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 – MINOR MINERAL – CLUSTER –PATTA LAND – FRESH QUARRY

THIRU.K. MANIKANDAN ROUGH STONE AND GRAVEL QUARRY

Cluster Extent – 17.36.5 Ha

(3 Proposed Quarries + 5 Existing quarries)

PROJECT DETAILS	
THIRU.K. MANIKANDAN, 47/40, Indra Nagar, Alavandan, Gandhi Nagar, Madurai North, Madurai – 625 020	
S.F.Nos. 1196/1A, 1196/3, 1196/4, 1196/5A **Extent: 1.99.0 Ha** Katchaikatti Village, Vadipatti Taluk, Madurai District, Tamil Nadu State	
Reserves **Rough Stone** =1,99,485 m^3 **Gravel** =28,926 m^3 **Peak Production** = 40,130 m^3 of Rough stone Proposed Depth =**22 m BGL**	
ToR obtained vide **File No: 13178 ToR Identification No: TO24B0108TN5609012N Dated: 10.02.2026**	
Environmental Consultant **GEO EXPLORATION AND MINING SOLUTIONS** **Old No. 260-B, New No. 17,** **Advaitha Ashram Road, Alagapuram,** **Salem – 636 004, Tamil Nadu, India** **Accredited for sector 1 Cat 'A', sector 31 & 38 Cat 'B'** **Certificate No : NABET/EIA/25-28/RA 0424** **Valid Till: 06.08.2028** Phone: 0427-2431989, Email: ifthiahmed@gmail.com, geothangam@gmail.com **Web: www.gemssalem.com**	**Laboratory** **CHENNAI METTEX LAB PRIVATE LIMITED** **(Approved by AAI, AGMARK, APEDA, BIS, EIC FSSAI, GAFTA, IOPEPC, MOEF & TEA BOARD)** **Jothi Complex, 83,** **M.K.N Road, Guindy,** **Chennai – 600 032**
Baseline Monitoring Period **MARCH – MAY 2026**	
JUNE 2026	

UNDERTAKING

I Thiru. Manikandan given undertaking that this EIA & EMP report prepared for our Rough stone and Gravel quarry situated in S.F.Nos. 1196/1A, 1196/3, 1196/4 & 1196/5A of Katchaikatti Village, Vadipatti Taluk, Madurai District, Tamil Nadu State based on the ToR issued by the State Level Environmental Impact Assessment Authority (SEIAA), Tamil Nadu vide File No: 13178 ToR Identification No: TO24B0108TN5609012N Dated: 10.02.2026

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



K. Manikandan

Place: Madurai
Dated: 22.06.2026

DECLARATION

I, M. Ifthikhar Ahmed – EIA Co Ordinator declare that this EIA & EMP report for the Rough stone and Gravel quarry in S.F.Nos. 1196/1A, 1196/3, 1196/4 & 1196/5A of Katchaikatti Village, Vadipatti Taluk, Madurai District, Tamil Nadu State 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: 22.06.2026

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

CODE	Name of the Owner	Village	S.F. Nos	Extent in Ha	Status
PROPOSED QUARRIES					
P1	**Thiru.K.Manikandan**.	Katchaikatti	1196/1A, 1196/3, 1196/4 & 1196/5A	1.99.0	File No: 13178 ToR Identification No: TO24B0108TN5609012N Dated: 10.02.2026
P2	**M/s. Concretia Rock Products Private Limited,** Katchaikatti Road, Vadipatti Taluk, Madurai District – 625 218.	Katchaikatti	1174/2, 3, 4B, 5B, 1192/1, 2, 1193/6A & 6B	2.29.5	File No: 11446 ToR Identification No: TO24B0108TN5947752N Dated: 20.03.2026
P3	**M/s. Concretia Rock Products Private Limited,** Katchaikatti Road, Vadipatti Taluk, Madurai District – 625 218.	Katchaikatti	1191/2,1191/3A, 1191/3D2, 1191/3B1, 1191/3D1, 1191/3C, 1191/14A, 1194/14B 1194/8 & 1194/7B	4.02.5	Pending at SEIAA
	TOTAL EXTENT			**8.31.0**	
EXISTING QUARRIES					
E-1	Meenaachi Sundram.A.D, S/o.Duraisamy	Katchaikatti	1168/25, 1171/3 & 1171/5	1.62.0Ha	23.02.2023 to 22.02.2028
E-2	Rajesh .K Managing Director M/s. Concretia Rock Prouct (Pvt) Ltd.		1185/1,1185/7A & 1185/8	1.79.5 Ha	16.11.2023 to 15.11.2028
E-3	Karuppusamy.S s/o.Solairajan, Madurai-625001		1186/2A,1186/3 & 1186/4	1.16.5 Ha	24.01.2024 to 23.01.2029
E4	Ramesh.K		1265/5, 1267/2A, 1267/2B, 1495/4(P), 1495/6(P)	2.46.0 Ha	02.07.2024 to 01.07.20234
E5	Thiru.B.Karuppaiah		1199/1B,1199/1C,1199/1D, 1199/1E, 1199/1F, 1199/1H,1199/1I,1199/1J, 1199/1K,1193/1&1193/2	2.01.5	29.10.2024 – 28.10.2034
	TOTAL EXTENT			**9.05.50 Ha**	
EXPIRED/ABANDONED QUARRIES					
Ex-1	Kannan.R	Katchaikatti	1168/7,1168/9,1168/19	1.91.0 Ha	23.09.2015 to 22.09.2020
Ex-2	Zavier		1164/2b	0.48.0 Ha	14.11.2009 To 13.11.2014
Ex-3	Selvi.G		1169/6b,1169/6I etc.,	0.67.0 Ha	10.04.2017 To 09.04.2022
Ex-4	M/s. Concretia Rock Prouct (Pvt) Ltd.		1185/2, 1185/3, 1185/4, 1185/5, 1185/6,1185/7B	1.90.0	28.08.2017 – 27.08.2022

Ex-5	Jayaraman S		1186/1B, 1186/5A, 1186/5B & 1186/6A	1.82.5	18.07.2017 – 17.08.2022
	TOTAL EXTENT			**6.78.5 Ha**	
	TOTAL CLUSTER EXTENT			**17.36.5 Ha**	

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

TERMS OF REFERENCE (ToR) COMPLIANCE

File No: 13178

ToR Identification No: TO25B0108TN5609012N Dated: 10.02.2026

SEAC CONDITIONS – MAJOR CONDITIONS		
1.	The PP shall mark the DGPS reference pillars and shall also erect fencing all around the boundary of the proposed area with gates for entry/exit and shall furnish the latest photographic/videographic proof showing the same during EIA appraisal.	Noted and Agreed We have erected the DGPS pillarson on all tha corners of the Mine lease area
SEAC CONDITIONS – SITE SPECIFIC		
	1. A Cluster Management Committee (CMC) shall be constituted including all the mines in the cluster as Committee Members for the effective management of the mining operation in the cluster through systematic & scientific approach with appointment of statutory personnel, appropriate environmental monitoring, good maintenance of haul roads and village/panchayat roads, authorized blasting operation etc. The PP shall submit the following details in the form of an Affidavit during the EIA appraisal: (i) Copy of the agreement forming CMC. (ii) The Organisation chart of the Committee with defining the role of the members (iii) The 'Standard Operating Procedures' (SoP) executing the planned activities.	Noted & agreed A Cluster Management Committee (CMC) was detailed in chapter 7, Page No. 144.
	2. The Geo referenced Boundary pillars to be erected on the field as per the mine rules and the evidence should be submitted along with the EIA report.	Noted and Agreed We have erected the DGPS pillars on on all tha corners of the Mine lease area
	3. The details of enumeration of structures including schools, colleges, primary health centres should be submitted along with the EIA report.	Noted and Agreed The Structure study has been detailed in Chapter 3
	4. The structures within the radius of (i) 50 m, (ii) 100 m, (iii) 200 m and (iv) 300m & upto 1km shall be enumerated with details such as dwelling houses with number of occupants, whether it belongs to the owner (or) not, places of worship, industries, factories, sheds, etc. and spell out the mitigation measures to be proposed for the protection of the above structures, if any during the quarrying operations.	Noted and Agreed The Structure study has been detailed in Chapter 3
	5. The proponent shall furnish photographs of adequate fencing, garland drainage built with siltation tank & green belt along the periphery including replantation of existing trees; maintaining the safety distance between the adjacent quarries & water bodies nearby provided as per the approved mining plan.	Noted & agreed The fencing has been erected around the mine lease area and the green belt activities has been carried out around the project site.
	6. The Proponent shall carry out Bio diversity study as a part of EIA study and the same shall be included in the Report.	Noted & agreed The EMP has been detailed in the Chapter -3
	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..	Noted and agreed It has been detailed in Chapter 10
	8. The PP shall carry out the comprehensive studies on the cumulative environmental impacts of the existing & proposed quarries which included drilling & blasting, loading & hauling on the surrounding village and structures.	Noted and Agreed
	9. The PP shall prepare a conceptual working plan accommodating the inclusion of haul road accessibility	Noted and Agreed

	keeping the benches intact, by ensuring the slope stability of the working benches to be constructed and existing quarry wall.	
	10. The PP shall install the CCTV camera for the continuous surveillance of mining activity & furnish the photographic/videographic evidence along with the EIA report.	Noted and Agreed
	SEAC STANDARD CONDITIONS	
3.1	1. In the case of existing/operating mines, a letter obtained from the concerned AD (Mines) shall be submitted and it shall include the following: (i) Original pit dimension (ii) Quantity achieved Vs EC Approved Quantity (iii) Balance Quantity as per Mineable Reserve calculated. (iv) Mined out Depth as on date Vs EC Permitted depth (v) Details of illegal/illicit mining (vi) Violation in the quarry during the past working. (vii) Quantity of material mined out outside the mine lease area (viii) Condition of Safety zone/benches (ix) Revised/Modified Mining Plan showing the benches of not exceeding 6 m height and ultimate depth of not exceeding 50m.	It is a fresh lease area
	2. Details of habitations around the proposed mining area and latest VAO certificate regarding the location of habitations within 300m radius from the periphery of the site.	Noted and Agreed Project Proponent obtained VAO certificate and there is no approved habitation within the radius of 300m & enclosed in Annexure.
	3. The proponent is requested to carry out a survey and enumerate on the structures located within the radius of (i) 50 m, (ii) 100 m, (iii) 200 m and (iv) 300 m (v) 500m shall be enumerated with details such as dwelling houses with number of occupants, whether it belongs to the owner (or) not, places of worship, industries, factories, sheds, etc with indicating the owner of the building, nature of construction, age of the building, number of residents, their profession and income, etc.	Noted & agreed The enumeration of structure detailed in chapter 3 in Socio Economic Environment,
	4. The PP shall submit a detailed hydrological report indicating the impact of proposed quarrying operations on the waterbodies like lake, water tanks, etc are located within 1 km of the proposed quarry.	Noted and agreed. The Hydrogeological study has been carried out in the project site considering the water bodies located within the radius of 1km. The hydrogeological study (Resistivity survey) is detailed in the EIA report, Chapter No.3
	5. The Proponent shall carry out Bio diversity study through reputed Institution and the same shall be included in EIA Report.	Noted and agreed The Bio diversity study has been conducted by the Functional Area Expert approved by the NABET. The same has been detailed in the Chapter No. 3
	6. The DFO letter stating that the proximity distance of Reserve Forests, Protected Areas, Sanctuaries, Tiger reserve etc., up to a radius of 25 km from the proposed site.	Noted and agreed Nearest Reserve Forest: Waguthumalai RF – 19.5km – North West
	7. In the case of proposed lease in an existing (or old) quarry where the benches are not formed (or) partially formed as per the approved Mining Plan, the Project Proponent (PP) shall the PP shall carry out the scientific studies to assess the slope stability of the working benches to be constructed and existing quarry wall, by involving any one of the reputed Research and Academic Institutions - CSIR-Central Institute of Mining & Fuel Research / Dhanbad, NIRM/Bangalore, Division of Geotechnical Engineering-IIT-Madras, NIT-Dept of	Noted and Agreed It is a fresh quarry Proposal.

	Mining Engg, Surathkal, and Anna University Chennai-CEG Campus. The PP shall submit a copy of the aforesaid report indicating the stability status of the quarry wall and possible mitigation measures during the time of appraisal for obtaining the EC.	
	8. However, in case of the fresh/virgin quarries, the Proponent shall submit a conceptual 'Slope Stability Plan' for the proposed quarry during the appraisal while obtaining the EC, when the depth of the working is extended beyond 30 m below ground level	Noted and Agreed It is a fresh quarry Proposal.
	9. The PP shall furnish the affidavit stating that the blasting operation in the proposed quarry is carried out by the statutory competent person as per the MMR 1961 such as blaster, mining mate, mine foreman, II/I Class mines manager appointed by the proponent.	Noted and agreed Proponent given under taking that the blasting will be carried out by the statutory person as per the MMR 1961.
	10. The PP shall present a conceptual design for carrying out only controlled blasting operation involving line drilling and muffle blasting in the proposed quarry such that the blast-induced ground vibrations are controlled as well as no fly rock travel beyond 30 m from the blast site.	Noted and agreed Chapter-2 sub - 2.5.1Drilling & Blasting Parameters NONEL initiation based controlled blasting operation involving line drilling and muffle blasting in the proposed quarry Chapter-4, Sub 4.4.2 Common Mitigation Measures for Respective Individual Proposed Projects The blasting will be carried out during favorable atmospheric condition and less human activity timings by using nonelectrical initiation system
	11. The EIA Coordinators shall obtain and furnish the details of quarry/quarries operated by the proponent in the past, either in the same location or elsewhere in the State with video and photographic evidences.	There is no quarry operated in the Name of the Project proponent
	12. If the proponent has already carried out the mining activity in the proposed mining lease area after 15.01.2016, then the proponent shall furnish the following details from AD/DD, mines,	Not Applicable It is a fresh lease proposal
	13. What was the period of the operation and stoppage of the earlier mines with last work permit issued by the AD/DD mines?	Not Applicable It is a fresh lease proposal
	14. Quantity of minerals mined out. · Highest production achieved in any one year · Detail of approved depth of mining. · Actual depth of the mining achieved earlier. · Name of the person already mined in that leases area. · If EC and CTO already obtained, the copy of the same shall be submitted. · Whether the mining was carried out as per the approved mine plan (or EC if issued) with stipulated benches.	Not Applicable It is a fresh lease proposal
	15. All corner coordinates of the mine lease area, superimposed on a High-Resolution Imagery/Topo sheet, topographic sheet, geomorphology, lithology and geology of the mining lease area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).	Project area boundary coordinates superimposed on Toposheet Chapter-1, Surface Features around the project area covering 10km radius Chapter-2,. Geology map of the project area covering 10km radius Chapter-2, Geomorphology Map of the Study Area covering 10 km radius Chapter-2,.
	16. The PP shall carry out Drone video survey covering the cluster, green belt, fencing, etc.,	Noted & agreed It will be submitted on final EIA appraisal.
	17. The proponent shall furnish photographs of adequate fencing, green belt along the periphery including replantation of existing trees & safety distance between the adjacent quarries & water bodies nearby provided as per the approved mining plan.	Noted & agreed Fencing, garland drainage & green belt photographs are enclosed in chapter 2. There are no trees in inside lease area.

		distance of 50 meters should be provided to the odai located on the southern side of the proposed S.F.No. 1196/1A. This odai flows in the eastern direction through SF Nos. 1187 and 1188.
	18. The Project Proponent shall provide the details of mineral reserves and mineable reserves, planned production capacity, proposed working methodology with justifications, the anticipated impacts of the mining operations on the surrounding environment, and the remedial measures for the same.	Noted and Agreed Details of Geological Resources and Proposed reserves are discussed under Chapter No. 2
	19. The Project Proponent shall provide the Organization chart indicating the appointment of various statutory officials and other competent persons to be appointed as per the provisions of the Mines Act'1952 and the MMR, 1961 for carrying out the quarrying operations scientifically and systematically in order to ensure safety and to protect the environment.	Noted and agreed Organization chart for the Competent persons to be appointed as per the provisions of the Mines Act 1952 is given in the Chapter No.6
	20. The Project Proponent shall conduct the hydro-geological study considering the contour map of the water table detailing the number of groundwater pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds, etc. within 1 km (radius) along with the collected water level data for both monsoon and non-monsoon seasons from the PWD / TWAD so as to assess the impacts on the wells due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided.	Noted and agreed 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.
	21. The proponent shall furnish the baseline data for the environmental and ecological parameters with regard to surface water/ground water quality, air quality, soil quality & flora/fauna including traffic/vehicular movement study.	Noted and agreed Baseline Data were collected for pre-monsoon season March 2026 to May 2026. Details in Chapter No. 3.
	22. The Proponent shall carry out the Cumulative impact study due to mining operations carried out in the quarry specifically with reference to the specific environment in terms of soil health, biodiversity, air pollution, water pollution, climate change and flood control & health impacts. Accordingly, the Environment Management plan should be prepared keeping the concerned quarry and the surrounding habitations in the mind.	Noted and agreed The Cumulative impact study due to mining operations are detailed in chapter 7..
	23. Rain water harvesting management with recharging details along with water balance (both monsoon & non-monsoon) be submitted.	Noted and agreed The lower part of the mine pit will act as temporary rainwater harvesting structure, besides Rainwater harvesting structure will be constructed near the mine office and labour shed after commencement of mining operation.
	24. Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.	Land use 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.
	25. Details of the land for storage of Overburden/Waste Dumps (or) Rejects outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be provided.	Not applicable

		There is no waste anticipated in this Rough Stone and gravel quarrying operation. The entire quarried out materials will be utilized (100%).
	26. Proximity to Areas declared as 'Critically Polluted' (or) the Project areas which attracts the court restrictions for mining operations, should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the TNPCB (or) Dept. of Geology and Mining should be secured and furnished to the effect that the proposed mining activities could be considered.	Not Applicable. Project area / Study area is not declared in 'Critically Polluted' Area and does not come under 'Aravalli Range.
	27. Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.	Noted and agreed The lower part of the mine pit will be utilized as rain water harvesting structure (Temporary) and the water will be used for the water sprinkling on haul roads and Greenbelt development purpose. Rainwater harvesting structure will be constructed near the mine office.
	28. Impact on local transport infrastructure due to the Project should be indicated.	Noted and agreed Traffic density survey was carried out to analyse the impact of transportation in the study area as per IRC guidelines 1961 and it is inferred that there is no significant impact due to the proposed transportation from the project area. Details have been provided in Chapter No.2.
	29. A tree survey study shall be carried out (nos., name of the species, age, diameter etc.,) both within the mining lease applied area & 300m buffer zone and its management during mining activity.	Noted and agreed It was proposed 1000Nos of trees were planted as a part of greenbelt development programme all along the periphery of the lease applied area and approach roads and village roads.
	30. A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific.	Noted and agreed After the completion of mining operation, the quarried-out land will be utilized as temporary storage reservoir. The details are given in the Chapter No.4
	31. As a part of the study of flora and fauna around the vicinity of the proposed site, the EIA coordinator shall strive to educate the local students on the importance of preserving local flora and fauna by involving them in the study, wherever possible.	Noted and Agreed
	32. The purpose of green belt around the project is to capture the fugitive emissions, carbon sequestration and to attenuate the noise generated, in addition to improving the aesthetics. A wide range of indigenous plant species should be planted as given in the Appendix-I in consultation with the DFO, State Agriculture University. The plant species with dense/moderate canopy of native origin should be chosen. Species of small/medium/tall trees alternating with shrubs should be planted in a mixed manner.	Noted and agreed The varieties of plantations have been proposed as per the Appendix given in the ToR. It is a Proposed Lease. Around 1000 trees are proposed to plant in the boundary area and in the village roads.
	33. Taller/one-year-old Saplings raised in appropriate size of bags; preferably ecofriendly bags should be planted as per the advice of local forest authorities/botanist/Horticulturist with regard to site specific choices. The proponent shall earmark the greenbelt area with GPS coordinates all along the boundary of the project site with at least 3 meters wide and in between blocks in an organized manner	Noted and Agreed

	34. A Disaster management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.	Noted and Agreed Disaster management Plan details in Chapter-7
	35. A Risk Assessment and management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.	Noted and Agreed A Risk Assessment and management Plan Chapter- 7
	36. Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.	Noted and Agreed Occupational Health impacts are given in the Chapter- 10.
	37. Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.	Noted and agreed. No Public Health Implications anticipated due to this project.
	38. The Socio-economic studies should be carried out within a 5 km buffer zone from the mining activity. Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.	Noted and Agreed Details explained Socio economic and impacts studies regarding Chapter No. 3
	39. Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given	Noted and Agreed No Litigation is pending against the project.
	40. Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.	Noted and agreed The benefits of the project are given in the Chapter No 8. • Through this project around 1000Nos of trees will be planted • The government will get revenue from the way of Seigniorage fee, royalty etc., Around 22 people will get direct employment through this project.
	41. If any quarrying operations were carried out in the proposed quarrying site for which now the EC is sought, the Project Proponent shall furnish the detailed compliance to EC conditions given in the previous EC with the site photographs which shall duly be certified by MoEF&CC, Regional Office, Chennai (or) the concerned DEE/TNPCB.	Not Applicable
	42. The PP shall prepare the EMP for the entire life of mine and also furnish the sworn affidavit stating to abide the EMP for the entire life of mine	Noted and Agreed Details are discussed in chapter no 10..
	43. Concealing any factual information or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this Terms of Conditions besides attracting penal provisions in the Environment (Protection) Act, 1986.	Noted and Agreed
SEIAA SPECIFIC CONDITIONS		
	After detailed discussions, the Authority accepts the recommendation of SEAC and decided to grant Terms of Reference (ToR) along with Public Hearing for the quantity of 1,99,485 m3 of Rough Stone & 28,926m3 of Gravel upto the depth of 22m BGL and annual peak production shall not exceed 40,280m3 of Rough Stone &	Noted and Agreed

	12,534m3 of Gravel as per the approved mining plan, under cluster for undertaking the combined Environment Impact Assessment Study and preparation of separate Environment Management Plan subject to the conditions as recommended by SEAC & normal conditions & the SEIAA Standard conditions.	
SEIAA STANDARD CONDITION		
Cluster Management Committee		
1	Cluster Management Committee, which must include all the proponents in the cluster as members including the existing as well as proposed quarry.	Noted and agreed Cluster management committee detailed in chapter 7, Cluster management committee has been formed with mutual agreement with the proponents including Proposed quarry at present are framed.
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..	Noted and agreed. As per the committee agreement proponents will coordinates for the Greenbelt development, Water sprinkling and tree plantation activities combined.
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.	Noted and agreed. The formation of committee with list of members has been submitted to the AD mines office, Madurai and the same will be update in every year.
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.	As per the committee agreement the blasting frequency will be discussed and carryout by the Mines Manager appointed by the proponents and the same will be updated in the committee minutes. Transport details in chapter-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 this EIA report.
6	The Cluster Management Committee shall form Environmental Policy to practice sustainablemining in a scientific and systematic manner in accordance with the law. The role played by the committee in implementing the Environmental policy devised shall be given in detail in the EIA Report.	Noted and agreed.
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	Noted and agreed. A proper action plan regarding the restoration will be followed by the committee.
8	The committee shall deliberate on the health of the workers/staff involved in the mining as well as the health of the public in the vicinity.	Noted and agreed.
Agriculture & Agro - Biodiversity		
9	Impact on surrounding agricultural fields around the proposed mining Area.	Noted and agreed. 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.
10	Impact on soil flora & vegetation around the project site.	Noted and agreed The vegetation details have been provided in chapter 3. There is no schedule I species of animals observed within study area as per Wildlife Protection Act, 1972 and no species falls in vulnerable, endangered or threatened

		category as per IUCN. There is no endangered red list species found in the study area.
11	Details of type of vegetations including no. of trees & shrubs within the proposed mining area and. If so, transplantation of such vegetations all along the boundary of the proposed mining area shall committed mentioned in EMP.	Noted and agreed The vegetation details have been provided in Chapter No 3. 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.
12	The Environmental Impact Assessment should study the biodiversity, the natural ecosystem, the soil micro flora, fauna and soil seed banks and suggest measures to maintain the natural Ecosystem	Noted and agreed The EIA study has been carried out as per this ToR Condition. The details are given in the EIA report Chapter No.3
13	Action should specifically suggest for sustainable management of the area and restoration of ecosystem for flow of goods and services.	Noted and agreed 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.
14	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 all side of the lease area.
Forests		
15	The project proponent shall detail 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
16	The Environmental Impact Assessment should study impact on forest, vegetation, endemic, vulnerable and endangered indigenous flora and fauna.	Details of flora and fauna studies given in the Chapter No.3
17	The Environmental Impact Assessment should study impact on standing trees and the existing trees should be numbered and action suggested for protection.	Noted and agreed
18	The Environmental Impact Assessment should study impact on protected areas, Reserve Forests, National Parks, Corridors and Wildlife pathways, near project site.	Noted and agreed
Water Environment		
19	Hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds etc. within I km (radius) so as to assess the impacts on the nearby waterbodies due to mining any ecological fragile areas. 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.	Hydro-geological study considering the open well and borewell within the radius of 1km along with water level contour map. The details are given in the Chapter No.3.
20	Erosin Control measures	Noted and agreed Garland drainage structures will be constructed around the lease area to control the erosion, as discussed in Section 4.3 under Chapter 4.
21	Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area on the nearby Villages, Water-bodies/ Rivers, & any ecological fragile areas.	Details in Chapter 3- Detailed EIA study has been carried out considering the impact to the water bodies and

		eco system of the area. Details are covered in the Chapter No.3 and 4.
22	The project proponent shall study impact on fish habitats and the food WEB/ food chain in the water body and Reservoir.	Noted & agreed Details discussed in Chapter 3 and 4 impact of bio diversity
23	The project proponent shall study and furnish the details on potential fragmentation impact of natural environment, by the activities.	Noted & agreed
24	The project proponent shall study and furnish the impact on aquatic plants and animals in water bodies and, possible scars on the landscape damages to nearby caves, heritage site, and archaeological sites possible land form changes visual and aesthetic impacts.	Noted & agreed. Details discussed under Chapter 3.
25	The Terms of Reference should specifically study impact on soil health, soil erosion, the soil physical, chemical components and microbial components.	Noted & agreed Details of impact on soil health, soil erosion, the soil, physical, chemical components and microbial components described in chapter-3.
26	The Environmental Impact Assessment should study on wetlands, water bodies, rivers streams, lakes and farmer sites.	Noted & agreed
27	The EIA shall include the impact of mining activity on the following: a) Hydrothermal/Geothermal effect due to destruction in the Environment. b) Bio-geochemical processes and its foot prints including Environmental stress.	Noted & agreed
Energy		
28	The measures taken to control Noise, Air, Water, Dust Control and steps adopted to efficiently utilise the Energy shall be furnished.	The mitigation measures to control the Noise, Air, Water and dust is given in the Chapter No.4.
Climate Change		
29	The Environmental Impact Assessment shall study in detail the carbon emission and also suggest the measures to mitigate carbon emission including development of carbon sinks and Temperature reduction including control of other emission and climate mitigation activities.	Details of carbon emission and mitigation activities are given int the Chapter No.4
30	The Environmental Impact Assessment should study impact on climate change, temperature rise, pollution and above soil & below soil carbon stock, soil health and physical, chemical & biological soil features.	Noted & agreed
31	Impact of mining on pollution leading to GHGs emissions and the impact of the same on the local livelihood.	Noted & agreed
Mine Closure Plan		
32	Detailed Mine Closure Plan covering the entire mine lease period as per precise area communication order issued and the scope for achieving SDGs.	Details in Chapter 2 mine closure plan
EMP		
33	Detailed Environment Management Plan along with adaptation, mitigation & remedial strategies covering the entire mine lease period as per precise area communication order issued.	The detailed Environmental Management plan has been prepared and given in the Chapter No.10
34	The Environmental Impact Assessment should hold detailed study on EMP with budget for green belt development and mine closure plan including disaster management plan	Details in Green belt development in chapter 4
Risk Assessment		
35	To furnish risk assessment and management plan including anticipated vulnerabilities during operational and post operational phases of Mining.	The risk assessment and its management plan for this project has been provided in Chapter No. 7.
Disaster Management Plan		

36	To furnish disaster management plan and disaster mitigation measures in regard to all aspects to avoid/reduce vulnerability to hazards & to cope with disaster/untoward accidents in & around the proposed mine lease area due to the proposed method of mining activity & its related activities covering the entire mine lease period as per precise area communication order issued.	The disaster management plan for this project has been provided in Chapter No. 7.
Others		
37	The project proponent shall furnish VAO certificate with reference to 300m radius regard to approved habitations, schools, Archaeological sites, Structures, railway lines, roads, water bodies such as streams, odai, vaari, canal, channel, river, lake pond, tank etc.	The Project Proponent have obtained VAO certificate and it will be attached in the annexure.
38	As per the MoEF& CC office memorandum F.No.22-65/2017-IA.lll 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.	Noted and agreed
39	The project proponent shall study and furnish the possible pollution due to plastic and microplastic on the environment. The ecological risks and impacts of plastic & microplastics on aquatic environment and fresh water systems due to activities, contemplated during mining may be investigated and reported.	Details of carbon emission and mitigation activities are given int the Chapter No.4

STANDARD TERMS OF REFERENCE		
1	Year-wise production details since 1994 should be given. clearly stating the highest production achieved in any one year prior to 1994.It may also be categorically informed whether there had been any increase in production after the EIA Notification 1994 came into force, w.r.t. the highest production achieved prior to 1994.	Not applicable. This is Not a violation category project. This proposal falls under B1 Category (Cluster Condition).
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	Noted & agreed.
4	All comer 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)	Map showing – Project area is superimposed on Satellite imagery is enclosed in Figure No. 2.4, Project area boundary coordinates superimposed on Toposheet – Figure No. 1.3, Surface Features around the project area covering 10km radius – Figure No. 2.5, Geology map of the project area covering 10km radius - Figure No. 2.8, Geomorphology Map of the Study Area covering 10 km radius – Figure No. 2.9,
5	Information should be provided in Survey of India Topo sheet in l: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	Map showing – Geology map of the project area covering 10km radius - Figure No. 2.8, Geomorphology Map of the Study Area covering 10 km radius – Figure No. 2.9,
6	Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority	The applied area was inspected by the officers of Department of Geology along with revenue officials and found that the land is fit for quarrying under the policy of State Government.
7	It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt 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,

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 90^0 bench angles. Quarrying activities will be carried out under the supervision of Competent Persons like Mines Manager, Mines Foreman and Mining Mate. Necessary permissions will be obtained from DGMS after obtaining Environmental Clearance.
9	The study area will comprise of l0 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.	Noted & agreed. 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, page No 20.
11	Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given.	Not Applicable. There is no waste anticipated during this quarry operation. The entire quarried out rough stone will be transported to the needy customers. No Dumps is proposed outside the lease area.
12	Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, il 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.	Not Applicable. 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 forest land involved in the Project including deposition of Net Present Value (NPV) and Compensatory Afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.	Not Applicable. 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 fights) Act, 2006 should be indicated.	Not Applicable. 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	Not Applicable. 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 l0 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.	Not Applicable. 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-l 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 '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.	Not Applicable. Project area / Study area is not declared in ‘Critically Polluted’ Area and does not come under ‘Aravalli Range.
20	Similarly. for Coastal Projects, a CRZ map duly authenticated by one of the authorized agencies demarcating LTL. HTL, CRZ area, location of the mine lease 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).	Not Applicable. The project doesn't attract The C. R. Z. Notification, 2018.
21	R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker	Not Applicable. There are no approved habitations within a radius of 300 meters.

	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 socioeconomic aspects should be discussed in the Report.	Therefore, R&R Plan / Compensation details for the Project Affected People (PAP) is not anticipated and Not Applicable for this project.
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 ol sensitive receprors. There should be at least one monitoring station within 500 m of the mine lease in the predominant downwind direction. The mineralogical composition of PM_{10}, particularly for free silica. should be given.	Baseline Data were collected for One Season (Pre-Monsoon) March 2026 to May 2026 as per CPCB Notification and MoEF & CC Guidelines. Details in Chapter No. 3, Page no. 34.
23	Air quality modelling should be carried out lor prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of Vehicles for transportation of mineral. The details of the model used and input parameters used for modelling should be provided. The air quality contours may be shown on a location map clearly, indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.	Air Quality Modelling for prediction of incremental GLC's of pollutant was carried out using AERMOD view 9.6.1 Model. Details in Chapter No. 4.
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.	Total Water Requirement: 2.5KLD – P1 Total Water Requirement: 2.5KLD – P2 Discussed under Chapter 2,
25	Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project, should be provided.	Not Applicable. Water for dust suppression, greenbelt development and domestic use will be sourced from accumulated rainwater/seepage water in mine pits and purchased from local water vendors through water tankers on daily requirement basis. Drinking water will be sourced from the approved water vendors.
26	Description of water conservation measures proposed to be adopted in the Project should be given. Details of rain water harvesting proposed in the project, if any, should be provided.	Part of the working pit will be allowed to collect rain water during the spell of rain will be used for greenbelt development and dust suppression.

		The Mine Closure Plan is prepared for converting the excavated pit into rain water harvesting structure and serve as water reservoir for the project village during draught season.
27	Impact of the Project on the water quality, both surface and groundwater. should be assessed and necessary safeguard measures, if any required, should be provided.	Impact Studies and Mitigation Measures of Water Environment including Surface Water and Ground Water are discussed in Chapter 4.
28	Based on actual monitored data, it may clearly be shown whether working will intersect. Ground water. 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.	Not Applicable. The ground water table inferred 73 m below ground level. – P1 The ultimate depth of quarry is 23m bgl – P1 The ultimate depth of quarry is 22m bgl – P2 This proposal of 23m bgl will not intersect the ground water table, which is inferred from the hydro-geological studies carried out at the project site. Discussed under Chapter 3.
29	Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion proposed, if any, and the impact of the same on the hydrology should be brought out.	Not Applicable. There is no stream, seasonal or other water bodies passing within the project area. Therefore, no modification/ diversion of water bodies is anticipated.
30	Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and bgl. A schematic diagram may also be provided for the same.	Highest elevation of the project area is 243m (max) AMSL. The ultimate depth of quarry is 42m bgl. Water level of the area is 75 m BGL
31	A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution.	Greenbelt Development Plan is discussed under Chapter 4 & 7.
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.	Traffic density survey was carried out to analyse the impact of Transportation in the study area as per IRC guidelines 1961 and it is inferred that there is no significant impact due to the proposed transportation from the project area. Details in Chapter 2.

33	Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.	Infrastructure & other facilities will be provided to the Mine Workers after the grant of quarry lease and the same has been discussed in the 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	Discussed under Chapter 2, Mine Closure Plan is a part of Approved Mining Plan enclosed as Annexure Volume – 1.
35	Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.	Occupational Health Impacts of the project and preventive measures are detailed under Chapter 4.
36	Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.	No Public Health Implications anticipated due to this project. Details of CER and CSR are discussed under Chapter 8.
37	Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.	No Negative Impact on Socio Economic Environment on the Study Area is anticipated and this project shall benefit the Socio-Economic Environment by ways of employment for 22 people directly and 50 people indirectly. Details in Chapter 4.
38	Detailed Environmental Management Plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project.	Detailed Environment Management Plan for the project to mitigate the anticipated impacts described under Chapter 4 is discussed under Chapter 10.
39	Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the project.	The outcome of public hearing will be updated in the final EIA/AMP report
40	Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.	No litigation is pending in any court against this project.
41	The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.	Project Cost is Rs. 41.2 lakhs/- CER Cost is Rs.3,00,000/- The EMP budget detailed in chapter 10, table no. 10.9
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	Besides the above, the below mentioned general points are also to be followed: -	
a	Executive Summary of the EIA/EMP Report	Enclosed as separate booklet.
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 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	Baseline monitoring reports are enclosed with This report in Chapter 3. Original Baseline monitoring reports will be submitted in the final EIA report during appraisal.
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-IAII(I) Dated: 4th August, 2009, which are available on the website of this Ministry, should be followed.	Noted & agreed. Instructions issued by MoEF & CC O.M. No. J-11013/41/2006-IAII (I) Dated: 4th August, 2009 are 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-IAII(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. 2.3 – Page No. 15. Topography, Geological, Year-Wise Development Production Plan and Sections Plan - Figure No.2.10 – Page No. 26. Mine Closure Plan – Figure No.2.11 – Page No. 27.

TABLE OF CONTENTS

1.INTRODUCTION 1

1.0 PREAMBLE 1

1.1 PURPOSE OF THE REPORT 2

1.2 IDENTIFICATION OF PROJECT AND PROJECT PROPONENT 3

1.3 BRIEF DESCRIPTION OF THE PROJECT 4

1.4 ENVIRONMENTAL CLEARANCE 8

1.5 TERMS OF REFERENCE (ToR) 9

1.6 POST ENVIRONMENT CLEARANCE MONITORING 9

1.7 GENERIC STRUCTURE OF EIA DOCUMENT 9

1.8 THE SCOPE OF THE STUDY 9

2. PROJECT DESCRIPTION 11

2.0 GENERAL 11

2.1 DESCRIPTION OF THE PROJECT 11

2.2 LOCATION OF THE PROJECT 11

2.3 GEOLOGY 21

2.4 RESOURCES AND RESERVES 27

2.5 METHOD OF MINING 32

2.6 GENERAL FEATURES 33

2.7 PROJECT REQUIREMENT 35

2.8 EMPLOYMENT REQUIREMENT: 36

2.9 PROJECT IMPLEMENTATION SCHEDULE 36

3. DESCRIPTION OF ENVIRONMENT 37

3.0 GENERAL 37

3.1 LAND ENVIRONMENT 39

3.2 WATER ENVIRONMENT 49

3.3 AIR ENVIRONMENT 61

3.4 NOISE ENVIRONMENT 72

3.6 SOCIO ECONOMIC ENVIRONMENT 94

4. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES 106

4.0 GENERAL 106

4.1 LAND ENVIRONMENT: 106

4.2 WATER ENVIRONMENT 108

4.3 AIR ENVIRONMENT 108

4.4 NOISE ENVIRONMENT *115*
4.6 SOCIO ECONOMIC *123*
4.7 OCCUPATIONAL HEALTH AND SAFETY *123*
4.8 MINE WASTE MANAGEMENT *124*
4.9 MINE CLOSURE *124*
5. ANALYSIS OF ALTERNATIVES (TECHNOLOGY AND SITE) 127
5.0 INTRODUCTION *127*
5.1 FACTORS BEHIND THE SELECTION OF PROJECT SITE *127*
5.2 ANALYSIS OF ALTERNATIVE SITE *127*
5.3 FACTORS BEHIND SELECTION OF PROPOSED TECHNOLOGY *127*
5.4 ANALYSIS OF ALTERNATIVE TECHNOLOGY *128*
6. ENVIRONMENTAL MONITORING PROGRAMME 129
6.0 GENERAL *129*
6.1 METHODOLOGY OF MONITORING MECHANISM *129*
6.2 IMPLEMENTATION SCHEDULE OF MITIGATION MEASURES *130*
6.3 MONITORING SCHEDULE AND FREQUENCY *131*
6.4 BUDGETARY PROVISION FOR EMP *131*
6.5 REPORTING SCHEDULES OF MONITORED DATA *132*
7. ADDITIONAL STUDIES 133
7.0 GENERAL *133*
7.1. PUBLIC CONSULTATION *133*
7.2 RISK ASSESSMENT *133*
7.3 DISASTER MANAGEMENT PLAN *135*
7.4 CUMULATIVE IMPACT STUDY *137*
7.5 PLASTIC WASTE MANAGEMENT PLAN *151*
7.6 CLUSTER MANAGEMENT COMMITTEE *151*
8.PROJECT BENEFITS 158
8.0 GENERAL *158*
8.1 EMPLOYMENT POTENTIAL *158*
8.2 SOCIO-ECONOMIC WELFARE MEASURES PROPOSED *158*
8.3 IMPROVEMENT IN PHYSICAL INFRASTRUCTURE *158*
8.4 IMPROVEMENT IN SOCIAL INFRASTRUCTURE *158*
8.5 OTHER TANGIBLE BENEFITS *159*
9. ENVIRONMENTAL COST BENEFIT ANALYSIS 160

10.ENVIRONMENTAL MANAGEMENT PLAN – M/S. CONCRETIA ROCK PRODUCTS PRIVATE LIMITED .. **Error! Bookmark not defined.**

10.0. GENERAL ..... ***Error! Bookmark not defined.***

10.1. ENVIRONMENTAL POLICY ..... ***Error! Bookmark not defined.***

10.2. LAND ENVIRONMENT MANAGEMENT – ..... ***Error! Bookmark not defined.***

1.3. SOIL MANAGEMENT ..... ***Error! Bookmark not defined.***

10.4. WATER MANAGEMENT ..... ***Error! Bookmark not defined.***

10.5. AIR QUALITY MANAGEMENT ..... ***Error! Bookmark not defined.***

10.6. NOISE POLLUTION CONTROL ..... ***Error! Bookmark not defined.***

10.7. GROUND VIBRATION AND FLY ROCK CONTROL ..... ***Error! Bookmark not defined.***

10.8. BIOLOGICAL ENVIRONMENT MANAGEMENT ..... ***Error! Bookmark not defined.***

10.9. OCCUPATIONAL SAFETY & HEALTH MANAGEMENT ..... ***Error! Bookmark not defined.***

10.10 CONCLUSION – ..... ***Error! Bookmark not defined.***

10.ENVIRONMENTAL MANAGEMENT PLAN – M/S. CONCRETIA ROCK PRODUCTS PRIVATE LIMITED 161

10.0. GENERAL *161*

10.1. ENVIRONMENTAL POLICY *161*

10.2. LAND ENVIRONMENT MANAGEMENT – *162*

SOIL MANAGEMENT *163*

10.4. WATER MANAGEMENT *163*

10.5. AIR QUALITY MANAGEMENT *164*

10.6. NOISE POLLUTION CONTROL *164*

10.7. GROUND VIBRATION AND FLY ROCK CONTROL *165*

10.8. BIOLOGICAL ENVIRONMENT MANAGEMENT *165*

10.9. OCCUPATIONAL SAFETY & HEALTH MANAGEMENT *167*

10.10 CONCLUSION – *172*

11. SUMMARY AND CONCLUSION 173

12. DISCLOSURE OF CONSULTANT 174

LIST OF TABLES

TABLE 1.1: DETAILS OF PROJECT PROPONENT 3

TABLE 1.2: SALIENT FEATURES OF THE PROPOSED PROJECT – P1 3

TABLE 1.2A: SALIENT FEATURES OF THE PROPOSED PROJECT – P2 ..... **Error! Bookmark not defined.**

TABLE 1.3: ENVIRONMENT ATTRIBUTES 9

TABLE 2.1: SITE CONNECTIVITY 11

TABLE 2.2: CO-ORDINATES– PROJECT BOUNDARY 12

TABLE 2.3: LAND USE PATTERN 21

TABLE 2.4: PRODUCTION DETAILS 21

TABLE 2.5: RANGE OF AQUIFER PARAMETERS 24

TABLE 2.6: RESOURCES AND RESERVES – P1 ..... **Error! Bookmark not defined.**

TABLE 2.7: YEAR-WISE PRODUCTION PLAN – P1 ..... **Error! Bookmark not defined.**

TABLE 2.7A: RESOURCES AND RESERVES – P2 27

TABLE 2.7B: YEAR-WISE PRODUCTION PLAN – P2 27

TABLE 2.8: ULTIMATE PIT DIMENSION – P1 ..... **Error! Bookmark not defined.**

TABLE 2.8A: ULTIMATE PIT DIMENSION – P2 30

TABLE 2.9: PROPOSED MACHINERY DEPLOYMENT 33

TABLE.2.10: TRAFFIC SURVEY LOCATIONS 33

TABLE 2.11: EXISTING TRAFFIC VOLUME 34

TABLE 2.12: ROUGH STONE & GRAVEL HOURLY TRANSPORTATION REQUIREMENT 34

TABLE 2.13: SUMMARY OF TRAFFIC VOLUME 34

TABLE 2.14: WATER REQUIREMENT FOR THE PROJECT 35

TABLE 2.15: PROPOSED MANPOWER DEPLOYMENT 36

TABLE 2.16: EXPECTED TIME SCHEDULE 36

TABLE 3.1: MONITORING ATTRIBUTES AND FREQUENCY OF MONITORING 38

TABLE 3.2: LAND USE / LAND COVER TABLE 10 Km RADIUS 39

TABLE 3.3: DETAILS OF ENVIRONMENT SENSITIVITY AROUND THE CLUSTER 43

TABLE 3.4: NEARBY WATER BODIES FROM THE PROPOSED PROJECT SITE 44

TABLE 3.5: SOIL SAMPLING LOCATIONS 44

TABLE 3.6: METHODOLOGY OF SAMPLING COLLECTION 45

TABLE 3.7: SOIL QUALITY OF THE STUDY AREA 47

TABLE 3.8: WATER SAMPLING LOCATIONS 49
TABLE 3.9: SURFACE WATER SAMPLING RESULTS 51
TABLE 3.10: GROUND WATER SAMPLING RESULTS 53
TABLE 3.11: PRE-MONSOON SEASON WATER LEVEL OF OPEN WELLS 1 KM RADIUS 56
TABLE 3.12: PRE-MONSOON SEASON WATER LEVEL OF BOREWELLS 1 KM RADIUS 57
TABLE 3.13: RAINFALL DATA 62
TABLE 3.14: METEOROLOGICAL DATA RECORDED AT SITE 62
TABLE 3.15: METHODOLOGY AND INSTRUMENT USED FOR AAQ ANALYSIS 64
TABLE 3.16: NATIONAL AMBIENT AIR QUALITY STANDARDS 64
TABLE 3.17: AMBIENT AIR QUALITY (AAQ) MONITORING LOCATIONS 65
TABLE 3.18: SUMMARY OF AAQ 1 to AAQ 7 67
TABLE 3.19: ABSTRACT OF AMBIENT AIR QUALITY DATA 67
TABLE 3.20: AVERAGE FUGITIVE DUST SAMPLE VALUES 70
TABLE 3.21: FUGITIVE DUST SAMPLE VALUES IN $\mu g/m^3$ 71
TABLE 3.22: DETAILS OF SURFACE NOISE MONITORING LOCATIONS 72
TABLE 3.23: AMBIENT NOISE QUALITY RESULT 74
TABLE 3.24: KATCHIAKATTI VILLAGE POPULATION FACTS 95
TABLE 3.25: POPULATION DATA OF STUDY AREA 96
TABLE 3.26: WORKERS PROFILE OF STUDY AREA 97
TABLE 3.27: COMMUNICATION & TRANSPORT FACILITIES IN THE STUDY AREA 98
TABLE 3.28: WATER & DRAINAGE FACILITIES IN THE STUDY AREA 99
TABLE 3.29: OTHER FACILITIES IN THE STUDY AREA 100
TABLE 3.30: EDUCATIONAL FACILITIES IN THE STUDY AREA 101
TABLE 3.31: MEDICAL FACILITIES IN THE STUDY AREA 102
TABLE 4.1: ESTIMATED EMISSION RATE 110
TABLE 4.2: INCREMENTAL & RESULTANT GLC OF PM_{10} 112
TABLE 4.3: INCREMENTAL & RESULTANT GLC OF $PM_{2.5}$ 112
TABLE 4.4: INCREMENTAL & RESULTANT GLC OF SO2 112
TABLE 4.5: INCREMENTAL & RESULTANT GLC OF NOX 113
TABLE 4.6: INCREMENTAL & RESULTANT GLC OF FUGITIVE 113
TABLE 4.7: ACTIVITY AND NOISE LEVEL PRODUCED BY MACHINERY 115

TABLE 4.8: PREDICTED NOISE INCREMENTAL VALUES....116

TABLE 4.9: PREDICTED PPV VALUES DUE TO BLASTING ....**Error! Bookmark not defined.**

TABLE 4.9A: PREDICTED PPV VALUES DUE TO BLASTING 117

TABLE 6.1 IMPLEMENTATION SCHEDULE 130

TABLE 6.2: PROPOSED MONITORING SCHEDULE POST EC....131

TABLE 6.3 ENVIRONMENT MONITORING PROGRAM BUDGET....132

TABLE 7.1 RISK ASSESSMENT & CONTROL MEASURES....133

TABLE 7.2: PROPOSED TEAMS TO DEAL WITH EMERGENCY SITUATION 135

TABLE 7.3: PROPOSED FIRE EXTINGUISHERS AT DIFFERENT LOCATIONS....137

TABLE 7.4: LIST OF QUARRIES WITHIN 500 METER RADIUS 138

TABLE 7.5: SALIENT FEATURES OF PROPOSAL “P1” 140

TABLE 7.6: SALIENT FEATURES OF PROPOSAL “P2” 141

TABLE 7.6: SALIENT FEATURES OF PROPOSAL “E1” 142

TABLE 7.7: SALIENT FEATURES OF PROPOSAL “E2” 143

TABLE 7.7: SALIENT FEATURES OF PROPOSAL “E3” 143

TABLE 7.8: SALIENT FEATURES OF PROPOSAL “E5” 144

TABLE 7.8: CUMULATIVE PRODUCTION LOAD OF ROUGH STONE 145

TABLE 7.9: CUMULATIVE PRODUCTION LOAD OF GRAVEL/ TOPSOIL....146

TABLE 7.10: CUMULATIVE PRODUCTION LOAD OF WEATHERED ROCK....146

TABLE 7.11: EMISSION ESTIMATION FROM QUARRIES WITHIN 500 METER RADIUS 146

TABLE 7.12: INCREMENTAL & RESULTANT GLC WITHIN CLUSTER 147

TABLE 7.13: PREDICTED NOISE INCREMENTAL VALUES FROM CLUSTER....148

TABLE 7.14: NEAREST HABITATION FROM EACH MINES 149

TABLE 7.15: GROUND VIBRATIONS AT EACH MINES....149

TABLE 7.16: SOCIO ECONOMIC BENEFITS FROM EACH MINES 150

TABLE 7.17: EMPLOYMENT BENEFITS FROM EACH MINES....150

TABLE 7.18: GREENBELT DEVELOPMENT BENEFITS FROM EACH MINES....150

TABLE 7.19: ACTION PLAN TO MANAGE PLASTIC WASTE 151

TABLE 8.1 CER – ACTION PLAN 159

TABLE 10.1. PROPOSED CONTROLS FOR LAND ENVIRONMENT ....**Error! Bookmark not defined.**

TABLE 10.2. PROPOSED CONTROLS FOR SOIL MANAGEMENT....**Error! Bookmark not defined.**

TABLE 10.3. PROPOSED CONTROLS FOR WATER ENVIRONMENT .....**Error! Bookmark not defined.**

TABLE 10.4. PROPOSED CONTROLS FOR AIR ENVIRONMENT .....**Error! Bookmark not defined.**

TABLE 10.5. PROPOSED CONTROLS FOR NOISE ENVIRONMENT.....**Error! Bookmark not defined.**

TABLE 10.6. PROPOSED CONTROLS FOR GROUND VIBRATIONS & FLY ROCK**Error! Bookmark not defined.**

TABLE 10.7. RECOMMENDED SPECIES FOR THE PLANTATION .....**Error! Bookmark not defined.**

TABLE 10.8. MEDICAL EXAMINATION SCHEDULE .....**Error! Bookmark not defined.**

TABLE 10.9: EMP BUDGET FOR PROPOSED PROJECT .....**Error! Bookmark not defined.**

TABLE 10.1. PROPOSED CONTROLS FOR LAND ENVIRONMENT 162

TABLE 10.2. PROPOSED CONTROLS FOR SOIL MANAGEMENT.....163

TABLE 10.3. PROPOSED CONTROLS FOR WATER ENVIRONMENT 163

TABLE 10.4. PROPOSED CONTROLS FOR AIR ENVIRONMENT 164

TABLE 10.5. PROPOSED CONTROLS FOR NOISE ENVIRONMENT.....164

TABLE 10.6. PROPOSED CONTROLS FOR GROUND VIBRATIONS & FLY ROCK.....165

TABLE 10.7. RECOMMENDED SPECIES FOR THE PLANTATION 167

TABLE 10.8. MEDICAL EXAMINATION SCHEDULE 168

TABLE 10.9: EMP BUDGET FOR PROPOSED PROJECT 170

LIST OF FIGURES

FIGURE 1.1: SATELLITE IMAGERY CLUSTER QUARRIES 3

FIGURE 1.2: LOCATION MAP OF THE PROJECT SITE 5

FIGURE 1.3: TOPOSHEET MAP OF THE STUDY AREA 10 KM RADIUS 6

FIGURE 1.4: TOPOSHEET MAP OF THE STUDY AREA 2KM RADIUS 7

FIGURE 2.1: TOPOGRAPHICAL VIEW OF PROJECT AREA – P1 12

FIGURE 2.1-A: FENCING, GARLAND DRAIN AND GREEN BELT PHOTOGRAPHS – P1**Error! Bookmark not defined.**

FIGURE 2.1-B: FENCING, GARLAND DRAIN AND GREEN BELT PHOTOGRAPHS – P2 13

FIGURE 2.2: GOOGLE IMAGE OF THE PROJECT AREA – P1 15

FIGURE 2.2A: GOOGLE IMAGE OF THE PROJECT AREA – P2 .....**Error! Bookmark not defined.**

FIGURE 2.3: QUARRY LEASE PLAN / SURFACE PLAN – P1 16

FIGURE 2.3A: QUARRY LEASE PLAN / SURFACE PLAN – P2 .....**Error! Bookmark not defined.**

FIGURE 2.4: VILLAGE MAP SUPERIMPOSED ON GOOGLE EARTH IMAGE 17

FIGURE 2.5: IMAGE SHOWING SURFACE FEATURES AROUND 10 KM RADIUS 18

FIGURE 2.6: IMAGE SHOWING SURFACE FEATURES AROUND 5 KM RADIUS 19

FIGURE 2.7: IMAGE SHOWING SURFACE FEATURES AROUND 1 KM RADIUS 20

FIGURE 2.8: REGIONAL GEOLOGY MAP 25

FIGURE 2.9: GEOMORPHOLOGY MAP 26

FIGURE 2.10: TOPOGRAPHY, GEOLOGICAL, YEAR-WISE DEVELOPMENT PRODUCTION PLAN AND SECTIONS – P1 28

FIGURE 2.10A: TOPOGRAPHY, GEOLOGICAL, YEAR-WISE DEVELOPMENT PRODUCTION PLAN AND SECTIONS – P2 .....**Error! Bookmark not defined.**

FIGURE 2.11: CLOSURE PLAN AND SECTIONS – P1 30

FIGURE 2.11A: CLOSURE PLAN AND SECTIONS – P2.....**Error! Bookmark not defined.**

FIGURE.2.12: MINERAL TRANSPORTATION ROUTE MAP 34

FIGURE 3.1: LAND USE LAND COVER MAP 2KM AND 10KM RADIUS 40

FIGURE 3.2: PHYSIOGRAPHIC MAP 10KM RADIUS 41

FIGURE 3.3: PIE DIAGRAM OF LAND USE AND LAND COVER - 10KM RADIUS IN AREA_% 42

FIGURE 3.4: SOIL SAMPLING LOCATIONS AROUND 10 KM RADIUS 45

FIGURE 3.5: SOIL MAP 46

FIGURE 3.6: WATER SAMPLING LOCATIONS AROUND 10 KM RADIUS 50

FIGURE 3.7: OPEN WELL CONTOUR MAP MARCH TO MAY 2026 56

FIGURE 3.8: BOREWELL CONTOUR MARCH TO MAY 2026 57

FIGURE 3.9: DRAINAGE MAP AROUND 10 KM RADIUS FROM PROJECT SITE 58

FIGURE 3.10: GROUND WATER PROSPECT MAP 59

FIGURE 3.11: WINDROSE DIAGRAM 63

FIGURE 3.12: AMBIENT AIR QUALITY LOCATIONS AROUND 10 KM RADIUS 66

FIGURE 3.13: BAR DIAGRAM OF SUMMARY OF AAQ 1 – AAQ7 68

FIGURE 3.14: BAR DIAGRAM OF PARTICULATE MATTER $PM_{2.5}$ 68

FIGURE 3.15: BAR DIAGRAM OF PARTICULATE MATTER PM_{10} 69

FIGURE 3.16: BAR DIAGRAM OF GASEOUS POLLUTANT SO_2 69

FIGURE 3.17: BAR DIAGRAM OF GASEOUS POLLUTANT NO_x 70

FIGURE 3.18: LINE DIAGRAM OF AVERAGE SPM VALUES 71

FIGURE 3.19: BAR DIAGRAM OF SPM VALUES 71

FIGURE 3.20: NOISE MONITORING STATIONS AROUND 10 KM RADIUS 73

FIGURE 3.21: DAY TIME NOISE LEVELS IN CORE AND BUFFER ZONE 74

FIGURE 3.22: NIGHT TIME NOISE LEVELS IN CORE AND BUFFER ZONE 75

FIGURE 4.1: AERMOD TERRAIN MAP 110

FIGURE 4.2: PREDICTED INCREMENTAL CONCENTRATION OF PM_{10} 111

FIGURE 4.3: PREDICTED INCREMENTAL CONCENTRATION OF PM_{25} 111

FIGURE 4.4: PREDICTED INCREMENTAL CONCENTRATION OF NO_X 111

FIGURE 4.5: PREDICTED INCREMENTAL CONCENTRATION OF SO2 111

FIGURE 4.5A: PREDICTED INCREMENTAL CONCENTRATION OF FUGITIVE 112

FIGURE 4.6: GROUND VIBRATION PREDICTION ..... **Error! Bookmark not defined.**

FIGURE 4.6A: GROUND VIBRATION PREDICTION 117

FIGURE 6.1: PROPOSED ENVIRONMENTAL MONITORING CELL 130

FIGURE 7.1: DISASTER MANAGEMENT TEAM LAYOUT 135

FIGURE 10.1: PERSONAL PROTECTIVE EQUIPMENT TO THE MINE WORKERS **Error! Bookmark not defined.**

FIGURE 10.1: PERSONAL PROTECTIVE EQUIPMENT TO THE MINE WORKERS 169

1.INTRODUCTION

1.0 PREAMBLE

Project - 1

The project proponent M/s.Concretia Rock Product Private Limited applied for Rough stone and Gravel quarry over an extent of 2.29.5 Ha in S.F.Nos. 1174/2, 3, 4B, 5B, 1192/1, 2, 1193/6A & 6B of Katchaikatti Village, Vadipatti Taluk, Madurai District, Tamil Nadu State.

- Proponent applied for Rough stone and Gravel quarry lease on 20.02.2023
- Precise area communication letter was issued by the District Collector vide letter no. 84/Kanimam/2023 Dated: 14.03.2024
- The Mining plan has been prepared by the Qualified person and got approved by the Deputy Director vide letter no. 84/Mines/2023 Dated: 12.06.2024
- The mining plan has been approved for the quantity of 1,30,000m^3 of Rough stone, 9,750m^3 of Weathered Rock and 20,278m^3 of Gravel up to a depth of 23m bgl for the period of Five years.
- Proponent applied for ToR for Environmental Clearance vide online Proposal No. SIA/TN/MIN/505308/2024, Dated: 09.11.2024.
- The proposal was placed in 516th SEAC meeting held on 06.12.2024 and the committee recommended for issue of ToR.
- The proposal was considered in 979th SEIAA meeting held on 12.03.2026 and issued ToR vide File.No.11446 TOR Identification No. TO24B0108TN5947752N Dated: 20.03.2026

As per the EIA Notification, 2006 and subsequent amendments and OM The proposal falls in the B1 Category (Cluster quarries - 3 proposal and 5 Existing quarries forming Cluster Category {Total Extent of the Cluster is 17.36.5Ha}- Cluster area calculated as per MoEF& CC Notification S.O. 2269(E) Dated 1st July 2016).

- Proponent applied for Terms of Reference vide Proposal No. SIA/TN/MIN/505308/2024, Dated: 09.11.2024 and the ToR was Granted vide File No: 11446 ToR Identification No: TO24B0108TN5947752N Dated: 20.03.2026.

Project – 2

The project proponent Thiru.K. Manikandan applied for Rough stone and Gravel quarry over an extent of 1.99.0 Ha in S.F.Nos. 1196/1A, 1196/3, 1196/4 & 1196/5A of Katchaikatti Village, Vadipatti Taluk, Madurai District, Tamil Nadu State.

- Proponent applied for Rough stone and Gravel quarry lease on 19.11.2024
- Precise area communication letter was issued by the District Collector vide letter no. 1437/Kanimam/2024 Dated: 29.10.2025
- The Mining plan has been prepared by the Qualified person and got approved by the Deputy Director vide letter no. 1437/Mines/2025-I Dated: 02.12.2025
- The mining plan has been approved for the quantity of 1,99,485 m^3 of Rough stone, and 28,926 m^3 of Gravel up to a depth of 22m bgl for the period of Five years.
- Proponent applied for ToR for Environmental Clearance vide online Proposal No. SIA/TN/MIN/561936/2025, Dated: 19.12.2025.
- The proposal was placed in 668th SEAC meeting held on 22.01.2026 and the committee recommended for issue of ToR.
- The proposal was considered in 956th SEIAA meeting held on 04.02.2026 and issued ToR vide File.No.13178 TOR Identification No. TO24B0108TN5609012N Dated: 10.02.2026

As per the EIA Notification, 2006 and subsequent amendments and OM The proposal falls in the B1 Category (Cluster quarries - 3 proposal and 5 Exiting quarries forming Cluster Category {Total Extent of the Cluster is 17.36.5 Ha}- Cluster area calculated as per MoEF& CC Notification S.O. 2269(E) Dated 1st July 2016).

- Proponent applied for Terms of Reference vide Proposal No. SIA/TN/MIN/505308/2024, Dated: 09.11.2024 and the ToR was Granted vide File No: 11446 ToR Identification No: TO24B0108TN5947752N Dated: 20.03.2026.

Based on the ToR Baseline Monitoring study has been carried out for one season i.e., **March to May 2026** and this EIA/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

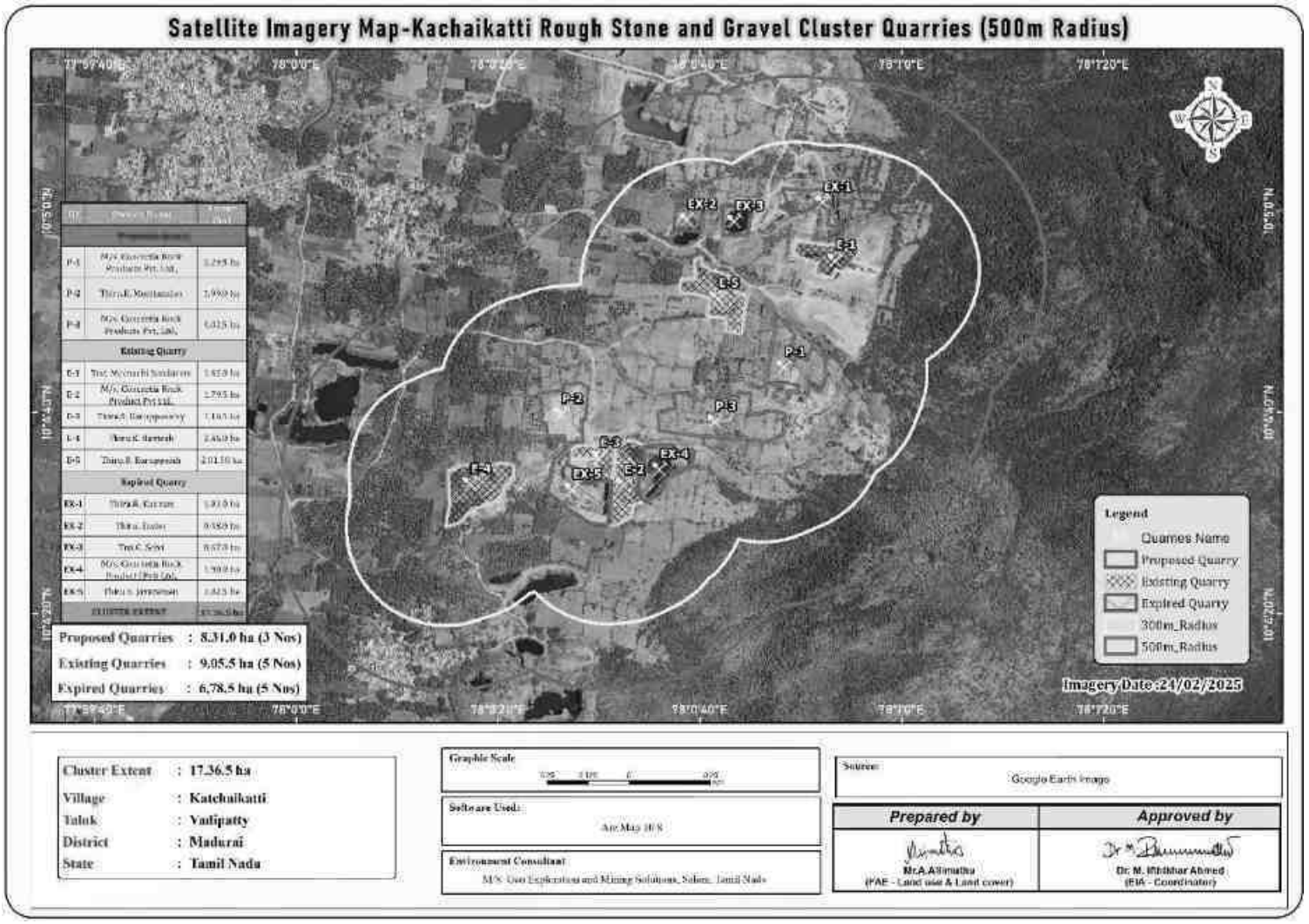
The Ministry of Environment and Forests, Govt. of India, through its EIA notification S.O. 1533(E) of 14th September 2006 and its subsequent amendments as per Gazette Notification S.O. 1886 of 20thApril 2022, Mining Projects are classified under two categories i.e. A (>250 Ha) and B (≤ 250 Ha), and Schematic 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 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"

FIGURE 1.1: SATELLITE IMAGERY CLUSTER QUARRIES



1.2 IDENTIFICATION OF PROJECT AND PROJECT PROPONENT

1.2.1 Identification of Project Proponent

TABLE 1.1: DETAILS OF PROJECT PROPONENT

P1	
Name of the Project Proponent	Thiru.K. Manikandan
Address	**S/o.Kannan,** **47/40 Indra Nagar,** **Alavandan, Gandhi Nagar,** **Madurai North, Madurai – 625 020**
Status	Individual

1.2.2 Identification of Project

TABLE 1.2: SALIENT FEATURES OF THE PROPOSED PROJECT – P1

Name of the Project	Thiru.K. Manikandan Rough stone and Gravel quarry	
S.F. No.	1196/1A, 1196/3, 1196/4 & 1196/5A	
Extent	1.99.0 Ha	
Village Taluk and District	Katchaikatti Village, Vadipatti Taluk, Madurai District	
Land Type	It is a Patta land – registered in the name of Thiru.C. Ramachandiran, & Thiru.C.R. Manikandan vide Patta no 2025 & 7802 and the consent has been obtained from the respective pattadhars vide Doc.2489/2020	
Toposheet No	58 – J/04	
Latitude between	10°04'36.55"N to 10°04'42.92‘’N	
Longitude between	78°00'24.09"E to 78°00’28.15"E	
Elevation of the area	243m AMSL	
Revised Scheme of Mining Plan period	5 Years	
Proposed Depth of Mining	22m bgl	
	Rough Stone in m^3	**Gravel in m^3**
Geological Resources	8,59,440	42,972
Mineable Reserves	2,85,180	28,926
Year wise Production	1,99,485	28,926
Peak Production	40,280	12,534
Ultimate Pit Dimension	X1Y1-AB-117m (L) X 59m (W) X 42m (D) X2Y2-AB-126m (L) X 60m (W) X 42m (D)	
Water Level in the region	75m bgl	
Method of Mining	Opencast Mechanized Mining Method is being carried out with 5.0-meter vertical bench with a bench width is not less than the bench height	
Topography	The lease applied area is almost plain topography. The area has gentle sloping towards South-western side and altitude of the area is 220m (max) above Mean Sea level. The area is covered by 2m thickness of Gravel and 2m thickness of weathered rock. Massive Charnockite is found after 4m (Gravel + Weathered Rock) which is clearly inferred from the existing quarry pit.	
Machinery proposed	Jack Hammer	1 Nos
	Compressor	2 No

	Excavator with Bucket and Rock Breaker	2 Nos
	Tippers	3 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	17 Nos	
Project Cost	Rs. 78,29,000/-	
CER Cost	Rs. 3,00,000/-	
Nearby Water Bodies	Odai	50m Safety-South
	Odai	110m NE
	Mullaiperiyar Channel	2.3km SW
	Sathaiyar River	7.7km NE
	Sathaiyar Dam	8.6km NE
	Vaigai River	8km SW
Greenbelt Development Plan	Proposed to plant 1000 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	2.5 KLD	
Nearest Habitation	450m – North West	
Nearest Reserve Forest	Waguthumalai RF – 660m – SouthEast	
Nearest Wild Life Sanctuary	Kodaikanal Wildlife Sanctuary – 36.2km – North West	

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.

1.3.2 Location of the Project

- The project sites located in Katchaikatti Village, Vadipatti Taluk, Madurai District, Tamil Nadu State.
- The lease applied area is located about 21km Northwest side of Madurai town, 5.0km East side of Vadipatti town and 1.7 km Southeast side of Katchaikatti Village.

	25.0km		3.7km		1.7km	
Madurai	⟶	Vadipatti	⟶	Katchaikatti	⟶	Lease applied area
	NW		East		SE	

FIGURE 1.2: LOCATION MAP OF THE PROJECT SITE

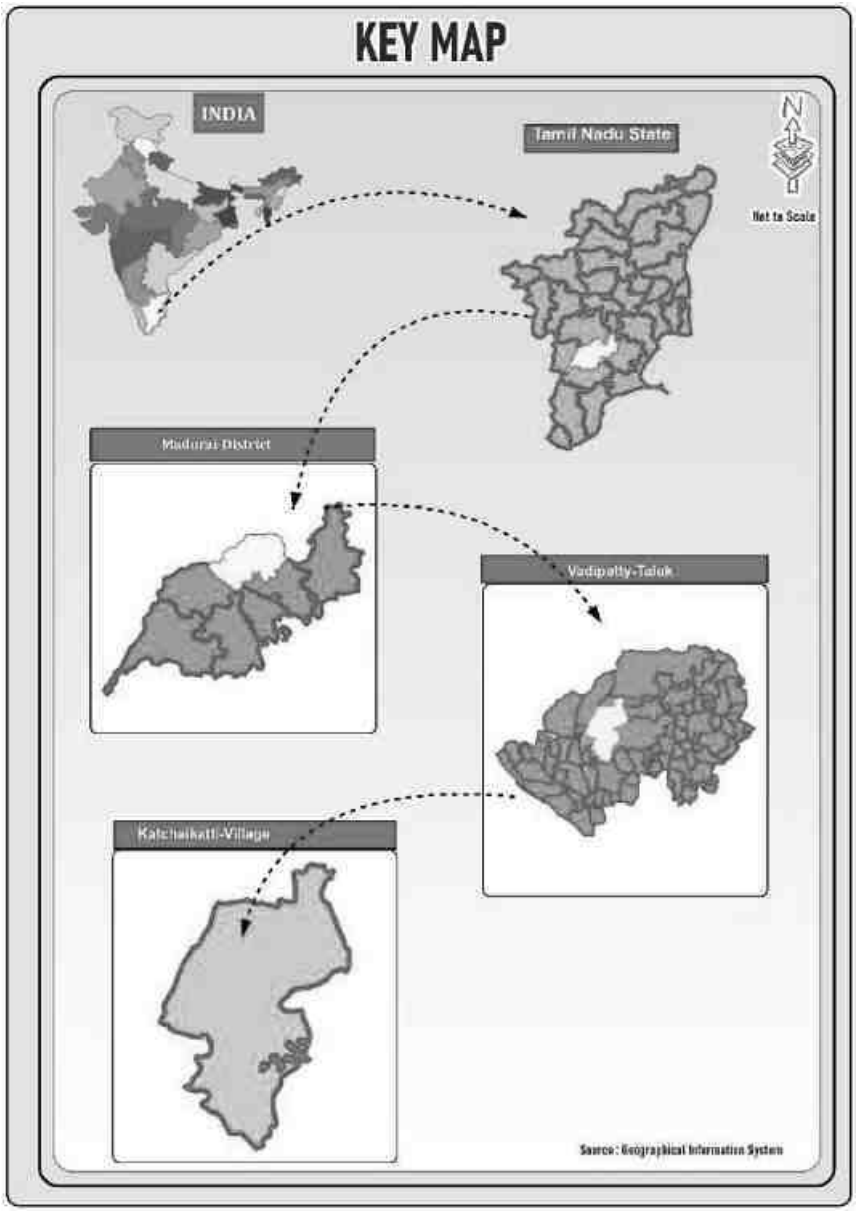


FIGURE 1.3: TOPOSHEET MAP OF THE STUDY AREA 10 KM RADIUS

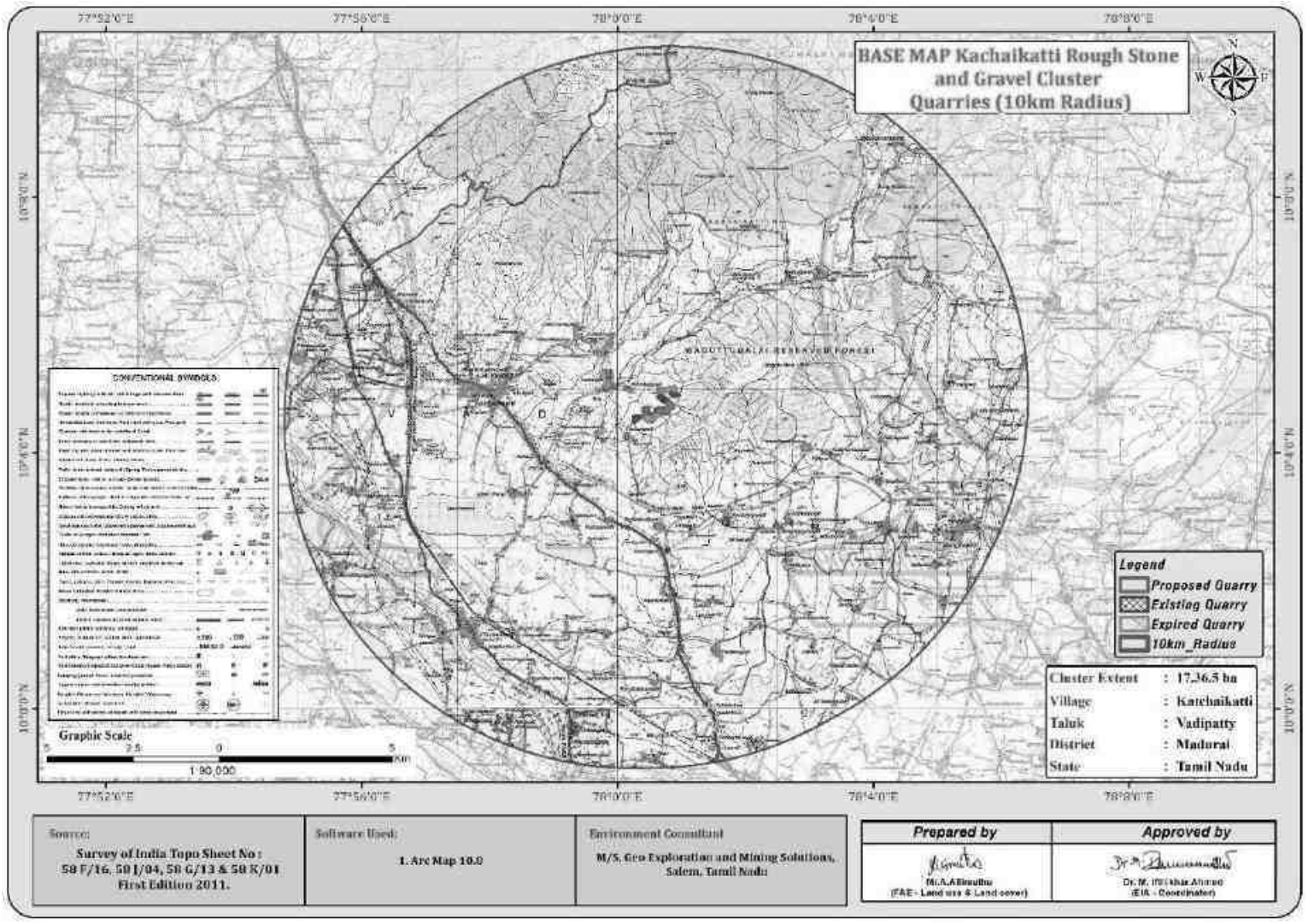
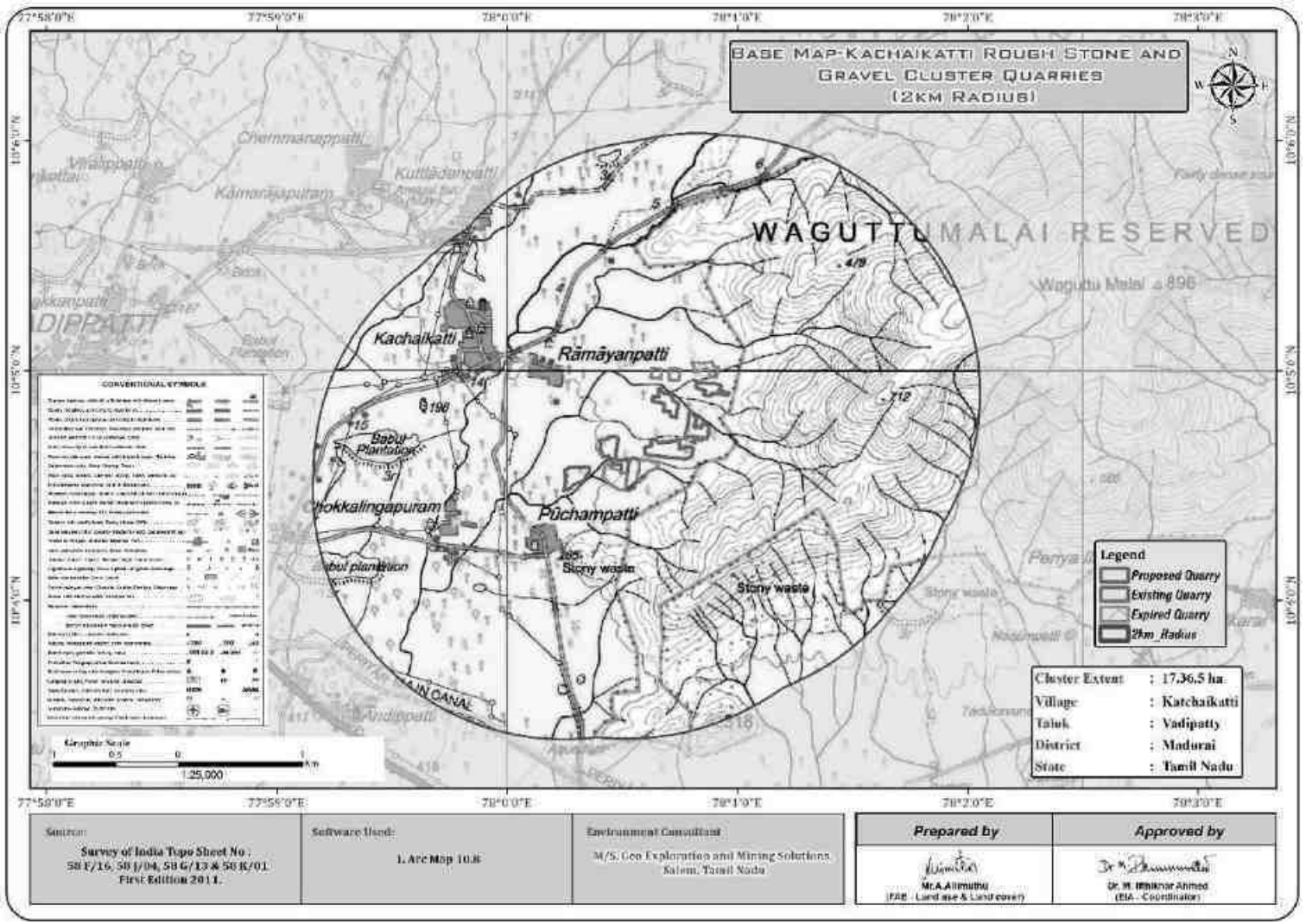


FIGURE 1.4: TOPOSHEET MAP OF THE STUDY AREA 2KM RADIUS



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 – P1

- Proponent applied for Rough stone and Gravel quarry lease on 19.11.2024
- Precise area communication letter was issued by the District Collector vide letter no. 1437/Kanimam/2024 Dated: 29.10.2025
- The Mining plan has been prepared by the Qualified person and got approved by the Deputy Director vide letter no. 1437/Mines/2025-1 Dated: 02.12.2025
- The mining plan has been approved for the quantity of 1,99,485 m^3 of Rough stone, and 28,926 m^3 of Gravel up to a depth of 22m bgl for the period of Five years.
- 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

SCOPING: - P1

- Proponent applied for Terms of Reference vide Proposal No. SIA/TN/MIN/561936/2025, Dated: 19.12.2025
- The proposal was placed in 668th SEAC meeting held on 22.01.2026 and the committee recommended for issue of ToR.
- The proposal was considered in 956th SEIAA meeting held on 04.02.2026 and issued ToR vide File No: 13178 ToR Identification No: TO24B0108TN5609012N Dated: 10.02.2026

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 File No: 13178 ToR Identification No: TO25B0108TN5609012N Dated: 10.02.2026

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 1st June and 1st 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 Pre monsoon season (March – May 2026) 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_{10}, PM $_{2.5}$, SO_2, NO_2	Continuous 24-hourly samples twice a week for three months at 7 locations (2 Core & 5 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 asper 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.
- Environment Protection Act,1986
- EIA notification, 2006
- ToR vide File No: 13178 ToR Identification No: TO24B0108TN5609012N Dated: 10.02.2026 – P1

****

2. PROJECT DESCRIPTION

2.0 GENERAL

The Proposed Rough Stone and Gravel Quarry requires Environmental Clearance. There are 3 proposed, and 5 existing quaries forming a cluster; calculated as per MoEF& CC Notification S.O. 2269(E) Dated 1st July 2016 and the total extent of cluster is 17.36.5 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

- The project sites located in Katchaikatti Village, Vadipatti Taluk, Madurai District, Tamil Nadu State.
- The lease applied area is located about 21km Northwest side of Madurai town, 5.0km East side of Vadipatti town and 1.7 km Southeast side of Katchaikatti Village.

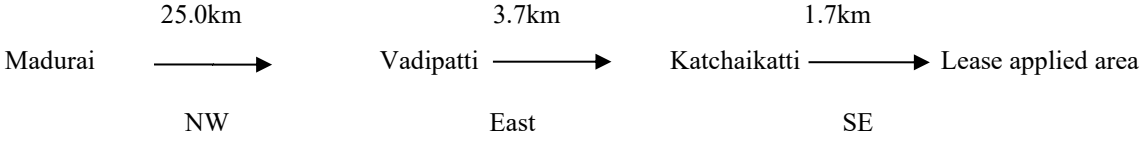


TABLE 2.1: SITE CONNECTIVITY

Nearest Roadway	National Highway – (NH-44) Madurai – Tirunelveli – 3.5km – SW State Highway – (SH-73) Tirumangalam – Silukkuvarpatti – 7.9km – South West
Nearest Village	Ramayanpatti - 970m – North West
Nearest Town	Vadipatti– 5.0km – West
Nearest Railway Station	Vadipatti Railway Station – 7.4km – West
Nearest Airport	Madurai Airport – 28km – SE
Seaport	Thoothukudi Seaport – 147 km – South East

Source: Survey of India Toposheet

TABLE 2.2: CO-ORDINATES– PROJECT BOUNDARY

P1		
Corner Nos.	**Latitude**	**Longitude**
1	10°04'41.93"N	78°00'24.06"E
2	10°04'42.04"N	78°00'25.36"E
3	10°04'42.23"N	78°00'26.49"E
4	10°04'42.76"N	78°00'26.45"E
5	10°04'42.82"N	78°00'27.52"E
6	10°04'42.92"N	78°00'28.15"E
7	10°04'42.43"N	78°00'28.93"E
8	10°04'39.34"N	78°00'28.64"E
9	10°04'39.33"N	78°00'28.25"E
10	10°04'37.97"N	78°00'28.28"E
11	10°04'37.97"N	78°00'28.35"E
12	10°04'36.89"N	78°00'28.36"E
13	10°04'36.88"N	78°00'27.07"E
14	10°04'36.55"N	78°00'26.62"E
15	10°04'37.68"N	78°00'26.54"E
16	10°04'37.59"N	78°00'26.54"E
17	10°04'38.96"N	78°00'24.77"E
18	10°04'39.03"N	78°00'24.35"E
19	10°04'39.45"N	78°00'24.09"E
20	10°04'39.61"N	78°00'24.33"E
21	10°04'40.61"N	78°00'24.36"E

Source: Approved Mining Plan

FIGURE 2.1: TOPOGRAPHICAL VIEW OF PROJECT AREA – P1



FIGURE 2.1-B: FENCING, GARLAND DRAIN AND GREEN BELT PHOTOGRAPHS – P1

















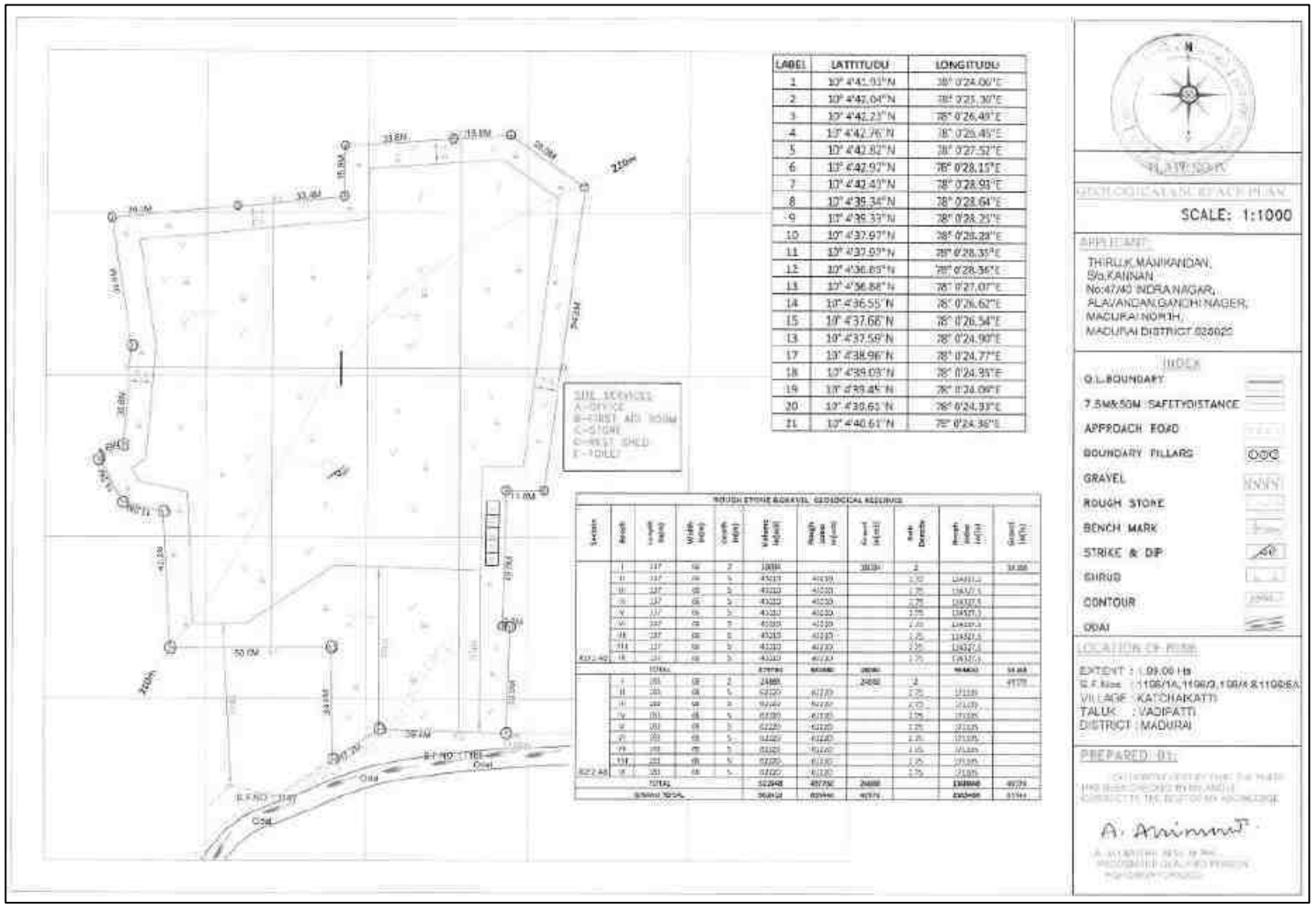


FIGURE 2.2: GOOGLE IMAGE OF THE PROJECT AREA – P1



LABEL	LATTITUDU	LONGITUDU
1	10° 4'41.93"N	78° 0'24.06"E
2	10° 4'42.04"N	78° 0'25.36"E
3	10° 4'42.23"N	78° 0'26.49"E
4	10° 4'42.76"N	78° 0'26.45"E
5	10° 4'42.82"N	78° 0'27.52"E
6	10° 4'42.92"N	78° 0'28.15"E
7	10° 4'42.43"N	78° 0'28.93"E
8	10° 4'39.34"N	78° 0'28.64"E
9	10° 4'39.33"N	78° 0'28.25"E
10	10° 4'37.97"N	78° 0'28.28"E
11	10° 4'37.97"N	78° 0'28.35"E
12	10° 4'36.89"N	78° 0'28.36"E
13	10° 4'36.88"N	78° 0'27.07"E
14	10° 4'36.55"N	78° 0'26.62"E
15	10° 4'37.68"N	78° 0'26.56"E
13	10° 4'37.99"N	78° 0'24.90"E
17	10° 4'38.96"N	78° 0'24.77"E
18	10° 4'39.03"N	78° 0'24.35"E
19	10° 4'39.45"N	78° 0'24.09"E
20	10° 4'39.61"N	78° 0'24.33"E
21	10° 4'40.61"N	78° 0'24.36"E

FIGURE 2.3: QUARRY LEASE PLAN / SURFACE PLAN – P1



Source: Approved Mining Plan

FIGURE 2.4: VILLAGE MAP SUPERIMPOSED ON GOOGLE EARTH IMAGE

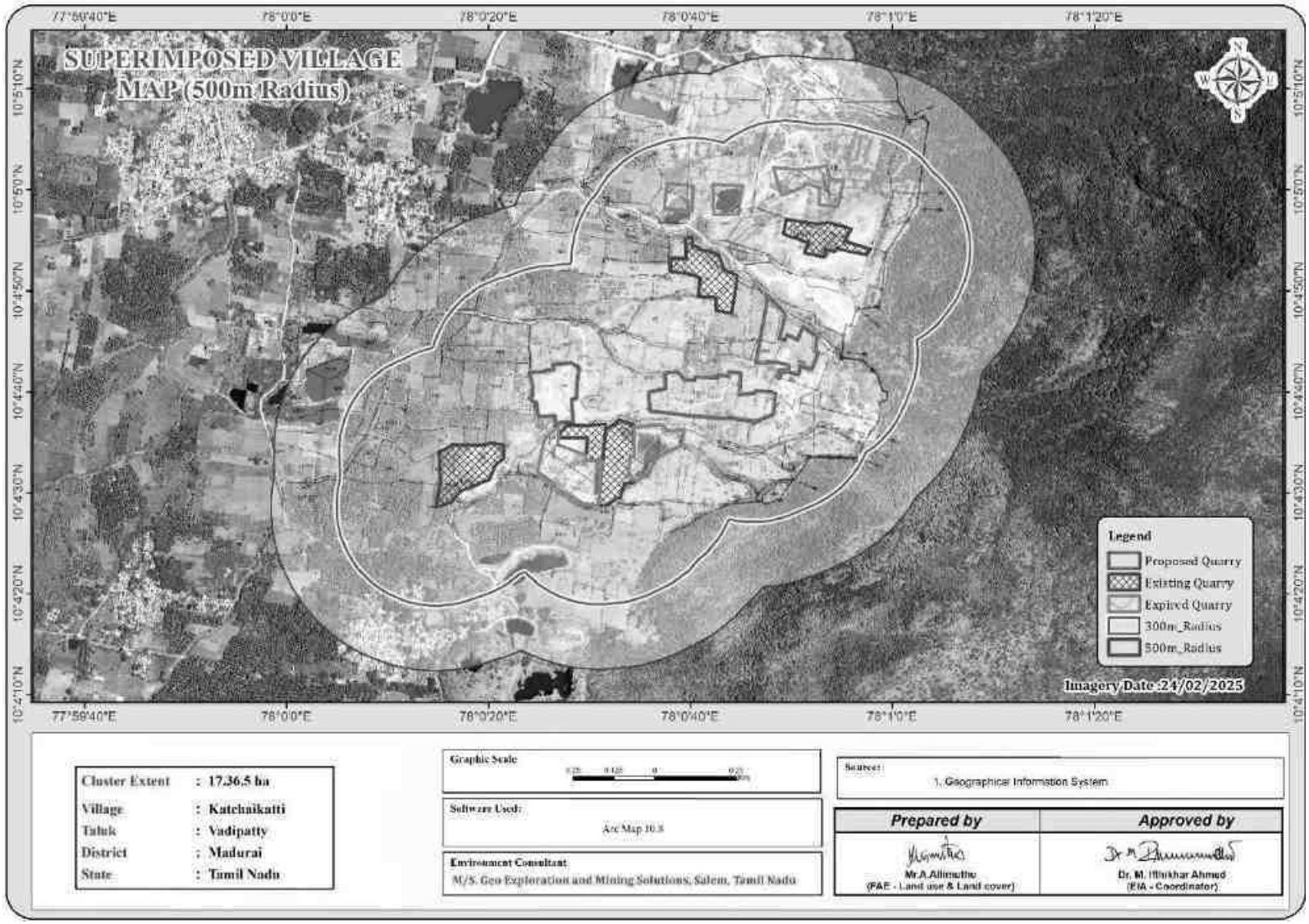


FIGURE 2.5: IMAGE SHOWING SURFACE FEATURES AROUND 10 KM RADIUS

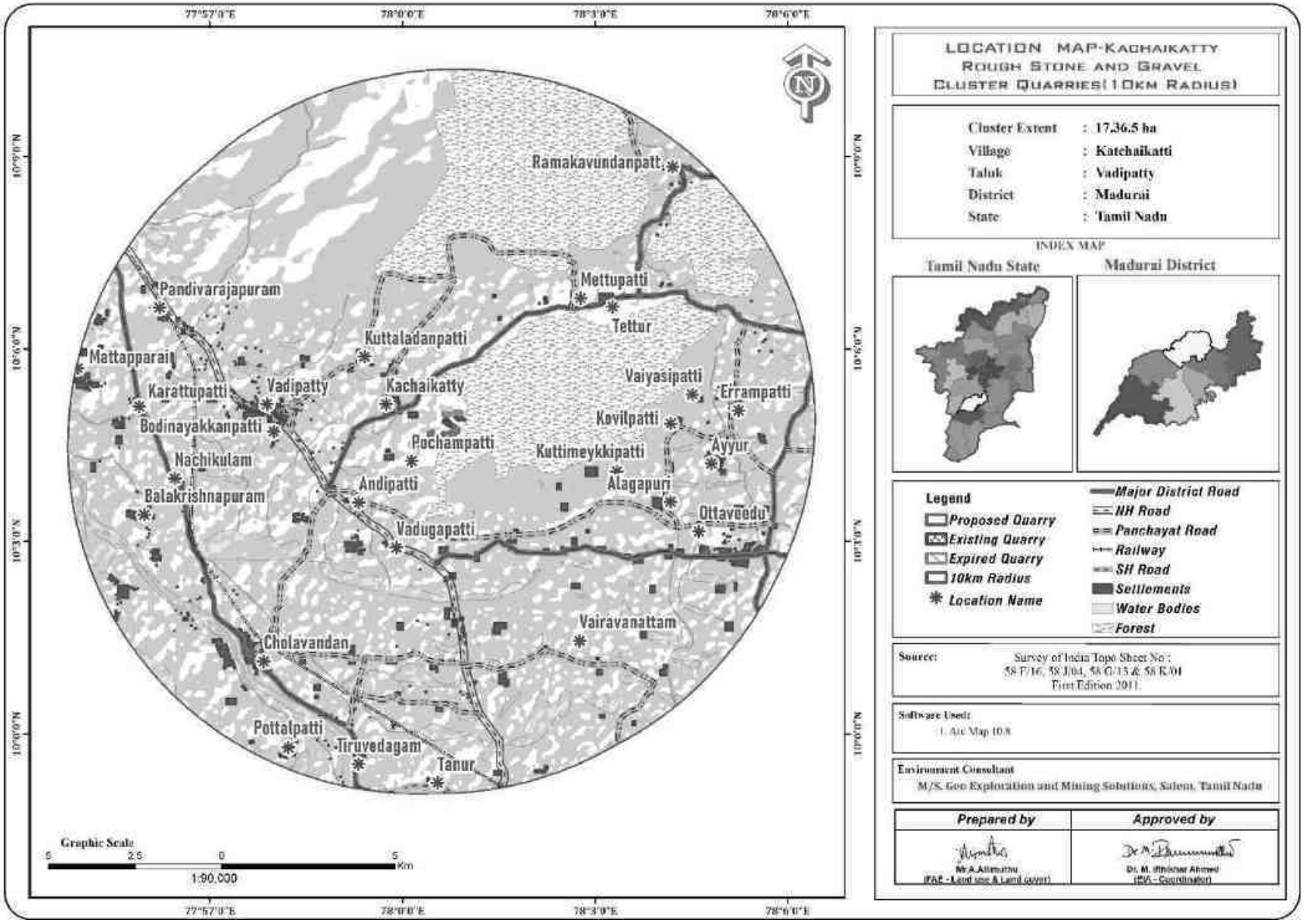


FIGURE 2.6: IMAGE SHOWING SURFACE FEATURES AROUND 5 KM RADIUS

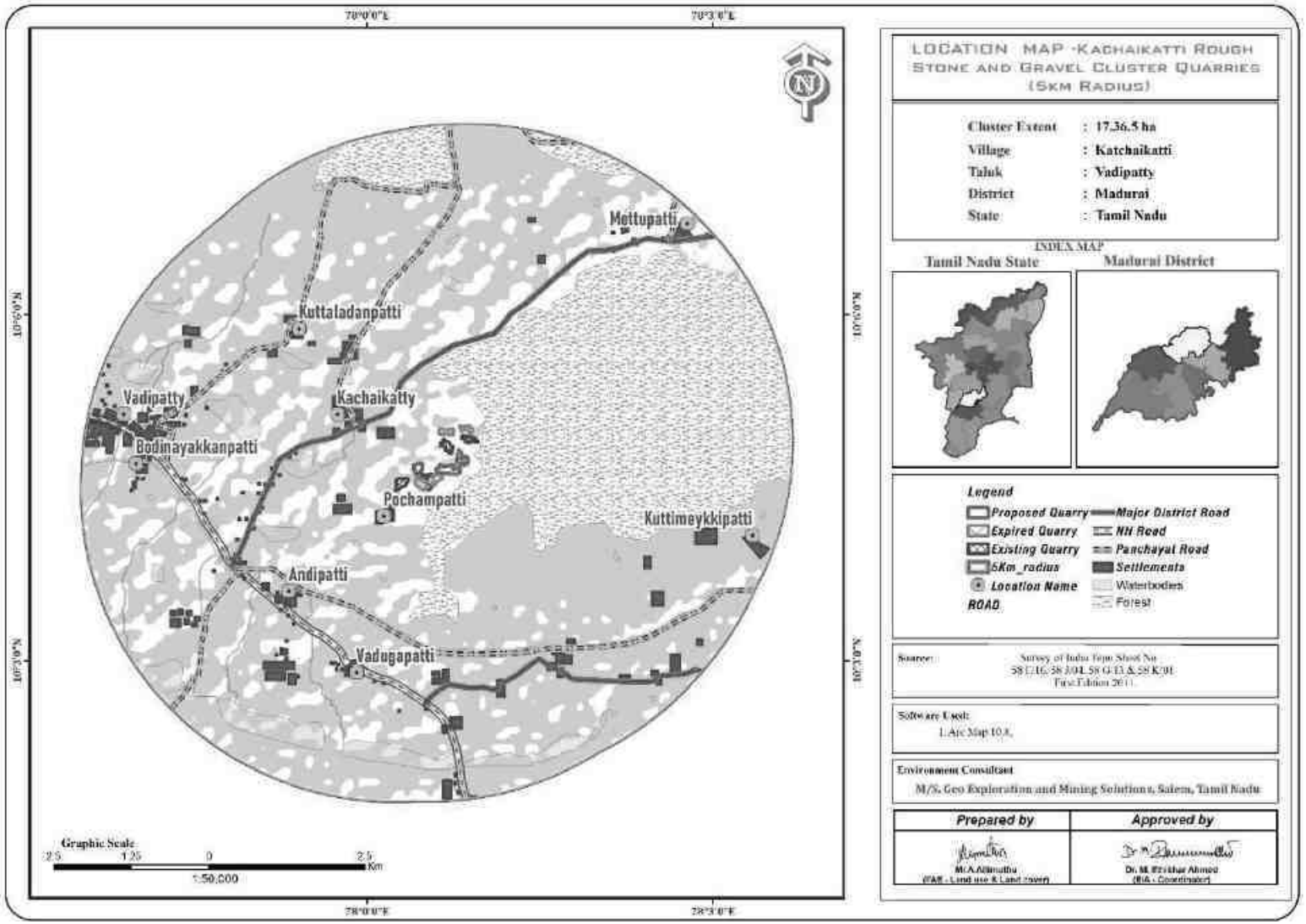
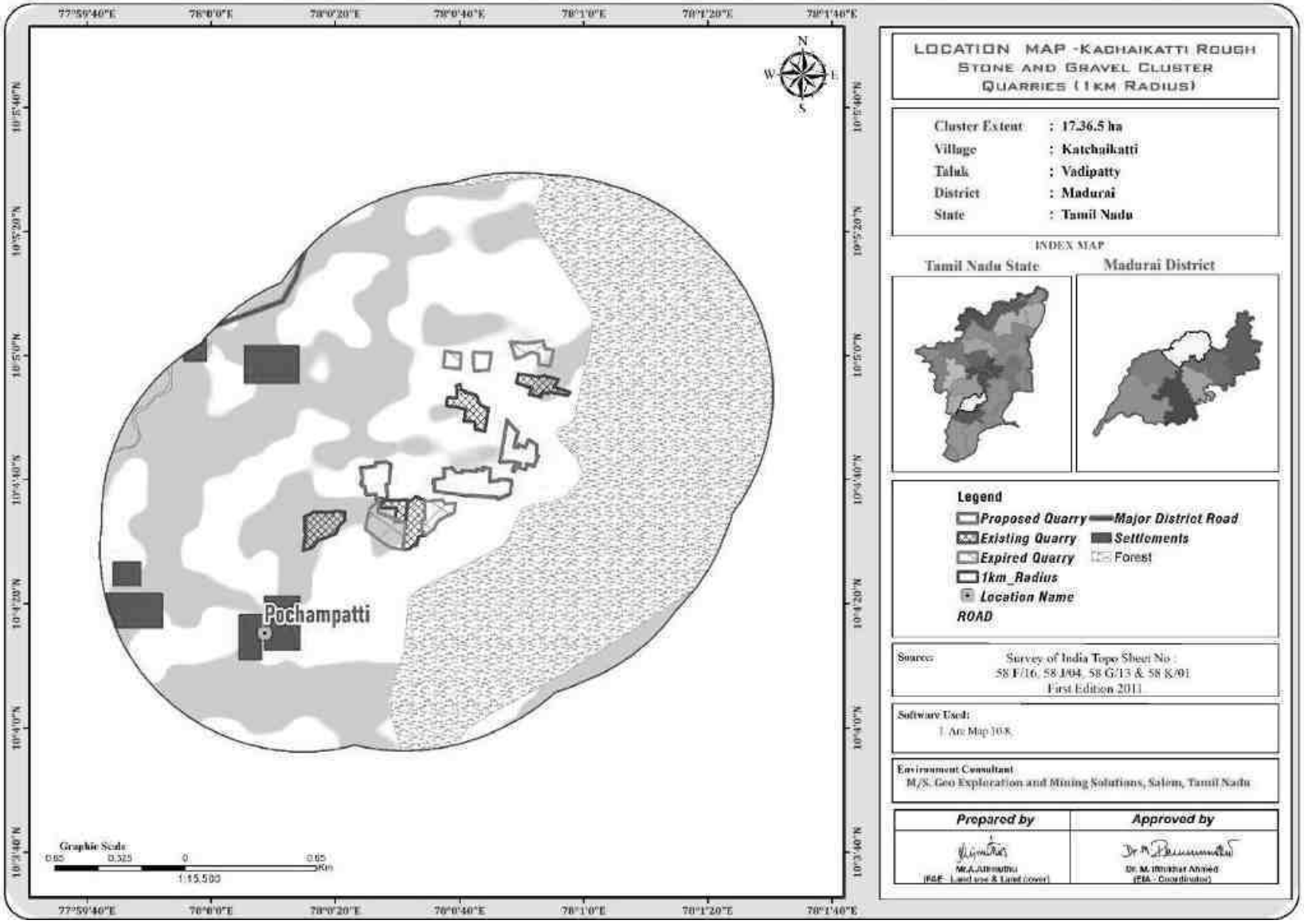


FIGURE 2.7: IMAGE SHOWING SURFACE FEATURES AROUND 1 KM RADIUS



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 Lease period (Ha)
Area Under Quarrying	Nil	1.30.00
Infrstructure	Nil	0.01.00
Roads	Nil	0.04.00
Green Belt	Nil	0.32.00
Unutilized Area	1.99.00	0.25.90
Drainage & Settling Tank	Nil	0.06.10
Grand Total	**1.99.00**	**1.99.00**

Source: Approved Mining Plan

TABLE 2.4: PRODUCTION DETAILS

P1		
PARTICULARS	**DETAILS**	
	Rough Stone in m^3	**Gravel in m^3**
Geological Resources	8,59,440	42,972
Mineable Reserves	2,85,180	28,926
Year wise Production	1,99,485	28,926
Peak Production	40,280	12,534
Mining Period	5 Years	
Number of Working Days	300 Days	
Production per day	133	
No of Lorry loads	11	
Total Depth of Mining	22m BGL	

2.3 GEOLOGY

Madurai district of Tamil Nadu forms a part of southern Granulitic terrain and is predominantly occupied by crystalline rocks of Archaean to late Proterozoic age. Regionally, the rocks can be grouped under five categories namely –
1.Metasedimentary group comprising quartzite, calc gneiss/crystalline limestone,garnet- sillimanite ± biotite ± cordierite ± spinel gneiss, minor garnet-cordierite gneiss and garnetiferousquartzo-feldspathic gneiss (Khondalites and leptynite), magnetite and quartzite.
2.Charnockite Group consisting of acid charnockite and pyroxene granulite.
3.Older Intrusive rocks consisting of amphibolite, pyroxenite and gabbro (maficsultramafics).
4.Migmatite group made up of banded hornblendebiotite gneiss, grey granitic gneiss,
pink granitic gneiss and grey hornblende granite

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

Madurai District is predominantly occupied by hornblende Biotite gneisses of PGC (II) with enclaves of Magnetite Quartzite, Pyroxene Granulite and Charnockite. The area exposes several bands of Pyroxene Granulite which is medium grained, medium to dark grey in colour and stand out prominently in the gneissic country generally parallel to regional foliation. Charnockite is coarse grained, massive, many places it is foliated, grey coloured and greasy and exposed as 22yroxen outcrops and small knolls. It is well exposed in Central, Western and Southern parts of the Madurai District. The general strike of foliation varies from ENE-WSW,E-W with dipping towards NW and N respectively.

Hornblende-Biotite gneiss is well foliated, medium to coarse grained, pale grey and exposed as sheets and small knolls. Pink Granite gneiss occurs as thin bands and lensoidal bodies. It is a medium grained rock composed of alternating bands of mafic (mainly of biotite and hornblende) and felsic (Feldspar and Quartz) minerals. It is well recognized in Avinashi area.

Basic intrusives such as 22yroxenite/dunite occurs as Outcrop and lensoidal bodies in the country rock and mostly concordant to the regional foliation. Many basic intrusive are reported in south and south-east of Madurai town. The trend of these bodies is east-west.

Nepheline syenite is a leucocratic, coarse-grained rock and composed mainly of Feldspar with Nepheline and shows pitted appearance due to removal of Nepleline. This alkaline rock is available in and around Sivanmalai area only.

Acid intrusives comprising pink granite, pegmatite and quartz veins are traversed country rocks in micro (cm wide-meter long) to meso-scale (few meters wide and several meter long) extend. Granite is exposed around 9 km SW of Avanashi. Small scale pegmatite and quartz veins are noticed almost in all the rock types.

Acid intrusives are overlain by sediments of Quaternary age, represented by Kankar and black cotton soil with Gypsum. Most of the area is covered by brown and red brown soil. Some part of the area covered with black cotton soil contains Gypsum as lumps. Black cotton soil covers south-western part of the district.

Source: District Survey Report for Minor Minerals Madurai District – May 2019

https://cdn.s3waas.gov.in/s3f5f8590cd58a54e94377e6ae2eded4d9/uploads/2019/06/2019061089.pdf

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 lease applied area is exhibits plain terrain. The area has gentle sloping towards Southwestern side. The maximum altitude of the area is 243m above Mean Sea level. The area is covered by 2m thickness of Gravel & 1m weathered Gravel which is clearly inferred from the existing quarry pits in the cluster.

2.3.3 Hydrogeology

The district is underlain predominantly by crystalline formations and alluvium is found along the courses of the river. Ground water occurs under phreatic conditions in weathered residuum and interconnected shallow fractures and under semi-confined to confined conditionsin deeper fractures. The depth of weathering varies from 20-25 m bgl in Usilampatti, Sedapatti and Kottampatti area, while it varies from 30 to 40 m bgl in remaining parts of the district. The depth of dug wells varies from 10 – 20 m with a yield of 45 – 135 lpm. In the exploration programme of Central Ground Water Board, 29% of the wells yielded less than 1 lps while 30% of the wells yielded between 1 – 3 lps. In general there are about 2 – 3 fracture zones less than 50 m and about 2 – 3 fracture form beyond 100 m also. The variation in the yield of bore wells are very high in the district. Potential fractures with high discharge have been established along Valandur-usilampatti Timmarasanayakanur, Thirali Peraiyur tract and Palkalainagar- Nilayur tract in the district. The depth to water level in the district varies from 3.13 to 7.66 m bgl during premonsoon (May) and 1.86 to 5.74 m bgl during post monsoon period.

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 Madurai 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.

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 brakish 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 boundaries of this deposit are well defined in Theniar sub basin where the thickness varies from 40 to 60m below ground level. In other areas the thickness of valley fill sediments slightly varies between 30 and 40m below ground level. Recharge is mainly from precipitation and surface runoff during monsoon seasons.The range of aquifer parameter values of valley fill sediments are furnished below

TABLE 2.5: RANGE OF AQUIFER PARAMETERS

Name	T (m^2 /d)	K (m/day)	Yield of wells (lpm)
Alluvium	210-1500	19.57 – 48.93	315 – 1080
Hard rocks	15-60	0.98-2.45	45-135
Valley fill sediments	75-150	1.95-4.40	225-450

Source:**http://nwm.gov.in/sites/default/files/Notes%20on%20Madurai%20District.pdf**

FIGURE 2.8: REGIONAL GEOLOGY MAP

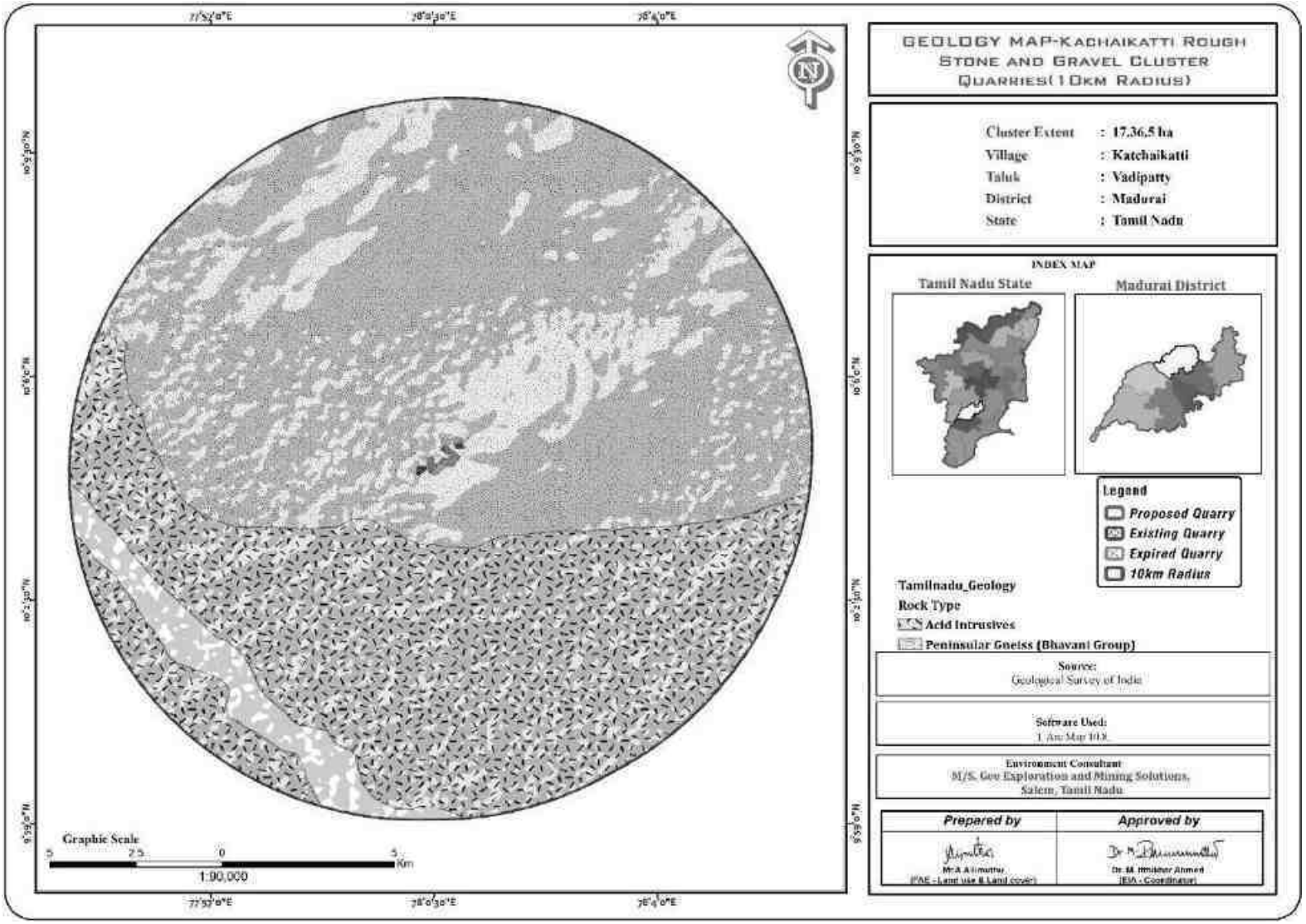
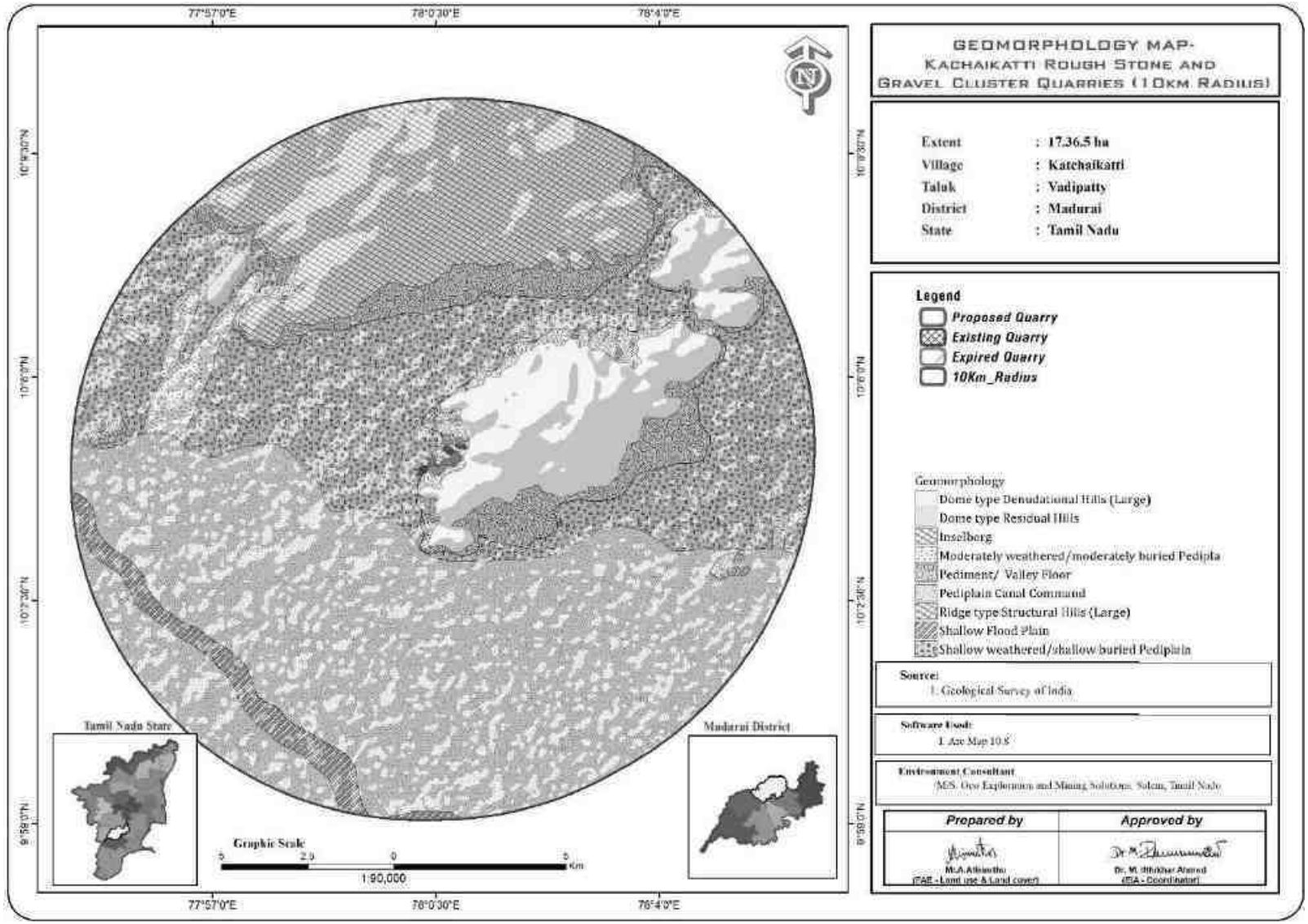


FIGURE 2.9: GEOMORPHOLOGY MAP



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 2.7A: RESOURCES AND RESERVES – P1

Description	Rough Stone in m^3	Gravel in m^3
Geological Resource in m^3	8,59,440	42,972
Mineable Resource in m^3	2,85,180	28,926

Source: Approved Mining Plan

TABLE 2.7B: YEAR-WISE PRODUCTION PLAN – P1

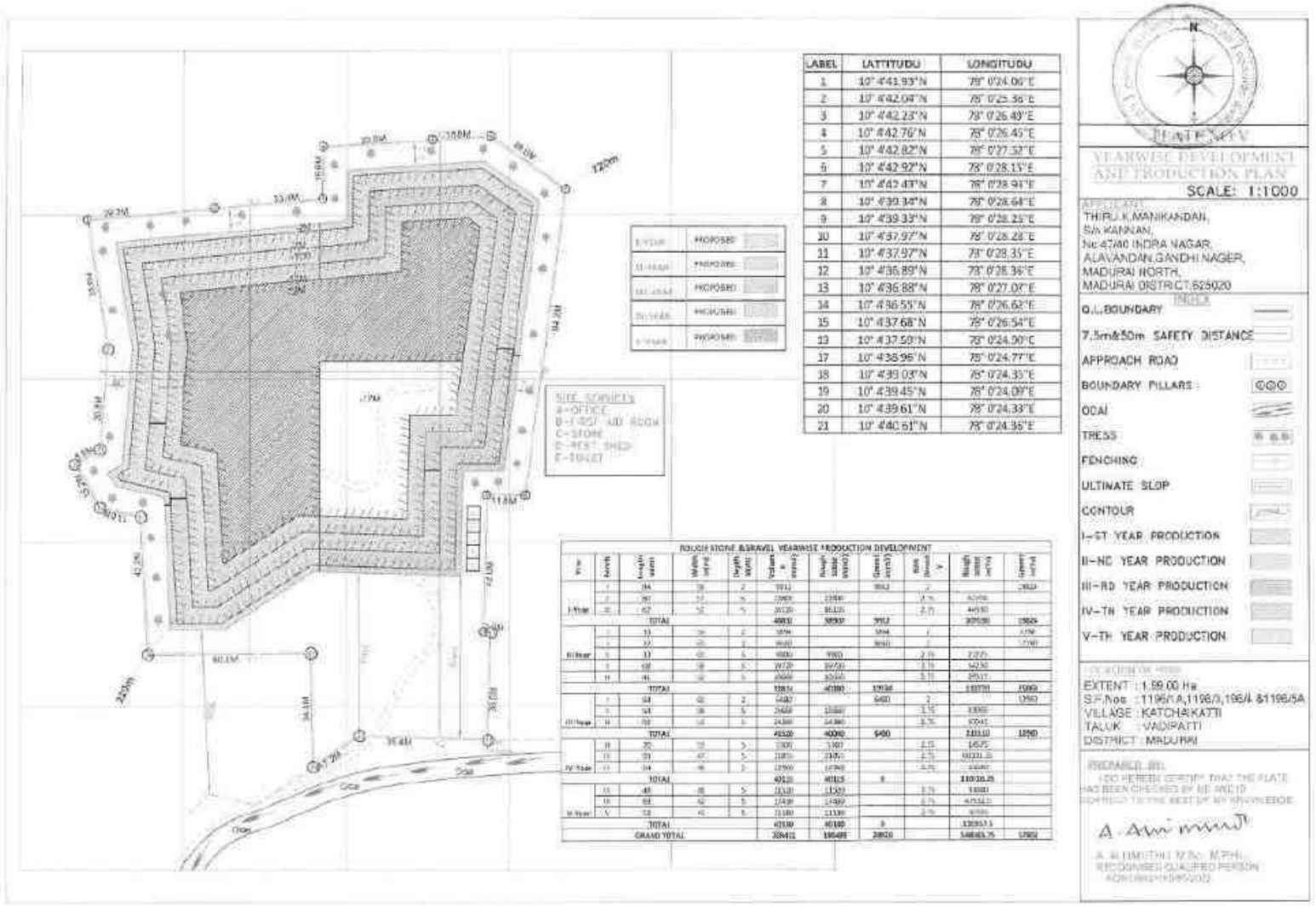
YEAR	Rough Stone in m^3	Gravel in m^3
I	38,920	9,912
II	40,280	12,534
III	40,040	6,480
IV	40,115	-
V	40,130	-
TOTAL	**1,99,485**	**28,926**

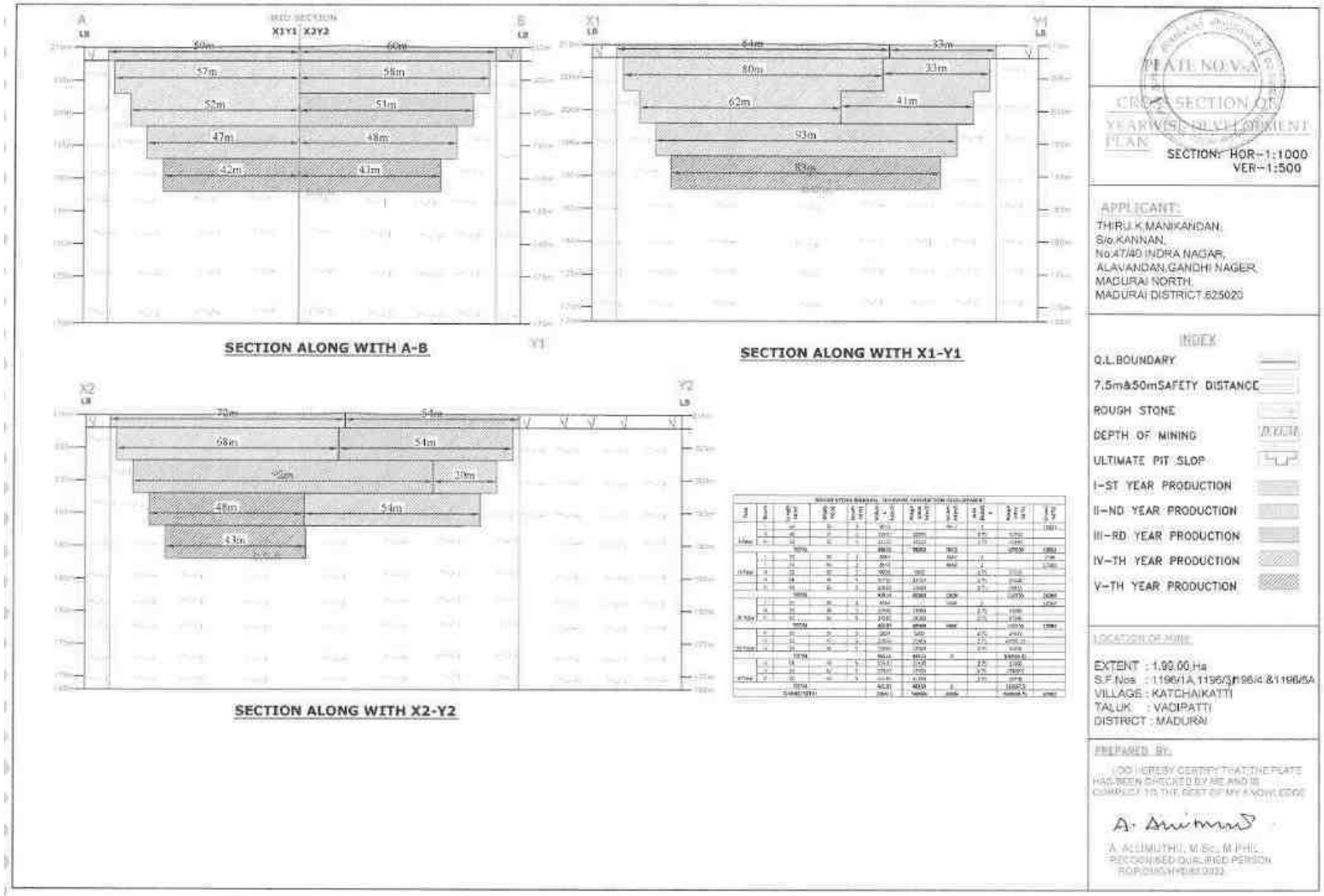
Source: Approved Mining Plan

Disposal of Waste

There is no Waste anticipated during this plan period hence, disposal of waste does not arise. The overburden in the form of Gravel and Weathered rock are already removed during the previous lease period. The excavated rough stone (100%) will be directly loaded into Tippers to the needy customers.

