is a single number descriptor for describing time varying noise levels.

**FIGURE 3.23: NOISE MONITORING STATIONS AROUND 10 KM RADIUS**



### 3.4.3 Analysis of Ambient Noise Level in the Study Area

The Digital Sound pressure level has been measured by a sound level meter (Model: HTC SL-1352)

An analysis of the different Leq data obtained during the study period has been made. Variation was noted during the day-time as well as night-time. The results are presented in below Table 3.32.

Day time: 6:00 hours to 22.00 hours.

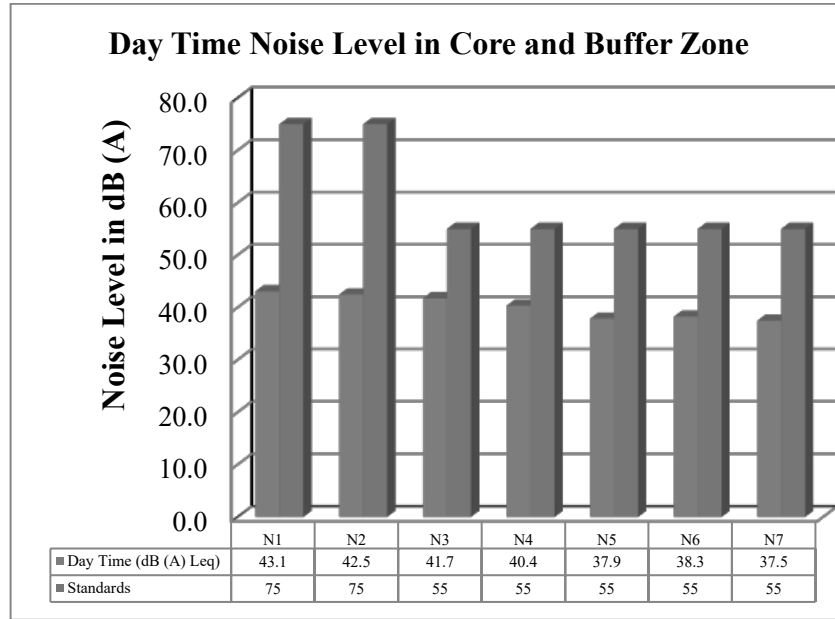
Night time: 22:00 hours to 6.00 hours.

**TABLE 3.22: AMBIENT NOISE QUALITY RESULT**

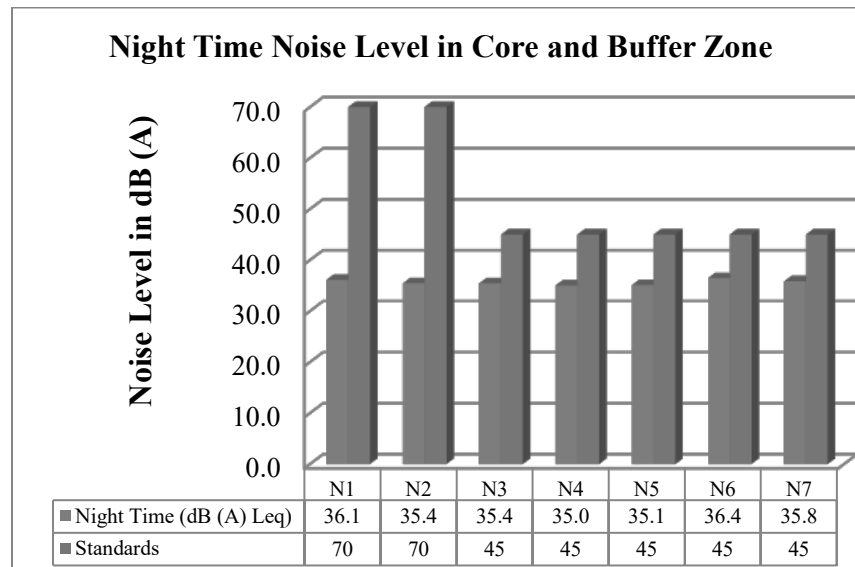
S. No	Locations	Noise level (dB (A) Leq)		Ambient Noise Standards
		Day Time	Night Time	
1	Core Zone	43.1	36.1	<b>Industrial</b> Day Time- 75 dB (A) Night Time- 70 dB (A)
2	Near Existing Quarry	42.5	35.4	
3	Eraiyyur	41.7	35.4	
4	Pathirapuliyur	40.3	35.0	
5	Iveli	37.9	35.1	<b>Residential</b> Day Time- 55 dB (A) Night Time- 45 dB (A)
6	Ilavampattu	38.3	36.4	
7	Veliyanur	37.5	35.8	

Source: On-site monitoring/sampling by EHS 360 lab Private Limited in association with GEMS

**FIGURE 3.24: DAY TIME NOISE LEVELS IN CORE AND BUFFER ZONE**



**FIGURE 3.25: NIGHT TIME NOISE LEVELS IN CORE AND BUFFER ZONE**



**3.4.4 Interpretation & Conclusion:**

Ambient noise levels were measured at 7 (Seven) locations around the proposed project area. Noise levels recorded in core zone during day time were from 43.1 dB (A) Leq and during night time were from 36.1 dB (A) Leq. Noise levels recorded in buffer zone during day time were from 37.5 to 42.5 dB (A) Leq and during night time were from 35.6 to 36.4 dB (A) Leq. Thus, the noise level for Industrial and Residential area meets the requirements of CPCB.

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### **3.5. Biological Environment**

#### **3.5.1. Study area Ecology**

Ecology is a branch of science that dealing the relations and interactions between organisms and their environment. An ecological survey of the study area was conducted, particularly with reference to the listing of species and assessment of the existing baseline ecological conditions in the study area. The main objective of the biological study is to collect the baseline data regarding flora and fauna in the study area. Data has been collected through extensive surveys of the area with reference to flora and fauna. Information is also collected from different sources i.e. government departments such as the District Forest Office, Government of Tamil Nadu.

#### **3.5.2. Objectives of Biological Studies**

- Undertake an intensive field survey to assess the status of floral & faunal component in different habitats in the core and buffer areas of the project site.
- Identification and listing of flora and fauna which are important as per the Wildlife (Protection) Act 1972.
- Suggest Wildlife conservation (species specific/habitat specific) and management plan for the threatened (critically endangered & endangered species - schedule I) faunal species if any reported within the study area.
- To identify the impacts of mining on agricultural lands and how it affects.
- Proper collection of information about wildlife Sanctuaries/ national parks/ biosphere reserves of the project area.
- Devise management & conservation measures for biodiversity.

##### **3.5.2.1. Field surveys**

The field visit was carried out to understand and assess the impacts of mining activities on flora & fauna and natural habitats and prediction after the enhancement of the production capacity of the mine. We evaluated the distribution and abundance of flora and fauna in the study area through primary and secondary data sources.

##### **3.5.2.2. Floral Study**

- The floral survey of the project area is based on field survey of the area.
- The local flora was identified by their morphological observation, such as the size, age and shape of the leaf, flowers, fruits, and their bark features of the stem, and also documented their habitat viz. Trees, Shrubs, Herbs, Grasses, Climbers etc.
- After surveying the core and the buffer areas, a detailed floral inventory has been compiled. A list of all plants from the study area was prepared and their habitats were recorded.
- The observations were taken on natural vegetation, roadside plantations, and non-forest areas (agricultural fields, in plain areas, village wasteland, etc.) for quantitative representation of different species.

##### **3.5.3. Methodology of Sampling**

Primary survey was conducted with established and accepted ecological methods in different habitats of study area. The field data collection mainly included biodiversity status assessment of different life forms habit of flora elements such as Trees, Shrubs, Climbers Herbs and Grass. Faunal diversity was assessed by inventorying the taxonomical groups like Mammals, Herpetofauna, birds and butterflies.

Nocturnal faunal species were searched by locating their calls during night time and by searching along the forest shrubs areas, dense dry bushes, below the stones, water bodies. During the study, to know more about

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the seasonal presence of flora and faunal species, information was obtained from local people and forest department.

Identification of vegetation in relation to the natural flora and crops was conducted through reconnaissance field surveys and onsite observations in core and buffer zone. The plant species identification was done based on the reference materials and also by examining the morphological characteristics and reproductive materials i.e. flowers, fruits and seeds. Land use pattern in relation to agriculture crop varieties were identified through physical verification of land and interaction with local villagers.

Plot method is used in the floral documentation in the core and buffer zone. For trees (10x10-m), shrubs (5x5-m) and herbs (1x1-m) plots were taken. Birds and butterflies were mainly focused during faunal assessment, transect method was employed for birds and butterflies. Transect is a path along which one counts and records the occurrence of an individual for study. A straight-line walk covering desired distance, within a time span of one hour to 30 minutes was carried out in the proposed region. Bird species were recorded during the hours of peak activity. 0700 to 1100 Hrs and 1430 to 1730 Hrs (Bibby et al. 2000).

Direct observations and bird calls were used for bird documentation. Same transects were used for counting butterflies. Opportunistic observations were made for Amphibians, reptiles and ordinates. Presence of mammals was recorded by direct and indirect signs. All possible transects were taken for birds and butterflies. Birds and butterflies were classified into species level. Recorded bird species were identified to species level using standard books (Ali & Ripley 1987, Grimmett et al., 2016).

**The secondary baseline data of flora and fauna has been compiled through the following data sources:**

1. Forest working plan
2. Schedule I to V: Indian Wildlife (Protection) Act, 1972
3. Vivek Menon, Indian Mammals: A Field Guide. Hachette Book publishing India Pvt.Ltd., India.
4. Daniel J.C. The Book of Indian Reptiles and Amphibians, Bombay Natural History Society., India.
5. Ali, S and Ripley. handbook of the Birds of India and Pakistan together with those of Nepal, Sikkim and Bhutan, Oxford University Press, Bombay.
6. ENVIS Centre on Wildlife and Protected Area.
7. Birds Life Data Zone
8. Ebird.org
9. Global Biodiversity Information Facility

### **3.5.3.1. Sampling**

A stratified simple random sampling procedure was employed to obtain a sample from study area. The study area was further stratified in different land use/ecosystems.

### **3.5.3.2. Sampling Size**

Keeping in mind both random sampling technique and covering all land use patterns for the study following sampling locations were chosen depending up on the area of the proposed site.

### **3.5.3.3. Timing of Study**

The study was carried out during morning and evening hours, to cover the different activity phases for important species such as time resting, feeding, hunting, and daily movements.

### **3.5.3.4. Observations from Sampling**

The various observations relating to flora and fauna species are discussed in detail below, in separate sections.

### 3.5.3.5. Field Equipment's/ References

Following tools/equipment were used for conducting phytosociological study.

- Ballpoint pen, Field bags, Field notebooks, field shoes, gloves, GPS, Measuring tapes and scales, Plant cutters, packet lens, ropes etc.
- Canon Mark III Camera with 50-500mm lens– Snap shots taken
- Leica Binoculars (8x 20) to spot/identify species
- IUCN Red Data Book – <https://www.iucnredlist.org/species>.

Ornithological/Entomological/Herpetological/Mammalian catalogues and pictorial descriptions from various authors and websites are followed for species identification.

### 3.5.4. Part I Field Sampling Techniques (Fauna Sampling)

#### 3.5.4.1. Transect walk – Birds

Six no transect lines with varying length (100m-300m) and fixed width (2m) were laid which cuts through the core and buffer areas of proposed site. The transect surveys were conducted from 0700 to 1100Hrs and 1430 to 1730Hrs (Bibby et al. 2000). All avifauna found along these transects were recorded for analysing the data. Counts were conducted while there is no heavy rain, mist or strong wind.

#### 3.5.4.2. Modified Pollard Walk – for Butterflies

The Modified Pollard Walk (Pollard 1977, 1993, Walpole 1999) using fixed width transect walk method were employed to investigate butterfly spatial distribution, diversity and abundance at the different survey sites.

#### 3.5.4.3. Visual Encounter Survey (VES) - reptiles and Amphibians

VES is a time-constrained sampling technique (Campbell and Christman, 1982; Corn and Bury, 1990). It needs a systematic search through an area or habitat for a prescribed time period (Campbell and Christman, 1982). The result of VES is measured against the time spent on search. VES technique is one of the simplest methods, and an appropriate technique for both inventory and monitoring Herpetofauna (Heyer et al. 1994).

#### 3.5.4.4. Observational methods- Mammals

For the purpose of recording mammals, we used two different observational techniques: (1) direct observations, and (2) recording of occurrences like holes, markings, scats, hairs, and spines (Menon 2003). For identification confirmations, photographs with a scale reference were used, and locations were recorded using a portable GPS device. Indigenous knowledge particularly that of the locals, was occasionally employed to compile a preliminary list of species and/or aid in the recognition of indicators.

### 3.5.5. Flora Composition in the Core Zone (Primary Survey)

Core zone flora sampling was conducted between 8.00 am to 10.00 am in three locations. The proposed applied lease area is flat topography, we used quadrat sampling methods. Taxonomically a total of 9 species belonging to 8 families have been recorded from the core mining lease area. Based on the habitat classification of the enumerated plants the majority of species were Herbs 6 followed by trees 2, and Shrubs 1. Details of flora with the scientific name were mentioned in Table No. 3.53. The result of the core zone of flora studies shows that Fabaceae and Poaceae, Apocynaceae are the main dominating species in the study area mentioned in Table No.3.53. No species found as threatened category.

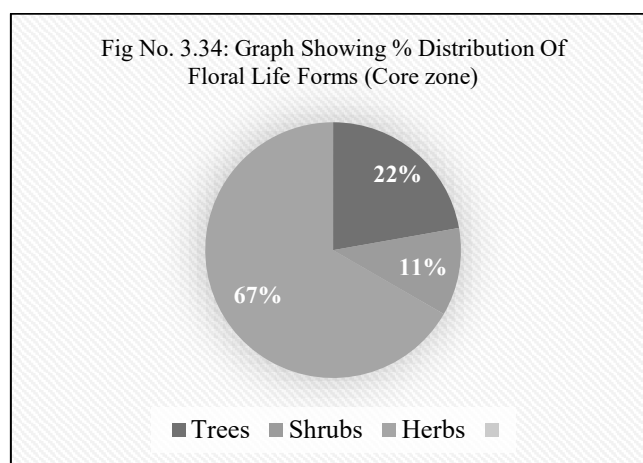
**Table No: 3.53. Flora in the Core zone of Eraiyur Village, Rough stone and gravel quarry (Primary data)**

Sl. No	English Name	Vernacular Name	Scientific Name	Family Name



<b>Trees</b>				
1	Velvet mesquite	Mullu Maram	Prosopis juliflora	Fabaceae
2	Neem	Vembu maram	Azadirachta indica	Meliaceae
<b>Shrubs</b>				
1	Milk Weed	Erukku	Calotropis gigantea	Apocynaceae
<b>Herbs</b>				
1	Common leucas	Thumbai	Leucas aspera	Lamiaceae
2	Coat buttons	Thatha poo	Tridax procumbens	Asteraceae
3	Devil 's thorn	Nerunji	Tribulus terrestris	Zygophyllales
4	Indian doab	Arugampul	Cynodon dactylon	Poaceae
5	Holy basil	Thulasi	Ocimum tenuiflorum	Lamiaceae
6	Indian nettle	Nayuruvi	Achyranthes aspera	Amaranthaceae

(Sources: Species observation in the field study)



The trees surveys were conducted around 300m radius from the proposed project site.

This is the standard scientific method followed by various workers in respect of phytosociological studies (Cotton and Curtis 1956; Ralhan et al. 1982; Saxena and Sing 1982; Nayak et al. 2000; Lu et al. 2004; Nautiyal 2008). While sampling, circumference at breast Height (CBH) of tree species was measured at 1.37m from ground level, along with the name of the species, phenology (flowering, fruiting, and flushes. After surveying areas, a detailed trees inventory has been compiled. A list of all plants from the study area was prepared and their habitats were recorded. The species of trees were documented during this base line survey. The dominant plant species growing in this area were Cocos nucifera Prosopis juliflora, etc. Please refer the Table No.3.54.

**Table No: 3.54. Tree survey around 300m radius from the proposed project site.**

S. No	English Name	Vernacular Name	Scientific Name	Family Name	No of trees
<b>Trees</b>					
1.	Neem	Vembu maram	Azadirachta indica	Meliaceae	8
2.	Asian Palmyra palm	Panai maram	Borassus flabellifer	Arecaceae	4
3.	Mesquite	Mullu maram	Prosopis juliflora	Fabaceae	18
4.	Millettia Pinnata	Pongam oiltree	Pongamia pinnata	Fabaceae	2
5.	Mango	Manga	Mangifera indica	Anacardiaceae	5

6.	Coconut	Thennai maram	Cocos nucifera	Arecaceae	6
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(Sources: Species observation in the field study)

**Table No: 3.55. Flora in Buffer Zone of Eraiyur Village, Rough stone and gravel quarry Villupuram District, Tamil Nadu (Primary data & Secondary data)**

SI. No	English Name	Vernacular Name	Scientific Name	Family Name
Trees				
1.	White-bark acacia	Velvelam	Acacia leucophloea	Mimosaceae
2.	Coconut	Thennai maram	Cocos nucifera	Arecaceae
3.	Neem or Indian lilac	Vembu	Azadirachta indica	Meliaceae
4.	Velvet mesquite	Mullu Maram	Prosopis juliflora	Fabaceae
5.	Frywood	Vaagai	Albizia lebbek	Mimosaceae
6.	Indian plum	Elanthai maram	Ziziphus mauritiana	Rhamnaceae
7.	Pongamia pinnata	Pongam	Millettia pinnata	Fabaceae
8.	Oil cake tree	Wunja	Albizia amara	Fabaceae
9.	Eucalyptus	Thailam maram	Eucalyptus tereticornis	Myrtaceae
10.	Velvet mesquite	Velikatthaan	Prosopis juliflora	Fabaceae
11.	River tamarind	Savunda	Leucaenaleucocephala	Fabaceae
12.	Madras thorn	Kudukapuli	Pithecellobium dulce	Fabaceae
13.	Portia tree	Poovarasam	Thespesia Populnea	Malvaceae
14.	Lemon	Ezhumuchaipalam	Citrus lemon	Rutaceae
15.	Jamun Fruit Plant	Naval maram	Syzygium cumini	Myrtaceae
16.	Gum arabic tree	Karuvellam	Vachellia nilotica	Fabaceae
17.	Kassod Tree	ManjalKonrai	Cassia siamea	Fabaceae
18.	Chinaberry	Malaivembu	Meliaazedarach	Meliaceae
19.	Sudu	Kalli	Euphorbia antiquorum	Euphorbiaceae
20.	Monkey pod tree	Kondraimaram	Samaneasaman	Fabaceae
21.	Asian Palmyra palm	Panai maram	Borassus flabellifer	Arecaceae
22.	Bamboo	Moongil	Bambusoideae	Poaceae
23.	Indian-almond	Vadamaram	Terminaliacatappa	Fabaceae
24.	Teak	Thekku	Tectona grandis	Verbenaceae
25.	Mahua	Iluppai	Bassia latifolia	Sapotaceae
26.	Indian mulberry	Nuna maram	Morinda tinctoria	Rubiaceae
27.	Banyan	Ala	Ficus benghalensis	Moraceae
28.	Yellow Flame	Iyalvagai	Peltophorumpterocarpum	Fabaceae
29.	Cashew	Munthiri	Anacardium occidentale	Anacardiaceae
30.	Common fig	Athi Maram	Ficus Carica	Anacardiaceae

31.	Horsetail She-oak	Savukku maram	Casuarina equisetifolia	Cucurbitaceae
32.	Tamarind	Puliyamaram	Tamarindus indica	Legumes
33.	Phoenix sylvestris	Pereatchai	Phoenix sylvestris	Arecaceae
34.	Creamy peacock flower	Perungondrai	Delonix elata	Fabaceae
35.	Sapodilla	Sappotta	Manilkarazapota	Sapotaceae
36.	Indian bael	Vilvam	Aegle marmelos	Rutaceae
37.	Indian gooseberry	Nelli	Phyllanthus emblica	Phyllanthaceae
38.	Guava	Koyya	Psidium guajava	Myrtaceae
39.	Mango	Manga	Mangifera indica	Anacardiaceae
40.	Sugar apple	Sitapalam	Annona squamosal	Annonaceae
41.	Papaya	Pappali maram	Carica papaya L	Caricaceae
42.	Banana tree	Vazhaimaram	Musa acuminata	Musaceae
43.	Jack fruit	Palamaram	Artocarpus heterophyllus	Moraceae
44.	Muntingia calabura	Singapore cherry	Muntingiacalabura	Malvaceae
<b>Shrubs</b>				
1.	Bush Morning Glory	Neiveli Kattamani	Ipomoea carnea	Convolvulaceae
2.	Chinese chastetree	Nochi	Vitex negundo	Lamiaceae
3.	Indian mallow	Thuthi	Abutilon indicum	Malvaceae
4.	Black-Honey Shrub	Ink Pazham	Phyllanthus reticulatus	Phyllanthaceae
5.	Jackal jujube	Surai Ilantai	Ziziphus oenoplia	Rhamnaceae
6.	Milk Weed	Erukku	Calotropis gigantea	Apocynaceae
7.	Jungle geranium	Vedchi	Ixora coccinea	Rubiaceae
8.	Solanum pubescens	Malaisundai	Solanum pubescens Willd	Solanaceae
9.	Plumeria alba	Malaiarali	Plumeria alba	Appocynaceae
10.	Night shade plan	Sundaika	Solanum torvum	Solanaceae
11.	Pinwheelflower	Nandiar vattai	Tabernaemontana coronaria	Apocynaceae
12.	Leaf Fig	Pie Aththi	Ficus hispida	Moraceae
13.	Stachytarpheta urticifolia	Rat tai	Stachytarpheaurticifolia	Verbenaceae
14.	Great bougainvillea	Kaakithapoo	Bougainvillea spectabilis	Nyctaginaceae
15.	Indian shot	Kalvalai	Canna indica	Cannaceae
16.	Devil's trumpet	Umathai	Datura metel	Solanaceae
17.	Jhahrberi	Narielandai	Ziziphus nummularia	Rhamnaceae
18.	Castor bean	Amanakku	Ricinus communis	Euphorbiaceae
19.	Shoe flower	Chemparuthi	Hibiscu rosa-sinensis	Malvaceae
20.	Nalta jute	Perattikkirai	Corcorus olitorius	Tiliaceae
21.	Bellyache bush	Kaatamanaku	Jatropagossypifolia	Euphorbiaceae

22.	Cape jasmine	Kumba poo	Gardenia jasminoides	Rubiaceae
23.	Touch-me-not	Thottalchinungi	Mimosa pudica	Mimosaceae
24.	Indian cork tree	Kattumalli	Millingtonia hortensis	Bignoniaceae
25.	Prickly pear	Nagathali	Opuntia	Cactaceae
26.	Triangular spruge	Chaturakalli	Euphorbia antiquorum	Euphorbiaceae
27.	Indian mallow	Maanikham	Abutilon indicum	Meliaceae
28.	Apple of sodom	Vellerukku	Calotropis procera	Asclepiadaceae
29.	Rough cocklebur	Marul-umattai	Xanthium strumarium	Asteraceae
30.	Pignut	Wild thulasi	Hyptis suaveolens	Lamiaceae
31.	Avaram	Avarai	Senna auriculata	Fabaceae
32.	Wild caper bush	Kattukkathir	Capparis sepiaria	Capparaceae
33.	Indian Oleander	Arali	Nerium indicum	Apocynaceae
34.	Pencil cactus	Thirukalli	Euphorbia tirucalli	Euphorbiaceae
35.	West Indian Lantana	Unni chedi	Lantana camara	Verbenaceae
<b>Herbs</b>				
1.	Mexican prickly poppy	Kudiyotti	Argemone mexicana	Papaveraceae
2.	Purple pitcher plant	Kavali	Tephrosia purpurea	Fabaceae
3.	Red Pea Eggplant	Vellai tuduvalai	Solanum trilobatum	Solanaceae
4.	Bindii	Nerunji Mull	Tribulus terrestris	Zygophyllaceae
5.	Chamber bitter	Malai Kizhanelli	Phyllanthus urinaria	Euphorbiaceae
6.	Carrot grass	Vishapoondu	Parthenium hysterophorus	Asteraceae
7.	Billygoat weed	Pumpillu	Ageratum conyzoides	Asteraceae
8.	Green amaranth	Kuppaikeerai	Amaranthus viridis	Amaranthaceae
9.	Aloe barbadensis	Katrazhai	Aloe vera	Asphodelaceae
10.	Indian Mercury	Kuppamani	Acalypha indica	Euphorbiaceae
11.	Indian nettle	Nayuruvi	Achyranthes aspera	Amaranthaceae
12.	Indian doab	Arugampul	Cynodon dactylon	Poaceae
13.	Rushfoil	Milakai Poondu	Croton sparsiflorus	Euphorbiaceae
14.	Rough cocklebur	Marul-umattai	Xanthium strumarium	Asteraceae
15.	Benghal dayflower	Kanavachai	Commelina benghalensis	Commelinaceae
16.	Septicweed	Kattuttakarai	Senna occidentalis	Fabaceae
17.	Mountain knotgrass	Sirupulai	Aerva lanata	Amaranthaceae
18.	Tickweed	Nai kadugu	Celome viscosa	Capparidaceae
19.	Egyptian senna	Mayurkondrai	Cassia tora	Caesalpinaceae
20.	Common leucas	Thumbai	Leucas aspera	Lamiaceae
21.	Fish poison	Kollukkai Vela	Tephrosia purpurea	Fabaceae

22.	Painted euphorbia	Pal perukki	Euphorbia heterophylla	Euphorbiaceae
23.	Pig weed	Mukkarattai Keerai	Boerheavia diffusa	Nyctaginaceae
24.	Asthma-plant	Amman pacharisi	Euphorbia hirta	Euphorbiaceae
25.	Poor land flatsedg	Kunnakora	Cyperus compressus	Cyperaceae
26.	Marsh Barbel	Neermulli	Hygrophila auriculata	Acanthaceae
27.	Bhringaraj	Karisalankanni	Eclipta alba	Asteraceae
28.	Spiny amaranth	Mullukkirai	Amaranthus spinosus	Amaranthaceae
29.	Holy basil	Thulasi	Ocimum tenuiflorum	Lamiaceae
30.	Indian Turnsole	Thel kodukku	Heliotropium indicum	Boraginaceae
31.	Tridax daisy	Thatha poo	Tridax procumbens	Asteraceae
32.	Globe Amaranth	Vaadamalli	Gomphrena globosa	Amaranthaceae
33.	Dwarf morning-glory	Vishnukranti	Evolvulus alsinoides	Convolvulaceae
34.	White head	Vellarugu	Enicostemma axillare	Gentianaceae
35.	Rushfoil	Reilpoondu	Croton sparsiflorus	Euphorbiaceae
36.	Negro Coffee	Payaverai	Cassia occidentalis	Caesalpiniaceae
37.	Gale of the wind	Keelaneeli	Phyllanthus niruri	Phyllanthaceae
38.	Obscure Morning Glory	Chirutali	Ipomea obscura	Convolvulaceae
39.	Arrowleaf sida	Jelly Leaf	Sida rhombifolia	Malvaceae
<b>Climber</b>				
1.	Balloon vine	Mudakathan	Cardiospermum halicacabum	Sapindaceae
2.	Ivy gourd	Kovai	Coccinia grandis	Cucurbitaceae
3.	Wild water lemon	Poonai puduku chedi	Passiflora foetida	Passifloraceae
4.	Stemmed vine	Perandai	Cissus quadrangularis	Vitaceae
5.	Stinking passionflower	Poonai puduku chedi	Passiflora foetida L	Passifloraceae
6.	Butterfly pea	Sangu poo	Clitoria ternatea	Fabaceae
7.	Rosary pea	Kundumani	abrus precatorius	Fabaceae
<b>Grass</b>				
1.	Great brome	Thodappam	Bromus diandrus	Poaceae
2.	Windmill grass	Chevvarakupul	Chloris barbata	Amaranthaceae
3.	Eragrostis	Pullu	Eragrostis ferruginea	Poaceae
4.	Watergrass	Mukkutikorei	Bulbostylis barbatta	Cyperaceae
5.	Finger grass	Kuruthupillu	Chloris dolichostachya	Poaceae
6.	Umbrella-sedge	Vattakorai	Cyperus difformis	Cyperaceae
7.	Marvel grass	Marvel grass	Dichanthium annulatum	Poaceae
8.	Tropical crabgrass	Crab grass	Digetaria adscendens	Poaceae

(Sources: Ethnobotanical study of medicinal plants used by traditional users in Villupuram district of Tamil Nadu, India

A Survey of Some Medicinally Important Plants in Villupuram District of Tamil Nadu India

Herbal medicines used by the local traditional healers in Villupuram district of Tamil Nadu, Southern India

**Ethnobotanical study of medicinal plants used by traditional users in Villupuram district of Tamil Nadu, India**

<https://identify.plantnet.org/>



a. *Azadirachta indica*



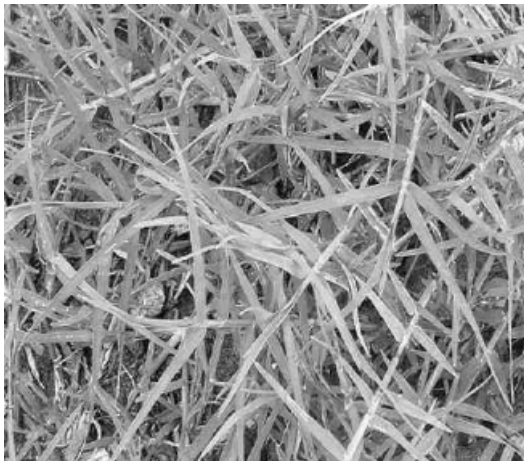
b. *Citrus lemon*



c. *Coccinia grandis*



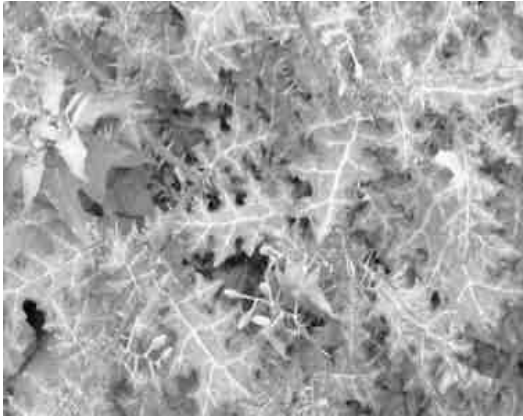
d. *Musa paradisiaca*



e. *Cynodon dactylon*



f. *Tridax daisy*



g. *Solanum virginianum*



h. *Mangifera indica*



I. *Abutilon indicum*



j. *Coccus nucifera*



k. *Lagenaria siceraria*



l. *Cissus quadrangularis*

m. *Solanum nigrum*n. *Parthenium hysterophorus*o. *Psidium guajava*p. *Prosopis juliflora***Fig No: 3.35. Flora species observation in the Buffer zone area**

### 3.5.5.3. Cropping Pattern and Major Crops at District level

Important crops grown in the district are paddy, black gram, groundnut, cumbu, maize, kora or thenai, varaku, red gram, turmeric, guava, watermelon, tapiaco, yam (karnai), small onion, indigo dye, coleus medicine, jasmine and sugarcane. The most important cash crop in the district is sugarcane, groundnut, turmeric, non-food crops and coleus. It is cultivable under both irrigatable and rainfed condition. In terms of area, paddy occupies is 40% total cultivable area of the district which is second highest in Tamil Nadu (2016-17). Sugarcane is the most important cash crop in the district.

Source: [Villupuram district diagnostic report](#)

### 3.6. Flora Composition in the Buffer Zone

Buffer zone flora sampling was conducted between 10.00 am to 4.00 pm in eight different locations in 10 km radius as per the ToR. The most important and widely used methods for a general assessment is belt transect methods. The study area was divided according to habitat types followed the random sampling methods in the selected area. For plant biodiversity study in the ecosystems, the quadrat methods were followed. The proposed mine lease area is exhibiting flat topography. The buffer region has a similar type of habitat, but it has a wider variety of vegetation than the core zone area. There are 133 different species identified in the buffer zone. Among the identified, floral (133) species were 44 trees, 39 herbs, 35 shrubs, 7 climbers and 8 grasses. According to the findings of the buffer zone flora studies, the dominant species in the study area are Fabaceae, Asteraceae, and Euphorbiaceae, as shown in Table No.3.2. Apart from the proposed project area, there is agricultural land.



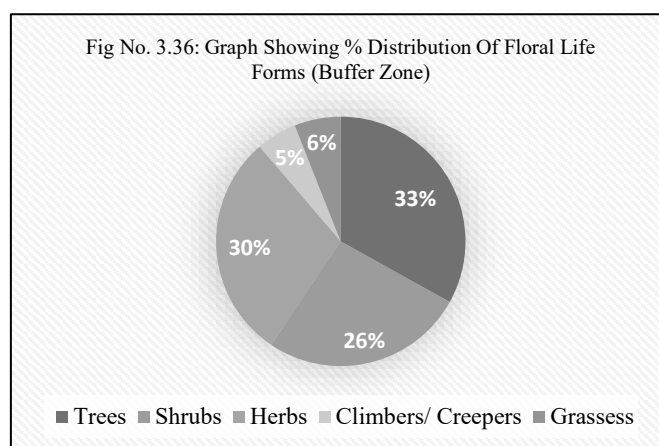
Horticulture and agricultural land are untouched. There are no impacts due to this mining activity. There are no Rare, Endangered, and Threatened Flora species in the mining area and their surrounding study area. A list of floral species has been prepared based on primary survey (site observations) and discussion with local people. The total number of different plant life forms under trees, shrubs, herbs, and climbers is shown in Table 3.56 and their % distribution is shown in Figure 3.36.

The most dominant species observed during the site survey of the study area are *Prosopis juliflora* (Velvet mesquite), *Borassus flabellifer* (Asian Palmyra palm), *Dalbergia sisso* (Tamarind), *Vachellia nilotica* (Gum arabic tree), etc. The shrubby vegetation is represented by *Opuntia* sp, *Lantana camara* (West Indian Lantana), *Vitex negundo* (Chinese chastetree), and *Parthenium hysterophorus* (Carrot grass) etc.

A list of floral species has been prepared based on a primary survey (site observations) and discussion with local people. The total number of different plant life forms under trees, shrubs, herbs, and climbers is shown in Table 3.56 and their % distribution is shown in Figure 3.34.

**Table 3.56: Number of floral life forms in the Study Area**

S. No	Plant Life Form	Number of Species
1	Trees	44
2	Shrubs	35
3	Herbs	39
4	Climber	7
5	Grasses	8
<b>Total No. of Species</b>		<b>133</b>



### 3.5.7. The vegetation in the RF / PF areas, ecologically sensitive areas etc.

There are no National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar sites, Tiger/Elephant Reserves/ (existing as well as proposed) within 10 km of the mine lease area. There are no protected forests within the project area. Hence submission of clearance from the National Board of Wildlife does not arise. No Wildlife Sanctuary in the study area. In addition, No Biosphere Reserves, Wildlife corridors, or, Tiger / Elephant reserves within 10 km of the project area. No protected (PF) forests either in the mine lease area or in the buffer zone. Thus, no forest land is involved in any manner.

There are no protected or ecologically sensitive areas such as National parks or Important Bird Areas (IBAs), or Wetlands or migratory routes of fauna or water bodies or human settlements within the proposed mine lease area. There are no Biosphere reserves or wildlife sanctuaries or National parks or Important Bird Areas

(IBAs), or migratory routes of fauna. Thus, the area under study (Mine lease area and the 10 Km buffer zone) is not ecologically sensitive.

Thus, no forest land is involved in any manner. There are no impacts due to this mining activity. There are neither forests nor forest dwellers nor 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.

### 3.6. Fauna

The fauna survey has been carried out as per the methodology cited and listed out Mammals, birds, Reptiles, Amphibians, and Butterflies. All the listed species were compared with Red Data Book and Indian Wildlife Protection Act, 1972. There are no rare, endangered, threatened (RET) and endemic species present in the core area.

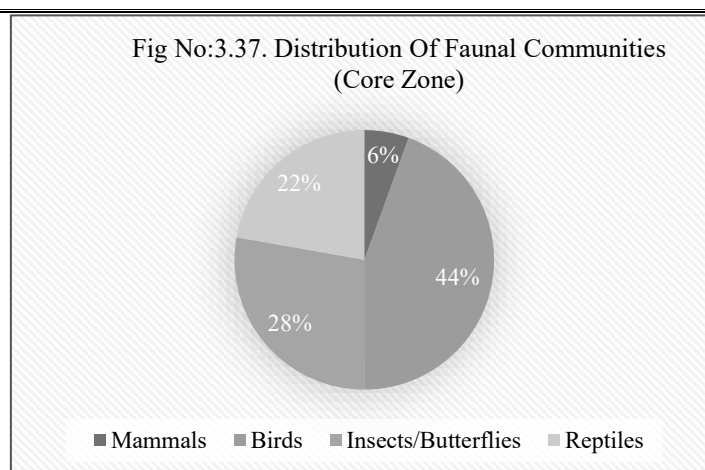
#### 3.6.1. Fauna Composition in the Core Zone

Core zone fauna samplings were conducted between 6.00 am to 8.00 am in three locations. A total of 16 varieties of species were observed in the Core zone of Eraiyur Village, Rough stone and gravel quarry (Table No.3.57) among them numbers Insects/Butterflies 5, Reptiles 3, Mammals 1, and Avians 6. A total of 15 species belonging to 9 families have been recorded from the core mining lease area. None of these species are threatened or endemic in the study area and surroundings. There is no Schedule I species and nine species are under Schedule IV according to the Indian Wildlife Act 1972. A total of 6 species of bird were sighted in the mining lease area. There are no critically endangered, endangered, vulnerable, and endemic species were observed. Details of fauna in the core zone with the scientific name were mentioned in Table No. 3.57.

**Table No: 3.57. Fauna in the Core zone of Eraiyur Village, Rough stone and gravel quarry (Primary data)**

SI. No	Common Name	Scientific Name	Schedule list WLPA 1972	IUCN Red List data
<b>Insects/Butterflies</b>				
1.	Striped tiger	Danaus plexippus	Schedule IV	LC
2.	Grasshopper	Hieroglyphus sp	NL	LC
3.	Common Tiger	Danaus genutia	NL	NL
4.	Termite	Hamitermes silvestri	NE	LC
5.	Tawny coster	Danaus chrysippus	Schedule IV	LC
<b>Reptiles</b>				
1.	Garden lizard	Calotes versicolor	NL	LC
2.	Common skink	Mabuya carinatus	NL	LC
3.	Green vine snake	Ahaetulla nasuta	Schedule IV	NL
<b>Mammals</b>				
1.	Indian Field Mouse	Mus booduga	Schedule IV	NL
<b>Aves</b>				
1.	Common myna	Acridotheres tristis	Schedule IV	LC
2.	House crow	Corvus splendens	Schedule V	LC
3.	Koel	Eudynamys	Schedule IV	LC
4.	Asian green bee-eater	Merops orientalis	Schedule IV	LC
5.	Common quail	Coturnix coturnix	Schedule IV	LC
6.	Black drongo	Dicrurus macrocercus	Schedule IV	LC

(Sources: Species observation in the field study)



### 3.6.2. Fauna Composition in the Buffer Zone

As animals, especially vertebrates move from place to place in search of food, shelter, mate or other biological needs, separate lists for core and buffer areas are not feasible however, a separate list of fauna pertaining to core and buffer zone are listed separately. Though there are no reserved forest in the buffer zone. As such there are no chances of occurrence of any rare or endangered or endemic or threatened (REET) species within the core or buffer area.

There are no Sanctuaries, National Parks, Tiger Reserve or Biosphere Reserve or Elephant Corridor or other protected areas within 10 km radius from the core area. It is evident from the available records, reports, and circumstantial evidence that the entire study area including the core and buffer areas were free from any endangered animals. There were no resident birds other than common bird species such as green bee-eaters, Indian blue robin, Common Mynas, Black drangos, Crows, etc.

List of Fauna & Their Conservation Status, Mammals: (\*directly sighted animals & Secondary data) is given in table No.5.58. The list of bird species recorded during the field survey and literature from the study area is given in Table 3.59. The list of reptilian species recorded during the field survey and literature from the study area are given in Table 3.60. The list of insect species recorded during the field survey and literature from the study area are given in Table 3.61. The list of Amphibian species recorded during the field survey and literature from the study area are given in Table 3.66 and List of Butterflies identified from the project site and their conservation status is given in Table No.3.62. It is apparent from the list that none of the species either spotted or reported is included in Schedule I of the Wildlife Protection Act. Similarly, none of them comes under the REET category.

Taxonomically a total of 60 species were identified from the project site. Based on habitat classification the majority of species were birds 22, followed by butterflies 16, reptiles, 8, Mammals, 5 and Insects 5 and amphibians 4. A total of 22 species of bird were sighted in the study area. There are no critically endangered, endangered, vulnerable, and endemic species were observed. There are no impacts on nearby fauna species.

Dominant species are mostly birds and buffer flies, and four amphibians were observed during the extensive field visit *Ranahexadactyla*, and *Ranatigrina* and etc. There is no schedule I Species in the study area. There are no critically endangered, endangered, vulnerable, and endemic species were observed.

**Table 3.58. List of Fauna & Their Conservation Status, Mammals: (\*directly sighted animals & Secondary data)**

SI. No	Scientific Name	Common Name	IUCN Conservation Status
1.	<i>Funambulus palmarum</i>	Indian palm squirrel	Schedule IV
2.	<i>Mus booduga</i>	Indian Field Mouse	Schedule IV

3.	Lepus nigricollis	Indian hare	Schedule IV
4.	Rattus norvegicus	Brown rat	Schedule IV
5.	Lepus nigricollis	Rabbit	Schedule IV

**Table 3.59. Listed birds (\*directly sighted animals & Secondary data)**

SI. No	Scientific Name	Common Name	IUCN Conservation Status
1.	Bubulcus ibis	Cattle Egret	Schedule IV
2.	Saxicoloidesfulicata	Indian Robin	Schedule IV
3.	Streptopeliachinensis	Spotted Dove	Schedule IV
4.	Accipiter badius	Shikra	Schedule IV
5.	Coraciasbenghalensis	Indian Roller	Schedule IV
6.	Anthusrufulus	Paddyfield Pipit	Schedule IV
7.	Nectarinia minima	Small Sunbird	Schedule IV
8.	Acridotherestrictis	Common Myna	Schedule IV
9.	Vanellusindicus	Red-wattled Lapwing	Schedule IV
10.	Dicurusmacrocerus	Black Drongo	Schedule IV
11.	Lonchurapunctulata	Spotted Munia	Schedule IV
12.	Dendrocittavagabunda	Indian Treepie	Schedule IV
13.	Corvussplendens	House Crow	Schedule V
14.	Eudynamys	Koel	Schedule IV
15.	Psittacula krameni	Rose ringed parakeet	Schedule IV
16.	Dicurus macrocerus	Black drongo	Schedule IV
17.	Corvus splendens	House crow	Schedule IV
18.	Alcedo atthis	Small blue kingfisher	Schedule IV
19.	Cuculus canorus	Common Cuckoo	Schedule IV
20.	Pycnonotus cafer	Red vented Bulbul	Schedule IV
21.	Meropsorientalis	Small Bee-eater	Schedule IV
22.	Halcyon smyrnensis	White-breasted Kingfisher	Schedule IV

**Table 3.60. List of Reptiles either spotted or reported from the study area (Primary and Secondary data)**

SI. No	Scientific Name	Common Name/English Name	Schedule list WPA 1972
1.	Calotes versicolor	Oriental garden lizard	NL
2.	Hemidactylus flaviviridis	House lizards	Schedule IV
3.	Ahaetulla nasuta	Green vine snake	Schedule IV
4.	Ptyas mucosa	Rat snake	Sch IV (Part II)
5.	Bungarus caeruleus	Common krait	Schedule IV
6.	Mabuya carinatus	Common skink	NL
7.	Nerodia piscator	Fresh water snake	Sch III (Part II)
8.	Groemyda bijuga	Fresh water tortoise	Sch III (Part II)

**Table 3.61. List of insects either spotted or reported from the study area**

SI. No	Scientific Name	Common Name	IUCN Conservation Status
1.	<i>Apis cerana</i>	Indian honey bee	-
2.	<i>Hamitermes silvestri</i>	Termite	LC
3.	<i>Hieroglyphus sp</i>	Grasshopper	LC
4.	<i>Ceratogomphus pictus</i>	Dragonfly	-
5.	<i>Sympetrum fonscolombi</i>	Dragonfly	-

**Table.3.62. List of Butterflies identified from the project site and their conservation status (Primary and Secondary data)**

SI. No	Scientific Name	Common Name	IUCN Conservation Status
1.	<i>Danaus genutia</i>	Striped Tiger	LC
2.	<i>Danaus chrysippuschrysippus</i>	Plain Tiger	LC
3.	<i>Danaus genutia</i>	Common Tiger	LC
4.	<i>Acraea terpsicore</i>	Tawny Coster	LC
5.	<i>Papiliopolytespolytes</i>	Common Mormon	LC
6.	<i>Papiliodemoleusdemoleus</i>	Lime Butterfly	LC
7.	<i>Hypolimnasmisippus</i>	Danaid Eggfly	LC
8.	<i>Catopsilia pyranthe</i>	Mottled emigrant	LC
9.	<i>Junoniahierta</i>	Yellow Pansy	LC
10.	<i>Junonialemonias</i>	Lemon Pansy	LC
11.	<i>Hypolimnasmisippus</i>	Danaid Eggfly	LC
12.	<i>Euchrysops snejus</i>	Gram Blue	LC
13.	<i>Euploea core</i>	Common Crow	LC
14.	<i>Melanitis ledaleda</i>	Common Evening Brown	LC
15.	<i>Colotis danae</i>	Crimson tip	LC
16.	<i>Junonia iphita</i>	Chocolate pansy	LC

A. *Calotes versicolor*B. *Ceratogomphus pictus*



C. *Sympetrum fonscolombii*



D. *Psittacula krameri*



E. *Colotis danae*



F. *Catopsilia pyranthe*



G. *Danaus chrysippus*



H. *Zizina Otis indica*

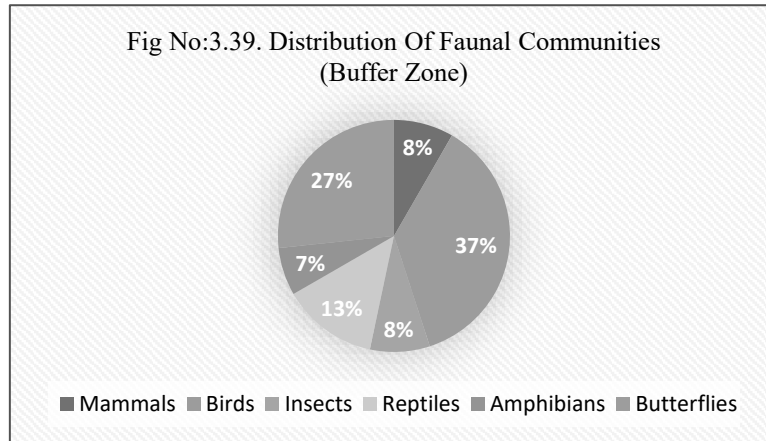


I. Chocolate pansy



J. *Dicrurus macrocercus*

**Fig No: 3.38. Flora species observation in the Buffer zone area**

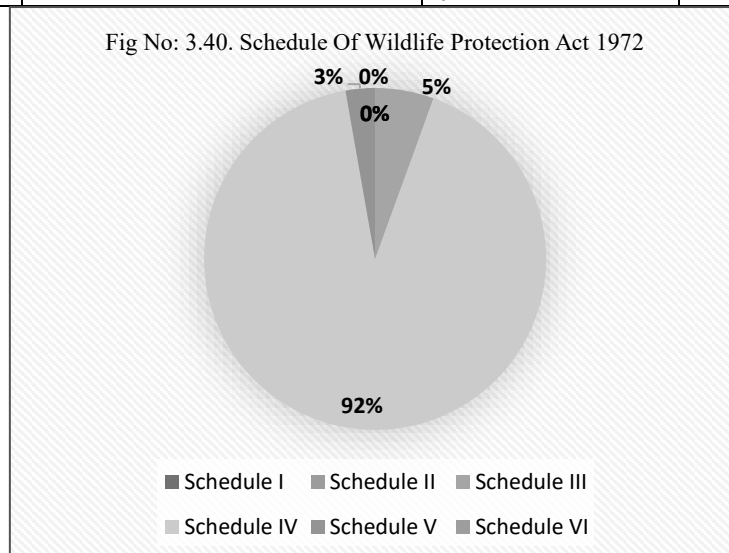


Livestock like cattle, buffalo, goat, poultry, duck and pig are reared for dairy products, meat, and egg and for agriculture purpose. Majority of cattle and buffalo are of local variety. Backyard poultry farms are mostly common in this area; however, some commercial poultry farms are also recorded in the study area.

The study area is marked with moderate population of flora and fauna. With reference to the Wildlife Protection Act 1972 total number of wildlife tabulated in this study can be characterized as given in the Table 3.63.

**Table No: 3.63 Characterization of Fauna in the Study Area (As Per W.P Act, 1972)**

S. No	Schedule of Wildlife Protection Act 1972	No. of species	Remark
1.	Schedule I	0	-
2.	Schedule II	0	-
3.	Schedule III	2	-
4.	Schedule IV	33	-
5.	Schedule V	1	-
6.	Schedule VI	0	-



**Table 3.64: Description of Flora & Fauna**

S. No	Type of Species	Name	Local Name
<b>Flora</b>			
1.	Endangered species	None	None
2.	Threatened species	None	None
3.	Near Threatened species	None	None
4.	Vulnerable species	None	None
<b>Fauna</b>			
5.	Endangered species	None	None
6.	Threatened species	None	None
7.	Near Threatened species	None	None
8.	Vulnerable species	None	None
9.	Migratory Corridors & Flight Paths	No corridors & flight paths	-
10.	Breeding & Spawning grounds	None	-
11.	Invasive Alien species	None	None

A comprehensive Central Legislation namely Wild Life (Protection) Act was enforced in 1972 to provide protection to wild animals. Schedule-I of this act contains the list of rare and endangered species, which are completely protected throughout the country. The list of wild animals and their conservation status as per Wild Life Act (1972) presented in Table 3.64 are the species recorded/reported from the study area, out of which 2 species belong to schedule-III, 1 species belongs to schedule-V and rest of the species belongs to schedule-IV of Wildlife protection Act, 1972. And there is no Invasive alien species (IAP) in the study area.

### 3.7. Aquatic Ecology

Mining activities will not have an impact on aquatic ecosystems because no effluent discharge from the Rough stone and gravel quarry is planned. There are no natural perennial surface water bodies, such as marshes, rivers, streams, lakes, or agricultural sites, inside the mining lease area. The study region contains a few seasonal bodies of water. There is no aquatic flora and, aquatic fauna. Hence, it does not harbour any significant aquatic life. Therefore, the project is not likely to affect the aquatic ecology. Aquatic weeds are found to be growing everywhere in 10 km radius area, in every water bog, pond, etc. Typha angustata can be found growing all along the drains of villages, small water-logged depressions, and agricultural fields lacking water but containing enough moisture to support its growth. And where water is present, Eichhornia crassipes has taken its roots and covers the entire water surface by its sprawl and invasion.

#### 3.7.1. Objectives of Aquatic Studies

- ❖ Generating data through actual field collection in these locations over the study period;
- ❖ Impacts on aquatic fauna/flora
- ❖ Consulted with locals to obtain knowledge about aquatic flora and animals.

#### 3.7.2. Macrophytes

The macrophytes observed within the study area are tabulated in Table 3.65

**Table No.3.65 Description of Macrophytes**

Sl. No	Scientific name	Common Name	Vernacular Name (Tamil)	IUCN Red List of Threatened Species
1.	Eichornia crassipe	Water hyacinth	Agayatamarai	NA
2.	Aponogeton natans	Floating lace plant	Kottikizhnagu	NA
3.	Nymphaea nouchali	Blue water lily	Nellambal	LC



4.	Typha angustifolia	Sambu	Narrowleaf cattail	LC
5.	Carex cruciata	Cross Grass	Koraipullu	NA
6.	Cyperus exultates	Tall Flat Sedge	Koraikizhangu	LC

**Sources:** Species observation in the field study

### 3.7.3. Aquatic Faunal Diversity

Amphibian species like the common Indian Burrowing frog, and green pond frog, and etc. were sighted near the water bodies located in the study area.

**Table 3.66. List of Amphibians either spotted or reported from the study area**

SI. No	Scientific Name	Common Name/English Name	Schedule list wildlife Protection act 1972
1.	Sphaerotherca breviceps	Indian Burrowing frog	Schedule IV
2.	Euphlyctis hexadactylus	Green pond frog	Schedule IV
3.	Bufo melanostictus	Indian Toad	Schedule IV
4.	Euphlyctiscynophlyctis	Skipper	Schedule IV

### 3.5.1. Fishes

Fish is commonly found in all types of natural water bodies and very common source of food in Eastern South India. The local fishermen were enquired and also the secondary resources were reviewed to collect information on the fishes found in the study area. Few common species are; Catla, Mrigal, Ticto barb, Greenstripe barb, Rohu and Pool barb etc., Species of fish reported in the study area are given in table 3.67. During the field investigation, all of the lakes were quite dry. Only the lakes gather fish data.

**Table 3.67. Based on Actual Sighting, based on inputs from locals and Perused from Secondary Data**

S. No	Common name	Scientific name	Family
1.	Ticto barb	Pethia ticto	Cyprinidae
2.	Mrigal	Cirrhinus mrigala	Chordata
3.	Rohu	Labeo rohita	Cyprinidae
4.	Catfish	Siluriformes	Diplomystidae
5.	Greenstripe barb	Puntius vittatus	Cyprininae
6.	Pool barb	Puntius sophore	Cyprinidae

Sources:

[Invasive Alien Species | IUCN](#)

[Ali, S. \(2002\). The Book of Indian Birds \(13th revised edition\). Oxford University Press, New Delhi. 326pp.](#)

[Ali, S and Ripley, S.D. 1969. Handbook of the Birds of India and Pakistan together with those of Nepal, Sikkim, Bhutan and Ceylon, 3. Stone Curlews to Owls. Oxford University Press, Bombay, 327pp.](#)

[Bird Life International 2012. In: IUCN 2012. IUCN Red List of Threatened Species. Version 2012.](#)

<http://www.indiaenvironmentportal.org.in/files/file/wildlife%20protection%20amendment%20act%202022.pdf>

### 3.10. Findings/Results

The assessment was carried out during the Winter season. The inspection day was quite all right with respectable weather. The details of the flora and fauna observed are given below.

S. No	Ecological sensitive habitat	Direction and Distance from the project site
1	National Parks/ Wildlife Sanctuary/ Biosphere reserves/ Elephant Reserve/ Any Other Reserve	Nil
2	Reserved Forests	Nil
3	Wildlife Corridors & Routes	No notified wildlife corridors are present in 10 km vicinity.
4	Wetlands / Water bodies	-
5	Ramsar Site	Nil
6	Important Bird Habitats	Nil
7	Breeding/nesting areas of endangered species	Not present
8	Mangroves	None

There are no critically endangered, endangered, vulnerable, and endemic species were observed. As the rainfall in the area is scanty and as no toxic wastes are produced or discharged on account of mining, the proposed mining activity is not going to have any additional and adverse impacts on these RET species. There are no ecologically sensitive areas or protected areas within the 10 Km radius. Hence no specific conservation for conservation of any RET species or Wildlife is envisaged.

### 3.8. Conclusion

The observations and assessment of the overall ecological scenario involve details such as classification of Biogeographic zone, eco-region, habitat types, and land cover, distances from natural habitats, vegetation/forest types, and sensitive ecological habitats such as Wetlands sites, Important Bird areas, migration corridors of important wildlife etc. Such baseline information provides better understanding of the situation and overall ecological importance of the area. This baseline information viewed against proposed project activities help in predicting their impacts on the wildlife and their habitats in the region. Data collected and information gathered from secondary literature on flora, fauna, protected area, natural habitats, and wildlife species etc., and consulted and discussed with local people, from the villages, herders and farmers who inhabit close to the proposed project area.

### 3.6 SOCIO ECONOMIC ENVIRONMENT

Socio-economic study is an essential part of environmental study. It includes demographic structure of the area, provision of basic amenities viz., housing, education, health and medical services, occupation, water supply, sanitation, communication, transportation, prevailing diseases pattern as well as feature like temples, historical monuments etc., at the baseline level. 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 and, thus, improve their standard of living.

#### STRUCTURE STUDY IN 300m RADIUS

There are no structures within the radius of 300m from the project site.

**FIGURE 3.29: STRUCTURE MAP 300m RADIUS**



#### 3.6.1 Objectives of the Study

The objectives of the socio-economic study are as follows:

- To study the socio-economic status of the people living in the study area.
- To assess the impact of the project on Quality of life of the people in the study area.
- To recommend Community Development measures needs to be taken up in the study Area.

#### 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 Measures

### 3.6.3 District Profile

There are two Revenue Divisions, Nine Revenue Taluks, Two Municipalities (Viluppuram and Tindivanam), Eight Town Panchayats, 13 Panchayat Unions and 688 Village Panchayats in the District. According to 2011 census, the Viluppuram district had a population of 3,458,873 with a sex-ratio of 987 females per 1,000 males, which is well above the national average of 929. A total of 404,106 residents were under the age of six, constituting 208,246 males and 195,860 females

### 3.6.4 Study area:

#### ERAIYUR VILLAGE

Eraiyr village is situated in Teshil Vanur, District Viluppuram and in State of Tamil Nadu India. Village has population of 3257 as per census data of 2011, in which male population is 1656 and female population is 1601. Total geographical area of Eraiyur village is 675.08 Hectares. Population density of Eraiyur is 5 persons per Hectares. Total number of house hold in village is 740.

Gram Panchayat name of the Eraiyur village is Eraiyur. CD Block name is Vanur and Teshil/Taluk or sub-district is Vanur. Data Reference year is 2009 of Census 2011. Sub District HQ Name is VANUR and Sub District HQ Distance is 12 Km from the village. District Head Quarter name is VILUPPURAM and it's distance from the village is 30KM. Nearest Town of the Eraiyur village is TINDIVANAM and nearest town distance is 17 km. Pincode of Eraiyur village is 604304. As per census 2011 village code of village Eraiyur is 632779.

#### Sex Ratio of Eraiyur Village -Census 2011

As per the Census Data 2011 there are 967 Femals per 1000 males out of 3257 total population of village. There are 1109 girls per 1000 boys under 6 years of age in the village

#### Literacy of Eraiyur Village

Out of total poplation total 1864 people in Eraiyur Village are literate, among them 1085 are male and 779 are female in the village. Total literacy rate of of Eraiyur is 64.93%, for male literacy is 73.66% and for female literacy rate is 55.72%.

#### Worker's profile of Eraiyur Village

Total working population of Eraiyur is 1596 which are either main or marginal workers. Total workers in the village are 1596 out of which 873 are male and 723 are female. Total main workers are 957 out of which female main workers are 610 and male main workers are 347. Total marginal workers of village are 639.

**TABLE 3.32: ERAIYUR VILLAGE CENSUS 2011 DATA**

Description	Census 2011 Data
Village Name	Eraiyr
Teshil Name	Vanur
District Name	Viluppuram
State Name	Tamil Nadu
Total Population	3257
Total Area	675(Hectares)
Total No of House Holds	740
Total Male Population	1656
Total Female Population	1601
0-6 Age group Total Population	386
0-6 Age group Male Population	183

0-6 Age group Female Population	203
Total Person Literates	1864
Total Male Literates	1085
Total Male Literates	779
Total Person Illiterates	1393
Total Male Illiterates	571
Total Male Illiterates	822
Scheduled Cast Persons	950
Scheduled Cast Males	473
Scheduled Cast Females	477
Scheduled Tribe Persons	0
Scheduled Tribe Males	0
Scheduled Tribe Females	0

Source: <https://etrace.in/census/village/eraiyur-vanur-district-viluppuram-tamil-nadu-632779/>

**TABLE 3.33 ERAIYUR WORKING POPULATION ---CENSUS 2011**

	<b>Total</b>	<b>Male</b>	<b>Female</b>
Total Workers	1596	873	723
Main Workers	957	610	347
Main Workers Cultivators	176	109	67
Agriculture Labourer	407	236	171
Household Industries	18	9	9
Other Workers	356	256	100
Marginal Workers	639	263	376
Non-Working Persons	1661	783	878

Source: <https://etrace.in/census/village/eraiyur-vanur-district-viluppuram-tamil-nadu-632779/>

**TABLE 3.34: POPULATION DATA OF STUDY AREA**

Sl.No.	Village Name	No of House Holds	Total Population	Male	Female	Total Literate Population	Male Literate	Female Literate	Total Illiterate Population	Male Illiterate	Female Illiterate
1	Ambuzhukkai	134	558	294	264	377	224	153	181	70	111
2	Eraiyrur	740	3257	1656	1601	1864	1085	779	1393	571	822
3	Idaiyapattu	181	794	407	387	529	302	227	265	105	160
4	Iveli	348	1440	716	724	898	506	392	542	210	332
5	Kadagampattu	144	601	315	286	462	269	193	139	46	93
6	Kanniyam	195	919	474	445	575	338	237	344	136	208
7	Karasanur	683	2862	1458	1404	1828	1084	744	1034	374	660
8	Konamangalam	227	907	455	452	632	354	278	275	101	174
9	Kondalamkuppam	96	353	175	178	270	144	126	83	31	52
10	Korakkeni	218	906	489	417	594	362	232	312	127	185
11	Kunnam	401	1742	873	869	1122	630	492	620	243	377
12	Kuralur	211	816	416	400	513	307	206	303	109	194
13	Nemili (V)	266	1238	627	611	835	471	364	403	156	247
14	Parangani	773	3393	1684	1709	2205	1203	1002	1188	481	707
15	Parikkalpattu	248	1077	548	529	777	422	355	300	126	174
16	Perumbakkam	501	2357	1199	1158	1540	878	662	817	321	496
17	Pombur	961	3994	2004	1990	2772	1531	1241	1222	473	749
18	Ponnampundi	132	565	289	276	375	214	161	190	75	115
19	Semangalam	863	3635	1859	1776	2331	1348	983	1304	511	793
20	Siruvai	454	1752	886	866	1079	608	471	673	278	395
21	Siruvalur (Ten)	369	1589	815	774	1105	644	461	484	171	313
22	Taludali	517	2257	1153	1104	1543	879	664	714	274	440
23	Tennalapakkam	352	1569	810	759	1069	623	446	500	187	313
24	Thenkulapakkam	219	1022	523	499	713	412	301	309	111	198
25	Tiruvaikkarai	738	3220	1627	1593	1904	1052	852	1316	575	741
26	Tollamur	332	1419	731	688	826	496	330	593	235	358
27	Vidur	1405	5748	2861	2887	3288	1883	1405	2460	978	1482

Source: www.censusindia.gov.in - Tamilnadu Census of India – 2011

**TABLE 3.35: WORKERS PROFILE OF STUDY AREA**

Sl.No.	Village Name	Total Workers Population	Male Workers	Female Workers	Total Main Workers	Main Workers Male	Main Workers Female	Main Cultivation Workers	Main Agriculture Workers	Main Other Workers	Non-Worker Population
1	Ambuzhukkai	247	164	83	183	145	38	60	68	53	311
2	Eraiyyur	1596	873	723	957	610	347	176	407	356	1661
3	Idaiyapattu	485	243	242	485	243	242	303	163	19	309
4	Iveli	891	483	408	766	438	328	621	89	52	549
5	Kadagampattu	443	238	205	53	30	23	36	7	10	158
6	Kanniyam	419	262	157	220	176	44	82	30	107	500
7	Karasanur	1575	901	674	753	530	223	163	99	474	1287
8	Konamangalam	527	287	240	523	285	238	218	234	64	380
9	Kondalamkuppam	184	112	72	177	110	67	30	106	40	169
10	Korakkeni	482	299	183	447	281	166	195	144	108	424
11	Kunnam	845	483	362	554	392	162	29	65	458	897
12	Kuralur	447	230	217	364	226	138	67	221	75	369
13	Nemili (V)	677	397	280	456	313	143	28	134	264	561
14	Parangani	1708	997	711	1057	755	302	124	452	466	1685
15	Parikkalpattu	530	323	207	529	323	206	37	284	208	547
16	Perumbakkam	1004	668	336	997	666	331	56	542	366	1353
17	Pombur	2220	1205	1015	1541	892	649	643	721	154	1774
18	Ponnampundi	298	167	131	43	40	3	15	4	24	267
19	Semangalam	1936	1110	826	1354	818	536	63	982	286	1699
20	Siruvai	912	522	390	188	111	77	2	131	52	840
21	Siruvalur (Ten)	987	520	467	178	122	56	45	25	99	602
22	Taludali	1158	718	440	634	569	65	286	63	262	1099
23	Tennalapakkam	696	452	244	616	416	200	85	319	195	873
24	Thenkulapakkam	674	357	317	245	173	72	16	120	105	348
25	Tiruvaikkarai	1496	877	619	992	775	217	84	122	751	1724
26	Tollamur	637	397	240	595	380	215	36	367	188	782
27	Vidur	2790	1763	1027	2557	1722	835	103	2122	302	2958

Source: www.censusindia.gov.in – Tamil Nadu Census of India – 2011

**TABLE 3.36: EDUCATIONAL FACILITIES IN THE STUDY AREA**

SI	Village Name	PPS		PS		MS		SS		SSS		DC		EC		MC		MI		PT		VTS		SSD	
		G	P	G	P	G	P	G	P	G	P	G	P	G	P	G	P	G	P	G	P	G	P	G	P
1	Ambuzhukkai	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
2	Eraiyur	1	2	1	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
3	Idaiyapattu	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
4	Iveli	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
5	Kadagampattu	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
6	Kanniyam	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
7	Karasanur	1	2	1	2	1	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
8	Konamangalam	1	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
9	Kondalamkuppam	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
10	Korakkeni	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
11	Kunnam	1	2	1	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
12	Kuralur	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
13	Nemili (V)	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
14	Parangani	1	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
15	Parikkalpattu	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
16	Perumbakkam	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
17	Pombur	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
18	Ponnampundi	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
19	Semangalam	1	2	1	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
20	Siruvai	1	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
21	Siruvalur (Ten)	1	2	1	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
22	Taludali	1	2	1	2	1	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
23	Tennalapakkam	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
24	Thenkulapakkam	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
25	Tiruvaikkarai	1	1	1	1	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
26	Tollamur	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
27	Vidur	1	1	1	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2

Abbreviations: PPS-Pre Primary School; SSS-Senior Secondary School; DC-Degree School; PT-Polytechnic; PS-Primary School; G-Government; EC-Engineering College; VTS-Vocational School /ITI; MS-Middle School; P-Private; MC-Medical College; SSD-Special School For Disabled; SS-Secondary School; MI-Management College/Institute;

Note – 1 - Available within the village; 2 - Not available



**TABLE 3.37: MEDICAL FACILITIES IN THE STUDY AREA**

SI. No.	Village Name	CHC	PHC	PHSC	MCW	TBC	HA	HAM	D	VH	MHC	FWC	NGM-I/O
1	Ambuzhukkai	0	0	0	0	0	0	0	0	0	0	0	5
2	Eraiyur	0	0	1	0	0	0	0	0	0	0	0	12
3	Idaiyapattu	0	0	0	0	0	0	0	0	0	0	0	4
4	Iveli	0	0	1	0	0	0	0	0	0	0	0	2
5	Kadagampattu	0	0	0	0	0	0	0	0	0	0	0	7
6	Kanniyam	0	0	0	0	0	0	0	0	0	0	0	5
7	Karasanur	0	0	1	0	0	0	0	0	0	0	0	10
8	Konamangalam	0	0	0	0	0	0	0	0	0	0	0	8
9	Kondalamkuppam	0	0	0	0	0	0	0	0	0	0	0	10
10	Korakkeni	0	0	0	0	0	0	0	0	0	0	0	5
11	Kunnam	0	0	0	0	0	0	0	0	0	0	0	10
12	Kuralur	0	0	0	0	0	0	0	0	0	0	0	3
13	Nemili (V)	0	0	1	0	0	0	0	0	1	0	0	8
14	Parangani	0	0	1	0	0	0	0	0	0	0	0	15
15	Parikkalpattu	0	0	0	0	0	0	0	0	0	0	0	6
16	Perumbakkam	0	0	0	0	0	0	0	0	0	0	0	10
17	Pombur	0	1	1	1	1	0	0	1	1	0	1	0
18	Ponnampundi	0	0	0	0	0	0	0	0	0	0	0	3
19	Semangalam	0	0	1	0	0	0	0	0	0	0	0	8
20	Siruvai	0	0	1	0	0	0	0	0	0	0	0	3
21	Siruvalur (Ten)	0	0	0	0	0	0	0	0	0	0	0	8
22	Taludali	0	0	1	0	0	0	0	0	0	0	0	4
23	Tennalapakkam	0	0	0	0	0	0	0	0	1	0	0	3
24	Thenkulapakkam	0	0	1	0	0	0	0	0	0	0	0	2
25	Tiruvaikkarai	0	0	1	0	0	0	0	0	0	0	0	6
26	Tollamur	0	0	1	0	0	0	0	0	0	0	0	10
27	Vidur	0	0	1	0	0	0	0	0	0	0	0	8

Abbreviations: CHC-Community Health Centre; TBC-TB Clinic; VH- Vetrernity Hospital; PHC-Primary Health Centre; HA-Aallopathic Hospital; FWC-Family Welfare Centre; PHSC-Primary Health Sub Centre; HAM-Alternative Medicine Hospital; MH-Mobile Health Clinic; MCW-Maternity and Child Welfare Centre; D-Dispensary; NGM-I/O-Non Government Medical Facilities In & Out Patient

Note – 1 - Available within the village; 2 - Not available a-facility available at <5kms b-facility available at >10kms

Source: www.censusindia.gov.in - Tamilnadu Census of India – 2011

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### 3.6.6 Recommendation and Suggestion

- The main activities in the area are agriculture, quarry operation and Crushing units there are 4 Numbers of quarries operated in the region and now only 2 quarry is operating at present which is expired lease period in 2024 February. Hence starting up of new mine in this region is necessary at current scenario
- 10 number of Crushers operating within 1km and the demand of Rough stone is high to the crushing units 100 Nos of people depending upon the Crushing units in the area and crushers are meeting scarcity due to supply demand in the region.
- Due to the project about 20 Nos of people will benefitted directly due to employment and more than 50 Nos of people and Crushers will benefitted through this project
- As part of CER activities proponent intends to spend Rs 5 Laksh for the improvement of School sanitation facilities, Greenbelt development and other needs.
- At the end of the life of the mine the mined-out pit will act as temporary reservoir, the collected rain water in the mine pit may utilized for the nearby agriculture lands.

#### **Apart from the following general activities will be conducted**

- Awareness program to be conducted to make the population aware to get education and a better livelihood.
- Vocational training programme can 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 can be generated.
- 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.

### 3.6.7 Summary & Conclusion

The socio-economic study of surveyed villages gives a clear picture of its population, average household size, literacy rate and sex ratio etc. It is also found that a part of population is suffering from lack of permanent job to run their day-to-day life. 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.

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## 4. 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 (Impacts) are identified, quantified and assessed.

### 4.1 LAND ENVIRONMENT:

#### 4.1.2 Anticipated Impact

- 1.65.26 Ha of the land will be under mining since the Permanent or temporary change on land use and land cover will occur
- Movement of heavy vehicles sometimes cause problems to agricultural land, human habitations due to dust, noise and it also causes traffic hazards.
- Due to degradation of land by pitting the aesthetic environment of the core zone may be affected.
- Earthworks during the rainy season increase the potential for soil erosion and sediment laden water entering the water ways.

If no due care is taken wash off from the exposed working area may choke the water course & can also causes the siltation of water course

### 4.1.2 Mitigation Measures

- The 1.65.26 Ha of the land will be converted into temporary reservoir which will full fill the water scarcity in the drought season and the nearby agriculture land will benefitted by the supply of water
- About 1210 Nos of trees will be planted in the lease area and approach road will retain the eco system
- The mining activity will be gradual confined in blocks and excavation will be undertaken progressively along with other mitigative measures like phase wise development in the production
- Construction of garland drains all around the quarry pits and construction of silt trap 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.,
- Fencing will be constructed before starting the mining operation and it will be maintained in the conceptual stage Security will be posted round the clock, to prevent inherent entry of the public and cattle.

### 4.1.3 Soil Environment

#### 4.1.4 Impact on Soil Environment

- Removal of vegetation cover
- Soil Erosion in the project site during rainy season due to quarry operation

#### 4.1.5 Mitigation Measures

- Garland drains will be constructed all around the project boundary to prevent surface flows from entering the quarry. 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 (Silt pond). 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.

#### 4.1.6 Waste Dump Management

There is no waste anticipated in this Rough Stone and gravel quarrying operation. The entire quarried out materials will be utilized (100%).

## 4.2 WATER ENVIRONMENT

### 4.2.1 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
  - Abstraction of water may lead to depletion of water table
  - 1.5 KLD water will be utilized for the quarrying operation

#### 4.2.2 Mitigation Measures

- Water for the quarrying operation such as sprinkling on haul roads, Greenbelt development will be sourced from the lower part of the mine pit which is specifically allotted to collect the rain water.
- Garland drain, settling tank will be constructed along the proposed mining lease area. The Garland drain will be connected to settling tank and sediments will be trapped in the settling traps and only clear water will be discharged out to the natural drainage
- Rainwater will be collected in sump in the mining pits and will be allowed to store and pumped out to surface setting tank of 15 m x 10m x 3m to remove suspended solids if any. This collected water will be judiciously used for dust suppression and such sites where dust likely to be generated and for developing green belt. The proponent will collect and judiciously utilize the rainwater as part of rainwater harvesting system.
- Periodic (every 6 month once) analysis of quarry pit water and ground water quality in nearby villages.
- Domestic sewage from site office & 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.

### 4.3 AIR ENVIRONMENT

#### 4.3.1. Anticipated Impact

- During mining, at various stages activities such as excavation, drilling, blasting, 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.

##### 4.3.1.1. Modelling of Incremental Concentration from all Proposed Projects

Wind erosion of the exposed areas and the air borne particulate matter generated by quarrying operation, and transportation are mainly PM<sub>10</sub> & PM<sub>2.5</sub> and emissions of Sulphur dioxide (SO<sub>2</sub>) & Oxides of Nitrogen (NO<sub>x</sub>) due to excavation/loading equipment and vehicles plying on haul roads are the cause of air pollution in the project area.

Similarly, loading - unloading and transportation of Rough Stone, wind erosion of the exposed area and movement of light vehicles causes of pollution. This leads to an impact on the ambient air environment around the project area.

Anticipated incremental concentration due to this quarrying activity and net increase in emissions due to quarrying activities within 500 meters around the project area is predicted by Open Pit Source modelling using

### AERMOD Software.

Prediction of impacts on air environment has been carried out taking into consideration cumulative production all the quarries fall in the Cluster. Air environment and net increase in emissions by Open pit source modelling in AERMOD Software AERMOD 9.61.

#### 4.3.2.1 Emission Estimation

An emissions factor is a representative value that attempts to relate the quantity of a pollutant released to the atmosphere with an activity associated with the release of that pollutant.

The general equation for emissions estimation is:

$$E = A \times EF \times (1-ER/100)$$

Where:

E = emissions;

A = activity rate;

EF = emission factor, and

ER =overall emission reduction efficiency, %

The proposed mining activity includes various activities like ground preparation, excavation, handling and transport of Rough Stone. These activities have been analysed systematically basing on USEPA-Emission Estimation Technique Manual, for Mining AP-42, to arrive at possible emissions to the atmosphere and estimated emissions are given in Table 4-2.

#### 4.3.2 Frame work of Computation & Model details

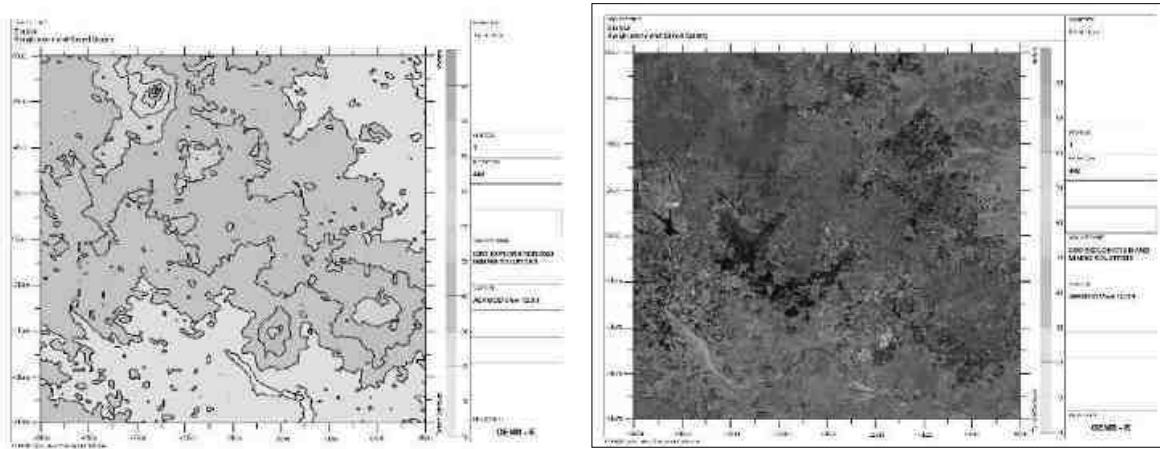
Suspended Particulate Matter (SPM) is the major pollutant occurred during quarrying activities. The prediction included the impact of Excavation, Drilling, Blasting (Occasionally), loading and movement of vehicles during transportation and meteorological parameters such as wind speed, wind direction, temperature, rainfall, humidity and Cloud cover.

Impact was predicted over the distance of 10 km around the source to assess the impact at each receptor separately at the various locations and maximum incremental GLC value at the project site. Maximum impact of PM<sub>10</sub> was observed close to the source due to low to moderate wind speeds. Incremental value of PM<sub>10</sub> was superimposed on the base line data monitored at the proposed site to predict total GLC of PM<sub>10</sub> due to combined impacts

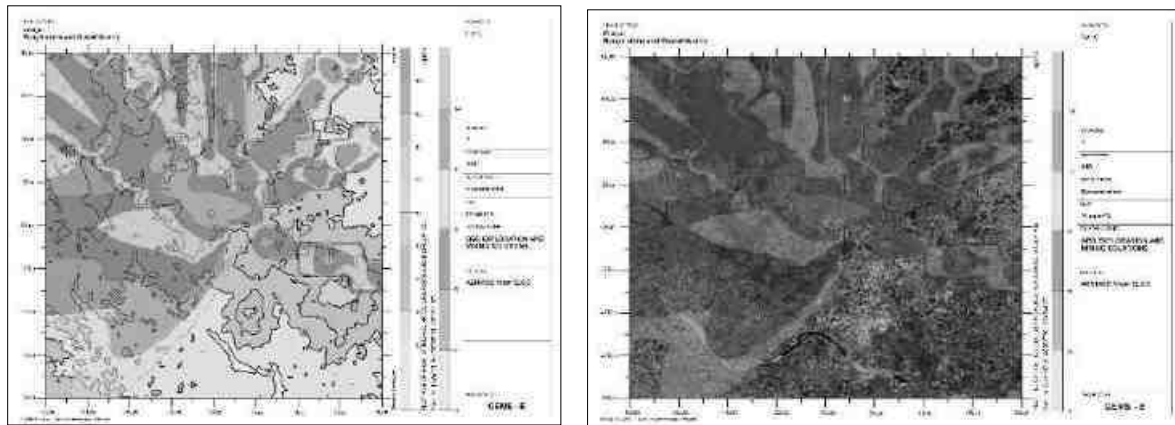
**TABLE 4.1: ESTIMATED EMISSION RATE**

PM <sub>10</sub>			
Activity	Source type	Value	Unit
Drilling	Point Source	0.075536782	g/s
Blasting	Point Source	0.000594849	g/s
Mineral Loading	Point Source	0.041203324	g/s
Haul Road	Line Source	0.002489536	g/s/m
Overall Mine	Area Source	0.055750836	g/s
SO <sub>2</sub>			
Activity	Source type	Value	Unit
Overall Mine	Area Source	0.000500328	g/s
NO <sub>x</sub>			
Overall Mine	Area Source	0.000026914	g/s

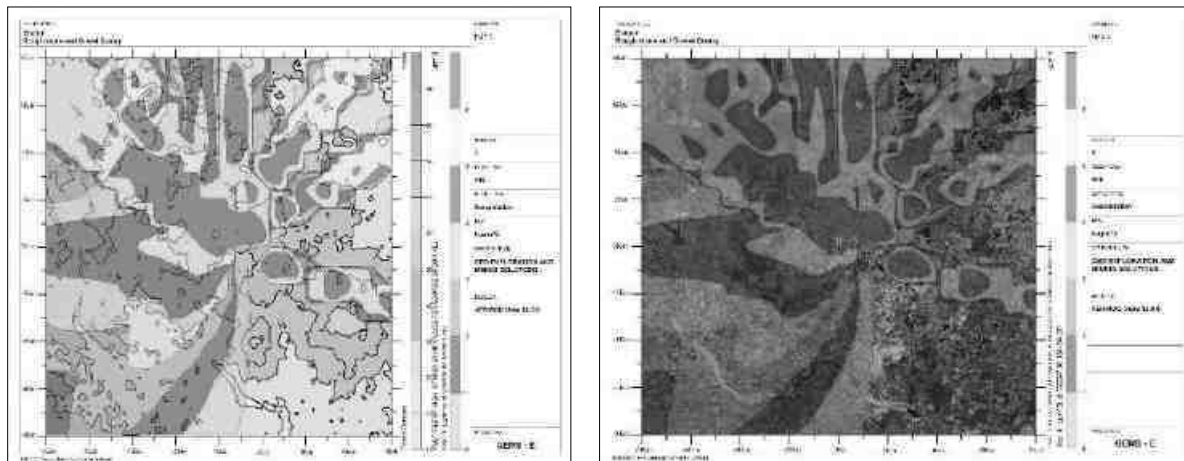
**FIGURE 4.1: AERMOD TERRAIN MAP**



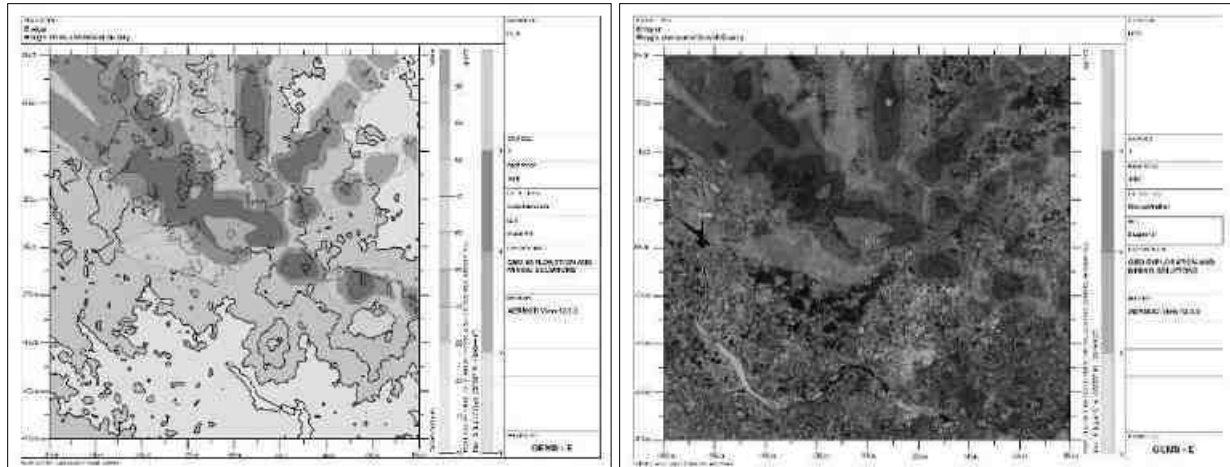
**FIGURE 4.2: PREDICTED INCREMENTAL CONCENTRATION OF PM<sub>10</sub>**



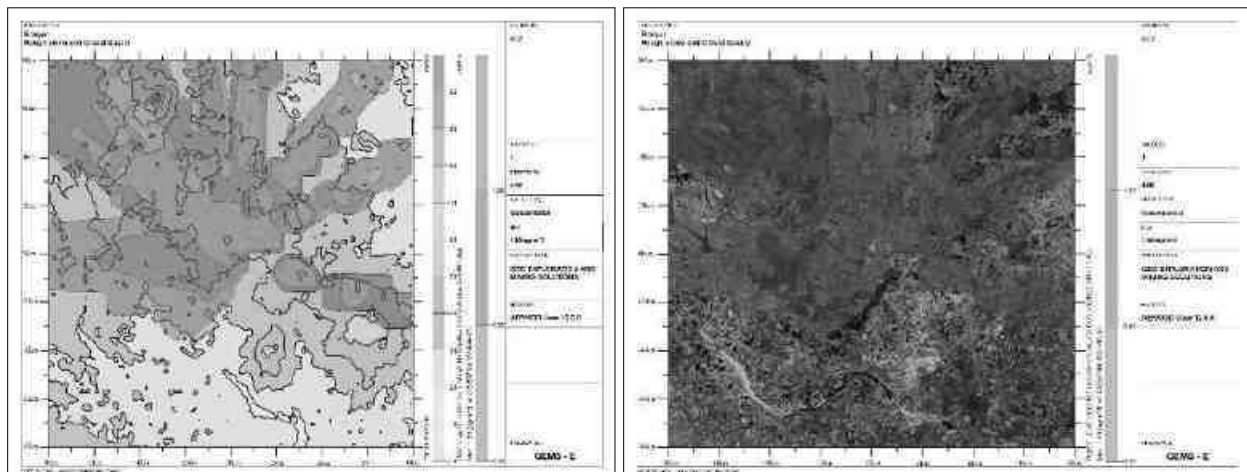
**FIGURE 4.3: PREDICTED INCREMENTAL CONCENTRATION OF PM<sub>2.5</sub>**



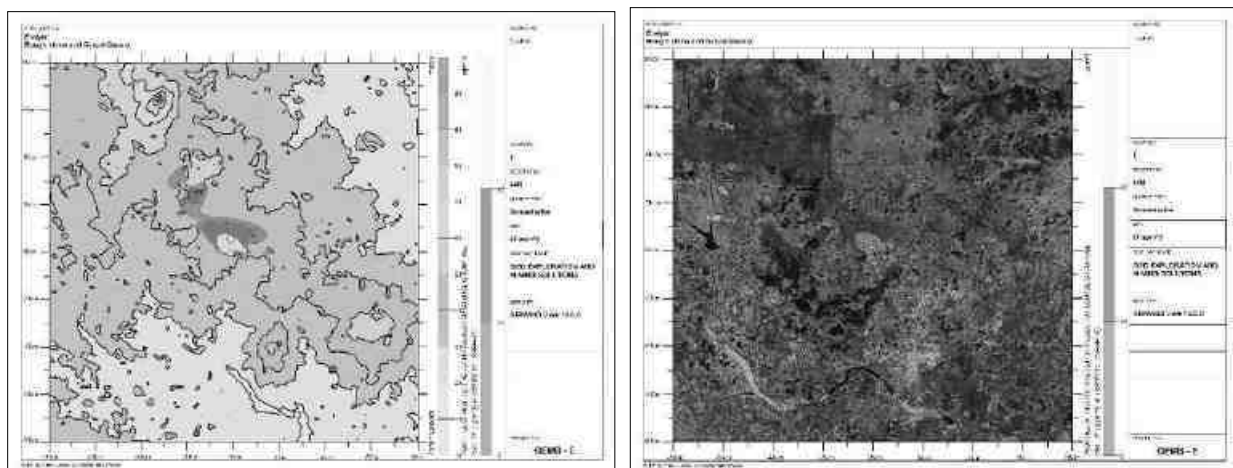
**FIGURE 4.4: PREDICTED INCREMENTAL CONCENTRATION OF NO<sub>x</sub>**



**FIGURE 4.5: PREDICTED INCREMENTAL CONCENTRATION OF SO<sub>2</sub>**



**FIGURE 4.6: PREDICTED INCREMENTAL CONCENTRATION OF FUGITIVE DUST**





### 4.3.2.1 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 Table below:

**TABLE 4.2: INCREMENTAL & RESULTANT GLC OF PM<sub>10</sub>**

Station Code	Location	X Coordinate (m)	Y Coordinate (m)	Average Baseline PM <sub>10</sub> (µg/m <sup>3</sup> )	Incremental value of PM <sub>10</sub> due to mining (µg/m <sup>3</sup> )	Total PM <sub>10</sub> (µg/m <sup>3</sup> )
AAQ1	12° 4'18.33"N 79°38'44.83"E	35	-73	45.6	14.85	75.3
AAQ2	12° 4'13.82"N 79°38'45.18"E	43	-213	44.1	13.00	57.1
AAQ3	12° 3'47.84"N 79°39'27.55"E	1330	-1011	43.3	0	43.3
AAQ4	12° 6'4.61"N 79°35'37.46"E	-5659	3207	44.3	9.95	54.25
AAQ5	12° 1'54.39"N 79°37'13.24"E	-2748	-4505	45.4	4.00	49.4
AAQ6	12° 5'5.60"N 79°42'13.04"E	6354	1388	44.0	0	44
AAQ7	12° 7'25.17"N 79°39'11.51"E	843	5688	46.0	14.10	60.1

**TABLE 4.3: INCREMENTAL & RESULTANT GLC OF PM<sub>2.5</sub>**

Station Code	Location	X Coordinate (m)	Y Coordinate (m)	Average Baseline PM <sub>2.5</sub> (µg/m <sup>3</sup> )	Incremental value of PM <sub>2.5</sub> due to mining (µg/m <sup>3</sup> )	Total PM <sub>2.5</sub> (µg/m <sup>3</sup> )
AAQ1	12° 4'18.33"N 79°38'44.83"E	35	-73	21.4	6.97	28.37
AAQ2	12° 4'13.82"N 79°38'45.18"E	43	-213	21.5	6.12	27.62
AAQ3	12° 3'47.84"N 79°39'27.55"E	1330	-1011	20.7	0	20.7
AAQ4	12° 6'4.61"N 79°35'37.46"E	-5659	3207	22.4	4.70	27.1
AAQ5	12° 1'54.39"N 79°37'13.24"E	-2748	-4505	22.2	3.50	25.7
AAQ6	12° 5'5.60"N 79°42'13.04"E	6354	1388	21.8	0	21.8
AAQ7	12° 7'25.17"N 79°39'11.51"E	843	5688	19.5	6.53	26.03

**TABLE 4.4: INCREMENTAL & RESULTANT GLC OF SO<sub>2</sub>**

Station Code	Location	X Coordinate (m)	Y Coordinate (m)	Average Baseline SO <sub>2</sub> (µg/m <sup>3</sup> )	Incremental value due to mining (µg/m <sup>3</sup> )	Total SO <sub>2</sub> (µg/m <sup>3</sup> )
AAQ1	12° 4'18.33"N 79°38'44.83"E	35	-73	6.7	1.89	8.59
AAQ2	12° 4'13.82"N 79°38'45.18"E	43	-213	6.7	1.80	8.5
AAQ3	12° 3'47.84"N 79°39'27.55"E	1330	-1011	6.2	0	6.2
AAQ4	12° 6'4.61"N 79°35'37.46"E	-5659	3207	6.5	1.20	7.7
AAQ5	12° 1'54.39"N 79°37'13.24"E	-2748	-4505	6.6	0	6.6
AAQ6	12° 5'5.60"N 79°42'13.04"E	6354	1388	6.3	0	6.3
AAQ7	12° 7'25.17"N 79°39'11.51"E	843	5688	7.3	1.85	9.15

**TABLE 4.5: INCREMENTAL & RESULTANT GLC OF NOX**

Station Code	Location	X Coordinate (m)	Y Coordinate (m)	Average Baseline NO <sub>x</sub> (µg/m <sup>3</sup> )	Incremental value due to mining (µg/m <sup>3</sup> )	Total NO <sub>x</sub> (µg/m <sup>3</sup> )
AAQ1	12° 4'18.33"N 79°38'44.83"E	35	-73	23.5	9.62	33.12
AAQ2	12° 4'13.82"N 79°38'45.18"E	43	-213	22.5	7.19	29.69
AAQ3	12° 3'47.84"N 79°39'27.55"E	1330	-1011	23.3	0	23.3
AAQ4	12° 6'4.61"N 79°35'37.46"E	-5659	3207	22.7	1.00	23.7
AAQ5	12° 1'54.39"N 79°37'13.24"E	-2748	-4505	20.7	0	20.7
AAQ6	12° 5'5.60"N 79°42'13.04"E	6354	1388	22.3	0	22.3
AAQ7	12° 7'25.17"N 79°39'11.51"E	843	5688	20.6	8.00	28.6

From the resultant of cumulative concentration i.e., Background + Incremental Concentration of pollutant in all the receptor locations without effective mitigation measures are still within the prescribed NAAQ limits of 100, 80 & 80 µg/m<sup>3</sup> for PM<sub>10</sub>, SO<sub>2</sub> & NO<sub>x</sub> respectively. By adopting suitable mitigation measures, the pollutant levels in the atmosphere can be further being controlled.

#### 4.3.4. 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 become very effective and the work environment will be improved from the point 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 –

- Establish time of blasting to suit the local conditions and water sprinkling on blasting face
- Avoid blasting i.e., when temperature inversion is likely to occur and strong wind blows towards residential areas
- 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
- 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 & 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 below 20 km/hr to avoid generation of dust.
- Water sprinkling on haul roads & 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 & makes reduction in the pollution.
- The un-metalled haul roads will be compacted weekly before being put into use.
- Over loading of tippers will be avoided to prevent spillage.

- It will be ensured that all transportation vehicles carry a valid PUC certificate
- Grading of haul roads and service roads to clear accumulation of loose materials

#### **Green Belt –**

- 1210 Nos of trees will be planted through this project in the lease area and village roads (Approach Road) to prevent the generation of dust due to movement of dumpers/trucks
- Green belt of adequate width will be developed around the project areas

#### **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 & tipper drivers
- Ambient Air Quality Monitoring will be conducted six months once to assess effectiveness of mitigation measures proposed

### **4.4 NOISE ENVIRONMENT**

Noise pollution is mainly due to operation like drilling & blasting and plying of trucks & HEMM. These activities will not cause any problem to the inhabitants of this area because there is no human settlement within 300m radius from the project site. Noise modelling has been carried out considering blasting and compressor operation (drilling) and transportation activities.

Predictions have been carried out to compute the noise level at various distances around the working pit due to these major noise-generating sources. Noise 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 model based on first principle.

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

Where:

$Lp_1$  &  $Lp_2$  are sound levels at points located at distances  $r_1$  &  $r_2$  from the source.

$Ae_{1,2}$  is the excess attenuation due to environmental conditions. Combined effect of all sources can be determined at various locations by logarithmic addition.

$$Lp_{total} = 10 \log \{10^{(Lp1/10)} + 10^{(Lp2/10)} + 10^{(Lp3/10)} + \dots\}$$

#### **4.4.1 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 4-8.

**TABLE 4.7: ACTIVITY AND NOISE LEVEL PRODUCED BY MACHINERY**

Sl.No.	Machinery / Activity	Impact on Environment?	Noise Produced in dB(A) at 50 ft from source*
1	Blasting	Yes	94
2	Jack Hammer	Yes	88
3	Compressor	No	81
4	Excavator	No	85
5	Tipper	No	84
Total Noise Produced			95.8

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

The total noise to be produced by mining machineries 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**

Location ID	N1	N2	N3	N4	N5	N6	N7
Maximum Monitored Value (Day) dB(A)	43.1	42.5	41.7	40.3	37.9	38.3	37.5
Incremental Value dB(A)	66.1	52.1	36.6	24.5	26.1	24.5	25.3
Total Predicted Noise level dB(A)	66.1	52.6	42.9	40.4	38.2	38.5	37.8

The incremental noise level is found within the range of 66.1dB (A) in Core Zone and 24.5 – 52.1 dB (A) in Buffer zone. The noise level at different receptors in buffer zone is lower due to the distance involved and other topographical features adding to the noise attenuation. The resultant Noise level due to monitored values and calculated values at the receptors are based on the mathematical formula considering attenuation due to Green Belt as 4.9 dB (A) the barrier effect. From the above table, it can be seen that the ambient noise levels at all the locations are within permissible limits of Industrial area (core zone) & 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.).

#### 4.4.2 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;
- Proper maintenance, oiling and greasing of machines will be done every week to reduce generation of noise;
- Provision of sound insulated chambers for the workers working on machines (HEMM) producing higher levels of noise;
- Silencers / mufflers will be installed in all machineries;
- Green Belt/Plantation will be developed around the project area and along the haul roads. The plantation minimizes propagation of noise;
- Personal Protective Equipment (PPE) like ear muffs/ear plugs will be provided to the operators of HEMM and persons working near HEMM and their use will be ensured through training and awareness.

- Regular medical check-up and proper training to personnel to create awareness about adverse noise level effects

**4.4.3 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:

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

Where –

V = peak particle velocity (mm/s)

K = site and rock factor constant

Q = maximum instantaneous charge (kg)

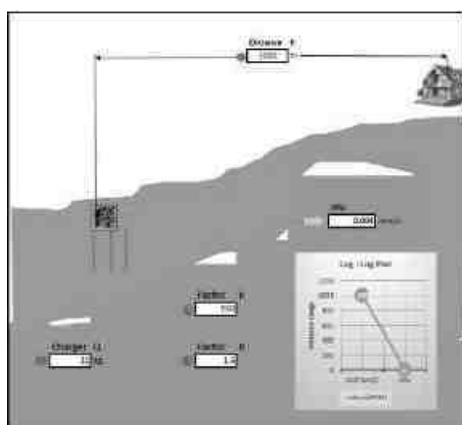
B = constant related to the rock and site (usually 1.6)

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 m/ms
P1	22	1000-SE	0.094

**FIGURE 4.6: GROUND VIBRATION PREDICTION**



From the above graph, the charge per blast of 22 kg 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. But the all the project proponents ensure that the charge per blast shall be less than 85 kg and carry out blasting twice or thrice a day

based on the onsite conditions under the supervision of competent person employed. However, as per statutory requirement control measures will be adopted to avoid the impacts due to ground vibrations and fly rocks due to blasting.

#### **4.4.3.1 Mitigation Measures**

- It is proposed to carry out blasting operation 20kg per round so that the vibration will be minimal
- The mining operation will be carried out without deep hole drilling, 25mm small dia cartridge will be utilized for the blasting
- The blasting operations in the project site without deep hole drilling and blasting using delay detonators, which reduces the ground vibrations;
- Proper quantity of explosive, 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.
- 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 such that the predicted peak particle velocity shall not exceed 8 mm/s.
- Vibration monitoring will be carried out every 6 months to check the efficacy of blasting practices

#### **4.5. Impact on the Biological Environment**

##### **4.5.1. Anticipated Impact on agricultural land associated with flora**

1. Dust particle settle on neighbouring agricultural land it is located about 100m on the west side. During operation and minerals are transported in approach roads.
2. There shall be negligible air emissions or effluents from the project site. During the loading of the truck, dust generation will be likely. This shall be a temporary effect and not anticipated to affect the surrounding vegetation significantly.

##### **4.5.2 Mitigation Measures**

###### **4.5.2.1. General Guidelines for Green Belt Development**

Drone survey was covered the green belt and fencing as per the terms of references. The green belt and plantation purposes in and around the proposed mine lease area native species, fruit-bearing trees, medicinal plants, and dense canopy trees should be selected. These species should be tolerant to pollution levels as per Bio- Geography zones of India.

After the operation of mining production capacity, Green belt and Plantation species should be in accordance with the Terms and Conditions of the Environmental Clearance Green belt is created not only for the purpose of protecting sensitive areas or maintaining the ecological balance but because they also act as efficient biological filters

or sinks for particulate and gaseous emissions, generated by vehicular movements and various industrial and mining activities. Optimally designed green belts can be effective in reducing the impact of fugitive emissions and pollutants accidentally or otherwise released at ground levels.

#### 4.5.3.2. Proposed Green Belt

Extensive green belt development will be started during the construction phase, which will continue till the operation of the plant. About 1500-2000 trees will be planted per hectare all around the plant, approach roads, and township premises. Locally available types of trees that are resistant to pollutants will be planted. In addition to the above, all open spaces available within the premises will be developed as nurseries, parks, gardens, and other forms of greenery. 5 m wide greenbelt will be developed along the plant premises, as per land available.

#### 4.5.3.3. Development of Green Belt

The plantation matrix adopted for the green belt development includes pit of 0.3 m x 0.3 m in size with a spacing of 2 m x 2 m. In addition, earth filling and manure may also be required for the proper nutritional balance and nourishment of the sapling. It is also recommended that the plantation has to be taken up randomly and the landscaping aspects could be taken into consideration. Multi-layered plantations comprising of medium height trees (7 m to 10 m) and shrubs (5 m height) are proposed for the green belt.

#### 4.5.3.4. Selection of Plant Species for Green Belt Development

It is also recommended that the plantation has to be taken up randomly and the landscaping aspects could be taken into consideration. Multi-layered plantations comprising of medium height trees (7 m to 10 m) and shrubs (5 m height) are proposed for the green belt. Green belt is plantation of trees for reducing the air pollution as they absorb both gaseous and particulate pollutant, thus removing them from atmosphere. Green plants form a surface capable of absorbing air pollutants and forming sinks for pollutants. It improves the aesthetic value of local environment. Under present project, green belts have been planned with emphasis on creating biodiversity; enhance natural surroundings and mitigating pollution. Regional tree saplings in eco-friendly bags like *Pterocarpus marsupium*, *Pongamia pinnata*, *Limonia acidissima*, and *Cassia roxburghii* will be planted along the Lease boundary and avenues as well as over Non-active dumps with intervals 3m in between with the GPS Coordinates. The greenbelt development plan aims to overall improvement in the environmental conditions of the region Native plant species will be preferred.

- The species should be wind-firm and deep-rooted.
- The species should form a dense canopy.
- Fast-growing plants will be planted
- Species tolerance to air pollution like SO<sub>2</sub> and NO<sub>2</sub> should be preferred.
- Plants having large leaf area index will be considered
- Soil improving plants (Nitrogen fixing rapidly decomposable leaf litter).
- Attractive appearance with good flowering and fruit-bearing.
- Birds and insects attract tree species.
- Roadsides will be planted with local vegetation.

**Table No 4.1. List of plant species proposed for Greenbelt development**

S. No	Scientific name	Tamil Name
1	<i>Aegle marmelos</i>	Vilva maram
2	<i>Albizia lebbeck</i>	Vaagai maram
3	<i>Cassia fistula</i>	Konrai tree
4	<i>Lannea coromandelica</i>	Othiyam
5	<i>Limonia acidissima</i>	Vila maram
6	<i>Syzygium cumini</i>	Naval maram
7	<i>Toona ciliata</i>	Santhana Vembu
8	<i>Ficus hispida</i>	Aththi maram

9	Borassus flabellifer	Panai-maram
10	Madhuca longifolia	Illupai maram

(\*Source: Term of Reference-ToR)

**Table No 4.2.Species suitable for abatement of noise and dust pollution**

S. No	Botanical name	Common name
1	Azadirachta indica	Vembhu maram
2	Ficus religiosa	Arasan maram
3	Ficus hispida	Aththi maram
4	Bombax ceiba	Mul Elavu
5	Syzygium cumini	Naval maram
6	Tamarindus indica	Puliyamaram
7	Mangifera indica	Manga maram
8	Harwickia binata	Anjan maram
9	Delonix regia	Neruppu Kondrai
10	Cassia Fistula	Sara Kondrai

(\*Source: Guidance for Developing Green belts Manual, CPCB 2000)

The above-suggested list covers species with thick canopy cover, perennial green nature, native origin, and a large leaf area index. The proposed species will help in forming an effective barrier between the mine site area and the surroundings.

These species need to be planted along the periphery of the lease area for absorb fugitive emissions and noise levels which is generated during mining activities. All the open spaces, where tree plantation may not be possible, should be covered with shrubs and grass to prevent erosion of topsoil.

#### 4.5.4. Anticipated Impact on Fauna

- Noise generation due to vehicle may affect avifauna.
- The lease area is not inhabited by any wild life, as there is no forest cover, hence there will not be any effect on migration or extinction of wildlife.
- There is no National Park, Biosphere Reserve, Wildlife corridors, and Tiger/Elephant Reserve found within 10 km radius of the project site.

##### 4.5.4.1. Measures for protection and conservation of wildlife species

- Topsoil has a large number of seeds of native plant species in the mining area.
- Topsoil will be used for restoration and suitable surfaces for planted seedlings.
- Checks and controls the movement of vehicles in and out of the mine.
- Undertaking mitigative measures for a conducive environment to the flora and fauna in consultation with Forest Department.
- A dust suppression system will be installed within the mine and periphery of the mine.
- Plantation around the mine area will help in creating habitats for small faunal species and create a better environment for various fauna. Creating and developing awareness for nature and wildlife in the adjoining villages.

#### 4.5.3. Impact on Aquatic Biodiversity

- The major lake along the project sites doesn't have a rich biodiversity and almost all the species of both fauna and flora listed are either least concerned or not evaluated.
- There is no impact on fish habitats and the food WEB/ food chain in the water body and Reservoir.



**Table No. 4.3. Overall Ecological impact assessments of Eraiyur Village, Rough stone Quarry, Vanur Taluk, Villupuram District and Tamil Nadu.**

S.No	Attributes	Assessment
	Activities of the project affect the breeding/nesting sites of birds and animals	No breeding and nesting site was identified in the mining lease site. The fauna sighted mostly migrated from the buffer area.
2	Located near an area populated by rare or endangered species	No Endangered, Critically Endangered, or vulnerable species were sighted in the core mining lease area.
3	Proximity to national park/wildlife sanctuary/reserve forest /mangroves/ coastline/estuary/sea	Nil
4	The proposed project restricts access to waterholes for wildlife	'No '
5	Proposed mining project impact surface water quality that also provides water to wildlife	'No 'scheduled or threatened wildlife animals are sighted regularly core in the core area.
6	Proposed mining project increase siltation that would affect nearby biodiversity areas.	Surface runoff management such as drains is constructed properly so there will be no siltation effect in the nearby mining area.
7	Risk of fall/slip or cause death to wild animals due to project activities.	'No'
8	The project release effluents into a water body that also supplies water to a wildlife.	No water body near to core zone so the chances of water becoming polluted is low.
9	Mining projects affect the forest-based livelihood/ any specific forest product on which local livelihood depended.	'No'
10	The project likely to affect migration routes.	'No 'migration route was observed during the monitoring period.
11	The project is likely to affect the flora of an area, which have medicinal value	'No'
12	Forestland is to be diverted, has carbon high sequestration.	'No 'There was no forest land diverted.
13	The project is likely to affect wetlands, Fish breeding grounds, and marine ecology.	'No'. Wetland was not present in the near core Mining lease area. No breeding and nesting ground is present in the core mining area.

(\*Source: EIA Guidance Manual-Mining and Minerals, 2010)

**TABLE 4.12: RECOMMENDED SPECIES FOR GREENBELT DEVELOPMENT PLAN**

Sl.No	Name of the plant (Botanical)	Family Name	Common Name	Habit
1	<i>Azadirachta indica</i>	Meliaceae	Neem, Vembu	Tree
2	<i>Albiziafalcataria</i>	Fabaceae	Tamarind, Puliymaram	Tree
3	<i>Polyalthialongifolia</i>	Annonaceae	Kattumaram	Tree
4	<i>Borassus Flabellifer</i>	Arecaceae	Palmyra Palm	Tree

The 7.5m Safety distance along the boundary has been identified to be utilized for subsequent Afforestation. However, the afforestation should always be carried out in a systematic and scientific manner. Regional trees like Neem, Pongamia, Pinnata will be planted along the Lease boundary and avenue plantation will be carried out in the project site. The rate of survival expected to be 80% in this area. Greenbelt development Plan is given in

**TABLE 4.13: GREENBELT DEVELOPMENT PLAN**

Year	No. of trees proposed to be planted	Area to be covered in m <sup>2</sup>	Name of the species

I	1210	The safety zone along the boundary barrier has been identified to be utilized for Greenbelt development and along village roads.	Neem, Pongamia, vilvam etc.,
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## 4.6 SOCIO ECONOMIC

### 4.6.1 Anticipated Impact

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

### 4.6.2 Mitigation Measures

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

## 4.7 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

### 4.7.1 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

### 4.7.2 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

### 4.7.3 Physical Hazards

The following measures are proposed for control of physical hazards

- Specific personnel training on work-site safety management will be taken up;
- Work site assessment will be done by rock scaling of each surface exposed to workers to prevent accidental rock falling and / or landslide, especially after blasting activities;
- Natural barriers, temporary railing, or specific danger signals will be provided along rock benches or other pit areas where work is performed at heights more than 2m from ground level;
- Maintenance of yards, roads and footpaths, providing sufficient water drainage and preventing slippery surfaces with an all-weather surface, such as coarse gravel will be taken up

### 4.7.4 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.

## 4.8 MINE WASTE MANAGEMENT

No waste is anticipated, the entire mined out material will be sold to needy crushers and customers.

## 4.9 MINE CLOSURE

The ultimate depth of the mine is 32m bgl and the life of the mine is 10 years, after completion of mining operation the following action will be taken in the project site as a part of Mine closure plan

- The total Mined out land would be around 1.65.26 Ha this land will be converted into temporary water reservoir which will facilitate to collect the rain water
- The stagnant water will be supplied to the nearby agriculture land during drought seasons
- Fencing will be re constructed around the pit after closure, the warning/ danger display board will be placed on all the sides of the project site
- The un utilized area and haul roads will be converted as plantation area, fruit bearing trees will be planted to retain the eco system of the area
- Final Mine closure plan will be prepared and submitted to the concerned authority

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.

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.

#### **4.9.1 Mine Closure Criteria**

The criteria involved in mine closure are discussed below:

##### **4.9.1.1 Physical Stability**

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

##### **4.9.1.2 Chemical Stability**

The solid wastes on the mine site should be chemically stable. This means that the consequences of chemical changes or conditions leading to leaching of metals, salts or organic compounds should not endanger public health and safety nor result in the deterioration of environmental attributes. If the pollutant 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.

##### **4.9.1.3 Biological Stability**

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

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

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

The Mine closure plan should be as per the approved mine 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.

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

### **5.0 INTRODUCTION**

Consideration of alternatives to a project proposal is a requirement of EIA process. During the scoping process, alternatives to a proposal 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 surrounding areas already undergone quarrying operation, there are 10 Crushers within the radius of 1km. Most of the quarries in the regions are abandoned and lease expired quarries. Hence this quarry will feed the Rough stone material to the crushing units.

The Rough Stone and Gravel Quarry Project for excavation of Rough Stone, which is site specific. The proposed mining lease areas have 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 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 well connected and accessible.
- The mining operations will not intersect the ground water level. Hence, no impact on ground water environment.
- Study 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 all the mine sites are mineral specific

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

The existing quarries in the area operated by Opencast Mechanised Mining operation with drilling and blasting method will be used to extract Rough Stone in the area. All the applied mining lease areas have following advantages –

- As the mineral deposition is homogeneous and batholith formation, therefore opencast method of working is preferred over underground method
- The material will be loaded with the help of excavators into dumpers / trippers and transported to the needy customers.
- Blasting and availability of drills along with controlled blasting technology gives desired fragmentation so that the mineral is handled safely and used without secondary blasting.
- 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.

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## 6. ENVIRONMENTAL MONITORING PROGRAMME

### 6.0 GENERAL

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 as well as the conditions set forth under the order issued by Tamil Nadu Pollution Control Board while granting CTO.

### 6.1 METHODOLOGY OF MONITORING MECHANISM

Implementation of EMP and periodic monitoring will be carried out by the project proponent. A comprehensive monitoring mechanism has been devised for monitoring of impacts due to this 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 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 all the proposed quarries.

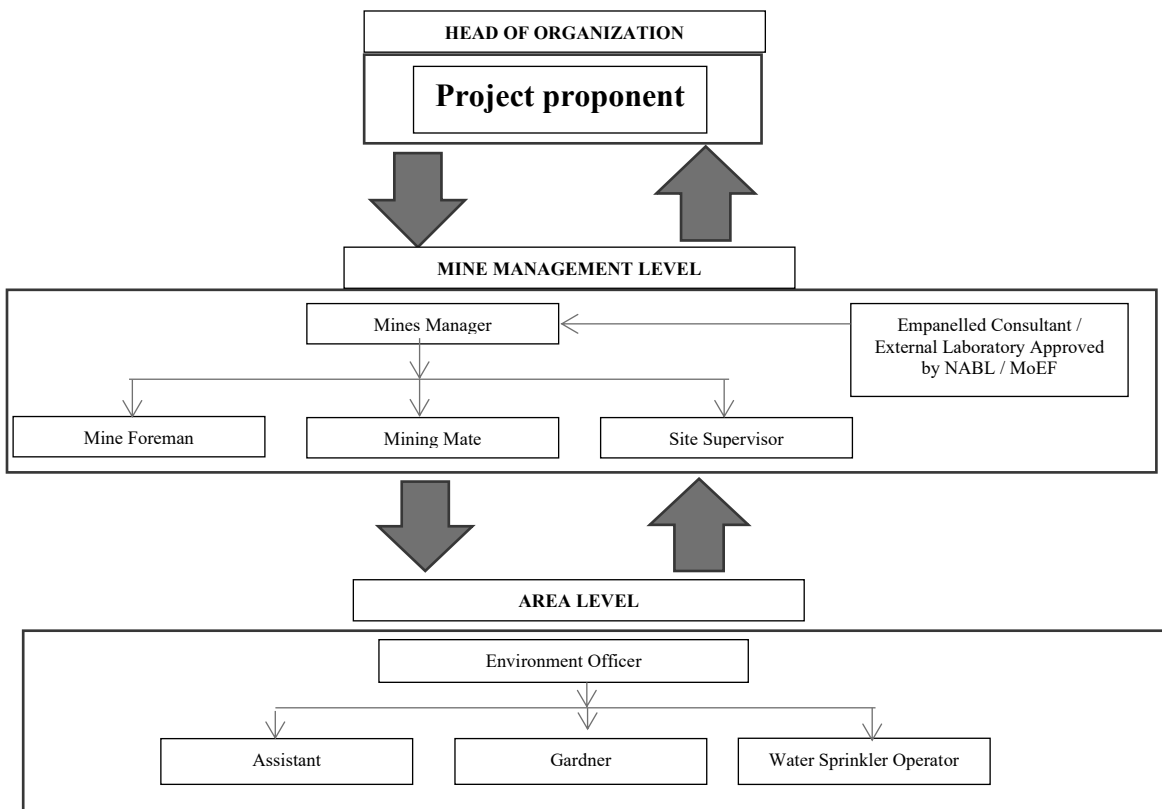
The responsibilities of this cell will be:

- 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 each proposed project proponent. The half-yearly reports are submitted to Ministry of Environment and Forest, Regional Office and SEIAA 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).

**FIGURE 6.1: PROPOSED ENVIRONMENTAL MONITORING CELL**



**6.2 IMPLEMENTATION SCHEDULE OF MITIGATION MEASURES**

The mitigation measures proposed in Chapter-4 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**

SI 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

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 monitoring are detailed in Table 6.2

**TABLE 6.2: PROPOSED MONITORING SCHEDULE POST EC FOR P1**

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 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 EMP

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 capital cost for Environmental Monitoring Programme is Rs 76,000/- and the recurring cost is Rs 76,000 per annum for each Proposed Project.

**TABLE 6.3 ENVIRONMENT MONITORING PROGRAM BUDGET**

S.No.	Parameter	Capital Cost	Recurring Cost per annum
1	Air Quality	Rs. 76,000/-	Rs. 76,000/-
2	Meteorology		
3	Water Quality		
4	Hydrology		



5	Soil Quality		
6	Noise Quality		
7	Vibration Study		
<b>Total</b>		<b>Rs 76,000/-</b>	<b>Rs 76,000/-</b>

Source: Approved Mining Plan

## 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.

## 7. ADDITIONAL STUDIES

### 7.0 GENERAL

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

- Public Consultation
- Risk Assessment
- Disaster Management Plan
- Cumulative Impact Study
- Plastic Waste Management

### 7.1. 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.

### 7.2 RISK ASSESSMENT

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, 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 all proposed projects. Risk Assessment is all about prevention of accidents and to take necessary steps to prevent it from happening.

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

**TABLE 7.1 RISK ASSESSMENT& CONTROL MEASURES**

S. No	Risk factors	Causes of risk	Control measures
1	Accidents due to explosives and heavy mining machineries	Improper handling and unsafe working practice	All safety precautions and provisions of Mine Act, 1952, Metalliferous Mines Regulation, 1961 and Mines Rules, 1955 will be strictly followed during all mining operations; Workers will be sent to the Training in the nearby Group Vocational Training Centre Entry of unauthorized persons will be prohibited; Fire-fighting and first-aid provisions in the mine office complex and mining area; Provisions of all the safety appliances such as safety boot, helmets, goggles etc. will be made available to the employees and regular check for their use

			<p>Working of quarry, as per approved plans and regularly updating the mine plans;</p> <p>Cleaning of mine faces on daily basis shall be daily done in order to avoid any overhang or undercut;</p> <p>Handling of explosives, charging and firing shall be carried out by competent persons only under the supervision of a Mine Manager;</p> <p>Maintenance and testing of all mining equipment as per manufacturer 's guidelines.</p>
2	Drilling	<p>Improper and unsafe practices</p> <p>Due to high pressure of compressed air, hoses may burst</p> <p>Drill Rod may break</p>	<p>Safe operating procedure established for drilling (SOP) will be strictly followed.</p> <p>Only trained operators will be deployed.</p> <p>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,</p> <p>Drilling shall not be carried on simultaneously on the benches at places directly one above the other.</p> <p>Periodical preventive maintenance and replacement of worn-out accessories in the compressor and drill equipment as per operator manual.</p> <p>All drills unit shall be provided with wet drilling shall be maintained in efficient working in condition.</p> <p>Operator shall regularly use all the personal protective equipment.</p>
4	Blasting	<p>Fly rock, ground vibration, Noise and dust.</p> <p>Improper charging, stemming &amp; Blasting/fining of blast holes</p> <p>Vibration due to movement of vehicles</p>	<p>Restrict maximum charge per delay as per regulations and by optimum blast hole pattern, vibrations will be controlled within the permissible limit and blasting can be conducted safely.</p> <p>SOP for Charging, Stemming &amp; Blasting/Firing of Blast Holes will be followed by blasting crew during initial stage of operation</p> <p>Shots are fired during daytime only.</p> <p>All holes charged on any one day shall be fired on the same day.</p> <p>The danger zone will be distinctly demarcated (by means of red flags)</p>
5	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>Before commencing work, drivers personally check the dumper/truck/tipper for oil(s), fuel and water levels, tyre inflation, general cleanliness and inspect the brakes, steering system, warning devices including automatically operated audio-visual reversing alarm, rear view mirrors, side indicator lights etc., are in good condition.</p> <p>Not allow any unauthorized person to ride on the vehicle nor allow any unauthorized person to operate the vehicle.</p> <p>Concave mirrors should be kept at all corners</p> <p>All vehicles should be fitted with reverse horn with one spotter at every tipping point</p> <p>Loading according to the vehicle capacity</p> <p>Periodical maintenance of vehicles as per operator manual</p>

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

Source: Analysed and Proposed by FAE & EC

### 7.3 DISASTER MANAGEMENT PLAN

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

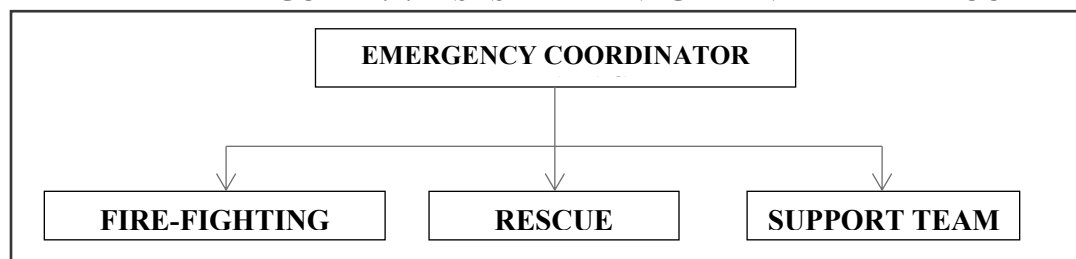
The Disaster Management Plan is aimed to ensure safety of life, protection of environment, protection of installation, restoration of production and salvage operations in this same order of priorities.

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

**FIGURE 7.1: DISASTER MANAGEMENT TEAM LAYOUT**



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

**TABLE 7.2: PROPOSED TEAMS TO DEAL WITH EMERGENCY SITUATION**

DESIGNATION	QUALIFICATION
<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. 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.

### **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 carryout rescue operation of trapped personnel. The people trained in first aid and fire-fighting shall be included in search and rescue team.

(f) Emergency security controller

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

### 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

### Proposed fire extinguishers at different locations –

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

**TABLE 7.3: PROPOSED FIRE EXTINGUISHERS AT DIFFERENT LOCATIONS**

LOCATION	TYPE OF FIRE EXTINGUISHERS
Electrical Equipment's	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

### Alarm system to be followed during disaster –

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

## 7.4 CUMULATIVE IMPACT STUDY

For easy representation of Proposed and Existing Quarries in the Cluster are given unique codes and identifies and studied in this EIA /EMP Report.

**TABLE 7.4: LIST OF QUARRIES WITHIN 500 METER RADIUS**

PROPOSED QUARRIES					
CODE	Name of the Owner	Village	S.F. Nos	Extent in Ha	Status
P1	Thiru.A.Veeraragavan S/o,Ananthavelu, mettu theru, vanur taluk,viluppuram District	Eraiyyur	75/1, 75/4, 75/5, 75/6 and 76/3B2	2.42.63	LrNo.SEIAA-TN/ F.No. 10444 /ToR-1626/2023 Dated: 12.12.2023.
P2	Thiru.K.Anandavelu, S/o,Kesavan,No.225, Mettu street,Eraiyyur Village,Vanur Taluk, Viluppuram District	Eraiyyur	76/2, 76/3A &76/6	2.18.0	-
<b>TOTAL EXTENT</b>				<b>4.60.63</b>	
EXISTING QUARRIES					
CODE	Name of the Owner	Village	S.F. Nos	Extent in Ha	Status
E-1	T.Vasudevan, S/o, Thangavel, Eraiyyur Village, Vanur Taluk, Viluppuram District.	Eraiyyur	80/3,80/4,81/1, 81/3,81/4,81/5, 81/6,94/1A,94/ 2,94/3	4.83.5	15.02.2019 to 14.02.2024
E-2	E.Jayasankar S/o, Elumalai, No.198, Vinayakar,Koil street,Eraiyyur Village, Vanur Taluk, Viluppuram District.	Eraiyyur	93/4,93/5,94/1 B,94/4	3.37.5	15.02.2019 to 14.02.2024
<b>TOTAL EXTENT</b>				<b>8.21.0</b>	
<b>TOTAL CLUSTER EXTENT</b>				<b>12.81.63</b>	

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

**TABLE 7.5: SALIENT FEATURES OF PROPOSAL “P1”**

Name of the Project	Thiru. A. Veeraragavan Rough Stone and Gravel Quarry	
S.F. No.	75/1, 75/4, 75/5, 75/6 and 76/3B2	
Extent	2.42.63 ha	
Village, Taluk and District	Eraiyyur Village, Vanur Taluk, Viluppuram District.	
Land Type	It is a patta lands, registered in the name of 1. Thiru A.Ganesan, 2.Thriu.D.Radhakrishnan vide patta Nos.5558,5511 & 5506. The applicant has obtained consent from the pattadhars for the period of fifteen years from 06.06.2022 to 05.06.2037.	
Toposheet No	57 P/12	
Latitude between	12° 04' 17.1389"N to 12° 04' 24.5551"N	
Longitude between	79° 38' 37.9720"E to 79° 38' 49.6101"E	
Elevation of the area	82m AMSL	
Lease period	10 Years	
Mining Plan period	5 years	
Proposed Depth of Mining	32m bgl (2m Gravel + 30m Rough stone)	
Geological Resources	Rough Stone in m <sup>3</sup>	Gravel m <sup>3</sup>
	7,27,890	48,526
Mineable Reserves	1,56,265	31,334
Year wise Production	1,56,265	31,334
Peak Production	35,195	12,334
Ultimate Pit Dimension	31 1m (L) x 89m (W) x 32m(D) bgl	
Water Level in the region	56 m bgl	
Method of Mining	Opencast Mechanized Mining Method involving drilling and Controlled blasting using Slurry Explosives	
Topography	The lease applied area is flat terrain. The area has gentle sloping towards North eastern side and altitude of the area is 82m above from Mean Sea level. The area is covered by 2m thickness of Gravel and followed by Massive Charnockite which is clearly inferred from the surface outcrops & nearby existing quarry pit.	
Machinery proposed	Jack Hammer	4 Nos
	Compressor	1 No
	Excavator with Bucket and Rock Breaker	1 No
	Tippers	2 Nos
Blasting Method	Controlled Blasting Method by shot hole drilling and small dia of 25mm slurry explosive are proposed to be used for shattering and heaving effect for removal and winning of Rough Stone. No deep hole drilling is proposed.	
Proposed Manpower Deployment	20 Nos	
Project Cost	Rs. 62,36,000/-	
EMP Cost	Rs. 3,80,000/-	
Total Project cost	Rs. 66,16,000/-	
CER Cost	Rs. 5,00,000/-	
Nearby Water Bodies	Odai	140m East
	Tank	270m NE
	Tank	750m SE
	Konnamangalam Lake	1.8km west



	Tank	2km NW
	Sangarabarani River	4.8km South
	Veedur Reservoir	5.5km SW
Greenbelt Development Plan	Proposed to plant 1210 Nos of trees considering 500 Nos of trees/ Ha criteria The plantation will be developed around the project site and nearby village roads	
Proposed Water Requirement	1.5 KLD	
Nearest Habitation	1.1km – South East	
Nearest Reserve Forest	Melkondai – 10.64 km – South West (Source - TNGIS)	
Nearest Wild Life Sanctuary	Oussudu Lake Birds Sanctuary -15km-South East	

Source: Approved Mining Plan

**TABLE 7.7: SALIENT FEATURES OF PROPOSAL “E1”**

Name of the Quarry	Thiru. T.Vasudevan Rough Stone & Gravel Quarry	
Toposheet No	57- P/12	
Latitude between	12°04'09"N to 12°04'19"N	
Longitude between	79°38'34"E to 79°38'45"E	
Geological Resources	Rough Stone in m <sup>3</sup>	Gravel m <sup>3</sup>
	36,65,304	-
Mineable Reserves	Rough Stone in m <sup>3</sup>	Gravel m <sup>3</sup>
	12,82,318	-
Year-wise production	Rough Stone in m <sup>3</sup>	Gravel m <sup>3</sup>
	4,04,793	
Ultimate Pit Dimension	327 (L) * 134 (W) * 27 (D)	
Method of Mining	Opencast Mechanized Mining Method involving drilling and blasting	
Machinery proposed	Jack Hammer	2 Nos
	Compressor	1 No
	Hydraulic Excavator	2 No
	Tippers	5Nos
Proposed Manpower Deployment	28	
Project Cost	67.31 lakhs	
CER Cost @ 2% of Project Cost	Rs.1,34,000/-	

Source: Approved Mining Plan

**TABLE 7.8: SALIENT FEATURES OF PROPOSAL “E2”**

Name of the Quarry	Thiru. E. Jayasankar Rough Stone & Gravel Quarry	
Toposheet No	57- P/12	
Latitude between	12°04'02"N to 12°04'13"N	
Longitude between	79°38'35"E to 79°38'42"E	
Geological Resources	Rough Stone in m <sup>3</sup>	Gravel m <sup>3</sup>
	26,13,790	-
Mineable Reserves	Rough Stone in m <sup>3</sup>	Gravel m <sup>3</sup>
	4,92,695	-
Year-wise production	Rough Stone in m <sup>3</sup>	Gravel m <sup>3</sup>
	3,78,010	
Ultimate Pit Dimension	221 (L) * 205 (W) * 37 (D)	
Method of Mining	Opencast Mechanized Mining Method involving drilling and blasting	
Machinery proposed	Jack Hammer	2 Nos

	Compressor	1 No
	Hydraulic Excavator	2 No
	Tippers	4Nos
Proposed Manpower Deployment	24	
Project Cost	50.17 lakhs	
CER Cost @ 2% of Project Cost	Rs.1,00,000/-	

Source: Approved Mining Plan

The Cumulative Impact is mainly anticipated due to drilling & blasting and excavation and transportation activities in all the quarries (proposed and existing) within the cluster and major impact anticipated is on Air & Noise Environment and Ground Vibrations due to blasting.

#### Air Environment –

Calculating the Cumulative Load of Mining within the cluster is as shown in table 7.16 & 7.17.

**TABLE 7.11: CUMULATIVE PRODUCTION LOAD OF ROUGH STONE**

Quarry	Production for five-year plan period	Per Year Production in m <sup>3</sup>	Per Day Production in m <sup>3</sup>	Number of Lorry Load Per Day
P1	1,56,265	31,253	117	10
<b>Total</b>	<b>1,56,265</b>	<b>31,253</b>	<b>117</b>	<b>10</b>
E1	4,04,793	80,958	270	23
E2	3,78,010	75,602	252	21
<b>Total</b>	<b>7,82,803</b>	<b>1,56,560</b>	<b>522</b>	<b>44</b>
<b>Grand Total</b>	<b>9,39,068</b>	<b>1,87,813</b>	<b>639</b>	<b>54</b>

**TABLE 7.12: CUMULATIVE PRODUCTION LOAD OF GRAVEL**

Quarry	Production for five-year plan period	Per Year Production in m <sup>3</sup>	Per Day Production in m <sup>3</sup>	Number of Lorry Load Per Day
P1	31,334	10,444	41	4
<b>Total</b>	<b>31,334</b>	<b>10,444</b>	<b>41</b>	<b>4</b>
PROPOSED PRODUCTION OF GRAVEL				
E1	-	-	-	-
E2	-	-	-	-
<b>Grand Total</b>	<b>31,334</b>	<b>10,444</b>	<b>41</b>	<b>4</b>

On a cumulative basis considering the proposed quarries, it can be seen that the overall production of Rough Stone is 526m<sup>3</sup> per day and overall production of Gravel is 35m<sup>3</sup> per day with a capacity of 53trips of Rough Stone per day and 3 Trips per day of Gravel from the cluster.

**Note:** Per day production of Rough Stone is calculated for 5 Years Lease Period and for Gravel production with 3 years production period. And the load of existing quarries is covered under existing environment of the cluster.

Based on the above production quantities the emissions due to various activities in all the 3 mines includes various activities like ground preparation, excavation, handling and transport of ore. These activities have been analysed systematically basing on USEPA-Emission Estimation Technique Manual, for Mining AP-42, to arrive at possible emissions to the atmosphere and estimated emissions are given in Table 7.18.

**TABLE 7.14: EMISSION ESTIMATION FROM QUARRIES WITHIN 500 METER RADIUS**

EMISSION ESTIMATION FOR QUARRY "P1"				
Estimated Emission Rate for PM <sub>10</sub>	Activity	Source type	Value	Unit

	Drilling	Point Source	0.075536782	g/s
	Blasting	Point Source	0.000594849	g/s
	Mineral Loading	Point Source	0.041203324	g/s
	Haul Road	Line Source	0.002489536	g/s/m
	Overall Mine	Area Source	0.055750836	g/s
Estimated Emission Rate for SO <sub>2</sub>	Overall Mine	Area Source	0.000500328	g/s
Estimated Emission Rate for NO <sub>x</sub>	Overall Mine	Area Source	0.000026914	g/s
<b>EMISSION ESTIMATION FOR QUARRY "E1"</b>				
	<b>Activity</b>	<b>Source type</b>	<b>Value</b>	<b>Unit</b>
Estimated Emission Rate for PM <sub>10</sub>	Drilling	Point Source	0.099790623	g/s
	Blasting	Point Source	0.002393664	g/s
	Mineral Loading	Point Source	0.043872754	g/s
	Haul Road	Line Source	0.002495978	g/s/m
	Overall Mine	Area Source	0.075420566	g/s
Estimated Emission Rate for SO <sub>2</sub>	Overall Mine	Area Source	0.001041021	g/s
Estimated Emission Rate for NO <sub>x</sub>	Overall Mine	Area Source	0.000105974	g/s
<b>EMISSION ESTIMATION FOR QUARRY "E2"</b>				
	<b>Activity</b>	<b>Source type</b>	<b>Value</b>	<b>Unit</b>
Estimated Emission Rate for PM <sub>10</sub>	Drilling	Point Source	0.095256515	g/s
	Blasting	Point Source	0.001897090	g/s
	Mineral Loading	Point Source	0.043197958	g/s
	Haul Road	Line Source	0.002493994	g/s/m
	Overall Mine	Area Source	0.064824751	g/s
Estimated Emission Rate for SO <sub>2</sub>	Overall Mine	Area Source	0.000864373	g/s
Estimated Emission Rate for NO <sub>x</sub>	Overall Mine	Area Source	0.000063352	g/s

Source: Emission Calculation

**TABLE 7.15: INCREMENTAL & RESULTANT GLC WITHIN CLUSTER**

<b>PM<sub>10</sub> in µg/m<sup>3</sup></b>	
Background	45.6
Incremental	14.85
Resultant	75.3
NAAQ Norms	<b>100 µg/m<sup>3</sup></b>
<b>PM<sub>2.5</sub> in µg/m<sup>3</sup></b>	
Background	21.4
Incremental	6.97
Resultant	28.37
NAAQ Norms	<b>60 µg/ m<sup>3</sup></b>
<b>So<sub>2</sub> in µg/m<sup>3</sup></b>	
Background	6.7
Incremental	1.89
Resultant	8.59
NAAQ Norms	<b>80 µg/ m<sup>3</sup></b>
<b>No<sub>2</sub> in µg/m<sup>3</sup></b>	
Background	23.5
Incremental	9.62
Resultant	33.52
NAAQ Norms	<b>80 µg/ m<sup>3</sup></b>

### 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.

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

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

Where:

$Lp_1$  &  $Lp_2$  are sound levels at points located at distances  $r_1$  &  $r_2$  from the source.

$Ae_{1,2}$  is the excess attenuation due to environmental conditions. Combined effect of all sources can be determined at various locations by logarithmic addition.

$$Lp_{total} = 10 \log \{10^{(Lp1/10)} + 10^{(Lp2/10)} + 10^{(Lp3/10)} + \dots\}$$

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

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

**TABLE 7.16: PREDICTED NOISE INCREMENTAL VALUES FROM CLUSTER**

Location ID	Background Value (Day) dB(A)	Incremental Value dB(A)	Total Predicted dB(A)	Residential Area Standards dB(A)
Habitation Near P1	48.2	47.3	46.3	55
Habitation Near E1	36.5	48.1	48.4	
Habitation Near E2	35.4	47.4	47.7	

Source: Lab Monitoring Data

The incremental noise level is found within the range of 48.1 – 47.3 dB (A) in Buffer zone. The noise level at different receptors in buffer zone is lower due to the distance involved and other topographical features adding to the noise attenuation. The resultant Noise level due to monitored values and calculated values at the receptors are based on the mathematical formula considering attenuation due to Green Belt as 4.9 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).

### Ground Vibrations

Ground vibrations due to mining activities in the all the 4 Mines within cluster 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 all the 4 mines 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 nearby the mining areas and may cause injury to persons or damage to the structures. Nearest Habitations from 4 mines respectively are as in below Table 7.21.

**TABLE 7.17: NEAREST HABITATION FROM EACH MINE**

Location ID	Distance & Direction
Habitation Near P1	1km- South East
Habitation Near P2	950 m North East
Habitation Near E1	1.1 km East
Habitation Near E2	1.1km East

The ground vibrations due to the blasting in all the mines are calculated using the empirical equation for assessment of peak particle velocity (PPV) is:

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

Where –

V = peak particle velocity (mm/s)

K = site and rock factor constant

Q = maximum instantaneous charge (kg)

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

R = distance from charge (m)

**TABLE 7.18: GROUND VIBRATIONS AT 3 MINES**

Location ID	Maximum Charge in kgs	Nearest Habitation in m	PPV in m/ms
P1	23	1km-SE	0.094
E1	58	1.1km East	0.175
E2	55	1.1km East	0.168

Source: Blasting Calculations

From the above table, the charge per blast is considered as maximum in each mine and the resultant PPV 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.

### Socio Economic Environment –

The 6 mines shall contribute towards CER and the community shall develop.

**TABLE 7.19: SOCIO ECONOMIC BENEFITS FROM 3 MINES**

Location ID	Project Cost	CER
P1	Rs. 66,16,000	Rs.5,00,000
E1	Rs.67,31,000/-	Rs.1,34,000
E2	Rs.50,17,500/-	Rs.1,00,000
<b>Total</b>	<b>Rs. 1,83,64,500/-</b>	<b>Rs.7,34,000</b>

As per para 6 (II) of the office memorandum, all the mines being a green field project & Capital Investment is ≤ 100 crores, they shall contribute 2% of Capital Investment towards CER as per directions of EAC/SEAC.

- Proposed Projects shall fund towards CER – **Rs 5,00,000/-**

**TABLE 7.20: EMPLOYMENT BENEFITS FROM 3 MINES**

Description	Employment
P1	20
<b>Total</b>	<b>20</b>
E1	28
E2	24
<b>Total</b>	<b>52</b>

Grand Total

72

A total of 20 people will get employment due to 1 proposed mines in cluster and 52 people are already employed at existing mines.

**TABLE 7.21: GREENBELT DEVELOPMENT BENEFITS FROM 3 MINES**

CODE	No of Trees proposed to be planted	Survival %	Area Covered Sq.m	Name of the Species
P1	1210	80%	The safety zone along the boundary barrier has been identified to be utilized for Greenbelt development	Neem, Pinnata, Pongamia, Ashoka etc.,
<b>Total</b>	<b>1210</b>			
E1	2420			
E2	1690			
<b>Total</b>	<b>4,110</b>			
<b>G.Total</b>	<b>5,320</b>			

Based on the Proposed Mining Plans it's anticipated that there shall growth of native species of Neem, Pinnata et., in the Cluster at a rate of 1210 Trees Planted over a period of 5 Years with Survival Rate of 80% by proposed quarry.

## 7.5 PLASTIC WASTE MANAGEMENT PLAN

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.

### 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.

**TABLE 7.22: ACTION PLAN TO MANAGE PLASTIC WASTE**

Sl.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 FAE's and EC

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## 8.PROJECT BENEFITS

### 8.0 GENERAL

The Proposed Project for Quarrying Rough Stone and gravel at Eraiyur Village aims to produce 1,56,265m<sup>3</sup> Rough Stone over a period of 5 Years and Gravel 31,334m<sup>3</sup> for period of 3 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 20 persons for carrying out mining operations and give preference to the local people in providing employment in the three proposed quarries in the cluster. In addition, there will be opportunity for indirect employment to many people in the form of contractual jobs, business opportunities, service facilities etc. the economic status of the local people will be enhanced due to mining project.

### 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 quarries are located in Eraiyur Village, Vanur Taluk and Viluppuram District of Tamil Nadu and the area have communications, roads and other facilities already well established. The following physical infrastructure facilities will further improve due to proposed mine.

- 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.,

### **CORPORATE SOCIAL RESPONSIBILITY**

The Project Proponent 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.

#### CSR Cost Estimation

- CSR activities will be taken up in the Eraiyur village mainly contributing to education, health, training of women self-help groups and contribution to infrastructure etc., CSR budget is allocated as 2.5% of the profit.

### **CORPORATE ENVIRONMENT RESPONSIBILITY**

For the existing quarries 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.

Proponent intends to spent Rs 5,00,000/- towards CER for the Government School near the project site the details are given below:

**TABLE 8.1 CER – ACTION PLAN**

<b>Activity</b>	<b>CER</b>
<ul style="list-style-type: none"> <li>• Renovation/ Construction of Existing Toilet</li> <li>• Providing Environmental Related books to the school Library</li> <li>• Carrying out plantation and maintenance in the school Ground</li> <li>• Any other requirements in consultation with the school Head master</li> </ul>	Rs 5,00,000/-



## **9. ENVIRONMENTAL COST BENEFIT ANALYSIS**

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

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## 10. 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 of 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 Thiru A.Veeraragavan 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 programmes 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.

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

The Environment Monitoring Cell discussed under Chapter 6 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 programme

- 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 (un utilized areas, infrastructure, haul Roads) will be utilized for greenbelt development. 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 programme.

**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 & 100 m 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 FAE's & EIA Coordinator

## 10.3. SOIL MANAGEMENT

There overburden in the form of Gravel which will directly loaded into tippers for the filling and levelling of low-lying areas.

**TABLE 10.2. PROPOSED CONTROLS FOR SOIL MANAGEMENT**

CONTROL	RESPONSIBILITY
Surface run-off from the project boundary via garland drains will be diverted to the mine pits	Mine Foreman & Mining Mate
Design haul roads and other access roads with drainage systems to minimize concentration of flow and erosion risk	Mines Manager
Empty sediment from sediment traps Maintain, repair or upgrade garland drain system	Mines Manager
Test soils for pH, EC, chloride, size & water holding capacity	Manager Mines

Source: Proposed by FAE's & EIA Coordinator

#### 10.4. WATER MANAGEMENT

In the proposed quarrying project, no process is involved for the effluent generation, only oil & grease from the machinery wash is anticipated and domestic sewage from mines office. The quarrying operation is proposed upto a depth of 32 m BGL, the water table in the area is 56 m below ground level, hence the proposed project will not intersect the Ground water table during entire quarry period.

**TABLE 10.3. PROPOSED CONTROLS FOR WATER ENVIRONMENT**

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

Source: Proposed by FAE's & EIA Coordinator

#### 10.5. AIR QUALITY MANAGEMENT

The proposed quarrying activity would result in the increase of particulate matter concentrations due to fugitive dust. Daily water sprinkling on the haul roads, approach roads in the vicinity would 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

**TABLE 10.4. PROPOSED CONTROLS FOR AIR ENVIRONMENT**

CONTROL	RESPONSIBILITY
Generation of dust during excavation is minimized by daily (twice) water sprinkling on working face and daily (twice) water sprinkling on haul road	Mines Manager
Wet drilling procedure /drills with dust extractor system to control dust generation during drilling at source itself is implemented	Mines Manager
Maintenance as per operator manual of the equipment and machinery in the mines to minimizing air pollution	Mines Manager
Ambient Air Quality Monitoring carried out in the project area and in surrounding villages to access 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 FAE's & 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.

**TABLE 10.5.:PROPOSED CONTROLS FOR NOISE ENVIRONMENT**

<b>CONTROL</b>	<b>RESPONSIBILITY</b>
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 are 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 FAE's & 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.

**TABLE 10.6.: PROPOSED CONTROLS FOR GROUND VIBRATIONS & FLY ROCK – P1**

<b>CONTROL</b>	<b>RESPONSIBILITY</b>
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 FAE's & 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 programme 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
  - 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

About 1210 nos. of saplings is proposed to be planted for the Mining plan period in safety barrier of applied mine lease area with survival rate 80%. The greenbelt development plan has been prepared keeping in view the land use changes that will occur due to mining operation in the area.

**TABLE 10.7: PROPOSED GREENBELT ACTIVITIES**

Year	No. of tress proposed to be planted	Area to be covered	Name of the species
I	1210	The plantation is along the safety distance, village road etc..	Neem, Pongamia, Vilvam, Ashoka etc.,

Source: Approved Mining plan

The objectives of the greenbelt development plan are –

- Provide a green belt around the periphery of the quarry area to combat the dispersal of dust in the adjoining areas,
- Protect the erosion of the soil, Conserve moisture for increasing ground water recharging,
- 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.

A well-planned Green Belt with multi rows (three tiers) preferably with long canopy leaves shall be developed with dense plantations around the boundary and haul roads to prevent air, dust noise propagation to undesired places and efforts will be taken for the enhancement of survival rate.

### 10.8.2. Species Recommended for Plantation

Following points have been considered while recommending the species for plantation:

- Creating of bio-diversity.
- Fast growing, thick canopy cover, perennial and evergreen large leaf area,
- Efficient in absorbing pollutants without major effects on natural growth

**TABLE 10.8. RECOMMENDED SPECIES FOR THE PLANTSATION**

S.No	Botanical Name	Local Name	Importance
1	Azadirachta indica	Neem, Vembu	Neem oil & neem products
2	Tamarindus indica	Tamarind	Edible & Medicinal and other Uses
3	Polyalthia longifolia	Nettilinkam	Tall and evergreen tree
4	Borassus Flabellifer	Palmyra Palm	Tall Wind breaker tree and its fruits are edible

Source: Proposed by FAE's & EIA Coordinator

## 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 –

The health status of workers in the mine will be regularly monitored under an occupational surveillance program. Under this program, all the employees are subjected to a detailed 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
- 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 keep upgrading the database of medical history of the employees.

**TABLE 10.9. MEDICAL EXAMINATION SCHEDULE**

Sl.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)					

### 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 colours 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.
- 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.
- 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 centres. 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 Programme**

The Proponent 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 Centres in the State and engage Environmental Consultants to provide periodical training to all the employees to carry out the mining operation in an eco-friendly manner as per Metalliferous Mines Regulation, 1961.

### **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 10.11 gives overall investment on the environmental safeguards and recurring expenditure for successful monitoring and implementation of control measures.



**TABLE 10.10: EMP BUDGET FOR PROPOSED PROJECT**

	Mitigation Measure	Provision for Implementation	Capital	Recurring
<b>Air Environment</b>	Compaction, gradation and drainage on both sides for Haulage Road	Rental Dozer & drainage construction on haul road @ Rs. 10,000/- per hectare; and yearly maintenance @ Rs. 10,000/- per hectare	24263	24263
	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
	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 - 4 Units	100000	10000
	No overloading of trucks/tippers/tractors	Manual Monitoring through Security guard	0	5000
	Stone carrying trucks will be covered by tarpaulin	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 - 2 Units	10000	500
	Regular monitoring of exhaust fumes as per RTO norms	Monitoring of Exhaust Fumes by Manual Labour	0	5000
	Regular sweeping and maintenance of approach roads for at least about 200 m from ML Area	Provision for 2 labours @ Rs.10,000/labour (Contractual) per Hectare	0	48526
	Installing wheel wash system near gate of quarry	Installation + Maintenance + Supervision	50000	20000
<b>Noise Environment</b>	Source of noise will be during operation of transportation vehicles, 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 implements 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 / Compentent 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 Tonnes of Blasted Material	0	406289
<b>Waste Management</b>	Waste management (Spent Oil, Grease etc.,)	Provision for domestic waste collection and disposal through authorized agency	5000	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>Mine Closure</b>	1. Progressive Closure Activity - Surface Runoff management	Provision for garland drain @ Rs. 10,000/- per Hectare with maintenance of Rs. 5,000/- per annum	24263	5000
	2. Progressive Closure Activity 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	485260	10000

	3. Progressive Closure Activity Green belt development - 500 trees per one hectare - Proposal for 1210 Tress (950 Tress inside the lease area and 260 Trees outside the 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)	190000	28500
		Avenue Plantation @ 300 per plant (capital) for plantation outside the lease area and @ 30 per plant maintenance (recurring)	78000	7800
	4. Implementation of Final Mine Closure Activity as per Approved Mining Plan on Last Year	Few activities already covered as progressive closure activities as greenbelt development, wire fencing, garland drain. *For Final Closure Activities 15% of the proposed closure cost will be spent during the final mine closure stage - Last Year	132750	0
	5. Contribution towards Green Fund. As per TNMMCR 1959, Rule 35 A	The Contribution towards Green Funds @ 10% of Seigniorage fee are indicated as part of EMP Budge and not necessarily implemented in the Project Site	921964	0
<b>Implementation of EC, Mining Plan &amp; DGMS Condition-Public hearing commitment</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 mentioning Environmental Conditions	10000	1000
	Air, Water, Noise and Soil Quality Sampling every 6 Months for Compliance Report of EC Conditions	Submission of 2 Half Yearly Compliance - Lab Monitoring Report as per CPCB norms	0	50000
	Workers will be provided with Personal Protective Equipment's	Provision of PPE @ Rs. 4000/- per employee with recurring based on wear and tear (say, @ Rs. 1000/- per employee) - 20 Employees	80000	20000
	Health check-up for workers will be provisioned	IME & PME Health check-up @ Rs. 1000/- per employee	0	20000

	Providing metal sheet fencing in south and west direction	metal fencing for 350m @ Rs.300/- per meter	1,05,000	10,000
	First aid facility will be provided	Provision of 2 Kits per Hectare @ Rs. 2000/-	0	4852.6
	Mine will have safety precaution signages, boards.	Provision for signages and boards made	10000	2000
	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	121315	10000
	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
	Construction of Green mesh along with wire fencing around the lease area	Per Hectare greenmesh cost @ Rs. 50,000/- with Maintenance of Rs 20,000/- per annum	1,50,000	20,000
<b>CER</b>	As per MoEF &CC OM 22-65/2017-IA.III Dated 25.02.2021	Detailed Description in following slides and Budget allocation is included as per MoeEF & CC OM	700000	0
<b>TOTAL</b>			<b>3028101</b>	<b>1582730</b>

\*Marked cost is already discussed in the mining plan hence that is not included in the total Environmental Management plan cost Total Cost for the five years. The EMP has been prepared for the entire **lease period of 10 years** for the peak production capacity of **35,195m<sup>3</sup> of Rough stone**.

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<b>Year</b>	<b>Total Cost</b>
<b>1<sup>st</sup></b>	₹ 46,10,832
<b>2<sup>nd</sup></b>	₹ 16,61,867
<b>3<sup>rd</sup></b>	₹ 17,44,960
<b>4<sup>th</sup></b>	₹ 18,32,209
<b>5<sup>th</sup></b>	₹ 20,56,569
<b>Total</b>	<b>119 Lakhs</b>

Cost inflation 5% per annum

Note: This Environmental Management plan cost will vary according to the public consultation comments

#### **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.

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## 11. SUMMARY AND CONCLUSION

This EIA & EMP report prepared for the proposed Rough Stone and Gravel Quarry project located in S.F. No 75/1,75/4,75/5,75/6 & 76/3B2, Eraiyur Village, Vanur Taluk and Viluppuram District belongs to Thiru.A.Veeraragavan the Project falls in the Cluster category consist of 2 Proposed, 2 Existing Quarries falls under “B” category as per MoEF & CC Notification S.O. 3977 (E).

Now, as per 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 clarified the requirement for EIA, EMP and therefore, Public Consultation for all areas from 5 to 25 ha falling in Category B-1 and appraised by SEAC/ SEIAA as well as for cluster situation.

The proposed project is categorized under category “B1” Activity 1(a) (mining lease area in cluster situation) and will be considered at SEIAA – TN after conducting Public Hearing and Submission of EIA/EMP Report for Grant of Environmental Clearance. “Draft EIA report prepared on the basis of ToR issued for carrying out public hearing for the grant of Environmental Clearance from SEIAA, Tamil Nadu”.

Environmental monitoring and audit mechanism have been recommended before and after commencement of the project, where necessary, to verify the accuracy of the EIA predictions and the effectiveness of recommended mitigation measures.

The main scope of the EIA study is to quantify the cumulative impact in the study area due to cluster quarries and formulate the effective mitigation measures for each individual leases. 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, Dust generation etc., have been discussed in this report. The baseline monitoring study has been carried out during the months December 2023 – February 2024 for various environmental components so as to assess the anticipated impacts of the cluster quarry projects on the environment and suitable mitigation measures for likely adverse impacts due to the proposed project is suggested individually for the respective proposed project under Chapter 10.

The project proponent ensures to obtain necessary clearances and quarrying will be carried out as per rules and regulations. The Mining Activity will be carried out in a phased manner as per the approved mining plan after obtaining EC, CTO from TNPCB, execution of lease deed and obtaining DGMS Permission and working will be carried out under the supervision of Competent Persons employed. Overall, the EIA report has predicted that the project will comply with all environment standards and legislation after commencement of the project and operational stage mitigation measures are implemented.

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Mining operations has positive impact on environment and socio economy such as landscape improvement, water as by-product, economy development and better public services, providing and supply of Rough Stone as per market demand. Sustainable and modern mining leads us to see positive impact of mining operation and providing consistent employment for nearly 20 people directly in the proposed projects and indirectly around 50 people.

As discussed, it is safe to say that the proposed quarries are not likely to cause any significant impact to the ecology of the area, as adequate preventive measures will be adopted to keep the various pollutants within the permissible limits. Green belt development around the area will also be taken up as an effective pollution mitigate technique, as well as to serve as biological indicators for the pollutants released from the Thiru A. Veeraragavan Rough Stone and Gravel Quarry (Extent – 2.42.63 ha).

## 12. DISCLOSURE OF CONSULTANT

Thiru A.Veeraragavan have engaged with M/s Geo Exploration and Mining Solutions, an Accredited Organization under Quality Council of India – National Accreditation Board for Education & Training, New Delhi, for carrying out the EIA Study as per the ToR Issued for the proposed project.

Name and address of the consultancy:

### GEO EXPLORATION AND MINING SOLUTIONS

No 17, Advaita Ashram Road,

Alagapuram, Salem – 636 004

Tamil Nadu, India

Email:infogeoexploration@gmail.com

Web: [www.gemssalem.com](http://www.gemssalem.com)

Phone: 0427 2431989.

The Accredited Experts and associated members who were engaged for this EIA study as given below –

Sl.No.	Name of the expert	In house/ Empanelled	EIA Coordinator		FAE	
			Sector	Category	Sector	Category
1	Dr. M. Ifthikhar Ahmed	In-house	1	A	WP GEO SC	B A A
2	Dr. P. Thangaraju	In-house	-	-	HG GEO	A A
3	Mr. A. Jagannathan	In-house	-	-	AP NV SHW	B A B
4	Mr. N. Senthilkumar	Empanelled	38 28	B B	AQ WP RH	B B A
5	Mrs. Jisha parameswaran	In-house	-	-	SW	B
6	Mr. Govindasamy	In-house	-	-	WP	B
7	Mrs. K. Anitha	In-house	-	-	SE	A
8	Mrs. Amirtham	In-house	-	-	EB	B
9	Mr. Alagappa Moses	Empanelled	-	-	EB	A
10	Mr. A. Allimuthu	In-house	-	-	LU	B
11	Mr. S. Pavel	Empanelled	-	-	RH	B
12	Mr. J. R. Vikram Krishna	Empanelled	-	-	SHW RH	A A

Abbreviations			
EC	EIA Coordinator	EB	Ecology and bio-diversity
AEC	Associate 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 modeling, and prediction	HW	Hazardous Wastes



## DECLARATION BY EXPERTS CONTRIBUTING TO THE EIA/EMP

This EIA/EMP for Thiru A. Veeraragavan Rough Stone & Gravel Quarry over an Extent of 2.42.63 ha in Eraiyur Village of Vanur Taluk, Viluppuram District of Tamil Nadu is prepared as per the Generic Structure of EIA Guidelines manual. It is also certified that information furnished in the above EIA study are true and correct to the best of our knowledge.

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

Name: **Dr. M. Ifthikhar Ahmed**

Designation: **EIA Coordinator**

Date & Signature:


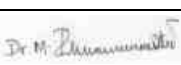

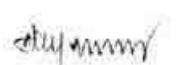

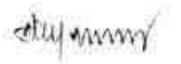








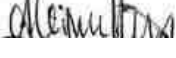





Period of Involvement: **January 2019 to till date**

### Associated Team Member with EIA Coordinator:


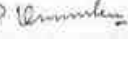

1. Mr. S. Nagamani
2. Mr.P. Viswanathan
3. Mr. M. Santhoshkumar
4. Mr. S. Ilavarasan

### FUNCTIONAL AREA EXPERTS ENGAGED IN THE PROJECT

Sl. No	Functional Area	Involvement	Name of the Expert/s	Signature
1	AP	<ul style="list-style-type: none"> <li>▪ Identification of different sources of air pollution due to the proposed mine activity</li> <li>▪ Prediction of air pollution and propose mitigation measures / control measures</li> </ul>	Mr. A. Jagannathan	
2	WP	<ul style="list-style-type: none"> <li>▪ Suggesting water treatment systems, drainage facilities</li> <li>▪ Evaluating probable impacts of effluent/waste water discharges into the receiving environment/water bodies and suggesting control measures.</li> </ul>	Dr. M. Ifthikhar Ahmed	
			Mr. N. Senthilkumar	
3	HG	<ul style="list-style-type: none"> <li>▪ Interpretation of ground water table and predict impact and propose mitigation measures.</li> <li>▪ Analysis and description of aquifer Characteristics</li> </ul>	Dr. P. Thangaraju	
4	GEO	<ul style="list-style-type: none"> <li>▪ Field Survey for assessing the regional and local geology of the area.</li> <li>▪ Preparation of mineral and geological maps.</li> <li>▪ Geology and Geo morphological analysis/description and Stratigraphy/Lithology.</li> </ul>	Dr. M. Ifthikhar Ahmed	
			Dr. P. Thangaraju	
5	SE	<ul style="list-style-type: none"> <li>▪ Revision in secondary data as per Census of India, 2011.</li> <li>▪ Impact Assessment &amp; Preventive Management Plan</li> <li>▪ Corporate Environment Responsibility.</li> </ul>	Mrs. K. Anitha	

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>	Mrs. Amirtham	
			Mr. Alagappa Moses	
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>	Mr. N. Senthilkumar	
			Mr. S. Pavel	
			Mr. J. R. Vikram Krishna	
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>	Mr. A. Allimuthu	
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>	Mr. A. Jagannathan	
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>	Mr. N. Senthilkumar	
11	SC	<ul style="list-style-type: none"> <li>▪ Assessing the impact on soil environment and proposed mitigation measures for soil conservation</li> </ul>	Dr. M. Iftikhar Ahmed	
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>	Mr. A. Jagannathan	
			Mr. J. R. Vikram Krishna	

**LIST OF TEAM MEMBERS ENGAGED IN THIS PROJECT**

Sl.No.	Name	Functional Area	Involvement	Signature
1	Mr. S. Nagamani	AP; GEO; AQ	<ul style="list-style-type: none"> <li>▪ Site Visit with FAE</li> <li>▪ Provide inputs &amp; Assisting FAE with sources of Air Pollution, its impact and suggest control measures</li> <li>▪ Provide inputs on Geological Aspects</li> <li>▪ Analyse &amp; provide inputs and assist FAE with meteorological data, emission estimation, AERMOD modelling and suggesting control measures</li> </ul>	
2	Mr. Viswathanan	AP; WP; LU	<ul style="list-style-type: none"> <li>▪ Site Visit with FAE</li> <li>▪ Provide inputs &amp; Assisting FAE with sources of Air Pollution, its impact and suggest control measures</li> <li>▪ Assisting FAE on sources of water pollution, its impacts and suggest control measures</li> <li>▪ Assisting FAE in preparation of land use maps</li> </ul>	
3	Mr. Santhoshkumar	GEO; SC	<ul style="list-style-type: none"> <li>▪ Site Visit with FAE</li> <li>▪ Provide inputs on Geological Aspects</li> <li>▪ Assist in Resources &amp; Reserve Calculation and preparation of Production Plan &amp; Conceptual Plan</li> <li>▪ Provide inputs &amp; Assisting FAE with soil conservation methods and identifying impacts</li> </ul>	

4	Mr. Umamahesvaran	GEO	<ul style="list-style-type: none"> <li>▪ Site Visit with FAE</li> <li>▪ Provide inputs on Geological Aspects</li> <li>▪ Assist in Resources &amp; Reserve Calculation and preparation of Production Plan &amp; Conceptual Plan</li> </ul>	<i>S. Umamahesvaran</i>
5	Mr. A. Allimuthu	SE	<ul style="list-style-type: none"> <li>▪ Site Visit with FAE</li> <li>▪ Assist FAE with collection of data's</li> <li>▪ Provide inputs by analysing primary and secondary data</li> </ul>	<i>A. Allimuthu</i>
6	Mr. S. Ilavarasan	LU; SC	<ul style="list-style-type: none"> <li>▪ Site Visit with FAE</li> <li>▪ Assisting FAE in preparation of land use maps</li> <li>▪ Provide inputs &amp; Assisting FAE with soil conservation methods and identifying impacts</li> </ul>	<i>S. Ilavarasan</i>
7	Mr. E. Vadivel	HG	<ul style="list-style-type: none"> <li>▪ Site Visit with FAE</li> <li>▪ Assist FAE &amp; provide inputs on aquifer characteristics, ground water level/table</li> <li>▪ Assist with methods of ground water recharge and conduct pump test, flow rate</li> </ul>	<i>E. Vadivel</i>
8	Mr. D. Dinesh	NV	<ul style="list-style-type: none"> <li>▪ Site Visit with FAE</li> <li>▪ Assist FAE and provide inputs on impacts due to proposed mine activity and suggest mitigation measures</li> <li>▪ Assist FAE with prediction modelling</li> </ul>	<i>D. Dinesh</i>
9	Mr. Panneer Selvam	EB	<ul style="list-style-type: none"> <li>▪ Site Visit with FAE</li> <li>▪ Assist FAE with collection of baseline data</li> <li>▪ Provide inputs and assist with labelling of Flora and Fauna</li> </ul>	<i>P. Panneer Selvam</i>
10	Mrs. Nathiya	EB	<ul style="list-style-type: none"> <li>▪ Site Visit with FAE</li> <li>▪ Assist FAE with collection of baseline data</li> <li>▪ Provide inputs and assist with labelling of Flora and Fauna</li> </ul>	<i>T. Annam</i>

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

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I, Dr. M. Ifthikhar Ahmed, Managing Partner, Geo Exploration and Mining Solutions, hereby, confirm that the above-mentioned Functional Area Experts and Team Members prepared the Cluster EIA/EMP for A.Veeraragavan Rough Stone & Gravel Quarry over an Extent of 2.42.63ha in Eraiyur Village of Vanur Taluk, Viluppuram District of Tamil Nadu. It is also certified that information furnished in the EIA study are true and correct to the best of our knowledge.

Signature & Date:



Name:

**Dr. M. Ifthikhar Ahmed**

Designation:

**Managing Partner**

Name of the EIA Consultant Organization:

**M/s. Geo Exploration and Mining Solutions**

NABET Certificate No & Issue Date:

**NABET/EIA/2225/RA 0276 Dated: 20-2-2023**

Validity:

**Valid till 06.08.2025**

# ANNEXURE

## THIRU A. VEERARAGAVAN ROUGH STONE AND GRAVEL QUARRY

S.F. Nos: 75/1, 75/4, 75/5, 75/6 and 76/3B2,

Eraiyr Village, Vanur Taluk,

Viluppuram District

**EXTENT = 2.42.63 Ha**

ToR obtained

**Lr No.SEIAA-TN/F.No.10444/SEAC/ToR-1626/2023 Dated: 12.12.2023**

### **Project Proponent**

**Thiru A.Veeraragavan,**

S/o. Anandavelu,

No. 225, Mettu Street,

Eraiyr Village, Vanur Taluk,

Viluppuram District – 604 304.

## LIST OF ANNEXURES

<b>ANNEXURES</b>	<b>DESCRIPTION</b>	<b>PAGE NOS</b>
<b>P1 THIRU.A.VEERA RAGAVAN</b>	COPY OF TERMS OF REFERENCE	1A – 23A
	COPY OF 500M RADIUS QUARRIES DETAILS LETTER	24A – 25A
	COPY OF MINING PLAN APPROVED LETTER	26A – 27A
	COPY OF APPROVED MINING PLAN WITH PLATES	28A – 108A
	COPY OF 300m & VAO ATTESTATION LETTER	109A – 110A
	COPY OF HYDROGEOLOGICAL REPORT	111A – 121A
	COPY OF INSPECTION REPORT	122A – 145A
	COPY OF DFO LETTER	146A – 147A
<b>E1 THIRU. T.VASUDEVAN</b>	COPY OF APPROVED MINING PLAN	148A – 187A
<b>E2 E.JAYASANKAR</b>	COPY OF APPROVED MINING PLAN	188A – 231A
	COPY OF BASE LINE MONITORING DATA	232A – 274A
	COPY OF CONSULTANT ACCREDITATION CERTIFICATE	275A



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

STATE LEVEL ENVIRONMENT  
IMPACT ASSESSMENT AUTHORITY-  
TAMILNADU

3<sup>rd</sup> Floor, Panagal Maaligai,  
No.1, Jeemis Road, Saidapet,  
Chennai - 600 015.  
Phone No. 044-24359973  
Fax No. 044-24359975

**TERMS OF REFERENCE (ToR)**

**Lr No.SEIAA-TN/F.No.10444/SEAC/ToR-1626/2023 Dated:12.12.2023**

To

Thiru. A.Veeraragavan,  
No. 225, Mettu Street,  
Eraiyur Village,  
Vanur Taluk,  
Villupuram District

Sir / Madam,

**Sub:** SEIAA, Tamil Nadu – Terms of Reference with Public Hearing (ToR) for the Proposed Rough Stone quarry lease over an extent 2.42.63 Ha of Patta land in S.F.Nos. 75/1,75/4,75/5,75/6 and 76/3B2 Eraiyur Village, Vanur Taluk, Viluppuram District, Tamil Nadu by Thiru A. Veeraragavan - 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/446038/2023, 27/09/2023.
  2. Your application submitted for Terms of Reference dated: 04.10.2023.
  3. Minutes of the 423rd SEAC meeting held on 15.11.2023.
  4. Minutes of the 678th SEIAA meeting held on 11.12.2023 & 12.12.2023.

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

The proponent, Thiru A. Veeraragavan has submitted application for Terms of Reference (ToR), in Form-I, Pre-Feasibility report for the Proposed Rough Stone quarry lease over an extent of 2.42.63 Ha

  
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of Patta land in S.F.Nos. 75/1,75/4,75/5,75/6 and 76/3B2 Eraiyur Village, Vanur Taluk, Viluppuram District, Tamil Nadu.

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

**Proposed Rough Stone and Gravel quarry over an extent of 2.42.63 Ha of Patta land in S.F.Nos. 75/1,75/4,75/5,75/6 and 76/3B2 Eraiyur Village, Vanur Taluk, Viluppuram District, Tamil Nadu by Thiru A. Veeraragavan- For Terms of Reference. (SIA/TN/MIN/446038/2023, 27/09/2023)**

The proposal was placed in this 423<sup>rd</sup> meeting of SEAC held on 15.11.2023. The Project Proponent made a detailed presentation on the proposed project. The details of the project furnished by the proponent are available on the PARIVESH web portal (parivesh.nic.in). **The SEAC noted the following among other things:**

1. The Project Proponent, Thiru A. Veeraragavan has applied seeking Terms of Reference for EIA study for the proposed Rough Stone and Gravel quarry over an extent of 2.42.63 Ha of Patta land in S.F.Nos. 75/1,75/4,75/5,75/6 and 76/3B2 Eraiyur Village, Vanur Taluk, Viluppuram 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 as amended.
3. Mine plan period is approved for 5 years. The approved production is 156265m<sup>3</sup> of Rough stone and 31334 m<sup>3</sup> of Gravel and the ultimate depth is 32m BGL. The annual peak production shall not exceed 35195m<sup>3</sup> of Rough stone and 12334 m<sup>3</sup> of Gravel.
4. **The SEAC further noted that a portion of the project site on northern side has been used as dumping site for the adjacent quarry.**

Based on the document and details furnished by the project proponent, SEAC decided to grant **Terms of Reference (ToR) with Public Hearing** subject to the following ToRs, in addition to (i) the standard terms of reference for EIA study shown in **Annexure-I** and (ii) the Standard ToR for non-coal mining projects and details issued by the MoEF&CC to be included in EIA/EMP Report:

1. The Proponent shall justify the selection of the site for carrying out the stone quarrying with the total volume arrived for the excavation & production adequate details such as lithology of the deposit, reserve estimation, place for waste dump/mined mineral storage, end-use of mined materials, identified potential customers/end-users and travel path.
2. The proponent is requested to carry out a survey and enumerate on the structures located within the radius of (i) 50 m, (ii) 100 m, (iii) 200 m and (iv) 300 m (v) 500m with details such as dwelling houses with number of occupants, whether it belongs to the owner (or) not, places

  
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- of worship, industries, factories, sheds, etc with indicating the owner of the building, nature of construction, age of the building, number of residents, their profession and income, etc.
3. The PP shall submit a detailed hydrological report indicating the impact of proposed quarrying operations on the waterbodies like lake, water tanks, etc located within 1 km of the proposed quarry.
  4. 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.
  5. The PP shall carry out a detailed hydrogeological study to spell out the water management plan for the proposed site.
  6. The Proponent shall carry out Bio diversity study through Department of Ecology and Environmental Sciences, Pondicherry University and the same shall be included in EIA Report.
  7. 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.

#### ANNEXURE-I

1. The PP shall furnish the letter obtained from the AD (Mines) indicating the existing pit dimensions and pit conditions showing the details on mine having worked during the earlier lease period.
2. The PP shall furnish DFO letter stating that the proximity distance of Reserve Forests, Protected Areas, Sanctuaries, Tiger reserve etc., up to a radius of 25 km from the proposed site.
3. The PP shall provide individual notice regarding the Public Hearing to the nearby house owners located in the vicinity of the project site.
4. The Proponent shall justify the selection of the site for carrying out the stone quarrying with the total volume arrived for the excavation & production adequate details such as lithology of the deposit, reserve estimation, place for waste dump/mined mineral storage, end-use of mined materials, identified potential customers/end-users and travel path.
5. The PP shall also justify the selection of mining methodology (conventional or non-conventional) adopting blasting techniques/non-explosive techniques with proper ground reality & laboratory testing.

  
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6. The proponent shall submit the "Blast Design Parameters for controlling the vibration and fly rock from the quarry blasting" considering the existence of sensitive structures including habitations within 500 m from the lease boundary.
7. The PP shall justify the estimation of HEMM population for excavation and transportation in the proposed quarries with proper calculation methodology adopted.
8. The PP shall enumerate the environmental settings situated within a radial distance of 1 km such rivers/water bodies/reserve forests/ grazing land/existence of the hospitals and educational institutions/structures.
9. The PP shall provide the details of the anticipated impacts of the mining operations on the surrounding environment and the remedial measures for the same.
10. The proponent is requested to carry out a survey and enumerate on the structures located within the radius of (i) 50 m, (ii) 100 m, (iii) 200 m and (iv) 300 m (v) 500m with details such as dwelling houses with number of occupants, whether it belongs to the owner (or) not, places of worship, industries, factories, sheds, etc with indicating the owner of the building, nature of construction, age of the building, number of residents, their profession and income, etc.
11. The PP shall submit a 'Slope Stability Action Plan' for the proposed quarry where the proposed depth exceeds 30 m and it shall cover the aspects of stability of quarry walls including the access ramp keeping the benches intact.
12. If the blasting operation is to be carried out, the PP shall present a conceptual design for carrying out the NONEL initiation based controlled blasting operation including the line drilling & muffle blasting techniques and a Simulation Model indicating the anticipated Blast-induced Ground Vibration levels in the proposed quarry as stipulated by the DGMS Circular No.7 of 1997, during the EIA Proposal.
13. 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.
14. The PP shall give an affidavit stating that no contractual persons provided by the explosive suppliers will be employed for carrying out the blasting operations in the proposed quarry.s
15. The PP shall also give an affidavit that no highly sensitive structure such as fire-cracker manufacturing units, Gas godown/explosive Magazine, LPG Bottling Units, etc are located within a radial distance of 300 m from the lease boundary of the proposed quarry.

  
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16. 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 20 m from the blast site.
17. 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.
18. The PP shall provide the environmental mitigation measures implemented for the crusher(s) located within the mining lease.
19. 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.
20. 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.
21. 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).
22. The PP shall carry out Drone video survey covering the cluster, Green belt, fencing etc.,
23. 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.
24. The Project Proponent shall provide the Organization chart indicating the appointment of

  
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- 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.
25. 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.
  26. The proponent shall furnish the baseline data for the environmental and ecological parameters with regard to surface water/ground water quality, air quality, soil quality & flora/fauna including traffic/vehicular movement study.
  27. The Proponent shall carry out the Cumulative impact study due to mining operations carried out in the quarry specifically with reference to the specific environment in terms of soil health, biodiversity, air pollution, water pollution, climate change and flood control & health impacts. Accordingly, the Environment Management plan should be prepared keeping the concerned quarry and the surrounding habitations in the mind.
  28. Rain water harvesting management with recharging details along with water balance (both monsoon & non-monsoon) be submitted.
  29. Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.
  30. Details of the land for storage of Overburden/Waste Dumps (or) Rejects outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be provided.
  31. 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.
  32. If the Village road/State highway/National highway are located within a radial distance of 500 m from the lease boundary of the quarry proposal, the PP shall carry out traffic studies to indicate impact on local transport infrastructure due to the Project and mitigation measures.

  
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33. 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.
34. A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific.
35. 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.
36. The Public hearing advertisement shall be published in one major National daily and one most circulated vernacular daily.
37. The PP shall produce/display the EIA report, Executive summary and other related information with respect to public hearing in Tamil Language also.
38. 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.
39. 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.
40. 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
41. 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.
42. 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.
43. Occupational Health impacts of the Project should be anticipated and the proposed preventive

  
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- 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.
44. 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.
  45. 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.
  46. Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.
  47. 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.
  48. 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.
  49. 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.
  50. 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

##### List of Native Trees Suggested for Planting

1. *Aegle marmelos* – Vilvam
2. *Adenaanthera pavonina* - Manjadi
3. *Albizia lebbbeck* – Vaagai
4. *Albizia amara* - Usil
5. *Bauhinia purpurea* - Mantharai
6. *Bauhinia racemosa* - Aathi
7. *Bauhinia tomentosa* – Iruvathi

  
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8. *Buchanania axillaris* - Kattuma
9. *Borassus flabellifer* - Panai
10. *Butea monosperma* - Murukka maram
11. *Bobax ceiba* - Ilavu, Sevvilavu
12. *Calophyllum inophyllum* - Punnai
13. *Cassia fistula* - Sarakondrai
14. *Cassia roxburghii*- Sengondrai
15. *Chloroxylon sweitenia* - Purasa maram
16. *Cochlospermum religiosum* - Kongu, Manjal Ilavu
17. *Cordia dichotoma* - Mookuchali maram
18. *Creteva adansonii* - Mavalingum
19. *Dillenia indica* - Uva, Uzha
20. *Dillenia pentagyna* - Siru Uva, Sitruzha
21. *Diospyros ebenum* - Karungali
22. *Diospyros chloroxylon* - Vaganai
23. *Ficus amplissima* - Kal Itchi
24. *Hibiscus tiliaceus* - Aatru poovarasu
25. *Hardwickia binata* - Aacha
26. *Holoptelia integrifolia* - Aayili
27. *Lannea coromandelica* - Odhiam
28. *Lagerstroemia speciosa* - Poo Marudhu
29. *Lepisanthus tetraphylla* - Neikottai maram
30. *Limonia acidissima* - Vila maram
31. *Litsea glutinosa* - Pisin pattai
32. *Madhuca longifolia* - Illuppai
33. *Manilkara hexandra* - Ulakkai Paalai
34. *Mimusops elengi* - Magizha maram
35. *Mitragyna parvifolia* - Kadambu
36. *Morinda pubescens* - Nuna
37. *Morinda citrifolia* - Vellai Nuna
38. *Phoenix sylvestre* - Eachai
39. *Pongamia pinnata* - Pungam
40. *Premna mollissima* - Munnai

  
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41. *Premna serratifolia* – Narumunnai
42. *Premna tomentosa* - Purangai Naari, Pudanga Naari
43. *Prosopis cinerea* - Vanni maram
44. *Pterocarpus marsupium* - Vengai
45. *Pterospermum canescens* – Vennangu, Tada
46. *Pterospermum xylocarpum* - Polavu
47. *Puthranjiva roxburghii* – Puthranjivi
48. *Salvadora persica* – Uгаа Maram
49. *Sapindus emarginatus* - Manipungan, Soapu kai
50. *Saraca asoca* - Asoca
51. *Streblus asper* - Piraya maram
52. *Strychnos nuxvomica* – Yetti
53. *Strychnos potatorum* - Therthang Kottai
54. *Syzygium cumini* - Naval
55. *Terminalia bellerica* - Thandri
56. *Terminalia arjuna* - Ven marudhu
57. *Toona ciliate* – Sandhana vembu
58. *Thespesia populnea* - Puvarasu
59. *Walsuratrifoliata* – valsura
60. *Wrightia tinctoria* – Veppalai
61. *Pithecellobium dulce* – Kodukkapuli

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

Proposed Rough Stone and Gravel quarry over an extent of 2.42.63 Ha of Patta land in S.F.Nos. 75/1,75/4,75/5,75/6 and 76/3B2 Eraiyur Village, Vanur Taluk, Viluppuram District, Tamil Nadu by Thiru A. Veeraragavan- For Terms of Reference. (SIA/TN/MIN/446038/2023, 27/09/2023)

The subject was placed in this 678<sup>th</sup> meeting of Authority held on 11.12.2023 & 12.12.2023. The Authority noted that the subject was placed in the 423<sup>rd</sup> meeting of SEAC held on 15.11.2023 and the SEAC has furnished its recommendations for the grant of Terms of Reference (ToR) with Public Hearing for EIA study subject to the conditions stated therein.

After detailed discussions, the Authority accepted the recommendation of SEAC and decided to grant **Terms of Reference (ToR) along with Public Hearing** based on studies, assessments and records to be produced as sought by the SEAC and SEIAA, under cluster for undertaking the combined Environment Impact Assessment Study and preparation of separate Environment Management Plan

  
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subject to the conditions as recommended by SEAC & normal conditions and conditions in Annexure 'B' of this minutes.


**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 .
  - b) Climate change leading to Droughts, Floods etc.

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

**Agriculture & Agro-Biodiversity**

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

**Forests**

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

**Water Environment**

- 23. Hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies such as rivers, tanks, canals,

ponds etc. within 1 km (radius) so as to assess the impacts on the nearby waterbodies due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided, covering the entire mine lease period.

24. Erosion Control measures.
25. Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area on the nearby Villages, Water-bodies/ Rivers, & any ecological fragile areas.
26. The project proponent shall study impact on fish habitats and the food WEB/ food chain in the water body and Reservoir.
27. The project proponent shall study and furnish the details on potential fragmentation impact on natural environment, by the activities.
28. The project proponent shall study and furnish the impact on aquatic plants and animals in water bodies and possible scars on the landscape, damages to nearby caves, heritage site, and archaeological sites possible land form changes visual and aesthetic impacts.
29. The Terms of Reference should specifically study impact on soil health, soil erosion, the soil physical, chemical components and microbial components.
30. The Environmental Impact Assessment should study on wetlands, water bodies, rivers streams, lakes and farmer sites.

#### **Energy**

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

#### **Climate Change**

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

#### **Mine Closure Plan**

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

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

**Others**

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

**A. STANDARD TERMS OF REFERENCE**

- 1) Year-wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification 1994 came into force, w.r.t. the highest production achieved prior to 1994.
- 2) A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given.

  
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- 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.

  
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- 11) Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given.
- 12) Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.
- 13) Status of forestry clearance for the broken up area and virgin forestland involved in the Project including deposition of Net Present Value (NPV) and Compensatory Afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.
- 14) Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.
- 15) The vegetation in the RF / PF areas in the study area, with necessary details, should be given.
- 16) A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly, detailed mitigative measures required, should be worked out with cost implications and submitted.
- 17) Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves/(existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished.
- 18) A detailed biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled-I fauna found in the study area, the necessary plan along with budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost.

  
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- 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. 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

  
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showing pre-dominant wind direction may also be indicated on the map.

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

  
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- 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

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

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

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

1. Project name and location (Village, District, State, Industrial Estate (if applicable)).
2. Process description in brief, specifically indicating the gaseous emission, liquid effluent and solid and hazardous wastes.
3. Measures for mitigating the impact on the environment and mode of discharge or disposal.

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

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

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

- a. A note confirming compliance of the TOR, with cross referencing of the relevant sections / pages of the EIA report should be provided.
- b. All documents may be properly referenced with index, page numbers and continuous page numbering.
- c. Where data are presented in the report especially in tables, the period in which the data were collected and the sources should be indicated.
- d. While preparing the EIA report, the instructions for the proponents and instructions for the consultants issued by MoEF & CC vide O.M. No. J-11013/41/2006-IA.II (I) dated 4th August, 2009, which are available on the website of this Ministry should also be followed.
- e. The consultants involved in the preparation of EIA/EMP report after accreditation with Quality Council of India (QCI)/National Accreditation Board of Education and Training (NABET) would need to include a certificate in this regard in the EIA/EMP reports prepared by them and data provided by other organization/Laboratories including their status of approvals etc. In this regard circular no F. No.J -11013/77/2004-IA-II(I) dated 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.

  
MEMBER SECRETARY  
SEIAA-TN

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

  
MEMBER SECRETARY  
SEIAA-TN

**Copy to:**

1. The Additional Chief Secretary to Government, Environment, Climate Change and 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 - 110 032.
3. The Chairman, 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 - 110 003.
6. The District Collector, Villupuram District.
7. Stock File.

From  
Tmt. N.Vijayalakshmi, M.Sc.,  
Deputy Director,  
Dept. of Geology and Mining,  
Viluppuram.

To  
Thiru A. Veeraragavan,  
S/o. Ananthavelu,  
Mettu Theru,  
Vanur Taluk,  
Viluppuram District.

**Rc.No.A/G&M/253/2022 Dated 03.08.2023**

Sub: Mines & Minerals - Minor Mineral - Rough stone and Gravel - Viluppuram District - Vanur Taluk - Eraiyur Village - over an extent of 2.42.63 hectares of patta lands - S.F.Nos.75/1 (0.53.5 hecets.), 75/4 (0.30.0 hecets.), 75/5 (0.76.0 hecets.), 75/6 (0.24.0 hecets.) and 76/3B2 (0.59.13 hecets.) - Quarry lease application preferred by Thiru A. Veeraragavan, S/o. Ananthavelu - Precise area communicated - Details of quarries situated within 500 meter radial distance - furnished - reg.

- Ref: 1. Deputy Director, Geology and Mining, Viluppuram Letter Rc.No.A G&M/253/2022 Dated 17.07.2023.
2. Representation from Thiru A. Veeraragavan, S/o. Ananthavelu Dated 03.08.2023.