FIGURE 2.10: TOPOGRAPHY, GEOLOGICAL, YEAR-WISE DEVELOPMENT PRODUCTION PLAN AND SECTIONS – P1




SECTION ALONG WITH A-B
SECTION ALONG WITH X1-Y1
SECTION ALONG WITH X2-Y2
PLATE NO:V-A
CROSS SECTION OF YEARWISE DEVELOPMENT PLAN
SECTION: HOR-1:1000 VER-1:500
APPLICANT:
THIRU.K.MANIKANDAN,
S/o.KANNAN,
No:47/40 INDRA NAGAR,
ALAVANDAN,GANDHI NAGER,
MADURAI NORTH,
MADURAI DISTRICT.625020
INDEX
Q.L.BOUNDARY
7.5m&50mSAFETY DISTANCE
ROUGH STONE
DEPTH OF MINING
ULTIMATE PIT SLOP
I-ST YEAR PRODUCTION
II-ND YEAR PRODUCTION
III-RD YEAR PRODUCTION
IV-TH YEAR PRODUCTION
V-TH YEAR PRODUCTION
LOCATION OF MINE
EXTENT : 1.99.00 Ha
S.F.Nos : 1196/1A,1196/3,1196/4 &1196/5A
VILLAGE : KATCHAIKATTI
TALUK : VADIPATTI
DISTRICT : MADURAI
PREPARED BY,
A. ALAGUTHU, M.Sc., M.PHIL.,
RECOGNISED QUALIFIED PERSON

Conceptual Mining Plan/ Final Mine Closure Plan

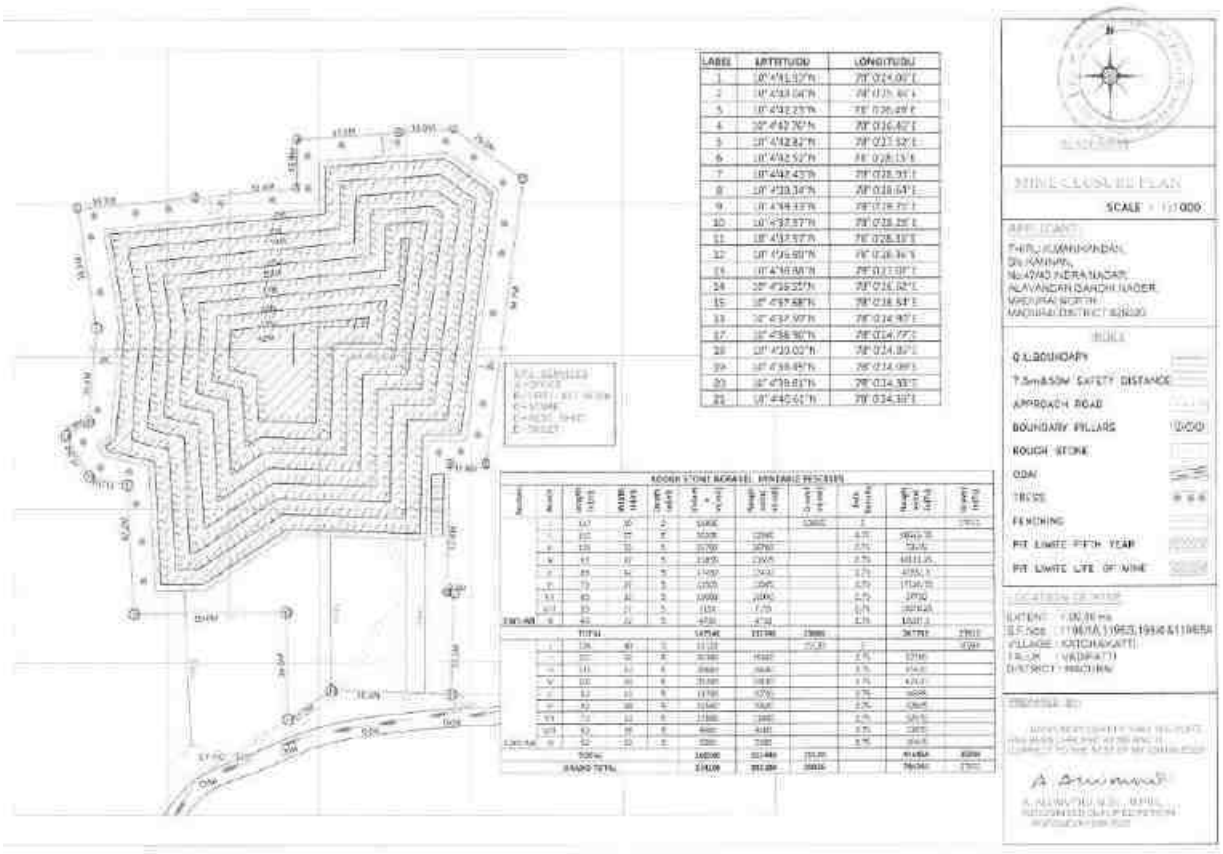
The ultimate pit size is designed based on certain practical parameters such as economical depth of mining, safety zones, permissible area, etc.

TABLE 2.8A: ULTIMATE PIT DIMENSION – P2

Section	Length (Max) (m)	Width (Max) (m)	Depth (Max)
X1Y1-AB	117	59	42m bgl
XY-CD	126	60	42m bgl

Source: Approved Mining Plan

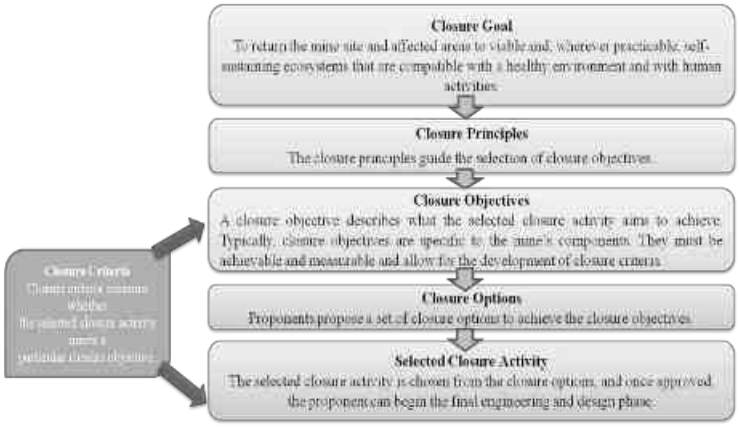
FIGURE 2.11: CLOSURE PLAN AND SECTIONS – P1



- 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 1st 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

Opencast Mechanized Mining Method is proposed by formation of 5.0-meterheight bench with a bench width not less than the bench height. Bench slope will be maintained as 60^0.

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	–	1.6 m
Charge per hole	–	0.50 – 0.75kg
Powder factor	–	6.0 tonnes/kg
Diameter of hole	–	32 mm
Production Capacity	=	$87m^3$ of Rough stone per day
Spacing X Burden X Depth	=	1.2m X 1.0m X 1.5m = $1.8m^3$
		= $1.8m^3$ X 2.75 (Bulk Density) = 4.95Ts per hole

hence for the production of $87m^3$ (239Ts) = 48Nos of holes to be drilled per day – P1

hence for the production of $132m^3$ (365Ts) = 73Nos of holes to be drilled per day – P2

Explosives per hole = ½ kg hence 61kg 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 made 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 2.9: PROPOSED MACHINERY DEPLOYMENT

P1				
S.NO.	**TYPE**	**NOS**	**SIZE/CAPACITY**	**MOTIVE POWER**
1	Jack hammer	1	1.2m to 2.0m	Compressed air
2	Compressor	2	400psi	Diesel Drive
3	Excavator with Bucket and Rock Breaker	2	300 HP	Diesel Drive
4	Tippers	3	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 are already 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 and given below in table no. 2.10.

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.2.10: TRAFFIC SURVEY LOCATIONS

Station Code	Road Name	Distance and Direction	Type of Road
TS-1	Thethoor Major District Road	1.2km NW	Major District Road

TS-2	Madurai outer Ring Road	1.8km SW	Outer Ring Road

Source: On-site monitoring by GEMS FAE & TM

TABLE 2.11: EXISTING TRAFFIC VOLUME

Station code	HMV		LMV		2/3 Wheelers		Total PCU
	No	PCU	No	PCU	No	PCU	
TS1	60	180	60	60	300	150	390
TS2	20	60	30	30	100	50	140

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 2.12: 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	47	141

FIGURE.2.12: MINERAL TRANSPORTATION ROUTE MAP

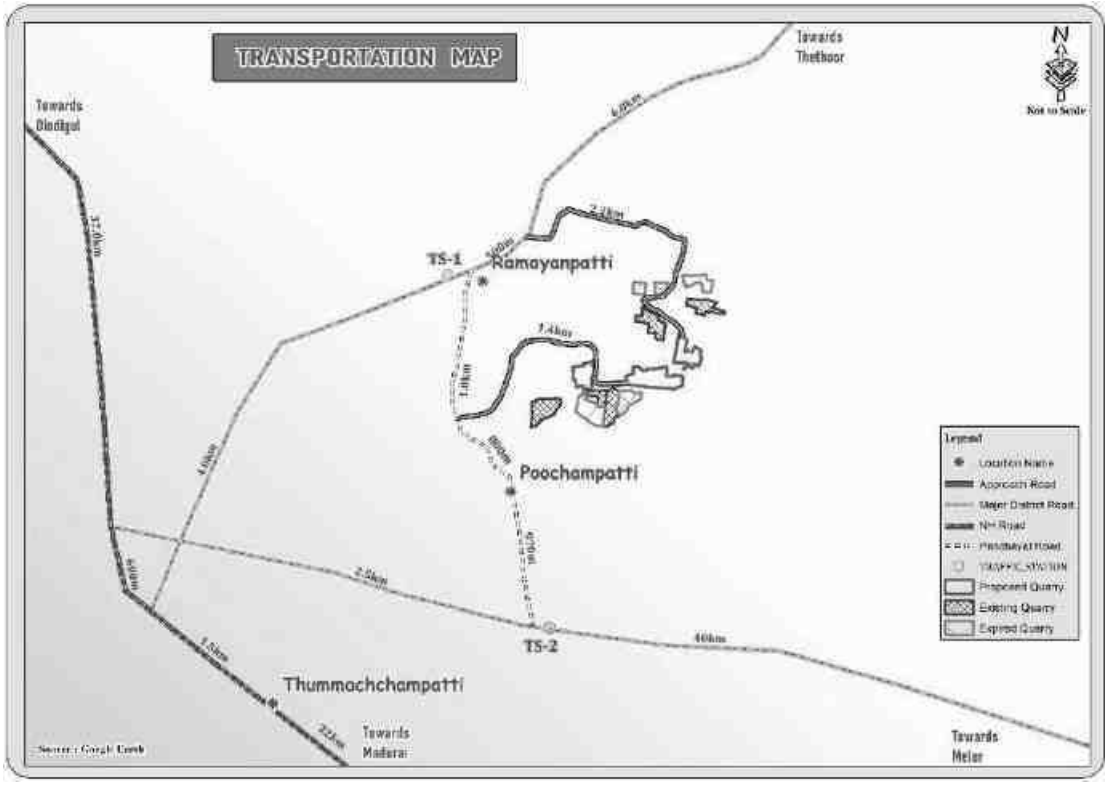


TABLE 2.13: SUMMARY OF TRAFFIC VOLUME

Route	Existing Traffic volume in PCU	Incremental traffic due to the project	Total traffic volume	Hourly Capacity in PCU as per IRC – 1960 guidelines
TS1	390	141	531	1500
TS2	140	141	281	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 village road can handle 1200 PCU in hour and Major district road can handle 1500 PCU in hour hence there will not be any conjunction due to this proposed transportation.

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 2.14: WATER REQUIREMENT FOR THE PROJECT

P1		
Purpose	**Quantity**	**Source**
Dust Suppression	1.0 KLD	From the existing pit or from the water vendors
Green Belt	0.5 KLD	From the existing pit or from the water vendors
Sanitation & Drinking	1.0 KLD	From the existing pit or from the water vendors.
Total	**2.5 KLD**	

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

The proposed quarrying activity requires HSD (High Speed Diesel) for machineries as per below quantum-

Rough stone: - P1

Per hour Excavator will consume = 16 liters / hour

Per hour Excavator will excavate = 20$m^3$of Rough stone

Rough stone quantity = 1,99,485/20 = 9974hours

Diesel consume = 9974hours x 16 liters

Total diesel consumption = **1,59,584** Liters of HSD will be utilized for Rough stone

Total diesel consumption = **1,59,584** Liters of HSD will be utilized for entire project life.

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 Rs. 189.43 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 2.15: PROPOSED MANPOWER DEPLOYMENT

. **Designation**	**P1**
a) Supervisory Category	
Mines Manager	1
b) Skilled Labour	
Mine Engineer	1
Mine Geologist	1
Blaster	1
c) Unskilled labour	
Labour & Helper	13
Total	**17**

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 2.16: EXPECTED TIME SCHEDULE

Sl.No.	**Particulars**	**Time Schedule (In Month)**					**Remarks if any**
		1st	**2nd**	**3rd**	**4th**	**5th**	
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 **March to May 2026** by CHENNAI METTEX LAB PRIVATE LIMITED 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 CHENNAI METTEX LAB PRIVATE LIMITED

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 Post monsoon season i.e., **March to May 2026**

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 were collected by installation of Respiratory Dust Samplers (RDS) for Fugitive dust, PM_{10} and SO_2, NO_X with gaseous attachments & Fine Dust Samplers (FDS) for $PM_{2.5}$ 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	1Hourly Continuous Mechanical/Automatic Weather Station	1	Site specific primary data& Secondary Data from IMD Station
*Ambient Air Quality	PM10 PM2.5 SO2 NOX Fugitive Dust	24 hourlies twice a week (March – May 2026)	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 CHENNAI METTEX LAB PRIVATE LIMITED 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

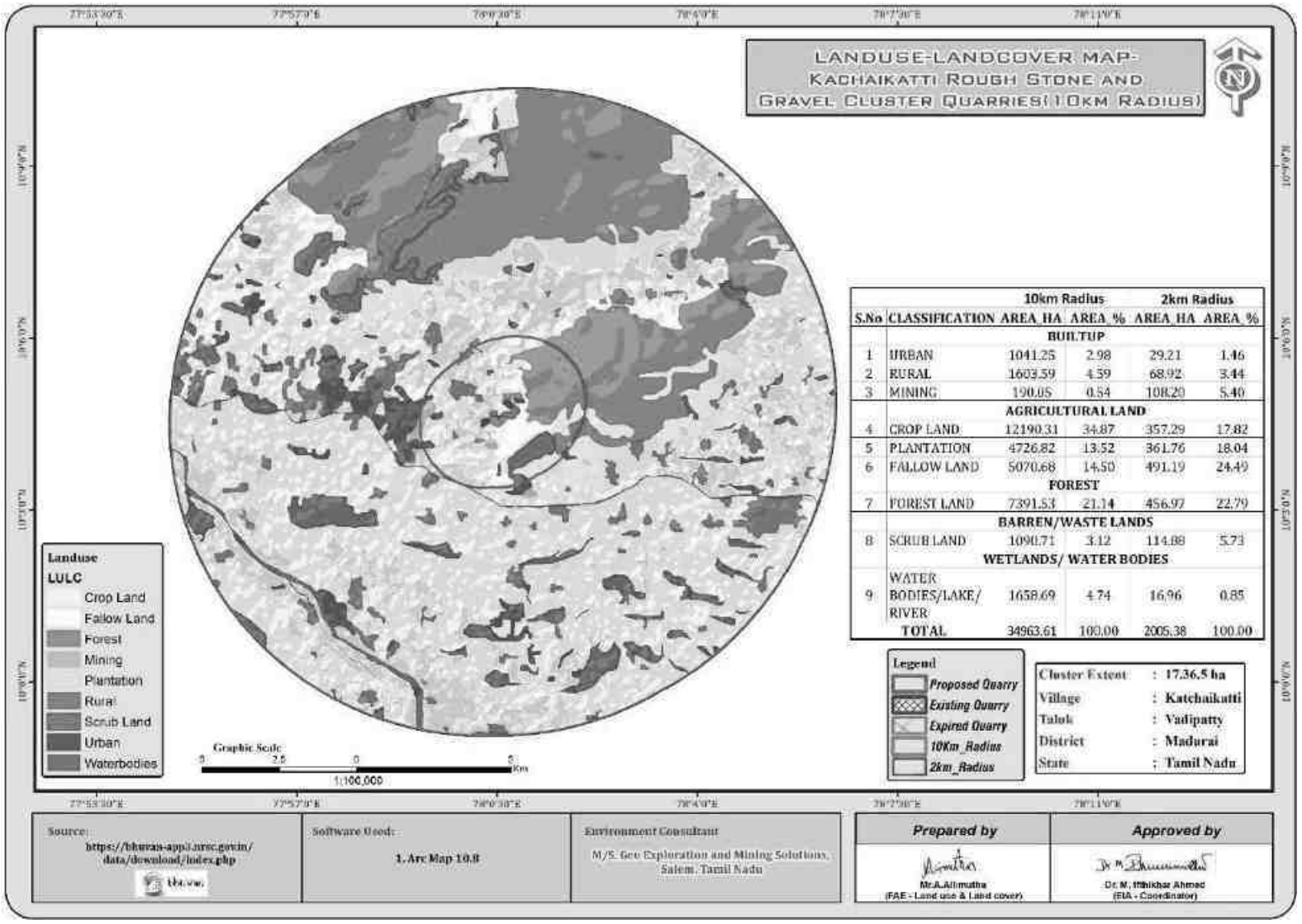
A visual interpretation technique has been adopted for land use classification based on the keys suggested in the chapter – V of the guidelines issued by NNRMS Bangalore & Level III classification with 1:50,000 scale for the preparation of land use mapping. Land use pattern of the area was studied through 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

		10km Radius		2km Radius	
S.No	**CLASSIFICATION**	**AREA_HA**	**AREA_%**	**AREA_HA**	**AREA_%**
	BUILTUP				
1	URBAN	1041.25	2.98	29.21	1.46
2	RURAL	1603.59	4.59	68.92	3.44
3	MINING	190.05	0.54	108.20	5.40
	AGRICULTURAL LAND				
4	CROP LAND	12190.31	34.87	357.29	17.82
5	PLANTATION	4726.82	13.52	361.76	18.04
6	FALLOW LAND	5070.68	14.50	491.19	24.49
	FOREST				
7	FOREST LAND	7391.53	21.14	456.97	22.79
	BARREN/WASTE LANDS				
8	SCRUB LAND	1090.71	3.12	114.88	5.73
	WETLANDS/ WATER BODIES				
9	WATER BODIES/LAKE/ RIVER	1658.69	4.74	16.96	0.85
TOTAL		34963.61	100.00	2005.38	100.00

Source: Survey of India Toposheet and Landsat Satellite Imagery

FIGURE 3.1: LAND USE LAND COVER MAP 2KM AND 10KM RADIUS



S.No	CLASSIFICATION	10km Radius AREA_HA	10km Radius AREA_%	2km Radius AREA_HA	2km Radius AREA_%
	BUILTUP				
1	URBAN	1041.25	2.98	29.21	1.46
2	RURAL	1603.59	4.59	68.92	3.44
3	MINING	190.05	0.54	108.20	5.40
	AGRICULTURAL LAND				
4	CROP LAND	12190.31	34.87	357.29	17.82
5	PLANTATION	4726.82	13.52	361.76	18.04
6	FALLOW LAND	5070.68	14.50	491.19	24.49
	FOREST				
7	FOREST LAND	7391.53	21.14	456.97	22.79
	BARREN/WASTE LANDS				
8	SCRUB LAND	1090.71	3.12	114.88	5.73
	WETLANDS/ WATER BODIES				
9	WATER BODIES/LAKE/ RIVER	1658.69	4.74	16.96	0.85
	TOTAL	34963.61	100.00	2005.38	100.00

FIGURE 3.2: PHYSIOGRAPHIC MAP 10KM RADIUS

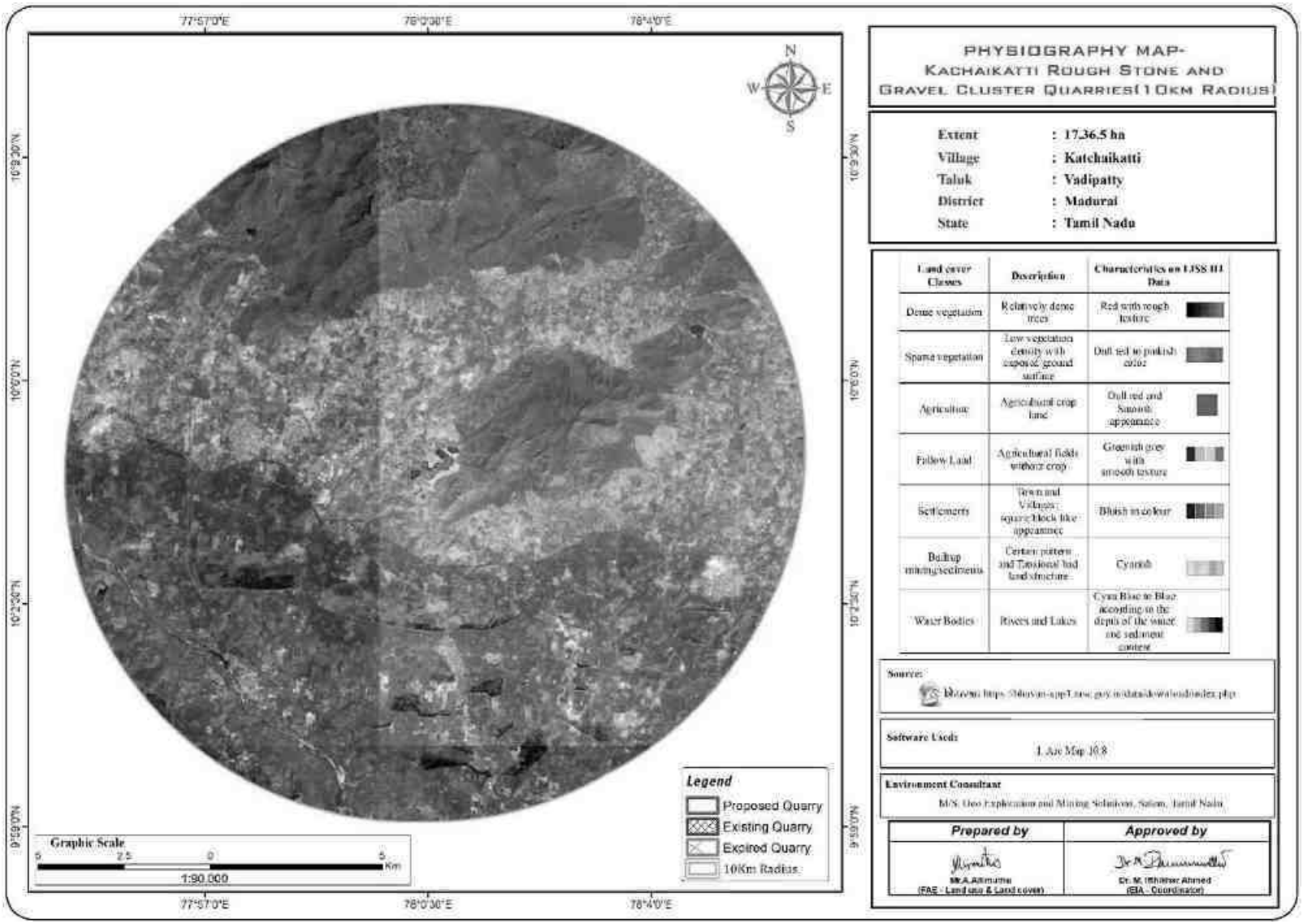
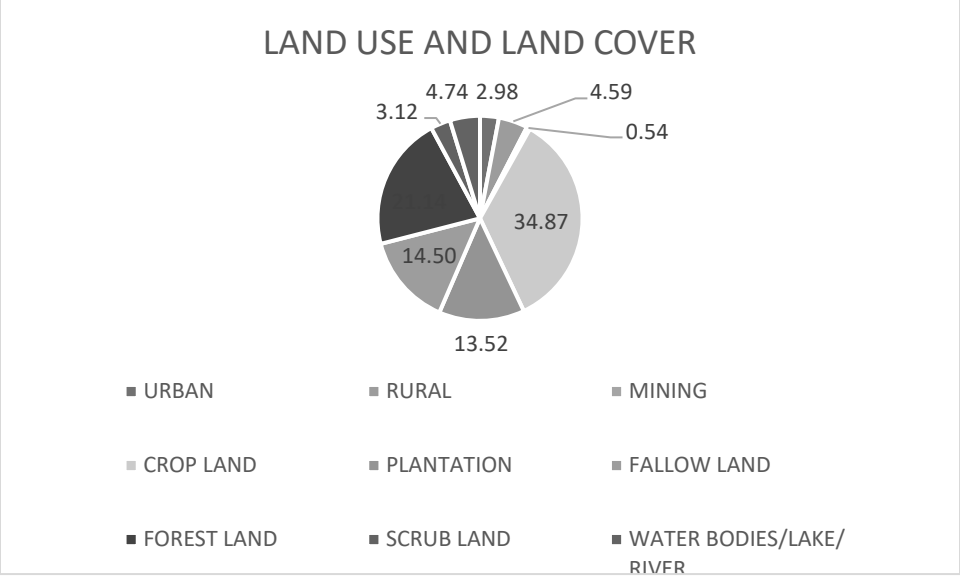


FIGURE 3.3: PIE DIAGRAM OF LAND USE AND LAND COVER - 10KM RADIUS IN AREA_%



From the Table No.3.2, Pie Diagram 3.1 and Land Use Map (Fig No.3.2) is inferred that the majority of the land in the study area is Agriculture land (includes crop land – 34.87%, plantation – 13.52% and Fallow land – 14.50%) range is 62.89% & in Build Up Land, mining area occupied 8.11%.

The total mining area within the study area is 190.05 ha i.e., 0.54%. The cluster area of 17.36.5 ha contributes about 10.9% 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 South East side and the quarry was surrounded by an expire & an existing quarry on South East side.

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, least active 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 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.

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	Kodaikanal Wildlife Sanctuary	36.2 km – North West
2	Reserved Forest	Waguthumalai RF	660 m – SouthEast
3	Tiger Reserve/ Elephant Reserve/ Biosphere Reserve	None	Nil within 10km Radius
4	Critically Polluted Areas	None	Nil within 10km Radius
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

P1		
Sl.No	**NAME**	**DISTANCE & DIRECTION**
1	Odai	50m Safety-South
2	Odai	110m NE
3	Mullaiperiyar Channel	2.3km SW
4	Sathaiyar River	7.7km NE
5	Sathaiyar Dam	8.6km NE
6	Vaigai River	8km 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 3.4.

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	10° 4'46.04"N 78° 0'48.54"E
2	S-2	Core Zone	Project Area	10° 4'41.32"N 78° 0'28.53"E
3	S-3	Katchaikatti (Agriculture Land)	1.5km NW	10° 5'14.81"N 78° 0'2.03"E
4	S-4	Kattankulam (Agriculture Land)	3.5km SW	10° 2'59.15"N 77°59'17.52"E
5	S-5	Ellaiyur (Barren Land)	3.4km NE	10° 6'28.33"N 78° 1'34.16"E
6	S-6	Vittankulam (Agriculture Land)	5.5km SE	10° 2'20.77"N 78° 2'37.35"E

Source: On-site monitoring/sampling by CHENNAI METTEX LAB PRIVATE LIMITED 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 CHENNAI METTEX LAB 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 3.4: SOIL SAMPLING LOCATIONS AROUND 10 KM RADIUS

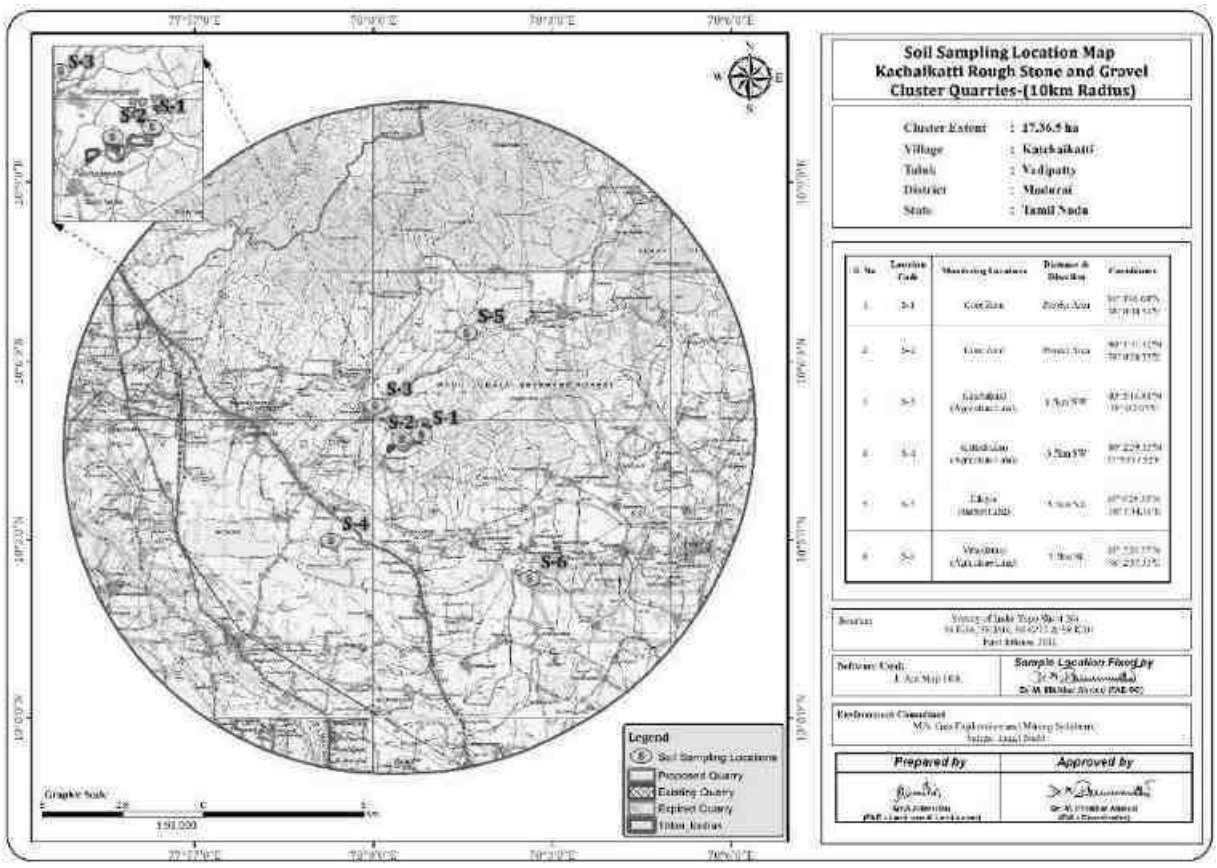


FIGURE 3.5: SOIL MAP

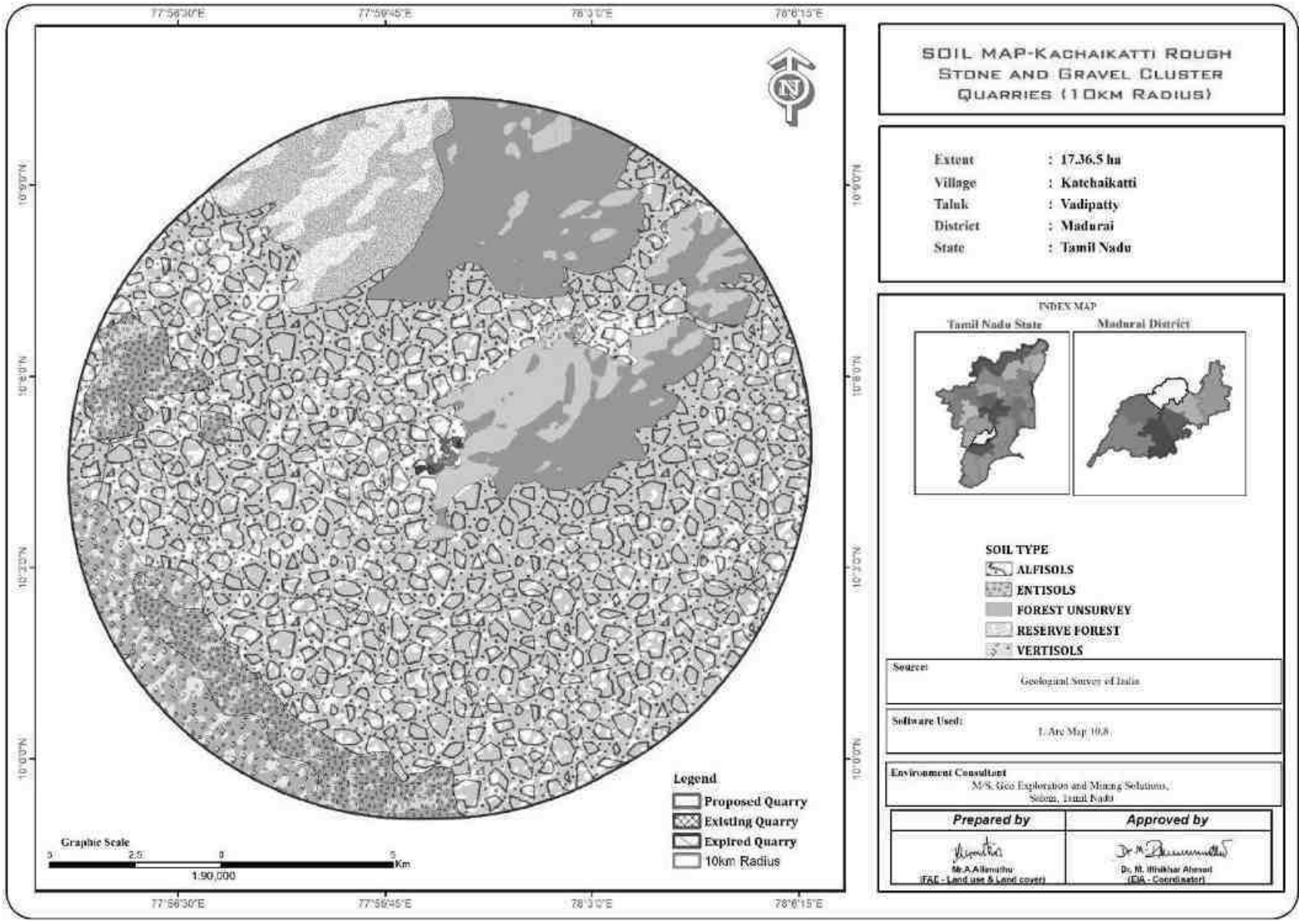


TABLE 3.7: SOIL QUALITY OF THE STUDY AREA

S. No	Test Parameters	Protocols	S1	S2	S3	S4	S5	S6
01	pH @ 25°C	IS 2720 Part 26 - 1987 (Reaff:2016)	4.56	6.69	6.96	6.12	5.31	5.22
02	Conductivity @ 25°C	IS 14767 - 2000 (Reaff : 2016)	278 µmhos/cm	251.0 µmhos/cm	326.4 µmhos/cm	269.5 µmhos/cm	321.1 µmhos/cm	302.5 µmhos/cm
03	**Texture :**							
	Clay	Gravimetric Method	29.5 %	29.2 %	28.8 %	29.4 %	28.0 %	27.7 %
	Sand		37.9 %	37.6 %	37.6 %	33.8 %	41.2 %	30.6 %
	Silt		32.6 %	33.2 %	33.6 %	36.8 %	30.8%	41.7 %
04	Water Holding Capacity	By Gravimetric Method	35.3 %	41.3 %	37.3%	36.8 %	36.2 %	27.9 %
05	Bulk Density	By Cylindrical Method	1.02 g/cm^3	1.15 g/cm^3	0.95 g/cm^3	1.02 g/cm^3	1.02 g/cm^3	1.08 g/cm^3
06	Porosity	By Gravimetric Method	32.8 %	29.3 %	36.9 %	32.3 %	33.2 %	27.8 %
07	Calcium as Ca	USEPA 3050 B – 1996 & USEPA 6010 C - 2000	61.5 mg/kg	5.5 mg/kg	66.5 mg/kg	55.5 mg/kg	56.9 mg/kg	59.6 mg/kg
08	Magnesium as Mg		31.3 mg/kg	21..4 mg/kg	27.4 mg/kg	22.6 mg/kg	32.6 mg/kg	29.8 mg/kg
09	Manganese as Mn		34.6 mg/kg	29.6 mg/kg	33.5 mg/kg	26.7 mg/kg	22.8 mg/kg	22.3 mg/kg
10	Zinc as Zn		3.02 mg/kg	3.47 mg/kg	4.81 mg/kg	6.98 mg/kg	2.19 mg/kg	3.15 mg/kg
11	Boron as B		2.19 mg/kg	1.18 mg/kg	1.91 mg/kg	1.82 mg/kg	2.20 mg/kg	1.01 mg/kg
12	Chloride as Cl	APHA 23rd Edn 2019 4500 Cl B	68.7 mg/kg	71.5 mg/kg	66.5 mg/kg	66.1 mg/kg	58.6 mg/kg	60.5 mg/kg
13	Total Soluble Sulphate as SO_4	IS 2720 Part 27 : 1977 (Reaff:2015)	0.023 %	0.022 %	0.032%	0.019 %	0.019 %	0.017 %
14	Potassium as K	USEPA 3050 B – 1996 & USEPA 6010 C - 2000	29.8 mg/kg	29.1 mg/kg	23.8 mg/kg	22.3 mg/kg	27.7 mg/kg	25.6 mg/kg
15	Total Phosphorus as P	IS 10158 : 1982 (Reaff: 2019)	5.79 mg/kg	4.31mg/kg	3.18 mg/kg	2.58 mg/kg	4.18 mg/kg	3.12 mg/kg
16	Total Nitrogen as N	IS 14684 : 1999 (Reaff:2019)	334.5 mg/kg	296.0 mg/kg	296.8 mg/kg	326.8 mg/kg	253.5 mg/kg	284.5 mg/kg
17	Cadmium as Cd		BDL (DL : 1.0 mg/kg)	BDL (DL : 1.0 mg/kg)	BDL (DL : 1.0 mg/kg)	BDL (DL : 1.0 mg/kg)	BDL (DL : 1.0 mg/kg)	BDL (DL : 1.0 mg/kg)

18	Total Chromium as Cr	USEPA 3050 B – 1996 & USEPA 6010 C - 2000	BDL (DL : 1.0 mg/kg)	BDL (DL : 1.0 mg/kg)	BDL (DL : 1.0 mg/kg)	BDL (DL : 1.0 mg/kg)	BDL (DL : 1.0 mg/kg)	BDL (DL : 1.0 mg/kg)
19	Copper as Cu		BDL (DL : 1.0 mg/kg)	BDL (DL : 1.0 mg/kg)	BDL (DL : 1.0 mg/kg)	BDL (DL : 1.0 mg/kg)	BDL (DL : 1.0 mg/kg)	BDL (DL : 1.0 mg/kg)
20	Lead as Pb		1.96 mg/kg	1.62 mg/kg	1.11 mg/kg	1.23 mg/kg	2.02 mg/kg	1.31 mg/kg
21	Iron as Fe		3.34 mg/kg	3.34 mg/kg	2.98 mg/kg	2.01 mg/kg	3.0 mg/kg	2.13 mg/kg
22	Organic Matter	IS : 2720 Part 22: 1972 (Reaff: 2015)	1.94 %	2.27 %	268 %	2.26 %	2.15 %	2.4 %
23	Organic Carbon	IS : 2720 Part 22: 1972 (Reaff: 2015)	1.24 %	1.32%	1.56 %	1.31 %	1.25 %	1.4 %
24	Cation Exchange Capacity	USEPA 9080 – 1986	26.6 meq/100g of soil	26.8 meq/100g of soil	23.6 meq/100g of soil	23.9 meq/100g of soil	28.1 meq/100g of soil	27.1 meq/100g of soil

Source: Sampling Results by CHENNAI METTEX LAB PRIVATE LIMITED in association with GEMS

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 varied between 27.7-29.5%, Sand varied between 30.6-41.2% and Silt varied between 30.8 – 41.7% and Bulk Density of Soils in the study area varied between 0.95-1.15 g/cm^3. The Water Holding Capacity of the soil samples is found to be medium i.e., ranging from 27.9-41.3%.

Chemical Characteristics

- The nature of soil is slightly alkaline to strongly alkaline with pH range 4.56-6.96
- The available Nitrogen content range between 253.5 – 334-5 mg/kg
- The available Phosphorus content range between 3.12-5.79mg/kg
- The available Potassium range between 22.3-29.8 mg/kg

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.

3.2.1 Surface Water Resources:

Vaigai 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 3.6.

TABLE 3.8: WATER SAMPLING LOCATIONS

S.NO	CODE	LOCATIONS	DISTANCE & DIRECTION	CO-ORDINATES
SURFACE WATER				
1	SW-1	Puliyan Kanmaai	1.5km West	10° 4'37.86"N 77°59'32.50"E
2	SW-2	Vaigai River	9km SW	10° 1'42.90"N 77°57'12.97"E
GROUND WATER				
3	OW-1	Near Project Area	280m NW	10° 4'50.42"N 78° 0'20.76"E
4	WW-2	Vittankulam	5.5km SE	10° 2'24.95"N 78° 2'38.63"E
5	BW-1	Near Project Area	100m SE	10° 4'38.70"N 78° 0'50.93"E
6	BW-2	Ellaiyur	3.4km NE	10° 6'29.05"N 78° 1'30.62"E

Source: On-site monitoring/sampling by CHENNAI METTEX LAB PRIVATE LIMITED in association with GEMS

FIGURE 3.6: WATER SAMPLING LOCATIONS AROUND 10 KM RADIUS

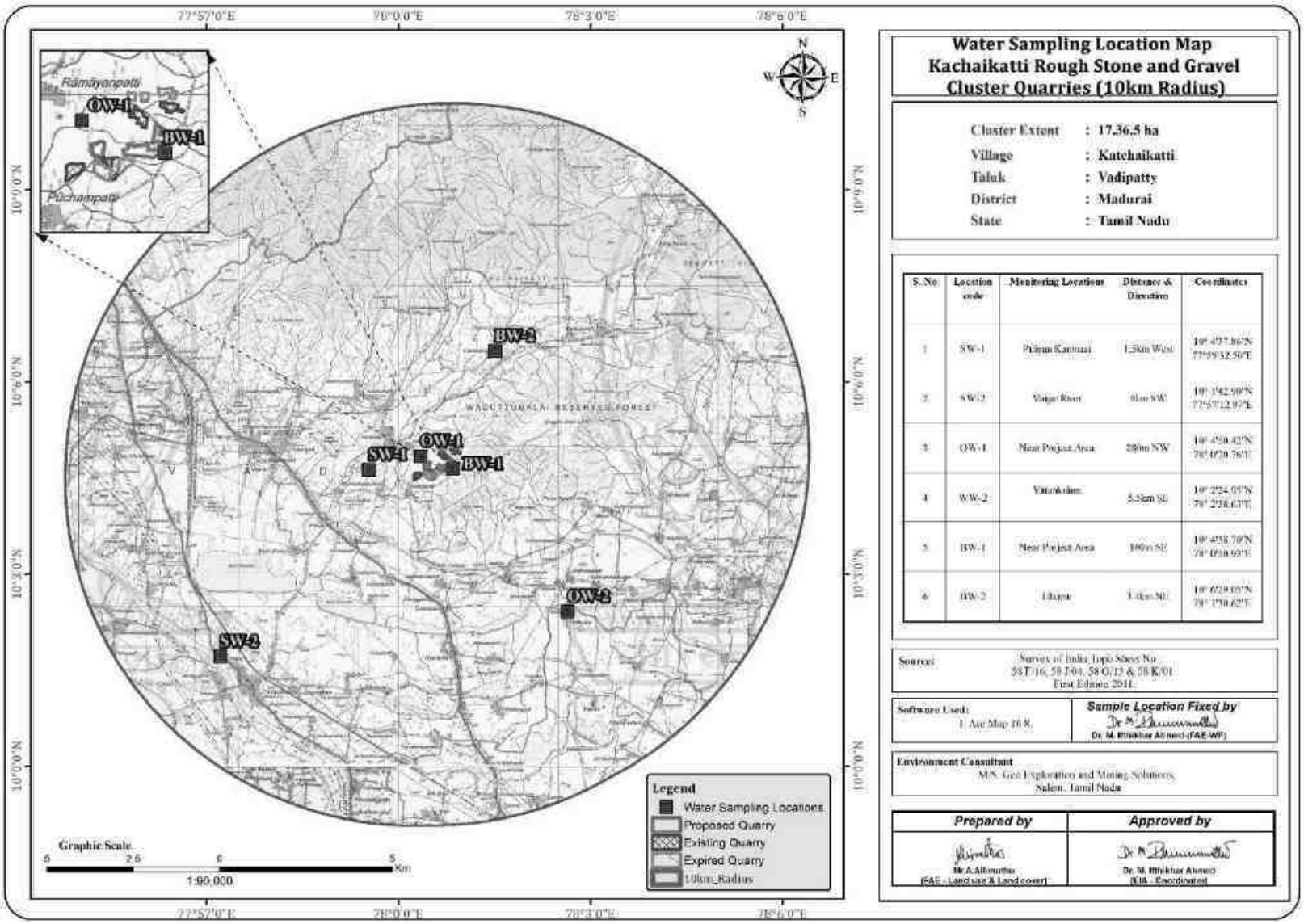


TABLE 3.9: SURFACE WATER SAMPLING RESULTS

TEST	TEST METHOD	UNIT	SW1-	SW2-
Discipline: Chemical				
Colour	IS 3025 Part 4:1983 (Reaff:2017)	Hazen	1 Hazen	1 Hazen
Odour	IS 3025 Part 5:2018	-	Agreeable	Agreeable
pH at 25°C	IS 3025 Part 11:1983 (Reaff:2017)	-	7.85	7.88
Conductivity @ 25°C	IS 3025 Part 14:2013 (Reaff:2019)	µmhos/cm	1340 µmhos/cm	1364 µmhos/cm
Turbidity	IS 3025 Part 10:1984 (Reaff:2017)	NTU	1 NTU	1 NTU
Total Dissolved Solids	IS 3025 Part 16:1984 (Reaff:2017)	mg/l	777.0 mg/l	791.0 mg/l
Total Hardness as $CaCO_3$	IS 3025 Part 21:2009 (Reaff:2019)	mg/l	224.0 mg/l	232.0 mg/l
Calcium as Ca	IS 3025 Part 40:1991 (Reaff:2019)	mg/l	52.9 mg/l	57.7 mg/l
Magnesium as Mg	IS 3025 Part 46:1994 (Reaff:2019)	mg/l	22.3 mg/l	21.4 mg/l
Total Alkalinity as $CaCO_3$	IS 3025 Part 23:1986 (Reaff:2019)	mg/l	198.5 mg/l	225.5 mg/l
Chloride as Cl	IS 3025 Part 32:1988 (Reaff:2019)	mg/l	246.5 mg/l	256.5 mg/l
Sulphate as SO_4	IS 3025 Part 24:1986 (Reaff:2019)	mg/l	45.2 mg/l	47.8 mg/l
Iron as Fe	IS 3025 Part 53:2003 (Reaff:2019)	mg/l	0.49 mg/l	0.43 mg/l
Residual Free Chlorine	IS 3025 Part 26:1986 (Reaff:2019)	mg/l	BDL (DL:0.1 mg/l)	BDL (DL:0.1 mg/l)
Fluoride as F	APHA 23rd Edn. 2017:4500 F, D	mg/l	0.41 mg/l	0.39 mg/l
Nitrate as NO_3	IS 3025 Part 34:1988 (Reaff:2019)	mg/l	13.3 mg/l	14.3 mg/l
Copper as Cu	IS 3025 Part 65:2014 (Reaff:2019)	mg/l	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)
Manganese as Mn	IS 3025 Part 65:2014 (Reaff:2019)	mg/l	BDL (DL:0.02 mg/l)	BDL (DL:0.02 mg/l)
Mercury as Hg	USEPA 200.8	mg/l	BDL (DL:0.0005 mg/l)	BDL (DL:0.0005 mg/l)
Cadmium as Cd	IS 3025 Part 65:2014 (Reaff:2019)	mg/l	BDL (DL:0.001 mg/l)	BDL (DL:0.001 mg/l)
Selenium as Se	IS 3025 Part 65:2014 (Reaff:2019)	mg/l	BDL (DL:0.005 mg/l)	BDL (DL:0.005 mg/l)
Aluminium as Al	IS 3025 Part 65:2014 (Reaff:2019)	mg/l	BDL (DL:0.005 mg/l)	BDL (DL:0.005 mg/l)
Lead as Pb	IS 3025 Part 65:2014 (Reaff:2019)	mg/l	BDL (DL:0.005 mg/l)	BDL (DL:0.005 mg/l)
Zinc as Zn	IS 3025 Part 65:2014 (Reaff:2019)	mg/l	BDL(DL : 0.05 mg/l)	BDL(DL : 0.05 mg/l)
Total Chromium as Cr	IS 3025 Part 65:2014 (Reaff:2019)	mg/l	BDL(DL : 0.02 mg/l)	BDL(DL : 0.02 mg/l)

Boron as B	IS 3025 Part 65:2014 (Reaff:2019)	mg/l	BDL(DL : 0.05 mg/l)	BDL(DL : 0.05 mg/l)
Mineral Oil	IS 3025 Part 39-1991 (Reaff. 2019)	mg/l	BDL(DL : 0.01 mg/l)	BDL(DL : 0.01 mg/l)
Phenolic compounds as C_6H_5OH	IS 3025 Part 43-1992(Reaff: 2019)	mg/l	BDL (DL:0.0005 mg/l)	BDL (DL:0.0005 mg/l)
Anionic Detergents (as MBAS)	IS 13428 – 2005 (Reaff:2019) (Annex K)	mg/l	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)
Cyanide as CN	IS 3025 Part 27-1986 (Reaff. 2019)	mg/l	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)
BOD @ 27°C for 3 days	IS 3025 Part 44:1993 (Reaff:2019)	mg/l	12.8 mg/l	14.8 mg/l
Chemical Oxygen Demand	IS 3025 Part 58:2006 (Reaff:2017)	mg/l	30.6 mg/l	40.2 mg/l
Dissolved Oxygen	IS 3025 Part 38:1989 (Reaff:2019)	mg/l	5.6 mg/l	5.9 mg/l
Barium as Ba	IS 3025 Part 65:2014 (Reaff:2019)	mg/l	BDL (DL:0.05 mg/l)	BDL (DL:0.05 mg/l)
Ammonia (as total ammonia-N)	IS 3025 Part 34-1988 (Reaff. 2019)	mg/l	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)
Sulphide as H_2S	IS 3025 Part 29-1986 (Reaff: 2019)	mg/l	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)
Molybdenum as Mo	IS 3025 Part 65:2014 (Reaff:2019)	mg/l	BDL (DL:0.02 mg/l)	BDL (DL:0.02 mg/l)
Total Arsenic as As	IS 3025 Part 65:2014 (Reaff:2019)	mg/l	BDL (DL:0.005 mg/l)	BDL (DL:0.005 mg/l)
Total Suspended Solids	IS 3025 Part 17 -1984 (Reaff:2017)	mg/l	10.9 mg/l	10.2 mg/l
Discipline: Biological				
Total Coliform	APHA 23rd Edn. 2017:9221F	MPN/100ml	1325 MPN/100ml	1215 MPN/100ml
Escherichia coli	APHA 23rd Edn. 2017:9221F	MPN/100ml	218 MPN/100ml	208 MPN/100ml

Source: On-site monitoring/sampling by CHENNAI METTEX LAB PRIVATE LIMITED in association with GEMS

TABLE 3.10: GROUND WATER SAMPLING RESULTS

TEST	PROTOCOL	Unit	WW1 - Near Project Area	WW2 - Duraisamypuram	BW1 - Near Project Area	BW2 – Thayilpatti
Discipline: Chemical						
Colour	IS 3025 Part 4:1983 (Reaff:2017)	-	1	1 Hazen	1 Hazen	1 Hazen
Odour	IS 3025 Part 5:2018	-	Agreeable	Agreeable	Agreeable	Agreeable
pH at 25°C	IS 3025 Part 11:1983 (Reaff:2017)	-	7.52	7.41	7.65	7.65
Conductivity @ 25°C	IS 3025 Part 14:2013 (Reaff:2019)	µmhos/cm	1140.0 µmhos/cm	1023 µmhos/cm	892.0 µmhos/cm	831.5 µmhos/cm
Turbidity	IS 3025 Part 10:1984 (Reaff:2017)	NTU	1 NTU	1 NTU	1 NTU	1 NTU
Total Dissolved Solids	IS 3025 Part 16:1984 (Reaff:2017)	mg/l	661.0mg/l	893.0 mg/l	517.0mg/l	482.0 mg/l
Total Hardness as $CaCO_3$	IS 3025 Part 21:2009 (Reaff:2019)	mg/l	192.0 mg/l	168.0 mg/l	156.0 mg/l	136.0 mg/l
Calcium as Ca	IS 3025 Part 40:1991 (Reaff:2019)	mg/l	49.6 mg/l	44.8 mg/l	33.6 mg/l	28.8 mg/l
Magnesium as Mg	IS 3025 Part 46:1994 (Reaff:2019)	mg/l	16.5 mg/l	13.6 mg/l	17.5 mg/l	15.5mg/l
Total Alkalinity as $CaCO_3$	IS 3025 Part 23:1986 (Reaff:2019)	mg/l	185.0 mg/l	156.0 mg/l	126.8mg/l	118.4 mg/l
Chloride as Cl	IS 3025 Part 32:1988 (Reaff:2019)	mg/l	210.0 mg/l	192.0 mg/l	169.5 mg/l	153.6 mg/l
Sulphate as SO_4	IS 3025 Part 24:1986 (Reaff:2019)	mg/l	38.9 mg/l	35.6 mg/l	29.8 mg/l	28.8 mg/l
Iron as Fe	IS 3025 Part 53:2003 (Reaff:2019)	mg/l	0.38 mg/l	0.32 mg/l	0.26 mg/l	0.25 mg/l
Residual Free Chlorine	IS 3025 Part 26:1986 (Reaff:2019)	mg/l	BDL (DL:0.1 mg/l)	BDL (DL:0.1 mg/l)	BDL (DL:0.1 mg/l)	BDL (DL:0.1 mg/l)
Fluoride as F	APHA 23rd Edn. 2017:4500 F,D	mg/l	0.34 mg/l	0.31 mg/l	0.28 mg/l	0.21 mg/l
Nitrate as NO_3	IS 3025 Part 34:1988 (Reaff:2019)	mg/l	2.1 mg/l	2.5 mg/l	2.6 mg/l	2.3 mg/l
Copper as Cu	IS 3025 Part 65:2014 (Reaff:2019)	mg/l	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)

Manganese as Mn	IS 3025 Part 65:2014 (Reaff:2019)	mg/l	BDL (DL:0.02 mg/l)	BDL (DL:0.02 mg/l)	BDL (DL:0.02 mg/l)	BDL (DL:0.02 mg/l)
Mercury as Hg	USEPA 200.8	mg/l	BDL (DL:0.0005 mg/l)	BDL (DL:0.0005 mg/l)	BDL (DL:0.0005 mg/l)	BDL (DL:0.0005 mg/l)
Cadmium as Cd	IS 3025 Part 65:2014 (Reaff:2019)	mg/l	BDL (DL:0.001 mg/l)	BDL (DL:0.001 mg/l)	BDL (DL:0.001 mg/l)	BDL (DL:0.001 mg/l)
Selenium as Se	IS 3025 Part 65:2014 (Reaff:2019)	mg/l	BDL (DL:0.005 mg/l)	BDL (DL:0.005 mg/l)	BDL (DL:0.005 mg/l)	BDL (DL:0.005 mg/l)
Aluminium as Al	IS 3025 Part 65:2014 (Reaff:2019)	mg/l	BDL (DL:0.005 mg/l)	BDL (DL:0.005 mg/l)	BDL (DL:0.005 mg/l)	BDL (DL:0.005 mg/l)
Lead as Pb	IS 3025 Part 65:2014 (Reaff:2019)	mg/l	BDL (DL:0.005 mg/l)	BDL (DL:0.005 mg/l)	BDL (DL:0.005 mg/l)	BDL (DL:0.005 mg/l)
Zinc as Zn	IS 3025 Part 65:2014 (Reaff:2019)	mg/l	BDL(DL : 0.05 mg/l)	BDL(DL : 0.05 mg/l)	BDL(DL : 0.05 mg/l)	BDL(DL : 0.05 mg/l)
Total Chromium as Cr	IS 3025 Part 65:2014 (Reaff:2019)	mg/l	BDL(DL : 0.02 mg/l)	BDL(DL : 0.02 mg/l)	BDL(DL : 0.02 mg/l)	BDL(DL : 0.02 mg/l)
Boron as B	IS 3025 Part 65:2014 (Reaff:2019)	mg/l	BDL(DL : 0.05 mg/l)	BDL(DL : 0.05 mg/l)	BDL(DL : 0.05 mg/l)	BDL(DL : 0.05 mg/l)
Mineral Oil	IS 3025 Part 39-1991 (Reaff. 2019)	mg/l	BDL(DL : 0.01 mg/l)	BDL(DL : 0.01 mg/l)	BDL(DL : 0.01 mg/l)	BDL(DL : 0.01 mg/l)
Phenolic compounds as C_6H_5OH	IS 3025 Part 43-1992(Reaff: 2019)	mg/l	BDL (DL:0.0005 mg/l)	BDL (DL:0.0005 mg/l)	BDL (DL:0.0005 mg/l)	BDL (DL:0.0005 mg/l)
Anionic Detergents (as MBAS)	IS 13428 – 2005 (Reaff:2019) (Annex K)	mg/l	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)
Cyanide as CN	IS 3025 Part 27-1986 (Reaff. 2019)	mg/l	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)
Barium as Ba	IS 3025 Part 44:1993 (Reaff:2019)	mg/l	BDL(DL:0.05 mg/l)	BDL(DL:0.05 mg/l)	BDL(DL:0.05 mg/l)	BDL(DL:0.05 mg/l)
Ammonia (as total ammonia-N)	IS 3025 Part 58:2006 (Reaff:2017)	mg/l	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)
Sulphide as H_2S	IS 3025 Part 38:1989 (Reaff:2019)	mg/l	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)
Molybdenum as Mo	IS 3025 Part 65:2014 (Reaff:2019)	mg/l	BDL (DL:0.02 mg/l)	BDL (DL:0.02 mg/l)	BDL (DL:0.02 mg/l)	BDL (DL:0.02 mg/l)
Total Arsenic as As	IS 3025 Part 34-1988 (Reaff. 2019)	mg/l	BDL (DL:0.005 mg/l)	BDL (DL:0.005 mg/l)	BDL (DL:0.005 mg/l)	BDL (DL:0.005 mg/l)
Total Suspended Solids	IS 3025 Part 29-1986 (Reaff: 2019)	mg/l	BDL (DL:1.0 mg/l)	BDL (DL:1.0 mg/l)	BDL (DL:1.0 mg/l)	BDL (DL:1.0 mg/l)

Discipline: Biological						
Total Coliform	APHA 23rd Edn. 2017:9221B	MPN/100ml	156 MPN/100ml	137.0 MPN/100ml	122 MPN/100ml	136 MPN/100ml
Escherichia coli	APHA 23rd Edn. 2017:9221F	MPN/100ml	< 1.8 MPN/100ml	< 1.8 MPN/100ml	< 1.8 MPN/100ml	< 1.8 MPN/100ml

Source: On-site monitoring/sampling by CHENNAI METTEX LAB PRIVATE LIMITED in association with GEMS

3.2.4 Interpretation& Conclusion

Surface Water

The pH varied from 7.85 – 7.88 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 777.0 – 791.0 mg/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 246.5 – 256.5 mg/l, Nitrates content is 13.3 – 14.3 mg/l and Sulphates varied from 45.2 – 47.8 mg/l.

Ground Water

The pH of the water samples collected ranged from 7.41 – 7.65 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 482 – 893 mg/l in all samples. Total hardness varied between 136 - 192 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 58-63m. The maximum depth proposed out of proposed projects is 42m BGL.

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 i.e., 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 8 open wells and 7 borewells.

The average water level in the open well is varies from = 10.7m to 12.9m bgl

The water level in the bore well is varies from = 60.4m to 62.5m bgl

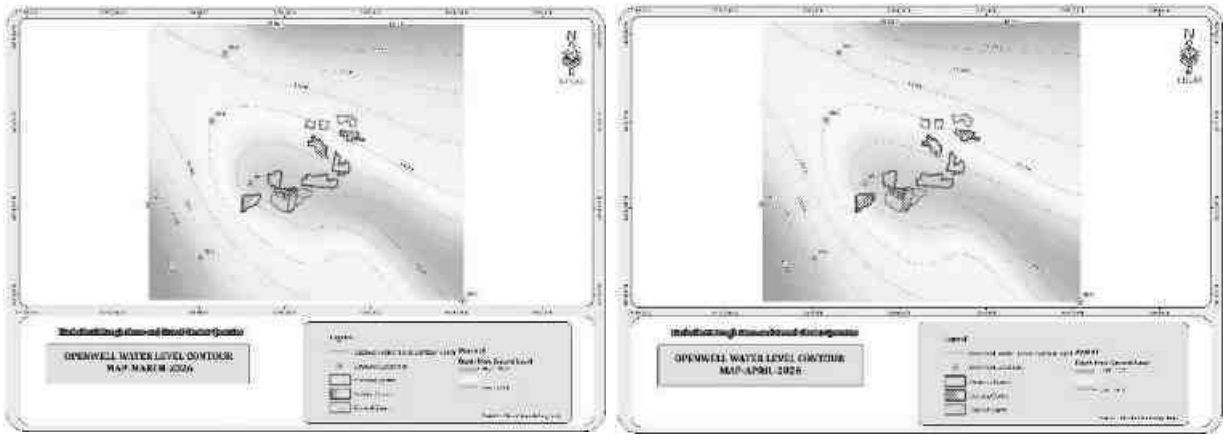
The water level in the area is above 58m-63m hence there is no possibilities of water table intersection during the entire mine life period besides it is also inferred topographically that there are no major water bodies intersecting the project area.

TABLE 3.11: PRE-MONSOON SEASON WATER LEVEL OF OPEN WELLS 1 KM RADIUS

S.NO	LABEL	LONGITUDE	LATITUDE	MARCH-26	APRIL-26	MAY-26
1	OW-1	78° 00' 17.9984" E	10° 04' 38.4589" N	14.6	15.2	15.8
2	OW-2	77° 59' 42.5596" E	10° 04' 31.3649" N	15.2	15.8	16.4
3	OW-3	78° 01' 32.3005" E	10° 03' 57.7992" N	14.6	15.2	15.8
4	OW-4	78° 00' 00.5513" E	10° 04' 12.5786" N	15.1	15.7	16.3
5	OW-5	78° 00' 04.5386" E	10° 05' 00.4166" N	14.8	15.4	16
6	OW-6	78° 00' 09.0154" E	10° 05' 23.7078" N	14.9	15.5	16.1
7	OW-7	78° 00' 24.8665" E	10° 05' 34.1926" N	15.2	15.8	16.4

Source: Onsite monitoring data

FIGURE 3.7: OPEN WELL CONTOUR MAP MARCH TO MAY 2026



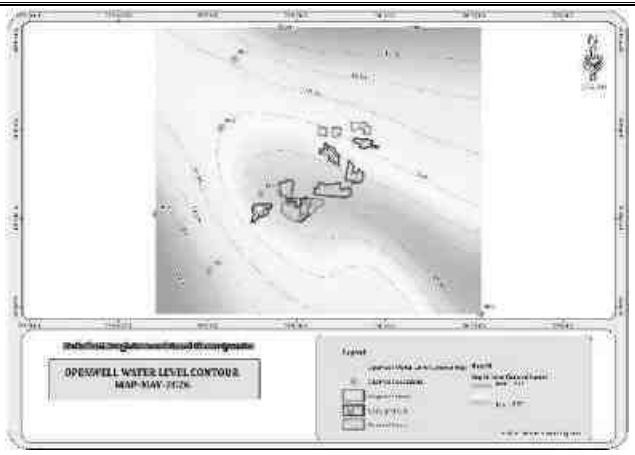


TABLE 3.12: PRE-MONSOON SEASON WATER LEVEL OF BOREWELLS 1 KM RADIUS

S.No	Name	LONGITUDE	LATITUDE	Mar-26	Apr-26	May-26
1	BW1	78° 00' 50.9079" E	10° 04' 38.7245" N	101.6	102.2	102.8
2	BW2	78° 00' 07.6372" E	10° 04' 19.8620" N	99.5	100.1	100.7
3	BW3	77° 59' 45.2959" E	10° 04' 25.6494" N	99.2	99.8	100.4
4	BW4	77° 59' 45.4471" E	10° 04' 56.2151" N	99.9	100.5	101.1
5	BW5	77° 59' 59.1077" E	10° 04' 46.6608" N	100.2	100.8	101.4
6	BW6	78° 00' 15.7094" E	10° 04' 55.3476" N	100.5	101.1	101.7
7	BW7	78° 00' 51.2923" E	10° 05' 11.7994" N	101.3	101.9	102.5
8	BW8	78° 00' 41.0745" E	10° 05' 45.1358" N	99.8	100.4	101
9	BW9	78° 01' 31.7260" E	10° 03' 52.4610" N	100.6	101.2	101.8

Source: Onsite monitoring data

FIGURE 3.8: BOREWELL CONTOUR MARCH TO MAY 2026

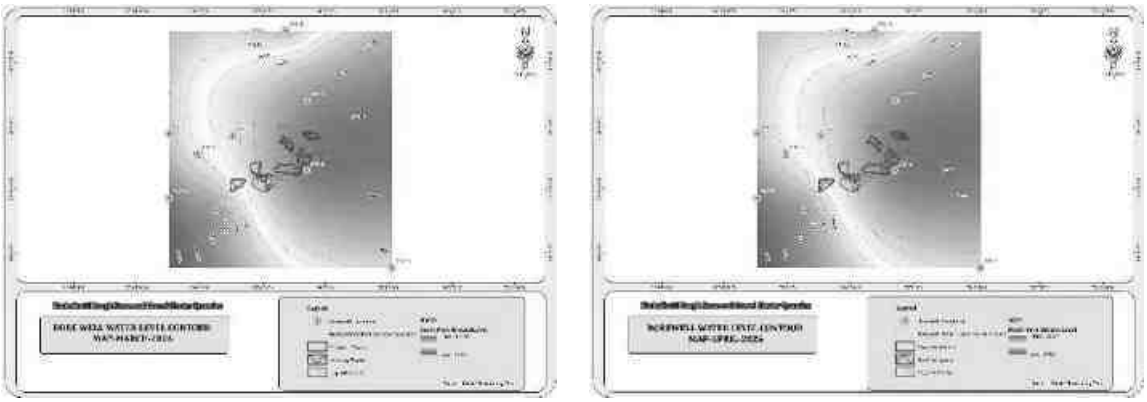


FIGURE 3.9: DRAINAGE MAP AROUND 10 KM RADIUS FROM PROJECT SITE

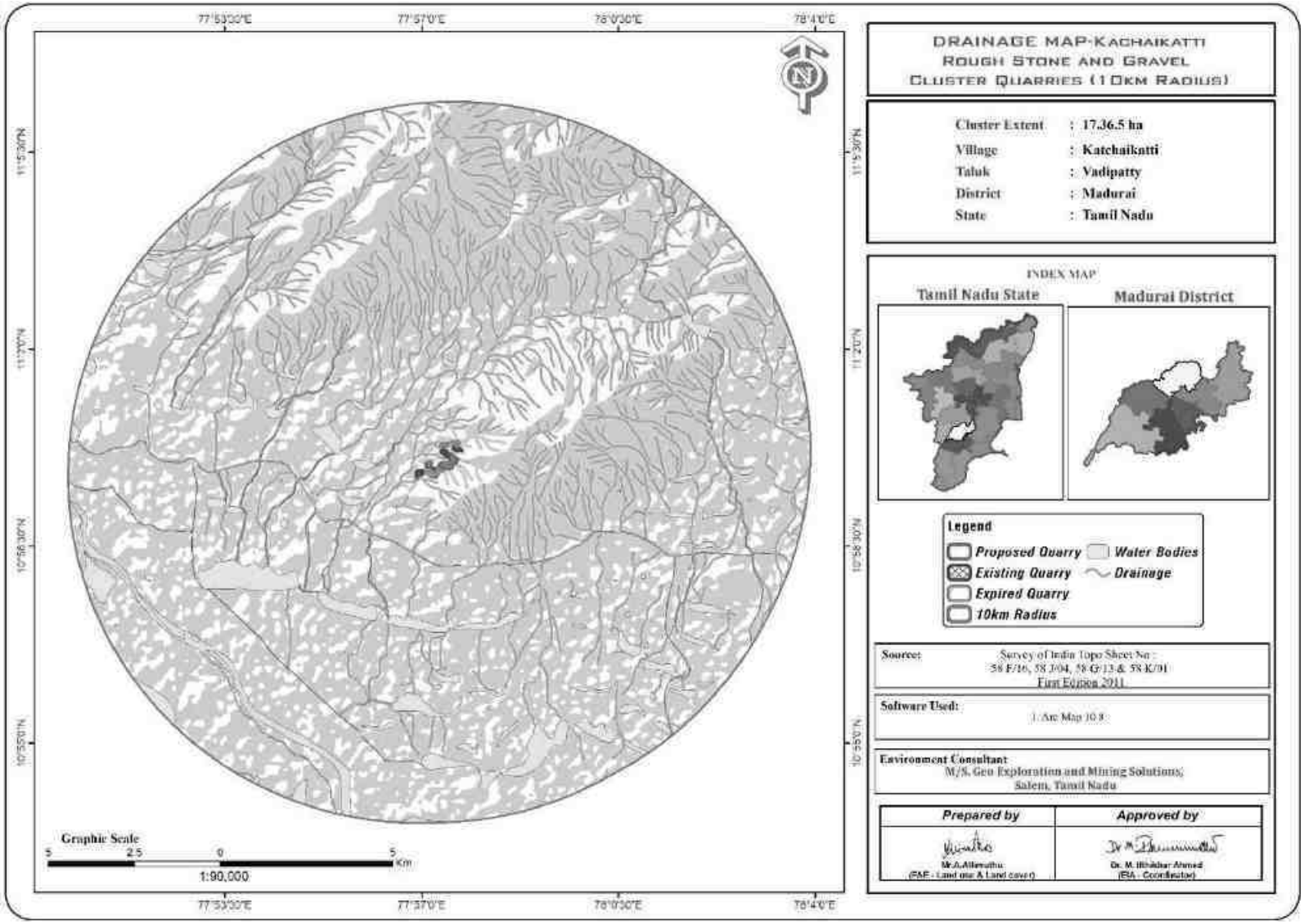
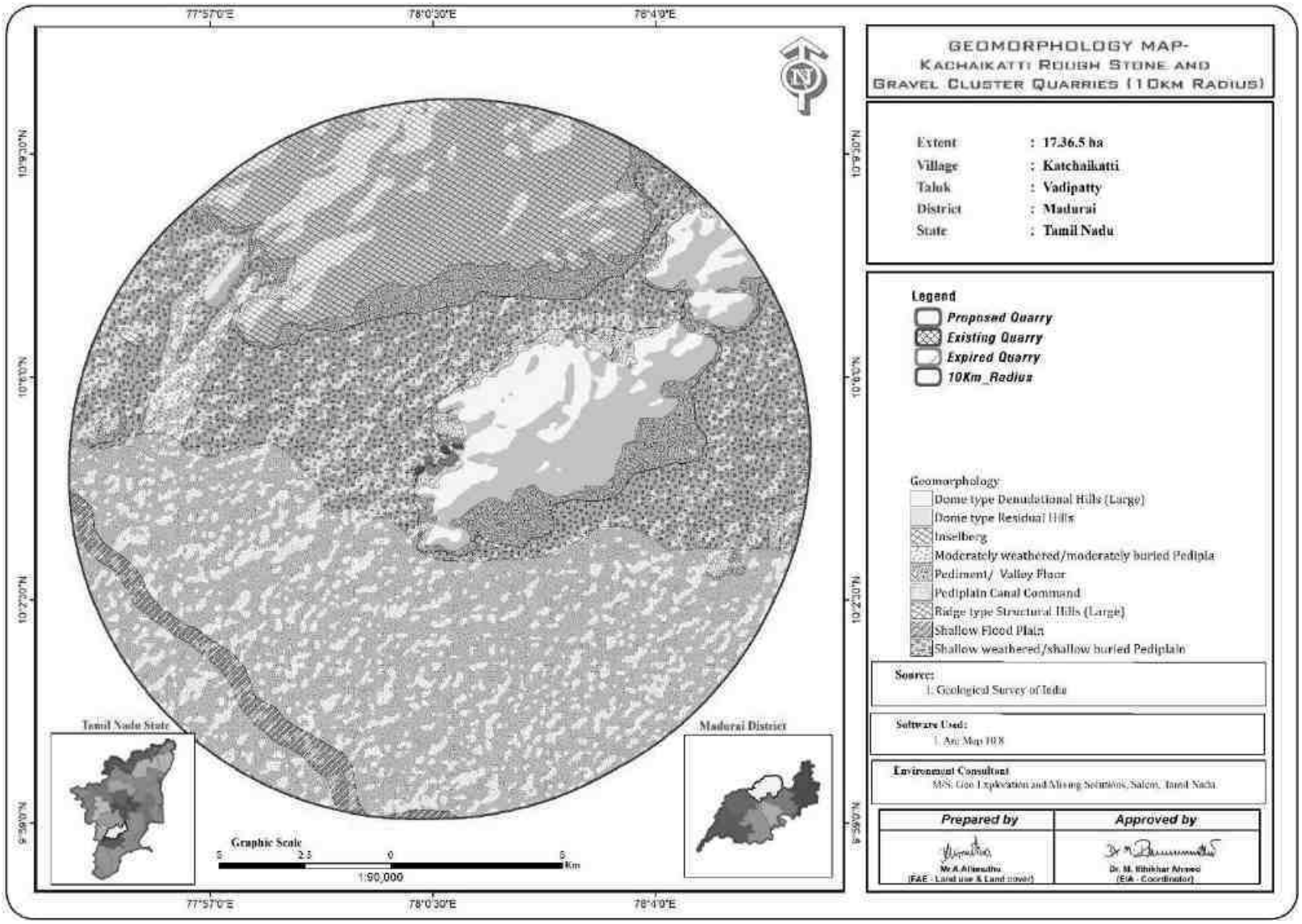


FIGURE 3.10: GROUND WATER PROSPECT MAP



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 farm 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.

$$\rho_a = \frac{G\Delta V}{I}$$

ΔV = potential difference between receiving electrodes

G = Geometric Factor.

Rocks show wide variation in resistivity ranging from 10-8 more than 10+14 ohmmeter. On a broad classification, one can group the rocks falling in the range of 10-8 to 1 ohmmeter as good conductors. 1 to 106 ohmmeter as intermediate conductors and 106 to 1012 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,

$$\rho_r = F\rho_w = a\,Ø^m\rho_w$$

ρr = Resistivity of Rocks

ρw = Resistivity of water in pores of rock

F = Formation Factor

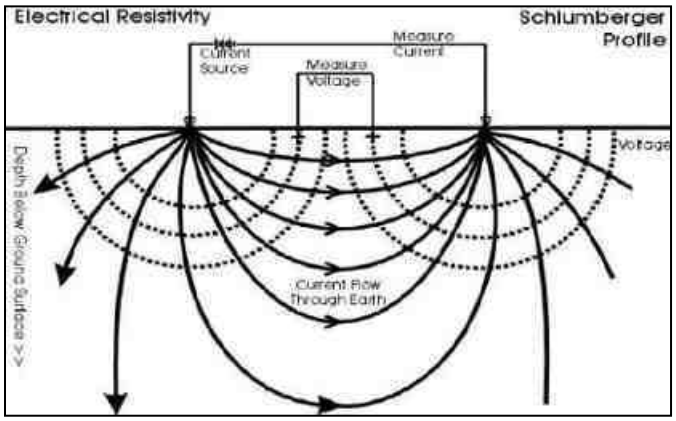
Ø = Fractional pore volume

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 nose ration can be enhanced by √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 … (1+2...+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 100 m. The maximum depth proposed out of proposed projects 73m 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 not intersected the water table is, 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-

- ✓ The atmospheric conditions prevailing in this region are of a tropical nature. The summers are much rainier than the winters in Madurai. This location is classified as Aw by Koppen and Geiger. In Madurai, the average annual temperature is 28.2°C | 82.7°F. The precipitation level on a yearly basis amounts to 849mm | 33.4inch as per the meteorological records.
- ✓ The Madurai are located close to the equator, making the summers difficult to define. The best time to travel is January, February, March, September, November, December.
- ✓ The month with the least amount of precipitation is January exhibiting a mere 16mm | 0.6inch rainfall. The greatest amount of precipitation occurs in October, with an average of 180mm | 7.1inch.
- ✓ The month of May boasts the highest average temperature, with a recorded maximum of 31.0°C | 87.8°F. The lowest average temperatures in the year occur in December, when it is around 24.6°C | 76.4°F.

https://en.climate-data.org/asia/india/tamil-nadu/madurai-5892/

TABLE 3.13: RAINFALL DATA

Actual Rainfall in mm						Normal Rainfall in mm
2019	2020	2021	2022	2023	2024 (As On 30.09.2024)	
13.7	1303.7	968.4	883.1	1166.8	549.1	773

TABLE 3.14: METEOROLOGICAL DATA RECORDED AT SITE

S.No	Parameters		Mar-2026	Apr-2026	May-2026
1	Temperature (^{0}C)	Max	30.53	30.96	31.23
		Min	25.92	27.26	27.93
		Avg	28.22	29.11	29.58
2	Relative Humidity (%)	Avg	62.35	69.32	68.73
3	Wind Speed (m/s)	Max	5.33	2.86	6.05
		Min	1.89	1.53	1.00

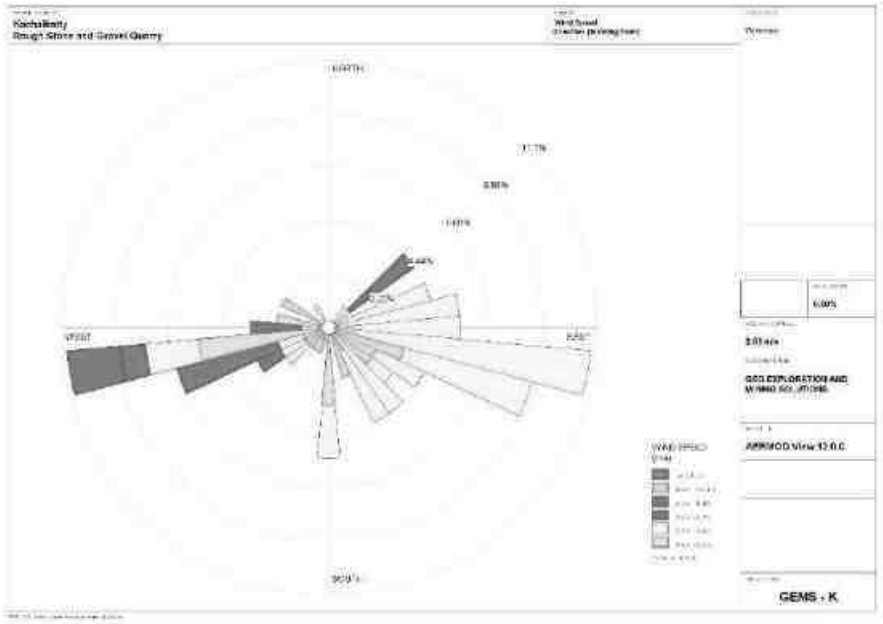
		Avg	3.61	2.19	3.52
4	Cloud Cover (OKTAS)		0-8	0-8	0-8
5	Wind Direction		E,ESE	ESE,SSE	WSW,W

Correlation between Secondary and Primary Data

The average rainfall over the period of five years 773m. The meteorological data collected at the site is almost similar to that of secondary data collected from TWAD Board – Virudhunagar.

Wind rose diagram of the study site is depicted in Figure. 3.11. Predominant downwind direction of the area during study season is West to East & SE

FIGURE 3.11: WINDROSE DIAGRAM



In the abstract of collected data wind rose were drawn on presented in figure No.3.11 during the monitoring period in the study area

1. Predominant winds were from NE,SE,SW
2. Wind speed readings were recorded between 2.10-3.60 m/s
3. Temperature readings ranging from 24.57 to 28.82°C
4. Relative humidity ranging from 62.35 – 69.32 %
5. 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 CHENNAI METTEX LAB PRIVATE LIMITED & 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 (µg/m3)	Annual Avg.* 24 hours**	50.0 80.0	20.0 80.0
2	Nitrogen Dioxide (µg/m3)	Annual Avg. 24 hours	40.0 80.0	30.0 80.0

3	Particulate matter (size less than 10µm) PM10 (µg/m3)	Annual Avg. 24 hours	60.0 100.0	60.0 100.0
4	Particulate matter (size less than 2.5 µm PM2.5 (µg/m3)	Annual Avg. 24 hours	40.0 60.0	40.0 60.0

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

*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 seven (7) locations, adopting a continuous 24 hourly (3 shift of 8-hour) schedule for the period March – May 2026. The baseline data of ambient air has been generated for PM_{10}, $PM_{2.5}$, Sulphur Dioxide (SO_2) & Nitrogen Dioxide (NO_2) 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 ± 0.5m 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 3.12 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	10° 4'44.94"N 78° 0'48.98"E
2	AAQ-2	Core Zone	Project Area	10° 4'39.36"N 78° 0'27.93"E
3	AAQ-3	Near Existing Quarry	250m NW	10° 4'55.01"N 78° 0'41.26"E
4	AAQ-4	Katchaikatti (School)	1.5km NW	10° 5'10.26"N 77°59'45.04"E
5	AAQ-5	Kattankulam (Residential)	3.5km SW	10° 3'1.81"N 77°59'17.57"E
6	AAQ-6	Ellaiyur (Residential)	3.4km NE	10° 6'28.66"N 78° 1'34.38"E
7	AAQ-7	Vittankulam (Residential)	5.5km SE	10° 2'19.14"N 78° 2'37.30"E

Source: On-site monitoring/sampling by CHENNAI METTEX LAB PRIVATE LIMITED in association with GEMS.

FIGURE 3.12: AMBIENT AIR QUALITY LOCATIONS AROUND 10 KM RADIUS

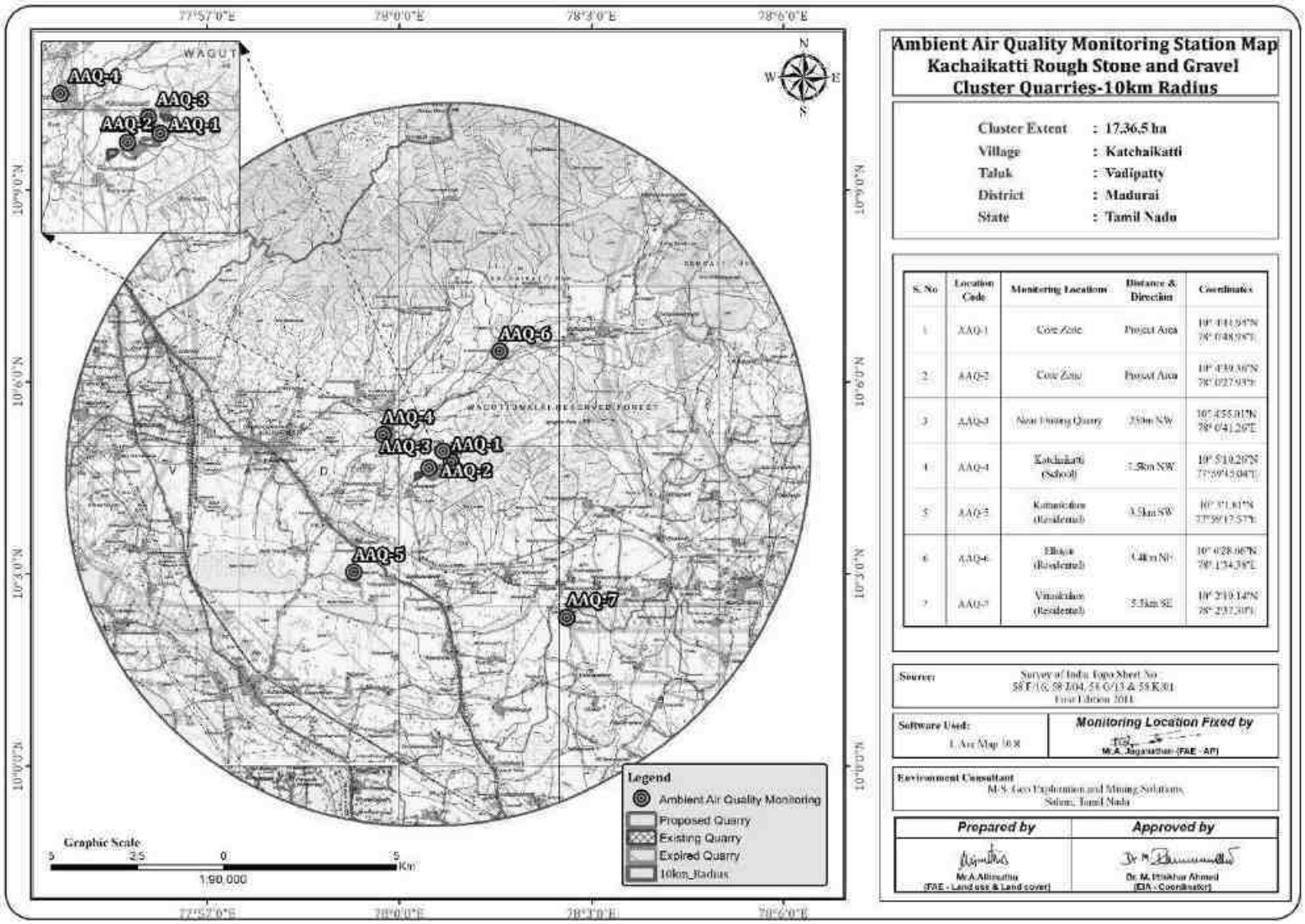


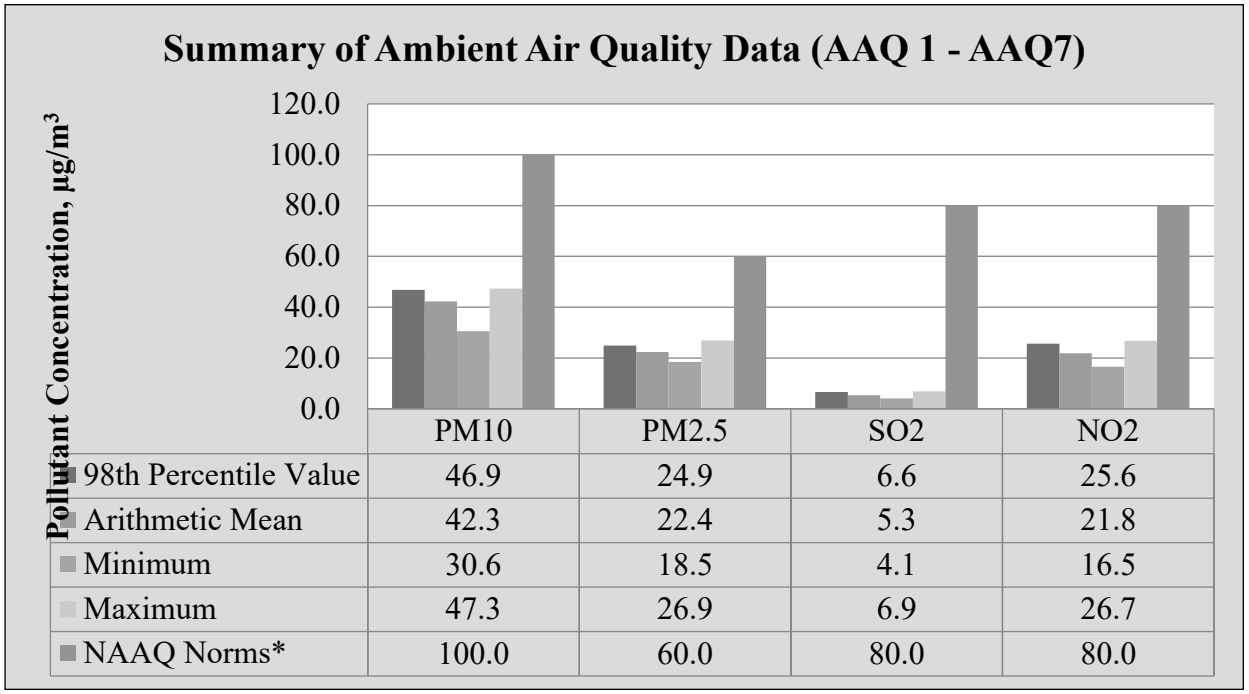
TABLE 3.18: SUMMARY OF AAQ 1 to AAQ 7

PM10	AAQ1	AAQ2	AAQ3	AAQ4	AAQ5	AAQ6	AAQ7
Arithmetic Mean	44.9	42.3	40.7	41.0	44.7	40.8	41.5
Minimum	42.0	30.6	34.9	36.8	42.5	38.5	36.8
Maximum	47.3	45.5	43.9	42.6	47.2	43.8	43.8
NAAQ Norms	100.0	100.0	100.0	100.0	100.0	100.0	100.0
PM2.5	**AAQ1**	**AAQ2**	**AAQ3**	**AAQ4**	**AAQ5**	**AAQ6**	**AAQ7**
Arithmetic Mean	22.7	22.3	22.4	21.9	23.5	23.2	20.8
Minimum	18.5	20.6	20.3	20.3	20.5	20.4	19.8
Maximum	26.9	23.7	24.2	23.8	24.8	24.9	22.6
NAAQ Norms	60.0	60.0	60.0	60.0	60.0	60.0	60.0
SO2	**AAQ1**	**AAQ2**	**AAQ3**	**AAQ4**	**AAQ5**	**AAQ6**	**AAQ7**
Arithmetic Mean	5.1	5.2	5.1	5.7	5.4	5.2	5.3
Minimum	4.1	4.3	4.1	4.5	4.1	4.1	4.1
Maximum	6.0	6.6	6.4	6.6	6.9	6.8	6.4
NAAQ Norms	80.0	80.0	80.0	80.0	80.0	80.0	80.0
NO2	**AAQ1**	**AAQ2**	**AAQ3**	**AAQ4**	**AAQ5**	**AAQ6**	**AAQ7**
Arithmetic Mean	23.9	23.2	23.2	20.5	20.6	19.4	22.1
Minimum	21.0	20.5	21.3	18.3	18.2	16.5	20.1
Maximum	26.7	25.6	25.7	23.7	25.5	23.5	24.6
NAAQ Norms	80.0	80.0	80.0	80.0	80.0	80.0	80.0

TABLE 3.19: ABSTRACT OF AMBIENT AIR QUALITY DATA

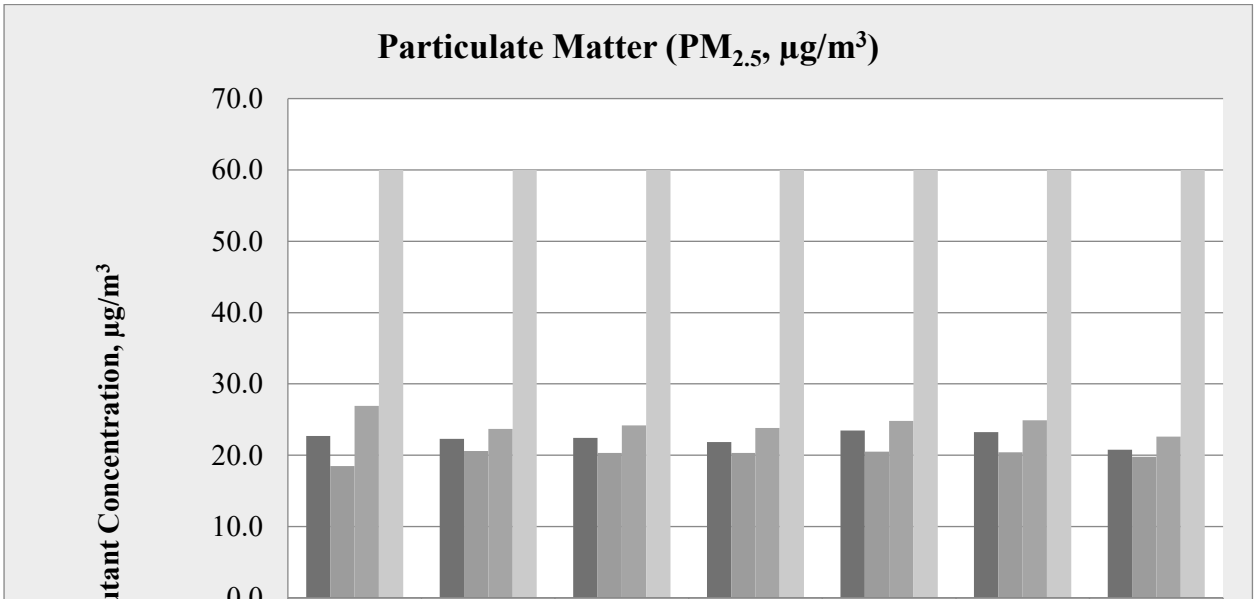
	Parameter	PM10	PM2.5	SO_2	NO_2
	No. of Observations	182	182	182	182
1	10th Percentile Value	40.1	20.4	4.4	18.9
2	20th Percentile Value	40.8	21.2	4.5	19.5
3	30th Percentile Value	41.4	21.6	4.9	20.5
4	40th Percentile Value	41.7	21.9	5.2	21.3
5	50th Percentile Value	42.1	22.4	5.4	21.9
6	60th Percentile Value	42.7	22.7	5.5	22.5
7	70th Percentile Value	43.6	23.3	5.6	23.4
8	80th Percentile Value	44.3	23.6	5.8	23.7
9	90th Percentile Value	45.3	24.1	6.1	24.5
10	95th Percentile Value	46.2	24.6	6.4	25.5
11	98th Percentile Value	46.9	24.9	6.6	25.6
12	Arithmetic Mean	42.3	22.4	5.3	21.8
13	Geometric Mean	42.2	22.3	5.2	21.7
14	Standard Deviation	2.5	1.4	0.6	2.2
15	Minimum	30.6	18.5	4.1	16.5
16	Maximum	47.3	26.9	6.9	26.7
	NAAQ Norms*	100.0	60.0	80.0	80.0
	% Values exceeding Norms*	0.0	0.0	0.0	0.0

FIGURE 3.13: BAR DIAGRAM OF SUMMARY OF AAQ 1 – AAQ7



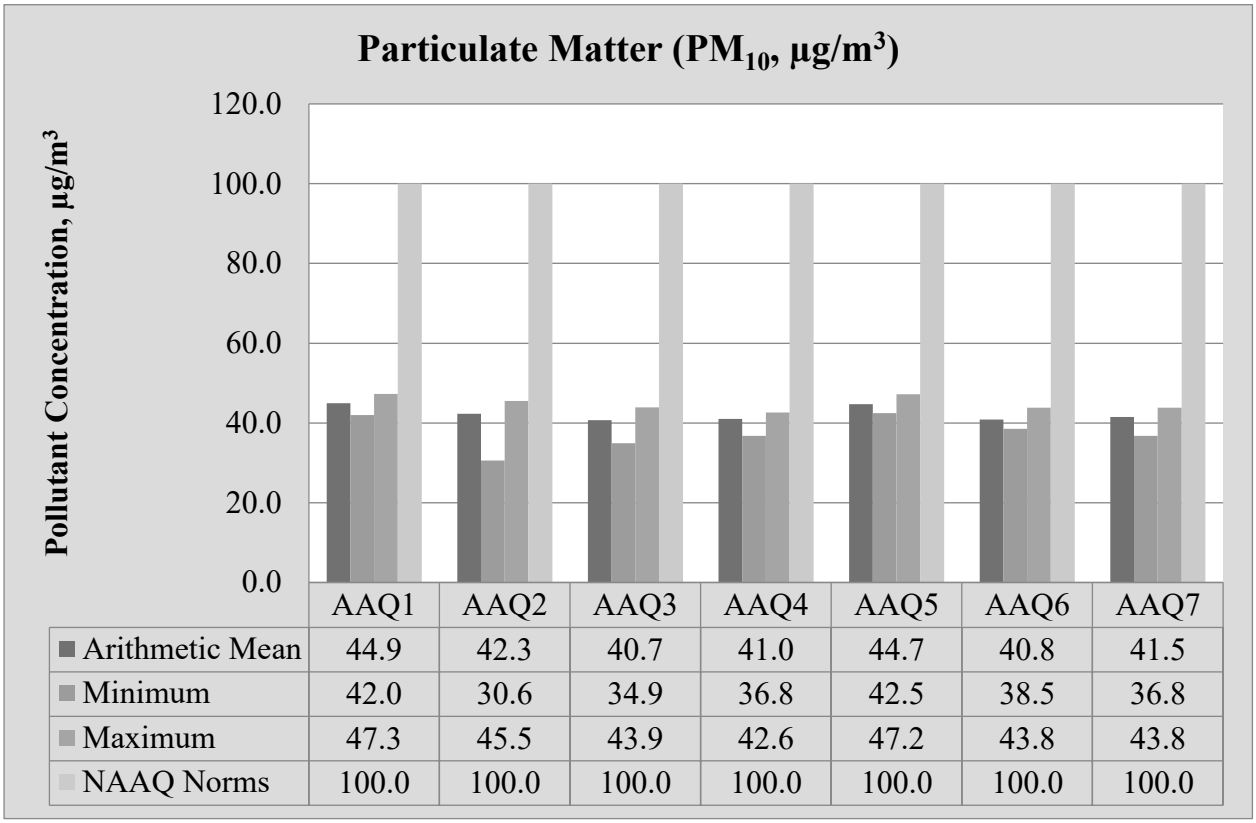
	PM10	PM2.5	SO2	NO2
98th Percentile Value	46.9	24.9	6.6	25.6
Arithmetic Mean	42.3	22.4	5.3	21.8
Minimum	30.6	18.5	4.1	16.5
Maximum	47.3	26.9	6.9	26.7
NAAQ Norms*	100.0	60.0	80.0	80.0

FIGURE 3.14: BAR DIAGRAM OF PARTICULATE MATTER $PM_{2.5}$



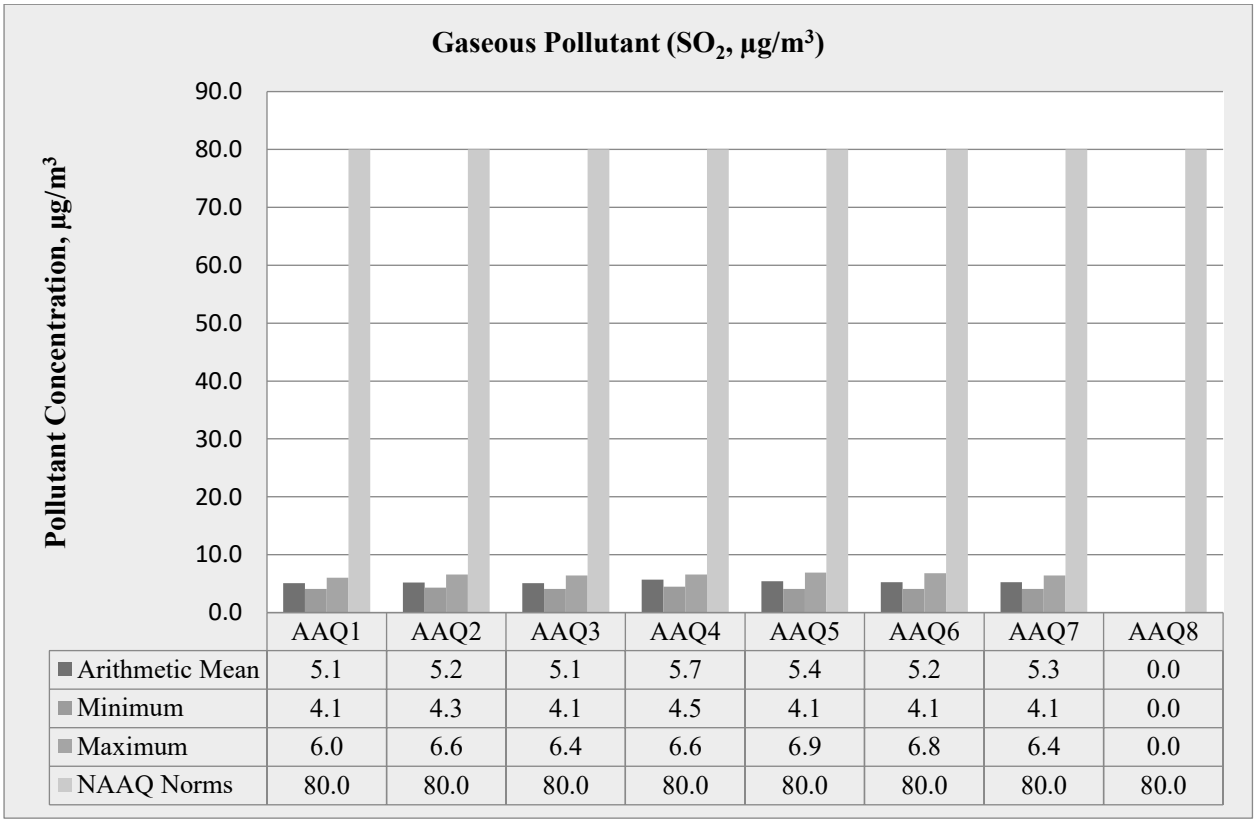
	AAQ1	AAQ2	AAQ3	AAQ4	AAQ5	AAQ6	AAQ7
Arithmetic Mean	22.7	22.3	22.4	21.9	23.5	23.2	20.8
Minimum	18.5	20.6	20.3	20.3	20.5	20.4	19.8
Maximum	26.9	23.7	24.2	23.8	24.8	24.9	22.6
NAAQ Norms	60.0	60.0	60.0	60.0	60.0	60.0	60.0

FIGURE 3.15: BAR DIAGRAM OF PARTICULATE MATTER PM_{10}



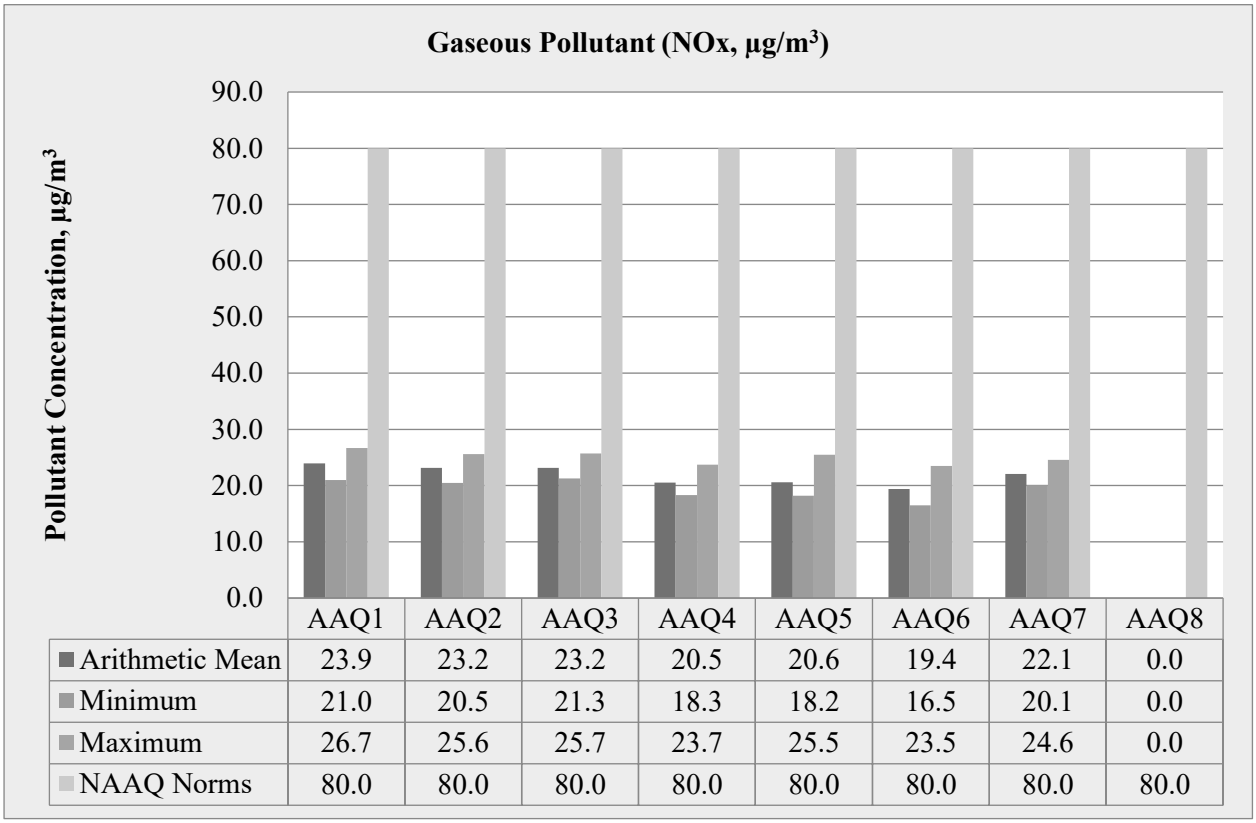
	AAQ1	AAQ2	AAQ3	AAQ4	AAQ5	AAQ6	AAQ7
Arithmetic Mean	44.9	42.3	40.7	41.0	44.7	40.8	41.5
Minimum	42.0	30.6	34.9	36.8	42.5	38.5	36.8
Maximum	47.3	45.5	43.9	42.6	47.2	43.8	43.8
NAAQ Norms	100.0	100.0	100.0	100.0	100.0	100.0	100.0

FIGURE 3.16: BAR DIAGRAM OF GASEOUS POLLUTANT SO_2



	AAQ1	AAQ2	AAQ3	AAQ4	AAQ5	AAQ6	AAQ7	AAQ8
Arithmetic Mean	5.1	5.2	5.1	5.7	5.4	5.2	5.3	0.0
Minimum	4.1	4.3	4.1	4.5	4.1	4.1	4.1	0.0
Maximum	6.0	6.6	6.4	6.6	6.9	6.8	6.4	0.0
NAAQ Norms	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0

FIGURE 3.17: BAR DIAGRAM OF GASEOUS POLLUTANT NO_x



3.3.7 Fugitive Dust Emission –

Fugitive dust was recorded at 7AAQ monitoring stations for 30 days average during the study period.

TABLE 3.20: AVERAGE FUGITIVE DUST SAMPLE VALUES

AAQ Locations	Avg SPM (µg/m^3)
AAQ 1	64.38
AAQ 2	66.86
AAQ 3	66.86
AAQ 4	61.39
AAQ 5	64.66
AAQ 6	64.04
AAQ7	62.77

FIGURE 3.18: LINE DIAGRAM OF AVERAGE SPM VALUES

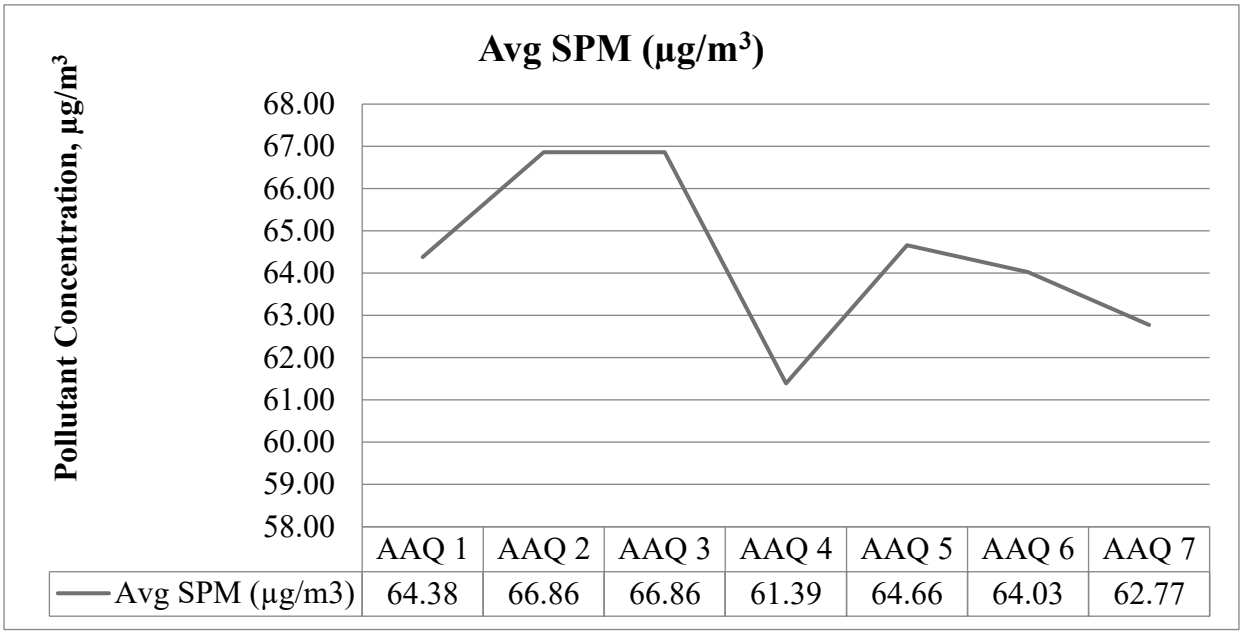
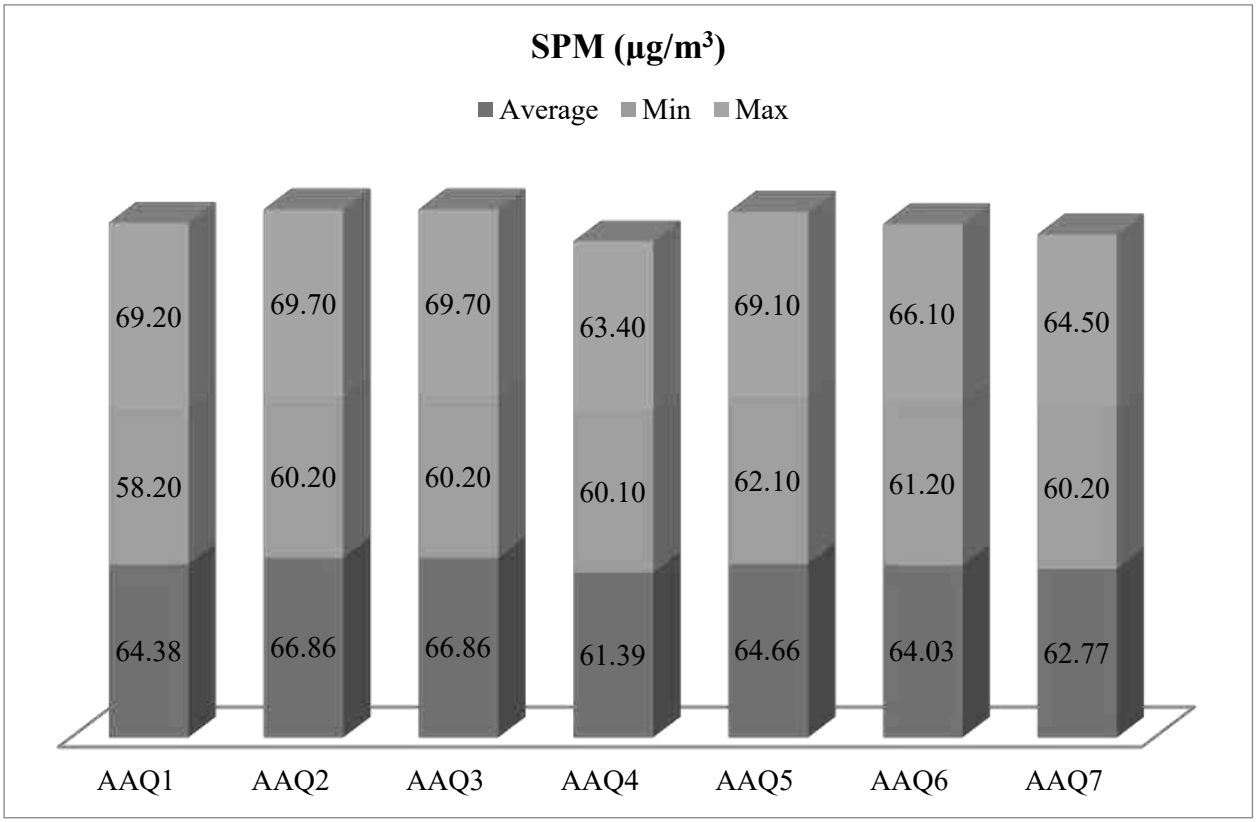


TABLE 3.21: FUGITIVE DUST SAMPLE VALUES IN µg/m³

SPM (µg/m³)	AAQ1	AAQ2	AAQ3	AAQ4	AAQ5	AAQ6	AAQ7
Average	64.38	66.86	66.86	61.39	64.66	64.03	62.77
Min	58.20	60.20	60.20	60.10	62.10	61.20	60.20
Max	69.20	69.70	69.70	63.40	69.10	66.10	64.50

Source: Calculations from Lab Analysis Reports

FIGURE 3.19: BAR DIAGRAM OF SPM VALUES



3.3.6 Interpretations & Conclusion

As per monitoring data, PM_{10} ranges from 30.6 to 47.3 µg/m^3, $PM_{2.5}$ data ranges from 18.5 to 26.9 µg/m^3, SO_2 ranges from 4.1 to 6.9 µg/m^3 and NO_2 data ranges from 16.5 to 26.7 µg/m^3. 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 3.22: DETAILS OF SURFACE NOISE MONITORING LOCATIONS

S. No	Location Code	Monitoring Locations	Distance & Direction	Coordinates
1	N-1	Core Zone	Project Area	10° 4'43.63"N 78° 0'51.93"E
2	N-2	Core Zone	Project Area	10° 4'41.99"N 78° 0'28.02"E
3	N-3	Near Existing Quarry	250m NW	10° 4'56.52"N 78° 0'39.78"E
4	N-4	Katchaikatti (School)	1.5km NW	10° 5'10.28"N 77°59'45.36"E
5	N-5	Kattankulam (Residential)	3.5km SW	10° 2'52.43"N 77°59'18.09"E
6	N-6	Ellaiyur (Residential)	3.4km NE	10° 6'29.03"N 78° 1'33.97"E
7	N-7	Vittankulam (Residential)	5.5km SE	10° 2'20.22"N 78° 2'36.97"E

Source: On-site monitoring/sampling by CHENNAI METTEX LAB PRIVATE LIMITED 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,

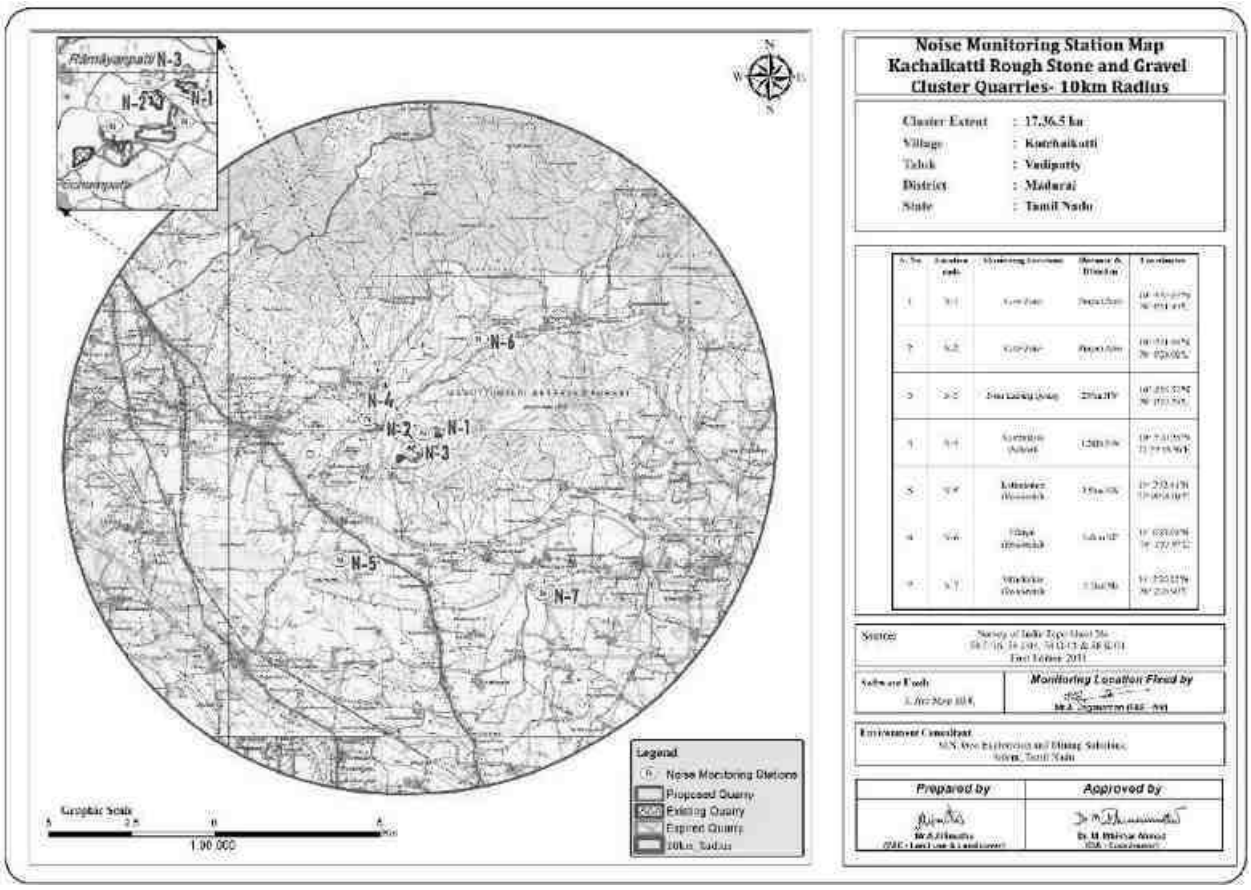
Leq = 10 Log L / T∑ (10Ln/10)

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 3.20: 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 3.23.