\*\*\*\*\*

With reference to your letter in the reference 2<sup>nd</sup> cited, the details of existing, proposed and abandoned quarries located within 500 mts. radial distance from the periphery of the proposed Rough stone and Gravel quarry over an extent of 2.42.63 hectares of patta lands in S.F.Nos. 75/1 (0.53.5 hecets.), 75/4 (0.30.0 hecets.), 75/5 (0.76.0 hecets.), 75/6 (0.24.0 hecets.) and 76/3B2 (0.59.13 hecets.) of Eraiyur Village, Vanur Taluk, Villupuram District are as follows.

**1. Existing quarries:**

Sl. No.	Name of the lessee / permit holder	Name of the Mineral	Taluk & Village	S.F. Nos.	Extent (in hecets)	Lease period	Remarks
1.	T.Vasudevan, S/o. Thangavel, Eraiyur Village, Vanur Taluk, Viluppuram District.	Rough Stone	Vanur, Eraiyur	80/3 80/4 81/1 81/3 81/4 81/5 81/6 94/1A 94/2 94/3	0.28.0 0.47.0 0.48.0 0.36.0 0.36.0 0.35.0 1.18.0 0.27.0 0.29.0 <u>0.79.5</u> <b>4.83.5</b>	15.02.2019 to 14.02.2024	-



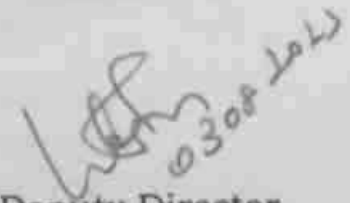
2.	E. Jayasankar, S/o. Elumalai, No.198, Vinayakar Koil Street, Eraiyr Village, Vanur Taluk, Viluppuram District.	Rough Stone	Vanur, Eraiyr	93/4 93/5 94/1B 94/4	1.14.0 0.21.0 0.27.0 <u>1.75.5</u> <b>3.37.5</b>	15.02.2019 to 14.02.2024	
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### II. Proposed Area :

Sl. No.	Name of the lessee / permit holder	Name of the Mineral	Taluk & Village	S.F. Nos.	Extent (in hecets)	Remarks
1.	Thiru K.Anandavelu, S/o.Kesavan, No.225, Mettu Street, Eraiyr Village, Vanur Taluk, Viluppuram District.	Rough stone & Gravel	Vanur, Eraiyr	76/2 76/3A 76/6	0.86.0 0.22.0 <u>1.10.0</u> <b>2.18.0</b>	-
2.	Thiru A. Veeraragavan, S/o. Ananthavelu, Mettu Theru, Vanur Taluk, Viluppuram District.	Rough stone & Gravel	Vanur, Eraiyr	75/1 75/4 75/5 75/6 76/3B2	0.53.5 0.30.0 0.76.0 0.24.0 <u>0.59.13</u> <b>2.42.63</b>	-

### III. Abandoned quarries :

Sl. No.	Name of the lessee / permit holder	Name of the Mineral	Taluk & Village	S.F. Nos.	Extent (in hecets)	Extent (in hecets)	Remarks
NIL							

  
 Deputy Director,  
 Geology and Mining,  
 Viluppuram.

From  
Tmt.N.Vijayalakshmi, M.Sc.,  
Deputy Director,  
Dept. of Geology and Mining,  
Viluppuram.

To  
Thiru A. Veeraragavan,  
S/o. Ananthavelu,  
Mettu Theru,  
Vanur Taluk,  
Viluppuram District.

**Rc.No.A/G&M/253/2022 Dated 03.08.2023**

Sub: Mines & Minerals – Minor Mineral – Rough stone and Gravel - Viluppuram District – Vanur Taluk – Eraiyur Village - over an extent of 2.42.63 hectares of patta lands – S.F.Nos.75/1 (0.53.5 hecets.), 75/4 (0.30.0 hecets.), 75/5 (0.76.0 hecets.), 75/6 (0.24.0 hecets.) and 76/3B2 (0.59.13 hecets.) – Quarry lease application preferred by Thiru A. Veeraragavan, S/o. Ananthavelu – Precise area communicated - Submission of mining plan for approval – Approved – reg.

- Ref :
1. G.O.Ms.No.79, Industries (MMC-1) Department dated 06.04.2015.
  2. G.O.(Ms).No.169, Ind. (MMC.1) Dept. dated 04.08.2020.
  3. Quarry lease application dated 15.06.2022 preferred by Thiru. A. Veeraragavan, S/o. Ananthavelu, Vanur Taluk, Viluppuram.
  4. Deputy Director, Geology and Mining, Viluppuram Letter Rc.No.A G&M/253/2022 Dated 17.07.2023.
  5. Representation from Thiru. A. Veeraragavan, S/o. Ananthavelu Dated 03.08.2023.

\*\*\*\*\*

In response to the precise area communicated vide the reference 4<sup>th</sup> cited, the applicant viz., Thiru A. Veeraragavan, S/o. Ananthavelu vide reference 5<sup>th</sup> cited has submitted three copies of mining plan for the area applied seeking grant of quarry lease for Rough and Gravel quarry over an extent of 2.42.63 hectares of patta lands in S.F.Nos. 75/1 (0.53.5 hecets.), 75/4 (0.30.0 hecets.), 75/5 (0.76.0 hecets.), 75/6 (0.24.0 hecets.) and 76/3B2 (0.59.13 hecets.) of Eraiyur Village, Vanur Taluk, Villupuram District with a request to approve the same.

2.,The mining plan so submitted has been verified in detail.

3. As per the guidelines / instructions issued by the Commissioner of Geology and Mining, Chennai vide letter Rc.No.3868/LC/2012, dated 19.11.2012, the mining plan 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) Amended Act, 2015, 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) 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, Viluppuram letter Rc.No.A/G&M/253/2022, Dated 17.07.2023, the following conditions have been incorporated in the Mining Plan.
- A) 7.5m safety distance shall be provided to the adjacent patta lands and 10m shall be provided for adjacent Government poramboke land to the lease applied area.
- (v) Quarrying shall be strictly done as per the approved Mining Plan.

Encl: Two copies of Approved Mining Plan.


Sd/-(N.Vijayalakshmi)  
Deputy Director,  
Dept. of Geology and Mining,  
Viluppuram.

/t.c.b.o./

M. Btm 31/12/23  
For Deputy Director,  
Dept. of Geology and Mining,  
Viluppuram.

Copy to:

The Director of Geology and Mining, Chennai-32.

  
31/12/23

**MINING PLAN ALONG WITH  
PROGRESSIVE QUARRY CLOSURE PLAN FOR  
ERAIYUR ROUGH STONE AND GRAVEL QUARRY**

(PREPARED UNDER RULES 41 & 42 AS PER THE AMENDED UNDER TAMIL NADU MINOR MINES  
CONCESSION RULES, 1959)

Lease period = Ten years  
Mining Plan Period = Five Years

IN

**LOCATION OF THE QUARRY LEASE APPLIED AREA**

EXTENT : 2.42.63Ha  
S.F.Nos. : 75/1, 75/4, 75/5, 75/6 and 76/3B2  
VILLAGE : ERAIYUR  
TALUK : VANUR  
DISTRICT : VILUPPURAM  
STATE : TAMIL NADU

FOR

**APPLICANT**

**THIRU. A. VEERARAGAVAN,**

S/o. Anandavelu,  
No. 225, Mettu Street, Eraiyur Village,  
Vanur Taluk,  
Viluppuram District,  
Tamil Nadu State – 604 304.

**PREPARED BY**

**Dr. M. IFTHIKHAR AHMED, M.Sc., M.B.A., F.G.S., Ph.D.,**

Recognised Qualified Person  
RQP/MAS/183/2004/A

No.17, Advaita Ashram Road,  
Alagapuram, Salem District – 636 004.  
Mobile No.: +91 94422 78601 & 94433 56539.  
E-Mail: infogeoexploration@gmail.com

**A. VEERARAGAVAN,**  
S/o. Anandavelu,  
No. 225, Mettu Street, Eraiyur Village,  
Vanur Taluk,  
Viluppuram District,  
Tamil Nadu State – 604 304.



**CONSENT LETTER FROM THE APPLICANT**

The Mining Plan and Progressive Quarry Closure plan in respect of Rough stone and Gravel Quarry lease applied area over an extent 2.42.63 Hectares of patta lands in S.F.Nos. 75/1, 75/4, 75/5, 75/6 and 76/3B2 of Eraiyur Village, Vanur Taluk, Viluppuram District, Tamil Nadu State has been prepared by

**Dr. M. IFTHIKHAR AHMED, M.Sc., M.B.A., F.G.S., Ph.D.,**  
Recognised Qualified Person  
RQP/MAS/183/2004/A

I request the Deputy Director, Department of Geology and Mining, Viluppuram District to make further correspondence regarding the modification of the Mining Plan with the said Recognised Qualified Person at his following address.

**Dr. M. IFTHIKHAR AHMED, M.Sc., M.B.A., F.G.S., Ph.D.,**  
No.17, Advaita Ashram Road,  
Alagapuram, Salem-636 004.  
Cell: +91 94422 78601 & 94433 56539.

I hereby undertake that all the modifications, if any made in the mining plan by the Recognised Qualified Person may be deemed to have been made with my knowledge and consent and shall be acceptable to me and binding on me in all respects.

Signature of the Applicant

*A. Veeraragavan*

(A. Veeraragavan)

Place: Viluppuram

Date: 26.07.2023

**A. VEERARAGAVAN,**  
S/o. Anandavelu,  
No. 225, Mettu Street, Eraiyur Village,  
Vanur Taluk,  
Viluppuram District,  
Tamil Nadu State – 604 304.



**DECLARATION OF THE APPLICANT**

The Mining Plan and Progressive Quarry Closure plan in respect of Rough stone and Gravel Quarry lease applied area over an extent 2.42.63 Hectares of patta lands in S.F.Nos. 75/1, 75/4, 75/5, 75/6 and 76/3B2 of Eraiyur Village, Vanur Taluk, Viluppuram District, Tamil Nadu State has been prepared in full consultation with me.

I have understood its contents and agree to implement the same in accordance with Laws, Rules and Act applicable to Quarry.

Signature of the Applicant

A. Veeraragavan.

(A. Veeraragavan)

Place: Viluppuram

Date: 26.07.2023

**Dr. M. IFTHIKHAR AHMED, M.Sc., M.B.A., F.G.S., Ph.D.,**

No.17, Advaita Ashram Road,

Alagapuram, Salem – 636 004.

Cell: +91 94422 78601 & 94433 56539.



**CERTIFICATE FROM THE RECOGNISED QUALIFIED PERSON**

This is to certify that the Provisions of under Rules 41 & 42 as per the Amended under Tamil Nadu Minor Mineral Concession Rules, 1959 have been observed in the preparation of Mining Plan and Progressive Quarry Closure plan for Rough stone and Gravel Quarry lease applied area over an extent 2.42.63 Hectares of patta lands in S.F.Nos. 75/1, 75/4, 75/5, 75/6 and 76/3B2 of Eraiyur Village, Vanur Taluk, Viluppuram District, Tamil Nadu State has been prepared for

**THIRU. A. VEERARAGAVAN,**

S/o. Anandavelu,

No. 225, Mettu Street, Eraiyur Village,

Vanur Taluk,

Viluppuram District,

Tamil Nadu State – 604 304.

Whenever specific permissions / exemptions / relaxations and approvals are required, the Applicant will approach the concerned authorities of the Deputy Director, Department of Geology and Mining, Viluppuram District, Tamil Nadu for such permissions/ exemptions / relaxations and approvals.

It is also certified that information furnished in the above Mining plan are true and correct to the best of my knowledge.

Signature of the RQP

Dr. M. IFTHIKHAR AHMED, M.Sc., M.B.A., F.G.S., Ph.D.,

RQP/MAS/183/2004/A

Place: Salem

Date: 02.08.2023

**Dr. M. IFTHIKHAR AHMED, M.Sc., M.B.A., F.G.S., Ph.D.,**

No.17, Advaita Ashram Road,

Alagapuram, Salem-636 004.

Cell: +91 94422 78601 & 94433 56539.



**CERTIFICATE FROM THE QUALIFIED PERSON**

Certified that the Provisions of Mines Act, Rules and Regulations and Orders made there under have been observed in the preparation of Mining Plan and Progressive Quarry Closure plan for Rough stone and Gravel Quarry lease applied area over an extent 2.42.63 Hectares of patta lands in S.F.Nos. 75/1, 75/4, 75/5, 75/6 and 76/3B2 of Eraiyrur Village, Vanur Taluk, Viluppuram District, Tamil Nadu State has been prepared for

**THIRU. A. VEERARAGAVAN,**

S/o. Anandavelu,

No. 225, Mettu Street, Eraiyrur Village,

Vanur Taluk,

Viluppuram District,

Tamil Nadu State – 604 304.

Whenever specific permissions/ exemptions/ relaxations and approvals are required, the Applicant will approach the concerned authorities of Director of Mines Safety, No. 5, II<sup>nd</sup> Street, Block – AA, Anna Nagar, Chennai-40, Tamil Nadu for such permissions/exemptions/relaxations and approvals.

It is also certified that information furnished in the mining plan are true and correct to the best of my knowledge.

Signature of the RQP

Dr. M. IFTHIKHAR AHMED, M.Sc., M.B.A., F.G.S., Ph.D.,

RQP/MAS/183/2004/A

Place: Salem

Date: 02.08.2023

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## **MINING PLAN ALONG WITH PROGRESSIVE QUARRY CLOSURE PLAN FOR ERAIYUR ROUGH STONE AND GRAVEL QUARRY**

(PREPARED UNDER RULES 41 & 42 AS PER THE AMENDED UNDER TAMIL NADU MINOR MINERAL  
CONCESSION RULES, 1959)

### **1.0 INTRODUCTION AND EXECUTIVE SUMMARY**

The Mining Plan and Environmental Management plan is prepared for **Thiru. A. Veeraragavan**, S/o. Anandavelu, residing at No. 225, Mettu Street, Eraiyur Village, Vanur Taluk, Viluppuram District, Tamil Nadu State – 604 304.

The applicant applied Rough stone and Gravel quarry over an extent of 2.42.63 Hectares of patta lands in S.F.Nos. 75/1, 75/4, 75/5, 75/6 and 76/3B2 of Eraiyur Village, Vanur Taluk, Viluppuram District, Tamil Nadu State under Rules 19 and 20 of Tamil Nadu Minor Mineral Concession Rules, 1959.

The application was processed by the Deputy Director, Department of Geology and Mining, Viluppuram District and passed a Precise area Communication letter vide **Roc.No. A/G(&)M/253/2022, Dated: 17.07.2023** to submit the Mining Plan for obtain approval from the Deputy Director, Department of Geology and Mining and obtain Environmental Clearance from the State Level Environment Impact Assessment Authority, Tamil Nadu with the conditions to provide (Refer Annexure No. I):

- I. A safety distance of 7.5 meters should be provided to the adjacent patta lands and 10 meters safety distance to the Government Poramboke lands while quarry operations.
- II. No hindrance shall be caused to the adjacent Government Poramboke lands, Road and patta lands while quarry operations.
- III. The applicant should submit the DGPS (Differential Global Positioning System) Survey report of the lease applied area before grant of quarry lease.

In order to ensure compliance of the order of the Honourable Supreme Court Dated: 27.02.2012 in I.A.No.12.13.2011 in Special Leave Petition SLP (C) No 19628-19629/2009, it has been now decided that all mining projects of minor minerals including their renewal irrespective of sizes of the lease would hence forth require prior environmental clearance mining project within the lease applied area up to less than 100Ha including projects or minor mineral with lease applied area less then 5Ha would be treated as category B as defined in the EIA notification 2006 and will be considered by the state Competent Authority notified by MoEF & CC as prescribed procedure prescribed under EIA notification 2006.



In the above circumstances the applicant through his consultant is hereby preparing the mining plan along with Progressive Quarry Closure Plan for approval and subsequent submission of Form-I, Form-1M and Pre feasibility report to obtain environmental clearance from the SEIAA, Tamil Nadu, Rough stone and Gravel quarry. This mining plan is prepared by considering the Rules 41 & 42 as Amended in Tamil Nadu Minor Mineral Concession Rules, 1959 and as per the EIA Notification 2006 and its subsequent Amendment and judgments till 2023.

**Short Notes of Mining plan:**

- a. Village Panchayat - Eraiur
- b. Panchayat Union - Vanur
- c. The Geological Resources are **7,15,110m<sup>3</sup>** of Rough stone and **47,674m<sup>3</sup>** of Gravel in the entire area.
- d. The Total Mineable Reserves are **1,56,265m<sup>3</sup>** of Rough stone and **31,334m<sup>3</sup>** of Gravel in the entire area.
- e. The proposed quantity of reserves/ (level of production) to be mined are **1,56,265m<sup>3</sup>** of Rough stone and **31,334m<sup>3</sup>** of Gravel for five years in the entire area.
- f. Total extent of the lease applied area is about 2.42.63Ha.
- g. Topography of the area = The area is flat topography
- h. Proposed Depth of mining = 32m (2m Gravel + 30m Rough Stone) below ground level.
- i. Lease period = Ten years
- j. This Mining Plan period = Five years
- k. It is a fresh lease applied area. At present the area is virgin
- l. Method of mining / level of mechanization.  
Opencast mechanized method, the quarry operation involves shallow jack hammer drilling, slurry blasting.
- m. Type of machineries proposed in the quarrying operation is given below.  
Excavators attached with rock breaker (Rental Basis).  
Jack hammer, Compressor (Diesel drive) (4 Jack Hammer capacity) (Rental Basis).
- n. No trees will be uprooted due to this quarry operation.
- o. The approach road from the main road to quarry will be constructed and same has been maintained in a good condition for the haulage of quarry materials and machineries.
- p. There is No Export of Rough stone and Gravel.



- q. Topo sketch covering 10Km and 1Km radius around the proposed area with markings of habitations, water bodies including streams, rivers, roads, major structure like bridges, wells, archeological importance, Place of worship is marked and enclosed as Plate No. IA and IB.
- r. The lease applied area is about 2.42.63Ha bounded by nineteen corners; the corners are designated as 1-19 clock wise from the Southeast side and the Co – ordinates for all the corners are clearly marked in the Quarry Lease and Surface Plan enclosed as Plate No. – II.
- s. The plans of proposed quarrying area showing the dimensions of the pit, their proposed depth and maximum area of proposed quarrying are and marked in the Topography, Geological and yearwise development and production Plan and sections enclosed as Plate No. III.
- t. General conditions will not be applicable for the proposed area. The area applied for quarry lease is 10Km away from the,
- i) Protected area under wild life protection ACT, 1972,
  - ii) Notified Eco sensitive areas,
  - iii) Critically polluted areas as identified by CPCB,
- u. Tamil Nadu – Puduchery border situated at 4.8km on the Southern side of the area.
- v. There is no wastage anticipated during this quarry operation, hence waste dump is not proposed in the lease applied area.
- w. Around 20 employees are deploying in the quarrying operation.
- x. Total Cost of the project is about Rs. 67,49,000/-.
- y. Infrastructures around the quarry lease applied area are given table below:

Table – I

Particulars	Location	Approximate aerial distance from lease applied area.
Nearest Post Office	Eraiyrur	1.7km – SE
Nearest Govt. School	Eraiyrur	1.7km – SE
Nearest Dispensary	Pombur	6km – SW
Nearest Town	Vanur	13km – SE
Nearest Police Station	Mailam	6.7km – NW
Nearest Govt. Hospital	Vanur	13km – SE
Nearest D.S.P. Office	Tindivanam	17km – North
Nearest Railway Station	Perani	10.5km – NW
Nearest Airport	Chennai	132km – NE
Nearest Seaport	Chennai	132km – NE
District Head Quarters	Viluppuram	23km – SW

**2.0 GENERAL INFORMATION**

**2.1 a) Name of the Applicant :** Thiru. A. Veeraragavan,  
: S/o. Anandavelu

**b) Address of the Applicant (With Phone No and Aadhaar No.)**

Address : No. 225, Mettu Street,  
Eraiyr Village,  
Vanur Taluk  
District : Viluppuram  
State with Pin Code : Tamil Nadu – 604 304  
Mobile No : +91 63838 07635  
Aadhaar No : 7694 9002 4514 (Refer Annexure No, VIII)  
Email ID : ganesanappadurai04@gmail.com

**c) Status of the Applicant (Individual / Company / Firm):**

The applicant is an individual.

**2.2 a) Mineral which the Applicant intends to mine:**

The Applicant intends to quarry Rough stone and Gravel.

**b) Precise area communication letter details received from the Competent Authority of the Government:**

The precise area communication letter was received from the Deputy Director, Department of Geology and Mining, Viluppuram District vide A/G(&)M/253/2022, Dated: 17.07.2023 (Refer Annexure No. I).

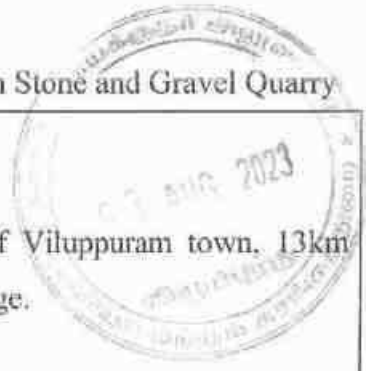
**c) Period of permission / lease to be granted:**

Ten years.

**d) Name and address of the Recognised Qualified Person preparing the mining plan:**

Name : Dr. M. IFTHIKHAR AHMED, M.Sc., M.B.A., F.G.S., Ph.D.,  
Recognised Qualified Person  
Registration Number : RQP/MAS/183/2004/A  
Address : No.17, Advaita Ashram Road,  
Alagapuram,  
Salem – 636 004.  
Mobile : +91 94422 78601 & 94433 56539  
Telephone No. : 0427- 2431989  
Email : infogeoexploration@gmail.com

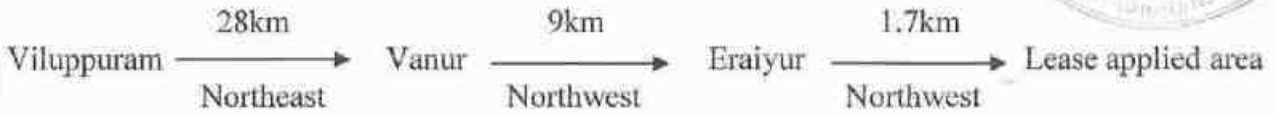
(Refer Annexure No. IX).



**3.0 LOCATION**

**a) Details of the area with location map:**

The lease applied area is located about 23km Northeast side of Viluppuram town, 13km Northwest side of Vanur town and 1.7km Northwest side of Eraiyrur Village.



**Location Map of the Lease Applied area**

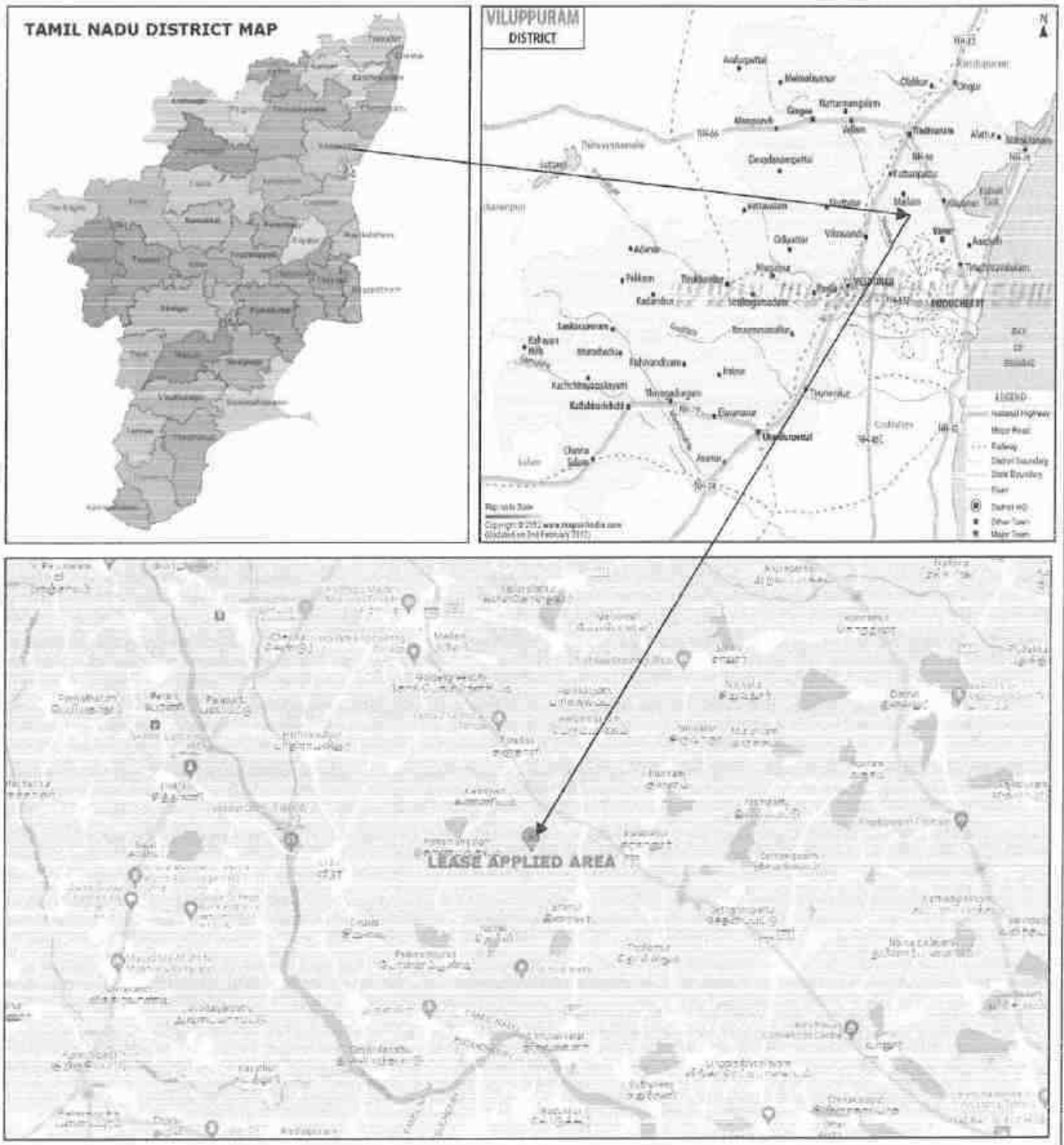




Table - 2

District	Taluk	Village	S.F. No.	Area in Ha.	Patta No.	Classification
Viluppuram	Vanur	Eraiyr	75/4	0.30.00	5558	Patta lands (Refer Annexure No. IV to VI)
			75/5	0.76.00		
			75/6	0.24.00		
			75/1	0.53.50	5511	
			76/3B2	0.59.13	5506	
<b>Total Extent</b>				<b>2.42.63</b>		

**b) Classification of the area (Ryotwari/ Poramboke / others):**

It is a Patta land, Classified as Punjai (Barren land) which is not fit for vegetation/ Cultivation.

**c) Ownership / Occupancy of the applied area (surface right):**

It is Patta lands, registered in the name of 1. Thiru. A. Ganesan, 2. Thiru. D. Radhakrishnan vide Patta Nos. 5558, 5511 and 5506 (Refer Annexure Nos. IV to VI). The applicant has obtained consent from the pattadars for the period of fifteen years from 06.06.2022 to 05.06.2037 and the same was duly registered on 06.06.2022(Refer Annexure No. VII).

**d) Toposheet No. with latitude and longitude:**

The lease applied area falls in the Toposheet No: 57 P/12 Latitude between: 12°04'17.1389"N to 12°04'24.5551"N and Longitude between: 79°38'37.9720"E to 79°38'49.6101"E on WGS datum-1984. Please refer the Plate Nos. I to II.

**e) Existence of public road / Railway line, if any nearby and approximate distance:**

The approach road (Cart track) is situated on the Southern side which is connects to the Vadhanur- Perumbakkam (Major District Road-808) Road located at 1.2km on the Eastern side of the area.

Multiple road access is available from the quarry to state highways and National Highway, no towns are enrooted hence the traffic density is not much more due to the transportation of Rough stone and Gravel.

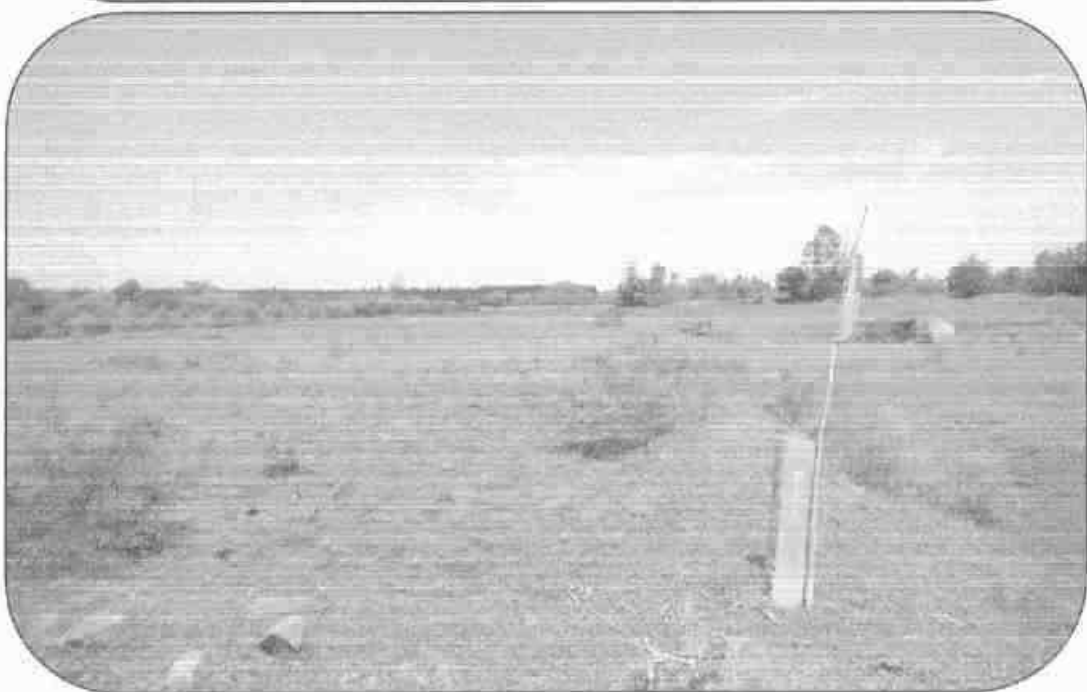
The approach road from the quarry to main road is already existence due to few existing quarries surrounded by the applied area, the same will be maintained and utilized for haulage of Rough stone and Gravel.

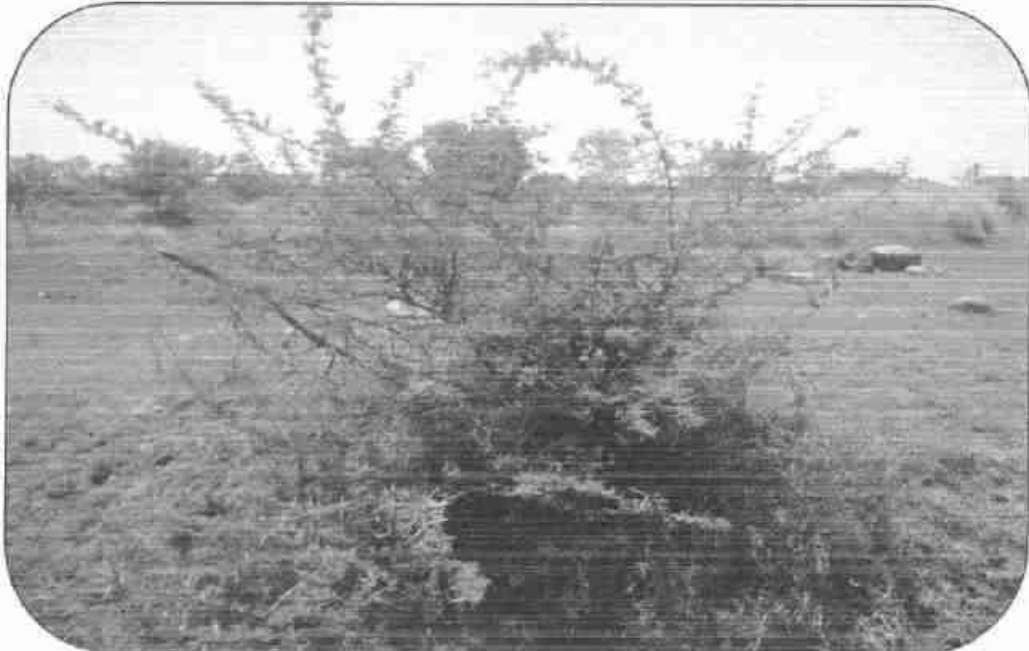
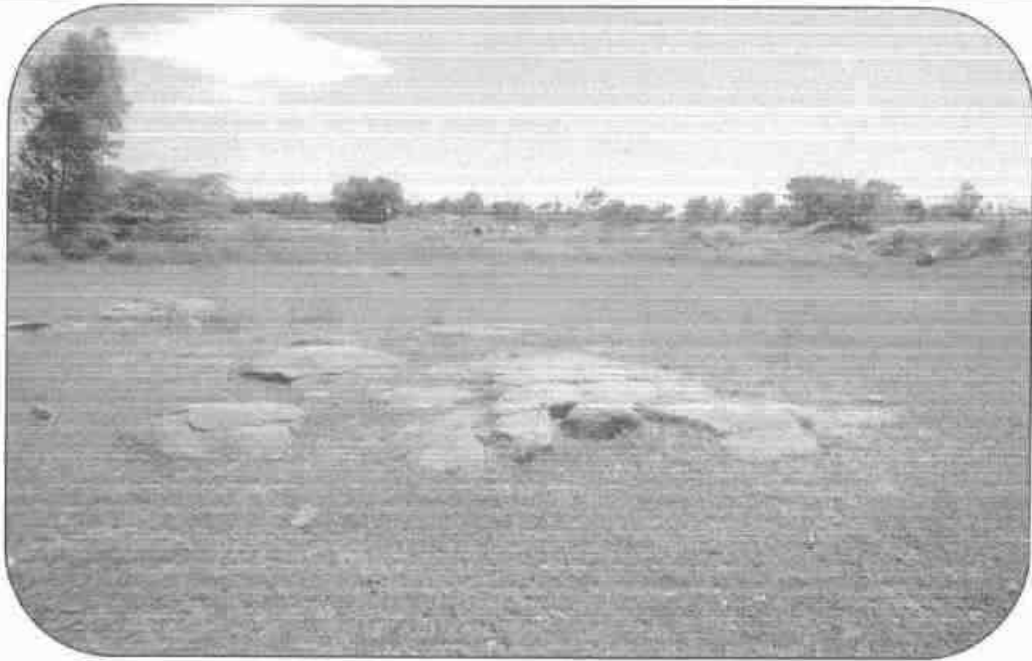
The Nearest Railway line is Viluppuram - Tindivanam which is located about 9.5km on the Western side of the area.



**PART - A****4.0 GEOLOGY AND MINERAL RESERVES****4.1 Brief description of the Topography and general Geology of the area (with plans):**

The lease applied area is flat terrain. The gradient is gentle towards Northeastern side and altitude of the area is 82m above from Mean sea level. The area is covered by 2m thickness of Gravel and followed by Massive Charnockite which is clearly inferred from the surface outcrops and nearby existing quarry pit. The Water level in the area is 56m below from general ground profile which is observed from the nearby bore wells. Average annual rainfall is about 985mm.

**Topographical view of Eraiyur Rough stone and Gravel Quarry lease applied area**



Peninsular gneiss forms the oldest rock formations, in which the massive formation of Charnockite lies over with rich accumulation of recent quaternary formation. On regional scale the Charnockite body  $N45^{\circ}E - S45^{\circ}W$  with dipping towards  $SE60^{\circ}$ .

The general geological sequences of the rocks in this area are given below:

AGE	FORMATION
Recent	- Quaternary formation (Gravel)
-----Unconformity-----	
Archaean	- Charnockite
	Peninsular Gneiss complex



**4.2 Details of exploration already carried out if any:**

State Geology and Mining Dept, Govt. of Tamil Nadu, has carried out the Regional prospecting and exploration in these areas during 1992 to 1993.

Geological Survey of India has carried out detailed mapping in Viluppuram District. Besides, the Qualified Person and his team members made a detailed geological study of the proposed area. The Rough stone formation is clearly inferred from the surface outcrops and nearby existing quarry pit.

**4.3 Estimation of Reserves:****a) Geological reserves with geological sections on a scale of 1:1000 / 1:2000**

As far as Rough stone (Charnockite) is concerned, the only practical method is the systematic geological mapping and delineation of Rough stone within the field and careful evaluation of body luster, physical properties, engineering properties, commercial aspects etc.,

Totally seven sections have been drawn, four sections along the strike direction as (A-B, C-D, E-F and G-H) Width wise and other three cross sections are drawn perpendicular to strike as (X-Y, X1-Y1 and X2-Y2) Length wise to cover the maximum area considered for lease upto a depth of 32m below from general Ground level.

The Topographical, Geological plan and sections demarcated the commercial marketable Rough stone (Charnockite) deposit has been prepared in the scale of 1:1000 (please refer the Geological plan and sections Plate No. III). As the sale of Rough stone are in terms of cubic meters (Volume) only and not in terms of tonnage.

**Estimation of Geological Resources (Plate No. III):**

The Geological Resources of Rough Stone and Gravel Quarry are calculated to a maximum depth of 32m (2m Gravel + 30m Rough Stone) below from the existing ground profile. The total Geological resources are calculated by area method. The total geological resources are given below.

Total Extent of the area	:	2.42.63 Hectares
Area in square meter (2.42.63 x 10,000)	:	24,263m <sup>2</sup>

Table - 3

Area (m <sup>2</sup> )	Depth (m)	Geological Resources of Rough stone @ 100% (m <sup>3</sup> )	Gravel (m <sup>3</sup> )
24263	2	-	48,526
24263	30	7,27,890	-

Total Geological Resources of Gravel	:	48,526m <sup>3</sup>
Total Geological Resources of Rough Stone	:	7,27,890m <sup>3</sup>

**Estimation of Mineable Reserves (Plate No. III):**

The mineable reserves are calculated after leaving the safety distance and Bench loss.

Table - 4

Section	Bench	Length (m)	Width (m)	Depth (m)	Mineable Reserves of Rough stone (m <sup>3</sup> ) @ 100%	Gravel (m <sup>3</sup> )
XY-AB	i	83	79	2	-	13114
	ii	77	73	5	28105	-
	iii	67	63	5	21105	-
	iv	57	53	5	15105	-
	v	47	43	5	10105	-
	vi	37	33	5	6105	-
	vii	27	23	5	3105	-
<b>Total</b>					<b>83630</b>	<b>13114</b>
X1Y1-CD	i	104	25	2	-	5200
	ii	104	19	5	9880	-
<b>Total</b>					<b>9880</b>	<b>5200</b>
X1Y1-EF	i	62	89	2	-	11036
	ii	59	83	5	24485	-
	iii	50	73	5	18250	-
	iv	40	63	5	12600	-
	v	28	53	5	7420	-
<b>Total</b>					<b>62755</b>	<b>11036</b>
X2Y2-GH	i	62	16	2	-	1984
<b>Grand Total</b>					<b>156265</b>	<b>31334</b>

Total Mineable Recoverable Reserves of Rough stone @ 100% : 1,56,265m<sup>3</sup>

Total Mineable Reserves of Gravel : 31,334m<sup>3</sup>

The mineable reserves have been computed as 1,56,265m<sup>3</sup> of Rough stone at the rate of 100% recovery and 31,334m<sup>3</sup> of Gravel upto a depth of 32m (2m Gravel + 30m Rough Stone) below from the general ground level.

**5.0 MINING****5.1. Method of mining (opencast / underground):**

Open cast Mechanized Mining is being carried out with 5.0 meter vertical bench with a bench width is not less than the bench height.

However, as far as the quarrying of Rough stone is concerned, observance of the provisions of Regulation 106(2) (b) is available with Director of Mines Safety. If the applicant intends to modify the dimensions of benches, relaxation and permission are available with Director of Mines Safety under 106 (2) (b) of Metalliferous Mines Regulations, 1961. In such a scenario if there is any drastic change in the Resources and Reserves a modified plan will be submitted to the concerned authority for necessary relaxation, clearance and permission. This relaxation will be applied and obtained after the execution of lease/Commencement of quarry operation.

**5.2. Mode of working (mechanized, semi mechanized, manual):**

The Rough Stone is proposed to quarry at 5m bench height & width with conventional Opencast Mechanized Method.

The quarry operation involves shallow jack hammer drilling, slurry explosives in blasting, excavation, Loading and transportation of Rough stone to the needy crusher.

The production of Rough stone in this quarry involves the following method which is typical for Rough Stone quarrying in contrast to other major mineral mining.

Splitting of rock mass of considerable volume from the parent rock mass by jackhammer drilling and blasting, hydraulic excavators are used for loading the Rough Stone from pithead to the needy crushers.

Occasionally hydraulic excavators are attached with rock breakers for fragmentation to avoid secondary blasting. The primary boulders thus splitted are removed from the pits by excavators and further made to smaller sizes by rock breakers attached in excavators. It is a conventional opencast mechanized method of mining.

**5.3. Proposed Bench Height and Width:**

The bench height is proposed 5.0 meter vertical bench and the width of the bench is not less than the Height.

**5.4. Indicate the overburden / mineral production expected pit wise as detailed below (composite plan and section showing pit layout, dumps, disposal of waste if any etc.):**

The overburden in the form of Gravel formation, the Gravel will be directly loaded into tippers for the filling and levelling of low lying areas, this will be done only after obtaining permission and paying necessary seigniorage fees to the Government. The excavated rough stone will be directly loaded into tippers to the needy customers. The Composite year wise Development and production plan and sections indicating the Pit lay out, Green belt development are shown in Plate No. III.

Year wise Development and Production Table

Table - 5

Year	Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Recoverable Reserve of Rough stone @ 100% (m <sup>3</sup> )	Gravel (m <sup>3</sup> )
I	XY-AB	i	57	79	2	-	9006
		ii	51	73	5	18615	-
		iii	41	63	5	12915	-
	<b>Total</b>						<b>31530</b>
II	XY-AB	i	26	79	2	-	4108
		ii	26	73	5	9490	-
		iii	26	63	5	8190	-
	XIY1-CD	i	104	25	2	-	5200
		ii	104	19	5	9880	-
	XIY1-EF	i	17	89	2	-	3026
		ii	14	83	5	5810	-
		iii	5	73	5	1825	-
	<b>Total</b>						<b>35195</b>
III	XIY1-EF	i	45	89	2	-	8010
		ii	45	83	5	18675	-
		iii	45	73	5	16425	-
	XI2Y2-GH	i	62	16	2	-	1984
<b>Total</b>						<b>35100</b>	<b>9994</b>
IV	XY-AB	iv	57	53	5	15105	-
	XIY1-EF	iv	40	63	5	12600	-
	<b>Total</b>						<b>27705</b>
V	XY-AB	v	47	43	5	10105	-
		vi	37	33	5	6105	-
		vii	27	23	5	3105	-
	XIY1-EF	v	28	53	5	7420	-
<b>Total</b>						<b>26735</b>	
<b>Grand Total=</b>						<b>156265</b>	<b>31334</b>

The Recoverable reserves have been computed as 1,56,265m<sup>3</sup> of Rough stone at the rate of 100% recovery for the period of five years and 31,334m<sup>3</sup> of Gravel for the period of first three years upto a depth of 32m (2m Gravel + 30m Rough Stone) below ground level.

The applicant ensures the total quantity proposed in the benches will not exceed during the quarrying operation. Besides the rough stone locked up in benches will be exploited after obtaining necessary permission from the office of Director of Mine Safety, Chennai region by submitting relevant documents, appropriate safety plans and its Mitigation measures.

Mining Plan and PQCP

Eraiyrur Rough Stone and Gravel Quarry



One lorry load	=	6m <sup>3</sup> (approx)
Total No of Working days	=	300 Days per year
Total quantity to be removed in this five years plan period	=	1,56,265m <sup>3</sup>
Hence total Lorry loads per day	=	1,56,265m <sup>3</sup> /6m <sup>3</sup>
	=	26,044 Lorry loads
	=	26,044/5 years
	=	5,209/300 days
<b>Rough Stone</b>	=	17 Lorry loads per day
Total quantity of gravel to be removed during three years	=	31,334m <sup>3</sup>
Hence total Lorry loads per day	=	31,334m <sup>3</sup> /6m <sup>3</sup>
	=	5,222 Lorry loads
	=	5,222/3 years
	=	1,741/300 days
<b>Gravel load per day</b>	=	6 Lorry load per day
Working hours = 9.00 am to 6.00 pm (with 1.00-2.00 P.M. lunch break)		

**5.5. Machineries to be used:**

**For Mining:**

The following machineries are utilized on rental basis for the development and production work at this quarry.

**I. DRILLING MACHINE:**

Table - 6

S.No.	Type	Nos	Dia Hole mm	Size Capacity	Motive power
1	Jack hammer	4	30-35	1.2m to 2.0m	Compressed air
2	Compressor	1	-	400 psi	Diesel Drive

**II. EXCAVATION & LOADING EQUIPMENT:**

S.No.	Type	Nos	Capacity	Motive Power
1	Excavator with Bucket and Rock Breaker	1	300	Diesel Drive

**III. HAULAGE WITHIN THE MINE & TRANSPORT EQUIPMENT:**

S.No.	Type	Nos.	Capacity	Motive Power
1	Tippers	2	20 tonnes	Diesel Drive

**5.6. Disposal of Overburden/Waste:**

The overburden in the form of Gravel formation, the Gravel will be directly loaded into tippers for the filling and levelling of low lying areas. The excavated rough stone (100%) will be directly loaded into tippers to the needy customers. There is no Waste anticipated during this plan period hence, disposal of waste does not arise.

**5.7. Brief note on conceptual mining plan for the entire lease period base on the geological, mining and environmental considerations:**

Conceptual mining plan is prepared with an object of long term systematic development of benches, layouts, selection of permanent structures, depth of quarrying and ultimate pit dimensions, selection of sites for construction of infrastructure, etc.,

The ultimate pit size is designed based on certain practical parameters such as economical depth of mining, safety zones, permissible area, etc.,

As the applicant has applied quarry lease for Ten years, the ultimate pit limit (dimension) at the end of this mining plan period is given below (Refer Plate No. V):

Table – 7

Length (Max) (m)	Width (Max) (m)	Depth (Max) (m)
311	89	32m Below Ground Level

The Greenbelt has proposed on the safety zone and Panchayat roads by planting tree saplings of native species. All the base line information studies like Air quality monitoring, Noise and vibration monitoring, Water analysis studies will be carried out every year as per the MoEF&CC Norms. Please refer Plate No. III & IV.

It is propose to engage any local institution to monitor the EIA and EMP during the course of quarrying operation after the grant of quarry lease.

There is no waste anticipated during the entire life of quarry. Hence, backfilling is not possible in this quarry. After completion of quarry operation the quarry pit allowed to collect the seepage and rain water to enhance the static level of ground water of the area and the water storage will be kept as temporary reservoir. The quarry area will be fenced with barbed wire fencing also safety bund constructed around the quarry to prevent inadvertent entry of public and cattle (Refer plate no. IV). The Conceptual Mining is based upon the entire ROM proposed for the life of the quarry.

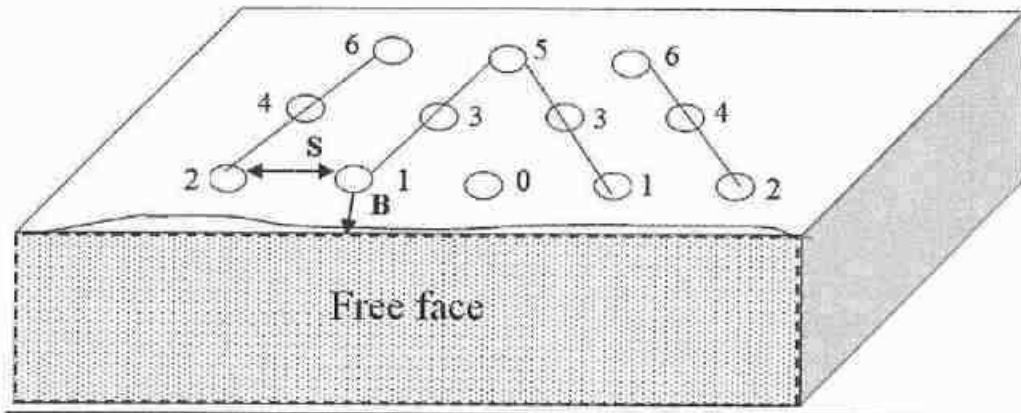


**6.0 BLASTING****6.1 Blasting pattern:**

The quarrying operation is proposed to be carried out by Mechanized Opencast Method in conjunction with conventional method of mining using Jack hammer drilling and blasting of shattering effect for loosening the Rough stone.

Drilling and blasting parameters are as follows:

Depth of Each hole	:	1.5m
Diameter of hole	:	30-32mm
Spacing between holes	:	1.2m
Burden for hole	:	1.0m
Pattern of hole	:	Zigzag – Multi-rows
Inclination of holes	:	80° from horizontal
Use of delay detonators	:	25millisecond relays
Detonating fuse	:	“Detonating” Cord

**BLASTING PATTERN DRAWING****Staggered “V” Pattern of Blasting Design**

Spacing	=	1.2m
Burden	=	1.0m
Depth of the hole	=	1.5m
No of holes proposed per day	=	90 Holes

**6.2 Type of explosives to be used:**

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 secondary blasting is proposed.



**6.3 Measures proposed to minimize ground vibration due to blasting:**

The quarry is situated more than 300m away from the nearby villages, Controlled blasting measures is being adopt for minimizing ground vibration and fly rock.

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

**Delay detonators:**

Delay blasting (millisecond delays) permits to divide the shot in 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	= 90 Holes
Yield	= 270 Tons
Powder factor	= 6 Tons/Kg of explosives
Total explosive required	= 45 Kg-Shurry explosives
Charge/ hole	= 0.5 Kg
Blasting at day time only	= 1.00 – 1.30 P.M.(whenever required)

**6.4 Storage and safety measures to be taken while blasting:**

The applicant will engage authorized explosive agency to carry out the small amount of blasting and it will be supervised by competent and statutory foreman/Permit Mines Manager. The explosives agencies should be have the valid Blaster certificate. He will blast holes in the quarry site. After the completion of Blasting the explosives Agencies will take it out back the remaining quantity of Explosives.

**7.0 MINE DRAINAGE**

**7.1 Depth of water table (based on nearby wells and water bodies):**

The water table in the area is about 56m BGL which is observed from the nearby bore well the data obtained from existing private boreholes. The lease applied area is fully covered by Massive Charnockite formation and it is revealed from the adjacent quarries. Hence the Ground Water problem will not arise. If water seepage may occur due to the fracture, the same will be used for Greenbelt. Anyhow, Garland drain will be constructed all along the boundary to prevent surface run-off water entering into the quarry.





Table – 8

Type	Distance & Direction	Location
Bore Well	910m on the Northeast	12°04'45.20"N 79°39'05.97"E

**7.2 Arrangements and places where the mine water is finally proposed to be discharged:**

The quarry operations are confined to well above the water table during the entire lease period. If water is encountered at quarry due to rain water and seepage, the same will be pumped out by SHP water pump and discharge to the Green belt development areas. Besides, the water will also be used for dust suppression on haul roads during Haulage of machineries.

**8.0 OTHER PERMANENT STRUCTURES (also shown in the map)**

**SALIENT FEATURES**

Table – 9

S. No.	Salient Features Present around site	Prescribed safety distance	If any present within Prescribed distance - Actual Distance from the site
1.	River/Canal/ Reservoirs	50m	There is no water body situated within 50m radius of the area. The nearest Odai Passing in S.F.No. 74/2 situated at 110m on the Northeast side (Refer Plate No. IB).
2.	Railways and Highways	50m	The Nearest National Highway Viluppuram – Tindivanam (NH-132) Road is situated about 8.4km on the Western side of the lease applied area. The State Highway Dheevanur – Vanur (SH-136) Road is located about 1.2km on the Northern side. The Major District Road is Vadhanur– Perumbakkam (MD-808) located at 1.2km on the Eastern side of the area. The Nearest Railway line is Viluppuram - Tindivanam which is located at 9.5km on the Western side of the area. (Refer Plate No. IB).
3.	Village Road	10m	There is no village road located within 10m radius.

## Mining Plan and PQCP

## Eraiur Rough Stone and Gravel Quarry

4.	Habitation / Village/ place of worship/ Public building/ Archaeological or Historical monument	300m	None of the above situated within 300m radius of the lease applied area (Refer Plate No I-B).															
5.	Adjacent Patta/ Govt. Land	7.5m/10m	<table border="1"> <thead> <tr> <th>Direction</th> <th>Classification</th> <th>Safety Distance</th> </tr> </thead> <tbody> <tr> <td>North</td> <td>Patta land</td> <td>7.5m</td> </tr> <tr> <td>East</td> <td>Patta land</td> <td>7.5m</td> </tr> <tr> <td>South</td> <td>Patta land</td> <td>7.5m</td> </tr> <tr> <td>West</td> <td>Patta land</td> <td>7.5m</td> </tr> </tbody> </table> <p>(Refer Plate No. II).</p>	Direction	Classification	Safety Distance	North	Patta land	7.5m	East	Patta land	7.5m	South	Patta land	7.5m	West	Patta land	7.5m
Direction	Classification	Safety Distance																
North	Patta land	7.5m																
East	Patta land	7.5m																
South	Patta land	7.5m																
West	Patta land	7.5m																
6.	Power House, EB line (HT & LT Line)	50m	There is no EB (LT/HT) line or Housing area situated within 50m radius of the area.															
7.	Boundaries of the permitted area	7.5m	<p>The boundaries of the permitted areas as follows:</p> <p>North – S.F.Nos. 76/2, 76/3B1, 76/6 and 74</p> <p>East – S.F.Nos. 73 and 75/7</p> <p>South – S.F.Nos. 75/2, 75/3 and 82</p> <p>West – S.F.No. 77</p> <p>(Refer Plate No. II).</p>															
8.	Reserve forest	60m	There is no reserved forest located within 60m radius of the lease applied area (Refer Plate No. IA).															
9.	Protected area / ECO sensitive area/ Wild Life Sanctuary/ Interstate Border	10km	<p>There is no Wild Life Sanctuary/ ECO sensitive area/ Critically Polluted Area/ CRZ located within 10km radius of the area (Refer Annexure No. IA).</p> <p>Tamil Nadu – Puduchery border situated at 4.8km on the Southern side.</p> <p>Oussudu Lake Birds Sanctuary located at 15.2km on the Southeast side of the area.</p>															

**9.0 EMPLOYMENT POTENTIAL & WELFARE MEASURES****9.1 Employment potential (skilled, semi-skilled, un skilled):**

The following manpower's are proposed in the mining plan to carry out the day-to-day quarrying activities, the same employment is maintaining aimed at the proposed production target and also to comply with the statutory provisions of the Metalliferous mines regulations, 1961.

**a. Skilled labour:**

Mine Foreman	:	1
Blaster/mate	:	1
Excavator – Operator & Driver	:	3
Jack hammer operator	:	8

**b. Semi-skilled:**

Security	:	1
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**c. Unskilled:**

Labour & Helper	:	3
Co-operator and Cleaner	:	3
<b>Total</b>	:	<b>20</b>

The above manpower is adequate to meet out the production schedule and the machinery strength envisaged in the mining plan and to comply with the statutory provisions of the Mines Safety Regulations. It is been ensured that the labour will not be employed less than 18 years, **No child labour** will engaged or entertained for any kind of quarrying operations. All the labours engaged for quarrying operations will be insured during the quarry lease period.

**9.2 Welfare Measures:****a) Drinking Water:**

Packaged drinking water is available from the nearby water vendors in Mailam which is located at 6.7km on the Northwest side of the lease applied area.

**b) Sanitary Facilities:**

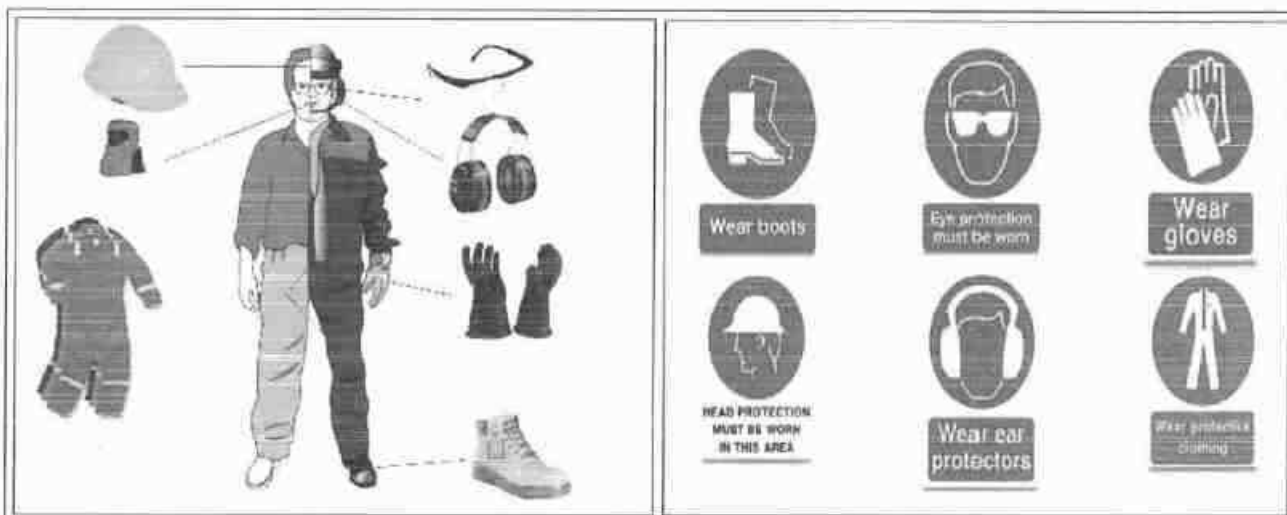
Hygienic modern Sanitary Facilities will be constructed as semi permanent structure and it will be maintained periodically.

**c) First aid facility:**

First aid kits are kept in Mines office room, in case of such eventuality is the victim will be given first aid immediately at the site by the competent and statutory foreman/permit manager/mate will be in charge of first aid and injured person will be taken to the hospital by the applicant's vehicle. Hospital is available in Vanur located at a distance of 13km on the Southeast side.

**d) Labour Health:**

Periodically medical check-up related to occupational health safety will be conducted to all the workers in applicant own cost.

**e) Precautionary safety measures to the labourers:**

- Helmets,
- Mine Goggles,
- Ear plugs,
- Ear muffs,
- Dust mask,
- Reflector jackets
- Safety Shoes

All personnel protective devices will be provided as per the specification approved by Director of mines safety. Periodically medical check-up will be conducted for all workers for any mine health related problems. Proper training and vocational education will be given by qualified and experienced safety officer to all the employees about the safety and systematic Rough stone quarrying operations. The drillers and workers will be sent for vocational training periodically, to carry out the quarrying operations scientifically and to safe guard the men and machinery and to create awareness about conventional opencast quarrying operations.

**PART - B****10.0 ENVIRONMENT MANAGEMENT PLAN****10.1 Existing Land use pattern:**

The quarry lease applied area is flat terrain. The area is a dry barren land devoid of Agriculture and Habitations. The land is previously did not used any specific purpose.

**LAND USE PATTERN****Table - 10**

<b>Description</b>	<b>Present area in (ha)</b>	<b>Area utilized (%)</b>
Area under quarry	Nil	-
Infrastructure	Nil	-
Roads	Nil	-
Green Belt	Nil	-
Unutilized	2.42.63	100
<b>Grand Total</b>	<b>2.42.63</b>	<b>100</b>









**10.2 Water Regime:**

It is a simple opencast quarry operation. The quality of water will not be affected due to this quarrying operation. During rainy season the water table in the adjacent area may raise up. The subject area is a hard batholithic formation hence, the water table will not encounter from adjacent lands. However, mitigation measures will be carried out like Garland drains constructed on all sides of quarry pit to avoid surface run-off rain water entering into the pit.





The waste water discharged to water bodies will be met the standard prescribed under the Environment (Protection) Act - 1986 by The Ministry of Environment, Forest and Climate change.

## 10.3 Flora and Fauna:

Table - 11

S.No	Name of the plant (Scientific)	Family Name	Common Name	Habit	Picture
1.	Casuarina equisetifolia	Casuarinaceae	Soukku, coastal she-oak	Tree	
2.	Azadirachta indica	Meliaceae	Neem, Vembu	Tree	
3.	Eucalyptus obliqua	Myrtaceae	Eucalyptus	Tree	
4.	Borassus flabellifer	Arecaceae	Palm tree	Tree	
5.	Calotropis gigantea	Apocynaceae	Erukku	shrub	
6.	Tectona grandis	Lamiaceae	Teak	Tree	
7.	Acacia nilotica	Fabaceae	Karuvelam	Tree	
8.	Senna auriculata	Fabaceae	Avarai	shrub	

List of Fauna

S.No.	Scientific Name	Common Name	Picture
1.	Capra aegagrus hircus	Goat	
2.	Bos taurus	Cow	
3.	Oryctolagus cuniculus	Rabbit	
4.	Corvus leuillanti	Crow	

**10.4 Climatic Conditions:**

The area receives rainfall of about 985mm/annum and the rainy season is mainly from Oct - Dec during monsoon. The summer is hot with maximum temperature of 42°C and winter encounters a minimum temperature of 21°C.

**10.5 Human settlement:**

There are few villages located within 5km radius of the area; the approximate distance, direction and populations are given table below:

Table – 12

S. No	Name of the Village	Approximate distance & Direction from lease applied area	Approximate population
1.	Eraiyr	1.7km – SE	3,300
2.	Perumbakkam	1.5km – NE	2,400
3.	Kanniyam	1.5km – NW	1,000
4.	Konamangalam	1.6km – SW	1,000

Basic human welfare Amenities such as Health Centre, Schools, Communication Facilities, Commercial Centres, etc., are available at Vanur located at a distance of 13km on the Southeastern side of the area.

**10.6 Plan for air, dust suppression:**

The air quality will be affected by the Suspended Particulate Matter (SPM) generated by the blasting, jack hammer drilling, Loading and unloading during the Rough stone quarry operation.

The following Mitigations measures will be adopted to arrest the dust at the source:

- Compaction, gradation and drainage on both sides for haulage road.
- Mist Water spraying will be carried out by means of water sprinklers to suppress the dust emission in the Haul roads.
- Vegetations will be formed on the non quarrying area.
- Avoiding spillages during the transportation.
- Wet drilling with latest eco friendly drill machine with separate dust extractor unit.
- Enforcing speed limits of 20km/hr within quarry area.
- Regular monitoring of exhaust fumes as per RTO norms.
- All personnel protective equipment like Nose-mask, earplug/ muffs will be provided to the Workers.

Air quality will be monitored periodically as per Norms and Mitigate measures carried out to prevent dust and Air propagation in to air. The estimated budget for dust suppression would be around Rs.52,000/year.



**10.7 Plan for Noise level control:**

The noise level increased due to the Excavation, Drilling, Blasting and Transportation.

**Engineering Noise control:**

Noise will be created due to the usage of Machineries and Vehicles. The following Care and techniques will be proposed to control the Noise and Vibration.

- Selection of new low – noise equipments for the Rough stone quarry operation.
- Proper maintenance done with regular interval by the Oiling and greasing for the machineries and vehicles to control the Source of noise during operation and transportation.
- Modifications of older equipment.
- NONEL blasting will be practiced to control Noise, ground vibration and fly rocks.
- Developing Green belts which act as Acoustic barrier, pollution absorbent and noise controller.
- Transporting vehicles are enforcing the speed limits of 20km/hour within quarry area to reduce Noise level.
- Sentries with flags & whistle will posted in village road junction and populated area to control and regulate traffic.

Shallow holes of 32mm diameter and maximum depth of 1.5m will be drilled and conventional low power explosives such as Slurry Explosives, ordinary safety fuse will be used for rough stone. Hence, ground vibration and noise pollution i.e., minimal and restricted within the quarry working area.

Noise level monitoring and other Mitigation measures will be carried out to reduce Noise and Vibration. The estimated budget for Noise level monitoring would be around **Rs. 2,000/Year**.

**10.8 Environmental impact assessment statement describing impact of mining on the next five years:**

In the mining plan proposed for a production of Rough stone does not involve deep hole drilling and blasting. Such limited mining activity is not likely to cause any impact adversely on the environment. As far as pollution of air, water and noise concerned, the environmental impact studies will be conducted as per EIA notification issued by MoEF& CC. It is B2 Category mine. The estimated budget would be around **Rs. 3,80,000/-**.

**10.9 Proposal for waste management:**

There is no waste anticipated in this Rough stone and Gravel quarrying operation. The entire quarried out materials will be utilized (100%).





**10.10 Proposal for reclamation of land affected during mining activities and at the end of mining (refilling / fencing etc.):**

The maximum depth of quarrying is proposed in the mining plan around 32m has been envisaged as workable depth for safe & economic mining during mining plan period. The quarry area will be fenced with Barbed wire fencing also safety bund constructed around the quarry to prevent inadvertent entry of public and cattle. There is no waste hence, no proposal for backfilling. The barbed wire fencing cost would be around **Rs. 3,00,000/-**.

**10.11 Programme of Greenbelt development (indicate extend, number, name of species to be afforested):**

The safety zone all along the boundary barrier has been identified to be utilized for Greenbelt development. Appropriate native species of Neem, Pongamia pinnata, Manchanathi, Casuarina, etc., trees will be planted in a phased manner as described below.

**Table – 13**

Year	No. of trees proposed to be planted	Survival %	Area to be covered sq.m.	Name of the species	No. of trees expected to be grown
I	150	80%	1430	Neem, Pongamia pinnata, Manchanathi, Casuarina, etc.,	120
II	150	80%	1430		120
III	150	80%	1429		120
IV	150	80%	1429		120
V	150	80%	1429		120

Nearly 7,147m<sup>2</sup> area is proposed to use under Greenbelt by planting 750 Numbers of trees during mining plan period with an anticipated survival rate of 80% (Please refer Plate No.III). The estimated budget for plantation and maintenance of Green belt development would be around **Rs. 1,50,000/-** for the period of five years. The Greenbelt Development will be formed in around the quarried out top bench with 500 tree saplings and 250 tree saplings in approach road. The cost would be around **Rs. 1,50,000/-**.

**10.12 Proposed financial estimate / budget for (EMP) environment management:**

Budget Provision for the Mining Plan period:

**Table – 14**

S. No	Monitory and Analysis Description	Rate per location	No. of location	Total Charges/ six months	Total Charges/ year
1	Ambient air quality monitoring	6500	4	26000	52000
2	Noise level monitoring	250	4	1000	2000
3	Ground vibration monitoring	1000	2	2000	4000
4	Water sampling and analysis	9000	1	9000	18000
<b>Total EMP Cost/ year</b>					<b>76,000</b>

The EMP cost would be around **Rs. 3,80,000/-** for the period of five years.



<b>A. Project cost / investment</b>		
i) Land cost	The Land value as per the Government Guideline land cost is calculated as follows, Total Extent = 2.42.63Ha Cost per Hectare = Rs. 2,47,500/- <b>Total Land Cost = Rs. 6,00,509/-</b> (source : <a href="https://tnreginet.gov.in/portal/">https://tnreginet.gov.in/portal/</a> )	Rs.6,01,000/-
ii) Machinery to be used	The following machineries are proposed to meet out the productions. Excavator attached with rock breaker Tipper, Tractor mounted compressor With jack Hammer and loose tools (Rental Basis).	Rs.40,00,000/-
iii) Refilling/ Fencing	Fencing will be constructed around the quarry pit to prevent the inadvertent entry of public and cattle cost would be around.	Rs.3,00,000/-
iv) Labourers shed	Labour sheds already constructed as semi permanent structure. The cost is around.	Rs. 3,00,000/-
v) Sanitary facility	Adequate latrine and urinal accommodation has provided at conveniently accessible places the cost would be around.	Rs. 1,00,000/-
vi) Others items	First aid room & accessories.	Rs. 50,000/-
vii) Drinking water facility for the labourers	Packaged drinking water will be provided for all the Labours. Drinking water will be readily available at conveniently accessible points during the whole of the working shift the cost would be around.	Rs.1,00,000/-
viii) Sanitary arrangement	The latrine and urinal will keep clean and sanitary condition. The maintenance cost would be around.	Rs. 50,000/-
ix) Safety kit	All the Safety kit such as Helmet, Earmuffs, Goggles, Reflector Jackets, Safety shoes etc., will be provided to the workers by the applicant own cost which would be around.	Rs.50,000/-
x) Water sprinkling	Water will be sprinkled in the haul roads by water sprinklers the cost would be around.	Rs.1,00,000/-
xi) Garland drain	Construction of Garland drain with check dam to prevent surface run-off rain water in to the quarry pit, the construction cost is around.	Rs. 2,85,000/-
xii) Greenbelt etc.	Greenbelt development and maintenance will be carried out in the boundary barriers the cost would be around.	Rs.1,50,000/-
	Greenbelt development and maintenance will be carried out in the quarried out top benches and approach road.	Rs.1,50,000/-
<b>Total Project Cost</b>		<b>Rs.62,36,000/-</b>

**B. EMP Cost :- (Per year)**

Air Quality monitoring	=	Rs. 52,000/-
Water Quality Sampling	=	Rs. 18,000/-
Noise Monitoring	=	Rs. 2,000/-
Ground vibration test	=	Rs. 4,000/-
<b>Total Cost</b>	=	<b>Rs. 76,000/-</b>

Total EMP Cost for the five years period is **Rs. 3,80,000/-**

**A+B =**

A. Project cost	=	Rs. 62,36,000/-
B. EMP Cost	=	Rs. 3,80,000/-
<b>Total Project Cost (A+B)</b>	=	<b>Rs. 66,16,000/-</b>

C. The applicant indents to involve corporate Environment responsibilities (CER) activity like providing Water Purifier, Plantation, Sanitary facilities to the Eraiyrur Govt. School at 2.0% from the total project cost the cost would be around **Rs. 1,33,000/-**

Total Project cost = Rs. 66,16,000/-

CER Cost (2%) = Rs. 1,33,000/-

**Total cost = Rs. 67,49,000/-**

(The Total cost of the project including EMP Cost is Rupees sixty seven lakhs and forty nine thousand only).



## 11.0 PROGRESSIVE QUARRY CLOSURE PLAN

### 11.1 Introduction:

The Progressive Quarry Closure Plan for Rough stone and Gravel quarry lease applied area over an extent of 2.42.63 Hectares of patta lands in S.F.Nos. 75/1, 75/4, 75/5, 75/6 and 76/3B2 of Eraiyur Village, Vanur Taluk, Viluppuram District, Tamil Nadu State has been prepared for **Thiru. A. Veeraragavan**, S/o. Anandavelu, residing at No. 225, Mettu Street, Eraiyur Village, Vanur Taluk, Viluppuram District, Tamil Nadu State – 604 304.

### 11.2 Present Land use pattern:

Land Use Table – 15

Description	Present area in (ha)
Quarrying Pit	Nil
Infrastructure	Nil
Roads	Nil
Green Belt	Nil
Unutilized Area	2.42.63
<b>Grand Total</b>	<b>2.42.63</b>

### 11.3 Method of Mining:

Open cast Mechanized Mining is being carried out with 5.0 meter vertical bench with a bench width is not less than the bench height for Rough stone.

However, as far as the quarrying of Rough stone is concerned, observance of the provisions of Regulation 106 (2) (b) is available with Director General of Mines Safety. If the applicant/lessee intends to modify the dimensions of benches, relaxation and permission are available with Director General of Mines Safety under 106 (2) (b) of Metalliferous Mines Regulations, 1961. In such a scenario if there is any drastic change in the Resources and Reserves a modified plan will be submitted to the concerned authority for necessary relaxation, clearance and permission. The relaxation will be applied and obtained after the execution of lease deed / commencement of quarry operation.

### 11.4 Mineral Processing Operations:

The quarried out Rough stone will be transported by the 20tonnes capacity Tippers to the needy crushers. Splitting of rock mass of considerable volume from the parent rock mass by jackhammer drilling and blasting, hydraulic excavators are used for loading the Rough Stone from pithead to the needy crushers.

**11.5 Reasons for closure:**

As the mineral is not going to be exhausted during the proposed plan period, no immediate closure is planned due to sufficient reserves are available to carry on the activities. Hence, the reason for closure will be discussed in the ensuing mining plan.

**11.6 Statutory obligations:**

The applicant ensures to comply all the conditions stipulated in the precise area communication letter before grant of quarry lease and during the course of quarry operations.

**11.7 Progressive quarry closure plan preparation:**

Name and address of the Recognised Qualified Person who prepared the progressive closure plan and name and address of the executing agency who is involved in the Preparation of progressive quarry closure plan.

**Dr. M. IFTHIKHAR AHMED, M.Sc., M.B.A., F.G.S., Ph.D.,**

Recognised Qualified Person

RQP/MAS/183/2004/A

No.17, Advaita Ashram Road,

Alagapuram, Salem-636 004.

Cell: 94433 56539, 94422 78601

The applicant will himself implement the closure plan; no outside agency will be involved.

**11.8 Review of Implementation of Mining Plan including Progressive Closure Plan upto the Final Closure Plan:**

Mining Plan and Progressive quarry closure plan are being submitted for the first time. It will be reviewed after five years and review of implementation will be given in the next mining plan.

**11.9 Closure Plan:****(i) Mined Out Land:**

At the end of mining plan period, about 1.65.26Ha of area will be mined out. Land use at various stages is given in the table below.

Land Use Table – 16

Description	Present area in (ha)	Area at the end of Lease period (ha)
Area under quarry	Nil	1.65.26
Infrastructure	Nil	0.01.00
Roads	Nil	0.03.00
Green Belt	Nil	0.71.47
Unutilized Area	2.42.63	0.01.90
<b>Grand Total</b>	<b>2.42.63</b>	<b>2.42.63</b>

**(ii) Water quality management:**

Following control measures will be adopted for controlling water pollution:-

- Garland drain will be constructed around the quarry area to prevent surface runoff rainwater entering in to the pit.
- Construction of check dams / gully plugs at strategic places to arrest silt wash off from broken up area.
- Collection of surface run-off from broken up area in mine pits for settling and only properly settled excess water from mine pit will be discharged to nearby users. The storm water/ mine water will be used for dust suppression, greenbelt development, etc.
- Periodic analysis of mine pit water and ground water quality in nearby villages.
- The quarried out pit will be allowed to collect rain and seepage water which will act as a reservoir for storage. This water storage will enhance the static level and ground water recharge of nearby wells and it will be used for agriculture purpose to the nearby agriculture lands.
- Domestic sewage from site office & urinals/latrines provided in QL is discharged in septic tank followed by soak pits.

**(iii) Air Quality Management:**

The proposed mining method is not likely to produce much of dust and fugitive emissions to cause damage to ambient air quality of the area. Workers will be provided with personnel protective equipment like face-mask, earplug/ muffs.

For air pollution management at the progressive quarry closure plan, greenbelt will be developed to prevent and control air pollution.

**(iv) Top Soil and Waste Management:**

There is no topsoil and waste generated during the proposed plan period. The entire quarried out Rough stone and Gravel will be utilized (100%). Hence, waste management does not arise.

**(v) Disposal of mining machinery:**

All the machineries will be engaged on rental basis and the same has been maintained in good condition during entire life of quarry. Hence, disposal or decommissioning of mining machinery does not arise.



**(vi) Safety & Security:**

Safety measures will be implemented to prevent access in the excavation area to unauthorized persons as per Mine Act 1952, MMR 1961.

- Safety measures will be implemented as per Mine Act 1952, MMR 1961, and Mines Rules 1955.
- Provisions of MMR 1961 shall be strictly followed and all roads shall be wider than the height of the bench or equal to the height of the bench and have a gradient of not more than 1 in 16.
- The bench height will be 5.0m.
- Width of working bench will be kept about 5.0 m for ease of operations and provide sufficient room for the movement of equipments.
- Protective equipment like dust masks, ear-plugs/ muffs and other equipments shall be provided for use by the work persons.
- Notices giving warning to prevent inadvertent entry of persons shall be displayed at all conspicuous places and in particular near mine entries.
- Danger signs shall be displayed near the excavations and proper signal by siren alarm will be provide to the public before blasting to prevent accident.
- Security guards will be posted.
- In the event of temporary closer, approaches will be fenced off and notice displayed.
- Installation of CCTV cameras in the quarry and entrance of the quarry.
- Monitoring of Quarrying operation by external agency as directed by authorities.

**(vii) Disaster Management and Risk Assessment:**

This should deal with action plan for high risk accidents like landslides, subsidence, flood, fire, seismic activities, tailing dam failures etc. and emergency plan proposed for quick evacuation, ameliorative measures to be taken etc. The capability of applicant to meet such eventualities and the assistance to be required from the local authorities should be described.

- The mechanized mining activities in the area may involve any high risk accident due to side falls/collapse, flying stones due to blasting etc.
- The complete mining operation will be carried out under the Management and control of experienced and qualified Mines Manager having Certificate of Competency to manage the mines granted by DGMS.
- All the provisions of Mines Act 1952, MMR 1961 and Mines Rules 1955, TNMMCR 1959 and other laws applicable to mine will be strictly complied with.
- During heavy rainfall the mining activities will be suspended.
- All persons in supervisory capacity will be provided with proper communication facilities.
- Competent persons will be provided FIRST AID kits which they will always carry.
- The quarried out benches, Greenbelt Development will be formed in all around the benches and safety barrier of the lease applied area.

**Environmental Monitoring Cell:**

A dedicated team nominated by the mine manager or Agent will monitor and maintain the environmental compliances of the quarry as per the approved Environment Management Plan and report the Compliance to the Mine Manager half yearly.

**Disaster Management Cell:**

The Competent Qualified Statutory managers appointed by the applicant as per the Director of Mines Safety will be responsible for Disaster Management. It care any eventualities his mobile number will be displayed and he will take all the precautions and safety measures as per Mines and Minerals (Development and Regulations) Act, 1957.

**(viii) Care and Maintenance during Temporary Discontinuance:**

In case of any temporary discontinuance due to court order or due to statutory requirement or any other unforeseen circumstance following measures shall be taken for care, maintenance and monitoring of conditions.

- Notice of temporary discontinuance of work in mine shall be given to the DGMS as per the MMR 1961.
- All the mining machinery shall be shifted to a safe place.
- Entrance to the mine or part of the mine, to be discontinued shall be fenced off. Fencing shall be as per the circular 11/1959 from DGMS.
- Security Guards shall be posted for the safety and to prevent any unauthorized entry to the area.
- Carry out regular maintenance of the facilities/area detailed below in such a way as would have been done as if the mines were operation:
  - Quarry roads and approach roads,
  - Fencing on approach roads,
  - Checking and maintenance of machines and equipment,
  - Drinking water arrangements,
  - Quarry office, first aid stations etc.
- Competent persons shall inspect the area regularly.
- Air, water and other environmental monitoring shall be carried out as per CPCB and IBM Guideline.
- Care and upkeep of plantation shall be carried out on regular basis.
- Status of the working and status monitoring for re-opening of the mines shall be discussed daily.

In case of discontinuance due to any natural calamities/abnormal conditions, mining operation will be restarted as early as possible after completing rescue work, restoring safety and security, repairs of roads etc.

**(ix) Economic Repercussion of Closure of Quarry and manpower Retrenchments:**

The quarry lease is granted for a period of Ten years. As per the production Programme envisaged, there will be no effect on the man power as the majority of persons belong to nearby villages and will have an option either to be available for employment for the next contract/ lease or do the agriculture in their fields.



**(x) Time Scheduling For Abandonment:**

The lease applied area has enormous potential for continuance of operations even after the expiry of the lease period. The details of time schedule of all abandonment will be given at the time of final closure plan.

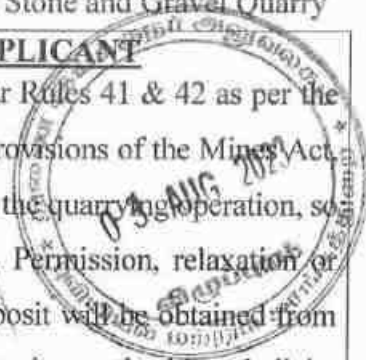
**(xi) Abandonment Cost:**

As at present mining is not going to be closed so abandonment cost could not be assessed. However based on the progressive quarry closure activities during the plan period, cost is assessed as given below:

Table – 17

ACTIVITY		YEAR					RATE	AMOUNT (INR)		
		I	II	III	IV	V				
Plantation under safety zone	Nos.	150	150	150	150	150	Rs. 200 Per sapling	Rs.1,50,000/-		
	Cost	30,000	30,000	30,000	30,000	30,000				
Plantation in the quarried out top bench	Nos.	-	-	200	150	150		Rs. 200 Per sapling	Rs.1,00,000/-	
	Cost	-	-	40,000	30,000	30,000				
Plantation in the approach road	Nos.	250	-	-	-	-			Rs. 200 Per sapling	Rs.50,000/-
	Cost	50,000	-	-	-	-				
Wire Fencing - 1000 meters		3,00,000	-	-	-	-	Rs. 300 Per Meter			Rs.3,00,000/-
Garland drain - 950 meters		2,85,000	-	-	-	-	Rs. 300 Per Meter			Rs.2,85,000/-
<b>TOTAL</b>								<b>Rs. 8,85,000/-</b>		

**12 ANY OTHER DETAILS INTEND TO FURNISH BY THE APPLICANT**



This Mining plan for Rough stone (Charnockite) and Gravel is under Rules 41 & 42 as per the Amended under Tamil Nadu Minor Mineral Concession Rules, 1959. The provisions of the Mines Act, Rules and Regulations and orders made there under shall be complied within the quarrying operation, so that the safety of the mine, machinery and person will be well protected. Permission, relaxation or exemption wherever required for the safe and scientific quarrying of the deposit will be obtained from the Department of Mines Safety. Any violation pointed out by the inspecting authorities shall be rectified and modified after scrutiny comments as per the guidelines of the Concerned Department and Authorities.

I hereby ensure that the information provided is correct to best of my knowledge and experience, some of the information contained in this report has been provided by external sources and by the applicant and is presented as the form as submitted by the applicant. The information is not intended to serve as legal advice related to the individual situation. I do not owe and specifically disclaim any liability resulting from the use during the course of quarrying operations after the grant of lease. The document may be scrutinized by the competent authority before approval.

Prepared by

*m. Ifthikhar Ahmed*

Dr. M. IFTHIKHAR AHMED, M.Sc., M.B.A., F.G.S., Ph.D.,  
Recognised Qualified person  
RQP/MAS/183/2004/A

Place: Salem  
Date: 02.08.2023

**DONATE RED  
SPREAD GREEN  
SAVE BLUE**

This mining plan is approved based on the instructions and guidelines issued by the Commissioner of Geology and Mining, Chennai vide letter Rc.No. 3858/LC/2012, dated: 19-11-2012 and based on incorporation of the conditions laid by the Deputy Director of Geology and Mining, Vilupperam in precise area communication letter Rc.No. A/GM/2531/2022 dated: 17.07.2023

*[Signature]*  
Deputy Director,  
Geology and Mining,  
Vilupperam.

Date: 03.08.2023

*MB  
3/8/23*



ந.க.எண். அ/புவி (ம) சுர/253/2022  
நாள்: 17. 07.2023

துணை இயக்குநர்,  
புவிமியல் மற்றும் சுரங்கத்துறை அலுவலகம்  
விழுப்புரம்.

குறிப்பாணை

**பொருள்:** கனிமங்களும் குவாரிகளும் - விழுப்புரம் மாவட்டம் -  
வானூர் வட்டம் - எறையூர் கிராமம், பட்டா புல எண்கள்:  
75/1(0.53.5), 75/4(0.30.0), 75/5(0.76.0),  
75/6(0.24.0) மற்றும் 76/3B2 (0.59.13) ஆகியவற்றில்  
2.42.63 ஹெக்டேர் பரப்பளவில் சாதாரண கற்கள்  
மற்றும் கிராவல் குவாரி குத்தகை உரிமம் வேண்டி  
மனுதாரர் திரு.வீராகவன், த/பெ. ஆனந்தவேலு  
என்பவர் விண்ணப்பம் செய்தது - உரிமம் வழங்க  
பரிந்துரை செய்து அறிக்கை வரப்பெற்றது - தகுதியான  
நிலப்பரப்பாக கருதி வரைவு சுரங்க திட்டம் மற்றும்  
சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணைய இசைவினை  
பெற்று சமர்ப்பிக்கக் கோருதல் - தொடர்பாக.

- பார்வை:**
1. திரு.வீராகவன், த/பெ. ஆனந்தவேலு,  
மேட்டுத்தெரு, எறையூர் கிராமம், வானூர் வட்டம்,  
விழுப்புரம் மாவட்டம், என்பவரது விண்ணப்பம்  
நாள்: 15.06.2022.
  2. வருவாய் கோட்டாட்சியர், விழுப்புரம் கடித எண்.  
ந.க. அ1/1969/2023, நாள்: 07.06.2023.
  3. விழுப்புரம், புவிமியல் மற்றும் சுரங்கத்துறை துணை  
இயக்குநர் அலுவலக உதவி புவிமியலாளர்  
புலத்தணிக்கை அறிக்கை நாள்: 23.06.2023.

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விழுப்புரம் மாவட்டம், வானூர் வட்டம், எறையூர் கிராமம், மேட்டுத்தெரு என்ற  
முகவரியைச் சேர்ந்த திரு.வீராகவன், த/பெ. ஆனந்தவேலு என்பவர் வானூர் வட்டம்,  
எறையூர் கிராமம், பட்டா புல எண்கள்: 75/1(0.53.5), 75/4(0.30.0), 75/5(0.76.0),  
75/6(0.24.0) மற்றும் 76/3B2 (0.59.13) ஆகியவற்றில் 2.42.63 ஹெக்டேர் பரப்பளவில்  
உள்ள நிலத்தில் 10 ஆண்டுகளுக்கு சாதாரண கற்கள் மற்றும் கிராவல் வெட்டியெடுத்து  
குவாரிபணி செய்ய உரிமம் வழங்கிட கோரி பார்வை 1-ல் கண்டவாறு விண்ணப்பம்  
செய்துள்ளார்.

மேற்படி விண்ணப்பம் தொடர்பாக, விழுப்புரம் வருவாய் கோட்டாட்சியர் மற்றும்  
விழுப்புரம், புவிமியல் மற்றும் சுரங்கத்துறை துணை இயக்குநர் அலுவலக உதவி  
புவிமியலாளர் ஆகியோரின் அறிக்கையில் விழுப்புரம் மாவட்டம், வானூர் வட்டம்,  
எறையூர் கிராமம், பட்டா புல எண்கள்: பட்டா புல எண்கள்: 75/1(0.53.5),  
75/4(0.30.0), 75/5(0.76.0), 75/6(0.24.0) மற்றும் 76/3B2 (0.59.13)  
ஆகியவற்றில் 2.42.63 ஹெக்டேர் பரப்பளவில் உள்ள பட்டா நிலத்தில் திரு.வீராகவன்,



த/பெ. ஆனந்தவேலு என்பவருக்கு பத்தாண்டுகளுக்கு சாதாரணக்கல் மற்றும் கிராவல் குவாரி உரிமம் வழங்க கீழ்க்கண்ட நிபந்தனைகளுக்குட்பட்டு அனுமதி வழங்கலாம் என பரிந்துரை செய்துள்ளனர்.

- i. விண்ணப்ப புலங்களின் அருகிலுள்ள பட்டா நிலங்களுக்கு 7.5 மீட்டர் பாதுகாப்பு இடைவெளிவிட்டும் அரசு புறம்போக்கு நிலங்களுக்கு 10 மீட்டர் பாதுகாப்பு இடைவெளி விட்டும் குவாரி பணி செய்ய வேண்டும்.
- ii. குவாரிப்பணி மேற்கொள்ளும் போது அருகிலுள்ள அரசு புறம்போக்கு, வண்டிப்பதை மற்றும் பட்டா நிலங்களுக்கு எவ்வித இடையூறும் இல்லாமல் குவாரிப்பணி செய்ய வேண்டும்.
- iii. குவாரி குத்தகை வழங்கும் முன்பு விண்ணப்பித்துள்ள இடத்தினை DGPS சர்வே பணி மேற்கொண்டு அதன் அறிக்கையை சமர்ப்பிக்க வேண்டும்.
- iv. தமிழ்நாடு சிறுகனிம சலுகை விதிகள் 1959 விதி-41ன்படி தகுதிவாய்ந்த நபரால் சுரங்க திட்டம் தயார் செய்து துணை இயக்குநர் அவர்களின் ஒப்புதல் பெறவேண்டும்.
- v. தமிழ்நாடு சிறுகனிம சலுகை விதிகள் 1959 விதி-42ன்படி மாநில சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையத்திடமிருந்து சுற்றுச்சூழல் சான்று பெற்று சமர்ப்பிக்கப்பட வேண்டும்.

எனவே, விழுப்புரம் வருவாய் கோட்டாட்சியர் மற்றும் விழுப்புரம் புவியியல் மற்றும் சுரங்கத்துறை துணை இயக்குநர் அலுவலக உதவி புவியியலாளர் ஆகியோரின் பரிந்துரை அறிக்கையின் அடிப்படையில், விழுப்புரம் மாவட்டம், வானூர் வட்டம், எறையூர் கிராமம், பட்டா புல எண்கள். 75/1(0.53.5), 75/4(0.30.0), 75/5(0.76.0), 75/6(0.24.0) மற்றும் 76/3B2 (0.59.13) ஆகியவற்றில் 24263 ஹெக்டேர் பரப்பளவில் 1959-ம் வருட தமிழ்நாடு சிறுகனிம விதிகள், விதி எண்.19-ன்படி மேற்கண்ட நிபந்தனைகளுக்குட்பட்டு 10 (பத்து) வருட காலத்திற்கு திரு.வீராகவன், த/பெ. ஆனந்தவேலு என்பவருக்கு சாதாரணக்கல் மற்றும் கிராவல் குவாரி உரிமம் வழங்குவதற்குரிய தகுதியான நிலப்பரப்பாக கருதப்படுகிறது.

அதன் அடிப்படையில், தமிழ்நாடு சிறு கனிம சலுகை விதிகள் 1959 விதி எண்.41-ன்படி குவாரிப்பணி மேற்கொள்வது தொடர்பாக வரைவு சுரங்க திட்டத்தினை தகுதிவாய்ந்த நபர் (QP) மூலமாக கீழ்க்கண்ட நிபந்தனைகளுக்குட்பட்டு தயாரித்து அதனை 90 தினங்களுக்குள் துணை இயக்குநர் (புவியியல் மற்றும் சுரங்கத்துறை) அவர்களின் பரிசீலனைக்கு சமர்ப்பிக்குமாறு விண்ணப்பதாரரை கேட்டுக்கொள்ளப்படுகிறது. மேலும் ஏற்பளிக்கப்பட்ட சுரங்கத்திட்டத்தின் தொடர்ச்சியாக 1959ம் வருடத்திய தமிழ்நாடு சிறுகனிம சலுகை விதிகள், விதி எண்.42-ன்படி சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையத்தின் தடையின்மை சான்று பெற்று சமர்ப்பிக்கும்



பட்சத்தில் மட்டுமே குவாரி உரிமம் வழங்கப்படும் என இதன் மூலம் தெரிவிக்கப்படுகிறது.

- i. விண்ணப்ப புலங்களின் அருகிலுள்ள பட்டா நிலங்களுக்கு 7.5 மீட்டர் பாதுகாப்பு இடைவெளிவிட்டும் அரசு புறம்போக்கு நிலங்களுக்கு 10 மீட்டர் பாதுகாப்பு இடைவெளி விட்டும் குவாரி பணி செய்ய வேண்டும்.
- ii. குவாரிப்பணி மேற்கொள்ளும் போது அருகிலுள்ள அரசு புறம்போக்கு, வண்டிப்பதை மற்றும் பட்டா நிலங்களுக்கு எவ்வித இடைபுறம் இல்லாமல் குவாரிப்பணி செய்ய வேண்டும்.
- iii. குவாரி குத்தகை வழங்கும் முன்பு விண்ணப்பித்துள்ள இடத்தினை DGPS சர்வே பணி மேற்கொண்டு அதன் அறிக்கையை சமர்ப்பிக்க வேண்டும்.

துணை இயக்குநர்,  
புவியியல் மற்றும் கரங்கத்துறை,  
விழுப்புரம்.

பெறுநர்  
திரு.வீராகவன்,  
த/பெ. ஆனந்தவேலு,  
மேட்டுத்தெரு,  
வானூர் வட்டம்,  
விழுப்புரம் மாவட்டம்.

MB  
17/07/22

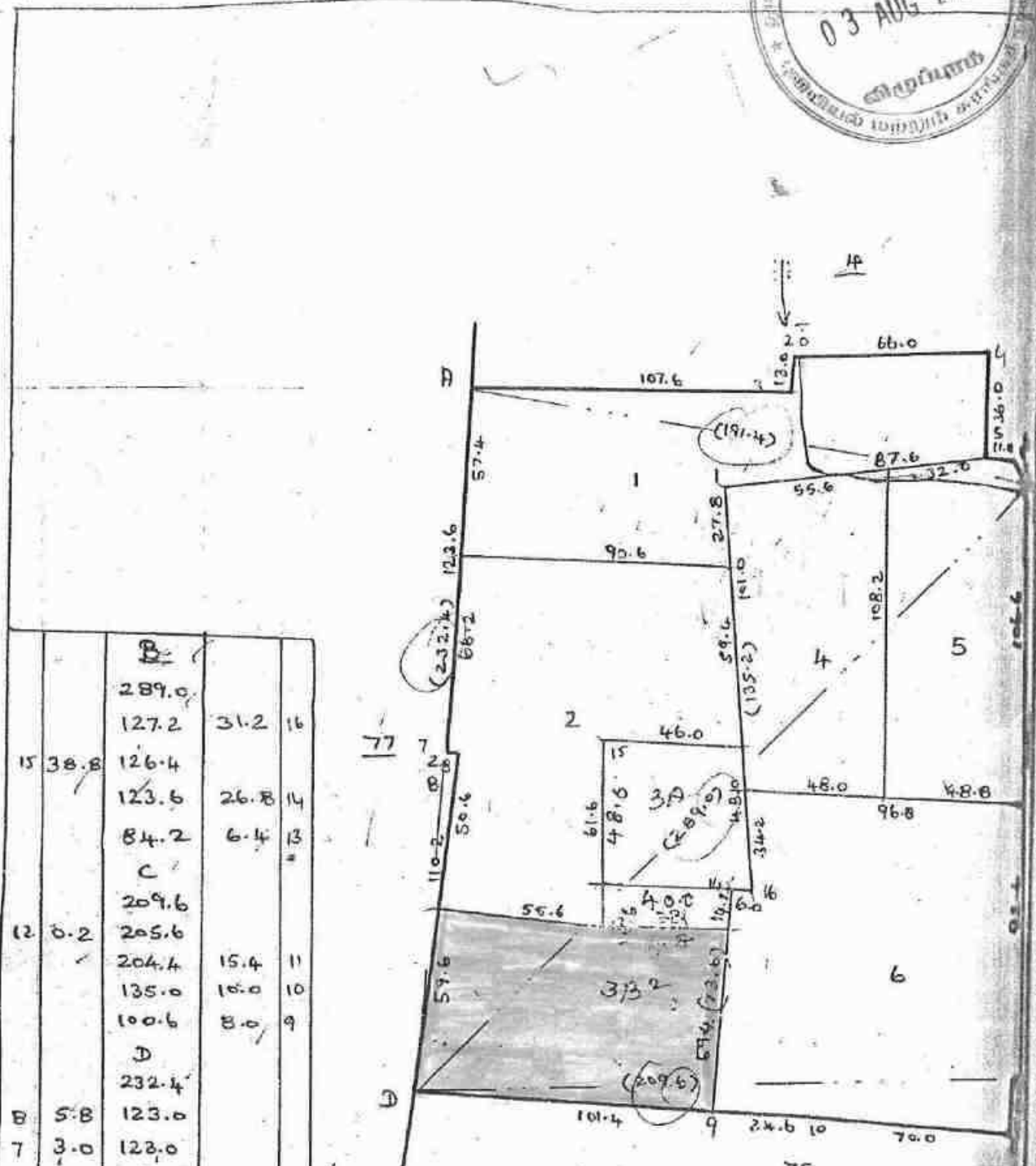
நகல்:-

1. மாநில சுற்றுச்சூழல் தூக்க மதிப்பீட்டு ஆணையம், சென்னை.
2. இயக்குநர், புவியியல் மற்றும் கரங்கத்துறை, கிண்டி, சென்னை.



ಎಣಿಕೆ: 1000 ಚ.ಮೀ  
 ಎಣಿಕೆ: 1000 ಚ.ಮೀ

ನಂ. 1000/2023



		<b>B</b>		
		289.0		
		127.2	31.2	16
15	38.8	126.4		
		123.6	26.8	14
		84.2	6.4	13
		<b>C</b>		
		209.6		
12	0.2	205.6		
		204.4	15.4	11
		135.0	10.0	10
		100.6	8.0	9
		<b>D</b>		
		232.4		
8	5.8	123.0		
7	3.0	123.0		
		<b>A</b>		
		191.4		
6	5.8	183.0		
6	4.8	172.6		
4	40.8	167.8		
3	16.0	106.2		
2	28.6	103.0		
		88.0	18.0	1
		<b>A</b>		

Sub. 3 A, 3B plotted as per  
 TWS A 90/1422  
 28.7.14

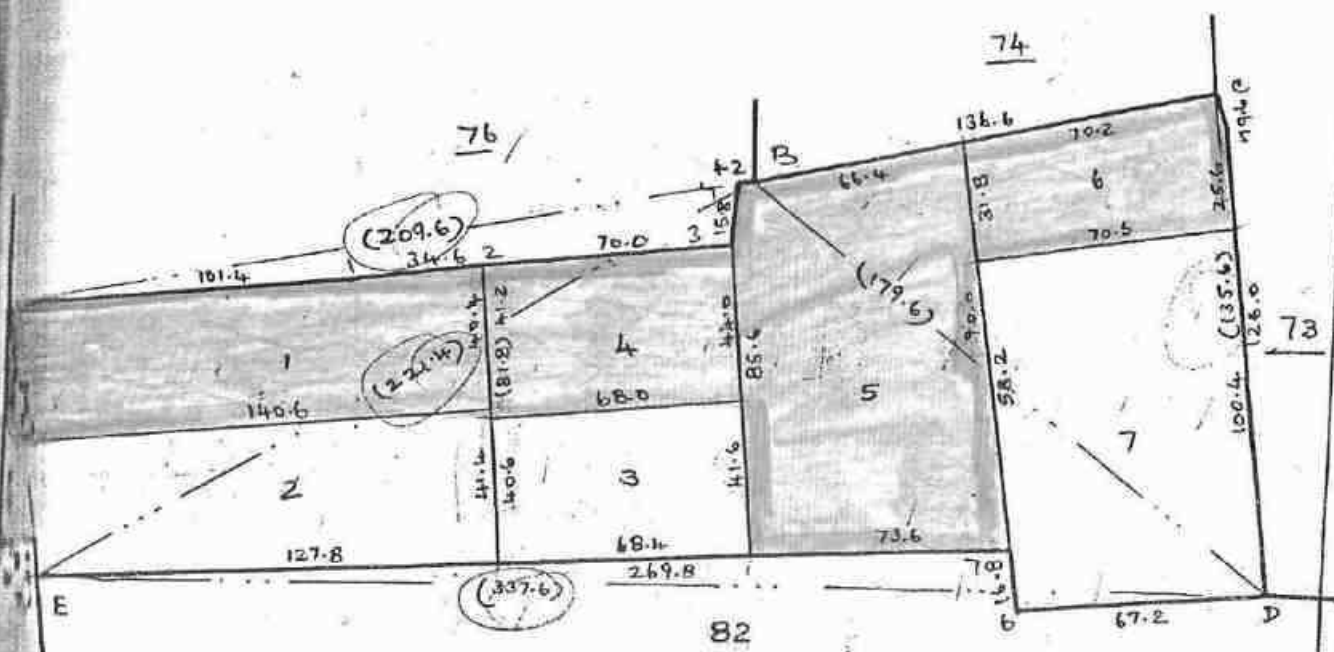
LEASE APPLIED AREA

Sub 3B1 & 3B2 plotted as per  
 HC 00407/1628 dt: 24.10.14

Prepared by  
 B. Thatchaya  
 20.5.20

68  
 010  
 H  
 3

சென்னை மாநகராட்சி  
 ஹைட்ரோ கிராம : 75



- E 75.2
- 3.6
- 11.0
- 2.4
- 0.2
- 1.8
- 4.2
- 3
- E 6.0
- 5.8
- 5.6
- 8.2
- 3.6
- 2.6
- 7
- 0.4
- 8.0
- 1.6
- A

LEASE APPLIED AREA

		B	
		221.4	
A	70.2	22.6	
		E	
		337.6	
		68.0	10.0 ?
6	6.4	66.8	
		D	
		135.6	
5	1.6	9.6	
		C	
		B	
		209.6	
4	0.2	205.6	
		204.4	15.4 3
		135.0	10.0 2
		100.6	8.0 1
		A	

		E	
		19.4	
B	8.4	11.8	
		F	
		E	
		74.0	
		59.6	12.8 F
		A	

Scale: 1:2000 MM  
 73A

Handwritten signature and date: J.S. 78.



Handwritten signature and official stamp.



LEASE APPLIED AREA

TIRUVANAM TALUK, V.No.168 Sht No.11.

ALAM

52. திருவள்ளூர்

தலைவர் : கல்வித்துறை  
பி.பி.பி. : திருவள்ளூர்

No. 14228  
Published pursuant to the provisions of  
the Act of 1908. Quarter sheet  
No. 11.  
Published pursuant to the provisions of  
the Act of 1908. Quarter sheet  
No. 11.





தமிழக அரசு

வருவாய்த் துறை

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

மாவட்டம் : விழுப்புரம்

வட்டம் : வானூர்

வருவாய் கிராமம் : எறையூர்

பட்டா எண் : 5558

உரிமையாளர்கள் பெயர்

1. அப்பகுரை தந்தை கணேசன்

புல எண்	உட்பிரிவு	முன்செய்		நுள்செய்		மற்றவை		குறிப்புகள்
		பரப்பு	தீர்வை	பரப்பு	தீர்வை	பரப்பு	தீர்வை	
		ஹெக் - ஏர்	ரூ - பை	ஹெக் - ஏர்	ரூ - பை	ஹெக் - ஏர்	ரூ - பை	
10	5	0 - 21.00	0.88	--	--	--	--	2019/0103 /07/184841--- -- 20-08-2019
20	4A	0 - 56.50	2.37	--	--	--	--	2019/0103 /07/184841--- -- 20-08-2019
75	4	0 - 30.00	1.26	--	--	--	--	2019/0103 /07/184841--- -- 20-08-2019
75	5	0 - 76.00	3.19	--	--	--	--	2019/0103 /07/184841--- -- 20-08-2019
75	6	0 - 24.00	1.01	--	--	--	--	2019/0103 /07/184841--- -- 20-08-2019
83	1	0 - 39.50	1.66	--	--	--	--	2019/0103 /07/184841--- -- 20-08-2019
9	3	0 - 14.50	0.61	--	--	--	--	2019/0103 /07/184841--- -- 20-08-2019
9	4A	0 - 4.50	0.19	--	--	--	--	2019/0103 /07/184841--- -- 20-08-2019
		2 - 66.00	11.17					

குறிப்பு 2 :

For C.L.SPL256 Erarayur Primary  
Agricultural Co-op Credit Society Ltd.

SECRETARY

PRESIDENT



தமிழக அரசு

வருவாய்த் துறை

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



மாவட்டம் : விழுப்புரம்

வட்டம் : வானூர்

வருவாய் கிராமம் : எறையூர்

பட்டா எண் : 5511

உரிமையாளர்கள் பெயர்

1. தனபால் தந்தை ராதாகிருஷ்ணன்

புல எண்	உட்பிரிவு	புன்செய்		தன்செய்		மற்றவை		குறிப்புகள்
		பரப்பு	தீர்வை	பரப்பு	தீர்வை	பரப்பு	தீர்வை	
		ஹெக் - ஏர்	ரூ - பை	ஹெக் - ஏர்	ரூ - பை	ஹெக் - ஏர்	ரூ - பை	
75	1	0 - 53.50	2.25	--	--	--	--	2018/0103 /07/134942--- -- 08-11-2018
		0 - 53.50	2.25					

குறிப்பு 2 :



1. மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் <https://eservices.tn.gov.in> என்ற இணைய தளத்தில் 07/02/051/05511/60132 என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.
2. இத் தகவல்கள் 08-06-2022 அன்று 10:50:05 AM தேர்தலில் அச்சடிக்கப்பட்டது.
3. கைப்பேசி கேமராவின் 2D barcode படிப்பான் மூலம் படித்து 3G/GPRS வழி இணையதளத்தில் சரிபார்க்கவும்

For C.L.SPL266 Fraiyur Primary  
Agricultural Co-op Credit Society Ltd.

SECRETARY  
08/06/2022  
PRESIDENT



தமிழக அரசு

வருவாய்த் துறை

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

மாவட்டம் : விழுப்புரம்

வட்டம் : வானூர்

வருவாய் கிராமம் : எறையூர்

பட்டா எண் : 5506

உரிமையாளர்கள் பெயர்

1. தன்பால் கவுண்டர்

தந்தை

ராதச்சிருஷ்ணன்

புல எண்	உட்பிரிவு	புன்செய்		நன்செய்		மற்றவை		குறிப்புகள்
		பரப்பு	தீர்வை	பரப்பு	தீர்வை	பரப்பு	தீர்வை	
		ஹெக் - ஏர்	ரூ - பை	ஹெக் - ஏர்	ரூ - பை	ஹெக் - ஏர்	ரூ - பை	
76	382	0 - 59.13	2.48	--	--	--	--	2018/0105 /07/104899--2018 /07/02/000031SD -- 17-10-2018
		0 - 59.13	2.48					

குறிப்பு 2 :



- மேற்கண்ட தகவல் / சான்றிதழ் தகவல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாய்கள் <https://eservices.tn.gov.in> என்ற இணைய தளத்தில் 07/02/051/05506/60186 என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்யக்கொள்ளவும்.
- இத் தகவல்கள் 08-06-2022 அன்று 10:51:15 AM நேரத்தில் அச்சடிக்கப்பட்டது.
- கைப்பேசி கேமராவின் 2D barcode படிப்பான் மூலம் படித்து 3G/GPRS வழி இணையதளத்தில் சரிபார்க்கவும்.

For C.L.SPL266 Fravur Primary  
Agricultural Co-op Credit Society Ltd.

SECRETARY  
PRESIDENT

## அ-பதிவேடு விவரங்கள்



மாவட்டம் : விழுப்புரம்

வட்டம் : வானூர்

கிராமம் : எறையூர்


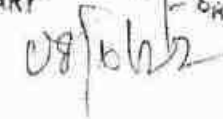
1. புல எண்	75	9. மண் வயனமும் ரகமும்	3 - 5
2. உட்பிரிவு எண்	1	10. மண் தரம்	5
3. பன்றல புல உட்பிரிவு எண்	27-4A	11. தீர்வை (ரூ - ஹெ)	4.20
4. பகுதி	-	12. பரப்பு (ஹெக்டேர் - ஏர்)	0 - 53.50
5. அரசு / ரயத்துவாரி	ரயத்துவாரி	13. மொத்த தீர்வை (ரூ - பை)	2.25
6. நிலத்தின் வகை	புஞ்சை	14. பட்டா எண்	5511
7. பாசன ஆதாரம்	-	15. குறிப்பு	-
8. இரு போகஸ்	-	16. பெயர்	1.சாதாகிருஷ்ணன்

## குறிப்பு 1:



1. மேற்கண்ட தகவல் / சான்றிதழ் தகவல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் <http://eservices.tn.gov.in> என்று இணைய தளத்தில் 80132 என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.

For C.L.SPL266 Erayur Primary  
Agricultural Co-op Credit Society Ltd.

  
SECRETARY  
  
PRESIDENT

அ-பதிவேடு விவரங்கள்

மாவட்டம் : விழுப்புரம்

வட்டம் : வானூர்

கிராமம் : எறையூர்

1. புல எண்	75	9. மண் வயனளவும் சகமும்	3 - 5
2. உட்பிரிவு எண்	4	10. மண் தரம்	5
3. பழைய புல உட்பிரிவு எண்	-3B	11. தீர்வை (ரூ - ஹெ)	4.20
4. பஞ்சி	-	12. பரப்பு (ஹெக்டேர் - ஏர்)	0 - 30.00
5. அரசு / ரயத்துவாரி	ரயத்துவாரி	13. மொத்த தீர்வை (ரூ - பை)	1.26
6. நிலத்தின் வகை	புஞ்சை	14. பட்டா எண்	5558
7. பாசன ஆதாரம்	-	15. குறிப்பு	-
8. இரு போகமா	-	16. பெயர்	1.கணேசன்




குறிப்பு 1:



1. மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் <http://eservices.tn.gov.in> என்ற இணைய தளத்தில் 80103 என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.

For C.L.SPL266 Erayur Primary  
Agricultural Co-op Credit Society Ltd.

  
SECRETARY 08/06/22 PRESIDENT

அபதிவேடு விவரங்கள்

மாவட்டம் : விழுப்புரம்

வட்டம் : வானூர்

கிராமம் : எறையூர்



1. புல எண்	75	9. மண் வயனரும் சகமும்	3 - 5
2. உட்பிரிவு எண்	5	10. மண் தரம்	5
3. பழைய புல உட்பிரிவு எண்	-3B	11. தீர்வை (ரூ - தொ)	4.20
4. பகுதி	-	12. பாப்பு (ஹெக்டேர் - ஏர்)	0 - 76.00
5. அரசு / ரயத்துவாரி	ரயத்துவாரி	13. மொத்த தீர்வை (ரூ - பை)	3.19
6. நிலத்தின் வகை	புஞ்சை	14. பட்டா எண்	5558
7. பாசன ஆதாரம்	-	15. குறிப்பு	-
8. இரு போகமா	-	16. பெயர்	1.கணேசன்

குறிப்பு 1:



1. மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் <http://eservices.tn.gov.in> என்ற இணைய தளத்தில் 80103 என்ற குறிப்பு எண்ணை உள்நீடு செய்து உறுதி செய்துகொள்ளவும்.

For C.L.SPL266 Erayur Primary  
Agricultural Co-op Credit Society Ltd.

SECRETARY  
PRESIDENT

அ-பதிவேடு விவரங்கள்



மாவட்டம் : விழுப்புரம்

வட்டம் : வானூர்

கிராமம் : ஏறையூர்

1. புல எண்	75	9. மண் வயனமும் ரகமும்	3 - 5
2. உட்பிரிவு எண்	6	10. மண் தரம்	5
3. பழைய புல உட்பிரிவு எண்	26-1	11. தீர்வை (ரூ - றெ)	4.20
4. பகுதி	-	12. பரப்பு (ஹெக்டேர் - ளர்)	0 - 24.00
5. அரசு / ரயத்துவாரி	ரயத்துவாரி	13. மொத்த தீர்வை (ரூ - பை)	1.01
6. நிலத்தின் வகை	புஞ்சை	14. பட்டா எண்	5558
7. பாசன ஆதாரம்	-	15. குறிப்பு	-
8. இரு போகமா	-	16. பெயர்	1.கணேசன்

குறிப்பு 1:



1. மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தரங்கள் <http://eservices.tn.gov.in> என்ற இணைய தளத்தில் 80103 என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.

For C.L.SPL266 Erayur Primary  
Agricultural Co-op Credit Society Ltd.

*D. Anand*  
SECRETARY *as kish* PRESIDENT

அ-பதிவேடு விவரங்கள்

மாவட்டம் : விழுப்புரம்

வட்டம் : வாலூர்

கிராமம் : எறையூர்



1. புல எண்	76	9. மண் வயளமும் சகமும்	3 - 5
2. உட்பிரிவு எண்	3B2	10. மண் தரம்	5
3. பழைய புல உட்பிரிவு எண்	76-3B	11. தீர்வை (ரூ - ஹெ)	4.20
4. பகுதி	P	12. பரப்பு (ஹெக்டேர் - ஏர்)	0 - 59.13
5. அரசு / ரயத்துவாரி	ரயத்துவாரி	13. மொத்த தீர்வை (ரூ - பை)	2.48
6. நிலத்தின் வகை	புஞ்சை	14. பட்டா எண்	5506
7. பாசன ஆதாரம்	-	15. குறிப்பு	-
8. இரு போகமா	-	16. பெயர்	1.ராநாகிருஷ்ணன்

குறிப்பு 1:



1. மேற்கண்ட தகவல் / சான்றிதழ் தகவல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாய்கள் <http://eservices.tn.gov.in> என்ற இணைய தளத்தில் 80186 என்ற குறிப்பு எண்ணை உள்விட்டு செய்து உறுதி செய்துகொள்ளவும்.

For C.L.SPL266 Eravur Primary  
Agricultural Co-op Credit Society Ltd.

SECRETARY  
PRESIDENT



1432- ஆம் பசனியில் அடிப்படி

மாடம் ஓரணர்

கிராமக் களக்கு  
வட்டம் சீயாபுரி



நில வரித் திட்டத்தின்படி புலங்களின் விபரம்.					செய்ப்புறு தரகுடைய பெயரும் எண்ணும் அல்லது அதுபோல தரகுடைய பெயர்.	சமூகப் பணிகள் பெயர்.	முதல் போகம்.				
(1) நில ஆளவை எண்.	(2) உயிரின எண்.	(3) பரப்பு.	(4) தீர்வை.	(5) ஒரு போகம் அல்லது இரு போகம்.			(6) கைப்பற்று தரகுடைய பெயரும் எண்ணும் அல்லது அதுபோல தரகுடைய பெயர்.	(7) நிலத்தின் எந்த பகுதி யாவது சமூகப்பணிகளில் பயன்பட்டுள்ளது.	(8) எந்த மாதத்தில் பயிற் செய்யப்பட்டது எந்த மாதத்தில் ஆறுவை செய்யப்பட்டது.	(9) பயிற் பெயர்.	(10) பயிற் / ஆறுவை யாள பரப்பு.
75	1	53.5	225	5511	நாதாதிஜன்	-	-	-	-	-	-
76	582	593	218	5506	நாதாதிஜன்	-	-	-	-	-	-
/ சண்முகம் /											
<p>செய்த அளவைக் குவாடி பணிகளில் பணியாற்றும் பெயர்: சண்முகம்</p> <p style="text-align: right;">O. S. S. S. No: 51, Crayu.</p>											

மத்தியில் வகுடவாரி புலவாரி கைப்பற்று சாகுபடி அடங்கல் கணக்கு

இரண்டாம் போகம்.

எந்த மாதத்தில் பயிர் செய்யப்பட்டது எந்த மாதத்தில் அறுவடை செய்யப்பட்டது.	(34) பயிரின் பெயர்.	(35) பயிரான / அறுவடையான பரப்பு.	(16) உண்மையான பாய்ச்சல் ஆதாரம்.	(37) விணைச்சல் அளவு விழுக்காடு.	கிராம அறுவடையின் குறிப்புகள் - (1) பயிர்செய்த பகுதிகளில் மட்டும் பயிரிடப்பட்ட இளங்கொட்டி விவசாயிகள் அளவில். (2) சைப்பற்றில் இவ்வாறான பயிர்செய்த பகுதிகளின் சாகுபடியின் பரப்பு தன்மையும். (3) முந்தைய மாதத்தில் பாய்ச்சல் உதவியின்றி பயிரிடப்பட்டவை என்று பதிவுசெய்யப்பட்ட நிலம் - கட்டுக்கு முந்தைய மாதங்களில் நீர் பாய்ச்சப்பட்ட விவசாயிகள்.	கீழ்க்கண்டவகையில் பயிரிடப்பட்டது உள்ள நிலத்தின் தன்மை மற்றும் பரப்பின் விவரங்கள் ஒவ்வொரு நில அளவை எண் அல்லது அதன் பகுதியில். (அ) வனம், (ஆ) பயனற்ற பயிர் செய்ய இயலாத நிலம், (இ) விவசாயம் மற்றும் இதர காரியங்களுக்கு பயன் படுத்தப் படும் நிலம், (ஈ) பயிரிடத்தக்க தரிக (உ) நிலையான பல் தரைகளும் மற்றும் இதர மேய்ச்சல் நிலங்களும், (ஊ) விதைக்கப்பட்ட நிகர பரப்பில் சேலிக்கப்பட்ட மரவகைய் பயிர்களும் தோப்புகளும், (ஈ) நடப்புத் தரிகள் (ஏ) இது தரிக நிலங்கள்.	(16.ஆ) பயிர் பரப்பையும் ஆரம்பக் குறிப்புகளையும்.
1	1	1		1	சாகுபடி		




1432 - ஆம் பசுவியில்

விசிட்யாட் மாவட்டம்

வாரணாசி வட்டம்

கிராமக் களஞ்சியம்



நில வரித் திட்டத்தின்படி புலன்களின் விபரம்.					சாகுபடி யாளரின் பெயர்.	முதல் போகம்.						
(1)	(2)	(3)	(4)	(5)		(6)	(7)	(8)	(9)	(10)	(11)	(12)
					கைப்பற்று தாரகூடைய பெயரும் எண்ணும் அல்லது ஆதாரகூடைய பெயர்.	நிலத்தில் எந்த பகுதி மரவந்து சாகுபடியாளரால் பயிற்சி பெட்டுள்ளதா.	எந்த மாதத்தில் பயிர் செய்யப்பட்டது எந்த மாதத்தில் அறுவடை செய்யப்பட்டது.	பயிரின் பெயர்.	பயிரான / அறுவடை யான பரப்பு.	உண்மையான பாய்க்கல் ஆதாரம்.	விளைச்சல் அளவு ரிசூக்காடு.	
75	4	030.0	126	5558	சுசுணாசனி	-	-	-	-	-	-	
75	5	076.0	319	5558	சுசுணாசனி	-	-	-	-	-	-	
75	6	024.0	101	5558	சுசுணாசனி	-	-	-	-	-	-	
					/ உண்மையான /							
					சாரங்க சிப்கான் விவாசி பணி தேய்யிட் பகன்வாடிகல் 6							
					வ.க.வி. உண்மையானகிராம							
					 Revenue Officer No. 56, P. O. 22 Warangal, T.N.							

எண் 2

கிராமத்தில் வருடவாரி புலவாரி கைப்பற்று சாகுபடி அடங்கல் கணக்கு



இரண்டாம் போகம்.				
(13)	எந்த மாநிலத்தில் பயிர் செய்யப்பட்டது எந்த மாநிலத்தில் அறுவடை செய்யப்பட்டது.			
(14)	பயிரின் பெயர்.			
(15)	பயிரான / அறுவடைபான பரப்பு.			
(16)	உண்மைபான பயிச்சல் ஆதாரம்.			
(17)	விளைச்சல் அளவு விழுக்காடு.			
(18)	கிராம அறுவடிகள் குறிப்புகள் :- (1) பயிர்களின் பகுதிகளில் யாண்டு பயிரிடப்பட்ட இளங்களில் விவரங்கள் அளவில். (2) கைப்பற்றில் இவ்வாறு நிலம் - களின் அளவுபற்றின் பரப்பு தன்மையும். (3) முந்தைய மாதத்தில் பயிச்சல் உதிர்ந்தது பயிரிடப்பட்டவை என்று பதிவாகியிருக்கும் கணக்கு விவரம் மாதங்களில் நீர் பயிச்சைப்பட்ட நிலங்கள்.	கிராமம்		
(18அ)	கீழ்க்கண்டவகையில் பயிரிடப்பட்டது உள்ள நிலத்தின் தன்மை மற்றும் பரப்பின் விவரங்கள் ஒவ்வொரு நில அளவை எண் அல்லது அந் பகுதியில். (அ) ஏளம், (ஆ) பயனற்ற பயிர் செய்ய இயலாத நிலம், (இ) விவசாயம் மற்றும் இதர காரியங்களுக்கு பயன் படுத்தும் பஞ்சம் நிலம், (ஈ) பயிரிடத்தக்க தரிக (உ) தினையான புல் தளங்களும் மற்றும் இதர மேய்ச்சல் நிலங்களும், (ஊ) விளைக்கப்பட்ட துகர பரப்பில் சேர்க்கப்படாத மரவுகைப் பயிர்களும் தோப்புகளும், (எ) நடப்புத் தரிகுகள் (ஏ) இதர தரிக நிலங்கள்.			
(19)	பயிர் பார்வைக்கும் அறுவடை குறிப்புகள்.			

3760/2022



தமிழ்நாடு TAMILNADU

CP 529434  
 உதயக. அருணாசலம்  
 வ.தா.வி. அலுவலர்  
 உரிமை எண். 2409/BL/2002  
 தமிழ்நாடு

6377  
 6-6-2022  
 அலுவலர்

கணினி  
 அலுவலர்

## குத்தகை சீவணம்

2022-ம் ஆண்டு ஜூன் மாதம் 06-ந் தேதி (06-06-2022) தமிழ்நாடு மாநிலம், விழுப்புரம் மாவட்டம், வானூர் வட்டம், எறையூர் கிராமம், விநாயகர் கோயில் தெரு, நெ.190-எ என்கிற முகவரியில் வசிக்கும் திரு. அப்பாதுரை அவர்களின் குமார் திரு. A.கணேசன் (இந்திய அரசாங்கம், ஆதார் அட்டை எண். 2930 2018 4165, செல் நெ. 9787744275). 1, தமிழ்நாடு மாநிலம், விழுப்புரம் மாவட்டம், வானூர் வட்டம், எறையூர் கிராமம், மேட்டுத் தெரு, நெ.306 என்கிற முகவரியில் வசிக்கும் திரு. அ.தனபால் கவுண்டர் அவர்களின் குமார் திரு. D.ராஜாகிருஷ்ணன் (இந்திய அரசாங்கம், ஆதார் அட்டை எண். 2472 4612 5667, செல் நெ. 7868929385). 2, - ஆகியோர் 1வது பார்ட்டி;

1வது பார்ட்டி

D. Radhakrishnan

2வது பார்ட்டி

A.விநாயகன்.

புத்தகம் 2022 அட்டை 3760 ஆவணம்  
 இடங்களின் சீவணம்  
 1வது தாள்.  
 பதிவு அலுவலர்.  
 வானூர்.



தமிழ்நாடு மாநிலம், விழுப்புரம் மாவட்டம், வானூர் வட்டம், எண்ணூர் கிராமம், மேட்டுத் தெரு, நெ.225 என்கிற முகவரியில் வசிக்கும் திரு.ஆனந்தவேலு அவர்களின் குமாரர் திரு.A.வீரராகவன் (இந்திய அரசாங்கம், ஆதார் அட்டை எண்.7694 3002 4514, செல் நெ.9655569407) - 2வது பார்ட்டி, ஆகிய நாங்கள் இருபார்ட்டிகளும் எழுதிக் கொண்ட குத்தகை ஆவணம், என்னவென்றால்



இதனடியில் சொத்து விபரத்தில் கண்ட கண்ட சொத்தினைப் பொறுத்து, எங்களில் 1வது பார்ட்டிகளில் 1வது நபர் 08.07.2019 தேதியில் சுயமாய் கிரையம் பெற்று மேற்படி ஆவணம் வானூர் சார்பதிவகத்தில் 1 புத்தகம், 2019ம் வருடத்திய 3291-ம் நெம்பராகப் பதிவாகி உள்ளது.

மேலும் இதனடியில் சொத்து விபரத்தில் கண்ட கண்ட சொத்தினைப் பொறுத்து, எங்களில் 1வது பார்ட்டிகளில் 2வது நபர் 21.03.2018 தேதியில் சுயமாய் கிரையம் பெற்று மேற்படி ஆவணம் வானூர் சார்பதிவகத்தில் 1 புத்தகம், 2018ம் வருடத்திய 1204-ம் நெம்பராகப் பதிவாகி உள்ளது.

மேற்கூறிய ஆவணங்களின்படி நம்மில் 1வது பார்ட்டிக்கு சொந்தமான சொத்து விபரத்தில் கண்ட கண்ட சொத்தினை, 1வது பார்ட்டி குத்தகைக்கு விடுவதாகவும், 2-வது பார்ட்டி இன்றிலிருந்து பதினைந்து (15) வருடங்களுக்கு, குத்தகைக்கு பெற்றுக் கொள்வதாகவும் ஒப்புக் கொண்டு, நாம் நமக்குள் மேற்படி 15 வருடத்திற்கு 2வது பார்ட்டி, 1வது பார்ட்டிக்கு ஒரு வருடத்திற்கு ரூபாய்.5,000/- வீதம் கரார் தீர்த்துக் கொண்டு இவ்விதமாக 15 வருடங்களுக்கு 2-வது பார்ட்டி குவாரி பணி செய்து கொள்ளவும், மற்றும் இதிலுள்ள மின் இணைப்பை பயன்படுத்திக் கொள்ளவும் 1வது பார்ட்டி சம்மதிக்கிறார்கள்.

மேற்படி குத்தகை காலம் முடியும் வரை கீழ்க்கண்ட சொத்திற்குண்டான வரியை 1வது பார்ட்டியே செலுத்திக் கொள்ள வேண்டியது. இதற்கு முன் பணம் ஏதுமில்லை. இதற்கு மாத வாடகை இல்லை. இந்தப்படி நாங்கள் இரு பார்ட்டிகளும் எழுதிக் கொண்ட குத்தகை ஆவணம். 2வது பார்ட்டி

1வது பார்ட்டி

  
D. Raghavakrishnan

2வது பார்ட்டி

A.வீரராகவன்.

புத்தகம் 2022 வருடத்தி 3270 ஆவணம்  
தாள்களைக் கொண்டது  
2வது தளம்.  
பதிவு அலுவலர்.  
வானூர்.





**வசாத்து வியயம்**

திண்டிவனம் பதிவு மாவட்டம், வானூர் சார் பதிவு மாவட்டம், ஊராட்சி எல்லைக்குட்பட்ட **எறையூர்** கிராமத்தில்,

அயன் புன்செய் புதிய சர்வே எண் .75/5-0.76.0, பழைய சர்வே எண்.27/3B - ஏக்கர் 1.91 செண்டு. ஒரு ஏக்கர் தொண்ணூற்று ஒன்று செண்டும்,

அயன் புஞ்சை புதிய சர்வே எண்.75/4-0.30.0, பழைய சர்வே எண்.27/3B - ஏக்கர் 0.74 செண்டு. எழுபத்து நான்கு செண்டும்,

அயன் புன்செய் புதிய சர்வே எண்.75/6-0.24.0, பழைய சர்வே எண்.26/1- ஏக்கர் 0.59 செண்டு. ஐம்பத்தி ஒன்பது செண்டும்,

அயன் புன்செய் புதிய சர்வே எண்.73/12 - 0.92.0 ஏர்ஸில், பழைய சர்வே எண்.24/11,12-ல் அ.கணேசன் நிலத்திற்கு தெற்கு, சோலைவாழி நிலத்திற்கு வடக்கு, தமிழ்ச்செல்வன் நிலத்திற்கு கிழக்கு, மேற்கு, இதன் மத்தியில் ஏக்கர் 0.50½ செண்டு, ஐம்பதரை செண்டும்,

அயன் புன்செய் புதிய சர்வே எண்கள்.75/1, 76/3, தற்போது உட்பிரிவுப்பு புதிய சர்வே எண்கள்.75/1, 76/3B, பழைய சர்வே எண்கள்.27/4A, 28/1A, 2B-ல் சின்னகண்ணன் நிலத்திற்கு வடக்கு, ஆனந்தவேலு நிலத்திற்கு தெற்கு, அப்பாவு, முனுசாமி நிலத்திற்கு கிழக்கு, ஆனந்தவேலு, ஏழுமலை இவர்கள் நிலத்திற்கு மேற்கு, இதன் மத்தியில் ஏக்கர் 2.78 செண்டு, இரண்டு ஏக்கர் எழுபது செண்டும்,

சேர்ந்து ஆக மொத்தம் ஏக்கர் 6.52½ செண்டு, ஆறு ஏக்கர் ஐம்பத்திரண்டரை செண்டு மட்டும் இந்த ஆவணத்திற்குட்பட்டது.

1வது பார்ட்டி

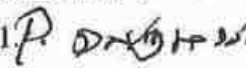



D. Radhakrishnan

2வது பார்ட்டி

A. விஜயகாந்தன் .

சாட்சிகள் :

1. P.  பெருமாள் த.பெ பூபாலன் எண்.279/2, வினாயகர் கோயில் தெரு, அம்பழிக்கை, எறையூர், வானூர் வட்டம், விழுப்புரம் மாவட்டம்-604304. (இந்திய அரசு, ஆதார் அடையாள அட்டை எண்.5874 1061 9720).

2.  செல்வமுத்துகுமரன் த.பெ மாசிலாமணி எண்.307, மேட்டுத் தெரு, எறையூர், வானூர் வட்டம், விழுப்புரம் மாவட்டம்-604304. (இந்திய அரசு, ஆதார் அடையாள அட்டை எண்.8953 3608 6552).

ஆவணம் தயார் செய்து வரைவு செய்தவர் :- R. சச்சிதானந்தம்,



மாநில ஆவண அலுவலர்

உரிமம் எண் அ.141/திவம்/2000, வானூர்.

பத்திரம் 2000 வா.திவம்/2000 ஆவணம்  
11. டீல்களைக் கொண்டது  
3வது தாள.  
பதிவு அலுவலர்.  
வானூர்.



1899ம் ஆண்டு இந்திய முத்திரைச் சட்டம் 42வது பிரிவின் கீழான சான்று



2022ம் ஆண்டு வரிசை எண் 2830

எறையூர், வானூர், விழுப்புரம், தமிழ்நாடு, இந்தியா. 805109 ல் வசிக்கும் திரு கணேசன் என்பவரிடமிருந்து ₹ 650/- (ரூபாய் அறுநூற்று ஐம்பது மட்டும்) இந்த ஆவணத்திற்காக இந்திய முத்திரைச் சட்டம் 42வது பிரிவின் படி குறைவாயிருந்த முத்திரைக் கட்டணம் வசூலிக்கப்பட்டது என நான் இதன் மூலம் சான்றளிக்கிறேன்.

*(Handwritten Signature)*

சார்பதிவாளர் : வானூர் இந்திய முத்திரைச் சட்டம் பிரிவு  
நாள் 06/06/2022 41ன் வானூர்.

2022 ஆம் ஆண்டு ஜூன் மாதம் 08ம் தேதி பி.ப. 03.07 மன்றங்களில் வானூர் சார்பதிவாளர் அலுவலகத்தில் தாக்கல் செய்து கட்டணம் ₹ 950/- செலுத்தியவர்.



இடது பெருவிரல்



*(Handwritten Signature)*

கூடுதல் விவரங்கள் ஆவண வாசகத்தில் உள்ளபடி.

எழுதிக் கொடுத்ததாக ஒப்புக் கொண்டவர் இடது பெருவிரல்



*(Handwritten Signature)*

கூடுதல் விவரங்கள் ஆவண வாசகத்தில் உள்ளபடி "சம்மதத்துடன் கூடிய ஆதார் அங்கீகாரம்" என்ற வழி இந்த நபரின் அடையாளம் விரல் ரேகை மூலம் ஆதார் ஆணையத்துடன் சரிபார்க்கப்பட்டது ஒப்பீட்டு எண் : 044749378ee6ccac51455a89c7bbeaf98b2956a

எழுதிக் கொடுத்ததாக ஒப்புக் கொண்டவர் இடது பெருவிரல்



*(Handwritten Signature: D. Radhakrishnan)*

கூடுதல் விவரங்கள் ஆவண வாசகத்தில் உள்ளபடி "சம்மதத்துடன் கூடிய ஆதார் அங்கீகாரம்" என்ற வழி இந்த நபரின் அடையாளம் விரல் ரேகை மூலம் ஆதார் ஆணையத்துடன் சரிபார்க்கப்பட்டது ஒப்பீட்டு எண் : 105500662772666ca729aa1969064e8d5066

புத்தகம் வரி  
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புத்தகம் வரி  
புத்தகம் வரி



R/வானூர்/புத்தகம்-1/3760/2022

எழுதி வாங்கியதாக ஒப்புக் கொண்டவர்  
இடது பெருவிரல்



A. வீராசுவாமின்

சுடுதல் விவரங்கள் ஆவண வாசகத்தில் உள்ளது  
"சம்மதத்துடன் கூடிய ஆதார் அங்கீகாரம்" என்ற வழி இந்த  
நபரின் அடையாளம் விரல் ரேகை மூலம் ஆதார்  
ஆணையத்துடன் சரிபார்க்கப்பட்டது ஒப்பீட்டு எண்  
5417072f27c856f2c14d34bb7bfc194963249


2022 ஆம் ஆண்டு ஜூன் மாதம் 6ம் நாள்

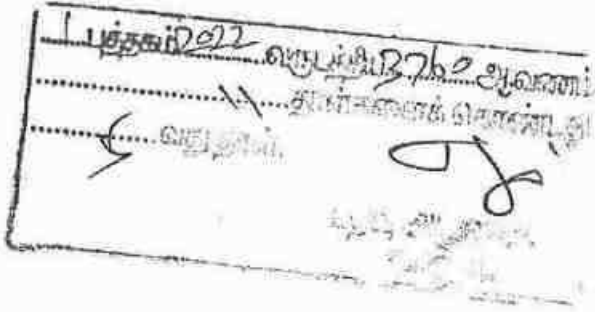
  
மணிகண்டன் சி  
சார்பதிவாளர்  
வானூர்



R/வானூர்/புத்தகம்-1/3760/2022 எண்ணாகப் பதிவு செய்யப்பட்டது.

நாள்: 06/09/2022  
வானூர்

  
மணிகண்டன் சி  
சார்பதிவாளர்





சொக்தானது நீர்நிலை பகுதியில் அமையப் பெறவில்லை என்பதற்கான  
சான்று/உறுதிமொழி (Declaration) (நீதிபேராணைஎண் 22163/2018ல்  
வழங்கப்பட்டதீர்ப்பரையைகாண்க)

இந்த ஆவணத்தில் கண்ட சொக்தானது நீர்நிலைகள், நீர்வழிப்பாதைகள், நீர்ப்பிடிப்பு பகுதிகளில் கட்டுப்படவில்லை என சான்றளிக்கிறோம். மேலும் இதனில் தங்களுக்கு தவறான தகவல் அல்லது சான்று அளிக்கப்பட்டதாக பின்னாளில் கண்டுபிடிக்கப்பட்டால் அதனால் நான்/நாங்கள் சட்ட பூர்வ நடவடிக்கைகளுக்கு உட்படுத்தப்படுவோம் என்பதையும் அறிவேன்/அறிவோம்.

ஆவணத்தை எழுதிப் பெறுபவர்களின்  
கையொப்பம்

A. சிவசுமன்

ஆவணத்தை எழுதிக் கொடுப்பவர்களின்  
கையொப்பம்

D. Radhakrishnan

புத்தகம் 2022 வருத்தி 3760 ஆவணம்
தாள்களைக் கொண்டது
வசூலாளர்





கிழப்பிள்ளை கமிட்டி  
Unique Identification Authority of India



ஆதார முகவரி  
S/O அப்பாதுரை, எண் 190-அ,  
விநாயகர் கோயில் தெரு,  
எறையூர் அஞ்சல் எறையூர்  
கிராமம், வாரணாசிராமம்,  
எறையூர், விழுப்புரம்,  
தமிழ்நாடு, 604304

Address:  
S/O Appadurai, NO 190-A,  
VINAYAGAR KOVIL STREET,  
ERAIYUR POST ERAIYUR  
VILLAGE, vanurattuk, Eraiyur,  
Eraiyr, Viluppuram, Tamil Nadu,  
604304

2930 2018 4165

1947  
1800 300 1947

http://uidai.gov.in

www.uidai.gov.in

இந்திய அரசாங்கம்  
Government of India  
க.கணேசன் அப்பாதுரை  
Ganesan Appadurai  
தந்தை : அப்பாதுரை  
Father : APPADURAI  
பிறந்தவருடம் / Year of Birth : 1963  
ஆண்மால் / Male



2930 2018 4165

ஆதாரர் - சாதாரண மனிதனின் அதிகாரம்

*(Handwritten signature)*

புத்தகம் 2930 2018 4165 ஆவணம்  
தாள்களைக் கொண்டு  
வசூலு தள்ளு.  
பதிவு அலுவலர்.  
வாரணாசிராமம்.





இந்திய அரசாங்கம்  
Unique Identification Authority of India  
Government of India

பதிவு அடையாளம் / Enrollment No.: 2007/26130/02140

To  
ராதாகிருஷ்ணன் தம்பையர்  
Radhakrishnan Dhanabal  
S/O Dhanabal  
NO 306 METTU STREET  
VANURTALUK  
Eraliyur  
Eraliyur  
Viluppuram  
Tamil Nadu 604304

20/08/2013  
51190775



உங்கள் ஆதார் எண் / Your Aadhaar No. :

புத்தம்பட்டி 2022 ஆகஸ்ட் 13 2022  
பதிவு செய்த  
வது தாள்  
பதிவு அலுவலர்  
வாசலார்

2472 4612 5667

ஆதார் - சாதாரண மனிதனின் அதிகாரம்

பதிவு அலுவலர்

இந்திய அரசாங்கம்  
Government of India

ராதாகிருஷ்ணன் தம்பையர்  
Radhakrishnan Dhanabal  
தந்தை : தம்பையர்  
Father : DHANABAL  
பிறந்த நாள் / DOB : 02/11/1983  
ஆண்பால் / male



2472 4612 5667

ஆதார் - சாதாரண மனிதனின் அதிகாரம்



இந்திய அரசாங்கம்  
**Government of India**

இந்திய தனிப்பட்ட அடையாள அமைப்பு ஆணையர்  
**Unique Identification Authority of India**

பதிவேட்டு எண் / Enrolment No.: 0134/90510/02667

**To**  
 வீரராகவன் ஆனந்தவேலு  
 Veeraragavan Anandavelu  
 S/O Anandavelu  
 H NO 225  
 METTU STREET  
 ERAYUR  
 VANURTALLUR  
 Erayur  
 Viluppuram Tamil Nadu - 604304  
 9655569407

Signature valid

**உங்கள் ஆதார் எண் / Your Aadhaar No. :**  
**7694 9002 4514**  
 VID : 9182 2382 5136 2670

எனது ஆதார், எனது அடையாளம்

---

பித்தம்பட்டி வந்தது 2760 ஆகவே...  
 தாளகலைக் கொ...  
 9... வது தான்...  
 ப...  
 ப...  
 ப...

வீரராகவன் ஆனந்தவேலு  
 Veeraragavan Anandavelu  
 பிறந்த நாள்/DOB: 01/01/1980  
 ஆண்/ MALE

**7694 9002 4514**  
 VID : 9182 2382 5136 2670

எனது ஆதார், எனது அடையாளம்




A. வீரராகவன்.







  
**பெரும்புலையர்**  
**Perumal Boopalan**  
 பிள்ளை : பெரும்புலையர்  
**Father : BOOPALAN**  
 பிள்ளை பெண்/DOB: 23/06/1957  
 உயிரினம் : Male  
**5874 1061 9720**

ஆதார - சாதாரண மனிதனின் அதிகாரம்

பி. பெரும்புலையர்

  
**ஆதாரம்**  
**Perumal Boopalan**  
 முகவரி : பெரும்புலையர் வீடு  
 கிண்டியார் கோட்டை தெரு. அம்புதுறை  
 அம்புதுறை, எர்சியூர், விழுப்புரம், தமிழ்நாடு  
 தஞ்சாவூர் - 604304  
**Address: S/O Boopalan,  
 279/2, VINAYAGAR KOVIL  
 STREET, VANUR TALUK,  
 Ambuzhukkal, Erstiyur,  
 Viluppuram, Tamil Nadu,  
 604304**  
**5874 1061 9720**

 1800 300 1047  
 help@nicai.gov.in  
 www.nicai.gov.in

பத்திரம் 221 வரலாற்று 2760 ஆவணம்  
 தாளகளைக் கொண்டது.  
 19 செப்டம்பர் 2022  
  
 பதிவு அலுவலர்.  
 வானூர்.



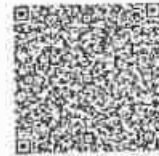


இந்திய அரசாங்கம்  
 Unique Identification Authority of India  
 Government of India

பதிவு அடையாளம் / Enrollment No.: 2007/26198/01766

To  
 செல்வமுத்துமரன் மரசிலாணி  
 Selvamuthukumarar Masilamani  
 S/O Masilamani  
 307 METTU STREET  
 VANURTALUK  
 Eriyur  
 Eriyur  
 Viluppuram  
 Tamil Nadu 604304

29/08/2013  
 61194714



உங்கள் ஆதார் எண் / Your Aadhaar No. :

**8953 3608 6552**

புத்தம் 2022 ஸெப்டம்பர் 27 ஆவணம்  
 துள்கலைக் கொண்டு ஆதார் - சாதாரண மனிதனின் அதிகாரம்  
 விடுதலை  
 இந்திய அரசாங்கம்  
 Government of India  
 செல்வமுத்துமரன் மரசிலாணி  
 Selvamuthukumarar Masilamani  
 தந்தை : மரசிலாமணி  
 Father : MASILAMANI  
 பிறந்த நாள் / DOB : 17/08/1973  
 ஆண்பால் / Male



**8953 3608 6552**

ஆதார் - சாதாரண மனிதனின் அதிகாரம்

M. Scharu K

आयकर विभाग  
INCOME TAX DEPARTMENT

भारत सरकार  
GOVT OF INDIA

स्थायी लेखा संख्या कार्ड  
Permanent Account Number Card  
**CHRPV1075J**



नाम / Name  
**VEERARAGAVAN A**

पिता का नाम / Father's Name  
**ANANDAVELU**

जन्म की तिथि /  
Date of Birth  
**01/01/1960**

18032022

A. Anandavelu  
हस्ताक्षर / Signature

यदि कार्ड खो जाये/यदि यह कार्ड किसी को मिले/किताब  
आयकर सेवा सेवा इकाई, एन सी डी यूए  
सीटी स्टर्लिंग, प्लॉट नं. 341,  
सर्वे नं. 341, सर्वे नं. 997/8,  
मॉडल कॉलोनी, नज़ीर डीप बंगला चौक के पास,  
पुणे - 411 016.

*If this card is lost / someone is lost card is found,  
please inform / return to :*

Income Tax PAN Services Unit, NSDL  
4th Floor, Mantri Sterling,  
Plot No. 341, Survey No. 997/8,  
Model Colony, Near Deep Bunglow Chowk,  
Pune - 411 016.






Tel: 91-20-7721 8090, Fax: 91-20-7721 8081  
e-mail: [helpline@nsdl.co.in](mailto:helpline@nsdl.co.in)

03 AUG 2007



ANNEXURE VII



	
இந்திய சர்க்கார் Government of India	
இந்திய அடையாள அமைதி ஆணைப்பகுதி Unique Identification Authority of India	
பதிவேட்டு எண்/ Enrolment No.: 0134/90510/02667	
To வீரராவன் ஆனந்தவேலு Veeraragavan Anandavelu S/O Anandavelu H NO 225 METTU STREET ERAIYUR VANURTALLIK Erayur Viluppuram Tamil Nadu - 604304 9655569407	
Signature valid 	
உங்கள் ஆதார் எண் / Your Aadhaar No. : <b>7694 9002 4514</b> VID : 9182 2382 5136 2670 எனது ஆதார், எனது அடையாளம்	
	
	வீரராவன் ஆனந்தவேலு Veeraragavan Anandavelu பிறந்த நாள்/DOB: 01/01/1980 ஆண்/ MALE
Issue Date: 28/08/2013	
<b>7694 9002 4514</b> VID : 9182 2382 5136 2670 எனது ஆதார், எனது அடையாளம்	

ANNEXURE 1x

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



M. Dharmalingam



अर्हताप्राप्त 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 एम. इफ्तिकार अहमद, 129/8, 11वीं क्रॉस, सिवया नगर, अलाघपुरम-पी.आ., सेलम - 636 004, तमिल नाडू, जिनका फोटो और हस्ताक्षर ऊपर दिया हुआ है, तथा जिनहोंने अपनी अर्हता और अनुभव का संतोषजनक साक्ष्य दिया है, को खनन योजना तैयार करने हेतु खनिज रियायत नियमावली 1960 के नियम 22सी के तहत अर्हताप्राप्त व्यक्ति के रूप में मान्यता प्रदान की जाती है।

Shri M. Ifthikhar Ahmed, 129/8, 11<sup>th</sup> Cross, Sivaya Nagar, Atagapuram (PO), Salem - 636 004, Tamilnadu 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.

उनकी पंजीयन संख्या है  
His registration number is

RQP /MAS/183/2004/A

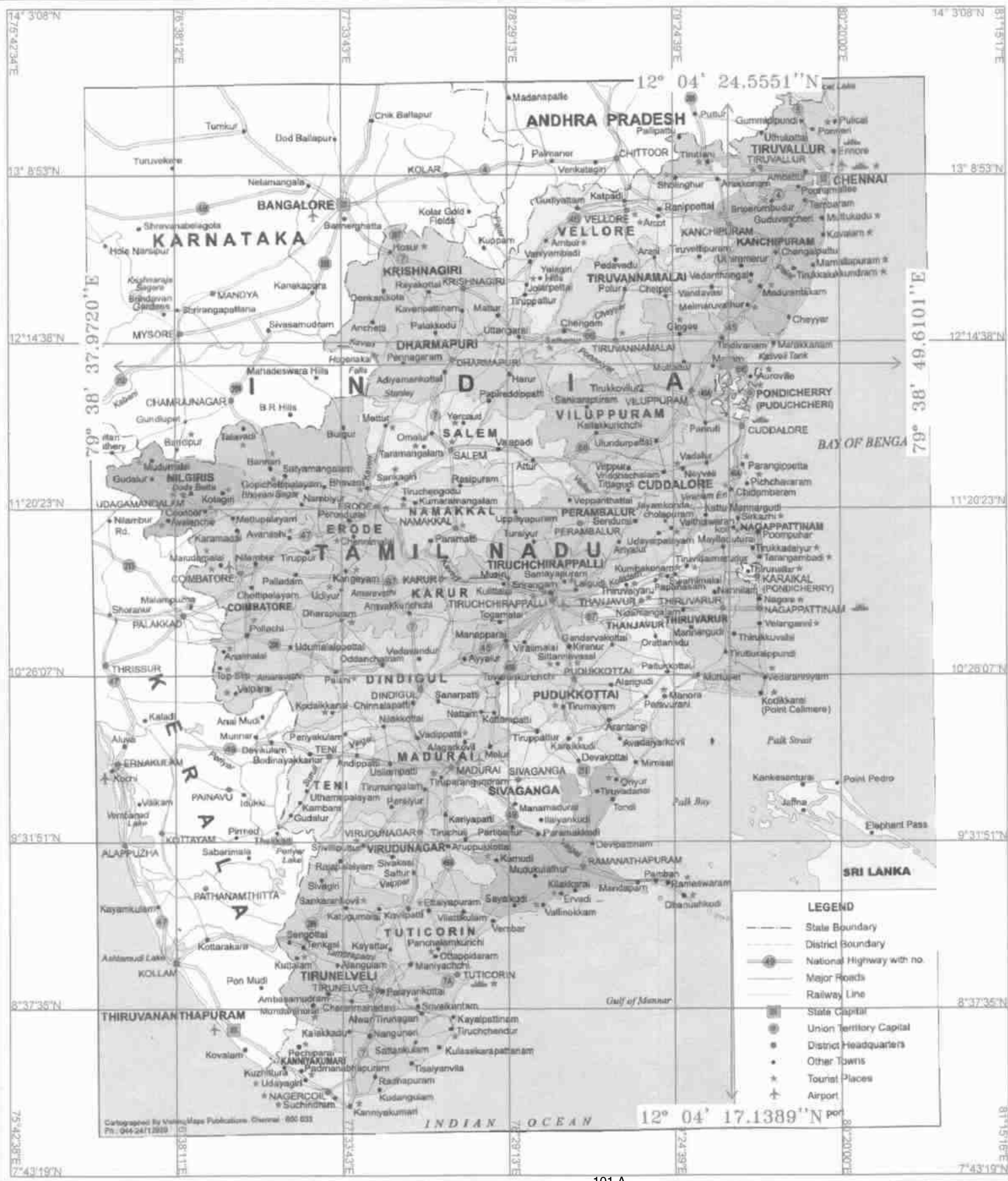
यह मान्यता 10 वर्षों की अवधि के लिए मान्यता है जो दिनांक 10.01.2024 को समाप्त होगी।  
This recognition is valid for a period of 10 years ending on 10.01.2024

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 be 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 : 02.01.2014

क्षेत्रीय खान नियंत्रक / Regional Controller of Mines  
भारतीय खान ब्यूरो / Indian Bureau of Mines  
चेन्नई क्षेत्र / Chennai Region



**PLATE NO: I**

DATE OF SURVEY : 28.07.2023

**APPLICANT:**

THIRU.VEERARAGAVAN,  
S/O.ANANDAVELU,  
METTU STREET,VANUR TALUK,  
VILUPPURAM DISTRICT.

**LOCATION OF QUARRY**

**LEASE APPLIED AREA:**  
S.F.No. : 75/1,4,5,6 and 76/3B2.  
EXTENT : 2.42.63 Ha.  
VILLAGE : ERAIYUR,  
TALUK : VANUR,  
DISTRICT : VILUPPURAM,  
STATE : TAMIL NADU.

**INDEX**

Q. L. A. AREA : ●

TOPO SHEET NO. : 57 P/12

LATITUDE : 12° 04' 17.1389''N to 12° 04' 24.5551''N

LONGITUDE : 79° 38' 37.9720''E to 79° 38' 49.6101''E

**LOCATION PLAN**

SCALE 1:24,00,000

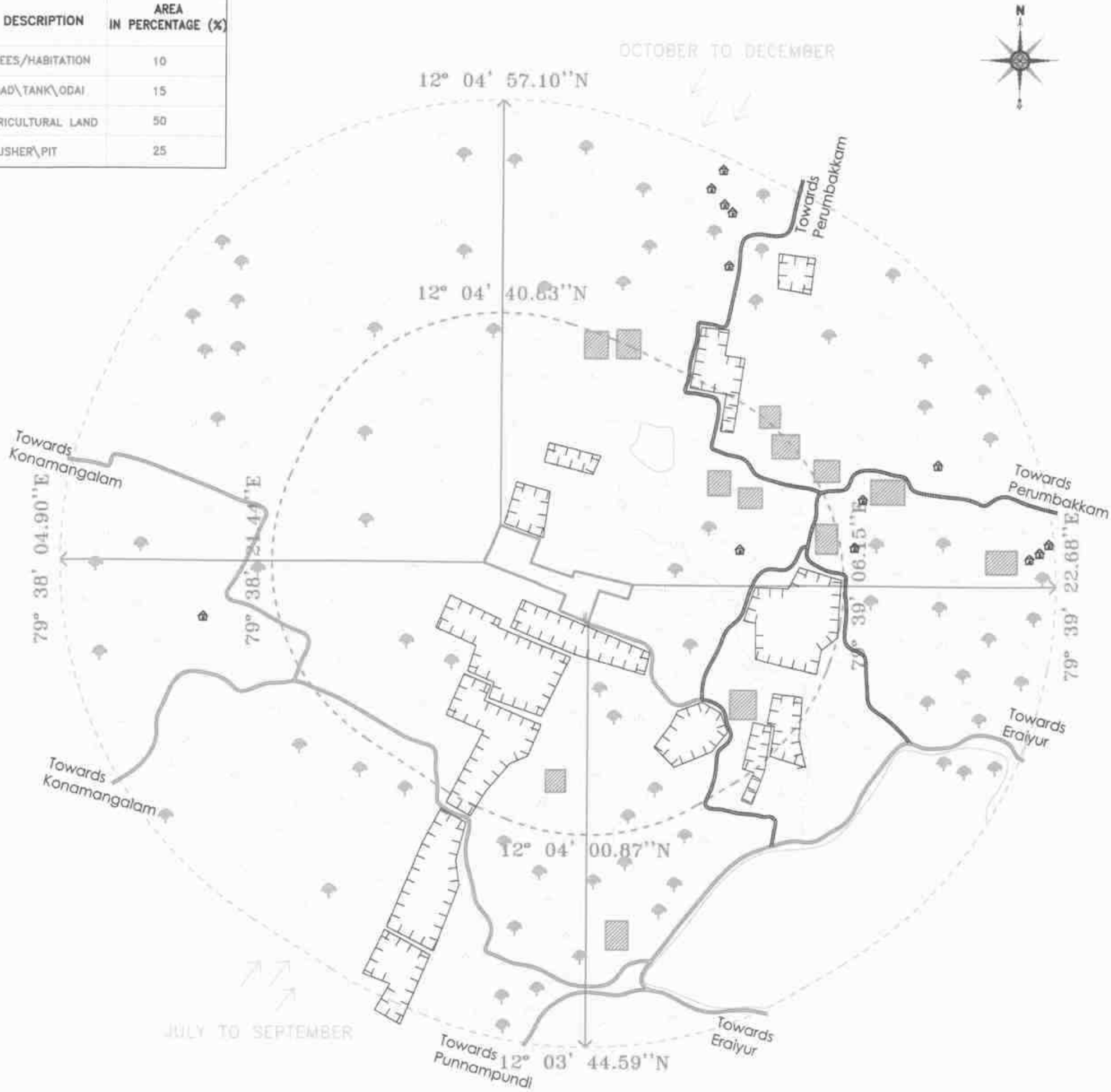
**PREPARED BY :**

THIS IS TO CERTIFY THAT THE INFORMATION IN THIS  
PLATE IS TRUE AND CORRECT TO THE  
BEST OF MY KNOWLEDGE BASED UPON THE LEASE MAP  
AUTHENTICATED BY STATE GOVERNMENT

*M. Iftikhar Ahmed*  
Dr.M.IFTIKHAR AHMED,M.Sc.,M.B.A.,F.G.S.,Ph.D,  
RECOGNIZED QUALIFIED PERSON  
ROP/MAS/183/2004/A

**LAND USE PATTERN**

DESCRIPTION	AREA IN PERCENTAGE (%)
TREES/HABITATION	10
ROAD\TANK\ODAI	15
AGRICULTURAL LAND	50
CRUSHER\PIT	25



**PLATE NO:I-B**

DATE OF SURVEY :28.07.2023

TOPO SHEET NO. : 57 P/12

LATITUDE : 12° 04' 17.1389"N to 12° 04' 24.5551"N

LONGITUDE : 79° 38' 37.9720"E to 79° 38' 49.6101"E

1KM RADIUS :

500M RADIUS :

Q.L.APPLIED AREA:



**APPLICANT:**

THIRU.VEERARAGAVAN,  
S/O.ANANDAVELU,  
METTU STREET,VANUR TALUK,  
VILUPPURAM DISTRICT.

**LOCATION OF QUARRY**

**LEASE APPLIED AREA:**

S.F.No. : 75/1,4,5,6 and 76/382.  
EXTENT : 2.42.63 Ha.  
VILLAGE : ERAIYUR,  
TALUK : VANUR,  
DISTRICT : VILUPPURAM,  
STATE : TAMIL NADU.

**INDEX**

APPROACH ROAD	
WIND DIRECTION	
TREES	
VILLAGE ROAD	
AGRICULTURE LAND	
QUARRY ROAD	
CRUSHER PLANT	
HABITATION	
QUARRY PIT	
ODAI	
TANK	

**ENVIRONMENTAL & LANDUSE PLAN(For 1Km Radius)**

SCALE 1:10,000

**PREPARED BY:**

THIS IS TO CERTIFY THAT THE INFORMATION IN THIS  
PLATE IS TRUE AND CORRECT TO THE  
BEST OF MY KNOWLEDGE BASED UPON THE LEASE MAP  
AUTHENTICATED BY STATE GOVERNMENT

*Dr. M. Ifthikhar Ahmed*  
Dr.M.IFTHIKHAR AHMED,M.Sc.,M.B.A.,F.G.S.,Ph.D,  
RECOGNIZED QUALIFIED PERSON  
RQP/MAS/183/2004/A



**APPLICANT:**  
 THIRU.VEERARAGAVAN,  
 S/O.ANANDAVELU,  
 METTU STREET,VANUR TALUK,  
 VILUPPURAM DISTRICT.

**LOCATION OF QUARRY LEASE APPLIED AREA:**  
 S.F.No. : 75/1.4.5,6 and 76/3B2.  
 EXTENT : 2.42.63 Ha.  
 VILLAGE : ERAIYUR,  
 TALUK : VANUR,  
 DISTRICT : VILUPPURAM,  
 STATE : TAMIL NADU.

**INDEX**

Q.L.APPLIED BOUNDARY	
APPROACH ROAD	
MAJOR ROAD	
PANCHAYAT ROAD	

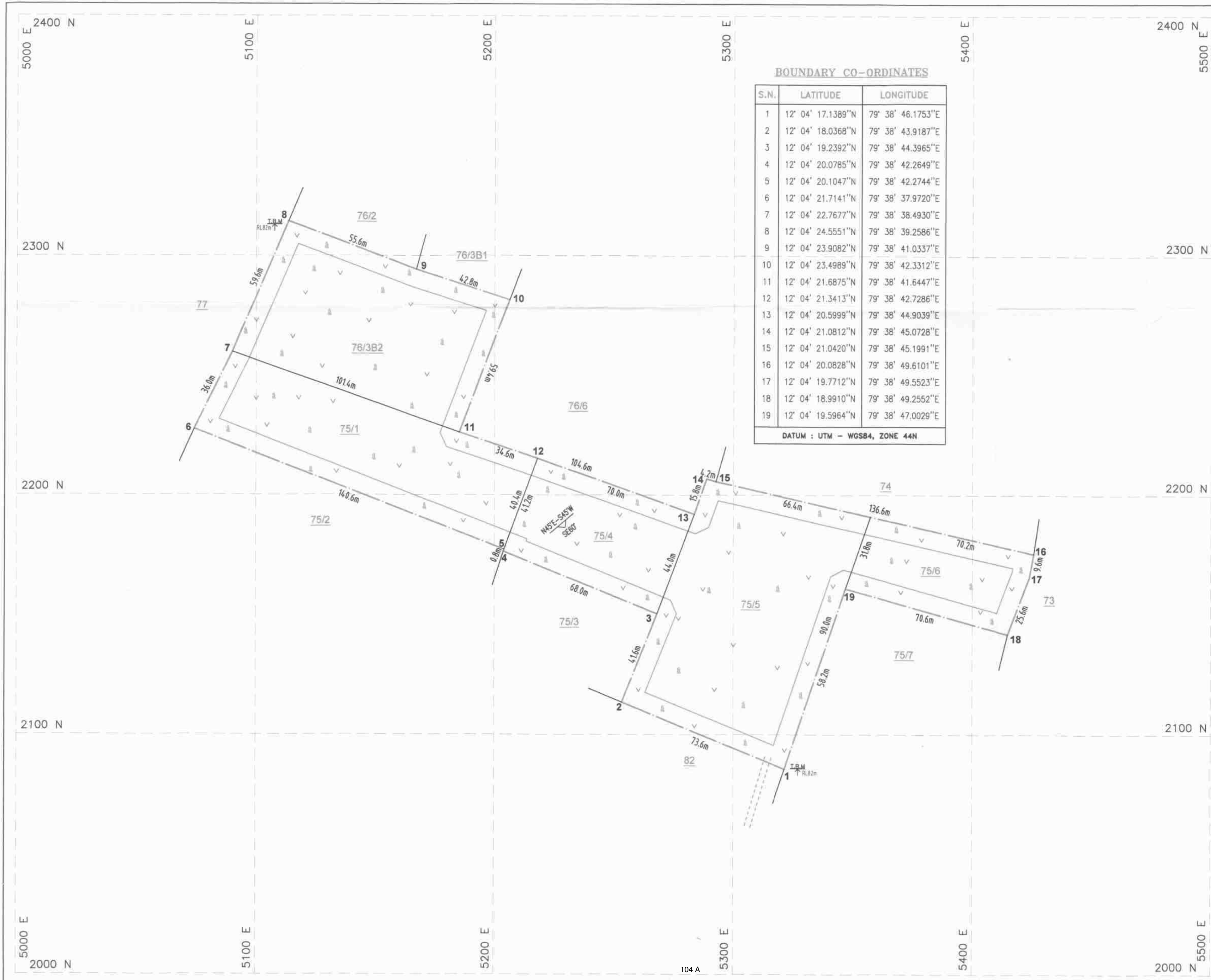
**ROUTE MAP**  
 Not to Scale

**PREPARED BY:**  
 THIS IS TO CERTIFY THAT THE INFORMATION IN THIS PLATE IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE BASED UPON THE LEASE MAP AUTHENTICATED BY STATE GOVERNMENT

*M. J. F. Thirumalaiah*  
 Dr. M. J. F. THIRUMALAI AHMED, M.Sc., M.B.A., F.G.S., Ph.D.,  
 RECOGNIZED QUALIFIED PERSON  
 RQP/MAS/183/2004/A



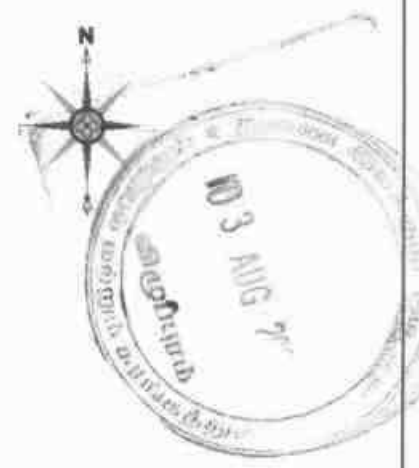




**BOUNDARY CO-ORDINATES**

S.N.	LATITUDE	LONGITUDE
1	12° 04' 17.1389"N	79° 38' 46.1753"E
2	12° 04' 18.0368"N	79° 38' 43.9187"E
3	12° 04' 19.2392"N	79° 38' 44.3965"E
4	12° 04' 20.0785"N	79° 38' 42.2649"E
5	12° 04' 20.1047"N	79° 38' 42.2744"E
6	12° 04' 21.7141"N	79° 38' 37.9720"E
7	12° 04' 22.7677"N	79° 38' 38.4930"E
8	12° 04' 24.5551"N	79° 38' 39.2586"E
9	12° 04' 23.9082"N	79° 38' 41.0337"E
10	12° 04' 23.4989"N	79° 38' 42.3312"E
11	12° 04' 21.6875"N	79° 38' 41.6447"E
12	12° 04' 21.3413"N	79° 38' 42.7286"E
13	12° 04' 20.5999"N	79° 38' 44.9039"E
14	12° 04' 21.0812"N	79° 38' 45.0728"E
15	12° 04' 21.0420"N	79° 38' 45.1991"E
16	12° 04' 20.0828"N	79° 38' 49.6101"E
17	12° 04' 19.7712"N	79° 38' 49.5523"E
18	12° 04' 18.9910"N	79° 38' 49.2552"E
19	12° 04' 19.5964"N	79° 38' 47.0029"E

DATUM : UTM - WGS84, ZONE 44N



**PLATE NO - II**  
DATE OF SURVEY : 28.07.2023

**APPLICANT:**  
THIRU.VEERARAGAVAN,  
S/O.ANANDAVELU,  
METTU STREET,VANUR TALUK,  
VILUPPURAM DISTRICT.

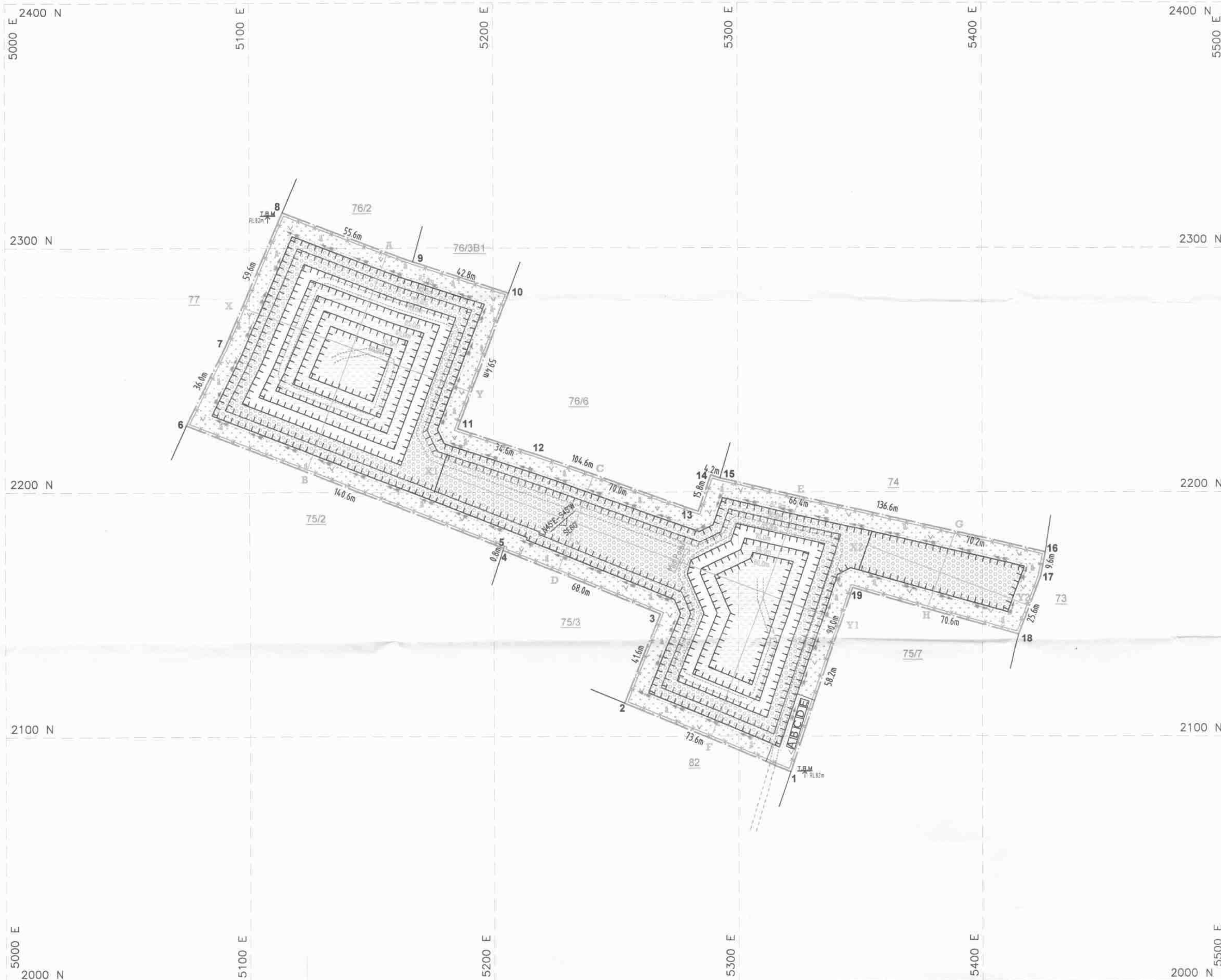
**LOCATION OF QUARRY LEASE APPLIED AREA:**  
S.F.No. : 75/1,4,5,6 and 76/3B2.  
EXTENT : 2.42.63 Ha.  
VILLAGE : ERAIYUR,  
TALUK : VANUR,  
DISTRICT : VILUPPURAM,  
STATE : TAMIL NADU.

**INDEX**

Q.L. APPLIED AREA BOUNDARY	
7.5m SAFETY DISTANCE	
TEMPORARY BENCH MARK	
QUARRY PIT	
APPROACH ROAD	
SHRUBS	
GRAVEL	
STRIKE AND DIP	

**QUARRY LEASE & SURFACE PLAN**  
SCALE 1 : 1000

**PREPARED BY:**  
THIS IS TO CERTIFY THAT THE INFORMATION IN THIS PLATE IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE BASED UPON THE LEASE MAP AUTHENTICATED BY STATE GOVERNMENT.  
  
Dr. M. IFTHIKHAR AHMED, M.Sc., M.B.A., F.G.S., Ph.D.,  
RECOGNIZED QUALIFIED PERSON  
ROP/MAS/183/2004/A



**BOUNDARY CO-ORDINATES**

S.N.	LATITUDE	LONGITUDE
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9	12° 04' 23.9082"N	79° 38' 41.0337"E
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11	12° 04' 21.6875"N	79° 38' 41.6447"E
12	12° 04' 21.3413"N	79° 38' 42.7286"E
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14	12° 04' 21.0812"N	79° 38' 45.0728"E
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18	12° 04' 18.9910"N	79° 38' 49.2552"E
19	12° 04' 19.5964"N	79° 38' 47.0029"E

DATUM : UTM - WGS84, ZONE 44N

PLATE NO - V  
DATE OF SURVEY : 28.07.2023

APPLICANT:  
THIRU.VEERARAGAVAN,  
S/O. ANANDAVELU,  
METTU STREET, VANUR TALUK,  
VILUPPURAM DISTRICT.

LOCATION OF QUARRY  
LEASE APPLIED AREA:  
S.F.No. : 75/1, 4, 5, 6 and 76/3B2.  
EXTENT : 2.42.63 Ha.  
VILLAGE : ERAIYUR,  
TALUK : VANUR,  
DISTRICT : VILUPPURAM,  
STATE : TAMIL NADU.

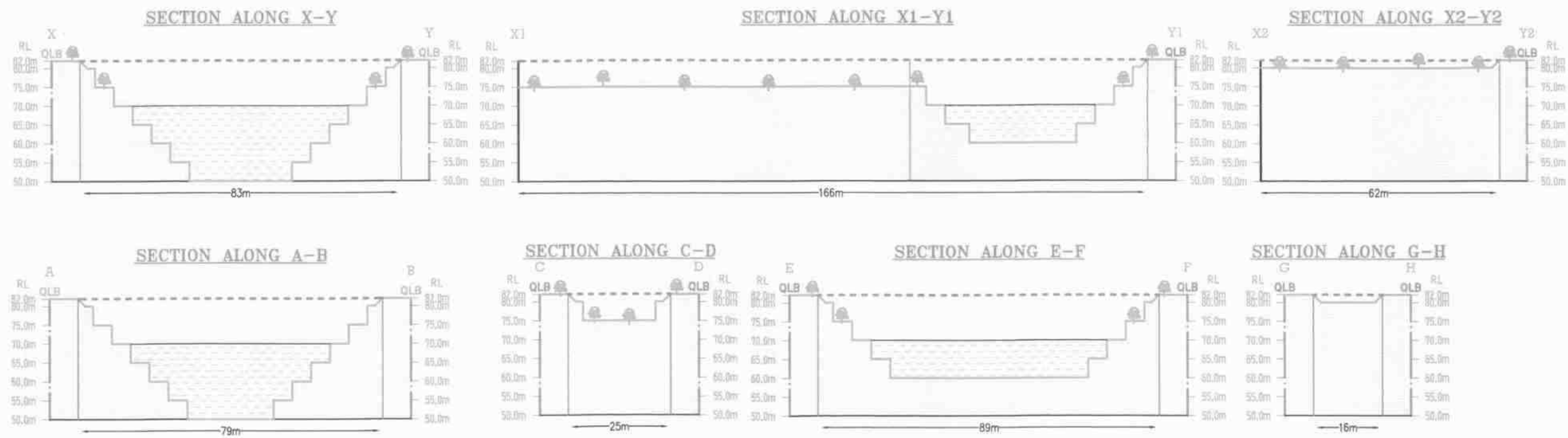
**INDEX**

- Q.L. APPLIED AREA BOUNDARY
- 7.5m SAFETY DISTANCE
- TEMPORARY BENCH MARK
- QUARRY PIT
- APPROACH ROAD
- STRIKE AND DIP
- QUARRY PIT
- QUARRY ROAD
- TREES
- EXISTING LANDFORM
- OLD SURFACE LEVEL
- FINISHED SURFACE LEVEL
- RAIN WATER STORAGE
- FENCING
- PROPOSED GARLAND DRAIN
- REHABILITATED LANDFORM

I-V Proposed Plantation

Proposed Pit Dimension  
311m X 89m X 32m(d)

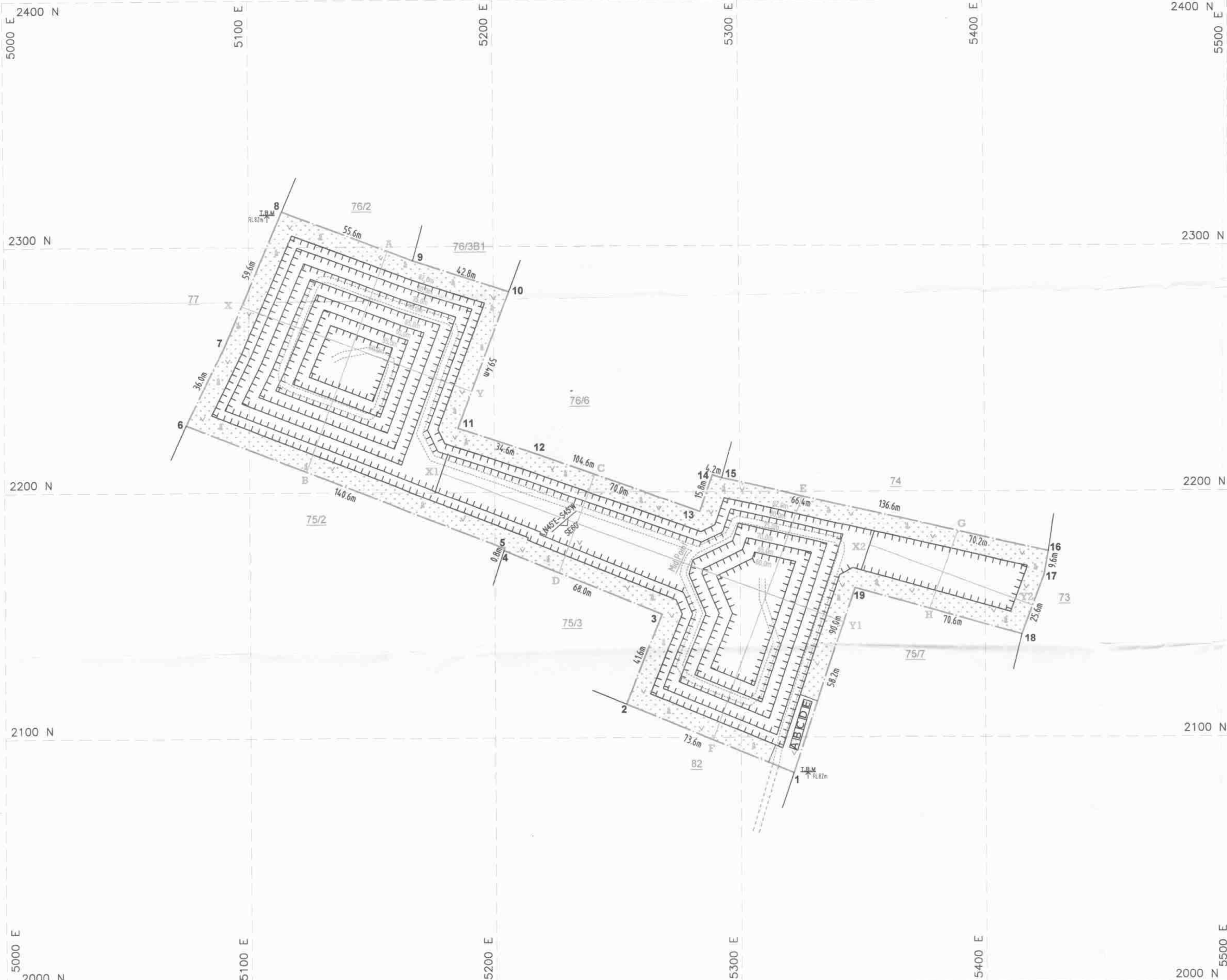
SITE SERVICES  
A-OFFICE  
B-FIRST AID ROOM  
C-STORE  
D-REST SHED  
E-TOILET



**PROGRESSIVE QUARRY CLOSURE  
PLAN & SCETIONS  
SCALE 1 : 1000**

PREPARED BY:  
THIS IS TO CERTIFY THAT THE INFORMATION IN THIS  
PLATE IS TRUE AND CORRECT TO THE  
BEST OF MY KNOWLEDGE BASED UPON THE LEASE MAP  
AUTHENTICATED BY STATE GOVERNMENT  
*Dr. M. Jithinhar*  
DR. M. JITHINHAR AHMED, M.Sc., M.S.A., F.G.S., Ph.D.,  
RECOGNIZED QUALIFIED PERSON  
RGP/MAS/183/2004/A





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DATUM : UTM - WGS84, ZONE 44N

PLATE NO - V  
DATE OF SURVEY : 28.07.2023

APPLICANT:  
THIRU.VEERARAGAVAN,  
S/O.ANANDAVELU,  
METTU STREET,VANUR TALUK,  
VILUPPURAM DISTRICT.

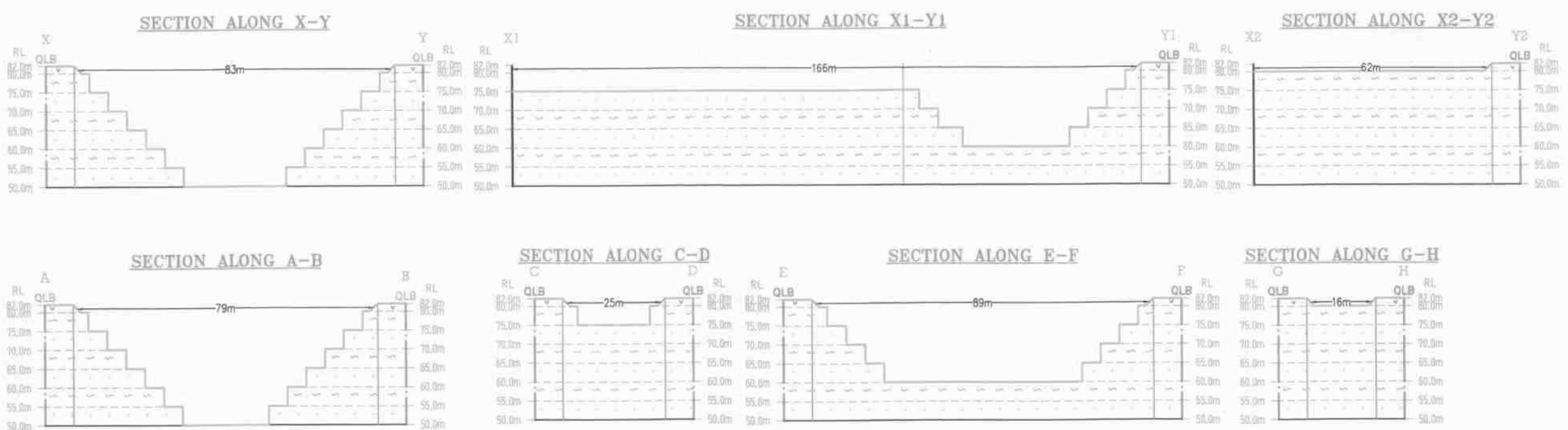
LOCATION OF QUARRY  
LEASE APPLIED AREA:  
S.F.No. : 75/1,4,5,6 and 76/382.  
EXTENT : 2.42.63 Ha.  
VILLAGE : ERANYUR,  
TALUK : VANUR,  
DISTRICT : VILUPPURAM,  
STATE : TAMIL NADU.