Day time: 6:00 hours to 22.00 hours.

Night time: 22:00 hours to 6.00 hours.

TABLE 3.23: AMBIENT NOISE QUALITY RESULT

S. No	Locations	Noise level (dB (A) Leq)		Ambient Noise Standards
		Day Time	Night Time	
1	Core Zone	38.3	35.1	**Industrial Day Time- 75 dB (A) Night Time- 70 dB (A)**
2	Core Zone	40.7	35.3	
3	Near Existing Quarry	37.6	36.5	**Residential Day Time– 55 dB (A) Night Time- 45 dB (A)**
4	Katchaikatti (School)	38.0	35.5	
5	Kattankulam (Residential)	37.9	35.1	
6	Ellaiyur (Residential)	40.9	35.6	
7	Vittankulam (Residential)	40.7	34.7	

Source: On-site monitoring/sampling by CHENNAI METTEX LAB PRIVATE LIMITED in association with GEMS.

FIGURE 3.21: DAY TIME NOISE LEVELS IN CORE AND BUFFER ZONE

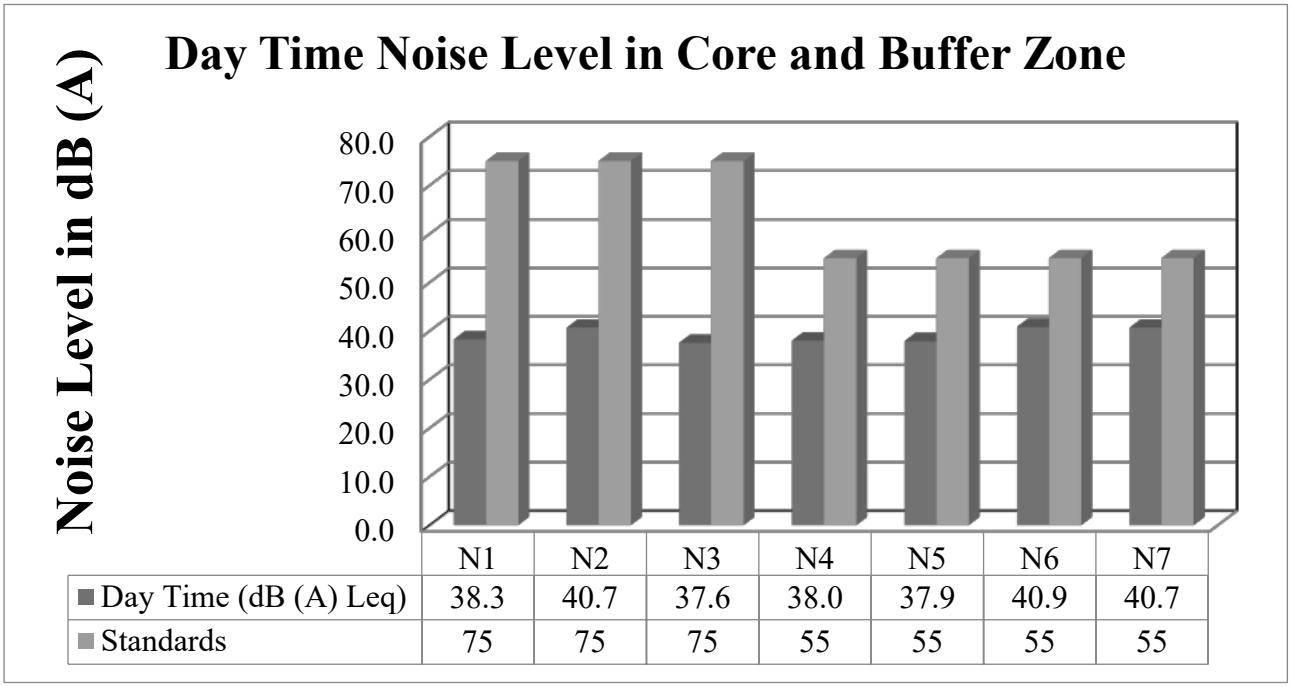
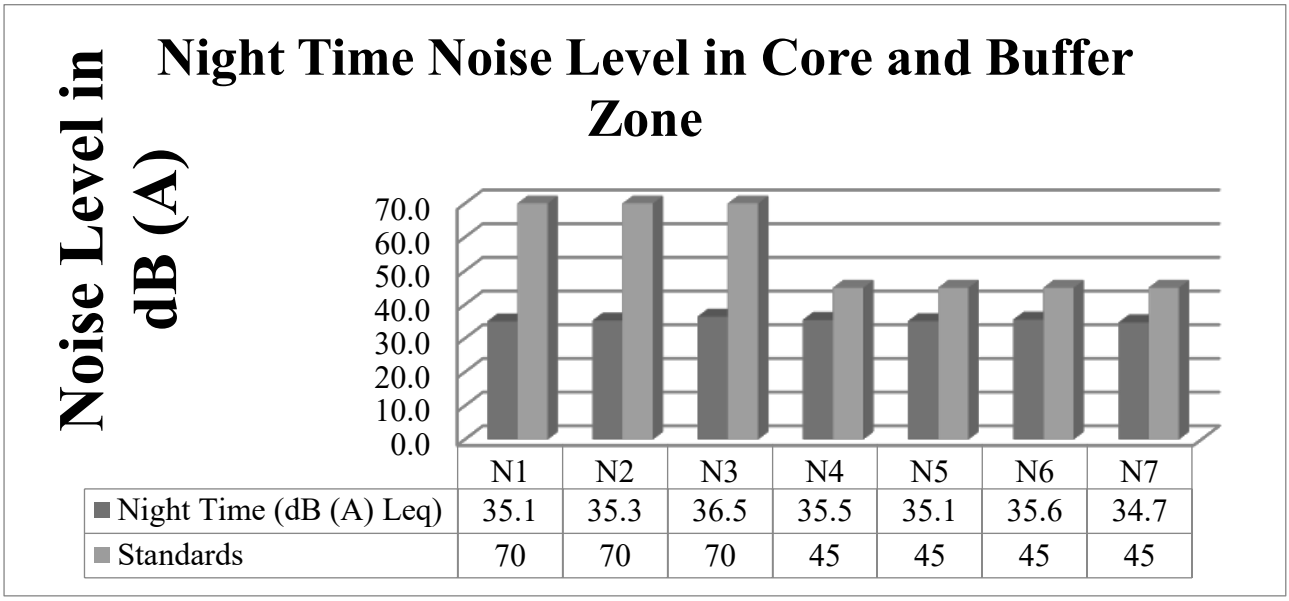


FIGURE 3.22: NIGHT TIME NOISE LEVELS IN CORE AND BUFFER ZONE



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 38.3 – 40.7 dB (A) Leq and during night time were from 35.1-35.3 dB (A) Leq. Noise levels recorded in buffer zone during day time were from 37.6 – 40.9 dB (A) Leq and during night time were from 34.7 – 36.5 (A)Leq. Thus, the noise level for Industrial and Residential area meets the requirements of CPCB.

3.5. Biological Environment

3.5.1.Study area Ecology

The proposed Rough stone and Gravel quarry core area total extent of 8.89.0Ha of has an impact on the diversity of flora and fauna of the surrounding area. But present work was carried out on the detailed study of the impacts of the Rough stone and gravel quarry on the ecology and biodiversity of the core lease area with the proper mitigation and sustainable management plan. The proposed mine lease area exhibits plain topography. The following methods were applied during the baseline study of flora, fauna and diversity assessment.

3.5.2. Objectives of Biological Studies

a) To study the likely impact of the proposed mining project on the local biodiversity and to suggest mitigation measures, if required, for vulnerable biota.
b) Undertake intensive field survey to assess the status of floral & faunal component in different habitats in the core and buffer areas of the project site.
c) Identification and listing of flora and fauna which are important as per the Wildlife (Protection) Act 1972.
d) 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 as per the Wildlife (Protection) amendment Act 2022.
e) To identify the impacts of mining on agricultural lands and how it affects.
f) Proper collection of information about wildlife Sanctuaries/ national parks/ biosphere reserves of the project area.
g) Devise management & conservation measures for biodiversity.

3.5.3. Necessity of the Ecology Management Plan

Monitoring the influence of anthropogenic activities on flagship species is an important part of conserving biodiversity, because the information gained is crucial for the development and adaptation of conservation management plans. Ecological monitoring provides feedback about the actual environmental impacts of a project. Monitoring results help judge the success of mitigation measures in protecting the environment. They are also used to ensure compliance with environmental standards, and to facilitate any needed project design or operational changes.

Regulatory bodies worldwide are increasingly recognizing the fact that human activities are causing environmental and ecological damage. To effectively deal with this environmental crisis, it is important to understand its dimensions and dynamics. What specifically are the damages, how are they changing over time, and the best means of prevention or mitigation. To develop precise ecology management plan, longer-term programs of monitoring and research must be designed and implemented. Such programs are capable of detecting environmental and ecological change over large areas, and of developing an understanding of the causes and consequences of those changes.

3.5.4. 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 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).

3.5.5. The secondary baseline data of flora and fauna has been complied through the following data sources:

1. Forest working plan
2. Schedule I to IV: The Wildlife (Protection) Amendment Act, 2022
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

3.5.6. 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.

3.5.7. Part I Field Sampling Techniques (Fauna Sampling)

3.5.7.1. 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.

3.5.7.2. 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.

3.5.7.3. 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).

3.5.7.4. 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.

3.5.7.5. Multiple Stage Quadrats – Vegetation

A variety of habitat or vegetation structure variables were measured using the Multiple Stage Quadrat sampling protocol (Sykes and Horrill 1977). All of those areas were sampled, and the major corners were temporarily delineated with colored ribbons. Each site was identified in the field using a compass and clinometer, and the plot's latitude, longitude, and elevation were recorded using a handheld Global Positioning System (Garmin 12XL).

3.5.8. Flora

3.5.8.1. Quadrat Sampling Method

The quadrat sampling technique was used for sampling vegetation. Sampling quadrats of the regular shape of dimensions 10 × 10 m, 5 × 5 m, and 1 × 1 m, were nested within each other and were defined as the units for sampling the area and measuring the diversity for trees, Shrubs, and herbs respectively.

3.5.8.2. Flora Composition in the Core Zone (Primary data)

Core zone flora samplings were conducted between 8.30 am to 10.30 am in three locations. The applied area is an exhibiting flat terrain, so we used quadrat sampling methods. Taxonomically a total of 20 species belonging to 14 families have been recorded from the core mining lease area based on habitat classification of the enumerated plants the majority of species were Trees 7, followed by Herbs 6, Shrubs 3 and Grasses 3.

Table No: 3.33. Flora in the Core zone of Katchaikatti Village, Rough stone and Gravel quarry, Vadipatti Taluk, Madurai District (Primary data)

SI. No	English Name	Vernacular Name	Scientific Name	Family Name
Trees				
1.	Neem	Vembu	*Azadirachta indica*	Meliaceae
2.	Mesquite	Mullu maram	*Prosopis juliflora*	Fabaceae
3.	Indian mulberry	Nuna maram	*Morinda tinctoria*	Rubiaceae
4.	Oak tree	Savukku	*Casuarina equisetifolia*	Casuarinaceae
5.	White Bark Acacia	Vela maram	*Vachellia leucophloea*	Fabaceae
6.	Bitter Albizia	Arappu Tree	*Albizia amara*	Fabaceae
7.	Acacia Nilotica	Karuvelam maram	*Vachellia nilotica*	Fabaceae
Shrubs				
1.	Tanner's cassia	Avaram	*Senna auriculata*	Fabaceae
2.	Hopbush	Virali chedi	*Dodonaea viscosa*	Sapindaceae
3.	Milk Weed	Erukku	*Calotropis gigantea*	Apocynaceae
Herbs				
1.	Common leucas	Thumbai	*Leucas aspera*	Lamiaceae
2.	Coat buttons	Thatha poo	*Tridax procumbens*	Asteraceae
3.	Bindii	Nerunji mullu	*Tribulus terrestris*	Zygophyllaceae
4.	Dog Mustard	Nai kadugu plant	*Cleome viscosa*	Cleomaceae
5.	Country Mallow	Nilatutti	*Sida cordifolia*	Malvaceae
6.	Prickly chaff flower	Nayuruvi	*Achyranthes aspera*	Amaranthaceae
Creeper				
1.	Stinking passionflower	Poonai puduku chedi	*Passiflora foetida L*	Passifloraceae
Grasses				
1.	Eragrostis	Pullu	*Eragrostis ferruginea*	Poaceae
2.	Nut grass	Korai	*Cyperus rotandus*	Poaceae
3.	Great brome	Thodappam	*Bromus diandrus*	Poaceae

Sources: Species observation in the field study



a. Azadirachta indica



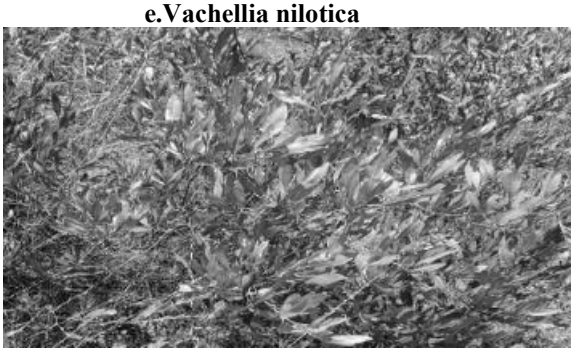
b. Albizia amara



e.Vachellia nilotica



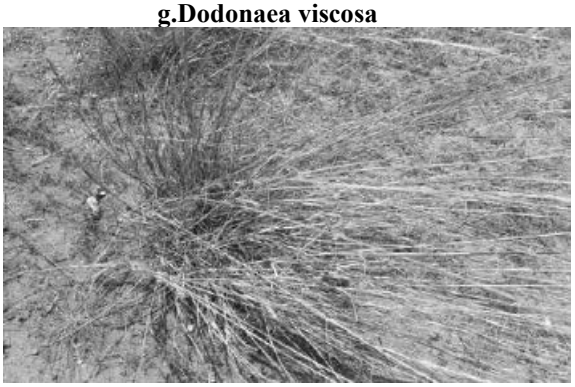
f.Croton bonplandianus



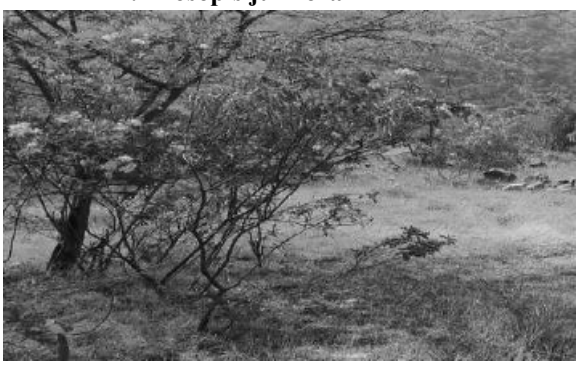
g.Dodonaea viscosa



h. Prosopis juliflora



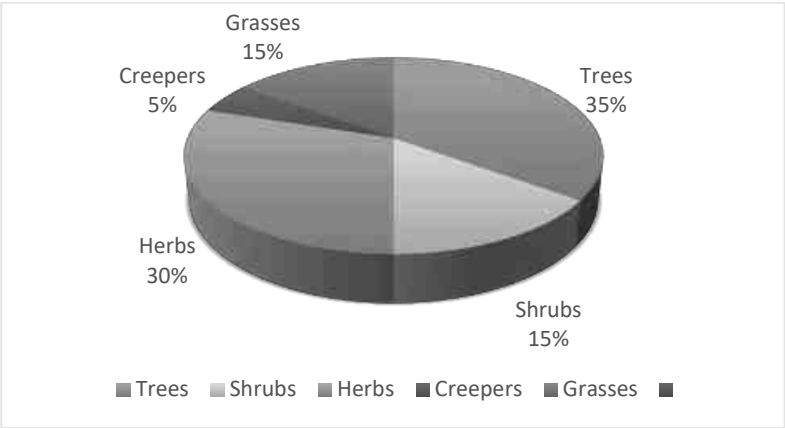
i. Bromus diandrus



j. Senna auriculata

Fig No: 3.26. Flora species observation in the Core zone area

Fig No. 3.27. Graph Showing % Distribution Of Floral Life Forms (Core Zone)



3.5.8.3 Flora Composition in the Buffer Zone (Primary data & Secondary data)

Buffer zone flora sampling was conducted between 10.30 am to 1.00 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/quadrate 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 quadrate methods were followed. The proposed project site there are 132 species in the buffer zone study area in total, based on records. The floral (132) varieties among them Trees 49, Herbs 39, Shrubs 25, Climbers/ Creepers 14, Grasses 3 and cactus 2 were identified. 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. Apart from the proposed project area, there is agricultural land. Horticulture and agricultural land are untouched. 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.

Table 3.34: Number of floral life forms in the Study Area

S. No	Plant Life Form	Number of Species
1	Trees	49
2	Shrubs	25
3	Herbs	39
4	Climber	10
5	Creeper	4
6	Grasses	3
7	Cactus	2
Total No. of Species		**132**

Table No: 3.35. Flora in Buffer Zone of M/s. Concretia Rock Products Private Limited, Katchaikatti Village, Rough stone and gravel quarry

SI.No	English Name	Vernacular Name	Scientific Name	Family Name
Trees				
1.	Gum arabic tree	Karuvelam	*Vachellia nilotica*	Fabaceae
2.	White-bark acacia	Vellaivelan	*Acacia leucophloea*	Mimosaceae
3.	Neem or Indian lilac	Vembu	*Azadirachta indica*	Meliaceae
4.	White Thorn	Seengai	*Acacia polyacantha*	Mimosaceae
5.	Horsetail She-oak	Chavuku	*Casuarina litorea*	Casuarinaceae
6.	Frywood	Vaagaimaram	*Albizia lebbeck*	Mimosaceae
7.	River tamarind	Subabul	*Leucaena leucocephala*	Mimosaceae
8.	Velvet mesquite	Mullu maram	*Prosopis juliflora*	Fabaceae
9.	Portia tree	Poovarasan	*Thespesia Populnea*	Malvaceae
10.	Indian ash tree	Othiyamaram	*Lannea coromandelica*	Anacardaceae
11.	Bael	Vilvam	*Aegle marmelos*	Rutaceae
12.	Indian gooseberry	Nelli	*Phyllanthus emblica*	Euphorbiaceae
13.	Lemon	Ezhumuchaipalam	*Citrus lemon*	Rutaceae
14.	Chinese chaste tree	Nochi	*Vitex negundo*	Verbenaceae
15.	Java Plum	Naval	*Syzygium cumini*	Myrtaceae
16.	Thorny bamboo	Moongil	*Bambusa arundinacea*	Poaceae
17.	Chinaberry	Malai Vembu	*Melia azadarach*	Meliaceae
18.	Asian Palmyra palm	Panai maram	*Borassus flabellifer*	Arecaceae
19.	Tree of heaven	Vathikuchimaram	*Ailanthus excelsa*	Simaroubaceae
20.	Tahitian gooseberry	Aranelli	*Phyllanthus acidus*	Euphorbiaceae
21.	Indian mulberry	Nuna maram	*Morinda tinctoria*	Rubiaceae
22.	Pongamia pinnata	Pongam	*Millettia pinnata*	Fabaceae
23.	Tasmanian blue gum	Eucalyptus	*Eucalyptus globulus*	Myrtaceae
24.	Guava	Koyya	*Psidium guajava*	Myrtaceae
25.	Sacred Tree	Thenthangkottai	*Butea monosperma*	Fabaceae
26.	Monoon longifolium	Nettulingamaram	*Polyalthiya longifolia*	Annonaceae
27.	Egyptian Pea	Sitthagathi	*Sesbania sesban*	Fabaceae
28.	Cluster fig	Atthi	*Ficus racemosa*	Moraceae
29.	Tamarind	Puliyamaram	*Tamarindus indica*	Legumes
30.	Drumstick tree	Murunga maram	*Moringa oleifera*	Moringaceae
31.	Ficus religiosa	Arasamaram	*Ficus religiosa*	Moraceae
32.	Oil cake tree	Usil	*Albizia amara*	Mimosaceae

33.	Papaya	Pappali maram	*Carica papaya L*	Caricaceae
34.	Banana tree	Vazhaimaram	*Musa acuminata*	Musaceae
35.	Vegetable hummingbird	Agatthi	*Sesbania grandiflora*	Fabaceae
36.	Teak	Thekku	*Tectona grandis*	Verbenaceae
37.	Clammy Cherry	Naruvili	*Cordia obliqua*	Cordiaceae
38.	Indian jujub	Elanthai	*Ziziphus mauritiana*	Rhamnaceae
39.	Ceylon Antidesma	Paei-eechchi	*Antidesma alexiteria*	Stylaginaceae
40.	Wild Cowrie Fruit	Kakkai-p-pala	*Casearia zeylanica*	Flacourtiaceae
41.	Mountain Pomegranate	Maalankaarai	*Catunaregam torulosa*	Rubiaceae
42.	Citron	Narthangai	*Citrus medica*	Rutaceae
43.	Horn -fruited jute	Naruvalli	*Corchorus tridens*	Tiliaceae
44.	Indian Cherry	Naruvili	*Cordia obliqua*	Cordiaceae
45.	Nilgiri Daphne-Leaf	Soluvam	*Daphniphyllum neilgherrense*	Daphniphyllaceae
46.	Bastard ebony	Karimaram	*Diospyros ovalifolia*	Ebenaceae
47.	Native olive	Kanthai	*Olea paniculata*	Oleaceae
48.	Small amla	Sirunelli	*Phyllanthus polyphyllus*	Euphorbiaceae
49.	Indian Laurel	Marutamaram	*Terminalia alata*	Combretaceae
Shrubs				
1.	Malabar catmint	Paeimirati	*Anisomeles malabarica*	Lamiaceae
2.	Coromandel Boxwood	Kaarai	*Canthium coromandelicum*	Rubiaceae
3.	Apple of sodom	Vellai erukku	*Calotropis procera*	Asclepidaceae
4.	Broom creeper	Kattukodi	*Cocculus hirsutus*	Menispermaceae
5.	Hopbush	Virali chedi	*Dodonaea viscosa*	Sapindaceae
6.	Indian Atalantia	Kattu elumichai	*Atalantia monophylla*	Rutaceae
7.	Bellyache bush	Kattamanakku	*Jatropha gossypifolia*	Euphorbiaceae
8.	Porcupine flower	Kaatukanagambaram	*Barleria prionitis*	Acanthaceae
9.	Avaram	Avarai	*Senna auriculata*	Fabaceae
10.	Castor bean	Amanakku	*Ricinus communis*	Euphorbiaceae
11.	Shoe flower	Chemparuthi	*Hibiscu rosa-sinensis*	Malvaceae
12.	Malabar nut	Adathoda	*Justicia adhatoda*	Acanthaceae
13.	Turkey berry	Sundai	*Solanum torvum*	Solanaceae
14.	Castor oil plant	Aamannukku	*Ricinus communis*	Euphorbiaceae
15.	Milk Weed	Erukku	*Calotropis gigantea*	Apocynaceae
16.	Touch-me-not	Thottalchinungi	*Mimosa pudica*	Mimosaceae
17.	Indian mallow	Thuthi	*Abutilon indicum*	Meliaceae
18.	West Indian Lantana	Unni chedi	*Lantana camara*	Verbenaceae
19.	Bandicoot Berry	Manippirandai	*Leea indica*	Leeaceae

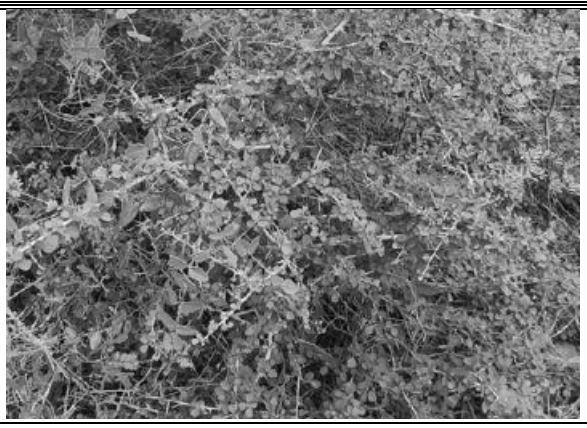
20.	Wild Tea	Kattuchandhanam	*Osyris wightiana*	Santalaceae
21.	Pavattai	Kattukkaranai	*Pavetta indica*	Rubiaceae
22.	Sirunetti	Sirunetti	*Polyalthia korintii*	Annonaceae
23.	Marking Nut	Seran kottai	*Semecarpus anacardium*	Anacardiaceae
24.	Fig Lime	Kattaari	*Streblus taxoides*	Moraceae
25.	Wild Jujube	Nariyilantai	*Ziziphus nummularia*	Rhamnaceae
Herbs				
1.	Watergrass	Mukkutikorei	*Bulbostylis barbata*	Cyperaceae
2.	Country Mallow	Nilatutti	*Sida cordifolia*	Malvaceae
3.	Sessile Joyweed	Ponnanganii	*Alternanthera sessilis*	Amaranthaceae
4.	Chamber bitter	Malai Kizhanelli	*Phyllanthus urinaria L.*	Euphorbiaceae
5.	Watergrass	Mukkorraikkorai	*Bulbostylis barbata*	Cyperaceae
6.	Madagascar Periwinkle	Nithyakalyani	*Catharanthus roseus*	Apocynaceae
7.	Sand Herbage	Manal keerai	*Gisekia pharnaceoides*	Aizoaceae
8.	Common couch	Naaippul	*Agropyron repens*	Poaceae
9.	Taro	Sempu	*Colocasia esculenta*	Araceae
10.	Carrot grass	Parttiniyam	*Parthenium hysterophorus*	Asteraceae
11.	Aloe barbadensis	Katrazhai	*Aloe vera*	Asphodelaceae
12.	Indian Mercury	Kuppamani	*Acalypha indica*	Euphorbiaceae
13.	Bristly Needle Grass	Thudappampillu	*Aristida setacea*	Poaceae
14.	Indian nettle	Nayuruvi	*Achyranthes aspera*	Amaranthaceae
15.	Nut grass	Korai kilangu	*Cyperus rotundus*	Cyperaceae
16.	Indian doab	Arugampul	*Cynodon dactylon*	Poaceae
17.	Datura metel	Oomathai	*Datura metel*	Solanaceae
18.	Large Caltrops	Yanai nerunji	*Pedalium murex L.*	Pedaliaceae
19.	Commelina benghalensis	Kanavalai	*Commelina benghalensi*	Commelinaceae
20.	Monarch redstem	Neermel nerupu	*Ammannia baccifera*	Lythraceae
21.	Common leucas	Thumbai	*Leucas aspera*	Lamiaceae
22.	Green amaranth	Kuppaikeerai	*Amaranthus viridis*	Amaranthaceae
23.	King of Bitters	Nilavaemboo	*Andrographis paniculata*	Acanthaceae
24.	Billygoat weed	Poompillu	*Ageratum conyzoides*	Asteraceae
25.	Holy basil	Thulasi	*Ocimum tenuiflorum*	Lamiaceae
26.	Asthma-plant	Ammanpachaiarisi	*Euphorbia hirta*	Euphorbiaceae
27.	Tridax daisy	Thatha poo	*Tridax procumbens*	Asteraceae
28.	Spiny amaranth	Mullukeerai	*Amaranthus spinosus*	Amaranthaceae
29.	Floating Lace Plant	Kottikilangu	*Aponogeton natans*	Aponogetonaceae
30.	Mexican prickly poppy	Biramathandu	*Argemone mexicana*	Papaveraceae

31.	American Basil	Naaithulasi	*Ocimum americanum*	Lamiaceae
32.	Green Chiretta	Periyanangai	*Andrographis ovata*	Acanthaceae
33.	Scarlet milkweed	Vellikkanthal	*Asclepias curassavica*	Asclepiadaceae
34.	Ammannia Waterwort	Nandukkal keerai	*Bergia ammannioides*	Elatinaceae
35.	Yellow Blumea	Kattu kasturi	*Blumeopsis flava*	Asteraceae
36.	chili peppers	Milagai	*Capsicum annuum*	Solanaceae
37.	Thottacinugi plant	sensitive pea	*Chamaecrista kleinii*	Caesalpiniaceae
38.	Bracted Heliotrope	Thetkodukki	*Heliotropium bracteatum*	Boraginaceae
39.	Stone breaker	Kallurukki	*Scoparia dulcis*	Scrophulariaceae
Climber				
1.	Balloon vine	Mudakkathan	*Cardiospermum halicacabum*	Sapindaceae
2.	Ivy gourd	Kovai	*Coccinia grandis*	Cucurbitaceae
3.	Asian pigeonwings	Sanguppu	*Clitoria ternatea*	Fabaceae
4.	Bitter apple	Peikkumatti	*Citrullus colocynthis*	Cucurbitaceae
5.	Wild water lemon	Poonai puduku chedi	*Passiflora foetida*	Passifloraceae
6.	Stemmed vine	Perandai	*Cissus quadrangularis*	Vitaceae
7.	Wild Grape	Nanaminukki	*Cissus pallida*	Vitaceae
8.	Elephant's Foot	Perumkorattaikodi	*Adenia wightiana*	Passifloraceae
9.	Indian Sarsaparilla	Mattaankodi	*Cryptolepis buchananii*	Asclepiadaceae
10.	snake vine	Molagaranai kodi	*Stephania japonica*	Menispermaceae
Creeper				
1.	Spreading Hogweed	Saaranai Keerai	*Boerhavia diffusa*	Nyctaginaceae
2.	Nut grass	Korai	*Cyperus rotandus*	Poaceae
3.	Cucumis maderaspatanus	Musumusukkai	*Mukia maderaspatana*	Cucurbitaceae
4.	Grona triflora	Siru puladi	*Desmodium triflorum*	Fabaceae
Grasses				
1.	Eragrostis	Pullu	*Eragrostis ferruginea*	Poaceae
2.	Windmill grass	Chevvarakupul	*Chloris barbata*	Amaranthaceae
3.	Great brome	Thodappam	*Bromus diandrus*	Poaceae
Cactus				
1.	Indian fig opuntia	Sapathikalli	*Opuntia ficus-indica*	Cactaceae
2.	Fleshy Spurge	Chathurakkalli	*Euphorbia antiquorum*	Euphorbiaceae

Sources: Species observation in the field study and secondary data
https://threatenedtaxa.org/index.php/JoTT/article/view/1140



Azadirachta indica



Canthium coromandelicum



Cascabela thevetia



Carica papaya



Prosopis juliflora



Lantana camara





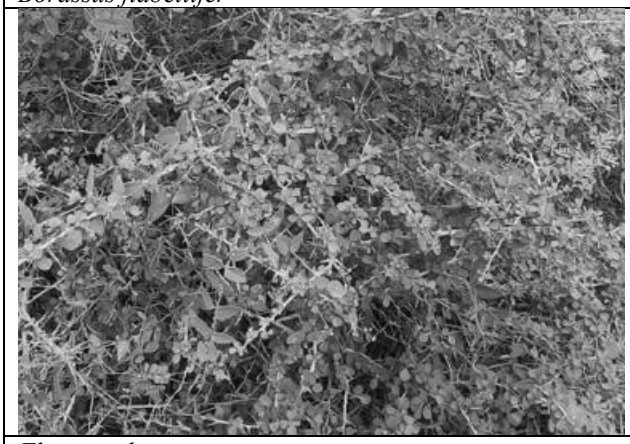
Tephrosia purpurea	*Calotropis gigantea*
	
Borassus flabellifer	*Croton bonplandianus*
	
Flueggea leucopyrus	*Morinda tinctoria*
	
Ziziphus Mauritiana	*Ricinus communis*
	
Solanum torvum	*Jatropha curcas*

Fig No: 3.28. Flora species observation in the Buffer zone area

3.5.8.4. The vegetation in the RF / PF areas, ecologically sensitive areas

Waguthumalai R.F. is located about 84m on Eastern side, Sirumalai R.F. is located about 5.4km on Northern side and Sembathi R.F. is located about 7.4km on North Eastern side of the area. Thus, no forest land is involved in any manner. There are no impacts due to this mining activity.

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. It is away from the proposed project site. 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.

3.5.9. Fauna

The faunal 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 the Red Data Book. There are no rare, endangered, threatened (RET), and endemic species present in the core area.

3.5.9.1. Fauna Composition in the Core Zone (Primary Data)

Core zone fauna samplings were conducted between 12.30 pm to 1.30 pm in two locations. A total of 24 varieties of species were observed in the Core zone of Katchaikatti Village, Rough stone and gravel quarry among them numbers of Insects/Butterfly 11, Reptiles 2, Mammals 2 and Avian 9.

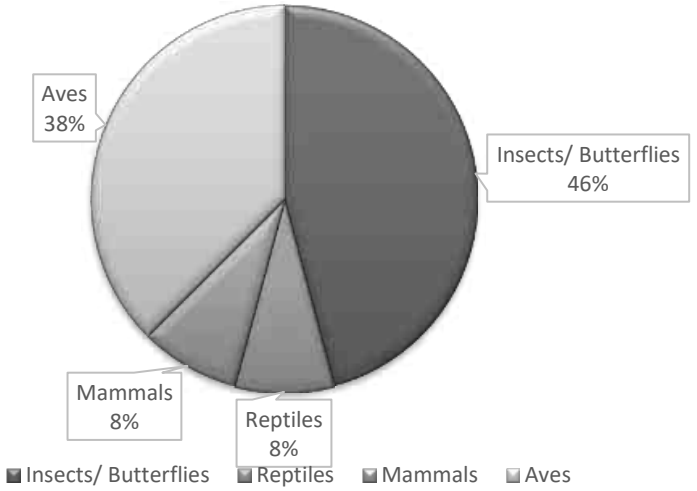
Table No: 3.36. Fauna in the Core zone of Katchaikatti Village, Rough stone and Gravel quarry, Vadipatti Taluk, Madurai District (Primary data)

SI. No	Common Name/English Name	Scientific Name	IUCN
Insects/Butterflies			
1.	Common Tiger	*Danaus genutia*	Not Evaluated
2.	Mottled emigrant	*Catopsilia pyranthe*	Not Evaluated
3.	Striped tiger	*Danaus plexippus*	Least Concern
4.	Danaid egg fly	*Hypolimnasmisippus*	Least Concern
5.	Red-veined darter	*Sympetrum fonscolombii*	Least Concern
6.	Peacock Pansy	*Junonia almana*	Least Concern
7.	Plain Tiger Butterfly	*Danaus chrysippus*	Least Concern
8.	Blue Tiger	*Tirumala limniace*	Not Evaluated
9.	Carolina Mantis	*Stagmomantis carolina*	Not Evaluated
10.	Common Red Soldier Beetle	*Rhagonycha fulva*	Not Evaluated
11.	Gray Bird Grasshopper	*Schistocerca nitens*	Not Evaluated
Reptiles			
1.	Oriental Garden lizard	*Calotes versicolor*	Least Concern
2.	Indian forest skink	*Sphenomorphus indicus*	Least Concern
Mammals			
1.	Common rat	*Rattus rattus*	Least Concern
2.	Indian palm squirrel	*Funambulus palmarum*	Least Concern

Aves			
1.	Common myna	*Acridotheres tristis*	Least Concern
2.	Green Bee Eater	*Merops orientalis*	Least Concern
3.	Ashy Drongo	*Dicrurus leucophaeus*	Least Concern
4.	Asian Koel	*Eudynamys scolopaceus*	Least Concern
5.	Yellow-billed Babbler	*Argya affinis*	Least Concern
6.	Rose-ringed parkeet	*Psittacula krameri*	Least Concern
7.	House crow	*Corvus splendens*	Least Concern
8.	Cattle egret	*Bubulcus ibis*	Least Concern
9.	Common quail	*Coturnix coturnix*	Least Concern

(Sources: Species observation in the field study)

Fig No:3.29. Distribution Of Faunal Communities (Core Zone)



3.5.9.2. Fauna Composition in the Buffer Zone

The Buffer zone fauna samplings were conducted between 3.00 pm to 6.00 pm in different locations. 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 forests 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 reserves or Elephant Corridor or other protected areas within 10 km radius of from the core area.

Taxonomically a total of 127 species recorded were from the buffer zone area. Based on habitat classification the majority of species were birds 60, followed by Butterflies 43, Reptiles 8, Insects 5, Mammals 5, and Amphibians 6. There are no critically endangered, endangered, vulnerable, and endemic species were observed. There are no impacts on nearby fauna species.

Table No: 3.37. List of Fauna & Their Conservation Status,
Mammals: (*directly sighted animals & Secondary data)

SI. No	Common Name/English Name	Scientific Name	IUCN
1.	Indian palm squirrel	*Funambulus palmarum*	Least Concern
2.	Indian Field Mouse	*Mus booduga*	Least Concern
3.	Indian hare	*Lepus nigricollis*	Least Concern
4.	Brown rat	*Rattus norwegicus*	Not Evaluated

Table No: 3.38. Listed birds (Primary & Secondary data)

SI. No	Common Name/English Name	Scientific Name	IUCN
1.	Indian robin	*Copsychus fulicatus*	Least Concern
2.	Asian Koel	*Eudynamys scolopaceus*	Least Concern
3.	Cattle egret	*Bubulcus ibis*	Least Concern
4.	Black Kite	*Milvus migrans*	Least Concern
5.	Rock pigeon	*Columba livia*	Least Concern
6.	Common myna	*Acridotheres tristis*	Least Concern
7.	House crow	*Corvus splendens*	Least Concern
8.	Brown headed Barbet	*Psilopogon zeylanicus*	Least Concern
9.	Red Vented Bulbul	*Pycnonotus cafer*	Least Concern
10.	Ashy Drongo	*Dicrurus leucophaeus*	Least Concern
11.	Green Bee Eater	*Merops orientalis*	Least Concern
12.	Purple sunbird	*Cinnyris asiaticus*	Least Concern
13.	Large Wood shrike	*Tephrodornis virgatus*	Least Concern
14.	House sparrow	*Passer domesticus*	Least Concern
15.	Brahminy Starling	*Sturnia pagodarum*	Least Concern
16.	Common Kingfisher	*Alcedo atthis*	Least Concern
17.	Rose-ringed parkeet	*Psittacula krameri*	Least Concern
18.	Common quail	*Coturnix coturnix*	Least Concern
19.	Pond herons	*Ardeola grayii*	Least Concern
20.	Black drongo	*Dicrurus macrocercus*	Least Concern
21.	Baya Weaver	*Ploceus philippines*	Not Evaluated
22.	Jungle Bush Quail	*Perdicula asiatica*	Least Concern
23.	Wood Sandpiper	*Tringa glareola*	Least Concern
24.	Blue-Tailed Bee Eater	*Merops philippinus*	Least Concern
25.	Indian Roller	*Coracias benghalensis*	Near Threatened
26.	Common Swallow	*Hirundo rustica*	Least Concern
27.	Purple Rumped Sunbird	*Leptocoma zeylonica*	Least Concern
28.	Spotted Dove	*Streptopelia chinensis*	Not Evaluated
29.	White-throated Kingfisher	*Halcyon smyrnensis*	Least Concern
30.	Common Sandpiper	*Actitis hypoleucos*	Least Concern
31.	Yellow-billed Babbler	*Argya affinis*	Least Concern
32.	Greater Coucal	*Centropus sinensis*	Least Concern
33.	Common Tailorbird	*Orthotomus sutorius*	Least Concern
34.	Spotted Owlet	*Athene brama*	Least Concern
35.	Red-wattled Lapwing	*Vanellus indicus*	Least Concern
36.	Little Cormorant	*Microcarbo niger*	Least Concern
37.	Oriental Honey-buzzard	*Pernis ptilorhynchus*	Least Concern
38.	Black-shouldered Kite	*Elanus caeruleus*	Least Concern
39.	Crested Serpent-Eagle	*Spilornis cheela*	Least Concern
40.	Shikra	*Accipiter badius*	Least Concern
41.	Black Eagle	*Ictinaetus malayensis*	Least Concern
42.	Common Kestrel	*Falco tinnunculus*	Least Concern
43.	Indian Peafowl	*Pavo cristatus*	Least Concern
44.	Emerald Dove	*Chalcophaps indica*	Least Concern
45.	Blossom-headed Parakeet	*Psittacula cyanocephala*	Least Concern
46.	Mottled Wood Owl	*Strix ocellata*	Least Concern
47.	White-breasted Kingfisher	*Halcyon smyrnensis*	Least Concern
48.	Brown-headed Barbet	*Megalaima zeylanica*	Not Evaluated
49.	Grey Wagtail	*Motacilla cinerea*	Least Concern
50.	Common Woodshrike	*Tephrodornis pondicerianus*	Least Concern
51.	Asian Fairy Bluebird	*Irena puella*	Least Concern

52.	Grey-headed Flycatcher	*Culicicapa ceylonensis*	Least Concern
53.	Velvet-fronted Nuthatch	*Sitta frontalis*	Least Concern
54.	Oriental White-eye	*Zosterops palpebrosa*	Not Evaluated
55.	Jungle Crow	*Corvus macrorhynchos*	Least Concern
56.	Indian Tree Pie	*Dendrocitta vagabunda*	Least Concern
57.	Ashy Woodswallow	*Artamus fuscus*	Least Concern
58.	Velvet-fronted Nuthatch	*Sitta frontalis*	Least Concern
59.	White-rumped Shama	*Copsychus malabaricus*	Least Concern
60.	Red-whiskered Bulbul	*Pycnonotus jocosus*	Least Concern

Reference: Ali, S. (2002). The Book of Indian Birds (13th revised edition). Oxford University Press, New Delhi. 326pp. https://indianbirds.in/pdfs/IB_5.5_143-145.pdf

Table No: 3.39. List of Reptiles either spotted or reported from the study area (*indicates direct observations & Secondary data)

SI. No	Common Name	Scientific Name	IUCN
1.	Oriental garden lizard	*Calotes versicolor*	Least Concern
2.	House lizards	*Hemidactylus frenatus*	Least Concern
3.	Green vine snake	*Ahaetulla nasuta*	Least Concern
4.	Common krait	*Bungarus caeruleus*	Least Concern
5.	Common skink	*Mabuya carinatus*	Not Evaluated
6.	Rock agama	*Psammophilus cf. blanfordanus*	Least Concern
7.	Pondichéry fan-throated lizard	*Sitana ponticeriana*	Least Concern
8.	Leschenault's leaf-toed gecko	*Hemidactylus leschenaultii*	Least Concern

Source : https://hamadryad.org/index.php/journal/article/view/141/111

Table No: 3.40. List of insects either spotted or reported from the study area

SI. No	Common Name	Scientific Name	IUCN
1.	Indian honey bee	*Apis cerana*	Not Evaluated
2.	Termite	*Hamitermes silvestri*	Not Evaluated
3.	Grasshopper	*Hieroglyphus daganensis*	Not Evaluated
4.	Ant	*Camponotus Vicinus*	Not Evaluated
5.	Dragonfly	*Ceratogomphus pictus*	Least Concern

Table No: 3.41. List of Butterflies reported from the study area and Secondary data

SI. No	Common Name	Scientific Name	IUCN
1.	Indian palm bob	*Suastus gremius*	Least Concern
2.	Common Mormon	*Papilio polytes*	Not Evaluated
3.	Lemon Pansy	*Junonia lemonias*	Not Evaluated
4.	Common Crow	*Euploea core*	Least Concern
5.	Common rose	*Pachliopta aristolochiae*	Least Concern

6.	Spotless grass yellow	*Eurema laeta*	Least Concern
7.	Common Evening Brown	*Melanitis leda*	Least Concern
8.	Peacock Royal	*Tajuria cippus*	Not Evaluated
9.	Common Tiger	*Danaus genutia*	Not Evaluated
10.	Lime Butterfly	*Papilio demoleus*	Not Evaluated
11.	Blue Mormon	*Papilio polymnestor*	Not Evaluated
12.	Danaid Eggfly	*Hypolimnas misippus*	Least Concern
13.	Great Eggfly	*Hypolimnas bolina*	Not Evaluated
14.	Common emigrant	*Catopsilia pomona*	Not Evaluated
15.	Tiny Grass Blue	*Zizula hylax*	Least Concern
16.	Blue Tiger	*Tirumala limniace*	Least Concern
17.	Crimson tip	*Colotisdanae*	Not Evaluated
18.	Common Indian crow	*Euploea core*	Least Concern
19.	Yellow Pansy	*Junonia hierta*	Least Concern
20.	Chocolate Pansy	*Junonia iphita*	Not Evaluated
21.	Double-branded Black Crow	*Euploea sylvester*	Not Evaluated
22.	Peacock Pansy	*Junonia almana*	Least Concern
23.	Psyche	*Leptosia nina*	Not Evaluated
24.	Plain Tiger Butterfly	*Danaus chrysippus*	Least Concern
25.	Lesser Grass Blue	*Zizina otis*	Least Concern
26.	Pale Grass Blue	*Pseudozizeeria maha*	Not Evaluated
27.	Broad-bordered Grass Yellow	*Eurema brigitta*	Least Concern
28.	Crimson Rose	*Pachliopta hector*	Least Concern
29.	Common Mime	*Papilio clytia*	Not Evaluated
30.	Common pierrot	*Castalius rosimon*	Not Evaluated
31.	Angled pierrot	*Caleta caleta*	Least Concern
32.	Common cerulean	*Jamides celeno*	Not Evaluated
33.	Monkey puzzle	*Rathinda amor*	Not Evaluated
34.	Tailess lineblue	*Nacaduba dubiosa*	Not Evaluated
35.	Common baron	*Euthalia aconthea*	Not Evaluated
36.	Common sailer	*Neptis hylas*	Not Evaluated
37.	Blueglassy tiger	*Danaus limniace*	Not Evaluated
38.	Indian red admiral	*Vanessa indica*	Not Evaluated
39.	Tawny coster	*Telchinia violae*	Not Evaluated
40.	Common grass yellow	*Eurema hecabe*	Least Concern
41.	White orange tip	*Ixias marianne*	Not Evaluated
42.	Common jezebel	*Delias eucharis*	Not Evaluated
43.	Indian skipper	*Spialia galba*	Not Evaluated

Source:https://www.academia.edu/128428319/Biodiversity_of_butterflies_in_Sirumalai_hills_Dindigul_Tamil_Nadu

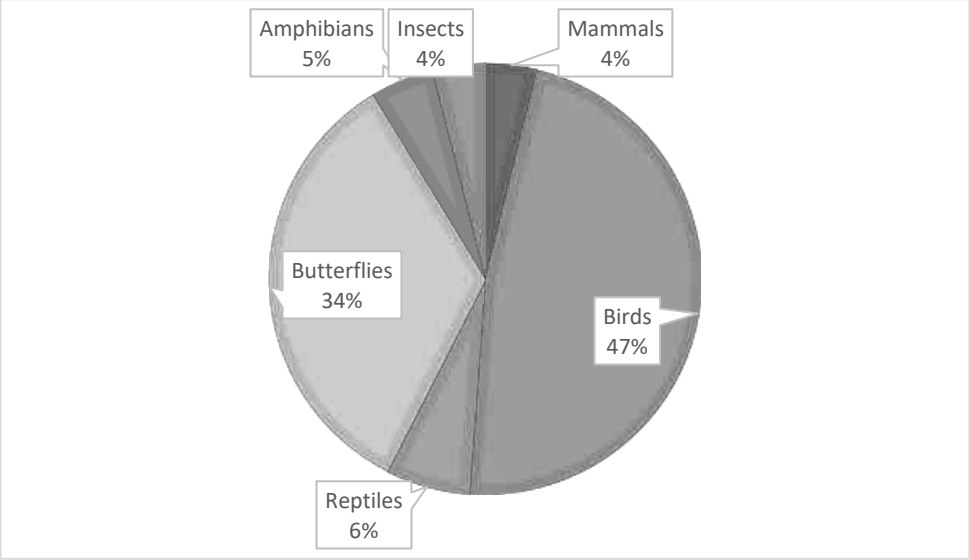


Fig No. 3.30: Diagram showing % distribution of faunal life forms

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.

3.5.10. 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. 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.

3.5.10.1. 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.

3.5.10.2. Macrophytes

Table No.3.42 Description of Macrophytes (Primary data & Secondary data)

Sl.No	Common Name	Scientific name	Vernacular Name (Tamil)	IUCN Red List of Threatened Species
1.	Water hyacinth	*Eichornia crassipe*	Agayatamarai	NA
2.	Floating lace plant	*Aponogeton natans*	Kottikizhnagu	NA
3.	Blue water lily	*Nymphaea nouchali*	Nellambal	LC
4.	Sambu	*Typha angustifolia*	Narrowleaf cattail	LC
5.	Cross Grass	*Carex cruciata*	Koraipullu	NA
6.	Tall Flat Sedge	*Cyperus exaltatus*	Koraikizhangu	LC

Sources: Species observation in the field study

3.5.10.3. 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 No. 3.43. Amphibians Observed/Recorded from the Study Area& Secondary data

SI. No	Common Name/English Name	Scientific Name	IUCN
1.	Indian Burrowing frog	*Sphaerotheca breviceps*	Least Concern
2.	Indian pond frog	*Phrynoderma hexadactylum*	Not Evaluated
3.	Asian common Toad	*Duttaphrynus melanostictus*	Least Concern
4.	Indian skittering frog	*Euphlyctis cynophlyctis*	Not Evaluated
5.	Common Indian cricket frog	*Minervarya agricola*	Least Concern
6.	Indian bullfrog	*Hoplobatrachus tigerinus*	Least Concern

Source: https://hamadryad.org/index.php/journal/article/view/141/111

3.5.10.4. Other Aquatic Fauna

Fishes

The study area has low aquatic diversity, with few types of fish living. The species of fish reported during the primary visit are Rohu, Catla, Catfish, etc. Species of fish reported in the study area

Based on Actual Sighting, based on inputs from locals and Perused from Secondary Data

S.No	Common name	Scientific name	Family
1.	Ponthia	*Puntius sophore*	Cyprinidae
2.	Catla	*Catla Catla*	Cyprinidae
3.	Catfish	*Siluriformes*	-
4.	Rohu	*Labeo rohita*	Cyprinidae

3.5.11. Findings/Results,

The assessment was carried out during the summer season. The inspection day was quite alright 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	➢ Waguthumalai R.F. – 84m- East ➢ Sirumalai R.F. – 5.4km- North ➢ Sembathi R.F. – 7.4km- NE
3.	Wildlife Corridors & Routes	No notified wildlife corridors are present in 10 km vicinity.
4.	Wetlands / Water bodies	➢ Odai – North side – 50m safety provided ➢ Odai – West side – 10m safety provided ➢ Canal – 1.5km- NW ➢ Canal – 2.0km- NW ➢ Periyar main canal – 2.8km -SW

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. 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. There is no endangered, endemic and RET Species. The proposed project is not going to have any direct or indirect adverse impact on the species mentioned above.

3.6. 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.

Sources:

Invasive Alien Species | IUCN
https://ebird.org/region/IN-TN-CP
Ali, S. (2002). The Book of Indian Birds (13th revised edition). Oxford University Press, New Delhi. 326pp.
Bird Life International 2012. In: IUCN 2012. IUCN Red List of Threatened Species. Version 2012.

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.

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 of the proposed mining project.
- 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

Madurai is a city in the Indian state of Tamil Nadu. Madurai is the administrative headquarters of Madurai district is a major city in the Indian state of Tamil Nadu. It is the cultural capital of Tamil Nadu and the administrative headquarters of Madurai District. As of the 2011 census, it was the third largest Urban agglomeration in Tamil Nadu after Chennai and Madurai and the 44th most populated city in India. The district is bounded by Theni in the west, Sivaganga in the east, Dindigul in the north, Virudhunagar in the south and small parts of Tiruchirappalli in the northeast.

3.6.4 Study area:

KATCHAIKATTI VILLAGE

According to Census 2011 information the location code or village code of Katchiakatti village is 640723. Katchiakatti village is located in Vadipatti taluka of Madurai district in Tamil Nadu, India. It is situated 5km away from sub-district headquarter Vadipatti (tehsildar office) and 30km away from district headquarter Madurai. As per 2009 stats, Seminipatti is the gram panchayat of Katchiakatti village.

The total geographical area of village is 2402.35 hectares. Katchiakatti has a total population of 13,141 peoples, out of which male population is 6,552 while female population is 6,589. Literacy rate of katchiakatti village is 62.58% out of which 70.07% males and 55.12% females are literate. There are about 3,350 houses in katchiakatti village. Pincode of katchiakatti village locality is 625218. Vadipatti is nearest town to katchiakatti village for all major economic activities.

TABLE 3.24: KATCHIAKATTI VILLAGE POPULATION FACTS

Population	13,141
Male Population	6,552
Female Population	6,589
Literate Population	8,223
Male Literate Population	4,591
Female Literate Population	3,632
Illiterate Population	4,918
Male Illiterate Population	1,961
Female Illiterate Population	2,957

TABLE 3.25: POPULATION DATA OF STUDY AREA

SI.No.	Village Name	No of HH	Total Population	Male	Female	Total Literate Population	Male Literate	Female Literate	Total Illiterate Population	Male Illiterate	Female Illiterate
1	Alagapuri	1073	4293	2140	2153	3224	1720	1504	1069	420	649
2	Andipatti	451	1677	860	817	1233	685	548	444	175	269
3	Chinnailandaikulam	365	1311	633	678	894	474	420	417	159	258
4	Chinnamanayakkanpatti	144	532	263	269	347	183	164	185	80	105
5	Chittalangudi	970	3696	1874	1822	2417	1364	1053	1279	510	769
6	Errampatti	545	2051	1039	1012	1292	716	576	759	323	436
7	Irumbadi	1576	5845	2951	2894	3975	2214	1761	1870	737	1133
8	Kallanai	2590	10045	5135	4910	7524	4121	3403	2521	1014	1507
9	Kalvelipatti	1233	4363	2153	2210	3005	1640	1365	1358	513	845
10	Karupatti	885	3399	1712	1687	2419	1316	1103	980	396	584
11	Katchaikatti	3350	13141	6552	6589	8223	4591	3632	4918	1961	2957
12	Katchirairuppu	427	1482	778	704	1171	661	510	311	117	194
13	Kattakulam	643	2440	1197	1243	1714	922	792	726	275	451
14	Keelachinnanampatti	199	768	360	408	520	274	246	248	86	162
15	Kilakarai	133	469	231	238	317	176	141	152	55	97
16	Kondayampatti	839	2999	1497	1502	2105	1149	956	894	348	546
17	Kovilpatti	347	1347	693	654	838	473	365	509	220	289
18	Kuthimeikipatti	326	1302	630	672	923	496	427	379	134	245
19	Moolakurichi	151	620	340	280	430	262	168	190	78	112
20	Nachikulam	1108	4378	2170	2208	3144	1710	1434	1234	460	774
21	Nagari	214	890	450	440	641	345	296	249	105	144
22	Nedungulam	422	1710	853	857	1222	642	580	488	211	277
23	Periya Ilandaikulam	398	1436	747	689	893	516	377	543	231	312
24	Pillayarnatham	119	491	241	250	315	173	142	176	68	108
25	Ramayagoundenpatti	169	742	389	353	384	237	147	358	152	206
26	Sambakulam	142	556	262	294	332	162	170	224	100	124
27	Sembathi	133	485	249	236	303	166	137	182	83	99
28	Sirumalai	102	407	207	200	163	92	71	244	115	129
29	Siruvalai	289	1282	636	646	946	518	428	336	118	218
30	Thanichiyam	1988	7573	3738	3835	5334	2882	2452	2239	856	1383
31	Thenur	1692	6464	3267	3197	4663	2558	2105	1801	709	1092
32	Thethoor	1538	5906	2996	2910	3804	2155	1649	2102	841	1261
33	Thirumalnattam	178	707	343	364	463	254	209	244	89	155
34	Thiruvalavayanallur	230	852	434	418	608	327	281	244	107	137
35	Thiruvedagam	793	3094	1551	1543	2173	1188	985	921	363	558
36	Thodaneri	398	1479	754	725	1073	590	483	406	164	242
37	Thummachchampatti	253	947	461	486	634	336	298	313	125	188
38	Urseri	1673	6505	3236	3269	4307	2391	1916	2198	845	1353
39	Vaigasipatti	305	1159	583	576	739	413	326	420	170	250
40	Vairavanatham	293	1064	543	521	749	406	343	315	137	178
41	Vayalur	219	984	496	488	731	391	340	253	105	148
42	Viralipatti	294	1133	581	552	678	386	292	455	195	260
43	Vittankulam	151	551	275	276	360	202	158	191	73	118

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

TABLE 3.26: WORKERS PROFILE OF STUDY AREA

SI.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	Alagapuri	1762	1050	712	132	77	55	891	708	2050	1762
2	Andipatti	421	247	174	5	4	1	264	151	653	421
3	Chinnailandaikulam	725	391	334	23	15	8	382	309	584	725
4	Chinnamanayakkanpatti	239	145	94	2	2	0	138	92	280	239
5	Chittalangudi	1381	941	440	176	136	40	681	508	1887	1381
6	Errampatti	1036	619	417	55	42	13	744	213	981	1036
7	Irumbadi	2683	1865	818	70	60	10	1497	1055	3018	2683
8	Kallanai	3731	2562	1169	165	130	35	1271	2199	5471	3731
9	Kalvelipatti	1782	1095	687	128	88	40	1121	518	2039	1782
10	Karupatti	1533	957	576	145	118	27	1069	305	1799	1533
11	Katchaikatti	7144	3951	3193	438	312	126	4558	2032	5754	7144
12	Katchirairuppu	611	349	262	27	18	9	473	111	490	611
13	Kattakulam	906	553	353	65	52	13	551	268	1144	906
14	Keelachinnanampatti	496	259	237	11	10	1	376	96	268	496
15	Kilakarai	296	153	143	11	7	4	254	29	162	296
16	Kondayampatti	1138	747	391	109	81	28	535	475	1514	1138
17	Kovilpatti	588	394	194	59	50	9	201	325	737	588
18	Kuthimeikipatti	715	392	323	71	32	39	494	141	540	715
19	Moolakurichi	161	156	5	1	1	0	132	28	411	161
20	Nachikulam	1556	966	590	465	256	209	589	440	2161	1556
21	Nagari	323	243	80	9	8	1	182	129	517	323
22	Nedungulam	908	496	412	71	58	13	637	173	727	908
23	Periya Ilandaikulam	622	345	277	144	79	65	337	140	562	622
24	Pillayarnatham	93	69	24	13	7	6	7	73	189	93
25	Ramayagoundenpatti	423	239	184	122	63	59	235	63	316	423
26	Sambakulam	48	24	24	4	3	1	40	4	180	48
27	Sembathi	244	145	99	6	6	0	172	64	238	244
28	Sirumalai	214	103	111	2	1	1	205	6	173	214
29	Siruvalai	233	197	36	11	10	1	32	185	688	233
30	Thanichiyam	3294	2131	1163	235	203	32	1614	1362	3937	3294
31	Thenur	2300	1630	670	233	152	81	771	1264	3647	2300
32	Thethoor	3038	1714	1324	438	278	160	2124	440	2617	3038
33	Thirumalnattam	378	205	173	0	0	0	325	52	328	378
34	Thiruvalavayanallur	320	238	82	14	14	0	65	236	459	320
35	Thiruvedagam	1235	783	452	74	60	14	700	430	1531	1235
36	Thodaneri	448	418	30	83	79	4	237	126	908	448
37	Thummachchampatti	590	306	284	77	30	47	289	214	349	590
38	Urseri	2844	1823	1021	99	72	27	1264	1452	3306	2844
39	Vaigasipatti	623	350	273	134	70	64	180	306	535	623
40	Vairavanatham	228	167	61	3	3	0	156	67	610	228
41	Vayalur	35	24	11	23	19	4	7	1	235	35
42	Viralipatti	549	314	235	65	53	12	378	104	551	549
43	Vittankulam	94	69	25	8	7	1	0	83	257	94

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

TABLE 3.27: COMMUNICATION & TRANSPORT FACILITIES IN THE STUDY AREA

Sl	Village Name	PO	SPO	PTO	T	PCO	MP	IC / CSC	PCF	BS	PBS	RS	NH	SH	MDR	BTR	GR	NWR	FP
1	Alagapuri	2	1	2	1	1	1	2	1	1	2	1	2	2	2	1	1	2	1
2	Andipatti	2	1	2	1	2	1	2	2	1	2	2	1	2	1	1	1	2	1
3	Chinnailandaikulam	2	1	2	1	2	1	2	2	1	1	2	2	2	1	1	1	2	1
4	Chinnamanayakkanpatti	2	2	2	2	2	1	2	2	2	2	2	1	2	1	1	1	2	1
5	Chittalangudi	2	1	2	1	2	1	2	2	1	1	2	2	2	2	1	1	2	1
6	Errampatti	2	1	2	1	2	1	2	2	1	2	2	2	2	2	1	1	2	1
7	Irumbadi	2	1	2	1	1	1	2	2	1	1	1	2	2	1	1	1	2	1
8	Kallanai	2	1	1	1	1	1	2	1	2	2	2	2	1	2	1	1	2	1
9	Kalvelipatti	2	1	2	1	1	1	2	2	1	2	2	2	2	1	1	1	2	1
10	Karupatti	1	1	1	1	1	1	2	2	2	2	2	2	2	2	1	1	2	1
11	Katchaikatti	2	1	2	1	1	1	2	2	1	1	2	2	2	2	1	1	2	1
12	Katchirairuppu	2	1	2	1	2	1	2	2	1	2	2	2	2	2	2	1	2	1
13	Kattakulam	2	2	2	1	1	1	2	2	2	2	2	2	2	1	1	1	2	1
14	Keelachinnanampatti	2	2	2	1	1	1	2	2	1	1	2	2	2	1	1	1	2	1
15	Kilakarai	2	1	2	2	2	1	2	2	1	2	2	2	2	2	1	1	2	1
16	Kondayampatti	2	1	2	1	2	1	2	2	1	2	2	2	2	2	1	1	2	1
17	Kovilpatti	2	2	2	1	2	1	2	2	2	2	2	2	2	2	1	1	2	1
18	Kuthimeikipatti	2	1	2	1	2	1	2	2	1	2	2	2	2	2	1	1	2	1
19	Moolakurichi	2	2	2	2	2	1	2	2	1	2	2	2	2	1	1	1	2	1
20	Nachikulam	2	1	2	1	1	1	2	2	1	1	2	2	2	1	1	1	2	1
21	Nagari	2	1	2	2	1	1	2	2	1	1	2	1	2	1	1	1	2	1
22	Nedungulam	2	1	2	1	1	1	2	2	1	1	2	2	2	1	1	1	2	1
23	Periya Ilandaikulam	2	2	2	1	2	1	2	2	1	2	2	2	2	2	1	1	2	1
24	Pillayarnatham	2	2	2	2	1	1	2	2	1	2	2	2	2	1	1	1	2	1
25	Ramayagoundenpatti	2	2	2	1	1	1	2	2	1	2	2	2	2	1	1	1	2	1
26	Sambakulam	2	2	2	2	2	1	2	2	1	2	2	2	2	2	1	1	2	1
27	Sembathi	2	2	2	1	2	1	2	2	2	2	2	2	2	1	1	1	2	1
28	Sirumalai	2	2	2	1	2	1	2	2	2	2	2	2	2	1	1	1	2	1
29	Siruvalai	2	1	2	1	1	1	2	2	1	1	2	2	2	2	1	1	2	1
30	Thanichiyam	1	1	1	1	1	1	2	2	1	1	2	1	2	1	1	1	2	1
31	Thenur	2	1	2	1	1	1	2	2	1	1	2	1	2	1	1	1	2	1
32	Thethoor	2	1	2	1	1	1	2	2	1	1	2	2	2	1	1	1	2	1
33	Thirumalnattam	2	1	2	2	2	1	2	2	1	1	2	2	2	1	1	1	2	1
34	Thiruvalavayanallur	2	2	2	1	1	1	2	2	2	2	2	2	2	1	1	1	2	1
35	Thiruvedagam	1	1	1	1	2	1	2	2	1	1	2	2	2	1	1	1	2	1
36	Thodaneri	2	1	2	1	1	1	1	2	2	1	2	2	2	1	1	1	2	1
37	Thummachchampatti	2	2	2	1	2	1	2	2	1	2	2	1	2	1	1	1	2	1
38	Urseri	2	1	2	1	1	1	2	2	1	1	2	2	2	2	1	1	2	1
39	Vaigasipatti	2	2	2	1	2	1	2	2	2	2	2	2	2	2	1	1	2	1
40	Vairavanatham	2	2	2	1	2	1	2	2	1	1	2	2	2	1	1	1	2	1
41	Vayalur	2	1	2	1	2	1	2	2	1	1	2	2	2	1	1	1	2	1
42	Viralipatti	2	2	2	1	1	1	2	2	2	2	2	2	2	2	1	1	2	1
43	Vittankulam	2	2	2	2	2	1	2	2	1	1	2	2	2	1	1	1	2	1

Abbreviations: PO - Post Office; MP - Mobile Phone Coverage; RS - Railway Station; GR - Gravel Roads; SPO - Sub Post Office; IC / CSC - Internet Cafe/Common Service Centre; NH - National Highways; NWR - Navigate waterways River; PTO - Post & Telegraph office; PCF - Private Courier Facility; SH - State Highways; FP - Foot path; T- Telephone (Landline); BS Public Bus Service; MDR - Major District Road; PCO - Public call office / Mobile; PBS - Private Bus Service; BTR - Black Topped (Pucca Roads). Note: 1 - Available within the village 2 - Not available

TABLE 3.28: WATER & DRAINAGE FACILITIES IN THE STUDY AREA

Sl	Village Name	TP	CW	UCW	HP	TW/BH	S	R/C	T/P/L	CD	OD	CT
1	Alagapuri	1	2	1	1	1	2	2	2	1	1	1
2	Andipatti	1	2	1	1	1	1	2	1	1	1	1
3	Chinnailandaikulam	1	2	2	2	1	2	2	2	1	1	1
4	Chinnamanayakkanpatti	1	2	2	2	2	2	2	2	1	1	1
5	Chittalangudi	1	2	1	2	1	2	2	2	1	1	1
6	Errampatti	1	1	2	1	1	2	2	2	1	1	1
7	Irumbadi	1	1	1	1	1	2	2	2	1	1	2
8	Kallanai	1	1	1	1	1	2	2	2	1	1	1
9	Kalvelipatti	1	1	1	1	1	2	2	2	1	1	2
10	Karupatti	1	2	1	1	1	1	2	2	1	1	2
11	Katchaikatti	1	1	1	1	1	2	1	2	1	1	1
12	Katchirairuppu	1	2	1	1	1	2	2	2	1	1	2
13	Kattakulam	1	2	2	1	1	2	2	2	1	1	1
14	Keelachinnanampatti	2	2	2	1	1	2	2	2	1	1	1
15	Kilakarai	1	2	2	2	2	2	2	2	2	1	2
16	Kondayampatti	1	1	1	1	1	2	2	2	1	1	2
17	Kovilpatti	1	1	1	1	1	2	2	2	1	1	1
18	Kuthimeikipatti	1	2	2	2	2	2	2	2	1	1	2
19	Moolakurichi	1	2	2	1	2	2	2	2	2	1	2
20	Nachikulam	1	1	1	1	1	2	2	2	1	1	2
21	Nagari	1	2	2	2	2	2	2	2	2	1	1
22	Nedungulam	1	2	2	2	1	2	2	2	1	1	2
23	Periya Ilandaikulam	1	2	2	2	2	2	2	2	1	1	1
24	Pillayarnatham	1	1	2	2	2	2	2	2	1	1	2
25	Ramayagoundenpatti	1	2	1	1	1	2	2	2	1	2	2
26	Sambakulam	2	2	2	2	2	2	2	2	1	1	2
27	Sembathi	1	1	1	2	1	2	2	2	2	2	1
28	Sirumalai	1	2	1	1	1	2	2	2	2	2	2
29	Siruvalai	1	2	2	1	1	2	2	2	1	1	2
30	Thanichiyam	1	1	1	1	1	2	2	2	1	1	2
31	Thenur	1	1	2	1	1	2	2	2	1	1	2
32	Thethoor	1	1	1	1	1	2	2	2	1	1	1
33	Thirumalnattam	1	2	2	2	2	2	2	2	1	1	2
34	Thiruvalavayanallur	1	2	2	2	1	2	2	2	1	1	1
35	Thiruvedagam	1	1	2	2	1	2	2	2	1	1	2
36	Thodaneri	1	2	2	2	1	2	2	2	1	1	1
37	Thummachchampatti	1	2	2	2	1	2	2	2	1	1	1
38	Urseri	1	1	1	1	1	2	2	2	1	1	2
39	Vaigasipatti	1	2	2	1	1	2	2	2	1	1	1
40	Vairavanatham	1	2	2	2	2	2	2	2	2	1	1
41	Vayalur	1	1	1	1	1	2	2	2	1	1	2
42	Viralipatti	1	2	2	2	1	2	1	2	1	1	2
43	Vittankulam	1	2	1	2	2	2	2	2	1	1	2

Abbreviations: T - Tap Water; R / C - River / Canal; CW - Covered Well; T/P/L - Tank / Pond / Lake; UCW - Uncovered Well; CD - Covered Drainage; HP - Hand Pump; OD - Open Drainage; TW/BH - Tube / Bore Well; CT - Community Toilet Complex for General public; S - Spring

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

TABLE 3.29: OTHER FACILITIES IN THE STUDY AREA

Sl	Village Name	ATM	CB	COB	ACS	SHG	PDS	RM	AMS	NC	NC-AC	CC	SF	PL		NPS	APS	BDRO	PS
1	Alagapuri	2	2	2	1	1	1	2	2	1	1	2	2	1		1	1	1	1
2	Andipatti	2	2	2	2	1	1	2	2	1	1	2	2	2		1	2	2	1
3	Chinnailandaikulam	2	2	2	2	1	1	1	2	1	1	1	1	1		1	1	1	1
4	Chinnamanayakkanpatti	2	2	1	1	1	1	2	2	1	1	1	1	1		1	1	1	1
5	Chittalangudi	2	2	1	2	1	1	2	2	1	1	1	1	1		1	1	1	1
6	Errampatti	2	2	2	2	1	1	2	2	2	2	2	2	1		1	2	1	1
7	Irumbadi	2	2	1	1	1	1	2	2	1	1	1	1	1		1	1	1	1
8	Kallanai	2	2	2	2	1	1	2	2	1	1	1	1	2		2	1	1	1
9	Kalvelipatti	2	2	2	2	1	1	2	2	1	1	2	1	2		1	1	2	1
10	Karupatti	2	2	2	2	1	1	2	2	1	1	2	2	1		1	1	2	1
11	Katchaikatti	2	2	2	2	1	1	2	2	1	1	1	1	2		1	1	1	1
12	Katchirairuppu	2	2	2	2	1	1	2	2	1	1	1	2	1		1	1	1	1
13	Kattakulam	2	2	2	2	1	1	2	2	1	1	2	1	2		1	2	2	1
14	Keelachinnanampatti	2	2	2	2	2	2	2	2	2	2	2	2	2		2	2	1	1
15	Kilakarai	2	2	2	2	1	1	2	2	1	1	1	1	2		2	1	1	1
16	Kondayampatti	2	2	2	2	1	1	2	2	1	1	2	2	2		1	1	2	1
17	Kovilpatti	2	2	2	1	1	1	1	2	1	1	1	1	1		1	1	1	1
18	Kuthimeikipatti	2	2	2	2	1	1	2	2	1	1	1	1	2		2	1	2	1
19	Moolakurichi	2	2	2	2	1	1	2	2	2	2	1	1	1		1	1	1	1
20	Nachikulam	2	2	2	2	1	1	2	2	1	1	2	1	2		1	1	1	1
21	Nagari	2	2	2	2	1	2	2	2	2	2	2	2	2		2	2	2	1
22	Nedungulam	2	2	2	2	1	1	2	2	2	2	2	2	2		1	2	2	1
23	Periya Ilandaikulam	2	2	2	1	1	1	2	2	1	1	1	1	1		1	1	1	1
24	Pillayarnatham	2	2	2	2	1	1	1	2	1	1	1	1	1		1	1	1	1
25	Ramayagoundenpatti	2	2	2	2	1	1	2	2	1	1	1	2	1		1	1	1	1
26	Sambakulam	2	1	1	2	1	1	2	2	1	1	1	1	2		1	1	1	1
27	Sembathi	2	2	1	1	1	1	2	2	1	1	1	1	1		1	1	1	1
28	Sirumalai	2	2	1	1	1	1	2	2	1	1	1	1	1		1	1	1	1
29	Siruvalai	2	2	2	2	1	1	2	2	1	1	1	1	1		1	1	1	1
30	Thanichiyam	2	2	2	2	1	2	2	2	2	2	2	2	2		1	2	2	1
31	Thenur	2	2	2	2	1	1	2	2	1	1	2	1	1		1	1	1	1
32	Thethoor	2	2	2	1	1	1	2	2	1	1	2	1	1		1	1	1	1
33	Thirumalnattam	2	2	2	2	1	1	2	2	1	1	2	1	1		1	1	1	1
34	Thiruvalavayanallur	2	2	1	1	1	1	2	2	1	1	1	1	1		1	1	1	1
35	Thiruvedagam	2	2	1	1	1	1	2	2	1	1	1	1	2		1	1	1	1
36	Thodaneri	2	2	2	2	1	1	2	2	1	1	1	1	1		1	1	1	1
37	Thummachchampatti	2	2	2	2	1	1	2	2	1	1	1	1	2		1	1	1	1
38	Urseri	2	2	2	2	1	1	2	2	1	1	1	1	1		1	1	1	1
39	Vaigasipatti	2	2	2	2	1	1	2	2	1	1	1	1	1		1	1	1	1
40	Vairavanatham	2	2	2	2	1	1	1	2	1	1	1	1	2		1	1	2	1
41	Vayalur	2	2	2	2	1	1	2	2	1	1	2	2	2		1	1	1	1
42	Viralipatti	2	2	2	2	1	1	2	2	1	1	2	2	1		1	2	1	1
43	Vittankulam	2	2	2	2	1	2	2	2	1	1	2	1	1		1	2	1	1

Abbreviations: ATM - Automatic Teller Machine; PDS - Public Distribution System (Shop); CB - Commerical Bank; RM - Regular Market; COB - Co-operative Bank; AMS - Agricultural Market Society; ACS - Agricultural Credit Societies; NC - Nutritional Centres; SHG - Self Help Group; NC-AC - Nutritional Centres - Anganwadi Centre; DBRO - Birth & Death Registration Office; PS - Power Supply Note – 1 - Available within the village; 2 - Not available

TABLE 3.30: EDUCATIONAL FACILITIES IN THE STUDY AREA

		PPS		PS		MS		SS		SSS		DC		EC		MC		MI		PT		VTS		SSD	
Sl	**Village Name**	**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	Alagapuri	1	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
2	Andipatti	1	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
3	Chinnailandaikulam	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
4	Chinnamanayakkanpatti	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
5	Chittalangudi	1	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
6	Errampatti	1	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
7	Irumbadi	1	2	1	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
8	Kallanai	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
9	Kalvelipatti	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
10	Karupatti	1	2	1	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
11	Katchaikatti	1	2	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
12	Katchirairuppu	1	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
13	Kattakulam	1	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
14	Keelachinnanampatti	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
15	Kilakarai	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
16	Kondayampatti	1	1	1	1	1	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2
17	Kovilpatti	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
18	Kuthimeikipatti	1	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
19	Moolakurichi	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
20	Nachikulam	1	2	1	2	1	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
21	Nagari	1	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
22	Nedungulam	1	2	1	2	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
23	Periya Ilandaikulam	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
24	Pillayarnatham	1	1	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
25	Ramayagoundenpatti	1	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
26	Sambakulam	1	1	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
27	Sembathi	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
28	Sirumalai	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
29	Siruvalai	1	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
30	Thanichiyam	1	1	1	1	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
31	Thenur	1	2	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
32	Thethoor	1	2	1	2	1	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
33	Thirumalnattam	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
34	Thiruvalavayanallur	2	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
35	Thiruvedagam	1	1	1	1	1	2	1	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2
36	Thodaneri	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
37	Thummachchampatti	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
38	Urseri	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
39	Vaigasipatti	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
40	Vairavanatham	1	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
41	Vayalur	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
42	Viralipatti	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
43	Vittankulam	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2

TABLE 3.31: MEDICAL FACILITIES IN THE STUDY AREA

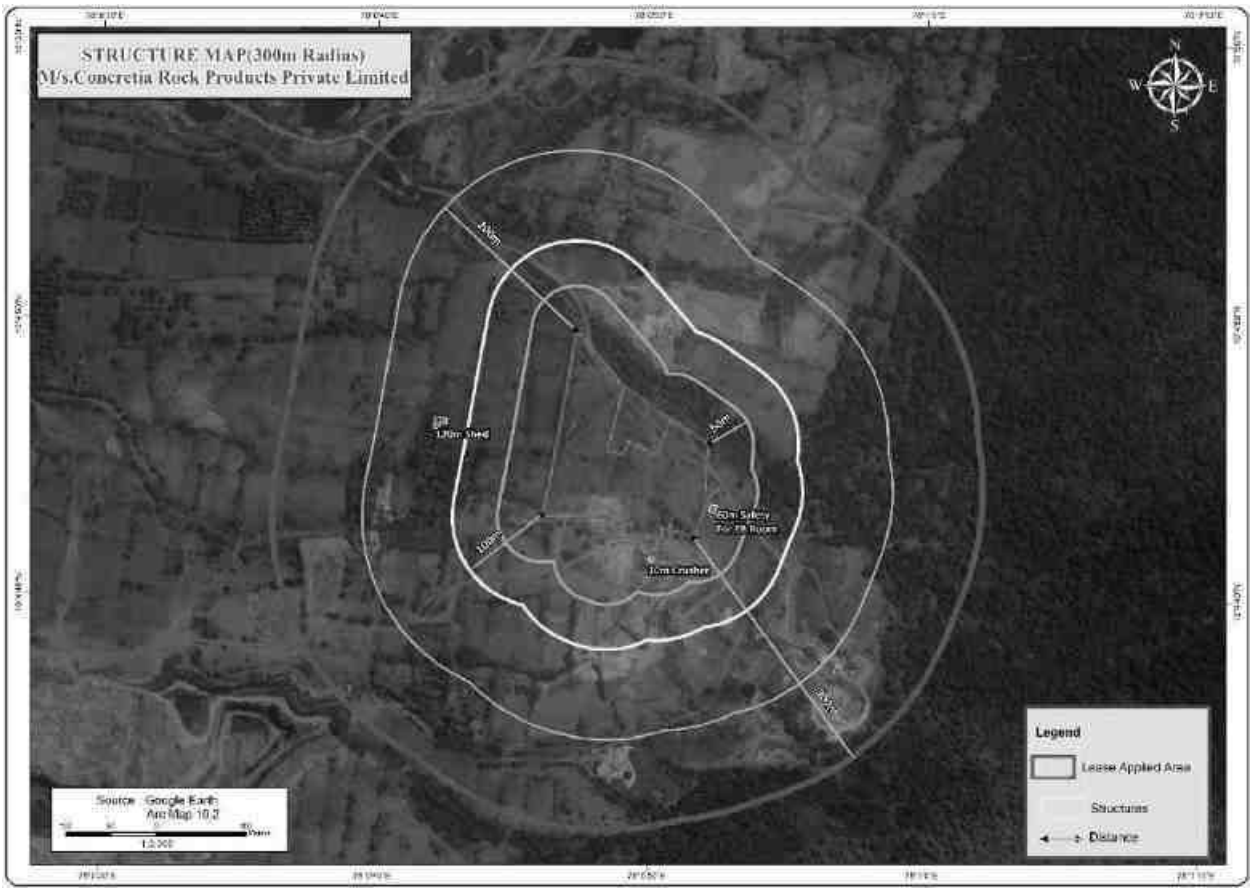
Sl. No.	Village Name	CHC	PHC	PHSC	MCW	TBC	HA	HAM	D	VH	MHC	FWC	NGM-I/O
1	Alagapuri	0	0	1	0	0	0	0	0	0	0	0	b
2	Andipatti	0	0	1	0	0	0	0	0	0	0	0	b
3	Chinnailandaikulam	0	0	0	0	0	0	0	0	0	0	0	a
4	Chinnamanayakkanpatti	0	0	0	0	0	0	0	0	0	0	0	b
5	Chittalangudi	0	0	2	0	0	0	0	0	0	0	0	a
6	Errampatti	0	0	1	1	0	0	0	0	1	0	0	a
7	Irumbadi	0	0	1	0	0	0	0	0	0	0	0	b
8	Kallanai	0	2	1	2	2	0	0	2	0	0	2	
9	Kalvelipatti	0	0	1	0	0	0	0	0	0	0	0	b
10	Karupatti	0	0	1	0	0	0	0	0	0	0	0	c
11	Katchaikatti	1	1	2	1	1	0	0	1	1	0	1	
12	Katchirairuppu	0	0	0	0	0	0	0	0	0	0	0	a
13	Kattakulam	0	0	0	0	0	0	0	0	0	0	0	b
14	Keelachinnanampatti	0	0	0	0	0	0	0	0	0	0	0	a
15	Kilakarai	0	0	1	0	0	0	0	0	0	0	0	b
16	Kondayampatti	0	0	1	0	0	0	0	0	1	0	0	b
17	Kovilpatti	0	0	0	0	0	0	0	0	0	0	0	b
18	Kuthimeikipatti	0	0	1	0	0	0	0	0	0	0	0	b
19	Moolakurichi	0	0	0	0	0	0	0	0	0	0	0	b
20	Nachikulam	0	0	1	0	0	0	0	0	1	0	0	b
21	Nagari	0	0	0	0	0	0	0	0	0	0	0	a
22	Nedungulam	0	0	0	0	0	0	0	0	0	0	0	a
23	Periya Ilandaikulam	0	0	0	0	0	0	0	0	0	0	0	b
24	Pillayarnatham	0	0	1	0	0	0	0	0	0	0	0	b
25	Ramayagoundenpatti	0	0	0	0	0	0	0	0	0	0	0	b
26	Sambakulam	0	0	1	0	0	0	0	0	1	0	0	b
27	Sembathi	0	0	0	0	0	0	0	0	0	0	0	a
28	Sirumalai	0	0	0	0	0	0	0	0	0	0	0	b
29	Siruvalai	0	0	0	0	0	0	0	0	0	0	0	b
30	Thanichiyam	0	1	1	1	1	0	0	1	1	0	1	
31	Thenur	0	0	1	0	0	0	0	0	0	0	0	a
32	Thethoor	0	0	2	0	0	0	0	0	0	0	0	b
33	Thirumalnattam	0	0	0	0	0	0	0	0	0	0	0	b
34	Thiruvalavayanallur	0	0	0	0	0	0	0	0	0	0	0	a
35	Thiruvedagam	0	0	1	0	0	0	0	0	1	0	0	b
36	Thodaneri	0	0	1	0	0	0	0	0	0	0	0	a
37	Thummachchampatti	0	0	0	0	0	0	0	0	0	0	0	b
38	Urseri	0	0	1	0	0	0	0	0	0	0	0	a
39	Vaigasipatti	0	0	0	0	0	0	0	0	0	0	0	a
40	Vairavanatham	0	0	0	0	0	0	0	0	0	0	0	b
41	Vayalur	0	0	0	0	0	0	0	0	0	0	0	b
42	Viralipatti	0	0	0	0	0	0	0	0	0	0	0	a
43	Vittankulam	0	0	0	0	0	0	0	0	0	0	0	b

Abbreviations: CHC-Community Health Centre; TBC-TB Clinic; VH- Veternity 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

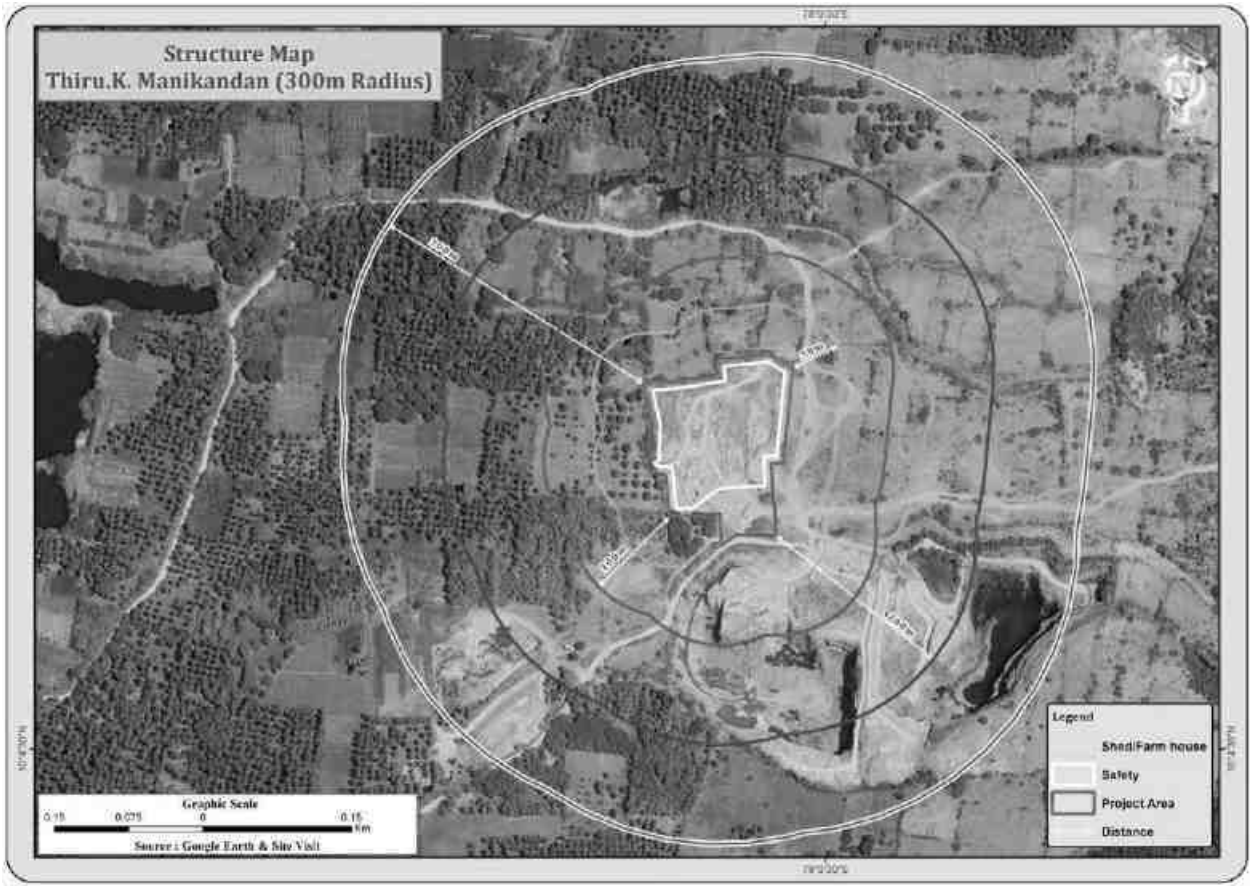
Source: www.censusindia.gov.in - Tamilnadu Census of India – 2011.

STRUCTURE MAP WITHIN 300M RADIUS – P1



Enumeration of Structures from 0 - 300m Radius						
Structure Numbers	**Distance & Direction from the project site**	**Structure Details and Usage Purpose**	**Type of Structure Structures (Kutcha/ Brick/ Cement/ RCC/ Framed Structures)**	**No. of Occupants**	**Structure belongs to owner (Yes/No)**	**Remarks**
1	10m – SE	Crusher	Framed structure	Nil	Yes	
2	60m – East	60m Safety For EB Room	RCC structure	Nil	Yes	
3	120m – West	Shed	Sheet structure	Nil	No	Used to store agriculture products

STRUCTURE MAP WITHIN 300M RADIUS – P2



3.6.6 Recommendation and Suggestion

- 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.
- Health care centre and ambulance facility can be provided to the population to get easy access to medical facilities. Maternity facility should be made available at the place to avoid going to distant places for treatment which involves risks. Apart from that as these areas are prone to various diseases a hospital with modern facilities should be opened on a priority basis in a central place to provide better health facilities to the villagers around the project.
- While developing an Action Plan, it is very important to identify the population who falls under the marginalized and vulnerable groups. So that special attention can be given to these groups with special provisions while making action plans.

3.6.7 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.

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:

4.1.1 Anticipated Impact

- 4.28.5 Ha of the land will be under mining site 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 cause the siltation of water course

4.1.2 Mitigation Measures

- The 4.28.5 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 be benefitted by the supply of water
- About 2300 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.

4.1.1.1 Soil Environment

Impact on Soil Environment

Erosion and Sedimentation (Removal of protective vegetation cover; Exposure of underlying soil horizons that may be less pervious, or more erodible than the surface layers; Reduced capacity of soils to absorb rainfall; Increased energy in storm-water runoff due to concentration and velocity; and Exposure of subsurface materials which are unsuitable for vegetation establishment).

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 sediments 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.

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
- 5.0 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 judicially 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.
- Wastewater 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.

4.3.2 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_{10}& $PM_{2.5}$ and emissions of Sulphur dioxide (SO_2) & Oxides of Nitrogen (NOx) 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 12.

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.

4.3.2.2 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_{10} was observed close to the source due to low to moderate wind speeds. Incremental value of PM_{10} was superimposed on the base line data monitored at the proposed site to predict total GLC of PM_{10} due to combined impacts

TABLE 4.1: ESTIMATED EMISSION RATE

P1			
Activity	**Source type**	**Value**	**Unit**
Drilling	Point Source	0.111788517	g/s
Blasting	Point Source	0.004222799	g/s
Mineral Loading	Point Source	0.046230216	g/s
Haul Road	Line Source	0.002505482	g/s/m
Overall Mine	Area Source	0.057876717	g/s
So2	Area Source	0.0015522	g/s
Nox	Area Source	0.000082606	g/s

P2			
Activity	**Source type**	**Value**	**Unit**
Drilling	Point Source	0.127112208	g/s
Blasting	Point Source	0.008026954	g/s
Mineral Loading	Point Source	0.048206776	g/s
Haul Road	Line Source	0.002517608	g/s/m
Overall Mine	Area Source	0.057059768	g/s
So2	Area Source	0.002263802	g/s
Nox	Area Source	0.000109055	g/s

FIGURE 4.1: AERMOD TERRAIN MAP

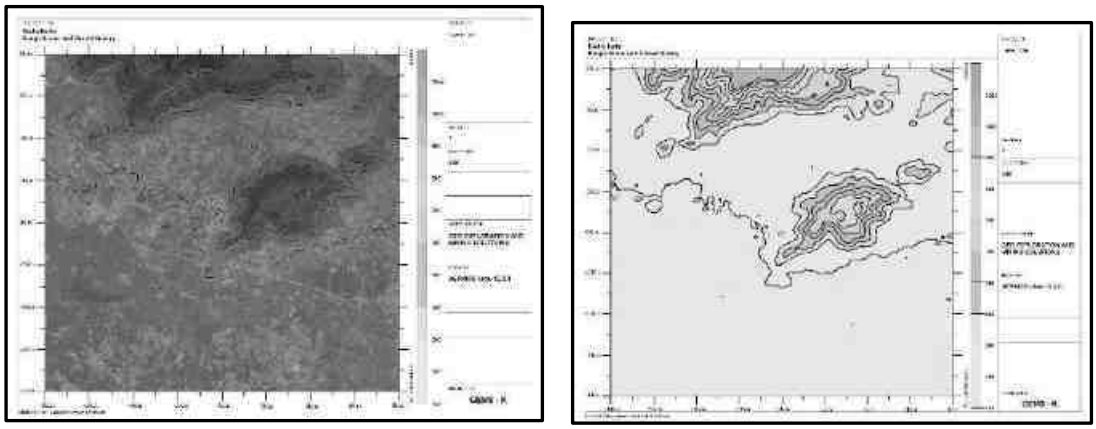


FIGURE 4.2: PREDICTED INCREMENTAL CONCENTRATION OF PM_{10}

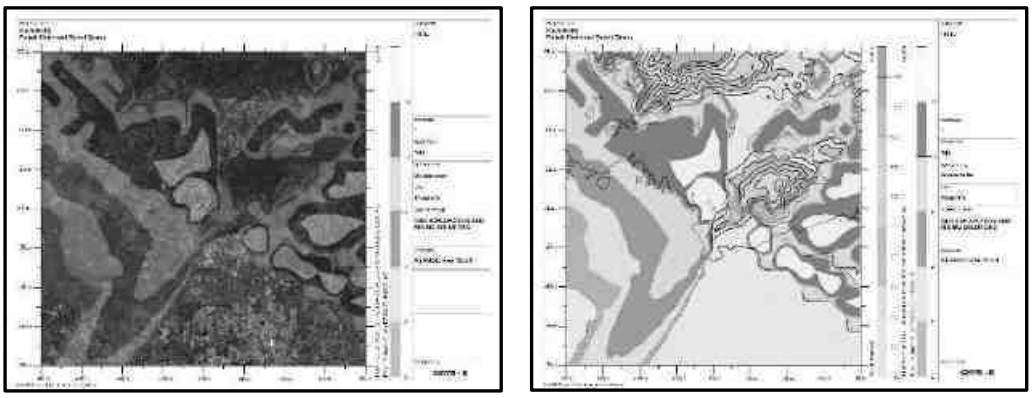


FIGURE 4.3: PREDICTED INCREMENTAL CONCENTRATION OF PM_{25}

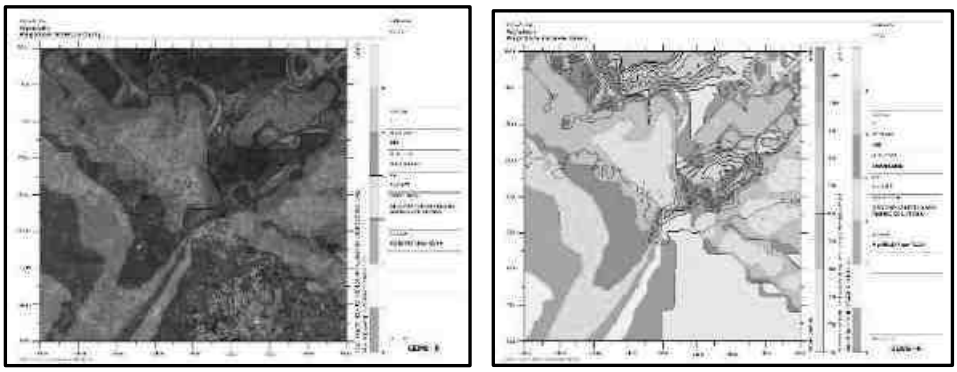


FIGURE 4.4: PREDICTED INCREMENTAL CONCENTRATION OF NO_X

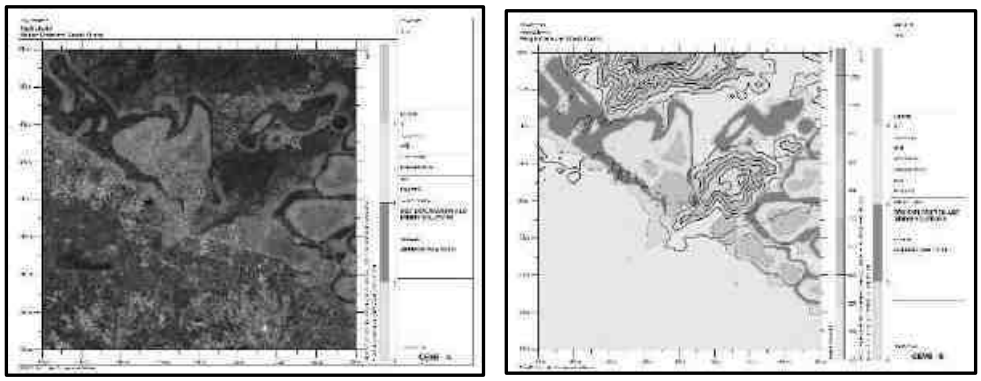


FIGURE 4.5: PREDICTED INCREMENTAL CONCENTRATION OF SO2

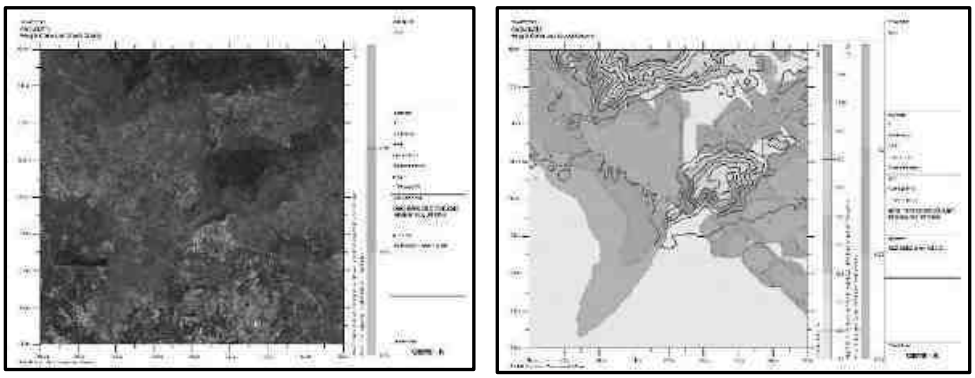
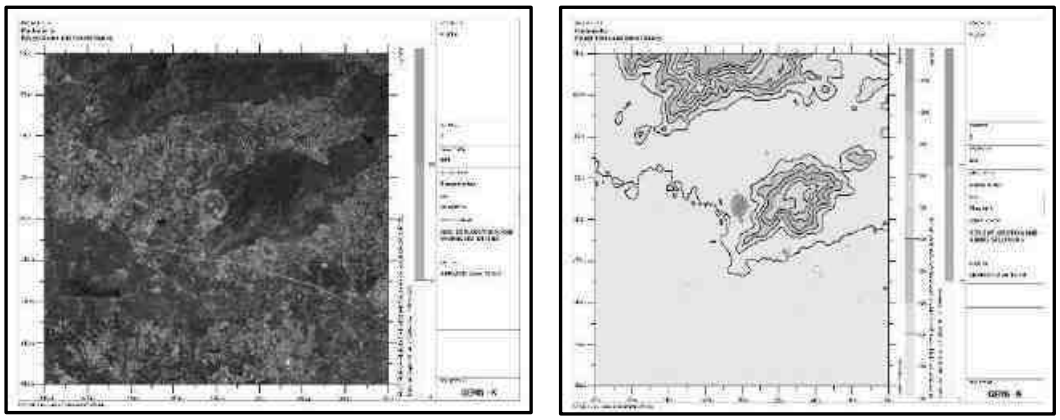


FIGURE 4.5A: PREDICTED INCREMENTAL CONCENTRATION OF FUGITIVE



4.3.2.3 Model Results

The post project Resultant Concentrations of PM_{10}, $PM_{2.5}$, SO_2&NO_X (GLC) is given in Table below:

TABLE 4.2: INCREMENTAL & RESULTANT GLC OF PM_{10}

Station Code	Location	X Coordinate (m)	Y Coordinate (m)	AverageBaselinePM10 (µg/m3)	Incremental value ofPM10 due to mining(µg/m3)	Total PM10 (µg/m3)
AAQ1	10° 4'44.94"N 78° 0'48.98"E	-14	14	44.9	13.67	58.57
AAQ2	10° 4'39.36"N 78° 0'27.93"E	-660	-160	42.3	13.00	55.3
AAQ3	10° 4'55.01"N 78° 0'41.26"E	-252	326	40.7	13.21	53.91
AAQ4	10° 5'10.26"N 77°59'45.04"E	-1977	798	41.0	11.50	52.5
AAQ5	10° 3'1.81"N 77°59'17.57"E	-2825	-3183	44.7	8.00	52.7
AAQ6	10° 6'28.66"N 78° 1'34.38"E	1384	3233	40.8	0	40.8
AAQ7	10° 2'19.14"N 78° 2'37.30"E	3318	-4503	41.5	0	41.5

TABLE 4.3: INCREMENTAL & RESULTANT GLC OF $PM_{2.5}$

Station Code	Location	X Coordinate (m)	Y Coordinate (m)	Average Baseline PM2.5(µg/m3)	Incremental value of PM2.5 due to mining (µg/m3)	Total PM2.5 (µg/m3)
AAQ1	10° 4'44.94"N 78° 0'48.98"E	-14	14	22.7	6.88	29.58
AAQ2	10° 4'39.36"N 78° 0'27.93"E	-660	-160	22.3	5.91	28.21
AAQ3	10° 4'55.01"N 78° 0'41.26"E	-252	326	22.4	6.46	28.86
AAQ4	10° 5'10.26"N 77°59'45.04"E	-1977	798	21.9	5.62	27.52
AAQ5	10° 3'1.81"N 77°59'17.57"E	-2825	-3183	23.5	4.56	28.06
AAQ6	10° 6'28.66"N 78° 1'34.38"E	1384	3233	23.2	0.29	23.49
AAQ7	10° 2'19.14"N 78° 2'37.30"E	3318	-4503	20.8	0	20.8

TABLE 4.4: INCREMENTAL & RESULTANT GLC OF SO2

Station Code	Location	X Coordinate (m)	Y Coordinate (m)	Average Baseline SO_2 (µg/m3)	Incremental value due to mining (µg/m3)	Total SO_2 (µg/m3)
AAQ1	10° 4'44.94"N 78° 0'48.98"E	-14	14	5.1	1.39	6.49

AAQ2	10° 4'39.36"N 78° 0'27.93"E	-660	-160	5.2	1.32	6.52
AAQ3	10° 4'55.01"N 78° 0'41.26"E	-252	326	5.1	1.36	6.46
AAQ4	10° 5'10.26"N 77°59'45.04"E	-1977	798	5.7	1.18	6.88
AAQ5	10° 3'1.81"N 77°59'17.57"E	-2825	-3183	5.4	0.57	5.97
AAQ6	10° 6'28.66"N 78° 1'34.38"E	1384	3233	5.2	0	5.2
AAQ7	10° 2'19.14"N 78° 2'37.30"E	3318	-4503	5.3	0	5.3

TABLE 4.5: INCREMENTAL & RESULTANT GLC OF NOX

Station Code	Location	X Coordinate (m)	Y Coordinate (m)	Average Baseline NOx ($\mu g/m^3$)	Incremental value due to mining($\mu g/m^3$)	Total NOx ($\mu g/m^3$)
AAQ1	10° 4'44.94"N 78° 0'48.98"E	-14	14	23.9	9.71	33.61
AAQ2	10° 4'39.36"N 78° 0'27.93"E	-660	-160	23.2	8.16	31.36
AAQ3	10° 4'55.01"N 78° 0'41.26"E	-252	326	23.2	9.30	32.5
AAQ4	10° 5'10.26"N 77°59'45.04"E	-1977	798	20.5	5.00	25.5
AAQ5	10° 3'1.81"N 77°59'17.57"E	-2825	-3183	20.6	0	20.6
AAQ6	10° 6'28.66"N 78° 1'34.38"E	1384	3233	19.4	0	19.4
AAQ7	10° 2'19.14"N 78° 2'37.30"E	3318	-4503	22.1	0	22.1

TABLE 4.6: INCREMENTAL & RESULTANT GLC OF FUGITIVE

Station Code	Location	X Coordinate (m)	Y Coordinate (m)	Average Baseline NOx ($\mu g/m^3$)	Incremental value due to mining($\mu g/m^3$)	Total NOx ($\mu g/m^3$)
AAQ1	10° 4'44.94"N 78° 0'48.98"E	-14	14	64.38	25.38	89.76
AAQ2	10° 4'39.36"N 78° 0'27.93"E	-660	-160	66.86	0	66.86
AAQ3	10° 4'55.01"N 78° 0'41.26"E	-252	326	66.86	25.00	91.86
AAQ4	10° 5'10.26"N 77°59'45.04"E	-1977	798	61.39	0	61.39
AAQ5	10° 3'1.81"N 77°59'17.57"E	-2825	-3183	64.66	0	64.66
AAQ6	10° 6'28.66"N 78° 1'34.38"E	1384	3233	64.03	0	64.03
AAQ7	10° 2'19.14"N 78° 2'37.30"E	3318	-4503	62.77	0	62.77

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/m3 for PM10, SO2 & NOX respectively. By adopting suitable mitigation measures, the pollutant levels in the atmosphere can be further being controlled.

4.3.3 Mitigation Measures

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

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 taurpaulin
- 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-metaled 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 –

- 2150 trees will be planted along the safety barrier located in the leased area to prevent dust generation due to movement of tippers/trucks.
- Some trees will be planted along village road and nearby schools.

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 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.

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

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.

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

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 nose prediction modelling.

TABLE 4.8: PREDICTED NOISE INCREMENTAL VALUES

Location ID	**N1**	**N2**	**N3**	**N4**	**N5**	**N6**	**N7**
Maximum Monitored Value (Day) dB(A)	46.3	48.3	45.3	43.5	46.3	48.2	48.2
Incremental Value dB(A)	60.1	57.8	49.5	34.0	27.3	29.3	25.1
Total Predicted Noise level dB(A)	60.3	58.3	50.9	44.0	46.4	48.3	48.2

The incremental noise level is found within the range of 60.1 dB (A) in Core Zone and 27.3-49.5 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 though 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)

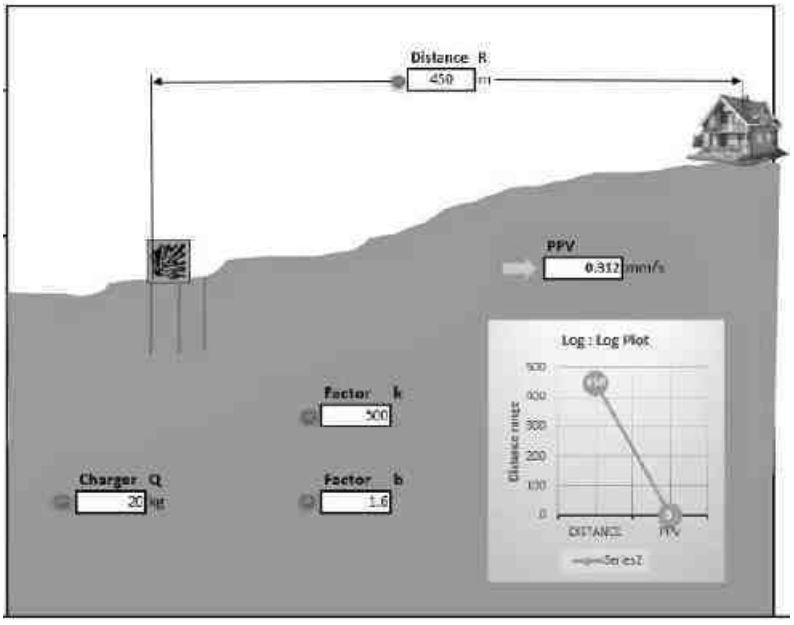
B = constant related to the rock and site (usually 1.6)

R = distance from charge (m)

TABLE 4.9A: PREDICTED PPV VALUES DUE TO BLASTING

Maximum Charge in kgs	Nearest Habitation in m	PPV in mm/s
20	450	0.312

FIGURE 4.6A: GROUND VIBRATION PREDICTION



From the above graph, the charge per blast of 20 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 proponent ensures that the charge per blast shall be 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**.**

Mitigation Measures

- It is proposed to carry out blasting operation 10kg per round so that the vibration will be minimal
- The mining operation will be carried out without deep hole drilling, 25mm small Di 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, 2ndClass Mines Manager/ 1stClass 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. Impact Identification and Evaluation

In general, impact prediction methods argue that the foremost step in impact appraisal must consider and identify project actions that are likely to bring significant changes in the project environment. The present study determined to predict the likely impacts of the Proposed Rough stone and Gravel quarry, mining Project in the surrounding environment with a specific focus on biological attributes covering habitats/ecosystems and associated

biodiversity. Likely impacts identified were categorized into different levels like direct or primary and indirect or secondary impacts based on the influence of sources of impacts.

4.5.2. Impact on Flora

- Project area is located approximately 84 m west of Waguthumalai Reserved Forest.
- No direct disturbance to forest vegetation is anticipated as mining activities will be confined within the lease area.
- Dust generated from excavation, loading, transportation, and haul road movement may settle on nearby vegetation and affect photosynthetic activity.
- Increased vehicular movement may cause minor disturbance to surrounding plant communities.

4.5.2.1. Anticipated Impact of mining activity on local flora and agricultural land

Anticipated Impact on Local Flora

- Removal of topsoil and existing vegetation during site preparation
- Dust deposition on plant leaves reducing photosynthesis
- Movement of heavy vehicles damaging nearby shrubs and grasses
- Reduction in soil moisture due to excavation activities
- Temporary disturbance to roadside vegetation

Anticipated Impact on Agricultural Land

- Agricultural land is located approximately 330 m from the project area.
- Dust generated from mining operations, excavation, loading, and transportation activities may cause minor dust deposition on nearby Agricultural land.
- Increased movement of vehicles may temporarily affect local access roads used by farmers.

4.5.2Mitigation Measures

4.5.2.1. General Guidelines for Green Belt Development

Green belt development is an important environmental management measure in mining projects to reduce dust pollution, attenuate noise, improve aesthetics, and create a buffer between the quarry and surrounding environment.

A green belt should be developed all along the periphery of the lease boundary to act as a physical and biological barrier between mining operations and surrounding areas. A minimum width of 7.5 m to 10 m is generally recommended wherever land is available, especially along haul roads, site boundaries, and sensitive locations such as nearby agricultural lands or settlements.

The selection of plant species should be based on native, fast-growing, and pollution-tolerant varieties. Indigenous species are preferred as they are better adapted to local climatic and soil conditions and support local biodiversity. Species should have characteristics such as dense canopy, deep root systems, and high dust-capturing ability. A mix of trees, shrubs, and ground covers should be planted to ensure multi-layered vegetation.

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 500 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. 5m 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 SO2 and NO2 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	*Aegle marmelos*	Vilva maram
2	*Albizia lebbeck*	Vaagai maram
3	*Cassia fistula*	Konrai tree
4	*Lannea coromandelica*	Othiyam
5	*Limonia acidissima*	Vila maram
6	*Syzygium cumini*	Naval maram
7	*Toona ciliata*	Santhana Vembu
8	*Ficus hispida*	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.

Some of the important aspects to be considered are:

- ✓ Planting of trees in each row will be in staggered orientation.
- ✓ In the front row, shrubs will be grown.
- ✓ Since the trunks of the tall trees are generally devoid of foliage, it will be useful to have shrubs in front of the trees so as to give coverage to this portion.
- ✓ The spacing between the trees will be maintained slightly less than the normal spaces, so that the trees may grow vertically and slightly increase the effective height of the green belt.

4.5.4. Anticipated Impact on Fauna

- ➢ Waguthumalai Reserved Forest is located approximately 84 m to the east of the project area.
- ➢ Mining activities may generate noise, dust, and increased vehicular movement, which could cause temporary disturbance to fauna inhabiting the nearby Reserved Forest.
- ➢ Small mammals, reptiles, and birds may avoid the immediate vicinity of the project area during operational hours due to human activity and machinery operation.
- ➢ Dust emissions may have a minor indirect impact on habitat quality and food resources available to wildlife.
- ➢ Movement of workers and vehicles outside the lease boundary will be strictly restricted to prevent disturbance to wildlife.

4.5.4.1. Measures for protection and conservation of wildlife species

- ➢ A green belt shall be developed along the lease boundary using native tree and shrub species to act as a buffer for wildlife.
- ➢ Regular water sprinkling on haul roads and working areas shall be undertaken to minimize dust generation and its impact on wildlife habitats.
- ➢ Vehicle movement shall be restricted to designated roads, and speed limits shall be enforced to prevent accidental injury to wildlife.
- ➢ Night-time mining and transportation activities shall be avoided, wherever feasible, to minimize disturbance to nocturnal species.
- ➢ Noise-generating equipment and machinery shall be properly maintained to reduce noise levels.
- ➢ Hunting, poaching, trapping, feeding, or harassment of wildlife by workers shall be strictly prohibited.

- Awareness and environmental training programs shall be conducted regularly for workers regarding wildlife conservation and protection.
- Waste generated from mining activities shall be properly collected and disposed of to prevent attraction of wild animals.
- Any sighting of rare, endangered, or injured wildlife shall be immediately reported to the Forest Department for appropriate action.
- Native species plantation and habitat enhancement measures shall be undertaken as part of the green belt development program.

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 Katchaikatti Village, Rough stone and gravel quarry, Vadipatti Taluk, Madurai District

S.No	Attributes	Assessment
1	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	Waguthumalai R.F. – 84m- East Sirumalai R.F. – 5.4km- North Sembathi R.F. – 7.4km- NE Kodaikanal Wildlife Sanctuary–36.8km-NW Kadavur Slender Loris Sanctuary-36.8km-NE
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
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)

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

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

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

4.7.2 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 23m bgl and the life of the mine is 5 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 0.91.78 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 discharges likely to cause adverse impacts is predicted in advance, appropriate mitigation measures like settling of suspended solids or passive treatment to improve water quality as well as quantity, etc., could be planned. Monitoring should demonstrate that there is no adverse effect of pollutant concentrations exceeding the statutory limits for the water, soil and air qualities in the area around the closed mine.

4.9.1.3 Biological Stability

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

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

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

The Mine closure plan should be as per the approved 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.

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 3 Crushers within the radius of 1km. Most of the quarries in the regions are abandoned and Existing 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 area shave 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 these projects. 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.

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.

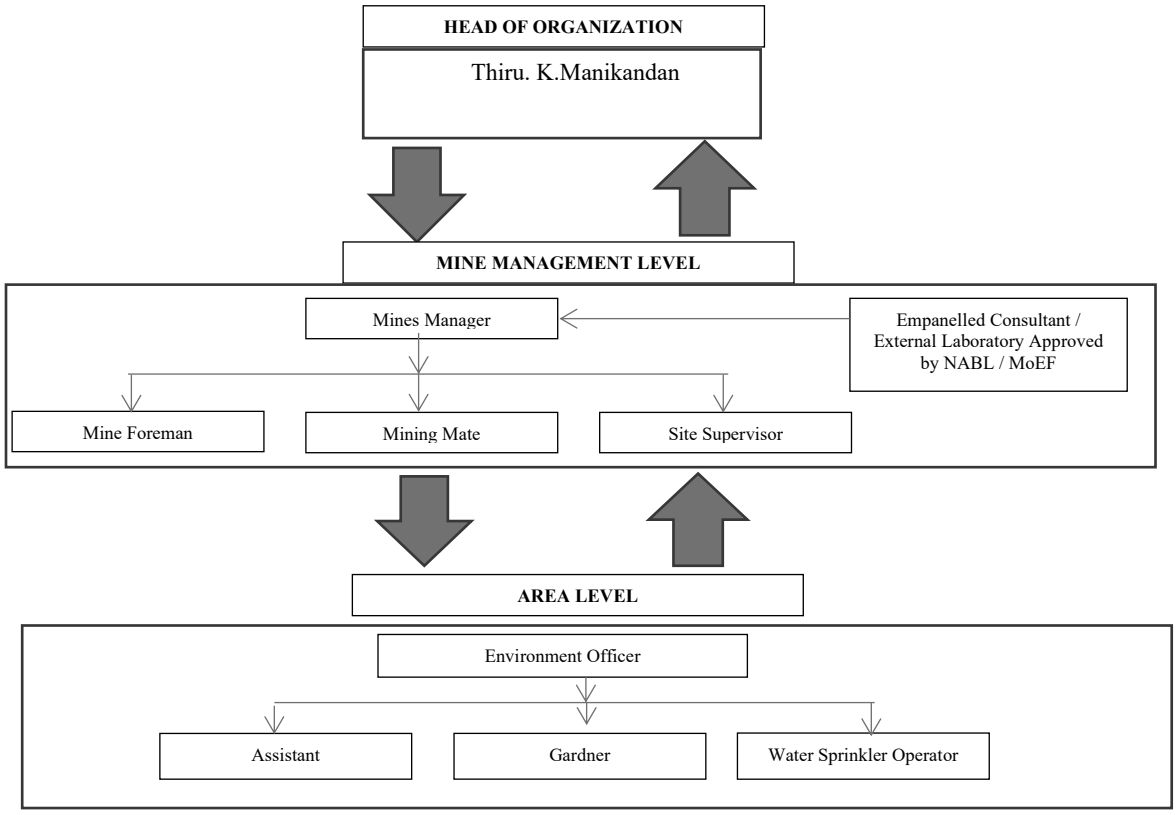
The responsibilities of this cell will be:

- 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

S.No.	Environment Attributes	Location	Monitoring		Parameters
			Duration	Frequency	
1	Air Quality	2 Locations (1 Core & 1 Buffer)	24 hours	Once in 6 months	Fugitive Dust, $PM_{2.5}$, PM_{10}, SO_2 and NO_x.
2	Meteorology	At mine site before start of Air Quality Monitoring & IMD Secondary Data	Hourly / Daily	Continuous online monitoring	Wind speed, Wind direction, Temperature, Relative humidity and Rainfall
3	Water Quality Monitoring	2 Locations (1SW & 1 GW)	-	Once in 6 months	Parameters specified under IS:10500, 1993 & CPCB Norms
4	Hydrology	Water level in open wells in buffer zone around 1 km at specific wells	-	Once in 6 months	Depth in 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/- per annum for Proposed Project.

TABLE 6.3 ENVIRONMENT MONITORING PROGRAM BUDGET

PROPOSAL			
Sl.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		
Total		**Rs 76,000/-**	**Rs 76,000/-**

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

The whole quarry operation will be carried out under the direction of a Qualified Competent Mine Manager holding certificate of competency to manage a metalliferous mine granted by the DGMS, Dhanbad for 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 Working of quarry, as per approved plans and regularly updating the mine plans; Cleaning of mine faces on daily basis shall be daily done in order to avoid any overhang or undercut; Handling of explosives, charging and firing shall be carried out by competent persons only under the supervision of a Mine Manager; Maintenance and testing of all mining equipment as per manufacturer 's guidelines.
2	Drilling	Improper and unsafe practices Due to high pressure of compressed air, hoses may burst Drill Rod may break	Safe operating procedure established for drilling (SOP) will be strictly followed. Only trained operators will be deployed. No drilling shall be commenced in an area where shots have been fired until the blaster/blasting foreman has made a thorough Examination of all places, Drilling shall not be carried on simultaneously on the benches at places directly one above the other. Periodical preventive maintenance and replacement of worn-out accessories in the compressor and drill equipment as per operator manual. All drills unit shall be provided with wet drilling shall be maintained in efficient working in condition. Operator shall regularly use all the personal protective equipment.
4	Blasting	Fly rock, ground vibration, Noise and dust. Improper charging, stemming & Blasting/ fining of blast holes Vibration due to movement of vehicles	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. SOP for Charging, Stemming & Blasting/Firing of Blast Holes will be followed by blasting crew during initial stage of operation Shots are fired during daytime only. All holes charged on any one day shall be fired on the same day. The danger zone will be distinctly demarcated (by means of red flags)
5	Transportation	Potential hazards and unsafe workings contributing to accident and injuries Overloading of material While reversal & overtaking of vehicle Operator of truck leaving his cabin when it is loaded.	Before commencing work, drivers personally check the dumper/truck/tipper for oil(s), fuel and water levels, tyre inflation, general cleanliness and inspect the brakes, steering system, warning devices including automatically operated audio-visual reversing alarm, rear view mirrors, side indicator lights etc., are in good condition. Not allow any unauthorized person to ride on the vehicle nor allow any unauthorized person to operate the vehicle. Concave mirrors should be kept at all corners All vehicles should be fitted with reverse horn with one spotter at every tipping point Loading according to the vehicle capacity Periodical maintenance of vehicles as per operator manual
6	Natural calamities	Unexpected happenings	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

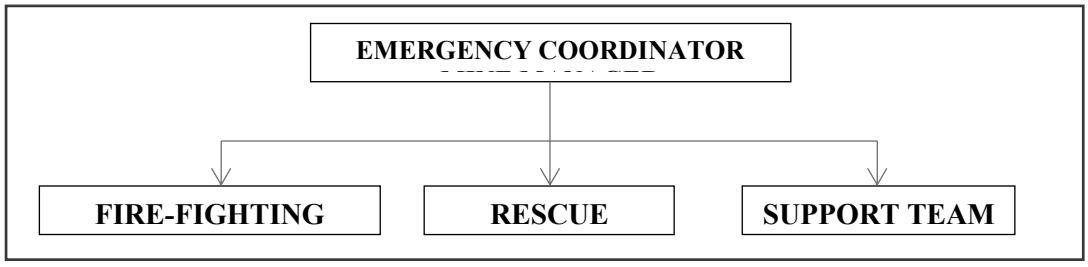
The Disaster Management Plan is aimed to ensure safety of life, protection of environment, protection of installation, restoration of production and salvage operations in this same order of priorities.

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

FIRE-FIGHTING TEAM	
Team Leader/ Emergency Coordinator (EC)	Mines Manager
Team Member	Mines Foreman
Team Member	Mining Mate
RESCUE TEAM	
Team Leader/ Emergency Coordinator (EC)	Mines Manager
Team Member/ Incident Controller (IC)	Environment Officer
Team Member	Mining Foreman
SUPPORT TEAM	
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_2 type, foam type, dry chemical powder type
Fuel Storage Area	CO_2 type, foam type, dry chemical powder type, Sand bucket
Office Area	Dry chemical type, foam type

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

CODE	Name of the Owner	Village	S.F. Nos	Extent in Ha	Status
PROPOSED QUARRIES					
P1	**Thiru.K.Manikandan**.	Katchaikatti	1196/1A, 1196/3, 1196/4 & 1196/5A	1.99.0 Ha	File No: 13178 ToR Identification No: TO24B0108TN5609012N Dated: 10.02.2026
P2	**M/s. Concretia Rock Products Private Limited,** Katchaikatti Road, Vadipatti Taluk, Madurai District – 625 218.	Katchaikatti	1174/2, 3, 4B, 5B, 1192/1, 2, 1193/6A & 6B	2.29.5 Ha	File No: 11446 ToR Identification No: TO24B0108TN5947752N Dated: 20.03.2026
P3	**M/s. Concretia Rock Products Private Limited,** Katchaikatti Road, Vadipatti Taluk, Madurai District – 625 218.	Katchaikatti	1191/2,1191/3A, 1191/3D2, 1191/3B1, 1191/3D1, 1191/3C, 1191/14A, 1194/14B 1194/8 & 1194/7B	4.02.5 Ha	Pending at SEIAA
	TOTAL EXTENT			**8.31.0 Ha**	
EXISTING QUARRIES					
E-1	Meenaachi Sundram.A.D, S/o.Duraisamy	Katchaikatti	1168/25, 1171/3 & 1171/5	1.62.0Ha	23.02.2023 to 22.02.2028
E-2	Rajesh .K Managing Director M/s. Concretia Rock Prouct (Pvt) Ltd.		1185/1,1185/7A & 1185/8	1.79.5 Ha	16.11.2023 to 15.11.2028
E-3	Karuppusamy.S s/o.Solairajan, Madurai-625001		1186/2A,1186/3 & 1186/4	1.16.5 Ha	24.01.2024 to 23.01.2029
E4	Ramesh.K		1265/5, 1267/2A, 1267/2B, 1495/4(P), 1495/6(P)	2.46.0 Ha	02.07.2024 to 01.07.20234
E5	Thiru.B.Karuppaiah		1199/1B,1199/1C,1199/1D, 1199/1E, 1199/1F, 1199/1H,1199/1I,1199/1J, 1199/1K,1193/1&1193/2	2.01.5	29.10.2024 – 28.10.2034
	TOTAL EXTENT			**9.05.50 Ha**	
EXPIRED/ABANDONED QUARRIES					
Ex-1	Kannan.R	Katchaikatti	1168/7,1168/9,1168/19	1.91.0 Ha	23.09.2015 to 22.09.2020
Ex-2	Zavier		1164/2b	0.48.0 Ha	14.11.2009 To 13.11.2014
Ex-3	Selvi.G		1169/6b,1169/6I etc.,	0.67.0 Ha	10.04.2017 To

					09.04.2022
Ex-4	M/s. Concretia Rock Prouct (Pvt) Ltd.		1185/2, 1185/3, 1185/4, 1185/5, 1185/6,1185/7B	1.90.0	28.08.2017 – 27.08.2022
Ex-5	Jayaraman S		1186/1B, 1186/5A, 1186/5B & 1186/6A	1.82.5	18.07.2017 – 17.08.2022
	TOTAL EXTENT			**6.78.5 Ha**	
			TOTAL CLUSTER EXTENT	**17.36.5 Ha**	

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

TABLE 7.5: SALIENT FEATURES OF PROPOSAL "P2"

Name of the Project	M/s. Concretia Rock Products Private Limited Rough stone and Gravel quarry		
S.F. No.	1174/2, 3, 4B, 5B, 1192/1, 2, 1193/6A & 6B		
Extent	2.29.5 Ha		
Village Taluk and District	Katchaikatti Village, Vadipatti Taluk, Madurai District		
Land Type	It is a Patta land – registered in the name of M/s.Concretia Rock Products Pvt Ltd vide 5984 and M/s.Royal Blue Metals Private Limited vide patta nos.4084, 4423,4266 The name of M/s Royal Blue Metals Private Limited now changed as M/s.Concretia Rock Products Pvt Ltd		
Toposheet No	58 – J/04		
Latitude between	10°04'41.26"N to 10°04'49.48"N		
Longitude between	78°00'46.46"E to 78°00'52.65"E		
Elevation of the area	243m AMSL		
Revised Scheme of Mining Plan period	5 Years		
Proposed Depth of Mining	23m bgl		
	Rough Stone in m^3	**Weathered Rock in m^3**	**Gravel in m^3**
Geological Resources	4,59,000	22,950	45,900
Mineable Reserves	1,30,000	9,750	20,278
Year wise Production	1,30,000	9,750	20,278
Peak Production	32,135	3,536	7,632
Ultimate Pit Dimension	XY-AB-71m (L) X 106m (W) X 23m (D) Xy-CD-39m (L) X 67m (W) X 23m (D)		
Water Level in the region	68m–73m bgl		
Method of Mining	Opencast Mechanized Mining Method is being carried out with 5.0-meter vertical bench with a bench width is not less than the bench height		
Topography	The lease applied area is almost plain topography. The area has gentle sloping towards South-western side and altitude of the area is 243m (max) above Mean Sea level. The area is covered by 2m thickness of Gravel and 2m thickness of weathered rock. Massive Charnockite is found after 4m (Gravel + Weathered Rock) which is clearly inferred from the existing quarry pit.		
Machinery proposed	Jack Hammer	4 Nos	
	Compressor	1 No	
	Excavator with Bucket and Rock Breaker	1 Nos	
	Tippers	2 Nos	
	Water sprinkler	1 No	
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	22 Nos		
Project Cost	Rs. 1,48,23,000/-		
CER Cost	Rs. 3,00,000/-		
Nearby Water Bodies	Nilaviyal Odai	50m Safety-North	

	Odai	10m Safety-SW
	Mullaiperiyar Channel	2.7km SW
	Sathaiyar River	7.2km NE
	Sathaiyar Dam	8.0km NE
	Vaigai River	8.5km SW
Greenbelt Development Plan	Proposed to plant 1150 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	2.5 KLD	
Nearest Habitation	960m – North West	
Nearest Reserve Forest	Waguthumalai RF – 240m – East	
Nearest Wild Life Sanctuary	Kodaikanal Wildlife Sanctuary – 36.8km – North West	

TABLE 7.6: SALIENT FEATURES OF PROPOSAL "P1"

Name of the Project	Thiru.K.Manikandan Rough stone and Gravel quarry	
S.F. No.	1196/1A, 1196/3, 1196/4 & 1196/5A	
Extent	1.99.0 Ha	
Village Taluk and District	Katchaikatti Village, Vadipatti Taluk, Madurai District	
Land Type	It is a Patta land – registered in the name of Thiru.C.Ramachandiran, & Thiru.C.R.Manikandan vide Patta no 2025 & 7802 and the consent has been obtained from the respective pattadhars vide Doc.2489/2020	
Toposheet No	58 – J/04	
Latitude between	10°04'36.55"N to 10°04'42.92‘’N	
Longitude between	78°00'24.09"E to 78°00’28.15"E	
Elevation of the area	243m AMSL	
Revised Scheme of Mining Plan period	5 Years	
Proposed Depth of Mining	22m bgl	
	Rough Stone in m^3	**Gravel in m^3**
Geological Resources	8,59,440	42,972
Mineable Reserves	2,85,180	28,926
Year wise Production	1,99,485	28,926
Peak Production	40,280	12,534
Ultimate Pit Dimension	X1Y1-AB-117m (L) X 59m (W) X 42m (D) X2Y2-AB-126m (L) X 60m (W) X 42m (D)	
Water Level in the region	75m bgl	
Method of Mining	Opencast Mechanized Mining Method is being carried out with 5.0-meter vertical bench with a bench width is not less than the bench height	
Topography	The lease applied area is almost plain topography. The area has gentle sloping towards South-western side and altitude of the area is 220m (max) above Mean Sea level. The area is covered by 2m thickness of Gravel and 2m thickness of weathered rock. Massive Charnockite is found after 4m (Gravel + Weathered Rock) which is clearly inferred from the existing quarry pit.	

Machinery proposed	Jack Hammer	1 Nos
	Compressor	2 No
	Excavator with Bucket and Rock Breaker	2 Nos
	Tippers	3 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	17 Nos	
Project Cost	Rs. 78,29,000/-	
CER Cost	Rs. 3,00,000/-	
Nearby Water Bodies	Odai	50m Safety-South
	Odai	110m NE
	Mullaiperiyar Channel	2.3km SW
	Sathaiyar River	7.7km NE
	Sathaiyar Dam	8.6km NE
	Vaigai River	8km SW
Greenbelt Development Plan	Proposed to plant 1000 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	2.5 KLD	
Nearest Habitation	450m – North West	
Nearest Reserve Forest	Waguthumalai RF – 660m – SouthEast	
Nearest Wild Life Sanctuary	Kodaikanal Wildlife Sanctuary – 36.2km – North West	

TABLE 7.6A: SALIENT FEATURES OF PROPOSAL "E1"

Name of the Quarry	Thiru.A.D.Meenachisundram Rough stone and Gravel Quarry	
S.F.No	1168/25, 1171/3 & 1171/5	
Extent	1.62.0 Ha	
Toposheet No	58-G/11	
Latitude between	10°04'53.29"N to 10°04'57.04"N	
Longitude between	78°44'49.19"E to 78°00'57.83"E	
Proposed Depth of Mining	37m BGL	
Geological Resources	Rough Stone in m^3	Gravel m^3
	5,67,000	32,400
Mineable Reserves	Rough Stone in m^3	Gravel m^3
	1,29,130	18,930
Year wise production details	Rough Stone in m^3	Gravel m^3
	1,29,130	18,930
Water Level in the surrounds area	60m-65m bgl	
Method of Mining	Opencast Mechanized Mining Method involving drilling and blasting	
Topography	The lease applied area is exhibits plain terrain. The area has gentle sloping towards south side and covered by grayish black cotton soil followed by weathered rock formation and massive charnockite rock formation.	
Machinery proposed	Jack Hammer	2 Nos
	Compressor	1 No

	Excavator	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	19 Nos	
Project Cost	Rs. 35.06 lakhs	
CER Cost	Rs. 5.0 Lakhs	
Greenbelt Development Plan	810 trees in the 7.5 m Safety Zone and approach road	
Proposed Water Requirement	2.0 KLD	
Nearest Habitation	990m SW	

Source: Approved Mining Plan

TABLE 7.7: SALIENT FEATURES OF PROPOSAL "E2"

Name of the Quarry	M/s. Concretia Rock Prouct (Pvt) Ltd. Rough stone and Gravel Quarry	
S.F.No	1185/1, 1185/7A & 1185/8	
Extent	1.79.5 Ha	
Toposheet No	58 G/11	
Latitude between	10°04'36.80"N to 10°04'28.87"N	
Longitude between	78°00'34.18"E to 78°00'30.79"E	
Proposed Depth of Mining	48m BGL	
Geological Resources	Rough Stone in m^3	Gravel m^3
	8,23,275	54,885
Mineable Reserves	Rough Stone in m^3	Gravel m^3
	1,26,510	20,889
Proposed production for five years plan period	Rough Stone in m^3	Gravel m^3
	1,26,510	20,889
Water Level in the surrounds area	60m-65m bgl	
Method of Mining	Opencast Mechanized Mining Method involving drilling and blasting	
Topography	The lease applied area is exhibits plain terrain. The area has gentle sloping towards south side and covered by grayish black cotton soil followed by weathered rock formation and massive charnockite rock formation	
Machinery proposed	Jack Hammer	2 Nos
	Compressor	1 No
	Excavator	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	15 Nos	
Project Cost (excluding EMP cost)	Rs.54.0 Lakhs/-	
CER Cost	Rs.1,08,000/-	
Greenbelt Development Plan	900 trees in the 7.5 m Safety Zone and approach road	
Proposed Water Requirement	1.5 KLD	
Nearest Habitation	720m SW	

TABLE 7.7A: SALIENT FEATURES OF PROPOSAL "E3"

Name of the Quarry	Thiru.S.Karuappusamy Rough stone and Gravel Quarry
S.F.No	1186/2A, 1186/3 & 1186/4
Extent	1.16.5 Ha
Toposheet No	58 G/11

Latitude between	10°04'32.97"N to 10°04'36.47"N	
Longitude between	78°00'26.81"E to 78°00'32.25"E	
Proposed Depth of Mining	48m BGL	
Geological Resources	Rough Stone in m^3	Gravel m^3
	3,63,030	24,202
Mineable Reserves	Rough Stone in m^3	Gravel m^3
	34,000	6,912
Proposed production for five years plan period	Rough Stone in m^3	Gravel m^3
	33,100	6,912
Water Level in the surrounds area	60m-65m bgl	
Method of Mining	Opencast Mechanized Mining Method involving drilling and blasting	
Topography	The lease applied area is exhibits plain terrain. The area has gentle sloping towards south side and covered by grayish black cotton soil followed by weathered rock formation and massive charnockite rock formation	
Machinery proposed	Jack Hammer	6 Nos
	Compressor	2 No
	Excavator	1 No
	Tippers	3 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	18 Nos	
Project Cost (excluding EMP cost)	Rs.38.97 Lakhs/-	
CER Cost	Rs.77,940/-	
Greenbelt Development Plan	585 trees in the 7.5 m Safety Zone and approach road	
Proposed Water Requirement	3.5 KLD	
Nearest Habitation	630m SW	

TABLE 7.8: SALIENT FEATURES OF PROPOSAL "E5"

Name of the Project	Thiru.B. Karuppaiah Rough stone and Gravel quarry	
S.F. No.	1199/1B,1199/1C,1199/1D, 1199/1E, 1199/1F, 1199/1H,1199/1I,1199/1J, 1199/1K,1193/1&1193/2	
Extent	2.01.5 Ha	
Village Taluk and District	Katchaikatti Village, Vadipatti Taluk, Madurai District	
Land Type	It is a Patta land – registered in the name of the proponent vide patta no.6445 & 6662.	
Toposheet No	58 – J/04	
Latitude between	10°04'47.79"N to 10°04'55.37"N	
Longitude between	78°00'37.99"E to 78°00'44.65"E	
Elevation of the area	243m AMSL	
Revised Scheme of Mining Plan period	5 Years	
Proposed Depth of Mining	30m bgl	
	Rough Stone in m^3	**Gravel in m^3**
Geological Resources	5,68,120	40,580
Mineable Reserves	1,84,603	27,862
Year wise Production	1,56,188	27,862
Peak Production	34,465	14,238

Water Level in the region	50m–55m bgl	
Method of Mining	Opencast Mechanized Mining Method is being carried out with 5.0-meter vertical bench with a bench width is not less than the bench height	
Topography	The lease applied area is exhibits falt terrian topography. The area has gentle sloping towards South-eastern side and altitude of the area is 211m (max) above Mean Sea level. The area is covered by 2m thickness of Gravel. Massive Charnockite is found after 2m (Gravel) which is clearly inferred from the existing quarry pit.	
Machinery proposed	Jack Hammer	3 Nos
	Compressor	1 No
	Excavator with Bucket and Rock Breaker	1 Nos
	Tippers	4 Nos
	Water sprinkler	1 No
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	19 Nos	
Project Cost	Rs. 56,55,300/-	
CER Cost	Rs. 5,00,000/-	
Proposed Water Requirement	5.9 KLD	
Nearest Habitation	660m – West	
Nearest Reserve Forest	Waguthumalai RF – 630m – East	
Nearest Wild Life Sanctuary	Kodaikanal Wildlife Sanctuary – 36.4km – North West	

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 7.8 to 7.9.

TABLE 7.8B: CUMULATIVE PRODUCTION LOAD OF ROUGH STONE

Quarry	Year wise production (Five Years)	Per Year Production in m^3	Per Day Production in m^3	Number of Lorry Load Per Day
P2	1,30,000	26,000	87	7
P1	1,99,485	39,897	132	11
Total	**3,29,485**	**65,897**	**219**	**18**
E1	1,29,130	25,826	86	7
E2	1,26,510	25,302	84	7
E3	33,100	6,620	22	2
E5	1,56,188	31,238	104	9
Total	**4,44,928**	**88,992**	**296**	**25**
Grand Total	**7,74,413**	**1,54,889**	**515**	**43**

TABLE 7.9: CUMULATIVE PRODUCTION LOAD OF GRAVEL/ TOPSOIL

Quarry	Year wise production (Three Years)	Per Year Production in m^3	Per Day Production in m^3	Number of Lorry Load Per Day
P2	20,278	6,759	23	2
P1	28,926	9,642	32	2
Total	**49,204**	**16,401**	**55**	**4**
E1	18,930	6,310	21	2
E2	20,889	6,963	23	2
E3	6,912	2,304	8	1
E5	27,862	9,287	31	3
Total	**74,593**	**24,864**	**83**	**8**
Grand Total	**1,23,797**	**41,265**	**138**	**12**

TABLE 7.10: CUMULATIVE PRODUCTION LOAD OF WEATHERED ROCK

Quarry	Year wise production (Three Years)	Per Year Production in m^3	Per Day Production in m^3	Number of Lorry Load Per Day
P2	9,750	3,250	11	1
P1	-	-	-	-
Total	**9,750**	**3,250**	**11**	**1**
E1	-	-	-	-
E2	-	-	-	-
E3	-	-	-	-
Total	-	-	-	-
Grand Total	**9,750**	**3,250**	**11**	**1**

On a cumulative basis considering the proposed quarries, it can be seen that the overall production of Rough Stone is $383m^3$ per day with a capacity of 32 trips of Rough Stone per day and Gravel/Topsoil is $106m^3$ per day with a capacity of 10 trips & Weathered Rock is $11m^3$ per day with a capacity of 1 trip of from the cluster.

Based on the above production quantities the emissions due to various activities in all the 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 7.10.

TABLE 7.11: EMISSION ESTIMATION FROM QUARRIES WITHIN 500 METER RADIUS

EMISSION ESTIMATION FOR QUARRY "P2"				
	Activity	**Source type**	**Value**	**Unit**
Estimated Emission Rate for PM_{10}	Drilling	Point Source	0.111788517	g/s
	Blasting	Point Source	0.004222799	g/s
	Mineral Loading	Point Source	0.046230216	g/s
	Haul Road	Line Source	0.002505482	g/s/m
	Overall Mine	Area Source	0.057876717	g/s
Estimated Emission Rate for SO_2	Overall Mine	Area Source	0.0015522	g/s
Estimated Emission Rate for NOx	Overall Mine	Area Source	0.000082606	g/s
EMISSION ESTIMATION FOR QUARRY "P1"				
	Activity	**Source type**	**Value**	**Unit**
Estimated Emission Rate for PM_{10}	Drilling	Point Source	0.127112208	g/s
	Blasting	Point Source	0.008026954	g/s
	Mineral Loading	Point Source	0.048206776	g/s
	Haul Road	Line Source	0.002517608	g/s/m

	Overall Mine	Area Source	0.057059768	g/s
Estimated Emission Rate for SO_2	Overall Mine	Area Source	0.002263802	g/s
Estimated Emission Rate for NOx	Overall Mine	Area Source	0.000109055	g/s
EMISSION ESTIMATION FOR QUARRY "E1"				
Estimated Emission Rate for PM_{10}	**Activity**	**Source type**	**Value**	**Unit**
	Drilling	Point Source	0.111563552	g/s
	Blasting	Point Source	0.004180480	g/s
	Mineral Loading	Point Source	0.046161526	g/s
	Haul Road	Line Source	0.002505138	g/s/m
	Overall Mine	Area Source	0.050293513	g/s
Estimated Emission Rate for SO_2	Overall Mine	Area Source	0.001480192	g/s
Estimated Emission Rate for NOx	Overall Mine	Area Source	0.000057533	g/s
EMISSION ESTIMATION FOR QUARRY "E2"				
Estimated Emission Rate for PM_{10}	**Activity**	**Source type**	**Value**	**Unit**
	Drilling	Point Source	0.110879599	g/s
	Blasting	Point Source	0.004053897	g/s
	Mineral Loading	Point Source	0.046140876	g/s
	Haul Road	Line Source	0.002505035	g/s/m
	Overall Mine	Area Source	0.052368428	g/s
Estimated Emission Rate for SO_2	Overall Mine	Area Source	0.001485138	g/s
Estimated Emission Rate for NOx	Overall Mine	Area Source	0.000063283	g/s
EMISSION ESTIMATION FOR QUARRY "E3"				
Estimated Emission Rate for PM_{10}	**Activity**	**Source type**	**Value**	**Unit**
	Drilling	Point Source	0.074158782	g/s
	Blasting	Point Source	0.000542535	g/s
	Mineral Loading	Point Source	0.040500036	g/s
	Haul Road	Line Source	0.002488369	g/s/m
	Overall Mine	Area Source	0.041409732	g/s
Estimated Emission Rate for SO_2	Overall Mine	Area Source	0.000399587	g/s
Estimated Emission Rate for NOx	Overall Mine	Area Source	0.000011078	g/s
EMISSION ESTIMATION FOR QUARRY "E5"				
Estimated Emission Rate for PM_{10}	**Activity**	**Source type**	**Value**	**Unit**
	Drilling	Point Source	0.118115934	g/s
	Blasting	Point Source	0.005561051	g/s
	Mineral Loading	Point Source	0.047176962	g/s
	Haul Road	Line Source	0.002510723	g/s/m
	Overall Mine	Area Source	0.055956389	g/s
Estimated Emission Rate for SO_2	Overall Mine	Area Source	0.001847375	g/s
Estimated Emission Rate for NOx	Overall Mine	Area Source	0.000088527	g/s

Source: Emission Calculation

TABLE 7.12: INCREMENTAL & RESULTANT GLC WITHIN CLUSTER

PM_{10} in µg/m^3	
Background	39.1
Incremental	12.77
Resultant	51.87
NAAQ Norms	**100 µg/m^3**
$PM_{2.5}$ in µg/m^3	
Background	18.9
Incremental	5.82
Resultant	24.72
NAAQ Norms	**60 µg/ m^3**
So2 in µg/m^3	

Background	4.7
Incremental	6.51
Resultant	11.21
NAAQ Norms	**80 µg/ m^3**
No2 in µg/m^3	
Background	18.3
Incremental	1.1
Resultant	19.4
NAAQ Norms	**80 µg/ m^3**

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.

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

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.

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

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 7.13: PREDICTED NOISE INCREMENTAL VALUES FROM CLUSTER

Location ID	Background Value (Day) dB(A)	Incremental Value dB(A)	Total Predicted dB(A)	Industrial Standards dB(A)
P2	46.3	60.1	60.3	**Industrial Day Time- 75 dB (A) Night Time- 70 dB (A)**
P1	48.3	57.8	58.3	
E1	45.3	60.1	60.2	
E2	46.3	54.1	54.7	
E3	48.2	54.1	55.1	
E5	48.2	60.1	60.4	

Source: Lab Monitoring Data

The incremental noise level is found within the range of 48.3 dB (A) in Core 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), dated19.09.2006 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 each mine 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 each mine respectively are as in below.

TABLE 7.14: NEAREST HABITATION FROM EACH MINES

Location ID	Distance & Direction
P1	960m-NW
P2	450m-NW
E1	1050m-W
E2	770m-NW
E3	710m-NW
E5	740m W

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 7.15: GROUND VIBRATIONS AT EACH MINES

Location ID	Maximum Charge in kgs	Nearest Habitation in m	PPV in mm/s
P2	20	960m-NW	0.093
P1	20	450m-NW	0.169
E1	20	1050m-W	0.312
E2	20	770m-NW	0.132
E3	20	710m-NW	0.151
E5	20	740m W	0.141

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 –

Each mine shall contribute towards CER and the community shall develop.

TABLE 7.16: SOCIO ECONOMIC BENEFITS FROM EACH MINES

Location ID	Project Cost	CER
P2	Rs. 1,52,03,000/-	Rs. 3,00,000/-
P1	Rs. 78,29,000/-	Rs. 3,00,000/-
Total	**Rs. 2,30,32,000/-**	**Rs. 6,00,000/-**
E1	Rs. 35,06,000 /-	Rs. 5,00,000/-
E2	Rs.54,00,000 /-	Rs.1,08,000/-
E3	Rs.38,97,000 /-	Rs.77,940/-
E5	Rs.56,55,300 /-	Rs.1,13,106/-
Total	**Rs. 1,84,58,300/-**	**Rs. 17,71,046/-**
Grand. Total	**Rs. 4,14,90,300/-**	**Rs. 23,71,046/-**

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 by all the mines.

TABLE 7.17: EMPLOYMENT BENEFITS FROM EACH MINES

Description	Employment
P2	22
P1	17
Total	**39**
E1	19
E2	15
E3	18
E5	19
Total	**71**
Grand Total	**110**

A total of 41 people will get employment due to 2 proposed mine in cluster and remaining people are already employed at existing mines.

TABLE 7.18: GREENBELT DEVELOPMENT BENEFITS FROM EACH MINES

Code	No of Trees proposed to be planted	Area Covered Sq.m	Name of the Species
P2	1,150	The safety zone along the boundary barrier has been identified to be utilized for Greenbelt development	Neem, Pungam, Vilvam, etc.,
P1	1000		
Total	**2,150**		
E1	810		
E2	900		
E3	585		
E4	1010		

Total	**3,305**		
G. Total	**5,455**		

For the proposed mining plan 2150 Nos of trees will be planted around lease area and approach road and 5455 trees are planted for existing 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 7.19: 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

7.6 CLUSTER MANAGEMENT COMMITTEE

The cluster management committee is proposed to form including of 3 Proposed quarry and 5 Existing quarries total extent of the cluster is **17.36.5** Ha

In the cluster management committee, the following Environmental Management plan will be followed the activities such as

- Transportation of Minerals and blasting activities with the coordination between the individual quarry owners.
- Sprinkling of water regularly thrice a day in the mutual understanding with the quarry owners

- Carrying out blasting operation as specified times by the Mines Managers and as per the EIA report
- Usage of Haul roads in a time specified by the Cluster Management Committee
- Following Safe operating procedure prescribed by the Mines Manager during natural calamities
- Planting Trees in the Government Land, School and within the project site
- Celebrating Safety month, Environmental Month along with the Mines Managers in every six months once
- Regularly follow the health of the workers and take medical examination as per the DGMS norms under the guidance of Mines Manager
- Meet at Association Hall monthly once to review the Environmental Management and Safety activities prescribed by the Cluster Management Committee
- We have read and understood all the above steps and we ensure to follow these specific steps Quarry owners in the Cluster management committee

Quarries in the Cluster Management Committee

CODE	Name of the Owner	Village	S.F. Nos	Extent in Ha	Status
PROPOSED QUARRIES					
P1	**Thiru.K.Manikandan**.	Katchaikatti	1196/1A, 1196/3, 1196/4 & 1196/5A	1.99.0 Ha	File No: 13178 ToR Identification No: TO24B0108TN5609012N Dated: 10.02.2026
P2	**M/s. Concretia Rock Products Private Limited,** Katchaikatti Road, Vadipatti Taluk, Madurai District – 625 218.	Katchaikatti	1174/2, 3, 4B, 5B, 1192/1, 2, 1193/6A & 6B	2.29.5 Ha	File No: 11446 ToR Identification No: TO24B0108TN5947752N Dated: 20.03.2026
P3	**M/s. Concretia Rock Products Private Limited,** Katchaikatti Road, Vadipatti Taluk, Madurai District – 625 218.	Katchaikatti	1191/2,1191/3A, 1191/3D2, 1191/3B1, 1191/3D1, 1191/3C, 1191/14A, 1194/14B 1194/8 & 1194/7B	4.02.5 Ha	Pending at SEIAA
	TOTAL EXTENT			**8.31.0 Ha**	
EXISTING QUARRIES					
E-1	Meenaachi Sundram.A.D, S/o.Duraisamy	Katchaikatti	1168/25, 1171/3 & 1171/5	1.62.0Ha	23.02.2023 to 22.02.2028
E-2	Rajesh .K Managing Director M/s. Concretia Rock Prouct (Pvt) Ltd.		1185/1,1185/7A & 1185/8	1.79.5 Ha	16.11.2023 to 15.11.2028
E-3	Karuppusamy.S s/o.Solairajan, Madurai-625001		1186/2A,1186/3 & 1186/4	1.16.5 Ha	24.01.2024 to 23.01.2029
E4	Ramesh.K		1265/5, 1267/2A, 1267/2B, 1495/4(P), 1495/6(P)	2.46.0 Ha	02.07.2024 to 01.07.20234

E5	Thiru.B.Karuppaiah		1199/1B,1199/1C,1199/1D, 1199/1E, 1199/1F, 1199/1H,1199/1I,1199/1J, 1199/1K,1193/1&1193/2	2.01.5	29.10.2024 – 28.10.2034
	TOTAL EXTENT			**9.05.50 Ha**	
EXPIRED/ABANDONED QUARRIES					
Ex-1	Kannan.R	Katchaikatti	1168/7,1168/9,1168/19	1.91.0 Ha	23.09.2015 to 22.09.2020
Ex-2	Zavier		1164/2b	0.48.0 Ha	14.11.2009 To 13.11.2014
Ex-3	Selvi.G		1169/6b,1169/6I etc.,	0.67.0 Ha	10.04.2017 To 09.04.2022
Ex-4	M/s. Concretia Rock Prouct (Pvt) Ltd.		1185/2, 1185/3, 1185/4, 1185/5, 1185/6,1185/7B	1.90.0	28.08.2017 – 27.08.2022
Ex-5	Jayaraman S		1186/1B, 1186/5A, 1186/5B & 1186/6A	1.82.5	18.07.2017 – 17.08.2022
	TOTAL EXTENT			**6.78.5 Ha**	
	TOTAL CLUSTER EXTENT			**17.36.5 Ha**	

STANDARD OPERATING PROCEDURE FOR KATCHAIKATTI VILLAGE CLUSTER MANAGEMENT COMMITTEE

1. **Maintenance of Haul Roads and Village Roads:**
    - 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-metaled 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
2. **Maintenance of Drilling Activities**

- 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.
- Usage of sharp drill bits while drilling which will help in reducing noise;
- Secondary blasting will be totally avoided and hydraulic rock breaker will be used for breaking boulders;
- Controlled blasting with proper spacing, burden, stemming and optimum charge/delay will be maintained;
- The blasting will be carried out during favourable atmospheric condition and less human activity timings by using nonelectrical initiation system;
- Proper maintenance, oiling and greasing of machines will be done every week to reduce generation of noise;
- Provision of sound insulated chambers for the workers working on machines (HEMM) producing higher levels of noise;
- Silencers / mufflers will be installed in all machineries;
- 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 though training and awareness.
- Regular medical check–up and proper training to personnel to create awareness about adverse noise level effects

3. Maintenance of Blasting Activities

- 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 (1.00 PM to 2.00 PM), 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
- The blasting operations in the cluster quarries are carried out 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, 2nd Class Mines Manager/ 1st Class Mines Manager) will be appointed.
- A set of shot firing rules will be drawn up and blasting shall commence outlining the detailed operating procedures that will be followed to ensure that shot firing operations on site take place without endangering the workforce or public.
- Sufficient angular stemming material will be used to confine the explosive force and minimise environmental disturbance caused by venting / misfire.
- The detonators will be connected in a predetermined sequence to ensure that only one charge is detonated at any one time and a NONEL or similar type initiation system will be used.
- The detonation delay sequence shall be designed so as to ensure that firing of the holes is in the direction of free faces so as to minimise vibration effects.
- Appropriate blasting techniques shall be adopted such that the predicted peak particle velocity shall not exceed 8 Hz.
- Vibration monitoring will be carried out every 6 months to check the efficacy of blasting practices

4. Maintenance of Greenbelt Activities

- Planting of trees all along main mine haul roads and regular grading of haul roads will be practiced to prevent the generation of dust due to movement of dumpers/trucks
- Green belt of adequate width will be developed around the project areas
- Suitable plan for conservation of Schedule-I Species have prepared and necessary fund for implement for the same will be made.
- All the preventive measures will be taken for growth & development of fauna.
- Creating and development awareness for nature and wildlife in the adjoin villages.
- The workers shall be trained to not harm any wildlife, should it come near the project site. No work shall be carried out after 6.00 pm

5. Maintenance of 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
- 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

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

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.

6. Cluster Management Committee Policy

- 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 programme 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
- 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.

8.PROJECT BENEFITS

8.0 GENERAL

The Proposed Project for Quarrying Rough Stone and Gravel at Katchaikatti Village aims to produce 1,99,485 m³ of Rough Stone over a period of 5 years and 28,926 m³ of Gravel to be quarried over a 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 110 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 quarry was located in Katchaikatti Village, Vadipatti Taluk, Madurai 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.,

8.5.1 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 Ethirkottai 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.

8.5.2 CORPORATE ENVIRONMENT RESPONSIBILITY

For the proposed quarry 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 3,00,000/- towards CER for the Government School near the project site the details are given below:

TABLE 8.1 CER – ACTION PLAN

Activity	CER
• Renovation/ Construction of Existing Toilet • Providing Environmental Related books to the school Library • Carrying out plantation and maintenance in the school Ground • Any other requirements in consultation with the school Head master	Rs 3,00,000/-

9. ENVIRONMENTAL COST BENEFIT ANALYSIS

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

10.ENVIRONMENTAL MANAGEMENT PLAN – THIRU K. MANIKANDAN

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 K.Manikandan** 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
Refuelling to be undertaken in a safe location, away from vehicle movement pathways & 100 m away of any watercourse Refuelling activity to be under visual observation at all times. Drainage of refuelling 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

SOIL MANAGEMENT

There is no Waste anticipated during this plan period hence, disposal of waste does not arise. The overburden in the form of Gravel and Weathered rock are already removed during the previous lease period. The excavated rough stone (100%) will be directly loaded into Trucks to the needy customers.

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 mine office. The quarrying operation is proposed up to a depth of 23m BGL, the water table in the area is 73m below ground level, hence the proposed projects 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

CONTROL	RESPONSIBILITY
Development of thick greenbelt all along the Buffer Zone (7.5 Meters) of the project area to attenuate the noise and the same will be maintained	Mines Manager
Preventive maintenance of mining machinery and replacement of worn-out accessories to control noise generation	Mines Foreman
Deployment of mining equipment with an inbuilt mechanism to reduce noise	Mines Manager
Provision of earmuff / ear plugs to workers working in noise prone zones in the mines	Mining Mate
Provision of effective silencers for mining machinery and transport vehicles	Mines Manager
Provision of sound proof AC operator cabins to HEMM	Mines Manager
Sharp drill bits are used to minimize noise from drilling	Mines Foreman

Controlled blasting technologies are adopted by using delay detonators to minimize noise from blasting	Mines Manager
Annual ambient noise level monitoring is carried out in the project area and in surrounding villages to access 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

CONTROL	RESPONSIBILITY
Controlled blasting using delay detonators will be carried out to maintain the PPV value (below 8Hz) well within the prescribed standards of DGMS	Mines Manager
Drilling and blasting will be carried under the supervision of qualified persons	Mines Manager
Proper stemming of holes should be carried out with statutory competent qualified blaster under the supervision of statutory mines manager to avoid any anomalies during blasting	Mines Manager
Suitable spacing and burden will be maintained to avoid misfire / fly rocks	Manager Mines
Number of blast holes will be restricted to control ground vibrations	Manager Mines
Blasting will be carried out only during noon time	Mining Mate
Undertake noise or vibration monitoring	Mines Manager
ensure blast holes are adequately stemmed for the depth of the hole and stemmed with suitable angular material	Mines Foreman

Source: Proposed by 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 1150nos. of saplings is proposed to be planted for the Mining plan period in safety barrier of applied mine lease area. The greenbelt development plan has been prepared keeping in view the land use changes that will occur due to mining operation in the area.

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.

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 10.7. RECOMMENDED SPECIES FOR THE PLANTATION

S.No	Botanical Name	Local Name
1	*Aegle marmelos*	Vilvamaram
2	*Albizia lebbeck*	Vaagai maram
3	*Cassia fistula*	Konrai tree
4	*Lannea coromandelica*	Othiyam
5	*Limoniaacidissima*	Vila maram
6	*Syzygiumcumini*	Naval maram
7	*Toona ciliata*	Santhana Vembu
8	*Ficus hispida*	Aththimaram
9	*Borassus flabellifer*	Panai-maram

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 10.8. MEDICAL EXAMINATION SCHEDULE

Sl.No	Activities	1st Year	2nd Year	3rd Year	4th Year	5th 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 and 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 10.9 gives overall investment on the environmental safeguards and recurring expenditure for successful monitoring and implementation of control measures.

TABLE 10.9: EMP BUDGET FOR PROPOSED PROJECT

Activities	Mitigation Measure	Provision for Implementation	Capital	Recurring per annum
Air Environment	Haul road maintenance & Water sprinkling	Lump sum fund allocation for daily maintenance of haul roads and thrice a day water sprinkling by fixed sprinklers or water tankers	0	50000
	Muffle blasting – To control fly rocks during blasting	Lump sum fund allocation Blasting face will be covered with sand bags / steel mesh / old tyres / used conveyor belts	0	5000
	Wet drilling procedure	Lump sum fund allocation for ensuring wet drilling by covering drill holes with wet gunny bags and spraying water while drilling	0	10000
	No overloading of trucks/tippers/tractors	Lump sum fund allocation Manual Monitoring through Security guard	0	5000
	Stone carrying trucks will be covered by tarpaulin	Lump sum fund allocation Manual Monitoring through Security guard	0	5000
	Enforcing speed limits of 20 km/hr within ML area	Lump sum fund allocation Manual Monitoring through Security guard	0	5000
	Regular monitoring of exhaust fumes as per RTO norms	Lump sum fund allocation Manual Monitoring through Security guard	0	5000
	Installing wheel wash system near gate of quarry	Installation + Maintenance + Supervision	50000	5000
Noise Environment	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 / Competent Person	0	0
	Provision for Portable blaster shed	Installation of Portable blasting shelter	50000	2000

	NONEL Blasting will be practiced to control Ground vibration and fly rocks	Rs. 30/- per 6 Tonnes of Blasted Material	0	0
Waste Management	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
Mine Closure	1. Progressive Closure Activity - Surface Runoff management	Provision made in Operating Cost	0	0
	2. Progressive Closure Activity Barbed Wire Fencing to quarry area will be provisioned.	Provision made in Operating Cost	0	0
	3. Greenbelt development under safety zone during the mining period	Provision made in Operating Cost	0	0
Implementation of EC, Mining Plan & DGMS Condition	Size 6' X 5' with blue background and white letters as mentioned in MoM Appendix II by the SEAC TN	Fixed Display Board at the Quarry Entrance as permanent structure 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	100000
	Workers will be provided with Personal Protective Equipment's	Lumpsum fund allocation	50000	15000
	Health checkup for workers will be provisioned	IME & PME Health checkup for all the employees will be covered batch wise.	0	50000
	First aid facility will be provided	Lumpsum fund allocation	0	5000
	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 will be made for vehicles /HEMMs. Flaggers will be deployed for traffic management	Lumpsum fund allocation	50000	10000
	Installation of CCTV cameras in the mines and mine entrance	Camera 4 Nos, DVR, Monitor with internet facility	30000	5000
	Appointment of Competent person for ensuring the safety operation	Provision made in operational cost	0	0
CER	As per MoEF &CC OM 22-65/2017-IA.III Dated 25.02.2021	Lumpsum fund allocation	300000	0
TOTAL			**5,60,000**	**3,02,000**

Year Wise Break Up	
I Year	**₹ 8,62,000/-**
II Year	₹ 3,17,100/-
III Year	₹ 3,32,955/-
IV Year	₹ 3,49,603/-
V Year	₹ 3,67,083/-
Total	**₹ 22.29 Lakhs**

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.

11. SUMMARY AND CONCLUSION

The Draft EIA & EMP report prepared for the proposed ThiruK.Manikandan Rough Stone and Gravel Quarry project located in of Katchaikatti Village, Vadipatti Taluk, Madurai District, Tamil Nadu State the Project falls in the Cluster category consist of 3 Proposed & 5 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 March – May 2026 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.

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 110 people directly in the proposed projects and indirectly around 200 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 Katchaikatti Rough Stone and Gravel Quarries (Cluster Extent 17.36.5 ha).

12. DISCLOSURE OF CONSULTANT

The Project Proponent's M/s. Concretia Rock Products Private Limited & Thiru.K. Manikandan have engaged 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.

Name and address of the consultancy:

GEO EXPLORATION AND MINING SOLUTIONS
No 17, Advaitha Ashram Road,
Alagapuram, Salem – 636 004
Tamil Nadu, India
Email: infogeoexploration@gmail.com
Web: **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** **38**	**A** **B**	WP GEO SC	A A A
2	Dr. P. Thangaraju	In-house	**1**	**A**	HG GEO	A A
3	Mr. N. Senthilkumar	Empanelled	**31** **38**	**A** **B**	AQ WP RH	A B A
4	Mr. J. R. Vikram Krishna	Empanelled	**1** **38**	**A** **B**	SHW RH NV	A A A
5	Mr. A. Jagannathan	In-house	**-**	**-**	AP NV SHW	A A B
6	Mrs. Jisha parameswaran	In-house	-	-	SW	B
7	Mr. Govindasamy	In-house	-	-	WP	B
8	Mr. Panneer Selvam	In-house	-	-	EB	B
9	Mr. A. Allimuthu	In-house	-	-	LU	B
10	Dr. T. Sasikala	Empanelled	-	-	SE	B

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

DECLARATION BY EXPERTS CONTRIBUTING TO THE EIA/EMP

Declaration by experts contributing to the EIA/EMP for ThiruK.Manikandan Rough Stone & Gravel Quarry over an Cluster Extent of **17.36.5 ha** in Kachaikatt1 Village, Vadipatti Taluk, Madurai District, Tamil Nadu State. 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.

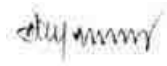
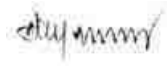
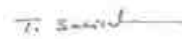
Name**:** **Dr. M. Ifthikhar Ahmed**

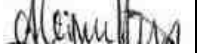
Designation**:** **EIA Coordinator**

Date & Signature: 

Period of Involvement: **March 2025 to till date**

FUNCTIONAL AREA EXPERTS ENGAGED IN THE PROJECT

Sl. No.	Functional Area	Involvement	Name of the Expert/s	Signature
1	AP	▪ Identification of different sources of air pollution due to the proposed mine activity ▪ Prediction of air pollution and propose mitigation measures / control measures	Mr. A. Jagannathan	
2	WP	▪ Suggesting water treatment systems, drainage facilities ▪ Evaluating probable impacts of effluent/waste water discharges into the receiving environment/water bodies and suggesting control measures.	Dr. M. Ifthikhar Ahmed	
3	HG	▪ Interpretation of ground water table and predict impact and propose mitigation measures. ▪ Analysis and description of aquifer Characteristics	Dr. P. Thangaraju	
4	GEO	▪ Field Survey for assessing the regional and local geology of the area. ▪ Preparation of mineral and geological maps. ▪ Geology and Geo morphological analysis/description and Stratigraphy/Lithology.	Dr. P. Thangaraju	
5	SE	▪ Revision in secondary data as per Census of India, 2011. ▪ Impact Assessment & Preventive Management Plan ▪ Corporate Environment Responsibility.	Dr. T. Sasikala	
6	EB	▪ Collection of Baseline data of Flora and Fauna. ▪ Identification of species labelled as Rare, Endangered and threatened as per IUCN list. ▪ Impact of the project on flora and fauna. ▪ Suggesting species for greenbelt development.	Mr. Panneer Selvam	
7	RH	▪ Identification of hazards and hazardous substances ▪ Risks and consequences analysis ▪ Vulnerability assessment ▪ Preparation of Emergency Preparedness Plan ▪ Management plan for safety.	Mr. J. R. Vikram Krishna	

8	LU	▪ Construction of Land use Map ▪ Impact of project on surrounding land use ▪ Suggesting post closure sustainable land use and mitigative measures.	Mr. A. Allimuthu	
9	NV	▪ Identify impacts due to noise and vibrations ▪ Suggesting appropriate mitigation measures for EMP.	Mr. A. Jagannathan	
10	AQ	▪ Identifying different source of emissions and propose predictions of incremental GLC using AERMOD. ▪ Recommending mitigations measures for EMP	Mr. N. Senthilkumar	
11	SC	▪ Assessing the impact on soil environment and proposed mitigation measures for soil conservation	Dr. M. Ifthikhar Ahmed	
12	SHW	▪ Identify source of generation of non-hazardous solid waste and hazardous waste. ▪ Suggesting measures for minimization of generation of waste and how it can be reused or recycled.	Mr. J. R. Vikram Krishna	

DECLARATION BY THE HEAD OF THE ACCREDITED CONSULTANT ORGANIZATION

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 this EIA/EMP for Rough Stone & Gravel Quarry Project over an Extent of 17.36.5 ha in Katchaikatti Village, Vadipatti Taluk, Madurai District, Tamil Nadu State. 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/25-28/RA 0424 Dated: 25-8-2025**

Validity: **Valid till 06.08.2028**

****

ANNEXURE

K. MANIKANDAN ROUGH STONE AND GRAVEL QUARRY

PROJECT DETAILS – P1
Thiru.K. Manikandan, 47/40, Indra Nagar, Alavandan, Gandhi Nagar, Madurai North, Madurai – 625 020
S.F.Nos. 1196/1A, 1196/3, 1196/4, 1196/5A **Extent: 1.99.0 Ha** Katchaikatti Village, Vadipatti Taluk, Madurai District, Tamil Nadu State

Environmental Consultant
GEO EXPLORATION AND MINING SOLUTIONS
Old No. 260-B, New No. 17,
Advaitha Ashram Road, Alagapuram,
Salem – 636 004, Tamil Nadu, India
Accredited for sector 1 Cat 'A', sector 31 & 38 Cat 'B'
Certificate No : NABET/EIA/25-28/RA 0424
Valid Till: 06.08.2028
Phone: 0427-2431989,
Email: ifthiahmed@gmail.com, geothangam@gmail.com
Web: www.gemssalem.com

Laboratory
CHENNAI METTEX LAB PRIVATE LIMITED
(Approved by AAI, AGMARK, APEDA, BIS, EIC FSSAI, GAFTA, IOPEPC, MOEF & TEA BOARD)
Jothi Complex, 83,
M.K.N Road, Guindy,
Chennai – 600 032

LIST OF ANNEXURES

ANNEXURES	DESCRIPTION	PAGE NOS
P1- Thiru. K. Manikandan	COPY OF TERMS OF REFERENCE	1A-20A
	COPY OF 500M RADIUS QUARRIES DETAILS LETTER	21A-23A
	COPY OF MINING PLAN APPROVED LETTER	24A-26A
	COPY OF APPROVED MINING PLAN WITH PLATES	27A-104A
	COPY OF HYDROGEOLOGY REPORT	105A-121A
E1- A.D.Meenaachi Sundaram	COPY OF EC COPY	122A-138A
E2- S. Karuppusamy	COPY OF ENVIRONMENTAL CLEARANCE	139A-175A
E3- THIRU.K. RAMESH	COPY OF ENVIRONMENTAL CLEARANCE	176A-212A
E4- M/s. SUMUKHA BLUE METALS.,	COPY OF ENVIRONMENTAL CLEARANCE	213A-235A
	COPY OF BASE LINE MONITORING DATA	236A-264A
	COPY OF CONSULTANT EXTENSION ACCREDITATION CERTIFICATE	265A

File No: 13178
Government of India
Ministry of Environment, Forest and Climate Change
(Issued by the State Environment Impact Assessment Authority(SEIAA), TAMIL NADU)
***

Dated: **10/02/2026**

To,

Thiru. MANIKANDAN
No.47/40, Indra Nagar, Alavandan, Gandhi Nagar, Madurai North, Madurai - 625020. TAMIL NADU.
manikandan.kannanmdu@gmail.com

Subject: Grant of Terms of Reference along with Public Hearing under the provision of the EIA Notification 2006-regarding.

Sir/Madam,

Sub: SEIAA, Tamil Nadu – Proposed Rough Stone and Gravel Quarry over an extent of 1.99.0 Ha in S.F.Nos. 1196/1A,1196/3,1196/4 & 1196/5A of Katchikatti Village, Vadipatti Taluk, Madurai District, Tamil Nadu by Thiru. K. Manikandan- under project category – "B1" and Schedule S.No. 1(a) – "Mining of Minerals"– **ToR issued along with Public Hearing** - preparation of EIA report – Regarding.
Ref: 1. Online proposal No. SIA/TN/MIN/561936/2025, Dated 19/12/2025.
2. Minutes of the 668th meeting of SEAC-II held on 22.01.2026.
3. Minutes of the 956th meeting of SEIAA held on 04.02.2026.

2. The particulars of the proposal are as below:

(i) TOR Identification No.	TO25B0108TN5609012N
(ii) File No.	13178
(iii) Clearance Type	TOR
(iv) Category	B1
(v) Project/Activity Included Schedule No.	1(a) Mining of minerals
(vii) Name of Project	Rough Stone and Gravel Quarry Project Belongs to Thiru. K. Manikandan
(viii) Name of Company/Organization	MANIKANDAN
(ix) Location of Project (District, State)	MADURAI, TAMIL NADU
(x) Issuing Authority	SEIAA
(xi) Applicability of General Conditions	no
(xii) Applicability of Specific Conditions	no

1.In view of the particulars given in the Para 1 above, the project proposal interalia including Form-1(Part A and B)

were submitted to the SEIAA for an appraisal by the SEAC under the provision of EIA notification 2006 and its subsequent amendments.

2.The above-mentioned proposal has been considered by SEIAA in the meeting held on 04.02.2026. The minutes of the meeting and all the Application and documents submitted [viz. Form-1 Part A, Part B] are available on PARIVESH portal which can be accessed by scanning the QR Code above.

3.The State Expert Appraisal Committee (SEAC), based on the information & clarifications provided by the project proponent and after detailed deliberations on all technical aspects recommended the proposal for grant of Terms of Reference with public hearing under the provision of EIA Notification, 2006 and as amended thereof subject to the stipulation of specific and general conditions as detailed in Annexure (2).

4.The SEIAA has examined the proposal in accordance with the Environment Impact Assessment (EIA) Notification, 2006 & further amendments thereto and after accepting the recommendations of the SEAC hereby decided to issue the following Terms of Reference with public hearing for instant proposal of **Thiru. K. Manikandan** under the provisions of EIA Notification, 2006 and as amended thereof.

5.The Ministry/SEIAA-TN reserves the right to stipulate additional conditions, if found necessary.

6.The Terms of Reference with public hearing to the aforementioned project is under provisions of EIA Notification, 2006. It does not tantamount to approvals/consent/permissions etc. required to be obtained under any other Act/Rule/regulation. The Project Proponent is under obligation to obtain approvals /clearances under any other Acts/ Regulations or Statutes, as applicable, to the project.

7.This issues with the approval of the Competent Authority.

8.The TORs with public hearing prescribed shall be valid for a period of three years from the date of issue, for submission of the EIA/EMP report as per OMNo.J-11013/41/2006-IA-II(I)(part) dated 29th August, 2017.

Annexure 1

Specific Terms of Reference s for (Mining Of Minerals)

1. Seiaa Specific Conditions :

S. No	Terms of Reference
1.1	After detailed discussions, the Authority accepts the recommendation of SEAC and decided to grant **Terms of Reference (ToR) along with Public Hearing for the quantity of 1,99,485 m^3 of Rough Stone & 28,926m^3 of Gravel upto the depth of 22m BGL and annual peak production shall not exceed 40,280m^3 of Rough Stone & 12,534m^3 of Gravel** as per the approved mining plan, under cluster for undertaking the combined Environment Impact Assessment Study and preparation of separate Environment Management Plan subject to the conditions as recommended by SEAC & normal conditions & the SEIAA Standard conditions.

2. Seiaa Standard Conditions :

S. No	Terms of Reference
2.1	**Cluster Management Committee** 1. Cluster Management Committee shall be framed which must include all the proponents in the cluster as members 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

S. No	Terms of Reference
	in the form of route map and network. 5. The committee shall deliberate on risk & emergency management plan, fire safety & evacuation plan and sustainable development goals pertaining to the cluster in a holistic manner especially during natural calamities like intense rain and the mitigation measures considering the inundation of the cluster and evacuation plan. 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 in the EIA Report. 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 deliberate on the health of the workers/staff involved in the mining as well as the health of the public in the vicinity. **Agriculture & Agro-Biodiversity** 9. Impact on surrounding agricultural fields around the proposed mining Area. 10. Impact on soil flora & vegetation around the project site. 11. Details of type of vegetation including no. of trees & shrubs within the proposed mining area and. If so, transplantation of such vegetation all along the boundary of the proposed mining area shall committed mentioned in EMP. 12. The Environmental Impact Assessment should study the agro-biodiversity, agro- forestry, horti-cultural plantations, the natural ecosystem, the soil micro flora, fauna and soil seed banks and suggest measures to maintain the natural Ecosystem. 13. Action should specifically suggest for sustainable management of the area and restoration of ecosystem for flow of goods and services. 14. The project proponent shall study and furnish the impact of project on plantations in adjoining patta lands, Horticulture, Agriculture and livestock. **Forests** 15. The project proponent shall detailed study on impact of mining on Reserve forests and free ranging wildlife. 16. The Environmental Impact Assessment should study impact on forest, vegetation, endemic, vulnerable and endangered indigenous flora and fauna. 17. The Environmental Impact Assessment should study impact on standing trees and the existing trees should be numbered and action suggested for protection. 18. The Environmental Impact Assessment should study impact on protected areas, Reserve Forests, National Parks, Corridors and Wildlife pathways, near project site. **Water Environment** 19. Hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) so as to assess the impacts on the nearby waterbodies due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided, covering the entire mine lease period. 20. Erosion Control measures. 21. Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area on the nearby Villages, Water-bodies/ Rivers, & any ecological fragile areas. 22. The project proponent shall study impact on fish habitats and the food WEB/ food chain in the water body and Reservoir. 23. The project proponent shall study and furnish the details on potential fragmentation impact on natural Environment, by the activities. 24. The project proponent shall study and furnish the impact on aquatic plants and animals in water bodies and possible scars on the landscape, damages to nearby caves, heritage site, and archaeological sites possible land form changes visual and aesthetic impacts.

S. No	Terms of Reference
	25. The Terms of Reference should specifically study impact on soil health, soil erosion, the soil physical, chemical components and microbial components. 26. The Environmental Impact Assessment should study on wetlands, water bodies, rivers streams, lakes and farmer sites. 27. The EIA shall include the impact of mining activity on the following: a) Hydrothermal/Geothermal effect due to destruction in the Environment. b) Bio-geochemical processes and its foot prints including Environmental stress. c) Sediment geochemistry in the surface streams. **Energy** 28. The measures taken to control Noise, Air, Water, Dust Control and steps adopted to efficiently utilise the Energy shall be furnished. **Climate Change** 29. The Environmental Impact Assessment shall study in detail the carbon emission and also suggest the measures to mitigate carbon emission including development of carbon sinks and temperature reduction including control of other emission and climate mitigation activities. 30. The Environmental Impact Assessment should study impact on climate change, temperature rise, pollution and above soil & below soil carbon stock, soil health and physical, chemical & biological soil features. 31. Impact of mining on pollution leading to GHGs emissions and the impact of the same on the local livelihood. **Mine Closure Plan** 32. Detailed Mine Closure Plan covering the entire mine lease period as per precise area communication order issued. **EMP** 33. Detailed Environment Management Plan along with adaptation, mitigation & remedial strategies covering the entire mine lease period as per precise area communication order issued and the scope for achieving SDGs. 34. The Environmental Impact Assessment should hold detailed study on EMP with budget for Green belt development and mine closure plan including disaster management plan. **Risk Assessment** 35. To furnish risk assessment and management plan including anticipated vulnerabilities during operational and post operational phases of Mining. **Disaster Management Plan** 36. To furnish disaster management plan and disaster mitigation measures in regard to all aspects to avoid/reduce vulnerability to hazards & to cope with disaster/untoward accidents in & around the proposed mine lease area due to the proposed method of mining activity & its related activities covering the entire mine lease period as per precise area communication order issued. **Others** 37. The project proponent shall furnish VAO certificate with reference to 300m radius regard to approved habitations, schools, Archaeological sites, Structures, railway lines, roads, water bodies such as streams, odai, vaari, canal, channel, river, lake pond, tank etc. 38. As per the MoEF& CC office memorandum F.No.22-65/2017-IA.III dated: 30.09.2020 and 20.10.2020 the proponent shall address the concerns raised during the public consultation and all the activities proposed shall be part of the Environment Management Plan. 39. The project proponent shall study and furnish the possible pollution due to plastic and microplastic on the Environment. The ecological risks and impacts of plastic & microplastics on aquatic Environment and fresh water systems due to activities, contemplated during mining may be investigated and reported.

SEAC conditions - Site specific

Major Conditions:

1. The PP shall mark the DGPS reference pillars and shall also erect fencing all around the boundary of the proposed area with gates for entry/exit and shall furnish the latest photographic/videographic proof showing the same during EIA appraisal.

General Conditions:

1. **A Cluster Management Committee (CMC) shall be constituted including all the mines in the cluster as Committee Members for the effective management of the mining operation in the cluster through systematic & scientific approach with appointment of statutory personnel, appropriate environmental monitoring, good maintenance of haul roads and village/panchayat roads, authorized blasting operation etc. The PP shall submit the following details in the form of an Affidavit during the EIA appraisal:**
   - **(i) Copy of the agreement forming CMC.**
   - **(ii) The Organisation chart of the Committee with defining the role of the members**
   - **(iii) The 'Standard Operating Procedures' (SoP) executing the planned activities**.
2. The Geo referenced Boundary pillars to be erected on the field as per the mine rules and the evidence should be submitted along with the EIA report.
3. The details of enumeration of structures including schools, colleges, primary health centres should be submitted along with the EIA report.
4. The structures within the radius of (i) 50 m, (ii) 100 m, (iii) 200 m and (iv) 300m & upto 1km shall be enumerated with details such as dwelling houses with number of occupants, whether it belongs to the owner (or) not, places of worship, industries, factories, sheds, etc. and spell out the mitigation measures to be proposed for the protection of the above structures, if any during the quarrying operations.
5. The proponent shall furnish photographs of adequate fencing, garland drainage built with siltation tank & green belt along the periphery including replantation of existing trees; maintaining the safety distance between the adjacent quarries & water bodies nearby provided as per the approved mining plan.
6. The Proponent shall carry out Bio diversity study as a part of EIA study and the same shall be included in the 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.
8. The PP shall carry out the comprehensive studies on the cumulative environmental impacts of the existing & proposed quarries which included drilling & blasting, loading & hauling on the surrounding village and structures.
9. The PP shall prepare a conceptual working plan accommodating the inclusion of haul road accessibility keeping the benches intact, by ensuring the slope stability of the working benches to be constructed and existing quarry wall.
10. The PP shall install the CCTV camera for the continuous surveillance of mining activity & furnish the photographic/videographic evidence along with the EIA report.

SEAC Standard conditions

1. In the case of existing/operating mines, a letter obtained from the concerned AD (Mines) shall be submitted and it shall include the following:
   (i) Original pit dimension
   (ii) Quantity achieved Vs EC Approved Quantity
   (iii) Balance Quantity as per Mineable Reserve calculated.
   (iv) Mined out Depth as on date Vs EC Permitted depth
   (v) Details of illegal/illicit mining
   (vi) Violation in the quarry during the past working.
   (vii) Quantity of material mined out outside the mine lease area
   (viii) Condition of Safety zone/benches
   (ix) Revised/Modified Mining Plan showing the benches of not exceeding 6 m height and ultimate depth of not exceeding 50m.
2. Details of habitations around the proposed mining area and latest VAO certificate regarding the location of habitations within 300m radius from the periphery of the site.
3. The proponent is requested to carry out a survey and enumerate on the structures located within the radius of (i) 50 m, (ii) 100 m, (iii) 200 m and (iv) 300 m (v) 500m shall be enumerated with details such as dwelling houses with number of occupants, whether it belongs to the owner (or) not, places of worship, industries, factories, sheds, etc with indicating the owner of the building, nature of construction, age of the building, number of residents, their profession and income, etc.

4. The PP shall submit a detailed hydrological report indicating the impact of proposed quarrying operations on the waterbodies like lake, water tanks, etc are located within 1 km of the proposed quarry.
5. The Proponent shall carry out Bio diversity study through reputed Institution and the same shall be included in EIA Report.
6. The DFO letter stating that the proximity distance of Reserve Forests, Protected Areas, Sanctuaries, Tiger reserve etc., up to a radius of 25 km from the proposed site.
7. In the case of proposed lease in an existing (or old) quarry where the benches are not formed (or) partially formed as per the approved Mining Plan, the Project Proponent (PP) shall the PP shall carry out the scientific studies to assess the slope stability of the working benches to be constructed and existing quarry wall, by involving any one of the reputed Research and Academic Institutions - CSIR-Central Institute of Mining & Fuel Research / Dhanbad, NIRM/Bangalore, Division of Geotechnical Engineering-IIT-Madras, NIT-Dept of Mining Engg, Surathkal, and Anna University Chennai-CEG Campus. The PP shall submit a copy of the aforesaid report indicating the stability status of the quarry wall and possible mitigation measures during the time of appraisal for obtaining the EC.
8. However, in case of the fresh/virgin quarries, the Proponent shall submit a conceptual 'Slope Stability Plan' for the proposed quarry during the appraisal while obtaining the EC, when the depth of the working is extended beyond 30 m below ground level.
9. The PP shall furnish the affidavit stating that the blasting operation in the proposed quarry is carried out by the statutory competent person as per the MMR 1961 such as blaster, mining mate, mine foreman, II/I Class mines manager appointed by the proponent.
10. The PP shall present a conceptual design for carrying out only controlled blasting operation involving line drilling and muffle blasting in the proposed quarry such that the blast-induced ground vibrations are controlled as well as no fly rock travel beyond 30 m from the blast site.
11. The EIA Coordinators shall obtain and furnish the details of quarry/quarries operated by the proponent in the past, either in the same location or elsewhere in the State with video and photographic evidences.
12. If the proponent has already carried out the mining activity in the proposed mining lease area after 15.01.2016, then the proponent shall furnish the following details from AD/DD, mines,

13. What was the period of the operation and stoppage of the earlier mines with last work permit issued by the AD/DD mines?
14. Quantity of minerals mined out.
    - Highest production achieved in any one year
    - Detail of approved depth of mining.
    - Actual depth of the mining achieved earlier.
    - Name of the person already mined in that leases area.
    - If EC and CTO already obtained, the copy of the same shall be submitted.
    - Whether the mining was carried out as per the approved mine plan (or EC if issued) with stipulated benches.
15. All corner coordinates of the mine lease area, superimposed on a High-Resolution Imagery/Topo sheet, topographic sheet, geomorphology, lithology and geology of the mining lease area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).
16. The PP shall carry out Drone video survey covering the cluster, green belt, fencing, etc.,
17. The proponent shall furnish photographs of adequate fencing, green belt along the periphery including replantation of existing trees & safety distance between the adjacent quarries & water bodies nearby provided as per the approved mining plan.
18. The Project Proponent shall provide the details of mineral reserves and mineable reserves, planned production capacity, proposed working methodology with justifications, the anticipated impacts of the mining operations on the surrounding environment, and the remedial measures for the same.
19. The Project Proponent shall provide the Organization chart indicating the appointment of various statutory officials and other competent persons to be appointed as per the provisions of the Mines Act'1952 and the MMR, 1961 for carrying out the quarrying operations scientifically and systematically in order to ensure safety and to protect the environment.
20. The Project Proponent shall conduct the hydro-geological study considering the contour map of the water table detailing the number of groundwater pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds, etc. within 1 km (radius) along with the collected water level data for both monsoon and non-monsoon

seasons from the PWD / TWAD so as to assess the impacts on the wells due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided.

21. The proponent shall furnish the baseline data for the environmental and ecological parameters with regard to surface water/ground water quality, air quality, soil quality & flora/fauna including traffic/vehicular movement study.
22. The Proponent shall carry out the Cumulative impact study due to mining operations carried out in the quarry specifically with reference to the specific environment in terms of soil health, biodiversity, air pollution, water pollution, climate change and flood control & health impacts. Accordingly, the Environment Management plan should be prepared keeping the concerned quarry and the surrounding habitations in the mind.
23. Rain water harvesting management with recharging details along with water balance (both monsoon & non-monsoon) be submitted.
24. Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.
25. Details of the land for storage of Overburden/Waste Dumps (or) Rejects outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be provided.
26. Proximity to Areas declared as 'Critically Polluted' (or) the Project areas which attracts the court restrictions for mining operations, should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the TNPCB (or) Dept. of Geology and Mining should be secured and furnished to the effect that the proposed mining activities could be considered.
27. Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.
28. Impact on local transport infrastructure due to the Project should be indicated.

29. A tree survey study shall be carried out (nos., name of the species, age, diameter etc.,) both within the mining lease applied area & 300m buffer zone and its management during mining activity.
30. A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific.
31. As a part of the study of flora and fauna around the vicinity of the proposed site, the EIA coordinator shall strive to educate the local students on the importance of preserving local flora and fauna by involving them in the study, wherever possible.
32. The purpose of Green belt around the project is to capture the fugitive emissions, carbon sequestration and to attenuate the noise generated, in addition to improving the aesthetics. A wide range of indigenous plant species should be planted as given in the appendix-I in consultation with the DFO, State Agriculture University. The plant species with dense/moderate canopy of native origin should be chosen. Species of small/medium/tall trees alternating with shrubs should be planted in a mixed manner.
33. Taller/one year old Saplings raised in appropriate size of bags, preferably ecofriendly bags should be planted as per the advice of local forest authorities/botanist/Horticulturist with regard to site specific choices. The proponent shall earmark the greenbelt area with GPS coordinates all along the boundary of the project site with at least 3 meters wide and in between blocks in an organized manner
34. A Disaster management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.
35. A Risk Assessment and management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.
36. Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.
37. Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.
38. The Socio-economic studies should be carried out within a 5 km buffer zone from the mining activity. Measures of socio-economic significance and influence to the local

community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.

39. Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.
40. Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.
41. If any quarrying operations were carried out in the proposed quarrying site for which now the EC is sought, the Project Proponent shall furnish the detailed compliance to EC conditions given in the previous EC with the site photographs which shall duly be certified by MoEF&CC, Regional Office, Chennai (or) the concerned DEE/TNPCB.
42. The PP shall prepare the EMP for the entire life of mine and also furnish the sworn affidavit stating to abide the EMP for the entire life of mine.
43. Concealing any factual information or submission of false/fabricated data and failure to 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.

STANDARD TERMS OF REFERENCE

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

and other ecological features of the study area (core and buffer zone).

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

of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.

13) Status of forestry clearance for the broken up area and virgin forestland involved in the Project including deposition of Net Present Value (NPV) and Compensatory Afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.

14) Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.

15) The vegetation in the RF / PF areas in the study area, with necessary details, should be given.

16) A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly, detailed mitigative measures required, should be worked out with cost implications and submitted.

17) Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves/(existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished.

18) A detailed biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled-I fauna found in the study area, the necessary plan along with budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost.

19) Proximity to Areas declared as 'Critically Polluted' or the Project areas likely to come

under the 'Aravali Range', (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Department should be secured and furnished to the effect that the proposed mining activities could be considered.

20) Similarly, for Coastal Projects, a CRZ map duly authenticated by one of the authorized agencies demarcating LTL. HTL, CRZ area, location of the mine lease with respect to CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority).

21) R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need based sample survey, family-wise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be clearly brought out whether the village(s) located in the mine lease area will be shifted or not. The issues relating to shifting of village(s) including their R&R and socio-economic aspects should be discussed in the Report.

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

23) Air quality modeling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of Vehicles for transportation of mineral. The details of the model used and input parameters used for modeling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive

receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.

24) The water requirement for the Project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the Project should be indicated.

25) Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.

26) Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.

27) Impact of the Project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided.

28) Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. The Report inter-alia, shall include details of the aquifers present and impact of mining activities on these aquifers. Necessary permission from Central Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished.

29) Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion proposed, if any, and the impact of the same on the hydrology should be brought out.

30) Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and bgl. A schematic diagram may also be provided for the same.

31) A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted cle arly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution.

32) Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those outside the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as State Government) should be covered. Project Proponent shall conduct Impact of Transportation study as per Indian Road Congress Guidelines.
33) Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.
34) Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report.
35) Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.
36) Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.
37) Measures of socio economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.
38) Detailed Environmental Management Plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project.
39) Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project.
40) Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.
41) The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.
42) A Disaster management Plan shall be prepared and included in the EIA/EMP Report.

43) Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.

44) Besides the above, the below mentioned general points are also to be followed:-

a) Executive Summary of the EIA/EMP Report

b) All documents to be properly referenced with index and continuous page numbering.

c) Where data are presented in the Report especially in Tables, the period in which the data were collected and the sources should be indicated.

d) Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF&CC/NABL accredited laboratories. All the original analysis/testing reports should be available during appraisal of the Project.

e) Where the documents provided are in a language other than English, an English translation should be provided.

f) The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted.

g) While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF&CC vide O.M. No. J-11013/41/2006-IA.II(I) dated 4th August, 2009, which are available on the website of this Ministry, should be followed.

h) Changes, if any made in the basic scope and project parameters (as submitted in Form-I and the PFR for securing the TOR) should be brought to the attention of MoEF&CC with reasons for such changes and permission should be sought, as the ToR may also have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH again with the revised documentation.

i) As per the circular no. J-11011/618/2010-IA.II(I) dated 30.5.2012, certified report of the status of compliance of the conditions stipulated in the Environment Clearance for the existing operations of the project, should be obtained from the Regional Office of Ministry of Environment, Forest and Climate Change, as may be applicable.

j) The EIA report should also include (i) surface plan of the area indicating contours of main topographic features, drainage and mining area, (ii) geological maps and sections and (iii) sections of the mine pit and external dumps, if any, clearly

showing the land features of the adjoining area.

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

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

1. Project name and location (Village, District, State, Industrial Estate (if applicable).
2. Process description in brief, specifically indicating the gaseous emission, liquid effluent and solid and hazardous wastes.
3. Measures for mitigating the impact on the environment and mode of discharge or disposal.
4. Capital cost of the project, estimated time of completion.
5. The proponent shall furnish the contour map of the water table detailing the number of wells located around the site and impacts on the wells due to mining activity.
6. A detailed study of the lithology of the mining lease area shall be furnished.
7. Details of village map, "A" register and FMB sketch shall be furnished.
8. Detailed mining closure plan for the proposed project approved by the Geology of Mining department shall be shall be submitted along with EIA report.
9. Obtain a letter /certificate from the Assistant Director of Geology and Mining standing that there is no other Minerals/resources like sand in the quarrying area within the approved depth of mining and below depth of mining and the same shall be furnished in the EIA report.
10. EIA report should strictly follow the Environmental Impact Assessment Guidance Manual for Mining of Minerals published February 2010.
11. Detail plan on rehabilitation and reclamation carried out for the stabilization and restoration of the mined areas.
12. The EIA study report shall include the surrounding mining activity, if any.
13. Modeling study for Air, Water and noise shall be carried out in this field and incremental increase in the above study shall be substantiated with mitigation measures.
14. A study on the geological resources available shall be carried out and reported.
15. A specific study on agriculture & livelihood shall be carried out and reported.
16. Impact of soil erosion, soil physical chemical and biological property changes may be assumed.
17. Site selected for the project - Nature of land - Agricultural (single/double crop), barren, Govt./ private land, status of is acquisition, nearby (in 2-3 km.) water body, population, with in 10km other industries, forest , eco-sensitive zones, accessibility, (note - in case of

industrial estate this information may not be necessary)

18. Baseline environmental data - air quality, surface and ground water quality, soil characteristic, flora and fauna, socio-economic condition of the nearby population
19. Identification of hazards in handling, processing and storage of hazardous material and safety system provided to mitigate the risk.
20. Likely impact of the project on air, water, land, flora-fauna and nearby population
21. Emergency preparedness plan in case of natural or in plant emergencies
22. Issues raised during public hearing (if applicable) and response given
23. CER plan with proposed expenditure.
24. Occupational Health Measures
25. Post project monitoring plan
26. The project proponent shall carry out detailed hydro geological study through intuitions/NABET Accredited agencies.
27. A detailed report on the green belt development already undertaken is to be furnished and also submit the proposal for green belt activities.
28. The proponent shall propose the suitable control measure to control the fugitive emissions during the operations of the mines.
29. A specific study should include impact on flora & fauna, disturbance to migratory pattern of animals.
30. Reserve funds should be earmarked for proper closure plan.
31. A detailed plan on plastic waste management shall be furnished. Further, the proponent should strictly comply with, Tamil Nadu Government Order (Ms) No.84 Environment and forests (EC.2) Department dated 25.06.2018 regarding ban on one time use and throw away plastics irrespective of thickness with effect from 01.01.2019 under Environment (Protection) Act, 1986. In this connection, the project proponent has to furnish the action plan.

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

a. A note confirming compliance of the TOR, with cross referencing of the relevant sections / pages of the EIA report should be provided.
b. All documents may be properly referenced with index, page numbers and continuous page numbering.
c. Where data are presented in the report especially in tables, the period in which the data were collected and the sources should be indicated.

d. While preparing the EIA report, the instructions for the proponents and instructions for the consultants issued by MoEF& CC vide O.M. No. J-11013/41/2006-IA.II (I) dated 4th August, 2009, which are available on the website of this Ministry should also be followed.

e. The consultants involved in the preparation of EIA/EMP report after accreditation with Quality Council of India (QCI)/National Accreditation Board of Education and Training (NABET) would need to include a certificate in this regard in the EIA/EMP reports prepared by them and data provided by other organization/Laboratories including their status of approvals etc. In this regard circular no F. No.J -l1013/77/2004-IA-II(I) dated 2nd December, 2009, 18th March 2010, 28th May 2010, 28th June 2010, 31st December 2010 & 30th September 2011 posted on the Ministry's website http://www.moef.nic.in/ may be referred.

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

Signed by
Rahul Nadh A R
Date: 10-03-2026 13:41:47
Reason: Verified and signed

From

Thiru.S.Vijayakumaran, M.Sc.,
Deputy Director,
Dept. of Geology and Mining,
Madurai.

To

Thiru.K.Manikandan,
S/o.Kannan,
No-47/40, Indra Nagar,
Alavandan, Gandhi Nagar,
Madurai North,
Madurai District - 625020.

Roc. No.1437/Mines/2024-2, dated. 02.12.2025

Sir,

Sub: Mines and Minerals - Minor Mineral – Rough stone and Gravel - Madurai District – Vadipatti Taluk – Katchaikatti Village – Patta lands - S.F. Nos. 1196/1A etc., - Over an extent of 1.99.0 Hects - Application preferred by Thiru.K.Manikandan - Precise Area Communicated - Draft Mining Plan submitted - Approval Accorded - 500m Radius Quarry details - Requested - Reg.

Ref:
1. Quarry lease application preferred by Thiru.K.Mani kandan, dated.19.11.2024.
2. Precise area communication letter Roc No.1437/ Mines/2024, dated.29.10.2025.
3. Letter dated.Nil, received from Thiru.K.Mani kandan along with draft mining plan. (Received on 10.11.2025
4. This office letter even no, dated. 02.12.2025.
5. Letter dated Nil. Received from Thiru.K.Mani kandan Received on 10.11.2025.

*****

Thiru.K.Manikandan has preferred an application for the grant of lease to quarry Rough stone and Gravel in S.F. Nos. 1196/1A (0.71.00), 1196/3 (0.32.00), 1196/4 (0.40.00) & 1196/5A (0.56.00) over an extent of 1.99.00 Hects of Katchaikatti Village, Vadipatti Taluk, Madurai District under Rule 19(1) of Tamil Nadu Minor Mineral Concession Rules, 1959.

Based on reports and recommendations of the Revenue Divisional Officer, Madurai and Assistant Geologist (Mines), precise area was communicated over an extent of 1.99.0 hects of patta lands in SF.Nos. 1196/1A (0.71.00), 1196/3 (0.32.00), 1196/4 (0.40.00) & 1196/5A (0.56.00) in Katchaikatti Village, Vadipatti Taluk to the applicant vide reference 2nd cited with a direction to submit mining plan as stipulated in rule 41 of Tamil Nadu Minor Mineral Concession Rules, 1959.

Accordingly, Thiru.K.Manikandan has submitted the draft Mining Plan and the same has been approved on 02.12.2025. Moreover, the applicant has requested to furnish the details of quarry lease / mining lease situated within 500 mts radius from the subject quarry for obtaining Environment Clearance from the State level Environment Impact Assessment Authority.

In this connection it is stated that, the following existing, abandoned / expired and proposed quarries are located within 500m radius distance from the proposed area.

a. Existing Quarries

Sl No	Name of the Owner	Village / Taluk	S.F.No.	Extent (in hects)	Collector's Proceedings No & date	Lease period
1.	M/s. Concretia Rock Product (Pvt) Ltd.,	Vadipatti / Katchaikatti	1185/1, 1185/7A & 1185/8	1.79.5	Roc.No. 407/Mines/ 2019, Dt.09.11.2023	16.11.2023 - 15.11.2028
2.	Karuppasamy.S,	Vadipatti / Katchaikatti	1186/2A, 1186/3 & 1186/4	1.16.5	Roc.No. 559/Mines/2020, Dated: 19.01.2024.	24.01.2024 - 23.01.2029
3.	Ramesh.K	Vadipatti / Katchaikatti	1265/5 (Part), 1267/2A, 1267/2B, 1495/4 (Part), 1495/5 (Part) & 1495/6 (Part)	2.46.0	Roc.No. 693/Mines/2020, Dated: 02.07.2024.	02.07.2024 - 01.07.2034

b. Expired / Abandoned Quarries

Sl No	Name of the Owner	Village / Taluk	S.F.No.	Extent (in hects)	Collector's Proceedings No & date	Lease period
1.	M/s. Concretia Rock Product (Pvt) Ltd.,	Vadipatti / Katchaikatti	1185/2, 1185/3, 1185/4, 1185/5, 1185/6 & 1185/7B	1.90.0	Roc.No.1606/Mines / 2016, Dated: 10.08.2017	28.08.2017 - 27.08.2022
2.	Jayaraman.S,	Vadipatti / Katchaikatti	1186/1B, 1186/5A, 1186/5B & 1186/6A	1.82.5	Roc.No.1429/Mines / 2016, Dated: 10.08.2017	18.08.2017 - 17.08.2022

c. Proposed Quarries

Sl No	Name of the Owner	Village / Taluk	S.F.No.	Extent (in hects)
1.	K.Manikandan	Vadipatti / Katchaikatti	1196/1A, 1196/3, 1196/4 & 1196/5A	1.99.0

02/12/2025

Deputy Director,
Dept. of Geology and Mining,
Madurai

Copy to:

Bou.08
2/12/25.

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

From

Thiru.S.Vijayakumaran, M.Sc.,
Deputy Director,
Dept. of Geology and Mining,
Madurai.

To

Thiru.K.Manikandan,
S/o.Kannan,
No-47/40, Indra Nagar,
Alavandan, Gandhi Nagar,
Madurai North,
Madurai District - 625020.

Roc. No.1437/Mines/2025-1, dated.02.12.2025

Sir,

Sub: Mines and Minerals - Minor Mineral – Rough stone and Gravel - Madurai District – Vadipatti Taluk – Katchaikatti Village – Patta lands - S.F. Nos. 1196/1A etc., - Over an extent of 1.99.0 Hects - Application preferred by Thiru.K.Manikandan - Precise Area Communicated - Draft Mining Plan submitted - Approval Accorded - Reg.

Ref:
1. Quarry lease application preferred by Thiru.K.Mani kandan, dated.19.11.2024.
2. Precise area communication letter Roc No.1437/ Mines/2024, dated.29.10.2025.
3. Letter dated.Nil, received from Thiru.K.Mani kandan along with draft mining plan. (Received on 10.11.2025

*****

Thiru.K.Manikandan has preferred an application for the grant of lease to quarry Rough stone and Gravel in S.F. Nos. 1196/1A (0.71.00), 1196/3 (0.32.00), 1196/4 (0.40.00) & 1196/5A (0.56.00) over an extent of 1.99.00 Hects of Katchaikatti Village, Vadipatti Taluk, Madurai District under Rule 19(1) of Tamil Nadu Minor Mineral Concession Rules, 1959.

Based on reports and recommendations of the Revenue Divisional Officer, Madurai and Assistant Geologist (Mines), precise area was communicated over an extent of 1.99.0 hects of patta lands in SF.Nos.

1196/1A (0.71.00), 1196/3 (0.32.00), 1196/4 (0.40.00) & 1196/5A (0.56.00) in Katchaikatti Village, Vadipatti Taluk to the applicant vide reference 2nd cited with a direction to submit mining plan as stipulated in rule 41 of Tamil Nadu Minor Mineral Concession Rules, 1959.

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

(i). That the mining plan is approved without prejudice to any other Law applicable to the quarry lease from time to time whether such Laws are made by the Central Government, State Government or any other authority.

(ii). This approval of the mining plan does not in any way imply the approval of the Government in terms of any other provisions of the Mines and Minerals (Development and Regulation) Act, 1957, or any other connected laws including Forest (Conservation) Act, 1980, Forest Conservation Rules, 1981, Environment Protection Act, 1980, Indian Explosives Act, 1884 (Central Act IV of 1884) and the rules made there under the Tamil Nadu Minor Mineral Concession Rules, 1959.

(iii). That the mining plan is approved without prejudice to any other order or direction from any court of competent jurisdiction.

(iv). Quarrying shall be done as per the approved Mining Plan and that the mining plan is approved without prejudice to

any other law applicable to the quarry lease from time to time whether such laws are made by the Central Government, State Government or any other authority.

(v). If anything is found to be concealed as required by the Mines Act in the contents of the Mining Plan and the proposal for rectification has not been made, the approval shall be deemed to have been withdrawn with immediate effect.

(vi). Waste material should be dumped within the lease granted area as carmarked in the Mining Plan.

(vii). Quarrying operations and production shall be carried out as per the approved Mining Plan and the applicant shall be liable to pay the cost of mineral if there is any deviation in the quantum indicated in the approved year wise quantum of production and any such cases as on date are to be dealt with as per Court direction.

(viii). If any violation is found during quarrying operation, the penal provisions of Tamil Nadu Minor Mineral Concession Rules 1959 and other rules and act in force will attract.

(ix). The applicant shall strictly adhere to the statutory and safety requirements.

Encl: Approved Mining Plan.

02/12/2025

Deputy Director,
Dept. of Geology and Mining,
Madurai.

Copy To:

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

2/12/25

MINING PLAN

FOR

KATCHAIKATTI VILLAGE ROUGH STONE AND GRAVEL MINING LEASE WITH PROGRESSIVE QUARRY CLOSURE PLAN

Consent Patta Land/Open cast-Semi Mechanized mining/Non-forest/ Non-Captive Use- "B2' Category

Lease period 10 Years from the date of lease execution

(Prepared under rule 41 of Tamil Nadu Minor Mineral Concession Rules, 1959)

LOCATION OF THE LEASE APPLIED AREA

STATE	:	TAMILNADU
DISTRICT	:	MADURAI
TALUK	:	VADIPATTI
VILLAGE	:	KATCHIKATTI
S.F. NOs	:	1196/1A,1196/3,1196/4 & 1196/5A
EXTENT	:	1.99.0 Hectares

ADDRESS OF THE APPLICANT

THIRU.K.MANIKANDAN

S/O. KANNAN,

NO-47/40,INDRA NAGAR,

ALAVANDAN, GANDHI NAGAR,

MADURAI NORTH,

MADURAI DISTRICT-625020.

PREPARED BY

A. ALLIMUTHU, M.Sc, M Phil.,

RQP/DMG/HYD/85/2022

GEO SALEM MINING SOLUTIONS

STATE BANK OFFICER COLONY

II[nd] CROSS, EVR APPARTMENT,

SALEM – 636 004.

CELL : 9788636242-9944471350

CONTENTS

Sl. No.	Description	Page No.
-	Certificates	5-8
-	Introductory notes	9
1.0	General	11
2.0	Location and Accessibility	13
	PART-A	
3.0	Geology and Mineral reserves	15
4.0	Mining	19
5.0	Blasting	24
6.0	Mine Drainage	26
7.0	Stacking of Mineral rejects and disposal of waste	27
8.0	Uses of Mineral	27
9.0	Others	28
10.0	Mineral processing/Beneficiations	28
	PART-B	
11.0	Environmental management plan	30
12.0	Progressive quarry closure plan	35
13.0	Financial assurance	37
14.0	Certificates	37
15.0	Plan and sections, etc	37
16.0	Any other details intend to furnish by the applicant	37
17.0	CSR Expenditure	38

ANNEXURES

Sl. No.	Description	Annexure No.
1.	Copy of precise area communication letter	I
2.	Copy of **FMB** (Field Measurement book)	II
3.	Copy of Patta & Land documents	III
4.	Copy of Consent document	IV
5.	Photo copy of the applied lease area	V
6.	Copy of ID Proof of the authorized signatory	VI
7.	Copy of Qualified Person Certificate	VII

LIST OF PLATES

Sl. No.	Description	Plate No.	Scale
1	Topo Sketch Plan	I	1:1,00,000
2	Key Map	I-A	Not to Scale
3	Satellite Map	II	1:5000
4	Mine Lease Plan	III	1:1000
5	Geological and Surface Plan	IV	1:1000
6	Cross section of Geological Plan	IV-A	Hor-1:1000 Ver-1:500
7	Year wise Development and Production Plan	V	Plan-1:1000
8	Cross section of Year wise Development Plan	V-A	Hor-1:1000 Ver-1:500
9	Mine Closure Plan	VI	1:1000
10	Cross Section of Mine Closure Plan	VI-A	Hor-1:1000 Ver-1:500
11	Mine Layout, Land Use afforestation Plan	VII	1:1000
12	Village and Environment Plan	VIII	1:5000

30 A

Thiru.k.manikandan
S/o. Kannan,
No-47/40,indra nagar,
Alavandan, gandhi nagar,
Madurai north,
Madurai district-625020.

CONSENT LETTER FROM THE APPLICANT

The Mining Plan in respect of rough stone and gravel quarry lease in Consent Patta Land at S.F.No: 1196/1A,1196/3,1196/4 & 1196/5A over an extent of 1.99.0 Hectares of Katchikatti Village, Vadipatti Taluk, Madurai District, Tamil Nadu State has been prepared by

A.ALLIMUTHU M.Sc.,M.Phil.,

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

A.ALLIMUTHU M.Sc.,M.Phil.
(Recognized Qualified Person)
REGN. No.RQP/DMG/HYD/85/2022
GEO SALEM MINING SOLUTIONS
State Bank Officer Colony,
II nd Cross, EVR Apartment
Salem District – 636 004.

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

Place: Madurai, TN.
Date:

K. [signature]

Signature of the applicant
(k.manikandan)

Thiru.k.manikandan
S/o. Kannan,
No-47/40,indra nagar,
Alavandan, gandhi nagar,
Madurai north,
Madurai district-625020.

DECLARATION

The Mining Plan in respect of rough stone and gravel quarry lease in Consent Patta Land at S.F.No: 1196/1A,1196/3,1196/4 & 1196/5A, over an extent of 1.99.0 hectares of Katchikatti Village, Vadipatti Taluk, Madurai District, Tamil Nadu State have been prepared with my consultation and I have understood the contents and agree to implement the same in accordance with the Mining Laws.

Place: Madurai, TN.
Date:

Signature of the applicant
(k.manikandan)

A. ALLIMUTHU, M.Sc.,M.Phil.,
(Recognized Qualified Person)
REG. No.RQP/DMG/HYD/85/2022
GEO SALEM MINING SOLUTIONS
State Bank Officer Colony,
II nd Cross, EVR Apartment
Salem District – 636 004.
Mob : **+91 97886 36242**
E-Mail : **salemmining@gmail.com.**

CERTIFICATE

This is to certify that, the provisions of 19(1), 20 & 33 Tamil Nadu Minor Minerals Concession Rules, 1959 have been observed in the Mining Plan for the grant of rough stone and gravel quarry lease in S.F.No: 1196/1A,1196/3,1196/4 & 1196/5A, over an extent of 1.99.0 hectares of Katchikatti Village, Vadipatti Taluk, Madurai District, Tamil Nadu State granted to **Mr. k.manikandan,** Madurai District.

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

Place: Salem, TN
Date:

A. Allimuthu

Signature of the Recognized Qualified Person

A.ALLIMUTHU,M.Sc.,M.Phil.,
Recognized Qualified Person
RQP/DMG/HYD/85/2022

A. ALLIMUTHU, M.Sc.,M.Phil.,
(Recognized Qualified Person)
REG. No.RQP/DMG/HYD/85/2022
GEO SALEM MINING SOLUTIONS
State Bank Officer Colony,
II nd Cross, EVR Apartment
Salem District – 636 004.
Mob : **+91 97886 36242**
E-Mail : **salemmining@gmail.com.**

CERTIFICATE

I certify that, in preparation of Mining Plan for rough stone and gravel quarry lease in S.F.No: 1196/1A,1196/3,1196/4 & 1196/5A, over an extent of 1.99.0 hectares of Katchikatti Village, Vadipatti Taluk, Madurai District, Tamil Nadu State prepared to **Mr. k.manikandan,** Madurai District, covers all the provisions of Mines Act, Rules, and Regulations etc., made there under and whenever specific permission are required, the applicant will approach the Director General of Mines Safety, Chennai. The standards prescribed by DGMS in respect of Mines Health will be strictly implemented.

Place: Salem, TN
Date:

A. Allimuthu.
Signature of the Recognized Qualified Person

A.ALLIMUTHU,M.Sc.,M.Phil.,
Recognized Qualified Person
RQP/DMG/HYD/85/2022

MINING PLAN

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

Consent Patta Land / Open cast-Semi-Mechanized mining/Non-forest/Non-Captive Use

Lease period 10 Years from the date of lease execution

(Prepared under rule 41 of Tamil Nadu Minor Mineral Concession Rules, 1959)

INTRODUCTORY NOTES:

a) **Introduction:** The Mining plan with progressive quarry closure plan is prepared for Mr.K.manikandan, S/o.Kannan, Door No.47/40, Indra nagar, Alavandan,Gandhi Nagar, Madurai North, Madurai District, Tamilnadu-625020. State and filed with application for new proposals has submitted to the Assistant Director, Department of Geology and Mining (G&M), Madurai dated 19.11.2024 had requested to grant the quarry lease for rough stone and gravel in S.F.No: 1196/1A,1196/3,1196/4 & 1196/5A, over an extent of 1.98.0hectares of Katchikatti Village, Vadipatti Taluk, Madurai District, Tamil Nadu State.

b) **The Precise area communication letter:** The Assistant Director, Department of Geology and mining, Madurai has directed to the applicant Mr.P.Muthulingam, through his precise area communication letter vide **Roc.No.1437/Mines/2024 Dated 29.10.2025,** for quarrying lease rough stone and gravel at Tamil Nadu State, Madurai District, Vadipatti Taluk, Katchikatti Village in S.F.No: 1196/1A,1196/3,1196/4 & 1196/5A over an extent of 1.99.0 Hectares has recommended as following conditions for a period of ten (10) years under Rule 19(1), 20 & 33 Tamil Nadu Minor Mineral concession rules, 1959.

i. The seniority amount for the minerals quarried shall be paid from time to time as per Schedule II of the Tamil Nadu Minor Mineral Concession Rules, 1959.

ii. The quarry shall be operated with a safety distance of 7.5 meters from the leasehold lands surrounding the field.

iii. Quarrying work should be carried out by leaving a safety distance of 50m from the Odai located on the South side of the lease area.

iv. Quarrying work should be carried out by leaving a safety distance of 10m form the Cart road located on the western side of the lease area.

v. Quarrying operations should be carried out using light explosives with qualified blaster.

vi. The area for which a lease is sought should be surveyed using DGPS method and a certificate for the same should be submitted.

vii. Quarrying operations should be carried out by experienced explosive users using low-energy explosives without any disturbance to the nearby leaseholders/without any encroachment on the nearby lease and government lands.

viii. The approved mining plan should be submitted within the due time as per the rules.

ix. A quarry license will be issued only if the prior approval of the Environmental Impact Assessment Authority is obtained for the area for which the quarry license is granted.

c) **Preparation and Submission of Mining Plan:** The Mining Plan with progressive quarry closure plan has been prepared under rule 41 and submitted under rule 42 of Tamil Nadu Minor Mineral Concession Rules, 1959 for mining lease as per conditions mentioned in the precise area communication letter **Roc.No.1437/Mines/2024 Dated 29.10.2025.**

d) **Geological resources and Mineable reserves:** Geological resource of estimated as **902412m^3 / 2449404MT** *(Note: MT= Metric Ton)* including the resources of safety zone, gravel etc. Of which, rough stone resources of about **859440m^3 / 2363460MT** and gravel is **42972m^3 / 85944MT**. The total mineable reserve is estimated to be **314106m^3 / 842097MT** by deducting the reserve safety zone, block in benches from the total Geological resources. of which, rough stone is about **285180m^3 / 784245MT** and gravel is **28926m^3 / 57852MT** up to a depth of 42m below ground level (Refer Plate No. IVA & VI-A).

e) **Proposed Production Schedule:** Total proposed production of rough stone is **199485m^3 / 548583.75MT** and gravel is **28926m^3/57852MT** up to a depth of 22m below ground level for ten years plan period. (Refer Plate No. V & VA).

f) **Environmental Sensitivity of the proposed lease area: -**

i). **Interstate boundary:** There is no interstate boundary around 10Km radius periphery of proposed lease area.

ii). **Wildlife Sanctuaries any:** There are no notified wildlife sanctuaries within the radius of 10km from the project site under the wildlife (Protection) Act, 1972.

iii). Forest (conservation) Act, 1980: No forest land granted for quarrying and there is no reserve forest around 60m radius.

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

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

a. Usage of sharp drill bits while drilling which will help in reducing noise.

b. Secondary blasting will be totally avoided and hydraulic rock breaker will be used for breaking boulders.

c. Controlled blasting with proper spacing, burden, stemming and optimum charge/delay will be maintained.

d. Green Belt/Plantation will be developed around the project area and along the haul roads. The plantation minimizes propagation of noise.

e. Water will be sprinkled on haul roads twice a day to avoid dust generation during transportation.

f. Transportation of material will be carried out during day time and material will be covered with tarpaulin.

g. The speed of tippers plying on the haul road will be limited below 20 km/hr to avoid generation of dust.

h. And any other conditions as stipulated by the concerned authorities should be followed to protect the environment.

1.0 GENERAL:

a.	Name of the Applicant	:	**Mr.K.Manikandan**
	Applicant address	:	S/o. Kannan, No-47/40,indra nagar, Alavandan, gandhi nagar, Madurai north,
	District	:	Madurai
	State	:	Tamilnadu
	Pin code	:	625020
	Phone	:	----
	Fax	:	Nil
	Gram	:	Nil
	Telex	:	Nil
	E-mail	:	.....

b.	Status of the Applicant		
	Private individual	:	Individual
	Cooperative Association	:	---
	Private company	:	---
	Public Company	:	--
	Public Sector Undertaking	:	---
	Joint Sector Undertaking	:	---
	Other (pl. specify)	:	---
c.	Mineral(s) Which are occurring in the area and which the applicant intends to mine	:	Rough Stone and Gravel Quarry Lease
d.	Period for which the mining lease granted /renewed/ proposed to be applied	:	The precise area has been communicated to the applicant for quarrying period of ten (10) years.
e.	Name of the QP preparing the Mining Plan	:	**A.ALLIMUTHU, M.Sc., M.Phil.,** RECOGNIZED QUALIFIED PERSON
	Address	:	GEO SALEM MINING SOLUTIONS **State Bank Officer Colony,** **II nd Cross, EVR Apartment** **Salem District – 636 004.** Mob : **+91 97886 36242** E-Mail : **salemmining@gmail.com.**
	Phone	:	+91 9788636242
	Fax	:	Nil
	e-mail	:	salemmining@gmail.com
	Telex	:	Nil
g.	Reference No. and date of consent letter from the state government	:	The precise area communication letter issued by The Assistant Director, Department Geology and Mining, Madurai vide **Roc.No.1437/Mines/2024 Dated 29.10.2025**

2.0 LOCATION AND ACCESSIBILITY:

a.	Details of the Area:	:	Refer plate no: I & II
	District & State	:	Madurai, Tamil Nadu
	Taluk	:	Vadipatti
	Village	:	Katchikatti

Khasra No./ Plot No./ Block Range/ Felling Series etc.:

Survey No	Sub Division	Total Extent in Hect	Patta No.	Village and Name of the Land Owner	Mine lease Applied S.F.No.	Mine lease Applied area out of total area in hect.
1196	1A	0.71.0	2025	Mr.Ramachandran S/o.Chelliya Ambulam	1196/1A	0.71.0
1196	3	0.32.0			1196/3	0.32.0
1196	4	0.40.0			1196/4	0.40.0
1196	5A	0.56.0	7802	Mr.Manikandan S/o. Ramachandran	1196/5A	0.56.0
Total Extent		**1.99.0**	**Applied lease area extent**			**1.99.0**

Lease area (hectares)	:	1.99.0 Hectares
Whether the area is recorded to be in forest (please specify whether protected, reserved, etc)	:	The proposed lease area is recorded as Consent Patta Land. Copy of land documents are enclosed. (Ref.Annex.No's: IV).
Ownership / Occupancy	:	This is a Consent Patta Land S.F.No.: 1196/1A, 1196/3, 1196/4 & 1196/5A is registered on the name of Mr.Ramachandran S/o.Chelliya Ambulam and Mr.Manikandan S/o. Ramachandran as vide patta no.2025 & 7802. Hence the pattadhar given consent to the applicant.
Existence of Public Road / Railway line if any nearby and approximate distance	:	✓ Exploited quarry materials will be transported through the approach road is situated on the western side of the lease area. ✓ There is NH road situated around 2.35km radius from the Eastern side of the lease area. ✓ There is an SH-568 is situated on the North side about 1.0km which is connecting Vadipatti-Palamedu Road. ✓ There is railway line situated around 3.5km radius is situated from Eastern side of the lease applied area.

	Toposheet No. with latitude and longitude	:	Toposheet No. **58 J/4** Latitude: From 10°04'36.55"N to 10°04'42.92"N Longitude: From 78°00'24.09"E to 78°00'28.15"E

Geo-Coordinates of the lease boundary:

LABEL	LATTITUDU	LONGITUDU
1	10° 4'41.93"N	78° 0'24.06"E
2	10° 4'42.04"N	78° 0'25.36"E
3	10° 4'42.23"N	78° 0'26.49"E
4	10° 4'42.76"N	78° 0'26.45"E
5	10° 4'42.82"N	78° 0'27.52"E
6	10° 4'42.92"N	78° 0'28.15"E
7	10° 4'42.43"N	78° 0'28.93"E
8	10° 4'39.34"N	78° 0'28.64"E
9	10° 4'39.33"N	78° 0'28.25"E
10	10° 4'37.97"N	78° 0'28.28"E
11	10° 4'37.97"N	78° 0'28.35"E
12	10° 4'36.89"N	78° 0'28.36"E
13	10° 4'36.88"N	78° 0'27.07"E
14	10° 4'36.55"N	78° 0'26.62"E
15	10° 4'37.68"N	78° 0'26.54"E
13	10° 4'37.59"N	78° 0'24.90"E
17	10° 4'38.96"N	78° 0'24.77"E
18	10° 4'39.03"N	78° 0'24.35"E
19	10° 4'39.45"N	78° 0'24.09"E
20	10° 4'39.61"N	78° 0'24.33"E
21	10° 4'40.61"N	78° 0'24.36"E

	Land use pattern (Forest, Agricultural, Grazing, Barren etc.)	:	It is an barren and Ryotwari land.
b.	***Attach a general location and vicinity map showing area boundaries and existing and proposed access routs. It is preferred that the area to be marked on a survey of India topographical map or a cadastral map or forest map as the case may be. However if***	:	Refer plate no-I & IA

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

i) INFRASTRUCTURE AND COMMUNICATION:

S.No	Description	Place	Distance	Direction
a.	Nearest post office	Vadipatty	5.12Km	Northwest
b.	Nearest police station	Vadipatty	3.5km	West
c.	Nearest fire station	Vadipatty	4.56km	Northwest
d.	Nearestmedical facility	Katchikatti	1.46km	North
e.	Nearest school	Ramayanpatty	1.62km	South
f.	Nearest railway station	Vadipatty	6.72km	Northwest
g.	Nearest port facility	Cochin	138km	SouthEest
h.	Nearest airport	Madurai	27.7km	South East
i.	Nearest DSP office	Samayanallur	10.9km	South
j.	Nearest villages	Ramayanpatty	0.78km	North West
		Poochampatty	0.85km	South
		Tathampatty	2.15km	West
		Keelakarai	4.79km	East

PART – A

3.0 GEOLOGY AND MINERAL RESERVES:

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

(i)	Topography	:	The proposed lease area is flat topography. The maximum elevation (220m) was observed north of the site. The slope is towards western side and falls in Toposheet no. **58 J/4**
(ii)	**General Geology of the District:** Madurai district of Tamil Nadu forms a part of southern Granulitic terrain and is predominantly occupied by crystalline rocks of Archaean to late Proterozoic age. Regionally, the rocks can be grouped under five categories namely		

i. Charnockite Group represented by Charnockite, Pyroxene Granulite and Magnetite Quartzite,

ii. Peninsular Gneissic Complex (II) comprising hornblende-biotite gneiss,

iii. Basic intrusive include Pyroxinite/Dunite

iv. Younger intrusive comprising, Nepheline-Syenite,Pink Granite, Pegmatite and Quartz veins and

v. Quaternary sediments of Kankar and soil.

Order of superposition of the proposed lease area,

Age	Group	Rock Formation
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
Archean	Charnockite Group	Charnockite (Unclassified) Pyroxene Granulite Banded Magnetite Quartzite

(iii) Local / Mine Geology of The Mineral Deposit:

Topography of the proposed lease area:

The applied lease area exhibits an flat topography and the maximum elevation 220m was observed north of the site. The rocks exhibits layered, medium to coarse grained hornblende biotite, orthopyroxene charnockite gneiss.

The Gravel is obtained the average of 0-2.0m and a rough stone starts from 2.0m to 40m (R.L.220-175m) from the surface level. The Surface plan showing elevation, contour, accessibility road and Geological map was prepared the proposed lease area.

Mode of origin:

The Charnockite series originally was assumed to have developed by the fractional crystallization of silicate magma. Subsequent studies have shown, however, that many, if not all, of the rocks are metamorphic, formed by

recrystallization at high pressures and moderately high temperatures.

Physiography of the rocks:

General characteristics of the rocks of this series has recorded that the rocks are in general bluish gray or darkish in colour and extremely fresh in appearance with an even grained granular structure.

Chemical composition of rocks:

The compositional characteristics of coexisting orthopyroxene, garnet and biotite have established several petrographic varieties within the Charnockites-Enderbites such as the granulite's and gneisses. Plagioclase feldspars, alkali feldspars and quartz are the salic minerals present in this series of rocks.

Order of superposition of the proposed lease area,

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

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

(b)	***The topographic plan of the lease area prepared on a scale of 1 :1000 or 1 : 2000 with contour interval of 3 to 10m depending upon the topography of the area should be taken as the base plan for preparation of geological plan. The details of exploration already carried out including evidences of mineral existence should be shown on the geological plan:***		
	a. Present status:	:	The RQP examined the surface features during survey. It is a existing quarry lease Present status refer Plate No.III.
	b. Surface Plan	:	Surface plan showing elevation contour and accessibility road was prepared at the scale of 1: 1000, as shown in Plate No. IV.
(c)	Geological sections should be prepared at suitable intervals on a scale of 1: 1000 / 1: 2000:	:	Longitudinal and transverse geological cross sections were prepared at the horizontal scale of 1: 1000 and at the vertical scale of 1:500, as shown in Plate No. IVA.
(d)	***Broadly indicate the Yearwise future programme of exploration, taking into consideration the future production programme planned in next five years***		

	as in table below:- No future programmed proposed in this area. Its massive homogeneous parent rock. Hence exploration proposal is not required to this mining project.

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

The geological resources were computed by cross section method with respect to the boundaries of the lease area. In this method, the lease area was divided into one longitudinal and two transverse section to calculate the volume of material up to the depth of 35m below ground level for ten years plan period. (Refer Plate No. IV & IVA). The one longitudinal and two transverse cross section were assigned X1Y1-AB & X2Y2-AB as respectively. Using the cross-sectional method, total reserve is estimated to be **902412m^3 / 2449404MT** including the resources of safety zone, and gravel, etc. Of which, rough stone resources of about **859440m^3 / 2363460MT** and gravel is **42972m^3 / 85944MT.**

ROUGH STONE &GRAVEL GEOLOGICAL RESERVES										
Section	Bench	Length in(m)	Width in(m)	Depth in(m)	Volume in(m3)	Rough sotne in(m3)	Gravel in(m3)	Bulk Density	Rough sotne in(Ts)	Gravel in(Ts)
X1Y1-AB	I	137	66	2	18084		18084	2		36168
	II	137	66	5	45210	45210		2.75	124327.5	
	III	137	66	5	45210	45210		2.75	124327.5	
	IV	137	66	5	45210	45210		2.75	124327.5	
	V	137	66	5	45210	45210		2.75	124327.5	
	VI	137	66	5	45210	45210		2.75	124327.5	
	VII	137	66	5	45210	45210		2.75	124327.5	
	VIII	137	66	5	45210	45210		2.75	124327.5	
	IX	137	66	5	45210	45210		2.75	124327.5	
TOTAL					379764	361680	18084		994620	36168
X1Y1-AB	I	183	68	2	24888		24888	2		49776
	II	183	68	5	62220	62220		2.75	171105	
	III	183	68	5	62220	62220		2.75	171105	
	IV	183	68	5	62220	62220		2.75	171105	
	V	183	68	5	62220	62220		2.75	171105	
	VI	183	68	5	62220	62220		2.75	171105	
	VII	183	68	5	62220	62220		2.75	171105	
	VIII	183	68	5	62220	62220		2.75	171105	
	IX	183	68	5	62220	62220		2.75	171105	
TOTAL					522648	497760	24888		1368840	49776
GRAND TOTAL					902412	859440	42972		2363460	85944

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

The total mineable reserve is estimated to be **314106m^3 / 842097MT** by deducting the reserve safety zone, block in benches from the total Geological resources up to a depth of 35m below ground level. Of which, rough stone is about **285180m^3 / 784245MT** and gravel is **28926m^3 / 57852MT**. The commercially viable rough stone has been prepared on 1: 1000 scale and sections are prepared in a scale of 1:1000 in horizontal axis and 1:500 as vertical axis (Refer plate no's. VI & VIA).

ROUGH STONE &GRAVEL MINEABLE RESERVES										
Sectoin	Bench	Length In(m)	Width In(m)	Depth In(m)	Volume In(m3)	Rough sotne In(m3)	Gravel In(m3)	Bulk Density	Rough sotne In(Ts)	Gravel In(Ts)
	I	117	59	2	13806		13806	2		27612
	II	113	57	5	32205	32205		2.75	88563.75	
	III	103	52	5	26780	26780		2.75	73645	
	IV	93	47	5	21855	21855		2.75	60101.25	
	V	83	42	5	17430	17430		2.75	47932.5	
	VI	73	37	5	13505	13505		2.75	37138.75	
	VII	63	32	5	10080	10080		2.75	27720	
	VIII	53	27	5	7155	7155		2.75	19676.25	
X1Y1-AB	IX	43	22	5	4730	4730		2.75	13007.5	
TOTAL					**147546**	**133740**	**13806**		**367785**	**27612**
	I	126	60	2	15120		15120	2		30240
	II	122	58	5	35380	35380		2.75	97295	
	III	112	53	5	29680	29680		2.75	81620	
	IV	102	48	5	24480	24480		2.75	67320	
	V	92	43	5	19780	19780		2.75	54395	
	VI	82	38	5	15580	15580		2.75	42845	
	VII	72	33	5	11880	11880		2.75	32670	
	VIII	62	28	5	8680	8680		2.75	23870	
X2Y2-AB	IX	52	23	5	5980	5980		2.75	16445	
TOTAL					**166560**	**151440**	**15120**		**416460**	**30240**
GRAND TOTAL					**314106**	**285180**	**28926**		**784245**	57852

4.0 MINING:

a)	Briefly describe the existing / proposed method for developing / working the deposit with all design parameters. (Note: In case of pocket deposits, sequence of development/working may be indicated on the same plan)	:	The mining operation is open-cast, semi-mechanized method are adopted and on single shift basis only. Under the regulation 106 of the Metalliferous Mines Regulations, 1961 in all open cast workings in hard rock, the benches and sides should be properly benched and sloped. The bench height should not exceed 5m and the bench width

			should not less than the bench height. The slope of the benches should not exceed 45° from horizontal.

b) ***Indicate quantum of development and tonnage and grade of production expected pit wise as in table below.***

Total proposed production for Five years of rough stone is about **199485m^3/548583.75MT** and gravel is **28926m^3 / 57852MT** up to a depth of 22m below ground level.(Refer Plate No's. V & VA).

Year	Pit No.(s)	Topsoil/ Overburden (m^3)	ROM (m^3)	Saleable rough stone (m^3) @ 100%	Rough stone (MT)	Saleable Gravel (m^3)	Saleable Gravel (MT)	Rough stone to waste ratio
I	I	...	48832	28920	93747	9912	19824	...
II	I	...	52814	40280	110770	12534	25068	...
III	I	...	46520	40040	110110	6480	12960	...
IV	I	...	40115	40115	110816.25	...	...	...
V	I	...	40130	40130	110857.5	...	...	...

ROUGH STONE &GRAVEL YEARWISE PRODUCTION DEVELOPMENT

Year	Bench	Length in(m)	Width in(m)	Depth in(m)	Volume in(m3)	Rough sotne in(m3)	Gravel in(m3)	Bulk Density	Rough sotne in(Ts)	Gravel in(Ts)
	I	84	59	2	9912		9912	2		19824
	II	80	57	5	22800	22800		2.75	62700	
I-Year	III	62	52	5	16120	16120		2.75	44330	
TOTAL					48832	38920	9912		107030	19824
	I	33	59	2	3894		3894	2		7788
	I	72	60	2	8640		8640	2		17280
II-Year	II	33	60	5	9900	9900		2.75	27225	
	II	68	58	5	19720	19720		2.75	54230	
	III	41	52	5	10660	10660		2.75	29315	
TOTAL					52814	40280	12534		110770	25068
	I	54	60	2	6480		6480	2		12960
	II	54	58	5	15660	15660		2.75	43065	
III-Year	III	92	53	5	24380	24380		2.75	67045	
TOTAL					46520	40040	6480		110110	12960
	III	20	53	5	5300	5300		2.75	14575	
	IV	93	47	5	21855	21855		2.75	60101.25	
IV-Year	IV	54	48	5	12960	12960		2.75	35640	
TOTAL					40115	40115	0		110316.25	
	IV	48	48	5	11520	11520		2.75	31680	
	IV	83	42	5	17430	17430		2.75	47932.5	
V-Year	V	52	43	5	11180	11180		2.75	30745	
TOTAL					40130	40130	0		110357.5	
GRAND TOTAL					228411	199485	28926		548583.75	57852

c)	***Composite plans and Year wise sections (In case of 'A' class mines):***	:	Not applicable. It is a "B" class quarry lease

d)	Attach supporting composite plan and section showing pit layouts, dumps, stacks of sub-grade mineral, if any, etc.	:	Composite plan not prepared in this proposed lease area

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

At this rate of production, the expected life of quarry is calculated as given below:

Rough stone:

Mineable reserves of rough stone (10 Years) = **285180m^3 / 784245MT**

Annual Peak production = **39897m^3 / 109716.75MT**

Gravel:

Mineable reserves of Gravel = **28926m^3 / 57852MT**

f) ***Attach a note furnishing a conceptual mining plan for the entire lease period (for "B" category mines) and upto the life of the mine (for "A" category mines) based on the geological, mining and environments considerations:***

i)	Time frame of completion of mineral exploration program in leasehold area: Give broad description identified potential areas to be covered in the given time frame:	:	Considering the indefinite depth persistence of the rough stone deposit is proved beyond the workable limits about up to a depth of 40m below ground level (R.L.218m to 178m) from the petrogenetic character of the charnockite rock as well as from the actual mining practice in the area and with the current trend of rough stone production the quarry may sustain for 10 years.

ii) Whether ultimate pit limit has been determined and demarcated on surface and geological plan :-

The ultimate pit limit has been determined and demarcated in the conceptual plan

SECTION X1Y1-AB				
Bench	**Overburden/ Mineral**	**L (m)**	**W (m)**	**D (m)**
I	Gravel	117	59	2
II	Rough stone	113	57	5
III		103	52	5
IV		93	47	5
V		83	42	5
VI		73	37	5
VII		63	32	5
VIII		53	27	5

		IX		43	22	5
		Total				**42**
		SECTION X2Y2-AB				
		Bench	**Overburden/ Mineral**	**L (m)**	**W (m)**	**D (m)**
		I	Gravel	126	60	2
		II	Rough stone	122	58	5
		III		112	53	5
		IV		102	48	5
		V		92	43	5
		VI		82	38	5
		VII		72	33	5
		VIII		62	28	5
		IX		52	23	5
		Total				**42**
iii)	Whether the site for disposal of waste rock or an un-saleable material have/ has been examined for adequacy of land and suitability of long term use in the event of continuation of mining activity: -	:	The recovery of rough stone in this quarry is 100%. There is no waste rock will be proposed in this lease area.			
iv)	Whether back filling of pits after recovery of mineral up to techno -economically feasible depth envisaged. If so, describe the broad features of the proposal: -	:	As the depth of persistence of the deposit may likely to continue for further depth, it is proposed not to backfilled the quarry pit.			
v)	Whether post mining land use envisaged: -	:	At the end of mining activities over the quarry pit may be utilized for storage of rain water and may be converted in to dumping yards for solid waste by adopting suitable technologies.			
g)	Open cast mining					
i)	Describe briefly giving salient features of the mode of working (Mechanized, Semi-Mechanized, manual)	:	It is a existing quarry lease. The mining operation is opencast, semi-mechanized methods are adopted and on single shift basis only. Under the regulation 106 of the Metalliferous Mines Regulations, 1961 in all opencast workings in hard rock, the benches and sides should be properly benched and			

			sloped. The bench height should not exceed 6m and the bench width should not less than the bench height. The slope of the benches should not exceed 45° from horizontal.
ii)	Describe briefly the layout of mine workings, the layout of faces and sites for disposal of overburden/waste. A reference to the plans enclosed under 4(b) and 4(d) will suffice		The rough stone is proposed to quarry at 5m bench height & width conventional opencast semi mechanized quarrying operation using shot hole drilling with the help of tractor mounted compressor attached with jack hammers, smooth blasting and waste and are removal using Hydraulic excavator and loaded directly to the tippers and transported to the needy customer. Bench height = 5mts. Bench width = 5mts.
	a. Details of Topsoil/ Overburden		There is no topsoil will be removed.
	b. Rough Stone waste and side burden waste:-		The recovery of rough stone in this quarry is 100%. There is no rough stone waste or side burden will be removed.
H	Underground Mining		Not applicable

i) ***Extent of mechanization:***

Describe briefly including the calculation for adequacy and type of machinery and equipment proposed to be used in different mining operations.

(I) Drilling Machines:

Drilling of shot holes will be carried out using tractor mounted compressor and jack hammer. Details of drilling equipment's are given below.

Type	Nos	Dia of hole (mm)	Size / Capacity	Make	Motive power	H.P.
Jack Hammer	1	32 mm	Hand held	--	Diesel	--
Compressor	2	---	Air	--	Diesel	--

(2) Loading Equipment:

Type	Nos	Size / Capacity	Make	Motive power	H.P.
Hydraulic Excavator	2	2.9-4.5m^3	--	Diesel	--

(3) Haulage and Transport Equipment

(a) Haulage within the mining leasehold:

Type	Nos	Size /	Make	Motive power	H.P.

			Capacity			
	Tipper	3	--	--	Diesel	--

Whether the dumpers are fitted with exhaust conditioner should be indicated:
The dumpers not used in this quarry area, hence it's a small B category mine.

b)	Transport from mine head to the destination	Tipper will be used for transport rough stone from the mine head to needy customer.
c)	Describe briefly the transport system (please specify)	Hydraulic excavator and tippers utilized for internal transport sizeable rough stone lumps and deliver to the customer's area.
	i) Ore transported by: own trucks / hired trucks	Hired trucks for initially production purposes
	ii) Main destination to which ore is transported (giving to and from distance)	The excavated stone materials road metal will be supplied to the consumers like road laying, earth filling, building construction, etc

a) Details of hauling / transport equipment:

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

4) **(4). Miscellaneous:**
Describe briefly any allied operations and machineries related to the mining of the deposit not covered earlier.

	(A) Operations	The mining operation is open-cast, semi-mechanized methods are adopted and on single shift basis only.
	(B) Machineries deployed	Machineries like Tractor mounted compressor attached with Jack hammers is proposed to drilling and blasting. Hydraulic Excavators and tipper combination are adapted.

5. **BLASTING:**
a) Broad blasting parameters like charge per hole, blasting pattern, charge per delay, maximum number of holes blasted in a round, manner and sequence of firing, etc.

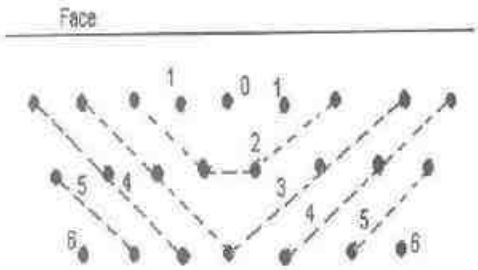
Blasting pattern:

The quarrying operation is proposed to carried by open cast mining in conjunction with conventional method using jack hammer drilling and blasting for

shattering effect and loosen the rough stone.