**INDEX**

- Q.L. APPLIED AREA BOUNDARY
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- TEMPORARY BENCH MARK
- QUARRY PIT
- APPROACH ROAD
- SHRUBS
- GRAVEL
- STRIKE AND DIP
- ROUGH STONE
- QUARRY PIT
- QUARRY ROAD

**CONCEPTUAL PLAN & SCETIONS**  
SCALE 1 : 1000

PREPARED BY:  
THIS IS TO CERTIFY THAT THE INFORMATION IN THIS  
PLATE IS TRUE AND CORRECT TO THE  
BEST OF MY KNOWLEDGE BASED UPON THE LEASE MAP  
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Dr. M. JITHISHAR AHMED, M.Sc., M.B.A., F.R.S., Ph.D.,  
RECOGNIZED QUALIFIED PERSON  
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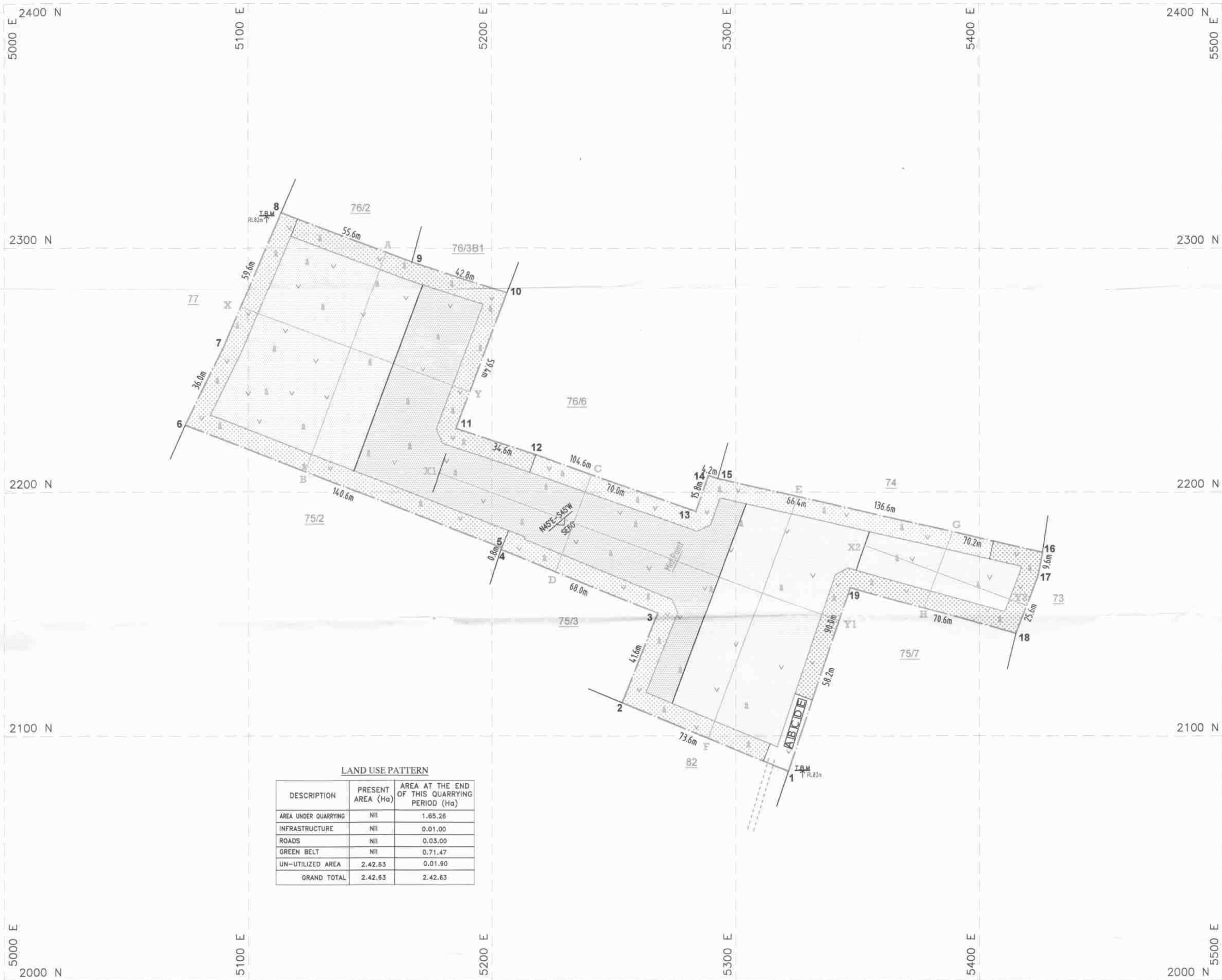


I-V Proposed Plantation

Ultimate Pit Dimension  
311m X 89m X 32m(d)

**SITE SERVICES**  
A-OFFICE  
B-FIRST AID ROOM  
C-STORE  
D-REST SHED  
E-TOILET





**BOUNDARY CO-ORDINATES**

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2	12° 04' 18.0368"N	79° 38' 43.9187"E
3	12° 04' 19.2392"N	79° 38' 44.3965"E
4	12° 04' 20.0785"N	79° 38' 42.2649"E
5	12° 04' 20.1047"N	79° 38' 42.2744"E
6	12° 04' 21.7141"N	79° 38' 37.9720"E
7	12° 04' 22.7677"N	79° 38' 38.4930"E
8	12° 04' 24.5551"N	79° 38' 39.2586"E
9	12° 04' 23.9082"N	79° 38' 41.0337"E
10	12° 04' 23.4989"N	79° 38' 42.3312"E
11	12° 04' 21.6875"N	79° 38' 41.6447"E
12	12° 04' 21.3413"N	79° 38' 42.7286"E
13	12° 04' 20.5999"N	79° 38' 44.9039"E
14	12° 04' 21.0812"N	79° 38' 45.0728"E
15	12° 04' 21.0420"N	79° 38' 45.1991"E
16	12° 04' 20.0828"N	79° 38' 49.6101"E
17	12° 04' 19.7712"N	79° 38' 49.5523"E
18	12° 04' 18.9910"N	79° 38' 49.2552"E
19	12° 04' 19.5964"N	79° 38' 47.0029"E

DATUM : UTM - WGS84, ZONE 44N

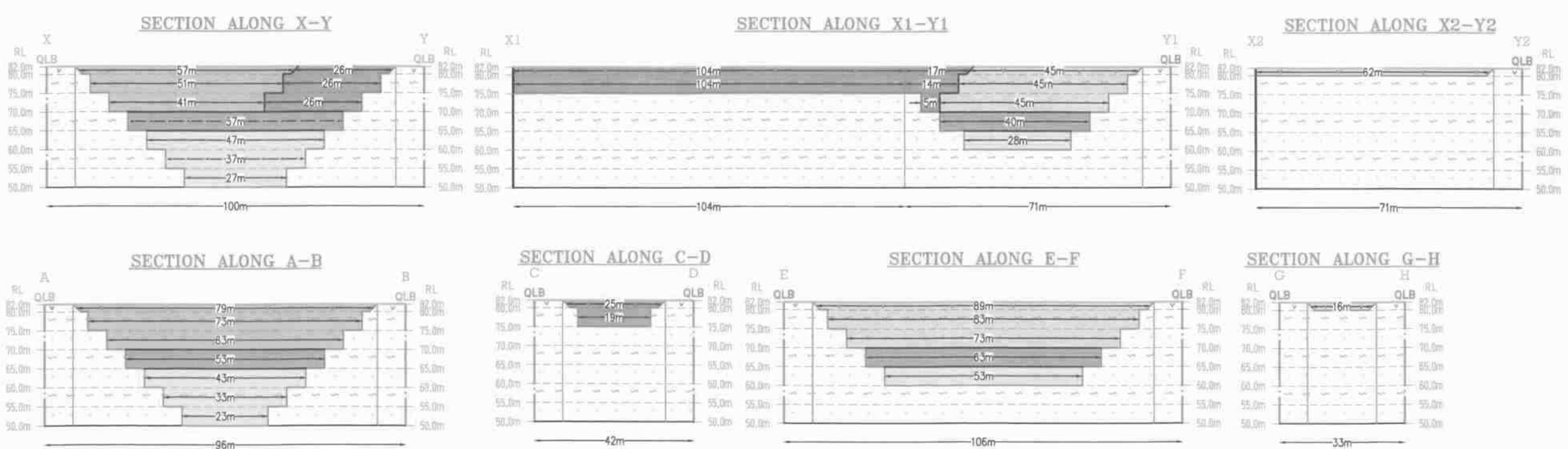
**LAND USE PATTERN**

DESCRIPTION	PRESENT AREA (Ha)	AREA AT THE END OF THIS QUARRYING PERIOD (Ha)
AREA UNDER QUARRYING	NII	1.65.26
INFRASTRUCTURE	NII	0.01.00
ROADS	NII	0.03.00
GREEN BELT	NII	0.71.47
UN-UTILIZED AREA	2.42.63	0.01.90
GRAND TOTAL	2.42.63	2.42.63

**PLATE NO - III**  
DATE OF SURVEY : 28.07.2023

**APPLICANT:**  
THIRU.VEERARAGAVAN,  
S/O.ANANDAVELU,  
METTU STREET,VANUR TALUK,  
VILUPPURAM DISTRICT.

**LOCATION OF QUARRY**  
**LEASE APPLIED AREA:**  
S.F.No. : 75/1, 4.5.6 and 76/3B2.  
EXTENT : 2.42.63 Ha.  
VILLAGE : ERAIYUR,  
TALUK : VANUR,  
DISTRICT : VILUPPURAM,  
STATE : TAMIL NADU.



**SITE SERVICES**

- A-OFFICE
- B-FIRST AID ROOM
- C-STORE
- D-REST SHED
- E-TOILET

**Year Proposed Plantation**

- I Year Proposed Plantation
- II Year Proposed Plantation
- III Year Proposed Plantation
- IV Year Proposed Plantation
- V Year Proposed Plantation

**Year Proposed area to be Quarried**

- 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

**INDEX**

- Q.L. APPLIED AREA BOUNDARY
- 7.5m SAFETY DISTANCE
- TEMPORARY BENCH MARK
- QUARRY PIT
- APPROACH ROAD
- SHRUBS
- GRAVEL
- STRIKE AND DIP
- ROUGH STONE

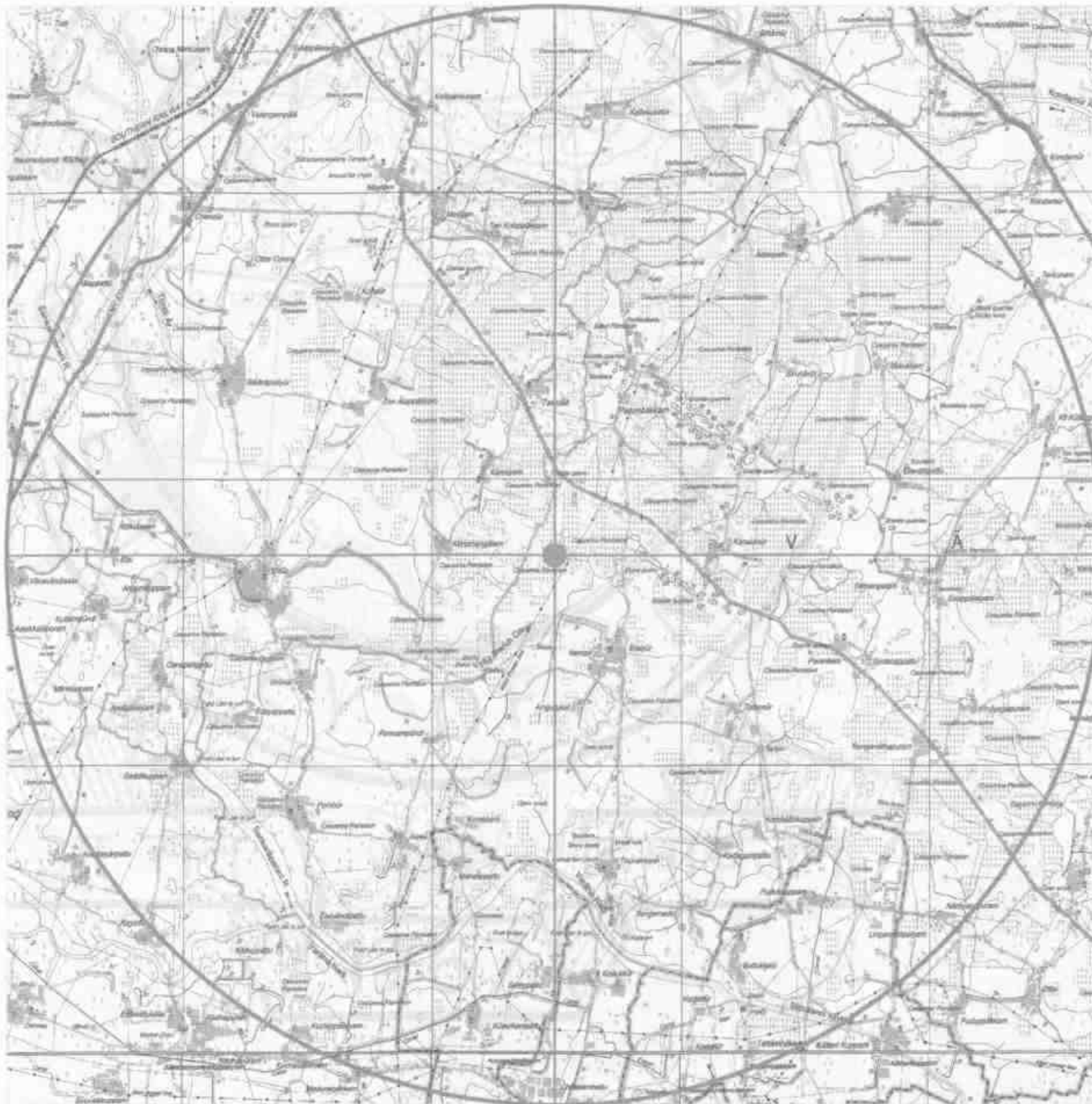
**TOPOGRAPHY, GEOLOGICAL PLAN & SECTIONS SHOWING YEARWISE DEVELOPMENT & PRODUCTION PLAN & SCETIONS**  
SCALE 1 : 1000

**PREPARED BY:**  
THIS IS TO CERTIFY THAT THE INFORMATION IN THIS PLATE IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE BASED UPON THE LEASE MAP AUTHENTICATED BY STATE GOVERNMENT

*Dr. M. J. Thiruveeraragavan*  
Dr. M. J. THIRUVEERARAGAVAN, M.B.A., F.C.S., Ph.D.,  
RECOGNIZED QUALIFIED PERSON  
RDP/MAS/183/2004/A



12° 09' 50.02"N



79° 33' 07.29"E

79° 44' 20.31"E

11° 58' 51.67"N

TOPO SHEET NO. : 57 P/12

LATITUDE : 12° 04' 17.1389"N to 12° 04' 24.5551"N

LONGITUDE : 79° 38' 37.9720"E to 79° 38' 49.6101"E

10KM RADIUS :

Q.L.APPLIED AREA:  
108 A

PLATE NO:I-A

DATE OF SURVEY : 28.07.2023

APPLICANT:

THIRU.VEERARAGAVAN,  
S/O.ANANDAVELU,  
METTU STREET,VANUR TALUK,  
VILUPPURAM DISTRICT.



LOCATION OF QUARRY  
LEASE APPLIED AREA:

S.F.No. : 75/1,4,5,6 and 76/3B2  
EXTENT : 2.42.63 Ha.  
VILLAGE : ERAIYUR,  
TALUK : VANUR,  
DISTRICT : VILUPPURAM,  
STATE : TAMIL NADU.

INDEX

CONVENTIONAL SYMBOLS

Express highway with toll with bridge with drainage course	
Roads, unmetalled according to experience	
Roads, metalled according to experience	
Unmetalled road, Cart-track, Pack-track with path, Foot-path	
Ditches with track or laid unmetalled Canal	
Canal, masonry or rock-lined, unmetalled, Weir	
Flow way with water channel with fixed S-type, Tidal weir	
Submerged rocks, Shoal, Swamp, Reeds	
Water tank, well, Tubewell, Spring, Tank, pond, dam	
Embankments, road or rail, Shutter ground	
Railways, broad gauge, double single with station, under construction	
Huller, other gauges, double single with station, stone, di	
Mineral line of railway, Km, Cutting with tunnel	
Contours with spot-heights, Vally slopes, Cells	
Spot heights (10m) (20m) (30m) (40m) (50m) (60m) (70m) (80m) (90m) (100m)	
Towns or Villages, unmetalled, scattered, Port	
Hulk, permanent temporary, Tower, Antroude	
Towers, Obelisk, Church, Mosque, High Tomb, Ganga	
Lighthouse, Lightning Rod, Light, unlighted, Anchorage	
Mine, Ore, pit, shaft, Glass, Spring	
Prison, asylum, other, Prison, Canteen, Bazaar, Other trees	
Areas, cultivated, wooded, Surveyed, etc.	
Boundaries, International	
State boundaries, International	
Boundaries, other, International, unmetalled	
Height, Horizontal, vertical, and approximate	
Barometric, aneroid, barometer	
Post office, Telegraph office, Overhead tank	
Rail, Road, or Transport, bus, station, Check house, Police station	
Camping ground, Forest, reserved, protected	
Spotted, various, unmetalled, tracks, or other	
Hospital, Dispensary, Veterinary, Hospital, Dispensary	
Aviation, Helipad, Tourist, etc.	
Tower, etc. with pylons, unmetalled, with poles, unmetalled	

TOPO SKETCH OF QUARRY  
LEASE APPLIED AREA FOR  
10KM RADIUS

SCALE- 1:100000

PREPARED BY :

THIS IS TO CERTIFY THAT THE INFORMATION IN THIS  
PLATE IS TRUE AND CORRECT TO THE  
BEST OF MY KNOWLEDGE BASED UPON THE LEASE MAP  
AUTHENTICATED BY STATE GOVERNMENT

Dr. M. IFTHIKHAR AHMED, M.Sc., M.B.A., F.G.S., Ph.D.,  
RECOGNIZED QUALIFIED PERSON  
ROP/MAS/183/2004/A



**TOPOGRAPHICAL VIEW OF ERAIYUR ROUGH STONE  
AND GRAVEL QUARRY LEASE APPLIED AREA**




Name of the Applicant : **Thiru. A. Veeraragavan,**  
S/o. Anandavelu,  
Address : No. 225, Mettu Street, Eraiyur Village,  
Vanur Taluk,  
Viluppuram District,  
Tamil Nadu State – 604 304.

**Location:**

S.F.Nos. : 75/1, 75/4, 75/5, 75/6 and 76/3B2  
Extent : 2.42.63 Ha  
Village : Eraiyur  
Taluk : Vanur  
District : Viluppuram

Signature of the Applicant

(A. Veeraragavan)

  
(Village Administrative officer)  
Village Administrative Office  
No: 51, Eraiyur,  
Vanur Tk.

சீரணிப்பு.

ஐயம்புரம் மாவட்டம், வானூர் அட்டம், லைசுரூர் கிராமத்தை சேர்ந்த சி. சூப்பாஸ் குமாரர் திரு. ராதாதிருமணன் மற்றும் திரு. சிப்பாசுர குமாரர் திரு. கணேசன் சீகரியார் மேற்கண்ட சுவாமிமீன் நிரந்தரமாக வசித்து வருகிறார்கள். அவர்களுக்கு லைசுரூர் கிராம அலுவலகத்தில் பல் பிள்ளைகள்: 75/1 - 0.53.5, 75/4 - 0.30.0, 75/5 - 0.76.0, 75/6 - 0.24.0 மற்றும் 76/3B2 - 0.59.0 குடும்ப அலுவலகம் மூலம் ஒதுக்கப்பட உள்ளது. மேற்படி பல் பிள்ளைகள் குத்தகை மற்றும் வேலை திரு. சீரநாகவன் த/வ ஆனந்தசெய்யு லைசுரூர் வட்டவார்ட்டில் உள்ளார். மேற்படி பல் பிள்ளைகள் சிறிது 300 மீ சிற்றளவில் புராதன கட்டிடம், பள்ளிகளும், லைசுரூர், உயர்நிலை அருகே கோயில்களும், கோயில்களும் குடும்ப அலுவலகம் திருவாரூர் பகுதியில் குடும்ப அலுவலகம் கிழக்கு மேல் சீரணிப்பிக்கிறது.

  
Village Administration Office  
No: 51, Eraiyur,  
TAMIL NADU

***Hydrogeological Report for***

**Rough stone and Gravel Quarry Over an extent of  
2.42.63ha, S.F.Nos. 75/1, 75/4, 75/5, 75/6 and 76/3B2  
of Eraiyur Village, Vanur Taluk, Viluppuram District,  
Tamil Nadu**

## **HYDROGEOLOGICAL REPORT**

### **1. INTRODUCTION**

#### **NAME OF THE APPLICANT WITH ADDRESS**

Name of the applicant : Thiru. A. Veeraragavan,  
S/o. Anandavelu  
Address : No. 225, Mettu Street,  
Eraiyur Village,  
Vanur Taluk,  
Viluppuram – 604 304.  
State : Tamil Nadu  
Mobile : +91 63838 07635

#### **DETAILS OF THE AREA**

Survey No : 75/1, 75/4, 75/5, 75/6 and 76/3B2  
Extent : 2.42.63ha  
Village : Eraiyur  
Taluk : Vanur  
District : Viluppuram

The Client requires detailed information on Ground Water Occurrences at Proposed Project Site. The objective of the present study is to assess the availability of groundwater and comment on aspects of depth to potential aquifers, aquifer availability and type, possible yields and water quality. For this purpose all available hydrogeological information of the areas has been analyzed, and a geophysical survey was done.

The investigations involved hydrogeological, geophysical field investigations and a detailed study in which the available relevant geological and hydrogeological data were collected, analyzed, collated and evaluated within the context of the Client's requirements. The data sources consulted were mainly:

- a) Central Ground Water Board (CGWB) Data
- b) State & District Geological and Hydrogeological Reports and Maps.
- c) Technical reports of the area by various organizations.

## **2. SCOPE OF THE WORKS –**

The scope of works includes:

- Site visits to familiarize with the project areas. Identify any issues that might impact the Ground Water Scenario due to proposed mining activities.
- To obtain, study and synthesize background information including the geology, hydrogeology and existing borehole data, for the purpose of improving the quality of assessment and preparing comprehensive hydrogeological reports,
- To carry out hydrogeological evaluation and geophysical investigations in the selected sites in order to determine potential for groundwater at project site.
- To prepare hydrogeological survey reports in conformity with the provisions of the rules and procedure outlined by the Central Ground Water Board (CGWB), by Assessment of water quality and potential infringement of National standards, Assessment of availability of groundwater and Impact of proposed activity on aquifer, water quality and other abstractors.

## **3. BACKGROUND INFORMATION**

### **Location**

The investigated site falls in the Toposheet No: 57 P/12 Latitude between 12°04'17.1389"N to 12°04'24.5551"N and Longitude between 79°38'37.9720"E to 79°38'49.6101"E on WGS datum-1984.

## **GEOLOGY AND GEOMORPHOLOGY**

### **GEOMORPHOLOGY**

The residual hills and denudation hills are common in Tirukoilur, Kallakurichi and Gingee taluks. Structural hills are noticed in the western part of the district. The shallow pediments and buried pediments are common in the central part of the district. Coastal areas are having older and younger flood plains and also beach landforms at places. The ground slope is gentle towards coast.

The valley fill near Villupuram is thick, which forms main ground water discharge zone. Lineaments are restricted to parts of Kallakurichi and Sankarapuram areas and productive fractures are noticed in select pockets. The crystalline sedimentary contact fault is having sympathetic fractures in hard rocks but mostly they are dry fractures.

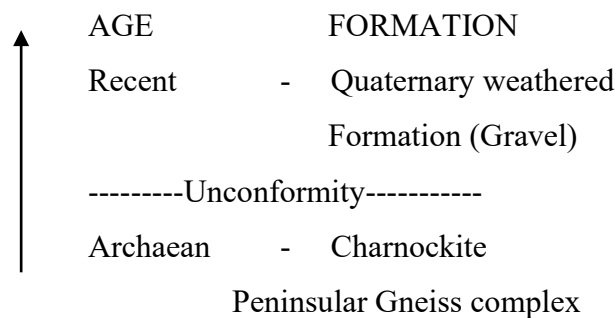
### **Soils**

The soils in the district are mostly forest soils and red soil. Alluvial soils are found in eastern side bordering coast. Black soils are confined to low ground in select pockets in Vanur taluk.

### **Regional Geology of the District-**

Villupuram District is underlain by crystalline metamorphic complex in the western parts of district and sedimentary tract in eastern side. A crystalline rocks (63%) and covered by sediments (37%).

The general geological sequence of formation is given below





The major part of the area is covered by metamorphic crystalline rocks of charnockite, granitic gneiss of Archaean age intruded by dolerite dykes and pegmatite veins. These rocks are highly metamorphosed and have been subjected to very severe folding, crushing and faulting. The Cretaceous formation is represented by Arenaceous Lime stone, Calcareous sand - stone and marl. The Tertiary formation is argillaceous comprising of Silty clay stones, argillaceous Lime stone.

#### **Tertiary Cuddalore sandstone**

Tertiary formations are represented by Cuddalore Sandstone and characterised as fluvial to brackish marine deposits. Predominantly this formation is divided into Lower and Upper Cuddalore formations. In the Upper Cuddalore formations the groundwater occurs in semi confined conditions, whereas in the Lower Cuddalore the groundwater occurs in confined condition with good groundwater potential.

#### **4. GEOPHYSICAL INVESTIGATION METHODS**

A variety of methods are available to assist in the assessment of geological sub-surface conditions. The main emphasis of the fieldwork undertaken was to determine the thickness and composition of the sub-surface formations and to identify water-bearing zones. This information was principally obtained in the field using, and vertical electrical soundings (VES). The VES probes the resistivity layering below the site of measurement. This method is described below.

#### **Resistivity Method**

Vertical electrical soundings (VES) were carried out to probe the condition of the sub-surface and to confirm the existence of deep groundwater. The VES investigates the resistivity layering below the site of measurement.

## Basic Principles

The electrical properties of rocks in the upper part of the earth's crust are dependent upon the lithology, porosity, and the degree of pore space saturation and the salinity of the pore water. Saturated rocks have lower resistivity than unsaturated and dry rocks. The higher the porosity of the saturated rock, or the higher the salinity of the saturating fluids, the lower is the resistivity. The presence of clays and conductive minerals also reduces the resistivity of the rock.

The resistivity of earth materials can be studied by measuring the electrical potential distribution produced at the earth's surface by an electric current that is passed through the earth. Current is moved through the subsurface from one current electrode to the other and the potential difference is recorded as the current passes. From this information, resistivity values of various layers are acquired and layer thickness can be identified.

The apparent resistivity values determined are plotted as a log function versus the log of the spacing between the electrodes. These plotted curves identify thickness of layers. If there are multiple layers (more than 2), the acquired data is compared to a master curve to determine layer thickness.

This method is least influenced by lateral in-homogeneities and capable of providing higher depth of investigation.

The resistance  $R$  of a certain material is directly proportional to its length  $L$  and cross-sectional area  $A$ , expressed as:

$$R = R_s * L/A \text{ (in Ohm)}$$

Where  $R_s$  is known as the specific resistivity (characteristic of the material and independent of its shape or size)

With Ohm's Law,

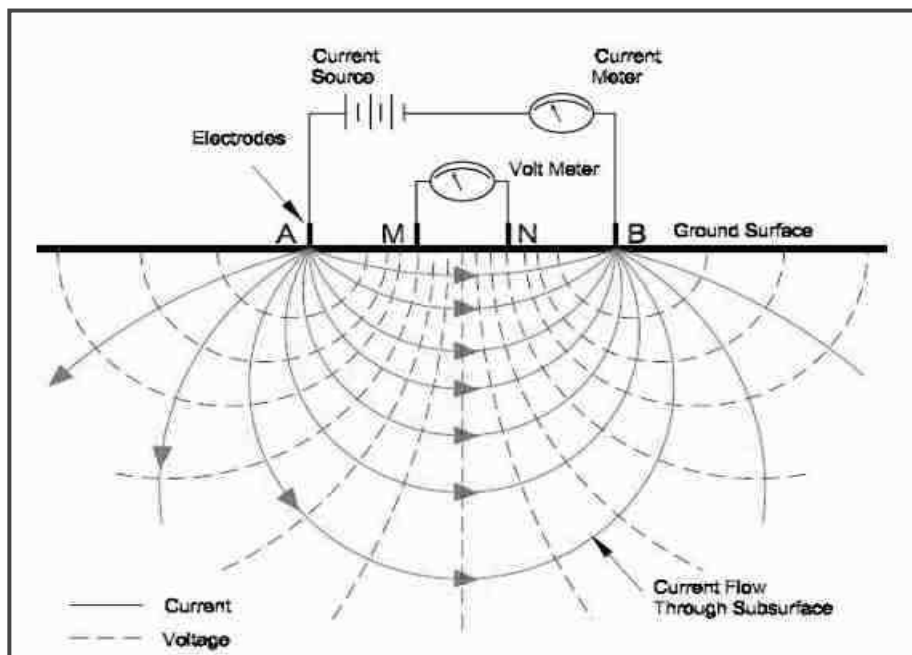
$$R = dV/I \text{ (Ohm)}$$

Where  $dV$  is the potential difference across the resistor and  $I$  is the electric current through the resistor. The specific resistivity may be determined by:

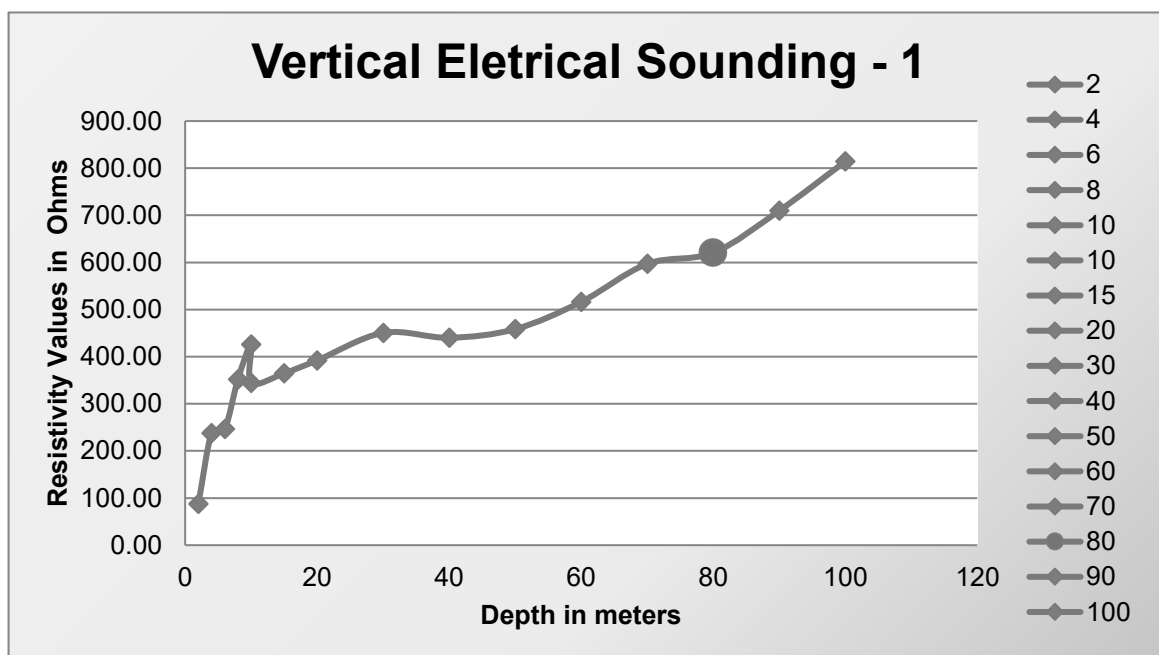
$$R_s = (A/L) * (dV/I) \text{ (in Ohm m)}$$

## Vertical Electrical Sounding (VES)

When carrying out a resistivity sounding, current is led into the ground by means of two electrodes. With two other electrodes, situated near the center of the array, the potential field generated by the current is measured. From the observations of the current strength and the potential difference, and taking into account the electrode separations, the ground resistivity can be determined. During a resistivity sounding, the separation between the electrodes is step-wise increased (known as a Schlumberger Array), thus causing the flow of current to penetrate greater depths. When plotting the observed resistivity values against depth on double logarithmic paper, a resistivity graph is formed, which depicts the variation of resistivity with depth. This graph can be interpreted with the aid of a computer, and the actual resistivity layering of the subsoil is obtained. The depths and resistivity values provide the hydro geologist with information on the geological layering and thus the occurrence of groundwater.

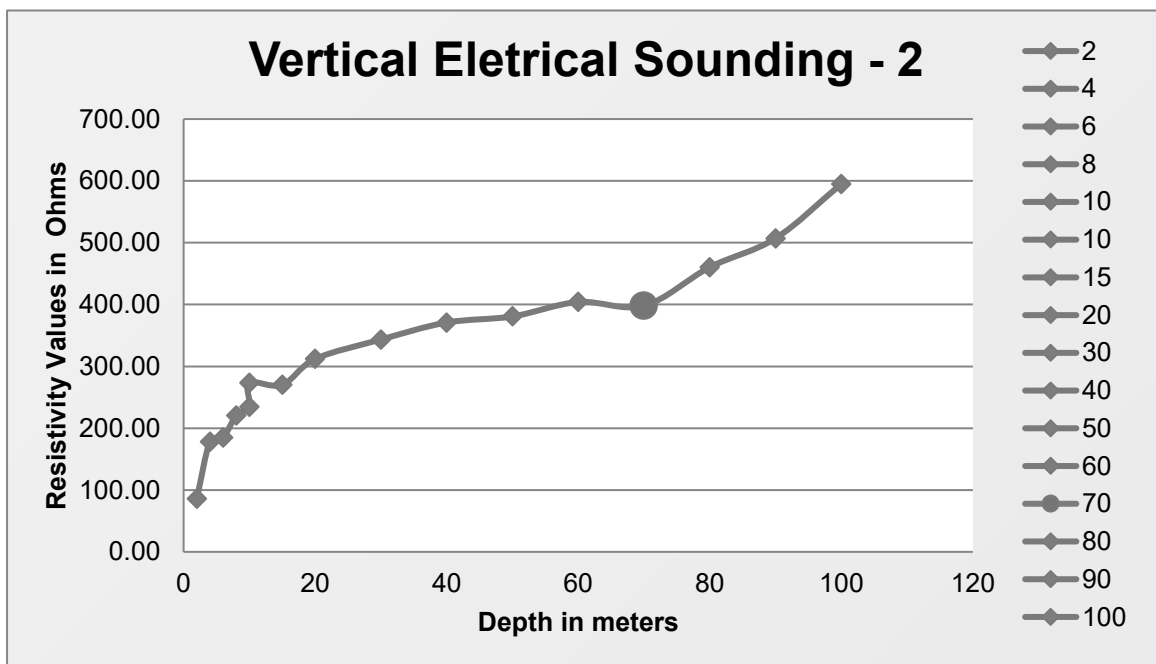


STATION-1					
GPS Co-Ordinates - 12° 4'21.49"N 79°38'39.02"E					
S.No.	Ab/2	Mn/2	K	R	Rho
1	2	1	4.71	18.55	87.37
2	4	1	23.55	10.10	237.86
3	6	1	54.95	4.48	246.18
4	8	1	98.91	3.56	352.12
5	10	1	155.45	2.74	425.93
6	10	5	23.55	14.61	344.07
7	15	5	62.80	5.81	364.87
8	20	5	117.75	3.33	392.11
9	30	5	274.75	1.64	450.59
10	40	5	494.55	0.89	440.15
11	50	5	777.15	0.59	458.52
12	60	5	1122.55	0.46	516.37
13	70	5	1530.75	0.39	596.99
14	80	5	2001.75	0.31	620.54
15	90	5	2535.55	0.28	709.95
16	100	5	3132.15	0.26	814.36



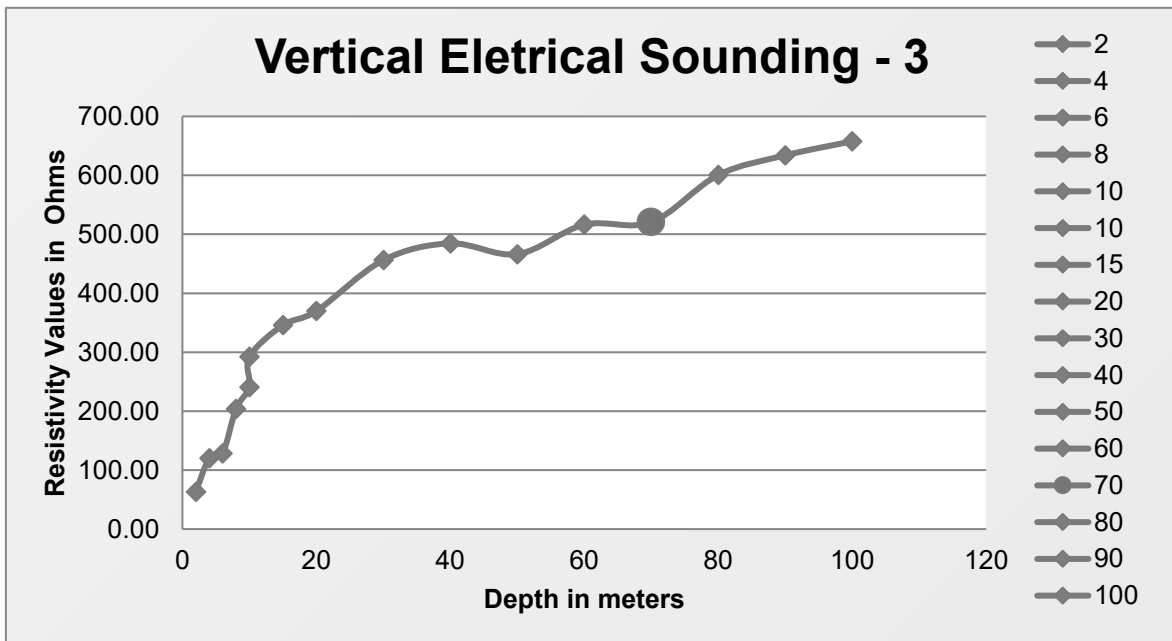
◆ This vertical electrical sounding graphs Red color is fracture zone.

STATION-2					
GPS Co-Ordinates - 12° 4'20.14"N 79°38'42.62"E					
S.No.	Ab/2	Mn/2	K	R	Rho
1	2	1	4.71	18.24	85.91
2	4	1	23.55	7.56	178.04
3	6	1	54.95	3.36	184.63
4	8	1	98.91	2.23	220.57
5	10	1	155.45	1.51	234.73
6	10	5	23.55	11.61	273.42
7	15	5	62.80	4.30	270.04
8	20	5	117.75	2.65	312.04
9	30	5	274.75	1.25	343.44
10	40	5	494.55	0.75	370.91
11	50	5	777.15	0.49	380.80
12	60	5	1122.55	0.36	404.12
13	70	5	1530.75	0.26	398.00
14	80	5	2001.75	0.23	460.40
15	90	5	2535.55	0.20	507.11
16	100	5	3132.15	0.19	595.11



◆ This vertical electrical sounding graphs Red color is fracture zone.

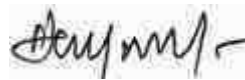
STATION-3					
GPS Co-Ordinates - 12° 4'18.87"N 79°38'46.11"E					
S.No.	Ab/2	Mn/2	K	R	Rho
1	2	1	4.71	13.45	63.35
2	4	1	23.55	5.09	119.87
3	6	1	54.95	2.33	128.03
4	8	1	98.91	2.06	203.75
5	10	1	155.45	1.55	240.95
6	10	5	23.55	12.41	292.26
7	15	5	62.80	5.51	346.03
8	20	5	117.75	3.14	369.74
9	30	5	274.75	1.66	456.09
10	40	5	494.55	0.98	484.66
11	50	5	777.15	0.60	466.29
12	60	5	1122.55	0.46	516.37
13	70	5	1530.75	0.34	520.46
14	80	5	2001.75	0.30	600.53
15	90	5	2535.55	0.25	633.89
16	100	5	3132.15	0.21	657.75



◆ This vertical electrical sounding graphs Red color is fracture zone.

## 5. Conclusion –

Based on the available information and the geophysical investigations it is concluded that the project area is considered to have medium groundwater potential. Productive aquifers are expected at depth of 75m to 80m where minor fractures are observed and shallow aquifers are expected above 65m to 70m BGL. The ultimate pit limit as per the approved mining plan depth is 32m below ground level which will have no impact on the Ground Water.



**Dr. P. Thangaraju, M.Sc., Ph.D.,  
Govt. Approved Hydro Geologist**

M/s. Geo Exploration and Mining Solutions,  
Regd. Office: No. 17, Advaita Ashram Road,  
Alagapuram, Salem – 636 004, Tamil Nadu  
Mobile: +91 - 94433 56539  
E-Mail: [infogeoexploration@gmail.com](mailto:infogeoexploration@gmail.com)



அனுப்புநர்

திரு. இரா.கோவர்தணன், பி.எஸ்.சி.,  
வருவாய் வட்டாட்சியர்,  
வானூர்.

பெறுநர்

வருவாய் கோட்டாட்சியர்,  
விழுப்புரம்.

ந.க.அ10/1846/2022, நாள்: .02.2023

அய்யா,

பொருள்:

கனிமமும் குவாரிகளும் - சிறுகனிமம் - சாதாரண கற்கள் மற்றும் கிராவல் - விழுப்புரம் மாவட்டம், வானூர் வட்டம் - எறையூர் கிராம பட்டா புல எண்.75/1, 75/4, 75/5 75/6, மற்றும் 76/3B2 ஆகியவற்றின் மொத்த பரப்பு 2.42.63 ஹெக்டேரில் 10 ஆண்டுகளுக்கு சாதாரண கற்கள் மற்றும் கிராவல் வெட்டியெடுத்து குவாரி நடத்த அனுமதி கோரி திரு.வீராகவன் த/பெ.ஆனந்தவேலு என்பவர் கொடுத்துக்கொண்ட மனு - அறிக்கை அனுப்புதல் - தொடர்பாக.

பார்வை:

- 1.விழுப்புரம், துணை இயக்குநர், புவியியல் மற்றும் சுரங்கத்துறை அலுவலக கடிதம், ந.க.அ/பு& சு/253/2022, நாள்:23.06.2022.
- 2.நெமிலி குறுவட்ட நில அளவரின் அறிக்கை உ.மு.எண்.44/2022, நாள்:25.11.2022.
- 3.திரு.வீராகவன் த/பெ.ஆனந்தவேலு, மேட்டுத்தெரு, எறையூர் கிராமம், வானூர் வட்டம் என்பவரின் மனு நாள்:15.06.2022.

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பார்வையில் காணும் கடிதங்களின் மீது தங்களின் கனிவான கவனம் கொணர விழுகிறேன்.

விழுப்புரம் மாவட்டம், வானூர் வட்டம், எறையூர் கிராமத்தைச் சேர்ந்த திரு. வீராகவன் த/பெ. ஆனந்தவேலு என்பவர் வானூர் வட்டம், எறையூர் கிராம புல எண். 75/1, 75/4, 75/5 75/6, மற்றும் 76/3B2 ஆகியவற்றின் மொத்த பரப்பு 2.42.63 ஹெக்டேரில் 10 ஆண்டுகளுக்கு சாதாரண கற்கள் மற்றும் கிராவல் குவாரி குத்தகை உரிமம் கோரி விண்ணப்பித்துக் கொண்டது தொடர்பாக நெமிலி வருவாய் ஆய்வாளர் கீழ்க்கண்டவாறு அறிக்கை சமர்ப்பித்துள்ளார்.

வானூர் வட்டம், எறையூர் கிராமத்தில் சாதாரண கற்கள் மற்றும் கிராவல் குவாரி குத்தகை உரிமம் கோரியுள்ள புலன்களின் விபரம் பின்வருமாறு.

வ.எண்	புல எண்	வகைபாடு	மொத்த விஸ்தீரணம் (ஹெக்டேர்)
1.	75/1	புன்செய்	0.53.5
2.	75/4,	புன்செய்	0.30.0
3.	75/5	புன்செய்	0.76.0
4.	75/6	புன்செய்	0.24.0
5.	76/3B2	புன்செய்	0.59.13
		மொத்தம்	2.42.63



மேற்காணும் புலன்கள் யாவும் ஒருங்கிணைந்து ஒரே புலமாக உள்ளது. வ.எண். 1 முதல் 5 வரை 2.42.63 ஹெக்டேர் புஞ்சை நிலங்கள் எறையூர் கிராம கணக்கில் பட்டா எண்:5558, 5511,5506 திரு. ராதாகிருஷ்ணன் த/பெ. தனபால் மற்றும் திரு. கணேசன் த/பெ. அப்பாதுரை என்பவரின் பெயரில் தாக்கலாகியுள்ளது. மேற்படி புலன்கள் யாவும் குத்தகை பத்திரம் மூலம் திரு. வீரராகவன் த/பெ. ஆனந்தவேலு என்பவருக்கு வழங்கப்பட்டுள்ளது. மேற்படி புலங்களில் ந.க.எண்.ஆ/பு&சு/253/2022 நாள்:23.06.2012ன்படி திரு. வீரராகவன் த/பெ. ஆனந்தவேலு என்பவர் கல்குவாரி உரிமம் கோரியுள்ள கிராம புல எண்.75/4, 75/5 75/6, 75/1, மற்றும் 76/3B2 ஆகியவற்றின் மொத்த பரப்பு 2.42.63 ஹெக்டேர் இப்புலங்களில் வில்லங்கம் ஏதுமில்லை.

மேற்காணும் புலங்களின் அருகே 300 மீட்டர் தொலைவிற்குள் குடியிருப்புகள் ஏதுமில்லை. உத்தேச புலங்களில் கிணறுகள், கல் கட்டிடங்கள், புராதானசின்னங்கள், சுடுகாடு ஏதுமில்லை. உயர் அழுத்தம் மற்றும் தாழ்வழுத்த மின்கம்பிகள், தொலைபேசி கம்பங்கள் ஏதும் 50 மீட்டர் தொலைவிற்குள் செல்லவில்லை. இங்கு கற்குவாரி செய்ய ஆட்சேபணை குறித்து கிராமத்தில் விளம்பரம் செய்யப்பட்டதில், ஆட்சேபணை ஏதும் வரப்பெறவில்லை. குவாரி குத்தகை உரிமம் வழங்கப்படவுள்ள இடத்தில் வெட்டப்படும் கற்கள் எடுத்து செல்ல மேற்படி கிராம எல்லையில் புல எண்.55/3- அ.பு. சாலை ஓரம், 55/1- ர.பு, 205/- அ.பு. ஏரி, 62/2 - அ.பு கல்லாங்குத்து வழியாகவும், புல எண்.67/19 ர.பு, 67/4 ர.பு, 67/3A ர.பு, 67/3B ர.பு, 67/2 ர.பு, 68/2<sup>உ</sup> ர.பு, 69/1 ர.பு, 14/5 ர.பு, 14/4 ர.பு, 14/3 ர.பு, 14/1 ர.பு, 13/1A ர.பு, 13/1B, 12/4 ர.பு, 12/3 ர.பு, 5/- அ.பு, 4/4 ர.பு, 4/5 ர.பு, 76/1 ர.பு ஆகியவற்றின் வழியாக எடுத்து செல்ல பாதை வசதி உள்ளது.

உத்தேச புலத்திற்கு சக்குபந்தி விபரம் வருமாறு.

1. புல எண். 75/1 - 0.53.5 ஏர்ஸ்  
வடக்கு : 76/3B2,6 - பட்டா நிலம்.  
தெற்கு : 75/2 - பட்டா நிலம்.  
கிழக்கு : 75/4 - பட்டா நிலம்  
மேற்கு : 77/5 - பட்டா நிலம்.
2. புல எண். 75/4 0.30.0 ஏர்ஸ்  
வடக்கு : 76/6 - பட்டா நிலம்.  
தெற்கு : 75/3 - பட்டா நிலம்.  
கிழக்கு : 75/5 - பட்டா நிலம்.  
மேற்கு : 75/1 - பட்டா நிலம்.
3. புல எண். 75/5 0.76.0 ஏர்ஸ்  
வடக்கு : 74/6 - பட்டா நிலம்.  
தெற்கு : 82/2 - பட்டா நிலம்.  
கிழக்கு : 75/6,7 - பட்டா நிலம்.  
மேற்கு : 76/6,75/3,4 - பட்டா நிலம்.

4. புல எண். 75/6 0.24.0 ஏர்ஸ்

வடக்கு : 74/6 - பட்டா நிலம்.  
தெற்கு : 75/7 - பட்டா நிலம்.  
கிழக்கு : 73/11,12 - பட்டா நிலம்.  
மேற்கு : 75/5 - பட்டா நிலம்.

5. புல எண். 76/3B2 0.59.13 ஏர்ஸ்

வடக்கு : 76/3B1,2 - பட்டா நிலம்.  
தெற்கு : 75/1 - பட்டா நிலம்.  
கிழக்கு : 76/6 - பட்டா நிலம்.  
மேற்கு : 77/4,5 - பட்டா நிலம்.

மனுதாரர் நன்னடத்தையுள்ளவர். சிவில்/ கிரிமினல் வழக்குகளில் சம்மந்தப்படவில்லை. மனுதராருக்கு இத்தொழிலில் முன் அனுபவம் உள்ளது. உத்தேச புலங்களுக்கு செல்ல பாதை வசதி உள்ளது. மேற்காணும் புலங்களில் புல எண்: 75/1, 75/4, 75/5 75/6, மற்றும் 76/3B2 ஆகியவற்றின் மொத்த பரப்பு 2.42.63 ஹெக்டேர் பரப்பளவில் சாதாரண கற்கள் வெட்டி எடுக்க மனுதாரர் அரசுக்கு செலுத்த வேண்டிய நிலுவைத் தொகை ஏதுமில்லை என்றும், மேற்படி விதிகளின்கீழ் குற்றம் புரியவோ, தண்டனை பெறவோ இல்லை என்பதை தெரிவித்துக்கொள்கிறேன்.

வானூர் வட்டம், எறையூர் கிராமத்தில் புல எண்கள் 75/1, 75/4, 75/5 75/6, மற்றும் 76/3B2 ஆகியவற்றின் மொத்த பரப்பு 2.42.63 ஹெக்டேர் சாதாரண கற்கள் மற்றும் கிராவல் குவாரி குத்தகை உரிமம் வழங்கலாம் என்பதைப் பணிவுடன் தெரிவித்துக் கொள்கிறேன்.

இத்துடன் விசாரணை அறிக்கை, புலவரைப்படம், கூட்டுவரைப்படம், மற்றும் கிராம கணக்கு ஆவணங்களின் நகல்கள் இணைத்து அனுப்பியுள்ளேன் என்பதையும் தெரிவித்துக்கொள்கிறேன்.

இணைப்பு: மேற்கண்டவாறு.

தங்கள் உண்மையுள்ள,

(2/16)

*(Handwritten Signature)*

வருவாய் வட்டாட்சியர்,  
வானூர்.

27.2.2023 *(Handwritten Signature)*

அனுப்பப்பட்டது  
தேதி. 27.2.2023.

**பார்வைக் குறிப்பு**

வட்டம்	: வானூர்
கிராமம்	: எறையூர்
தணிக்கை நாள்	: 25.11.2022
தணிக்கை அலுவலர்	: வருவாய் வட்டாட்சியர், வானூர்
புல எண்கள்	: கிராம புல எண். 75/1, 75/4, 75/5 75/6, மற்றும் 76/3B2 - 2.42.63 ஹெக்டேர்
இடம்	: எறையூர் கிராமம்
நோக்கம்	: சாதாரண கற்கள் மற்றும் கிராவல் வெட்டி எடுக்க குவாரி குத்தகை உரிமம் கோரியது தொடர்பாக.

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விழுப்புரம் மாவட்டம், வானூர் வட்டம், எறையூர் கிராமத்தைச் சேர்ந்த திரு. வீரராகவன் த/பெ. ஆனந்தவேலு என்பவர் வானூர் வட்டம், எறையூர் கிராம புல எண். 75/1, 75/4, 75/5 75/6, மற்றும் 76/3B2 ஆகியவற்றின் மொத்த பரப்பு 2.42.63 ஹெக்டேரில் 10 ஆண்டுகளுக்கு சாதாரண கற்கள் மற்றும் கிராவல் குவாரி குத்தகை உரிமம் கோரி விண்ணப்பித்துக் கொண்டது தொடர்பாக புலத்தணிக்கை செய்யப்பட்டது.

வானூர் வட்டம், எறையூர் கிராமத்தில் சாதாரண கற்கள் மற்றும் கிராவல் குவாரி குத்தகை உரிமம் கோரியுள்ள புலங்களின் விபரம் பின்வருமாறு.

வ.எண்	புல எண்	வகைபாடு	மொத்த விஸ்தீரணம் (ஹெக்டேர்)
1.	75/1	புன்செய்	0.53.5
2.	75/4,	புன்செய்	0.30.0
3.	75/5	புன்செய்	0.76.0
4.	75/6	புன்செய்	0.24.0
5.	76/3B2	புன்செய்	0.59.13
		மொத்தம்	2.42.63

மேற்காணும் புலங்கள் யாவும் ஒருங்கிணைந்து ஒரே புலமாக உள்ளது. வ.எண். 1 முதல் 5 வரை 2.42.63 ஹெக்டேர் புஞ்சை நிலங்கள் எறையூர் கிராம கணக்கில் பட்டா எண்.5558, 5511,5506 திரு. ராதாகிருஷ்ணன் த/பெ. தனபால் மற்றும் திரு. கணேசன் த/பெ. அப்பாதுரை என்பவரின் பெயரில் தாக்கலாகியுள்ளது. மேற்படி புலங்கள் யாவும் குத்தகை பத்திரம் மூலம் திரு. வீரராகவன் த/பெ. ஆனந்தவேலு என்பவருக்கு வழங்கப்பட்டுள்ளது. மேற்படி புலங்களில் ந.க.எண்.ஆ/பு&சு/253/2022 நாள்:23.06.2012ன்படி திரு. வீரராகவன் த/பெ. ஆனந்தவேலு என்பவர் கல்குவாரி உரிமம்

கோரியுள்ள கிராம புல எண்.75/4, 75/5 75/6, 75/1, மற்றும் 76/3B2 ஆகியவற்றின் மொத்த பரப்பு 2.42.63 ஹெக்டேர் இப்புலங்களில் வில்லங்கம் ஏதுமில்லை.

மேற்காணும் புலங்களின் அருகே 300 மீட்டர் தொலைவிற்குள் குடியிருப்புகள் ஏதுமில்லை. உத்தேச புலங்களில் கிணறுகள், கல் கட்டிடங்கள், புராதானசின்னங்கள், சுடுகாடு ஏதுமில்லை. உயர் அழுத்தம் மற்றும் தாழ்வழுத்த மின்கம்பிகள், தொலைபேசி கம்பங்கள் ஏதும் 50 மீட்டர் தொலைவிற்குள் செல்லவில்லை. இங்கு கற்குவாரி செய்ய ஆட்சேபணை குறித்து கிராமத்தில் விளம்பரம் செய்யப்பட்டதில், ஆட்சேபணை ஏதும் வரப்பெறவில்லை. குவாரி குத்தகை உரிமம் வழங்கப்படவுள்ள இடத்தில் வெட்டப்படும் கற்கள் எடுத்து செல்ல மேற்படி கிராம எல்லையில் புல எண்.55/3- அ.பு. சாலை ஓரம், 55/1- ர.பு, 205/- அ.பு. ஏரி, 62/2 - அ.பு கல்லாங்குத்து வழியாகவும், புல எண்.67/19 ர.பு, 67/4 ர.பு, 67/3A ர.பு, 67/3B ர.பு, 67/2 ர.பு, 68/2<sup>உ</sup> ர.பு, 69/1 ர.பு, 14/5 ர.பு, 14/4 ர.பு, 14/3 ர.பு, 14/1 ர.பு, 13/1A ர.பு, 13/1B, 12/4 ர.பு, 12/3 ர.பு, 5/- அ.பு, 4/4 ர.பு, 4/5 ர.பு, 76/1 ர.பு ஆகியவற்றின் வழியாக எடுத்து செல்ல பாதை வசதி உள்ளது.

உத்தேச புலத்திற்கு சக்குபந்தி விபரம் வருமாறு.

6. புல எண். 75/1 - 0.53.5 ஏர்ஸ்
  - வடக்கு : 76/3B2,6 - பட்டா நிலம்
  - தெற்கு : 75/2 - பட்டா நிலம்.
  - கிழக்கு : 75/4 - பட்டா நிலம்
  - மேற்கு : 77/5 - பட்டா நிலம்.
7. புல எண். 75/4 0.30.0 ஏர்ஸ்
  - வடக்கு : 76/6 - பட்டா நிலம்.
  - தெற்கு : 75/3 - பட்டா நிலம்.
  - கிழக்கு : 75/5 - பட்டா நிலம்.
  - மேற்கு : 75/1 - பட்டா நிலம்.
8. புல எண். 75/5 0.76.0 ஏர்ஸ்
  - வடக்கு : 74/6 - பட்டா நிலம்.
  - தெற்கு : 82/2 - பட்டா நிலம்.
  - கிழக்கு : 75/6,7 - பட்டா நிலம்.
  - மேற்கு : 76/6,75/3,4 - பட்டா நிலம்.
9. புல எண். 75/6 0.24.0 ஏர்ஸ்
  - வடக்கு : 74/6 - பட்டா நிலம்.
  - தெற்கு : 75/7 - பட்டா நிலம்.
  - கிழக்கு : 73/11,12 - பட்டா நிலம்.
  - மேற்கு : 75/5 - பட்டா நிலம்.
10. புல எண். 76/3B2 0.59.13 ஏர்ஸ்
  - வடக்கு : 76/3B1,2 - பட்டா நிலம்.
  - தெற்கு : 75/1 - பட்டா நிலம்.
  - கிழக்கு : 76/6 - பட்டா நிலம்.
  - மேற்கு : 77/4,5 - பட்டா நிலம்.

மனுதாரர் நன்னடத்தையுள்ளவர். சிவில்/ கிரிமினல் வழக்குகளில் சம்மந்தப்படவில்லை. மனுதாரருக்கு இத்தொழிலில் முன் அனுபவம் உள்ளது. உத்தேச புலங்களுக்கு செல்ல பாதை வசதி உள்ளது. மேற்காணும் புலங்களில் புல எண்: 75/1, 75/4, 75/5 75/6, மற்றும் 76/3B2 ஆகியவற்றின் மொத்த பரப்பு 2.42.63 ஹெக்டேர் பரப்பளவில் சாதாரண கற்கள் வெட்டி எடுக்க மனுதாரர் அரசுக்கு செலுத்த வேண்டிய நிலுவைத் தொகை ஏதுமில்லை என்றும், மேற்படி விதிகளின்கீழ் குற்றம் புரியவோ, தண்டனை பெறவோ இல்லை என்பதை தெரிவித்துக்கொள்கிறேன்.

வானூர் வட்டம், எறையூர் கிராமத்தில் புல எண்கள் 75/1, 75/4, 75/5 75/6, மற்றும் 76/3B2 ஆகியவற்றின் மொத்த பரப்பு 2.42.63 ஹெக்டேர் சாதாரண கற்கள் மற்றும் கிராவல் குவாரி குத்தகை உரிமம் வழங்கலாம்.

  
வருவாய் வட்டாட்சியர்,  
வானூர்.

வானூர் வருவாய் வட்டாட்சியர் அவர்களுக்கு பணிநிதனுப்பப்படுகிறது.

விழுப்புரம் மாவட்டம், வானூர் வட்டம், எறையூர் கிராமத்தைச் சேர்ந்த திரு. வீரராகவன் த/பெ. ஆனந்தவேலு என்பவர் வானூர் வட்டம், எறையூர் கிராம புல எண். 75/1, 75/4, 75/5 75/6, மற்றும் 76/3B2 ஆகியவற்றின் மொத்த பரப்பு 2.42.63 ஹெக்டேரில் 10 ஆண்டுகளுக்கு சாதாரண கற்கள் மற்றும் கிராவல் குவாரி குத்தகை உரிமம் கோரி விண்ணப்பித்துக் கொண்டது தொடர்பாக எனது விசாரணை அறிக்கையினை கீழ்க்கண்டவாறு தெரிவித்துக்கொள்கிறேன்.

எனக்கு வானூர் வட்டம், எறையூர் கிராமத்தில் சாதாரண கற்கள் மற்றும் கிராவல் குவாரி குத்தகை உரிமம் கோரியுள்ள புலன்களின் விபரம் வருமாறு.

வ.எண்	புல எண்	வகைபாடு	மொத்த விஸ்தீரணம் (ஹெக்டேர்)
1.	75/1	புன்செய்	0.53.5
2.	75/4,	புன்செய்	0.30.0
3.	75/5	புன்செய்	0.76.0
4.	75/6	புன்செய்	0.24.0
5.	76/3B2	புன்செய்	0.59.13
		மொத்தம்	2.42.63

மேற்காணும் புலன்கள் யாவும் ஒருங்கிணைந்து ஒரே புலமாக உள்ளது. வ.எண். 1 முதல் 5 வரை 2.42.63 ஹெக்டேர் புஞ்சை நிலங்கள் எறையூர் கிராம கணக்கில் பட்டா எண்.5558, 5511,5506 திரு. ராதாகிருஷ்ணன் த/பெ. தனபால் மற்றும் திரு. கணேசன் த/பெ. அப்பாதுரை என்பவரின் பெயரில் தாக்கல் ஆகியுள்ளது. மேற்படி புலன்கள் யாவும் குத்தகை பத்திரம் மூலம் திரு. வீரராகவன் த/பெ. ஆனந்தவேலு என்பவருக்கு வழங்கப்பட்டுள்ளது. மேற்படி புலங்களில் ந.க.எண்.ஆ/பு&ச/253/2022 நாள்:23.06.2012ன்படி திரு. வீரராகவன் த/பெ. ஆனந்தவேலு என்பவர் கல்குவாரி உரிமம் கோரியுள்ள கிராம புல எண்.75/4, 75/5 75/6, 75/1, மற்றும் 76/3B2 ஆகியவற்றின் மொத்த பரப்பு 2.42.63 ஹெக்டேர் இப்புலங்களில் வில்லங்கம் ஏதுமில்லை. மேற்காணும் புலங்களின் அருகே 300 மீட்டர் தொலைவிற்குள் குடியிருப்புகள் ஏதுமில்லை. உத்தேச புலங்களில் கிணறுகள், கல் கட்டிடங்கள், புராதானசின்னங்கள், சுடுகாடு ஏதுமில்லை. உயர் அழுத்தம் மற்றும் தாழ்வழுத்த மின்கம்பிகள், தொலைபேசி கம்பங்கள் ஏதும் 50 மீட்டர்

தொலைவிற்குள் செல்லவில்லை. இங்கு கற்குவாரி செய்ய ஆட்சேபணை குறித்து கிராமத்தில் விளம்பரம் செய்யப்பட்டதில், ஆட்சேபணை ஏதும் வரப்பெறவில்லை. குவாரி குத்தகை உரிமம் வழங்கப்படவுள்ள இடத்தில் வெட்டப்படும் கற்கள் எடுத்து செல்ல மேற்படி கிராம எல்லையில் புல எண்.55/3- அ.பு. சாலை ஓரம், 55/1- ர.பு, 205/- அ.பு. ஏரி, 62/2 - அ.பு கல்லாங்குத்து வழியாகவும், புல எண்.67/19 ர.பு, 67/4 ர.பு, 67/3A ர.பு, 67/3B ர.பு, 67/2 ர.பு, 68/2~~4~~ ர.பு, 69/1 ர.பு, 14/5 ர.பு, 14/4 ர.பு, 14/3 ர.பு, 14/1 ர.பு, 13/1A ர.பு, 13/1B, 12/4 ர.பு, 12/3 ர.பு, 5/- அ.பு, 4/4 ர.பு, 4/5 ர.பு, 76/1 ர.பு ஆகியவற்றின் வழியாக எடுத்து செல்ல பாதை வசதி உள்ளது.

உத்தேச புலத்திற்கு சக்குபந்தி விபரம் வருமாறு.

1. புல எண். 75/1 - 0.53.5 ஏர்ஸ்
  - வடக்கு : 76/3B2,6 - பட்டா நிலம்
  - தெற்கு : 75/2 - பட்டா நிலம்.
  - கிழக்கு : 75/4 - பட்டா நிலம்
  - மேற்கு : 77/5 - பட்டா நிலம்.

2. புல எண். 75/4 0.30.0 ஏர்ஸ்
  - வடக்கு : 76/6 - பட்டா நிலம்.
  - தெற்கு : 75/3 - பட்டா நிலம்.
  - கிழக்கு : 75/5 - பட்டா நிலம்.
  - மேற்கு : 75/1 - பட்டா நிலம்.

3. புல எண். 75/5 0.76.0 ஏர்ஸ்
  - வடக்கு : 74/6 - பட்டா நிலம்.
  - தெற்கு : 82/2 - பட்டா நிலம்.
  - கிழக்கு : 75/6,7 - பட்டா நிலம்.
  - மேற்கு : 76/6,75/3,4 - பட்டா நிலம்.



4. புல எண். 75/6 0.24.0 ஏர்ஸ்


வடக்கு : 74/6 - பட்டா நிலம்.  
தெற்கு : 75/7 - பட்டா நிலம்.  
கிழக்கு : 73/11,12 - பட்டா நிலம்.  
மேற்கு : 75/5 - பட்டா நிலம்.

5. புல எண். 76/3B2 0.59.13 ஏர்ஸ்

வடக்கு : 76/3B1,2 - பட்டா நிலம்.  
தெற்கு : 75/1 - பட்டா நிலம்.  
கிழக்கு : 76/6 - பட்டா நிலம்.  
மேற்கு : 77/4,5 - பட்டா நிலம்.

மனுதாரர் நன்னடத்தையுள்ளவர். சிவில்/ கிரிமினல் வழக்குகளில் சம்மந்தப்படவில்லை. மனுதாரருக்கு இத்தொழிலில் முன் அனுபவம் உள்ளது. உத்தேச புலங்களுக்கு செல்ல பாதை வசதி உள்ளது. மேற்காணும் புலங்களில் புல எண்: 75/1, 75/4, 75/5 75/6, மற்றும் 76/3B2 ஆகியவற்றின் மொத்த பரப்பு 2.42.63 ஹெக்டேர் பரப்பளவில் சாதாரண கற்கள் வெட்டி எடுக்க மனுதாரர் அரசுக்கு செலுத்த வேண்டிய நிலுவைத் தொகை ஏதுமில்லை என்றும், மேற்படி விதிகளின்கீழ் குற்றம் புரியவோ, தண்டனை பெறவோ இல்லை என்பதை தெரிவித்துக்கொள்கிறேன்.

வானூர் வட்டம், எறையூர் கிராமத்தில் புல எண்கள் 75/1, 75/4, 75/5 75/6, மற்றும் 76/3B2 ஆகியவற்றின் மொத்த பரப்பு 2.42.63 ஹெக்டேர் சாதாரண கற்கள் மற்றும் கிராவல் குவாரி குத்தகை உரிமம் வழங்கலாம் என பணிவுடன் தெரிவித்துக்கொள்கிறேன்.

  
வக்தவரிய ஆய்வாளர்  
தெயிலி குறுவட்டம்  
வானூர் வட்டம்



ந.க.அ10/1846/2022,  
நாள்: 27.07.2022

வட்டாட்சியர் அலுவலகம்,  
வானூர்.

### குறிப்பாணை

- பொருள்:** கனிமமும் குவாரிகளும் - சிறுகனிமம் - சாதாரண கற்கள் மற்றும் கிராவல் - விழுப்புரம் மாவட்டம் வானூர் வட்டம் - எறையூர்கிராமம் - பட்டா புலனண்கள் 75/4 (0.30.0), 75/5 (0.76.0), 75/6 (0.24.0), 75/1 (0.53.5) மற்றும் 76/3பி2 (0.59.13) ஆகியவற்றில் 2.42.63 ஹெக்டர் பரப்பளவில் 10 ஆண்டுகளுக்கு சாதாரண கற்கள் மற்றும் கிராவல் வெட்டியெடுத்து குவாரி நடத்த அனுமதி கோரி திரு.வீரராகவன் த/பெ.ஆனந்தவேலு என்பவர் கொடுத்துக்கொண்ட மனு - அறிக்கை கோருதல் - தொடர்பாக.
- பார்வை:** 1. விழுப்புரம், துணை இயக்குநர், புவியியல் மற்றும் சுரங்கத்துறை அலுவலக கடிதம், ந.க.அ/பு&சு/253/2022, நாள்: 23.06.2022.  
2. திரு.வீரராகவன் த/பெ.ஆனந்தவேலு, மேட்டுத்தெரு, எறையூர் கிராமம், வானூர் வட்டம் என்பவரின் மனு நாள்: 15.06.2022.

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விழுப்புரம் மாவட்டம், வானூர் வட்டம், எறையூர்கிராமம், பட்டா புலனண்கள் 75/4 (0.30.0), 75/5 (0.76.0), 75/6 (0.24.0), 75/1 (0.53.5) மற்றும் 76/3பி2 (0.59.13) ஆகியவற்றில் 2.42.63 ஹெக்டர் பரப்பளவில் 10 ஆண்டுகளுக்கு சாதாரண கற்கள் மற்றும் கிராவல் வெட்டியெடுத்து குவாரி நடத்த அனுமதி கோரி திரு.வீரராகவன் த/பெ.ஆனந்தவேலு அனுமதி கோரி பார்வை 2-ல் காணும் விண்ணப்பம் அளித்தது தொடர்பாக பார்வை 1-ல் காணும் கடிதத்தில் விசாரணை அறிக்கை கோரியதின் பேரில் புலத்தின் புகைபடத்துடன் கீழ்க்கண்ட குறிப்புகளுடன் அறிக்கை அனுப்பி வைக்க நெமிலி வருவாய் ஆய்வர் மற்றும் நெமிலிகுறுவட்ட நில அளவர் ஆகியோர்கள் கேட்டுக்கொள்ளப்படுகிறார்கள்.

1. குவாரி குத்தகை கோரியுள்ள புலங்களில் இருந்து குடியிருப்பு பகுதிகள் எனில் 300மீ சுற்றுவட்டாரத்திற்குள் இருக்கக்கூடாது. இது குறித்து விளக்கமான குறிப்புகள் இடம் பெற வேண்டும்.

2. மின்கம்பி பாதைகளுக்கும் / தொலைபேசி பாதைகளுக்கும் குத்தகை கோரும் புலங்களுக்கும் அடையே 50மீ இடைவெளி இருக்கவேண்டும். 50மீ தொலைவிற்குள் இருந்தால் அதற்காக ஒதுக்க வேண்டிய பாதுகாப்பு இடைவெளி புலவரைபடத்தில் குறிப்பிடவேண்டும்.

3. குவாரி குத்தகை வழங்க ஆட்சேபணை உள்ளதா? என்பது குறித்த விவரம் ஆட்சேபணைகள் ஏதுமிருப்பின் அதன் உண்மைத்தன்மை குறித்தும், ஆட்சேபணை ஏற்கத்தக்கதா? இல்லையா? என்று குறிப்பாக அறிக்கையில் தெரிக்கவேண்டும்.

4. குவாரி குத்தகை கோரும் பகுதிக்கு பாதை வசதி குறித்த விவரங்கள் இடம்பெற வேண்டும்.

5. குவாரி குத்தகை கோரும் புலங்களுக்கு அருகில் நான்கு எல்லைகளிலும் உள்ள புல எண்கள் மற்றும் அதன் வகைப்பாட்டினை தெரிவிக்கவேண்டும்.

6. வட்டாட்சியரால் கையொப்பமிடப்பட்ட தெளிவாக உள்ள 3 நகல்கள் புலவரைபடம் மற்றும் கூட்டு புலவரைபடம் மற்றும் கிராமகணக்கு ஆவணங்களின் நகல்களும் இணைக்கவேண்டும்.

7. குத்தகைதாரர் குவாரி அனுமதி கோரும் புல எண்களில், குறிப்பிட்ட புலங்களில், புலத்தின் ஒரு பகுதியில் மட்டும் குவாரி செய்ய அனுமதி வேண்டும் பட்சத்தில் அந்த குறிப்பிட்ட பகுதியை புலவரைபடத்தில் அளவுகருடன் வரையறுத்து காட்டவேண்டும்.

8. உரிமம் கோரும் இடத்திற்கு ஏற்களவே அனுமதி வழங்கப்பட்டுள்ளதா என்பது குறித்தும், அருகில் அரசு புறம்போக்கு நிலம் / நீர்நிலை புறம்போக்கு இருப்பின் அவற்றின் விவரம் குறித்தும் தெரியப்படுத்த வேண்டும்.

9. புறம்போக்கு இடத்திற்கும், மறு செய்துள்ள இடத்திற்கும் இடையே கான்கிரீட் கற்களை ஊன்றி கம்பி வேலி அமைக்க வேண்டும்.

10. அரசாணை எண்.295, தொழில்துறை (ஆ.ஆ.ஊ.1) நாள்:03.11.2021-ன்படி குவாரி குத்தகை உரிமம் கோரும் பகுதியானது தொல்லியல்/புராதான/வரலாற்று சின்னங்கள் அமைந்துள்ள இடத்திலிருந்து 500 மீட்டர் இடைவெளி இருக்க வேண்டும். தேசிய பூங்காக்கள், வன விலங்கு சரணாலயம், புலிகள் காப்பகம், யானை வழித்தடங்கள், காப்புக்காடுகள் ஆகியவற்றிலிருந்து 1 கி.மீ இடைவெளி அல்லது மத்திய சுற்றுசூழல் வனம் மற்றும் பருவ நிலை மாற்றம் அமைச்சகத்தால் அறிவுறுத்தப்பட்டுள்ள அளவிற்கு இடைவெளி விடப்பட வேண்டும்.

இணைப்பு: விண்ணப்பம் மற்றும் ஆவணங்கள்.

அ/வ

வருவாய் வட்டாட்சியர்(பொ),  
வானூர்.

பெறுநர்

1. வருவாய் ஆய்வாளர்,  
நெமிலிகுறுவட்டம்.
2. நில அளவர்,  
நெமிலிகுறுவட்டம்.

நகல்: திரு.வீராகவன்  
த/பெ.ஆனந்தவேலு,  
மேட்டுத்தெரு,  
எறையூர் கிராமம்,  
வானூர் வட்டம்,  
விழுப்புரம்.





## பொது விளம்பரம்

விழுப்புரம் மாவட்டம், வானூர் வட்டம், எறையூர் கிராமத்தைச் சேர்ந்த திரு. வீரராகவன் த/பெ. ஆனந்தவேலு என்பவர் வானூர் வட்டம், எறையூர் கிராம புல எண். 75/1, 75/4, 75/5 75/6, மற்றும் 76/3B2 ஆகியவற்றின் மொத்த பரப்பு 2.42.63 ஹெக்டேரில் சாதாரண கற்கள் மற்றும் கிராவல் குவாரி 10 ஆண்டுகளுக்கு குத்தகை உரிமம் வழங்கக் கோரி விண்ணப்பித்துக் கொண்டது தொடர்பாக வானூர் வட்டம், எறையூர் கிராமத்தில் மேற்படி குத்தகை உரிமம் வழங்கப்பட்டுவதில் கிராம பொதுமக்களுக்கு ஏதும் ஆட்சேபனை இருப்பின் எழுத்து பூர்வமாக வானூர் வருவாய் வட்டாட்சியர் அவர்களிடம் 15 தினங்களுக்குள் தெரிவித்துக்கொள்ள கேட்டுக்கொள்கிறேன்.

  
Village Administration Office  
No: 51, Eraiyur,  
Vandur - 62

வியூப்புரம் மாவட்டம், வானூர் வட்டம், எறையூர் கிராம நிர்வாக அலுவலர் மற்றும் கிராம உதவியாளர் கொடுத்துக் கொண்ட வாக்குமூலம்.

ஆஜர்,

வானூர் வட்டம், எறையூர் கிராம புல எண்: 75/1, 75/4, 75/5 75/6, மற்றும் 76/3B2 ஆகியவற்றின் மொத்த பரப்பு 2.42.63 ஹெக்டேரில் சாதாரண கற்கள் மற்றும் கிராவல் குவாரி 10 ஆண்டுகளுக்கு குத்தகை உரிமம் வழங்கக் கோரி வானூர் வட்டம் எறையூர் கிராமத்தைச் சேர்ந்த திரு. வீரராகவன் த/பெ. ஆனந்தவேலு என்பவர் விண்ணப்பித்துக்கொண்டது தொடர்பாக நெமிலி குறுவட்ட வருவாய் ஆய்வாளரின் விசாரணை எனத் தெரிந்துக்கொண்டோம்.

வானூர் வட்டம், எறையூர் கிராமத்தில் கீழ்க்கண்ட விவரப்படி உள்ள பட்டா புஞ்சை நிலங்களில் 10 ஆண்டுகளுக்கு சாதாரண கற்கள் மற்றும் கிராவல் குவாரி குத்தகை உரிமம் கோரி வானூர் வட்டம் எறையூர் கிராமத்தைச் சேர்ந்த திரு. வீரராகவன் த/பெ. ஆனந்தவேலு என்பவர் விண்ணப்பித்துள்ளார்.மனுதாரர் குத்தகை உரிமம் கோரியுள்ள புலன்களின் விவரம் வருமாறு.

வ.எண்	புல எண்	வகைபாடு	மொத்த விஸ்தீரணம் (ஹெக்டேர்)
1.	75/1	புன்செய்	0.53.5
2.	75/4,	புன்செய்	0.30.0
3.	75/5	புன்செய்	0.76.0
4.	75/6	புன்செய்	0.24.0
5.	76/3B2	புன்செய்	0.59.13
		மொத்தம்	2.42.63

மேற்காணும் புலன்கள் யாவும் ஒருங்கிணைந்து ஒரே புலமாக உள்ளது. வ.எண். 1 முதல் 5 வரை 2.42.63 ஹெக்டேர் புஞ்சை நிலங்கள் எறையூர் கிராம கணக்கில் பட்டா எண்.5558, 5511,5506 திரு. ராதாகிருஷ்ணன் த/பெ. தனபால் மற்றும் திரு. கணேசன் த/பெ. அப்பாதுரை என்பவரின் பெயரில் தாக்கல் ஆகியுள்ளது. மேற்படி புலன்கள் யாவும் குத்தகை பத்திரம் மூலம் திரு. வீரராகவன் த/பெ. ஆனந்தவேலு என்பவருக்கு வழங்கப்பட்டுள்ளது. மேற்படி புலங்களில் ந.க.எண்.ஆ/பு&ச/253/2022 நாள்:23.06.2012ன்படி திரு. வீரராகவன் த/பெ. ஆனந்தவேலு என்பவர் கல்குவாரி உரிமம் கோரியுள்ள கிராம புல எண்.75/4, 75/5 75/6, 75/1, மற்றும் 76/3B2

ஆகியவற்றின் மொத்த பரப்பு 2.42.63 ஹெக்டேர் இப்புலங்களில் வில்லங்கம் ஏதுமில்லை. மேற்காணும் புலங்களின் அருகே 300 மீட்டர் தொலைவிற்குள் குடியிருப்புகள் ஏதுமில்லை. உத்தேச புலங்களில் கிணறுகள், கல் கட்டிடங்கள், புராதானசின்னங்கள், சுடுகாடு ஏதுமில்லை. உயர் அழுத்தம் மற்றும் தாழ்வழுத்த மின்கம்பிகள், தொலைபேசி கம்பங்கள் ஏதும் 50 மீட்டர் தொலைவிற்குள் செல்லவில்லை. இங்கு கற்குவாரி செய்ய ஆட்சேபணை குறித்து கிராமத்தில் விளம்பரம் செய்யப்பட்டதில், ஆட்சேபணை ஏதும் வரப்பெறவில்லை. குவாரி குத்தகை உரிமம் வழங்கப்படவுள்ள இடத்தில் வெட்டப்படும் கற்கள் எடுத்து செல்ல மேற்படி கிராம எல்லையில் புல எண்.55/3- அ.பு. சாலை ஓரம், 55/1- ர.பு, 205/- அ.பு. ஏரி, 62/2 - அ.பு கல்லாங்குத்து வழியாகவும், புல எண்.67/19 ர.பு, 67/4 ர.பு, 67/3A ர.பு, 67/3B ர.பு, 67/2 ர.பு, 68/2<sup>உ</sup> ர.பு, 69/1 ர.பு, 14/5 ர.பு, 14/4 ர.பு, 14/3 ர.பு, 14/1 ர.பு, 13/1A ர.பு, 13/1B, 12/4 ர.பு, 12/3 ர.பு, 5/- அ.பு, 4/4 ர.பு, 4/5 ர.பு, 76/1 ர.பு ஆகியவற்றின் வழியாக எடுத்து செல்ல பாதை வசதி உள்ளது.

உத்தேச புலத்திற்கு சக்குபந்தி விபரம் வருமாறு.

1. புல எண். 75/1 - 0.53.5 ஏர்ஸ்

வடக்கு : 76/3B2,6 - பட்டா நிலம்

தெற்கு : 75/2 - பட்டா நிலம்.

கிழக்கு : 75/4 - பட்டா நிலம்

மேற்கு : 77/5 - பட்டா நிலம்.

2. புல எண். 75/4 0.30.0 ஏர்ஸ்

வடக்கு : 76/6 - பட்டா நிலம்.

தெற்கு : 75/3 - பட்டா நிலம்.

கிழக்கு : 75/5 - பட்டா நிலம்.

மேற்கு : 75/1 - பட்டா நிலம்.

3. புல எண். 75/5 0.76.0 ஏர்ஸ்

வடக்கு : 74/6 - பட்டா நிலம்.

தெற்கு : 82/2 - பட்டா நிலம்.

கிழக்கு : 75/6,7 - பட்டா நிலம்.

மேற்கு : 76/6,75/3,4 - பட்டா நிலம்.

4. புல எண். 75/6 0.24.0 ஏர்ஸ்

வடக்கு : 74/6 - பட்டா நிலம்.  
தெற்கு : 75/7 - பட்டா நிலம்.  
கிழக்கு : 73/11,12 - பட்டா நிலம்.  
மேற்கு : 75/5 - பட்டா நிலம்.

5. புல எண். 76/3B2 0.59.13 ஏர்ஸ்

வடக்கு : 76/3B1,2 - பட்டா நிலம்.  
தெற்கு : 75/1 - பட்டா நிலம்.  
கிழக்கு : 76/6 - பட்டா நிலம்.  
மேற்கு : 77/4,5 - பட்டா நிலம்.

மனுதாரர் நன்னடத்தையுள்ளவர். சிவில்/கிரிமினல் வழக்குகளில் சம்மந்தப்படவில்லை. மனுதாரருக்கு இத்தொழிலில் முன் அனுபவம் உள்ளது. உத்தேச புலங்களுக்கு செல்ல பாதை வசதி உள்ளது. மேற்காணும் புலங்களில் புல எண்: 75/1, 75/4, 75/5 75/6, மற்றும் 76/3B2 ஆகியவற்றின் மொத்த பரப்பு 2.42.63 ஹெக்டேரில் வானூர் வட்டம் எறையூர் கிராமத்தைச் சேர்ந்த திரு. வீரராகவன் த/பெ. ஆனந்தவேலு என்பவர் 2.42.63 பரப்பளவில் சாதாரண கற்கள் மற்றும் கிராவல் குவாரி குத்தகை தொர்பாக மனுதாரர் அரசுக்கு செலுத்த வேண்டிய நிலுவைத் தொகை ஏதுமில்லை என்றும், மேற்படி விதிகளின்கீழ் குற்றம் புரியவோ, தண்டனை பெறவோ இல்லை என்பதை தெரிவித்துக்கொள்கிறோம்.

எனவே மனுதாரருக்கு வானூர் வட்டம், எறையூர் கிராமத்தில் புல எண்கள் 75/1, 75/4, 75/5 75/6, மற்றும் 76/3B2 ஆகியவற்றின் மொத்த பரப்பு 2.42.63 ஹெக்டேர் சாதாரண கற்கள் மற்றும் கிராவல் குவாரி குத்தகை உரிமம் வழங்குமாறு பணிவுடன் கேட்டுக்கொள்கிறோம்.

கிராம முயற்சிகள்

1) S. J.

2) N. Nelli

3) P. Lingam

4) T. R. B. M. 24

5) R. Gomathi

படித்துப்பார்த்தேன் சரி

மனுதாரர் ஆய்வாளர்  
செய்தி குறிப்பிடும்  
வானூர் வட்டம்

F. J. Paul  
23/11/2023.  
Village Administration Office  
No: 51, Erayur,  
Tamil Nadu

K. Subbaraj VA  
கிராம முயற்சிகள்

6) S-RAMU

7) Dinky. J

8) N. சுவாமி

9) உமாவதி. J

10) நித்தியா. K



விழுப்புரம் மாவட்டம், வானூர் வட்டம், எறையூர் கிராமத்தைச் சேர்ந்த திரு. வீரராகவன் த/பெ. ஆனந்தவேலு என்பவர் கொடுத்துக் கொண்ட வாக்குமூலம்.

ஆஜர்,

நான் மேற்படி முகவரியில் வசித்து வருகிறேன், நான் வானூர் வட்டம், எறையூர் கிராம புல எண்: 75/1, 75/4, 75/5 75/6, மற்றும் 76/3B2 ஆகியவற்றின் மொத்த பரப்பு 2.42.63 ஹெக்டேரில் 10 ஆண்டுகளுக்கு குத்தகை உரிமம் வழங்கக் கோரி கொடுத்துக்கொண்ட மனுவிற்கு நெமிலி குறுவட்ட வருவாய் ஆய்வாளரின் விசாரணை எனத் தெரிந்துக்கொண்டேன்.

எனக்கு வானூர் வட்டம், எறையூர் கிராமத்தில் சாதாரண கற்கள் மற்றும் கிராவல் குவாரி குத்தகை உரிமம் கோரியுள்ள புலங்களின் விபரம் வருமாறு.

வ.எண்	புல எண்	வகைபாடு	மொத்த விஸ்தீரணம் (ஹெக்டேர்)
1.	75/1	புன்செய்	0.53.5
2.	75/4,	புன்செய்	0.30.0
3.	75/5	புன்செய்	0.76.0
4.	75/6	புன்செய்	0.24.0
5.	76/3B2	புன்செய்	0.59.13
		மொத்தம்	2.42.63

மேற்காணும் புலங்கள் யாவும் ஒருங்கிணைந்து ஒரே புலமாக உள்ளது. வ.எண். 1 முதல் 5 வரை 2.42.63 ஹெக்டேர் புஞ்சை நிலங்கள் எறையூர் கிராம கணக்கில் பட்டா எண்.5558, 5511,5506 திரு. ராதாகிருஷ்ணன் த/பெ. தனபால் மற்றும் திரு. கணேசன் த/பெ. அப்பாதுரை என்பவரின் பெயரில் தாக்கல் ஆகியுள்ளது. மேற்படி புலங்கள் யாவும் குத்தகை பத்திரம் மூலம் திரு. வீரராகவன் த/பெ. ஆனந்தவேலு ஆகிய எனக்கு வழங்கியுள்ளனர் மேற்படி புலங்களில் ந.க.எண்.ஆ/பு&ச/253/2022 நாள்:23.06.2012ன்படி திரு. வீரராகவன் த/பெ. ஆனந்தவேலு என்பவர் கல்குவாரி உரிமம் கோரியுள்ள கிராம புல எண்.75/4, 75/5 75/6, 75/1, மற்றும் 76/3B2 ஆகியவற்றின் மொத்த பரப்பு 2.42.63 ஹெக்டேர் இப்புலங்களில் வில்லங்கம் ஏதுமில்லை. மேற்காணும் புலங்களின் அருகே 300 மீட்டர் தொலைவிற்குள் குடியிருப்புகள் ஏதுமில்லை. உத்தேச புலங்களில் கிணறுகள், கல் கட்டிடங்கள், புராதானசின்னங்கள், சுடுகாடு ஏதுமில்லை. உயர் அழுத்தம் மற்றும் தாழ்வழுத்த மின்கம்பிகள், தொலைபேசி கம்பங்கள் ஏதும் 50 மீட்டர்



தொலைவிற்குள் செல்லவில்லை. இங்கு கற்குவாரி செய்ய ஆட்சேபணை குறித்து கிராமத்தில் விளம்பரம் செய்யப்பட்டதில், ஆட்சேபணை ஏதும் வரப்பெறவில்லை. குவாரி குத்தகை உரிமம் வழங்கப்படவுள்ள இடத்தில் வெட்டப்படும் கற்கள் எடுத்து செல்ல மேற்படி கிராம எல்லையில் புல எண்.55/3- அ.பு. சாலை ஓரம், 55/1- ர.பு, 205/- அ.பு. ஏரி, 62/2 - அ.பு கல்லாங்குத்து வழியாகவும், புல எண்.67/19 ர.பு, 67/4 ர.பு, 67/3A ர.பு, 67/3B ர.பு, 67/2 ர.பு, 68/2<sup>ல</sup> ர.பு, 69/1 ர.பு, 14/5 ர.பு, 14/4 ர.பு, 14/3 ர.பு, 14/1 ர.பு, 13/1A ர.பு, 13/1B, 12/4 ர.பு, 12/3 ர.பு, 5/- அ.பு, 4/4 ர.பு, 4/5 ர.பு, 76/1 ர.பு ஆகியவற்றின் வழியாக எடுத்து செல்ல பாறை வசதி உள்ளது.

உத்தேச புலத்திற்கு சக்குபந்தி விபரம் வருமாறு.

1. புல எண். 75/1 - 0.53.5 ஏர்ஸ்

வடக்கு : 76/3B2,6 - பட்டா நிலம்  
தெற்கு : 75/2 - பட்டா நிலம்.  
கிழக்கு : 75/4 - பட்டா நிலம்  
மேற்கு : 77/5 - பட்டா நிலம்.

2. புல எண். 75/4 0.30.0 ஏர்ஸ்

வடக்கு : 76/6 - பட்டா நிலம்.  
தெற்கு : 75/3 - பட்டா நிலம்.  
கிழக்கு : 75/5 - பட்டா நிலம்.  
மேற்கு : 75/1 - பட்டா நிலம்.

3. புல எண். 75/5 0.76.0 ஏர்ஸ்

வடக்கு : 74/6 - பட்டா நிலம்.  
தெற்கு : 82/2 - பட்டா நிலம்.  
கிழக்கு : 75/6,7 - பட்டா நிலம்.  
மேற்கு : 76/6,75/3,4 - பட்டா நிலம்.

4. புல எண். 75/6 0.24.0 ஏர்ஸ்

வடக்கு : 74/6 - பட்டா நிலம்.  
தெற்கு : 75/7 - பட்டா நிலம்.  
கிழக்கு : 73/11,12 - பட்டா நிலம்.  
மேற்கு : 75/5 - பட்டா நிலம்.

5. புல எண். 76/3B2 0.59.13 ஏர்ஸ்

வடக்கு : 76/3B1,2 - பட்டா நிலம்.  
தெற்கு : 75/1 - பட்டா நிலம்.  
கிழக்கு : 76/6 - பட்டா நிலம்.  
மேற்கு : 77/4,5 - பட்டா நிலம்.

நான் நன்னடத்தையுள்ளவர். சிவில்/ கிரிமினல் வழக்குகளில் சம்மந்தப்படவில்லை. மனுதராருக்கு இத்தொழிலில் முன் அனுபவம் உள்ளது. உத்தேச புலங்களுக்கு செல்ல பாதை வசதி உள்ளது. மேற்காணும் புலங்களில் புல எண்: 75/1, 75/4, 75/5 75/6, மற்றும் 76/3B2 ஆகியவற்றின் மொத்த பரப்பு 2.42.63 ஹெக்டேர் பரப்பளவில் சாதாரண கற்கள் வெட்டி எடுக்க மனுதாரர் அரசுக்கு செலுத்த வேண்டிய நிலுவைத் தொகை ஏதுமில்லை என்றும், மேற்படி விதிகளின்கீழ் குற்றம் புரியவோ, தண்டனை பெறவோ இல்லை என்பதை தெரிவித்துக்கொள்கிறேன்.

எனவே எனக்கு வானூர் வட்டம், எறையூர் கிராமத்தில் புல எண்கள் 75/1, 75/4, 75/5 75/6, மற்றும் 76/3B2 ஆகியவற்றின் மொத்த பரப்பு 2.42.63 ஹெக்டேர் சாதாரண கற்கள் மற்றும் கிராவல் குவாரி குத்தகை உரிமம் வழங்குமாறு பணிவுடன் கேட்டுக்கொள்கிறேன். மேற்காணும் வாக்குமூலங்கள் யாவும் உண்மை என்றும் உண்மைக்கு புறம்பானவை என்று தெரியவந்தால் அரசு எடுக்கும் நடவடிக்கைக்கு உட்படுகிறேன் என்றும் உறுதி கூறுகிறேன்.

*Carman*  
சென்னை  
தெய்வீக குறுவட்டம்  
வானூர் வட்டம்

படித்துப்பார்த்தேன் சரி

படிக்கக்கேட்டேன் சரி

A. விஜயகாண்ட்.

வாரியம் உருவம் வட்டியை அளவளவி பண்படுத்தும் பரிசீலனை.

பார்வை : ௩-௧-௮ 10/1846 /2022 நாள் . 2-7-2022

51. நகராட்சி

பார்வையின் கண்ட முடிவுகள்படி வாரியம் உருவம் நகராட்சி கீழ்க்கண்டவற்றை . 75/4 - 0.30.0 ஏரன் , 75/5 - 0.76.0 ஏரன் , 75/6 - 0.24.0 ஏரன் 75/1 - 0.53.5 ஏரன் , 76/3B2 - 0.59.13 ஏரன் ஆகிய தொகுதிகளில் 2.42.63 ஏர் பரப்பளவின் ஆண்டிதேவையாக 2022-23 ஆண்டில் வாரியம் சீரமைப்பு பணியை மேற்கொள்ள திட்டமிட்டு 10 ஆண்டுகளுக்குள் அந்த தொகுதிகளை கீழ்க்கண்டவற்றை மீட்டி உருவாக்கம் செய்யப்பட்டு பண்படுத்தும் பரிசீலனை செய்து கொடுக்கப்படுகிறது.

வாரியம் உருவம் வாரியம் உருவம் நகராட்சி கீழ்க்கண்டவற்றை 76/3B2 - ௩-4 - 0.59.13 ஏரன் பட்டியலில் 5506. தனியாக நகராட்சி மன்றம் முதலமைச்சர், 40 ஏரன் . 75/1 - 0.53.50 - ௩-4 - பட்டியலில் 5511. தனியாக மன்றம் முதலமைச்சர், 40 ஏரன் . 75/4 - 0.30.0 ௩-4 - 40 ஏரன் . 75/5 - 0.76.0 - ௩-4 - 75/6 - 0.24.0 ஏரன் ஆகியவற்றை பட்டியலில் 5558. அப்பகுதியை மீட்டி மேற்கண்ட வாரியம் வாய்விட்டு உருவாக்கம் செய்யும் பணியை மேற்கொள்ள 31.60/2022 இல் படி கீழ்க்கண்டவற்றை 75/1, 4, 5, 6, 76/3B2 - இல் குறிப்பிட்டு உருவாக்கம் செய்யும் பணியை மேற்கொள்ள 10 ஆண்டுகளுக்குள் மேற்கொள்ள திட்டமிட்டு கொடுக்கப்படுகிறது.

**நகராட்சி பரிசீலனையின் விவரம் :-**

- அலகுகள் - 40 ஏரன் 76/3B2, 2 - ௩-4 - பட்டியலில்
- நகரிகள் - 40 ஏரன் 75/1 - ௩-4 - பட்டியலில்
- செய்க்கை - 40 ஏரன் 76/6 - ௩-4 - பட்டியலில்
- கேள்விகள் - 40 ஏரன் 75/4 ௩-4 - பட்டியலில்

40775/1  
-0.53.50  
பிள்ளை

அக்கன் - 40775/1 - 76/3B2, 6-5.4 - பட்டாபட்டி  
தெற்கன் - 40775/2 - 75/2 - 5.4. பட்டாபட்டி  
கிழக்கன் - 40775/4 - 75/4 - 5.4. பட்டாபட்டி  
மேற்கன் - 40775/5 - 77/5 - 5.4. பட்டாபட்டி

40775/4  
-0.30.00 பிள்ளை

அக்கன் - 40775/4 - 76/6 - 5.4. பட்டாபட்டி  
தெற்கன் - 40775/3 - 75/3 - 5.4. பட்டாபட்டி  
கிழக்கன் - 40775/5 - 75/5 - 5.4. பட்டாபட்டி  
மேற்கன் - 40775/1 - 75/1 - 5.4. பட்டாபட்டி

40775/5  
-0.76 பிள்ளை

அக்கன் - 40775/5 - 74/6 - 5.4. பட்டாபட்டி  
தெற்கன் - 40775/2 - 82/2 - 5.4. பட்டாபட்டி  
கிழக்கன் - 40775/6, 7 - 75/6, 7 - 5.4. பட்டாபட்டி  
மேற்கன் - 40775/6, 75/4, 75/3 - 5.4. பட்டாபட்டி

40775/6  
-0.24.00 பிள்ளை

அக்கன் - 40775/6 - 74/6 - 5.4. பட்டாபட்டி  
தெற்கன் - 40775/7 - 75/7 - 5.4. பட்டாபட்டி  
கிழக்கன் - 40775/11, 12 - 73/11, 12 - 5.4. பட்டாபட்டி  
மேற்கன் - 40775/5 - 75/5 - 5.4. பட்டாபட்டி

பாதுகாப்பு இடைவெளிக்கு அங்கீகரிக்கப்பட்டிருக்கிறது

மேற்கண்ட 40775/1 முதல் 40775/6 வரையில் 300 மீட்டர் சுற்றளவில்  
இயங்குபயன் அளவு கட்டுப்பாடுகளை தனியார் திருவிளக்குகளை மாற்றிக்கொடுப்பது  
சாத்தியமானது. மேலும் மேற்கண்ட குத்தக உதவல் அங்கீகரிக்கப்பட்ட உட்கட்ட  
40775/1 முதல் 40775/6 வரையில் அங்கீகரிக்கப்பட்டிருக்கிறது. தனியார் திருவிளக்குகளை  
மாற்றிக்கொடுப்பது சாத்தியமானது.

மேலும் இயல் எண்ணின் கோவை, மகூத, சரசு பொன்ற உயர்ப்பு  
 தளங்கள் யுத்தினால். கந்தலும், மான்கள், தோல், நீர்திணைகள்,  
 புராண சிவன்கள், உணர் உயர்ந்த மரங்கள், சிவகாம மரம்பு இவ்வாறு  
 யுத்த இன்தை. மேற்கண்ட புராணத்தின் மூலம் எடுக்கப்படும் கற்களை  
 சேமித்து வைக்க பொதுமான் இடமளி உண்டாக.

பாணத உத்தி:-

குத்தல் உத்தி கார்டு உத்தி இத்தி இத்தி 9212  
 எடுக்கப்படும் கற்களை தரமய அளவீடுகள். 55/1-54, 55/3- 51-4- காலை  
 205-51-4. 55 - 62/2-51-4 - கள்ளாத்தி, 67/19- 54, 67/4, 3A, 3B, 2-5  
 68/2B-54 - 69/1-54, 14/5, 1, 3, 4 - 54 13/2-54, 12/3, 4, -54, 5-51  
 4/415 - 54, 76/1, 2, 3A, 6 - 54 குத்தல் சிவகாம அளவீடுகள் மூலம் தடுக்கப்படும் -  
 எடுக்கப்படும் கற்களை பொது பாணத உத்தி உத்தி எடுக்கப்படும்  
 பணிக்குறிப்பும்புகளும். தயார் செய்து காண்பு  
 27/14/20  
 9212

அனுப்புநர்

திருமதி.N.விஜயலட்சுமி, எம்.எஸ்.சி.,  
துணை இயக்குநர்,  
புவியியல் மற்றும் சுரங்கத்துறை,  
விழுப்புரம்.

பெறுநர்

வருவாய் கோட்டாட்சியர்,  
விழுப்புரம்.

ந.க.அ/பு&சு/253/2022 நாள். 06.2022

அய்யா,



பொருள் :

கனிமங்களும் குவாரிகளும் - சிறுகனிமம் - சாதாரண கற்கள் மற்றும் கிராவல் - விழுப்புரம் மாவட்டம் - வானூர் வட்டம் - எறையூர் கிராமம் - பட்டா புல எண்கள். 75/4 (0.30.0), 75/5 (0.76.0), 75/6 (0.24.0), 75/1 (0.53.5), 76/3பி2 (0.59.13) ஆகியவற்றில் 2.42.63 ஹெக்டர் பரப்பளவில் பத்தாண்டுகளுக்கு சாதாரண கற்கள் மற்றும் கிராவல் வெட்டியெடுக்க குவாரி குத்தகை அனுமதி கோரி திரு.A.வீரராகவன், த/பெ.ஆனந்தவேலு என்பவரது மனு - அறிக்கை கோருதல் - தொடர்பாக.

பார்வை :

திரு.A.வீரராகவன், த/பெ.ஆனந்தவேலு, மேட்டுத்தெரு, எறையூர் கிராமம், வானூர் வட்டம், விழுப்புரம் மாவட்டம் என்பவரது விண்ணப்பம் நாள்.15.06.2022.

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திரு.A.வீரராகவன், த/பெ.ஆனந்தவேலு, எறையூர் கிராமம் என்பவர் வானூர் வட்டம், எறையூர் கிராமம், பட்டா புல எண்கள். 75/4 (0.30.0), 75/5 (0.76.0), 75/6 (0.24.0), 75/1 (0.53.5), 76/3பி2 (0.59.13) ஆகியவற்றில் 2.42.63 ஹெக்டர் பரப்பளவில் பத்தாண்டுகளுக்கு சாதாரண கற்கள் மற்றும் கிராவல் வெட்டியெடுக்க குவாரி குத்தகை அனுமதி கோரி பார்வையில் காணும் விண்ணப்பத்தினை சமர்ப்பித்துள்ளார்.

மேற்கண்ட பார்வையில் காணும் விண்ணப்பம் இணைப்புகளுடன் வானூர் வட்டாட்சியருக்கு அனுப்பப்பட்டு விசாரணை அறிக்கையை தங்கள் மூலமாக அனுப்பி வைக்குமாறு தெரிவிக்கப்பட்டுள்ளது. எனவே வானூர் வட்டாட்சியரிடமிருந்து அறிக்கையை பெற்று தங்களது விசாரணை அறிக்கையுடன் இவ்வலுவலகத்திற்கு அனுப்பி வைக்குமாறு தங்களை கேட்டுக் கொள்கிறேன்.

அறிக்கை அனுப்பும்போது மேற்படி புலத்தின் புகைப்படத்துடன் கீழ்க்கண்ட இனங்கள் சம்பந்தமான குறிப்புகளை விவரங்களுடன் அனுப்புமாறும் கேட்டுக் கொள்கிறேன்.

1. குவாரி குத்தகை கோரியுள்ள புலங்களிலிருந்து குடியிருப்பு பகுதிகள் 300 மீட்டர் சுற்று வட்டத்திற்குள் இருக்க கூடாது. இதுகுறித்து விளக்கமான குறிப்புகள் இடம் பெற வேண்டும்.
2. மின்கம்பி பாதைகள் / தொலைபேசி பாதைகள் / இரயில் பாதைகளுக்கு இருபுறமும் 50 மீட்டர் பாதுகாப்பு இடைவெளி விட்டு அதற்காக ஒதுக்க வேண்டிய பாதுகாப்பு இடைவெளி புலவரைபடத்தில் குறிப்பிடப்பட வேண்டும்.



3. குவாரி குத்தகை வழங்க ஆட்சேபனை ஏதும் உள்ளதா என்பது குறித்த விவரம், ஆட்சேபனைகள் ஏதுமிருப்பின் அதன் உண்மைத்தன்மை குறித்தும், ஆட்சேபனை ஏற்கத்தக்கதா? இல்லையா? என்று குறிப்பாக அறிக்கையில் தெரிவிக்க வேண்டும்.
4. குவாரி குத்தகை கோரும் பகுதிக்கு பாதை வசதி குறித்த விவரங்கள் இடம்பெற வேண்டும்.
5. குவாரி குத்தகை கோரும் புலங்களுக்கு அருகில் நான்கு எல்லைகளிலும் உள்ள புல எண்கள் மற்றும் அதன் வகைப்பாட்டினை தெரிவிக்க வேண்டும்.
6. வட்டாட்சியரால் கையொப்பமிடப்பட்ட தெளிவாக உள்ள 3 நகல்கள் புலவரைப்படம் மற்றும் கூட்டுப் புலவரைப்படம் மற்றும் கிராமக்கணக்கு ஆவணங்களின் நகல்களும் இணைக்க வேண்டும்.
7. குத்தகைதாரர் குவாரி அனுமதி கோரும் புல எண்களில், குறிப்பிட்ட புலங்களில், புலத்தின் ஒரு பகுதியில் மட்டும் குவாரி செய்ய அனுமதி வேண்டும் பட்சத்தில் அந்த குறிப்பிட்ட பகுதியை புல வரைபடத்தில் அளவுகளுடன் வரையறுத்து காட்ட வேண்டும்.
8. உரிமம் கோரும் இடத்திற்கு ஏற்கனவே அனுமதி வழங்கப்பட்டுள்ளதா என்பது குறித்தும், அருகில் அரசு புறம்போக்கு நிலம் / நீர்நிலை புறம்போக்கு இருப்பின் அவற்றின் விபரம் குறித்தும் தெரியயடுத்த வேண்டும்.
9. புறம்போக்கு இடத்திற்கும், மனு செய்துள்ள இடத்திற்கும் இடையே கான்கிரீட் கற்களை ஊன்றி கம்பி வேலி அமைக்க வேண்டும்.
10. அரசாணை எண்: 295, தொழில்துறை (MMC1) நாள்: 03.11.2021-ன்படி குவாரி குத்தகை உரிமம் கோரும் பகுதியானது தொல்லியல்/புராதான/வரலாற்று சின்னங்கள் அமைந்துள்ள இடத்திலிருந்து 500 மீட்டர் இடைவெளி இருக்க வேண்டும். தேசிய பூங்காக்கள், வன விலங்கு சரணாலயம், புலிகள் காப்பகம், யானை வழித்தடங்கள், காப்புக்காடுகள் ஆகிவற்றிலிருந்து 1 கி.மீ இடைவெளி அல்லது மத்திய சுற்றுச்சூழல் வனம் மற்றும் பருவ நிலை மாற்றம் அமைச்சகத்தால் அறிவிறுத்தப்பட்டுள்ள அளவிற்கு இடைவெளி விடப்படவேண்டும்.

இணைப்பு : விண்ணப்பம் மற்றும் ஆவணங்கள்.

  
 துணை இயக்குநர்,  
 புவியியல் மற்றும் சுரங்கத்துறை,  
 விழுப்பரம்.

நகல் : வட்டாட்சியர், வானூர் - இணைப்புகளுடன்.  
 (அறிக்கையை வருவாய் கோட்டாட்சியர், விழுப்புரம்  
 அவர்கள் மூலமாக அனுப்பி வைக்க).

  
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தமிழ்நாடு வனத்துறை

பெறுநர்.

மாவட்ட ஆட்சியர்,  
விழுப்புரம் மாவட்டம்,  
விழுப்புரம்.

அனுப்பநர்.

திரு.கமேஷ் சோமன், இ.வ.ப.,  
மாவட்ட வன அலுவலர்,  
விழுப்புரம் வனக்கோட்டம்,  
விழுப்புரம்.

ந.க.எண்.5921/2023/வ. நாள். 25.08.2023

அய்யா.

பொருள்: வனம் - திண்டிவனம் வனச்சரகத்திற்கு உட்பட்ட வானூர்  
வட்டம் என்றழூர் கிராமத்தில் SF Nos. 75/1(0.53.5),  
75/4(0.30.0), 75/5(0.24.0), 76/3B2(0.59.13) 2.42.63 எக்டர்  
பரப்பளவில் சுரங்கம் அமைய உள்ள பகுதிக்கு அநுகில்  
உள்ள காப்புக்காட்டின் விபரங்கள் கோரியது. - தொடர்பாக.

பார்வை: 1 துணை இயக்குநர், புவியியல் மற்றும் சுரங்கம், விழுப்புரம்  
ந.க.எண்.A/G&M/253/2022, நாள்:03.08.2023.

2 வனச்சரக அலுவலர், திண்டிவனம் வனச்சரகம்  
திண்டிவனம் ந.க.எண்.238/2023 நாள்: 23.08.2023.

\*\*\*

மேற்காணும் பொருள் தொடர்பாக, பார்வை 1-ல் காணும் துணை  
இயக்குநர், புவியியல் மற்றும் சுரங்கத்துறை, விழுப்புரம் அவர்களின் கடிதத்தில்  
திண்டிவனம் வனச்சரகத்திற்குட்பட்ட வானூர் வட்டம், என்றழூர் கிராமத்தில்  
SF Nos 75/1(0.53.5), 75/4(0.30.0), 75/5(0.24.0), 76/3B2(0.59.13) மொத்த பரப்பு  
2.42.63 எக்டர் பரப்பளவில் மண் மற்றும் கல் சுரங்கம் அமைய உள்ள பகுதிக்கு  
அநுகில் உள்ள காப்புக்காடு மற்றும் பறவைகள் சரணாலயத்தின் விபரங்கள்  
பின்வருமாறு தெரிவிக்கப்படுகிறது.

வ.எண்	குவாரி அமைய உள்ள இடத்தின் GPS அளவீடு	காப்புக்காடு / சரணாலயத்தின் பெயர்	காப்புக்காடு / சரணாலயத்தின் GPS அளவீடு	இடையே உள்ள தொலைவு (கி.மீ)
1.	N 12.07228 E 079.64708	குமளம்பாடு காப்புக்காடு (TAF CORN)	N 12.14830 E 079.78488	17.12 கி.மீ
2.	N 12.07228 E 079.64708	கழுமெளி பறவைகள் சரணாலயம்	N 12.119485 E 079.83335	20.0 கி.மீ
3.	N 12.07197 E 079.64702	உகட்டேரி பறவைகள் சரணாலயம்	N 11.973566 E 079.75149	15.61 கி.மீ



மேற்காணும் விவரங்கள் பார்வை 1 மற்றும் 2-ல் காணும் கடிதங்களில் குறிப்பிடப்பட்டுள்ள GPS விபரங்கள் அடிப்படையில் மட்டுமே வழங்கப்படும் தகவலாகும் என்ற விபரத்தை அன்புடன் தெரிவித்துக்கொள்கிறேன்.

இணைப்பு - மேற்கூறியவாறு

நங்கள் மண்டலமயங்கள்

மாவட்ட வனத்துறை,  
விழுப்புரம் மண்டலம்,  
விழுப்புரம்.

25.12.20

நகல்: வனப்பாதுகாவலர், விழுப்புரம் மண்டலம், விழுப்புரம் அவர்களுக்கு பணிந்து சமர்ப்பிக்கப்படுகிறது.

நகல்: துணை இயக்குநர், புவியியல் மற்றும் சரங்கம், விழுப்புரம்.

இனிவரும் காலங்களில் அனுப்பப்படும் கடிதங்கள் மாவட்ட ஆட்சியர் சூலமங்க அனுப்பிவைக்குமாறு கேட்டுக்கொள்ளப்படுகிறது.

# MINING PLAN FOR ERAIYUR ROUGH STONE QUARRY



(Prepared under Rule 19, 41 Tamilnadu Minor Mineral Concession Rules, 1959  
and amended Minor Mineral Conservation and Development Rules, 2018)

**Lease In Own Patta Land  
(Period: (Five) 5 Years)**

*FOR*

## LOCATION OF THE LEASE APPLIED AREA

**Extent : 4.83.5 Ha**  
**S.F.Nos : 80/3, 80/4, 81/1, 81/3, 81/4,  
81/5, 81/6, 94/1A, 94/2 & 94/3**  
**Village : Eraiyur**  
**Taluk : Vanur**  
**District : Viluppuram**  
**State : Tamil Nadu**

*IN*

## Applicant

**Thiru. T. Vasudevan,  
S/o. Thangavel,  
Eraiyur Village, Vanur Taluk,  
Viluppuram District - 604 304  
Cell No: 9585931689**

## Prepared by

**R.RAJASEKAR.M.Sc.  
Recognised Qualified Person  
RQP/CNN/264/2015/A  
No.4A, Chozha Nagar, Pennadam Post,  
Tittakudi Taluk, Cuddalore- 606105.  
Cell: 9486905579, 8870110245  
e.mail: raja.parvathi @ gmail.com**



**CONTENTS**

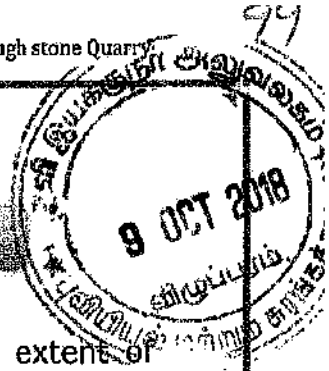
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1	Precise Area Communication Letter issued from the District Collector	I
2	FMB Sketch along with measurements	II
3	Land Documents (Patta, Adangal, A.Register, etc.,)	III
4	Copy of Identity Proof	IV
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**LIST OF PLATES**

Sl. No.	Description	Plate No	Scale
1	Location Plan	I	Not to scale
2	Key Plan	II	Not to scale
3	Topo Sketch of quarry lease area for 10Km Radius.	III	1:100000
4	Satellite Imagery	IV	1:10000
5	Environmental Management Plan	V	1:10000
6	Quarry Lease and Surface Plan	VI	Plan-1:1000
7	Topography, Geological Plan & Section Year wise Development, Production Plan & Sections	VII, VII-A VII-B & VII-C	Plan-1:1000 SecHor-1:1000; Ver-1:500
8	Conceptual Plan and Sections	VIII , VIII-A, VIII -B VIII -C & VIII -D	Plan-1:1000 Sec Hor-1:1000; Ver-1:500

**CONSENT LETTER FROM THE MINE OWNER**

The Mining Plan in respect of **Rough Stone quarry** over an extent of **4.83.5 hectares of Own Patta land** in S.F.Nos. **80/3(0.28.0), 80/4(0.47.0), 81/1(0.48.0), 81/3(0.36.0), 81/4(0.36.0), 81/5(0.35.0), 81/6(1.18.0), 94/1A(0.27.0), 94/2(0.29.0) & 94/3(0.79.5)** of **Eraiyur Village, Vanur Taluk, Viluppuram District** and Tamilnadu State has been prepared by **Thiru.R.Rajasekaran, M.Sc., Recognised Qualified Person** and Registration Number. **RQP/CNN/264/2015/A**

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

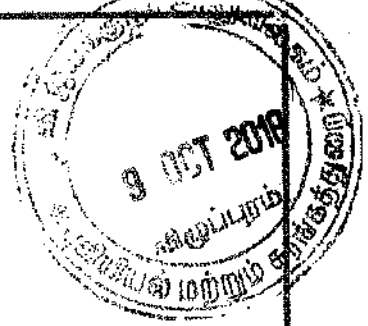
**R.RAJASEKAR.M.Sc.,**  
**Recognised Qualified Person**  
**Reg.No.RQP/CNN/264/2015/A**  
 No.4A, Chozha Nagar, Pennadam Post,  
 Tittakudi Taluk, Cuddalore- 606105.  
 Cell - 9486905579/8870110245.  
 Email: raja.parvathi@gmail.com

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

*x T. Vasudevan*  
 Signature of the Applicant  
**(T.Vasudevan)**

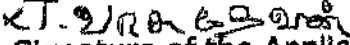
Place : Viluppuram  
 Date : .10.2018

**Thiru.T.Vasudevan,**  
S/o.Thangavel,  
Eraiyr Village, Vanur Taluk,  
Viluppuram District - 604 304



**DECLARATION**

The Mining Plan in respect of **Rough Stone quarry** over an extent of 4.83.5 hectares of Own Patta land in S.F.Nos. 80/3(0.28.0), 80/4(0.47.0), 81/1(0.48.0), 81/3(0.36.0), 81/4(0.36.0), 81/5(0.35.0), 81/6(1.18.0), 94/1A(0.27.0), 94/2(0.29.0) & 94/3(0.79.5) of Eraiyur Village, Vanur Taluk, Viluppuram District and Tamil Nadu State has been prepared with my consultation and I have understood the contents and agree to implement the same in accordance with the Mining Laws.

  
Signature of the Applicant

**(T.Vasudevan)**

Place : Viluppuram

Date : 09.10.2018

R.RAJASEKAR.M.Sc.,  
 Recognised Qualified Person,  
 Reg.No. RQP/CNN/264/2015/A  
 No.4A, Chozha Nagar, Pennadam Post,  
 Tittakudi Taluk,  
 Cuddalore Dt - 606105,Tamilnadu



**CERTIFICATE**

This is to certify that, the provisions of Minor Minerals Conservation and Development Rules, 2010 (MMCDR) have been observed in the Mining Plan for the grant of **Rough Stone quarry** lease over an extent of 4.83.5 hectares of Own Patta land in S.F.Nos. 80/3(0.28.0), 80/4(0.47.0), 81/1(0.48.0), 81/3(0.36.0), 81/4(0.36.0), 81/5(0.35.0), 81/6(1.18.0), 94/1A (0.27.0), 94/2(0.29.0) & 94/3(0.79.5) of Eraiyur Village, Vanur Taluk, Viluppuram District, Tamil Nadu State applied by **Thiru. T.Vasudevan**

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

It is also certified that Information furnished in the above Mining Plan are true and correct to the best of my knowledge.

**Certified**

Signature of Recognised Qualified Person

**R. RAJASEKAR, M.Sc.,**  
 Recognised Qualified Person  
 Reg.No. RQP/CNN/264/2015/A

Place : Cuddalore

Date : 09.10.2018

R.RAJASEKAR.M.Sc.,  
Recognised Qualified Person,  
Reg.No. RQP/CNN/264/2015/A  
No.4A, Chozha Nagar, Pennadam Post,  
Tittakudi Taluk,  
Cuddalore- 606105,Tamilnadu.

**CERTIFICATE**

Certified that, In preparation of Mining Plan for **Rough Stone quarry** over an extent of 4.83.5 hectares of Own Patta land in S.F.Nos. 80/3(0.28.0), 80/4(0.47.0), 81/1(0.48.0), 81/3(0.36.0), 81/4(0.36.0), 81/5(0.35.0), 81/6(1.18.0), 94/1A (0.27.0), 94/2(0.29.0) & 94/3(0.79.5) of Erailyur Village, Vanur Taluk, Viluppuram District, Tamilnadu State

**Thiru.T.Vasudevan** covers all the provisions of Mines Act, Rules, and Regulations etc., made there under and whenever specific permission are required, the Applicant will approach the Director General of Mines Safety, Chennai. The standards prescribed by DGMS in respect of Mines Health will be strictly implemented.

**Certified**

Signature of Recognised Qualified Person

**R. RAJASEKAR, M.Sc.,**  
Recognised Qualified Person  
Reg.No. RQP/CNN/264/2015/A

Place : Cuddalore

Date : 09.10.2018



# **MINING PLAN FOR ERAIYUR** **ROUGH STONE QUARRY**

Over an extent of 4.83.5 hectares at S.F.Nos. 80/3, 80/4, 81/1, 81/3, 81/4, 81/5, 81/6, 81/7, 81/8, 81/9, 81/10, 81/11, 81/12, 81/13, 81/14, 81/15, 81/16, 81/17, 81/18, 81/19, 81/20, 81/21, 81/22, 81/23, 81/24, 81/25, 81/26, 81/27, 81/28, 81/29, 81/30, 81/31, 81/32, 81/33, 81/34, 81/35, 81/36, 81/37, 81/38, 81/39, 81/40, 81/41, 81/42, 81/43, 81/44, 81/45, 81/46, 81/47, 81/48, 81/49, 81/50, 81/51, 81/52, 81/53, 81/54, 81/55, 81/56, 81/57, 81/58, 81/59, 81/60, 81/61, 81/62, 81/63, 81/64, 81/65, 81/66, 81/67, 81/68, 81/69, 81/70, 81/71, 81/72, 81/73, 81/74, 81/75, 81/76, 81/77, 81/78, 81/79, 81/80, 81/81, 81/82, 81/83, 81/84, 81/85, 81/86, 81/87, 81/88, 81/89, 81/90, 81/91, 81/92, 81/93, 81/94, 81/95, 81/96, 81/97, 81/98, 81/99, 81/100 at Eraiyur Village, Vanur Taluk, Viluppuram District for a lease period of (Five) 5 Years only.

*(Prepared under Rule 19, 41 Tamilnadu Minor Mineral Concession Rules, 1959 and amended Minor Mineral Conservation and Development Rules, 2010)*



## **1.0 INTRODUCTION**

The present Mining Plan and Environmental Management Plan are prepared for **Thiru.T.Vasudevan**, S/o.Thangavel, Eraiyur Village, Vanur Taluk, Viluppuram District – 604 304.

1. The excavated Rough stone is used for building basement and road construction stones and also used for crushing units road projects and other infrastructure development work in and around the district.
2. The application was meritoriously processed and precise area communication letter issued by the District Collector, Viluppuram District has passed an order vide *R.C.No. A/G&M/181/2018 Dated 27.09.2018*
3. The applicant has to submit Mining Plan and to get approval from the Assistant Director, Department of Geology & Mining, Viluppuram District and to obtain Environmental Clearance from the District Level Environment Impact Assessment Authority (DEIAA), Viluppuram District, Tamil Nadu State, vide MOEF and Climate Change Notification. S.O.141 (E) dated 15.01.2016.
4. Geological Resources is estimated at  $36,65,304m^3$  of Rough stone up to a depth of 87.0m (Max) and Mineable Reserves is estimated at  $12,82,318m^3$  of Rough stone up to a depth of 72.0m (Max) after leaving the safety distance of 7.5m from the boundary of the lease applied quarry area and safety distance of 10m should be provided for the Village road passing on Eastern side of the

applied area as indicated in precise area communication letter and relevant mining laws in force.

5. **Production Schedule** is proposed an average production of **4,08,793m<sup>3</sup>** (67,465 Lorry Loads) of **Rough stone** up to a depth of **27.0m** (Max) below ground level for the period of (Five) **5 Years** only.



## I. ENVIRONMENTAL PARAMETERS,

### i. Forest Conservation Act, 1980:

- ❖ There is no Reserved Forest around 10Km Radius from the boundary of lease applied area.

### ii. Interstate Boundary:

- ❖ (Puducherry) Chettipattu Village - 5.1 Km - Southern side
- ❖ (Puducherry) Sandhai Pudukuppam Village - 5.9 Km - Southeastern

### iii. Wildlife (Protection) Act, 1972:

- ❖ The area does not attract the Wild Life Sanctuary around 10Km Radius from the boundary of lease applied area.

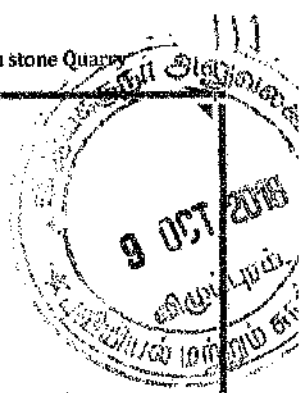
### iv. The Coastal Regulation Zone (CRZ) Notification 1991:

- ❖ There is no Coastal Regulation Zone (CRZ) around 10Km Radius from the boundary of lease applied area.

### v. Infrastructure around 500m Radius :

Table No: 1

S.No	Description	Distance from boundary of Quarry site	Direction
1	Approach Road	0.7 Km	SE
2	Water Bodies (River, Urani, Pond, Odai etc.,	283m(Odai)	S
		575m (Lake)	SE
3	Habitation	---	---
4	HT / LT- Line	---	---

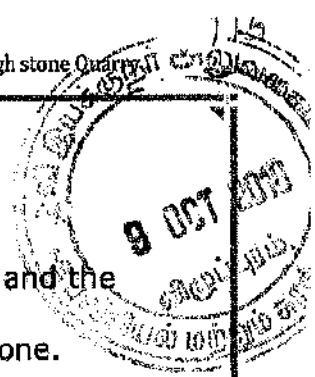
**II. ENVIRONMENTAL MEASURES TO BE ADOPTED SHALL BE,**

1. Dust Control at source while *wet drilling* and *controlled blasting*.
2. Dust suppression at loading point and transport haul roads.
3. Noise Control In Blasting, control of fly rock missiles and Vibration by doing peak particle velocity with In standard as prescribed by the DGMS and MOEF.
4. Unnecessary land degradation should be avoided or damaged land should be reclaimed or rehabilitated.
5. Avoid uneven rat hole mining and follow scientific and systematic mining by safe bench system of open cast mining.
6. Mining near major fracture zones if any should be avoided to control ground water fluctuation in the adjacent agricultural lands.
7. Emission test of vehicles should be in tack to maintain minimum emission level of fuel gases.
8. Noise level should not exceed *80db* and the vehicles should use only permitted Air Horn while on road near residential areas.
9. Safety zones as prescribed by the Department of Geology and Mining from adjacent infrastructures should be strictly to adhere to.
10. Any other conditions as stipulated by the concerned authorities should be followed to protect the Environment and Ecology of the area.

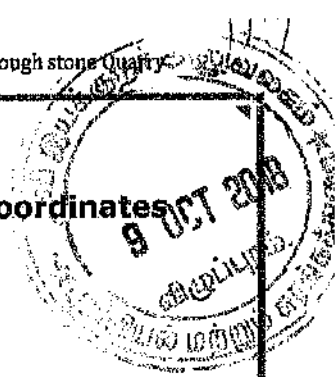
**2.0. EXECUTIVE SUMMARY**

The area applied for lease is a Rough Stone quarry in Own Patta land of Survey Numbers - 80/3, 80/4, 81/1, 81/3, 81/4, 81/5, 81/6, 94/1A, 94/2 & 94/3 of Eraiyur Village, Vanur Taluk and Viluppuram District.

1. Name of the Village Panchayat - Eraiyur
2. Name of the Panchayat Union - Vanur
3. The proposed Total Movable Reserves - 12,82,318m<sup>3</sup> of Rough stone formation.
4. **Production Schedule** is proposed an average production of 4,04,793m<sup>3</sup> (67,465 Lorry Loads) of **Rough stone** up to a depth of 27.0m(Max) below ground level for the period of (Five) 5 Years only
5. Total extent of the area - **4.83.5 Ha**
6. Proposed Lease Period - (Five) **5 years** only
7. Existing depth of mining - 17.0m (Max) below ground level
8. Proposed Depth of mining - **27.0m (Max)** below ground level  
(i.e.; 10m extending from the existing old pit)
9. Method of mining / level of mechanization - Opencast, Semi-mechanized Mining with a bench height of 5.0m & width of 5.0m is proposed and involves shallow Jackhammer drilling, Slurry blasting is proposed for this quarrying operation.
10. Types of Machineries used in the quarry - Jack hammer 30-32mm dia,
11. Tractor mounted compressor attached with Jack hammer.
12. Excavator of 0.9m<sup>3</sup> bucket capacity is attached with Rock breaker is proposed to deploy for quarrying operation. Total consumption for Rough stone is around = 3,23,840 Liters of HSD for the entire period of life of the quarry.



13. No Trees will be uprooted due to this quarrying operation.
14. The existing road from the main road to quarry is in good condition and the
15. Same will be maintained and utilized for Transportation of Rough stone.
16. There is no Export of this quarrying Rough stone.
17. Topo sketch covering 10Km, 500m radius around the proposed area with markings of Habitations, Water bodies like Streams, Rivers, Roads, Major structure like Bridges, Wells, Archeological, Historical Importance, Places of worship is marked and enclosed as Plate No. IV & V
18. The lease applied area is 4.83.5 Ha bounded by 20 corners, the corners are designated a 1-20 Clockwise from the South western corner and the coordinates are clearly marked in Plate no - VI
19. The diagram showing the Mining area, dimensions of the Pit, proposed depth of mining for the mining plan period are enclosed as Plate No -VI
20. The lease applied area is 10Km away from the protected area under Wildlife Production Act 1972, critically polluted area as identified by CPCB and notified Eco sensitive areas.
21. There are no wastages anticipated during this quarry operation, hence waste dump is not proposed in this lease applied area.
22. Around 28 Employees are deploying in this quarrying operation.



1. The lease applied area is bounded by all corners and the coordinates are clearly marked in Plate no - VI

Table -2

Corners	Co-ordinates		Distance between the corners
	Latitude	Longitude	
1	12° 04' 16.98" N	79° 38' 34.04" E	1-2 = 52.4m
2	12° 04' 18.58" N	79° 38' 34.65" E	2-3 = 40.6m
3	12° 04' 19.79" N	79° 38' 35.19" E	3-4 = 72.6m
4	12° 04' 18.77" N	79° 38' 37.35" E	4-5 = 7.6m
5	12° 04' 18.53" N	79° 38' 37.27" E	5-6 = 88.0m
6	12° 04' 17.48" N	79° 38' 39.97" E	6-7 = 22.4m
7	12° 04' 16.81" N	79° 38' 39.68" E	7-8 = 180.8m
8	12° 04' 14.71" N	79° 38' 45.27" E	8-9 = 13.0m
9	12° 04' 14.33" N	79° 38' 45.10" E	9-10 = 80.0m
10	12° 04' 11.87" N	79° 38' 44.19" E	10-11 = 65.8m
11	12° 04' 10.02" N	79° 38' 43.09" E	11-12 = 7.2m
12	12° 04' 09.81" N	79° 38' 42.98" E	12-13 = 15.2m
13	12° 04' 10.02" N	79° 38' 42.52" E	13-14 = 9.4m
14	12° 04' 9.72" N	79° 38' 42.52" E	14-15 = 103.4m
15	12° 04' 10.91" N	79° 38' 39.33" E	15-16 = 43.6m
16	12° 04' 11.44" N	79° 38' 37.99" E	16-17 = 38.4m
17	12° 04' 12.60" N	79° 38' 38.48" E	17-18 = 27.0m
18	12° 04' 13.51" N	79° 38' 36.28" E	18-19 = 35.6m
19	12° 04' 14.60" N	79° 38' 36.68" E	19-20 = 33.8m
20	12° 04' 15.61" N	79° 38' 37.11" E	20-01 = 102.0m

## 2. Lease Boundaries:

- i. Eastern Side : Patta Land
- ii. Western Side : Patta Land
- iii. Northern Side : Patta Land
- iv. Southern Side : Patta Land

**PART - A****3.0. GENERAL INFORMATION:****3.1. Name of the Applicant with Address, contact no, email etc.,**

Name : **Thiru.T.Vasudevan,**  
S/o.Thangavel,  
Eraiur Village,  
Vanur Taluk,  
District : Viluppuram  
State : Tamilnadu  
Pin code : 604 304  
Contact no : 9585931689  
Email :

**3.2. Status of the Applicant (Individual / Company / Firm)**

The applicant is a Private Individual.

**3.3. Mineral which the Applicant intends to mine**

Rough Stone only.

**3.4. Precise area communication Letter details received from the competent authority of the government.**

Precise area communication letter issued from the District Collector, Viluppuram vide. R.C.No.A /G&M/181/2018 Dated 27.09.2018

**3.5. Period of permission / lease to be granted**

The applicant has applied permission for Five years. The District Collector consider grant for a lease period of (Five) **5 years** only.

**3.6. Name and Address of the RQP/Authorized person for preparing the Mining Plan**

Name : **R.RAJASEKAR. M.Sc.,**  
Address : No.4A, Chozha Nagar,  
Pennadam Post, Tittakudi Taluk,  
Cuddalore - 606105.  
Mobile Number : **9486905579/8870110245**  
Registration Number : RQP/CNN/264/2015/A  
Valid Till : 27.04.2025.  
e-mail : raja.parvathi @ gmail.com

**4.0. LOCATION**

Table No: 3

<b>State</b>	Tamil Nadu
<b>District</b>	Viluppuram
<b>Taluk</b>	Vanur
<b>Village</b>	Eralyur
<b>S.F.Nos</b>	80/3, 80/4, 81/1, 81/3, 81/4, 81/5, 81/6, 94/1A, 94/2 & 94/3
<b>Extent in (Ha)</b>	4.83.5 Hectare

**4.1. Details of Existence of public road /railway line, if any nearby and approximate distance.**

Table No: 4

S.No	Description	Place	Distance (Km)	Direction
1	Bus stand	Eralyur	1.4	Southeastern
2	Post Office	Eralyur	1.4	Southeastern
3	Government School	Eralyur	1.4	Southeastern
4	Primary Health Centre	Vanur	10.9	Southeastern
5	Ambulance	Vanur	10.9	Southeastern
6	Police Station	Vanur	10.9	Southeastern
7	Fire service	Vanur	10.9	Southeastern
8	Railway Station	Perani	10.5	Northwestern
9	Airport	Chennai	116.9	Northeastern
10	Seaport	Chennai	133.0	Northeastern





**a. Classification of the Area ( Ryotwari / Poramboke / others)**

- It is a Own Patta land and non-agricultural land

**b. Ownership / Occupancy of the applied area (Surface rights)**

- It is a Patta land registered in the name of the applicant Thiru.T.Vasudevan, vide Patta Nos - 180 & 967
- The applicant has got surface rights to the quarry lease applied area. Please refer Annexure-III

**c. Toposheet No. with Latitude and Longitude**

Toposheet No: 57- P/12

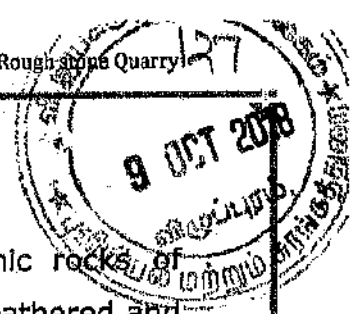
Latitude : 12°04'09"N to 12°04'19"N

Longitude : 79°38'34"E to 79°38'45"E

**5.0. GEOLOGY AND MINERAL RESERVES**

**5.1. Topography:**

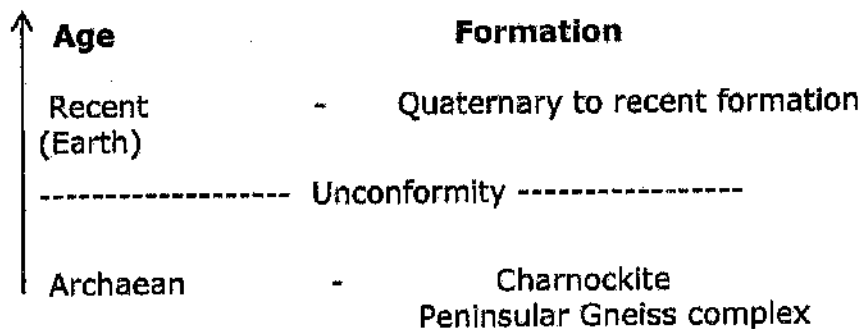
- ❖ The lease applied area exhibits almost Plain topography covered by Rough stone formation.
- ❖ The massive Charnockite formation is clearly visible to within quarry area pit and nearby quarried pit of the area and gentle sloping towards southeastern side of the area, the altitude of the area is above 44.0m MSL.
- ❖ No major river is found nearby the lease applied area.
- ❖ Water Level is found at a depth of 75m to 80m below ground level, 75m in Rainy seasons and 80m in Summer seasons by monitoring nearby bore hole.
- ❖ Temperature of the area is reported to be 18°C to a maximum of 42°C during summer.
- ❖ Rainfall of this area is about 800mm to 900mm during the both NE & SW monsoons.



### 5.2. General Geology of the area (with plans):

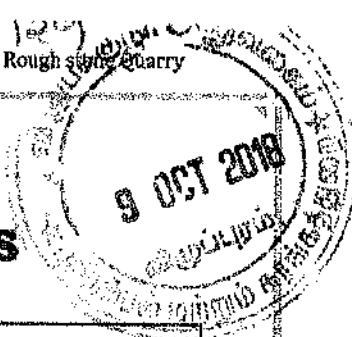
- ❖ The area is underlain by the wide range of metamorphic rocks of peninsular gneissic complex. These rocks are extensively weathered and overlain by the recent valley fills and alluvium at places.
- ❖ The geological formations found in the district are Archaean rocks like Gneisses, Granites, Charnockite basic granulites and calc-gneisses. The younger formations are Quartz veins and pegmatite.
- ❖ The rock type noticed in the area for lease is Charnockite which contains mostly Quartz and Feldspar with some ferromagnesian minerals.
- ❖ The Charnockite is part of peninsular Gneisses, a high grade metamorphic rock.
- ❖ The strike of the Charnockite formation is N 45° W - S 45° W with dipping towards SE 60°.

The General Geological succession of the area is given as under.



### 5.3. Details of Exploration already carried out if any:

- ❖ There is no exploration was carried out in this applied quarry area.
- ❖ The Department of Geology and Mining has been carried out geological exploration and regional mapping study of the lease area.
- ❖ Besides the RQP and his Team members made a detailed geological study of the area the massive Rough stone formation is clearly inferred to visible within quarried pits.



# Proposed Quarry Site Photos

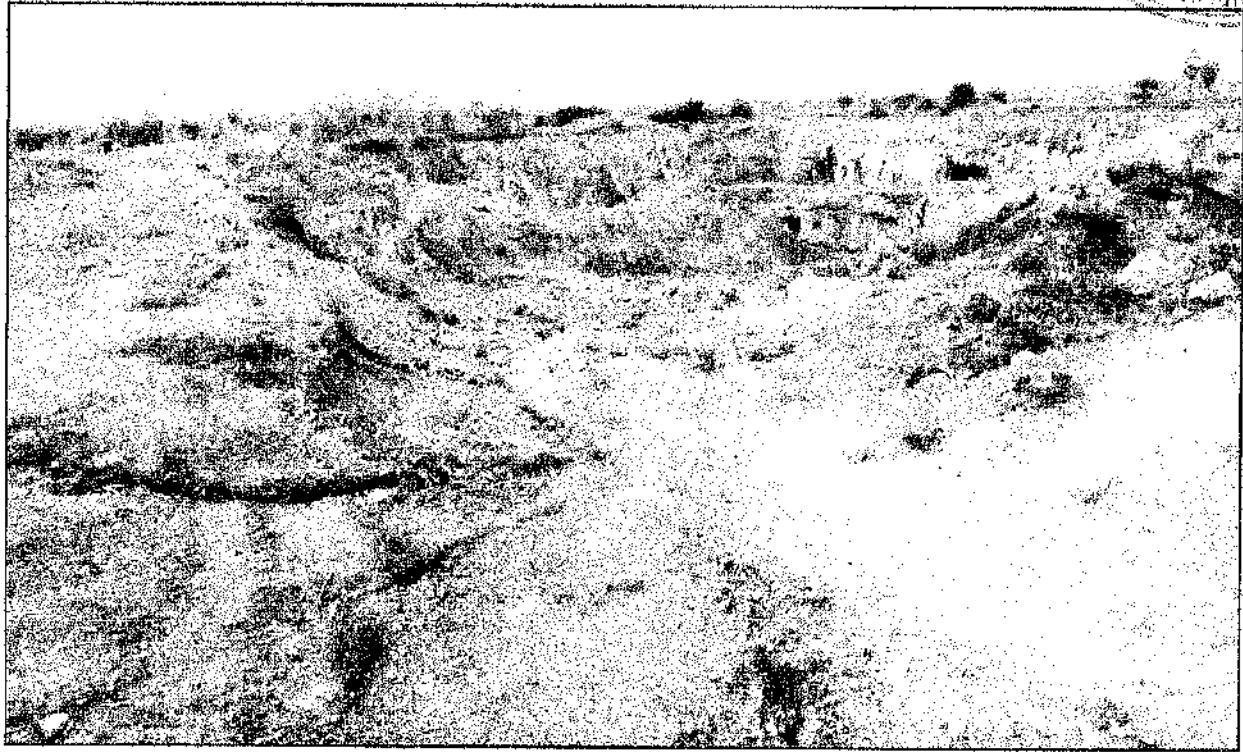
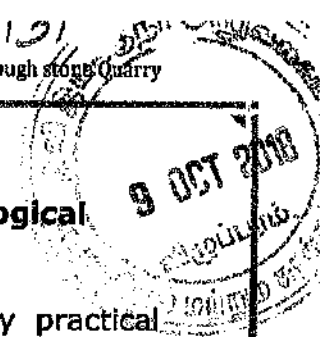


Fig.2 - Photograph shows general view of the lease applied area



### 5.3. a. Estimation of Reserves (Geological Resources with geological sections on a scale of 1:1000/1:2000)

- ❖ As far as Rough stone (Charnockite) is concerned, the only practical method is the systematic geological mapping and delineation of Rough stone within the field and careful evaluation of body lustre, physical properties, engineering properties, commercial aspects etc.,
- ❖ Totally Five sections have been drawn, One sections drawn length wise as (X-Y), Four Sections drawn width wise as (A-B), (C-D), (E-F) & (G-H) to cover maximum area considered for lease.
- ❖ The Topographical, Geological plan and sections demarcated the commercial, marketable Rough stone (Charnockite) deposit has been prepared in Scale 1:1000 and Sections have been drawn with a scale of Hor 1:1000 and Ver 1:500 respectively.
- ❖ Please refer Plate No. VII, VII-A, VII-B & VII-C as Rough stone are terms of Cubic Meters (Volume) only and not for in terms of Tonnage calculations.

#### I. GEOLOGICAL RESOURCES :

The Geological Resources is estimated as 36,65,304m<sup>3</sup> of Rough stone up to a depth of 87.0m (Max).

Table No: 5

GEOLOGICAL RESOURCES					
Section	Length in (m)	Width in (m)	Depth in (m)	Volume m <sup>3</sup>	Geological Resources of Rough stone in m <sup>3</sup>
XY-AB	106	92	72	702144	702144
XY-CD	76	156	70	829920	829920
XY-EF	112	174	70	1364160	1364160
XY-GH	52	174	85	769080	769080
<b>TOTAL</b>					<b>3665304</b>

#### Existing Pit Dimension

The excavated old existing pit dimension in previous mining lease periods.

Pit No	Length in (m) (Max)	Width in (m) (Avg)	Depth in (m) (Max)
I	97	75	15.0m (bgl)
II	75	129	17.0m (bgl)
III	112	156	17.0m (bgl)
IV	39	155	2.0m (bgl)

**II. AVAILABLE MINEABLE RESERVES :**

The available Mineable Reserves are calculated by deducting 7.5m & 10m safety distance and bench loss of bench height 5.0m and bench width 5.0m.

Table No-7

<b>MINEABLE RESERVES</b>						
Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume in m <sup>3</sup>	Mineable Reserves of Rough stone In m <sup>3</sup>
XY-AB	IV	97	77	2	14938	14938
	V	92	67	5	30820	30820
	VI	87	57	5	24795	24795
	VII	82	47	5	19270	19270
	VIII	77	37	5	14245	14245
	IX	72	27	5	9720	9720
	X	67	17	5	5695	5695
	XI	62	7	5	2170	2170
<b>TOTAL</b>						<b>121653</b>
XY-CD	V	76	141	5	53580	53580
	VI	76	131	5	49780	49780
	VII	76	121	5	45980	45980
	VIII	76	111	5	42180	42180
	IX	76	101	5	38380	38380
	X	76	91	5	34580	34580
	XI	76	81	5	30780	30780
	XII	76	71	5	26980	26980
	XIII	76	61	5	23180	23180
XIV	76	51	5	19380	19380	
XV	76	41	5	15580	15580	
<b>TOTAL</b>						<b>380380</b>
XY-EF	V	112	159	5	89040	89040
	VI	112	149	5	83440	83440
	VII	112	139	5	77840	77840
	VIII	112	129	5	72240	72240
	IX	112	119	5	66640	66640
	X	112	109	5	61040	61040
	XI	109	99	5	53955	53955
	XII	104	89	5	46280	46280
	XIII	99	79	5	39105	39105
	XIV	94	69	5	32430	32430
XV	89	59	5	26255	26255	
<b>TOTAL</b>						<b>648265</b>
XY-GH	II	42	159	5	33390	33390
	III	37	149	5	27565	27565
	IV	32	139	5	22240	22240
	V	27	129	5	17415	17415
	VI	22	119	5	13090	13090
	VII	17	109	5	9265	9265
	VIII	12	99	5	5940	5940
	IX	7	89	5	3115	3115
<b>TOTAL</b>						<b>132020</b>
<b>GRAND TOTAL</b>						<b>1282318</b>

The available Mineable Reserves is computed as **12,82,318m<sup>3</sup>** of Rough Stone at the rate of 100% recovery upto a depth of **72.0m(Max)** below ground level.

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- ❖ The primary boulders thus splatted are removed from the pits by excavators and further made to smaller sizes by rock breakers attached in excavators. It is a conventional opencast semi mechanized method of mining.

### 6.3. Proposed bench Height and Width

The quarrying of Rough Stone is proposed to safely the bench height of 5.0m and bench width of 5.0m not less than the bench height.

### 6.4. Indicate the overburden/mineral production expected pit wise as detailed as below (Composite plan and section showing pit layout, dumps, disposal of waste if any etc.,)

The over burden in the form of Earth was removed during the previous quarrying work, hence no proposal for the excavation of Earth in the present mining plan period. The excavated Roughstone will be directly loaded into Tippers to the needy customers. The Composite plan, Development plan and section indicating pit layout, Green belt development are shown in Plate No.VII.

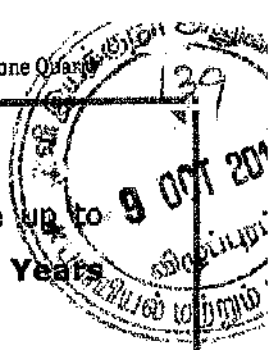
### III. RECOVERABLE RESERVES :

The Year wise Recoverable Reserves are calculated by deducting 7.5m & 10m safety distance and bench height 5.0m and bench width 5.0m.

Table No: 8

YEARWISE DEVELOPMENT & PRODUCTION RESERVES								
Year	Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume in m <sup>3</sup>	Recoverable Reserves of Rough stone in m <sup>3</sup>	
I	XY-GH	II	42	159	5	33390	33390	
		III	37	149	5	27565	27565	
		IV	32	139	5	22240	22240	
		<b>TOTAL</b>					<b>83195</b>	
II	XY-EF	V	112	159	5	89040	89040	
						<b>TOTAL</b>	<b>89040</b>	
III	XY-EF	VI	112	149	5	83440	83440	
						<b>TOTAL</b>	<b>83440</b>	
IV	XY-CD	V	76	141	5	53580	53580	
		VI	76	45	5	17100	17100	
		<b>TOTAL</b>					<b>70680</b>	
V	XY-CD	VI	76	86	5	32680	32680	
		XY-AB	IV	97	77	2	14938	14938
			V	92	67	5	30820	30820
						<b>TOTAL</b>	<b>78438</b>	
<b>GRAND TOTAL</b>							<b>404793</b>	

- ❖ The Mineral of Rough Stone Production is proposed to the lease period of (Five) 5 Years only.



- ❖ Recoverable Reserves are estimated **4,04,793m<sup>3</sup>** of **Rough stone** up to **27.0m** depth below ground level for a lease period of (Five) **5 Years** only.

**Production quantity per day** (1Load=6m<sup>3</sup> approx) (1Year=260 Working days)

$$\begin{aligned} \text{Rough stone quantity} &= 4,04,793\text{m}^3 / 67465 \text{ Loads} \\ &= 67465 / 1300 \text{ days (5 years)} \\ &= 312\text{m}^3 \text{ or } \mathbf{52 \text{ Lorry Loads}} \text{ per day} \end{aligned}$$

The applicant ensures the total quantity of proposed reserves in benches will not exceed the quarrying operation. Besides the Rough stone locked up in bench loss will be exploited after obtaining necessary permission from Director General of Mines Safety, Chennai region by submit the relevant documents, appropriate safety plans and its necessary mitigation safety measures.

## 6.5. MACHINERIES TO BE USED

### a. Mining

It is proposed to use the following machineries on rental basis for the development and production work in this quarrying operation,

S.No	Type	Nos	Dia Hole mm	Size capacity	Make	Motive Power
1	Jack Hammer	2	32	1.2m to 6m	Atlas Copco	Compressed air
2	Compressor	1	-	400psi	Atlas Copco	Diesel Drive

### b. Loading

Manual loading (considerable Rough stone) accumulates the same will be loaded by Hired front end loader like JCB) Excavator of 0.90m<sup>3</sup> bucket capacity (with Rock breaker attachment)

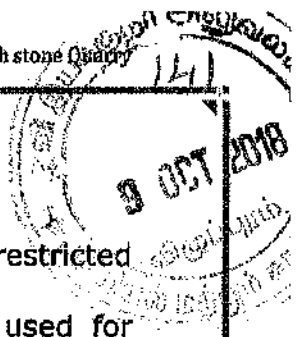
S.No	Type	Nos	Bucket capacity	Make	Motive Power
1	Excavator	2	0.90m <sup>3</sup>	Tata Hitachi - 210	Diesel Drive

### c. Transportation

Tipppers / Trucks = 5 Nos.10 Tons capacity (from the quarry to destination (customer/other buyers))

S.No	Type	Nos	Capacity	Make	Motive Power
1	Tipppers	5	10 Tons	Ashok Leyland	Diesel Drive





**6.6. Energy**

The Electricity for Mines office and Lights only at nights (working is restricted on day time only between 9Am to 5Pm). Diesel (HSD) will be used for quarrying machineries around **3,23,840 Liters of HSD** will be used for the entire project life. Diesel will be brought from nearby diesel pumps. No power is required for the project. Lightings on the Night will be taken from nearby electric poles after obtaining permission from concerned authorities.

**1. Rough stone:**

The Excavator will consume = 16 Liters / 1 hour  
 The Excavator will excavate = 20m<sup>3</sup> of Rough stone  
 Rough stone quantity = 4,04,793 /20  
 = 20240 hours  
 Diesel consume = 20240 hours x 16 liters  
 Total diesel consumption = 3,23,840 Liters of HSD will be utilized for Rough Stone

Total consumption for Rough stone is around = **3,23,840 Liters of HSD** for the entire period of life of the quarry.

**6.7. Disposal of Overburden/Waste**

The over burden In the form of Earth was removed during the previous quarrying work, hence no proposal for the excavation of Earth in the present mining plan period.

**6.8. Brief Note on Conceptual Mining Plan for the entire lease period**

Conceptual Mining Plan is prepared with an object of (Five) 5 Years of systematic development of bench lay outs, selection of ultimate pit limit, depth of quarrying, ultimate pit slope, selection of sites for construction of infrastructures etc.,

Ultimate pit size is designed based on certain practical factors such as the economical depth of mining, safety zones, permissible areas etc.,

**Ultimate Pit dimension is given as under**

Length In Max (m)	Width In Max (m)	Depth in (m)
327	134	27.0 (max)



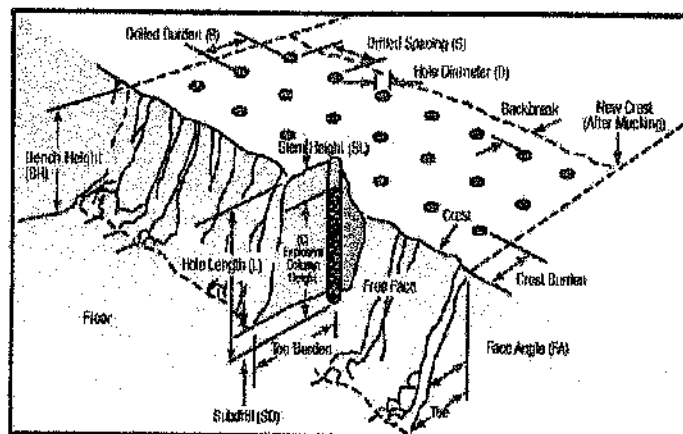
Afforestation has been proposed on all along the safety barrier by planting native species of Saplings. All the baseline information studies like Air Quality monitoring, Noise and Vibration monitoring, Water Analysis studies will be carried out every year as per the MOEF norms. It is proposed to engage any local institution to monitor the EIA and EMP studies during the course of quarrying operation after the grant of quarry lease.

## 7.0. BLASTING

### 7.1. Blasting Pattern:

The massive formation shall be broken into pieces of portable size by drilling and blasting using jack hammers and shot hole blasting. Powder factor of explosives for breaking such hard rock shall be in the order of 6 to 7 Tonnes per K.g of explosives. Blasting parameters are as follows.

Diameter of the hole	: 30-32 mm
Spacing	: 1.2m
Depth	: 1 to 1.5m
Burden for hole	: 1.0m
Pattern of hole	: zig zag-Multi-rows
Inclination of hole	: 80° from the horizontal
Use of delay detonators	: 25 millisecond
Detonating fuse	: Detonating cord



### 7.2. Types of Explosives

Small dia, 25mm Slurry explosive 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

### **7.3. Measures proposed to minimize ground vibration due to blasting**

- ❖ Controlled blasting measures will be adopted for minimizing ground vibration and fly of rocks. Shallow depth drilling and smooth blasting is proposed to carry out with minimum usage of explosive mainly to give shattering effect in Rough stone for easy excavation and control of fly rocks.
- ❖ The following steps shall be adopted to control ground vibration due to blasting. The minimum recommended delay time of 8ms was introduced to minimize ground vibration.
- ❖ In case of electronic detonators, which are inherently much more accurate delays (+/- 0.2 milliseconds delay) to minimize the ground vibration.
- ❖ Use of Ammonium nitrate, fuel oil mixture for shot holes may be avoided because which cause for high fly of rocks in view critical diameter problem. Only high strength explosives like slurry will be used in the form of cartridge.

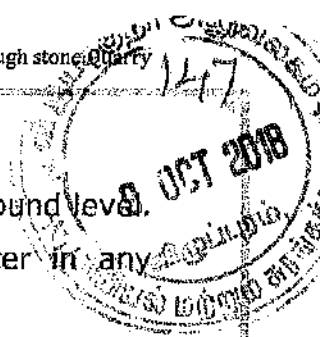
### **7.4. Storage of Explosives and safety measures to be taken while blasting.**

- ❖ The Applicant is advised to engage an authorized explosive agency to carry out small amount of blasting and it will be supervised by the competent statutory Mining Mate /Foreman /Manager. The explosive agency should have the valid Blaster Certificate.
- ❖ He will blast holes in quarry site. After completion the blasting, the agency will take it out back the remaining quantity of explosives to the temporarily available the Magazine at the quarry site. The blasting time of the day is proposed to be 12 PM to 12.30 PM.
- ❖ First Aid Box will be keeping ready at all the time in Mines Office room. Necessary precautionary announcement will be carried out before the blasting operation.

## **8.0. MINE DRAINAGE**

### **8.1. Depth of Water Level**

- ❖ The ground Water Level is noticed at the depth of 70m to 75m below ground level by monitoring nearby bore hole, during the climatic conditions, the fluctuations of water level is 70m in Rainy seasons and 75m in Summer seasons of this quarry area.



- ❖ The quarry operation is proposed upto a depth of **27.0m** below ground level. Hence the quarrying operation may not affect the ground water in any manner.
- ❖ It shall be ensured that quarrying shall not be carried out below ground water table under any circumstances.
- ❖ *If ground water table occurs/intervenes within the permitted depth, then also the quarrying shall be stopped.*

### **8.2. Arrangement 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 from seepage shall be less than 300LPM and it will be pumped out periodically by a stand by diesel powered Centrifugal pump with 5HP Motor.
- ❖ The quality of water is potable and no contamination with any hazardous things.
- ❖ Hence, the water stored in quarrying pit will be pumped out the adjacent agricultural fields and further stored in old pit the water is used for Dust suppression / Plantation purposes.

### **9.0. ECOLOGY AND BIODIVERSITY**

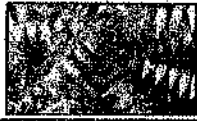

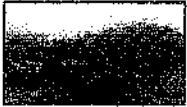
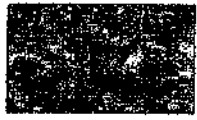

The green belt in the lease area be developed taking into consideration the availability of area as the efficiency of green belt in pollution control mainly depends on tree species, its width, distance from pollution sources, side of the habitat from working place and tree height. The proposed green belt should be designed to control PM10, gaseous pollutants, noise, surface run off and soil erosion etc., While considering the above aspects due care should be taken for selecting the suitable characteristics plant species such as fast growing, locally suitable plant species, resistant to specific pollutant and those which would maintain the regional ecological balance, soil and hydrological conditions.

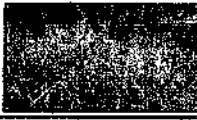


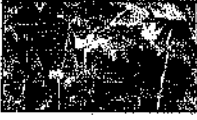

Flora as observed and identified in the field are covered by mostly Neem Erukku, , Panai trees, Palmlra tree and few Coconut trees are found more on regional scale. The Applicant has developed trees like Neem, Pungam, Teak, Caesarians and Eucalyptus, regional trees etc., with Proper nursery garden and plantation on vacant land. The fauna species observed around the 500m radius of the project site is given in the table



**List of Flora observed around the quarry site  
(Flora Trees & Flora Shrubs)**


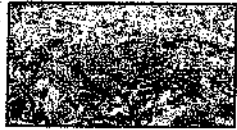

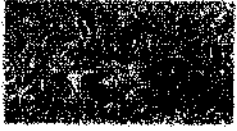

**Table No: 10**






<b>Flora - Trees</b>			
<b>S.No</b>	<b>Tamil Name</b>	<b>Botanical Name</b>	<b>Photograph</b>
1	Neem tree	Azadirachata indica	
2	Panal tree	Borassus flabellifer	
3	Mullu Maram	Prosopis juliflora	
4	Nuna Maram	Morinda citrifolia	
5	Savukku Maram	Casuarina cunninghamiana	

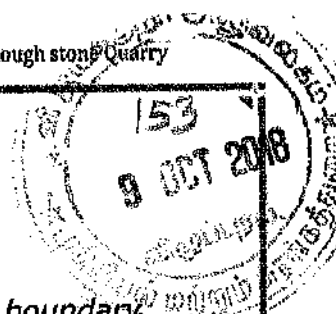
<b>Flora - Shrubs</b>			
<b>S.No</b>	<b>Tamil Name</b>	<b>Botanical Name</b>	<b>Photograph</b>
1	Korai	Cyperus pangorei	
2	Avaram	Senna articulata	
3	Erukku	Calotropis	
4	Mookuthichedi	Tridax procumbens	
5	Musumusukkai	Melothria	

**List of Fauna observed around the quarry site  
(Fauna Mammals & Fauna Avian)**

**Table No: 11**

<b>Fauna Mammals</b>			
<b>S.No</b>	<b>Common Name</b>	<b>scientific name</b>	<b>Photograph</b>
1	Anil	Funambulus Palmarum	
2	Thavalai	Cane toad	
3	Keeri	Herpestes Edwardsii	
4	Rabbit	Oryctolagus cuniculus	
5	Udummbu	Varanus	

<b>Avian Fauna</b>			
1	Crow	Corvus Splendens	
2	Myna	Acridotheres tristis	
3	Chittukuruvi	Saxicoloides Fulicatus	
4	Parunthu	Haliastur Indus	
5	Pura	Columbidae	



## 10.0. OTHER PERMANENT STRUCTURES

### 10.1. *Habitations / Village Natham (300m)*

- ❖ There are no inhabited sites within the radius of 300m from the boundary of lease area under Rule 36(1-A) (a) TNMMCR 1959.
- ❖ The Nearest Village habitation is Eraiyur at the distance of 1.4Km on Southeastern side of the lease area.
- ❖ The applicant ensures the quarrying operation will be carried out without any hindrance to the habitants and adjoining land owners.

### 10.2. *Power lines (HT/LT) (50m)*

- ❖ There are no (LT/HT) lines within a radius of 50m.

### 10.3. *Water bodies (River, Pond, Lake, Odal, Channel etc.,) (50m)*

- ❖ The *Odal* is located at the distance of 283m on Southern side from the boundary of lease applied area.
- ❖ There is a lake located at the distance of 575m on Southeastern side from the boundary of lease applied area.

### 10.4. *Archeological / Historical Monuments (500m)*

- ❖ There are no Archeological / Historical Monuments within a radius of 500m from the boundary of lease applied area.

### 10.5. *Existence of public road / (SH,NH others), Railway line if any (50m)*

- ❖ There is an existing road from the area leads Eraiyur – Thiruvakkarai road at the Eastern side of the area.
- ❖ SH-136 Tindivanam to Puducherry road is located which is about 1.6Km on the Northern side of the area.
- ❖ NH-45 Viluppuram to Chennai road is located which is about 10.2Km on the Western side of the area.
- ❖ The Nearest Railway line is Perani station line which is about 10.5Km on the Northwestern side of the area.

### 10.6. *Places of Worship (Temples, Church, Mosque etc.,) (500m)*

- ❖ There is no Places of Worship within a radius of 500m.

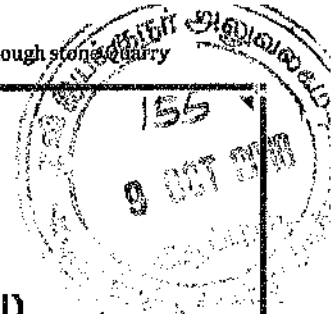
### 10.7. *Reserved Forest / Forest / Wild Life Sanctuary etc., (10Km)*

#### ➤ **Interstate Boundary:**

- ❖ (Pondicherry) Chettipattu Village – 5.1Km – Southern side
- ❖ (Pondicherry) Sandhal Pudukuppam Village – 5.9Km – Southeastern

### 10.8 *Any Other Structures*

NII



## 11.0. EMPLOYMENT POTENTIAL & WELFARE MEASURES

### 11.1. Employment Potential (Management & Supervisory personal)

The following man powers are proposed carry out the day to day quarrying activities at the proposed production and also comply with the statutory provision of the MMR 1961.

#### **Management and Supervisor:**

- |   |        |
|---|--------|
| 1. Mines Manager (with valid statutory qualification) | : 1 No |
| 2. Mines Foreman (with valid statutory qualification) | : 1 No |
| 3. Mines Mate (with valid statutory qualification)    | : 1 No |
| 4. Blaster  | : 1 No |

#### **Labours, Skilled, Semi-Skilled & Un-skilled**

- |   |          |
|---|----------|
| a. Skilled (Operators- Excavator & Jackhammer)        | : 5 Nos  |
| b. Semi-skilled (Driver)                              | : 5 Nos  |
| c. Unskilled (Musdoor/ Labours, Cleaners & Watch man) | : 14 Nos |

**Total : 28 Nos**

Allowing 10% absenteeism, the no. of men of roll will be around 26 Nos.

It is been ensured that, **Child Labour under 18 Years of age will not be engaged for any quarrying operation.**

Necessary Life Insurance policies will be taken by the applicant to all the employees up to the end of the lease period.

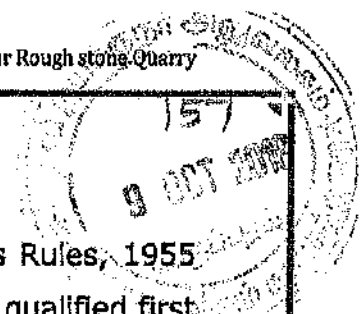
### 11.2. Welfare Measures

#### **a. Drinking Water**

Drinking water is available from the nearby agriculture land or water vendors in Eralyur Village which is about 1.4Km on Southeastern side of the area.

#### **b. Sanitary facilities**

- ❖ Semi-permanent latrines & urinals shall be maintained at convenient places for use of Labours as per the provisions of Rule (33) of the Mines Rules, 1955 separately for males and females. Washing facilities shall also be arranged as per Rule (36) of Mines Rules, 1955 and it will be maintained periodically.



**c. First Aid Facility**

- ❖ First Aid station as per provisions under Rule (44) of the Mines Rules, 1955 will be provided and First aid kits kept in mines office room, the qualified first aid personnel should be appointed or nominated to attend emergency first aid treatment.
- ❖ In case of eventuality, the victim will be given first aid immediately at the site and the injured person will be taken to the hospital is about 9.4Km on Southeastern side of Vanur. The competent and statutory of Foreman / Mate / Permit Manager will be incharge of the First aid.

**d. Labour Health**

- ❖ Periodic medical examination has to be arranged for occupational health once in a year in addition to attending medical treatment of occupational injuries under the Rule 45(A), Mines Rules, 1955.

**e. Precautionary safety measures to the Laborers**

- ❖ All the quarry workers will be provided with Safety device include such as safety helmet, mine goggles, ear muffs, ear Plugs, dust mask, sand respirator (avoid silica dusts forms-Silicosis), reflector jackets, safety thick shoes, etc., as Personnel Productive Equipment (PPE) as per the circulars and amendments made for Mine Labours under the guidance of DGMS.
- ❖ Periodically medical checkup will be conducted for all workers for any mine health problems.
- ❖ Proper training and induction will be given by qualified and experienced safety officer to all employees about the safe and systematic quarrying operation.
- ❖ The drillers and workers are sent for vocational training periodically to carry out the quarrying operations scientifically to safeguard the men machinery and mineral and to create awareness of conventional opencast quarrying operation.



**PART - B****12.0. ENVIRONMENTAL MANAGEMENT****12.1. Existing Land Use Pattern**

The area is exhibit Plain topography. The applied area is dry barren land and devoid of agriculture and habitations and the area is not used for the specific vegetation. The surrounding area is practiced by the seasonal cultivation.

*The existing Land use pattern is given as under*

Table No-12

S. No.	Land Use	Present Area (Hect)	Area in use during the quarrying period (Hect)
1.	Quarrying Pit	4.04.6	4.38.0
2.	Infrastructure	0.01.0	0.01.0
3.	Roads	0.01.0	0.01.0
4.	Green Belt	Nil	0.11.2
5.	Unutilized	0.76.9	0.32.3
	<b>Total</b>	<b>4.83.5Ha</b>	<b>4.83.5Ha</b>

**12.2. Water Regime**

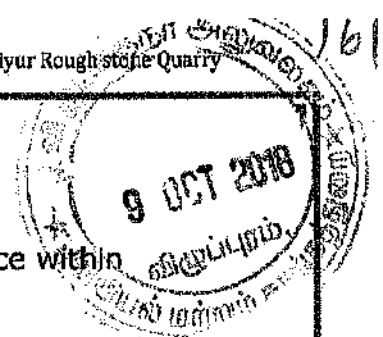
Water Level in this area quarry area is noticed at a depth of 70m to 75m below ground level, observed nearby borehole the quarrying of Rough stone is proposed up to a depth of 27.0m (Max) below ground level. Hence, it will not affect the quality of ground water depletion of this area.

**12.3. Flora and Fauna**

The Thorny bushes are placed in quarry area and Neem, Panai trees are noticed nearby the quarry area. Except acacia bushes, no other valuable trees are noticed in the lease applied area. Further, neither flora of botanical interest nor fauna of zoological interest is noticed in this area.

**12.4. Climatic conditions**

The area receives annual rainfall of about 800mm to 900mm and the rainy season is mainly from Oct - Dec receives rain both in south west and north east monsoon. The Summer is hot with maximum temperature of 38°C and during Winter encounters a minimum temperature of 20°C.



### 12.5. Human Settlement

The nearest habitations with the population, approx. distance within 5.0Km radius from the proposed quarry site are as given under,

Table No-13

S. No	Name of the Village	Approximate distance	Direction from lease applied area	Approximate population
1.	Karasanur	3.2 Km	North - East	160
2.	Eraiyr	1.4 Km	South - East	600
3.	Ponnampundi	3.0 Km	South - West	190
4.	Kunamangalam	1.7 Km	North - West	410

### 12.6. Plan for Air, Dust Suppression

The air quality will be affected by the Suspended Particulate Matter (SPM) generated by the blasting, jack hammer drilling, loading and unloading during the quarrying operation. The following mitigation measures will be carried out, Mist water spraying will be carried out by means of water sprinklers to suppress dust emission in the Haul roads. The native species of Neem etc., will be planted along the lease boundary and Safety buffer zone. The quarried out materials will be fully covered by the Tarpaulin during transportation to avoid the spillage of materials. The Air quality will be monitored periodically as per the norms and mitigative measures carried out to prevent dust and air propagation in to the air. Operators, those exposed directly to such conditions will be provide such as (PPE) Personnel Protective Equipment's like Dust mask, Ear plug, Helmet, Gloze etc., as per the Mines Act -1952.

The estimated budget for dust suppression would be around **Rs.20,000/-** for the period of 5 Years only.

### 12.7. Plan for Noise Control

- ❖ The quarrying of Rough Stone will be carried out by Shallow holes of 32mm diameter and 1.5meter depth of wet drilling and conventional low power explosives such as slurry explosives, ordinary safety fuse only. Hence the ground vibration and noise pollution will be very minimum and restricted within the quarry workings. However, periodical noise level

monitoring and other mitigation measures will be carried out to reduce the noise level and vibration in and around the quarry site.

- ❖ Nowhere the noise level should exceed the permissible limit of 80db during the quarry working hours.
- ❖ The drivers will be strictly instructed to move the vehicle during the transportation not exceeding 40.0Km per Hour, Sentries with Red Flag & whistle will be posted in village junction and regulate traffic.
- ❖ The estimated budget for Noise level monitoring would be around **Rs.20,000/-** for the period of 5 Years only.

### **12.8. Environmental Impact Assessment Statement Describing Impact on mining on the next Five years**

- ❖ The mining plan proposed is for a small production of Rough stone without involving deep hole drilling and heavy blasting. Such limited mining activity is not likely to cause any impact adversely on environment as far as pollution of air, Water and noise is concerned, anyhow environmental impact studies will be conducted as per EIA notification issued by MOEF. It is B2 Category of mine.
- ❖ The estimated Cost would be around **Rs. 3,70,000/-** for a period of 5 Years only.

### **12.9. Proposal for Waste Management**

There are no wastes anticipated during in this Rough stone quarry operation. The quarried out materials 100% will be utilized.

### **12.10. Proposal of Reclamation of Land affected during mining activities and at the end of mining (refilling/fencing etc.,)**

In the proposed mining plan only a maximum depth of **27.0m** (Max) below ground level has been envisaged as workable depth for Safe & Economic mining during the lease period. Hence, after quarry reaches Ultimate Pit Limit (for this lease period) of 27.0m depth, *S1 type Fencing* will be constructed around the quarried pits to prevent inherent entry of the public and cattle.

There is no proposal for refilling and rehabilitation. The Barbed wire fencing cost would be around **Rs.1,00,000/-**

**12.11. Program for Afforestation:**

The 7.5m & 10m safety distance along the lease boundary has been identified to be utilized for Afforestation in a phased manner as described below.

Table - 14

Year	No. of Saplings proposed to be planted	Survival-%	Area to be covered Sq.m	Name of the species	No. of Saplings expected to be grown
I	60	80%	225	Neem	48
II	60	80%	225	Neem	48
III	60	80%	225	Neem	48
IV	60	80%	225	Neem	48
V	60	80%	255	Neem	48

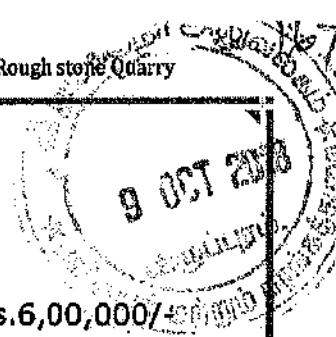
- Nearly 1125 Sq.m area is proposed to use under Afforestation by planting 60Nos of Neem Saplings etc., every year in the spacing interval of (5m X 5m) with an anticipated survival rate of 80%.
- Appropriate native species of Neem, Pungan, Teak and Casuarinas Saplings will be planted approach roads, service roads, nearby villages, village roads, government school etc.,
- Saplings of local plants of regional trees will be planted as per the consultation of the local Forest Department.
- The Quarry Land use, Layout and Afforestation Plan are showing in Plate No. VII.

**12.12. Proposed Financial Estimate / Budget for (EMP) Environment Management**

Table - 14

S.No	Monitory and Analysis Description	Rate per location	No. of location	Total Charges for monitoring		
				6 months	Per Year	5 Years
1	Ambient Air quality monitoring	5000	4	20000	40000	2,00,000
2	Water sampling and analysis	10000	1	10000	20000	1,00,000
3	Noise level monitoring	500	4	2000	4000	20,000
4	Ground vibration monitoring	2500	2	5000	10000	50,000
Total EMP Cost				37000	74000	3,70,000

The Environment Monitoring EMP Studies Cost would be around **Rs. 3,70,000/-** for a period of 5 Years only.



## I. Project Cost & Investment:

### 1) Land cost

It is a Patta land, the approximate present land cost is about Rs.6,00,000/- per Hectare hence the land cost is calculated as **Rs. 29,01,000/-**

### 2) Refilling/ Fencing

There is no proposal for Refilling, after the excavation of Rough Stone the quarried out land will be fenced with barbed wire fencing the cost would be around **Rs. 80,000/-**

### 3) Laborers shed

Labours are proposed for quarrying Rough Stone. The machine operators and workers are from nearby local villages, hence no cost is involved. Rest shelter will be constructed as semi-permanent structure at the cost of **Rs.1,50,000/-**

### 4) Sanitary facility

Sanitary facility will be constructed as semi-permanent structure, the cost will be around **Rs.1,00,000/-**

## II. Machinery to be used :

The Machineries like Jack Hammer, Tractor mounted compressor attached with Jack hammer, Excavator Of 0.9m<sup>3</sup> bucket capacity attached with Rock Breaker are proposed to deploy for quarrying operation and Tippers/Trucks of 10 Tons capacity will be used for the quarrying transportation for hired basis, the cost will be around **Rs.35,00,000/-**

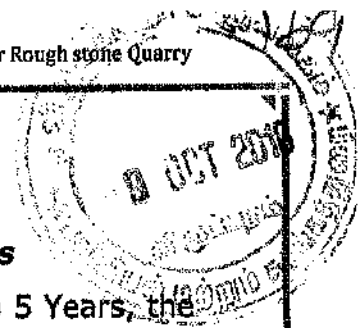
### I. Fixed Asset Cost :-

1. Land cost	= Rs. 29,01,000/-
2. Refilling/Fencing cost	= Rs. 80,000/-
3. Rest shelter	= Rs. 1,50,000/-
4. Sanitary Facility	= Rs. 1,00,000/-

### II. Machinery Cost :-

= Rs. 35,00,000/-

**Total Project Cost = Rs. 67,31,000/-**



### **III. Expenditure :**

#### **1) Drinking Water facility and other utilities for the labourers**

28 Labours at the rate of Rs.2500/- month for a period of (Five) 5 Years, the cost will be around **Rs.1,50,000/-**

#### **2) Sanitary arrangement**

Sanitary maintenance at the cost of Rs.2,000/- month the cost will be around Rs.1,20,000/- for a period of (Five) 5 Years.

#### **3) Safety kits**

Rs.50,000 will be spent for the safety kits such as Helmet, Mine Goggles, Ear plugs, Ear muff, Dust Mask, Reflector jackets and safety Shoes.

#### **4) Water sprinkling (if necessary)**

Rs 2000/- month will be spent for sprinkling the water on haul roads for Dust suppression; the cost will be around Rs.1,20,000/- for a period of (Five) 5 Years.

#### **5) Afforestation etc.,**

Afforestation is proposed within safety zones of the lease applied area and plantations will be carried out on the nearby villages and village roads, Govt School after consultation with the Panchayat authorities. The cost estimate is around Rs.60,000/-

### **Expenditure :**

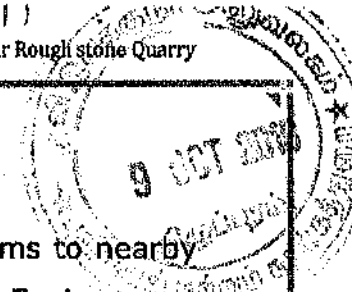
1. Drinking water	= Rs. 1,50,000/-
2. Sanitary Arrangements	= Rs. 1,20,000/-
3. Safety kits	= Rs. 50,000/-
4. Water Sprinkling	= Rs. 1,20,000/-
5. Afforestation cost	= Rs. 60,000/-

### **Environment Monitoring / 5 Years :**

1) Air Quality Sampling	= Rs. 2,00,000/-
2) Water Quality Sampling	= Rs. 1,00,000/-
3) Noise Level Monitoring	= Rs. 20,000/-
4) Ground vibration test	= Rs. 50,000/-
<b>EMP Cost Total</b>	<b>= Rs. 8,70,000/-</b>

(Expenditure Including EMP Studies)

<b>Total Project Cost</b>	<b>= Rs. 67,31,000/-</b>
<b>EMP Cost</b>	<b>= Rs. 8,70,000/-</b>



### **12.13 Corporate Social Responsibility (CSR):**

- ❖ The Applicant shall be distributed Note books, Stationary items to nearby Govt Primary School and to conduct the Medical camp, Environment awareness program, etc., to nearby villages after consultation with local panchayat authorities.
- ❖ The Applicant shall ensure that a minimum of 2.5% from the Total project cost (Rs.1,68,000/-) for the entire lease period will be utilized for the CSR Activities.
- ❖ *District Mineral Fund @10% of the Royalty shall be given to the Dept. of Geology and Mining.*

### **13.0. MINE CLOSURE PLAN**

#### **13.1. Steps proposed for phased restoration, reclamation of already mined out area.**

- ❖ This conventional Systematic, Scientific and Eco- Friendly quarrying operation for a depth of 27.0m (Max) below ground level and not required any Backfill, Reclamation and Rehabilitation, the quarried out lands will be used for Water storage purpose.
- ❖ The mined out area will be fenced on top of open cast working with S1 Fencing to arrest the entry of cattle and public in to the quarry site.

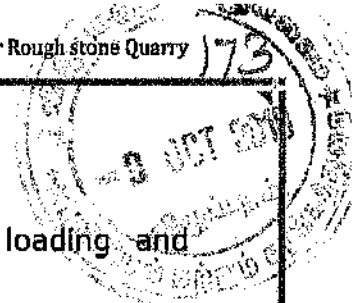
#### **13.2. Measures to be under taken on mine closure as per Act & Rules.**

- ❖ Measure will be taken as per Act & Rules. The quarried pit will be fenced by using Barbed wire fencing to prevent inherent entry of public and cattle.

#### **13.3. Mitigation measures to be undertaken for safety and restoration/ reclamation of the already mined out area.**

##### **Air Quality:**

- ❖ (Air quality will be degrade due to drilling, blasting, mining operation and transportation)
- ❖ Drilling will be carried out by Wet drilling mode to control the dust propagation into the air.
- ❖ Blasting will be carried out on limited scale.
- ❖ Mist Water spraying on haul roads is proposed to prevent the dust propagation into the air.

**Noise and Vibration:**

- ❖ The noise will be formed due to the drilling, blasting, loading and movement of Vehicles, Machinerles etc.,
- ❖ The applicant has proposed to plant native species of Neem saplings all along safety area to prevent Noise besides Wet drilling will be practiced to prevent dust and spillage.
- ❖ All the Vehicles, Machinerles will be maintained in good conditions as per RTO and TNPCB Norms to prevent Noise, Smoke and Vibration to maintain Noise levels below 80 dB(decibel).

**Water Regime:**

- ❖ The quarrying operation has proposed upto a maximum depth of 27.0m below ground level is well above the ground water table (Summer 75m and Rainy seasons 70m) for a period of 5 Years only. Hence the ground water table will not affect in any manner.
- ❖ The seepage and rain water stored in quarrying pit will be drained out by 5 H.P motor pump and will be discharged through filter media to boundary barrier for afforestation and excess water will be sprayed on haul roads to prevent dust propagation in to the atmosphere.
- ❖ The Roughstone quarry will not produce any harmful toxic effluence in the form of Solid, Liquid or Gas.

**Human Health and Safety:**

- ❖ All the labors are provided with Safety Equipments like safety Helmet, Goggles, Ear muff, Ear Plug, Safety Jackets, Hand gloves, Thick Shoes etc.,at applicant cost, as per the specifications of the Director of Mines Safety.
- ❖ The competent qualified person Foreman/Permit Mines Manager will provide First Aid will take care of small and minor injuries. If any accident happens, the Victim will be taken to the nearby hospital by the own vehicle which is always kept in the mines office. The nearest hospital is about 9.4 Km on southeastern side of Vanur Village





**14.0 ANY OTHER DETAILS INTEND TO FURNISH BY THE APPLICANT**

- i. The measures will be taken as per Act & Rules and Regulations and orders made there under shall be complied with, so that the safety of mine, machinery and mine workers will be protected.
- ii. It is expected that the mining will be done skillful, systematically, scientifically, and Eco-friendly quarrying operation.
- iii. There is no deep hole drilling and heavy blasting of this lease area.
- iv. The Applicant will endeavor every attempt to quarry the Rough Stone economically without any wastage and to improve the environment and ecology.
- v. Any violation pointed out by the inspecting authorities shall be rectified as per the guidelines of the Department.

**Prepared by**

Signature of Recognised Qualified Person

**R. RAJASEKAR, M.Sc.,**  
Recognised Qualified Person  
Reg.No.RQP/CNN/264/2015/A

Place : Cuddalore  
Date : .10.2018

This mining plan is approved based on the instructions & guidelines issued by the Commissioner of Geology and Mining Chennai Vide letter No. No:3888/AC/2012 Dated: 19.11.12 and based on Incorporation of the conditions laid by the Controller, Villupuram in Process area communication letter No.No: A (G/M/18) 2018 Dated: 27.9.2018

Dated: 09/10/2018

Assistant Director G&M  
Villupuram

09/10/18  
9/10/18

# MINING PLAN FOR ERAIYUR ROUGH STONE & EARTH QUARRY

(Prepared under Rule 19, 41 Tamilnadu Minor Mineral Concession Rules, 1959  
and amended Minor Mineral Conservation and Development Rules, 2010)

**Lease In Own Patta Land**

**(Period: (Five) 5 Years)**

*FOR*

## LOCATION OF THE LEASE APPLIED AREA

**Extent : 3.37.5 Ha**  
**S.F.Nos : 93/4, 93/5, 94/1B & 94/4**  
**Village : Eraiyur**  
**Taluk : Vanur**  
**District : Viluppuram**  
**State : Tamil Nadu**

*IN*

## Applicant

**Thiru. E. Jayasankar,**  
**S/o. Elumalai,**  
**Eraiyur Village, Vanur Taluk,**  
**Viluppuram District - 604 304**  
**Cell No: 9047033282**

Prepared by

**R. RAJASEKAR. M.Sc.**

**Recognised Qualified Person**

**RQP/CNN/264/2015/A**

**No.4A, Chozha Nagar, Pennadam Post,**

**Tittakudi Taluk, Cuddalore- 606105.**

**Cell: 9486905579, 8870110245**

**e.mail: raja.parvathi @ gmail.com**

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**LIST OF ANNEXURES**

Sl. No.	Description	Annexure No.
1	Precise Area Communication Letter issued from the District Collector	I
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5	Copy of RQP Certificate	V

**LIST OF PLATES**

Sl. No.	Description	Plate No	Scale
1	Location Plan	I	Not to scale
2	Key Plan	II	Not to scale
3	Topo Sketch of quarry lease area for 10Km Radius.	III	1:100000
4	Satellite Imagery	IV	1:10000
5	Environmental Management Plan	V	1:10000
6	Quarry Lease and Surface Plan	VI	Plan-1:1000
7	Topography, Geological Plan & Section Year wise Development, Production Plan & Sections	VII, VII-A, VII-B & VII-C	Plan-1:1000 SecHor-1:1000; Ver-1:500
8	Conceptual Plan and Sections	VIII , VIII-A,VIII-B & VIII-C	Plan-1:1000 Sec Hor-1:1000; Ver-1:500

**CONSENT LETTER FROM THE MINE OWNER**

The Mining Plan in respect of **Rough Stone & Earth quarry** over an extent of **3.37.5** hectares of **Own Patta land** in S.F.Nos. **93/4, 93/5, 94/1B & 94/4** of **Eraiyrur Village, Vanur Taluk, Viluppuram District** and Tamilnadu State has been prepared by **Thiru.R.Rajasekaran, M.Sc., Recognised Qualified Person** and Registration Number. **RQP/CNN/264/2015/A**

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

**R.RAJASEKAR.M.Sc.,**  
**Recognised Qualified Person**  
**Reg.No.RQP/CNN/264/2015/A**  
 No.4A, Chozha Nagar, Pennadam Post,  
 Tittakudi Taluk, Cuddalore- 606105.  
 Cell - 9486905579/8870110245.  
 Email: raja.parvathi @gmail.com

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

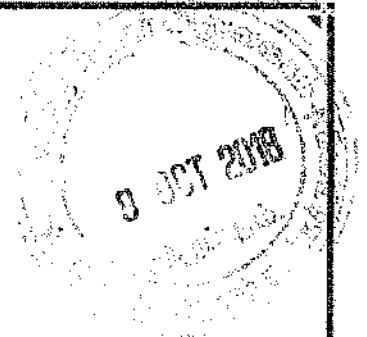
Signature of the Applicant

**(E.Jayasankar)**

Place : Viluppuram

Date : 09.10.2018

**Thiru.E.Jayasankar,**  
S/o.Elumalai,  
Eraiyr Village,  
Vanur Taluk,  
Viluppuram District - 604 304



**DECLARATION**

The Mining Plan in respect of **Rough Stone & Earth quarry** over an extent of 3.37.5 hectares of Own Patta land in S.F.Nos. 93/4, 93/5, 94/1B & 94/4 of Eraiyur Village, Vanur Taluk, Viluppuram District and Tamil Nadu State has been prepared with my consultation and I have understood the contents and agree to implement the same in accordance with the Mining Laws.

x

Signature of the Applicant  
**(E.Jayasankar)**

Place : Viluppuram

Date : 09 .10.2018

R.RAJASEKAR.M.Sc.,  
Recognised Qualified Person,  
Reg.No.RQP/CNN/264/2015/A  
No.4A, Chozha Nagar, Pennadam Post,  
Tittakudi Taluk,  
Cuddalore Dt - 606105,Tamilnadu.