Rough stone production for 10 years = **285180m^3 / 784245MT**

BLAST DESIGN	
Blasthole Diameter (D) in mm	32
Burden (B) in m	1.2
Spacing (S) in m	1.38
Subdrill in m	0.5
Charge length (C) in m	0.70
Stemming	0.5
Hole Length (L) in m	1.2
Bench Height (BH) in m	2.5
Mass of explosive/hole in g	437.5
Stemming material size in mm	3.2
Burden stiffness ratio	2.08
Blast volume/hole in m3	4.14
Production of rough stone/day in m3	82
Number of blast holes/day	20
Number of blast round/day	7
Blasthole pattern	Staggered
Mass of explosive /day in kg	8.66
Powder factor in kg/m3	0.11
Loading density	0.63
Type of explosives	Slurry
Diameter of packaging in mm	25
Initiation system	Nonel
Fly rock distance in m	1



Stagged method of mining

b) Type of explosives used / to be used:

Following explosives are recommended for efficient blasting with safe practice.

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

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

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

	Shallow depths jack hammer drilling and blasting is proposed to be carried out with minimum use of explosive mainly to give hearing effect in rough stone for easy excavation and to control fly rock. Delay detonators: Delay blasting permits to divide the shot to smaller charges, which are detonated in a predetermined millisecond sequence at specific time intervals. The major advantages of delay blasting are: ❖ Reduction of ground vibration ❖ Reduction in air blast ❖ Reduction in over break ❖ Improved fragmentation ❖ Better control of fly rock Blasting program for the production per day No of holes : 20 holes Yield : $82m^3$ Total explosive required : 8.66kg-Slurry explosives Charge per hole : 0.5kg Blasting at day time only : 12.0p.m-1.0p.m	
c)	Powder factor in ore and overburden / waste / development heading / stope	:	Powder factor is proposed as 0.11kg per hole of explosives
d)	Whether secondary blasting is needed, if so describe it briefly		There is no secondary blasting involved.
e)	Storage of explosives (like capacity and type of explosive magazine)		1. The applicant is advised to engage an authorized explosive agency to carry out blasting. 2. First Aid Box will be keeping ready at all the time. 3. Necessary precautionary announcement will be carried out before the blasting operation.
6.	***MINE DRAINAGE:***		
a)	Likely depth of water table based on observations from nearby wells and water bodies	:	The ground water table is reported as of 75m in summer and 70m in rainy season from the general ground level observed in the adjacent

			bore well.
b)	Workings expected to be _____ m. above / reach below water table by the year _____ .	:	Proposed mining depth is 35m below ground level. Now, the present Mining lease shall be proposed above the water table and hence, quarrying may not affect the ground water.
c)	Quantity and quality of water likely to be encountered, the pumping arrangements and places where the mine water is finally proposed to be discharged	:	The ground water may not rise immediately in this type of mining. However, the rain water percolation and collection of water from the seepage shall be less than 300 L pm and it shall be pumped out periodically by a stand by diesel powered Centrifugal pump motivated with 7.5 H.P. Motor. The quality of water is potable and it is not contaminated with any hazardous things.
7.	***STACKING OF MINERAL REJECTS AND DISPOSAL OF WASTE:***		
a).	Indicate briefly the nature and quantity of top soil, overburden / waste and mineral rejects likely to be generated during the years: No other wastes are removed during years.		
b).	Land chosen for disposal of waste with proposed justification	:	There is no topsoil will be removed.
c).	Attach a note indicating the manner of disposal and configuration, sequence of buildup of dumps along with the proposals for the stacking of sub-grade ore, to be indicated Year wise.	:	The recovery of rough stone in this quarry is 100%. If rough stone may be unsold will be keep within the lease boundary.
8.	***USE OF MINERAL:***		
a).	Describe briefly the end-use of the mineral (sale to intermediary parties, captive	:	The excavated stone materials will be supplied to the consumers like stone pillar, sized stone, etc. For instance, aggregates are

	consumption, export, industrial use)		mostly used for building, roads and footpaths., etc
b).	Indicate physical and chemical specifications stipulated by buyers	:	Basically, the materials produced at this quarry are rough stone (charnockite) and gravel the same are used for building materials and road metal. So, there is no chemical specifications are specified. Only physical specifications are involved.
c).	Give details in case blending of different grades of ores is being practiced or is to be practiced at the mine to meet specifications stipulated by buyers.	:	Not blending process is involved, after blasting the rough stone and gravel will be directly loaded to the needy customer.
9.	***OTHERS***		
	Describe briefly the following a) Site services	:	Infrastructure required for such mines like office, stores, canteen, first aid station, shelter latrine and bath rooms have been provided as per the Metalliferous Mines Regulations, 1961 as a welfare amenity for our quarry laborers.

b) Employment potential:

As per Mines safety under the provisions of Metalliferous Mines Rules, 1961 under the Mines Act, 1952, whenever the workers are employed more than 10, it is preferred to have a qualified Mining Mate to keep all the production workers directly under his control and supervision.

The following man power is proposed for quarrying stone material during the ten years period the same manpower will be utilize for this mining plan period to achieve the proposed production and to comply the provisions of as per the MMR, 1961 norms.

1.	Highly Skilled	Mines Manager	1No.
		Mine Engineer	1No.
		Mine Geologist	1No
		Blaster	1No
2.	Unskilled	Musdoor / Labours	13 No's
		Total =	**17No's**

10	**MINERAL PROCESSING/BENEFICIATIONS:**		
(a)	If processing / beneficiations of the ore or minerals mined is	:	Excavated rough stone minerals directly will

	planned to be conducted on site or adjacent to the extraction area, briefly describe the nature of the processing /beneficiation. This should indicate size and grade of feed material and concentrate (finished marketable product), recovery rate.		be used by the applicant for required size ½, ¾ and 1½ inches Jelly which are mainly used in road and building construction purpose. The recovery of rough stone in this quarry is 100%.
(b)	Explain the disposal method for tailings or waste from the processing plant (quantity and quality of tailings proposed to be discharged, size and capacity of tailing pond, toxic effect of such tailings, if any, with process adopted to neutralize any such effect before their disposal and dealing of excess water from the tailing dam).	:	No water shall be used for quarrying or any other processing except drinking water to be drawn from public sources. Some stagnation of rain water in the pit shall be used for drilling and spraying haul roads. Therefore, need for tailing dam doesn't arise. But tailing control of rain water flow during rainy season has to be done by decanting the SPM in a pit before passing the water in to natural system.
(c)	A flow sheet or schematic diagram of the processing procedure should be attached.	:	Not applicable.
(d)	Specify quantity and type of chemicals to be used in the processing plant.	:	Not applicable
(e)	Specify quantity and type of chemicals to be stored on site / plant.	:	Not applicable
(f)	Indicate quantity (cu.m. per day) of water required for mining and processing and sources of supply of water. Disposal of water and of recycling.	:	Drinking is 0.2KLD, utilized water is 0.8KLD, Dust suppression is 1.0KLD and Green Belt is 1.0KLD. Minimum quantity of water 3.0KLD per day. It is proposed to make an authorized water vendors for drinking water, dust suppression. The workers utilized water will be used for green belt development. The sewage water to a tune of 0.9KLD generated from the mine office toilet and mine labour toilet will be diverted to the

			septic tank followed by soak pit.

PART – B

11.0 ENVIRONMENTAL MANAGEMENT PLAN:

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

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

Sl. No.	Land Use	Present area (Hect.)
1.	Area under Mining	Nil
2	Infrastructure	Nil
3	Roads	Nil
4	Unutilized	1.99.0
5	Green belt	Nil
6	Settling Tank & Drainage	Nil
	Grand Total	**1.99.0**

11.2	Water Regime	:	Water table in this area is noticed at a depth of 65m in summer and 60m in rainy season from the general ground level and presently the quarrying of rough stone is ultimate up to a depth of 40m below ground level. Hence, it will not affect the ground water depletion of this area. It is proposed to make an authorized water vendors for drinking water, dust suppression. The workers utilized water will be used for green belt development.
11.3	Flora and Fauna	:	There is no major flora observed in this area and except bushes, shrubs, no other valuable trees are noticed in the lease area. Further, neither flora of botanical interest nor fauna of zoological interest is noticed in this area.
11.4	Quality of air, ambient noise level and water	:	Air or dust expected to be generated from drilling process, hauling roads, places of excavation etc., will be suppressed by periodical wetting of land by water spraying. Quarrying of rough stone will be carried out

			by drilling and blasting by using low power explosives, and hence, noise will be very minimum. However, periodical noise level monitoring will be carried out every six months around the quarry site.
11.5	Climatic conditions: The basin area experiences tropical climate being hot and dry for the greater part of the year. The period from March to June is generally hot. The temperature ranges from 20° to 38°C. Rainfall: The area receives rainfall through both south-west and north-east monsoons.About 40 percent of the precipitation is contributed by south-west monsoon and northeast monsoon accounts for 50 to 60 percent. The average annual rainfall for the basinarea is 720 mm.		
11.6	Human Settlement: The nearest villages are found in the buffer zone with population as per 2011 census.		

S.No	Village	Direction	Distance in Kms	Population
1	Ramayanpatty	0.78km	North West	2160
2	Pochampatti	0.85km	South	1024
3	Thathampatti	2.15km	West	1305
4	keelakarai	4.79km	East	2112

11.7	Public buildings, places of worship and monuments	:	No infrastructure like residential building, are found within radius of 300m. The places of special interest like archeological monuments, Sanctuaries, etc., are found around 10km radius.
11.8	Attach plans showing the locations of sampling stations	:	The proposed Ambient air quality, Water quality Ambient noise level and vibration are periodically tested for every season (6 months once) around 5km radius as per the guidance of MoEF and EIA Notification 2006 and also covering DGMS norms.

11.9	Does area (partly or fully) fall under notified area under Water (Prevention & Control of Pollution), Act, 1974	:	The proposed area not fall under notified area under Water (Prevention & Control of Pollution), Act, 1974

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

i) ***Land area indicating the area likely to be degraded due to quarrying / pitting, dumping, roads, workshop, processing plant, township etc:***

Due to quarrying and exploitation of the rough stone, there will impact in the form i.e. change in the ground profile, pits, and dumps. The details of the land use pattern, during the ensuing plan period and till lease period is shown in the tabular form:

Sl. No.	Land Use	Area in use during the quarrying period (Hect.)
1	Area under Mining	1.30.00
2	Infrastructure	0.01.00
3	Roads	0.04.00
4	Green Belt	0.32.00
5	Un-Utilized Area	0.25.90
6	Drainage & Settling Tank	0.06.10
	Grand Total	**1.99.0**

ii).	Air Quality		Air or dust expected to be generated from drilling process, hauling roads, places of excavation etc.., will be suppressed by periodical wetting of land by water spraying.
iii).	Water quality		A water sample from the open/bore wells was tested to NABL approved lab to assess hardness, Salinity, colour, Specific gravity, etc.
iv).	Noise levels		Quarrying of rough stone and gravel will be carried out by drilling and blasting by using low power explosives, and hence, noise will be very minimum. However, periodical noise level monitoring will be carried out every six months around the quarry site.

v).	Vibration levels (due to blasting)		No deep hole blasting envisaged. Small dia shot holes are used for breaking boulders. The maximum peak particles velocity shall be recoded using mini seismograph devises as per the guidance of MoEF and EIA Notification 2006 and also covering DGMS norms.
vi).	Water regime		No major river or any odai track are found around 500m radius.
vii).	Socio-economics		1. To provide Employment opportunities of the nearby villagers. 2. For the cultural development of the nearby villagers.
viii).	Historical monuments etc.		There are no historical monuments, etc found around 300m radius.

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

i).	temporary storage and utilization of topsoil	:	No separate of topsoil will be removed.
ii).	Yearwise proposal for reclamation of land affected by abandoned quarries and other mining activities during ten years (and upto conceptual plan period for 'A' category mines) clarifying the extent of back filling and re-contouring and / or alternative use of unfilled / partially filled excavations / road sides / slopes and mine. In case abandoned quarries/ pits are proposed to be used as reservoir, their size, water holding capacity and	:	The present mining is proposed to an average depth of 42m below ground level from the below ground level has been envisaged as workable depth for safe & economic mining during the lease period. The mined-out area will be fenced on top of working bench with S1 fencing. No immediate proposals for closure of pit as the rough stone persist still at deeper level.

	proposal for utilization of such water be given.		

iii). ***Programme of afforestation, Yearwise for the initial ten years (and upto conceptual plan period for 'A' category mines) indicating the number of plants with name of species to be afforested under different areas in hectares.***

Green Belt Development:

Safety barrier, nearby school area and Nearest Panchayat approach Roads has been identified to be utilized for Greenbelt appropriate native species of Neem, Pungan and other regional trees will be planted in a phased manner as described below

Year	Place	Area in Sq.m	No.of Plants	Rate of survival	Rate	Amount in Rs
First	Lease Boundary	4060	450	80%	@100 Rs Per sapling	45,000/-
Second	Approach road and Nearby Village Road	--	350	80%		35,000/-
Third	Schools	--	350	80%		35,000/-
					Total	**1,15,000/-**

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

			from the quarry.
ix).	Measures for protecting historical monuments and for rehabilitation of human settlements likely to be disturbed due to mining activity.	:	No historical monuments and for rehabilitation of human settlements doesn't to be disturbed during mining activity.
x).	Socioeconomic benefits arising out of mining.	:	The nearest villages are will get employment benefits.

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

Not applicable. It is B category quarry

12.0 PROGRESSIVE QUARRY CLOSURE PLAN:

12.1	Steps proposed for phased restoration, reclamation of already mined out area.	:	Present mining is proposed to depth of 35m below ground level. The mined-out area will be fenced on top of working bench with S1 fencing to arrest the entry of cattle's and public in to the quarry site.
12.2	Measures to be under taken on mine closure as per Act & Rules	:	Measures will be taken as per the Acts and Rules. The quarried pit will be fenced by Barbed wire fencing. Green belt development at the rate of 450 trees will be proposed in the quarry area. No immediate proposals for closure of pit as the rough stone persist still at deeper level.
12.3	Mitigation measures to be undertaken for safety and restoration/ reclamation of the already mined out area	:	The quarry lease is an existing mining lease, no mitigation measures observed.
12.4	Mine closure activity	:	The mining plan is proposed to depth of 42m below ground level has been envisaged as workable depth for safe & economic mining during the lease period. The mined-out area will be fenced on top of open cast working with S1 fencing. No immediate proposals for closure of pit as the rough stone persist still at deeper level.
12.5	Safety and security	:	Safety measures implement to the prevent access to surface opening excavations will be taken as Metalliferous mine regulations,

			1961, it is a small open cast mining method adopted. Safety provisions like helmet, goggles, safety shoes, Dust mask, Ear muffs etc have to be provided as per the circulars and amendments made for Mine labours under the guidance of DGMS being a mechanized operation.
12.6	Disaster management and Risk Assessment	:	Open cast mining method is adopted in this quarry. If the benches are made with proposed height and with no risk will be there. Even then if any minor or major accident happens the quarry staffs having First aid facilities with first aid box with all necessary medicine and stretches etc., to give first aid treatment at the site and will arrange immediately the vehicle to reach nearest hospital, if any disaster happens the lessee is capable to meet such eventualities. At the time of any accident during mining activity, proposal of first aid facility at quarry and one vehicle always ready at quarry site.
12.7	Care and maintenance during temporary discontinuance	:	A board of discontinuance will be changed on the main entrance of the working place. One watch man will be kept on the quarry area for security purposes also look after the survival of the plants.
12.8	Economic repercussions of closure of quarry and man power entrenchments	:	During the ten years mining period the employment potential will be generated, general financial status and socio-economic conditions of approx. 17 labors will be improved.

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

A	**Fixed Asset Cost:**		
	1. Land Cost (consent for eleven years)	:	Rs. 2,20,000
	2. Labour Shed		Rs. 1,00,000/-

	3. Sanitary Facility	:	Rs. 1,00,000/-
	4. Fencing	:	Rs. 3,00,000/-
	5. Other expenses (Security guard, dust bin, etc)	:	Rs. 4,00,000/-
	Total	:	**Rs. 11,20,000/-**
B	**B. Machinery cost**	:	**Rs. 30,00,000/-** (Hire Basis)
C	**Total Expenditure of EMP cost** (for ten years)		
	1. Drinking Water Facility	:	Rs. 1,50,000/-
	2. Sanitary facility & Maintenance	:	Rs. 2,00,000/-
	3. Permanent water sprinkler	:	Rs. 2,50,000/-
	4. Afforestation and its maintenance	:	Rs. 1,15,000/-
	5. Safety Kits	:	Rs. 1,00,000/-
	6. Provision of tyre washing facility	:	Rs. 1,50,000/-
	7. Blasting materials with blast mat cost	:	Rs. 20,00,000/-
	8. Drainage & Settling Tank (0.06.10Hect or 610 Sq.m x 400)	:	Rs. 2,44,000/-
	9. Environment monitoring	:	Rs. 5,00,000/-
	Total	:	**Rs. 37,09,000/-**
D	**Total Project Cost (A+B+C)**	:	**Rs. 78,29,000/-**

13.0 FINANCIAL ASSURANCE:

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

14.0 CERTIFICATES:

All required certificates are enclosed.

15.0 PLAN AND SECTIONS, ETC:

Plan and Sections are submitted along with mining plan.

16.0 ANY OTHER DETAILS INTEND TO FURNISH BY THE APPLICANT

(i) Care and precautionary measures will be taken for the safety of workers as per Rules and Acts.

(ii) The applicant will endeavor every attempt to quarry the rough stone economically without any wastage and to improve the environment and ecology.

(iii)The Mining Plan is prepared by incorporating the conditions stipulated in the precise area communication issued by the Assisatnt Director, Department of

Geology and Mining, Madurai vide letter **Roc.No.1437/Mines/2024 Dated 29.10.2025.**

(iv) Total proposed production rough stone is **199485m^3/548583.75MT** and gravel is **28926m^3 / 57852MT** up to a depth of 22m below ground level for five years plan period.

17.0 CSR Expenditure:

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

Place: Salem, TN

Date:

A. Allimuthu

Signature of the Recognized Qualified Person

A.ALLIMUTHU, M.Sc., M.Phil.,
Recognized Qualified Person
RQP/DMG/HYD/65/2022

This Mining Plan is approved subject to the conditions/stipulate on indicated in the Mining Plan Approval Roc. No.1437/mines Dated. 02/12/25.

This Mining Plan is approved based on incorporation of the particulars specified under sub rule (7) (i)to (7) (vii) & 8 of Rule 41 of Tamil Nadu Minor Mineral Concession Rules, 1959 and subject to the future fulfillment of the conditions laid down under sub rule (9) of Rule 41 of Tamil Nadu Minor Mineral Concession Rules, 1959.

02/12/2025

Deputy Director,
Geology and Mining,
Madurai.

2/12/25.

64 A

ANNEXURE -I

புவியியல் மற்றும் சுரங்கத்துறை

ந.க.எண.1437/கனிமம்/2024

துணை இயக்குநர் அலுவலகம்,
மாவட்ட ஆட்சியர் அலுவலக வளாகம்,
மதுரை.

நாள்: 29.10.2025

குறிப்பாணை

பொருள்: கனிமங்களும் குவாரிகளும் - சிறுகனிமம் - சாதாரணகற்கள் மற்றும் கிராவல் - மதுரை மாவட்டம் - வாடிப்பட்டி வட்டம் - கச்சைகட்டி கிராமம் - புல எண். 1196/1A-ல் பரப்பு (0.71.00) ஏர்ஸ், 1196/4 பரப்பு (0.40.00) ஏர்ஸ், 1196/3 ல் பரப்பு (0.32.00) ஏர்ஸ், 1196/5A பரப்பு (0.56.00) பரப்பளவில் ஆகியவற்றில் மொத்த விஸ்தீர்ணம் 1.99.0 ஹெக்டேர் - 10 (பத்து) வருடங்களுக்கு சாதாரணகற்கள் மற்றும் கிராவல் குவாரி உரிமம் வழங்கல் - உகந்த பரப்பு (Precise Area) தேர்வு செய்யப்பட்டது - சுரங்கத்திட்டம் மற்றும் மாநில அளவிலான சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையத்தின் இசைவினைப் பெற்று சமர்ப்பிக்க கோருவது - தொடர்பாக.

பார்வை:
1. திரு.K.மணிகண்டன், த/பெ.கண்ணன், 47/40 இந்திரா நகர் ஆளவந்தான், காந்தி நகர் மதுரை வடக்கு என்பவரது விண்ணப்பம் நாள்.19.11.2024. இவ்வலுவலகத்தில் பெறப்பட்ட நாள்.19.11.2024.
2. இவ்வலுவலக இதே எண்ணிட்ட கடிதம் நாள் 19.12.2024 மற்றும் 01.07.2025.
3. மதுரை வருவாய் கோட்டாட்சியரின் கடிதம் ந.க.எண். E-3525157/சி/2025 , நாள்.16.09.2025.
4. உதவி புவியியலாளர், புவியியல் மற்றும் சுரங்கத்துறை புலத்தணிக்கை அறிக்கை, நாள். 19.09.2025.
5. தொடர்புடைய ஆவணங்கள்.

*****

மதுரை மாவட்டம், வாடிப்பட்டி வட்டம், கச்சைகட்டி கிராமம், 1196/1A (0.71.00), 1196/3 (0.32.00), 1196/4 (0.40.00) மற்றும் 1196/5A (0.56.00) ஆகியவற்றில் மொத்த விஸ்தீர்ணம் 1.99.0 ஹெக்டேர் பரப்பில் 10 வருடங்களுக்கு சாதாரணகற்கள் மற்றும் கிராவல் வெட்டி எடுத்து குவாரி செய்ய குத்தகை உரிமம் வழங்க கேட்டு திரு.K.மணிகண்டன் என்பவர் பார்வை 1-இல் காணும் விண்ணப்பத்தினை சமர்ப்பித்துள்ளார்.

2) மேற்கண்ட விண்ணப்பம் தொடர்பாக, மதுரை வருவாய் கோட்டாட்சியர் மற்றும் புவியியல் மற்றும் சுரங்கத்துறை, உதவி புவியியலாளர் ஆகியோரின் ஆய்வு அறிக்கையில், மதுரை மாவட்டம், வாடிப்பட்டி வட்டம், கச்சைகட்டி கிராமம், புல எண்கள். 1196/1A (0.71.00) மற்றும் 1196/4 ஆனது பட்டா எண்.2025-ன்படி செல்லையா அம்பலம் மகன் ராமச்சந்திரன் மற்றும் ராமச்சந்திரன் மகன் மணிகண்டன் பெயரில் கூட்டுப்பட்டாவாக கிராம கணக்கில் தாக்கலாகியுள்ளது. புல எண்கள்.1196/3 மற்றும் 1196/5A ஆனது பட்டா எண். 7802-ன் படி செல்லையா மகன் ராமச்சந்திரன் பெயரில் கிராம கணக்கில் தாக்கலாகியுள்ளது. மேற்படி கூட்டுப்பட்டாதாரர்கள் மற்றும் பட்டாதாரர் ஆகியோரிடம் விண்ணப்பதாரர் 11 ஆண்டுகள் குத்தகைக்கு கல்குவாரி உரிமம் பெற்று குவாரிப்பணி மேற்கொள்ள வாடிப்பட்டி சார்பதிவாளர் அலுவலக ஆவண எண்.2489/2024 நாள். 17.10.2024 அன்று பதிவு செய்து அதன் நகலினை இவ்வலுவலகத்தில் சமர்பித்துள்ளார். விண்ணப்பப் புலங்களில் ஏற்கனவே குத்தகை உரிமம் ஏதும் வழங்கப்படவில்லை. அனுமதி கோரும் விண்ணப்பப் புல எண்களில் 1 முதல் 2 மீ ஆழம் வரை மண் / கிராவல் மற்றும் அதற்கு கீழ் எம்.சாண்ட் மற்றும் ஜல்லி தயாரிக்க பயன்படும் பாறை வகைகள் அமையப்பெற்றுள்ளன என்பது அருகில் உள்ள குவாரி பள்ளங்கள் மூலம் தெரியவருகிறது. விண்ணப்பிக்கப்பட்ட புலங்களை சுற்றிலும் 300 மீட்டர் சுற்றளவில் தொல்லியல்துறையின் மூலம் பாதுகாக்கப்பட்ட பகுதிகளாக அறிவிக்கப்பட்ட இடங்கள் மற்றும் வரலாற்றுச் சின்னங்கள் ஏதும் இல்லை. விண்ணப்ப புலங்களில் புல எண்கள். 1196/1A-ன் தெற்கு பகுதியில் புல எண். 1187, 1188-ல் கிழமேலாக ஓடை செல்கிறது. மேலும், 60 மீட்டர் சுற்றளவில் காப்பு காடுகள் மற்றும் 50 மீட்டர் சுற்றளவில் தேசிய / மாநில நெடுஞ்சாலைகள், கட்டிடங்கள் ஏதும் இல்லை. மேலும் மேற்படி புலங்களில் இருந்து 300 மீட்டர் சுற்றளவிற்குள் கிராம நத்தம், அங்கீகரிக்கப்பட்ட குடியிருப்பு மனைகள் மற்றும் கட்டுமானங்கள் ஏதுமில்லை என மதுரை வருவாய் கோட்டாட்சியர் அறிக்கை செய்துள்ளார். எனவே, மதுரை மாவட்டம்,

வாடிப்பட்டி வட்டம், கச்சைகட்டி கிராமம், 1196/1A (0.71.00), 1196/3 (0.32.00), 1196/4 (0.40.00) மற்றும் 1196/5A (0.56.00) ஆகியவற்றில் மொத்த விஸ்தீர்ணம் 1.99.0 ஹெக்டேர் பரப்பளவிற்கு சாதாரணகற்கள் மற்றும் கிராவல் வெட்டி எடுத்து குவாரிப்பணி செய்ய திரு.K.மணிகண்டன் என்பவருக்கு தமிழ்நாடு சிறுகனிம சலுகை விதிகள் 1959 விதி. 19(1) மற்றும் 20 -ன்கீழ் பத்து (10) ஆண்டுகளுக்கு, கீழ்க்காணும் நிபந்தனைகளுக்குட்பட்டு குவாரி குத்தகை உரிம அனுமதி வழங்கலாம் என பரிந்துரை செய்துள்ளனர்.

3) எனவே, துறை அலுவலர்களின் பரிந்துரையினை ஏற்றும் நிபந்தனைகளுக்கு உட்பட்டும், மதுரை மாவட்டம், வாடிப்பட்டி வட்டம், கச்சைகட்டி கிராமம், 1196/1A (0.71.00), 1196/3 (0.32.00), 1196/4 (0.40.00) மற்றும் 1196/5A (0.56.00) ஆகியவற்றில் மொத்த விஸ்தீர்ணம் 1.99.0 ஹெக்டேர் பரப்பில் சாதாரண கற்கள் மற்றும் கிராவல் குவாரி செய்வதற்கு 10 (பத்து) வருட காலத்திற்கு கீழ்காணும் நிபந்தனைகளுக்கு உட்பட்டு தகுதிவாய்ந்த நிலப்பரப்பாக (Precise area) கருதப்படுகிறது.

நிபந்தனைகள்

1. விண்ணப்பப் புலங்களைச் சுற்றியுள்ள பட்டா நிலங்களுக்கு 7.5 மீட்டர் பாதுகாப்பு இடைவெளி விட வேண்டும்.
2. விண்ணப்ப புலங்களில் புல எண். 1196/1A-ன் தெற்கு பகுதியில் புல எண். 1187, 1188-ல் கிழமேலாக செல்லும் ஓடைக்கு 50மீ பாதுகாப்பு இடைவெளிவிட்டு குவாரி பணி மேற்கொள்ள வேண்டும்.
3. வாடிப்பட்டி வட்டம், கச்சைகட்டி கிராமம், 1196/1A (0.71.00), 1196/3 (0.32.00), 1196/4 (0.40.00) மற்றும் 1196/5A (0.56.00) ஆகியவற்றில் மொத்த விஸ்தீர்ணம் 1.99.0 ஹெக்டேர் பரப்பளவுள்ள பூமியிலிருந்து சாதாரண கற்கள் மற்றும் கிராவல் வெட்டியெடுக்க குவாரி குத்தகை உரிமம் வழங்குவது தொடர்பாக, ஏற்பளிக்கப்பட்ட சுரங்கத்திட்டம் மற்றும் சுற்றுச்சூழல் ஒப்புதல் ஆகியன பெற்றளிக்கப்பட வேண்டும்.

4) மேலும், தமிழ்நாடு சிறுகனிம சலுகை விதிகள்-1959, விதி எண்.41-இன்படி குவாரிப்பணி மேற்கொள்வது தொடர்பாக வரைவு சுரங்கதிட்டத்தினை 90 தினங்களுக்குள் சமர்பிக்குமாறு மனுதாரரைக் கேட்டுக்கொள்ளப்படுகிறது. அதன் தொடர்ச்சியாக ஏற்பளிக்கப்பட்ட சுரங்கத் திட்டத்தினை பெற்றுவிதி எண்.42-இன்படி சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையத்தின் இசைவினைப் பெற்று சமர்பிக்கும் பட்சத்தில் மட்டுமே குவாரி உரிமம் வழங்கப்படும் என்ற விபரம் விண்ணப்பதாரர் திரு.K.மணிகண்டன் என்பவருக்கு தெரிவிக்கப்படுகிறது.

துணை இயக்குநர்,
புவியியல் மற்றும் சுரங்கத்துறை,
மதுரை.

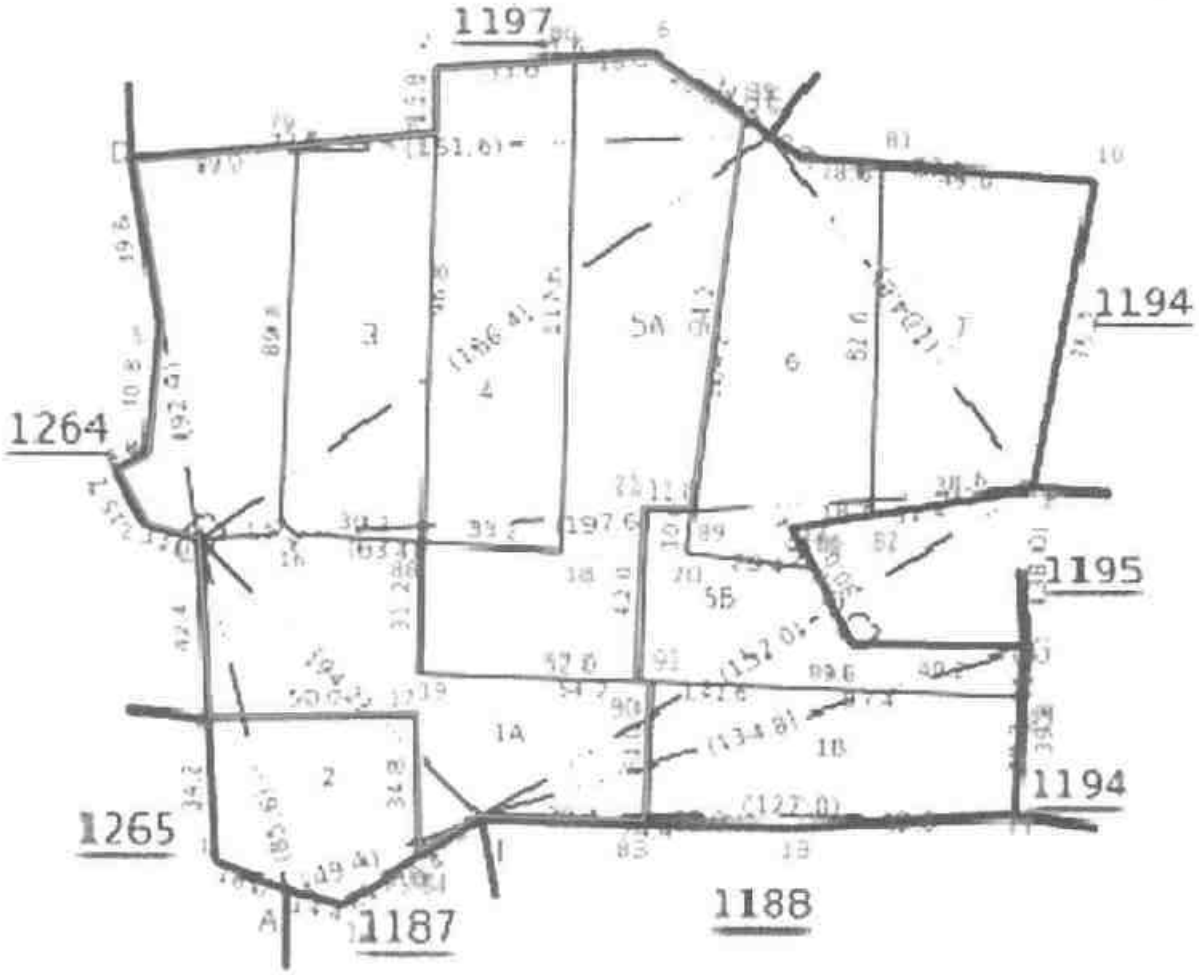
பெறுநர்:

திரு.K.மணிகண்டன்,
த/பெ.கண்ணன்,
47/40 இந்திரா நகர்,
ஆளவந்தான், காந்தி நகர்,
மதுரை வடக்கு வட்டம்,
மதுரை மாவட்டம்.

நகல்:

உறுப்பினர் செயலர்,
மாநில சுற்றுசூழல் தாக்க மதிப்பீட்டு ஆணையம் (SEIAA),
சென்னை.

ANNEXURE-II



MINING LEASE APPLIED AREA

A. Allimuthu

A.ALLIMUTHU,M.Sc.,M.Phil.,
Recognized Qualified Person
RQP/DMG/HYD/85/2022

Signed By Tahsildar
Name of approver : tahv
Date of Approval : 10-02-2018

Date of Issue: 06-11-2025 11:47:07

ANNEXURE -III

தமிழ்நாடு அரசு

வருவாய் மற்றும் பேரிடர் மேலாண்மைத் துறை

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

மாவட்டம் : மதுரை வட்டம் : வாடிப்பட்டி

வருவாய் கிராமம் : 3 கச்சைகட்டி பட்டா எண் : 7802

உரிமையாளர்கள் பெயர்

1. செல்லையா மகன் ராமச்சந்திரன்

புல எண்	உட்பிரிவு	புன்செய்		நன்செய்		மற்றவை		குறிப்புரைகள்
		பரப்பு	தீர்வை	பரப்பு	தீர்வை	பரப்பு	தீர்வை	
		ஹெக் - ஏர்	ரூ - பை	ஹெக் - ஏர்	ரூ - பை	ஹெக் - ஏர்	ரூ - பை	
1196	3	0 - 32.00	0.89	--	--	--	--	2024/0103/24/344212-- ------ Digitally signed:approved through AutoMutation - 02/09/2024 05:14:44:PM
1196	5A	0 - 56.00	1.08	--	--	--	--	2024/0103/24/344212--203/1415 ------ Digitally signed:approved through AutoMutation - 02/09/2024 05:14:44:PM
		0 - 88.00	1.97					

குறிப்பு :

1. மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் **https://eservices.tn.gov.in** என்ற இணைய தளத்தில் **P/24/14/003/07802/170367** என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.
2. இத் தகவல்கள் 06-11-2025 அன்று 12:39:05 PM நேரத்தில் அச்சடிக்கப்பட்டது.
3. கைப்பேசி கேமராவின்2D barcode படிப்பான் மூலம் படித்து 3G/GPRS வழி இணையதளத்தில் சரிபார்க்கவும்

தமிழ்நாடு அரசு

வருவாய் மற்றும் பேரிடர் மேலாண்மைத் துறை

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

மாவட்டம் : மதுரை வட்டம் : வாடிப்பட்டி

வருவாய் கிராமம் : 3 கச்சைகட்டி பட்டா எண் : 2025

உரிமையாளர்கள் பெயர்

1. செல்லையா அம்பலம் மகன் ராமச்சந்திரன்

2. ராமச்சந்திரன் மகன் மணிகண்டன்

புல எண்	உட்பிரிவு	புன்செய்		நன்செய்		மற்றவை		குறிப்புரைகள்
		பரப்பு	தீர்வை	பரப்பு	தீர்வை	பரப்பு	தீர்வை	
		ஹெக் - ஏர்	ரூ - பை	ஹெக் - ஏர்	ரூ - பை	ஹெக் - ஏர்	ரூ - பை	
1196	1A	0 - 71.00	1.72	--	--	--	--	2020/0103/24/124923--203/1415 ------ Digitally signed:THIRUNAVUKKARASUK Zonal Deputy Tahsildar 14/07/2020 02:13:58:PM
1196	4	0 - 40.00	1.11	--	--	--	--	2020/0103/24/124923--- ------ Digitally signed:THIRUNAVUKKARASUK Zonal Deputy Tahsildar 14/07/2020 02:13:58:PM
		1 - 11.00	2.83					

குறிப்பு :

1. மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் **https://eservices.tn.gov.in** என்ற இணைய தளத்தில் **P/24/14/003/02025/120399** என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.
2. இத் தகவல்கள் 06-11-2025 அன்று 12:35:31 PM நேரத்தில் அச்சடிக்கப்பட்டது.
3. கைப்பேசி கேமராவின்2D barcode படிப்பான் மூலம் படித்து 3G/GPRS வழி இணையதளத்தில் சரிபார்க்கவும்

ஆ. எண். 51. கச்சைக்கட்டி.

2	3	4	6	7	8	9	10	11	12
						ரூ. பை.	ஹெ ஏர்.	ரூ. பை.		
				4	2 77	0 32·0	0 89	2560 இளவர்கள் எ. ஜெக நாதன் (1), எ. செல்வம் என்கிற பால இருஷ்ணன் (2), காப்பாளர் மாமா R. திருமால் ரெட்டியார்.	
			8-1	4	2 77	0 40·0	1 11	2025 எ. குரு சாமி (1), தேவராஜ் (2).	
						0 20	0 56		
			3-2	4	2 77	0 75·0	2 08	2560 இளவர்கள் எ. ஜெக நாதன் (1) எ. செல்வம் என்கிற பால இருஷ்ணன் (2), காப்பாளர் மாமா R. திருமால் ரெட்டியார்.	3364-ஆம் பட்டா மாற்றுவதற்கு சிபாரிசு T.K.SC/203/89 Date: 25.3.89
			9-1	4	2-77	0 19·0	1 00		
			4-1	4	2 77	0 37·0	1 03	2025 எ. குரு சாமி (1), தேவராஜ் (2).	3364 ஆம் பட்டா மாற்றுவதற்கு சிபாரிசு T.K.SC/203/89 Date: 25.3.89
			1-1	4	2 77	0 35·0	0 97	2560 இளவர்கள் எ. ஜெக நாதன் (1), எ. செல்வம் என்கிற பால இருஷ்ணன் (2), காப்பாளர் மாமா R. திருமால் ரெட்டியார்.	3364 ஆம் பட்டா மாற்றுவதற்கு சிபாரிசு T.K.SC/203/89 Date: 25.3.89
						3 37·5	9 37		
	47-1		3	3	71	0 55.0	2 04	2464 ரா. கோவிந்த ரெட்டியார் மற்றும் மூன்று பேர்களும்.	
	-2		3	3	71	0 56·0	2 10	2625 ரெ. ராமசாமி ரெட்டியார்.	
	-3		3	3	71	0 15·5	0 57	2626 ரெ. வெல்லிட சாமிரெட்டி யார்.	
			3	3	71	0 11.5	0 43	2627 ப. ராஜ கோபால்.	
			3	3	71	0 34·0	1 26	2627 ப. ராஜ கோபால்.	

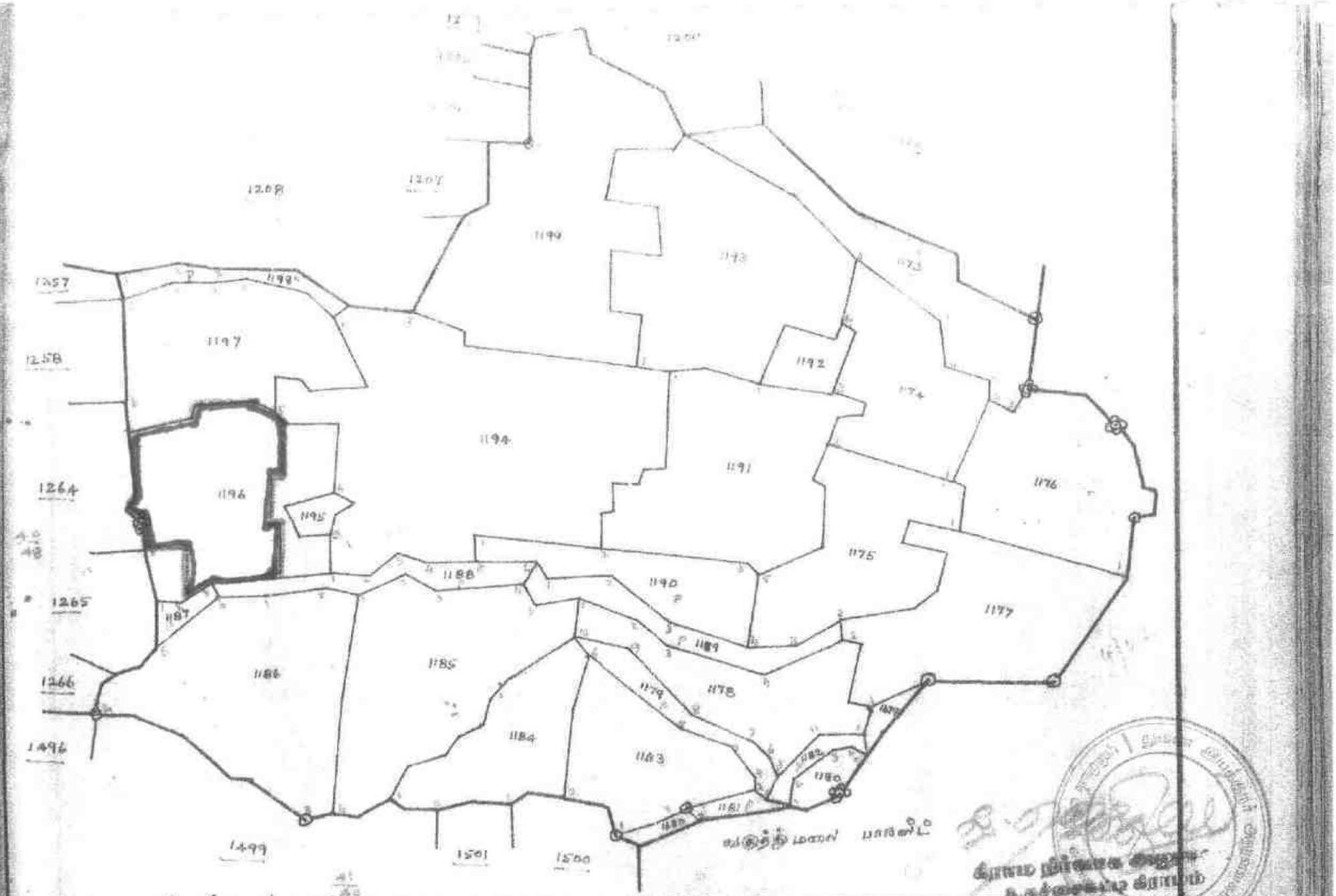
தொடர்ச்சியைப் பார்க்கவும்.

தேசிய தகவல் மையம்
மாவட்ட அலகு

ஆம் பஞ்சாயில் மாவட்டம் கிராமக் கணக்கு வட்டம்

பயிர்த் [illegible] தின்படி வகைகளின் விபரம்.					கைப்பற்று தாருடைய பெயரும் எண்ணும் அல்லது அனுபோக தாருடைய பெயர்.	சாகுபடியாளின் பெயர்.	முதல் போகம்.					
		பயிர்.	தீர்வை.	ஒரு போகம் அல்லது இரு போகம்.		நிலத்தின் எந்த பகுதி யாவது சாகுபடியாளரால் பயிரிடப்பட்டுள்ளதா	எந்த மாதத்தில் பயிர் செய்யப்பட்டது எந்த மாதத்தில் அறுவடை செய்யப்பட்டது.	பயிரின் பெயர்.	பயிரை / அறுவடை யான பரப்பு.	உள்ளபடியான பாய்ச்சல் ஆதாயம்.	விளைச்சல் அளவு விபரம்.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)

380/ 1-R.F. III-A-10-20,00,000 Cps.-GBP.-Mdu.-7-2023.



A. Allimuthu

A. ALLIMUTHU, M.Sc., M.Phil.,
Recognized Qualified Person
QUP/DMG/HYD/85/2022

3.4.2002

74 A

ANNEXURE - IV



தமிழ் நாடு தமிழ்நாடு TAMILNADU

AD 672421

K. மணிகண்டன்
மதுரை

17 OCT 2024

M.C. மருதராஜ்
முத்திரைத்தாள் விற்பனையாளர்
ROC No. 3307/2017/2018-19
மேற்பார்வை வைப்பாட்சி வட்டம்

குத்தகை பத்திரம் (Lease Deed)

வாய்தா காலம் **11** (பதினோரு) வருடங்கள்

2024 ம் வருடம் அக்டோபர் மாதம் **17** ம் தேதிக்கு

தமிழ் ஸ்ரீ குரோதி வருடம் புரட்டாசி மாதம் **31** ம் தேதிக்கு

மதுரை-625020, K.K.நகர், கதவு எண் 636 என்ற விலாசத்தில் வசிக்கும் திரு.செல்லையா அம்பலம் அவர்களின் குமாரர் திரு.C.ராமச்சந்திரன்-1 (ஆதார் எண் 6362 4063 5101) (செல்: 97868 88888), மேற்படி 1-வது நபரின் குமாரர் திரு.C.R.மணிகண்டன்-2 (ஆதார் எண் 7903 9567 2673) (செல்: 99441 28888) (Lessor)

Lessor

Lessee

.....1.....புத்தகம்2024ம் ஆணடின்
2489ம் நீர் ஆவணம்...15.....
தாள்களைக் கொண்டது
.....ம் தான்

சார்பதிவாளர்

மதுரை-625020, மதுரை வடக்கு, காந்திநகர், ஆளவந்தான், இந்திரா நகர், கதவு எண் 47/40 என்ற விலாசத்தில் வசித்துவரும் திரு.கண்ணன் அவர்களின் குமாரர் திரு.K.மணிகண்டன்-3 (ஆதார் எண் 2127 4900 2841) (செல்: 87540 70478) **(Lessee)**

நம்மில் 1,2 நபர்கள் 1-வது பார்ட்டியாகவும் 3-வது நபர் 2-வது பார்ட்டியாகவும் இருந்து எழுதிக்கொண்ட குத்தகை (Lease Deed) பத்திரம் என்னவென்றால்

இதனடியிற் காணும் 1-வது லக்க சொத்தில் ஏக்கர் 1 செண்டு 37-ஐயும் மற்றும் 2,3 லக்க சொத்துக்களையும் நம்மில் 1-வது பார்ட்டியில் 1-வது நபர் தன்னுடைய பெயரில் சுயார்ஜித சொந்தமாய் கிரையம் பெற்று மேற்படி கிரைய ஆவணம் **கடந்த 28.01.2019 ம் தேதியில் வாடிப்பட்டி சார்பதிவகத்தில் 1 புத்தகம் 156/2019 நம்பராகவும் மற்றும் கடந்த 02.09.2024 ம் தேதியில் வாடிப்பட்டி சார்பதிவகத்தில் 1 புத்தகம் 2113/2024 நம்பராகவும்** தனித்தனியே பதிவுசெய்யப்பட்டு மேற்படி கிரைய ஆவணங்களின்படி 1-வது பார்ட்டியில் 1-வது நபருக்கு கிடைத்தும் மற்றும் இதனடியிற் காணும் 1-வது லக்க சொத்தில் ஏக்கர் 1 செண்டு 37-ஐ நம்மில் 1-வது பார்ட்டியில் 2-வது நபர் தன்னுடைய பெயரில் சுயார்ஜித சொந்தமாய் கிரையம் பெற்று மேற்படி கிரைய ஆவணம் **கடந்த 01.07.2020 ம் தேதியில் வாடிப்பட்டி சார்பதிவகத்தில் 1 புத்தகம் 1110/2020 நம்பராக** பதிவு செய்யப்பட்டு மேற்படி கிரைய ஆவணத்தின்படி 1-வது பார்ட்டியில் 2-வது நபருக்கு கிடைத்தும் 1-வது பார்ட்டியின் பெயரில் வருவாய் துறையினரால் 7802 & 2025 நிர் பட்டாக்கள் வழங்கப்பட்டு 1-வது பார்ட்டி தங்களுடைய கைவசம் வைத்து அனுபவித்துவரும் இதனடியில் கண்ட சொத்துக்களை நாளது தேதியிலிருந்து 11 (பதினோரு) வருடங்களுக்கு 2-வது பார்ட்டிக்கு அரசிடம் அனுமதி பெற்று கல்குவாரி அமைப்பதற்கு குத்தகைக்கு பேசி மேற்படி சொத்திற்கு வருட குத்தகை தொகையாக வருடத்திற்கு **ரூ.20,000/-**

Lessor **Lessee**

1 புத்தகம் 2021ம் ஆண்டில்

(ரூபாய் இருபதாயிரம்) வீதம் **ரூ.2,20,000/-** (ரூபாய் இரண்டு லட்சத்து இருபதாயித்திற்கு) மொத்த குத்தகையாக பேசி முடிவு செய்து நாளது தேதியில் 2-வது பார்ட்டியிடமிருந்து 1-வது பார்ட்டி நேரில் அட்வான்சாக ரொக்கமாக பெற்றுக்கொண்டது **ரூ.2,00,000/-** (ரூபாய் இரண்டு லட்சம் மட்டும்) மேற்படி தொகைக்கு அறுதியாக இன்று தேதியிலிருந்து **11 (பதினோரு)** வருடகால வரைதாவிற்கு இதனடியில் கண்ட சொத்தை 1-வது பார்ட்டி 2-வது பார்ட்டியிடம் ஒப்படைத்துவிட்டபடியால் மேற்படி சொத்தில் 2-வது பார்ட்டி தன்னுடைய பெயரில் அரசிடம் கல்குவாரி அனுமதி பெற்று அரசு விதிமுறைகளுக்கு உட்பட்டு கல்குவாரி தொழில் செய்துகொள்ள வேண்டியது என்று மேற்படி அனுமதி பெற்று கல்குவாரி நடக்கும் காலத்தில் கல்குவாரி சம்மந்தமாக ஏற்படும் அனைத்து பிரச்சனைகளையும் 2-வது பார்ட்டியே தீர்த்து நிவர்த்தி செய்துகொள்ளவேண்டியது என்றும் குத்தகை காலத்தில் கல்குவாரி சம்மந்தமாக ஏற்படும் அனைத்து நடவடிக்கைகளும் 1-வது பார்ட்டியை கட்டுப்படுத்தாது என்று நாம் மூன்றுபேர்களும் இரண்டு பார்ட்டியாக இருந்து இந்த குத்தகை பத்திரம் எழுதிக்கொண்டுள்ளோம்.

சொத்துக்கள் விபரம்

1)மதுரை டி. மதுரை வடக்கு ரிடி, வாடிப்பட்டி சப்டி, வாடிப்பட்டி வட்டம், கச்சைகட்டி கிராமம் 2025 நிர் கூட்டுரிமை பட்டாவுக்கு கட்டுப்பட்ட புன்செய் சர்வே 1196/1A நம்பரில் 0-71.00 ஏர்சுக்கு ஏக்கர் 1 செண்டு 75 உள்ள நிலமும், புன்செய் சர்வே 1196/4 நம்பரில் 0-40.00 ஏர்சுக்கு செண்டு 99 உள்ள நிலமும் ஆக மொத்தம் **ஏக்கர் 2 செண்டு 74** ம்

Lessor **Lessee**

.....1.....புத்தகம்2024ம் ஆண்டின்
2489.....ம் நிர் ஆவணம்.....15
தாள்களைக் கொண்டது
.....2.....ம் தாள்

77 A

2.மேற்படி **கச்சைகட்டி** கிராமம் 7802 நிர் தனியுரிமை பட்டாவுக்கு கட்டுப்பட்ட புன்செய் சர்வே **1196/3** நம்பரில் **0-32.00** ஏர்சுக்கு செண்டு **79** க்கு நான்குமால் விபரம்:-

வடக்கே -- இம்ரான்கான் புன்செய் நிலம்

கிழக்கே -- ராமச்சந்திரன் புன்செய் நிலம்

தெற்கே -- ராமச்சந்திரன் புன்செய் நிலம்

மேற்கே -- ராமச்சந்திரன் புன்செய் நிலம்

இதற்குள்பட்ட செண்டு **79** ம்

3.மேற்படி **கச்சைகட்டி** கிராமம் 7802 நிர் தனியுரிமை பட்டாவுக்கு கட்டுப்பட்ட புன்செய் சர்வே **1196/5A** நம்பரில் **0-56.00** ஏர்சுக்கு ஏக்கர் **1** செண்டு **38** க்கு நான்குமால் விபரம்:-

வடக்கே - இம்ரான்கான் புன்செய் நிலம்

கிழக்கே - சீதாலெட்சுமி புன்செய் நிலம்

தெற்கே - ராமச்சந்திரன் வகையறர் நிலமும், சீதாலெட்சுமி நிலமும்

மேற்கே - ராமச்சந்திரன் புன்செய் நிலம்

இதற்குள்பட்ட ஏக்கர் **1** செண்டு **38** ம்

Lessor **Lessee**

.....1.....புத்தகம் இதிலும் ஆணையில்
24-8-9ம் நிர் ஆவணம்.....1.....
தாள்களைக் கொண்டது
.....4.....ம் தாள்

ஆக 1 முதல் 3 லக்க சொத்துக்கள் கூடியது **ஏக்கர் 4 சென்டு 91** உள்ள புன்செய் நிலங்கள் இந்த குத்தகை பத்திரத்திற்கு கட்டுப்பட்டது.

Lessor

Lessee

சாட்சிகள்:

1) கருப்பசாமி த/பெ சோலைராஜன் (ஆதார் எண் 8024 4411 5508) (செல் நம்பர் 70922 22773) கதவு எண் 9C, காஜா தெரு, மதுரை தெற்கு, மதுரை-625001.

2) பிரபு த/பெ முனியாண்டி (ஆதார் எண் 6523 4614 1537) கதவு எண் 3/173, ஊத்துக்குளி, தென்கரை, மதுரை-625207.

.....1.....பத்தகம்விலிடம் ஆணமன
2489.ம் நீர் ஆவணம்....15....
தாள்களைக் கொண்டது
.....5.....ம் தாள்

சார்பதிவாளர்

ஆவணம் தயாரித்தவர்:

செ.இராமமூர்த்தி

சொத்தானது நீர்நிலை பகுதியில் அமையப் பெறவில்லை என்பதற்கான சான்று/உறுதிமொழி (Declaration) (நீதி பேராணை எண் 22163/2018-ல் வழங்கப்பட்ட தீர்ப்புரையை காண்க.

இந்த ஆவணத்தில் கண்ட சொத்தானது நீர்நிலைகள், நீர்வழிப்பாதைகள், நீர்பிடிப்பு பகுதியில் கட்டுப்படவில்லை என சான்றளிக்கிறோம். மேலும் இதனில் தங்களுக்கு தவறான தகவல் அல்லது சான்று அளிக்கப்பட்டதாக பின்னாளில் கண்டுபிடிக்கப்பட்டால் அதனால் நான்/நாங்கள் சட்ட பூர்வ நடவடிக்கைகளுக்கு உட்படுத்தப்படுவோம் என்பதையும் அறிவேன்/அறிவோம்.

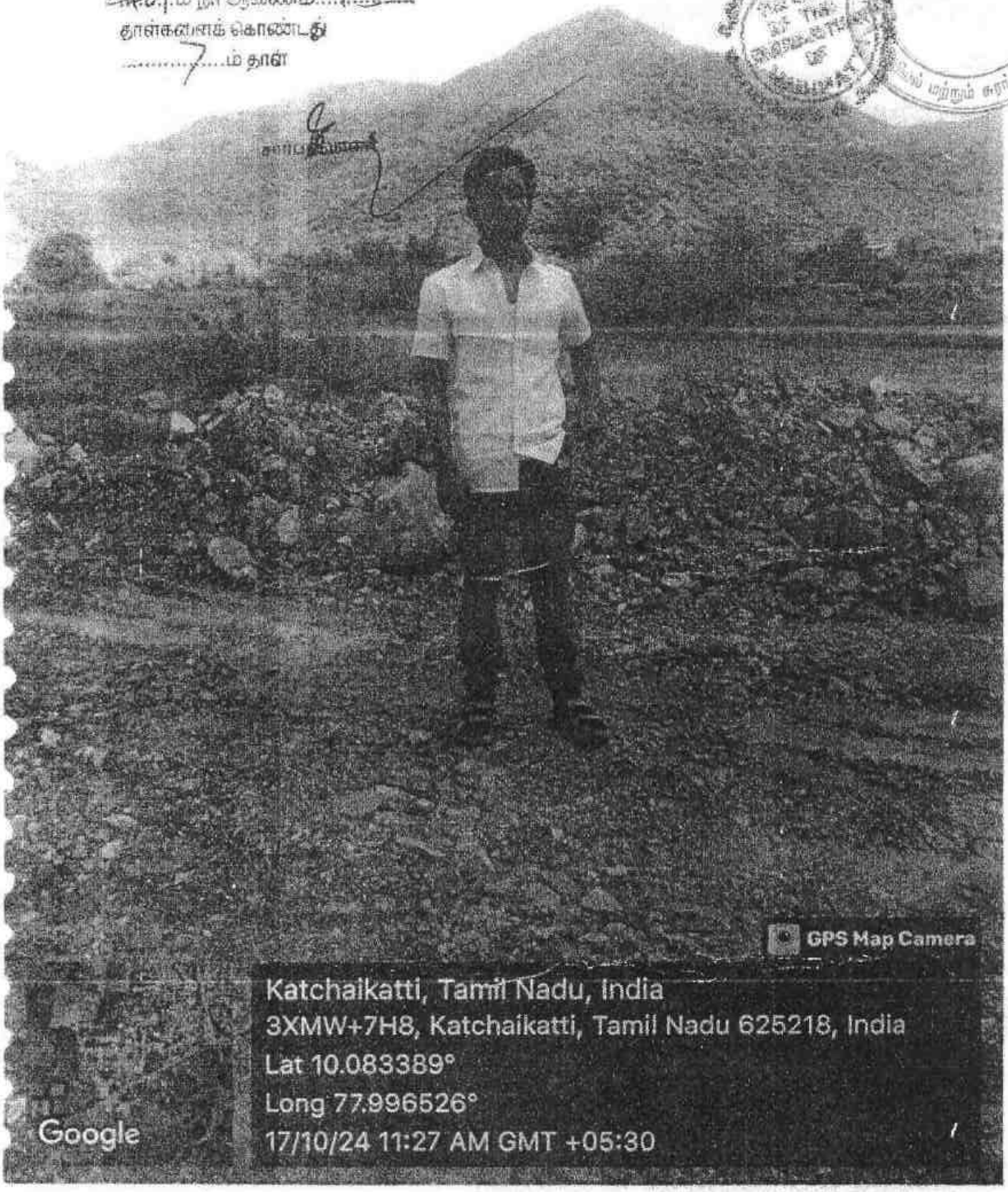
Lessor

Lessee

.....1.....புத்தகம்.....4.....ம் ஆண்டில்
2489ம் நீர் ஆவணம்.....15
தாள்களைக் கொண்டது
.....6.....ம் தான்

சார்பதிவாளர்

1 புத்தகம் இதில் ஆணைகள்
உள்ளன நீர் ஆவணம் 1 ஆக
தாள்களாக கொண்டது
7 ம் தாள்









C. Ramachandran

1 .....புத்தகமிலிருந்து ஆணடின
24.8.9.ம நீர் ஆவணம்...15.....
தாள்களைக் கொண்டது
.....8.....ம் தாள்

சார்பதிவாளர்





आधार

இந்திய அரசாங்கம்

Government of India

Enrollment No: 2007/20731/01713

To

Maruandan Kannan

S/O: Kannan

NO 47 /40, INDRA NAGAR

Alavandan

Gandhi Nagar (ma)

Madurai North Madurai

Tamil Nadu 625020

MN2957/05493FT

2013

295 5493

உங்கள் ஆதார் எண் / Your Aadhaar No.

2127 4900 2841

ஆதார் - சாதாரண மனிதனின் அதிகாரம்

இந்திய அரசாங்கம்

Government of India

மாரிமுத்து கண்ணன்

Marimuthu Kannan

தந்தை: கண்ணன் கருப்பையா

Father : KANNAN KARUPAYA

பிறந்த வருடம் / Year of Birth: 1984

ஆண்/ஆ / Male

2127 4900 2841

ஆதார் - சாதாரண மனிதனின் அதிகாரம்

Government of India

AADHAAR

தகவல்

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

INFORMATION

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

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

ஆதார்

Unique Identification Authority of India

முகவரி:

S/O: கண்ணன் எண் 47 /40, இந்திரா நகர், ஆலவந்தான், மதுரை, காந்தி நகர் (மா), தமிழ் நாடு, 625020

Address:

S/O: Kannan, NO 47 /40, INDRA NAGAR, Alavandan, Madurai, Gandhi Nagar (ma), Tamil Nadu, 625020

2127 4900 2841

1800 300 1947

www.uidai.gov.in

.....1.....புத்தகம் இதுவும் ஆணடில்

24.89.ம் நீர் ஆவணம்.....15.....

தாள்களைக் கொண்டது

.....9.....ம் தாள்

சார்பதிவாளர்

K.

83 A

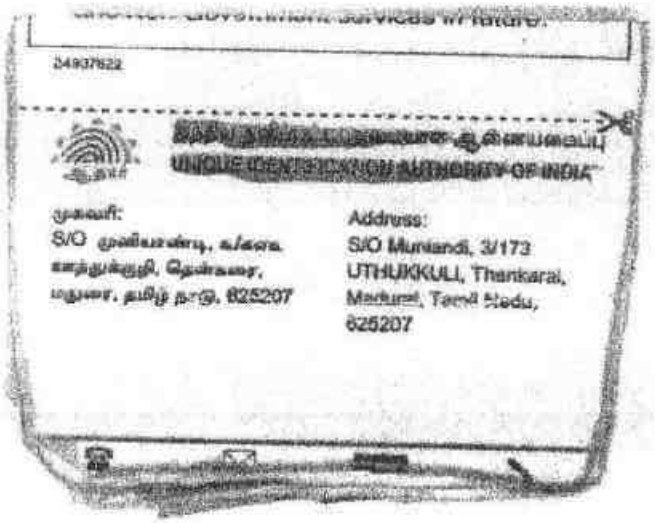






2. [signature]





[signature]

1 புத்தகம்இரண்டும் ஆணடில்
24.8.9ம் நீர் ஆவணம் 15
தான்களைக் கொண்டது
10 ம் தான்

சார்நிலைவாள்

தமிழ்நாடு அரசு

வருவாய்த் துறை

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

மாவட்டம் : மதுரை

வட்டம் : வாடிப்பட்டி

வருவாய் கிராமம் : 3 கச்சைகட்டி

பட்டா எண் : 7802

உரிமையாளர்கள் பெயர்

செல்லையா மகன் ராமச்சந்திரன்

புல எண்	உட்பிரிவு	புன்செய்		நன்செய்		மற்றவை		குறிப்புரைகள்
		பரப்பு	தீர்வை	பரப்பு	தீர்வை	பரப்பு	தீர்வை	
		ஹெக் - ஏர்	ரூ - பை	ஹெக் - ஏர்	ரூ - பை	ஹெக் - ஏர்	ரூ - பை	
1196	3	0 - 32.00	0.89	--	--	--	--	2024/0103/24/344212-- -------- 02-09-2024
1196	5A	0 - 56.00	1.08	--	--	--	--	2024/0103/24/344212--203/1415 -------- 02-09-2024
		0 - 88.00	1.97					

குறிப்பு :

1. மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் **https://eservices.tn.gov.in** என்ற இணைய தளத்தில் **24/14/003/07802/170367** என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.
2. இத் தகவல்கள் 15-10-2024 அன்று 04:51:53 PM நேரத்தில் அச்சடிக்கப்பட்டது.
3. கைப்பேசி கேமராவின்2D barcode படிப்பான் மூலம் படித்து 3G/GPRS வழி இணையதளத்தில் சரிபார்க்கவும்

1 புத்தகம் இதும் ஆண்டின்
2489 ம் நீர் ஆவணம் 15
தாள்களைக் கொண்டது
11 ம் தாள்

சார்பதிவாளர்

தமிழ்நாடு அரசு

வருவாய்த் துறை

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

மாவட்டம் : மதுரை வட்டம் : வாடிப்பட்டி

வருவாய் கிராமம் : 3 கச்சைகட்டி பட்டா எண் : 2025

உரிமையாளர்கள் பெயர்

1 செல்லையா அம்பலம் மகன் ராமச்சந்திரன் -

2 ராமச்சந்திரன் மகன் மணிகண்டன் -

புல எண்	உட்பிரிவு	புன்செய்		நன்செய்		மற்றவை		குறிப்புரைகள்
		பரப்பு	தீர்வை	பரப்பு	தீர்வை	பரப்பு	தீர்வை	
		ஹெக் - ஏ	ரூ - பை	ஹெக் - ஏ	ரூ - பை	ஹெக் - ஏ	ரூ - பை	
1196	1A	0 71.00	1.72	--	--	--	--	2020/0103 /24/124923--203/1415 -------- 14-07-2020
1196	4	0 - 40.00	1.11	--	--	--	--	2020/0103 /24/124923--- -------- 14-07-2020
		1 - 11.00	2.83					

குறிப்பு :

1. மேற்கண்ட தகவல் / சான்றிதழ் தகவல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் **https://eservices.tn.gov.in** என்ற இணைய தளத்தில் **24/14/003 /02025/120399** என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.
2. இத் தகவல்கள் 15-10-2024 அன்று 11:28:11 AM நேரத்தில் அச்சடிக்கப்பட்டது.
3. கைப்பேசி கேமராவின்2D barcode படிப்பான் மூலம் படித்து 3G/GPRS வழி இணையதளத்தில் சரிபார்க்கவும்

1 புத்தகம் 2.4 ம் ஆணழல்
248.9 ம் நீர் ஆவணம் 15
தாள்களைக் கொண்டது
1.2 ம் தாள்

சார்பதிவாளர்

தமிழ்நாடு அரசு
பதிவுத்துறை
ஒப்புகைச்சீட்டு

24-89
2024

பார்வைக்குறிப்பு விவரங்கள்

சார்பதிவாளர் அலுவலகப் பெயர்	வாடிப்பட்டி
விண்ணப்ப எண்	S01LANDVV202410171644563
பரிவர்த்தனை எண்	REG202410177672183
பரிவர்த்தனை நாள்	17/10/2024

விண்ணப்ப விவரங்கள்

விண்ணப்பதாரர் பெயர்	RAMACHANDRAN
சேவை வகை	சார்பதிவாளர் அலுவலகத்தில் ஆவணப் பதிவு (புதியது)
பதிவுக் கட்டணம் (₹)	4960/- ....1....புத்தகம்/0&1டம் ஆணைக் 2489.ம் நீர் ஆவணம் 15
கணினிக் கட்டணம் (₹)	600/- நாள்களைக் கொண்டது
குறுந்தகடுக் கட்டணம் (₹)	100/- ....13....ம் தான்
ஆவண எழுத்தர் நலநிதி (₹)	10/-

சார்பதிவாளர்

தொகை செலுத்திய விவரங்கள்

வங்கியின் பெயர்	பாரத ஸ்டேட் வங்கி
வங்கிக்குறிப்பு எண்	CK00EIEFF1
பணம் செலுத்திய விதம்	இணைய வழி
செலுத்தப்பட்ட தொகை (₹)	5670/-
தொகை செலுத்தும் நிலைப்பாடு	வெற்றி
தொகை செலுத்திய நாள்	17/10/2024

எதனும் சந்தேகங்கள்/குறைகள் இருப்பின் கீழ்க்கண்ட வழிமுறைகளில் தெரிவிக்கலாம்

கட்டணமில்லா தொலைபேசி எண்	1800 102 5174
மின்னஞ்சல் முகவரி	helpdesk@tnreginet.net

R/வாடிப்பட்டி/புத்தகம்-1/2489/2024

2024 ஆம் ஆண்டு அக்டோபர் மாதம் 17ம் தேதி பி.ப. 12:53 மணியளவில் வாடிப்பட்டி சார்பதிவாளர் அலுவலகத்தில் முன்னிலை செய்தது. கட்டணம் ₹ 5,670/- செலுத்தியவர்

புத்தகம் இரண்டும் ஆணடில்
2489.ம் நீர் ஆவணம் 15
தாள்களைக் கொண்டது
14.ம் தான்

சார்பதிவாளர்

இடது பெருவிரல்





கூடுதல் விவரங்கள் ஆவண வாசகத்தில் உள்ளபடி

எழுதிக் கொடுத்ததாக ஒப்புக் கொண்டவர்
இடது பெருவிரல்





"சம்மதத்துடன் கூடிய ஆதார் அங்கீகாரம்" என்ற வழி இந்த நபரின் அடையாளம் விரல் ரேகை மூலம் ஆதார் ஆணையத்துடன் சரிபார்க்கப்பட்டது. ஒப்பீட்டு என்

UKC:017873255dbee89ce34c2ebddea3eaae3f6bc6

(Details from UIDAI : Ramachandran C S/O Chelliah Ambalam, 03-08-1959, xxxxxxxx5101)



எழுதிக் கொடுத்ததாக ஒப்புக் கொண்டவர்
இடது பெருவிரல்





"சம்மதத்துடன் கூடிய ஆதார் அங்கீகாரம்" என்ற வழி இந்த நபரின் அடையாளம் விரல் ரேகை மூலம் ஆதார் ஆணையத்துடன் சரிபார்க்கப்பட்டது. ஒப்பீட்டு என்

UKC:287369b5e1a30dd0ea4fe69fd55904b5db900f

(Details from UIDAI : Manikandan Ramachandran S/O C Ramachandran, 26-10-1992, xxxxxxxx2673)



எழுதி வாங்கியதாக ஒப்புக் கொண்டவர்
இடது பெருவிரல்





"சம்மதத்துடன் கூடிய ஆதார் அங்கீகாரம்" என்ற வழி இந்த நபரின் அடையாளம் விரல் ரேகை மூலம் ஆதார் ஆணையத்துடன் சரிபார்க்கப்பட்டது. ஒப்பீட்டு என்

UKC:673589b1c262ae662143168f9b0cae3fa8dc2c

(Details from UIDAI : Manikandan Kannan S/O: Kannan, 25-11-1994, xxxxxxxx2841)



2024 ஆம் ஆண்டு அக்டோபர் மாதம் 17ம் நாள்

பண்ணாங்கைவேள் டு
சார்பதிவாளர்
வாடிப்பட்டி

R/வாடிப்பட்டி/புத்தகம்-1/2489/2024 எண்ணாகப் பதிவு செய்யப்பட்டது

நாள் 17/10/2024
வாடிப்பட்டி

பண்ணாங்கைவேள் டு
சார்பதிவாளர்
வாடிப்பட்டி

.....1.....புத்தகம்1இதிலும் ஆணழக்
2489ம் நூர் ஆவணம்..15.....
தான்தலைக் கொண்டது
.....15.....ம் தான

சார்பதிவாளர்



आयकर विभाग
INCOME TAX DEPARTMENT
भारत सरकार
GOVT OF INDIA

स्थायी लेखा संख्या कार्ड
Permanent Account Number Card
FRZPM8696B

नाम / Name
MANIKANDAN

पिता का नाम / Father's Name
KANNAN

जन्म की तारीख
Date of Birth
25/11/1994

हस्ताक्षर / Signature

ANNEXURE -V

LEASE AREA IMAGE VIEW-1



LEASE AREA IMAGE VIEW-2



ANNEXURE – VI



இந்திய அரசாங்கம்
Unique Identification Authority of India
Government of India

பதிவு எண் / Enrollment No.: 2007/20731/01713

To
Manikandan Kannan
S/O: Kannan
NO 47 /40 INDRA NAGAR
Alavandan
Gandhi Nagar (ma)
Madurai North Madurai
Tamil Nadu 625020

08/04/2013
29570549

MN295705493FT

உங்கள் ஆதார் எண் / Your Aadhaar No.:

2127 4900 2841

ஆதார் - சாதாரண மனிதனின் அதிகாரம்

இந்திய அரசாங்கம்
Government of India

Manikandan Kannan
தந்தை : KANNAN KARUPAYA
Father : KANNAN KARUPAYA
பிறந்த வருடம் / Year of Birth: 1994
ஆண் / Male

2127 4900 2841

ஆதார் - சாதாரண மனிதனின் அதிகாரம்

File No.DMG-P/4/2022-DMG

ANNEXURE-VII



GOVERNMENT OF TELANGANA
DEPARTMENT OF MINES AND GEOLOGY

CERTIFICATE OF REGISTRATION
AS RECOGNIZED QUALIFIED PERSON
TO PREPARE MINING PLAN

[Under Rule 14(2) of Granite Conservation and Development Rules, 1999 & Rule 7(B) of Telangana State Minor Mineral Concession Rules, 1966]

Sri A. Allimuthu, *S/o. Arumugam, D.No.1/231, Pattakarnavalayu,* Chinnamuthiyampatti, Puduppalayam Post, Edapaddi Taluk, Salem District, Tamil Nadu-636306 *whose photograph and signature is affixed herein above, having given evidence of his qualification and experience is hereby granted recognition under Rule 14(2) of Granite Conservation & Development Rules, 1999 and Rule 7(B) of Telangana State Minor Mineral Concession Rules, 1966 as Recognized Qualified Person (RQP) to prepare Mining Plan.*

Registration Number: RQP/DMG/HYD/86/2022

This Recognition is valid for period of (10) years with effect from 26.04.2022.

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

Place: Hyderabad,
Date: 26.04.2022.

DIRECTOR OF MINES AND GEOLOGY

A. Allimuthu

A.ALLIMUTHU,M.Sc.,M.Phil.,
Recognized Qualified Person
RQP/DMG/HYD/86/2022

Signed by D Ratnakar Rose
Date: 26-04-2022 09:41:13
Reason: Approved



N

PLATE NO: I

APPLICANT:

THIRU.K.MANIKANDAN,
S/o.KANNAN,
No:47/40 INDRA NAGAR,
ALAVANDAN,GANDHI NAGER,
MADURAI NORTH,
MADURAI DISTRICT.625020

LOCATION OF MINE

EXTENT : 1.99.00 Ha
S.F.Nos : 1196/1A,1196/3,1196/4&1196/5A
VILLAGE : KATCHAIKATTI
TALUK : VADIPATTI
DISTRICT : MADURAI

INDEX

TOPO SHEET NO : 58 J/4
LATITUDE : 10° 4'36.55"N To 10° 4'42.92"N
LONGITUDE : 78° 0'24.09"E To 78° 0'28.15"E

Q.L.APPLIED AREA

10KM RADIUS



TOPO SKETCH OF QUARRY LEASE APPLIED AREA FOR 10Km RADIUS

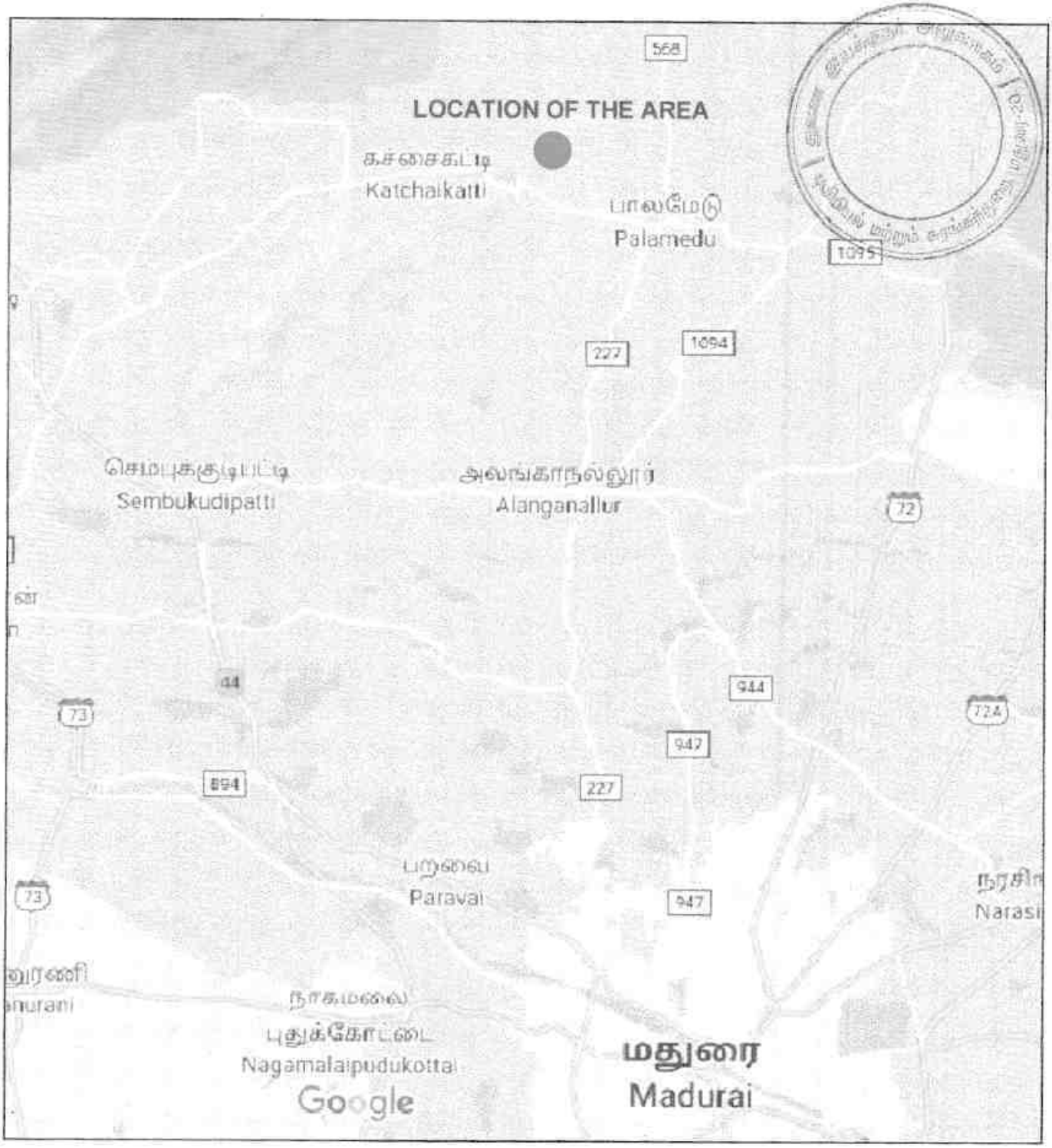
SCALE– 1:100000

PREPARED BY:

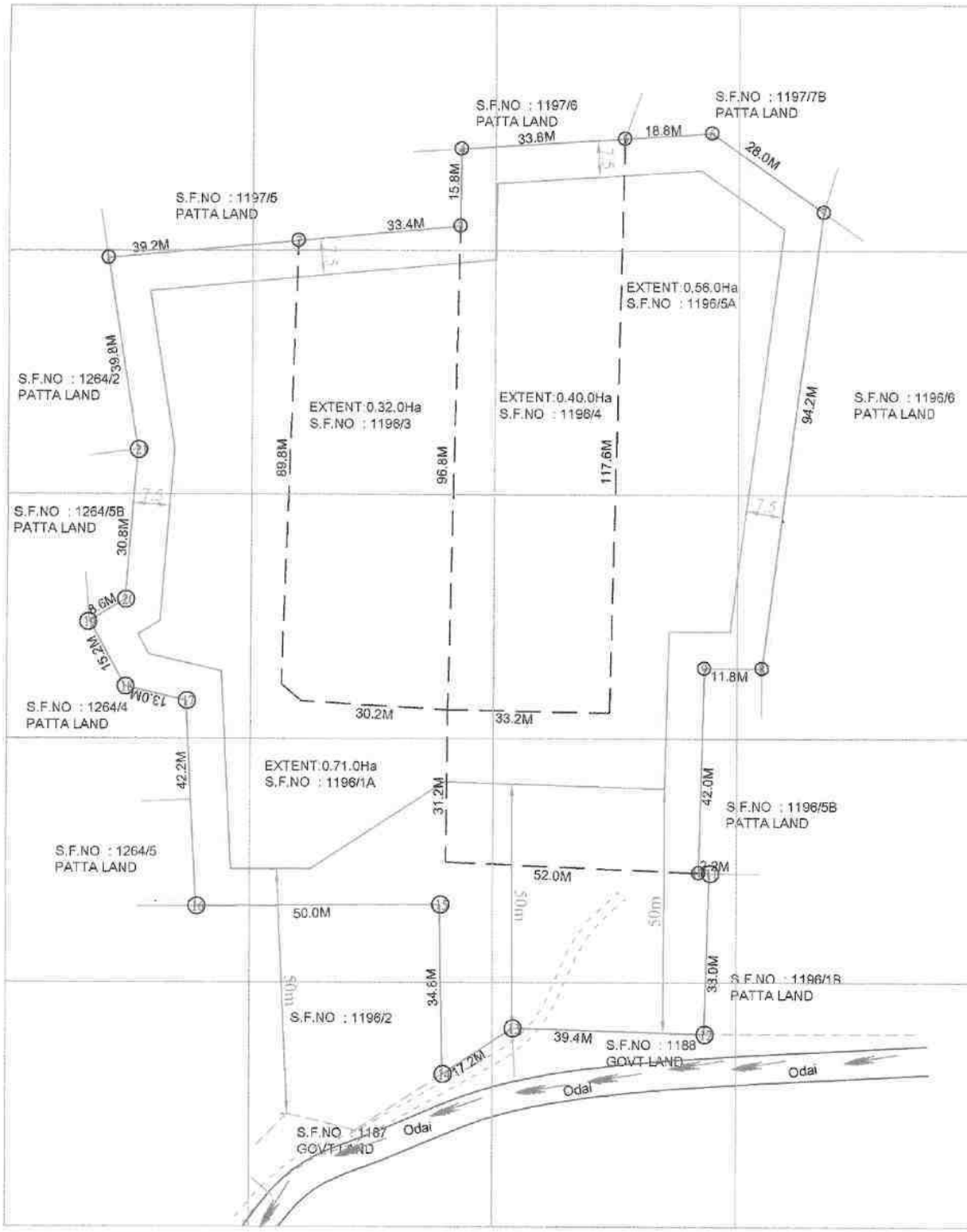
I DO HEREBY CERTIFY THAT THE PLATE HAS BEEN CHECKED BY ME AND IS CORRECT TO THE BEST OF MY KNOWLEDGE

A. Allimuthu.

A. ALLIMUTHU, M.Sc., M.PHIL.,
RECOGNISED QUALIFIED PERSON
RQP/DMG/HYD/85/2022



APPLICANT: THIRU.K.MANIKANDAN, S/o.KANNAN, No:47/40 INDRA NAGAR, ALAVANDAN,GANDHI NAGER, MADURAI NORTH, MADURAI DISTRICT.625020	INDEX LOCATION OF THE AREA : NH ROAD : STATE ROAD :	PLATE NO : II KEY MAP NOT TO SCALE
LOCATION OF MINE: EXTENT : 1.99.00 Ha S.F.Nos : 1196/1A,1196/3,1196/4 &1196/5A VILLAGE : KATCHAIKATTI TALUK : VADIPATTI DISTRICT : MADURAI		PREPARED BY: I DO HEREBY CERTIFY THAT THE PLATE HAS BEEN CHECKED BY ME AND IS CORRECT TO THE BEST OF MY KNOWLEDGE A. Alumuthu A. ALLIMUTHU, M.Sc., M.Phil., RECOGNISED QUALIFIED PERSON



LABEL	LATTITUDU	LONGITUDU
1	10° 4'41.93"N	78° 0'24.06"E
2	10° 4'42.04"N	78° 0'25.36"E
3	10° 4'42.23"N	78° 0'26.49"E
4	10° 4'42.76"N	78° 0'26.45"E
5	10° 4'42.82"N	78° 0'27.52"E
6	10° 4'42.92"N	78° 0'28.15"E
7	10° 4'42.43"N	78° 0'28.93"E
8	10° 4'39.34"N	78° 0'28.64"E
9	10° 4'39.33"N	78° 0'28.25"E
10	10° 4'37.97"N	78° 0'28.28"E
11	10° 4'37.97"N	78° 0'28.35"E
12	10° 4'36.89"N	78° 0'28.36"E
13	10° 4'36.88"N	78° 0'27.07"E
14	10° 4'36.55"N	78° 0'26.62"E
15	10° 4'37.68"N	78° 0'26.54"E
13	10° 4'37.59"N	78° 0'24.90"E
17	10° 4'38.96"N	78° 0'24.77"E
18	10° 4'39.03"N	78° 0'24.35"E
19	10° 4'39.45"N	78° 0'24.09"E
20	10° 4'39.61"N	78° 0'24.33"E
21	10° 4'40.61"N	78° 0'24.36"E

N

PLATE NO:III

MINE LEASE PLAN

SCALE: PLAN-1:1000

APPLICANT:

THIRU.K.MANIKANDAN,
S/o.KANNAN,
No:47/40 INDRA NAGAR,
ALAVANDAN,GANDHI NAGER,
MADURAI NORTH,
MADURAI DISTRICT.625020

INDEX

- Q.L.BOUNDARY
- 7.5m&50MSAFETY DISTANCE
- APPROACH ROAD
- BOUNDARY PILLARS ①②③
- SUB DIVISION
- ODAI

LOCATION OF MINE

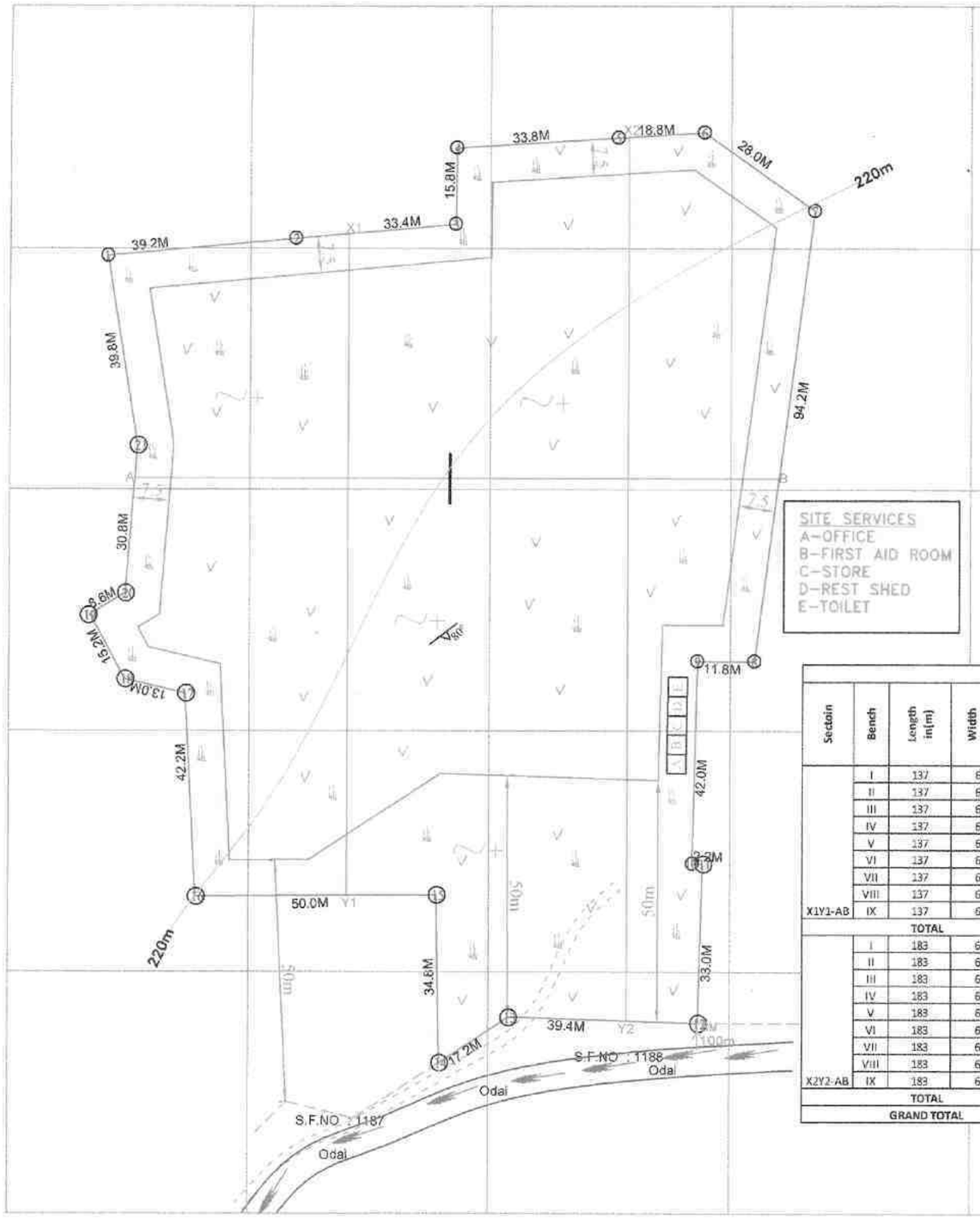
EXTENT : 1.99.00 Ha
S.F.Nos : 1196/1A,1196/3,196/4&1196/5A
VILLAGE : KATCHAIKATTI
TALUK : VADIPATTI
DISTRICT : MADURAI

PREPARED BY:

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

A. Allimuthu

A. ALLIMUTHU, M.Sc., M.PHIL.,
RECOGNISED QUALIFIED PERSON
RQP/DMG/HYD/85/2022



LABEL	LATTITUDU	LONGITUDU
1	10° 4'41.93"N	78° 0'24.06"E
2	10° 4'42.04"N	78° 0'25.36"E
3	10° 4'42.23"N	78° 0'26.49"E
4	10° 4'42.76"N	78° 0'26.45"E
5	10° 4'42.82"N	78° 0'27.52"E
6	10° 4'42.92"N	78° 0'28.15"E
7	10° 4'42.43"N	78° 0'28.93"E
8	10° 4'39.34"N	78° 0'28.64"E
9	10° 4'39.33"N	78° 0'28.25"E
10	10° 4'37.97"N	78° 0'28.28"E
11	10° 4'37.97"N	78° 0'28.35"E
12	10° 4'36.89"N	78° 0'28.36"E
13	10° 4'36.88"N	78° 0'27.07"E
14	10° 4'36.55"N	78° 0'26.62"E
15	10° 4'37.68"N	78° 0'26.54"E
13	10° 4'37.59"N	78° 0'24.90"E
17	10° 4'38.96"N	78° 0'24.77"E
18	10° 4'39.03"N	78° 0'24.35"E
19	10° 4'39.45"N	78° 0'24.09"E
20	10° 4'39.61"N	78° 0'24.33"E
21	10° 4'40.61"N	78° 0'24.36"E

ROUGH STONE &GRAVEL GEOLOGICAL RESERVES

Sectoin	Bench	Length in(m)	Width in(m)	Depth in(m)	Volume in(m3)	Rough sotne in(m3)	Gravel in(m3)	Bulk Density	Rough sotne in(Ts)	Gravel in(Ts)
	I	137	66	2	18084		18084	2		36168
	II	137	66	5	45210	45210		2.75	124327.5	
	III	137	66	5	45210	45210		2.75	124327.5	
	IV	137	66	5	45210	45210		2.75	124327.5	
	V	137	66	5	45210	45210		2.75	124327.5	
	VI	137	66	5	45210	45210		2.75	124327.5	
	VII	137	66	5	45210	45210		2.75	124327.5	
	VIII	137	66	5	45210	45210		2.75	124327.5	
X1Y1-AB	IX	137	66	5	45210	45210		2.75	124327.5	
TOTAL					379764	361680	18084		994620	36168
	I	183	68	2	24888		24888	2		49776
	II	183	68	5	62220	62220		2.75	171105	
	III	183	68	5	62220	62220		2.75	171105	
	IV	183	68	5	62220	62220		2.75	171105	
	V	183	68	5	62220	62220		2.75	171105	
	VI	183	68	5	62220	62220		2.75	171105	
	VII	183	68	5	62220	62220		2.75	171105	
	VIII	183	68	5	62220	62220		2.75	171105	
X2Y2-AB	IX	183	68	5	62220	62220		2.75	171105	
TOTAL					522648	497760	24888		1368840	49776
GRAND TOTAL					902412	859440	42972		2363460	85944

PLATE NO.IV

GEOLOGICAL&SURFACE PLAN

SCALE: 1:1000

APPLICANT:

THIRU.K.MANIKANDAN,
S/o.KANNAN,
No:47/40 INDRA NAGAR,
ALAVANDAN,GANDHI NAGER,
MADURAI NORTH,
MADURAI DISTRICT.625020

INDEX

- Q.L.BOUNDARY
- 7.5M&50M SAFETYDISTANCE
- APPROACH ROAD
- BOUNDARY PILLARS
- GRAVEL
- ROUGH STONE
- BENCH MARK
- STRIKE & DIP
- SHRUB
- CONTOUR
- ODAI

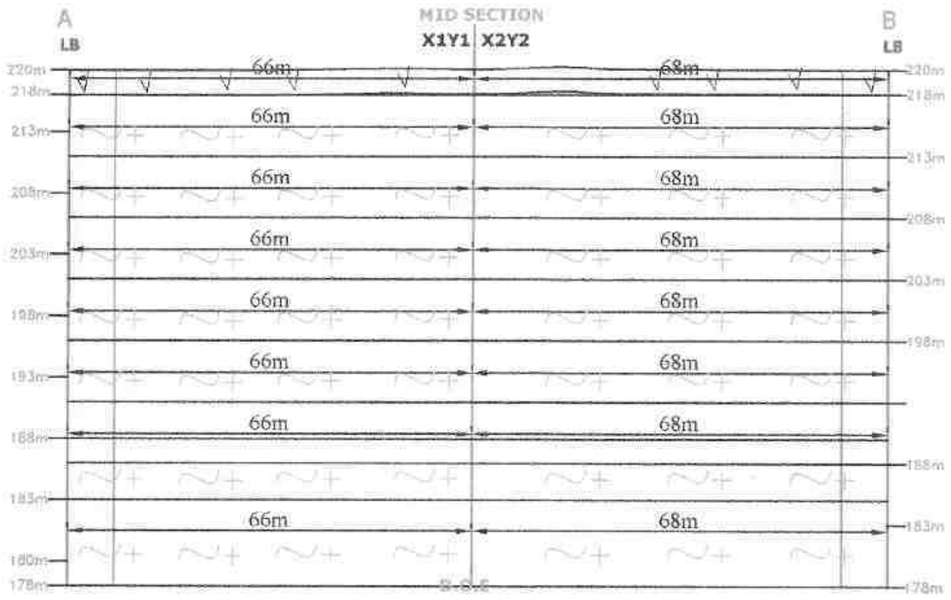
LOCATION OF MINE

EXTENT : 1.99.00 Ha
S.F.Nos : 1196/1A,1196/3,196/4 &1196/5A
VILLAGE : KATCHAIKATTI
TALUK : VADIPATTI
DISTRICT : MADURAI

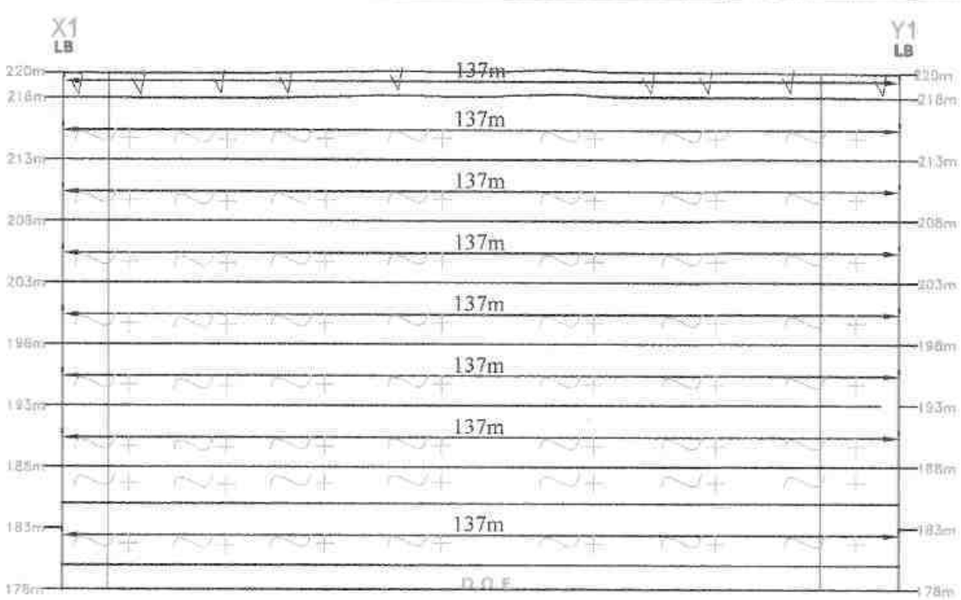
PREPARED BY:

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

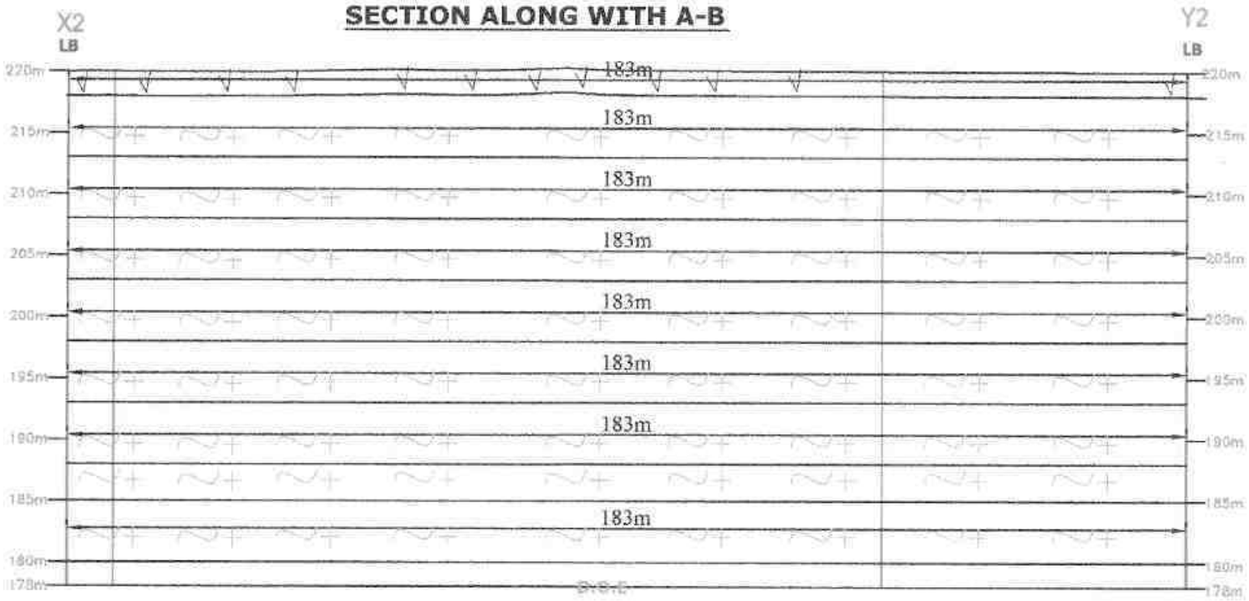
A. ALLIMUTHU, M.Sc., M.PHIL.,
RECOGNISED QUALIFIED PERSON
RQP/DMG/HYD/85/2022



SECTION ALONG WITH A-B



SECTION ALONG WITH X1-Y1



SECTION ALONG WITH X2-Y2

ROUGH STONE &GRAVEL GEOLOGICAL RESERVES

Section	Bench	Length in(m)	Width in(m)	Depth in(m)	Volume in(m3)	Rough stone in(m3)	Gravel in(m3)	Bulk Density	Rough stone in(Tn)	Gravel in(Tn)
X1Y1-AB	I	137	66	2	18084		18084	2		36168
	II	137	66	5	45210	45210		2.75	124327.5	
	III	137	66	5	45210	45210		2.75	124327.5	
	IV	137	66	5	45210	45210		2.75	124327.5	
	V	137	66	5	45210	45210		2.75	124327.5	
	VI	137	66	5	45210	45210		2.75	124327.5	
	VII	137	66	5	45210	45210		2.75	124327.5	
	VIII	137	66	5	45210	45210		2.75	124327.5	
	IX	137	66	5	45210	45210		2.75	124327.5	
	TOTAL				379764	361680	18084		994620	36168
X1Y1-AB	I	183	66	2	24888		24888	2		49776
	II	183	66	5	62220	62220		2.75	171105	
	III	183	66	5	62220	62220		2.75	171105	
	IV	183	66	5	62220	62220		2.75	171105	
	V	183	66	5	62220	62220		2.75	171105	
	VI	183	66	5	62220	62220		2.75	171105	
	VII	183	66	5	62220	62220		2.75	171105	
	VIII	183	66	5	62220	62220		2.75	171105	
	IX	183	66	5	62220	62220		2.75	171105	
	TOTAL				522648	497760	24888		1368840	49776
GRAND TOTAL					902412	859440	42972		2363460	85944

PLATE NO.IV-A

CROSS SECTION OF GEOLOGICAL PLAN

SECTION: HOR–1:1000
VER–1:500

APPLICANT:

THIRU.K.MANIKANDAN,
S/o.KANNAN,
No:47/40 INDRA NAGAR,
ALAVANDAN,GANDHI NAGER,
MADURAI NORTH,
MADURAI DISTRICT.625020

INDEX

Q.L.BOUNDARY

7.5&,50M SAFETY DISTANCE

GRAVEL

ROUGH STONE

MID POINT

DEPTH OF ESTIMATION D.O.E

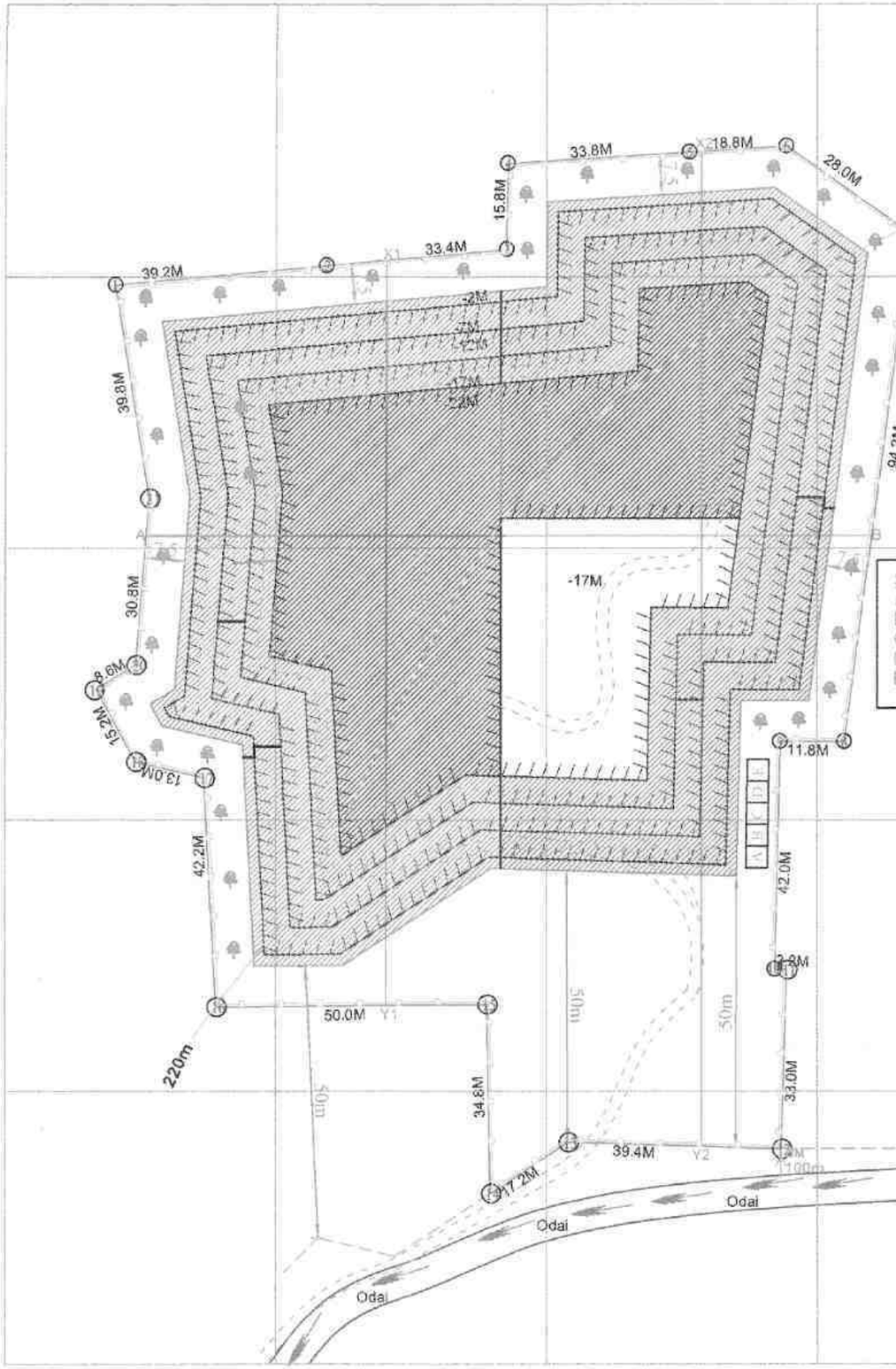
LOCATION OF MINE

EXTENT : 1.99.00 Ha
S.F.Nos : 1196/1A,1196/3,1196/4 &1196/5A
VILLAGE : KATCHAIKATTI
TALUK : VADIPATTI
DISTRICT : MADURAI

PREPARED BY:

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

A. ALLIMUTHU, M.Sc., M.PHIL.,
RECOGNISED QUALIFIED PERSON
RQP/DMG/HYD/85/2022



I-YEAR	PROPOSED
II-YEAR	PROPOSED
III-YEAR	PROPOSED
IV-YEAR	PROPOSED
V-YEAR	PROPOSED

SITE SERVICES
A-OFFICE
B-FIRST AID ROOM
C-STORE
D-REST SHED
E-TOILET

LABEL	LATTITUDU	LONGITUDU
1	10° 4'41.93"N	78° 0'24.06"E
2	10° 4'42.04"N	78° 0'25.36"E
3	10° 4'42.23"N	78° 0'26.49"E
4	10° 4'42.76"N	78° 0'26.45"E
5	10° 4'42.82"N	78° 0'27.52"E
6	10° 4'42.92"N	78° 0'28.15"E
7	10° 4'42.43"N	78° 0'28.93"E
8	10° 4'39.34"N	78° 0'28.64"E
9	10° 4'39.33"N	78° 0'28.25"E
10	10° 4'37.97"N	78° 0'28.28"E
11	10° 4'37.97"N	78° 0'28.35"E
12	10° 4'36.89"N	78° 0'28.36"E
13	10° 4'36.88"N	78° 0'27.07"E
14	10° 4'36.55"N	78° 0'26.62"E
15	10° 4'37.68"N	78° 0'26.54"E
13	10° 4'37.59"N	78° 0'24.90"E
17	10° 4'38.96"N	78° 0'24.77"E
18	10° 4'39.03"N	78° 0'24.35"E
19	10° 4'39.45"N	78° 0'24.09"E
20	10° 4'39.61"N	78° 0'24.33"E
21	10° 4'40.61"N	78° 0'24.36"E

ROUGH STONE &GRAVEL YEARWISE PRODUCTION DEVELOPMENT

Year	Bench	Length in(m)	Width in(m)	Depth in(m)	Volume in(m3)	Rough sotne in(m3)	Gravel in(m3)	Bulk Density	Rough sotne in(Ts)	Gravel in(Ts)
	I	84	59	2	9912		9912	2		19824
	II	80	57	5	22800	22800		2.75	62700	
I-Year	III	62	52	5	16120	16120		2.75	44330	
TOTAL					48832	38920	9912		107030	19824
	I	33	59	2	3894		3894	2		7788
	I	72	60	2	8640		8640	2		17280
II-Year	II	33	60	5	9900	9900		2.75	27225	
	II	68	58	5	19720	19720		2.75	54230	
	III	41	52	5	10660	10660		2.75	29315	
TOTAL					52814	40280	12534		110770	25068
	I	54	60	2	6480		6480	2		12960
	II	54	58	5	15660	15660		2.75	43065	
III-Year	III	92	53	5	24380	24380		2.75	67045	
TOTAL					46520	40040	6480		110110	12960
	III	20	53	5	5300	5300		2.75	14575	
	IV	93	47	5	21855	21855		2.75	60101.25	
IV-Year	IV	54	48	5	12960	12960		2.75	35640	
TOTAL					40115	40115	0		110316.25	
	IV	48	48	5	11520	11520		2.75	31680	
	IV	83	42	5	17430	17430		2.75	47932.5	
V-Year	V	52	43	5	11180	11180		2.75	30745	
TOTAL					40130	40130	0		110357.5	
GRAND TOTAL					228411	199485	28926		548583.75	57852

PLATE NO:V

YEARWISE DEVELOPMENT AND PRODUCTION PLAN

SCALE: 1:1000

APPLICANT:
THIRU.K.MANIKANDAN,
S/o.KANNAN,
No:47/40 INDRA NAGAR,
ALAVANDAN,GANDHI NAGER,
MADURAI NORTH,
MADURAI DISTRICT.625020

INDEX

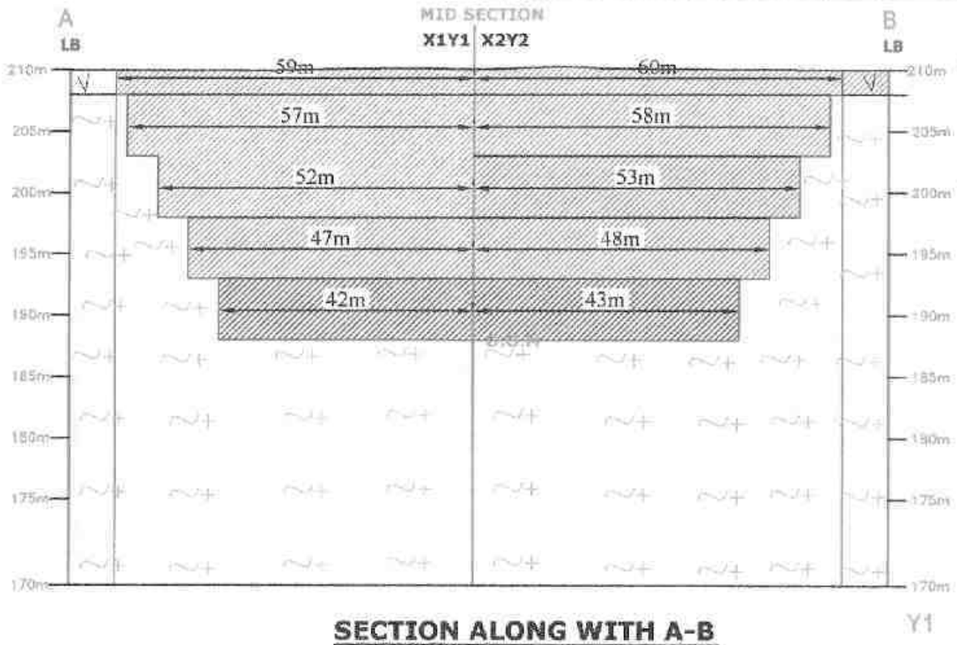
- Q.L.BOUNDARY
- 7.5m&50m SAFETY DISTANCE
- APPROACH ROAD
- BOUNDARY PILLARS
- ODAI
- TRESS
- FENCHING
- ULTIMATE SLOP
- CONTOUR
- I-ST YEAR PRODUCTION
- II-ND YEAR PRODUCTION
- III-RD YEAR PRODUCTION
- IV-TH YEAR PRODUCTION
- V-TH YEAR PRODUCTION

LOCATION OF MINE
EXTENT : 1.99.00 Ha
S.F.Nos : 1196/1A,1196/3,196/4 &1196/5A
VILLAGE : KATCHAIKATTI
TALUK : VADIPATTI
DISTRICT : MADURAI

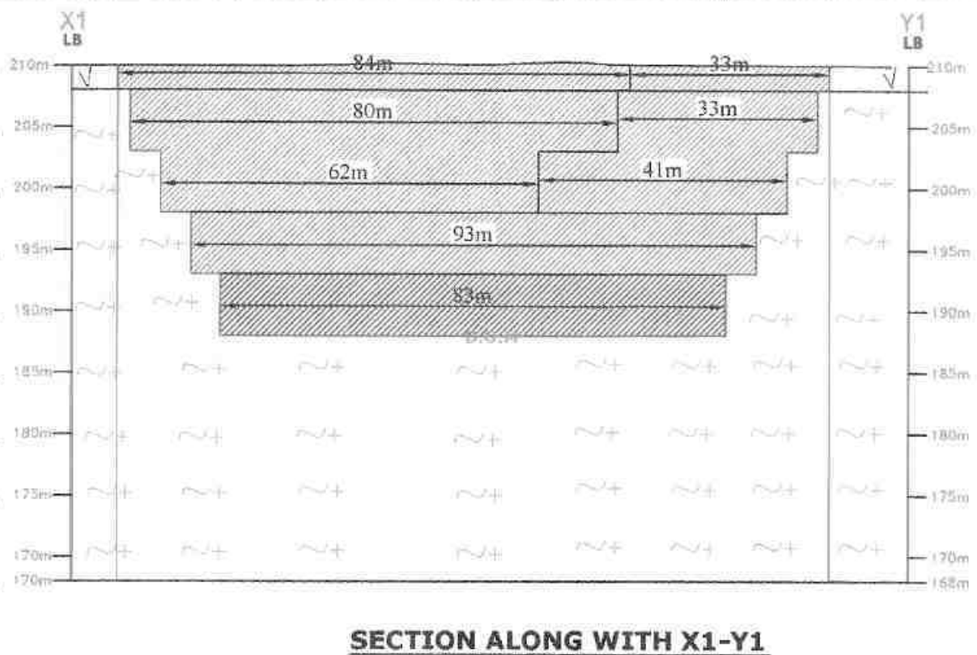
PREPARED BY:
I DO HEREBY CERTIFY THAT THE PLATE HAS BEEN CHECKED BY ME AND IS CORRECT TO THE BEST OF MY KNOWLEDGE

A. Allimuthu

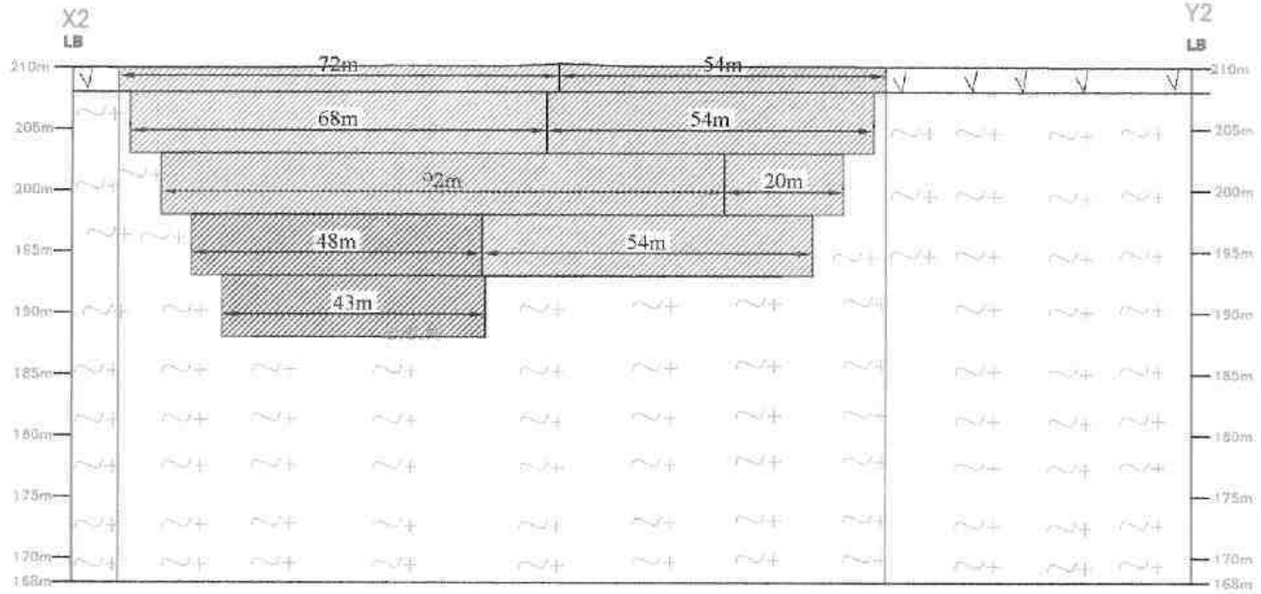
A. ALLIMUTHU, M.Sc., M.PHIL.,
RECOGNISED QUALIFIED PERSON
RQP/DMG/HYD/85/2022



SECTION ALONG WITH A-B



SECTION ALONG WITH X1-Y1



SECTION ALONG WITH X2-Y2

ROUGH STONE &GRAVEL YEARWISE PRODUCTION DEVELOPMENT

Year	Bench	Length (m)	Width (m)	Depth (m)	Volume = (m³)	Rough stone (m³)	Gravel (m³)	Bulk Density	Rough stone (MT)	Gravel (MT)
I-Year	I	88	88	2	9812		9812	2		19624
	II	80	87	5	22800	22800		2.75	62700	
	III	62	52	5	16130	16130		2.75	44380	
TOTAL					48932	38920	9812		107080	19624
II-Year	I	88	88	2	3894		3894	2		7788
	I	72	69	2	8646		8646	2		17292
	II	88	88	5	9800	9800		2.75	26950	
	II	69	58	5	19720	19720		2.75	54230	
	III	41	52	5	10660	10660		2.75	29315	
TOTAL					52834	40180	12534		110495	25080
III-Year	I	54	60	2	6480		6480	2		12960
	II	54	58	5	15660	15660		2.75	43065	
	III	92	53	5	24380	24380		2.75	67045	
TOTAL					46520	40040	6480		110110	12960
IV-Year	III	20	53	5	5300	5300		2.75	14575	
	IV	93	47	5	21855	21855		2.75	60101.25	
	IV	56	48	5	12960	12960		2.75	35640	
TOTAL					40115	40115	0		110316.25	
V-Year	IV	48	48	5	11520	11520		2.75	31680	
	IV	88	45	5	17430	17430		2.75	47932.5	
	V	93	48	5	11180	11180		2.75	30745	
TOTAL					40130	40130	0		110357.5	
GRAND TOTAL					228411	199485	28926		548583.75	57952

PLATE NO:V-A

CROSS SECTION OF YEARWISE DEVELOPMENT PLAN

SECTION: HOR–1:1000
VER–1:500

APPLICANT:

THIRU.K.MANIKANDAN,
S/o.KANNAN,
No:47/40 INDRA NAGAR,
ALAVANDAN,GANDHI NAGER,
MADURAI NORTH,
MADURAI DISTRICT.625020

INDEX

- Q.L.BOUNDARY
- 7.5m&50mSAFETY DISTANCE
- ROUGH STONE
- DEPTH OF MINING (D.O.M)
- ULTIMATE PIT SLOP
- I–ST YEAR PRODUCTION
- II–ND YEAR PRODUCTION
- III–RD YEAR PRODUCTION
- IV–TH YEAR PRODUCTION
- V–TH YEAR PRODUCTION