**CERTIFICATE**

This is to certify that, the provisions of Minor Minerals Conservation and Development Rules, 2010 (MMCDR) have been observed in the Mining Plan for the grant of **Rough Stone & Earth quarry** lease over an extent of 3.37.5 hectares of Own Patta land in S.F.Nos. 93/4, 93/5, 94/1B & 94/4 Eralyur Village, Vanur Taluk, Viluppuram District, Tamil Nadu State applied by **Thiru. E.Jayasankar**

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

It is also certified that information furnished in the above Mining Plan are true and correct to the best of my knowledge.

**Certified**

A handwritten signature in black ink, appearing to read "Rajasekar", written over a horizontal line.

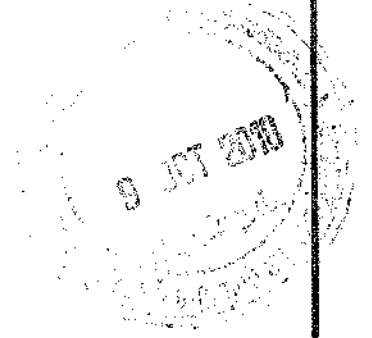
Signature of Recognised Qualified Person

**R. RAJASEKAR, M.Sc.,**  
Recognised Qualified Person  
Reg.No.RQP/CNN/264/2015/A

Place : Cuddalore

Date : .10.2018

R.RAJASEKAR.M.Sc.,  
Recognised Qualified Person,  
Reg.No. RQP/CNN/264/2015/A  
No.4A, Chozha Nagar, Pennadam Post,  
Tittakudi Taluk,  
Cuddalore- 606105,Tamilnadu.

**CERTIFICATE**

Certified that, in preparation of Mining Plan for **Rough Stone & Earth quarry** over an extent of 3.37.5 hectares of Own Patta land in S.F.Nos. 93/4, 93/5, 94/1B & 94/4 of Eraiyur Village, Vanur Taluk, Viluppuram District, Tamilnadu State

**Thiru.E.Jayasankar** covers all the provisions of Mines Act, Rules, and Regulations etc., made there under and whenever specific permission are required, the Applicant will approach the Director General of Mines Safety, Chennai. The standards prescribed by DGMS in respect of Mines Health will be strictly implemented.

Certified

Signature of Recognised Qualified Person

**R. RAJASEKAR, M.Sc.,**  
Recognised Qualified Person  
Reg.No.RQP/CNN/264/2015/A

Place : Cuddalore

Date :



# **MINING PLAN FOR ERAIYUR ROUGH STONE & EARTH QUARRY**

Over an extent of 3.37.5 hectares at S.F.Nos. 93/4, 93/5, 94/1B & 94/4 at Eraiyur Village, Vanur Taluk, Viluppuram District for a lease period of (Five) 5 Years only.

*(Prepared under Rule 19, 41 Tamilnadu Minor Mineral Concession Rules, 1959 and amended Minor Mineral Conservation and Development Rules, 2010)*

## **1.0 INTRODUCTION**

The present Mining Plan and Environmental Management Plan are prepared for **Thiru.E.Jayasankar**, S/o.Elumalai, residing at Eraiyur Village, Vanur Taluk, Viluppuram District – 604 304.

1. The excavated Rough stone is used for building basement and road construction stones and also used for crushing units and Earth is used for filling and leveling of low lying areas for road projects and other infrastructure development work in and around the district.
2. The application was meritoriously processed and precise area communication letter issued by the District Collector, Viluppuram District has passed an order vide *R.C.No. A/G&M/180/2018 Dated 27.09.2018*
3. The applicant has to submit Mining Plan and to get approval from the Assistant Director, Department of Geology & Mining, Viluppuram District and to obtain Environmental Clearance from the District Level Environment Impact Assessment Authority (DEIAA), Viluppuram District, Tamil Nadu State, vide MOEF and Climate Change Notification. S.O.141 (E) dated 15.01.2016.
4. Geological Resources is estimated at 26,13,170m<sup>3</sup> of Rough stone up to a depth of 87.0m (Max) & 10,254m<sup>3</sup> of Earth up to a depth of 2.0m and Mineable Reserves is estimated at 4,92,695m<sup>3</sup> of Rough stone up to a depth of 62.0m (Max) and 8,171m<sup>3</sup> of Earth up to a depth of 2.0m after leaving the safety distance of 7.5m from the boundary of the lease applied quarry area and safety distance of 10m should be provided for the Odal passing on Southern side and also Village road passing on Eastern side of the applied area as indicated in precise area communication letter and relevant mining laws in force.

5. **Production Schedule** is proposed an average production of **3,78,010m<sup>3</sup>** (63,002 Lorry Loads) of **Rough stone** up to a depth of **37.0m (Max)** and **8,171m<sup>3</sup>** (1,362 Lorry Loads) of **Earth** up to a depth of **2.0m** below ground level for the period of (Five) **5 Years** only.

#### **I. ENVIRONMENTAL PARAMETERS,**

##### **i. Forest Conservation Act, 1980:**

- ❖ There is no Reserved Forest around 10Km Radius from the boundary of lease applied area.

##### **ii. Interstate Boundary:**

- ❖ (Puducherry) Chettipattu Village - 5.1 Km - Southern side
- ❖ (Puducherry) Sandhal Pudukuppam Village - 5.9 Km - Southeastern

##### **iii. Wildlife (Protection) Act, 1972:**

- ❖ The area does not attract the Wild Life Sanctuary around 10Km Radius from the boundary of lease applied area.

##### **iv. The Coastal Regulation Zone (CRZ) Notification 1991:**

- ❖ There is no Coastal Regulation Zone (CRZ) around 10Km Radius from the boundary of lease applied area.

##### **v. Infrastructure around 500m Radius :**

Table No: 1

<b>S.No</b>	<b>Description</b>	<b>Distance from boundary of Quarry site</b>	<b>Direction</b>
1	Approach Road	700m	SE
2	Water Bodies (River, Urani, Pond, Odai etc.,	10m(Odai)	S
		710m (Periya Eri)	SE
3	Habitation	1.6Km (Eralyur)	SE
4	HT / LT- Line	---	---

**II. ENVIRONMENTAL MEASURES TO BE ADOPTED SHALL BE,**

1. Dust Control at source while *wet drilling* and *controlled blasting*.
2. Dust suppression at loading point and transport haul roads.
3. Noise Control in Blasting, control of fly rock missiles and Vibration by doing peak particle velocity with in standard as prescribed by the DGMS and MOEF.
4. Unnecessary land degradation should be avoided or damaged land should be reclaimed or rehabilitated.
5. Avoid uneven rat hole mining and follow scientific and systematic mining by safe bench system of open cast mining.
6. Mining near major fracture zones if any should be avoided to control ground water fluctuation in the adjacent agricultural lands.
7. Emission test of vehicles should be in tack to maintain minimum emission level of fuel gases.
8. Noise level should not exceed *80db* and the vehicles should use only permitted Air Horn while on road near residential areas.
9. Safety zones as prescribed by the Department of Geology and Mining from adjacent infrastructures should be strictly to adhere to.
10. Any other conditions as stipulated by the concerned authorities should be followed to protect the Environment and Ecology of the area.

**2.0. EXECUTIVE SUMMARY**

The area applied for lease is a Rough Stone & Earth quarry in Own Patta land at Survey Numbers - 93/4, 93/5, 94/1B & 94/4 of Eraiyur Village, Vanur Taluk and Viluppuram District.

1. Name of the Village Panchayat - Eraiyur
2. Name of the Panchayat Union - Vanur
3. The proposed Total Movable Reserves - 3,78,010m<sup>3</sup> of Rough stone and 8,171m<sup>3</sup> of Earth formation.
4. **Production Schedule** is proposed an average production of **3,78,010m<sup>3</sup>** (63,002 Lorry Loads) of **Rough stone** up to a depth of 37.0m(Max) (ie; 35m = 2.0m to 37.0m ) and **8,171m<sup>3</sup>** (1,362 Lorry Load) of **Earth** upto a depth of 2.0m below ground level for the period of (Five) 5 Years only
5. Total extent of the area - **3.37.5 Ha**
6. Proposed Lease Period - (Five) **5 years** only
7. Existing depth of mining - 17.0m below ground level
8. Proposed Depth of mining - **37.0m (Max)** below ground level (ie;20.0m extending from the old existing Pit of the area)
9. Method of mining / level of mechanization - Opencast, Semi-mechanized Mining with a bench height of 5.0m & width of 5.0m Is proposed and involves shallow Jackhammer drilling, Slurry blasting is proposed for this quarrying operation.
10. Types of Machinerles used in the quarry - Jack hammer 30-32mm dia,
11. Tractor mounted compressor attached with Jack hammer.
12. Excavator of 0.9m<sup>3</sup> bucket capacity is attached with Rock breaker is proposed to deploy for quarrying operation. Total consumption for Rough

stone & Earth is around = 3,03,776 Liters of HSD for the entire period of life of the quarry.

13. No Trees will be uprooted due to this quarrying operation.
14. The existing road from the main road to quarry is in good condition and the
15. Same will be maintained and utilized for Transportation of Rough stone.
16. There is no Export of this quarrying Rough stone.
17. Topo sketch covering 10Km, 1Km, 500m, 300m radius around the proposed area with markings of Habitations, Water bodies like Streams, Rivers, Roads, Major structure like Bridges, Wells, Archeological, Historical Importance, Places of worship is marked and enclosed as Plate No. IV & V
18. The lease applied area is 3.37.5 Ha bounded by 17 corners, the corners are designated a 1-17 Clockwise from the South western corner and the coordinates are clearly marked in Plate no - VI
19. The diagram showing the Mining area, dimensions of the Pit, proposed depth of mining for the mining plan period are enclosed as Plate No -VI
20. The lease applied area is 10Km away from the protected area under Wildlife Production Act 1972, critically polluted area as identified by CPCB and notified Eco sensitive areas.
21. There are no wastages anticipated during this quarry operation, hence waste dump is not proposed in this lease applied area.
22. Around 24 Employees are deploying in this quarrying operation.

1. The lease applied area is bounded by all corners and the coordinates are clearly marked in Plate no - VI

Table -2

Corners	Co-ordinates		Distance between the corners
	Latitude	Longitude	
1	12° 04' 03.46"N	79° 38' 35.07"E	1-2 = 102.8m
2	12° 04' 06.53"N	79° 38' 36.44"E	2-3 = 82.2m
3	12° 04' 09.01"N	79° 38' 37.44"E	3-4 = 86.6m
4	12° 04' 10.30"N	79° 38' 34.89"E	4-5 = 71.2m
5	12° 04' 12.43"N	79° 38' 35.83"E	5-6 = 36.0m
6	12° 04' 13.51"N	79° 38' 36.29"E	6-7 = 72.0m
7	12° 04' 12.60"N	79° 38' 38.48"E	7-8 = 38.4m
8	12° 04' 11.46"N	79° 38' 37.94"E	8-9 = 43.6m
9	12° 04' 10.93"N	79° 38' 39.28"E	9-10 = 103.4m
10	12° 04' 09.67"N	79° 38' 42.45"E	10-11 = 38.6m
11	12° 04' 08.46"N	79° 38' 42.10"E	11-12 = 50.4m
12	12° 04' 06.96"N	79° 38' 41.44"E	12-13 = 56.4m
13	12° 04' 07.64"N	79° 38' 39.71"E	13-14 = 75.2m
14	12° 04' 05.41"N	79° 38' 38.68"E	14-15 = 36.4m
15	12° 04' 04.34"N	79° 38' 38.17"E	15-16 = 65.0m
16	12° 04' 02.56"N	79° 38' 37.00"E	16-17 = 43.4m
17	12° 04' 03.02"N	79° 38' 35.64"E	17-01 = 21.8m

## 2. Lease Boundaries:

- i. Eastern Side : Patta Land
- ii. Western Side : Patta Land
- iii. Northern Side : Patta Land
- iv. Southern Side : Government Land (Odai Poramboke)

**PART - A****3.0. GENERAL INFORMATION:****3.1. Name of the Applicant with Address, contact no, email etc.,**

Name : **Thiru.E.Jayasankar,**  
S/o.Elumalai,  
Eraiur Village,  
Vanur Taluk,  
District : Viluppuram  
State : Tamilnadu  
Pin code : 604 304  
Contact no : 9047033282  
Email : jai5757@gmail.com

**3.2. Status of the Applicant (Individual / Company / Firm)**

The applicant is a Private Individual.

**3.3. Mineral which the Applicant intends to mine**

Rough Stone & Earth only.

**3.4. Precise area communication Letter details received from the competent authority of the government.**

Precise area communication letter Issued from the District Collector, Viluppuram vide. R.C.No.A /G&M/180/2018 Dated 27.09.2018

**3.5. Period of permission / lease to be granted**

The applicant has applied permission for Five years. The District Collector consider grant for a lease period of (Five) **5 years** only.

**3.6. Name and Address of the RQP/Authorized person for preparing the Mining Plan**

Name : **R.RAJASEKAR. M.Sc.,**  
Address : No.4A, Chozha Nagar,  
Pennadam Post, TittakudiTaluk,  
Cuddalore - 606105.  
Mobile Number : **9486905579/8870110245**  
Registration Number : RQP/CNN/264/2015/A  
Valid Till : 27.04.2025.  
e-mail : raja.parvathi @ gmail.com

**4.0. LOCATION**

Table No: 3

<b>State</b>	Tamil Nadu
<b>District</b>	Viluppuram
<b>Taluk</b>	Vanur
<b>Village</b>	Eraiyur
<b>S.F.Nos</b>	93/4, 93/5, 94/1B & 94/4
<b>Extent in (Ha)</b>	3.37.5 Hectare

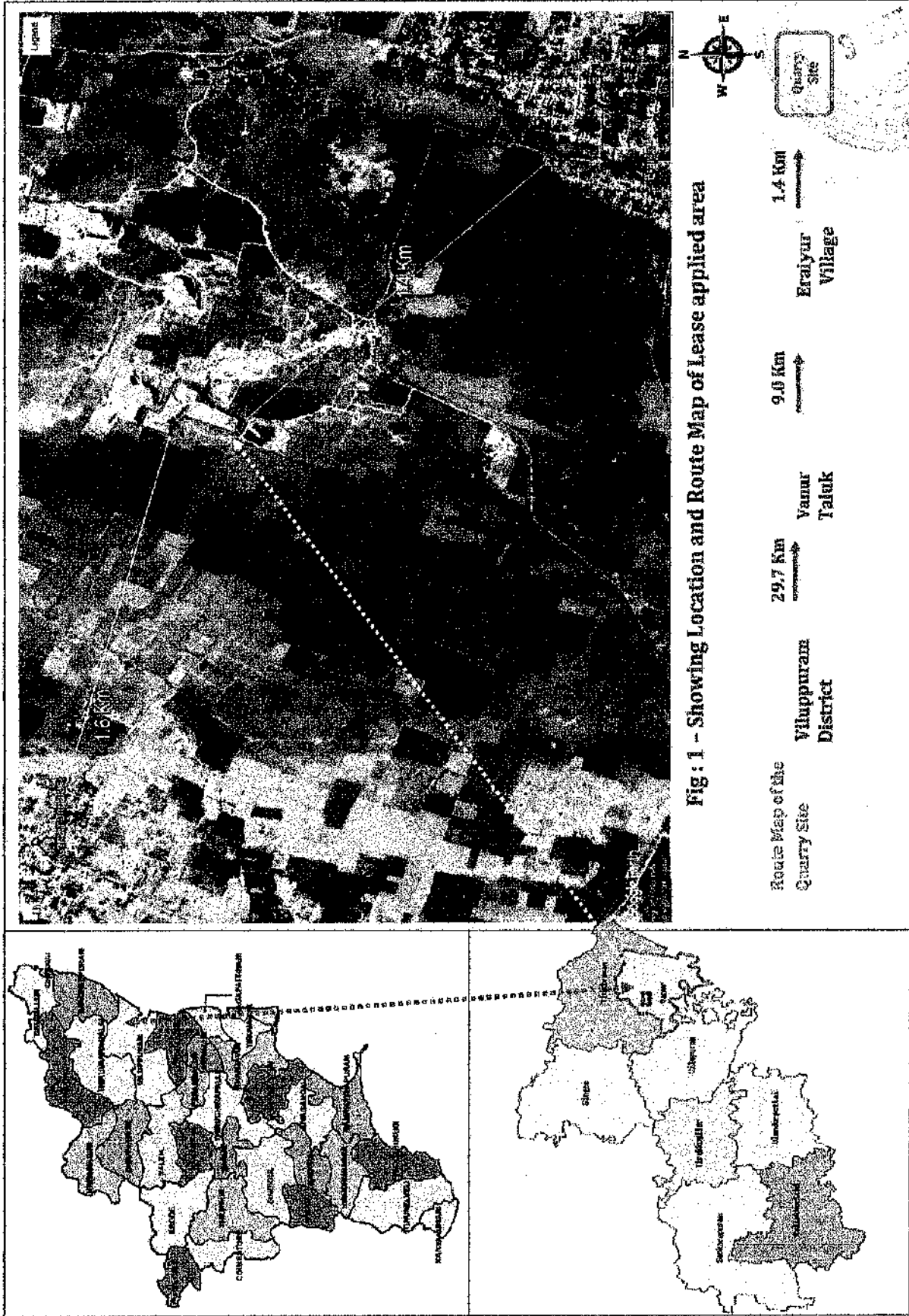
**4.1. Details of Existence of public road /railway line, if any nearby and approximate distance.**

Table No: 4

<b>S.No</b>	<b>Description</b>	<b>Place</b>	<b>Distance (Km)</b>	<b>Direction</b>
1	Bus stand	Eraiyur	1.4	Southeastern
2	Post Office	Eraiyur	1.4	Southeastern
3	Government School	Eraiyur	1.4	Southeastern
4	Primary Health Centre	Vanur	10.9	Southeastern
5	Ambulance	Vanur	10.9	Southeastern
6	Police Station	Vanur	10.9	Southeastern
7	Fire service	Vanur	10.9	Southeastern
8	Railway Station	Perani	10.5	Northwestern
9	Airport	Chennai	116.9	Northeastern
10	Seaport	Chennai	133.0	Northeastern



**LOCATION OF THE LEASE APPLIED AREA**



**a. Classification of the Area ( Ryotwari / Poramboke / others)**

- It is a Own Patta land and non-agricultural land

**b. Ownership / Occupancy of the applied area (Surface rights)**

- It is a Patta land registered in the name of the applicant Thiru.E.Jayasankar, vide Patta Nos – 67 & 968.
- The applicant has got surface rights to the quarry lease applied area. Please refer Annexure-III

**c. Toposheet No. with Latitude and Longitude**

Toposheet No: 57- P/12

Latitude : 12°04'02"N to 12°04'13"N

Longitude : 79°38'35"E to 79°38'42"E

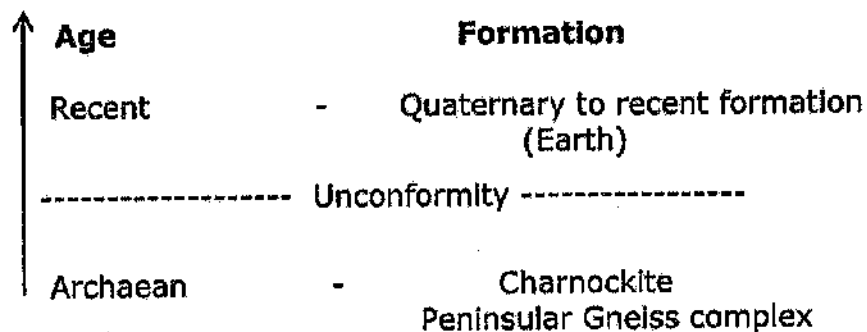
**5.0. GEOLOGY AND MINERAL RESERVES****5.1. Topography:**

- ❖ The lease applied area exhibits almost Plain topography covered by Rough stone & Earth formation.
- ❖ The massive Charnockite formation is clearly visible within quarried pit and nearby quarried pit of the area followed by the 2.0m (Avg) of Earth and gentle sloping towards southeastern side of the area, the altitude of the area is above 44.0m MSL.
- ❖ No major river is found nearby the lease applied area.
- ❖ Water Level is found at a depth of 70m to 75m below ground level, 70m in Rainy seasons and 75m in Summer seasons by monitoring nearby bore hole.
- ❖ Temperature of the area is reported to be 18°C to a maximum of 42°C during summer.
- ❖ Rainfall of this area is about 800mm to 900mm during the both NE & SW monsoons.

### 5.2. General Geology of the area (with plans):

- ❖ The area is underlain by the wide range of metamorphic rocks of peninsular gneissic complex. These rocks are extensively weathered and overlain by the recent valley fills and alluvium at places.
- ❖ The geological formations found in the district are Archaean rocks like Gneisses, Granites, Charnockite basic granulites and calc-gneisses. The younger formations are Quartz veins and pegmatite.
- ❖ The rock type noticed in the area for lease is Charnockite which contains mostly Quartz and Feldspar with some ferromagnesian minerals.
- ❖ The Charnockite is part of peninsular Gneisses, a high grade metamorphic rock.
- ❖ The strike of the Charnockite formation is  $N 45^{\circ} E - S 45^{\circ} W$  with dipping towards  $SE 60^{\circ}$ .

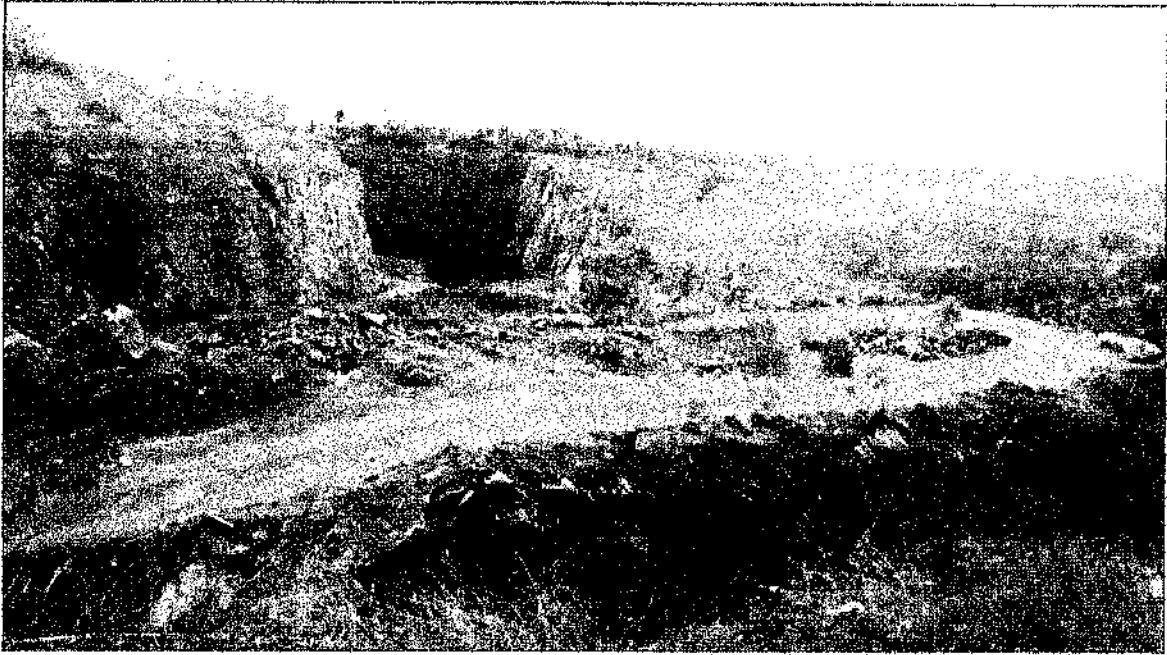
The General Geological succession of the area is given as under.



### 5.3. Details of Exploration already carried out if any:

- ❖ There is no exploration was carried out in this applied quarry area.
- ❖ The Department of Geology and Mining has been carried out geological exploration and regional mapping study of the lease area.
- ❖ Besides the RQP and his Team members made a detailed geological study of the area the massive Rough stone formation is clearly inferred to be visible within quarried pit and nearby quarried pits.

# Proposed Quarry Site Photos



**Fig.2 - Photograph shows general view of the lease applied area**

### 5.3. a. Estimation of Reserves (Geological Resources with geological sections on a scale of 1:1000/1:2000)

- ❖ As far as Rough stone (Charnockite) is concerned, the only practical method is the systematic geological mapping and delineation of Rough stone within the field and careful evaluation of body lustre, physical properties, engineering properties, commercial aspects etc.,
- ❖ Totally Five sections have been drawn, Two sections drawn length wise as (X-Y) & (X1-Y1), Three Sections drawn width wise as (A-B), (C-D) & (E-F) to cover maximum area considered for lease.
- ❖ The Topographical, Geological plan and sections demarcated the commercial, marketable Rough stone (Charnockite) deposit has been prepared in Scale 1:1000 and Sections have been drawn with a scale of Hor 1:1000 and Ver 1:500 respectively.
- ❖ Please refer Plate No. VII, VII-A, VII-B & VII-C as Rough stone are terms of Cubic Meters (Volume) only and not for in terms of Tonnage calculations.

#### I. GEOLOGICAL RESOURCES :

The Geological Resources is estimated as 26,13,790m<sup>3</sup> of Rough stone up to a depth of 87.0m (Max) & 10,254m<sup>3</sup> Earth up to a depth of 2.0m

Table No: 5

GEOLOGICAL RESOURCES						
Section	Length in (m)	Width in (m)	Depth in (m)	Volume m <sup>3</sup>	Geological Resources of Earth in m <sup>3</sup>	Geological Resources of Rough stone in m <sup>3</sup>
XY-AB	110	62	70	477400		477400
X1Y1-AB	42	162	1	6804	6804	
	71	162	85	977670		977670
X1Y1-CD	75	46	1	3450	3450	
	94	78	85	623220		623220
X1Y1-EF	102	75	70	535500		535500
<b>TOTAL</b>					<b>10254</b>	<b>2613790</b>

**Existing Pit Dimension**

The already excavated old existing pit dimension as in previous quarry lease period.

Pit No	Length in (m) (Max)	Width in (m) (Avg)	Depth in (m) (Max)
I	175	70	17.0 (bgl)
II	128	33	1.0 (bgl)
III	160	70	17.0 (bgl)
IV	75	34	1.0 (bgl)

**II. AVAILABLE MINEABLE RESERVES :**

The available Mineable Reserves are calculated by deducting 7.5m safety distance and safety distance of 10m should be provided for the Odal passing on Southern side and also Village road passing on Eastern side of the applied area and bench loss of bench height 5.0m and bench width 5.0m.

Table No-7

MINEABLE RESERVES							
Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume in m <sup>3</sup>	Earth in m <sup>3</sup>	Mineable Reserves of Rough stone in m <sup>3</sup>
XY-AB	V	95	54	5	25650		25650
	VI	85	50	5	21250		21250
	VII	75	45	5	16875		16875
	VIII	65	40	5	13000		13000
	IX	55	35	5	9625		9625
	X	45	30	5	6750		6750
	XI	35	25	5	4375		4375
	XII	25	20	5	2500		2500
	XIII	15	15	5	1125		1125
<b>TOTAL</b>							<b>101150</b>
X1Y1-AB	I	35	151	1	5285	5285	
	II	32	151	5	24160		24160
	III	27	151	5	20385		20385
	IV	22	151	5	16610		16610
	V	46	151	5	34730		34730
	VI	41	146	5	29930		29930
	VII	36	141	5	25380		25380
	VIII	31	136	5	21080		21080
	IX	26	131	5	17030		17030
	X	21	126	5	13230		13230

	XI	16	121	5	9680		9680
	XII	11	116	5	6380		6380
	XIII	6	111	5	3330		3330
<b>TOTAL</b>						<b>5285</b>	<b>221925</b>
X1Y1- CD	I	74	39	1	2886	2886	
	II	75	36	5	13500		13500
	III	75	31	5	11625		11625
	IV	75	26	5	9750		9750
	V	94	43	5	20210		20210
	VI	94	33	5	15510		15510
	VII	94	23	5	10810		10810
	VIII	94	13	5	6110		6110
	IX	94	3	5	1410		1410
<b>TOTAL</b>						<b>2886</b>	<b>88925</b>
X1Y1-EF	V	92	57	5	26220		26220
	VI	87	47	5	20445		20445
	VII	82	37	5	15170		15170
	VIII	77	27	5	10395		10395
	IX	72	17	5	6120		6120
	X	67	7	5	2345		2345
<b>TOTAL</b>							<b>80695</b>
<b>GRAND TOTAL</b>						<b>8171</b>	<b>492695</b>

The available Mineable Reserves is computed as **4,92,695m<sup>3</sup>** of Rough Stone and **8,171m<sup>3</sup>** of Earth formation at the rate of 100% recovery upto a depth of **62.0m(Max)** below ground level.

## **6.0. MINING**

### **6.1. Method of Mining (Open cast / Underground)**

Opencast method of semi mechanized mining with 5.0m vertical bench height and width 5.0m of the bench is not less than bench height.

However, as far as the quarrying of Rough stone & Earth is concerned, observance of the provisions of Regulation 106 (2) (b) as above is seldom possible due to various inherent petro genetic factors coupled with mining difficulties. Hence it is proposed to obtain relaxation to the provisions of the above regulation from the Director of mines safety for which necessary provision is available with the regulation 106 (2) (b) of MMR-1961, under Mine Act-1952.

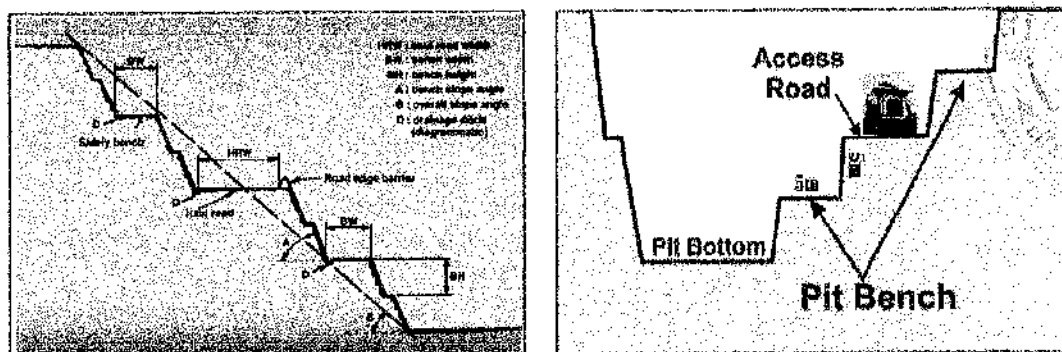


Figure shows Open pit Mining method

## 6.2. Mode of Working (Mechanized, Semi-mechanized, Manual)

- ❖ The Rough Stone is proposed to quarry 5.0m bench height and 5.0m bench width with conventional opencast semi-Mechanized method. The quarrying operation involves manual Jackhammer drilling, Slurry explosives blasting, loading and transportation of Rough stone to the needy nearby crusher units, road formation works of residential and industrial customers.
- ❖ The production of Roughstone in this quarry involves the following method which is typical for Rough stone quarrying in contrast to other major mineral mining.
- ❖ The splitting of rock mass of considerable volume from the parent rock mass by jackhammer drilling and blasting ,hydraulic excavators are used for loading of Roughstone from pithead to the needy crushers.
- ❖ The hydraulic excavators are attached with rock breakers for fragmentation to avoid secondary blasting.
- ❖ The primary boulders thus splatted are removed from the pits by excavators and further made to smaller sizes by rock breakers attached in excavators. It is a conventional opencast semi mechanized method of mining.

## 6.3. Proposed bench Height and Width

The quarrying of Rough Stone & Earth is proposed to safely the bench height of 5.0m and bench width of 5.0m not less than the bench height.

## 6.4. Indicate the overburden/mineral production expected pit wise as detailed as below (Composite plan and section showing pit layout, dumps, disposal of waste if any etc.,)

The overburden in the form of Earth formation upto a depth of 2.0m below ground level is dumped along the lease boundary as earthen bund and



bund and used for the filling and leveling of low lying areas. The excavated Roughstone will be directly loaded into Tippers to the needy crusher /customers site. The Composite plan, Development plan and section indicating pit layout, Green belt development are shown in Plate No.VII.

### III. RECOVERABLE RESERVES :

The Year wise Recoverable Reserves are calculated by deducting 7.5m safety distance and safety distance of 10m should be provided for the Odai passing on Southern side and also Village road passing on Eastern side of the applied area and bench loss of bench height 5.0m and bench width 5.0m.

Table No: 8

YEARWISE DEVELOPMENT & PRODUCTION RESERVES								
Year	Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume in m <sup>3</sup>	Earth in m <sup>3</sup>	Recoverable Reserves of Rough stone in m <sup>3</sup>
I	X1Y1-AB	I	35	151	1	5285	5285	
		II	32	151	5	24160		24160
		III	27	151	5	20385		20385
		IV	22	151	5	16610		16610
		V	20	151	5	15100		15100
<b>TOTAL</b>							<b>5285</b>	<b>76255</b>
II	X1Y1-AB	V	26	151	5	19630		19630
	X1Y1-CD	I	74	39	1	2886	2886	
		II	75	36	5	13500		13500
		III	75	31	5	11625		11625
		IV	75	26	5	9750		9750
V	94	43	5	20210		20210		
<b>TOTAL</b>							<b>2886</b>	<b>74715</b>
III	X1Y1-EF	V	92	57	5	26220		26220
	XY-AB	V	95	54	5	25650		25650
		VI	85	50	5	21250		21250
<b>TOTAL</b>								<b>73120</b>
IV	X1Y1-AB	VI	41	146	5	29930		29930
		VII	36	141	5	25380		25380
	X1Y1-CD	VI	94	33	5	15510		15510
		VII	94	23	5	10810		10810
<b>TOTAL</b>								<b>81630</b>
V	X1Y1-EF	VI	87	47	5	20445		20445
		VII	82	37	5	15170		15170
	XY-AB	VII	75	45	5	16875		16875
		VIII	65	40	5	13000		13000
	X1Y1-AB	VIII	10	136	5	6800		6800
<b>TOTAL</b>								<b>72290</b>
<b>GRAND TOTAL</b>							<b>8171</b>	<b>378010</b>

- ❖ The Mineral of Rough Stone Production Is proposed to the lease period of (Five) 5 Years only.
- ❖ Recoverable Reserves are estimated **3,78,010m<sup>3</sup>** of **Rough stone** up to depth of **37.0m** below ground level and **8,171m<sup>3</sup>** of **Earth** up to depth of **2.0m** for a lease period of (Five) **5 Years** only.

**Production quantity per day** (1Load=6m<sup>3</sup> approx) (1Year=260 Working days)

**Rough stone quantity** = 3,78,010m<sup>3</sup> / 63002 Loads  
 = 63002 / 1300 days (5 years)  
 = 288m<sup>3</sup> or **48 Lorry Loads** per day

**Earth quantity** = 8,171m<sup>3</sup> / 1362 Loads  
 = 1362 / 520 days (2 years)  
 = 18m<sup>3</sup> or **3 Lorry Loads** per day

The applicant ensures the total quantity of proposed reserves in benches will not exceed the quarrying operation. Besides the Rough stone locked up in bench loss will be exploited after obtaining necessary permission from Director General of Mines Safety, Chennai region by submit the relevant documents, appropriate safety plans and its necessary mitigation safety measures.

## 6.5. MACHINERIES TO BE USED

### a. Mining

It is proposed to use the following machineries on rental basis for the development and production work in this quarrying operation,

S.No	Type	Nos	Dia Hole mm	Size capacity	Make	Motive Power
1	Jack Hammer	2	32	1.2m to 6m	Atlas Copco	Compressed air
2	Compressor	1	-	400psi	Atlas Copco	Diesel Drive

### b. Loading

Manual loading (considerable Rough stone) accumulates the same will be loaded by Hired front end loader like JCB) Excavator of 0.90m<sup>3</sup> bucket capacity (with Rock breaker attachment)

S.No	Type	Nos	Bucket capacity	Make	Motive Power
1	Excavator	2	0.90m <sup>3</sup>	Tata Hitachi - 210	Diesel Drive

### c. Transportation

Tipplers / Trucks = 4 Nos.10 Tons capacity (from the quarry to destination (customer/other buyers))

S.No	Type	Nos	Capacity	Make	Motive Power
1	Tipplers	4	10 Tons	Ashok Leyland	Diesel Drive

### 6.6. Energy

The Electricity for Mines office and Lights only at nights (working is restricted on day time only between 9Am to 5Pm). Diesel (HSD) will be used for quarrying machineries around **3,03,776 Liters of HSD** will be used for the entire project life. Diesel will be brought from nearby diesel pumps. No power is required for the project. Lightings on the Night will be taken from nearby electric poles after obtaining permission from concerned authorities.

#### 1. Rough stone:

The Excavator will consume = 16 Liters / 1 hour  
 The Excavator will excavate = 20m<sup>3</sup> of Rough stone  
 Rough stone quantity = 3,78,010/20  
 = 18901 hours  
 Diesel consume = 18901 hours x 16 liters  
 Total diesel consumption = 3,02,416 Liters of HSD will be utilized for Rough Stone

#### 2. Earth:

The Excavator will consume = 10 Liters / 1 hour  
 The Excavator will excavate = 60m<sup>3</sup> of Earth  
 Earth Quantity = 8171 / 60  
 = 136 hours  
 Diesel consume = 136 hours x 10 Liters

Total diesel consumption = 1360 Liters of HSD will be utilized for Earth formation

Total consumption for Rough stone & Earth is around = **3,03,776 Liters of HSD** for the entire period of life of the quarry.

### 6.7. Disposal of Overburden/Waste

The over burden in the form of Earth is  $8,171\text{m}^3$  Is removed will be used for filling and leveling of low lying areas road project and other infrastructure development work in and around the District.

### 6.8. Brief Note on Conceptual Mining Plan for the entire lease period

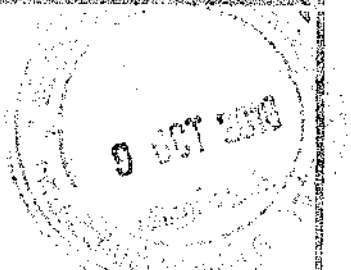
Conceptual Mining Plan Is prepared with an object of (Five) 5 Years of systematic development of bench lay outs, selection of ultimate pit limit, depth of quarrying, ultimate pit slope, selection of sites for construction of Infrastructures etc.,

Ultimate pit size is designed based on certain practical factors such as the economical depth of mining, safety zones, permissible areas etc.,

#### Ultimate Pit dimension is given as under

Length in Max (m)	Width in Max (m)	Depth in (m)
221	205	37.0 (max)

Afforestation has been proposed on all along the safety barrier by planting native species of Saplings. All the baseline information studies like Air Quality monitoring, Noise and Vibration monitoring, Water Analysis studies will be carried out every year as per the MOEF norms. It is proposed to engage any local institution to monitor the EIA and EMP studies during the course of quarrying operation after the grant of quarry lease.

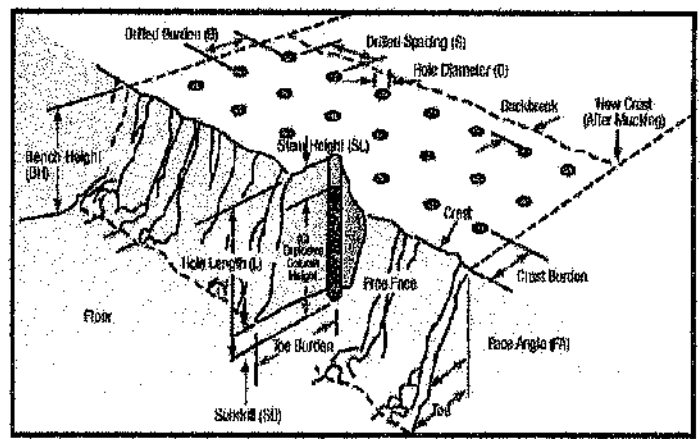


**7.0. BLASTING**

**7.1. Blasting Pattern:**

The massive formation shall be broken into pieces of portable size by drilling and blasting using jack hammers and shot hole blasting. Powder factor of explosives for breaking such hard rock shall be in the order of 6 to 7 Tonnes per K.g of explosives. Blasting parameters are as follows.

Diameter of the hole	: 30-32 mm
Spacing	: 1.2m
Depth	: 1 to 1.5m
Burden for hole	: 1.0m
Pattern of hole	: zig zag-Multi-rows
Inclination of hole	: 80° from the horizontal
Use of delay detonators	: 25 millisecond
Detonating fuse	: Detonating cord



**7.2. Types of Explosives**

Small dia, 25mm Slurry explosive 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

**7.3. Measures proposed to minimize ground vibration due to blasting**

- ❖ Controlled blasting measures will be adopted for minimizing ground vibration and fly of rocks. Shallow depth drilling and smooth blasting is proposed to carry out with minimum usage of explosive mainly to give shattering effect in Rough stone for easy excavation and control of fly rocks.

- ❖ The following steps shall be adopted to control ground vibration due to blasting. The minimum recommended delay time of 8ms was introduced to minimize ground vibration.
- ❖ In case of electronic detonators, which are inherently much more accurate delays (+/- 0.2 milliseconds delay) to minimize the ground vibration.
- ❖ Use of Ammonium nitrate, fuel oil mixture for shot holes may be avoided because which cause for high fly of rocks in view critical diameter problem. Only high strength explosives like slurry will be used in the form of cartridge.

#### **7.4. Storage of Explosives and safety measures to be taken while blasting.**

- ❖ The Applicant is advised to engage an authorized explosive agency to carry out small amount of blasting and it will be supervised by the competent statutory Mining Mate /Foreman /Manager. The explosive agency should have the valid Blaster Certificate.
- ❖ He will blast holes in quarry site. After completion the blasting, the agency will take it out back the remaining quantity of explosives to the temporarily available the Magazine at the quarry site. The blasting time of the day is proposed to be 12 PM to 12.30 PM.
- ❖ First Aid Box will be keeping ready at all the time in Mines Office room. Necessary precautionary announcement will be carried out before the blasting operation.

### **8.0. MINE DRAINAGE**

#### **8.1. Depth of Water Level**

- ❖ The ground Water Level is noticed at the depth of 70m to 75m below ground level by monitoring nearby bore hole, during the climatic conditions, the fluctuations of water level is 70m in Rainy seasons and 75m in Summer seasons of this quarry area.
- ❖ The quarry operation is proposed upto a depth of 37.0m below ground level. Hence the quarrying operation may not affect the ground water in any manner.

- ❖ It shall be ensured that quarrying shall not be carried out below ground water table under any circumstances.
- ❖ *If ground water table occurs/Intervenes within the permitted depth, then also the quarrying shall be stopped.*

### **8.2. Arrangement 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 from seepage shall be less than 300LPM and it will be pumped out periodically by a stand by diesel powered Centrifugal pump with 5HP Motor.
- ❖ The quality of water is potable and no contamination with any hazardous things.
- ❖ Hence, the water stored in quarrying pit will be pumped out the adjacent agricultural fields and further stored in old pit the water is used for Dust suppression / Plantation purposes.

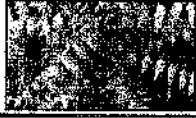

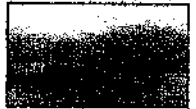
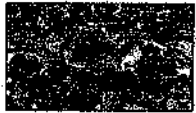

### **9.0. ECOLOGY AND BIODIVERSITY**

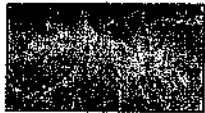

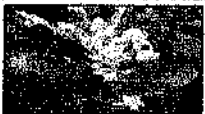


The green belt in the lease area be developed taking into consideration the availability of area as the efficiency of green belt in pollution control mainly depends on tree species, its width, distance from pollution sources, side of the habitat from working place and tree height. The proposed green belt should be designed to control PM10, gaseous pollutants, noise, surface run off and soil erosion etc., While considering the above aspects due care should be taken for selecting the suitable characteristics plant species such as fast growing, locally suitable plant species, resistant to specific pollutant and those which would maintain the regional ecological balance, soil and hydrological conditions.

Flora as observed and identified in the field are covered by mostly Neem Erukku, , Panal trees, Palmira tree and few Coconut trees are found more on regional scale. The Applicant has developed trees like Neem, Pungam, Teak, Caesarians and Eucalyptus, regional trees etc., with Proper nursery garden and plantation on vacant land. The fauna species observed around the 500m radius of the project site is given in the table

**List of Flora observed around the quarry site  
(Flora Trees & Flora Shrubs)**


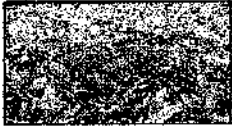



**Table No: 9**





<b>Flora - Trees</b>			
<b>S.No</b>	<b>Tamil Name</b>	<b>Botanical Name</b>	<b>Photograph</b>
1	Neem tree	Azadirachataindica	
2	Panai tree	Borassus flabellifer	
3	Mullu Maram	Prosopisjuliflora	
4	NunaMaram	Morindacitrifolia	
5	SavukkuMaram	Casuarinacunninghamiana	

<b>Flora - Shrubs</b>			
<b>S.No</b>	<b>Tamil Name</b>	<b>Botanical Name</b>	<b>Photograph</b>
1	Korai	CyperusPangorei	
2	Avaram	Senna articulate	
3	Erukku	Calotropis	
4	Mookuthichedi	Tridax procumbens	
5	Musumusukkai	Melothria	



**List of Fauna observed around the quarry site  
(Fauna Mammals & Fauna Avian)  
Table No: 10**

<b>Fauna Mammals</b>			
<b>S.No</b>	<b>Common Name</b>	<b>scientific name</b>	<b>Photograph</b>
1	Anil	Funambulus Palmarum	
2	Thavalai	Cane toad	
3	Keeri	Herpestes Edwardsii	
4	Rabbit	Oryctolagus cuniculus	
5	Udummbu	Varanus	

<b>Avian Fauna</b>			
1	Crow	Corvus Splendens	
2	Myna	Acridotheres tristis	
3	Parunthu	Haliastur Indus	
4	Pura	Columbidae	

## 10.0. OTHER PERMANENT STRUCTURES

### 10.1. *Habitatons / Village Natham (300m)*

- ❖ *There are no inhabited sites within the radius of 300m from the boundary of lease area under Rule 36(1-A) (a) TNMMCR 1959.*
- ❖ *The Nearest Village habitation is Eraiyur at the distance of 1.6Km on Southeastern side of the lease area.*
- ❖ *The applicant ensures the quarrying operation will be carried out without any hindrance to the habitants and adjoining land owners.*

### 10.2. *Power lines (HT/LT) (50m)*

- ❖ *There are no (LT/HT) lines within a radius of 50m.*

### 10.3. *Water bodies (River, Pond, Lake, Odai, Channel etc.,) (50m)*

- ❖ *The Odai is located at the distance of 10m on Southern side from the boundary of lease applied area.*
- ❖ *There is a lake located at the distance of 710m on Southeastern side from the boundary of lease applied area.*

### 10.4. *Archeological / Historical Monuments (500m)*

- ❖ *There are no Archeological / Historical Monuments within a radius of 500m from the boundary of lease applied area.*

### 10.5. *Existence of public road / (SH, NH others), Railway line if any (50m)*

- ❖ *There is an existing road from the area leads Eraiyur - Thiruvakkaral road at the Eastern side of the area.*
- ❖ *SH-136 Tindivanam to Puducherry road is located which is about 1.6Km on the Northern side of the area.*
- ❖ *NH-45 Viluppuram to Chennai road is located which is about 10.2Km on the Western side of the area.*
- ❖ *The Nearest Railway line is Perani station line which is about 10.5Km on the Northwestern side of the area.*

### 10.6. *Places of Worship (Temples, Church, Mosque etc.,) (500m)*

- ❖ *There is no Places of Worship within a radius of 500m.*

### 10.7. *Reserved Forest / Forest / Wild Life Sanctuary etc., (10Km)*

#### ➤ *Interstate Boundary:*

- ❖ *(Pondicherry) Chettipattu Village - 5.1 Km - Southern side*
- ❖ *(Pondicherry) Sandhai Pudukuppam Village - 5.9 Km - Southeastern*

**10.8 Any Other Structures**

Nil

**11.0. EMPLOYMENT POTENTIAL & WELFARE MEASURES:****11.1. Employment Potential (Management & Supervisory personal)**

The following man powers are proposed carry out the day to day quarrying activities at the proposed production and also comply with the statutory provision of the MMR 1961.

**Management and Supervisor:**

- |   |        |
|---|--------|
| 1. Mines Manager (with valid statutory qualification) | : 1 No |
| 2. Mines Foreman (with valid statutory qualification) | : 1 No |
| 3. Mines Mate (with valid statutory qualification)    | : 1 No |
| 4. Blaster  | : 1 No |

**Labours, Skilled, Semi-Skilled & Un-skilled**

- |   |          |
|---|----------|
| a. Skilled (Operators- Excavator & Jackhammer)        | : 5 Nos  |
| b. Semi-skilled (Driver)                              | : 5 Nos  |
| c. Unskilled (Musdoor/ Labours, Cleaners & Watch man) | : 10 Nos |

**Total : 24 Nos**

Allowing 10% absenteeism, the no. of men of roll will be around 22 Nos.

It is been ensured that, **Child Labours under 18 Years of age will not be engaged for any quarrying operation.**

Necessary Life Insurance policies will be taken by the applicant to all the employees up to the end of the lease period.

**11.2. Welfare Measures****a. Drinking Water**

Drinking water is available from the nearby agriculture land or water vendors in Erailyur Village which is about 1.6Km on Southeastern side of the area.

**b. Sanitary facilities**

- ❖ Semi-permanent latrines & urinals shall be maintained at convenient places for use of Labours as per the provisions of Rule (33) of the Mines Rules, 1955 separately for males and females. Washing facilities shall also be arranged as per Rule (36) of Mines Rules, 1955 and it will be maintained periodically.

**c. First Aid Facility**

- ❖ First Aid station as per provisions under Rule (44) of the Mines Rules, 1955 will be provided and First aid kits kept in mines office room, the qualified first aid personnel should be appointed or nominated to attend emergency first aid treatment.
- ❖ In case of eventuality, the victim will be given first aid immediately at the site and the injured person will be taken to the hospital is about 10.6Km on Southeastern side of Vanur. The competent and statutory of Foreman / Mate / Permit Manager will be incharge of the First aid.

**d. Labour Health**

- ❖ Periodic medical examination has to be arranged for occupational health once in a year in addition to attending medical treatment of occupational injuries under the Rule 45(A), Mines Rules, 1955.

**e. Precautionary safety measures to the Laborers**

- ❖ All the quarry workers will be provided with Safety device include such as safety helmet, mine goggles, ear muffs, ear Plugs, dust mask, sand respirator (avoid silica dusts forms-Silicosis), reflector jackets, safety thick shoes, etc., as Personnel Productive Equipment (PPE) as per the circulars and amendments made for Mine Labours under the guidance of DGMS.
- ❖ Periodically medical checkup will be conducted for all workers for any mine health problems.
- ❖ Proper training and induction will be given by qualified and experienced safety officer to all employees about the safe and systematic quarrying operation.
- ❖ The drillers and workers are sent for vocational training periodically to carry out the quarrying operations scientifically to safeguard the men machinery and mineral and to create awareness of conventional opencast quarrying operation.

**PART - B****12.0 ENVIRONMENTAL MANAGEMENT****12.1. Existing Land Use Pattern**

The area is exhibit Plain topography. The applied area is dry barren land and devoid of agriculture and habitations and the area is not used for the specific vegetation. The surrounding area is practiced by the seasonal cultivation.

*The existing Land use pattern is given as under*

Table No-11

S. No.	Land Use	Present Area (Hect)	Area in use during the quarrying period (Hect)
1.	Quarrying Pit	2.16.5	2.56.5
2.	Infrastructure	Nil	0.02.0
3.	Roads	0.01.0	0.01.0
4.	Green Belt	Nil	0.15.0
5.	Unutilized	1.20.0	0.63.0
	<b>Total</b>	<b>3.37.5Ha</b>	<b>3.37.5Ha</b>

**12.2. Water Regime**

Water Level in this area quarry area is noticed at a depth of 70m to 75m below ground level, observed nearby borehole the quarrying of Rough stone & Earth is proposed up to a depth of 37.0m (Max) below ground level. Hence, it will not affect the quality of ground water depletion of this area.

**12.3. Flora and Fauna**

The Thorny bushes are placed in quarry area and Neem, Panal trees are noticed nearby the quarry area. Except acacia bushes, no other valuable trees are noticed in the lease applied area. Further, neither flora of botanical interest nor fauna of zoological interest is noticed in this area.

**12.4. Climatic conditions**

The area receives annual rainfall of about 800mm to 900mm and the rainy season is mainly from Oct - Dec receives rain both in south west and north east monsoon. The Summer is hot with maximum temperature of 38°C and during Winter encounters a minimum temperature of 20°C.

**12.5. Human Settlement**

The nearest habitations with the population, approx. distance within 5.0Km radius from the proposed quarry site are as given under,

Table No-13

S. No	Name of the Village	Approximate distance	Direction from lease applied area	Approximate population
1.	Karasanur	3.2 Km	North - East	160
2.	Eraiyur	1.4 Km	South - East	600
3.	Ponnampundi	3.0 Km	South - West	190
4.	Kunamangalam	1.7 Km	North - West	410

### 12.6. Plan for Air, Dust Suppression

The air quality will be affected by the Suspended Particulate Matter (SPM) generated by the blasting, jack hammer drilling, loading and unloading during the quarrying operation. The following mitigation measures will be carried out, Mist water spraying will be carried out by means of water sprinklers to suppress dust emission in the Haul roads. The native species of Neem etc., will be planted along the lease boundary and Safety buffer zone. The quarried out materials will be fully covered by the Tarpaulin during transportation to avoid the spillage of materials. The Air quality will be monitored periodically as per the norms and mitigative measures carried out to prevent dust and air propagation in to the air. Operators, those exposed directly to such conditions will be provide such as (PPE) Personnel Protective Equipment's like Dust mask, Ear plug, Helmet, Gloze etc., as per the Mines Act -1952.

The estimated budget for dust suppression would be around **Rs.20,000/-** for the period of 5 Years only.

### 12.7. Plan for Noise Control

- ❖ The quarrying of Rough Stone will be carried out by Shallow holes of 32mm diameter and 1.5meter depth of wet drilling and conventional low power explosives such as slurry explosives, ordinary safety fuse only. Hence the ground vibration and noise pollution will be very minimum and restricted within the quarry workings. However, periodical noise level monitoring and other mitigation measures will be carried out to reduce the noise level and vibration in and around the quarry site.
- ❖ Nowhere the noise level should exceed the permissible limit of 80db during the quarry working hours.

- ❖ The drivers will be strictly instructed to move the vehicle during the transportation not exceeding 40.0Km per Hour, Sentries with Red Flag & whistle will be posted in village junction and regulate traffic.
- ❖ The estimated budget for Noise level monitoring would be around **Rs.20,000/-** for the period of 5 Years only.

### **12.8. Environmental Impact Assessment Statement Describing Impact on mining on the next Five years**

- ❖ The mining plan proposed is for a small production of Rough stone without involving deep hole drilling and heavy blasting. Such limited mining activity is not likely to cause any impact adversely on environment as far as pollution of air, Water and noise is concerned, anyhow environmental impact studies will be conducted as per EIA notification issued by MOEF. It is B2 Category of mine.
- ❖ The estimated Cost would be around **Rs. 3,70,000/-** for a period of 5 Years only.

### **12.9. Proposal for Waste Management**

There are no wastes anticipated during in this Rough stone & Earth quarry operation. The quarried out materials 100% will be utilized.

### **12.10. Proposal of Reclamation of Land affected during mining activities and at the end of mining (refilling/fencing etc.,)**

In the proposed mining plan only a maximum depth of **37.0m** (Max) below ground level has been envisaged as workable depth for Safe & Economic mining during the lease period. Hence, after quarry reaches Ultimate Pit Limit (for this lease period) of 37.0m depth, *S1 type Fencing* will be constructed around the quarried pits to prevent inherent entry of the public and cattle.

There is no proposal for refilling and rehabilitation. The Barbed wire fencing cost would be around **Rs.1,00,000/-**

**12.11. Program for Afforestation:**

The 7.5m & 10m safety distance along the lease boundary has been identified to be utilized for Afforestation in a phased manner as described below

Table - 14

Year	No. of Saplings proposed to be planted	Survival %	Area to be covered Sq.m	Name of the species	No. of Saplings expected to be grown
I	60	80%	300	Neem	48
II	60	80%	300	Neem	48
III	60	80%	300	Neem	48
IV	60	80%	300	Neem	48
V	60	80%	300	Neem	48

- Nearly 1500 Sq.m area is proposed to use under Afforestation by planting 60Nos of Neem Saplings etc., every year in the spacing interval of (5m X 5m) with an anticipated survival rate of 80%.
- Appropriate native species of Neem, Pungan, Teak and Casuarinas Saplings will be planted approach roads, service roads, nearby villages, village roads, government school etc.,
- Saplings of local plants of regional tress will be planted as per the consultation of the local Forest Department.
- The Quarry Land use, Layout and Afforestation Plan are showing in Plate No. VII.

**12.12. Proposed Financial Estimate / Budget for (EMP) Environment Management**

Table - 14

S.No	Monitory and Analysis Description	Rate per location	No. of location	Total Charges for monitoring		
				6 months	Per Year	5 Years
1	Ambient Air quality monitoring	5000	4	20000	40000	2,00,000
2	Water sampling and analysis	10000	1	10000	20000	1,00,000
3	Noise level monitoring	500	4	2000	4000	20,000
4	Ground vibration monitoring	2500	2	5000	10000	50,000
Total EMP Cost				37000	74000	3,70,000

The Environment Monitoring EMP Studies Cost would be around **Rs. 3,70,000/-** for a period of 5 Years only.



**I. Project Cost & Investment:****1) Land cost**

It is a Patta land, the approximate present land cost is about Rs.5,00,000/- per Hectare hence the land cost is calculated as **Rs. 16,87,500/-**

**2) Refilling/ Fencing**

There is no proposal for Refilling, after the excavation of Rough Stone & Earth the quarried out land will be fenced with barbed wire fencing the cost would be around **Rs. 80,000/-**

**3) Laborers shed**

Labours are proposed for quarrying Rough Stone. The machine operators and workers are from nearby local villages, hence no cost is involved. Rest shelter will be constructed as semi-permanent structure at the cost of **Rs.1,50,000/-**

**4) Sanitary facility**

Sanitary facility will be constructed as semi-permanent structure, the cost will be around **Rs.1,00,000/-**

**II. Machinery to be used :**

The Machinerles like Jack Hammer, Tractor mounted compressor attached with Jack hammer, Excavator Of 0.9m<sup>3</sup> bucket capacity attached with Rock Breaker are proposed to deploy for quarrying operation and Tippers/Trucks of 10 Tons capacity will be used for the quarrying transportation for hired basis, the cost will be around **Rs.30,00,000/-**

**I. Fixed Asset Cost :-**

1. Land cost	= Rs. 16,87,500/-
2. Refilling/Fencing cost	= Rs. 80,000/-
3. Rest shelter	= Rs. 1,50,000/-
4. Sanitary Facility	= Rs. 1,00,000/-

**II. Machinery Cost :-**

= Rs. 30,00,000/-

**Total Project Cost = Rs. 50,17,500/-**

**III. Expenditure :****1) Drinking Water facility and other utilities for the labourers**

24 Labours at the rate of Rs.2000/- month for a period of (Five) 5 Years, the cost will be around **Rs.1,20,000/-**

**2) Sanitary arrangement**

Sanitary maintenance at the cost of Rs.1,500/- month the cost will be around Rs.90,000/- for a period of (Five) 5 Years.

**3) Safety kits**

Rs.40,000 will be spent for the safety kits such as Helmet, Mine Goggles, Ear plugs, Ear muff, Dust Mask, Reflector jackets and safety Shoes.

**4) Water sprinkling (if necessary)**

Rs 2000/- month will be spent for sprinkling the water on haul roads for Dust suppression; the cost will be around Rs.1,20,000/- for a period of (Five) 5 Years.

**5) Afforestation etc.,**

Afforestation is proposed within safety zones of the lease applied area and plantations will be carried out on the nearby villages and village roads, Govt School after consultation with the Panchayat authorities. The cost estimate is around Rs.60,000/-

**Expenditure :**

1. Drinking water	= Rs. 1,20,000/-
2. Sanitary Arrangements	= Rs. 90,000/-
3. Safety kits	= Rs. 40,000/-
4. Water Sprinkling	= Rs. 1,20,000/-
5. Afforestation cost	= Rs. 60,000/-

**Environment Monitoring / 5 Years :**

1) Air Quality Sampling	= Rs. 2,00,000/-
2) Water Quality Sampling	= Rs. 1,00,000/-
3) Noise Level Monitoring	= Rs. 20,000/-
4) Ground vibration test	= Rs. 50,000/-
<i>EMP Cost Total</i>	<i>= Rs. 8,00,000/-</i>

(Expenditure Including EMP Studies)

<b>Total Project Cost</b>	<b>= Rs. 50,17,500/-</b>
<b>EMP Cost</b>	<b>= Rs. 8,00,000/-</b>

**12.13 Corporate Social Responsibility (CSR):**

- ❖ The Applicant shall be distributed Note books, Stationary items to nearby Govt Primary School and to conduct the Medical camp, Environment awareness program, etc., to nearby villages after consultation with local panchayat authorities.
- ❖ The Applicant shall ensure that a minimum of 2.5% from the Total project cost (Rs.1,25,437/-) for the entire lease period will be utilized for the CSR Activities.
- ❖ *District Mineral Fund @10% of the Royalty shall be given to the Dept. of Geology and Mining.*

**13.0 MINE CLOSURE PLAN****13.1. Steps proposed for phased restoration, reclamation of already mined out area.**

- ❖ This conventional Systematic, Scientific and Eco- Friendly quarrying operation for a depth of 37.0m (Max) below ground level and not required any Backfill, Reclamation and Rehabilitation, the quarried out lands will be used for Water storage purpose.
- ❖ The mined out area will be fenced on top of open cast working with S1 Fencing to arrest the entry of cattle and public in to the quarry site.

**13.2. Measures to be under taken on mine closure as per Act & Rules.**

- ❖ Measure will be taken as per Act & Rules. The quarried pit will be fenced by using Barbed wire fencing to prevent Inherent entry of public and cattle.

**13.3. Mitigation measures to be undertaken for safety and restoration/ reclamation of the already mined out area.****Air Quality:**

- ❖ (Air quality will be degrade due to drilling, blasting, mining operation and transportation)
- ❖ Drilling will be carried out by Wet drilling mode to control the dust propagation into the air.
- ❖ Blasting will be carried out on limited scale.
- ❖ Mist Water spraying on haul roads is proposed to prevent the dust propagation into the air.

**Noise and Vibration:**

- ❖ (The noise will be formed due to the drilling, blasting, loading and movement of Vehicles, Machineries)
- ❖ The applicant has proposed to plant native species of Neem saplings all along safety area to prevent Noise besides Wet drilling will be practiced to prevent dust and spillage.
- ❖ All the Vehicles, Machineries will be maintained in good conditions as per RTO and TNPCB Norms to prevent Noise, Smoke and Vibration to maintain Noise levels below 80 dB(decibel).

**Water Regime:**

- ❖ The quarrying operation has proposed upto a maximum depth of 37.0m below ground level is well above the ground water table (Summer 75m and Rainy seasons 70m) for a period of 5 Years only. Hence the ground water table will not affect in any manner.
- ❖ The seepage and rain water stored in quarrying pit will be drained out by 5 H.P motor pump and will be discharged through filter media to boundary barrier for afforestation and excess water will be sprayed on haul roads to prevent dust propagation in to the atmosphere.
- ❖ The Roughstone and Earth quarry will not produce any harmful toxic effluence in the form of Solid, Liquid or Gas.

**Human Health and Safety:**

- ❖ All the labors are provided with Safety Equipments like safety Helmet, Goggles, Ear muff, Ear Plug, Safety Jackets, Hand gloves, Thick Shoes etc.,at applicant cost, as per the specifications of the Director of Mines Safety.
- ❖ The competent qualified person Foreman/Permit Mines Manager will provide First Aid will take care of small and minor injuries. If any accident happens, the Victim will be taken to the nearby hospital by the own vehicle which is always kept in the mines office. The nearest hospital is about 10.6Km on southeastern side of Vanur Village

**14.0 ANY OTHER DETAILS INTEND TO FURNISH BY THE APPLICANT**

- i. The measures will be taken as per Act & Rules and Regulations and orders made there under shall be complied with, so that the safety of mine, machinery and mine workers will be protected.
- ii. It is expected that the mining will be done skillful, systematically, scientifically, and Eco-friendly quarrying operation.
- iii. There is no deep hole drilling and heavy blasting of this lease area.
- iv. The Applicant will endeavor every attempt to quarry the Rough Stone economically without any wastage and to improve the environment and ecology.
- v. Any violation pointed out by the inspecting authorities shall be rectified as per the guidellnes of the Department.

**Prepared by**



Signature of Recognised Qualified Person

**R. RAJASEKAR, M.Sc.,**  
Recognised Qualified Person  
Reg.No.RQP/CNN/264/2015/A

Place : Cuddalore

Date : .10.2018

A/614M/180/2018  
09/10/2018  
27/09/2018  
49/10/18

03/11/18

**TEST REPORT**

<b>Report No</b>	EHS360/TR/2024-25/002	<b>Report Date</b>	04.03.2024
<b>Site Location</b>	<b>THIRU. A. VEERARAGAVAN ROUGH STONE AND GRAVEL QUARRY</b> S.F.Nos. . 75/1, 75/4, 75/5, 75/6 and 76/3B2, Eraiyrur Village, Vanur Taluk, Viluppuram District.		
<b>Sampling Method</b>	IS 5182	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Air	<b>Sample Code</b>	EHS360/002
<b>Sample Description</b>	Ambient Air Quality Monitoring	<b>Sample Condition</b>	Good
<b>Sampling Location</b>	<b>AAQ 2 – Near Existing Quarry- 12° 4'13.82"N 79°38'45.18"E</b>		

Date	Period. hrs	PM10(µg/m3)	PM2.5(µg/m3)	SO2 (µg/m3)	NO2 (µg/m3)	O3 (µg/m3)	NH3 (µg/m3)	CO (mg/ m3)
01.12.2023	7:00-7:00	45.8	21.2	6.2	21.8	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
02.12.2023	7:15-7:15	44.6	22.3	7.5	22.7	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
08.12.2023	7:00-7:00	45.1	20.4	7.3	22.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
09.12.2023	7:15-7:15	42.5	21.3	6.0	23.2	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
15.12.2023	7:00-7:00	42.8	22.5	7.1	21.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
16.12.2023	7:15-7:15	43.5	20.6	7.3	22.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
22.12.2023	7:00-7:00	44.6	22.0	6.1	23.2	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
23.12.2023	7:15-7:15	45.2	21.3	7.2	22.0	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
29.12.2023	7:00-7:00	46.1	22.5	6.4	21.9	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
30.12.2023	7:15-7:15	42.1	20.0	7.3	23.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
05.01.2024	7:00-7:00	44.5	22.5	5.9	22.2	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
06.01.2024	7:15-7:15	45.2	20.3	5.2	23.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
12.01.2024	7:00-7:00	45.3	21.2	7.3	21.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
13.01.2024	7:15-7:15	45.0	22.3	6.1	22.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
19.01.2024	7:00-7:00	46.1	22.0	7.4	23.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
20.01.2024	7:15-7:15	45.0	21.3	6.5	22.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
26.01.2024	7:00-7:00	46.5	22.5	7.6	23.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
27.01.2024	7:15-7:15	44.3	20.3	6.0	22.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
02.02.2024	7:00-7:00	45.6	22.5	5.2	21.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
03.02.2024	7:15-7:15	44.2	21.6	6.5	22.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
09.02.2024	7:00-7:00	45.1	20.5	6.6	22.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
10.02.2024	7:15-7:15	46.3	22.4	7.4	21.9	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
16.02.2024	7:00-7:00	46.9	20.3	6.3	22.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
17.02.2024	7:15-7:15	44.2	22.4	7.2	22.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
23.02.2024	7:00-7:00	43.4	21.6	7.1	22.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
24.02.2024	7:15-7:15	45.6	21.5	7.3	23.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
NAAQ* Standard		<100	<60	<80	<80	<100	<400	<4

**Note:** BDL: Below Detection Limit ;DL: Detection Limit

**Remarks:** The values observed for the pollutants given above are within the CPCB standards.

\*\*\*\*\*End of Report\*\*\*\*\*



Verified by

Authorised Signatory

Name : Santhosh Kumar A  
Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

**TEST REPORT**

<b>Report No</b>	EHS360/TR/2024-25/002	<b>Report Date</b>	04.03.2024
<b>Site Location</b>	<b>THIRU. A. VEERARAGAVAN ROUGH STONE AND GRAVEL QUARRY</b> S.F.Nos. . 75/1, 75/4, 75/5, 75/6 and 76/3B2, Eraiyrur Village, Vanur Taluk, Viluppuram District.		
<b>Sampling Method</b>	IS 5182	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Air	<b>Sample Code</b>	EHS360/002
<b>Sample Description</b>	Ambient Air Quality Monitoring	<b>Sample Condition</b>	Good
<b>Sampling Location</b>	<b>AAQ 2 – Near Existing Quarry- 12° 4'13.82"N 79°38'45.18"E</b>		

Date	Period. hrs	SPM (µg/m³)	As (ng/m³)	C6H6 (µg/m³)	BaP (ng/m³)	Pb (µg/m³)	Ni (ng/m³)
01.12.2023	7:00-7:00	65.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
02.12.2023	7:15-7:15	64.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
08.12.2023	7:00-7:00	64.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
09.12.2023	7:15-7:15	65.8	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
15.12.2023	7:00-7:00	65.4	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
16.12.2023	7:15-7:15	64.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
22.12.2023	7:00-7:00	65.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
23.12.2023	7:15-7:15	65.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
29.12.2023	7:00-7:00	66.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
30.12.2023	7:15-7:15	66.9	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
05.01.2024	7:00-7:00	66.7	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
06.01.2024	7:15-7:15	65.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
12.01.2024	7:00-7:00	65.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
13.01.2024	7:15-7:15	66.4	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
19.01.2024	7:00-7:00	66.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
20.01.2024	7:15-7:15	66.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
26.01.2024	7:00-7:00	65.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
27.01.2024	7:15-7:15	64.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
02.02.2024	7:00-7:00	66.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
03.02.2024	7:15-7:15	65.8	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
09.02.2024	7:00-7:00	65.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
10.02.2024	7:15-7:15	65.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
16.02.2024	7:00-7:00	65.9	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
17.02.2024	7:15-7:15	65.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
23.02.2024	7:00-7:00	64.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
24.02.2024	7:15-7:15	65.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
NAAQ* Standard		<200	<100	<60	<80	<80	<100

**Note:** BDL: Below Detection Limit ;DL: Detection Limit  
**Remarks:** The values observed for the pollutants given above are within the CPCB standards.

\*\*\*\*\*End of Report\*\*\*\*\*

Page 1 of 1

Verified by



Authorised Signatory

Name: Santhosh Kumar A  
 Designation: Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report.  
 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client.  
 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

**TEST REPORT**

TC-9583

<b>Report No</b>	EHS360/TR/2024-25/003	<b>Report Date</b>	04.03.2024
<b>Site Location</b>	<b>THIRU. A. VEERARAGAVAN ROUGH STONE AND GRAVEL QUARRY</b> S.F.Nos. . 75/1, 75/4, 75/5, 75/6 and 76/3B2, Eraiyrur Village, Vanur Taluk, Viluppuram District.		
<b>Sampling Method</b>	IS 5182	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Air	<b>Sample Code</b>	EHS360/003
<b>Sample Description</b>	Ambient Air Quality Monitoring	<b>Sample Condition</b>	Good
<b>Sampling Location</b>	<b>AAQ3 –Eraiyrur - 12° 3'47.84"N 79°39'27.55"E</b>		

Date	Period. hrs	PM10(µg/m3)	PM2.5(µg/m3)	SO2 (µg/m3)	NO2 (µg/m3)	O3 (µg/m3)	NH3 (µg/m3)	CO (mg/ m3)
01.12.2023	7:00-7:00	43.2	22.3	5.2	24.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
02.12.2023	7:15-7:15	42.1	20.1	5.3	24.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
08.12.2023	7:00-7:00	41.0	20.3	7.0	22.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
09.12.2023	7:15-7:15	43.5	20.1	6.2	23.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
15.12.2023	7:00-7:00	44.5	20.2	7.3	24.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
16.12.2023	7:15-7:15	45.2	21.4	5.0	22.0	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
22.12.2023	7:00-7:00	43.0	20.0	5.6	23.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
23.12.2023	7:15-7:15	42.1	21.3	6.2	24.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
29.12.2023	7:00-7:00	43.5	21.2	5.0	22.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
30.12.2023	7:15-7:15	44.5	20.3	5.3	23.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
05.01.2024	7:00-7:00	45.3	21.5	5.1	24.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
06.01.2024	7:15-7:15	43.0	20.5	7.2	23.0	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
12.01.2024	7:00-7:00	42.1	20.3	5.0	22.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
13.01.2024	7:15-7:15	44.5	20.1	6.2	24.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
19.01.2024	7:00-7:00	45.6	20.0	7.2	22.0	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
20.01.2024	7:15-7:15	41.1	21.3	6.3	23.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
26.01.2024	7:00-7:00	42.2	20.5	7.2	24.8	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
27.01.2024	7:15-7:15	43.5	21.5	5.3	23.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
02.02.2024	7:00-7:00	45.1	20.4	6.2	22.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
03.02.2024	7:15-7:15	43.5	21.1	7.1	24.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
09.02.2024	7:00-7:00	44.2	21.1	6.8	23.7	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
10.02.2024	7:15-7:15	42.1	21.1	7.2	21.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
16.02.2024	7:00-7:00	41.0	20.5	5.3	22.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
17.02.2024	7:15-7:15	43.1	20.3	6.6	24.8	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
23.02.2024	7:00-7:00	44.5	20.0	7.8	22.0	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
24.02.2024	7:15-7:15	43.0	20.5	6.4	21.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
NAAQ* Standard		<100	<60	<80	<80	<100	<400	<4

**Note:** BDL: Below Detection Limit ;DL: Detection Limit

**Remarks:** The values observed for the pollutants given above are within the CPCB standards.

\*\*\*\*\*End of Report\*\*\*\*\*

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Verified by




Authorised Signatory



Name : Santhosh Kumar A  
Designation : Quality Manager

- Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report.  
3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client.  
4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.



## TEST REPORT

<b>Report No</b>	EHS360/TR/2024-25/003	<b>Report Date</b>	04.03.2024
<b>Site Location</b>	<b>THIRU. A. VEERARAGAVAN ROUGH STONE AND GRAVEL QUARRY</b> S.F.Nos. . 75/1, 75/4, 75/5, 75/6 and 76/3B2, Eraiyr Village, Vanur Taluk, Viluppuram District.		
<b>Sampling Method</b>	IS 5182	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Air	<b>Sample Code</b>	EHS360/003
<b>Sample Description</b>	Ambient Air Quality Monitoring	<b>Sample Condition</b>	Good
<b>Sampling Location</b>	AAQ3 –Eraiyr - 12° 3'47.84"N 79°39'27.55"E		

Date	Period. hrs	SPM (µg/m <sup>3</sup> )	As (ng/m <sup>3</sup> )	C6H6 (µg/m <sup>3</sup> )	BaP (ng/m <sup>3</sup> )	Pb (µg/m <sup>3</sup> )	Ni (ng/m <sup>3</sup> )
01.12.2023	7:00-7:00	65.4	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
02.12.2023	7:15-7:15	64.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
08.12.2023	7:00-7:00	65.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
09.12.2023	7:15-7:15	64.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
15.12.2023	7:00-7:00	65.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
16.12.2023	7:15-7:15	64.0	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
22.12.2023	7:00-7:00	65.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
23.12.2023	7:15-7:15	64.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
29.12.2023	7:00-7:00	67.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
30.12.2023	7:15-7:15	65.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
05.01.2024	7:00-7:00	63.8	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
06.01.2024	7:15-7:15	65.0	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
12.01.2024	7:00-7:00	66.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
13.01.2024	7:15-7:15	66.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
19.01.2024	7:00-7:00	67.0	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
20.01.2024	7:15-7:15	65.0	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
26.01.2024	7:00-7:00	65.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
27.01.2024	7:15-7:15	66.6	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
02.02.2024	7:00-7:00	67.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
03.02.2024	7:15-7:15	65.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
09.02.2024	7:00-7:00	67.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
10.02.2024	7:15-7:15	66.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
16.02.2024	7:00-7:00	63.0	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
17.02.2024	7:15-7:15	66.6	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
23.02.2024	7:00-7:00	65.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
24.02.2024	7:15-7:15	65.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
<b>NAAQ* Standard</b>		<200	<100	<60	<80	<80	<100

**Note:** BDL: Below Detection Limit ;DL: Detection Limit

**Remarks:** The values observed for the pollutants given above are within the CPCB standards.

\*\*\*\*\*End of Report\*\*\*\*\*

Page 1 of 1

Verified by



Authorised Signatory

A-S-K

**Name : Santhosh Kumar A**  
Designation : Quality Manager

- Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

**TEST REPORT**

<b>Report No</b>	EHS360/TR/2024-25/004	<b>Report Date</b>	04.03.2024
<b>Site Location</b>	<b>THIRU. A. VEERARAGAVAN ROUGH STONE AND GRAVEL QUARRY</b> S.F.Nos. . 75/1, 75/4, 75/5, 75/6 and 76/3B2, Eraiyrur Village, Vanur Taluk, Viluppuram District.		
<b>Sampling Method</b>	IS 5182	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Air	<b>Sample Code</b>	EHS360/004
<b>Sample Description</b>	Ambient Air Quality Monitoring	<b>Sample Condition</b>	Good
<b>Sampling Location</b>	<b>AAQ4 – Pathirapuliyur- 12° 5'44.96"N 79°35'36.32"E</b>		

Date	Period. hrs	PM10(µg/m3)	PM2.5(µg/m3)	SO2 (µg/m3)	NO2 (µg/m3)	O3 (µg/m3)	NH3 (µg/m3)	CO (mg/ m3)
01.12.2023	7:00-7:00	45.2	21.2	6.2	23.0	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
02.12.2023	7:15-7:15	46.3	22.3	7.3	21.2	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
08.12.2023	7:00-7:00	45.2	21.0	6.1	22.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
09.12.2023	7:15-7:15	45.1	22.8	6.2	21.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
15.12.2023	7:00-7:00	44.2	22.0	6.3	22.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
16.12.2023	7:15-7:15	45.1	21.3	7.2	24.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
22.12.2023	7:00-7:00	45.3	22.5	6.0	22.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
23.12.2023	7:15-7:15	44.1	23.4	6.3	23.2	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
29.12.2023	7:00-7:00	43.1	22.6	7.4	23.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
30.12.2023	7:15-7:15	43.5	21.3	6.5	22.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
05.01.2024	7:00-7:00	44.3	22.0	7.1	22.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
06.01.2024	7:15-7:15	44.9	23.5	7.5	21.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
12.01.2024	7:00-7:00	44.3	22.4	6.2	23.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
13.01.2024	7:15-7:15	43.2	22.5	6.3	24.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
19.01.2024	7:00-7:00	44.1	23.0	6.4	24.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
20.01.2024	7:15-7:15	44.1	22.4	7.6	23.2	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
26.01.2024	7:00-7:00	44.2	21.6	5.2	22.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
27.01.2024	7:15-7:15	43.2	23.5	7.0	23.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
02.02.2024	7:00-7:00	44.3	22.0	6.6	21.0	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
03.02.2024	7:15-7:15	44.0	21.3	7.3	22.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
09.02.2024	7:00-7:00	44.5	23.4	6.4	23.2	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
10.02.2024	7:15-7:15	43.6	22.0	7.2	23.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
16.02.2024	7:00-7:00	44.7	23.1	5.2	22.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
17.02.2024	7:15-7:15	43.2	23.5	6.5	21.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
23.02.2024	7:00-7:00	44.0	21.0	6.3	22.8	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
24.02.2024	7:15-7:15	43.3	23.5	5.6	23.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
NAAQ* Standard		<100	<60	<80	<80	<100	<400	<4

**Note:** BDL: Below Detection Limit ;DL: Detection Limit

**Remarks:** The values observed for the pollutants given above are within the CPCB standards.

\*\*\*\*\*End of Report\*\*\*\*\*

Page 1 of 1

Verified by



Authorised Signatory

A-57

Name: Santhosh Kumar A  
Designation: Quality Manager

- Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report.  
3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client.  
4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

## TEST REPORT

<b>Report No</b>	EHS360/TR/2024-25/004	<b>Report Date</b>	04.03.2024
<b>Site Location</b>	<b>THIRU. A. VEERARAGAVAN ROUGH STONE AND GRAVEL QUARRY</b> S.F.Nos. . 75/1, 75/4, 75/5, 75/6 and 76/3B2, Eraiyr Village, Vanur Taluk, Viluppuram District.		
<b>Sampling Method</b>	IS 5182	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Air	<b>Sample Code</b>	EHS360/004
<b>Sample Description</b>	Ambient Air Quality Monitoring	<b>Sample Condition</b>	Good
<b>Sampling Location</b>	AAQ4 – Pathirapuliur- 12° 5'44.96"N 79°35'36.32"E		

Date	Period. hrs	SPM (µg/m <sup>3</sup> )	As (ng/m <sup>3</sup> )	C6H6 (µg/m <sup>3</sup> )	BaP (ng/m <sup>3</sup> )	Pb (µg/m <sup>3</sup> )	Ni (ng/m <sup>3</sup> )
01.12.2023	7:00-7:00	66.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
02.12.2023	7:15-7:15	65.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
08.12.2023	7:00-7:00	65.0	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
09.12.2023	7:15-7:15	62.0	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
15.12.2023	7:00-7:00	64.6	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
16.12.2023	7:15-7:15	63.6	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
22.12.2023	7:00-7:00	64.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
23.12.2023	7:15-7:15	65.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
29.12.2023	7:00-7:00	66.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
30.12.2023	7:15-7:15	67.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
05.01.2024	7:00-7:00	68.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
06.01.2024	7:15-7:15	66.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
12.01.2024	7:00-7:00	67.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
13.01.2024	7:15-7:15	64.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
19.01.2024	7:00-7:00	64.0	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
20.01.2024	7:15-7:15	65.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
26.01.2024	7:00-7:00	65.4	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
27.01.2024	7:15-7:15	66.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
02.02.2024	7:00-7:00	66.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
03.02.2024	7:15-7:15	65.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
09.02.2024	7:00-7:00	66.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
10.02.2024	7:15-7:15	67.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
16.02.2024	7:00-7:00	68.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
17.02.2024	7:15-7:15	65.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
23.02.2024	7:00-7:00	64.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
24.02.2024	7:15-7:15	65.0	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
<b>NAAQ* Standard</b>		<200	<100	<60	<80	<80	<100

**Note:** BDL: Below Detection Limit ;DL: Detection Limit

**Remarks:** The values observed for the pollutants given above are within the CPCB standards.

\*\*\*\*\*End of Report\*\*\*\*\*

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Verified by



Authorised Signatory

A S K

**Name: Santhosh Kumar A**  
Designation : Quality Manager

- Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report.  
 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client.  
 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

**TEST REPORT**

<b>Report No</b>	EHS360/TR/2024-25/005	<b>Report Date</b>	04.03.2024
<b>Site Location</b>	<b>THIRU. A. VEERARAGAVAN ROUGH STONE AND GRAVEL QUARRY</b> S.F.Nos. . 75/1, 75/4, 75/5, 75/6 and 76/3B2, Eraiyr Village, Vanur Taluk, Viluppuram District.		
<b>Sampling Method</b>	IS 5182	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Air	<b>Sample Code</b>	EHS360/005
<b>Sample Description</b>	Ambient Air Quality Monitoring	<b>Sample Condition</b>	Good
<b>Sampling Location</b>	<b>AAQ5 – Iveli - 12° 1'54.39"N 79°37'13.24"E</b>		

Date	Period. hrs	PM10(µg/m3)	PM2.5(µg/m3)	SO2 (µg/m3)	NO2 (µg/m3)	O3 (µg/m3)	NH3 (µg/m3)	CO (mg/ m3)
01.12.2023	7:00-7:00	42.2	20.1	7.2	22.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
02.12.2023	7:15-7:15	43.3	21.3	6.9	23.2	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
08.12.2023	7:00-7:00	44.5	22.4	7.2	22.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
09.12.2023	7:15-7:15	44.6	23.5	6.3	24.0	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
15.12.2023	7:00-7:00	46.5	22.6	7.4	23.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
16.12.2023	7:15-7:15	47.2	21.0	7.6	22.2	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
22.12.2023	7:00-7:00	48.0	23.1	6.2	21.0	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
23.12.2023	7:15-7:15	45.0	22.4	7.0	19.0	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
29.12.2023	7:00-7:00	42.3	23.5	7.1	20.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
30.12.2023	7:15-7:15	41.0	20.5	6.4	21.2	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
05.01.2024	7:00-7:00	40.3	21.6	7.5	22.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
06.01.2024	7:15-7:15	43.5	22.3	6.3	19.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
12.01.2024	7:00-7:00	44.5	23.5	7.0	20.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
13.01.2024	7:15-7:15	45.3	22.5	6.6	22.0	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
19.01.2024	7:00-7:00	46.1	21.5	7.2	19.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
20.01.2024	7:15-7:15	47.1	23.6	6.4	19.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
26.01.2024	7:00-7:00	48.0	20.0	6.0	19.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
27.01.2024	7:15-7:15	46.2	23.0	7.3	22.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
02.02.2024	7:00-7:00	47.2	22.4	6.4	20.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
03.02.2024	7:15-7:15	48.0	21.5	7.6	19.2	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
09.02.2024	7:00-7:00	45.5	23.0	6.2	19.0	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
10.02.2024	7:15-7:15	46.3	22.5	6.3	20.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
16.02.2024	7:00-7:00	47.2	21.6	4.6	19.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
17.02.2024	7:15-7:15	48.1	23.4	5.5	19.0	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
23.02.2024	7:00-7:00	46.3	22.4	5.2	19.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
24.02.2024	7:15-7:15	45.2	21.0	5.5	18.8	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
<b>NAAQ* Standard</b>		<100	<60	<80	<80	<100	<400	<4

**Note:** BDL: Below Detection Limit ; DL: Detection Limit

**Remarks:** The values observed for the pollutants given above are within the CPCB standards.

\*\*\*\*\*End of Report\*\*\*\*\*



Verified by

Authorised Signatory

Name: Santhosh Kumar A  
Designation: Quality Manager

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## TEST REPORT

<b>Report No</b>	EHS360/TR/2024-25/005	<b>Report Date</b>	04.03.2024
<b>Site Location</b>	<b>THIRU. A. VEERARAGAVAN ROUGH STONE AND GRAVEL QUARRY</b> S.F.Nos. . 75/1, 75/4, 75/5, 75/6 and 76/3B2, Eraiyur Village, Vanur Taluk, Viluppuram District.		
<b>Sampling Method</b>	IS 5182	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Air	<b>Sample Code</b>	EHS360/005
<b>Sample Description</b>	Ambient Air Quality Monitoring	<b>Sample Condition</b>	Good
<b>Sampling Location</b>	AAQ5 – Iveli - 12° 1'54.39"N 79°37'13.24"E		

Date	Period. hrs	SPM (µg/m <sup>3</sup> )	As (ng/m <sup>3</sup> )	C6H6 (µg/m <sup>3</sup> )	BaP (ng/m <sup>3</sup> )	Pb (µg/m <sup>3</sup> )	Ni (ng/m <sup>3</sup> )
01.12.2023	7:00-7:00	66.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
02.12.2023	7:15-7:15	65.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
08.12.2023	7:00-7:00	65.0	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
09.12.2023	7:15-7:15	65.0	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
15.12.2023	7:00-7:00	66.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
16.12.2023	7:15-7:15	67.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
22.12.2023	7:00-7:00	68.0	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
23.12.2023	7:15-7:15	62.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
29.12.2023	7:00-7:00	64.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
30.12.2023	7:15-7:15	65.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
05.01.2024	7:00-7:00	66.0	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
06.01.2024	7:15-7:15	67.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
12.01.2024	7:00-7:00	68.0	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
13.01.2024	7:15-7:15	63.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
19.01.2024	7:00-7:00	64.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
20.01.2024	7:15-7:15	64.4	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
26.01.2024	7:00-7:00	62.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
27.01.2024	7:15-7:15	63.0	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
02.02.2024	7:00-7:00	64.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
03.02.2024	7:15-7:15	62.0	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
09.02.2024	7:00-7:00	65.0	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
10.02.2024	7:15-7:15	66.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
16.02.2024	7:00-7:00	67.0	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
17.02.2024	7:15-7:15	68.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
23.02.2024	7:00-7:00	67.0	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
24.02.2024	7:15-7:15	65.0	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
<b>NAAQ* Standard</b>		<200	<100	<60	<80	<80	<100

**Note:** BDL: Below Detection Limit ;DL: Detection Limit

**Remarks:** The values observed for the pollutants given above are within the CPCB standards.

\*\*\*\*\*End of Report\*\*\*\*\*

Page 1 of 1

Verified by



Authorised Signatory

A S K

**Name: Santhosh Kumar A**  
Designation : Quality Manager

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**TEST REPORT**

<b>Report No</b>	EHS360/TR/2024-25/006	<b>Report Date</b>	04.03.2024
<b>Site Location</b>	<b>THIRU. A. VEERARAGAVAN ROUGH STONE AND GRAVEL QUARRY</b> S.F.Nos. . 75/1, 75/4, 75/5, 75/6 and 76/3B2, Eraiyr Village, Vanur Taluk, Viluppuram District.		
<b>Sampling Method</b>	IS 5182	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Air	<b>Sample Code</b>	EHS360/006
<b>Sample Description</b>	Ambient Air Quality Monitoring	<b>Sample Condition</b>	Good
<b>Sampling Location</b>	<b>AAQ 6 – Ilavampattu- 12° 5'5.60"N 79°42'13.04"E</b>		

Date	Period. hrs	PM10(µg/m3)	PM2.5(µg/m3)	SO2 (µg/m3)	NO2 (µg/m3)	O3 (µg/m3)	NH3 (µg/m3)	CO (mg/ m3)
01.12.2023	7:00-7:00	42.0	21.2	6.2	22.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
02.12.2023	7:15-7:15	43.5	22.3	6.4	23.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
08.12.2023	7:00-7:00	44.5	20.1	7.2	22.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
09.12.2023	7:15-7:15	45.6	22.3	6.3	21.0	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
15.12.2023	7:00-7:00	43.1	21.0	7.3	22.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
16.12.2023	7:15-7:15	44.5	22.5	6.4	21.0	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
22.12.2023	7:00-7:00	45.6	23.0	7.3	22.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
23.12.2023	7:15-7:15	42.1	21.4	5.2	23.0	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
29.12.2023	7:00-7:00	43.5	22.0	5.0	22.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
30.12.2023	7:15-7:15	45.1	21.3	7.1	23.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
05.01.2024	7:00-7:00	42.0	22.4	6.2	21.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
06.01.2024	7:15-7:15	44.3	21.5	5.3	23.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
12.01.2024	7:00-7:00	45.6	22.4	5.4	23.0	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
13.01.2024	7:15-7:15	43.7	20.3	5.3	21.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
19.01.2024	7:00-7:00	45.1	21.0	7.5	20.0	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
20.01.2024	7:15-7:15	45.8	22.5	6.6	21.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
26.01.2024	7:00-7:00	42.0	21.6	7.0	23.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
27.01.2024	7:15-7:15	43.1	22.7	6.4	22.0	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
02.02.2024	7:00-7:00	44.5	21.3	5.2	21.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
03.02.2024	7:15-7:15	45.6	22.7	5.3	22.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
09.02.2024	7:00-7:00	43.2	21.3	5.4	23.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
10.02.2024	7:15-7:15	42.1	22.6	5.5	22.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
16.02.2024	7:00-7:00	43.5	20.5	6.0	23.7	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
17.02.2024	7:15-7:15	44.2	22.3	7.3	22.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
23.02.2024	7:00-7:00	45.1	21.4	6.4	21.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
24.02.2024	7:15-7:15	44.6	22.5	7.5	22.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
<b>NAAQ* Standard</b>		<100	<60	<80	<80	<100	<400	<4

**Note:** BDL: Below Detection Limit ;DL: Detection Limit

**Remarks:** The values observed for the pollutants given above are within the CPCB standards.

\*\*\*\*\*End of Report\*\*\*\*\*

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Verified by



Authorised Signatory

Name : Santhosh Kumar A  
Designation : Quality Manager

- Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report.  
3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client.  
4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

## TEST REPORT

<b>Report No</b>	EHS360/TR/2024-25/006	<b>Report Date</b>	04.03.2024
<b>Site Location</b>	<b>THIRU. A. VEERARAGAVAN ROUGH STONE AND GRAVEL QUARRY</b> S.F.Nos. . 75/1, 75/4, 75/5, 75/6 and 76/3B2, Eraiur Village, Vanur Taluk, Viluppuram District.		
<b>Sampling Method</b>	IS 5182	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Air	<b>Sample Code</b>	EHS360/006
<b>Sample Description</b>	Ambient Air Quality Monitoring	<b>Sample Condition</b>	Good
<b>Sampling Location</b>	AAQ 6 – Ilavampattu- 12° 5'5.60"N 79°42'13.04"E		

Date	Period. hrs	SPM (µg/m <sup>3</sup> )	As (ng/m <sup>3</sup> )	C6H6 (µg/m <sup>3</sup> )	BaP (ng/m <sup>3</sup> )	Pb (µg/m <sup>3</sup> )	Ni (ng/m <sup>3</sup> )
01.12.2023	7:00-7:00	63.9	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
02.12.2023	7:15-7:15	65.0	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
08.12.2023	7:00-7:00	65.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
09.12.2023	7:15-7:15	66.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
15.12.2023	7:00-7:00	66.0	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
16.12.2023	7:15-7:15	65.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
22.12.2023	7:00-7:00	66.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
23.12.2023	7:15-7:15	67.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
29.12.2023	7:00-7:00	68.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
30.12.2023	7:15-7:15	65.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
05.01.2024	7:00-7:00	64.4	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
06.01.2024	7:15-7:15	66.4	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
12.01.2024	7:00-7:00	65.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
13.01.2024	7:15-7:15	65.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
19.01.2024	7:00-7:00	66.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
20.01.2024	7:15-7:15	64.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
26.01.2024	7:00-7:00	65.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
27.01.2024	7:15-7:15	64.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
02.02.2024	7:00-7:00	63.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
03.02.2024	7:15-7:15	62.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
09.02.2024	7:00-7:00	65.0	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
10.02.2024	7:15-7:15	63.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
16.02.2024	7:00-7:00	62.8	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
17.02.2024	7:15-7:15	63.6	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
23.02.2024	7:00-7:00	65.7	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
24.02.2024	7:15-7:15	64.4	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
<b>NAAQ* Standard</b>		<200	<100	<60	<80	<80	<100

**Note:** BDL: Below Detection Limit ;DL: Detection Limit

**Remarks:** The values observed for the pollutants given above are within the CPCB standards.

\*\*\*\*\*End of Report\*\*\*\*\*

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Verified by



Authorised Signatory

A-17

**Name: Santhosh Kumar A**  
Designation: Quality Manager

- Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

**TEST REPORT**

<b>Report No</b>	EHS360/TR/2024-25/007	<b>Report Date</b>	04.03.2024
<b>Site Location</b>	<b>THIRU. A. VEERARAGAVAN ROUGH STONE AND GRAVEL QUARRY</b> S.F.Nos. . 75/1, 75/4, 75/5, 75/6 and 76/3B2, Eraiyrur Village, Vanur Taluk, Viluppuram District.		
<b>Sampling Method</b>	IS 5182	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Air	<b>Sample Code</b>	EHS360/007
<b>Sample Description</b>	Ambient Air Quality Monitoring	<b>Sample Condition</b>	Good
<b>Sampling Location</b>	<b>AAQ7 – Veliyanur- 12° 7'25.17"N 79°39'11.51"E</b>		

Date	Period. hrs	PM10(µg/m3)	PM2.5(µg/m3)	SO2 (µg/m3)	NO2 (µg/m3)	O3 (µg/m3)	NH3 (µg/m3)	CO (mg/ m3)
01.12.2023	7:00-7:00	45.1	20.1	7.2	19.0	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
02.12.2023	7:15-7:15	43.2	19.1	8.3	20.2	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
08.12.2023	7:00-7:00	44.0	18.5	6.0	21.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
09.12.2023	7:15-7:15	46.3	19.0	8.2	22.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
15.12.2023	7:00-7:00	47.5	20.6	7.3	18.0	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
16.12.2023	7:15-7:15	47.2	21.3	6.0	19.2	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
22.12.2023	7:00-7:00	48.5	19.5	7.4	22.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
23.12.2023	7:15-7:15	47.0	19.6	8.3	21.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
29.12.2023	7:00-7:00	46.3	18.7	7.3	22.0	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
30.12.2023	7:15-7:15	45.0	18.1	8.0	18.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
05.01.2024	7:00-7:00	43.2	19.5	7.4	20.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
06.01.2024	7:15-7:15	45.1	19.6	8.3	21.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
12.01.2024	7:00-7:00	46.5	18.5	6.3	19.0	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
13.01.2024	7:15-7:15	47.3	19.0	7.0	22.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
19.01.2024	7:00-7:00	48.2	18.1	8.2	21.0	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
20.01.2024	7:15-7:15	46.2	19.5	6.4	20.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
26.01.2024	7:00-7:00	45.5	20.0	7.3	22.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
27.01.2024	7:15-7:15	46.0	20.6	6.8	18.0	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
02.02.2024	7:00-7:00	47.2	21.5	8.1	19.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
03.02.2024	7:15-7:15	48.3	20.6	7.0	20.0	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
09.02.2024	7:00-7:00	46.0	19.5	6.3	21.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
10.02.2024	7:15-7:15	47.2	18.0	8.4	22.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
16.02.2024	7:00-7:00	45.0	20.8	7.0	22.0	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
17.02.2024	7:15-7:15	43.2	19.6	6.5	19.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
23.02.2024	7:00-7:00	44.5	18.1	8.3	20.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
24.02.2024	7:15-7:15	47.0	19.5	7.5	21.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
NAAQ* Standard		<100	<60	<80	<80	<100	<400	<4

**Note:** BDL: Below Detection Limit ;DL: Detection Limit

**Remarks:** The values observed for the pollutants given above are within the CPCB standards.

\*\*\*\*\*End of Report\*\*\*\*\*

Page 1 of 1

Verified by



Authorised Signatory

A S A

Name : Santhosh Kumar A  
Designation : Quality Manager

- Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report.  
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## TEST REPORT

<b>Report No</b>	EHS360/TR/2024-25/007	<b>Report Date</b>	04.03.2024
<b>Site Location</b>	<b>THIRU. A. VEERARAGAVAN ROUGH STONE AND GRAVEL QUARRY</b> S.F.Nos. . 75/1, 75/4, 75/5, 75/6 and 76/3B2, Eraiyur Village, Vanur Taluk, Viluppuram District.		
<b>Sampling Method</b>	IS 5182	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Air	<b>Sample Code</b>	EHS360/007
<b>Sample Description</b>	Ambient Air Quality Monitoring	<b>Sample Condition</b>	Good
<b>Sampling Location</b>	AAQ7 – Veliyanur- 12° 7'25.17"N 79°39'11.51"E		

Date	Period. hrs	SPM (µg/m <sup>3</sup> )	As (ng/m <sup>3</sup> )	C6H6 (µg/m <sup>3</sup> )	BaP (ng/m <sup>3</sup> )	Pb (µg/m <sup>3</sup> )	Ni (ng/m <sup>3</sup> )
01.12.2023	7:00-7:00	66.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
02.12.2023	7:15-7:15	67.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
08.12.2023	7:00-7:00	68.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
09.12.2023	7:15-7:15	70.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
15.12.2023	7:00-7:00	65.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
16.12.2023	7:15-7:15	66.0	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
22.12.2023	7:00-7:00	65.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
23.12.2023	7:15-7:15	67.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
29.12.2023	7:00-7:00	68.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
30.12.2023	7:15-7:15	69.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
05.01.2024	7:00-7:00	70.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
06.01.2024	7:15-7:15	68.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
12.01.2024	7:00-7:00	70.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
13.01.2024	7:15-7:15	65.4	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
19.01.2024	7:00-7:00	68.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
20.01.2024	7:15-7:15	69.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
26.01.2024	7:00-7:00	71.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
27.01.2024	7:15-7:15	65.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
02.02.2024	7:00-7:00	66.4	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
03.02.2024	7:15-7:15	67.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
09.02.2024	7:00-7:00	68.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
10.02.2024	7:15-7:15	69.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
16.02.2024	7:00-7:00	70.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
17.02.2024	7:15-7:15	68.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
23.02.2024	7:00-7:00	66.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
24.02.2024	7:15-7:15	65.4	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
<b>NAAQ* Standard</b>		<200	<100	<60	<80	<80	<100

**Note:** BDL: Below Detection Limit ;DL: Detection Limit

**Remarks:** The values observed for the pollutants given above are within the CPCB standards.

\*\*\*\*\*End of Report\*\*\*\*\*

Page 1 of 1

Verified by



Authorised Signatory

A-57

**Name : Santhosh Kumar A**  
Designation : Quality Manager

- Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.