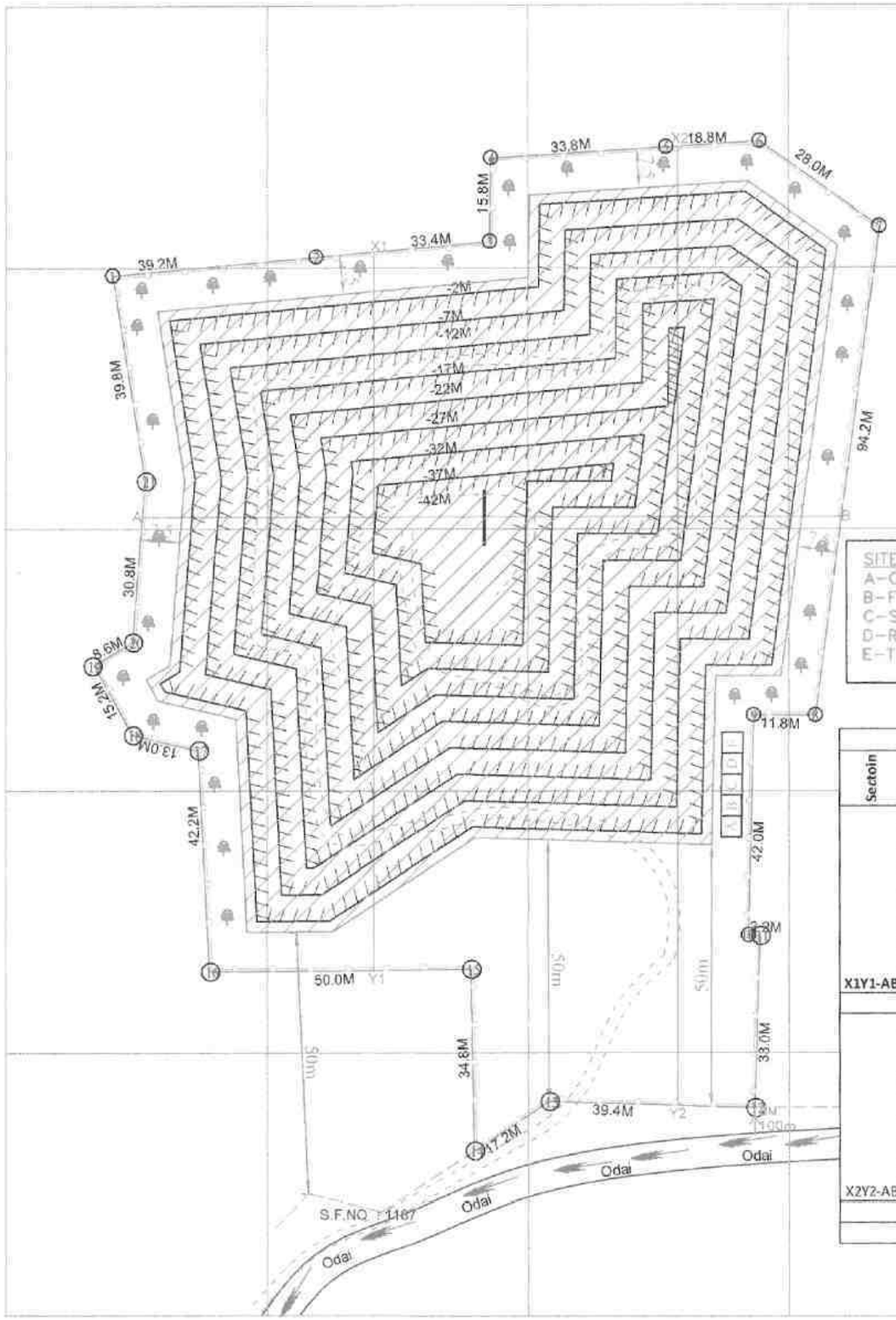
LOCATION OF MINE

EXTENT : 1.99.00 Ha
S.F.Nos : 1196/1A,1196/3,1196/4 &1196/5A
VILLAGE : KATCHAIKATTI
TALUK : VADIPATTI
DISTRICT : MADURAI

PREPARED BY:

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

A. ALLIMUTHU, M.Sc., M.PHIL.,
RECOGNISED QUALIFIED PERSON
RQP/DMG/HYD/85/2022



SITE SERVICES
A-OFFICE
B-FIRST AID ROOM
C-STORE
D-REST SHED
E-TOILET

LABEL	LATTITUDU	LONGITUDU
1	10° 4'41.93"N	78° 0'24.06"E
2	10° 4'42.04"N	78° 0'25.36"E
3	10° 4'42.23"N	78° 0'26.49"E
4	10° 4'42.76"N	78° 0'26.45"E
5	10° 4'42.82"N	78° 0'27.52"E
6	10° 4'42.92"N	78° 0'28.15"E
7	10° 4'42.43"N	78° 0'28.93"E
8	10° 4'39.34"N	78° 0'28.64"E
9	10° 4'39.33"N	78° 0'28.25"E
10	10° 4'37.97"N	78° 0'28.28"E
11	10° 4'37.97"N	78° 0'28.35"E
12	10° 4'36.89"N	78° 0'28.36"E
13	10° 4'36.88"N	78° 0'27.07"E
14	10° 4'36.55"N	78° 0'26.62"E
15	10° 4'37.68"N	78° 0'26.54"E
13	10° 4'37.59"N	78° 0'24.90"E
17	10° 4'38.96"N	78° 0'24.77"E
18	10° 4'39.03"N	78° 0'24.35"E
19	10° 4'39.45"N	78° 0'24.09"E
20	10° 4'39.61"N	78° 0'24.33"E
21	10° 4'40.61"N	78° 0'24.36"E

ROUGH STONE &GRAVEL MINEABLE RESERVES

Section	Bench	Length in(m)	Width in(m)	Depth in(m)	Volume in(m3)	Rough sotne in(m3)	Gravel in(m3)	Bulk Density	Rough sotne in(Ts)	Gravel in(Ts)
	I	117	59	2	13806		13806	2		27612
	II	113	57	5	32205	32205		2.75	88563.75	
	III	103	52	5	26780	26780		2.75	73645	
	IV	93	47	5	21855	21855		2.75	60101.25	
	V	83	42	5	17430	17430		2.75	47932.5	
	VI	73	37	5	13505	13505		2.75	37138.75	
	VII	63	32	5	10080	10080		2.75	27720	
	VIII	53	27	5	7155	7155		2.75	19676.25	
X1Y1-AB	IX	43	22	5	4730	4730		2.75	13007.5	
TOTAL					147546	133740	13806		367785	27612
	I	126	60	2	15120		15120	2		30240
	II	122	58	5	35380	35380		2.75	97295	
	III	112	53	5	29680	29680		2.75	81620	
	IV	102	48	5	24480	24480		2.75	67320	
	V	92	43	5	19780	19780		2.75	54395	
	VI	82	38	5	15580	15580		2.75	42845	
	VII	72	33	5	11880	11880		2.75	32670	
	VIII	62	28	5	8680	8680		2.75	23870	
X2Y2-AB	IX	52	23	5	5980	5980		2.75	16445	
TOTAL					166560	151440	15120		416460	30240
GRAND TOTAL					314106	285180	28926		784245	57852

PLATE NO VI

MINE CLOSURE PLAN

SCALE : 1:1000

APPLICANT:

THIRU.K.MANIKANDAN,
S/o.KANNAN,
No:47/40 INDRA NAGAR,
ALAVANDAN,GANDHI NAGER,
MADURAI NORTH,
MADURAI DISTRICT.625020

INDEX

- Q.L.BOUNDARY
- 7.5m&50M SAFETY DISTANCE
- APPROACH ROAD
- BOUNDARY PILLARS
- ROUGH STONE
- ODAI
- TRESS
- FENCHING
- PIT LIMITE FIFTH YEAR
- PIT LIMITE LIFE OF MINE

LOCATION OF MINE

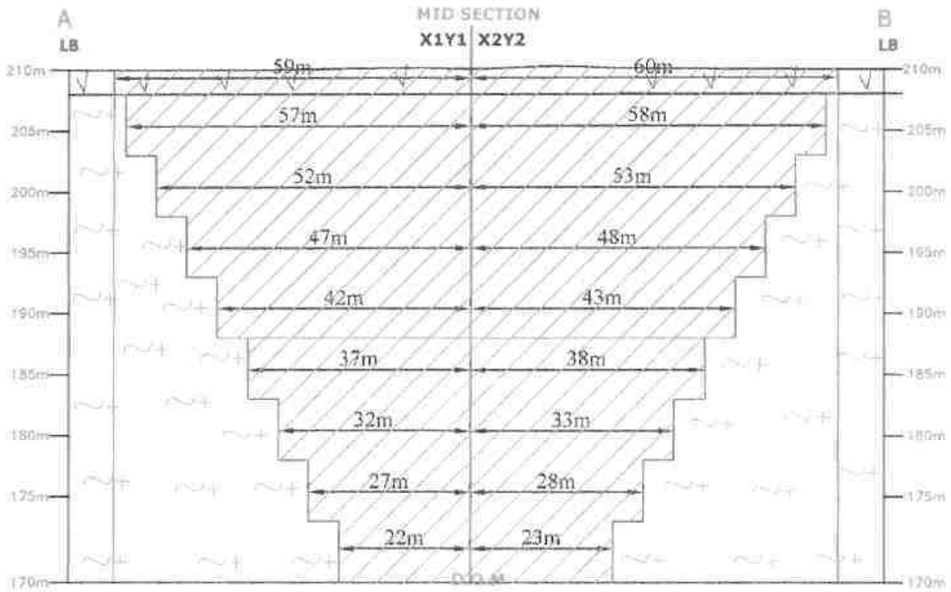
EXTENT : 1.99.00 Ha
S.F.Nos : 1196/1A,1196/3,196/4 &1196/5A
VILLAGE : KATCHAIKATTI
TALUK : VADIPATTI
DISTRICT : MADURAI

PREPARED BY:

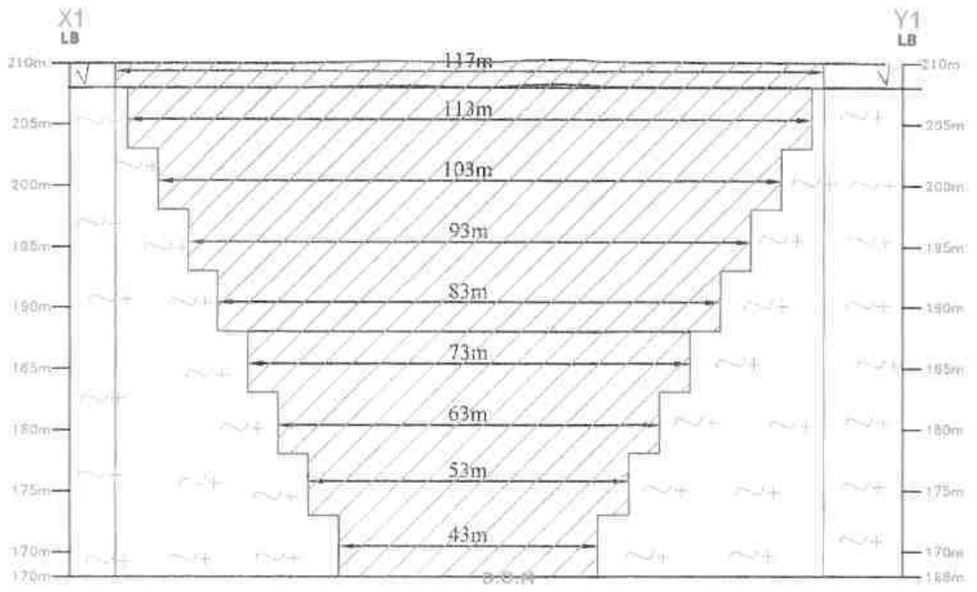
I DO HEREBY CERTIFY THAT THE PLATE HAS BEEN CHECKED BY ME AND IS CORRECT TO THE BEST OF MY KNOWLEDGE

A. Allimuthu

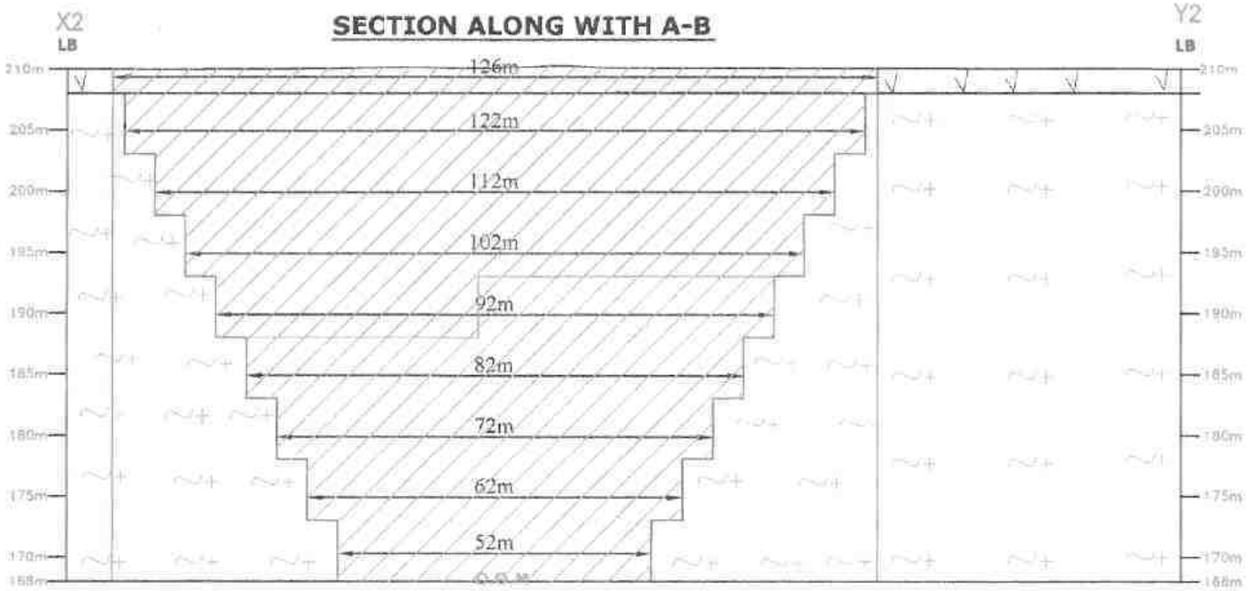
A. ALLIMUTHU, M.Sc., M.PHIL.,
RECOGNISED QUALIFIED PERSON
RQP/DMG/HYD/85/2022



SECTION ALONG WITH A-B



SECTION ALONG WITH X1-Y1



SECTION ALONG WITH X2-Y2

ULTIMATE PIT				
Sectoin	Bench	Length in(m)	Width in(m)	Depth in(m)
	I	117	59	2
	II	113	57	5
	III	103	52	5
	IV	93	47	5
	V	83	42	5
	VI	73	37	5
	VII	63	32	5
	VIII	53	27	5
X1Y1-AB	IX	43	22	5
TOTAL				42M

ULTIMATE PIT				
Sectoin	Bench	Length in(m)	Width in(m)	Depth in(m)
	I	126	60	2
	II	122	58	5
	III	112	53	5
	IV	102	48	5
	V	92	43	5
	VI	82	38	5
	VII	72	33	5
	VIII	62	28	5
X2Y2-AB	IX	52	23	5
TOTAL				42M

ROUGH STONE &GRAVEL MINEABLE RESERVES										
Sectoin	Bench	Length in(m)	Width in(m)	Depth in(m)	Volum e in(m3)	Rough stone in(m3)	Gravel in(m3)	Bulk Density	Rough stone in(Ts)	Gravel in(Ts)
	I	117	59	2	13806		13806	2		27612
	II	113	57	5	32205	32205		2.75	88563.75	
	III	103	52	5	26780	26780		2.75	73645	
	IV	93	47	5	21855	21855		2.75	60101.25	
	V	83	42	5	17430	17430		2.75	47932.5	
	VI	73	37	5	13505	13505		2.75	37138.75	
	VII	63	32	5	10080	10080		2.75	27720	
	VIII	53	27	5	7155	7155		2.75	19676.25	
X1Y1-AB	IX	43	22	5	4730	4730		2.75	13007.5	
TOTAL					147546	133740	13806		367785	27612
	I	126	60	2	15120		15120	2		30240
	II	122	58	5	35380	35380		2.75	97295	
	III	112	53	5	29680	29680		2.75	81620	
	IV	102	48	5	24480	24480		2.75	67320	
	V	92	43	5	19780	19780		2.75	54395	
	VI	82	38	5	15580	15580		2.75	42845	
	VII	72	33	5	11880	11880		2.75	32670	
	VIII	62	28	5	8680	8680		2.75	23870	
X2Y2-AB	IX	52	23	5	5980	5980		2.75	16445	
TOTAL					166560	151440	15120		416460	30240
GRAND TOTAL					314106	285180	28926		784245	57852

PLATE NO:V1-A

CROSS SECTION OF MINE CLOSURE PLAN

SECTION: HOR–1:1000
VER–1:500

APPLICANT:

THIRU.K.MANIKANDAN,
S/o.KANNAN,
No:47/40 INDRA NAGAR,
ALAVANDAN,GANDHI NAGER,
MADURAI NORTH,
MADURAI DISTRICT.625020

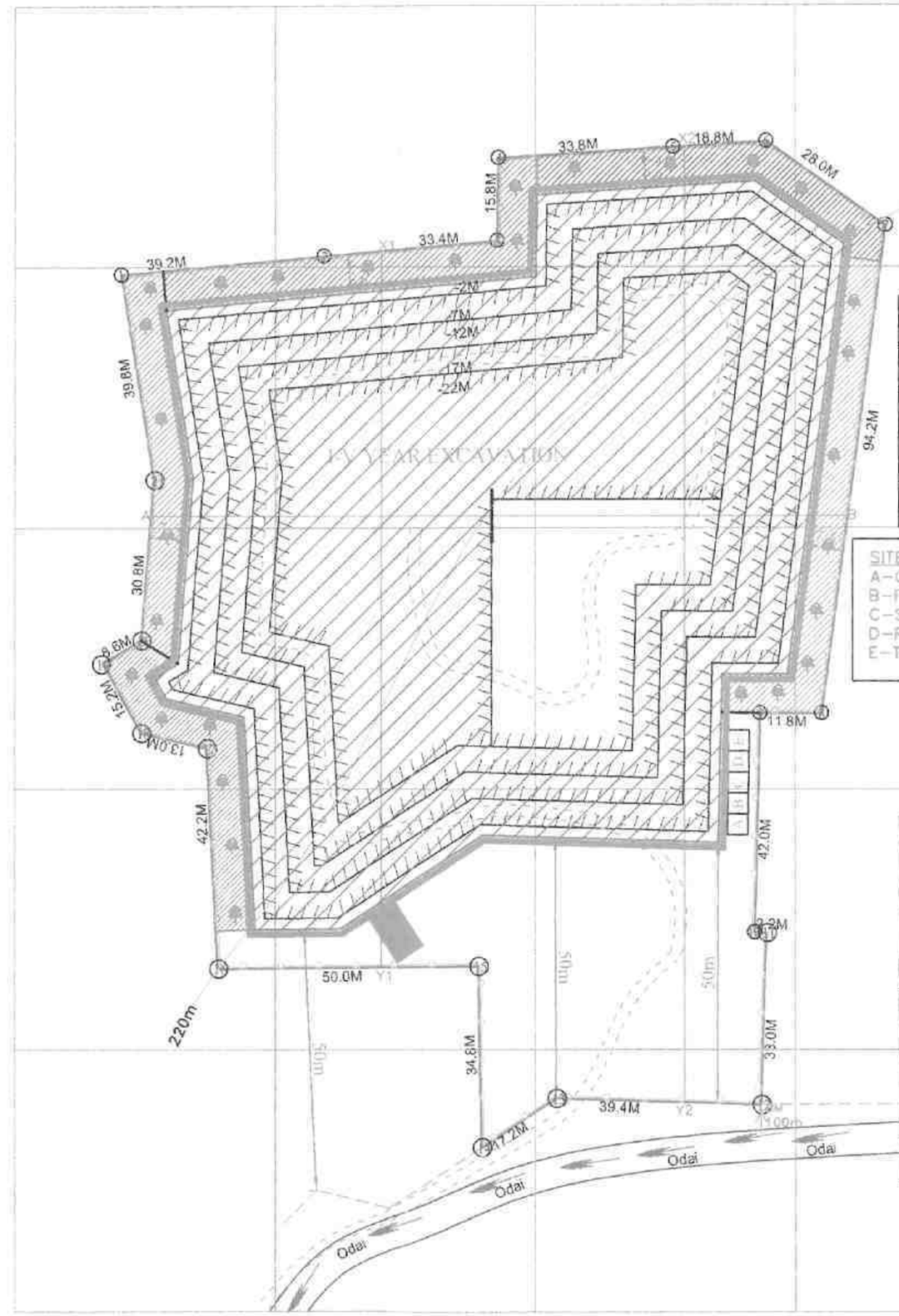
INDEX

- Q.L.BOUNDARY
- 7.5m&50M SAFETY DISTANCE
- ROUGH STONE
- ULTIMATE PIT SLOP
- I–ST FIVE YEAR
- REMAINING FIVE YEAR
- DEPTH OF MINING — D.O.M

EXTENT : 1.99.00 Ha
S.F.Nos : 1196/1A,1196/3,1196/4 &1196/5A
VILLAGE : KATCHAIKATTI
TALUK : VADIPATTI
DISTRICT : MADURAI

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

A. ALLIMUTHU, M.Sc., M.PHIL.,
RECOGNISED QUALIFIED PERSON
RQP/DMG/HYD/85/2022



I-YEAR	PLANTATION
II-YEAR	PLANTATION
III-YEAR	PLANTATION
IV-YEAR	PLANTATION
V-YEAR	PLANTATION

SITE SERVICES
A-OFFICE
B-FIRST AID ROOM
C-STORE
D-REST SHED
E-TOILET

LABEL	LATTITUDU	LONGITUDU
1	10° 4'41.93"N	78° 0'24.06"E
2	10° 4'42.04"N	78° 0'25.36"E
3	10° 4'42.23"N	78° 0'26.49"E
4	10° 4'42.76"N	78° 0'26.45"E
5	10° 4'42.82"N	78° 0'27.52"E
6	10° 4'42.92"N	78° 0'28.15"E
7	10° 4'42.43"N	78° 0'28.93"E
8	10° 4'39.34"N	78° 0'28.64"E
9	10° 4'39.33"N	78° 0'28.25"E
10	10° 4'37.97"N	78° 0'28.28"E
11	10° 4'37.97"N	78° 0'28.35"E
12	10° 4'36.89"N	78° 0'28.36"E
13	10° 4'36.88"N	78° 0'27.07"E
14	10° 4'36.55"N	78° 0'26.62"E
15	10° 4'37.68"N	78° 0'26.54"E
13	10° 4'37.59"N	78° 0'24.90"E
17	10° 4'38.96"N	78° 0'24.77"E
18	10° 4'39.03"N	78° 0'24.35"E
19	10° 4'39.45"N	78° 0'24.09"E
20	10° 4'39.61"N	78° 0'24.33"E
21	10° 4'40.61"N	78° 0'24.36"E

LAND USE PATTERN TABLE

S.L NO.	DESCRIPTION	PRESENT AREA	AREA TO BE ADDED FOR REQUIRED DURING THIS PERIOD	COLOR
1.	QUARRY	NIL	1.30.00	
2.	DRAINAGE &SETTLING TANK	NIL	0.06.10	
3.	INFRA STRUCTURE	NIL	0.01.00	AIR
4.	MINE ROADS	NIL	0.04.00	
5.	AREA UNDER PLANTATION	NIL	0.32.00	
6.	UN-UTILISED AREA	1.99.00	0.25.90	
	TOTAL AREA IN Ha	1.99.00	1.99.00Ha	

N

MINE LAYOUT& LAND USE PLAN

SCALE : 1:1000

APPLICANT:
THIRU.K.MANIKANDAN,
S/o.KANNAN,
No:47/40 INDRA NAGAR,
ALAVANDAN,GANDHI NAGER,
MADURAI NORTH,
MADURAI DISTRICT.625020

INDEX

Q.L.BOUNDARY
7.5m&50M SAFETY DISTANCE
APPROACH ROAD
BOUNDARY PILLARS
TRESS
ODAI
I-V-YEAR EXCAVATION
FENCHING
ULTIMATE SLOP
CONTOUR

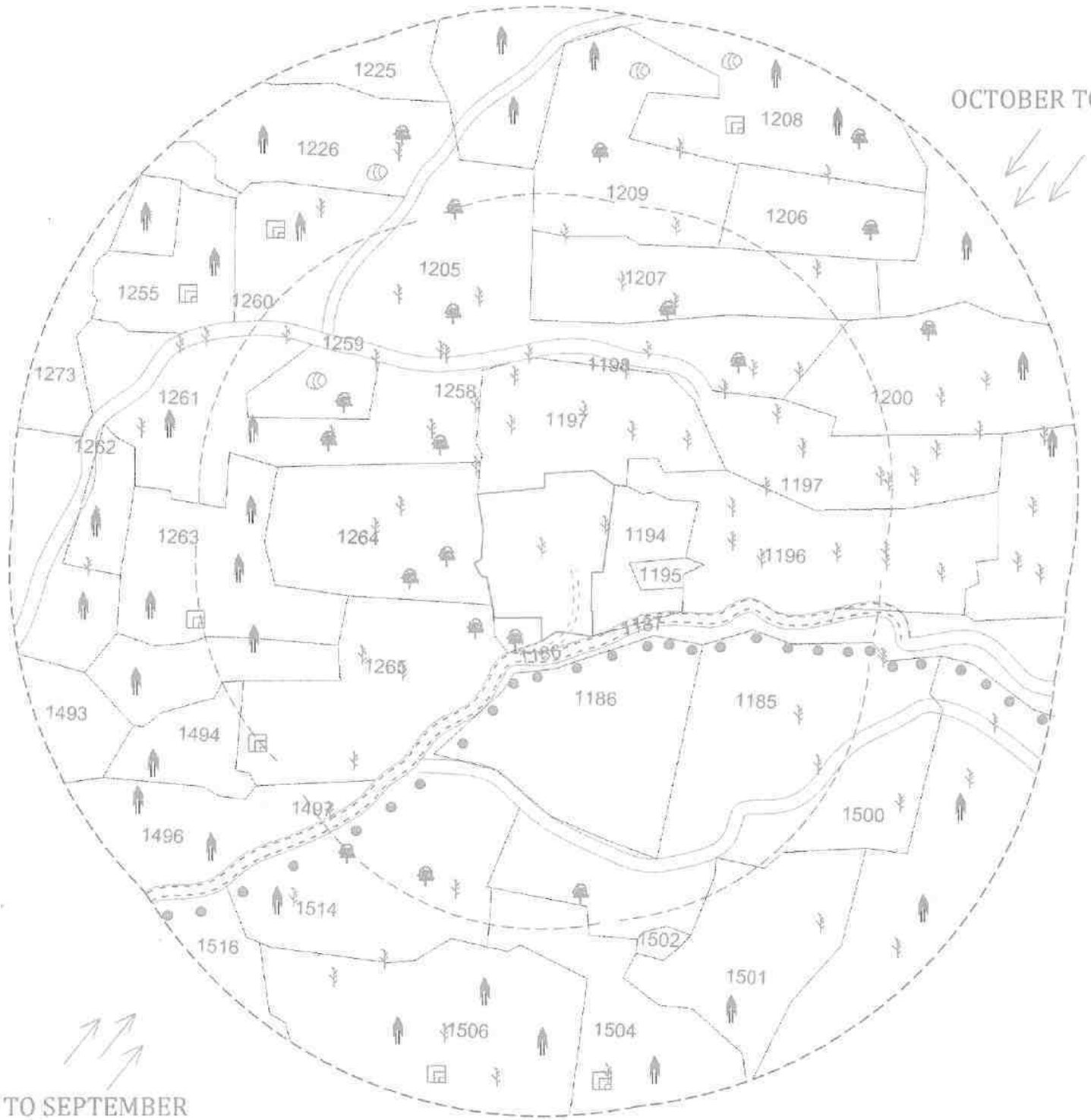
LOCATION OF MINE

EXTENT : 1.99.00 Ha
S.F.Nos : 1196/1A,1196/3,196/4 &1196/5A
VILLAGE : KATCHAIKATTI
TALUK : VADIPATTI
DISTRICT : MADURAI

PREPARED BY:

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

A. ALLIMUTHU. M.Sc., M.PHIL.,
RECOGNISED QUALIFIED PERSON
RQP/DMG/HYD/85/2022



VILLAGE AND ENVIRONMENTAL PLAN

SCALE:1:5000

APPLICANT:

THIRU.K,MANIKANDAN,
S/o.KANNAN,
No:47/40 INDRA NAGAR,
ALAVANDAN,GANDHI NAGER,
MADURAI NORTH,
MADURAI DISTRICT.625020

INDEX

- Q.L.BOUNDARY
- 500M RADIUS
- APPROACH ROAD
- ODAI
- ADJUSENT QUARRY
- WELL
- CART TRACK
- TREES
- MINE ROAD

LOCATION OF MINE

EXTENT : 1.99.00 Ha
S.F.Nos : 1196/1A,1196/3,1196/4 &1196/5A
VILLAGE : KATCHAIKATTI
TALUK : VADIPATTI
DISTRICT : MADURAI

PREPARED BY:

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

A. ALLIMUTHU, M.Sc., M.PHIL.,
RECOGNISED QUALIFIED PERSON
RQP/DMG/HYD/85/2022

HYDRO - GEOLOGICAL STUDIES AT THIRU. K. MANIKANDAN ROUGH STONE AND GRAVEL QUARRY IN KATCHIKATTI VILLAGE, VADIPATTI TALUK, MADURAI DISTRICT, TAMIL NADU.

Table of Contents

1 INTRODUCTION 70

1.1. Scope of Study 70

1.2. Profiles in the Study Area. 71

2 STUDY AREA DESCRIPTION 71

2.1 Topography of the Lease Area and Its Surrounding Environments: 72

3 REGIONAL GEOLOGY OF MADURAI DISTRICT 73

4 HYDROGEOLOGY 74

5. METHODOLOGY OF STUDY 74

5.1 Geophysical Investigation 75

5.1.1 Vertical Electrical resistivity sounding for aquifer study. 75

5.2.2 Basic Principles 75

6. GEOPHYSICAL DATA INTERPRETATION & GRAPH 79

7. CONCLUSION 83

HYDRO - GEOLOGICAL STUDIES AT THIRU. K. MANIKANDAN ROUGH STONE AND GRAVEL QUARRY IN KATCHIKATTI VILLAGE, VADIPATTI TALUK, MADURAI DISTRICT, TAMIL NADU.

1 INTRODUCTION

Proprietor of Thiru. K. Manikandan Rough stone and Gravel quarry Over an extent of 1.99.0 hectares of Patta land in S.F. Nos. 1196/1A, 1196/3, 1196/4 & 1196/5A of Katchikatti Village, VadipattI Taluk, Madurai District, Tamil Nadu state on the hydrological regime of thearea, the above area has been studied & investigated for finding out Ground water level and aquifer thickness and water quality in and around mine lease area. The electrical resistivity method, TEM study in Rough stone and gravel quarry and genesis rock with determine the shallow and deeper freshwater aquifer in the proposed mining area in Katchikatti Village.

1.1. Scope of Study

The main aim of the study is to identify the shallow and deeper aquifer investigation through electrical resistivity VES, Method is used to measure the apparent resistivity of the Study area. The present study is estimating the ground water level in Katchikatti Village, VadipattI Taluk, Madurai District, Tamil Nadu village proposed leasehold area and their surrounding area. The study area is mostly covered by Water level, type of sand, type of rock and their basement rock characters. The main aim of the study is to determine the water table and flow movement of this Lease and surrounding area **(Fig.1)**

1.2. Profiles in the Study Area.

Name of the Lessee	: Thiru. K. Manikandan
Survey No	: 1196/1A, 1196/3, 1196/4 & 1196/5A
Extent	: 1.99.0 hectares
Village	: Katchikatti
Taluka	: VadipattI
District	: Madurai
State	: Tamil Nadu

2 STUDY AREA DESCRIPTION

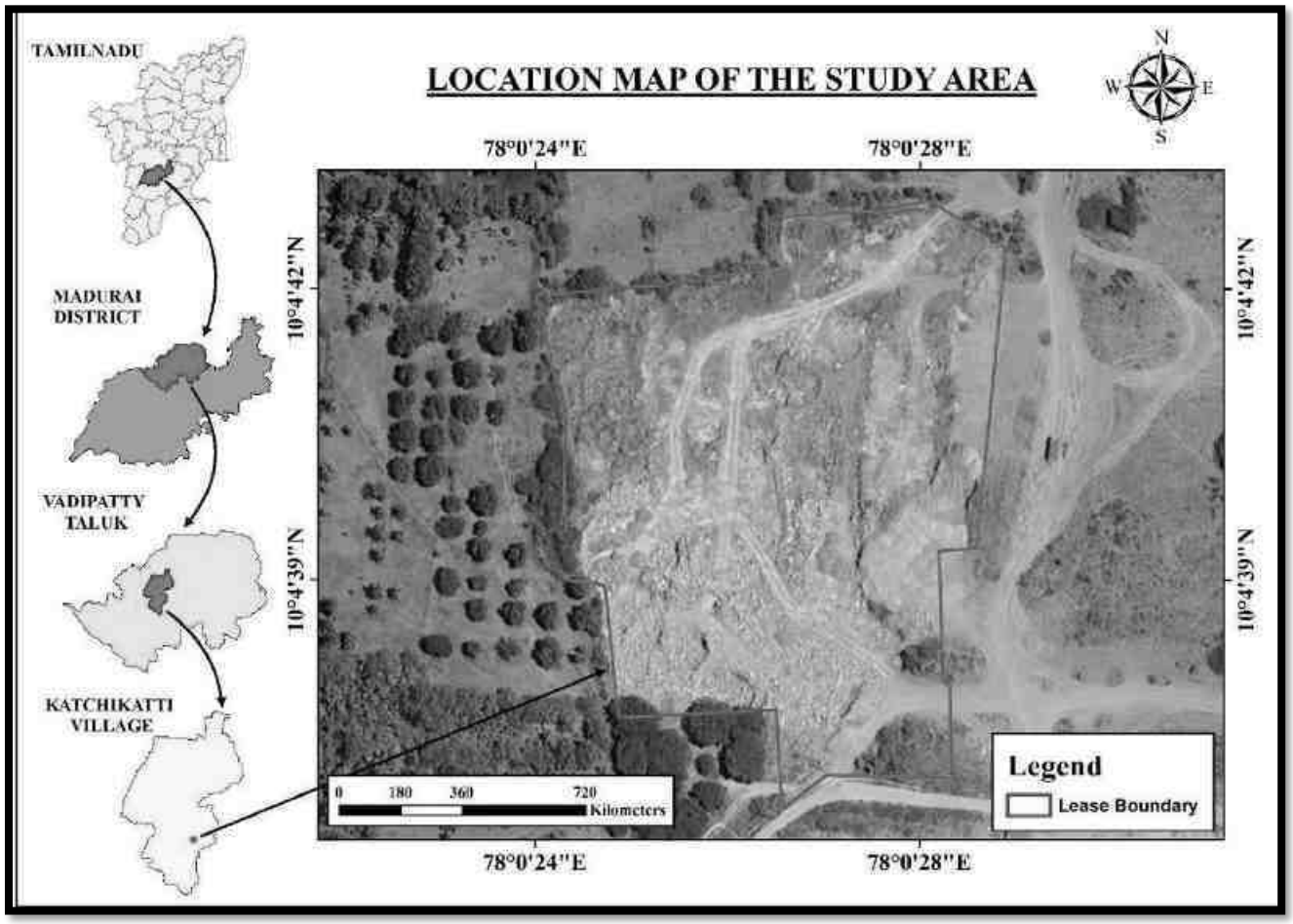


Figure.1. Shows proposed mine lease area

The lease applied area falls in the Toposheet No: **58 J/04** Latitude between: **10°04'36.55" N to 10°04'42.92" N** and Longitude between: **78°00'24.09''E to 78°00'28.15" E** on WGS datum-1984 The lease applied area is located about 21km Northwest side of Madurai town, 5km East side of Vadipatty town and 7km Southwest side of Kachaikatty Village.

	25km		12km		7km	
Madurai	→	Vadipatty	→	Kachaikatty	→	Lease applied area
	Northwest		East		Southwest	

2.1 Topography of the Lease Area and Its Surrounding Environments:

The applied lease area exhibits an flat topography and the maximum elevation 220m was observed north of the site. The rocks exhibits layered, medium to coarse grained hornblende biotite, orthopyroxene charnockite gneiss. The Gravel is obtained the average of 0-2.0m and a rough stone starts from 2.0m to 40m (R.L.220-175m) from the surface level. The Surface plan showing elevation, contour, accessibility road and Geological map was prepared the proposed lease area.

The Water level in the surrounding area is 68m – 73m below from general ground profile which is observed from the nearby bore wells. Average annual rainfall is about 985mm.



Figure 2. Topography and Outcrop in the lease area

3 REGIONAL GEOLOGY OF MADURAI DISTRICT

Madurai with a total area of 3860 sq.km.is one of the trifurcated districts of the erstwhile composite Madurai and is situated between North latitudes 9° 30' - 10° 16' and east longitudes 77° 15' - 78° 25'. It is bound by Theni district in the west, Dindigul district in the north, Karur and Sivaganga districts in the east and by Virudunagar district in the south. It comprises 10 taluks, viz., Madurai East, Madurai West, Thirupparankundram, Usilampatti, Tirumangalam, Madurai South, Madurai North, Vadipatti, Peraiyur and Melur taluks with Madurai City as the district headquarters. Madurai district is covered by granulite facies high grade metamorphic rocks and younger intrusives which fall under the following categories:

1. Metasedimentary group comprising quartzite, calc gneiss/crystalline limestone, garnet-sillimanite ± biotite ± cordierite ± spinel gneiss, minor garnet-cordierite gneiss and garnetiferous quartzo-feldspathic gneiss (Khondalites and leptynite), magnetite and quartzite.

2. Charnockite Group consisting of acid charnockite and pyroxene granulite.

3. Older Intrusive rocks consisting of amphibolite, pyroxenite and gabbro (mafic ultra-mafic).

4. Migmatite group made up of banded hornblende biotite gneiss, grey granitic gneiss, pink granitic gneiss and grey hornblende granite.

5. The younger acid intrusive comprises granite and pegmatite. In the metasedimentary group, rocks of arenaceous, calcareous, and argillaceous composition have undergone metamorphism under the granulite facies. This group includes quartzite, calc gneiss/diopside granulite, marble, garnet-sillimanite gneiss (Khondalite), with occasional bands of garnetiferous quartzo-feldspathic gneiss (leptynite) and garnet cordierite gneiss. These rocks are found as individual bands, enclaves, or tectonic slices within the predominantly charnockite-migmatite region. Quartzite, a significant member of the metasedimentary group, occupies the crests of linear ridges with variable thickness ranging from less than a meter to 150 meters.

4 HYDROGEOLOGY

The district is underlain predominantly by crystalline formations and alluvium is found along the courses of the river. Ground water occurs under phreatic conditions in weathered residuum and interconnected shallow fractures and under semi-confined to confined conditions in deeper fractures. The depth of weathering varies from 20-25 m bgl in Usilampatti, Sedapatti and Kottampatti area, while it varies from 30 to 40 m bgl in remaining parts of the district. The depth of dug wells varies from 10 – 20 m with a yield of 45 – 135 lpm. In the exploration programme of Central Ground Water Board, 29% of the wells yielded less than 1 lps while 30% of the wells yielded between 1 – 3 lps. In general there are about 2 – 3 fracture zones less than 50 m and about 2 – 3 fracture form beyond 100 m also. The variation in the yield of bore wells are very high in the district. Potential fractures with high discharge have been established along Valandur-usilampatti Timmarasanayakanur, ThiraliPeraiyur tract and Palkalainagar- Nilayur tract in the district. The depth to water level in the district varies from 3.13 to 7.66 m bgl during premonsoon (May) and 1.86 to 5.74 m bgl during post monsoon period. (Source: CGWB).

5. METHODOLOGY OF STUDY

1. Open well and bore well water level measurement, depth of water level diameter of open well, agriculture land survey.
2. Geophysical survey for deep aquifer in nearby site Rock and soil geology also collected for the aquifer characteristic study.
3. Aquifer thickness and quality measurement study in nearby proposed mine site areas of the study area.

5.1 Geophysical Investigation

5.1.1 Vertical Electrical resistivity sounding for aquifer study.

The electrical resistivity study is used to determine aquifer and occurred rock in the proposed site. The DDR 3 equipment was used for data collection **(Fig.3)**

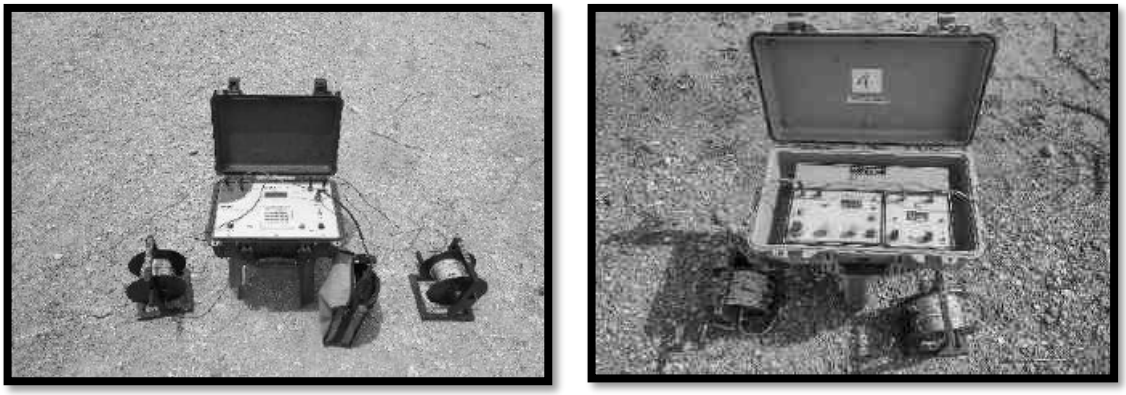


Figure 3. Electrical resistivity survey Instruments.

5.2.2 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:

$$R = Rs * L/A \text{ (in Ohm)}$$

Where Rs 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:

$$Rs = (A/L) * (dV/I) \text{ (in Ohm m)}$$

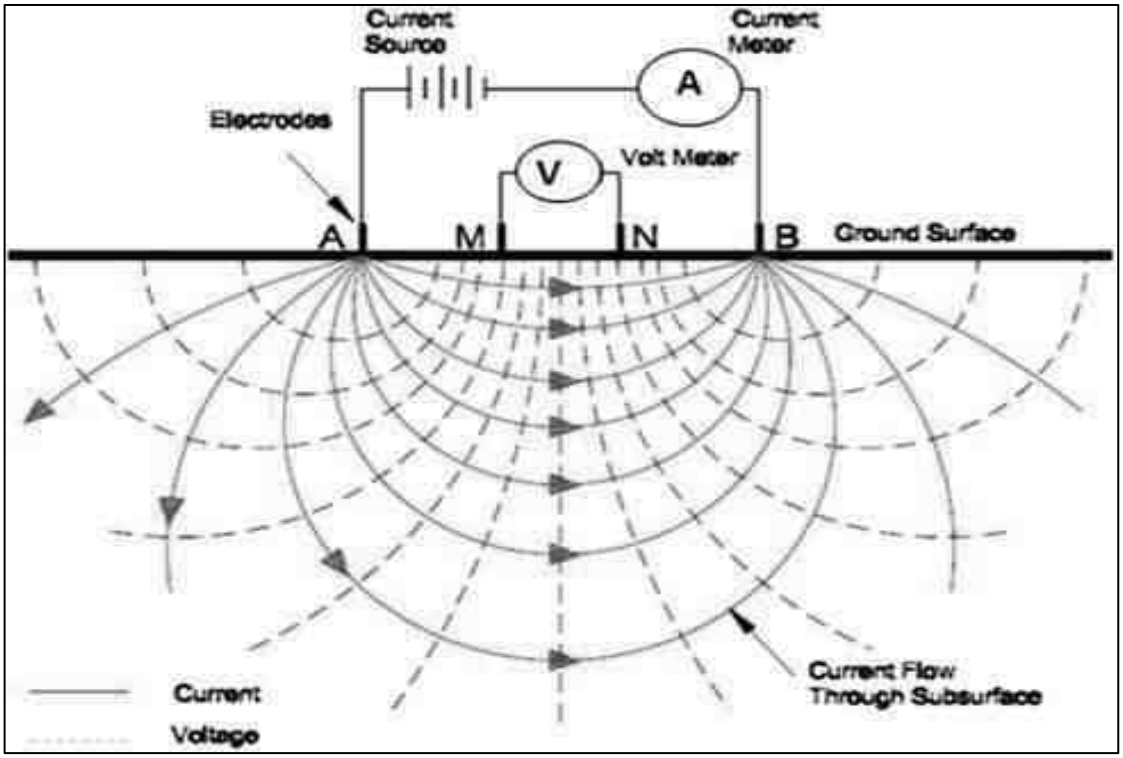


Figure 4. Schematic Diagram of Electrical resistivity principle

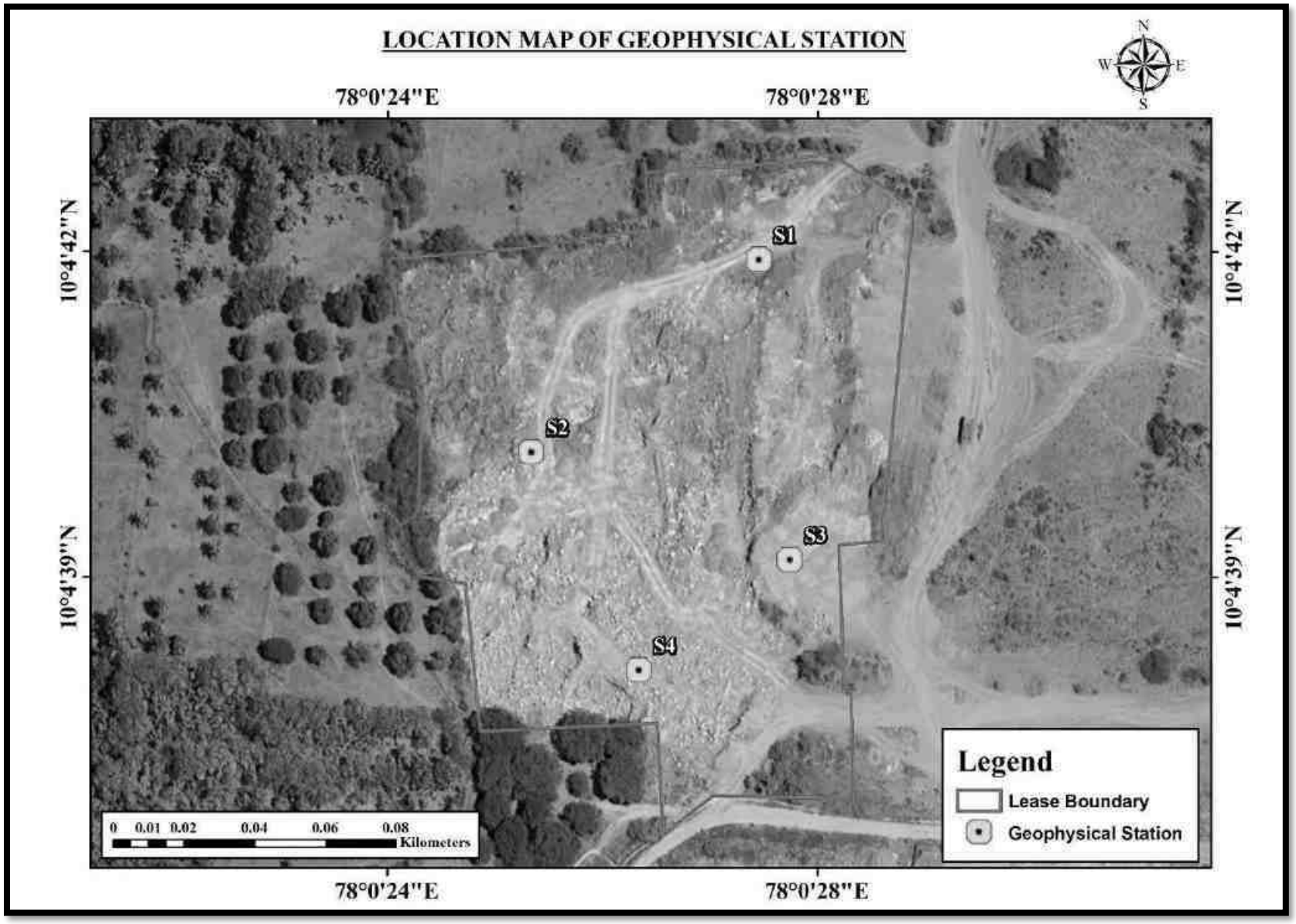


Figure 5. Geophysical survey location in the lease area

6. GEOPHYSICAL DATA INTERPRETATION & GRAPH

Table 1 Geophysical data of Station 1

STATION-1				
AB/2 (m)	MN/2(m)	Geometric Factor (K)	Resistance (R) Ohm	Apparent Resistivity Rho Ohm-meter
2	1	4.7	6.12	28.8
6	1	55.0	2.31	127.0
8	1	99.0	0.84	83.1
10	1	155.5	0.76	118.2
10	5	23.6	5.73	135.0
20	5	117.8	3.28	386.4
30	5	274.9	2.25	618.5
40	5	494.8	1.56	771.9
50	5	777.5	1.57	1220.7
60	5	1123.1	1.39	1561.1
70	5	1531.5	0.98	1500.9
80	5	2002.8	0.87	1742.4
90	5	2536.8	0.81	2054.8
100	5	3133.7	0.65	2036.9

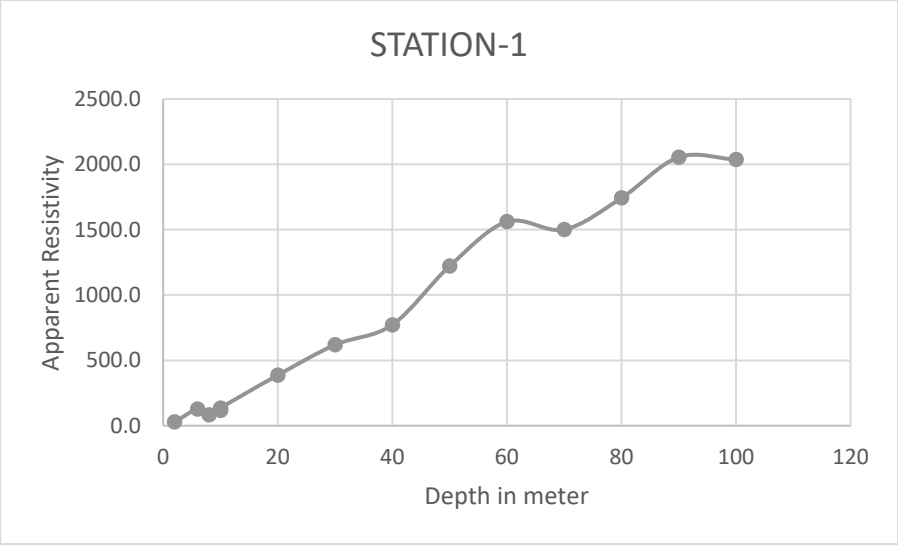


Figure 6 Graphical Representation of Geophysical data Station 1

Table 2 Geophysical data of Station 2

STATION-2				
AB/2 (m)	**MN/2(m)**	**Geometric Factor (K)**	**Resistance (R) Ohm**	**Apparent Resistivity Rho Ohm-meter**
2	1	4.7	5.38	25.4
6	1	55.0	2.06	113.3
8	1	99.0	1.56	154.4
10	1	155.5	0.95	147.7
10	5	23.6	4.89	115.2
20	5	117.8	2.41	283.9
30	5	274.9	2.30	632.2
40	5	494.8	1.87	925.3
50	5	777.5	1.62	1259.6
60	5	1123.1	1.37	1538.7
70	5	1531.5	0.98	1500.9
80	5	2002.8	0.87	1742.4
90	5	2536.8	0.80	2029.5
100	5	3133.7	0.75	2350.3

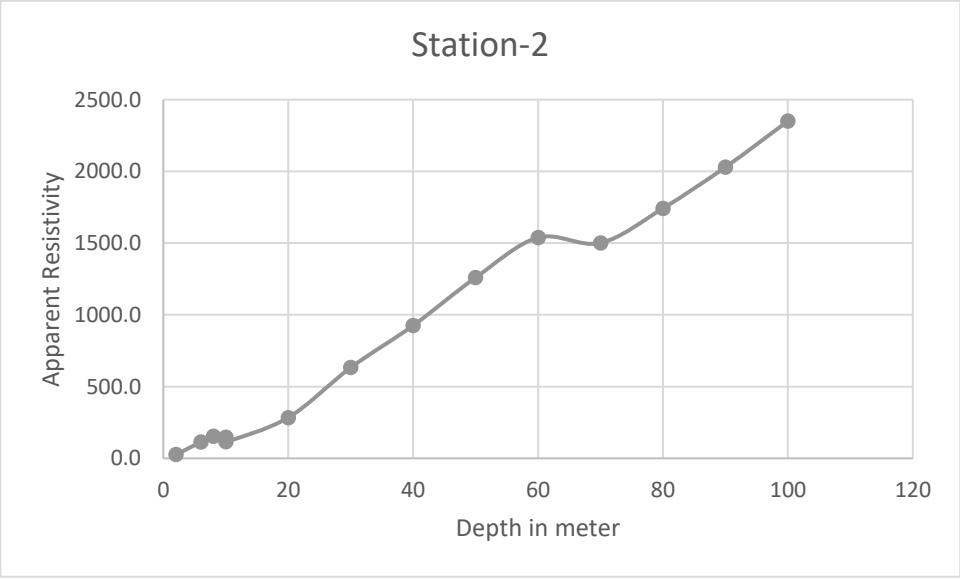


Figure 7 Graphical Representation of Geophysical data Station 2

Table 3 Geophysical data of Station 3

STATION-3				
AB/2 (m)	**MN/2(m)**	**Geometric Factor (K)**	**Resistance (R) Ohm**	**Apparent Resistivity Rho Ohm-meter**
2	1	4.7	7.13	33.6
6	1	55.0	3.19	175.4
8	1	99.0	1.76	174.2
10	1	155.5	0.85	132.2
10	5	23.6	6.13	144.4
20	5	117.8	3.88	457.1
30	5	274.9	2.80	769.7
40	5	494.8	2.20	1088.6
50	5	777.5	1.55	1205.2
60	5	1123.1	1.32	1482.5
70	5	1531.5	0.96	1470.3
80	5	2002.8	0.86	1722.4
90	5	2536.8	0.67	1699.7
100	5	3133.7	0.61	1911.6

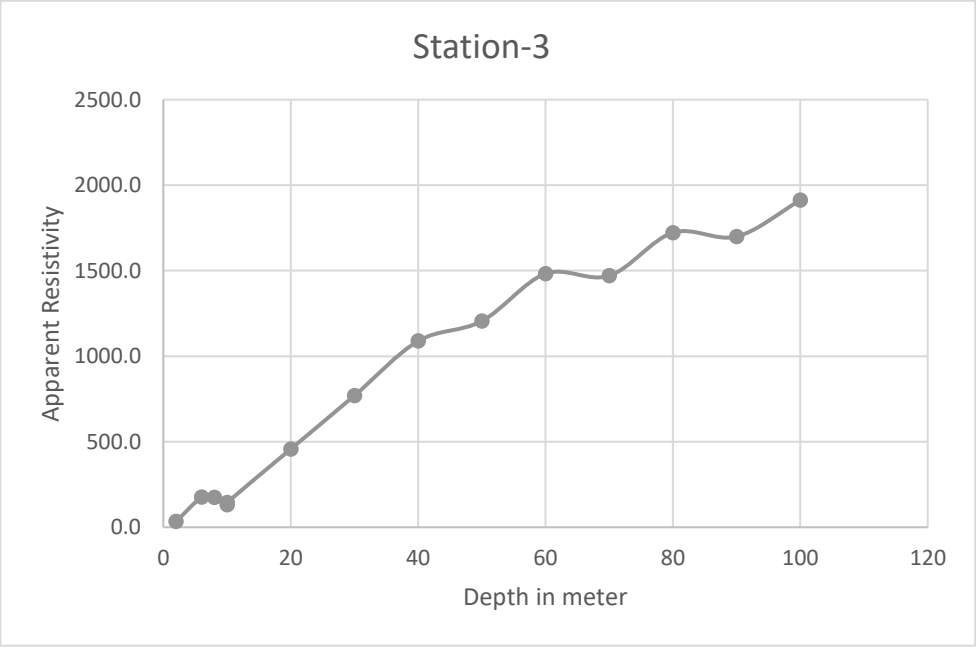


Figure 8 Graphical Representation of Geophysical data Station 3

Table 4 Geophysical data of Station 4

STATION-4				
AB/2 (m)	**MN/2(m)**	**Geometric Factor (K)**	**Resistance (R) Ohm**	**Apparent Resistivity Rho Ohm-meter**
2	1	4.7	4.91	23.1
6	1	55.0	2.24	123.2
8	1	99.0	1.18	116.8
10	1	155.5	0.76	118.2
10	5	23.6	5.16	121.6
20	5	117.8	3.16	372.3
30	5	274.9	2.34	643.2
40	5	494.8	1.9	940.1
50	5	777.5	1.46	1135.2
60	5	1123.1	1.16	1302.8
70	5	1531.5	0.86	1317.1
80	5	2002.8	0.79	1582.2
90	5	2536.8	0.68	1725.1
100	5	3133.7	0.61	1911.6

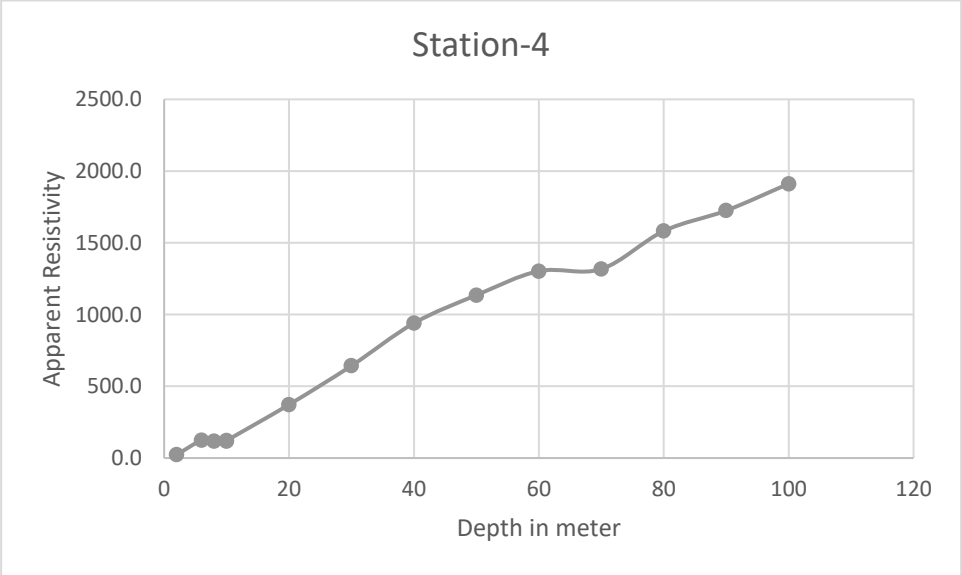


Figure 9 Graphical Representation of Geophysical data Station 4

7.CONCLUSION

- The lease applied area is exhibits flat topography and the maximum elevation 220m above from Mean Sea Level.
- The geological study of the given area covered by Gravel and rough stone in the entire area. The discharge of the groundwater controlled by the massive charnockite rock.
- The study area exhibits vertical dipping hence it acts as a barrier and restrict the groundwater flow movement in the mine lease area.
- Based on the geophysical investigation, Vertical Electrical Sounding (VES) were conducted to determine the subsurface water table and rock types up to depth of 100 m.
- The subsurface formation up to this depth can be categorized as follows,
    - **0m to 2m (Average) – Gravel**
    - **2m to 42m (Average)- Charnockite Formation**
- In this mine lease area, groundwater occurs at shallow depth, depending on the intensity of weathering and its development is much less compared to gneissic formation. The mine area such no major intersections of water table are expected up to 50m.
- The aquifer are found within the weathered / fractured metamorphic terrain. Currently the aquifers are located at **68 to 73 meters** below ground level (BGL). However, considering the approved mining plan ultimate depth, which is **42 meters** below ground level. It will not impact the groundwater table.
- From the above study it can be concluded there will be no adverse effect on the hydrological regime, water drainage, environment, and livelihood. Agricultural activity in the region.

Dr. P. Thangaraju, M.Sc., Ph.D.,
Govt. Approved Hydro Geologist
M/s. Geo Exploration and Mining Solutions,
Regd. Office: No. 17, Advaitha Ashram Road,

Alagapuram, Salem – 636 004, Tamil Nadu.

TMT. P. RAJESWARI, I.F.S.,
MEMBER SECRETARY

STATE LEVEL ENVIRONMENT IMPACT ASSESSMENT AUTHORITY – TAMIL NADU
3rd Floor, Panagal Maaligai,
No.1, Jeenis Road, Saidapet,
Chennai-15.
Phone No. 044-24359973
Fax No. 044-24359975

ENVIRONMENTAL CLEARANCE

Lr. No.SEIAA-TN/F.No.8046/1(a)/EC.No: 4681/2021 dated: 13.08.2021

To

Thiru.A.D.Meenaachisundram
D.No.1/354-2, Ramasamy Nagar
Thirumalpuram
Thirupalai
Madurai District - 625014.

Sir/Madam,

Sub: SEIAA-TN – Proposed Rough stone quarry lease over an extent of 1.62.0ha at S.F.Nos.1168/25, 1171/3 & 1171/5 of Katchaikatti Village, Vadipatti Taluk, Madurai District, Tamil Nadu by Thiru.A.D.Meenaachisundram - issue of Environmental Clearance– Reg.

Ref:
1. Online Proposal No. SIA/TN/MIN/ 181246/2020, Dated: 30.10.2020.
2. Application for Environmental Clearance dated: 17.11.2020.
3. Minutes of the 218th Meeting of SEAC held on 09.07.2021
4. Minutes of the 452nd Meeting of SEIAA held on 09.08.2021.

Details of Minor Mineral Activity:-

This has reference to your application second cited. The proposal is for obtaining Environmental Clearance for mining/quarrying of minor minerals based on the particulars furnished in your application as shown below.

13 AUG 2021

MEMBER SECRETARY
SEIAA-TN

122 A

1	**Name of Project Proponent and address**	Thiru.A.D.Meenaachisundram D.No.1/354-2, Ramasamy Nagar Thirumalpuram Thirupalai Madurai District - 625014.
2	**Location of the Proposed Activity**	
	Survey Number	1168/25, 1171/3 & 1171/5
	Latitude and Longitude	10°04'53.29" N to 10°04'57.04"N 78°00'49.19"E to 78°00'57.83"E
	Village	Katchaikatti
	Taluk	Vadipatti
	District	Madurai
3	**Proposed Activity**	
	i. Minor mineral	Rough Stone
	ii. Mining Lease Area	1.62.0ha
	iii. Approved quantity	129130cu.m of Rough stone & 18930cu.m of Gravel
	iv. Depth of Mining	32m
	v. Type of mining	Opencast Mechanized Mining Method.
	vi. Category(B1/B2)	B2
	vii. Precise area communication approved by the District Collector with date	Na.Ka.No.651/2019-Kanimam, dated:31.08.2020
	viii. Mining plan approval by Assistant Director of Geology and Mining, with date	Rc.No.651/2019 mines, dt 05.10.2020
	ix. Mining period	5 year
4	**Whether Project area attracts any General conditions specified in the EIA notification, 2006 as amended:-**	Not attracted. Affidavit furnished.
5	**Man Power requirement per day:**	19 Employees
6	**Utilities**	

13 AUG 2021

MEMBER SECRETARY
SEIAA-TN

123 A

	i. Source of Water :	Water Vendors & Existing Bore well
	ii. Quantity of Water Requirement in KLD:	2.0 KLD
	a. Domestic & Drinking purpose	0.5 KLD
	b. Green Belt & Dust Suppression	1.5 KLD & 0.5 KLD
	iii. Power Requirement:	
	a. Domestic Purpose	TNEB
	b. Industrial Purpose	109320Liters of HSD
7	**Cost**	
	i. Project Cost	Rs. 35,06,000/-
	ii. EMP Cost	Rs. 3,80,000/-
8	**Validity:** **This Environmental Clearance is granted for the production of 129130cu.m of Rough stone & 18930cu.m of Gravel for the period of 5 year from the date of execution of the mining lease.**	

Affidavit

The Proponent has furnished affidavit in One Hundred Rupees stamp paper attested by the Notary stating that

I, Thiru.A.D.Meenaachisundram, D.No.1/354-2, Ramasamy Nagar, Thirumalpuram, Thirupalai, Madurai District - 625014., solemnly declare and sincerely affirm that:

I have applied for getting Environmental Clearance to SEIAA, Tamil Nadu for mining lease for mining of Rough stone quarry lease over an extent of 1.62.0ha at S.F.Nos.1168/25, 1171/3 & 1171/5 of Katchaikatti Village, Vadipatti Taluk, Madurai District, Tamil Nadu.

1. I swear to state and confirm that within 10km area of the mine site, I have applied for Environmental Clearance, none of the following in situated.
   a. Protected areas notified under the Wild Life (Protection) Act, 1972.
   b. Critically polluted areas as notified by the central pollution control board constituted under water (Prevention and control of pollution) Act, 1974.
   c. Eco – sensitive areas as notified.

13 AUG 2021

MEMBER SECRETARY
SEIAA-TN

124 A

d. Interstate boundaries and international boundaries within 10km radius from the boundary of the proposed side.

2. I will complete the following corporate environment responsibility (CER) activities before commencement of the quarrying activities.

CER Activity	Project Cost (Rs. In Lakhs)	CER Cost 2.0% of project cost (Rs. In Lakhs)
1. I assure to spend out CER Cost for water purifier, medicine storage rack, cot and bed facilities to the dispensary and water purifier and table facilities to the government school at 2.0% from the total project cost.	38.86	0.78
Total cost Allocation	38.86	0.78

3. The following quarries are located within the radisu of 500m from the periphery of my quarry.

Proposed Quarry:

S.No	Name and Address of the applicant	Village & Taluk	S.F. No	Extent (in Hects)	Classification of land
1.	A.D.Meenachisundaram	Krishnapuram village, Vadipatti Taluk	1168/25, 1171/3 & 1171/5	1.62.0	Patta land
Nil					

Existing Quarry:

S.No.	Name and Address of the lease	S.F. No., Village & Taluk	Extent (in Hects)	District Proc.Letter/Date	Lease Period	Remarks
1.	Selvi.G.	1169/6B 1169/6I etc Katchaikatti	0.67.0	Roc.No.457/52012, dt.30.04.2015	10.04.2017 to 09.04.2022	--

Abandoned Quarry

S.No.	Name and Address of the lease	S.F. No., Village & Taluk	Extent (in Hects)	District Proc.Letter/Date	Lease Period	Remarks

13 AUG 2021

MEMBER SECRETARY
SEIAA-TN

125 A

1.	Kannan.R	1168/7 1169/9 1168/19 Katchaikatti	1.91.0	Roc.No.139/2014, dt.08.08.2015	23.09.2015 to 22.09.2020	--
2.	Zavier	1164/2B Katchaikatti	0.48.0	Roc.No.605/09/Mines	14.11.2009 to 13.11.2014	--

4. There will not be hindrance or disturbance to the people living during quarrying and transportation.
5. There is No approved habitation within 500m radius from the periphery of my quarry.
6. I swear that afforestation will be carried out during the course of quarrying operation and maintained.
7. The required insurance will be taken in the name of the labourers working in my quarry site.
8. The approach road from the main road to quarry is will be constructed and maintained in a good condition for the haulage of quarry materials and machineries.
9. I will not engage any child labour in my quarry site and I aware that engaging child labour is punishable under the law.
10. All types of safety / protective equipments will be provided to all the labourers working in my quarry.
11. No permanent structures, temples, etc., are located within 300m radius from the periphery of my quarry.

I ensure to do all the social and Environment commitment as mentioned in the Mining Plan to the best of my knowledge.

Details of Quarries located within 500M radius from the proposed quarry:

The Project Proponent has submitted a copy of the letter obtained from the Joint Director/Assistant Director(i/c) of Geology & Mining, Madurai District in his Rc.No.651/2021-Mines, dated: 06.10.2020 has stated that the details of other quarries within a radius 500m from the boundary of the proposed quarry site as follows:

Proposed Quarry:

S.No	Name and Address of the applicant	Village & Taluk	S.F. No	Extent (in Hects)	Classification of land
1.	A.D.Meenachisundaram	Krishnapuram village,	1168/25, 1171/3 &	1.62.0	Patta land

13 AUG 2021

MEMBER SECRETARY
SEIAA-TN

126 A

		Vadipatti Taluk	1171/5		
Nil					

Existing Quarry:

S.No.	Name and Address of the lease	S.F. No., Village & Taluk	Extent (in Hects)	District Proc.Letter/Date	Lease Period	Remarks
1.	Selvi.G.	1169/6B 1169/6l etc Katchaikatti	0.67.0	Roc.No.457/52012, dt.30.04.2015	10.04.2017 to 09.04.2022	--

Abandoned Quarry

S.No.	Name and Address of the lease	S.F. No., Village & Taluk	Extent (in Hects)	District Proc.Letter/Date	Lease Period	Remarks
1.	Kannan.R	1168/7 1169/9 1168/19 Katchaikatti	1.91.0	Roc.No.139/2014, dt.08.08.2015	23.09.2015 to 22.09.2020	--
2.	Zavier	1164/2B Katchaikatti	0.48.0	Roc.No.605/09/Mines	14.11.2009 to 13.11.2014	--

Appraisal by SEAC:

The proposal was placed in the 218th meeting of SEAC held on 09.07.2021. Based on the presentation made and the documents furnished by the Project proponent, SEAC decided to recommend the project proposal to SEIAA for grant of Environmental Clearance subject to the following conditions, in addition to standard conditions stipulated by the MoEF & CC:

1. Restricting the maximum depth of mining from 32m considering the environmental impacts due to the mining, safety of the working personnel and following the principle of the sustainable mining are permitted for mining over five years.
2. The proponent shall form the proper benches as per the approved mining plan during the operation of the quarry considering the hydro-geological regime of the surrounding area as well as for safe mining.
3. The Proponent should install cautionary board at the entry and important locations of the mining site displaying caution notice to the public about the danger of the entering the mining lease.
4. The proponent shall conducted annual physical fitness test and eye test for the employees to ensure health & safety during occupation.
5. Fugitive emission measurements should be carried out during the mining operation and the report on the same may be submitted to SEIAA once in six months.

13 AUG 2021

MEMBER SECRETARY
SEIAA-TN

127 A

6. The Proponent shall ensure that the Noise level is monitored during mining operation at the project site and adequate noise level reduction measures undertaken.
7. The proponent shall erect fencing all around the boundary of the proposed area with gates for entry/exit as per the conditions and shall furnish the photographs/map showing the same before obtaining the CTO from TNPCB.
8. Greenbelt needs to be developed in the periphery of the mines area sothat at the closure time the trees would have grown well.
9. Ground water quality monitoring should be conducted once every six months and the report should be submitted to TNPCB.
10. After mining is completed, proper leveling should be done by the Project proponent & Environmental Management Plan furnished by the Proponent should be strictly followed.
11. The Project proponent shall, after ceasing mining operations, undertake regrassing the mining area and any other area which may have been disturbed due to their mining activities and restore the land to a condition that is fit for the growth of fodder, flora, fauna etc
12. Proper barrier to reduce noise level, dust pollution and to hold down any possible fly material (debris) should be established by providing greenbelt and/or metal sheets along the boundary of the quarrying site and suitable working methodology to be adopted by considering the wind direction.
13. The operation of the quarry should not affect the agriculture activities & water bodies near the project site and a safety distance of 50m from the water body should be left vacant without any mining activity.
14. Transportation of the quarried materials shall not cause any hindrance to the Village people or damage to the existing Village road.
15. The Project Proponent shall comply with the mining and other relevant rules and regulations wherever applicable.
16. The proponent shall develop an adequate greenbelt with native species on the periphery of the mine lease area before the commencement of the mining activity, in consultation with DFO of the concerned district/agriculture.
17. The project proponent should provide a detailed plan regarding the green belt area surrounding the mining area at least with a width of 3m.

13 AUG 2021

MEMBER SECRETARY
SEIAA-TN

18. The quarrying activity shall be stopped if the entire quantity indicated in the Mining plan is quarried even before the expiry of the quarry lease period and the same shall be monitored by the District Authorities.
19. Prior clearance from Forestry & Wild Life including clearance from committee of the National Board for Wildlife as applicable shall be obtained before starting the quarrying operation, if the project site attracts the NBWL clearance.
20. To ensure safety measures along the boundary of the quarry site, security guards are to be posted during the entire period of the mining operation.
21. The mine closure plan submitted by the project proponent shall be strictly followed after the lapse of the mine.
22. 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 furnish the detailed EMP mentioning all the activities as proposed in the CER and furnish the same before placing the subject to SEIAA.
23. All the conditions imposed by the Deputy Director, Geology & Mining, Madurai District in the mining plan approval and the precise area communication should be strictly followed.

Discussion by SEIAA and the Remarks:-

The proposal was placed before the SEIAA in its 452nd SEIAA meeting held on 09.08.2021. After detailed discussion, the Authority noted as.

1. The Proponent, Thiru. A.D.Meenaachisundram has applied seeking Environmental Clearance for the proposed Rough Stone & Gravel lease over an extent of 1.62.0Ha at S.F.No. 1168/25, 1171/3 & 1171/5 at Katchaikatti Village, Vadipatti Taluk, Madurai District, Tamil Nadu.
2. In the minutes of 218th SEAC meeting held on SEAC held on 09.07.2021, the SEAC has recommended the project proposal for grant of Environmental Clearance subject to the following conditions among others.
    a. Restricting the maximum depth of mining from 32m considering the environmental impacts due to the mining, safety of the working personnel and following the principle of the sustainable mining are permitted for mining over five years.
3. As per the recommendation of SEAC, the ultimate depth of mining is restricted to 32m. **As per the approved mining plan, for the restricted depth of mining 32m, the maximum minable quantities is 129130cu.m of Rough stone & 18930cu.m of Gravel.**

13 AUG 2021

MEMBER SECRETARY
SEIAA-TN

In view of the above, the Authority unanimously accepts the recommendation of SEAC and decided to grant Environmental Clearance subject to the conditions as recommended by SEAC & normal condition in addition to the following condition.

1. **As per the recommendation of SEAC and as accepted by the proponent, the ultimate depth of mining is restricted to 32m considering the environmental impacts due to the mining, safety of the working personnel and following the principle of the sustainable mining and Consequently the maximum minable quantities is 129130cu.m of Rough stone & 18930 cu.m of Gravel is permitted for mining over a period of five years.**
2. 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 furnish the detailed EMP, mentioning all the CER activities as committed. All the CER activity shall be carried out before obtaining CTO from TNPCB.

Part-A: Conditions to be Complied before commencing mining operations:-

1. **The project proponent shall advertise in at least two local newspapers widely circulated in the region, one of which shall be in the vernacular language informing the public that**

I.	**The project has been accorded Environmental Clearance.**
II.	**Copies of clearance letters are available with the Tamil Nadu Pollution Control Board.**
III.	**Environmental Clearance may also be seen on the website of the SEIAA.**
IV.	**The advertisement should be made within 7 days from the date of receipt of the clearance letter and a copy of the same shall be forwarded to the SEIAA.**

2. Mining activity should be reviewed by the District Collector after three years and decide for further extension.
3. The mine closure plan submitted by the project proponent shall be strictly followed after the lapse of the mine.
4. NOC from the Standing committee of the NBWL shall be obtained, if protected areas are located within 10 Km from the proposed project site.

13 AUG 2021

MEMBER SECRETARY
SEIAA-TN

130 A

5. The project proponent shall comply the conditions laid down in the Section V, Rule 36 of Tamil Nadu Minor Minerals Concession Rules 1959.
6. **A copy of the Environment Clearance letter shall be sent by the proponent to the concerned Panchayat, Town Panchayat / Panchayat union/ Municipal Corporation, Urban Local Body and the Local NGO, if any, from whom suggestions/ representations, if any, were received while processing the proposal. The clearance letter shall also be put on the website of the proponent and also kept at the site, for the general public to see.**
7. Quarry lease area should be demarcated on the ground with wire fencing to show the boundary of the lease area on all sides with red flags on every pillar shall be erected before commencement of quarrying.
8. The proponent shall ensure that First Aid Box is available at site.
9. The excavation activity shall not alter the natural drainage pattern of the area.
10. The excavated pit shall be restored by the project proponent for useful purposes.
11. The proponent shall quarry and remove only in the permitted areas as per the approved Mining Plan details.
12. The quarrying operation shall be restricted between 7AM and 5 PM.
13. The proponent shall take necessary measures to ensure that there shall not be any adverse impacts due to quarrying operation on the nearby human habitations, by way of pollution to the environment.
14. A minimum distance of 50mts. from any civil structure shall be kept from the periphery of any excavation area.
15. The mined out pits should be backfilled where warranted and area should be suitably landscaped to prevent environmental degradation. The mine closure plan as furnished in the proposal shall be strictly followed with back filling and tree plantation.
16. Wet drilling method is to be adopted to control dust emissions. Delay detonators and shock tube initiation system for blasting shall be used so as to reduce vibration and dust.
17. Drilling and blasting shall be done only either by licensed explosive agent or by the proponent after obtaining required approvals from Competent Authorities.
18. Blasting shall be carried out after announcing to the public adequate through public address system to avoid any accident.

13 AUG 2021

MEMBER SECRETARY
SEIAA-TN

131 A

19. A study has to be conducted to assess the optimum blast parameters and blast design to keep the vibration limits less than prescribed levels and only such design and parameters should be implemented while blasting is done. Periodical monitoring of the vibration at specified location to be conducted and records kept for inspection.
20. The Proponent shall take appropriate measures to ensure that the GLC shall comply with the revised NAAQ norms notified by MoEF& CC, GoI on 16.11.2009.
21. The following measures are to be implemented to reduce Air Pollution during transportation of mineral
    i. Roads shall be graded to mitigate the dust emission.
    ii. Water shall be sprinkled at regular interval on the main road and other service roads to suppress dust
22. The following measures are to be implemented to reduce Noise Pollution
    i. Proper and regular maintenance of vehicles and other equipment
    ii. Limiting time exposure of workers to excessive noise.
    iii. The workers employed shall be provided with protection equipment and earmuffs etc.
    iv. Speed of trucks entering or leaving the mine is to be limited to moderate speed of 25 kmph to prevent undue noise from empty trucks.
    v. All noise generating machinery the compressor, generator to be enclosed in acoustic enclosure so as to reduce noise in working area.
23. Measures should be taken to comply with the provisions laid under Noise Pollution (Regulation and Control) (Amendment) Rules, 2010, dt: 11.01.2010 issued by the MoEF& CC, GoI to control noise to the prescribed levels.
24. Suitable conservation measures to augment groundwater resources in the area shall be planned and implemented in consultation with Regional Director, CGWB. Suitable measures should be taken for rainwater harvesting.
25. Permission from the competent authority should be obtained for drawl of ground water, if any, required for this project.
26. Topsoil, if any, shall be stacked properly with proper slope with adequate measures and should be used for plantation purpose.
27. The following measures are to be adopted to control erosion of dumps:-
    i. Retention/ toe walls shall be provided at the foot of the dumps.

13 AUG 2021

MEMBER SECRETARY
SEIAA-TN

132 A

ii. Worked out slopes are to be stabilized by planting appropriate shrub/ grass species on the slopes.

28. Waste oils, used oils generated from the EM machines, mining operations, if any, shall be disposed as per the Hazardous& other wastes (Management, and Trans Boundary Movement) Rules, 2016 and its amendments thereof to the recyclers authorized by TNPCB.
29. Concealing the factual data or failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract action under the provisions of Environment (Protection) Act, 1986.
30. Rain water harvesting to collect and utilize the entire water falling in land area should be provided.
31. Rain water getting accumulated in the quarry floor shall not be discharged directly to the nearby stream or water body. If it is to be let into the nearby water body, it has to be discharged into a silt trap on the surface within the lease area and only the overflow after allowing settling of soil be let into the nearby waterways. The silt trap should be of sufficient dimensions to catch all the silt water being pumped out during one season. The silt trap should be cleaned of all the deposited silt at the end of the season and kept ready for taking care of the silt in the next season.
32. The lease holder shall undertake adequate safeguard measures during extraction of material and ensure that due to this activity, the hydro-geological regime of the surrounding area shall not be affected. Regular monitoring of ground water level and quality shall be carried out around the mine lease area during the mining operation. If at any stage, if it is observed that the groundwater table is getting depleted due to the mining activity; necessary corrective measures shall be carried out. District Collector/mining officer shall ensure this.
33. No tree-felling shall be done in the leased area, except only with the permission from competent Authority.
34. To take up environmental monitoring of the proposed quarry site before, during and after the mining activities including vibration study data, water, air & flora/fauna environment, slurry water generated/disposed and method of disposal, involving a reputed academic Institution.

STATE LEVEL ENVIRONMENT IMPACT ASSESSMENT AUTHORITY - TN
13 AUG 2021
Panagal Maligai, Saidapet, Chennai-15

MEMBER SECRETARY
SEIAA-TN

133 A

35. It shall be ensured that the total extent of nearby quarries(existing, abandoned and proposed) located within 500 meter radius from the periphery of this quarry is not exceeding 5 hectares within the mining lease period of this application.
36. It shall be ensured that there is no habitation is located within 300 meter radius from the periphery of the quarry site and also ensure that no hindrance will be caused to the people of the habitation located within 300m radius from the periphery of the quarry site.
37. Free Silica test should be conducted and reported to TNPCB, Department of Geology and Mining and Regional Director, MoEF& CC, GOI.
38. Air sampling at intersection point should be conducted and reported to TNPCB, Department of Geology and Mining and Regional Director, MoEF& CC, GOI.
39. Bunds to be provided at the boundary of the project site.
40. The project proponent shall undertake plantation/afforestation work by planting the native species on all side of the lease area at the rate of 400/Ha. Suitable tall tree saplings should be planted on the bunds and other suitable areas in and around the work place.
41. Floor of excavated pit to be levelled and sides to be sloped with gentle slope (Except for granite quarries) in the mine closure phase.
42. The Project Proponent shall ensure a minimum of 2.5% of the annual turnover will be utilized for the CSR Activity
43. The Project Proponent shall provide solar lighting system to the nearby villages.
44. Earthen bunds and barbed wire fencing around the pits with green belt all along the boundary shall be developed and maintained.
45. Safety equipments to be provided to all the employees.
46. Safety distance of 50m has to be provided in case of railway, reservoir, canal/odai
47. The Assistant/Deputy Director, Department of Geology & mining shall ensure that the proponent has engaged the blaster with valid Blasting license/certificate obtained from the competent authority before execution of mining lease.
48. The proponent shall furnish the Baseline data covering the Air, Water, Noise and land environment quality for the proposed quarry site before execution of mining lease.
49. The proponent shall erect the pillars in accordance with the Rules for depicting GPS details in the earmarked boundary of the quarry site to monitor electronically before execution of mining.

13 AUG 2021

MEMBER SECRETARY
SEIAA-TN

134 A

50. The proponent has to provide insurance protection to the workers in the case of existing mining or provide the affidavit in case of fresh lease before execution of mining lease.
51. The proponent has to display the name board at the quarry site showing the details of Proponent, lease period, extent, etc., with respect to the existing activity before execution of mining.
52. Heavy earth machinery equipments if utilized, after getting approval from the competent authority.
53. The Proponent shall ensure that the project activity including blasting, mining transportation etc should in no way have adverse impact to the other forests, such as reserve forests and social forests, tree plantation and bio diversity, surrounding water bodies etc.
54. The proponent shall provide Green Belt development at the rate of not less than 400 trees/Hectare. The tree saplings shall be not less than 3m height.
55. The fugitive emissions should be monitored during the mining activity and should be reported to TNPCB once in a month and the operation of the quarry should no way impact the agriculture activity & water bodies near the project site.
56. All the commitment made by the project proponent in the proposal shall be strictly followed.
57. The mining lease holders shall, after ceasing mining operations, undertake re-grassing the mining area and any other area which may have been disturbed due to their mining activities and restore the land to a condition which is fit for growth of fodder, flora, fauna etc.
58. The Project proponent has to strictly comply the outcome/direction of the Hon'ble NGT, Principle Bench, New Delhi in the O.A No.186 of 2016 (M.A.No.350/2016), O.A. No.200/2016, O.A.No.580/2016 (M.A.No.1182/2016), O.A.No.102/2017, O.A.No.404/ 2016 (M.A.No. 758/2016, M.A. No. 920 /2016, M.A.No.1122/2016, M.A.No. 12/2017 & M.A.No.843/2017), O.A.No.405/2016 and O.A.No.520 of 2016 (M.A.No.981/2016, M.A.No.982/2016 & M.A.No.384/2017).

Part B: General Conditions:

1. EC is given only on the factual records, documents and the commitment furnished in non judicial stamp paper by the proponent.

13 AUG 2021

MEMBER SECRETARY
SEIAA-TN

135 A

2. The Proponent shall obtain the Consent from the TNPC Board before commencing the activity.
3. No change in mining technology and scope of working should be made without prior approval of the SEIAA, Tamil Nadu.
4. No change in the calendar plan including excavation, quantum of mineral (minor mineral) should be made.
5. Effective safeguard measures, such as regular water sprinkling shall be carried out in critical areas prone to air pollution and having high levels of particulate matter such as loading and unloading point and all transfer points. Extensive water sprinkling shall be carried out on haul roads. It should be ensured that the Ambient Air Quality parameters conform to the norms prescribed by the Central Pollution Control Board in this regard.
6. Effective safeguards shall be adopted against health risks on account of breeding of vectors in the water bodies created due to excavation of earth.
7. A berm shall be left from the boundary of adjoining field having a width equal to at least half the depth of proposed excavation.
8. Loading and unloading areas including all the transfer points should also have efficient dust control arrangements. These should be properly maintained and operated.
9. Vehicular emissions shall be kept under control and be regularly monitored. The mineral transportation shall be carried out through the covered trucks only and the vehicles carrying the mineral shall not be overloaded.
10. Access and haul roads to the quarrying area should be restored in a mutually agreeable manner where these are considered unnecessary after extraction has been completed.
11. All Personnel shall be provided with protective respiratory devices including safety shoes, masks, gloves etc. Supervisory people should be provided with adequate training and information on safety and health aspects. Occupational health surveillance program of the workers should be undertaken periodically to observe any contractions due to exposure to dust and take corrective measures, if needed.
12. Periodical medical examination of the workers engaged in the project shall be carried out and records maintained. For the purpose, schedule of health examination of the workers should be drawn and followed accordingly. The workers shall be provided with personnel protective measures such as masks, gloves, boots etc.

13 AUG 2021

Rajeswari
MEMBER SECRETARY
SEIAA-TN

136 A

13. Workers/labourers shall be provided with facilities for drinking water and sanitation facility for Female and Male separately.
14. The project proponent shall ensure that child labour is not employed in the project as per the sworn affidavit furnished.
15. The funds earmarked for environmental protection measures should be kept in separate account and should not be diverted for other purpose. Year wise expenditure should be reported to the Ministry of Environment and Forests and its Regional Office located at Chennai.
16. The Environmental Clearance does not absolve the applicant/proponent of his obligation/requirement to obtain other statutory and administrative clearances from other statutory and administrative authorities.
17. This Environmental Clearance does not imply that the other statutory / administrative clearances shall be granted to the project by the concerned authorities. Such authorities would be considering the project on merits and be taking decisions independently of the Environmental Clearance
18. The SEIAA, Tamil Nadu may alter/modify the above conditions or stipulate any further conditions in the interest of environment protection.
19. The SEIAA, Tamil Nadu may cancel the Environmental Clearance granted to this project under the provisions of EIA Notification, 2006, at any stage of the validity of this Environmental Clearance, if it is found or if it comes to the knowledge of this SEIAA, TN that the project proponent has deliberately concealed and/or submitted false or misleading information or inadequate data for obtaining the Environmental Clearance.
20. Failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract action under the provisions of the Environment (Protection) Act, 1986.
21. The above conditions will be enforced inter-alia, under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, the Public Liability Insurance Act, 1991, along with their amendments, Minor Mineral Conservation & Development Rules, 2010 framed under MMDR Act 1957, National Commission for protection of Child Right Rules, 2006, Wildlife Protection Act, 1972, Forest Conservation Act, 1980, Biodiversity Conservation Act, 2016, the Biological Diversity

13 AUG 2021

MEMBER SECRETARY
SEIAA-TN

137 A

Act, 2002 and Biological diversity Rules, 2004 and Rules made there under and also any other orders passed by the Hon'ble Supreme Court of India/Hon'ble High Court of Madras and any other Courts of Law relating to the subject matter.

22. Any other conditions stipulated by other Statutory/Government authorities shall be complied.
23. Any appeal against this Environmental Clearance shall lie with the Hon'ble National Green Tribunal, if preferred, within a period of 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010.
24. The Environmental Clearance is issued based on the documents furnished by the project proponent. In case any documents found to be incorrect/not in order at a later date the Environmental Clearance issued to the project will be deemed to be revoked/ cancelled.

MEMBER SECRETARY
SEIAA-TN

Copy to:

1. The Secretary, Ministry of Mines, Government of India, Shastri Bhawan, New Delhi.
2. The Principal Secretary to Government, Environment and Forests Department, Tamil Nadu.
3. The Principal Secretary to Government, Industries Department, Tamil Nadu.
4. The Additional Principal Chief Conservator of Forests, Regional Office (SZ), 34, HEPC Building, 1st& 2nd Floor, Cathedral Garden Road, Nungambakkam, Chennai – 34.
5. The Chairman, Central Pollution Control Board, PariveshBhawan, CBD-Cum-Office Complex, East Arjun Nagar, New Delhi-110 032.
6. The Chairman, TNPC Board, 76, Mount Salai,Guindy, Chennai-32
7. The District Collector, Madurai District.
8. The Commissioner of Geology and Mines,Guindy,Chennai-32
9. EIA Division, Ministry of Environment & Forests, Paryavaran Bhawan, New Delhi.
10. Spare.
11. The president/EO/BDO, Katchaikatti Village Panchayat, Vadipatti Taluk, Madurai District

13 AUG 2021

ENVIRONMENTAL CLEARANCE

PARIVESH

(Pro-Active and Responsive Facilitation by Interactive, and Virtuous Environmental Single-Window Hub)

Government of India
Ministry of Environment, Forest and Climate Change
(Issued by the State Environment Impact Assessment Authority(SEIAA), TAMIL NADU)

To,

The Owner
THIRU S KARUPPASAMY RSG QUARRY
Katchaikatti Village -625001

Subject: Grant of Environmental Clearance (EC) to the proposed Project Activity under the provision of EIA Notification 2006-regarding

Sir/Madam,

This is in reference to your application for Environmental Clearance (EC) in respect of project submitted to the SEIAA vide proposal number SIA/TN/MIN/414272/2023 dated 12 Jan 2023. The particulars of the environmental clearance granted to the project are as below.

1.	**EC Identification No.**	**EC23B001TN142039**
2.	**File No.**	8387
3.	**Project Type**	New
4.	**Category**	B
5.	**Project/Activity including Schedule No.**	1(a) Mining of minerals
6.	**Name of Project**	Katchaikatti Rough stone and Gravel Quarry Project Belongs to S.Karuppasamy over an extent of 1.16.5Ha of Patta lands in S.F.Nos. 1186/2A, 1186/3, 1186/4 of Katchaikatti Village, Vadipatti Taluk, Madurai District, Tamil Nadu State.
7.	**Name of Company/Organization**	THIRU S KARUPPASAMY RSG QUARRY
8.	**Location of Project**	TAMIL NADU
9.	**TOR Date**	N/A

The project details along with terms and conditions are appended herewith from page no 2 onwards.

(e-signed)
Thiru.Deepak S.Bilgi
Member Secretary
SEIAA - (TAMIL NADU)

Date: 12/10/2023

Note: A valid environmental clearance shall be one that has EC identification number & E-Sign generated from PARIVESH.Please quote identification number in all future correspondence.

This is a computer generated cover page.

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

STATE LEVEL ENVIRONMENT IMPACT
ASSESSMENT AUTHORITY – TAMIL NADU
3rd Floor, Panagal Maaligai,
No.1, Jeenis Road, Saidapet,
Chennai-15.
Phone No. 044-24359973
Fax No. 044-24359975

ENVIRONMENTAL CLEARANCE

Lr.No. SEIAA-TN/F.No.8387/1(a)/EC.No:6075/2023, dated:19.09.2023

Sir/Madam,

Sub: SEIAA, TN – Proposed of Rough Stone & Gravel Quarry lease over an extent of 1.16.5Ha in S.F.Nos.1186/2A, 1186/3 & 1186/4 of Katchaikatti Village, Vadipatti Taluk, Madurai District, Tamil Nadu By Thiru.S.Karuppasamy - under project category – "B2" and Schedule S.No.1(a)–Issue of Environmental Clearance – Regarding.

Ref:

1. Your application submitted Terms of Reference dated: 25.02.2021
2. **Tor Issued** letter No. SEIAA-TN/F. No. 8387/SEAC/ToR-972/2021 Dated:05.07.2021.
3. Public Hearing conducted on 05.07.2022
4. Online Proposal No. SIA/TN/MIN/61171/2021, dt: 24.02.2021
5. Project proponent submitted EIA Report to SEIAA-TN on 18.01.2023.
6. Minutes of the 370th Meeting of SEAC held on 25.04.2023
7. Minutes of the 617th Meeting of SEIAA held on 15.05.2023
8. Minutes of the 632nd Meeting of SEIAA held on 21.06.2023
9. Minutes of the 404th SEAC meeting held on 25.08.2023.
10. Minutes of the 655th authority meeting held on 19.09.2023.

Details of Minor Mineral Activity: -

This has reference to your application 4th & 5th cited, the proposal for obtaining Environmental Clearance for mining/quarrying of minor minerals based on the particulars furnished in your application as shown below.

MEMBER SECRETARY
SEIAA-TN

Sl. No	Salient Features of the Proposal		
1.	Name of the Owner/Firm	:	Thiru.S.Karuppasamy S/o.Soolairajan No.9C, Kajastreet, Madurai District
2.	Type of quarrying	:	Rough Stone & Gravel Quarry
3.	S.F Nos. of the quarry site	:	1186/2A, 1186/3 & 1186/4
4.	Village in which situated	:	Katchaikatti
5.	Taluk in which situated	:	Vadipatti
6.	District in which situated	:	Madurai
7.	Extent of quarry (in ha.)	:	1.16.5Ha
8.	Latitude & Longitude of all corners of the quarry site	:	PILLAR ID / LATITUDE / LONGITUDE 1 / 1004'36.47" N / 7800'32.25" E 2 / 1004'32.97" N / 7800'32.06" E 3 / 1004'33.30" N / 7800'29.63" E 4 / 1004'36.17" N / 7800'26.81" E 5 / 1004'36.26" N / 7800'27.40" E
9.	Topo Sheet No.	:	58- J/4
10.	Type of mining	:	Opencast Semi Mechanized Mining
11.	Period of Current Mine Plan		5 years
12.	Production (Quantity in m^3)		33100m^3 of Rough tone & 6912m^3 of Gravel
13.	Depth of Quarrying		22m BGL
14.	Depth of water table	:	55m BGL
15.	Man Power requirement per day:	:	18 Nos.
16.	Water requirement: i) Drinking Water & Domestic Purpose ii) Dust suppression	:	3.5KLD 1.0 KLD 1.5 KLD

MEMBER SECRETARY
SEIAA-TN

	iii) Green belt		1.0 KLD
17.	Power requirement a. Domestic Purpose b. Industrial purpose		TNEB 27,630Liters of HSD
18.	Precise area communication approved by the District Collector with date	:	Rc.No.559/2020-Kanimam, dated: 15.12.2020
19.	Mining Plan approved by Joint Director / Assistant Director (i/c), Department of Geology and Mining with date	:	Roc. No.559/2020-Mines, dated: 27.01.2021
20.	Joint Director / Assistant Director (i/c) mines 500m cluster letter		Roc. No.442/2020-Mines, dated: 02.02.2021
21.	VAO Certificate Regarding Structures within 300m Radius		Letter dated: 09.02.2021
22.	Project Cost (excluding EMP cost)	:	Rs.38.97
23.	EMP cost (in Rs. Lakh).	:	Rs.83.53 Lakhs/ 5 Years
24.	CER cost (in Rs. Lakh).	:	Rs.5 Lakhs
	Validity; **This Environmental Clearance is accorded for the quantity of 33100m^3 of Rough Stone & 6912m^3 of Gravel and the depth upto 22m BGL and the annual peak production should not exceed 6750m^3 of Rough Stone & 3328m^3 of Gravel.** **The Environmental Clearance issued is valid as per the approved mine plan period and as per MoEF&CC's notification S.O.1533(E) dated.14.09.2006 and S.O. 1807(E) dated 12.04.2022**		

AFFIDAVIT FURNHSED BY THE PROPONENT

The Proponent has furnished affidavit in Hundred Rupees stamp paper attested by the Notary stating that

MEMBER SECRETARY
SEIAA-TN

I **S.Karuppasamy** S/o. Soolairajan, aged about 33 years, residing at Door No.9C, Kajastreet, Madurai District, Tamil Nadu State-625 001, solemnly declare and sincerely affirm that, I had applied for getting prior Environment Clearance to SEIAA-Tamil Nadu for rough stone and gravel quarry in Patta land at S.F.No's: 1186/2A, 1186/3 & 1186/4, over an extent of 1.16.5hectares of Katchaikatti Village, Vadipatti Taluk, Madurai District, Tamil Nadu State.

1) I solemnly declare and sincerely affirm that the project doesn't attract general conditions as per EIA notification, 2006.
   a) There are no protected areas notified under the wild life (Protection) Act, 1972 around 10km radius.
   b) No critically polluted areas as notified by the central pollution control board constituted under water (Prevention and Control of Pollution) Act 1974.
   c) No eco-Sensitive areas as notified around 10km radius.
   d) There is no interstate within 10km radius from the boundary of the proposed site.
   e) There is no coastal zone found around 10km radius and this project site doesn't attract CRZ Notification, 2019.

2) I will do the following Corporate Environment Responsibility (CER) activities before commencement of the quarrying activities.

CER Activity	**CER Cost**
Panchayat Union Primary School, Ramayanpatti Village, Vadipatti Taluk, Madurai District.	
Environment related library books & Rack	20,000/-
Drinking Water facilities including Borewell	1,50,000/-
Plantation in School ground	30,000/-
Renovate Toilet facilities with tap water	2,50,000/-
Painting for Budlings	50,000/-
Total Cost Allocation	**Rs. 5,00,000/-**

a) EMP BUDGET (10 Years)

Mitigation measure	**Provision for Implementation**	**Capital in RS**	**Recurring in Rs**
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	12,000	12,000
Fixed Water Sprinkling Arrangements + Water sprinkling by own water tankers	Fixed water Sprinkler with Installation charges and New Water Tanker in Capital	8,00,000	50,000

MEMBER SECRETARY
SEIAA-TN

	cost and Water in recurring cost @ Rs. 150 per tanker @ Water Sprinkling Thrice a day		
Air Quality will be regularly monitored as per norms within ML & Ambient Area	Yearly Compliance as per CPCB norms	0	50,000
Muffle blasting – To control fly rocks during blasting	Blasting face will be covered with sand bags / steel mesh / old tyres / used conveyor belts	0	5,000
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	50,000	5,000
No overloading of trucks/tippers/tractors	Manual Monitoring through Security guard	0	5,000
Stone carrying trucks will be covered by tarpaulin	Monitoring if trucks will be covered by tarpaulin	0	10,000
Enforcing speed limits of 20 km/hr within ML area	Installation of Speed Governers @ Rs. 5000/- per Tipper/Dumper	15,000	0
Regular monitoring of exhaust fumes as per RTO norms	Monitoring of Exhaust Fumes	0	5,000
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	30,000
Installing wheel wash system near gate of quarry	Installation + Maintenance + Supervision	50,000	20,000
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 for all the diesel engines of vehicles.	Provision made in Operating Cost	0	0
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

MEMBER SECRETARY
SEIAA-TN

Proper warning system before blasting will be adopted and clearance of the area before blasting will be ensured.	Blowing Whistle by Mining Mate / Blaster / Competent Person	0	0
Provision for Portable blaster shed	Installation of Portable blasting shelter	50,000	2,000
NONEL blasting	Rs.30/- per 6 ton	0	94,500
Water management	Provision for garland drain @ Rs. 10,000/- per Hectare with maintenance of Rs. 5,000/- per annum	12,000	6,000
Waste management	Provision for domestic waste collection and disposal through authorized agency	25,000	20,000
	Installation of dust bins	5,000	2,000
Bio toilets will be made available outside mine lease on the land of owner itself	Provision made in Operating Cost	0	0
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	10,000	1,000
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)	72,000	18,000
Health checkup for workers will be provisioned	IME & PME Health checkup @ Rs. 1000/- per employee	0	18,000
First aid facility will be provided	Provision of 2 Kits per Hectare @ Rs. 2000/-	0	3,000
Mine will have safety precaution signages, boards.	Provision for signages and boards made	10,000	2,000
Calvinized chain link Fencing of height 3.6m to quarry area will be provisioned (Rs.70/Kg).	Per Hectare fencing Cost @ Rs. 2,00,000/- with Maintenance of Rs 10,000/- per annum	2,20,000	12,000
No parking will be provided on the transport routes.	Parking area with shelter and flags@ Rs. 50,000/- per hectare project and Rs. 10,000/- as maintenance cost	60,000	12,000
Installation of CCTV cameras in the mines and mine entrance	Camera 6 Nos, DVR, Monitor with internet facility	30,000	5,000
Implementation as per Mining Plan and ensure safe quarry working	Mines Manager (1st Class / 2nd Class / Mine Foreman) Mines Geologist and Mining Mate as per MMDR 2017	0	7,80,000
Slope Stability	Slope Stability study and Action Plan	0	0

MEMBER SECRETARY
/SEIAA-TN

Green belt development - 500 trees per one hectare	1200 saplings should plant in the safety areas. (1200 Saplings x Rs.200)	2,40,000	24,000
Green fund G.O.(Ms). No.23, Dated: 28.09.2021	Section IVA of TNMMCR 1959 (an amount at the rate of ten percentage of the seigniorage fee) Seigniorage fee for rough stone = Rs. 59, Gravel= Rs.33	2,18,099	0
	Total	**18.79 Lakhs**	**11.91 Lakhs**

Recurring cost in Year 1	Recurring cost @ 5% inflation Rs in Lakhs								
	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
11.91	12.50	13.12	13.77	14.45	15.17	15.92	16.71	17.54	18.88

Total Recurring cost for 10 years in Lakhs	**Rs. 149.31 Lakhs**
Total Cost (Capital + Recurring) in Lakhs	**Rs. 168.1 Lakhs**

3) Details of quarry located within 500m radius from the periphery of proposed lease area.

i) Existing Quarries:

Sl. No	Name of the Owner	Village	S.F. No	Extent (in hects)	Collector's Proceedings No & date	Lease periods
----Nil----						

ii) Abandoned / Expired Quarries:

Sl. No	Name of the Owner	Village	S.F. No	Extent (in hects)	Collector's Proceedings No & date	Lease periods
1.	S.Jeyaraman	Katchaikatti	86/1B, 1186/5A, 1186/5B & 1186/6A	1.82.5	Roc.No.1429/ 2016, Dt 10.08.2017	18.08.2017 to 17.08.2022
2.	K.Rajesh	Katchaikatti	1185/2, 1185/3, 1185/4, 1185/5, etc.,	1.90.0	Roc.No.1606/ 2016 Dt 10.08.2017	28.08.2017 to 27.08.2022

iii) Present Proposed Quarries:

Sl. No	Name of the Owner	Village	S.F. No	Extent (in hects)
1.	Thiru.S.Karuppasamy	Katchaikatti	1186/2A, 1186/3 & 1186/4	1.16.5

MEMBER SECRETARY
SEIAA-TN

2.	Thiru.K.Ramesh	Katchaikatti	1265/5, 1267/2A etc.,	2.46.0
3.	Tvl.Concretia Rock Products Pvt.Ltd	Katchaikatti	1185/2, 1185/3, 1185/4, 1185/5, 1185/6 & 1185/7B	1.90.0

4) There will not be hindrance or disturbance to the people living no enrooted / nearby our quarry site while transporting the mineral our material and due to quarrying activities.

5) There is no approved habitation within 300m radius from the periphery of our proposed lease area.

6) I swear that afforestation will be carried out during the course of quarrying operation and maintained.

7) The required insurance will be taken in the name of the laborers working in our proposed lease area.

8) The existing road from the main road to quarry is in good condition and the same will be maintained and utilized for transportation of rough stone and gravel.

9) I will not engage any child labor in our quarry site and we aware that engaging child labor is punishable under the law.

10) All types of safety / protective equipment will be provided to all the laborers working in our proposed lease area.

11) No permanent structures, temples etc., are located within 300m radius from the periphery of our proposed lease area.

I ensure to do all the social and Environment commitment as mentioned in the Mining plan to the best of our knowledge.

DETAILS OF QUARRIES LOCATED WITHIN 500M RADIUS FROM THE PROPOSED QUARRY:

The Project Proponent has submitted a copy of the letter obtained from the Joint Director / Assistant Director (i/c), Department of Geology & Mining, Madurai District in his letter Roc. No.442/2020-Mines, dated: 02.02.2021 has stated that the details of other quarries within a radius 500m from the boundary of the proposed quarry site as follows:

i) Existing Quarries:

Sl. No	Name of the Owner	Village	S.F. No	Extent (in hects)	Collector's Proceedings No & date	Lease periods
----Nil----						

MEMBER SECRETARY
SEIAA-TN

ii) Abandoned / Expired Quarries:

Sl. No	Name of the Owner	Village	S.F. No	Extent (in hects)	Collector's Proceedings No & date	Lease periods
1.	S.Jeyaraman	Katchaikatti	86/1B, 1186/5A, 1186/5B & 1186/6A	1.82.5	Roc.No.1429/ 2016, Dt 10.08.2017	18.08.2017 to 17.08.2022
2.	K.Rajesh	Katchaikatti	1185/2, 1185/3, 1185/4, 1185/5, etc.,	1.90.0	Roc.No.1606/ 2016 Dt 10.08.2017	28.08.2017 to 27.08.2022

iii) Present Proposed Quarries:

Sl. No	Name of the Owner	Village	S.F. No	Extent (in hects)
1.	Thiru.S.Karuppasamy	Katchaikatti	1186/2A, 1186/3 & 1186/4	1.16.5
2.	Thiru.K.Ramesh	Katchaikatti	1265/5, 1267/2A etc.,	2.46.0
3.	Tvl.Concretia Rock Products Pvt.Ltd	Katchaikatti	1185/2, 1185/3, 1185/4, 1185/5, 1185/6 & 1185/7B	1.90.0

DISCUSSION BY SEIAA AND THE REMARKS: -

The subject was placed in the 655th authority meeting held on 19.09.2023. The authority noted that the subject was appraised in the 404th SEAC meeting held on 25.08.2023. SEAC has furnished its recommendations for granting Environmental Clearance subject to the conditions stated therein.

After detailed discussions, the Authority taking into account the recommendations of SEAC and also the safety aspects and to ensure sustainable, scientific and systematic mining, decided to grant Environmental Clearance **for the quantity of 33100 m^3 of Rough Stone & 6912 m^3 of Gravel and the depth upto 22m BGL and the annual peak production should not exceed 6750 m^3 of Rough Stone & 3328 m^3 of Gravel.** This is also subject to the conditions imposed by SEAC, normal conditions stipulated by MOEF&CC in addition to the following conditions and the conditions in Annexure 'A' of this minutes.

1. Keeping in view of MoEF&CC's notification S.O.1533(E) dated.14.09.2006 and S.O. 1807(E) dated 12.04.2022, this Environmental Clearance is valid as per the approved mine plan period.
2. The EC granted is subject to review by District Collector, Mines Dept. and TNPCB on completion of every mine plan period, till the project life. They should also review the EC conditions to ensure that they have all been adhered to and implemented.

MEMBER SECRETARY
SEIAA-TN

3. The project proponent shall furnish a Certified Compliance Report obtained from MoEF&CC while seeking a renewal of the mining plan to cover the project life.
4. The progressive and final mine closure plan including the green belt implementation and environmental norms should be strictly followed as per the EMP.
5. As per the OM vide F. No. IA3-22/1/2022-IA-III [E- 172624] Dated: 14.06.2022, the Project Proponents are directed to submit the six-monthly compliance on the environmental conditions prescribed in the prior environmental clearance letter(s) through newly developed compliance module in the PARIVESH Portal from the respective login.
6. The amount allocated for EMP should be kept in a separate account and both the capital and recurring expenditures should be done year wise for the works identified, approved and as committed. The work & expenditure made under EMP should be elaborated in the bi-annual compliance report submitted and also should be brought to the notice of concerned authorities during inspections.
7. The PP shall carryout transplantation/plantation/afforestation of tall native saplings in the ratio1:10 in regard to existing the trees cut down (or) 500 Nos. of Trees per hectare of mining lease area all along the periphery within the proposed mining area and as well as avenue plantation as committed.

Annexure 'A'

a) EC Compliance

1. The Environmental Clearance is accorded based on the assurance from the project proponent that there will be full and effective implementation of all the undertakings given in the Application Form, Pre-feasibilty Report, mitigation measures as assured in the Environmental Impact Assessment/ Environment Management Plan and the mining features including Progressive Mine Closure Plan as submitted with the application.
2. All the conditions as presented by the proponent in the PPT during SEAC appraisal should be addressed in Full.
3. The proponent shall submit Compliance Reports on the status of compliance of the stipulated EC conditions including results of monitored data. It shall be sent to the respective Regional Office of Ministry of Environment, Forests and Climate Change, Govt. of India and also to the Office of State Environment Impact Assessment Authority (SEIAA).
4. Concealing the factual data or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract action under the provisions of Environment (Protection) Act, 1986.

MEMBER SECRETARY
SEIAA-TN

b) **Applicable Regulatory Frameworks**

5. The project proponent shall strictly adhere to the provisions of Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, the Public Liability Insurance Act, 1991, along with their amendments, Minor Mineral Conservation &Development Rules, 2010 framed under MMDR Act 1957, National Commission for protection of Child Right Rules, 2006, Wildlife Protection Act, 1972, Forest Conservation Act, 1980, Biodiversity Conservation Act, 2016, the Biological Diversity Act, 2002, Biological diversity Rules, 2004 & TN Forest Act, 1882 and Rules made there under and also any other orders passed by the Hon'ble Supreme Court of India/Hon'ble High Court of Madras and any other Courts of Law relating to the subject matter

c) **Safe mining Practices**

6. The AD/DD, Dept. of Geology & Mining shall ensure operation of the proposed quarry after the submission slope stability study conducted through the reputed research & Academic Institutions such as NIRM, IITs, NITS Anna University, and any CSIR Laboratories etc.
7. The AD/DD, Dept. of Geology &Mining & Director General of Mine safety shall ensure strict compliance and implementation of bench wise recommendations/action plans as recommended in the scientific slope stability study of the reputed research & Academic Institutions as a safety precautionary measure to avoid untoward accidents during mining operation.
8. A minimum buffer distance specified as per existing rules and statutory orders shall be maintained from the boundary of the quarry to the nearest dwelling unit or other structures, and from forest boundaries or any other ecologically sensitive and archeologically important areas or the specific distance specified by SEIAA in EC as per the recommendations of SEAC depending on specific local conditions.

d) **Water Environment – Protection and mitigation measures**

9. The proponent shall ensure that the activity does not disturb the water bodies and natural flow of surface and groundwater, nor cause any pollution, to water sources in the area.
10. The proponent shall ensure that the activities do not impact the water bodies/wells in the neighboring open wells and bore wells. The proponent shall ensure that the activities do not in any way affect the water quantity and quality in the open wells and bore wells in the vicinity or impact the water table and levels. The proponent shall ensure that the activities do not disturb the river flow, nor affect the Odai, Water bodies, Dams in the vicinity.
11. Water level in the nearest dug well in the downstream side of the quarry should be monitored regularly and included in the Compliance Report.

MEMBER SECRETARY
SEIAA-TN

12. Quality of water discharged from the quarry should be monitored regularly as per the norms of State Pollution Control Board and included in the Compliance Report.
13. Rain Water Harvesting facility should be installed as per the prevailing provisions of TNMBR/TNCDBR, unless otherwise specified. Maximum possible solar energy generation and utilization shall be ensured as an essential part of the project.
14. Regular monitoring of flow rates and water quality upstream and downstream of the springs and perennial nallahs flowing in and around the mine lease area shall be carried out and reported in the compliance reports to SEIAA.
15. Regular monitoring of ground water level and water quality shall be carried out around the mine area during mining operation. At any stage, if it is observed that ground water table is getting depleted due to the mining activity; necessary corrective measures shall be carried out.
16. Garland drains and silt traps are to be provided in the slopes around the core area to channelize storm water. De-silting of Garland canal and silt traps have to be attended on a daily basis. A labour has to be specifically assigned for the purpose. The proponent shall ensure the quality of the discharging storm water as per the General Effluent Discharge Standards of CPCB.

e) Air Environment – Protection and mitigation measures

17. The activity should not result in CO_2 release and temperature rise and add to micro climate alternations.
18. The proponent shall ensure that the activities undertaken do not result in carbon emission, and temperature rise, in the area.
19. The proponent shall ensure that Monitoring is carried out with reference to the quantum of particulate matter during excavation; blasting; material transport and also from cutting waste dumps and haul roads.

f) Soil Environment – Protection and mitigation measures

20. The proponent shall ensure that the operations do not result in loss of soil biological properties and nutrients.
21. The proponent shall ensure that activity does not deplete the indigenous soil seed bank and disturb the mycorrizal fungi, soil organism, soil community nor result in eutrophication of soil and water.
22. The activities should not disturb the soil properties and seed and plant growth. Soil amendments as required to be carried out, to improve soil health.
23. Bio remediation using microorganisms should be carried out to restore the soil environment to enable carbon sequestration.

MEMBER SECRETARY
SEIAA-TN

24. The proponent shall ensure that the mine restoration is done using mycorrizal VAM, vermin-composting, Biofertilizers to ensure soil health and biodiversity conservation.
25. The proponent shall ensure that the topsoil is protected and used in planting activities in the area.
26. The proponent shall ensure that topsoil to be utilized for site restoration and Green belt alone within the proposed area.
27. The top soil shall be temporarily stored at earmarked place (s) and used for land reclamation and plantation. The over burden (OB) generated during the mining operations shall be stacked at earmarked dump site(s) only. The OB dumps should be scientifically vegetated with suitable native species to prevent erosion and surface run off. At critical points, use of geotextile shall be undertaken for stabilization of the dump. Protective wall or gabions should be made around the dump to prevent erosion / flow of sediments during rains. The entire excavated area shall be backfilled.
28. Activities should not result in invasion of site by exotic and alien plant and animal species and disturb the native biodiversity and soil micro flora and fauna.

g) Noise Environment – Protection and mitigation measures

29. The peak particle velocity at 500m distance or within the nearest habitation, whichever is closer shall be monitored periodically as per applicable DGMS guidelines.
30. The sound at project sites disturb the villages in respect of both human and animal population. Consequent sleeping disorders and stress may affect the health in the villages located close to mining operations. Hence, the PP shall ensure that the biological clock of the villages are not disturbed because of the mining activity.

h) Biodiversity - Protection and mitigation measures

31. The proponent should ensure that there is no disturbance to the agriculture plantations, social forestry plantations, waste lands, forests, sanctuary or national parks. There should be no impact on the land, water, soil and biological environment and other natural resources due to the mining activities.
32. No trees in the area should be removed and all the trees numbered and protected. In case trees fall within the proposed quarry site the trees may be transplanted in the Greenbelt zone. The proponent shall ensure that the activities in no way result in disturbance to forest and trees in vicinity. The proponent shall ensure that the activity does not disturb the movement of grazing animals and free ranging wildlife. The proponent shall ensure that the activity does not disturb the biodiversity, the flora & fauna in the ecosystem. The proponent shall ensure that the activity

MEMBER SECRETARY
SEIAA-TN

does not result in invasion by invasive alien species. The proponent shall ensure that the activities do not disturb the resident and migratory birds. The proponent shall ensure that the activities do not disturb the vegetation and wildlife in the adjoining reserve forests and areas around.

33. The proponent shall ensure that the activities do not disturb the agro biodiversity and agro farms. Actions to be taken to promote agroforestry, mixed plants to support biodiversity conservation in the mine restoration effort.
34. The proponent shall ensure that all mitigation measures listed in the EIA/EMP are taken to protect the biodiversity and natural resources in the area.
35. The proponent shall ensure that the activities do not impact green lands/grazing fields of all types surrounding the mine lease area which are food source for the grazing cattle.

i) Climate Change

36. The project activity should not in any way impact the climate and lead to a rise in temperature.
37. There should be least disturbance to landscape resulting in land use change, contamination and alteration of soil profiles leading to Climate Change.
38. Intensive mining activity should not add to temperature rise and global warming.
39. Operations should not result in GHG releases and extra power consumption leading to Climate Change.
40. Mining through operational efficiency, better electrification, energy use, solar usage, use of renewable energy should try to decarbonize the operations.
41. Mining Operation should not result in droughts, floods and water stress, and shortages, affecting water security both on site and in the vicinity.
42. Mining should not result in water loss from evaporation, leaks and wastage and should support to improve the ground water.
43. Mining activity should be flood proof with designs and the drainage, pumping techniques shall ensure climate-proofing and socio-economic wellbeing in the area and vicinity.

j) Reserve Forests & Protected Areas

44. The activities should provide nature based support and solutions for forest protection and wildlife conservation.
45. The project activities should not result in forest fires, encroachments or create forest fragmentation and disruption of forest corridors.
46. There should be no disturbance to the freshwater flow from the forest impacting the water table and wetlands.

MEMBER SECRETARY
SEIAA-TN

47. The project proponent should support all activities of the forest department in creating awareness to local communities on forest conservation.
48. The project activities should not alter the geodiversity and geological heritage of the area.
49. The activities should not result in temperature rise due to increased fossil fuels usage disrupting the behaviour of wildlife and flora.
50. The activities should support and recognise the rights and roles of indigenous people and local communities and also support sustainable development.
51. The project activities should support the use of renewables for carbon capture and carbon storage in the project site and forest surrounds.
52. The project activities should not result in changes in forest structure, habitats and genetic diversity within forests.

k) Green Belt Development

53. The proponent shall ensure that in the green belt development more indigenous trees species (Appendix as per the SEAC Minutes) are planted.
54. The proponent shall ensure the area is restored and rehabilitated with native trees as recommended in SEAC Minutes (in Appendix).

l) Workers and their protection

55. The project proponent is responsible for implementing all the provisions of labour laws applicable from time to time to quarrying /Mining operations. The workers on the site should be provided with on-site accommodation or facilities at a suitable boarding place, protective equipment such as ear muffs, helmet, etc.
56. The proponent has to provide insurance protection to the workers in the case of existing mining or provide the affidavit in case of fresh lease before execution of mining lease.
57. The workers shall be employed for working in the mines and the working hours and the wages shall be implemented/enforced as per the Mines Act, 1952.

m) Transportation

58. No Transportation of the minerals shall be allowed in case of roads passing through villages/ habitations. In such cases, PP shall construct a bypass road for the purpose of transportation of the minerals leaving an adequate gap (say at least 200 meters) so that the adverse impact of sound and dust along with chances of accidents could be mitigated. All costs resulting from widening and strengthening of existing public road network shall be borne by the PP in consultation with nodal State Govt. Department. Transportation of minerals through road movement in case of existing village/ rural roads shall be allowed in consultation with nodal

MEMBER SECRETARY
SEIAA-TN

State Govt. Department only after required strengthening such that the carrying capacity of roads is increased to handle the traffic load. The pollution due to transportation load on the environment will be effectively controlled and water sprinkling will also be done regularly. Vehicular emissions shall be kept under control and regularly monitored. Project should obtain Pollution Under Control (PUC) certificate for all the vehicles from authorized pollution testing centers.

59. The Main haulage road within the mine lease should be provided with a permanent water sprinkling arrangement for dust suppression. Other roads within the mine lease should be wetted regularly with tanker-mounted water sprinkling system. The other areas of dust generation like crushing zone, material transfer points, material yards etc. should invariably be provided with dust suppression arrangements. The air pollution control equipments like bag filters, vacuum suction hoods, dry fogging system etc. shall be installed at Crushers, belt-conveyors and other areas prone to air pollution. The belt conveyor should be fully covered to avoid generation of dust while transportation. PP shall take necessary measures to avoid generation of fugitive dust emissions.

n) Storage of wastes

60. The project proponent shall store/dump the waste generated within the earmarked area of the project site for mine closure as per the approved mining plan.

o) CER/EMP

61. The CER should be fully Implemented and fact reflected in the Half-yearly compliance report.
62. The EMP shall also be implemented in consultation with local self-government institutions & Govt. departments.
63. The follow-up action on the implementation of CER Shall be included in the compliance report.

p) Directions for Reclamation of mine sites

64. The mining closure plan should strictly adhere to appropriate soil rehabilitation measures to ensure ecological stability of the area. Reclamation/Restoration of the mine site should ensure that the Geotechnical, physical, chemical properties are sustainable that the soil structure composition is buildup, during the process of restoration.
65. The proponent shall ensure that the mine closure plan is followed as per the mining plan and the mine restoration should be done with native species, and site restored to near original status. The proponent shall ensure that the area is ecologically restored to conserve the ecosystems and ensure flow of goods and services.