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Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

**TEST REPORT**

<b>Report No</b>	EHS360/TR/2024-25/024	<b>Report Date</b>	04.03.2024
<b>Site Location</b>	<b>THIRU. A. VEERARAGAVAN ROUGH STONE AND GRAVEL QUARRY</b> S.F.Nos. . 75/1, 75/4, 75/5, 75/6 and 76/3B2, Eraiyrur Village, Vanur Taluk, Viluppuram District.		
<b>Sampling Method</b>	IS 5182	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Air	<b>Sample Code</b>	EHS360/024
<b>Sample Description</b>	Ambient Air Quality Monitoring	<b>Sample Condition</b>	Good
<b>Sampling Location</b>	<b>AAQ 1 – Core Zone-12° 4'18.33"N 79°38'44.83"E</b>		

Date	Period. hrs	PM10(µg/m3)	PM2.5(µg/m3)	SO2 (µg/m3)	NO2 (µg/m3)	O3 (µg/m3)	NH3 (µg/m3)	CO (mg/ m3)
01.12.2023	7:00-7:00	45.3	21.3	7.2	24.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
02.12.2023	7:15-7:15	45.2	20.1	7.3	23.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
08.12.2023	7:00-7:00	46.1	21.1	6.4	22.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
09.12.2023	7:15-7:15	45.6	21.3	6.2	24.2	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
15.12.2023	7:00-7:00	46.3	22.4	6.3	23.6	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
16.12.2023	7:15-7:15	44.2	21.5	7.6	22.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
22.12.2023	7:00-7:00	45.2	21.3	6.3	23.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
23.12.2023	7:15-7:15	46.3	20.1	7.4	24.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
29.12.2023	7:00-7:00	46.1	21.2	6.5	23.2	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
30.12.2023	7:15-7:15	46.3	21.3	7.1	23.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
05.01.2024	7:00-7:00	44.2	20.5	6.2	24.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
06.01.2024	7:15-7:15	46.3	21.6	5.5	22.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
12.01.2024	7:00-7:00	45.2	21.5	6.3	24.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
13.01.2024	7:15-7:15	45.1	20.3	5.5	23.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
19.01.2024	7:00-7:00	44.5	21.3	5.4	24.0	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
20.01.2024	7:15-7:15	45.6	20.3	6.2	24.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
26.01.2024	7:00-7:00	46.2	20.5	6.5	22.1	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
27.01.2024	7:15-7:15	46.2	21.2	6.4	24.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
02.02.2024	7:00-7:00	46.2	22.6	6.6	23.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
03.02.2024	7:15-7:15	46.2	22.5	8.2	24.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
09.02.2024	7:00-7:00	44.5	21.5	7.3	22.9	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
10.02.2024	7:15-7:15	44.5	21.4	6.1	24.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
16.02.2024	7:00-7:00	45.6	22.3	8.2	23.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
17.02.2024	7:15-7:15	46.2	22.5	7.3	22.3	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
23.02.2024	7:00-7:00	46.3	21.5	6.6	23.4	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
24.02.2024	7:15-7:15	45.3	22.8	7.4	22.5	BDL(DL:5.0)	BDL(DL:1.0)	BDL(DL:1.14)
NAAQ* Standard		<100	<60	<80	<80	<100	<400	<4

**Note:** BDL: Below Detection Limit ;DL: Detection Limit

**Remarks:** The values observed for the pollutants given above are within the CPCB standards.

\*\*\*\*\*End of Report\*\*\*\*\*

Page 1 of 1

Verified by



Authorised Signatory

Name : Santhosh Kumar A  
Designation : Quality Manager

- Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report.  
3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client.  
4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

**TEST REPORT**

<b>Report No</b>	EHS360/TR/2024-25/024	<b>Report Date</b>	04.03.2024
<b>Site Location</b>	<b>THIRU. A. VEERARAGAVAN ROUGH STONE AND GRAVEL QUARRY</b> S.F.Nos. . 75/1, 75/4, 75/5, 75/6 and 76/3B2, Eraiyrur Village, Vanur Taluk, Viluppuram District.		
<b>Sampling Method</b>	IS 5182	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Air	<b>Sample Code</b>	EHS360/024
<b>Sample Description</b>	Ambient Air Quality Monitoring	<b>Sample Condition</b>	Good
<b>Sampling Location</b>	<b>AAQ 1 – Core Zone-12° 4'18.33"N 79°38'44.83"E</b>		

Date	Period. hrs	SPM (µg/m <sup>3</sup> )	As (ng/m <sup>3</sup> )	C6H6 (µg/m <sup>3</sup> )	BaP (ng/m <sup>3</sup> )	Pb (µg/m <sup>3</sup> )	Ni (ng/m <sup>3</sup> )
01.12.2023	7:00-7:00	65.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
02.12.2023	7:15-7:15	66.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
08.12.2023	7:00-7:00	67.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
09.12.2023	7:15-7:15	66.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
15.12.2023	7:00-7:00	67.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
16.12.2023	7:15-7:15	67.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
22.12.2023	7:00-7:00	66.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
23.12.2023	7:15-7:15	66.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
29.12.2023	7:00-7:00	67.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
30.12.2023	7:15-7:15	67.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
05.01.2024	7:00-7:00	67.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
06.01.2024	7:15-7:15	66.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
12.01.2024	7:00-7:00	66.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
13.01.2024	7:15-7:15	66.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
19.01.2024	7:00-7:00	67.7	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
20.01.2024	7:15-7:15	66.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
26.01.2024	7:00-7:00	67.3	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
27.01.2024	7:15-7:15	67.1	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
02.02.2024	7:00-7:00	67.9	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
03.02.2024	7:15-7:15	67.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
09.02.2024	7:00-7:00	66.2	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
10.02.2024	7:15-7:15	66.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
16.02.2024	7:00-7:00	66.0	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
17.02.2024	7:15-7:15	67.5	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
23.02.2024	7:00-7:00	67.8	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
24.02.2024	7:15-7:15	66.4	BDL (DL:0.1)	BDL (DL:1.0)	BDL (DL:1.0)	BDL (DL:0.1)	BDL (DL:0.1)
NAAQ* Standard		<200	<100	<60	<80	<80	<100

**Note:** BDL: Below Detection Limit ;DL: Detection Limit

**Remarks:** The values observed for the pollutants given above are within the CPCB standards.

\*\*\*\*\*End of Report\*\*\*\*\*

Page 1 of 1

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Authorised Signatory

*A.S.K.*

Name : Santhosh Kumar A  
Designation : Quality Manager

- Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

**TEST REPORT**

<b>Report No</b>	EHS360/TR/2024-25/008	<b>Report Date</b>	04.03.2024
<b>Site Location</b>	<b>THIRU. A. VEERARAGAVAN ROUGH STONE AND GRAVEL QUARRY</b> S.F.Nos. . 75/1, 75/4, 75/5, 75/6 and 76/3B2, Eraiur Village, Vanur Taluk, Viluppuram District.		
<b>Sampling Method</b>	IS 9989	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Noise Level Monitoring	<b>Sample Code</b>	EHS360/ 008
<b>Sample Description</b>	Ambient Noise	<b>Sample Collected Date</b>	26.02.2024

Location	N1 – Core Zone- 12° 4'21.89"N 79°38'38.45"E			N2 – Near Existing Quarry – 12° 4'9.82"N 79°38'43.35"E		
Parameter	Min	Max	Result	Min	Max	Result
Time	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
06:00-07:00	40.2	42.3	41.4	40.2	42.3	41.4
07:00-08:00	42.3	44.1	43.3	42.3	44.2	43.4
08:00-09:00	43.1	45.3	44.3	41.5	45.3	43.8
09:00-10:00	41.2	44.3	43.0	43.5	46.1	45.0
10:00-11:00	42.1	44.2	43.3	41.2	44.5	43.2
11:00-12:00	43.2	45.1	44.3	42.6	44.3	43.5
12:00-13:00	40.3	43.2	42.0	41.5	43.2	42.4
13:00-14:00	42.5	44.6	43.7	40.2	42.1	41.3
14:00-15:00	44.1	48.1	46.5	42.1	44.6	43.5
15:00-16:00	42.3	44.2	43.4	40.2	42.3	41.4
16:00-17:00	42.3	45.1	43.9	41.2	43.7	42.6
17:00-18:00	44.1	46.3	45.3	43.6	45.2	44.5
18:00-19:00	41.2	45.4	43.8	42.2	44.3	43.4
19:00-20:00	42.1	44.3	43.3	40.2	42.6	41.6
20:00-21:00	40.2	42.3	41.4	42.1	45.2	43.9
21:00-22:00	39.2	40.2	39.7	38.2	40.2	39.3
22:00-23:00	38.6	42.3	40.8	36.5	38.9	37.9
23:00-00:00	36.2	38.6	37.6	37.2	39.2	38.3
00:00-01:00	35.2	38.4	37.1	36.4	38.1	37.3
01:00-02:00	34.1	39.2	37.4	35.2	36.8	36.1
02:00-03:00	33.2	36.2	35.0	31.1	34.2	32.9
03:00-04:00	31.6	34.2	33.1	30.2	35.2	33.4
04:00-05:00	34.2	36.2	35.3	35.6	37.6	36.7
05:00-06:00	35.6	38.5	37.3	32.1	34.2	33.3
Result	Day Means		43.1	Day Means		42.5
	Night Means		36.1	Night Means		35.4

Note: CPCB Norms Industrial Area Day Time:75 dB(A); Night Time:70 dB(A)  
The Noise level in the above location exists within the permissible limits of CPCB.

\*\*\*\*\*End of Report\*\*\*\*\*

Page 1 of 1

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Authorised Signatory

A-17

Name: Santhosh Kumar A  
Designation: Quality Manager

- Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

**TEST REPORT**

<b>Report No</b>	EHS360/TR/2024-25/009	<b>Report Date</b>	04.03.2024
<b>Site Location</b>	<b>THIRU. A. VEERARAGAVAN ROUGH STONE AND GRAVEL QUARRY</b> S.F.Nos. . 75/1, 75/4, 75/5, 75/6 and 76/3B2, Eraiyr Village, Vanur Taluk, Viluppuram District.		
<b>Sampling Method</b>	IS 9989	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Noise Level Monitoring	<b>Sample Code</b>	EHS360/ 009
<b>Sample Description</b>	Ambient Noise	<b>Sample Collected Date</b>	26.02.2024

Location	N3 – Eraiyr -12° 3'47.39"N 79°39'27.68"E			N4 – Pathirapuliyr - 12° 5'45.20"N 79°35'35.75"E		
Parameter	Min	Max	Result	Min	Max	Result
Time	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
06:00-07:00	41.2	42.3	41.8	40.3	42.3	41.4
07:00-08:00	40.3	42.1	41.3	41.3	43.5	42.5
08:00-09:00	41.3	43.2	42.4	42.1	44.1	43.2
09:00-10:00	40.3	42.1	41.3	41.3	43.6	42.6
10:00-11:00	42.1	44.1	43.2	40.3	42.5	41.5
11:00-12:00	40.1	42.3	41.3	38.2	40.2	39.3
12:00-13:00	42.3	44.1	43.3	39.2	42.1	40.9
13:00-14:00	41.2	43.6	42.6	36.1	42.5	40.4
14:00-15:00	40.1	42.1	41.2	35.2	37.2	36.3
15:00-16:00	42.3	44.3	43.4	38.6	42.1	40.7
16:00-17:00	41.3	44.1	42.9	40.1	43.1	41.9
17:00-18:00	42.3	44.3	43.4	42.3	44.6	43.6
18:00-19:00	44.2	46.2	45.3	41.6	46.2	44.5
19:00-20:00	41.2	42.1	41.7	36.5	38.6	37.7
20:00-21:00	40.2	42.3	41.4	34.1	36.5	35.5
21:00-22:00	37.6	38.2	37.9	36.5	38.6	37.7
22:00-23:00	34.1	36.2	35.3	35.2	37.1	36.3
23:00-00:00	34.2	36.1	35.3	34.2	36.5	35.5
00:00-01:00	33.2	35.2	34.3	32.1	34.2	33.3
01:00-02:00	35.2	38.2	37.0	33.6	35.6	34.7
02:00-03:00	34.2	36.1	35.3	34.2	36.7	35.6
03:00-04:00	36.2	38.2	37.3	36.4	38.9	37.8
04:00-05:00	32.2	34.6	33.6	31.2	33.2	32.3
05:00-06:00	33.5	36.2	35.1	34.6	36.9	35.9
Result	Day Means		<b>41.7</b>	Day Means		<b>40.3</b>
	Night Means		<b>35.4</b>	Night Means		<b>35.0</b>

Note: CPCB Norms Industrial Area Day Time:75 dB(A); Night Time:70 dB(A)  
The Noise level in the above location exists within the permissible limits of CPCB.

\*\*\*\*\*End of Report\*\*\*\*\*

Page 1 of 1

Verified by



Authorised Signatory

Name: Santhosh Kumar A  
Designation: Quality Manager

- Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

**TEST REPORT**

<b>Report No</b>	EHS360/TR/2024-25/010	<b>Report Date</b>	04.03.2024
<b>Site Location</b>	<b>THIRU. A. VEERARAGAVAN ROUGH STONE AND GRAVEL QUARRY</b> S.F.Nos. . 75/1, 75/4, 75/5, 75/6 and 76/3B2, Eraiyr Village, Vanur Taluk, Viluppuram District.		
<b>Sampling Method</b>	IS 9989	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Noise Level Monitoring	<b>Sample Code</b>	EHS360/ 010
<b>Sample Description</b>	Ambient Noise	<b>Sample Collected Date</b>	26.02.2024

Location	N5 – Iveli –12° 1'55.12"N 79°37'13.62"E			N6 – Ilavampattu–12° 5'0.83"N 79°42'12.46"E		
Parameter	Min	Max	Result	Min	Max	Result
Time	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
06:00-07:00	40.2	42.3	41.4	41.3	42.3	41.8
07:00-08:00	42.3	44.5	43.5	38.2	39.5	38.9
08:00-09:00	41.2	43.2	42.3	40.2	42.1	41.3
09:00-10:00	42.3	44.5	43.5	42.3	44.2	43.4
10:00-11:00	38.6	40.1	39.4	44.2	46.3	45.4
11:00-12:00	36.2	42.3	40.2	40.1	44.2	42.6
12:00-13:00	34.1	36.9	35.7	39.2	42.1	40.9
13:00-14:00	30.2	33.6	32.2	38.6	41.1	40.0
14:00-15:00	36.5	38.2	37.4	37.1	39.6	38.5
15:00-16:00	34.5	36.2	35.4	36.2	38.1	37.3
16:00-17:00	32.5	35.4	34.2	35.4	37.5	36.6
17:00-18:00	38.9	40.2	39.6	34.6	36.1	35.4
18:00-19:00	37.2	39.6	38.6	33.1	35.6	34.5
19:00-20:00	36.2	38.1	37.3	32.5	34.2	33.4
20:00-21:00	34.1	36.2	35.3	31.4	32.6	32.0
21:00-22:00	33.2	35.2	34.3	30.2	34.2	32.6
22:00-23:00	32.4	34.6	33.6	34.6	36.5	35.7
23:00-00:00	32.1	34.5	33.5	36.9	38.2	37.6
00:00-01:00	31.6	36.7	34.9	34.8	36.4	35.7
01:00-02:00	35.2	38.6	37.2	36.4	38.9	37.8
02:00-03:00	34.6	36.9	35.9	32.1	39.2	37.0
03:00-04:00	33.1	35.4	34.4	34.2	36.4	35.4
04:00-05:00	32.5	35.6	34.3	35.6	37.2	36.5
05:00-06:00	34.2	36.3	35.4	32.2	36.8	35.1
Result	Day Means		<b>37.9</b>	Day Means		<b>38.3</b>
	Night Means		<b>35.1</b>	Night Means		<b>36.4</b>

Note: CPCB Norms Industrial Area Day Time:75 dB(A); Night Time:70 dB(A)  
The Noise level in the above location exists within the permissible limits of CPCB.

\*\*\*\*\*End of Report\*\*\*\*\*

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Authorised Signatory

A-57

Name : Santhosh Kumar A  
Designation : Quality Manager

- Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

**TEST REPORT**

<b>Report No</b>	EHS360/TR/2024-25/011	<b>Report Date</b>	04.03.2024
<b>Site Location</b>	<b>THIRU. A. VEERARAGAVAN ROUGH STONE AND GRAVEL QUARRY</b> S.F.Nos. . 75/1, 75/4, 75/5, 75/6 and 76/3B2, Eraiyr Village, Vanur Taluk, Viluppuram District.		
<b>Sampling Method</b>	IS 9989	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Noise Level Monitoring	<b>Sample Code</b>	EHS360/ 011
<b>Sample Description</b>	Ambient Noise	<b>Sample Collected Date</b>	26.02.2024

Location	N7 - Veliyanur - 12° 7'25.81"N 79°39'11.33"E		
arameter	Min	Max	Result
Time	dB(A)	dB(A)	dB(A)
06:00-07:00	35.2	39.2	<b>37.6</b>
07:00-08:00	36.1	38.1	<b>37.2</b>
08:00-09:00	34.2	38.9	<b>37.2</b>
09:00-10:00	33.2	35.2	<b>34.3</b>
10:00-11:00	32.1	36.1	<b>34.5</b>
11:00-12:00	30.2	32.4	<b>31.4</b>
12:00-13:00	36.5	38.6	<b>37.7</b>
13:00-14:00	39.8	40.2	<b>40.0</b>
14:00-15:00	38.6	42.3	<b>40.8</b>
15:00-16:00	39.2	44.1	<b>42.3</b>
16:00-17:00	37.2	38.9	<b>38.1</b>
17:00-18:00	36.4	39.8	<b>38.4</b>
18:00-19:00	35.2	38.4	<b>37.1</b>
19:00-20:00	36.8	38.9	<b>38.0</b>
20:00-21:00	39.8	40.1	<b>40.0</b>
21:00-22:00	34.2	36.4	<b>35.4</b>
22:00-23:00	36.5	38.2	<b>37.4</b>
23:00-00:00	34.2	36.4	<b>35.4</b>
00:00-01:00	33.1	35.2	<b>34.3</b>
01:00-02:00	32.5	34.6	<b>33.7</b>
02:00-03:00	33.6	35.9	<b>34.9</b>
03:00-04:00	35.2	37.6	<b>36.6</b>
04:00-05:00	36.4	38.2	<b>37.4</b>
05:00-06:00	37.1	39.6	<b>38.5</b>
Result	Day Means		<b>37.5</b>
	Night Means		<b>35.8</b>

Note: CPCB Norms Industrial Area Day Time:75 dB(A); Night Time:70 dB(A)  
The Noise level in the above location exists within the permissible limits of CPCB.

\*\*\*\*\*End of Report\*\*\*\*\*

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Name: Santhosh Kumar A  
Designation: Quality Manager

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**TEST REPORT**

<b>Report No</b>	EHS360/TR/2024-25/012	<b>Report Date</b>	04.03.2024
<b>Site Location</b>	<b>THIRU. A. VEERARAGAVAN ROUGH STONE AND GRAVEL QUARRY</b> S.F.Nos. . 75/1, 75/4, 75/5, 75/6 and 76/3B2, Eraiyrur Village, Vanur Taluk, Viluppuram District.		
<b>Sampling Method</b>	SOP Method	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Soil	<b>Sample Code</b>	EHS360/ 012
<b>Sample Description</b>	Soil 1	<b>Sample Collected Date</b>	26.02.2024
<b>Qty. of Sample Received</b>	2 KG	<b>Sample Received On</b>	27.02.2024
<b>Sample Condition</b>	Good	<b>Test Commenced On</b>	04.03.2024
<b>Sampling Location</b>	Core Zone		

S.No	Test Parameters	Protocols	Results
01	pH @ 25°C	IS 2720 Part 26 - 1987 (Reaff:2016)	8.56
02	Conductivity @ 25°C	IS 14767 - 2000 (Reaff : 2016)	461 µmhos/cm
03	Water Holding Capacity	By Gravimetric Method	47.5 %
04	Bulk Density	By Cylindrical Method	1.02 g/cm <sup>3</sup>
05	Porosity	By Gravimetric Method	45.6 %
06	Calcium as Ca	Food and Agriculture organization of the united Nation Rome 2007 : 2018	51.6 mg/kg
07	Magnesium as Mg		35.5 mg/kg
08	Chloride as Cl	APHA 23 <sup>rd</sup> Edn 2019 4500 Cl B	60.8 mg/kg
09	Soluble Sulphate as SO <sub>4</sub>	IS 2720 Part 27 : 1977 (Reaff:2015)	0.0014 %
009	Total Phosphorus as P	IS 009158 : 1982 (Reaff: 2019)	4.4 mg/kg
11	Total Nitrogen as N	IS 14684 : 1999 (Reaff:2019)	370.5 mg/kg
12	Organic Matter	IS : 2720 Part 22: 1972 (Reaff: 2015)	1.67 %
13	Organic Carbon	IS : 2720 Part 22: 1972 (Reaff: 2015)	0.97 %

\*\*\*\*\*End of Report\*\*\*\*\*

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Name : Santhosh Kumar A  
Designation : Quality Manager

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**TEST REPORT**

<b>Report No</b>	EHS360/TR/2024-25/012	<b>Report Date</b>	04.03.2024
<b>Site Location</b>	<b>THIRU. A. VEERARAGAVAN ROUGH STONE AND GRAVEL QUARRY</b> S.F.Nos. . 75/1, 75/4, 75/5, 75/6 and 76/3B2, Eraiyr Village, Vanur Taluk, Viluppuram District.		
<b>Sampling Method</b>	SOP Method	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Soil	<b>Sample Code</b>	EHS360/012
<b>Sample Description</b>	Soil 1	<b>Sample Collected Date</b>	26.02.2024
<b>Qty. of Sample Received</b>	2 KG	<b>Sample Received On</b>	27.02.2024
<b>Sample Condition</b>	Good	<b>Test Commenced On</b>	04.03.2024
<b>Sampling Location</b>	Core Zone		

S.No	Test Parameters	Protocols	Results
14	<b>Texture :</b>		
	Clay	Gravimetric Method	31.7 %
	Sand		32.5 %
	Silt		35.8 %
15	Manganese as Mn	USEPA 3050 B – 1996 & USEPA 60009 C - 2000	17 mg/kg
16	Zinc as Zn		3.3 mg/kg
17	Boron as B		3.9 mg/kg
18	Potassium as K		31.7 mg/kg
19	Cadmium as Cd		BDL (DL : 1.0 mg/kg)
20	Total Chromium as Cr		1.57
21	Copper as Cu		BDL (DL : 1.0 mg/kg)
22	Lead as Pb		2.7 mg/kg
23	Iron as Fe		3.33 mg/kg
24	Cation Exchange Capacity		USEPA 9080 – 1986

\*\*\*\*\*End of Report\*\*\*\*\*

Page 1 of 1

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Authorised Signatory

Name : Santhosh Kumar A  
Designation : Quality Manager

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**TEST REPORT**

<b>Report No</b>	EHS360/TR/2024-25/013	<b>Report Date</b>	04.03.2024
<b>Site Location</b>	<b>THIRU. A. VEERARAGAVAN ROUGH STONE AND GRAVEL QUARRY</b> S.F.Nos. . 75/1, 75/4, 75/5, 75/6 and 76/3B2, Eraiur Village, Vanur Taluk, Viluppuram District.		
<b>Sampling Method</b>	SOP Method	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Soil	<b>Sample Code</b>	EHS360/013
<b>Sample Description</b>	Soil 2	<b>Sample Collected Date</b>	26.02.2024
<b>Qty. of Sample Received</b>	2 KG	<b>Sample Received On</b>	27.02.2024
<b>Sample Condition</b>	Good	<b>Test Commenced On</b>	04.03.2024
<b>Sampling Location</b>	Keeranur		

S.No	Test Parameters	Protocols	Results
01	pH @ 25°C	IS 2720 Part 26 - 1987 (Reaff:2016)	8.24
02	Conductivity @ 25°C	IS 14767 - 2000 (Reaff : 2016)	500 µmhos/cm
03	Water Holding Capacity	By Gravimetric Method	47.6 %
04	Bulk Density	By Cylindrical Method	1.05 g/cm <sup>3</sup>
05	Porosity	By Gravimetric Method	48.8 %
06	Calcium as Ca	Food and Agriculture organization of the united Nation Rome 2007 : 2018	56.7 mg/kg
07	Magnesium as Mg		41 mg/kg
08	Chloride as Cl	APHA 23 <sup>rd</sup> Edn 2019 4500 Cl B	25.6 mg/kg
09	Soluble Sulphate as SO <sub>4</sub>	IS 2720 Part 27 : 1977 (Reaff:2015)	0.0014 %
009	Total Phosphorus as P	IS 009158 : 1982 (Reaff: 2019)	2.2 mg/kg
11	Total Nitrogen as N	IS 14684 : 1999 (Reaff:2019)	425 mg/kg
12	Organic Matter	IS : 2720 Part 22: 1972 (Reaff: 2015)	2.62 %
13	Organic Carbon	IS : 2720 Part 22: 1972 (Reaff: 2015)	1.52 %

\*\*\*\*\*End of Report\*\*\*\*\*

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Authorised Signatory

Name : Santhosh Kumar A  
Designation : Quality Manager

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**TEST REPORT**

<b>Report No</b>	EHS360/TR/2024-25/013	<b>Report Date</b>	04.03.2024
<b>Site Location</b>	<b>THIRU. A. VEERARAGAVAN ROUGH STONE AND GRAVEL QUARRY</b> S.F.Nos. . 75/1, 75/4, 75/5, 75/6 and 76/3B2, Eraiur Village, Vanur Taluk, Viluppuram District.		
<b>Sampling Method</b>	SOP Method	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Soil	<b>Sample Code</b>	EHS360/013
<b>Sample Description</b>	Soil 2	<b>Sample Collected Date</b>	26.02.2024
<b>Qty. of Sample Received</b>	2 KG	<b>Sample Received On</b>	27.02.2024
<b>Sample Condition</b>	Good	<b>Test Commenced On</b>	04.03.2024
<b>Sampling Location</b>	Keeranur		

S.No	Test Parameters	Protocols	Results
14	<b>Texture :</b>		
	Clay	Gravimetric Method	33.4 %
	Sand		31.6 %
	Silt		35.0 %
15	Manganese as Mn	USEPA 3050 B – 1996 & USEPA 60009 C - 2000	22.4 mg/kg
16	Zinc as Zn		5.64 mg/kg
17	Boron as B		5.1 mg/kg
18	Potassium as K		42 mg/kg
19	Cadmium as Cd		BDL (DL : 1.0 mg/kg)
20	Total Chromium as Cr		BDL (DL : 1.0 mg/kg)
21	Copper as Cu		BDL (DL : 1.0 mg/kg)
22	Lead as Pb		1.13 mg/kg
23	Iron as Fe		2.12 mg/kg
24	Cation Exchange Capacity		USEPA 9080 – 1986

\*\*\*\*\*End of Report\*\*\*\*\*

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Name : Santhosh Kumar A  
Designation : Quality Manager

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**TEST REPORT**

<b>Report No</b>	EHS360/TR/2024-25/014	<b>Report Date</b>	04.03.2024
<b>Site Location</b>	<b>THIRU. A. VEERARAGAVAN ROUGH STONE AND GRAVEL QUARRY</b> S.F.Nos. . 75/1, 75/4, 75/5, 75/6 and 76/3B2, Eraiyr Village, Vanur Taluk, Viluppuram District.		
<b>Sampling Method</b>	SOP Method	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Soil	<b>Sample Code</b>	EHS360/014
<b>Sample Description</b>	Soil 3	<b>Sample Collected Date</b>	26.02.2024
<b>Qty. of Sample Received</b>	2 KG	<b>Sample Received On</b>	27.02.2024
<b>Sample Condition</b>	Good	<b>Test Commenced On</b>	04.03.2024
<b>Sampling Location</b>	Velayudhampalayam		

S.No	Test Parameters	Protocols	Results
01	pH @ 25°C	IS 2720 Part 26 - 1987 (Reaff:2016)	8.17
02	Conductivity @ 25°C	IS 14767 - 2000 (Reaff : 2016)	430 µmhos/cm
03	Water Holding Capacity	By Gravimetric Method	49.4 %
04	Bulk Density	By Cylindrical Method	1.01 g/cm <sup>3</sup>
05	Porosity	By Gravimetric Method	48.8 %
06	Calcium as Ca	Food and Agriculture organization of the united Nation Rome 2007 : 2018	49 mg/kg
07	Magnesium as Mg		35.5 mg/kg
08	Chloride as Cl	APHA 23 <sup>rd</sup> Edn 2019 4500 Cl B	42.3 mg/kg
09	Soluble Sulphate as SO <sub>4</sub>	IS 2720 Part 27 : 1977 (Reaff:2015)	0.0025 %
009	Total Phosphorus as P	IS 009158 : 1982 (Reaff: 2019)	2.66 mg/kg
11	Total Nitrogen as N	IS 14684 : 1999 (Reaff:2019)	6.1 mg/kg
12	Organic Matter	IS : 2720 Part 22: 1972 (Reaff: 2015)	2.02 %
13	Organic Carbon	IS : 2720 Part 22: 1972 (Reaff: 2015)	1.17 %

\*\*\*\*\*End of Report\*\*\*\*\*  
Page 1 of 1

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Authorised Signatory



Name : Santhosh Kumar A  
Designation : Quality Manager

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**TEST REPORT**

<b>Report No</b>	EHS360/TR/2024-25/014	<b>Report Date</b>	04.03.2024
<b>Site Location</b>	<b>THIRU. A. VEERARAGAVAN ROUGH STONE AND GRAVEL QUARRY</b> S.F.Nos. . 75/1, 75/4, 75/5, 75/6 and 76/3B2, Eraiyr Village, Vanur Taluk, Viluppuram District.		
<b>Sampling Method</b>	SOP Method	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Soil	<b>Sample Code</b>	EHS360/014
<b>Sample Description</b>	Soil 3	<b>Sample Collected Date</b>	26.02.2024
<b>Qty. of Sample Received</b>	2 KG	<b>Sample Received On</b>	27.02.2024
<b>Sample Condition</b>	Good	<b>Test Commenced On</b>	04.03.2024
<b>Sampling Location</b>	Velayudhampalayam		

S.No	Test Parameters	Protocols	Results
14	<b>Texture :</b>		
	Clay	Gravimetric Method	29.8 %
	Sand		33.6 %
	Silt		36.6 %
15	Manganese as Mn	USEPA 3050 B – 1996 & USEPA 60009 C - 2000	25.8 mg/kg
16	Zinc as Zn		3.24 mg/kg
17	Boron as B		4.1 mg/kg
18	Potassium as K		6.5 mg/kg
19	Cadmium as Cd		BDL (DL : 1.0 mg/kg)
20	Total Chromium as Cr		2.02
21	Copper as Cu		BDL (DL : 1.0 mg/kg)
22	Lead as Pb		1.6 mg/kg
23	Iron as Fe		1.05 mg/kg
24	Cation Exchange Capacity		USEPA 9080 – 1986

\*\*\*\*\*End of Report\*\*\*\*\*

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A. S. K.

Name : Santhosh Kumar A  
Designation : Quality Manager

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**TEST REPORT**

<b>Report No</b>	EHS360/TR/2024-25/015	<b>Report Date</b>	04.03.2024
<b>Site Location</b>	<b>THIRU. A. VEERARAGAVAN ROUGH STONE AND GRAVEL QUARRY</b> S.F.Nos. . 75/1, 75/4, 75/5, 75/6 and 76/3B2, Eraiyr Village, Vanur Taluk, Viluppuram District.		
<b>Sampling Method</b>	SOP Method	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Soil	<b>Sample Code</b>	EHS360/015
<b>Sample Description</b>	Soil 4	<b>Sample Collected Date</b>	26.02.2024
<b>Qty. of Sample Received</b>	2 KG	<b>Sample Received On</b>	27.02.2024
<b>Sample Condition</b>	Good	<b>Test Commenced On</b>	04.03.2024

S.No	Test Parameters	Protocols	Results
01	pH @ 25°C	IS 2720 Part 26 - 1987 (Reaff:2016)	8.57
02	Conductivity @ 25°C	IS 14767 - 2000 (Reaff : 2016)	456 µmhos/cm
03	Water Holding Capacity	By Gravimetric Method	46.3. %
04	Bulk Density	By Cylindrical Method	0.99 g/cm <sup>3</sup>
05	Porosity	By Gravimetric Method	46.6 %
06	Calcium as Ca	Food and Agriculture organization of the united Nation Rome 2007 : 2018	76.5 mg/kg
07	Magnesium as Mg		61 mg/kg
08	Chloride as Cl	APHA 23 <sup>rd</sup> Edn 2019 4500 Cl B	52.6 mg/kg
09	Soluble Sulphate as SO <sub>4</sub>	IS 2720 Part 27 : 1977 (Reaff:2015)	0.0028 %
009	Total Phosphorus as P	IS 009158 : 1982 (Reaff: 2019)	4.4 mg/kg
11	Total Nitrogen as N	IS 14684 : 1999 (Reaff:2019)	425.5 mg/kg
12	Organic Matter	IS : 2720 Part 22: 1972 (Reaff: 2015)	1.91 %
13	Organic Carbon	IS : 2720 Part 22: 1972 (Reaff: 2015)	1.11 %

\*\*\*\*\*End of Report\*\*\*\*\*  
Page 1 of 1

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Name : Santhosh Kumar A  
Designation : Quality Manager

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## TEST REPORT

<b>Report No</b>	EHS360/TR/2024-25/015	<b>Report Date</b>	04.03.2024
<b>Site Location</b>	<b>THIRU. A. VEERARAGAVAN ROUGH STONE AND GRAVEL QUARRY</b> S.F.Nos. . 75/1, 75/4, 75/5, 75/6 and 76/3B2, Eraiyur Village, Vanur Taluk, Viluppuram District.		
<b>Sampling Method</b>	SOP Method	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Soil	<b>Sample Code</b>	EHS360/015
<b>Sample Description</b>	Soil 4	<b>Sample Collected Date</b>	26.02.2024
<b>Qty. of Sample Received</b>	2 KG	<b>Sample Received On</b>	27.02.2024
<b>Sample Condition</b>	Good	<b>Test Commenced On</b>	04.03.2024
<b>Sampling Location</b>	Thammareddipalayam		

S.No	Test Parameters	Protocols	Results
14	<b>Texture :</b>		
	Clay	Gravimetric Method	31.1 %
	Sand		32.4 %
	Silt		36.5 %
15	Manganese as Mn	USEPA 3050 B – 1996 & USEPA 60009 C - 2000	20.5 mg/kg
16	Zinc as Zn		5.1 mg/kg
17	Boron as B		2.44 mg/kg
18	Potassium as K		30 mg/kg
19	Cadmium as Cd		BDL (DL : 1.0 mg/kg)
20	Total Chromium as Cr		3.54
21	Copper as Cu		BDL (DL : 1.0 mg/kg)
22	Lead as Pb		2.1 mg/kg
23	Iron as Fe		4.5 mg/kg
24	Cation Exchange Capacity	USEPA 9080 – 1986	43.7 meq/0090g of soil

\*\*\*\*\*End of Report\*\*\*\*\*

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*A-S-K*

**Name : Santhosh Kumar A**  
Designation : Quality Manager

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**TEST REPORT**

<b>Report No</b>	EHS360/TR/2024-25/016	<b>Report Date</b>	04.03.2024
<b>Site Location</b>	<b>THIRU. A. VEERARAGAVAN ROUGH STONE AND GRAVEL QUARRY</b> S.F.Nos. . 75/1, 75/4, 75/5, 75/6 and 76/3B2, Eraiur Village, Vanur Taluk, Viluppuram District.		
<b>Sampling Method</b>	SOP Method	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Soil	<b>Sample Code</b>	EHS360/016
<b>Sample Description</b>	Soil 5	<b>Sample Collected Date</b>	26.02.2024
<b>Qty. of Sample Received</b>	2 KG	<b>Sample Received On</b>	27.02.2024
<b>Sample Condition</b>	Good	<b>Test Commenced On</b>	04.03.2024
<b>Sampling Location</b>	Neikkaranpalayam		

S.No	Test Parameters	Protocols	Results
01	pH @ 25°C	IS 2720 Part 26 - 1987 (Reaff:2016)	8.74
02	Conductivity @ 25°C	IS 14767 - 2000 (Reaff : 2016)	485 µmhos/cm
03	Water Holding Capacity	By Gravimetric Method	46.7 %
04	Bulk Density	By Cylindrical Method	1.1 g/cm <sup>3</sup>
05	Porosity	By Gravimetric Method	46.5 %
06	Calcium as Ca	Food and Agriculture organization of the united Nation Rome 2007 : 2018	74.5 mg/kg
07	Magnesium as Mg		52 mg/kg
08	Chloride as Cl	APHA 23 <sup>rd</sup> Edn 2019 4500 Cl B	31.1 mg/kg
09	Soluble Sulphate as SO <sub>4</sub>	IS 2720 Part 27 : 1977 (Reaff:2015)	0.0019 %
009	Total Phosphorus as P	IS 009158 : 1982 (Reaff: 2019)	3.55 mg/kg
11	Total Nitrogen as N	IS 14684 : 1999 (Reaff:2019)	400 mg/kg
12	Organic Matter	IS : 2720 Part 22: 1972 (Reaff: 2015)	1.98 %
13	Organic Carbon	IS : 2720 Part 22: 1972 (Reaff: 2015)	1.15 %

\*\*\*\*\*End of Report\*\*\*\*\*

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Name : Santhosh Kumar A  
Designation : Quality Manager

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**TEST REPORT**

<b>Report No</b>	EHS360/TR/2024-25/016	<b>Report Date</b>	04.03.2024
<b>Site Location</b>	<b>THIRU. A. VEERARAGAVAN ROUGH STONE AND GRAVEL QUARRY</b> S.F.Nos. . 75/1, 75/4, 75/5, 75/6 and 76/3B2, Eraiur Village, Vanur Taluk, Viluppuram District.		
<b>Sampling Method</b>	SOP Method	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Soil	<b>Sample Code</b>	EHS360/016
<b>Sample Description</b>	Soil 5	<b>Sample Collected Date</b>	26.02.2024
<b>Qty. of Sample Received</b>	2 KG	<b>Sample Received On</b>	27.02.2024
<b>Sample Condition</b>	Good	<b>Test Commenced On</b>	04.03.2024
<b>Sampling Location</b>	Neikkaranpalayam		

S.No	Test Parameters	Protocols	Results
14	<b>Texture :</b>		
	Clay	Gravimetric Method	31.6 %
	Sand		32.8 %
	Silt		35.6 %
15	Manganese as Mn	USEPA 3050 B – 1996 & USEPA 60009 C – 2000	27.1 mg/kg
16	Zinc as Zn		4.9 mg/kg
17	Boron as B		6.6 mg/kg
18	Potassium as K		17 mg/kg
19	Cadmium as Cd		BDL (DL : 1.0 mg/kg)
20	Total Chromium as Cr		5.2
21	Copper as Cu		BDL (DL : 1.0 mg/kg)
22	Lead as Pb		2.01 mg/kg
23	Iron as Fe		8.08 mg/kg
24	Cation Exchange Capacity		USEPA 9080 – 1986

\*\*\*\*\*End of Report\*\*\*\*\*

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*A.S.K*

Name: Santhosh Kumar A  
Designation : Quality Manager

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**TEST REPORT**

<b>Report No</b>	EHS360/TR/2024-25/017	<b>Report Date</b>	04.03.2024
<b>Site Location</b>	<b>THIRU. A. VEERARAGAVAN ROUGH STONE AND GRAVEL QUARRY</b> S.F.Nos. . 75/1, 75/4, 75/5, 75/6 and 76/3B2, Eraiur Village, Vanur Taluk, Viluppuram District.		
<b>Sampling Method</b>	SOP Method	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Soil	<b>Sample Code</b>	EHS360/017
<b>Sample Description</b>	Soil 6	<b>Sample Collected Date</b>	26.02.2024
<b>Qty. of Sample Received</b>	2 KG	<b>Sample Received On</b>	27.02.2024
<b>Sample Condition</b>	Good	<b>Test Commenced On</b>	04.03.2024
<b>Sampling Location</b>	Ayyampalayam		

S.No	Test Parameters	Protocols	Results
01	pH @ 25°C	IS 2720 Part 26 - 1987 (Reaff:2016)	8.19
02	Conductivity @ 25°C	IS 14767 - 2000 (Reaff : 2016)	467 µmhos/cm
03	Water Holding Capacity	By Gravimetric Method	46.14 %
04	Bulk Density	By Cylindrical Method	1.08 g/cm <sup>3</sup>
05	Porosity	By Gravimetric Method	47.1 %
06	Calcium as Ca	Food and Agriculture organization of the united Nation Rome 2007 : 2018	64.4 mg/kg
07	Magnesium as Mg		28.6 mg/kg
08	Chloride as Cl	APHA 23 <sup>rd</sup> Edn 2019 4500 Cl B	61.4 mg/kg
09	Soluble Sulphate as SO <sub>4</sub>	IS 2720 Part 27 : 1977 (Reaff:2015)	0.0019 %
009	Total Phosphorus as P	IS 009158 : 1982 (Reaff: 2019)	7.26 mg/kg
11	Total Nitrogen as N	IS 14684 : 1999 (Reaff:2019)	405.9 mg/kg
12	Organic Matter	IS : 2720 Part 22: 1972 (Reaff: 2015)	2.009 %
13	Organic Carbon	IS : 2720 Part 22: 1972 (Reaff: 2015)	1.22 %

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Name : Santhosh Kumar A  
Designation : Quality Manager

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**TEST REPORT**

<b>Report No</b>	EHS360/TR/2024-25/017	<b>Report Date</b>	04.03.2024
<b>Site Location</b>	<b>THIRU. A. VEERARAGAVAN ROUGH STONE AND GRAVEL QUARRY</b> S.F.Nos. . 75/1, 75/4, 75/5, 75/6 and 76/3B2, Eraiur Village, Vanur Taluk, Viluppuram District.		
<b>Sampling Method</b>	SOP Method	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Soil	<b>Sample Code</b>	EHS360/017
<b>Sample Description</b>	Soil 6	<b>Sample Collected Date</b>	26.02.2024
<b>Qty. of Sample Received</b>	2 KG	<b>Sample Received On</b>	27.02.2024
<b>Sample Condition</b>	Good	<b>Test Commenced On</b>	04.03.2024
<b>Sampling Location</b>	Ayyampalayam		

S.No	Test Parameters	Protocols	Results
14	<b>Texture :</b>		
	Clay	Gravimetric Method	30.9 %
	Sand		34.6 %
	Silt		34.5 %
15	Manganese as Mn	USEPA 3050 B – 1996 & USEPA 60009 C – 2000	30.2 mg/kg
16	Zinc as Zn		5.66 mg/kg
17	Boron as B		1.24 mg/kg
18	Potassium as K		20.4 mg/kg
19	Cadmium as Cd		BDL (DL : 1.0 mg/kg)
20	Total Chromium as Cr		7.12
21	Copper as Cu		BDL (DL : 1.0 mg/kg)
22	Lead as Pb		1.01 mg/kg
23	Iron as Fe		2.26 mg/kg
24	Cation Exchange Capacity		USEPA 9080 – 1986

\*\*\*\*\*End of Report\*\*\*\*\*

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A-S7

Name : Santhosh Kumar A  
Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

## TEST REPORT

<b>Report No</b>	EHS360/TR/2024-25/018	<b>Report Date</b>	27.02.2024
<b>Site Location</b>	<b>THIRU. A. VEERARAGAVAN ROUGH STONE AND GRAVEL QUARRY</b> S.F.Nos. . 75/1, 75/4, 75/5, 75/6 and 76/3B2, Eraiyr Village, Vanur Taluk, Viluppuram District.		
<b>Sampling Method</b>	SOP Method	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Water	<b>Sample Code</b>	EHS360/018
<b>Sample Description</b>	Surface Water (SW-1)	<b>Sample Collected Date</b>	26.02.2024
<b>Qty. of Sample Received</b>	2 Litres	<b>Sample Received On</b>	27.02.2024
<b>Sample Condition</b>	Fit for Analysis	<b>Test Commenced On</b>	04.03.2024
<b>Sampling Location</b>	<b>Eraiyr Periya Eri</b>		

S.No.	Parameters	Test Method	RESULTS
<b>Discipline: Chemical</b>			
1	Colour	IS 3025 Part 4:1983	10 Hazen
2	Odour	IS 3025 Part 5:2018	Agreeable
3	pH at 25°C	IS 3025 Part 11:1983	7.91
4	Conductivity @ 25°C	IS 3025 Part 14:2013	1038 µmhos/cm
5	Turbidity	IS 3025 Part 10:1984	3.2 NTU
6	Total Dissolved Solids	IS 3025 Part 16:1984	613 mg/l
7	Total Hardness as CaCO <sub>3</sub>	IS 3025 Part 21:2018	183.19 mg/l
8	Calcium as Ca	IS 3025 Part 40:1991	31.4 mg/l
9	Magnesium as Mg	IS 3025 Part 46:1994	25.5 mg/l
10	Total Alkalinity as CaCO <sub>3</sub>	IS 3025 Part 23:1986	180 mg/l
11	Chloride as Cl	IS 3025 Part 32:1988	143 mg/l
12	Sulphate as SO <sub>4</sub>	IS 3025 Part 24:1986	70.1 mg/l
13	Iron as Fe	IS 3025 Part 53:2003	0.28 mg/l
14	Residual Free Chlorine	IS 3025 Part 26:1986	BDL (DL:0.1 mg/l)
15	Fluoride as F	APHA 23 <sup>rd</sup> Edn. 2017:4500 F,D	0.21 mg/l
16	Nitrate as NO <sub>3</sub>	IS 3025 Part 34:1988	8.16 mg/l

\*\*\*\*\*End of Report\*\*\*\*\*

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Name: Santhosh Kumar A  
Designation: Quality Manager

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## TEST REPORT

<b>Report No</b>	EHS360/TR/2024-25/018	<b>Report Date</b>	27.02.2024
<b>Site Location</b>	<b>THIRU. A. VEERARAGAVAN ROUGH STONE AND GRAVEL QUARRY</b> S.F.Nos. . 75/1, 75/4, 75/5, 75/6 and 76/3B2, Eraiyur Village, Vanur Taluk, Viluppuram District.		
<b>Sampling Method</b>	SOP Method	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Water	<b>Sample Code</b>	EHS360/018
<b>Sample Description</b>	Surface Water (SW-1)	<b>Sample Collected Date</b>	26.02.2024
<b>Qty. of Sample Received</b>	2 Litres	<b>Sample Received On</b>	27.02.2024
<b>Sample Condition</b>	Fit for Analysis	<b>Test Commenced On</b>	04.03.2024
<b>Sampling Location</b>	Eraiyur Periya Eri		

S.No.	Parameters	Test Method	RESULTS
17	Copper as Cu	IS 3025 Part 65:2014	BDL (DL:0.01 mg/l)
18	Manganese as Mn	IS 3025 Part 65:2014	BDL (DL:0.02 mg/l)
19	Mercury as Hg	USEPA 200.8	BDL (DL:0.0005 mg/l)
20	Cadmium as Cd	IS 3025 Part 65:2014	BDL (DL:0.001 mg/l)
21	Selenium as Se	IS 3025 Part 65:2014	BDL (DL:0.005 mg/l)
22	Aluminium as Al	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
23	Lead as Pb	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
24	Zinc as Zn	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.05 mg/l)
25	Total Chromium as Cr	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.02 mg/l)
26	Boron as B	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.05 mg/l)
27	Mineral Oil	IS 3025 Part 39-1991 (Reaff. 2019)	BDL(DL : 0.01 mg/l)
28	Phenolic compounds as C <sub>6</sub> H <sub>5</sub> OH	IS 3025 Part 43-1992(Reaff: 2019)	BDL (DL:0.0005 mg/l)
29	Anionic Detergents (as MBAS)	IS 13428 – 2005 (Reaff:2019) (Annex K)	BDL (DL:0.01 mg/l)
30	Cyanide as CN	IS 3025 Part 27-1986 (Reaff. 2019)	BDL (DL:0.01 mg/l)
31	BOD @ 27°C for 3 days	IS 3025 Part 44:1993 (Reaff:2019)	8.2 mg/l
32	Chemical Oxygen Demand	IS 3025 Part 58:2006 (Reaff:2017)	44 mg/l
33	Dissolved Oxygen	IS 3025 Part 38:1989 (Reaff:2019)	5.5 mg/l
34	Barium as Ba	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL:0.05 mg/l)
35	Ammonia (as total ammonia-N)	IS 3025 Part 34-1988 (Reaff. 2019)	2.35 mg/l
36	Sulphide as H <sub>2</sub> S	IS 3025 Part 29-1986 (Reaff: 2019)	BDL (DL:0.01 mg/l)
37	Molybdenum as Mo	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.02 mg/l)
38	Total Arsenic as As	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
39	Total Suspended Solids	IS 3025 Part 17 -1984 (Reaff:2017)	18.0 mg/l
	<b>Discipline:</b> Biological	<b>Group:</b> Water	
40	Total Coliform	APHA 23 <sup>rd</sup> Edn. 2017:9221B	610 MPN/100ml
41	<i>Escherichia coli</i>	APHA 23 <sup>rd</sup> Edn. 2017:9221F	112 MPN/100ml

\*\*\*\*\*End of Report\*\*\*\*\*

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A S K

**Name : Santhosh Kumar A**  
Designation : Quality Manager

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**TEST REPORT**

<b>Report No</b>	EHS360/TR/2024-25/019	<b>Report Date</b>	27.02.2024
<b>Site Location</b>	<b>THIRU. A. VEERARAGAVAN ROUGH STONE AND GRAVEL QUARRY</b> S.F.Nos. . 75/1, 75/4, 75/5, 75/6 and 76/3B2, Eraiyr Village, Vanur Taluk, Viluppuram District.		
<b>Sampling Method</b>	SOP Method	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Water	<b>Sample Code</b>	EHS360/019
<b>Sample Description</b>	Surface Water (SW-2)	<b>Sample Collected Date</b>	26.02.2024
<b>Qty. of Sample Received</b>	2 Litres	<b>Sample Received On</b>	27.02.2024
<b>Sample Condition</b>	Fit for Analysis	<b>Test Commenced On</b>	04.03.2024
<b>Sampling Location</b>	Sangaraparani River		

S.No.	Parameters	Test Method	RESULTS
	<b>Discipline: Chemical</b>		
1	Colour	IS 3025 Part 4:1983	5 Hazen
2	Odour	IS 3025 Part 5:2018	Agreeable
3	pH at 25°C	IS 3025 Part 11:1983	7.19
4	Conductivity @ 25°C	IS 3025 Part 14:2013	822 µmhos/cm
5	Turbidity	IS 3025 Part 10:1984	2.4 NTU
6	Total Dissolved Solids	IS 3025 Part 16:1984	485 mg/l
7	Total Hardness as CaCO <sub>3</sub>	IS 3025 Part 21:2018	126.24 mg/l
8	Calcium as Ca	IS 3025 Part 40:1991	27.5 mg/l
9	Magnesium as Mg	IS 3025 Part 46:1994	23.1 mg/l
10	Total Alkalinity as CaCO <sub>3</sub>	IS 3025 Part 23:1986	130 mg/l
11	Chloride as Cl	IS 3025 Part 32:1988	105 mg/l
12	Sulphate as SO <sub>4</sub>	IS 3025 Part 24:1986	45.5 mg/l
13	Iron as Fe	IS 3025 Part 53:2003	0.12 mg/l
14	Residual Free Chlorine	IS 3025 Part 26:1986	BDL (DL:0.1 mg/l)
15	Fluoride as F	APHA 23 <sup>rd</sup> Edn. 2017:4500 F,D	0.25 mg/l
16	Nitrate as NO <sub>3</sub>	IS 3025 Part 34:1988	5.5 mg/l

\*\*\*\*\*End of Report\*\*\*\*\*

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Name : Santhosh Kumar A  
Designation : Quality Manager

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**TEST REPORT**

<b>Report No</b>	EHS360/TR/2024-25/019	<b>Report Date</b>	27.02.2024
<b>Site Location</b>	<b>THIRU. A. VEERARAGAVAN ROUGH STONE AND GRAVEL QUARRY</b> S.F.Nos. . 75/1, 75/4, 75/5, 75/6 and 76/3B2, Eraiyrur Village, Vanur Taluk, Viluppuram District.		
<b>Sampling Method</b>	SOP Method	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Water	<b>Sample Code</b>	EHS360/019
<b>Sample Description</b>	Surface Water (SW-2)	<b>Sample Collected Date</b>	26.02.2024
<b>Qty. of Sample Received</b>	2 Litres	<b>Sample Received On</b>	27.02.2024
<b>Sample Condition</b>	Fit for Analysis	<b>Test Commenced On</b>	04.03.2024
<b>Sampling Location</b>	Sangaraparani River		

S.No.	Parameters	Test Method	RESULTS
17	Copper as Cu	IS 3025 Part 65:2014	BDL (DL:0.01 mg/l)
18	Manganese as Mn	IS 3025 Part 65:2014	BDL (DL:0.02 mg/l)
19	Mercury as Hg	USEPA 200.8	BDL (DL:0.0005 mg/l)
20	Cadmium as Cd	IS 3025 Part 65:2014	BDL (DL:0.001 mg/l)
21	Selenium as Se	IS 3025 Part 65:2014	BDL (DL:0.005 mg/l)
22	Aluminium as Al	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
23	Lead as Pb	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
24	Zinc as Zn	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.05 mg/l)
25	Total Chromium as Cr	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.02 mg/l)
26	Boron as B	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.05 mg/l)
27	Mineral Oil	IS 3025 Part 39-1991 (Reaff. 2019)	BDL(DL : 0.01 mg/l)
28	Phenolic compounds as C <sub>6</sub> H <sub>5</sub> OH	IS 3025 Part 43-1992(Reaff: 2019)	BDL (DL:0.0005 mg/l)
29	Anionic Detergents (as MBAS)	IS 13428 – 2005 (Reaff:2019)(Annex K)	BDL (DL:0.01 mg/l)
30	Cyanide as CN	IS 3025 Part 27-1986 (Reaff. 2019)	BDL (DL:0.01 mg/l)
31	BOD @ 27°C for 3 days	IS 3025 Part 44:1993 (Reaff:2019)	6.2 mg/l
32	Chemical Oxygen Demand	IS 3025 Part 58:2006 (Reaff:2017)	40 mg/l
33	Dissolved Oxygen	IS 3025 Part 38:1989 (Reaff:2019)	5.2 mg/l
34	Barium as Ba	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL:0.05 mg/l)
35	Ammonia (as total ammonia-N)	IS 3025 Part 34-1988 (Reaff. 2019)	1.12 mg/l
36	Sulphide as H <sub>2</sub> S	IS 3025 Part 29-1986 (Reaff: 2019)	BDL (DL:0.01 mg/l)
37	Molybdenum as Mo	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.02 mg/l)
38	Total Arsenic as As	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
39	Total Suspended Solids	IS 3025 Part 17 -1984 (Reaff:2017)	15.1 mg/l
	<b>Discipline: Biological</b>	<b>Group: Water</b>	
40	Total Coliform	APHA 23 <sup>rd</sup> Edn. 2017:9221B	500 MPN/100ml
41	<i>Escherichia coli</i>	APHA 23 <sup>rd</sup> Edn. 2017:9221F	122 MPN/100ml

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Name: Santhosh Kumar A  
Designation: Quality Manager

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**TEST REPORT**

<b>Report No</b>	EHS360/TR/2024-25/020	<b>Report Date</b>	27.02.2024
<b>Site Location</b>	<b>THIRU. A. VEERARAGAVAN ROUGH STONE AND GRAVEL QUARRY</b> S.F.Nos. . 75/1, 75/4, 75/5, 75/6 and 76/3B2, Eraiur Village, Vanur Taluk, Viluppuram District.		
<b>Customer Name</b>			
<b>Sampling Method</b>	SOP Method	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Water	<b>Sample Code</b>	EHS360/020
<b>Sample Description</b>	Ground Water (WW-1)	<b>Sample Collected Date</b>	26.02.2024
<b>Qty. of Sample Received</b>	2 Litres	<b>Sample Received On</b>	27.02.2024
<b>Sample Condition</b>	Fit for Analysis	<b>Test Commenced On</b>	04.03.2024
<b>Near Project Area</b>	Near Project Area		

S.No.	Parameters	Test Method	RESULTS
	<b>Discipline:</b> Chemical	<b>Group:</b> Water	
1	Colour	IS 3025 Part 4:1983 (Reaff:2017)	5
2	Odour	IS 3025 Part 5:2018	Agreeable
3	pH at 25°C	IS 3025 Part 11:1983 (Reaff:2017)	7.11
4	Conductivity @ 25°C	IS 3025 Part 14:2013 (Reaff:2019)	891 µmhos/cm
5	Turbidity	IS 3025 Part 10:1984 (Reaff:2017)	1.1 NTU
6	Total Dissolved Solids	IS 3025 Part 16:1984 (Reaff:2017)	526 mg/l
7	Total Hardness as CaCO <sub>3</sub>	IS 3025 Part 21:2018 (Reaff:2019)	178.75 mg/l
8	Calcium as Ca	IS 3025 Part 40:1991 (Reaff:2019)	34.4 mg/l
9	Magnesium as Mg	IS 3025 Part 46:1994 (Reaff:2019)	22.6 mg/l
10	Total Alkalinity as CaCO <sub>3</sub>	IS 3025 Part 23:1986 (Reaff:2019)	170 mg/l
11	Chloride as Cl	IS 3025 Part 32:1988 (Reaff:2019)	110.1 mg/l
12	Sulphate as SO <sub>4</sub>	IS 3025 Part 24:1986 (Reaff:2019)	60 mg/l
13	Iron as Fe	IS 3025 Part 53:2003 (Reaff:2019)	0.19 mg/l
14	Residual Free Chlorine	IS 3025 Part 26:1986 (Reaff:2019)	BDL (DL:0.1 mg/l)
15	Fluoride as F	APHA 23 <sup>rd</sup> Edn. 2017:4500 F,D	0.21 mg/l
16	Nitrate as NO <sub>3</sub>	IS 3025 Part 34:1988 (Reaff:2019)	3.1 g/l

\*\*\*\*\*End of Report\*\*\*\*\*  
Page 1 of 1

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Authorised Signatory

Name : Santhosh Kumar A  
Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

## TEST REPORT

<b>Report No</b>	EHS360/TR/2024-25/020	<b>Report Date</b>	27.02.2024
<b>Site Location</b>	<b>THIRU. A. VEERARAGAVAN ROUGH STONE AND GRAVEL QUARRY</b> S.F.Nos. . 75/1, 75/4, 75/5, 75/6 and 76/3B2, Eraiyrur Village, Vanur Taluk, Viluppuram District.		
<b>Sampling Method</b>	SOP Method	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Water	<b>Sample Code</b>	EHS360/020
<b>Sample Description</b>	Ground Water (WW-1)	<b>Sample Collected Date</b>	26.02.2024
<b>Qty. of Sample Received</b>	2 Litres	<b>Sample Received On</b>	27.02.2024
<b>Sample Condition</b>	Fit for Analysis	<b>Test Commenced On</b>	04.03.2024
<b>Sampling Location</b>	Near Project Area		

S.No.	Parameters	Test Method	RESULTS
17	Copper as Cu	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.01 mg/l)
18	Manganese as Mn	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.02 mg/l)
19	Mercury as Hg	USEPA 200.8	BDL (DL:0.0005 mg/l)
20	Cadmium as Cd	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.001 mg/l)
21	Selenium as Se	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
22	Aluminium as Al	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
23	Lead as Pb	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
24	Zinc as Zn	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.05 mg/l)
25	Total Chromium as Cr	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.02 mg/l)
26	Boron as B	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.05 mg/l)
27	Mineral Oil	IS 3025 Part 39-1991 (Reaff. 2019)	BDL(DL : 0.01 mg/l)
28	Phenolic compounds as C <sub>6</sub> H <sub>5</sub> OH	IS 3025 Part 43-1992(Reaff: 2019)	BDL (DL:0.0005 mg/l)
29	Anionic Detergents (as MBAS)	IS 13428 – 2005 (Reaff:2019) (Annex K)	BDL (DL:0.01 mg/l)
30	Cyanide as CN	IS 3025 Part 27-1986 (Reaff. 2019)	BDL (DL:0.01 mg/l)
31	Barium as Ba	IS 3025 Part 44:1993 (Reaff:2019)	BDL(DL:0.05 mg/l)
32	Ammonia (as total ammonia-N)	IS 3025 Part 58:2006 (Reaff:2017)	BDL (DL:0.01 mg/l)
33	Sulphide as H <sub>2</sub> S	IS 3025 Part 38:1989 (Reaff:2019)	BDL (DL:0.01 mg/l)
34	Molybdenum as Mo	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.02 mg/l)
35	Total Arsenic as As	IS 3025 Part 34-1988 (Reaff. 2019)	BDL (DL:0.005 mg/l)
36	Total Suspended Solids	IS 3025 Part 29-1986 (Reaff: 2019)	BDL (DL:1.0 mg/l)
	<b>Discipline:</b> Biological	<b>Group:</b> Water	
37	Total Coliform	APHA 23 <sup>rd</sup> Edn. 2017:9221B	220 MPN/100ml
38	<i>Escherichia coli</i>	APHA 23 <sup>rd</sup> Edn. 2017:9221F	< 1.8 MPN/100ml

\*\*\*\*\*End of Report\*\*\*\*\*



Verified by  
*[Signature]*

Authorised Signatory  
*[Signature]*  
**Name : Santhosh Kumar A**  
 Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

**TEST REPORT**

<b>Report No</b>	EHS360/TR/2024-25/021	<b>Report Date</b>	04.03.2024
<b>Site Location</b>	<b>THIRU. A. VEERARAGAVAN ROUGH STONE AND GRAVEL QUARRY</b> S.F.Nos. . 75/1, 75/4, 75/5, 75/6 and 76/3B2, Eraiyr Village, Vanur Taluk, Viluppuram District.		
<b>Customer Name</b>			
<b>Sampling Method</b>	SOP Method	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Water	<b>Sample Code</b>	EHS360/021
<b>Sample Description</b>	Ground Water (WW-2)	<b>Sample Collected Date</b>	26.02.2024
<b>Qty. of Sample Received</b>	2 Litres	<b>Sample Received On</b>	27.02.2024
<b>Sample Condition</b>	Fit for Analysis	<b>Test Commenced On</b>	04.03.2024
<b>Sampling Location</b>	Veliyanur		

S.No.	Parameters	Test Method	RESULTS
	<b>Discipline:</b> Chemical	<b>Group:</b> Water	
1	Colour	IS 3025 Part 4:1983 (Reaff:2017)	5
2	Odour	IS 3025 Part 5:2018	Agreeable
3	pH at 25°C	IS 3025 Part 11:1983 (Reaff:2017)	7.63
4	Conductivity @ 25°C	IS 3025 Part 14:2013 (Reaff:2019)	984 µmhos/cm
5	Turbidity	IS 3025 Part 10:1984 (Reaff:2017)	1.0 NTU
6	Total Dissolved Solids	IS 3025 Part 16:1984 (Reaff:2017)	580 mg/l
7	Total Hardness as CaCO <sub>3</sub>	IS 3025 Part 21:2018 (Reaff:2019)	165.44 mg/l
8	Calcium as Ca	IS 3025 Part 40:1991 (Reaff:2019)	26.1 mg/l
9	Magnesium as Mg	IS 3025 Part 46:1994 (Reaff:2019)	24.4 mg/l
10	Total Alkalinity as CaCO <sub>3</sub>	IS 3025 Part 23:1986 (Reaff:2019)	190 mg/l
11	Chloride as Cl	IS 3025 Part 32:1988 (Reaff:2019)	100.2 mg/l
12	Sulphate as SO <sub>4</sub>	IS 3025 Part 24:1986 (Reaff:2019)	86 mg/l
13	Iron as Fe	IS 3025 Part 53:2003 (Reaff:2019)	0.15 mg/l
14	Residual Free Chlorine	IS 3025 Part 26:1986 (Reaff:2019)	BDL (DL:0.1 mg/l)
15	Fluoride as F	APHA 23 <sup>rd</sup> Edn. 2017:4500 F,D	0.12 mg/l
16	Nitrate as NO <sub>3</sub>	IS 3025 Part 34:1988 (Reaff:2019)	6.84 mg/l

\*\*\*\*\*End of Report\*\*\*\*\*

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Name : Santhosh Kumar A  
Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

## TEST REPORT

<b>Report No</b>	EHS360/TR/2024-25/021	<b>Report Date</b>	04.03.2024
<b>Site Location</b>	<b>THIRU. A. VEERARAGAVAN ROUGH STONE AND GRAVEL QUARRY</b> S.F.Nos. . 75/1, 75/4, 75/5, 75/6 and 76/3B2, Eraiyur Village, Vanur Taluk, Viluppuram District.		
<b>Sampling Method</b>	SOP Method	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Water	<b>Sample Code</b>	EHS360/021
<b>Sample Description</b>	Ground Water (WW-2)	<b>Sample Collected Date</b>	26.02.2024
<b>Qty. of Sample Received</b>	2 Litres	<b>Sample Received On</b>	27.02.2024
<b>Sample Condition</b>	Fit for Analysis	<b>Test Commenced On</b>	04.03.2024
<b>Sampling Location</b>	Veliyanur		

S.No.	Parameters	Test Method	RESULTS
17	Copper as Cu	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.01 mg/l)
18	Manganese as Mn	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.02 mg/l)
19	Mercury as Hg	USEPA 200.8	BDL (DL:0.0005 mg/l)
20	Cadmium as Cd	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.001 mg/l)
21	Selenium as Se	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
22	Aluminium as Al	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
23	Lead as Pb	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
24	Zinc as Zn	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.05 mg/l)
25	Total Chromium as Cr	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.02 mg/l)
26	Boron as B	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.05 mg/l)
27	Mineral Oil	IS 3025 Part 39-1991 (Reaff. 2019)	BDL(DL : 0.01 mg/l)
28	Phenolic compounds as C <sub>6</sub> H <sub>5</sub> OH	IS 3025 Part 43-1992(Reaff: 2019)	BDL (DL:0.0005 mg/l)
29	Anionic Detergents (as MBAS)	IS 13428 – 2005 (Reaff:2019) (Annex K)	BDL (DL:0.01 mg/l)
30	Cyanide as CN	IS 3025 Part 27-1986 (Reaff. 2019)	BDL (DL:0.01 mg/l)
31	Barium as Ba	IS 3025 Part 44:1993 (Reaff:2019)	BDL(DL:0.05 mg/l)
32	Ammonia (as total ammonia-N)	IS 3025 Part 58:2006 (Reaff:2017)	BDL (DL:0.01 mg/l)
33	Sulphide as H <sub>2</sub> S	IS 3025 Part 38:1989 (Reaff:2019)	BDL (DL:0.01 mg/l)
34	Molybdenum as Mo	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.02 mg/l)
35	Total Arsenic as As	IS 3025 Part 34-1988 (Reaff. 2019)	BDL (DL:0.005 mg/l)
36	Total Suspended Solids	IS 3025 Part 29-1986 (Reaff: 2019)	BDL (DL:1.0 mg/l)
	<b>Discipline: Biological</b>	<b>Group: Water</b>	
37	Total Coliform	APHA 23 <sup>rd</sup> Edn. 2017:9221B	144 MPN/100ml
38	<i>Escherichia coli</i>	APHA 23 <sup>rd</sup> Edn. 2017:9221F	< 1.8 MPN/100ml

\*\*\*\*\*End of Report\*\*\*\*\*



Verified by

*[Signature]*

Authorised Signatory

*[Signature]*  
 Name : Santhosh Kumar A  
 Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

**TEST REPORT**

<b>Report No</b>	EHS360/TR/2024-25/022	<b>Report Date</b>	04.03.2024
<b>Site Location</b>	<b>THIRU. A. VEERARAGAVAN ROUGH STONE AND GRAVEL QUARRY</b> S.F.Nos. . 75/1, 75/4, 75/5, 75/6 and 76/3B2, Eraiyrur Village, Vanur Taluk, Viluppuram District.		
<b>Customer Name</b>			
<b>Sampling Method</b>	SOP Method	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Water	<b>Sample Code</b>	EHS360/022
<b>Sample Description</b>	Ground Water (BW-1)	<b>Sample Collected Date</b>	26.02.2024
<b>Qty. of Sample Received</b>	2 Litres	<b>Sample Received On</b>	27.02.2024
<b>Sample Condition</b>	Fit for Analysis	<b>Test Commenced On</b>	04.03.2024
<b>Sampling Location</b>	Near Project Area		

S.No.	Parameters	Test Method	RESULTS
	<b>Discipline:</b> Chemical	<b>Group:</b> Water	
1	Colour	IS 3025 Part 4:1983 (Reaff:2017)	5
2	Odour	IS 3025 Part 5:2018	Agreeable
3	pH at 25°C	IS 3025 Part 11:1983 (Reaff:2017)	7.05
4	Conductivity @ 25°C	IS 3025 Part 14:2013 (Reaff:2019)	1003 µmhos/cm
5	Turbidity	IS 3025 Part 10:1984 (Reaff:2017)	1.0 NTU
6	Total Dissolved Solids	IS 3025 Part 16:1984 (Reaff:2017)	592 mg/l
7	Total Hardness as CaCO <sub>3</sub>	IS 3025 Part 21:2018 (Reaff:2019)	181.58 mg/l
8	Calcium as Ca	IS 3025 Part 40:1991 (Reaff:2019)	30.1 mg/l
9	Magnesium as Mg	IS 3025 Part 46:1994 (Reaff:2019)	25.9 mg/l
10	Total Alkalinity as CaCO <sub>3</sub>	IS 3025 Part 23:1986 (Reaff:2019)	164 mg/l
11	Chloride as Cl	IS 3025 Part 32:1988 (Reaff:2019)	127.1 mg/l
12	Sulphate as SO <sub>4</sub>	IS 3025 Part 24:1986 (Reaff:2019)	80.6 mg/l
13	Iron as Fe	IS 3025 Part 53:2003 (Reaff:2019)	0.19 mg/l
14	Residual Free Chlorine	IS 3025 Part 26:1986 (Reaff:2019)	BDL (DL:0.1 mg/l)
15	Fluoride as F	APHA 23 <sup>rd</sup> Edn. 2017:4500 F,D	0.22 mg/l
16	Nitrate as NO <sub>3</sub>	IS 3025 Part 34:1988 (Reaff:2019)	6.94 mg/l

\*\*\*\*\*End of Report\*\*\*\*\*

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Name : Santhosh Kumar A  
Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

## TEST REPORT

<b>Report No</b>	EHS360/TR/2024-25/022	<b>Report Date</b>	04.03.2024
<b>Site Location</b>	<b>THIRU. A. VEERARAGAVAN ROUGH STONE AND GRAVEL QUARRY</b> S.F.Nos. . 75/1, 75/4, 75/5, 75/6 and 76/3B2, Eraiyur Village, Vanur Taluk, Viluppuram District.		
<b>Sampling Method</b>	SOP Method	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Water	<b>Sample Code</b>	EHS360/022
<b>Sample Description</b>	Ground Water (BW-1)	<b>Sample Collected Date</b>	26.02.2024
<b>Qty. of Sample Received</b>	2 Litres	<b>Sample Received On</b>	27.02.2024
<b>Sample Condition</b>	Fit for Analysis	<b>Test Commenced On</b>	04.03.2024
<b>Sampling Location</b>	Near Project Area		

S.No.	Parameters	Test Method	RESULTS
17	Copper as Cu	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.01 mg/l)
18	Manganese as Mn	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.02 mg/l)
19	Mercury as Hg	USEPA 200.8	BDL (DL:0.0005 mg/l)
20	Cadmium as Cd	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.001 mg/l)
21	Selenium as Se	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
22	Aluminium as Al	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
23	Lead as Pb	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
24	Zinc as Zn	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.05 mg/l)
25	Total Chromium as Cr	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.02 mg/l)
26	Boron as B	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.05 mg/l)
27	Mineral Oil	IS 3025 Part 39-1991 (Reaff. 2019)	BDL(DL : 0.01 mg/l)
28	Phenolic compounds as C <sub>6</sub> H <sub>5</sub> OH	IS 3025 Part 43-1992(Reaff: 2019)	BDL (DL:0.0005 mg/l)
29	Anionic Detergents (as MBAS)	IS 13428 – 2005 (Reaff:2019) (Annex K)	BDL (DL:0.01 mg/l)
30	Cyanide as CN	IS 3025 Part 27-1986 (Reaff. 2019)	BDL (DL:0.01 mg/l)
31	Barium as Ba	IS 3025 Part 44:1993 (Reaff:2019)	BDL(DL:0.05 mg/l)
32	Ammonia (as total ammonia-N)	IS 3025 Part 58:2006 (Reaff:2017)	BDL (DL:0.01 mg/l)
33	Sulphide as H <sub>2</sub> S	IS 3025 Part 38:1989 (Reaff:2019)	BDL (DL:0.01 mg/l)
34	Molybdenum as Mo	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.02 mg/l)
35	Total Arsenic as As	IS 3025 Part 34-1988 (Reaff. 2019)	BDL (DL:0.005 mg/l)
36	Total Suspended Solids	IS 3025 Part 29-1986 (Reaff: 2019)	BDL (DL:1.0 mg/l)
	<b>Discipline:</b> Biological	<b>Group:</b> Water	
37	Total Coliform	APHA 23 <sup>rd</sup> Edn. 2017:9221B	144 MPN/100ml
38	<i>Escherichia coli</i>	APHA 23 <sup>rd</sup> Edn. 2017:9221F	< 1.8 MPN/100ml

\*\*\*\*\*End of Report\*\*\*\*\*

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A-17

Name : Santhosh Kumar A  
Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

**TEST REPORT**

<b>Report No</b>	EHS360/TR/2024-25/023	<b>Report Date</b>	04.03.2024
<b>Site Location</b>	<b>THIRU. A. VEERARAGAVAN ROUGH STONE AND GRAVEL QUARRY</b> S.F.Nos. . 75/1, 75/4, 75/5, 75/6 and 76/3B2, Eraiur Village, Vanur Taluk, Viluppuram District.		
<b>Customer Name</b>			
<b>Sampling Method</b>	SOP Method	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Water	<b>Sample Code</b>	EHS360/023
<b>Sample Description</b>	Ground Water (BW-2)	<b>Sample Collected Date</b>	26.02.2024
<b>Qty. of Sample Received</b>	2 Litres	<b>Sample Received On</b>	27.02.2024
<b>Sample Condition</b>	Fit for Analysis	<b>Test Commenced On</b>	04.03.2024
<b>Sampling Location</b>	Ilavampattu		

S.No.	Parameters	Test Method	RESULTS
	<b>Discipline:</b> Chemical	<b>Group:</b> Water	
1	Colour	IS 3025 Part 4:1983 (Reaff:2017)	5
2	Odour	IS 3025 Part 5:2018	Agreeable
3	pH at 25°C	IS 3025 Part 11:1983 (Reaff:2017)	7.86
4	Conductivity @ 25°C	IS 3025 Part 14:2013 (Reaff:2019)	1158 µmhos/cm
5	Turbidity	IS 3025 Part 10:1984 (Reaff:2017)	1 NTU
6	Total Dissolved Solids	IS 3025 Part 16:1984 (Reaff:2017)	684 mg/l
7	Total Hardness as CaCO <sub>3</sub>	IS 3025 Part 21:2018 (Reaff:2019)	211.10 mg/l
8	Calcium as Ca	IS 3025 Part 40:1991 (Reaff:2019)	35.5 mg/l
9	Magnesium as Mg	IS 3025 Part 46:1994 (Reaff:2019)	29.8 mg/l
10	Total Alkalinity as CaCO <sub>3</sub>	IS 3025 Part 23:1986 (Reaff:2019)	211 mg/l
11	Chloride as Cl	IS 3025 Part 32:1988 (Reaff:2019)	143 mg/l
12	Sulphate as SO <sub>4</sub>	IS 3025 Part 24:1986 (Reaff:2019)	89.1 mg/l
13	Iron as Fe	IS 3025 Part 53:2003 (Reaff:2019)	0.31 mg/l
14	Residual Free Chlorine	IS 3025 Part 26:1986 (Reaff:2019)	BDL (DL:0.1 mg/l)
15	Fluoride as F	APHA 23 <sup>rd</sup> Edn. 2017:4500 F,D	0.33 mg/l
16	Nitrate as NO <sub>3</sub>	IS 3025 Part 34:1988 (Reaff:2019)	7.0 mg/l

\*\*\*\*\*End of Report\*\*\*\*\*



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Authorised Signatory

Name : Santhosh Kumar A  
Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

## TEST REPORT

<b>Report No</b>	EHS360/TR/2024-25/023	<b>Report Date</b>	04.03.2024
<b>Site Location</b>	<b>THIRU. A. VEERARAGAVAN ROUGH STONE AND GRAVEL QUARRY</b> S.F.Nos. . 75/1, 75/4, 75/5, 75/6 and 76/3B2, Eraiyur Village, Vanur Taluk, Viluppuram District.		
<b>Sampling Method</b>	SOP Method	<b>Sample Drawn by</b>	Laboratory
<b>Sample Name</b>	Water	<b>Sample Code</b>	EHS360/023
<b>Sample Description</b>	Ground Water (BW-2)	<b>Sample Collected Date</b>	26.02.2024
<b>Qty. of Sample Received</b>	2 Litres	<b>Sample Received On</b>	27.02.2024
<b>Sample Condition</b>	Fit for Analysis	<b>Test Commenced On</b>	04.03.2024
<b>Sampling Location</b>	Ilavampattu		

S.No.	Parameters	Test Method	RESULTS
17	Copper as Cu	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.01 mg/l)
18	Manganese as Mn	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.02 mg/l)
19	Mercury as Hg	USEPA 200.8	BDL (DL:0.0005 mg/l)
20	Cadmium as Cd	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.001 mg/l)
21	Selenium as Se	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
22	Aluminium as Al	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
23	Lead as Pb	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
24	Zinc as Zn	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.05 mg/l)
25	Total Chromium as Cr	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.02 mg/l)
26	Boron as B	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.05 mg/l)
27	Mineral Oil	IS 3025 Part 39-1991 (Reaff. 2019)	BDL(DL : 0.01 mg/l)
28	Phenolic compounds as C <sub>6</sub> H <sub>5</sub> OH	IS 3025 Part 43-1992(Reaff: 2019)	BDL (DL:0.0005 mg/l)
29	Anionic Detergents (as MBAS)	IS 13428 – 2005 (Reaff:2019) (Annex K)	BDL (DL:0.01 mg/l)
30	Cyanide as CN	IS 3025 Part 27-1986 (Reaff. 2019)	BDL (DL:0.01 mg/l)
31	Barium as Ba	IS 3025 Part 44:1993 (Reaff:2019)	BDL(DL:0.05 mg/l)
32	Ammonia (as total ammonia-N)	IS 3025 Part 58:2006 (Reaff:2017)	BDL (DL:0.01 mg/l)
33	Sulphide as H <sub>2</sub> S	IS 3025 Part 38:1989 (Reaff:2019)	BDL (DL:0.01 mg/l)
34	Molybdenum as Mo	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.02 mg/l)
35	Total Arsenic as As	IS 3025 Part 34-1988 (Reaff. 2019)	BDL (DL:0.005 mg/l)
36	Total Suspended Solids	IS 3025 Part 29-1986 (Reaff: 2019)	BDL (DL:1.0 mg/l)
	<b>Discipline:</b> Biological	<b>Group:</b> Water	
37	Total Coliform	APHA 23 <sup>rd</sup> Edn. 2017:9221B	151 MPN/100ml
38	<i>Escherichia coli</i>	APHA 23 <sup>rd</sup> Edn. 2017:9221F	< 1.8 MPN/100ml

\*\*\*\*\*End of Report\*\*\*\*\*

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Verified by



Authorised Signatory

Name : Santhosh Kumar A  
Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.





## National Accreditation Board for Education and Training



### Certificate of Accreditation

#### Geo Exploration & Mining Solutions, Salem

No. 17, Advaita Ashram Road, Fairlands, Salem – 636 004, Tamilnadu, India.

The organization is accredited as **Category-A** under the QCI-NABET Scheme for Accreditation of EIA Consultant Organization, Version 3: for preparing EIA-EMP reports in the following Sectors –

S.No	Sector Description	Sector (as per)		Cat.
		NABET	MoEFCC	
1	Mining of minerals opencast only	1	1 (a) (i)	A
2	Industrial estates/ parks/ complexes/areas, export processing Zones (EPZs), Special Economic Zones (SEZs), Biotech Parks, Leather Complexes	31	7 (c)	B
3	Building and construction projects	38	8(a)	B

**Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in RAAC minutes dated Jan 06, 2023 and 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/23/2684 dated Feb 20, 2023. The accreditation needs to be renewed before the expiry date by Geo Exploration & Mining Solutions, Salem following due process of assessment.

Sr. Director, NABET  
Dated: Feb 20, 2023

Certificate No.  
NABET/EIA/2225/RA 0276

Valid up to  
August 06, 2025

For the updated List of Accredited EIA Consultant Organizations with approved Sectors please refer to the QCI-NABET website.