MEMBER SECRETARY
SEIAA-TN

66. A crucial factor for success of reclamation site is to select sustainable species to enable develop a self-sustaining eco system. Species selected should easily establish, grow rapidly, and possess good crown and preferably be native species. Species to be planted in the boundary of project site should be un palatable for cattle's/ goats and should have proven capacity to add leaf-litter to soil and decompose. The species planted should be adaptable to the site conditions. Should be preferably pioneer species, deciduous in nature to allow maximum leaf-litter, have deep root system, fix atmospheric nitrogen and improve soil productivity. Species selected should have the ability to tolerate altered pit and toxicity of and site. They should be capable of meeting requirement of local people in regard to fuel fodder and should be able to attract bird, bees and butterflies. The species should be planted in mixed association.
67. For mining area reclamation plot culture experiments to be done to identify/ determine suitable species for the site.
68. Top soil with a mix of beneficial microbes (Bacteria/Fungi) to be used for reclamation of mine spoils. AM Fungi (Arbuscular mycorrhizal fungi), plant growth promoting Rhizo Bacteria and nitrogen fixing bacteria to be utilized.
69. Soil and moisture conservation and water harvesting structures to be used where ever possible for early amelioration and restoration of site.
70. Top soil is most important for successful rehabilitation of mined sites. Topsoil contains majority of seeds and plant propagation, soil microorganism, Organic matter and plant nutrients. Wherever possible the topsoil should be immediately used in the area of the for land form reconstruction, to pre mining conditions.
71. Over burdens may be analyzed and tested for soil characteristics and used in the site for revegetation. Wherever possible seeds, rhizome, bulbs, etc of pioneering spices should be collected, preserved and used in restoring the site.
72. Native grasses seeds may be used as colonizers and soil binders, to prevent erosion and allow diverse self- sustaining plant communities to establish. Grasses may offer superior tolerance to drought, and climatic stresses.
73. Reclamation involves planned topographical reconstruction of site. Care to be taken to minimize erosion and runoff. Topsoils should have necessary physical, chemicals, ecological, properties and therefore should be stored with precautions and utilized for reclamation process. Stocked topsoil should be stabilized using grasses to protect from wind. Seeds of various indigenous and local species may be broad casted after topsoil and treated overburden are spread.

MEMBER SECRETARY
SEIAA-TN

74. Alkaline soils, acidic soils, Saline soils should be suitably treated/amended using green manure, mulches, farmyard manure to increase organic carbon. The efforts should be taken to landscape and use the land post mining. The EMP and mine closure plan should provide adequate budget for re-establishing the site to pre-mining conditions. Effective steps should be taken for utilization of over burden. Mine waste to be used for backfilling, reclamation, restoration, and rehabilitation of the terrain without affecting the drainage and water regimes. The rate of rehabilitation should be similar to rate of mining. The land disturbed should be reshaped for long term use. Mining should be as far as possible be eco-friendly. Integration of rehabilitation strategies with mining plan will enable speedy restoration.
75. Efforts should to taken to aesthetically improve the mine site. Generally, there are two approaches to restoration i.e Ecological approach which allows tolerant species to establish following the succession process allowing pioneer species to establish. The other approach i.e plantation approach is with selected native species are planted. A blend of both methods may be used to restore the site by adding soil humus and mycorrhiza.
76. Action taken for restoration of the site should be specifically mentioned in the EC compliances.

CONDITIONS IMPOSED BY SEAC:

1. The SEIAA is requested to seek a clarification from the office of the Competent Authority over the omission of the mine operated M/s. Concretia Rock Products Pvt Ltd in S.F. No. 1185/1 in the cluster area letter.
2. The prior Environmental Clearance granted for this mining project shall be valid for the project life including production value as laid down in the mining plan approved and renewed by competent authority, from time to time, subject to a maximum of thirty years, whichever is earlier **vide MoEF&CC Notification S.O. 1807(E) dated 12.04.2022**.
3. The mine manager and other statutory competent persons such as blaster (or) mine mate shall be appointed before the commencement of mining operation as per the provisions of Mines Act 1952 and Metalliferrous Mines Regulations, 1961.
4. The PP shall submit the 'Notice of Opening' of the quarry to the Regional Inspector/Director of Mines Safety, Chennai Region under the section 16 of the Mines Act, 1952 and in accordance with the Reg. 3 of MMR 1961 before obtaining the CTO.

MEMBER SECRETARY
SEIAA-TN

5. The proponent shall create a separate bank account and shall deposit the cost allocated for the committed EMP activities every year and the said expenditure details spent on the committed EMP activities shall be maintained & periodically submitted to TNPCB.
6. Since the Reserve Forest is situated at a distance of 160 m from the lease, the PP shall carry out the following Mitigation Measures:
    a. The PP shall develop Green Belt (Thick Tree plantation in three rows) **along the boundary of the mine lease area along the embankment of the odai / canal** existing adjacent to the lease before obtaining the CTO from the TNPCB.
    b. The proponent shall construct and maintain proper fencing all around the boundary of the proposed working quarry adjacent to the direction of the location of the Reserved Forest before the commencement of the operation and shall furnish the photographs showing the same before obtaining the CTO from TNPCB.
    c. The PP shall take steps so that the overburden, waste rock, rejects and fines generated during the mining operations shall be stored in separate dumps positioned in opposite direction to the location of the reserved forest.
    d. The PP shall ensure that such waste/reject dumps shall be properly secured to prevent escape of material there from in harmful quantities which may cause degradation of environment and to prevent causation of floods.
    e. The PP shall select the site for dumps on impervious ground to ensure minimum leaching effects due to precipitations.
    f. The PP shall take necessary steps that wherever possible, the waste rock, overburden etc. shall be back-filled into the mine excavations with a view to restoring the land to its original use as far as possible.
    g. Wherever back-filling of waste rock in the area excavated during mining operations is not feasible, the PP shall take adequate steps in discussion with the concerned DFO to suitably terrace the waste dumps ensuring the stability through vegetation to consolidate the green belt development in the areas adjacent to the reserved forest location.
    h. The PP shall carry out the scientific investigations in order to keep the ground and noise vibrations caused by blasting operations and movement of HEMM such as Excavators, Trucks within safe limit.

MEMBER SECRETARY
SEIAA-TN

i. The PP shall not perform secondary breakage involving the drilling & blasting in the quarrying operations and it can be replaced with non-conventional methods such as noise-controlled rock breakers, usage of non-explosive expansive materials/chemicals, Hydraulic Splitting based on the suitable scientific studies carried out by any reputed scientific and academic institutions.

j. The PP shall take adequate steps to control the air pollution due to fines, dust, smoke or gaseous emissions during the quarrying operations within 'Permissible Limits' specified under the environmental laws.

k. The Quarrying and Mining activities shall be restricted in the Eco-sensitive Zone of 60 m from the boundary of the Reserved area and hence the PP shall not even indulge in constructing the haul roads in these areas.

l. No development on existing steep hill slopes or slopes with a high degree of erosion shall be permitted. Hence, the PP shall not carry out the quarrying on steep hill slopes with a gradient of 200 or more or areas with a high degree of erosion on forestland.

m. The PP shall give an affidavit at the time of lease execution that there will be no felling of trees (or) any encroachment will not be made on these Reserved Forest lands and also within the Eco- sensitive Zone of 60 m without the prior permission of the State Government in case of reserve forest land as per the procedures laid down by the State Government.

n. The PP shall not use plastic carry bags within the quarry area.

o. The PP shall ensure that all the haul roads within the quarry lease shall be provided with adequate number of road side drains and these drains shall be kept free form blockage for runoff disposals. This run off from the road side drainage shall relate to the natural drainage system in the area.

p. The PP shall adhere to the provisions of the MoEF had issued Notification No. S.O. 1545 dated 25th June 2009 regulating certain activities in the eco-sensitive zone to conserve and protect the reserved forest area from ecological and environmental point of view.

7. The PP shall carry out the scientific studies within a period of six months from the commencement of mining operations, for reducing the 'Cumulative impact of blast-induced ground/air vibrations, fly rock and dust by adopting suitable Controlled Blasting Operations', by involving a reputed Research and Academic Institution such as CSIR-Central Institute of Mining & Fuel Research (CIMFR) / Dhanbad, NIRM, IIT-Madras, NIT-Dept of Mining Engg.

MEMBER SECRETARY
SEIAA-TN

Surathkal, and Anna University Chennai-CEG Campus, etc. A copy of such scientific study report shall be submitted to the SEIAA, MoEF, TNPCB, AD/Mines-DGM and DMS, Chennai as a part of Environmental Compliance without deviation.

8. The Project Proponent (PP) shall submit a 'Slope stability action plan' incorporating the haul road ramp keeping the existing benches properly aligned for the proposed quarry lease after it is duly vetted by the concerned AD (Mines) before obtaining CTO from TNPCB.
9. However, the PP shall carry out the scientific studies to assess the slope stability of the benches and quarry wall when the depth of the quarry touches 30 m (or) after the completion of 3 years of operation whichever is earlier, by involving a reputed Research and Academic Institution such as CSIR-Central Institute of Mining & Fuel Research (CIMFR) / Dhanbad, NIRM, IIT-Madras, NIT-Dept of Mining Engg, Surathkal, and Anna University Chennai-CEG Campus, etc. A copy of such scientific study report shall be submitted to the SEIAA, MoEF, TNPCB, AD/Mines-DGM and DMS, Chennai as a part of Environmental Compliance without any deviation.
10. Further, the PP shall furnish necessary application to the Regional Inspector of Mines, DGMS, Chennai Region (DMS, Chennai) for obtaining the relaxation as per the provisions given in the Reg. 106 & Reg. 111 of MMR 1961 while working in the cluster situation within a period of six months from the commencement of mining operation.
11. Since the quarry site lies in the cluster situation, the PP shall furnish a 'Standard Operating Procedure' for carrying out the safe method of carrying out the controlled blasting operation to the concerned DEE/TNPCB before obtaining the CTO from the TNPCB.
12. The PP shall use the jack hammer drill machine fitted with the dust extractor for the drilling operations such that the fugitive dust is controlled effectively at the source.
13. The PP shall ensure that the blasting operations are carried out by only the statutory persons like Blaster/Mine Mate/Mine Foreman directly employed by him as per the provisions of MMR 1961 and it shall not be carried out by the persons other than the above statutory personnel.
14. The PP shall ensure that adequate measures are taken to control the propagation of dust at the source level along the haulroads leading to the highways & village panchayat roads where the trucks are plying with loaded material.
15. The PP shall meticulously carry out the mitigation measures as spelt out in the revised EMP.
16. The PP shall undertake suitable measures for the socio-economic development in the villages situated around the quarry.

MEMBER SECRETARY
SEIAA-TN

17. Proper barriers to reduce noise level and dust pollution should be established by providing greenbelt along the boundary of the quarrying site and suitable working methodology to be adopted by considering the wind direction.
18. 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 adhere EMP furnished.
19. As accepted by the Project proponent the CER cost is Rs. **5 lakhs** and the amount shall be spent for the Panchayat Union Primary School, Ramayampatti as committed, before obtaining CTO from TNPCB.
20. The PP shall inform send the 'Notice of Opening' of the quarry to the Director of Mines Safety, Chennai Region before obtaining the CTO from the TNPCB.
21. The Project Proponent shall abide by the annual production scheduled specified in the approved mining plan and if any deviation is observed, it will render the Project Proponent liable for legal action in accordance with Environment and Mining Laws.
22. The proponent shall appoint the statutory competent persons relevant to the proposed quarry size as per the provisions of Mines Act 1952 and Metalliferous Mines Regulations, 1961, as amended from time to time.
23. Within a period one month from the execution of lease deed, the PP shall ensure that the persons deployed in the quarry including all the contractual employees/truck drivers shall undergo initial/periodical training in the DGMS approved GVTC situated in Trichy / Salem / Hosur.
24. The PP shall construct a garland drain of size, gradient and length around the proposed quarry incorporating garland canal, silt traps, siltation pond and outflow channel connecting to a natural drain should be provided prior to the commencement of mining. Garland drain, silt-traps, siltation ponds and outflow channel should be de-silted periodically and geo-tagged photographs of the process should be included in the HYCR.
25. Monitoring of drainage water should be carried out at different seasons by an NABL accredited lab and clear water should only be discharged into the natural stream. Geo-tagged photographs of the drainage and sampling site should be submitted along with HYCR.
26. The proponent shall install the 'S3 (or) G2' type of fencing all around the boundary of the proposed working quarry with gates for entry/exit before the commencement of the operation as recommended in the DGMS Circular, 11/1959 and shall furnish the photographs showing the same before obtaining the CTO from TNPCB.

MEMBER SECRETARY
SEIAA-TN

27. The Proponent shall submit a conceptual 'Slope Stability Action Plan' incorporating the benches & accessible haul road approved by the concerned AD (Mines) for the proposed quarry to the DEE/TNPCB at the time of obtaining the CTO.
28. The PP shall ensure that the persons employed in the quarry whether permanent, temporary or contractual are undergoing the initial/periodical medical examination in the DGMS approved OHS Clinics/Hospitals as per the DGMS Circular No. 01 of 2011 before they are engaged in mining activities.
29. The PP shall ensure that the persons employed in the quarry whether permanent, temporary or contractual are provided with adequate PPEs before engaged in mining operations.
30. The PP shall meticulously carry out the mitigation measures as spelt out in the approved EMP.
31. Proper barriers to reduce noise level and dust pollution should be established by providing greenbelt along the boundary of the quarrying site and suitable working methodology should be adopted by considering the wind direction.
32. The Project Proponent shall ensure that the funds earmarked for environmental protection measures are kept in a separate bank account and should not be diverted for other purposes. Year-wise expenditure should be included in the HYCR.
33. The Project Proponent shall send a copy of the EC to the concerned Panchayat/local body.
34. Perennial maintenance of haulage road/village / Panchayat Road shall be done by the project proponent as required, in coordination with the concerned Govt. Authority.
35. Perennial sprinkling arrangements shall be in place on the haulage road for fugitive dust suppression. Fugitive emission measurements should be carried out during the mining operation at regular intervals and submit the consolidated report to TNPCB once in six months.
36. The Proponent shall ensure that the noise level is monitored during mining operation at the project site for all the machineries deployed and adequate noise level reduction measures are undertaken accordingly. The report on the periodic monitoring shall be included in the HYCR.
37. Proper barriers to reduce noise level and dust pollution should be established by providing greenbelt along the boundary of the quarrying site and suitable working methodology to be adopted by considering the wind direction.
38. 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. 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.

MEMBER SECRETARY
SEIAA-TN

39. Taller/one year old saplings raised in appropriate size of bags (preferably eco-friendly bags) should be planted in proper spacing 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.
40. **Noise and Vibration Related:** (i) Appropriate measures should be taken for control of noise levels below 85 dBA in the work environment. Workers engaged in operations of HEMM, etc. should be provided with ear plugs/muffs, (ii) Noise levels should be monitored regularly (on weekly basis) near the major sources of noise generation within the core zone.
41. The PP shall carry out maximum of only one round of controlled blast per day, restricted to the maximum of 30 to 40 number of holes per round with maintaining maximum charge per delay in such a manner that the blast-induced ground vibration level (Peak Particle Velocity) measured in the houses/structures located at a distance of 500 m shall not exceed 2.0 mm/s and no fly rock shall travel beyond 20 m from the site of blasting.
42. The PP shall also ensure that the blasting operations are not carried out on a 'day after day' basis and a minimum 24 hours break should be observed between blasting days to reduce the environmental impacts effectively.
43. If 'Deep-hole large diameter drilling and blasting' is required, then the PP shall obtain special permission from DGMS.
44. The PP shall ensure that the blasting operations shall be carried out during a prescribed time interval with a prior notice to the habitations situated around the proposed quarry after having posted the sentries/guards adequately to confirm the non-exposure of public within the danger zone of 500 m from the boundary of the quarry. The PP shall use the jack hammer drill machine fitted with the dust extractor for the drilling operations such that the fugitive dust is controlled effectively at the source.
45. The PP shall ensure that the blasting operations are carried out by the blaster/Mine Mate/Mine Foreman employed by him in accordance with the provisions of MMR 1961 and it shall not be carried out by the persons other than the above statutory personnel.
46. The proponent shall undertake in a phased manner restoration, reclamation and rehabilitation of lands affected by the quarrying operations and shall complete this work before the conclusion of such operations as per the Environmental Management Plan& the approved Mine Closure Plan.

MEMBER SECRETARY
SEIAA-TN

47. Ground water quality monitoring should be conducted once in every six months and the report should be submitted to TNPCB.

48. The operation of the quarry should not affect the agricultural activities & water bodies near the project site and a 50 m safety distance from water body should be maintained without carrying any activity. The proponent shall take appropriate measures for "Silt Management" and prepare a SOP for periodical de-siltation indicating the possible silt content and size in case of any agricultural land exists around the quarry.

49. The proponent shall provide sedimentation tank / settling tank with adequate capacity for runoff management.

50. The proponent shall ensure that the transportation of the quarried granite stones shall not cause any hindrance to the Village people/Existing Village Road and shall take adequate safety precautionary measures while the vehicles are passing through the schools / hospital. The Project Proponent shall ensure that the road may not be damaged due to transportation of the quarried granite stones; and transport of granite stones will be as per IRC Guidelines with respect to complying with traffic congestion and density.

51. To ensure safety measures along the boundary of the quarry site, security guards are to be posted during the entire period of the mining operation.

52. The Project Proponent shall comply with the provisions of the Mines Act, 1952, MMR 1961 and Mines Rules 1955 for ensuring safety, health and welfare of the people working in the mines and the surrounding habitants.

53. The project proponent shall ensure that the provisions of the MMDR Act, 1957&the MCDR 2017 and Tamilnadu Minor Mineral Concession Rules 1959 are compiled by carrying out the quarrying operations in a skillful, scientific and systematic manner keeping in view proper safety of the labour, structure and the public and public works located in that vicinity of the quarrying area and in a manner to preserve the environment and ecology of the area.

MEMBER SECRETARY
SEIAA-TN

54. The quarrying activity shall be stopped if the entire quantity indicated in the Mining plan is quarried even before the expiry of the quarry lease period and the same shall be informed to the District AD/DD (Geology and Mining) District Environmental Engineer (TNPCB) and the Director of Mines Safety (DMS), Chennai Region by the proponent without fail.

55. The Project Proponent shall abide by the annual production scheduled specified in the approved mining plan and if any deviation is observed, it will render the Project Proponent liable for legal action in accordance with Environment and Mining Laws.

56. All the conditions imposed by the Assistant/Deputy Director, Geology & Mining, concerned District in the mining plan approval letter and the Precise area communication letter issued by concerned District Collector should be strictly followed.

57. That the grant of this E.C. is issued from the environmental angle only, and does not absolve the project proponent from the other statutory obligations prescribed under any other law or any other instrument in force. The sole and complete responsibility, to comply with the conditions laid down in all other laws for the time-being in force, rests with the project proponent.

58. As per the directions contained in the OM F.No.22-34/2018-IA.III dated 16th January 2020 issued by MoEFCC, the Project Proponent shall, undertake re-grassing the mining area and any other area which may have been disturbed due to his mining activities and restore the land to a condition which is fit for growth of fodder, flora, fauna etc. The compliance of this direction shall be included in the Half Yearly Compliance Report which will be monitored by SEAC at regular intervals.

59. The mining lease holders shall, after ceasing mining operations, undertake re-grassing the mining area and any other area which may have been disturbed due to their mining activities and restore the land to a condition which is fit for growth of fodder, flora, fauna etc.

60. 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 adhere to the EMP as committed.

MEMBER SECRETARY
SEIAA-TN

Appendix -I
List of Native Trees Suggested for Planting

No	Scientific Name	Tamil Name	Tamil Name
1	*Aegle marmelos*	Vilvam	வில்வம்
2	*Adenaanthera pavonina*	Manjadi	மஞ்சாடி, ஆனைக்குன்றிமணி
3	*Albizia lebbeck*	Vaagai	வாகை
4	*Albizia amara*	Usil	உசில்
5	*Bauhinia purpurea*	Mantharai	மந்தாரை
6	*Bauhinia racemosa*	Aathi	ஆத்தி
7	*Bauhinia tomentos*	Iruvathi	இருவாத்தி
8	*Buchanania axillaris*	Kattuma	காட்டுமா
9	*Borassus flabellifer*	Panai	பனை
10	*Butea monosperma*	Murukkamaram	முருக்கமரம்
11	*Bobax ceiba*	Ilavu, Sevvilavu	இலவு
12	*Calophyllum inophyllum*	Punnai	புன்னை
13	*Cassia fistula*	Sarakondrai	சரக்கொன்றை
14	*Cassia roxburghii*	Sengondrai	செங்கொன்றை
15	*Chloroxylon sweitenia*	Purasamaram	புரசு மரம்
16	*Cochlospermum religiosum*	Kongu, Manjalllavu	கோங்கு, மஞ்சள் இலவு
17	*Cordia dichotoma*	Naruvuli	நருவுளி
18	*Crateva adansoni*	Mavalingum	மாவிலங்கம்
19	*Dillenia indica*	Uva, Uzha	உசா
20	*Dillenia pentagyna*	SiruUva, Sitruzha	சிறு உசா
21	*Diospyro sebenum*	Karungali	கருங்காலி
22	*Diospyro schloroxylon*	Vaganai	வாகனை
23	*Ficus amplissima*	Kalltchi	கல் இச்சி
24	*Hibiscus tiliaceou*	Aatrupoovarasu	ஆற்றுப்பூவரசு
25	*Hardwickia binata*	Aacha	ஆச்சா
26	*Holoptelia integrifolia*	Aayili	ஆயா மரம், ஆயிலி
27	*Lannea coromandelica*	Odhiam	ஓதியம்
28	*Lagerstroemia speciosa*	Poo Marudhu	பூ மருது
29	*Lepisanthus tetraphylla*	Neikottaimaram	நெய் கொட்டை மரம்
30	*Limonia acidissima*	Vila maram	விலா மரம்
31	*Litsea glutinos*	Pisinpattai	அரம்பா, பிசின்பட்டை
32	*Madhuca longifolia*	Illuppai	இலுப்பை
33	*Manilkara hexandra*	UlakkaiPaalai	உலக்கை பாலை
34	*Mimusops elengi*	Magizhamaram	மகிழமரம்
35	*Mitragyna parvifolia*	Kadambu	கடம்பு
36	*Morinda pubescens*	Nuna	நுணா
37	*Morinda citrifolia*	Vellai Nuna	வெள்ளை நுணா
38	*Phoenix sylvestre*	Eachai	ஈச்சமரம்
39	*Pongamia pinnat*	Pungam	புங்கம்

MEMBER SECRETARY
SEIAA-TN

40	*Premna mollissima*	Munnai	முன்னை
41	*Premna serratifolia*	Narumunnai	நறு முன்னை
42	*Premna tomentosa*	Malaipoovarasu	மலை பூவரசு
43	*Prosopis cinerea*	Vanni maram	வன்னி மரம்
44	*Pterocarpus marsupium*	Vengai	வேங்கை
45	*Pterospermum canescens*	Vennangu, Tada	வெண்ணாங்கு
46	*Pterospermum xylocarpum*	Polavu	புலவு
47	*Puthranjiva roxburghi*	Karipala	கறிபாலா
48	*Salvadora persica*	Ugaa Maram	உகா மரம்
49	*Sapindus emarginatus*	Manipungan, Soapukai	மணிப்புங்கன் சோப்புக்காய்
50	*Saraca asoca*	Asoca	அசோகா
51	*Streblus asper*	Piray maram	பிராய் மரம்
52	*Strychnos nuxvomic*	Yetti	எட்டி
53	*Strychnos potatorum*	Therthang Kottai	தேத்தான் கொட்டை
54	*Syzygium cumini*	Naval	நாவல்
55	*Terminaia belleric*	Thandri	தான்றி
56	*Terminalia arjuna*	Ven marudhu	வெண் மருது
57	*Toona ciliate*	Sandhana vembu	சந்தன வேம்பு
58	*Thespesia populnea*	Puvarasu	பூவரசு
59	*Walsuratrifoliata*	valsura	வால்சுரா
60	*Wrightia tinctoria*	Veppalai	வெப்பாலை
61	*Pithecellobium dulce*	Kodukkapuli	கொடுக்காப்புளி

Appendix –II
Display Board
(Size 6' x5' with Blue Background and White Letters)

.....கரங்கம்

கரங்களில் குவாரி செயல்பாடுகளுக்கான சுற்றுச்சூழல் அனுமதி கீழ்கண்ட நிபந்தனைகளுக்கு உட்பட்டு வழங்கப்பட்டுள்ளது SEIAA/.....தேதியிடப்பட்டு, சுற்றுச்சூழல் அனுமதி _____தேதி வரை செல்லத்தக்கதாக உள்ளது

பகுதி வரைபடம் மேற்பார்வைக்கான கரங்கத் திட்டம்	குவாரியின் எல்லைகளைக் குறிக்க வேலி அமைக்க வேண்டும்
	கரங்கப்பரப்பைச் சுற்றி ஆழம் நிலமட்டத்திலிருந்து ___ மீட்டருக்கு மிகாமல் இருக்க வேண்டும்
	காற்றில் மாசு ஏற்படாதவாறு கரங்க பணிகளை மேற்கொள்ள வேண்டும்.
நடப்பட்டு பராமரிக்கப்படவேண்டிய மரங்களை எண்ணிக்கை	வாகனங்கள் செல்லும் பாதையில் மாசு ஏற்படாத அளவிற்கு தண்ணீரை முறையாக தண்ணீர் லாரிகளின் மூலமாக அவ்வப்போது தெளிக்க வேண்டும்
	இரைச்சல் அளவையும் தூசி மாசுபாட்டையும் குறைப்பதற்காக குவாரியின் எல்லையை சுற்றி அடர்த்தியான பசுமை பகுதியை ஏற்படுத்த வேண்டும்.
கரங்கத்தில் வெடி வைக்கும்பொழுது நிலஅதிர்வுகள் ஏற்படாதவாறும் மற்றும் கற்கள் பறக்காதவாறும் பாதுகாப்பு நடவடிக்கைகளை உள்ளிப்பாக செயல்படுத்தப்பட வேண்டும்	
கரங்கத்தில் இருந்து ஏற்படும் இரைச்சல் அளவு 85 டெசிபல்ஸ் (dBA) அளவிற்கு மேல் ஏறபடாதவாறு தகுந்த கட்டுப்பாடுகளை மேற கொள்ள வேண்டும்.	
கரங்க சட்ட விதிகள் 1955 கீழ் கரங்கத்தில் உள்ள பணியார்களுக்கு தகுந்த பாதுகாப்பு கருவிகள் வழங்கவதோடு கண்காணிப்பும் கடிப்பறை வசதிகளை செய்து தர வேண்டும்.	
சிறமம் அல்லது பஞ்சாயத்து வழியாக வாகனங்கள் செல்லும் சாலையை தொடர்ந்து நன்கு பராமரிக்க வேண்டும்.	
கரங்கப்பணிகளால் அருகில் உள்ள விவசாயப் பணிகள் மற்றும் நிர்நிலைகள் பாதிக்கப்படக் கூடாது.	
நிர்நிலைகள் பாதிக்கப்படாமல் இருப்பதை உறுதி செய்யும் வகையில் நிலத்தடி நிரின் தரத்தினை தொடர்ந்து கண்காணிக்க வேண்டும்.	
கரங்கத்திலிருந்து கனிம பொருட்களை எடுத்துச் செல்வது சிறம மக்களுக்கு எந்தத் சிறமத்தினையும் ஏற்படுத்தாதவாறு பாதுகாப்போடும் மற்றும் சுற்றுச்சூழல் பாதிக்கவாத வண்ணம் வாகனங்களை இயக்க வேண்டும்.	
கரங்கப்பணிகள் முடிக்கப்பட்டவுடன் கரங்க மூடல் திட்டத்தில் உள்ளவாறு கரங்கத்தினை மூட வேண்டும்	
கரங்க நடவடிக்கைகளை முடித்தபின்னர் கரங்கப் பகுதி மற்றும் கரங்க நடவடிக்கைகளால் இடையூறு ஏற்படக்கூடிய வேறு எந்தப் பகுதியையும் மறுசுழற்சுமான செய்து தாவரங்கள் விலங்குகள் ஆகியவற்றின் வளர்சிக்கு ஏற்ற வகையில் பசுமைப்பகுதியை உருவாக்க வேண்டும்.	
முழுமையான நிபந்தனைகளை கூடிய பார்வையிட (http://parivesh.nic.in) எனும் இணையதளத்தையும் பார்வையிடவும் மேலும் எந்தவித சுற்றுச்சூழல் சார்ந்த புகார்களுக்கு சென்னையில் உள்ள சுற்றுச்சூழல் மற்றும் வன அமைச்சகத்தின் ஒருங்கிணைந்த வட்டார அலுவலகம்: 044 – 28222325 (அல்லது) தமிழ்நாடு மாசு கட்டுப்பாடு வாரியத்தில் மாவட்ட சுற்றுச்சூழல் பொறியாளரை அணுகவும்	

MEMBER SECRETARY
SEIAA-TN

STANDARD CONDITIONS

1. **Part-A: Conditions to be Complied before commencing mining operations: -**

1. **The project proponent shall advertise in at least two local newspapers widely circulated in the region, one of which shall be in the vernacular language informing the public that** I. **The project has been accorded Environmental Clearance.** II. **Copies of clearance letters are available with the Tamil Nadu Pollution Control Board.** III. **Environmental Clearance may also be seen on the website of the SEIAA.** IV. **The advertisement should be made within 7 days from the date of receipt of the clearance letter and a copy of the same shall be forwarded to the SEIAA.**

2. Mining activity should be reviewed by the District Collector after three years and decide for further extension.
3. NOC from the Standing committee of the NBWL shall be obtained, if protected areas are located within 10 Km from the proposed project site.
4. The project proponent shall comply the conditions laid down in the Section V, Rule 36 of Tamil Nadu Minor Minerals Concession Rules 1959.
5. **A copy of the Environment Clearance letter shall be sent by the proponent to the concerned Panchayat, Town Panchayat / Panchayat union/ Municipal Corporation, Urban Local Body and the Local NGO, if any, from whom suggestions/ representations, if any, were received while processing the proposal. The clearance letter shall also be put on the website of the proponent and also kept at the site, for the general public to see.**
6. Quarry lease area should be demarcated on the ground with wire fencing to show the boundary of the lease area on all sides with red flags on every pillar shall be erected before commencement of quarrying.
7. The proponent shall ensure that First Aid Box is available at site.
8. The excavation activity shall not alter the natural drainage pattern of the area.
9. The excavated pit shall be restored by the project proponent for useful purposes.
10. The proponent shall quarry and remove only in the permitted areas as per the approved Mining Plan details.
11. The quarrying operation shall be restricted between 7AM and 5 PM.

MEMBER SECRETARY
SEIAA-TN

12. The proponent shall take necessary measures to ensure that there shall not be any adverse impacts due to quarrying operation on the nearby human habitations, by way of pollution to the environment.
13. A minimum distance of 50mts. from any civil structure shall be kept from the periphery of any excavation area.
14. Depth of quarrying should be as per approved mining plan.
15. The mined out pits should be backfilled where warranted and area should be suitably landscaped to prevent environmental degradation. The mine closure plan as furnished in the proposal shall be strictly followed with back filling and tree plantation.
16. Wet drilling method is to be adopted to control dust emissions. Delay detonators and shock tube initiation system for blasting shall be used so as to reduce vibration and dust.
17. Drilling and blasting shall be done only either by licensed explosive agent or by the proponent after obtaining required approvals from Competent Authorities.
18. Blasting shall be carried out after announcing to the public adequate through public address system to avoid any accident.
19. A study has to be conducted to assess the optimum blast parameters and blast design to keep the vibration limits less than prescribed levels and only such design and parameters should be implemented while blasting is done. Periodical monitoring of the vibration at specified location to be conducted and records kept for inspection.
20. The Proponent shall take appropriate measures to ensure that the GLC shall comply with the revised NAAQ norms notified by MoEF& CC, GoI on 16.11.2009.
21. The following measures are to be implemented to reduce Air Pollution during transportation of mineral
    i. Roads shall be graded to mitigate the dust emission.
    ii. Water shall be sprinkled at regular interval on the main road and other service roads to suppress dust
22. The following measures are to be implemented to reduce Noise Pollution
    i. Proper and regular maintenance of vehicles and other equipment
    ii. Limiting time exposure of workers to excessive noise.
    iii. The workers employed shall be provided with protection equipment and earmuffs etc.
    iv. Speed of trucks entering or leaving the mine is to be limited to moderate speed of 25 kmph to prevent undue noise from empty trucks.

MEMBER SECRETARY
SEIAA-TN

v. All noise generating machinery the compressor, generator to be enclosed in acoustic enclosure so as to reduce noise in working area.

23. Measures should be taken to comply with the provisions laid under Noise Pollution (Regulation and Control) (Amendment) Rules, 2010, dt: 11.01.2010 issued by the MoEF& CC, GoI to control noise to the prescribed levels.
24. Suitable conservation measures to augment groundwater resources in the area shall be planned and implemented in consultation with Regional Director, CGWB. Suitable measures should be taken for rainwater harvesting.
25. Permission from the competent authority should be obtained for drawl of ground water, if any, required for this project.
26. Topsoil, if any, shall be stacked properly with proper slope with adequate measures and should be used for plantation purpose.
27. The following measures are to be adopted to control erosion of dumps: -
    i. Retention/ toe walls shall be provided at the foot of the dumps.
    ii. Worked out slopes are to be stabilized by planting appropriate shrub/ grass species on the slopes.
28. Waste oils, used oils generated from the EM machines, mining operations, if any, shall be disposed as per the Hazardous& other wastes (Management, and Trans Boundary Movement) Rules, 2016 and its amendments thereof to the recyclers authorized by TNPCB.
29. Concealing the factual data or failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract action under the provisions of Environment (Protection) Act, 1986.
30. Rain water harvesting to collect and utilize the entire water falling in land area should be provided.
31. Rain water getting accumulated in the quarry floor shall not be discharged directly to the nearby stream or water body. If it is to be let into the nearby water body, it has to be discharged into a silt trap on the surface within the lease area and only the overflow after allowing settling of soil be let into the nearby waterways. The silt trap should be of sufficient dimensions to catch all the silt water being pumped out during one season. The silt trap should be cleaned of all the deposited silt at the end of the season and kept ready for taking care of the silt in the next season.
32. The lease holder shall undertake adequate safeguard measures during extraction of material and ensure that due to this activity, the hydro-geological regime of the surrounding area shall

MEMBER SECRETARY
SEIAA-TN

not be affected. Regular monitoring of ground water level and quality shall be carried out around the mine lease area during the mining operation. If at any stage, if it is observed that the groundwater table is getting depleted due to the mining activity; necessary corrective measures shall be carried out. District Collector/mining officer shall ensure this.

33. No tree-felling shall be done in the leased area, except only with the permission from competent Authority.
34. To take up environmental monitoring of the proposed quarry site before, during and after the mining activities including vibration study data, water, air & flora/fauna environment, slurry water generated/disposed and method of disposal, involving a reputed academic Institution.
35. It shall be ensured that the total extent of nearby quarries (existing, abandoned and proposed) located within 500 meter radius from the periphery of this quarry is not exceeding 5 hectares within the mining lease period of this application.
36. It shall be ensured that there is no habitation is located within 300 meter radius from the periphery of the quarry site and also ensure that no hindrance will be caused to the people of the habitation located within 300m radius from the periphery of the quarry site.
37. Free Silica test should be conducted and reported to TNPCB, Department of Geology and Mining and Regional Director, MoEF& CC, GOI.
38. Air sampling at intersection point should be conducted and reported to TNPCB, Department of Geology and Mining and Regional Director, MoEF& CC, GOI.
39. Bunds to be provided at the boundary of the project site.
40. The project proponent shall undertake plantation/afforestation work by planting the native species on all side of the lease area at the rate of 400/Ha. Suitable tall tree saplings should be planted on the bunds and other suitable areas in and around the work place.
41. Floor of excavated pit to be levelled and sides to be sloped with gentle slope (Except for granite quarries) in the mine closure phase.
42. The Project Proponent shall ensure a minimum of 2.5% of the annual turnover will be utilized for the CSR Activity
43. The Project Proponent shall provide solar lighting system to the nearby villages.
44. Earthen bunds and barbed wire fencing around the pits with green belt all along the boundary shall be developed and maintained.
45. Safety equipments to be provided to all the employees.
46. Safety distance of 50m has to be provided in case of railway, reservoir, canal/odai

MEMBER SECRETARY
SEIAA-TN

47. The Assistant/Deputy Director, Department of Geology & mining shall ensure that the proponent has engaged the blaster with valid Blasting license/certificate obtained from the competent authority before execution of mining lease.
48. The proponent shall furnish the Baseline data covering the Air, Water, Noise and land environment quality for the proposed quarry site before execution of mining lease.
49. The proponent shall erect the pillars in accordance with the Rules for depicting GPS details in the earmarked boundary of the quarry site to monitor electronically before execution of mining.
50. The proponent has to provide insurance protection to the workers in the case of existing mining or provide the affidavit in case of fresh lease before execution of mining lease.
51. The proponent has to display the name board at the quarry site showing the details of Proponent, lease period, extent, etc., with respect to the existing activity before execution of mining.
52. Heavy earth machinery equipments if utilized, after getting approval from the competent authority.
53. The Proponent shall ensure that the project activity including blasting, mining transportation etc should in no way have adverse impact to the other forests, such as reserve forests and social forests, tree plantation and bio diversity, surrounding water bodies etc.
54. The proponent shall provide Green Belt development at the rate of not less than 400 trees/Hectare. The tree saplings shall be not less than 3m height.
55. The fugitive emissions should be monitored during the mining activity and should be reported to TNPCB once in a month and the operation of the quarry should no way impact the agriculture activity & water bodies near the project site.
56. All the commitment made by the project proponent in the proposal shall be strictly followed.
57. The mining lease holders shall, after ceasing mining operations, undertake re-grassing the mining area and any other area which may have been disturbed due to their mining activities and restore the land to a condition which is fit for growth of fodder, flora, fauna etc.

Part B: General Conditions:

1. EC is given only on the factual records, documents and the commitment furnished in non judicial stamp paper by the proponent.
2. The Proponent shall obtain the Consent from the TNPC Board before commencing the activity.
3. No change in mining technology and scope of working should be made without prior approval of the SEIAA, Tamil Nadu.

MEMBER SECRETARY
SEIAA-TN

4. No change in the calendar plan including excavation, quantum of mineral (minor mineral) should be made.
5. Effective safeguard measures, such as regular water sprinkling shall be carried out in critical areas prone to air pollution and having high levels of particulate matter such as loading and unloading point and all transfer points. Extensive water sprinkling shall be carried out on haul roads. It should be ensured that the Ambient Air Quality parameters conform to the norms prescribed by the Central Pollution Control Board in this regard.
6. Effective safeguards shall be adopted against health risks on account of breeding of vectors in the water bodies created due to excavation of earth.
7. A berm shall be left from the boundary of adjoining field having a width equal to at least half the depth of proposed excavation.
8. Loading and unloading areas including all the transfer points should also have efficient dust control arrangements. These should be properly maintained and operated.
9. Vehicular emissions shall be kept under control and be regularly monitored. The mineral transportation shall be carried out through the covered trucks only and the vehicles carrying the mineral shall not be overloaded.
10. Access and haul roads to the quarrying area should be restored in a mutually agreeable manner where these are considered unnecessary after extraction has been completed.
11. All Personnel shall be provided with protective respiratory devices including safety shoes, masks, gloves etc. Supervisory people should be provided with adequate training and information on safety and health aspects. Occupational health surveillance program of the workers should be undertaken periodically to observe any contractions due to exposure to dust and take corrective measures, if needed.
12. Periodical medical examination of the workers engaged in the project shall be carried out and records maintained. For the purpose, schedule of health examination of the workers should be drawn and followed accordingly. The workers shall be provided with personnel protective measures such as masks, gloves, boots etc.
13. Workers/labourers shall be provided with facilities for drinking water and sanitation facility for Female and Male separately.
14. The project proponent shall ensure that child labour is not employed in the project as per the sworn affidavit furnished.

MEMBER SECRETARY
SEIAA-TN

15. The funds earmarked for environmental protection measures should be kept in separate account and should not be diverted for other purpose. Year wise expenditure should be reported to the Ministry of Environment and Forests and its Regional Office located at Chennai.
16. The Environmental Clearance does not absolve the applicant/proponent of his obligation/requirement to obtain other statutory and administrative clearances from other statutory and administrative authorities.
17. This Environmental Clearance does not imply that the other statutory / administrative clearances shall be granted to the project by the concerned authorities. Such authorities would be considering the project on merits and be taking decisions independently of the Environmental Clearance
18. The SEIAA, Tamil Nadu may alter/modify the above conditions or stipulate any further conditions in the interest of environment protection.
19. The SEIAA, Tamil Nadu may cancel the Environmental Clearance granted to this project under the provisions of EIA Notification, 2006, at any stage of the validity of this Environmental Clearance, if it is found or if it comes to the knowledge of this SEIAA, TN that the project proponent has deliberately concealed and/or submitted false or misleading information or inadequate data for obtaining the Environmental Clearance.
20. Failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract action under the provisions of the Environment (Protection) Act, 1986.
21. The above conditions will be enforced inter-alia, under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, the Public Liability Insurance Act, 1991, along with their amendments, Minor Mineral Conservation & Development Rules, 2010 framed under MMDR Act 1957,National Commission for protection of Child Right Rules,2006, Wildlife Protection Act, 1972, Forest Conservation Act, 1980, Biodiversity Conservation Act, 2016, the Biological Diversity Act,2002 and Biological diversity Rules, 2004 and Rules made there under and also any other orders passed by the Hon'ble Supreme Court of India/Hon'ble High Court of Madras and any other Courts of Law relating to the subject matter.
22. Any other conditions stipulated by other Statutory/Government authorities shall be complied.
23. Any appeal against this Environmental Clearance shall lie with the Hon'ble National Green Tribunal, if preferred, within a period of 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010.

MEMBER SECRETARY
SEIAA-TN

24. The Environmental Clearance is issued based on the documents furnished by the project proponent. In case any documents found to be incorrect/not in order at a later date the Environmental Clearance issued to the project will be deemed to be revoked/ cancelled.

MEMBER SECRETARY
SEIAA-TN

Copy to:

1. The Secretary, Ministry of Mines, Government of India, Shastri Bhawan, New Delhi.
2. The Additional Chief Secretary to Government, Environment and Forests Department, Tamil Nadu.
3. The Additional Chief Secretary to Government, Industries Department, Tamil Nadu.
4. The Additional Principal Chief Conservator of Forests, Regional Office (SZ), 34, HEPC Building, 1st & 2nd Floor, Cathedral Garden Road, Nungambakkam, Chennai – 34.
5. The Chairman, Central Pollution Control Board, Parivesh Bhawan, CBD-Cum-Office Complex, East Arjun Nagar, New Delhi-110 032.
6. The Chairman, TNPC Board,76, Mount Salai, Guindy, Chennai-32
7. The District Collector, Madurai District
8. The Commissioner of Geology and Mines, Guindy, Chennai-32
9. Assistant Director, Department of Geology & Mining, Coimbatore District.
10. EI Division, Ministry of Environment & Forests, Paryavaran Bhawan, New Delhi.
11. File Copy

Signature Not Verified
Digitally signed by Thiru.Deepak S.Bilgi
Member Secretary
Date: 10/12/2023 7:02:22 PM

ENVIRONMENTAL CLEARANCE

PARIVESH

(Pro-Active and Responsive Facilitation by Interactive, and Virtuous Environmental Single-Window Hub)

Government of India
Ministry of Environment, Forest and Climate Change
(Issued by the State Environment Impact Assessment Authority(SEIAA), TAMIL NADU)

To,

The Proprietor
K RAMESH ROUGH STONE
Ladapillai Street Mahalipatti, Madurai -625001

Subject: Grant of Environmental Clearance (EC) to the proposed Project Activity under the provision of EIA Notification 2006-regarding

Sir/Madam,

This is in reference to your application for Environmental Clearance (EC) in respect of project submitted to the SEIAA vide proposal number SIA/TN/MIN/414513/2023 dated 02 May 2023. The particulars of the environmental clearance granted to the project are as below.

1.	**EC Identification No.**	**EC23B001TN123921**
2.	**File No.**	8461
3.	**Project Type**	New
4.	**Category**	B
5.	**Project/Activity including Schedule No.**	1(a) Mining of minerals
6.	**Name of Project**	Katchaikatti Rough stone and Gravel quarry belongs to K.Ramesh over an extent of 2.46.0ha of Patta land in S.F.Nos.1265/5 (P), 1267/2A, 1267/2B, 1495/4 (P), 1495/5 (P) & 1495/6 (P) of Katchaikatti Village, Vadipatti Taluk, Madurai District, Tamil Nadu.
7.	**Name of Company/Organization**	K RAMESH ROUGH STONE
8.	**Location of Project**	TAMIL NADU
9.	**TOR Date**	N/A

The project details along with terms and conditions are appended herewith from page no 2 onwards.

Date: 06/07/2023

(e-signed)
Thiru.Deepak S.Bilgi
Member Secretary
SEIAA - (TAMIL NADU)

Note: A valid environmental clearance shall be one that has EC identification number & E-Sign generated from PARIVESH.Please quote identification number in all future correspondence.

This is a computer generated cover page.

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

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

ENVIRONMENTAL CLEARANCE

Lr. No.SEIAA-TN/F.No.8461/EC.No:5821/2023 dated:19.06.2023

Sir/Madam,

Sub: SEIAA-TN – Proposed Rough Stone & Gravel quarry Lease over an extent of 2.46.0 Ha at S.F.No. 1265/5 (P), 1267/2A, 1267/2B, 1495/4 (P), 1495/5(P) & 1495/6(P) in Katchaikatti Village, Vadipatti Taluk, Madurai District, Tamil Nadu by Thiru. K. Ramesh – under Category "B1" of Item 1(a) "Mining of Minerals Projects" of the Schedule to the EIA Notification, 2006 - issue of Environmental Clearance – Regarding.

Ref: 1. Your Application Seeking Terms of Reference Submitted On 17.03.2021.
2. ToR issued vide Lr.No: SEIAA-TN/ F.No.8461/ SEAC/ ToR-994/2021, Dated: 28.07.2021.
3. Public Hearing conducted on 05.07.2022.
4. Online Proposal No SIA/TN/MIN/414513/2023 dated.13.01.2023.
5. Your Application for Environmental Clearance dated: 24.01.2023.
6. Minutes of the 371st meeting of SEAC held on 26.04.2023.
7. Minutes of the 618th meeting of SEIAA held on 16.05.2023.
8. Minutes of the 631st meeting of SEIAA held on 19.06.2023.

Details of Minor Mineral Activity:-

This has reference to your application 4th & 5th cited. The proposal is for obtaining Environmental Clearance for mining / quarrying of minor minerals based on the particulars furnished in your application as shown below.

MEMBER SECRETARY
SEIAA-TN

Sl. No	Details of the Proposal	Data Furnished
1	Name of the Owner/Firm	Thiru. K. Ramesh S/o. Kannan, D.No.7, New No.42, Ladapillai Street, Mahakalipatty, Madurai District – 625 001.
2	Type of quarrying	Rough Stone and Gravel Quarry
3	S.F No. of the quarry site	1265/5 (P), 1267/2A, 1267/2B, 1495/4 (P), 1495/5(P) & 1495/6(P)
4	Village in which situated	Katchaikatti
5	Taluk in which situated	Vadipatti
6	District in which situated	Madurai
7	Extent of quarry (in ha.)	2.46.0 ha
8	Latitude & Longitude of the quarry site	10°04'32.29"N 78°0'17.45"E
9	Topo Sheet No.	58-J/4
10	Type of mining	Opencast Semi Mechanized Mining
11	Period of Current mine Plan	5 years
12	Production (Quantity in m^3)	2,71,015m^3 of Rough Stone and 36,392 m^3 of gravel
13	Depth of mining	22m below ground level
14	Depth of water table	35m BGL
15	Man Power requirement	18 Nos.
16	Water requirement: 1. Drinking & Domestic Purposes 2. Dust suppression 3. Green Belt	3.0 KLD 0.5 KLD 1.5 KLD 1.0 KLD
17	Power requirement	2,48,498 liters of HSD for the entire project life

MEMBER SECRETARY
SEIAA-TN

18	Precise area communication approved by Joint Director/ Assistant Director (i/c), Dept. of Geology & Mining with date	Roc.No.693/2020-Mines dated:04.01.2021.
19	Mining Plan approved by the Joint Director/ Assistant Director (i/c), Dept. of Geology and Mining with date	Roc.No.693/2020-Mines dated:27.01.2021.
20	500m cluster letter issued by the Joint Director/ Assistant Director (i/c), Dept. of Geology and Mining with date	Roc.No.693/2020-Mines dated:08.02.2021.
21	VAO certificate regarding habitations in 300m radius	23.02.2021
22	Project Cost (excluding EMP)	Rs. 34,00,000/-
23	EMP cost	Capital Cost: Rs. 40,82,461/- Recurring Cost: 20,87,420/-
24	ToR details	ToR issued vide Lr.No: SEIAA-TN/ F.No.8461/ SEAC/ ToR-994/2021, Dated: 28.07.2021.
25	Public hearing conducted on	05.07.2022
26	EIA Report submitted on	18.01.2023
27	CER	Rs.5,00,000/-
28	**Validity:** **This Environmental Clearance is accorded for the quantity of 2,71,015m^3 of Rough Stone and 36,392m^3 of gravel upto the restricted depth of 22m below ground level as per the approved mining plan and is valid as per the approved mine plan period and as per MoEF&CC's notification S.O.1533(E) dated.14.09.2006 and S.O. 1807(E) dated 12.04.2022**	

The Proponent has furnished affidavit in Hundred Rupees stamp paper attested by the Notary stating that

I **K.Ramesh** S/o. Kannan, aged about 45 years, residing at Door No.7, New No.42, Ladapillai Street, Mahakalipatty, Madurai District, Tamil Nadu State-625 001, solemnly declare and sincerely affirm that, I have applied for getting Environment Clearance to SEIAA-

MEMBER SECRETARY
SEIAA-TN

Tamil Nadu for rough stone and gravel quarry in Patta land at S.F.No's: 1265/5(P), 1267/2A, 1267/2B, 1495/4(P), 1495/5(P) & 1495/6(P), over an extent of 2.46.0hectares of Katchaikatti Village, Vadipatti Taluk, Madurai District, Tamil Nadu State.

1) I solemnly declare and sincerely affirm that the project doesn't attract general conditions as per EIA notification, 2006.

   a) There are no protected areas notified under the wild life (Protection) Act, 1972 around 10km radius.
   b) No critically polluted areas as notified by the central pollution control board constituted under water (Prevention and Control of Pollution) Act 1974.
   c) No eco-Sensitive areas as notified around 10km radius.
   d) There is no interstate within 10km radius from the boundary of the proposed site.
   e) There is no coastal zone found around 10km radius and this project site doesn't attract CRZ Notification, 2019.

2) I will do the following Corporate Environment Responsibility (CER) activities before commencement of the quarrying activities.

CER Activity	CER Cost
Panchayat Union Primary School, Ramaiyanpatti Village.	
Environment related library books & Rack	20,000/-
Compound wall renovation	10,000/-
Plantation in School ground	20,000/-
Toilet facility	2,00,000/-
Painting for Budlings	2,50,000/-
Total Cost Allocation	**Rs. 5,00,000/-**

a) EMP BUDGET

Capital Cost	**Rs. 40,82,461/-**
Recurring Cost	**Rs. 20,87,420/-**

MEMBER SECRETARY
SEIAA-TN

Recurring cost @ 5% inflation Rs					
Year 1	Year 2	Year 3	Year 4	Year 5	T=R+C
20,87,420	21,91,791	23,01,380	24,16,449	26,24,771	**Rs.1,57,04,272/-**

Capital cost	Recurring cost @ 5% inflation Rs					
	Year 6	Year 7	Year 8	Year 9	Year 10	T=R+C
20,41,230	15,61,916	16,40,011	17,22,011	18,08,111	18,98,516	**Rs. 1,06,71,795/-**

Ist 5 years	**Rs. 1,57,04,272/-**
IInd 5 Years	**Rs. 1,06,71,795/-**
EMP for 10 years	**Rs. 2,63,76,067/-**

3) KML file to obtain TOR is wrong. The KML file of the lease area uploaded for EC in parivesh 2.O portal is correct and the Co-ordinates are as follows:

Toposheet No: 58 J/4

Latitude : 10°04'28.60"N to 10°04'34.68"N

Longitude : 78°0'14.68"E to 78°0'21.23"E

S.No	Four Corners	Latitude	Longitude
1.	North East	10°04'34.68"N	78°0'21.23"E
2.	South East	10°04'31.20"N	78°0'17.45"E
3.	North West	10°04'34.06"N	78°0'14.68"E
4.	South West	10°04'28.60"N	78°0'14.77"E

4) Details of quarry located within 500m radius from the periphery of proposed lease area.

i) Existing Quarry:

Sl. No	Name of the Owner	Village	S.F. No	Extent (in hects)	Collector's Proceedings No & date	Lease periods

MEMBER SECRETARY
SEIAA-TN

1.	S.Jeyaraman	Katchaikatti	86/1B, 1186/5A, 1186/5B & 1186/6A	1.82.5	Roc.No.1429/ 2016 Dt 10.08.2017	18.08.2017 to 17.08.2022
2.	D.Rajesh	Katchaikatti	1185/2, 1185/3, 1185/4, 1185/5, etc.,	1.90.0	Roc.No.1606/ 2016 Dt 10.08.2017	28.08.2017 to 27.08.2022

ii) Abandoned Quarries:

Sl. No	Name of the Owner	Village	S.F. No	Extent (in hects)	Collector's Proceedings No & date	Lease periods
----Nil----						

iii) Proposed Quarries:

Sl. No	Name of the Owner	Village	S.F. No	Extent (in hects)	Collector's Proceedings No & date	Lease periods
1.	Thiru.K.Ramesh	Katchaikatti	1265/5, 1267/2A ect.,	2.46.0	Proposed area	
2.	Thiru.S.Karuppasamy	Katchaikatti	1186/2A, 1186/3 & 1186/4	1.16.5	Proposed area	

5) There will not be hindrance or disturbance to the people living no enrooted / nearby our quarry site while transporting the mineral our material and due to quarrying activities.

6) There is no approved habitation within 300m radius from the periphery of our proposed lease area.

7) I swear that afforestation will be carried out during the course of quarrying operation and maintained.

MEMBER SECRETARY
SEIAA-TN

8) The required insurance will be taken in the name of the laborers working in our proposed lease area.

9) The existing road from the main road to quarry is in good condition and the same will be maintained and utilized for transportation of rough stone and gravel.

10) I will not engage any child labor in our quarry site and we aware that engaging child labor is punishable under the law.

11) All types of safety / protective equipment will be provided to all the laborers working in our proposed lease area.

12) No permanent structures, temples etc., are located within 300m radius from the periphery of our proposed lease area.

I ensure to do all the social and Environment commitment as mentioned in the Mining plan to the best of our knowledge.

Details of Quarries located with in 500 Radius from the Proposed quarry:

The Project Proponent has submitted a copy of the letter obtained from the Joint Director/ Assistant Director (i/c) of Geology & Mining, Madurai District. In his/her Letter Roc.No.693/2020-Mines dated:08.02.2021.. he/she has stated the details of other quarries (Proposed / Existing / Abandoned Quarries) within a radius 500m from the boundary of the proposed quarry site as follows:

a. Existing Quarry:

Sl. No	Name of the Owner	Village	S.F. No	Extent (in hects)	Collector's Proceedings No & date	Lease periods
1.	S.Jeyaraman	Katchaikatti	86/1B, 1186/5A, 1186/5B & 1186/6A	1.82.5	Roc.No.1429/ 2016 Dt 10.08.2017	18.08.2017 to 17.08.2022
2.	D.Rajesh	Katchaikatti	1185/2, 1185/3, 1185/4, 1185/5, etc.,	1.90.0	Roc.No.1606/ 2016 Dt 10.08.2017	28.08.2017 to 27.08.2022
			Total	**3.72.5**		

MEMBER SECRETARY
SEIAA-TN

b. **Abandoned / expired quarries:**

Sl. No	Name of the Owner	Village	S.F. No	Extent (in hects)	Collector's Proceedings No & date	Lease periods
----Nil----						

c. **Present Proposed quarries:**

Sl. No	Name of the Owner	Village	S.F. No	Extent (in hects)	Collector's Proceedings No & date	Lease periods
1.	Thiru.K.Ramesh	Katchaikatti	1265/5, 1267/2A ect.,	2.46.0	Proposed area	
2.	Thiru.S.Karuppasamy	Katchaikatti	1186/2A, 1186/3 & 1186/4	1.16.5	Proposed area	

Appraisal by SEAC: -

The proposal was placed for appraisal in this 371st meeting of SEAC held on 26.04.2023. The details of the project furnished by the proponent are available on the website (parivesh.nic.in).

SEAC noted the following:

1. The Project Proponent, Thiru. K. Ramesh has applied for Environmental Clearance for the Proposed Rough Stone & Gravel quarry Lease over an extent of 2.46.0 Ha at S.F.No. 1265/5 (P), 1267/2A, 1267/2B, 1495/4 (P), 1495/5(P) & 1495/6(P) in Katchaikatti Village, Vadipatti Taluk, Madurai District, Tamil Nadu.
2. The project/activity is covered under Category "B1" of item 1(a) "Mining of Minerals Project' of the Schedule to the EIA Notification,2006.

Based on the presentation and documents furnished by the project proponent, after detailed deliberations, **SEAC considering the safety aspects decided to recommend the proposal for the grant of Environmental Clearance for the restricted & revised quantity of 2,71,015m³ of Rough Stone and 36,392m3 of gravel with maintaining a depth of 22m Below ground level and the annual peak production of not exceeding 61,325m³ of rough stone,** subject to the standard

MEMBER SECRETARY
SEIAA-TN

conditions as per the Annexure of this minutes & normal conditions stipulated by MOEF&CC, in addition to the following specific conditions:

1. The prior Environmental Clearance granted for this mining project shall be valid for the project life including production value as laid down in the mining plan approved and renewed by competent authority, from time to time, subject to a maximum of thirty years, whichever is earlier vide MoEF&CC Notification S.O. 1807(E) dated 12.04.2022.
2. PP shall upload the correct kml file in the Parivesh portal before obtaining EC.
3. The PP shall inform the notice of opening of the quarry to the Director of Mines Safety (DMS)/Chennai Region and get the necessary statutory permission under the MMR 1961 before obtaining the CTO.
4. The PP shall submit the 'Notice of Opening' of the quarry to the Regional Inspector/Director of Mines Safety, Chennai Region under the section 16 of the Mines Act, 1952 and in accordance with the Reg. 3 of MMR 1961 before obtaining the CTO.
5. The proponent shall maintain the 'S3 (or) G2' type of fencing all around the boundary of the proposed working quarry with gates for entry/exit before the commencement of the operation as recommended in the DGMS Circular, 11/1959 and shall furnish the photographs showing the same before obtaining the CTO from TNPCB.
6. Further, the PP shall maintain the garland drain with proper size, gradient and length along the boundary of the pit leaving behind the mandatory safety zone of 7.5 / 10 m as it is designed to take care of run-off water (size, gradient and length) before obtaining the CTO from TNPCB.
7. The PP shall ensure that the benches & haul road are properly designed and formed in accordance with the provisions of MMR 1991.
8. No 'Deep-hole large diameter drilling and blasting' is permitted in the proposed quarry.
9. The PP shall use the jack hammer drill machine fitted with the dust extractor for the drilling operations such that the fugitive dust is controlled effectively at the source.
10. The PP shall ensure that the blasting operations are carried out by the blaster/Mine Mate/Mine Foreman employed by him in accordance with the provisions of MMR 1961 and it shall not be carried out by the persons other than the above statutory personnel.
11. The PP shall ensure that the blasting operations shall be carried out during a prescribed time interval with a prior notice to the temple / habitations situated around the proposed quarry after

MEMBER SECRETARY
SEIAA-TN

having posted the sentries/guards adequately to confirm the non-exposure of public within the danger zone of 500 m from the boundary of the quarry.

12. Within six months from the commencement of mining operations, the PP shall carry out the scientific studies on 'Design of Suitable blast parameters for reducing the cumulative impact of blast-induced ground/air vibrations and fly rock caused due to operation of the quarries in the cluster by adopting appropriate controlled blasting techniques', by involving any of the reputed Research and Academic Institution such as CSIR-Central Institute of Mining and Fuel Research / Dhanbad, NIRM/Bangalore, IIT-Madras, NIT-Dept of Mining Engg, Surathkal, and Anna University Chennai-CEG Campus, etc shall be carried out before the commencement of mining operations. A copy of such scientific study report shall be submitted to the SEIAA, MoEF, TNPCB, and DMS, Chennai as a part of Environmental Compliance.
13. The PP shall carry out the scientific studies to assess the slope stability of the working benches and quarry wall within one year of operation whichever is earlier, by involving a reputed Research and Academic Institution such as CSIR-Central Institute of Mining and Fuel Research / Dhanbad, NIRM/Bangalore, IIT-Madras, NIT-Dept of Mining Engg, Surathkal, and Anna University Chennai-CEG Campus, etc shall be carried out before the commencement of mining operations. A copy of such scientific study report shall be submitted to the SEIAA, MoEF, TNPCB, and DMS, Chennai as a part of Environmental Compliance.
14. The PP shall meticulously carry out the mitigation measures as spelt out in the revised EMP.
15. The Project Proponent shall ensure that the funds earmarked for environmental protection measures should be kept in separate account and should not be diverted for other purpose. Year-wise expenditure should be reported to the MoEF& CC Ministry and its Integrated Regional Office (IRO) located in Chennai.
16. The Project Proponent shall send a copy of the clearance letter marked to concerned Panchayat from whom any suggestion/representation has been received while processing the proposal.
17. 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 adhere EMP furnished.
18. As accepted by the Project proponent the CER cost is Rs. **5 lakhs** and the amount shall be spent for the Panchayat Union Primary School, Ramaiyanpatti Village for the activities as committed, before obtaining CTO from TNPCB.

MEMBER SECRETARY
SEIAA-TN

ANNEXURE-I

1. The proponent shall mandatorily appoint the required number of statutory officials and the competent persons in relevant to the proposed quarry size as per the provisions of Mines Act 1952 and Metalliferrous Mines Regulations, 1961.
2. The proponent shall erect fencing all around the boundary of the proposed area with gates for entry/exit before the commencement of the operation and shall furnish the photographs/map showing the same before obtaining the CTO from TNPCB.
3. Perennial maintenance of haulage road/village / Panchayat Road shall be done by the project proponent as required in connection with the concerned Govt. Authority.
4. The Project Proponent shall adhere to the working parameters of mining plan which was submitted at the time of EC appraisal wherein year-wise plan was mentioned for total excavation i.e. quantum of mineral, waste, over burden, inter burden and top soil etc.. No change in basic mining proposal like mining technology, total excavation, mineral & waste production, lease area and scope of working (viz. method of mining, overburden & dump management, O.B & dump mining, mineral transportation mode, ultimate depth of mining etc.) shall not be carried out without prior approval of the Ministry of Environment, Forest and Climate Change, which entail adverse environmental impacts, even if it is a part of approved mining plan modified after grant of EC or granted by State Govt. in the form of Short Term Permit (STP), Query license or any other name.
5. The reject/waste generated during the mining operations shall be stacked at earmarked waste dump site(s) only. The physical parameters of the waste dumps like height, width and angle of slope shall be governed as per the approved Mining Plan as per the guidelines/circulars issued by DGMS w.r.t. safety in mining operations shall be strictly adhered to maintain the stability of waste dumps.
6. The proponent shall ensure that the slope of dumps is suitably vegetated in scientific manner with the native species to maintain the slope stability, prevent erosion and surface run off. The gullies formed on slopes should be adequately taken care of as it impacts the overall stability of dumps.
7. Perennial sprinkling arrangement shall be in place on the haulage road for fugitive dust suppression. Fugitive emission measurements should be carried out during the mining operation at regular intervals and submit the consolidated report to TNPCB once in six months.

MEMBER SECRETARY
SEIAA-TN

8. The Project Proponent shall carry out slope stability study by a reputed academic/research institution such as NIRM, IIT, Anna University for evaluating the safe slope angle if the proposed dump height is more than 30 meters. The slope stability report shall be submitted to concerned Regional office of MoEF&CC, Govt. of India, Chennai as well as SEIAA, Tamilnadu.
9. The Proponent shall ensure that the Noise level is monitored during mining operation at the project site for all the machineries deployed and adequate noise level reduction measures undertaken accordingly. The report on the periodic monitoring shall be submitted to TNPCB once in 6 months.
10. Proper barriers to reduce noise level and dust pollution should be established by providing greenbelt along the boundary of the quarrying site and suitable working methodology to be adopted by considering the wind direction.
11. 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 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.
12. Taller/one year old Saplings raised in appropriate size of bags, preferably eco-friendly bags should be planted in proper escapements 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.
13. **Noise and Vibration Related:** (i) The Proponent shall carry out only the Controlled Blasting operation using NONEL shock tube initiation system during daytime. Usage of other initiation systems such as detonating cord/fuse, safety fuse, ordinary detonators, cord relays, should be avoided in the blasting operation. The mitigation measures for control of ground vibrations and to arrest fly rocks should be implemented meticulously under the supervision of statutory competent persons possessing the I / II Class Mines Manager / Foreman / Blaster certificate issued by the DGMS under MMR 1961, appointed in the quarry. No secondary blasting of boulders shall be carried out in any occasions and only the Rock Breakers (or) other suitable non-explosive techniques shall be adopted if such secondary breakage is required. The Project

MEMBER SECRETARY
SEIAA-TN

Proponent shall provide required number of the security sentries for guarding the danger zone of 500 m radius from the site of blasting to ensure that no human/animal is present within this danger zone and also no person is allowed to enter into (or) stay in the danger zone during the blasting. (ii) Appropriate measures should be taken for control of noise levels below 85 dBA in the work environment. Workers engaged in operations of HEMM, etc. should be provided with ear plugs/muffs. (iii) Noise levels should be monitored regularly (on weekly basis) near the major sources of noise generation within the core zone.

14. Ground water quality monitoring should be conducted once in every six months and the report should be submitted to TNPCB.
15. The operation of the quarry should not affect the agricultural activities & water bodies near the project site and a 50 m safety distance from water body should be maintained without carrying any activity. The proponent shall take appropriate measures for "Silt Management" and prepare a SOP for periodical de-siltation indicating the possible silt content and size in case of any agricultural land exists around the quarry.
16. The proponent shall provide sedimentation tank / settling tank with adequate capacity for runoff management.
17. The proponent shall ensure that the transportation of the quarried materials shall not cause any hindrance to the Village people/Existing Village Road and shall take adequate safety precautionary measures while the vehicles are passing through the schools / hospital. The Project Proponent shall ensure that the road may not be damaged due to transportation of the quarried rough stones; and transport of rough stones will be as per IRC Guidelines with respect to complying with traffic congestion and density.
18. To ensure safety measures along the boundary of the quarry site, security guards are to be posted during the entire period of the mining operation.
19. After mining operations are completed, the mine closure activities as indicated in the mine closure plan shall be strictly carried out by the Proponent fulfilling the necessary actions as assured in the Environmental Management Plan.
20. The Project proponent shall, after ceasing mining operations, undertake re-grassing the mining area and any other area which may have been disturbed due to their mining activities and restore the land to a condition that is fit for the growth of fodder, flora, fauna etc.

MEMBER SECRETARY
SEIAA-TN

21. The Project Proponent shall comply with the provisions of the Mines Act, 1952, MMR 1961 and Mines Rules 1955 for ensuring safety, health and welfare of the people working in the mines and the surrounding habitants.
22. The project proponent shall ensure that the provisions of the MMRD, 1956, the MCDR 2017 and Tamilnadu Minor Mineral Concession Rules 1959 are compiled by carrying out the quarrying operations in a skillful, scientific and systematic manner keeping in view proper safety of the labour, structure and the public and public works located in that vicinity of the quarrying area and in a manner to preserve the environment and ecology of the area.
23. The quarrying activity shall be stopped if the entire quantity indicated in the Mining plan is quarried even before the expiry of the quarry lease period and the same shall be informed to the District AD/DD (Geology and Mining) District Environmental Engineer (TNPCB)and the Director of Mines Safety (DMS), Chennai Region by the proponent without fail.
24. The Project Proponent shall abide by the annual production scheduled specified in the approved mining plan and if any deviation is observed, it will render the Project Proponent liable for legal action in accordance with Environment and Mining Laws.
25. Prior clearance from Forestry & Wild Life including clearance from committee of the National Board for Wildlife as applicable shall be obtained before starting the quarrying operation, if the project site attracts the NBWL clearance, as per the existing law from time to time.
26. All the conditions imposed by the Assistant/Deputy Director, Geology & Mining, concerned District in the mining plan approval letter and the Precise area communication letter issued by concerned District Collector should be strictly followed.
27. The mining lease holders shall, after ceasing mining operations, undertake re-grassing the mining area and any other area which may have been disturbed due to their mining activities and restore the land to a condition which is fit for growth of fodder, flora, fauna etc.
28. The Project proponent shall install a Display Board at the entrance of the mining lease area/abutting the public Road, about the project information as shown in the **Appendix –II** of this minute.

MEMBER SECRETARY
SEIAA-TN

Appendix -I
List of Native Trees Suggested for Planting

No	Scientific Name	Tamil Name	Tamil Name
1	*Aegle marmelos*	Vilvam	வில்வம்
2	*Adenaanthera pavonina*	Manjadi	மஞ்சாடி, ஆனைகுன்றிமணி
3	*Albizia lebbeck*	Vaagai	வாகை
4	*Albizia amara*	Usil	உசில
5	*Bauhinia purpurea*	Mandharai	மந்தாரை
6	*Bauhinia racemosa*	Aathi	ஆத்தி
7	*Bauhinia tomentos*	Iruvathi	இருவாத்தி
8	*Buchanania axillaris*	Kattuma	காட்டுமா
9	*Borassus flabellifer*	Panai	பனை
10	*Butea monosperma*	Murukkamaram	முருக்கமரம்
11	*Bobax ceiba*	Ilavu, Sevvilavu	இலவு
12	*Calophyllum inophyllum*	Punnai	புன்னை
13	*Cassia fistula*	Sarakondrai	சரக்கொன்றை
14	*Cassia roxburghii*	Sengondrai	செங்கொன்றை
15	*Chloroxylon swietenia*	Purasamaram	புரசு மரம்
16	*Cochlospermum religiosum*	Kongu, Manjalllavu	கோங்கு, மஞ்சள் இலவு
17	*Cordia dichotoma*	Naruvuli	நருவுளி
18	*Crateva adansoni*	Mavalingum	மாவிலங்கம்
19	*Dillenia indica*	Uva, Uzha	உசா
20	*Dillenia pentagyna*	SiruUva, Sitruzha	சிறு உசா
21	*Diospyro sebenum*	Karungali	கருங்காலி
22	*Diospyro schloroxylon*	Vaganai	வாகனை
23	*Ficus amplissima*	Kalltchi	கல் இச்சி
24	*Hibiscus tiliaceou*	Aatrupoovarasu	ஆற்றுப்பூவரசு
25	*Hardwickia binata*	Aacha	ஆச்சா
26	*Holoptelia integrifolia*	Aayili	ஆயா மரம், ஆயில்
27	*Lannea coromandelica*	Odhiam	ஓதியம்
28	*Lagerstroemia speciosa*	Poo Marudhu	பூ மருது
29	*Lepisanthus tetraphylla*	Neikottaimaram	நெய் கொட்டை மரம்
30	*Limonia acidissima*	Vila maram	விளா மரம்
31	*Litsea glutinos*	Pisinpattai	அரம்பா, பிசின்பட்டை
32	*Madhuca longifolia*	Illuppai	இலுப்பை
33	*Manilkara hexandra*	UlakkaiPaalai	உலக்கை பாலை
34	*Mimusops elengi*	Magizhamaram	மகிழமரம்
35	*Mitragyna parvifolia*	Kadambu	கடம்பு
36	*Morinda pubescens*	Nuna	நுணா
37	*Morinda citrifolia*	Vellai Nuna	வெள்ளை நுணா
38	*Phoenix sylvestre*	Eachai	ஈச்சமரம்
39	*Pongamia pinnat*	Pungam	புங்கம்

MEMBER SECRETARY
SEIAA-TN

40	*Premna mollissima*	Mumu	முன்னை
41	*Premna serratifolia*	Narumuuai	நறு முன்னை
42	*Premna tomentosa*	Malaipoovarasu	மலை பூவரசு
43	*Prosopis cineria*	Vanni maram	வன்னி மரம்
44	*Pterocarpus marsupium*	Vengai	வேங்கை
45	*Pterospermum canescens*	Vennangu, Tada	வெண்ணாங்கு
46	*Pterospermum xylocarpum*	Polavu	புலவு
47	*Putiranjiva roxburgh*	Karipala	கறிபாலா
48	*Salvadora persica*	Uga a Maram	மாகா மரம்
49	*Sapindus emarginatus*	Manupungan, Soapukai	மணிபுங்கன் சோபுகாய்
50	*Saraca asoca*	Asoca	அசோகா
51	*Streblus asper*	Piray maram	பிராய மரம்
52	*Strychnos nuxvomic*	Yetti	எட்டி
53	*Strychnos potatorum*	Therthang Kottai	தேத்தான் கொட்டை
54	*Syzygium cumini*	Naval	நாவல்
55	*Terminalia belleric*	Thandri	தான்றி
56	*Terminalia arjuna*	Ven marudhu	வெண் மருது
57	*Toona ciliate*	Sandhana vembu	சந்தன வேம்பு
58	*Thespesia populnea*	Puvarasu	பூவரசு
59	*Walsuratrifoliata*	valsura	வால்சுரா
60	*Wrightia tinctoria*	Veppalu	வெப்பாலை
61	*Pithecellobium dulce*	Kodukkapuli	கொடுக்காப்புளி

Appendix –II

Display Board

(Size 6' x5' with Green Background and White Letters)

.....கரங்கம்

கரங்கங்களில் குவாரி செயல்பாடுகளுக்கான சுற்றுச்சூழல் அனுமதி கீழ்கண்ட நிபந்தனைகளுக்கு உட்பட்டு வழங்கப்பட்டுள்ளது SEIAA/------ தேதியிடப்பட்டு சுற்றுச்சூழல் அனுமதி _____ தேதி வரை செல்லத்தக்கதாக உள்ளது.

பசுமை பகுதி வளர்ச்சி மேம்பாட்டுக்கான கரங்கத் திட்டம்	குவாரியின் எல்லையைச் சுற்றி வேலி அமைக்க வேண்டும்
	காக்கப்பாளையில் கூறும் தளமட்டத்திலிருந்து பிட்டாக்கு மிகாமல் இருக்க வேண்டும்
	காற்றில் மாசு ஏறபடாதவாறு கரங்க பணிகளை மேற்கொள்ள வேண்டும்.
	வாகனங்கள் செல்லும் பாதையில் மாசு ஏறபடாத அளவிற்கு தண்ணீரை முறையாக
	தண்ணீர் லாரிகளின் மூலமாக தெளிக்க வேண்டும்
நடவுப்பட பராமரிக்கப்பட வேண்டிய மரங்கள் எண்ணிக்கை	இரைச்சல் அளவையும் தூசி மாசுபாட்டையும் குறைப்பதற்காக குவாரியின் எல்லையை
	சுற்றி அடர்த்தியான பசுமை பகுதியை ஏறபடுத்த வேண்டும்
கரங்கத்தில் வெடி வைக்கும்பொழுது நிலஅதிர்வுகள் ஏறபடாதவாறும் மற்றும் கற்கள் பறக்காதவாறும் பாதுகாப்பு நடவடிக்கைகளை உண்மிப்பாக செயல்படுத்தப்பட வேண்டும்	
கரங்கத்தில் இருந்து ஏற்படும் இரைச்சல் அளவு 85 டெசிபல்ஸ் (dBA) அளவிற்கு மேல் ஏறபடாதவாறு தகுந்த கட்டுபாடுகளை மேற் கொள்ள வேண்டும்.	
கரங்க சட்ட விதிகள் 1955ன் கீழ் கரங்கத்தில் உள்ள பணியாளர்களுக்கு தகுந்த பாதுகாப்பு கருவிகள் வழங்கவதோடு	
கால்நாழுள்ள சுழிப்பறை வசதிகளை செய்து தர வேண்டும்.	
கிராமம் அல்லது பஞ்சாயத்து வழியாக வாகனங்கள் செல்லும் சாலையை தொடர்ந்து நன்கு பராமரிக்க வேண்டும்.	
கரங்கப்பணிகளால் அருகில் உள்ள விவசாய பணிகள் மற்றும் தீர்நிலைகள் பாதிக்கப்படக் கூடாது.	
தீர்நிலைகள் பாதிக்கப்படாமல் இருப்பதை உறுதி செய்யும் வகையில் நிலத்தடி நீரின் தரத்தினை தொடர்ந்து கண்காணிக்க வேண்டும்	
கரங்கத்திலிருந்து கனிம பொருட்களை எடுத்துச் செல்லது கிராம மக்களுக்கு எந்தத் சிரமத்தினையும் ஏற்படுத்தாதவாறு	
பாதுகாப்போடும் மற்றும் சுற்றுச்சூழல் பாதிக்கவாத வண்ணம் வாகனங்களை இயக்க வேண்டும்	
கரங்கப்பணிகள் (முடிக்கப்பட்ட பி ன கரங்க முடல திட்டத்தில் உள்ளவாறு கரங்கத்தினை மு வேண்டும்	
கரங்க நடவடிக்கைகளை முடித்தபின்ன் கரங்கப் பகுதி மற்றும் கரங்க நடவடிக்கைகளால் இடையூறு ஏற்படகூடிய	
வேறு எந்தப் பகுதியையும் மறுசுழற்சிமான செய்து தாவரங்கள் விலங்குகள் ஆகியவறறின் வாழ்விக்கு ஏறற வகையில்	
பசுமைப்பகுதியை உருவாக்க வேண்டும்.	
முழுமையான நிபந்தனைகளை அரிய பார்வையை [illegible]	
சுற்றுச்சூழல் சார்ந்த புகார்களுக்கு, சென்னையில் உள்ள சுற்றுச்சூழல் மற்றும் வன அலுவலகத்தை ஒருங்கிணைந்த கட்டண	
அலுவலகம் 044 – 28222325 (அல்லது) தமிழ்நாடு மாசுக் கட்டுப்பாடு வாரியத்தின் மாவட்ட சுற்றுச்சூழல் பொறியாளரை அணுகவும்	

MEMBER SECRETARY
SEIAA-TN

Discussion by SEIAA and the Remarks:-

The subject was placed in the 631st authority meeting held on 19.06.2023. Earlier, the proposal was placed in the 618th authority meeting held on 16.05.2023. The authority noted that the subject was appraised in the 371st SEAC meeting held on 26.04.2023. SEAC has furnished its recommendations to the authority for granting environmental clearance subject to the conditions stated therein.

The Authority, during deliberations, noted that the proponent has uploaded different KML files in the ToR proposal (SIA/TN/MIN/61732/2021) & the EC proposal (SIA/TN/MIN/414513/2023). Hence, as per SEAC Specific condition no.2, the proponent shall upload the correct KML file in the PARIVESH Portal.

The proponent, vide letter dated.15.06.2023 furnished a reply for the above queries/details requested in the 618th authority meeting. In this regard, the proposal is placed in this 631st Authority meeting.

The Authority after examining the reply/details furnished by the proponent and also taking into account the recommendations of SEAC, the safety aspects and to ensure sustainable, scientific and systematic mining, decided to grant Environmental Clearance for the **quantity of 2,71,015m^3 of Rough Stone and 36,392m3 of gravel upto the restricted depth of 22m below ground level** as per the mine plan approved by the Department of Geology & Mining. This is also subject to the standard conditions as per Annexure - (I) of SEAC minutes, other normal conditions stipulated by MOEF&CC & all other specific conditions as recommended by SEAC in addition to the following conditions and the conditions in Annexure 'A' of this minutes.

1. Keeping in view of MoEF&CC's notification S.O.1533(E) dated.14.09.2006 and S.O. 1807(E) dated 12.04.2022, this Environmental Clearance is valid as per the approved mine plan period.
2. The EC granted is subject to review by District Collector, Mines Dept. and TNPCB on completion of every 5 years till the project life. They should also review the EC conditions to ensure that they have all been adhered to and implemented.
3. The project proponent shall furnish a Certified Compliance Report obtained from MoEF&CC while seeking a renewal of the mining plan to cover the project life.
4. The progressive and final mine closure plan including the green belt implementation and environmental norms should be strictly followed as per the EMP.
5. As per the OM vide F. No. IA3-22/1/2022-IA-III [E- 172624] Dated: 14.06.2022, the Project Proponents are directed to submit the six-monthly compliance on the environmental conditions

MEMBER SECRETARY
SEIAA-TN

prescribed in the prior environmental clearance letter(s) through newly developed compliance module in the PARIVESH Portal from the respective login.

6. The amount allocated for EMP should be kept in a separate account and both the capital and recurring expenditures should be done year wise for the works identified, approved and as committed. The work & expenditure made under EMP should be elaborated in the bi-annual compliance report submitted and also should be brought to the notice of concerned authorities during inspections.

Annexure 'A'

EC Compliance

1. The Environmental Clearance is accorded based on the assurance from the project proponent that there will be full and effective implementation of all the undertakings given in the Application Form, Pre-feasibilty Report, mitigation measures as assured in the Environmental Impact Assessment/ Environment Management Plan and the mining features including Progressive Mine Closure Plan as submitted with the application.
2. All the conditions as presented by the proponent in the PPT during SEAC appraisal should be addressed in Full.
3. The proponent shall submit Compliance Reports on the status of compliance of the stipulated EC conditions including results of monitored data. It shall be sent to the respective Regional Office of Ministry of Environment, Forests and Climate Change, Govt. of India and also to the Office of State Environment Impact Assessment Authority (SEIAA).
4. Concealing the factual data or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract action under the provisions of Environment (Protection) Act, 1986.

Applicable Regulatory Frameworks

5. The project proponent shall strictly adhere to the provisions ofWater (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, the Public Liability Insurance Act, 1991, along with their amendments, Minor Mineral Conservation &Development Rules, 2010 framed under MMDR Act 1957, National Commission for protection of Child Right Rules, 2006, Wildlife Protection Act, 1972, Forest Conservation Act, 1980, Biodiversity Conservation Act, 2016, the Biological Diversity Act, 2002 and Biological diversity Rules, 2004 and Rules made there under and also any other

MEMBER SECRETARY
SEIAA-TN

orders passed by the Hon'ble Supreme Court of India/Hon'ble High Court of Madras and any other Courts of Law relating to the subject matter

Safe mining Practices

6. The AD/DD, Dept. of Geology &Mining shall ensure operation of the proposed quarry after the submission slope stability study conducted through the reputed research & Academic Institutions such as NIRM, IITs, NITS Anna University, and any CSIR Laboratories etc.
7. The AD/DD, Dept. of Geology &Mining & Director General of Mine safety shall ensure strict compliance and implementation of bench wise recommendations/action plans as recommended in the scientific slope stability study of the reputed research & Academic Institutions as a safety precautionary measure to avoid untoward accidents during mining operation.
8. A minimum buffer distance specified as per existing rules and statutory orders shall be maintained from the boundary of the quarry to the nearest dwelling unit or other structures, and from forest boundaries or any other ecologically sensitive and archeologically important areas or the specific distance specified by SEIAA in EC as per the recommendations of SEAC depending on specific local conditions.

Water Environment – Protection and mitigation measures

9. The proponent shall ensure that the activity does not disturb the water bodies and natural flow of surface and groundwater, nor cause any pollution, to water sources in the area.
10. The proponent shall ensure that the activities do not impact the water bodies/wells in the neighboring open wells and bore wells. The proponent shall ensure that the activities do not in any way affect the water quantity and quality in the open wells and bore wells in the vicinity or impact the water table and levels. The proponent shall ensure that the activities do not disturb the river flow, nor affect the Odai, Water bodies, Dams in the vicinity.
11. Water level in the nearest dug well in the downstream side of the quarry should be monitored regularly and included in the Compliance Report.
12. Quality of water discharged from the quarry should be monitored regularly as per the norms of State Pollution Control Board and included in the Compliance Report.
13. Rain Water Harvesting facility should be installed as per the prevailing provisions of TNMBR/TNCDBR, unless otherwise specified. Maximum possible solar energy generation and utilization shall be ensured as an essential part of the project.

MEMBER SECRETARY
SEIAA-TN

14. Regular monitoring of flow rates and water quality upstream and downstream of the springs and perennial nallahs flowing in and around the mine lease area shall be carried out and reported in the compliance reports to SEIAA.
15. Regular monitoring of ground water level and water quality shall be carried out around the mine area during mining operation. At any stage, if it is observed that ground water table is getting depleted due to the mining activity; necessary corrective measures shall be carried out.
16. Garland drains and silt traps are to be provided in the slopes around the core area to channelize storm water. De-silting of Garland canal and silt traps have to be attended on a daily basis. A labour has to be specifically assigned for the purpose. The proponent shall ensure the quality of the discharging storm water as per the General Effluent Discharge Standards of CPCB.

Air Environment – Protection and mitigation measures

17. The activity should not result in CO_2 release and temperature rise and add to micro climate alternations.
18. The proponent shall ensure that the activities undertaken do not result in carbon emission, and temperature rise, in the area.
19. The proponent shall ensure that Monitoring is carried out with reference to the quantum of particulate matter during excavation; blasting; material transport and also from cutting waste dumps and haul roads.

Soil Environment – Protection and mitigation measures

20. The proponent shall ensure that the operations do not result in loss of soil biological properties and nutrients.
21. The proponent shall ensure that activity does not deplete the indigenous soil seed bank and disturb the mycorrizal fungi, soil organism, soil community nor result in eutrophication of soil and water.
22. The activities should not disturb the soil properties and seed and plant growth. Soil amendments as required to be carried out, to improve soil health.
23. Bio remediation using microorganisms should be carried out to restore the soil environment to enable carbon sequestration.
24. The proponent shall ensure that the mine restoration is done using mycorrizal VAM, vermin-composting, Biofertilizers to ensure soil health and biodiversity conservation.

MEMBER SECRETARY
SEIAA-TN

25. The proponent shall ensure that the topsoil is protected and used in planting activities in the area.
26. The proponent shall ensure that topsoil to be utilized for site restoration and Green belt alone within the proposed area.
27. The top soil shall be temporarily stored at earmarked place (s) and used for land reclamation and plantation. The over burden (OB) generated during the mining operations shall be stacked at earmarked dump site(s) only. The OB dumps should be scientifically vegetated with suitable native species to prevent erosion and surface run off. At critical points, use of geotextile shall be undertaken for stabilization of the dump. Protective wall or gabions should be made around the dump to prevent erosion / flow of sediments during rains. The entire excavated area shall be backfilled.

Noise Environment – Protection and mitigation measures

28. The peak particle velocity at 500m distance or within the nearest habitation, whichever is closer shall be monitored periodically as per applicable DGMS guidelines.
29. The sound at project sites disturb the villages in respect of both human and animal population. Consequent sleeping disorders and stress may affect the health in the villages located close to mining operations. Hence, the PP shall ensure that the biological clock of the villages are not disturbed because of the mining activity.

Biodiversity - Protection and mitigation measures

30. The proponent should ensure that there is no disturbance to the agriculture plantations, social forestry plantations, waste lands, forests, sanctuary or national parks. There should be no impact on the land, water, soil and biological environment and other natural resources due to the mining activities.
31. No trees in the area should be removed and all the trees numbered and protected. In case trees fall within the proposed quarry site the trees may be transplanted in the Greenbelt zone. The proponent shall ensure that the activities in no way result in disturbance to forest and trees in vicinity. The proponent shall ensure that the activity does not disturb the movement of grazing animals and free ranging wildlife. The proponent shall ensure that the activity does not disturb the biodiversity, the flora & fauna in the ecosystem. The proponent shall ensure that the activity does not result in invasion by invasive alien species. The proponent shall ensure that the activities do not disturb the resident and migratory birds. The proponent shall ensure that the

MEMBER SECRETARY
SEIAA-TN

activities do not disturb the vegetation and wildlife in the adjoining reserve forests and areas around.

32. The proponent shall ensure that the activities do not disturb the agro biodiversity and agro farms. Actions to be taken to promote agroforestry, mixed plants to support biodiversity conservation in the mine restoration effort.
33. The proponent shall ensure that all mitigation measures listed in the EIA/EMP are taken to protect the biodiversity and natural resources in the area.
34. The proponent shall ensure that the activities do not impact green lands/grazing fields of all types surrounding the mine lease area which are food source for the grazing cattle.

Climate Change

35. The project activity should not in any way impact the climate and lead to a rise in temperature.
36. There should be least disturbance to landscape resulting in land use change, contamination and alteration of soil profiles leading to Climate Change.
37. Intensive mining activity should not add to temperature rise and global warming.
38. Operations should not result in GHG releases and extra power consumption leading to Climate Change.
39. Mining through operational efficiency, better electrification, energy use, solar usage, use of renewable energy should try to decarbonize the operations.
40. Mining Operation should not result in droughts, floods and water stress, and shortages, affecting water security both on site and in the vicinity.
41. Mining should not result in water loss from evaporation, leaks and wastage and should support to improve the ground water.
42. Mining activity should be flood proof with designs and the drainage, pumping techniques shall ensure climate-proofing and socio-economic wellbeing in the area and vicinity.

Reserve Forests & Protected Areas

43. The activities should provide nature based support and solutions for forest protection and wildlife conservation.
44. The project activities should not result in forest fires, encroachments or create forest fragmentation and disruption of forest corridors.
45. There should be no disturbance to the freshwater flow from the forest impacting the water table and wetlands.

MEMBER SECRETARY
SEIAA-TN

46. The project proponent should support all activities of the forest department in creating awareness to local communities on forest conservation.
47. The project activities should not alter the geodiversity and geological heritage of the area.
48. The activities should not result in temperature rise due to increased fossil fuels usage disrupting the behaviour of wildlife and flora.
49. The activities should support and recognise the rights and roles of indigenous people and local communities and also support sustainable development.
50. The project activities should support the use of renewables for carbon capture and carbon storage in the project site and forest surrounds.
51. The project activities should not result in changes in forest structure, habitats and genetic diversity within forests.

Green Belt Development

52. The proponent shall ensure that in the green belt development more indigenous trees species (Appendix as per the SEAC Minutes) are planted.
53. The proponent shall ensure the area is restored and rehabilitated with native trees as recommended in SEAC Minutes (in Appendix).

Workers and their protection

54. The project proponent is responsible for implementing all the provisions of labour laws applicable from time to time to quarrying /Mining operations. The workers on the site should be provided with on-site accommodation or facilities at a suitable boarding place, protective equipment such as ear muffs, helmet, etc.
55. The proponent has to provide insurance protection to the workers in the case of existing mining or provide the affidavit in case of fresh lease before execution of mining lease.
56. The workers shall be employed for working in the mines and the working hours and the wages shall be implemented/enforced as per the Mines Act, 1952.

Transportation

57. No Transportation of the minerals shall be allowed in case of roads passing through villages/ habitations. In such cases, PP shall construct a bypass road for the purpose of transportation of the minerals leaving an adequate gap (say at least 200 meters) so that the adverse impact of sound and dust along with chances of accidents could be mitigated. All costs resulting from widening and strengthening of existing public road network shall be borne by the PP in

MEMBER SECRETARY
SEIAA-TN

consultation with nodal State Govt. Department. Transportation of minerals through road movement in case of existing village/ rural roads shall be allowed in consultation with nodal State Govt. Department only after required strengthening such that the carrying capacity of roads is increased to handle the traffic load. The pollution due to transportation load on the environment will be effectively controlled and water sprinkling will also be done regularly. Vehicular emissions shall be kept under control and regularly monitored. Project should obtain Pollution Under Control (PUC) certificate for all the vehicles from authorized pollution testing centers.

58. The Main haulage road within the mine lease should be provided with a permanent water sprinkling arrangement for dust suppression. Other roads within the mine lease should be wetted regularly with tanker-mounted water sprinkling system. The other areas of dust generation like crushing zone, material transfer points, material yards etc. should invariably be provided with dust suppression arrangements. The air pollution control equipments like bag filters, vacuum suction hoods, dry fogging system etc. shall be installed at Crushers, belt-conveyors and other areas prone to air pollution. The belt conveyor should be fully covered to avoid generation of dust while transportation. PP shall take necessary measures to avoid generation of fugitive dust emissions.

Storage of wastes

59. The project proponent shall store/dump the waste generated within the earmarked area of the project site for mine closure as per the approved mining plan.

CER/EMP

60. The CER Should be fully Implemented and fact reflected in the Half-yearly compliance report.
61. The EMP Shall also be implemented in consultation with local self-government institutions.
62. The follow-up action on the implementation of CER Shall be included in the compliance report.

Directions for Reclamation of mine sites

63. The mining closure plan should strictly adhere to appropriate soil rehabilitation measures to ensure ecological stability of the area. Reclamation/Restoration of the mine site should ensure that the Geotechnical, physical, chemical properties are sustainable that the soil structure composition is buildup, during the process of restoration.

MEMBER SECRETARY
SEIAA-TN

64. The proponent shall ensure that the mine closure plan is followed as per the mining plan and the mine restoration should be done with native species, and site restored to near original status. The proponent shall ensure that the area is ecologically restored to conserve the ecosystems and ensure flow of goods and services.

65. A crucial factor for success of reclamation site is to select sustainable species to enable develop a self-sustaining eco system. Species selected should easily establish, grow rapidly, and possess good crown and preferably be native species. Species to be planted in the boundary of project site should be un palatable for cattle's/ goats and should have proven capacity to add leaf-litter to soil and decompose. The species planted should be adaptable to the site conditions. Should be preferably pioneer species, deciduous in nature to allow maximum leaf-litter, have deep root system, fix atmospheric nitrogen and improve soil productivity. Species selected should have the ability to tolerate altered pit and toxicity of and site. They should be capable of meeting requirement of local people in regard to fuel fodder and should be able to attract bird, bees and butterflies. The species should be planted in mixed association.

66. For mining area reclamation plot culture experiments to be done to identify/ determine suitable species for the site.

67. Top soil with a mix of beneficial microbes (Bacteria/Fungi) to be used for reclamation of mine spoils. AM Fungi (Arbuscular mycorrhizal fungi), plant growth promoting Rhizo Bacteria and nitrogen fixing bacteria to be utilized.

68. Soil and moisture conservation and water harvesting structures to be used where ever possible for early amelioration and restoration of site.

69. Top soil is most important for successful rehabilitation of mined sites. Topsoil contains majority of seeds and plant propagation, soil microorganism, Organic matter and plant nutrients. Wherever possible the topsoil should be immediately used in the area of the for land form reconstruction, to pre mining conditions.

70. Over burdens may be analyzed and tested for soil characteristics and used in the site for revegetation. Wherever possible seeds, rhizome, bulbs, etc of pioneering spices should be collected, preserved and used in restoring the site.

71. Native grasses seeds may be used as colonizers and soil binders, to prevent erosion and allow diverse self- sustaining plant communities to establish. Grasses may offer superior tolerance to drought, and climatic stresses.

MEMBER SECRETARY
SEIAA-TN

72. Reclamation involves planned topographical reconstruction of site. Care to be taken to minimize erosion and runoff. Topsoils should have necessary physical, chemicals, ecological, properties and therefore should be stored with precautions and utilized for reclamation process. Stocked topsoil should be stabilized using grasses to protect from wind. Seeds of various indigenous and local species may be broad casted after topsoil and treated overburden are spread.
73. Alkaline soils, acidic soils, Saline soils should be suitably treated/amended using green manure, mulches, farmyard manure to increase organic carbon. The efforts should be taken to landscape and use the land post mining. The EMP and mine closure plan should provide adequate budget for re-establishing the site to pre-mining conditions. Effective steps should be taken for utilization of over burden. Mine waste to be used for backfilling, reclamation, restoration, and rehabilitation of the terrain without affecting the drainage and water regimes. The rate of rehabilitation should be similar to rate of mining. The land disturbed should be reshaped for long term use. Mining should be as far as possible be eco-friendly. Integration of rehabilitation strategies with mining plan will enable speedy restoration.
74. Efforts should to taken to aesthetically improve the mine site. Generally, there are two approaches to restoration i.e Ecological approach which allows tolerant species to establish following the succession process allowing pioneer species to establish. The other approach i.e plantation approach is with selected native species are planted. A blend of both methods may be used to restore the site by adding soil humus and mycorrhiza.
75. Action taken for restoration of the site should be specifically mentioned in the EC compliances

Part-A: Conditions to be Complied before commencing mining operations:-

1. **The project proponent shall advertise in at least two local newspapers widely circulated in the region, one of which shall be in the vernacular language informing the public that**
   - **I. The project has been accorded Environmental Clearance.**
   - **II. Copies of clearance letters are available with the Tamil Nadu Pollution Control Board.**
   - **III. Environmental Clearance may also be seen on the website of the SEIAA.**

MEMBER SECRETARY
SEIAA-TN

IV. **The advertisement should be made within 7 days from the date of receipt of the clearance letter and a copy of the same shall be forwarded to the SEIAA.**

2. Mining activity should be reviewed by the District Collector after three years and decide for further extension.
3. NOC from the Standing committee of the NBWL shall be obtained, if protected areas are located within 10 Km from the proposed project site.
4. The project proponent shall comply the conditions laid down in the Section V, Rule 36 of Tamil Nadu Minor Minerals Concession Rules 1959.
5. **A copy of the Environment Clearance letter shall be sent by the proponent to the concerned Panchayat, Town Panchayat / Panchayat union/ Municipal Corporation, Urban Local Body and the Local NGO, if any, from whom suggestions/ representations, if any, were received while processing the proposal. The clearance letter shall also be put on the website of the proponent and also kept at the site, for the general public to see.**
6. Quarry lease area should be demarcated on the ground with wire fencing to show the boundary of the lease area on all sides with red flags on every pillar shall be erected before commencement of quarrying.
7. The proponent shall ensure that First Aid Box is available at site.
8. The excavation activity shall not alter the natural drainage pattern of the area.
9. The excavated pit shall be restored by the project proponent for useful purposes.
10. The proponent shall quarry and remove only in the permitted areas as per the approved Mining Plan details.
11. The quarrying operation shall be restricted between 7AM and 5 PM.
12. The proponent shall take necessary measures to ensure that there shall not be any adverse impacts due to quarrying operation on the nearby human habitations, by way of pollution to the environment.
13. A minimum distance of 50mts. from any civil structure shall be kept from the periphery of any excavation area.
14. The mined out pits should be backfilled where warranted and area should be suitably landscaped to prevent environmental degradation. The mine closure plan as furnished in the proposal shall be strictly followed with back filling and tree plantation.

MEMBER SECRETARY
SEIAA-TN

15. Wet drilling method is to be adopted to control dust emissions. Delay detonators and shock tube initiation system for blasting shall be used so as to reduce vibration and dust.
16. Drilling and blasting shall be done only either by licensed explosive agent or by the proponent after obtaining required approvals from Competent Authorities.
17. Blasting shall be carried out after announcing to the public adequate through public address system to avoid any accident.
18. A study has to be conducted to assess the optimum blast parameters and blast design to keep the vibration limits less than prescribed levels and only such design and parameters should be implemented while blasting is done. Periodical monitoring of the vibration at specified location to be conducted and records kept for inspection.
19. The Proponent shall take appropriate measures to ensure that the GLC shall comply with the revised NAAQ norms notified by MoEF& CC, GoI on 16.11.2009.
20. The following measures are to be implemented to reduce Air Pollution during transportation of mineral
    i. Roads shall be graded to mitigate the dust emission.
    ii. Water shall be sprinkled at regular interval on the main road and other service roads to suppress dust
21. The following measures are to be implemented to reduce Noise Pollution
    i. Proper and regular maintenance of vehicles and other equipment
    ii. Limiting time exposure of workers to excessive noise.
    iii. The workers employed shall be provided with protection equipment and earmuffs etc.
    iv. Speed of trucks entering or leaving the mine is to be limited to moderate speed of 25 kmph to prevent undue noise from empty trucks.
    v. All noise generating machinery the compressor, generator to be enclosed in acoustic enclosure so as to reduce noise in working area.
22. Measures should be taken to comply with the provisions laid under Noise Pollution (Regulation and Control)(Amendment) Rules, 2010, dt: 11.01.2010 issued by the MoEF& CC, GoI to control noise to the prescribed levels.
23. Suitable conservation measures to augment groundwater resources in the area shall be planned and implemented in consultation with Regional Director, CGWB. Suitable measures should be taken for rainwater harvesting.

MEMBER SECRETARY
SEIAA-TN

24. Permission from the competent authority should be obtained for drawl of ground water, if any, required for this project.
25. Topsoil, if any, shall be stacked properly with proper slope with adequate measures and should be used for plantation purpose.
26. The following measures are to be adopted to control erosion of dumps:-
    i. Retention/ toe walls shall be provided at the foot of the dumps.
    ii. Worked out slopes are to be stabilized by planting appropriate shrub/ grass species on the slopes.
27. Waste oils, used oils generated from the EM machines, mining operations, if any, shall be disposed as per the Hazardous& other wastes (Management, and Trans Boundary Movement) Rules, 2016 and its amendments thereof to the recyclers authorized by TNPCB.
28. Concealing the factual data or failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract action under the provisions of Environment (Protection) Act, 1986.
29. Rain water harvesting to collect and utilize the entire water falling in land area should be provided.
30. Rain water getting accumulated in the quarry floor shall not be discharged directly to the nearby stream or water body.If it is to be let into the nearby water body, it has to be discharged into a silt trap on the surface within the lease area and only the overflow after allowing settling of soil be let into the nearby waterways. The silt trap should be of sufficient dimensions to catch all the silt water being pumped out during one season.The silt trap should be cleaned of all the deposited silt at the end of the season and kept ready for taking care of the silt in the next season.
31. The lease holder shall undertake adequate safeguard measures during extraction of material and ensure that due to this activity, the hydro-geological regime of the surrounding area shall not be affected.Regular monitoring of ground water level and quality shall be carried out around the mine lease area during the mining operation.If at any stage, if it is observed that the groundwater table is getting depleted due to the mining activity; necessary corrective measures shall be carried out. District Collector/mining officer shall ensure this.
32. No tree-felling shall be done in the leased area, except only with the permission from competent Authority.

MEMBER SECRETARY
SEIAA-TN

33. To take up environmental monitoring of the proposed quarry site before, during and after the mining activities including vibration study data, water, air & flora/fauna environment, slurry water generated/disposed and method of disposal, involving a reputed academic Institution.
34. It shall be ensured that the total extent of nearby quarries(existing, abandoned and proposed) located within 500 meter radius from the periphery of this quarry is not exceeding 5 hectares within the mining lease period of this application.
35. It shall be ensured that there is no habitation is located within 300 meter radius from the periphery of the quarry site and also ensure that no hindrance will be caused to the people of the habitation located within 300m radius from the periphery of the quarry site.
36. Free Silica test should be conducted and reported to TNPCB, Department of Geology and Mining and Regional Director, MoEF& CC, GOI.
37. Air sampling at intersection point should be conducted and reported to TNPCB, Department of Geology and Mining and Regional Director, MoEF& CC, GOI.
38. Bunds to be provided at the boundary of the project site.
39. The project proponent shall undertake plantation/afforestation work by planting the native species on all side of the lease area at the rate of 400/Ha. Suitable tall tree saplings should be planted on the bunds and other suitable areas in and around the work place.
40. Floor of excavated pit to be levelled and sides to be sloped with gentle slope (Except for granite quarries) in the mine closure phase.
41. The Project Proponent shall ensure a minimum of 2.5% of the annual turnover will be utilized for the CSR Activity
42. The Project Proponent shall provide solar lighting system to the nearby villages.
43. Earthen bunds and barbed wire fencing around the pits with green belt all along the boundary shall be developed and maintained.
44. Safety equipments to be provided to all the employees.
45. Safety distance of 50m has to be provided in case of railway, reservoir, canal/odai
46. The Assistant/Deputy Director, Department of Geology & mining shall ensure that the proponent has engaged the blaster with valid Blasting license/certificate obtained from the competent authority before execution of mining lease.
47. The proponent shall furnish the Baseline data covering the Air, Water, Noise and land environment quality for the proposed quarry site before execution of mining lease.

MEMBER SECRETARY
SEIAA-TN

48. The proponent shall erect the pillars in accordance with the Rules for depicting GPS details in the earmarked boundary of the quarry site to monitor electronically before execution of mining.
49. The proponent has to provide insurance protection to the workers in the case of existing mining or provide the affidavit in case of fresh lease before execution of mining lease.
50. The proponent has to display the name board at the quarry site showing the details of Proponent, lease period, extent, etc., with respect to the existing activity before execution of mining.
51. Heavy earth machinery equipments if utilized, after getting approval from the competent authority.
52. The Proponent shall ensure that the project activity including blasting, mining transportation etc should in no way have adverse impact to the other forests, such as reserve forests and social forests, tree plantation and bio diversity, surrounding water bodies etc.
53. The proponent shall provide Green Belt development at the rate of not less than 400 trees/Hectare. The tree saplings shall be not less than 3m height.
54. The fugitive emissions should be monitored during the mining activity and should be reported to TNPCB once in a month and the operation of the quarry should no way impact the agriculture activity & water bodies near the project site.
55. All the commitment made by the project proponent in the proposal shall be strictly followed.
56. The mining lease holders shall, after ceasing mining operations, undertake re-grassing the mining area and any other area which may have been disturbed due to their mining activities and restore the land to a condition which is fit for growth of fodder, flora, fauna etc.
57. All required sanitary and hygienic measures should be in place before starting construction activities and they have to be maintained throughout the construction phase.
58. The company shall stress upon the preventive aspects of occupational health.
59. A separate environment and safety management cell with qualified staff shall be set up before commissioning of construction activities and shall be retained throughout the lifetime of the industry, for implementation of the stipulated environmental safeguards.
60. A scientific site/ ecological rehabilitation and restoration plan on long term basis should be drawn to carryout restoration with native species and Bio diversity.
61. The Green/Blue plan should guide the restoration of the site. The rehabilitation/restoration plan should be submitted to SEIAA-TN within one month. If applicable.

MEMBER SECRETARY
SEIAA-TN

62. The existing water bodies should not be disturbed to ensure sustainable environment for aquatic life forms.
63. The proponent should completely implement all environmental pollution control measures as detailed in the EIA report and in the additional report.
64. Avenue plantation wherever needed has to be carried out along the route for dust suppression.
65. The green belt developed for the prevention of dust pollution should not form a part of the larger green belt development envisaged in the EIA report.
66. Regular monitoring and check up for pulmonary and carcinogenic diseases to be carried out regularly, not only for the workers involved in the mines but also to the people in the villages adjoining the mines. Interaction with the Primary Health Centre & district medical officer should be on regular basis to monitor the incidence of the diseases if any and to provide suitable medical facility for the patients.
67. Monitoring of well water levels and water quality of the wells in the locations furnished in the EIA report shall be done during pre-monsoon and post monsoon period and results submitted to the Regional Office of MoEF, Chennai and SEIAA.
68. Monitoring of water quality and air quality in and around the project site in the selected monitoring points as mentioned in the EIA report shall be continued regularly involving Academic Institutions.
69. Hydro geological study including infiltration test shall be conducted by any reputed agency to estimate leachate quantity.
70. Regular medical check-up for mine workers and nearby residents around the project site involving community medical centre/NIMH shall be conducted.
71. As per norms, the health study should be conducted through competent/approved health organization and report submitted for one year.
72. The effective safe guard measures shall be provided to control particulate dust level in critical areas, transfer points and haul road within the mine area.
73. NOC from the State GWA for drawing ground water shall be obtained, if ground water table is intersected.
74. Green belt shall be provided as per norms of MoEF& CC, GOI, in consultation with local DFO.

MEMBER SECRETARY
SEIAA-TN

75. All the recommendations made in the EIA report of the project shall be effectively implemented.
76. A booklet containing the Dos and Don'ts shall be prepared in vernacular languages for the use of the mine engineers/ managers and the workers to ensure that all necessary environmental, safety and health measures are undertaken.
77. All the environmental protection measures and safeguards as recommended in the EIA report shall be complied with.
78. Hydro geological study of the area shall be reviewed annually and report submitted to the Authority. No water bodies including natural drainage system in the area shall be disturbed due to activities associated with the operation of the Mining activity.
79. A separate Environmental Management Cell equipped with full fledged laboratory facilities to carry out the various Environmental Management and Monitoring functions shall be set up under the control of a Senior Executive.
80. The project proponent shall upload the status of compliance of the stipulated environmental clearance conditions, including results of monitored data on their website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of the MoEF at Chennai, the respective Zonal Office of CPCB and the SPCB. The criteria pollutant levels namely; RSPM, SO2, NOx or critical sector parameters, indicated for the projects shall be monitored and displayed at a convenient location near the main gate of the company in the public domain.

Part B: <u>General Conditions:</u>

1. EC is given only on the factual records, documents and the commitment furnished in non judicial stamp paper by the proponent.
2. The Proponent shall obtain the Consent from the TNPC Board before commencing the activity.
3. No change in mining technology and scope of working should be made without prior approval of the SEIAA, Tamil Nadu.
4. No change in the calendar plan including excavation, quantum of mineral (minor mineral) should be made.
5. Effective safeguard measures, such as regular water sprinkling shall be carried out in critical areas prone to air pollution and having high levels of particulate matter such as loading and unloading point and all transfer points. Extensive water sprinkling shall be carried out on haul

MEMBER SECRETARY
SEIAA-TN

roads. It should be ensured that the Ambient Air Quality parameters conform to the norms prescribed by the Central Pollution Control Board in this regard.

6. Effective safeguards shall be adopted against health risks on account of breeding of vectors in the water bodies created due to excavation of earth.
7. A berm shall be left from the boundary of adjoining field having a width equal to at least half the depth of proposed excavation.
8. Loading and unloading areas including all the transfer points should also have efficient dust control arrangements. These should be properly maintained and operated.
9. Vehicular emissions shall be kept under control and be regularly monitored. The mineral transportation shall be carried out through the covered trucks only and the vehicles carrying the mineral shall not be overloaded.
10. Access and haul roads to the quarrying area should be restored in a mutually agreeable manner where these are considered unnecessary after extraction has been completed.
11. All Personnel shall be provided with protective respiratory devices including safety shoes, masks, gloves etc. Supervisory people should be provided with adequate training and information on safety and health aspects. Occupational health surveillance program of the workers should be undertaken periodically to observe any contractions due to exposure to dust and take corrective measures, if needed.
12. Periodical medical examination of the workers engaged in the project shall be carried out and records maintained. For the purpose, schedule of health examination of the workers should be drawn and followed accordingly. The workers shall be provided with personnel protective measures such as masks, gloves, boots etc.
13. Workers/labourers shall be provided with facilities for drinking water and sanitation facility for Female and Male separately.
14. The project proponent shall ensure that child labour is not employed in the project as per the sworn affidavit furnished.
15. The funds earmarked for environmental protection measures should be kept in separate account and should not be diverted for other purpose. Year wise expenditure should be reported to the Ministry of Environment and Forests and its Regional Office located at Chennai.

MEMBER SECRETARY
SEIAA-TN

16. The Environmental Clearance does not absolve the applicant/proponent of his obligation/requirement to obtain other statutory and administrative clearances from other statutory and administrative authorities.

17. This Environmental Clearance does not imply that the other statutory / administrative clearances shall be granted to the project by the concerned authorities. Such authorities would be considering the project on merits and be taking decisions independently of the Environmental Clearance

18. The SEIAA, Tamil Nadu may alter/modify the above conditions or stipulate any further conditions in the interest of environment protection.

19. The SEIAA, Tamil Nadu may cancel the Environmental Clearance granted to this project under the provisions of EIA Notification, 2006, at any stage of the validity of this Environmental Clearance, if it is found or if it comes to the knowledge of this SEIAA, TN that the project proponent has deliberately concealed and/or submitted false or misleading information or inadequate data for obtaining the Environmental Clearance.

20. Failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract action under the provisions of the Environment (Protection) Act, 1986.

21. The above conditions will be enforced inter-alia, under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, the Public Liability Insurance Act, 1991, along with their amendments, Minor Mineral Conservation &Development Rules, 2010 framed under MMDR Act 1957,National Commission for protection of Child Right Rules,2006, Wildlife Protection Act, 1972, Forest Conservation Act, 1980, Biodiversity Conservation Act, 2016, the Biological Diversity Act,2002 and Biological diversity Rules, 2004 and Rules made there under and also any other orders passed by the Hon'ble Supreme Court of India/Hon'ble High Court of Madras and any other Courts of Law relating to the subject matter.

22. Any other conditions stipulated by other Statutory/Government authorities shall be complied.

23. Any appeal against this Environmental Clearance shall lie with the Hon'ble National Green Tribunal, if preferred, within a period of 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010.

MEMBER SECRETARY
SEIAA-TN

24. The Environmental Clearance is issued based on the documents furnished by the project proponent. In case any documents found to be incorrect/not in order at a later date the Environmental Clearance issued to the project will be deemed to be revoked/ cancelled.

MEMBER SECRETARY
SEIAA-TN

Copy to:

1. The Secretary, Ministry of Mines, Government of India, Shastri Bhawan, New Delhi.
2. The Additional Chief Secretary to Government, Environment and Forests Department, Tamil Nadu.
3. The Additional Chief Secretary to Government, Industries Department, Tamil Nadu.
4. The Chairman, Central Pollution Control Board, Parivesh Bhawan, CBD-Cum-Office Complex, East Arjun Nagar, New Delhi-110 032.
5. The Chairman, TNPC Board,76, Mount Salai,Guindy, Chennai-32
6. The District Collector, Madurai District.
7. The Commissioner of Geology and Mines,Guindy,Chennai-32
8. EI Division, Ministry of Environment & Forests, Paryavaran Bhawan, New Delhi Spare.
9. Mail copy to regional office, MoEF&CC, Chennai
10. File Copy

Signature Not Verified
Digitally signed by Thiru.Deepak S.Bilgi
Member Secretary
Date: 7/6/2023 10:43:05 AM

File No.: 9858
Government of India
Ministry of Environment, Forest and Climate Change
(Issued by the State Environment Impact Assessment Authority(SEIAA), TAMIL NADU)
***

Dated **04/04/2024**

To,

BOSE KARUPPAIAH
BOSE KARUPPAIAH
B. Karuppaiah, S/o. Bose, No.209A, Vilakkulam, Puliyangulam, Melapidayur, Sivagangai District-630606. , Puliyangulam, SIVAGANGA, TAMIL NADU, 630606
karuppaiahbose06@gmail.com

Subject: Grant of prior Environmental Clearance (EC) to the proposed Mining Project under the provisions of EIA Notification 2006-regarding

Sir/Madam,

This is in reference to your application submitted to SEIAA vide proposal number SIA/TN/MIN/453245/2023 dated 23/02/2024 for grant of prior Environmental Clearance (EC) to the project under the provision of the EIA Notification 2006-and as amended thereof.

Ref:

1. Your application submitted for Terms of Reference dated:28.02.2023.
2. Tor Issued vide letter No. SEIAA-TN/F. No.9858/SEAC/ToR-1441/2023 Dated:10.05.2023.
3. Public Hearing conducted on 12.09.2023.
4. Online Proposal No. SIA/TN/MIN/453245/2023, dt:25.11.2023 for EC.

Project proponent submitted EIA Report to SEIAA-TN on 27.11.2023.

2. The particulars of the proposal are as below :

(i) EC Identification No.	EC23B0108TN5449025N
(ii) File No.	9858
(iii) Clearance Type	Fresh EC
(iv) Category	B1
(v) Project/Activity Included Schedule No.	1(a) Mining of minerals,1(a) Mining of minerals
(vii) Name of Project	B. KARUPPAIAH ROUGH STONE AND GRAVEL MINING LEASE
(ix) Location of Project (District, State)	MADURAI, TAMIL NADU
(x) Issuing Authority	SEIAA
(xii) Applicability of General Conditions	No

3. In view of the particulars given in the Para 1 above, the project proposal interalia including Form-2(Part A, B and C)/ EIA & EMP Reports were submitted to the SEIAA for an appraisal by the SEIAA under the provision of EIA notification 2006 and its subsequent amendments.

4. The above-mentioned proposal has been considered by SEIAA in the meeting held on 18/03/2024. The minutes of the meeting and all the project documents are available on PARIVESH portal which can be accessed from the PARIVESH portal by scanning the QR Code above.

5. The SEAC, based on information submitted viz: Form 1 (Part A, B and C), EIA/EMP report etc., & clarification provided by the project proponent and after detailed deliberations on all technical aspects and public hearing issues and compliance thereto furnished by the Project Proponent, recommended the proposal for grant of Environment Clearance under the provision of EIA Notification, 2006 and as amended thereof subject to stipulation of Specific and Standard EC conditions as detailed in the point below.

6. The SEIAA has examined the proposal in accordance with the provisions contained in the Environment Impact Assessment (EIA) Notification, 2006 & further amendments thereto and based on the recommendations of the SEIAA hereby accords Environment Clearance for the instant proposal to M/s. BOSE KARUPPAIAH under the provisions of EIA Notification, 2006 and as amended thereof subject to compliance of the Specific and Standard EC conditions as given in Annexure (2)

7. The Ministry/SEIAA-TN reserves the right to stipulate additional conditions, if found necessary.

8. The Environmental Clearance to the aforementioned project is under provisions of EIA Notification, 2006. It does not tantamount to approvals/consent/permissions etc. required to be obtained under any other Act/Rule/regulation. The Project Proponent is under obligation to obtain approvals /clearances under any other Acts/ Regulations or Statutes, as applicable, to the project.

9. The PP is under obligation to implement commitments made in the Environment Management Plan, which forms part of this EC.

10. **Salient features of the proposal are as follows**:

Sl. No	**Salient Features of the Proposal**		
1.	Name of the Owner/Firm	:	Thiru.B. Karuppaiah, S/o. Bose, No.209A, Vilakkulam, Puliyangulam, Melapidavur, Sivagangai District-630606.
2.	Type of quarrying	:	Rough Stone & Gravel Quarry
3.	S.F Nos. of the quarry site	:	1193/1, 1193/2, 1199/1B, 1199/1C, 1199/1D, 1199/1E, 1199/1F, 1199/1H, 1199/1I, 1199/1J & 1199/1K.
4.	Village in which situated	:	Katchaikatti
5.	Taluk in which situated	:	Vadipatti
6.	District in which situated	:	Madurai
7.	Extent of quarry (in ha.)	:	2.01.50 Ha
8.	Latitude & Longitude of all corners of the quarry site	:	10°4'47.79"N to 10°4'55.37"N 78°0'37.99"E to 78°0'44.65"E
9.	Topo Sheet No.	:	58 – J/04
10.	Type of mining	:	Opencast mechanized Mining
11.	Period of Current Mine Plan		5 years
12.	Production (Quantity in m^3)		As per the mining plan the lease period is 10 years. The mining plan is for the period of five years & production should not exceed 1,56,188 m^3 of Rough stone & 27,862 m^3 of Gravel .
13. .	Depth of Quarrying		30m BGL
14.	Depth of water table	:	50m-55m BGL

15.	Man Power requirement per day:	:	19 Nos
16.	Water requirement: 1. i) Drinking Water & Domestic 2. Purpose 3. ii) Dust suppression 4. iii) Green belt	:	5.9 KLD 1.9 KLD 2.0 KLD 2.0 KLD
17.	Power requirement a. Domestic Purpose b. Industrial purpose	:	TNEB 100 Unit
18.	Precise area communication approved by the Joint Director / Assistant Director(i/c), Department of Geology and Mining	:	Rc.No.831/Mines/2022, dated:05.01.2023
19.	Mining Plan approved by Joint Director / Assistant Director(i/c), Department of Geology and Mining	:	Rc.No.831/Mines/2022, dated:08.02.2023
20.	Joint Director / Assistant Director(i/c), Department of Geology and Mining, 500m Cluster Letter		Rc.No.831/Mines/2022, dated:08.02.2023
21.	VAO Certificate Regarding Structures within 300m Radius		Letter Dated:22.02.2023
22.	Tor Issued		Lr No. SEIAA-TN/F.No.9858/SEAC/ TOR-1441/2023 Dated: 10.05.2023.
23.	Public Hearing		12.09.2023
24.	EIA Report Submitted		27.11.2023
25.	Project Cost (excluding EMP cost)	:	Rs. 56,55,300/-
26.	EMP cost (in Rs. Lakh).	:	Capital Cost – Rs. 34.59 Lakhs Recurring Cost – Rs. 3.59 Lakhs
27.	CER cost (in Rs. Lakh).	:	Rs. 5,00,000 /- as accepted by the PP
	Validity; **This Environmental Clearance is accorded for the quantity of 1,56,188 m^3 of Rough stone & 27,862 m^3 of Gravel up to the depth of 30m and the annual peak production should not exceed 34,645 m^3 of Rough Stone & 14,238 m^3 of Gravel.** **The Environmental Clearance issued is valid as per the approved mine plan period and as per MoEF&CC's notification S.O.1533(E) dated.14.09.2006 and S.O. 1807(E) dated 12.04.2022.**		

11. General Instructions:

1. The project proponent shall prominently advertise it at least in two local newspapers of the District or State, of which one shall be in the vernacular language within seven days indicating that the project has been accorded environment clearance and the details of SEIAA website where it is displayed.

2. The copies of the environmental clearance shall be submitted by the project proponents to the Heads of local bodies, Panchayats and Municipal Bodies in addition to the relevant offices of the Government who in turn must display the same for 30 days from the date of receipt.

3. The project proponent shall have a well laid down environmental policy duly approved by the Board of Directors (in case of Company) or competent authority, duly prescribing standard operating procedures to have proper checks and balances and to bring into focus any infringements/deviation/violation of the environmental / forest / wildlife norms / conditions.

4. Action plan for implementing EMP and environmental conditions along with responsibility matrix of the project proponent (during construction phase) and authorized entity mandated with compliance of conditions (during operational phase) shall be prepared. The year wise funds earmarked for environmental protection measures shall be kept in separate account and not to be diverted for any other purpose. Six monthly progress of implementation

of action plan shall be reported to the Ministry/Regional Office along with the Six-Monthly Compliance Report.

5. Concealing factual data or submission of false/fabricated data may result in revocation of this environmental clearance and attract action under the provisions of Environment (Protection) Act, 1986.

6. The Regional Office of this SEIAAshall monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the officer (s) of the Regional Office by furnishing the requisite data / information/monitoring reports.

7. Any appeal against this EC shall lie with the National Green Tribunal, if preferred, within a period of 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010.

12. This issue with an approval of the Competent Authority. For information on deliberations, refer to the minutes of SEAC and SEIAA available in the PARIVESH Portal

Copy To

1. The Secretary, Ministry of Mines, Government of India, Shastri Bhawan, New Delhi.
2. The Additional Chief Secretary to Government, Environment and Forests Department, Tamil Nadu.
3. The Additional Chief Secretary to Government, Natural Resources Department, Tamil Nadu.
4. The Additional Principal Chief Conservator of Forests, Regional Office (SZ), 34, HEPC Building, 1st & 2nd Floor, Cathedral Garden Road, Nungambakkam, Chennai – 34.
5. The Chairman, Central Pollution Control Board, Parivesh Bhawan, CBD-Cum-Office Complex, East Arjun Nagar, New Delhi-110 032.
6. The Chairperson, TNPC Board,76, Mount Salai, Guindy, Chennai-32.
7. The District Collector, Madurai District.
8. The Commissioner of Geology and Mines, Guindy, Chennai-32.
9. Assistant Director, Department of Geology & Mining, Madurai District.
10. EI Division, Ministry of Environment & Forests, Paryavaran Bhawan, New Delhi.
11. File Copy.

Annexure 1

Specific EC Conditions for (Mining Of Minerals)

1. Mining Conditions - Site Specific

S. No	EC Conditions
1.1	**1)** The prior Environmental Clearance granted for this mining project shall be valid for the project life including production value as laid down in the mining plan approved and renewed by competent authority, from time to time, subject to a maximum of thirty years, whichever is earlier, **vide MoEF&CC Notification S.O, 1807(E) dated 12.04.2022.** 2) Tree plantation & fencing and installation of garland drainage with siltation tank around the mine lease area shall be completed before obtaining the CTO from the TNPCB. 3) The PP shall ensure that the loaded trucks shall be covered completely with the Tarpaulin firmly after loading the rough stone before the vehicle leaves the mine limit. 4) The PP shall mark the DGPS reference pillars painted with blue & white colour indicating the safety barrier of 7.5 m to be left under the Rule 13 (1) of MCDR, 1988 within the lease boundary and protective bunds, before obtaining the CTO from the TNPCB. 5) The PP shall constitute the Cluster Committee involving the other quarry operators as indicated in the Public Hearing for ensuring the environmental management in the cluster before obtaining the CTO from the TNPCB. 6) The PP shall not employ any external agency for carrying out the blasting operation and he shall

S. No	EC Conditions
	also install the temporary magazines approved by the concerned licensing authority before the execution of the lease, for storing the authorized explosives & detonators separately in accordance with the Explosive Rules, 2008. 7) **Since the structures are situated within a radial distance of 500 m,** the PP shall carry out the scientific studies **within a period of six months** from the commencement of quarrying operations, to design the controlled blast parameters for reducing the blast-induced ground/air- vibrations and eliminating the fly rock from the blasting operations carried out in the quarry, by involving anyone of these reputed Research and Academic Institution such as CSIR-Central Institute of Mining & Fuel Research / Dhanbad, NIRM/Bangalore, IIT-Madras, NIT-Dept of Mining Engg, Surathkal, and Anna University Chennai-CEG Campus. A copy of such scientific study report shall be submitted to the SEIAA, MoEF, TNPCB, AD/Mines-DGM and DMS, Chennai as a part of Environmental Compliance without any deviation. 8) The PP shall only carry out the NONEL-based (or) Electronic Detonator based blasting operation for controlling the environmental impacts with keeping the security guards at a radial distance of 500 m by ensuring that all persons within such area have taken proper shelter. 9) Considering the cluster of quarries are located, the PP shall ensure that the haul road dust is constructed with bitumen to minimize dust generation but however the suppression/watering are being done to maintain the required moisture level in all active haul roads. A fleet of water trucks with adequate water spray systems are available and operational at all times 10) **Since the waterbodies are situated nearby,** the PP shall carry out the scientific studies to assess the hydrogeological condition of the quarry within a period of six months from the date of lease execution, by involving any one of the reputed Research and Academic Institution - CSIR-Central Institute of Mining & Fuel Research / Dhanbad, NIRM/Bangalore, Division of Geotechnical Engineering-IIT-Madras, NIT-Dept of Mining Engg, Surathkal, University of Madras – Centre for Environmental Studies, and Anna University Chennai-Dept of Geology, CEG Campus. A copy of such scientific study report shall be submitted to the SEIAA, MoEF, TNPCB, AD/Mines-DGM and DMS, Chennai as a part of Environmental Compliance without any deviation. 11) The PP shall furnish an affidavit indicating the Standard Operating Procedures (SoP) for carrying out the 'Best Mining Practices' in the areas of drilling, blasting excavation, transportation and green belt development, in securing the safety of the persons living within a radial distance of 500 m (danger zone) to the concerned AD (Mines) at the time of lease execution. 12) The PP shall not carry out the deep hole larger diameter blasting and the secondary blasting of oversize fragments /boulders during the life of the lease period. 13) The PP shall **annually** carry out an Occupational Health Survey (OHS) includes free silica test, **in accordance with the guidelines & period of examination laid in the DGMS (Tech.) (S&T) Circular No. 01 of 2011**, on OHS of the persons working in mines prone to generate the airborne dust, under Section 9A of Mines Act, 1952 by actively involving State Government officials and Non-Government Organizations(NGO) working in the Occupational Health Survey (Medical Examination).A copy of such annual compliance certificate shall be submitted to the SEIAA, MoEF, TNPCB, AD/Mines-DGM and DMS, Chennai as a part of Environmental Compliance without any deviation. 14) The PP shall adhere to the **special mitigation measures as the proposed quarry is located within 1 km from the reserve forest as stipulated in the Annexure**

2. Seiaa Specific Conditions:

S. No	EC Conditions
2.1	1. Keeping in view of MoEF&CC's notification S.O.1533(E) dated.14.09.2006 and S.O. 1807(E) dated.12.04.2022, this Environmental Clearance is valid as per the approved mine plan period. 2. The EC granted is subject to review by District Collector, Mines Dept. and TNPCB on

S. No	EC Conditions
	completion of every 5 years and also during the mine plan period, till the project life so as to review the EC conditions and to ensure that they have all been adhered to and implemented. 3. The project proponent shall submit a Certified Compliance Report obtained from IRO of MoEF&CC to the monitoring, regulatory and other concerned authorities including SEIAA, while seeking a renewal of the mining plan to cover the project life. 4. There should be regular monitoring of air quality, water quality, ground water level and noise quality and reports regarding the same should be submitted to TNPCB, SEIAA & IRO of MoEF&CC once in every 6 months. 5. The proponent shall strictly adhere to the mining plan and half yearly and annual returns shall be submitted to the Director of Geology and Mining Department with copy marked to TNPCB, SEIAA & IRO of MoEF&CC. 6. Ground & surface water in and around the project area should be monitored frequently and water quality and quantity reports should be submitted every year to IRO of MoEF&CC & TNPCB. 7. Biodiversity in and around the project area should be monitored frequently and detailed biodiversity report should be submitted every year to IRO of MoEF&CC & TNPCB. 8. The progressive and final mine closure plan including the green belt implementation and environmental norms should be strictly followed as per the EMP and as per the amount committed and approved in EC for EMP. Status of progressive mine closure and green belt implementation should be included in the half yearly compliance report submitted to TNPCB, SEIAA & IRO of MoEF&CC. 9. As per the OM vide F. No. IA3-22/1/2022-IA-Ill [E- 172624] Dated: 14.06.2022, the Project Proponents are directed to submit the six-monthly compliance on the environmental conditions prescribed in the priorenvironmental clearance letter(s) through newly developed compliance module in the PARIVESH Portal from the respective login. 10. The amount allocated for EMP should be kept in a separate account and both the capital and recurring expenditures should be done year wise for the works identified, approved and as committed. The work &expenditure made under EMP should be elaborated in the bi-annual compliance report submitted and also should be brought to the notice of IRO of MoEF&CC, TNPCB and other concerned authorities during inspections.

3. Special Mitigation Measures For The Quarries Located In Close Proximity To The Windmills, If Applicable

S. No	EC Conditions
3.1	<table><tr><th rowspan="2">Sl. No</th><th colspan="2">Existing (or) Virgin Quarry</th></tr><tr><th>Wind Mills located at a distance of 150 m to 300 m</th><th>Wind Mills located beyond 300 m Up to 500 m</th></tr><tr><td>1.</td><td>Appointment of I/II Class Mines Manager Certificate of Competency under MMR 1961.</td><td>Appointment of I/II Class Mines Manager Certificate of Competency under MMR 1961.</td></tr><tr><td>2.</td><td>Special precautions are to be taken during blasting within danger zone such as posting guards, etc.</td><td>Blast design parameters should be mentioned in mining plan/scheme. and may be reviewed by a competent mining engineer.</td></tr><tr><td>3.</td><td>Blast design parameters should be mentioned in mining plan/scheme.</td><td>MCPD and total charge should be fixed such that it should nott exceed 1.3 kg and 26.50 kg respectively.</td></tr><tr><td>4.</td><td>The recommendations of scientific organisation need to be incorporated in the mining plan/scheme before its</td><td>Fresh scientific study may be conducted if mine management wants to increase the MCPD and total explosive charge above the quantity of 1.30 kg and</td></tr></table>

S. No	EC Conditions

	approval.	26.50 kg respectively. Continuous monitoring using seismograph should also be done in such cases by the mine management.
5.	Engagement of blasting in-charge having Diploma/Degree in mining engineering for day-to-day blasting.	Engagement of blasting in-charge having Diploma/Degree in mining engineering for day-to-day blasting.
6.	Training of the blasting crew on controlled blasting practices before engaged in operation.	Training of the blasting crew on controlled blasting practices before engaged in operation.
7.	Submission of monthly report on blast design pattern and detailed explosive consumption as well as volume of rock excavation to a statutory body viz. DGMS, DMG, PESO or SPCB.	Submission of monthly report on blast design pattern and detailed explosive consumption as well as volume of rock excavation to a statutory body viz. DGMS, DMG, SPCB. Report of recorded ground vibration need to be added in monthly report.
8.	Report of recorded ground vibration need to be added in monthly report which shall be sent to all the statutory body viz. DGMS, DMG, SPCB.	Report of recorded ground vibration need to be added in monthly report which shall be sent to all the statutory body viz. DGMS, DMG, SPCB.
9.	Small diameter emulsion cartridge of 25 mm diameter (125 gm weight per cartridge) shall be used. However, ANFO explosives may also be used as main explosive charge.	Small diameter emulsion cartridge of 25 mm diameter (125 gm weight per cartridge) shall be used. However, ANFO explosives may also be used as main explosive charge.
10.	Electronic (or) Non-electric detonators (Nonel) shall be used in all the blasts for in-hole explosive initiation and surface hole-to-hole firing.	Non-electric detonators (Nonel) shall be used in all the blasts for in-hole explosive initiation and surface hole-to-hole firing.
11.	Max. number of holes in a round: 30.	Max. number of holes in a round: 40 to 60.

4. Special Mitigation Measures For The Quarries Located Within 1 Km From The Reserve Forests, If Applicable

S. No	EC Conditions
4.1	1. Since the R.F is located very close to the proposed quarry site, the PP shall develop Green Belt (Thick Tree plantation in two to three rows) along the boundary of the mine lease area before obtaining the CTO from the TNPCB. 2. The proponent shall construct and maintain proper fencing all around the boundary of the proposed working quarry adjacent to the direction of the location of the Reserved Forest before the commencement of the operation and shall furnish the photographs showing the same before obtaining the CTO from TNPCB. 3. The PP shall take steps so that the overburden, waste rock, rejects and fines generated during the mining operations shall be stored in separate dumps positioned in opposite direction to the location of the reserved forest. 4. The PP shall ensure that such waste/reject dumps shall be properly secured to prevent escape of material there from in harmful quantities which may cause degradation of environment and to prevent causation of floods.

S. No	EC Conditions
	5. The PP shall select the site for dumps on impervious ground to ensure minimum leaching effects due to precipitations. 6. The PP shall take necessary steps that wherever possible, the waste rock, overburden etc. shall be back-filled into the mine excavations with a view to restoring the land to its original use as far as possible. 7. Wherever back-filling of waste rock in the area excavated during mining operations is not feasible, the PP shall take adequate steps in discussion with the concerned DFO to suitably terrace the waste dumps ensuring the stability through vegetation to consolidate the green belt development in the areas adjacent to the reserved forest location. 8. The PP shall carry out the scientific investigations in order to keep the ground and noise vibrations caused by blasting operations and movement of HEMM such as Excavators, Trucks within safe limit. 9. The PP shall not perform secondary breakage involving the drilling & blasting in the quarrying operations and it can be replaced with non-conventional methods such as noise-controlled rock breakers, usage of non-explosive expansive materials/chemicals, Hydraulic Splitting based on the suitable scientific studies carried out by any reputed scientific and academic institutions. 10. The PP shall take adequate steps to control the air pollution due to fines, dust, smoke or gaseous emissions during the quarrying operations within 'Permissible Limits' specified under the environmental laws. 11. The Quarrying and Mining activities shall be restricted in the Eco-sensitive Zone of 60 m from the boundary of the Reserved area and hence the PP shall not even indulge in constructing the haul roads in these areas. 12. No development on existing steep hill slopes or slopes with a high degree of erosion shall be permitted. Hence, the PP shall not carry out the quarrying on steep hill slopes with a gradient of 20^0 or more or areas with a high degree of erosion on forestland. 13. The PP shall give an affidavit at the time of lease execution that there will be no felling of trees (or) any encroachment will not be made on these Reserved Forest lands and also within the Eco-sensitive Zone of 60 m without the prior permission of the State Government in case of reserve forest land as per the procedures laid down by the State Government. 14. The PP shall not use plastic carry bags within the quarry area. 15. The PP shall ensure that all the haul roads within the quarry lease shall be provided with adequate number of road side drains and these drains shall be kept free form blockage for runoff disposals. This run off from the road side drainage shall relate to the natural drainage system in the area. 16. The PP shall adhere to the provisions of the MoEF had issued Notification No. S.O. 1545 dated 25th June 2009 regulating certain activities in the eco-sensitive zone to conserve and protect the reserved forest area from ecological and environmental point of view.

5. Seac Standard Conditions

S. No	EC Conditions
5.1	1) The PP shall inform send the 'Notice of Opening' of the quarry to the Director of Mines Safety,

S. No	EC Conditions
	Chennai Region before obtaining the CTO from the TNPCB. 2) The proponent shall appoint the statutory competent persons relevant to the proposed quarry size as per the provisions of Mines Act 1952 and Metalliferous Mines Regulations, 1961, as amended from time to time. 3) Within a period one month from the execution of lease deed, the PP shall ensure that the persons deployed in the quarry including all the contractual employees/truck drivers shall undergo initial/periodical training in the DGMS approved GVTC situated in Trichy / Salem / Hosur. 4) The PP shall construct a garland drain of size, gradient and length around the proposed quarry incorporating garland canal, silt traps, siltation pond and outflow channel connecting to a natural drain should be provided prior to the commencement of mining. Garland drain, silt-traps, siltation ponds and outflow channel should be de-silted periodically and geo-tagged photographs of the process should be included in the HYCR. 5) Monitoring of drainage water should be carried out at different seasons by an NABL accredited lab and clear water should only be discharged into the natural stream. Geo-tagged photographs of the drainage and sampling site should be submitted along with HYCR. 6) The proponent shall install the 'S3 (or) G2' type of fencing all around the boundary of the proposed working quarry with gates for entry/exit before the commencement of the operation as recommended in the DGMS Circular, 11/1959 and shall furnish the photographs showing the same before obtaining the CTO from TNPCB. 7) The Proponent shall submit a conceptual 'Slope Stability Action Plan' incorporating the benches & accessible haul road approved by the concerned AD (Mines) for the proposed quarry to the DEE/TNPCB at the time of obtaining the CTO. 8) The PP shall ensure that the persons employed in the quarry whether permanent, temporary or contractual are undergoing the initial/periodical medical examination in the DGMS approved OHS Clinics/Hospitals as per the DGMS Circular No. 01 of 2011 before they are engaged in mining activities. 9) The PP shall ensure that the persons employed in the quarry whether permanent, temporary or contractual are provided with adequate PPEs before engaged in mining operations. 10) Proper barriers to reduce noise level and dust pollution should be established by providing greenbelt along the boundary of the quarrying site and suitable working methodology should be adopted by considering the wind direction. 11) The Project Proponent shall ensure that the funds earmarked for environmental protection measures are kept in a separate bank account and should not be diverted for other purposes. Year-wise expenditure should be included in the HYCR. 12) The Project Proponent shall send a copy of the EC to the concerned Panchayat/local body. 13) Perennial maintenance of haulage road/village / Panchayat Road shall be done by the project proponent as required, in coordination with the concerned Govt. Authority. 14) Perennial sprinkling arrangements shall be in place on the haulage road for fugitive dust suppression. Fugitive emission measurements should be carried out during the mining operation at regular intervals and submit the consolidated report to TNPCB once in six months. 15) The Proponent shall ensure that the noise level is monitored during mining operation at the project site for all the machineries deployed and adequate noise level reduction measures are undertaken accordingly. The report on the periodic monitoring shall be included in the HYCR. 16) 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. 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. 17) Taller/one year old saplings raised in appropriate size of bags (preferably eco-friendly bags) should be planted in proper spacing 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

S. No	EC Conditions
	meters wide and in between blocks in an organized manner. 18) **Noise and Vibration Related:** (i) Appropriate measures should be taken for control of noise levels below 85 dBA in the work environment. Workers engaged in operations of HEMM, etc. should be provided with ear plugs/muffs, (ii) Noise levels should be monitored regularly (on weekly basis) near the major sources of noise generation within the core zone. 19) The PP shall carry out maximum of only one round of controlled blast per day, restricted to the maximum of 30 to 40 number of holes per round with maintaining maximum charge per delay in such a manner that the blast-induced ground vibration level (Peak Particle Velocity) measured in the houses/structures located at a distance of 500 m shall not exceed 2.0 mm/s and no fly rock shall travel beyond 20 m from the site of blasting. 20) The PP shall also ensure that the blasting operations are not carried out on a 'day after day' basis and a minimum 24 hours break should be observed between blasting days to reduce the environmental impacts effectively. 21) If 'Deep-hole large diameter drilling and blasting' is required, then the PP shall obtain special permission from DGMS. 22) The PP shall ensure that the blasting operations shall be carried out during a prescribed time interval with a prior notice to the habitations situated around the proposed quarry after having posted the sentries/guards adequately to confirm the non-exposure of public within the danger zone of 500 m from the boundary of the quarry. The PP shall use the jack hammer drill machine fitted with the dust extractor for the drilling operations such that the fugitive dust is controlled effectively at the source. 23) The PP shall ensure that the blasting operations are carried out by the blaster/Mine Mate/Mine Foreman employed by him in accordance with the provisions of MMR 1961 and it shall not be carried out by the persons other than the above statutory personnel. 24) The proponent shall undertake in a phased manner restoration, reclamation and rehabilitation of lands affected by the quarrying operations and shall complete this work before the conclusion of such operations as per the Environmental Management Plan& the approved Mine Closure Plan. 25) Ground water quality monitoring should be conducted once in every six months and the report should be submitted to TNPCB. 26) The operation of the quarry should not affect the agricultural activities & water bodies near the project site and a 50 m safety distance from water body should be maintained without carrying any activity. The proponent shall take appropriate measures for "Silt Management" and prepare a SOP for periodical de-siltation indicating the possible silt content and size in case of any agricultural land exists around the quarry. 27) The proponent shall provide sedimentation tank / settling tank with adequate capacity for runoff management. 28) The proponent shall ensure that the transportation of the quarried granite stones shall not cause any hindrance to the Village people/Existing Village Road and shall take adequate safety precautionary measures while the vehicles are passing through the schools / hospital. The Project Proponent shall ensure that the road may not be damaged due to transportation of the quarried granite stones; and transport of granite stones will be as per IRC Guidelines with respect to complying with traffic congestion and density. 29) To ensure safety measures along the boundary of the quarry site, security guards are to be posted during the entire period of the mining operation. 30) The Project Proponent shall comply with the provisions of the Mines Act, 1952, MMR 1961 and Mines Rules 1955 for ensuring safety, health and welfare of the people working in the mines and the surrounding habitants. 31) The project proponent shall ensure that the provisions of the MMDR Act, 1957&the MCDR 2017 and Tamil Nadu Minor Mineral Concession Rules 1959 are compiled by carrying out the quarrying operations in a skillful, scientific and systematic manner keeping in view proper safety of the labour, structure and the public and public works located in that vicinity of the quarrying area and in a manner to preserve the environment and ecology of the area.

S. No	EC Conditions
	32) The quarrying activity shall be stopped if the entire quantity indicated in the Mining plan is quarried even before the expiry of the quarry lease period and the same shall be informed to the District AD/DD (Geology and Mining) District Environmental Engineer (TNPCB) and the Director of Mines Safety (DMS), Chennai Region by the proponent without fail. 33) All the conditions imposed by the Assistant/Deputy Director, Geology & Mining, concerned District in the mining plan approval letter and the Precise area communication letter issued by concerned District Collector should be strictly followed. 34) That the grant of this E.C. is issued from the environmental angle only, and does not absolve the project proponent from the other statutory obligations prescribed under any other law or any other instrument in force. The sole and complete responsibility, to comply with the conditions laid down in all other laws for the time-being in force, rests with the project proponent. 35) As per the directions contained in the OM F.No.22-34/2018-IA.III dated 16th January 2020 issued by MoEF&CC, the Project Proponent shall, undertake re-grassing the mining area and any other area which may have been disturbed due to his mining activities and restore the land to a condition which is fit for growth of fodder, flora, fauna etc. The compliance of this direction shall be included in the Half Yearly Compliance Report which will be monitored by SEAC at regular intervals. 36) The mining lease holders shall, after ceasing mining operations, undertake re-grassing the mining area and any other area which may have been disturbed due to their mining activities and restore the land to a condition which is fit for growth of fodder, flora, fauna etc. 37) 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 adhere to the EMP as committed.

6. Seiaa Standard Conditions:

S. No	EC Conditions
6.1	**a) EC Compliance:** 1. The Environmental Clearance is accorded based on the assurance from the project proponent that there will be full and effective implementation of all the undertakings given in the Application Form, Pre-feasibility Report, mitigation measures as assured in the Environmental Impact Assessment/ Environment Management Plan and the mining features including Progressive Mine Closure Plan as submitted with the application. 2. All the conditions as presented by the proponent in the PPT during SEAC appraisal should be addressed in Full. 3. The proponent shall submit Compliance Reports on the status of compliance of the stipulated EC conditions including results of monitored data. It shall be sent to the respective Regional Office of Ministry of Environment, Forests and Climate Change, Govt. of India and also to the Office of State Environment Impact Assessment Authority (SEIAA). 4. Concealing the factual data or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract action under the provisions of Environment (Protection) Act, 1986. **b) Applicable Regulatory Frameworks:** 5. The project proponent shall strictly adhere to the provisions of Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, the Public Liability Insurance Act, 1991, along with their amendments, Minor Mineral Conservation &Development Rules, 2010 framed under MMDR Act 1957, National Commission for protection of Child Right Rules, 2006, Wildlife Protection Act, 1972, Forest

S. No	EC Conditions
	Conservation Act, 1980, Biodiversity Conservation Act, 2016, the Biological Diversity Act, 2002, Biological diversity Rules, 2004 & TN Forest Act, 1882 and Rules made there under and also any other orders passed by the Hon'ble Supreme Court of India/Hon'ble High Court of Madras and any other Courts of Law relating to the subject matter **c) Safe mining Practices:** 6. The AD/DD, Dept. of Geology & Mining shall ensure operation of the proposed quarry after the submission of slope stability study conducted through the reputed research & Academic Institutions such as NIRM, IITs, NITS Anna University, and any CSIR Laboratories etc and ensure strict compliance and implementation of bench wise recommendations/action plans as recommended in the scientific slope stability study. 7. A minimum buffer distance specified as per existing rules and statutory orders shall be maintained from the boundary of the quarry to the nearest dwelling unit or other structures, and from forest boundaries or any other ecologically sensitive and archeologically important areas or the specific distance specified by SEIAA in EC as per the recommendations of SEAC depending on specific local conditions. **d) Water Environment – Protection and mitigation measures:** 8. The proponent shall ensure that the activity does not disturb the water bodies, neighboring open wells, bore wells and natural flow of surface and groundwater, nor cause any pollution, to water sources in the area nor effect the water quality and water quantity in the water sources. 9. Water level in the nearest dug well in the downstream side of the quarry should be monitored regularly and included in the Compliance Report. 10. Quality of water discharged from the quarry should be monitored regularly as per the norms of State Pollution Control Board and included in the Compliance Report. 11. Rain Water Harvesting facility should be installed as per the prevailing provisions of TNMBR/TNCDBR, unless otherwise specified. Maximum possible solar energy generation and utilization shall be ensured as an essential part of the project. 12. Regular monitoring of flow rates and water quality upstream and downstream of the springs and perennial nallahs flowing in and around the mine lease area shall be carried out and reported in the compliance reports to SEIAA. At any stage, if it is observed that ground water table is getting depleted due to the mining activity; necessary corrective measures shall be carried out. 13. Garland drains and silt traps are to be provided in the slopes around the core area to channelize storm water. De-silting of Garland canal and silt traps have to be attended on a daily basis. A labour has to be specifically assigned for the purpose. The proponent shall ensure the quality of the discharging storm water as per the General Effluent Discharge Standards of CPCB. **e) Air Environment – Protection and mitigation measures:** 14. The activity should not result in CO2 release and temperature rise and add to micro climate alternations. 15. The proponent shall ensure that Monitoring is carried out with reference to the quantum of particulate matter during excavation; blasting; material transport and also from cutting waste dumps and haul roads. **f) Soil Environment – Protection and mitigation measures:** 16. The proponent shall ensure that the operations neither result in loss of soil biological properties and nutrients nor deplete the indigenous soil seed bank and disturb the mycorrizal fungi, soil organism, soil community and result in eutrophication of soil and water. Further, the activities

S. No	EC Conditions
	should not disturb the soil properties and seed and plant growth. Soil amendments as required to be carried out, to improve soil health. 17. Bio remediation using microorganisms should be carried out to restore the soil environment to enable carbon sequestration. 18. The proponent shall ensure that the mine restoration is done using mycorrizal VAM, vermin-composting, Biofertilizers and the topsoil is protected and used in planting activities, site restoration and establishment of green belt in the area to ensure soil health and biodiversity conservation. 19. The top soil shall be temporarily stored at earmarked place (s) and used for land reclamation and plantation. The over burden (OB) generated during the mining operations shall be stacked at earmarked dump site(s) only. The OB dumps should be scientifically vegetated with suitable native species to prevent erosion and surface run off. At critical points, use of geotextile shall be undertaken for stabilization of the dump. Protective wall or gabions should be made around the dump to prevent erosion / flow of sediments during rains. The entire excavated area shall be backfilled. 20. Activities should not result in invasion of site by exotic and alien plant and animal species and disturb the native biodiversity and soil micro flora and fauna. **g) Noise Environment – Protection and mitigation measures:** 21. The peak particle velocity at 500m distance or within the nearest habitation, whichever is closer shall be monitored periodically as per applicable DGMS guidelines. The activity of the proponent should not effect the biological clock of the villages resulting in stress, sleeping disorders affecting health. **h) Biodiversity - Protection and mitigation measures:** 22. The proponent should ensure that there is no disturbance to the agriculture plantations, social forestry plantations, waste lands, forests, sanctuary or national parks. There should be no impact on the land, water, soil and biological environment and other natural resources due to the mining activities. 23. No trees in the area should be removed and all the trees numbered and protected. In case trees fall within the proposed quarry site the trees may be transplanted in the Greenbelt zone. The proponent shall ensure that the activities in no way result in disturbance to forest and trees in vicinity. The proponent shall ensure that the activity does not disturb the movement of grazing animals and free ranging wildlife. The proponent shall ensure that the activity does not disturb the biodiversity, the flora & fauna in the ecosystem. The proponent shall ensure that the activities do not disturb the resident and migratory birds. The proponent shall ensure that the activities do not disturb the vegetation and wildlife in the adjoining reserve forests and areas around. Also, the activities should not disturb the agro biodiversity, agro farms, green lands and grazing fields of all types. Actions to be taken to promote agroforestry, mixed plants to support biodiversity conservation in the mine restoration effort. 24. The proponent shall ensure that all mitigation measures listed in the EIA/EMP are taken to protect the biodiversity and natural resources in the area. **i) Climate Change:** 25. There should be least disturbance to landscape resulting in land use change, contamination and alteration of soil profiles leading to Climate Change. 26. Operations should not result in GHG releases and extra power consumption leading to Climate Change. 27. Mining through operational efficiency, better electrification, energy use, solar usage, use of renewable energy should try to decarbonize the operations.

S. No	EC Conditions
	28. Mining should not result in water loss from evaporation, leaks and wastage and should support to improve the ground water. 29. Mining activity should be flood proof with designs and the drainage, pumping techniques shall ensure climate-proofing and socio-economic wellbeing in the area and vicinity. **j) Reserve Forests & Protected Areas:** 30. The activities should provide nature based support and solutions for forest protection and wildlife conservation. 31. The project activities should neither result in forest fires, encroachments nor create forest fragmentation and disruption of forest corridors and alter the geodiversity and geological heritage of the area. 32. There should be no disturbance to the freshwater flow from the forest impacting the water table and wetlands. 33. The project proponent should support all activities of the forest department in creating awareness to local communities on forest conservation. 34. The activities should not result in temperature rise due to increased fossil fuels usage disrupting the behaviour of wildlife and flora. 35. The activities should support and recognise the rights and roles of indigenous people and local communities and also support sustainable development. 36. The project activities should support the use of renewables for carbon capture and carbon storage in the project site and forest surrounds. 37. The project activities should not result in changes in forest structure, habitats and genetic diversity within forests. **k) Green Belt Development:** 38. The proponent shall ensure that in the green belt development more indigenous trees species as suggested in Appendix of SEAC Minutes are planted and that the area is restored and rehabilitated with native trees . **l) Workers and their protection:** 39. The project proponent is responsible for implementing all the provisions of labour laws applicable from time to time to quarrying /Mining operations. The workers on the site should be provided with on-site accommodation or facilities at a suitable boarding place, protective equipment such as ear muffs, helmet, etc. 40. The proponent has to provide insurance protection to the workers and the working hours and wages shall be implemented/enforced as per the Mines Act, 1952 in the case of existing mining or provide the affidavit in case of fresh lease before execution of mining lease. **m) Transportation:** 41. No Transportation of the minerals shall be allowed in case of roads passing through villages/ habitations. In such cases, PP shall construct a bypass road for the purpose of transportation of the minerals leaving an adequate gap (say at least 200 meters) so that the adverse impact of sound and dust along with chances of accidents could be mitigated. All costs resulting from widening and strengthening of existing public road network shall be borne by the PP in consultation with nodal State Govt. Department. Transportation of minerals through road movement in case of existing village/ rural roads shall be allowed in consultation with nodal State Govt. Department only after required strengthening such that the carrying capacity of roads is increased to handle the traffic load. The pollution due to transportation load on the environment will be effectively controlled and

S. No	EC Conditions
	water sprinkling will also be done regularly. Vehicular emissions shall be kept under control and regularly monitored. Project should obtain Pollution Under Control (PUC) certificate for all the vehicles from authorized pollution testing centers. 42. The Main haulage road within the mine lease should be provided with a permanent water sprinkling arrangement for dust suppression. Other roads within the mine lease should be wetted regularly with tanker-mounted water sprinkling system. The other areas of dust generation like crushing zone, material transfer points, material yards etc. should invariably be provided with dust suppression arrangements. The air pollution control equipments like bag filters, vacuum suction hoods, dry fogging system etc. shall be installed at Crushers, belt-conveyors and other areas prone to air pollution. The belt conveyor should be fully covered to avoid generation of dust while transportation. PP shall take necessary measures to avoid generation of fugitive dust emissions. **n) Storage of wastes** 43. The project proponent shall store/dump the waste generated within the earmarked area of the project site for mine closure as per the approved mining plan. **o) CER/EMP:** 44. The CER should be fully Implemented and fact reflected in the Half-yearly compliance report. 45. The EMP shall also be implemented in consultation with local self-government institutions & Govt. departments as indicated in SEAC meeting. **p) Directions for Reclamation of mine sites:** 46. The mining closure plan should strictly adhere to appropriate soil rehabilitation measures to ensure ecological stability of the area. Reclamation/Restoration of the mine site should ensure that the Geotechnical, physical, chemical properties are sustainable that the soil structure composition is buildup, during the process of restoration. The proponent shall ensure that the mine closure plan is followed as per the mining plan and the mine restoration should be done with native species, and site restored to near original status. The proponent shall ensure that the area is ecologically restored to conserve the ecosystems and ensure flow of goods and services. 47. A crucial factor for success of reclamation site is to select sustainable species to enable develop a self-sustaining eco system. Species selected should easily establish, grow rapidly, and possess good crown and preferably be native species. Species to be planted in the boundary of project site should be un palatable for cattle's/ goats and should have proven capacity to add leaf-litter to soil and decompose. The species planted should be adaptable to the site conditions. Should be preferably pioneer species, deciduous in nature to allow maximum leaf-litter, have deep root system, fix atmospheric nitrogen and improve soil productivity. Species selected should have the ability to tolerate altered pit and toxicity of and site. They should be capable of meeting requirement of local people in regard to fuel fodder and should be able to attract bird, bees and butterflies. The species should be planted in mixed association. 48. Top soil with a mix of beneficial microbes (Bacteria/Fungi) to be used for reclamation of mine spoils. AM Fungi (Arbuscular mycorrhizal fungi), plant growth promoting Rhizo Bacteria and nitrogen fixing bacteria to be utilized. Soil and moisture conservation and water harvesting structures to be used where ever possible for early amelioration and restoration of site. Top soil is most important for successful rehabilitation of mined sites. Topsoil contains majority of seeds and plant propagation, soil microorganism, Organic matter and plant nutrients. Wherever possible the topsoil should be immediately used in the area of the for land form reconstruction, to pre mining conditions. 49. Over burdens may be analyzed and tested for soil characteristics and used in the site for revegetation. Wherever possible seeds, rhizome, bulbs, etc., of pioneering spices should be

S. No	EC Conditions
	collected, preserved and used in restoring the site. Native grasses seeds may be used as colonizers and soil binders, to prevent erosion and allow diverse self- sustaining plant communities to establish. Grasses may offer superior tolerance to drought, and climatic stresses. 50. Reclamation involves planned topographical reconstruction of site. Care to be taken to minimize erosion and runoff. Topsoil should have necessary physical, chemicals, ecological, properties and therefore should be stored with precautions and utilized for reclamation process. Stocked topsoil should be stabilized using grasses to protect from wind. Seeds of various indigenous and local species may be broad casted after topsoil and treated overburden are spread. Alkaline soils, acidic soils, Saline soils should be suitably treated/amended using green manure, mulches, farmyard manure to increase organic carbon. The efforts should be taken to landscape and use the land post mining. The EMP and mine closure plan should provide adequate budget for re-establishing the site to pre-mining conditions. Effective steps should be taken for utilization of over burden. Mine waste to be used for backfilling, reclamation, restoration, and rehabilitation of the terrain without affecting the drainage and water regimes. The rate of rehabilitation should be similar to rate of mining. Efforts should to taken to aesthetically improve the mine site. Action taken for restoration of the site should be specifically mentioned in the EC compliances.

Standard EC Conditions for (Mining of minerals)

1. Statutory Compliance

S. No	EC Conditions
1.1	The Environmental clearance shall be subject to orders of Hon'ble Supreme Court of India, Hon'ble High Courts, NGT and any other Court of Law, from time to time, and as applicable to the project
1.2	The project proponent shall obtain forest clearance under the provisions of Forest (Conservation) Act, 1986, in case of the diversion of forest land for non-forest purpose involved in the project.
1.3	The project proponent shall obtain clearance from the National Board for Wildlife, if applicable.
1.4	The project proponent shall prepare a Site-Specific Conservation Plan & Wildlife Management Plan and approved by the Chief Wildlife Warden. The recommendations of the approved Site-Specific Conservation Plan / Wildlife Management Plan shall be implemented in consultation with the State Forest Department. TThe implementation report shall be furnished along with the six-monthly compliance report (in case of the presence of schedule-I species in the study area).
1.5	The project proponent shall obtain Consent to Establish / Operate under the provisions of Air (Prevention & Control of Pollution) Act, 1981 and the Water (Prevention & Control of Pollution) Act, 1974 from the concerned State pollution Control Board/ Committee.
1.6	The project proponent shall obtain the necessary permission from the Central Ground Water Authority
1.7	Solid/hazardous waste generated in the mines needs to addressed in accordance to the Solid Waste Management Rules, 2016/Hazardous & Other Waste Management Rules, 2016.
1.8	Permission of power supply to be taken from the concerned authority for meeting power demand of

S. No	EC Conditions
	the project site.
1.9	The maximum production or peak production at any given time shall not exceed the limit as prescribed in the EC.
1.10	Validity of EC is as per life of the mine mentioned in EC letter or 30 years as per EIA Notification, 2006 and its amendments therein

2. Air Quality Monitoring And Mitigation Measure

S. No	EC Conditions
2.1	Adequate ambient air quality monitoring stations shall be established in the core zone as well as in the buffer zone for monitoring of pollutants, namely particulates, SO2 and NOx. Location of the stations shall be decided based on the meteorological data, topographical features and environmentally and ecologically sensitive receptors in consultation with the State Pollution Control Board. Online ambient air quality monitoring station/stations may also be installed in addition to the regular air monitoring stations as per the requirement and/or in consultation with the SPCB
2.2	Transportation of mineral, to the extent if permitted by road, shall be carried out by covered trucks/conveyors. Effective control measures such as regular water sprinkling/rain gun/ Fog cannon /mist sprinkling etc., shall be carried out in critical areas prone to air pollution with higher level of particulate matter all through the transport roads, loading/unloading and transfer points. Fugitive dust emissions from all sources shall be controlled regularly. It shall be ensured that the ambient air quality parameters conform to the norms prescribed by the Central/State Pollution Control Board.
2.3	Major approach roads shall be black topped and properly maintained.
2.4	PP to install solar lights along the road used for transportation of mineral to avoid the accidents at night and also seek its maintenance.
2.5	The transportation of mineral shall be carried out as per the provisions and route proposed in the approved mining plan. Transportation of the mineral through the existing road passing through any village shall be avoided. In case, it is proposed to construct a 'bypass' road, it should be so constructed that the impact of sound, dust and accidents could be appropriately mitigated.
2.6	Vehicular emissions shall be kept under control and regularly monitored. All the vehicles engaged in mining and allied activities shall operate only after obtaining ‘PUC’ certificate from the authorized pollution testing centres.
2.7	Adequate number of Fog canon (mist sprayer) shall be installed to reduce the impact of air pollution at dust generating sources with time bound action plan.
2.8	Post environmental closure third party monitoring by reputed instituted in air quality, water, land & soil etc shall be carried out and analysed with EMP measures at regular interval. A suitable recommendation in this regard, shall be furnished to IRO, MoEF&CC for compliance. The data used for analysis shall be obtained from continuos AQMS, site specific water regime. Also third party shall analyses the implementation of river diversion, meeting to the requirement of project report.

3. Water Quality Monitoring And Mitigation Measures

S. No	EC Conditions
3.1	The monitoring data shall be uploaded on the company's website and displayed at the project site at a suitable location. The circular No.J-20012/1/2006-lA.11 (M) dated 27th May, 2009 issued by Ministry of Environment, Forest and Climate Change shall also be referred in this regard for its compliance.
3.2	Regular monitoring of ground water level and quality shall be carried out in and around the mine lease area by establishing a network of existing wells and constructing new piezometers during the mining operations. The monitoring of ground water levels shall be carried out four times a year i.e. pre-monsoon, monsoon, post-monsoon and winter. The ground water quality shall be monitored once a year, and the data thus collected shall be sent regularly to MOEFCC/RO.
3.3	Monitoring of water quality upstream and downstream of river including pons, lakes, tanks shall be carried out once in six months and record of monitoring data shall be maintained and submitted to the Ministry of Environment, Forest and Climate Change/Regional Office.
3.4	Ground water, excluding mine water, shall not be used for mining operations. Rainwater harvesting shall be implemented for conservation and augmentation of ground water resources.
3.5	The project proponent shall not alter major water channels around the site. Appropriate embankment shall be provided along the side of the river/nallah flowing near or adjacent to the mine. The embankment constructed along the river/nallah boundary shall be of suitable dimensions and critical patches shall be strengthened by stone pitching on the river front side, stabilized with plantation so as to withstand the peak water pressure preventing any chance of mine inundation.
3.6	Garland drains (of suitable size, gradient and length) around the critical areas i.e. mine shaft and low lying areas, shall be designed keeping at least 50% safety margin over and above the peak sudden rainfall and maximum discharge in the area adjoining the mine sites. The sump capacity shall also provide adequate retention period to allow proper settling of silt material of the surface runoff
3.7	The water pumped out from the mine, after siltation, shall be utilized for industrial purpose viz. watering the mine area, roads, green belt development etc. The drains shall be regularly desilted particularly after monsoon and maintained properly
3.8	Adequate groundwater recharge measures shall be taken up for augmentation of ground water. The project authorities shall meet water requirement of nearby village(s) in case the village wells go dry due to dewatering of mine.
3.9	The surface drainage plan including surface water conservation plan for the area of influence affected by the said mining operations shall be prepared, considering the presence of any river/rivulet/pond/lake etc., with impact of mining activities on it, and implemented by the project proponent. The surface drainage plan and/or any diversion of natural water courses shall be as per the provisions of the approved Mining Plan/ EIA-EMP submitted to this Ministry/SEIAA-TN and the same should be done with due approval of the concerned State/GoI Authority. The construction of embankment to prevent any danger against inrush of surface water into the mine should be as per the approved mining plan and as per the permission of DGMS.

4. Noise And Vibration Monitoring And Prevention

S. No	EC Conditions
4.1	Adequate measures shall be taken for control of noise levels as per Noise Pollution Rules, 2016 in the work environment. Workers engaged in blasting and drilling operations, operation of HEMM, etc shall be provided with personal protective equipments (PPE) like ear plugs/muffs in conformity with the prescribed norms and guidelines in this regard. Adequate awareness programme for users to be conducted. Progress in usage of such accessories to be monitored.
4.2	The noise level survey shall be carried out as per the prescribed guidelines to assess noise exposure of the workmen at vulnerable points in the mine premises, and report in this regard shall be submitted to the Ministry/RO on six-monthly basis.

5. Mining Plan

S. No	EC Conditions
5.1	Mining shall be carried out under strict adherence to provisions of the Mines Act 1952 and subordinate legislations made there-under as applicable.
5.2	No change in mining method i.e. UG to OC, calendar programme and scope of work shall be made without obtaining prior approval of the Ministry of Environment, Forests and Climate Change (MoEFCC)/SEIAA-TN.
5.3	Mining shall be carried out as per the approved mining plan (including Mine Closure Plan) abiding by mining laws related to non - coal mining and the relevant circulars issued by Directorate General Mines Safety (DGMS).
5.4	Underground work place environmental conditions shall be rendered ergonomic and air breathable with adequate illumination in conformance with DGMS standards.
5.5	No mining shall be carried out in forest land without obtaining Forestry Clearance as per Forest (Conservation) Act, 1980 and also adhering to The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 read with provisions of Indian Forest Act, 1927.
5.6	Efforts should be made to reduce energy and fuel consumption by conservation, efficiency improvements and use of renewable energy.

6. Land Recalmation

S. No	EC Conditions
6.1	Digital Survey of entire lease hold area/core zone using Satellite Remote Sensing survey shall be carried out at least once in three years for monitoring land use pattern and report in 1:50,000 scale or as notified by Ministry of Environment, Forest and Climate Change(MOEFCC) from time to time shall be submitted to MOEFCC/Regional Office (RO).
6.2	Regular monitoring of subsidence movement on the surface over and around the working areas and its impact on natural drainage pattern, water bodies, vegetation, structure, roads and surroundings shall be continued till movement ceases completely. In case of observation of any high rate of subsidence beyond the limit prescribed, appropriate effective mitigation measures shall be taken to avoid loss of life and materials. Cracks should be effectively plugged in with ballast and clay

S. No	EC Conditions
	soil/suitable material.
6.3	Fly ash shall be used for external dump of overburden, backfilling or stowing of mine as per provisions contained in clause (i) and (ii) of subparagraph (8) of fly ash notification issued vide SO 2804 (E) dated 3rd November, 2009 as amended from time to time. Efforts shall be made to utilize gypsum generated from Flue Gas Desulfurization (FGD), if any, along with fly ash for external dump of overburden, backfilling of mines. Compliance report shall be submitted to Regional Office of MoEF&CC, CPCB and SPCB.
6.4	A separate team for subsidence monitoring and surface mitigation measures shall be constituted and continuous monitoring & implementation of mitigation measures be carried out.
6.5	Native tree species shall be selected and planted over areas affected by subsidence.
6.6	The project proponent shall make necessary alternative arrangements, if grazing land is involved in core zone, in consultation with the State government to provide alternate areas for livestock grazing, if any. In this context, the project proponent shall implement the directions of Hon'ble Supreme Court with regard to acquiring grazing land.

7. Public Hearing And Human Health Issues

S. No	EC Conditions
7.1	Adequate illumination shall be ensured in all mine locations (as per DGMS standards) and monitored.
7.2	The project proponent shall undertake occupational health survey for initial and periodical medical examination of the personnel engaged in the project and maintain records accordingly as per the provisions of the Mines Rules, 1955 and DGMS circulars. Besides regular periodic health check-up, 20% of the personnel identified from workforce engaged in active mining operations shall be subjected to health check-up for occupational diseases and hearing impairment, if any, as amended time to time.
7.3	Personnel (including outsourced employees) working in core zone shall wear protective respiratory devices and shall also be provided with adequate training and information on safety and health aspects.
7.4	Skill training as per safety norms specified by DGMS shall be provided to all workmen including the outsourcing employees to ensure high safety standards in mines.
7.5	Effective arrangement shall be made to provide and maintain at suitable points conveniently situated, a sufficient supply of drinking water for all the persons employed.
7.6	Implementation of the time bound action plan on the issues raised during the public hearing shall be ensured. The project proponent shall undertake all the tasks/measures as per the time bound action plan submitted with budgetary provisions during the public hearing. Land oustees shall be compensated as per the norms laid down in the R&R policy of the company/State Government/Central Government, as applicable.

S. No	EC Conditions
7.7	The project proponent shall follow the mitigation measures provided in this Ministry's OM No.Z-11013/5712014-IA.I1 (M) dated 29th October, 2014, titled 'Impact of mining activities on habitations-issues related to the mining projects wherein habitations and villages are the part of mine lease areas or habitations and villages are surrounded by the mine lease area'.
7.8	PP to conduct need based assessment survey of the area to for in order to decide the activities to be carried under the CSR and to provide detail of the activity carried out with adequate budgetary provision and time bound action plan.
7.9	PP must ensure an emergency action plan during pandemic in order to provide assistance to the nearby villages located within the 10 km radius buffer zone (If required)
7.10	PP is asked to also identify the rural areas for installation of solar light with its maintenance within the study area of 10 km radius buffer zone with time bound action plan
7.11	PP to take measure for installation of Renewable Energy sources in nearby area falling within 10 km radius

8. Corporate Environment Responsibility

S. No	EC Conditions
8.1	The company shall have a well laid down environmental policy duly approve by the Board of Directors. The environmental policy should prescribe for standard operating procedures to have proper checks and balances and to bring into focus any infringements/deviation/violation of the environmental/forest/wildlife norms/conditions. The company shall have defined system of reporting infringements/deviation/violation of the environmental/forest/wildlife norms/conditions and/or shareholders/stake holders.
8.2	A separate Environmental Cell both at the project and company head quarter level, with qualified personnel shall be set up under the control of senior Executive, who will directly to the head of the organization.
8.3	Action plan for implementing EMP and environmental conditions along with responsibility matrix of the company shall be prepared and shall be duly approved by competent authority. The year wise funds earmarked for environmental protection measures shall be kept in separate account and not to be diverted for any other purpose. Year wise progress of implementation of action plan shall be reported to the Ministry/Regional Office along with the Six Monthly Compliance Report.
8.4	Self environmental audit shall be conducted annually. Every three years third party environmental audit shall be carried out.
8.5	PP should establish in house (at project site) environment laboratory for measurement of environment parameter with respect to air quality and water (surface and ground. A dedicated team to oversee environment management shall be setup which should comprise of Environment Engineers, Laboratory chemist and staff for monitoring of air, water quality parameters on routine basis. Any non- compliance or infringement should be reported to the concerned authority

9. Miscellaneous

S. No	EC Conditions
9.1	The project proponent shall make public the environmental clearance granted for their project along with the environmental conditions and safeguards at their cost by prominently advertising it at least in two local newspapers of the District or State, of which one shall be in the vernacular language within seven days and in addition this shall also be displayed in the project proponent's website permanently.
9.2	The copies of the environmental clearance shall be submitted by the project proponents to the Heads of local bodies, Panchayats and Municipal Bodies in addition to the relevant offices of the Government who in turn has to display the same for 30 days from the date of receipt.
9.3	The project proponent shall upload the status of compliance of the stipulated environment clearance conditions, including results of monitored data on their website and update the same on half-yearly basis.
9.4	The project proponent shall submit six-monthly reports on the status of the compliance of the stipulated environmental conditions on the website of the ministry of Environment, Forest and Climate Change at environment clearance portal.
9.5	The project proponent shall submit the environmental statement for each financial year in Form-V to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently and put on the website of the company.
9.6	The project authorities shall inform to the Regional Office of the MOEFCC regarding commencement of mining operations.
9.7	The project authorities must strictly adhere to the stipulations made by the State Pollution Control Board and the State Government.
9.8	The project proponent shall abide by all the commitments and recommendations made in the EIA/EMP report, commitment made during Public Hearing and also that during their presentation to the State Expert Appraisal Committee.
9.9	No further expansion or modifications in the plant shall be carried out without prior approval of the Ministry of Environment, Forests and Climate Change (MoEF&CC)/SEIAA-TN.
9.10	Concealing factual data or submission of false/fabricated data may result in revocation of this environmental clearance and attract action under the provisions of Environment (Protection) Act, 1986.
9.11	The Ministry/SEIAA-TN may revoke or suspend the clearance, if implementation of any of the above conditions is not satisfactory.
9.12	The Ministry/SEIAA-TN reserves the right to stipulate additional conditions if found necessary. The Company in a time bound manner shall implement these conditions.
9.13	The Regional Office of this Ministry shall monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the officer (s) of the Regional Office by furnishing the requisite data / information/monitoring reports.
9.14	The above conditions shall be enforced, inter-alia under the provisions of the Water (Prevention

S. No	EC Conditions
	& Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 and the Public Liability Insurance Act, 1991 along with their amendments and Rules and any other orders passed by the Hon'ble Supreme Court of India / High Courts and any other Court of Law relating to the subject matter.
9.15	The proponent shall abide by all the commitments and recommendations made in the EIA/EMP report and also that during presentation to the SEAC. All the commitments made on the issues raised during public hearing shall also be implemented in letter and spirit.
9.16	Compensation of the land acquired for the project shall be settled as per the R&R Policy. Adequate facility of drinking water, plantation and other social amenities should be provided to established R&R villages.
9.17	Persons of nearby villages shall be given training on livelihood and skill development to make them employable with its proper records.
9.18	The illumination and sound at night at project sites disturb the villages in respect of both human and animal population. Consequent sleeping disorders and stress may affect the health in the villages located close to mining operations. Habitations have a right for darkness and minimal noise levels at night. PPs must ensure that the biological clock of the villages is not disturbed; by orienting the floodlights/ masks away from the villagers and keeping the noise levels well within the prescribed limits for day light/night hours

Signature Not Verified

Digitally Signed by : A R Rahul Nadh IAS
Member Secretary, SEIAA

Date: 04/04/2024

CHENNAI METTEX LAB PRIVATE LIMITED®

Jothi Complex, 83, M.K.N. Road, Guindy, Chennai - 600 032, Tamil Nadu, INDIA
Phone : +91 44 22323163, 22311034, 42179490, 42179491 I CIN : U74999TN2008PTC069459
Email : test@mettexlab.com I Web : www.mettexlab.com

TEST REPORT

ISSUED TO: M/s. Concretia Rock Products Pvt Ltd - Madurai

Site Address: M/s. Kachaikatty Rough Stone & Gravel Quarry
1174/2,3,4B,5B, 1192/1,2, 1193/6A & 6B, 1196/1A, 1196/3, 1196/4 & 1196/5A
Kachaikatty Village, Vadipatty Taluk & Madurai District, Tamil Nadu.

Test Certificate No : CML/25-26/T019583 Test Certificate Date : 27.05.2026
Location of Sampling : **AAQ – 1, Core Zone- Near Project Area - 10° 4'44.94"N 78° 0'48.98"E**
Sampling Plan &Procedure : CML/LAB/ENV/SOP/AAQ (IS 5182 & USEPA Compendium)
Sampling Instrument ID &Calibration Due Date: CML/ENV/RDS/026 & 18.11.2026
Sampling Instrument ID &Calibration Due Date: CML/ENV/FDS/011 & 19.11.2026

Ambient AirMonitoring Details		Particulate Pollutant			Gaseous Pollutant					Metals Pollutant			Organic Pollutant	
Parameters		SPM	PM_{10}	$PM_{2.5}$	SO_2	NO_2	NH_3	O_3	CO	Pb	Ni	As	C_6H_6	BaP
NAAQ Norms		200	100	60	80	80	400	180	4	1	20	6	5	1
Unit		µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	mg/m³	µg/m³	ng/m³	ng/m³	µg/m³	ng/m³
Date	Period.hrs	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
01.03.2026	7:00-7:00	63.0	43.2	18.5	4.5	24.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
02.03.2026	7:30-7.30	64.2	44.5	22.8	4.5	23.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
07.03.2026	7:00-7:00	65.3	45.1	23.6	4.4	24.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
08.03.2026	7:30-7.30	65.0	46.3	20.4	5.8	25.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
14.03.2026	7:00-7:00	66.1	47.1	21.2	5.2	23.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
15.03.2026	7:30-7.30	67.2	45.0	22.3	5.8	24.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
21.03.2026	7:00-7:00	66.0	46.2	23.5	5.0	25.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
22.03.2026	7:30-7.30	64.3	44.2	22.6	5.3	23.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
28.03.2026	7:00-7:00	62.3	45.3	21.5	4.6	25.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
29.03.2026	7:30-7.30	63.3	46.1	22.3	5.6	24.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
04.04.2026	7:00-7:00	64.4	42.0	23.6	5.4	25.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
05.04.2026	7:30-7.30	65.5	43.5	21.4	4.2	23.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
11.04.2026	7:00-7:00	66.0	45.0	25.5	5.2	25.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
12.04.2026	7:30-7.30	64.0	46.2	23.2	6.0	22.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
18.04.2026	7:00-7:00	63.0	47.3	22.4	5.2	21.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
19.04.2026	7:30-7.30	64.2	45.0	23.5	6.	23.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
25.04.2026	7:00-7:00	64.5	46.2	22.4	4.53	25.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
26.04.2026	7:30-7.30	64.2	47.1	21.8	4.1	23.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
01.05.2026	7:00-7:00	65.8	45.2	23.6	5.2	24.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
02.05.2026	7:30-7.30	63.1	43.9	20.5	4.5	25.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
08.05.2026	7:00-7:00	64.7	43.6	21.6	4.5	23.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
09.05.2026	7:30-7.30	65.3	42.5	23.4	5.8	25.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
15.05.2026	7:00-7:00	62.0	44.2	22.5	4.6	22.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
16.05.2026	7:30-7.30	66.9	43.9	26.9	5.4	21.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
22.05.2026	7:00-7:00	65.4	46.7	26.4	5.6	22.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
23.05.2026	7:30-7.30	58.2	43.2	22.3	5.5	26.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Note: BDL: Below Detection Limit ;**DL**: Detection Limit ; **NH_3**: BDL (DL:20); **O_3**: BDL (DL:20); **CO**: BDL (DL:1.0); **Pb**: BDL (DL:0.1); **Ni**: BDL (DL:1.0); **As**: BDL (DL:1.0); **C_6H_6**: BDL (DL:1.0); **BaP**: BDL (DL:0.1)
Remarks: The values observed for the pollutants given above are within the CPCB standards.

End of Report

For Chennai Mettex Lab Private Limited

Reviewed & Authorised by
V. SELVAKUMAR
Technical Manager
Authorised Signatory

NOTE: Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be liable for legal action. Unless otherwise stated the submitted results in this test report refer only to the sample(s) tested and such sample(s) are retained for 15 days only from the completion date of testing., except in case of regulatory samples, which will be retained for a specific period as per statutory requirement; while perishable & environmental testing related remnant samples will be discarded consequent upon completion of testing. Samples are not drawn by us unless otherwise stated. This document cannot be reproduced except in full, without prior written approval of the laboratory. This report is for the exclusive use of Chennai Mettex Lab's customer, and is provided in accordance with the agreement between Chennai Mettex Lab and its Customer.

CHENNAI METTEX LAB PRIVATE LIMITED®

Jothi Complex, 83, M.K.N. Road, Guindy, Chennai - 600 032, Tamil Nadu, INDIA
Phone : +91 44 22323163, 22311034, 42179490, 42179491 I CIN : U74999TN2008PTC069459
Email : test@mettexlab.com I Web : www.mettexlab.com

TEST REPORT

ISSUED TO: M/s. Concretia Rock Products Pvt Ltd - Madurai

Site Address: M/s. Kachaikatty Rough Stone & Gravel Quarry
1174/2,3,4B,5B, 1192/1,2, 1193/6A & 6B, 1196/1A, 1196/3, 1196/4 & 1196/5A
Kachaikatty Village, Vadipatty Taluk & Madurai District, Tamil Nadu.

Test Certificate No : CML/25-26/T019584 Test Certificate Date : 27.05.2026
Location of Sampling : **AAQ – 2, Near Project Area - 10° 4'39.36"N 78° 0'27.93" E**
Sampling Plan &Procedure : CML/LAB/ENV/SOP/AAQ (IS 5182 & USEPA Compendium)
Sampling Instrument ID &Calibration Due Date: CML/ENV/RDS/027 & 18.11.2026
Sampling Instrument ID &Calibration Due Date: CML/ENV/FDS/012 & 19.11.2026

Ambient Air Monitoring Details		Particulate Pollutant			Gaseous Pollutant					Metals Pollutant			Organic Pollutant	
Parameters		SPM	PM_{10}	$PM_{2.5}$	SO_2	NO_2	NH_3	O_3	CO	Pb	Ni	As	C_6H_6	BaP
NAAQ Norms		200	100	60	80	80	400	180	4	1	20	6	5	1
Unit		µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	mg/m³	µg/m³	ng/m³	ng/m³	µg/m³	ng/m³
Date	Period.hrs	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
01.03.2026	7:00-7:00	60.3	41.4	23.1	4.62	23.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
02.03.2026	7:30-7.30	69.2	43.2	22.9	5.8	24.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
07.03.2026	7:00-7:00	68.9	41.9	22.4	5.2	23.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
08.03.2026	7:30-7.30	69.4	43.5	20.6	4.8	21.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
14.03.2026	7:00-7:00	67.6	41.7	21.9	5.5	22.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
15.03.2026	7:30-7.30	68.7	42.4	23.5	6.6	24.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
21.03.2026	7:00-7:00	69.6	43.6	21.8	5.2	22.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
22.03.2026	7:30-7.30	67.5	41.7	21.4	4.3	23.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
28.03.2026	7:00-7:00	68.9	42.3	22.3	4.3	25.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
29.03.2026	7:30-7.30	68.4	44.4	21.6	5.2	24.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
04.04.2026	7:00-7:00	69.3	45.5	23.5	6.6	23.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
05.04.2026	7:30-7.30	67.8	44.3	22.0	5.6	25.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
11.04.2026	7:00-7:00	69.7	39.4	23.5	4.5	23.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
12.04.2026	7:30-7.30	68.4	43.1	23.0	5.6	24.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
18.04.2026	7:00-7:00	69.3	42.0	22.4	4.6	23.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
19.04.2026	7:30-7.30	68.8	44.0	21.6	5.1	24.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
25.04.2026	7:00-7:00	69.7	40.3	22.2	6.2	23.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
26.04.2026	7:30-7.30	69.5	41.2	21.6	4.7	21.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
01.05.2026	7:00-7:00	68.6	45.0	22.0	4.7	22.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
02.05.2026	7:30-7.30	65.0	42.7	23.7	5.8	23.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
08.05.2026	7:00-7:00	64.0	41.9	21.1	4.5	22.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
09.05.2026	7:30-7.30	63.2	43.2	22.6	5.6	23.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
15.05.2026	7:00-7:00	60.2	44.6	23.4	4.6	21.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
16.05.2026	7:30-7.30	61.2	42.4	22.0	4.5	20.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
22.05.2026	7:00-7:00	63.2	42.9	21.5	5.5	21.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
23.05.2026	7:30-7.30	62.0	30.6	22.4	5.4	22.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Note: BDL: Below Detection Limit ;**DL**: Detection Limit ; **NH_3**: BDL (DL:20); **O_3**: BDL (DL:20); **CO**: BDL (DL:1.0); **Pb**: BDL (DL:0.1); **Ni**: BDL (DL:1.0); **As**: BDL (DL:1.0); **C_6H_6**: BDL (DL:1.0); **BaP**: BDL (DL:0.1)
Remarks: The values observed for the pollutants given above are within the CPCB standards.

End of Report

For Chennai Mettex Lab Private Limited

Reviewed & Authorised by
V. SELVAKUMAR
Technical Manager
Authorised Signatory

NOTE: Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be liable for legal action. Unless otherwise stated the submitted results in this test report refer only to the sample(s) tested and such sample(s) are retained for 15 days only from the completion date of testing., except in case of regulatory samples, which will be retained for a specific period as per statutory requirement; while perishable & environmental testing related remnant samples will be discarded consequent upon completion of testing. Samples are not drawn by us unless otherwise stated. This document cannot be reproduced except in full, without prior written approval of the laboratory. This report is for the exclusive use of Chennai Mettex Lab's customer, and is provided in accordance with the agreement between Chennai Mettex Lab and its Customer.

CHENNAI METTEX LAB PRIVATE LIMITED®

Jothi Complex, 83, M.K.N. Road, Guindy, Chennai - 600 032, Tamil Nadu, INDIA
Phone : +91 44 22323163, 22311034, 42179490, 42179491 I CIN : U74999TN2008PTC069459
Email : test@mettexlab.com I Web : www.mettexlab.com

TEST REPORT

ISSUED TO: M/s. Concretia Rock Products Pvt Ltd - Madurai

Site Address: M/s. Kachaikatty Rough Stone & Gravel Quarry
1174/2,3,4B,5B, 1192/1,2, 1193/6A & 6B, 1196/1A, 1196/3, 1196/4 & 1196/5A
Kachaikatty Village, Vadipatty Taluk & Madurai District, Tamil Nadu.

Test Certificate No : CML/25-26/T019585 Test Certificate Date : 27.05.2026
Location of Sampling : **AAQ – 3, Near Existing Quarry - 10° 4'55.01"N 78° 0'41.26"E**
Sampling Plan &Procedure : CML/LAB/ENV/SOP/AAQ (IS 5182 & USEPA Compendium)
Sampling Instrument ID &Calibration Due Date: CML/ENV/RDS/030 & 18.11.2026
Sampling Instrument ID &Calibration Due Date: CML/ENV/FDS/013 & 19.11.2026

Ambient AirMonitoring Details		Particulate Pollutant			Gaseous Pollutant					Metals Pollutant			Organic Pollutant	
Parameters		SPM	PM_{10}	$PM_{2.5}$	SO_2	NO_2	NH_3	O_3	CO	Pb	Ni	As	C_6H_6	BaP
NAAQ Norms		200	100	60	80	80	400	180	4	1	20	6	5	1
Unit		µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	mg/m³	µg/m³	ng/m³	ng/m³	µg/m³	ng/m³
Date	Period.hrs	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
01.03.2026	7:00-7:00	62.3	41.9	21.8	4.3	23.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
02.03.2026	7:30-7.30	62.7	43.9	23.8	4.2	21.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
07.03.2026	7:00-7:00	62.9	41.5	22.1	5.5	23.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
08.03.2026	7:30-7.30	61.2	43.6	21.4	5.4	22.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
14.03.2026	7:00-7:00	63.7	41.5	23.8	5.5	21.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
15.03.2026	7:30-7.30	62.5	42.5	22.8	5.6	21.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
21.03.2026	7:00-7:00	65.8	42.7	23.6	4.2	23.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
22.03.2026	7:30-7.30	62.7	43.6	21.7	4.6	25.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
28.03.2026	7:00-7:00	61.4	41.7	22.5	5.6	22.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
29.03.2026	7:30-7.30	62.8	42.6	23.9	4.1	21.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
04.04.2026	7:00-7:00	62.8	41.9	22.1	6.4	23.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
05.04.2026	7:30-7.30	62.5	42.5	23.5	4.5	21.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
11.04.2026	7:00-7:00	61.4	41.8	22.5	5.5	22.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
12.04.2026	7:30-7.30	63.5	35.8	20.3	4.5	24.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
18.04.2026	7:00-7:00	64.2	34.9	22.5	5.1	25.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
19.04.2026	7:30-7.30	62.0	36.1	23.6	4.6	23.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
25.04.2026	7:00-7:00	63.5	39.1	21.5	5.5	24.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
26.04.2026	7:30-7.30	64.1	38.3	20.3	5.4	23.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
01.05.2026	7:00-7:00	63.7	37.4	21.5	5.5	21.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
02.05.2026	7:30-7.30	62.8	35.6	23.5	5.8	23.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
08.05.2026	7:00-7:00	62.3	36.4	20.3	4.5	25.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
09.05.2026	7:30-7.30	63.7	41.9	24.2	5.6	21.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
15.05.2026	7:00-7:00	64.0	43.9	23.9	5.5	23.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
16.05.2026	7:30-7.30	63.1	42.6	21.5	5.4	23.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
22.05.2026	7:00-7:00	62.8	43.5	21.9	4.5	22.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
23.05.2026	7:30-7.30	63.9	41.8	22.4	5.3	24.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Note: BDL: Below Detection Limit ;**DL**: Detection Limit ; **NH_3**: BDL (DL:20); **O_3**: BDL (DL:20); **CO**: BDL (DL:1.0);
Pb: BDL (DL:0.1); **Ni**: BDL (DL:1.0); **As**: BDL (DL:1.0); **C_6H_6**: BDL (DL:1.0); **BaP**: BDL (DL:0.1)
Remarks: The values observed for the pollutants given above are within the CPCB standards.

End of Report

For Chennai Mettex Lab Private Limited

Reviewed & Authorised by
V. SELVAKUMAR
Technical Manager
Authorised Signatory

NOTE: Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders will be liable for legal action. Unless otherwise stated the submitted results in this test report refer only to the sample(s) tested and such sample(s) are retained for 15 days from the completion date of testing., except in case of regulatory samples, which will be retained for a specific period as per statutory requirement, while perishable & environmental testing related remnant samples will be discarded consequent upon completion of testing. Samples are not drawn by us unless otherwise stated. This document cannot be reproduced except in full, without prior written approval of the laboratory. This report is for the exclusive use of Chennai Mettex Lab's customer, and is provided in accordance with the agreement between Chennai Mettex Lab and its Customer.

CHENNAI METTEX LAB PRIVATE LIMITED®

Jothi Complex, 83, M.K.N. Road, Guindy, Chennai - 600 032, Tamil Nadu, INDIA
Phone : +91 44 22323163, 22311034, 42179490, 42179491 I CIN : U74999TN2008PTC069459
Email : test@mettexlab.com I Web : www.mettexlab.com

TEST REPORT

ISSUED TO: M/s. Concretia Rock Products Pvt Ltd - Madurai

Site Address: M/s. Kachaikatty Rough Stone & Gravel Quarry
1174/2,3,4B,5B, 1192/1,2, 1193/6A & 6B, 1196/1A, 1196/3, 1196/4 & 1196/5A
Kachaikatty Village, Vadipatty Taluk & Madurai District, Tamil Nadu.

Test Certificate No : CML/25-26/T019586 Test Certificate Date : 27.05.2026
Location of Sampling : **AAQ – 4, Katchaikatti (School) - 10° 5'10.26"N 77°59'45.04"E**
Sampling Plan &Procedure : CML/LAB/ENV/SOP/AAQ (IS 5182 & USEPA Compendium)
Sampling Instrument ID &Calibration Due Date: CML/ENV/RDS/031 & 18.11.2026
Sampling Instrument ID &Calibration Due Date: CML/ENV/FDS/014 & 19.11.2026

Ambient AirMonitoring Details		Particulate Pollutant			Gaseous Pollutant					Metals Pollutant			Organic Pollutant	
Parameters		SPM	PM_{10}	$PM_{2.5}$	SO_2	NO_2	NH_3	O_3	CO	Pb	Ni	As	C_6H_6	BaP
NAAQ Norms		200	100	60	80	80	400	180	4	1	20	6	5	1
Unit		µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	mg/m³	µg/m³	ng/m³	ng/m³	µg/m³	ng/m³
Date	Period.hrs	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
01.03.2026	7:00-7:00	63.4	40.7	22.5	5.2	19.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
02.03.2026	7:30-7.30	60.1	40.1	23.3	5.4	18.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
07.03.2026	7:00-7:00	60.4	41.6	22.7	6.2	19.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
08.03.2026	7:30-7.30	60.2	41.0	23.8	5.3	19.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
14.03.2026	7:00-7:00	60.3	42.1	22.1	6.2	21.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
15.03.2026	7:30-7.30	61.2	42.5	21.9	4.5	18.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
21.03.2026	7:00-7:00	61.7	41.1	21.4	6.1	21.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
22.03.2026	7:30-7.30	61.8	42.0	22.2	5.5	19.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
28.03.2026	7:00-7:00	61.4	40.9	21.8	6.1	21.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
29.03.2026	7:30-7.30	61.3	41.5	21.9	5.3	19.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
04.04.2026	7:00-7:00	61.8	40.6	22.6	6.0	19.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
05.04.2026	7:30-7.30	61.4	41.4	22.7	5.2	22.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
11.04.2026	7:00-7:00	60.2	40.2	21.0	6.0	18.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
12.04.2026	7:30-7.30	60.4	41.5	22.6	5.6	19.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
18.04.2026	7:00-7:00	60.5	39.9	21.1	6.0	21.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
19.04.2026	7:30-7.30	61.2	40.1	21.3	5.8	20.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
25.04.2026	7:00-7:00	61.3	40.6	21.2	5.2	19.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
26.04.2026	7:30-7.30	62.7	40.9	22.1	5.6	20.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
01.05.2026	7:00-7:00	62.4	41.3	20.3	5.7	19.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
02.05.2026	7:30-7.30	62.8	41.0	20.3	5.7	19.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
08.05.2026	7:00-7:00	60.4	41.6	21.9	5.4	18.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
09.05.2026	7:30-7.30	60.9	42.5	20.8	6.1	22.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
15.05.2026	7:00-7:00	61.8	42.6	21.8	5.4	23.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
16.05.2026	7:30-7.30	61.5	41.9	22.6	6.4	23.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
22.05.2026	7:00-7:00	62.2	40.8	21.7	6.6	21.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
23.05.2026	7:30-7.30	62.9	36.8	20.9	5.2	22.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Note: BDL: Below Detection Limit ;**DL**: Detection Limit ; **NH_3**: BDL (DL:20); **O_3**: BDL (DL:20); **CO**: BDL (DL:1.0); **Pb**: BDL (DL:0.1); **Ni**: BDL (DL:1.0); **As**: BDL (DL:1.0); **C_6H_6**: BDL (DL:1.0); **BaP**: BDL (DL:0.1)
Remarks: The values observed for the pollutants given above are within the CPCB standards.

End of Report

For Chennai Mettex Lab Private Limited

Reviewed & Authorised by
V. SELVAKUMAR
Technical Manager
Authorised Signatory

NOTE: Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be liable for legal action. Unless otherwise stated the submitted results in this test report refer only to the sample(s) tested and such sample(s) are retained for 15 days only from the completion date of testing .. except in case of regulatory samples, which will be retained for a specific period as per statutory requirement; while perishable & environmental testing related remnant samples will be discarded consequent upon completion of testing. Samples are not drawn by us unless otherwise stated. This document cannot be reproduced except in full, without prior written approval of the laboratory. This report is for the exclusive use of Chennai Mettex Lab's customer, and is provided in accordance with the agreement between Chennai Mettex Lab and its Customer.

CHENNAI METTEX LAB PRIVATE LIMITED®

Jothi Complex, 83, M.K.N. Road, Guindy, Chennai - 600 032, Tamil Nadu, INDIA
Phone : +91 44 22323163, 22311034, 42179490, 42179491 I CIN : U74999TN2008PTC069459
Email : test@mettexlab.com I Web : www.mettexlab.com

TEST REPORT

ISSUED TO: M/s. Concretia Rock Products Pvt Ltd - Madurai

Site Address: M/s. Kachaikatty Rough Stone & Gravel Quarry
1174/2,3,4B,5B, 1192/1,2, 1193/6A & 6B, 1196/1A, 1196/3, 1196/4 & 1196/5A
Kachaikatty Village, Vadipatty Taluk & Madurai District, Tamil Nadu.

Test Certificate No : CML/25-26/T019587 Test Certificate Date : 27.05.2026
Location of Sampling : **AAQ – 5, Kattankulam (Residential)- 10° 3'1.81"N 77°59'17.57"E**
Sampling Plan &Procedure : CML/LAB/ENV/SOP/AAQ (IS 5182 & USEPA Compendium)
Sampling Instrument ID &Calibration Due Date: CML/ENV/RDS/032 & 18.11.2026
Sampling Instrument ID &Calibration Due Date: CML/ENV/FDS/030 & 19.11.2026

Ambient AirMonitoring Details		Particulate Pollutant			Gaseous Pollutant					Metals Pollutant			Organic Pollutant	
Parameters		SPM	PM_{10}	$PM_{2.5}$	SO_2	NO_2	NH_3	O_3	CO	Pb	Ni	As	C_6H_6	BaP
NAAQ Norms		200	100	60	80	80	400	180	4	1	20	6	5	1
Unit		µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	mg/m³	µg/m³	ng/m³	ng/m³	µg/m³	ng/m³
Date	Period.hrs	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
01.03.2026	7:00-7:00	62.4	43.9	23.2	5.2	20.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
02.03.2026	7:30-7.30	62.7	45.3	24.6	6.0	19.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
07.03.2026	7:00-7:00	62.8	46.2	23.1	5.9	19.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
08.03.2026	7:30-7.30	62.4	45.8	23.9	4.5	19.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
14.03.2026	7:00-7:00	62.1	46.1	24.5	5.1	20.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
15.03.2026	7:30-7.30	62.3	45.2	24.1	5.9	19.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
21.03.2026	7:00-7:00	64.2	44.9	23.5	4.3	19.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
22.03.2026	7:30-7.30	64.8	43.5	23.9	5.1	19.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
28.03.2026	7:00-7:00	64.9	43.9	24.1	6.6	19.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
29.03.2026	7:30-7.30	65.1	44.4	23.5	5.8	19.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
04.04.2026	7:00-7:00	65.1	43.8	23.8	4.2	20.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
05.04.2026	7:30-7.30	65.2	44.7	24.1	5.9	19.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
11.04.2026	7:00-7:00	62.4	43.6	23.5	5.5	18.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
12.04.2026	7:30-7.30	63.7	45.9	23.8	5.1	18.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
18.04.2026	7:00-7:00	64.2	45.1	24.1	6.9	19.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
19.04.2026	7:30-7.30	64.8	45.8	23.5	5.5	20.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
25.04.2026	7:00-7:00	64.2	44.7	23.1	4.2	20.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
26.04.2026	7:30-7.30	65.3	44.9	24.5	6.8	21.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
01.05.2026	7:00-7:00	65.9	43.1	24.8	5.3	20.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
02.05.2026	7:30-7.30	64.1	42.5	23.5	4.1	21.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
08.05.2026	7:00-7:00	65.5	42.9	23.1	5.5	21.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
09.05.2026	7:30-7.30	65.7	43.5	20.5	5.1	22.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
15.05.2026	7:00-7:00	66.6	44.2	21.3	5.2	25.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
16.05.2026	7:30-7.30	67.4	45.3	22.6	5.5	23.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
22.05.2026	7:00-7:00	68.2	46.2	23.6	5.4	22.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
23.05.2026	7:30-7.30	69.1	47.2	21.9	5.6	23.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Note: BDL: Below Detection Limit ;**DL**: Detection Limit ; **NH_3**: BDL (DL:20); **O_3**: BDL (DL:20); **CO**: BDL (DL:1.0); **Pb**: BDL (DL:0.1); **Ni**: BDL (DL:1.0); **As**: BDL (DL:1.0); **C_6H_6**: BDL (DL:1.0); **BaP**: BDL (DL:0.1)
Remarks: The values observed for the pollutants given above are within the CPCB standards.

End of Report

For Chennai Mettex Lab Private Limited

Reviewed & Authorised by
V. SELVAKUMAR
Technical Manager
Authorised Signatory

NOTE: Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be subject to the full extent for legal action. Unless otherwise stated the submitted results in this test report refer only to the sample(s) tested and such sample(s) are retained for 15 days only from the completion date of testing., except in case of regulatory samples, which will be retained for a specific period as per statutory requirement; while perishable & environmental testing related remnant samples will be discarded consequent upon completion of testing. Samples are not drawn by us unless otherwise stated. This document cannot be reproduced except in full, without prior written approval of the laboratory. This report is for the exclusive use of Chennai Mettex Lab's customer, and is provided in accordance with the agreement between Chennai Mettex Lab and its Customer.

CHENNAI METTEX LAB PRIVATE LIMITED®

Jothi Complex, 83, M.K.N. Road, Guindy, Chennai - 600 032, Tamil Nadu, INDIA
Phone : +91 44 22323163, 22311034, 42179490, 42179491 I CIN : U74999TN2008PTC069459
Email : test@mettexlab.com I Web : www.mettexlab.com

TEST REPORT

ISSUED TO: M/s. Concretia Rock Products Pvt Ltd - Madurai

Site Address: M/s. Kachaikatty Rough Stone & Gravel Quarry
1174/2,3,4B,5B, 1192/1,2, 1193/6A & 6B, 1196/1A, 1196/3, 1196/4 & 1196/5A
Kachaikatty Village, Vadipatty Taluk & Madurai District, Tamil Nadu.

Test Certificate No : CML/25-26/T019588 Test Certificate Date : 27.05.2026
Location of Sampling : **AAQ – 6, Ellaiyur (Residential) - 10° 6'28.66"N 78° 1'34.38" E**
Sampling Plan &Procedure : CML/LAB/ENV/SOP/AAQ (IS 5182 & USEPA Compendium)
Sampling Instrument ID &Calibration Due Date: CML/ENV/RDS/033 & 18.11.2026
Sampling Instrument ID &Calibration Due Date: CML/ENV/FDS/031 & 19.11.2026

Ambient AirMonitoring Details		Particulate Pollutant			Gaseous Pollutant					Metals Pollutant			Organic Pollutant	
Parameters		SPM	PM_{10}	$PM_{2.5}$	SO_2	NO_2	NH_3	O_3	CO	Pb	Ni	As	C_6H_6	BaP
NAAQ Norms		200	100	60	80	80	400	180	4	1	20	6	5	1
Unit		µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	mg/m³	µg/m³	ng/m³	ng/m³	µg/m³	ng/m³
Date	Period.hrs	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
01.03.2026	7:00-7:00	62.2	40.3	24.6	4.9	19.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
02.03.2026	7:30-7.30	62.8	39.3	23.5	4.8	18.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
07.03.2026	7:00-7:00	63.4	38.5	24.5	5.8	18.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
08.03.2026	7:30-7.30	63.7	39.5	23.1	4.5	18.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
14.03.2026	7:00-7:00	63.9	40.8	24.7	5.5	19.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
15.03.2026	7:30-7.30	64.1	40.1	23.2	4.4	19.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
21.03.2026	7:00-7:00	64.5	41.7	22.9	5.5	18.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
22.03.2026	7:30-7.30	64.8	41.2	23.7	5.2	19.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
28.03.2026	7:00-7:00	65.2	41.5	23.2	4.3	19.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
29.03.2026	7:30-7.30	65.7	40.6	24.5	4.2	18.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
04.04.2026	7:00-7:00	65.8	41.3	24.9	5.5	18.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
05.04.2026	7:30-7.30	61.2	41.7	23.4	5.4	19.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
11.04.2026	7:00-7:00	62.8	40.4	24.1	4.5	18.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
12.04.2026	7:30-7.30	64.4	40.9	23.5	5.0	17.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
18.04.2026	7:00-7:00	64.7	41.2	23.2	5.8	19.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
19.04.2026	7:30-7.30	65.1	40.5	24.6	4.5	18.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
25.04.2026	7:00-7:00	65.8	41.4	24.9	5.6	17.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
26.04.2026	7:30-7.30	66.1	41.9	23.1	5.7	16.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
01.05.2026	7:00-7:00	64.2	40.1	22.8	4.1	18.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
02.05.2026	7:30-7.30	64.3	39.9	22.3	5.6	19.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
08.05.2026	7:00-7:00	63.1	39.5	21.5	6.8	18.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
09.05.2026	7:30-7.30	63..8	40.2	21.6	5.0	21.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
15.05.2026	7:00-7:00	62.1	41.5	21.8	6.4	22.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
16.05.2026	7:30-7.30	62.9	43.8	20.4	6.1	23.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
22.05.2026	7:00-7:00	63.8	41.6	22.5	5.5	23.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
23.05.2026	7:30-7.30	64.3	42.6	21.4	5.7	22.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Note: BDL: Below Detection Limit ;**DL**: Detection Limit ; **NH_3**: BDL (DL:20); **O_3**: BDL (DL:20); **CO**: BDL (DL:1.0); **Pb**: BDL (DL:0.1); **Ni**: BDL (DL:1.0); **As**: BDL (DL:1.0); **C_6H_6**: BDL (DL:1.0); **BaP**: BDL (DL:0.1)
Remarks: The values observed for the pollutants given above are within the CPCB standards.

End of Report

For Chennai Mettex Lab Private Limited

Reviewed & Authorised by
V. SELVAKUMAR
Technical Manager
Authorised Signatory

NOTE: Any unauthorised alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders will be liable for legal action. Unless otherwise stated the submitted results in this test report refer only to the sample(s) tested and such sample(s) are retained for 15 days only from the completion date of testing., except in case of regulatory samples, which will be retained for a specific period as per statutory requirement; while perishable & environmental testing related remnant samples will be discarded consequent upon completion of testing. Samples are not drawn by us unless otherwise stated. This document cannot be reproduced except in full, without prior written approval of the laboratory. This report is for the exclusive use of Chennai Mettex Lab's customer, and is provided in accordance with the agreement between Chennai Mettex Lab and its Customer.

CHENNAI METTEX LAB PRIVATE LIMITED®

Jothi Complex, 83, M.K.N. Road, Guindy, Chennai - 600 032, Tamil Nadu, INDIA
Phone : +91 44 22323163, 22311034, 42179490, 42179491 I CIN : U74999TN2008PTC069459
Email : test@mettexlab.com I Web : www.mettexlab.com

TEST REPORT

ISSUED TO: M/s. Concretia Rock Products Pvt Ltd - Madurai

Site Address: M/s. Kachaikatty Rough Stone & Gravel Quarry
1174/2,3,4B,5B, 1192/1,2, 1193/6A & 6B, 1196/1A, 1196/3, 1196/4 & 1196/5A
Kachaikatty Village, Vadipatty Taluk & Madurai District, Tamil Nadu.

Test Certificate No : CML/25-26/T019589 Test Certificate Date : 27.05.2026
Location of Sampling : **AAQ – 7, Vittankulam (Residential) - 10° 2'19.14"N 78° 2'37.30"E**
Sampling Plan &Procedure : CML/LAB/ENV/SOP/AAQ (IS 5182 & USEPA Compendium)
Sampling Instrument ID &Calibration Due Date: CML/ENV/RDS/034 & 18.11.2026
Sampling Instrument ID &Calibration Due Date: CML/ENV/FDS/032 & 19.11.2026

Ambient Air Monitoring Details		Particulate Pollutant			Gaseous Pollutant					Metals Pollutant			Organic Pollutant	
Parameters		SPM	PM_{10}	$PM_{2.5}$	SO_2	NO_2	NH_3	O_3	CO	Pb	Ni	As	C_6H_6	BaP
NAAQ Norms		200	100	60	80	80	400	180	4	1	20	6	5	1
Unit		µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	mg/m³	µg/m³	ng/m³	ng/m³	µg/m³	ng/m³
Date	Period.hrs	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
01.03.2026	7:00-7:00	63.4	41.5	21.1	5.3	21.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
02.03.2026	7:30-7.30	62.8	42.9	20.9	4.6	21.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
07.03.2026	7:00-7:00	63.9	41.3	20.5	5.9	20.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
08.03.2026	7:30-7.30	62.5	42.7	20.1	6.4	20.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
14.03.2026	7:00-7:00	61.7	41.6	19.8	5.5	24.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
15.03.2026	7:30-7.30	63.8	40.1	20.0	4.8	24.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
21.03.2026	7:00-7:00	62.9	41.6	20.5	5.6	24.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
22.03.2026	7:30-7.30	63.4	40.2	20.3	4.5	21.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
28.03.2026	7:00-7:00	62.5	41.7	20.1	6.2	21.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
29.03.2026	7:30-7.30	62.7	40.1	20.9	4.8	24.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
04.04.2026	7:00-7:00	62.3	42.6	21.2	5.4	24.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
05.04.2026	7:30-7.30	62.4	42.1	20.1	5.8	21.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
11.04.2026	7:00-7:00	63.5	41.8	20.8	4.3	21.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
12.04.2026	7:30-7.30	62.4	40.3	20.3	5.9	21.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
18.04.2026	7:00-7:00	61.9	41.7	21.9	5.4	21.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
19.04.2026	7:30-7.30	63.8	41.9	20.1	5.8	20.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
25.04.2026	7:00-7:00	62.5	41.1	20.6	4.1	20.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
26.04.2026	7:30-7.30	63.4	41.3	20.4	5.7	21.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
01.05.2026	7:00-7:00	61.9	41.4	20.3	5.2	20.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
02.05.2026	7:30-7.30	62.3	42.9	20.3	4.9	21.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
08.05.2026	7:00-7:00	62.4	43.8	21.9	5.5	20.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
09.05.2026	7:30-7.30	63.5	42.5	20.8	4.8	22.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
15.05.2026	7:00-7:00	61.8	42.6	21.8	5.1	23.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
16.05.2026	7:30-7.30	64.5	41.9	22.6	4.4	23.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
22.05.2026	7:00-7:00	63.7	40.8	21.7	5.7	21.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
23.05.2026	7:30-7.30	60.2	36.8	20.9	5.2	22.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Note: BDL: Below Detection Limit ;**DL**: Detection Limit ; **NH_3**: BDL (DL:20); **O_3**: BDL (DL:20); **CO**: BDL (DL:1.0); **Pb**: BDL (DL:0.1); **Ni**: BDL (DL:1.0); **As**: BDL (DL:1.0); **C_6H_6**: BDL (DL:1.0); **BaP**: BDL (DL:0.1)
Remarks: The values observed for the pollutants given above are within the CPCB standards.

End of Report

For Chennai Mettex Lab Private Limited

Reviewed & Authorised by
V. SELVAKUMAR
Technical Manager
Authorised Signatory

NOTE: Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders will be liable for legal action. Unless otherwise stated the submitted results in this test report refer only to the sample(s) tested and such sample(s) are retained for 15 days only from the completion date of testing., except in case of regulatory samples, which will be retained for a specific period as per statutory requirement, while perishable & environmental testing related remnant samples will be discarded consequent upon completion of testing. Samples are not drawn by us unless otherwise stated. This document cannot be reproduced except in full, without prior written approval of the laboratory. This report is for the exclusive use of Chennai Mettex Lab's customer, and is provided in accordance with the agreement between Chennai Mettex Lab and its Customer.

CHENNAI METTEX LAB PRIVATE LIMITED®

Jothi Complex, 83, M.K.N. Road, Guindy, Chennai - 600 032, Tamil Nadu, INDIA
Phone : +91 44 22323163, 22311034, 42179490, 42179491 I CIN : U74999TN2008PTC069459
Email : test@mettexlab.com I Web : www.mettexlab.com

TEST REPORT

ISSUED TO: M/s. Concretia Rock Products Pvt Ltd - Madurai

Site Address: M/s. Kachaikatty Rough Stone & Gravel Quarry
1174/2,3,4B,5B, 1192/1,2, 1193/6A & 6B, 1196/1A, 1196/3, 1196/4 & 1196/5A
Kachaikatty Village, Vadipatty Taluk & Madurai District, Tamil Nadu.

Test Certificate No : CML/25-26/T019590 Test Certificate Date : 27.05.2026
Sample Description : Ambient Noise Monitoring
Location of Sampling : N1 - Core zone - Project Area - 10° 4'43.63"N 78° 0'51.93"E
Location of Sampling : N2 - Core zone - Project Area - 10° 4'41.99"N 78° 0'28.02"E
Sampling Plan & Procedure: CML/LAB/ENV/SOP/N&L & IS 9989:1981
Sampling Instrument : CML/ENV/SLM/001 & CML/ENV/SLM/009

Sampling Date : 16.03.2026						
Location	N1 – Core zone -Project Area			N2 - Core zone -Project Area		
Parameter	Min	Max	Result	Min	Max	Result
Time	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
06:00-07:00	40.5	42.3	41.5	39.5	42.3	41.1
07:00-08:00	35.2	37.2	36.3	37.2	43.1	41.1
08:00-09:00	34.2	36.2	35.3	35.2	41.2	39.2
09:00-10:00	33.1	34.1	33.6	36.1	40.5	38.8
10:00-11:00	32.6	34.2	33.5	35.2	38.6	37.2
11:00-12:00	31.2	33.2	32.3	36.1	38.2	37.3
12:00-13:00	32.6	34.6	33.7	38.2	40.2	39.3
13:00-14:00	33.4	35.4	34.5	39.2	42.3	41.0
14:00-15:00	37.1	39.1	38.2	38.2	45.2	43.0
15:00-16:00	36.2	38.2	37.3	36.5	48.2	45.5
16:00-17:00	38.2	40.1	39.3	37.2	45.2	42.8
17:00-18:00	40.3	42.3	41.4	36.8	45.2	42.8
18:00-19:00	42.1	44.2	43.3	37.2	44.1	41.9
19:00-20:00	44.5	46.3	45.5	38.1	44.3	42.2
20:00-21:00	42.1	44.1	43.2	39.1	41.2	40.3
21:00-22:00	44.2	46.3	45.4	38.2	40.8	39.7
22:00-23:00	35.2	37.4	36.4	37.4	39.2	38.4
23:00-00:00	34.2	36.4	35.4	35.6	38.5	37.3
00:00-01:00	33.3	35.4	34.5	34.2	36.5	35.5
01:00-02:00	31.2	34.2	33.0	33.2	35.4	34.4
02:00-03:00	32.6	37.3	35.6	32.6	34.6	33.7
03:00-04:00	35.2	38.6	37.2	33.2	35.2	34.3
04:00-05:00	34.1	35.2	34.7	34.5	36.2	35.4
05:00-06:00	33.6	36.1	35.0	35.6	37.2	36.5
Result	Day Mean		**38.3**	Day Mean		**40.7**
	Night Mean		**35.1**	Night Mean		**35.3**

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

For Chennai Mettex Lab Private Limited

Reviewed & Authorised by
V. SELVAKUMAR
Technical Manager
Authorised Signatory

NOTE: Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of law or legal action. Unless otherwise stated the submitted results in this test report refer only to the sample(s) tested and such sample(s) are retained for 15 days only from the completion date of testing .. except in case of regulatory samples, which will be retained for a specific period as per statutory requirement; while perishable & environmental testing related remnant samples will be discarded consequent upon completion of testing. Samples are not drawn by us unless otherwise stated. This document cannot be reproduced except in full, without prior written approval of the laboratory. This report is for the exclusive use of Chennai Mettex Lab's customer, and is provided in accordance with the agreement between Chennai Mettex Lab and its Customer.

CHENNAI METTEX LAB PRIVATE LIMITED®

Jothi Complex, 83, M.K.N. Road, Guindy, Chennai - 600 032, Tamil Nadu, INDIA
Phone : +91 44 22323163, 22311034, 42179490, 42179491 I CIN : U74999TN2008PTC069459
Email : test@mettexlab.com I Web : www.mettexlab.com

TEST REPORT

ISSUED TO: M/s. Concretia Rock Products Pvt Ltd - Madurai

Site Address: M/s. Kachaikatty Rough Stone & Gravel Quarry
1174/2,3,4B,5B, 1192/1,2, 1193/6A & 6B, 1196/1A, 1196/3, 1196/4 & 1196/5A
Kachaikatty Village, Vadipatty Taluk & Madurai District, Tamil Nadu.

Test Certificate No : CML/25-26/T019591 Test Certificate Date : 27.05.2026
Sample Description : Ambient Noise Monitoring
Location of Sampling : N3 – Near Existing Quarry - 10°4'56.52"N 78° 0'39.78"E
Location of Sampling : N4 – Katchaikatti (School) - 10° 5'10.28"N 77°59'45.36"E E
Sampling Plan & Procedure: CML/LAB/ENV/SOP/N&L & IS 9989:1981
Sampling Instrument : CML/ENV/SLM/003 & CML/ENV/SLM/001

Sampling Date : 13.04.2026						
Location	N3 – Near Existing Quarry			N4 – Katchaikatti (School)		
Parameter	Min	Max	Result	Min	Max	Result
Time	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
06:00-07:00	35.4	37.2	36.4	37.5	40.2	39.1
07:00-08:00	33.2	35.6	34.6	38.5	42.3	40.8
08:00-09:00	36.2	38.2	37.3	36.2	40.3	38.7
09:00-10:00	34.1	38.2	36.6	34.1	37.2	35.9
10:00-11:00	31.2	33.4	32.4	35.2	37.6	36.6
11:00-12:00	33.4	35.2	34.4	36.2	34.5	35.4
12:00-13:00	35.6	36.4	36.0	38.2	40.3	39.4
13:00-14:00	38.2	39.1	38.7	37.4	43.2	41.2
14:00-15:00	38.6	39.9	39.3	36.5	40.2	38.7
15:00-16:00	36.1	38.2	37.3	38.4	42.3	40.8
16:00-17:00	37.2	39.2	38.3	39.6	43.5	42.0
17:00-18:00	38.1	39.2	38.7	37.2	40.2	39.0
18:00-19:00	38.6	39.7	39.2	38.6	35.1	37.2
19:00-20:00	36.5	42.3	40.3	34.2	36.2	35.3
20:00-21:00	32.2	44.2	41.5	33.3	38.5	36.6
21:00-22:00	33.6	45.3	42.6	32.1	36.2	34.6
22:00-23:00	34.2	36.2	35.3	31.2	36.8	34.8
23:00-00:00	35.2	37.2	36.3	30.1	35.2	33.4
00:00-01:00	32.1	33.6	32.9	32.1	33.4	32.8
01:00-02:00	32.3	33.4	32.9	33.4	35.4	34.5
02:00-03:00	37.6	39.2	38.5	32.5	38.2	36.2
03:00-04:00	37.2	39.5	38.5	31.2	39.1	36.7
04:00-05:00	36.2	39.7	38.3	30.2	40.3	37.7
05:00-06:00	36.1	39.2	37.9	32.1	39.5	37.2
Result	**Day Mean**		**37.6**	**Day Mean**		**38.0**
	Night Mean		**36.5**	**Night Mean**		**35.5**

Note: CPCB Norms Residential Area Day Time:55 dB(A); Night Time:45 dB(A)
The Noise level in the above location exists within the permissible limits of CPCB.

End of Report

For Chennai Mettex Lab Private Limited

Reviewed & Authorised by
V. SELVAKUMAR
Technical Manager
Authorised Signatory

NOTE: Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders will be liable for legal action. Unless otherwise stated the submitted results in this test report refer only to the sample(s) tested and such sample(s) are retained for 15 days only from the completion date of testing., except in case of regulatory samples, which will be retained for a specific period as per statutory requirement; while perishable & environmental testing related remnant samples will be discarded consequent upon completion of testing. Samples are not drawn by us unless otherwise stated. This document cannot be reproduced except in full, without prior written approval of the laboratory. This report is for the exclusive use of Chennai Mettex Lab's customer, and is provided in accordance with the agreement between Chennai Mettex Lab and its Customer.

CHENNAI METTEX LAB PRIVATE LIMITED®

Jothi Complex, 83, M.K.N. Road, Guindy, Chennai - 600 032, Tamil Nadu, INDIA
Phone : +91 44 22323163, 22311034, 42179490, 42179491 I CIN : U74999TN2008PTC069459
Email : test@mettexlab.com I Web : www.mettexlab.com

TEST REPOR

ISSUED TO: M/s. Concretia Rock Products Pvt Ltd - Madurai

Site Address: M/s. Kachaikatty Rough Stone & Gravel Quarry
1174/2,3,4B,5B, 1192/1,2, 1193/6A & 6B, 1196/1A, 1196/3, 1196/4 & 1196/5A
Kachaikatty Village, Vadipatty Taluk & Madurai District, Tamil Nadu.

Test Certificate No : CML/25-26/T019592 Test Certificate Date : 27.05.2026
Sample Description : Ambient Noise Monitoring
Location of Sampling : N5 – Kattankulam (Residential) - 10°2'52.43"N 77°59'18.09"E
Location of Sampling : N6 – Ellaiyur (Residential) - 10°6'29.03"N 78° 1'33.97"E
Sampling Plan & Procedure: CML/LAB/ENV/SOP/N&L & IS 9989:1981
Sampling Instrument : CML/ENV/SLM/009 & CML/ENV/SLM/001

Sampling Date : 05.05.2026						
Location	N5 – Kattankulam (Residential)			N6 - Ellaiyur (Residential)		
Parameter	Min	Max	Result	Min	Max	Result
Time	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
06:00-07:00	35.2	37.2	36.3	40.5	42.3	41.5
07:00-08:00	34.2	36.2	35.3	39.5	42.3	41.1
08:00-09:00	33.1	34.1	33.6	37.2	43.1	41.1
09:00-10:00	32.6	34.2	33.5	35.2	41.2	39.2
10:00-11:00	31.2	33.2	32.3	36.1	40.5	38.8
11:00-12:00	32.6	34.6	33.7	35.2	38.6	37.2
12:00-13:00	33.4	35.4	34.5	36.1	38.2	37.3
13:00-14:00	37.1	39.1	38.2	38.2	40.2	39.3
14:00-15:00	36.2	38.2	37.3	39.2	42.3	41.0
15:00-16:00	38.2	40.1	39.3	38.2	45.2	43.0
16:00-17:00	40.3	42.3	41.4	36.5	48.2	45.5
17:00-18:00	42.1	44.2	43.3	37.2	45.2	42.8
18:00-19:00	44.5	46.3	45.5	36.8	45.2	42.8
19:00-20:00	42.1	44.1	43.2	37.2	44.1	41.9
20:00-21:00	44.2	46.3	45.4	38.1	44.3	42.2
21:00-22:00	35.2	37.4	36.4	39.1	41.2	40.3
22:00-23:00	34.2	36.4	35.4	38.2	40.8	39.7
23:00-00:00	33.3	35.4	34.5	37.4	39.2	38.4
00:00-01:00	31.2	34.2	33.0	35.6	38.5	37.3
01:00-02:00	32.6	37.3	35.6	34.2	36.5	35.5
02:00-03:00	35.2	38.6	37.2	33.2	35.4	34.4
03:00-04:00	34.1	35.2	34.7	32.6	34.6	33.7
04:00-05:00	33.6	36.1	35.0	33.2	35.2	34.3
05:00-06:00	34.1	37.2	35.9	34.5	36.2	35.4
Result	**Day Mean**		**37.9**	**Day Mean**		**40.9**
	Night Mean		**35.1**	**Night Mean**		**35.6**

Note: CPCB Norms Residential Area Day Time:55 dB(A); Night Time:45 dB(A)
The Noise level in the above location exists within the permissible limits of CPCB.

End of Report

For Chennai Mettex Lab Private Limited

Reviewed & Authorised by
V. SELVAKUMAR
Technical Manager
Authorised Signatory

NOTE: Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders will be liable for legal action. Unless otherwise stated the submitted results in this test report refer only to the sample(s) tested and such sample(s) are retained for 15 days only from the completion date of testing .. except in case of regulatory samples, which will be retained for a specific period as per statutory requirement, while perishable & environmental testing related remnant samples will be discarded consequent upon completion of testing. Samples are not drawn by us unless otherwise stated. This document cannot be reproduced except in full, without prior written approval of the laboratory. This report is for the exclusive use of Chennai Mettex Lab's customer, and is provided in accordance with the agreement between Chennai Mettex Lab and its Customer.

CHENNAI METTEX LAB PRIVATE LIMITED®

Jothi Complex, 83, M.K.N. Road, Guindy, Chennai - 600 032, Tamil Nadu, INDIA
Phone : +91 44 22323163, 22311034, 42179490, 42179491 I CIN : U74999TN2008PTC069459
Email : test@mettexlab.com I Web : www.mettexlab.com

TEST REPORT

ISSUED TO: M/s. Concretia Rock Products Pvt Ltd - Madurai

Site Address: M/s. Kachaikatty Rough Stone & Gravel Quarry
1174/2,3,4B,5B, 1192/1,2, 1193/6A & 6B, 1196/1A, 1196/3, 1196/4 & 1196/5A
Kachaikatty Village, Vadipatty Taluk & Madurai District, Tamil Nadu.

Test Certificate No : CML/25-26/T019593 Test Certificate Date : 27.05.2026
Sample Description : Ambient Noise Monitoring
Location of Sampling : N7 – Vittankulam (Residential) - 10°2'20.22"N 78° 2'36.97"E
Sampling Plan & Procedure: CML/LAB/ENV/SOP/N&L & IS 9989:1981
Sampling Instrument : C/ENV/SLM/003

Location	N- 7 Vittankulam (Residential		
Parameter	Min	Max	Result
Time	dB(A)	dB(A)	dB(A)
06:00-07:00	39.5	42.3	41.1
07:00-08:00	37.2	43.1	41.1
08:00-09:00	35.2	41.2	39.2
09:00-10:00	36.1	40.5	38.8
10:00-11:00	35.2	38.6	37.2
11:00-12:00	36.1	38.2	37.3
12:00-13:00	38.2	40.2	39.3
13:00-14:00	39.2	42.3	41.0
14:00-15:00	38.2	45.2	43.0
15:00-16:00	36.5	48.2	45.5
16:00-17:00	37.2	45.2	42.8
17:00-18:00	36.8	45.2	42.8
18:00-19:00	37.2	44.1	41.9
19:00-20:00	38.1	44.3	42.2
20:00-21:00	39.1	41.2	40.3
21:00-22:00	38.2	40.8	39.7
22:00-23:00	37.4	39.2	38.4
23:00-00:00	35.6	38.5	37.3
00:00-01:00	34.2	36.5	35.5
01:00-02:00	33.2	35.4	34.4
02:00-03:00	32.6	34.6	33.7
03:00-04:00	33.2	35.2	34.3
04:00-05:00	34.5	36.2	35.4
05:00-06:00	31.2	33.2	32.3
Result	**Day Mean**		**40.7**
	Night Mean		**34.7**

End of Report

For Chennai Mettex Lab Private Limited

Reviewed & Authorised by
V. SELVAKUMAR
Technical Manager
Authorised Signatory

NOTE: Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders will be liable for legal action. Unless otherwise stated the submitted results in this test report refer only to the sample(s) tested and such sample(s) are retained for 15 days only from the completion date of testing , except in case of regulatory samples, which will be retained for a specific period as per statutory requirement; while perishable & environmental testing related remnant samples will be discarded consequent upon completion of testing. Samples are not drawn by us unless otherwise stated. This document cannot be reproduced except in full, without prior written approval of the laboratory. This report is for the exclusive use of Chennai Mettex Lab's customer, and is provided in accordance with the agreement between Chennai Mettex Lab and its Customer.

CHENNAI METTEX LAB PRIVATE LIMITED®

Jothi Complex, 83, M.K.N. Road, Guindy, Chennai - 600 032, Tamil Nadu, INDIA
Phone : +91 44 22323163, 22311034, 42179490, 42179491 I CIN : U74999TN2008PTC069459
Email : test@mettexlab.com I Web : www.mettexlab.com

TEST REPORT

ISSUED TO: M/s. Concretia Rock Products Pvt Ltd - Madurai

Site Address: M/s. Kachaikatty Rough Stone & Gravel Quarry 1174/2,3,4B,5B, 1192/1,2, 1193/6A & 6B, 1196/1A, 1196/3, 1196/4 & 1196/5A, Kachaikatty Village, Vadipatty Taluk & Madurai District, Tamil Nadu.

T.C Date : 27.05.2026
T.C No : CML/26-27/T019594
Date Of Receipt : 16.05.2026
Analysis Commenced On: 16.05.2026
Analysis Completed On : 27.05.2026

Cust. Ref : SRF Dated : 15.05.2026

Lab No : 2709103/001

Sample Description : **Surface Water (SW-1) – Puliyan Kanmaai**
(as stated by customer)

TEST	PROTOCOL	RESULTS
Discipline: Chemical	**Group:** Water	
Colour	IS 3025 Part 4:2021	1 Hazen
Odour	IS 3025 Part 5:2018	Agreeable
pH at 25°C	IS 3025 Part 11:2022 (electrometric method)	7.85
Conductivity @ 25°C	IS 3025 Part 14:2013	1340 µmhos/cm
Turbidity	IS 3025 Part 10:2023	1 NTU
Total Dissolved Solids	IS 3025 Part 16:2023	777.0 mg/l
Total Hardness as $CaCO_3$	IS 3025 Part 21:2009 (EDTA titrimetric method)	224.0 mg/l
Calcium as Ca	IS 3025 Part 40:1991 (EDTA titrimetric method)	52.9 mg/l
Magnesium as Mg	IS 3025 Part 46:2023	22.3 mg/l
Total Alkalinity as $CaCO_3$	IS 3025 Part 23:2023	198.5 mg/l
Chloride as Cl	IS 3025 Part 32:1988 (Argentometric Method)	246.5 mg/l
Sulphate as SO_4	IS 3025 Part 24/Sec 1-2022	45.2 mg/l
Iron as Fe	IS 3025 Part 53:2003 (1,10 phenanthroline method)	0.49 mg/l
Residual Free Chlorine	IS 3025 Part 26:2021	BDL (DL:0.1 mg/l)
Fluoride as F	APHA 24th Edn. 2023:4500 F,D	0.41 mg/l
Nitrate as NO_3	IS 3025 Part 34:1988 (Chromotropic acid method)	13.3 mg/l
Copper as Cu	IS 3025 Part 65:2022	BDL (DL:0.01 mg/l)
Manganese as Mn	IS 3025 Part 65:2022	BDL (DL:0.02 mg/l)
Mercury as Hg	IS 3025 Part 65:2022	BDL (DL:0.0005 mg/l)
Cadmium as Cd	IS 3025 Part 65:2022	BDL (DL:0.001 mg/l)
Selenium as Se	IS 3025 Part 65:2022	BDL (DL:0.005 mg/l)

...Contd....2

NOTE: Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders will be liable for legal action. Unless otherwise stated the submitted results in this test report refer only to the sample(s) tested and such sample(s) are retained for 15 days only from the completion date of testing., except in case of regulatory samples, which will be retained for a specific period as per statutory requirement; while perishable & environmental testing related remnant samples will be discarded consequent upon completion of testing. Samples are not drawn by us unless otherwise stated. This document cannot be reproduced except in full, without prior written approval of the laboratory. This report is for the exclusive use of Chennai Mettex Lab's customer, and is provided in accordance with the agreement between Chennai Mettex Lab and its Customer.

CHENNAI METTEX LAB PRIVATE LIMITED®

Jothi Complex, 83, M.K.N. Road, Guindy, Chennai - 600 032, Tamil Nadu, INDIA
Phone : +91 44 22323163, 22311034, 42179490, 42179491 I CIN : U74999TN2008PTC069459
Email : test@mettexlab.com I Web : www.mettexlab.com

TEST	PROTOCOL	RESULTS
Aluminium as Al	IS 3025 Part 65:2022	BDL (DL:0.005 mg/l)
Lead as Pb	IS 3025 Part 65:2022	BDL (DL:0.005 mg/l)
Zinc as Zn	IS 3025 Part 65:2022	BDL(DL : 0.05 mg/l)
Total Chromium as Cr	IS 3025 Part 65:2022	BDL(DL : 0.02 mg/l)
Boron as B	IS 3025 Part 65:2022	BDL(DL : 0.05 mg/l)
Mineral Oil	IS 3025 Part 39-2021	BDL(DL : 0.01 mg/l)
Phenolic compounds as C_6H_5OH	IS 3025 Part 43/Sec 1 - 2022	BDL (DL:0.0005 mg/l)
Anionic Detergents (as MBAS)	IS 3025 Part 68:2019	BDL (DL:0.01 mg/l)
Cyanide as CN	IS 3025 Part 27/Sec 1-2021 (Colorimetric method)	BDL (DL:0.01 mg/l)
BOD @ 27°C for 3 days	IS 3025 Part 44:2023	12.8 mg/l
Chemical Oxygen Demand	IS 3025 Part 58:2023	30.6 mg/l
Dissolved Oxygen	IS 3025 Part 38:1989 (Azide Modification)	5.6 mg/l
Barium as Ba	IS 3025 Part 65:2022	BDL (DL:0.05 mg/l)
Ammonia (as total ammonia-N)	IS 3025 Part 34-1988 (Nesslerization method)	BDL (DL:0.01 mg/l)
Sulphide as H_2S	IS 3025 Part 29-2022	BDL (DL:0.01 mg/l)
Molybdenum as Mo	IS 3025 Part 65:2022	BDL (DL:0.02 mg/l)
Total Arsenic as As	IS 3025 Part 65:2022	BDL (DL:0.005 mg/l)
Total Suspended Solids	IS 3025 Part 17 -2022	10.9 mg/l
Discipline: Biological	**Group:** Water	
Total Coliform	APHA 24th Edn. 2023-9221 B	1600 MPN/100ml
Escherichia coli	APHA 24th Edn. 2023-9221 F	220 MPN/100ml
Note : APHA – American Public Health Association, BDL – Below Detection Limit, DL – Detection Limit, MPN – Most Probable Number.		

End of Report

For Chennai Mettex Lab Private Limited

Reviewed & Authorised by
B. ARUNAN
Technical Manager
Authorised Signatory

Reviewed & Authorised by
V. SELVAKUMAR
Technical Manager
Authorised Signatory

NOTE: Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders will be liable for legal action. Unless otherwise stated the submitted results in this test report refer only to the sample(s) tested and such sample(s) are retained for 15 days only from the completion date of testing , except in case of regulatory samples, which will be retained for a specific period as per statutory requirement; while perishable & environmental testing related remnant samples will be discarded consequent upon completion of testing. Samples are not drawn by us unless otherwise stated. This document cannot be reproduced except in full, without prior written approval of the laboratory. This report is for the exclusive use of Chennai Mettex Lab's customer, and is provided in accordance with the agreement between Chennai Mettex Lab and its Customer.

CHENNAI METTEX LAB PRIVATE LIMITED®

Jothi Complex, 83, M.K.N. Road, Guindy, Chennai - 600 032, Tamil Nadu, INDIA
Phone : +91 44 22323163, 22311034, 42179490, 42179491 I CIN : U74999TN2008PTC069459
Email : test@mettexlab.com I Web : www.mettexlab.com

TEST REPORT

ISSUED TO: M/s. Concretia Rock Products Pvt Ltd - Madurai

Site Address: M/s. Kachaikatty Rough Stone & Gravel Quarry 1174/2,3,4B,5B, 1192/1,2, 1193/6A & 6B, 1196/1A, 1196/3, 1196/4 & 1196/5A, Kachaikatty Village, Vadipatty Taluk & Madurai District, Tamil Nadu.

T.C Date : 27.05.2026
T.C No : CML/26-27/T019595
Date Of Receipt : 16.05.2026
Analysis Commenced On: 16.05.2026
Analysis Completed On : 27.05.2026

Cust. Ref : SRF Dated : 15.05.2026

Lab No : 2709103/002

Sample Description : Surface Water (SW-2) – Vaigai River
(as stated by customer)

TEST	PROTOCOL	RESULTS
Discipline: Chemical	**Group:** Water	
Colour	IS 3025 Part 4:2021	1 Hazen
Odour	IS 3025 Part 5:2018	Agreeable
pH at 25°C	IS 3025 Part 11:2022 (electrometric method)	7.88
Conductivity @ 25°C	IS 3025 Part 14:2013	1364 µmhos/cm
Turbidity	IS 3025 Part 10:2023	1 NTU
Total Dissolved Solids	IS 3025 Part 16:2023	791.0 mg/l
Total Hardness as $CaCO_3$	IS 3025 Part 21:2009 (EDTA titrimetric method)	232.0 mg/l
Calcium as Ca	IS 3025 Part 40:1991 (EDTA titrimetric method)	57.7 mg/l
Magnesium as Mg	IS 3025 Part 46:2023	21.4 mg/l
Total Alkalinity as $CaCO_3$	IS 3025 Part 23:2023	225.5 mg/l
Chloride as Cl	IS 3025 Part 32:1988 (Argentometric Method)	256.5 mg/l
Sulphate as SO_4	IS 3025 Part 24/Sec 1-2022	47.8 mg/l
Iron as Fe	IS 3025 Part 53:2003 (1,10 phenanthroline method)	0.43 mg/l
Residual Free Chlorine	IS 3025 Part 26:2021	BDL (DL:0.1 mg/l)
Fluoride as F	APHA 24th Edn. 2023:4500 F,D	0.39 mg/l
Nitrate as NO_3	IS 3025 Part 34:1988 (Chromotropic acid method)	14.3 mg/l
Copper as Cu	IS 3025 Part 65:2022	BDL (DL:0.01 mg/l)
Manganese as Mn	IS 3025 Part 65:2022	BDL (DL:0.02 mg/l)
Mercury as Hg	IS 3025 Part 65:2022	BDL (DL:0.0005 mg/l)
Cadmium as Cd	IS 3025 Part 65:2022	BDL (DL:0.001 mg/l)
Selenium as Se	IS 3025 Part 65:2022	BDL (DL:0.005 mg/l)

...Contd....2

NOTE: Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders will be liable for legal action. Unless otherwise stated the submitted results in this test report refer only to the sample(s) tested and such sample(s) are retained for 15 days only from the completion date of testing .. except in case of regulatory samples, which will be retained for a specific period as per statutory requirement, while perishable & environmental testing related remnant samples will be discarded consequent upon completion of testing. Samples are not drawn by us unless otherwise stated. This document cannot be reproduced except in full, without prior written approval of the laboratory. This report is for the exclusive use of Chennai Mettex Lab's customer, and is provided in accordance with the agreement between Chennai Mettex Lab and its Customer.

CHENNAI METTEX LAB PRIVATE LIMITED®

Jothi Complex, 83, M.K.N. Road, Guindy, Chennai - 600 032, Tamil Nadu, INDIA
Phone : +91 44 22323163, 22311034, 42179490, 42179491 I CIN : U74999TN2008PTC069459
Email : test@mettexlab.com I Web : www.mettexlab.com

TEST	PROTOCOL	RESULTS
Aluminium as Al	IS 3025 Part 65:2022	BDL (DL:0.005 mg/l)
Lead as Pb	IS 3025 Part 65:2022	BDL (DL:0.005 mg/l)
Zinc as Zn	IS 3025 Part 65:2022	BDL(DL : 0.05 mg/l)
Total Chromium as Cr	IS 3025 Part 65:2022	BDL(DL : 0.02 mg/l)
Boron as B	IS 3025 Part 65:2022	BDL(DL : 0.05 mg/l)
Mineral Oil	IS 3025 Part 39-2021	BDL(DL : 0.01 mg/l)
Phenolic compounds as C_6H_5OH	IS 3025 Part 43/Sec 1 - 2022	BDL (DL:0.0005 mg/l)
Anionic Detergents (as MBAS)	IS 3025 Part 68:2019	BDL (DL:0.01 mg/l)
Cyanide as CN	IS 3025 Part 27/Sec 1-2021 (Colorimetric method)	BDL (DL:0.01 mg/l)
BOD @ 27°C for 3 days	IS 3025 Part 44:2023	14.8 mg/l
Chemical Oxygen Demand	IS 3025 Part 58:2023	40.2 mg/l
Dissolved Oxygen	IS 3025 Part 38:1989 (Azide Modification)	5.9 mg/l
Barium as Ba	IS 3025 Part 65:2022	BDL (DL:0.05 mg/l)
Ammonia (as total ammonia-N)	IS 3025 Part 34-1988 (Nesslerization method)	BDL (DL:0.01 mg/l)
Sulphide as H_2S	IS 3025 Part 29-2022	BDL (DL:0.01 mg/l)
Molybdenum as Mo	IS 3025 Part 65:2022	BDL (DL:0.02 mg/l)
Total Arsenic as As	IS 3025 Part 65:2022	BDL (DL:0.005 mg/l)
Total Suspended Solids	IS 3025 Part 17 -2022	10.2 mg/l
Discipline: Biological	**Group:** Water	
Total Coliform	APHA 24th Edn. 2023-9221 B	1600 MPN/100ml
Escherichia coli	APHA 24th Edn. 2023-9221 F	210 MPN/100ml
Note : APHA – American Public Health Association, BDL – Below Detection Limit, DL – Detection Limit, MPN – Most Probable Number.		

End of Report

For Chennai Mettex Lab Private Limited

Reviewed & Authorised by
B. ARUNAN
Technical Manager
Authorised Signatory

Reviewed & Authorised by
V. SELVAKUMAR
Technical Manager
Authorised Signatory

NOTE: Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders will be liable for legal action. Unless otherwise stated the submitted results in this test report refer only to the sample(s) tested and such sample(s) are retained for 15 days only from the completion date of testing .. except in case of regulatory samples, which will be retained for a specific period as per statutory requirement, while perishable & environmental testing related remnant samples will be discarded consequent upon completion of testing. Samples are not drawn by us unless otherwise stated. This document cannot be reproduced except in full, without prior written approval of the laboratory. This report is for the exclusive use of Chennai Mettex Lab's customer, and is provided in accordance with the agreement between Chennai Mettex Lab and its Customer.

CHENNAI METTEX LAB PRIVATE LIMITED®

Jothi Complex, 83, M.K.N. Road, Guindy, Chennai - 600 032, Tamil Nadu, INDIA
Phone : +91 44 22323163, 22311034, 42179490, 42179491 I CIN : U74999TN2008PTC069459
Email : test@mettexlab.com I Web : www.mettexlab.com

TEST REPORT

ISSUED TO: M/s. Concretia Rock Products Pvt Ltd - Madurai

Site Address: M/s. Kachaikatty Rough Stone & Gravel Quarry 1174/2,3,4B,5B, 1192/1,2, 1193/6A & 6B, 1196/1A, 1196/3, 1196/4 & 1196/5A, Kachaikatty Village, Vadipatty Taluk & Madurai District, Tamil Nadu.

T.C Date : 27.05.2026

T.C No : CML/26-27/T019596

Date Of Receipt : 16.05.2026

Analysis Commenced On: 16.05.2026

Analysis Completed On : 27.05.2026

Cust. Ref : SRF Dated : 15.05.2026

Lab No : 2709103/003

Sample Description : **Open Well Water (OW-1)- Near Project Area**
(as stated by customer)

TEST	PROTOCOL	RESULTS
Discipline: Chemical	**Group:** Water	
Colour	IS 3025 Part 4:2021	1 Hazen
Odour	IS 3025 Part 5:2018	Agreeable
pH at 25°C	IS 3025 Part 11:2022 (electrometric method)	7.52
Conductivity @ 25°C	IS 3025 Part 14:2013	1140.0 µmhos/cm
Turbidity	IS 3025 Part 10:2023	1 NTU
Total Dissolved Solids	IS 3025 Part 16:2023	661.0mg/l
Total Hardness as $CaCO_3$	IS 3025 Part 21:2009 (EDTA titrimetric method)	192.0 mg/l
Calcium as Ca	IS 3025 Part 40:1991 (EDTA titrimetric method)	49.6 mg/l
Magnesium as Mg	IS 3025 Part 46:2023	16.5 mg/l
Total Alkalinity as $CaCO_3$	IS 3025 Part 23:2023	185.0 mg/l
Chloride as Cl	IS 3025 Part 32:1988 (Argentometric Method)	210.0 mg/l
Sulphate as SO_4	IS 3025 Part 24/Sec 1-2022	38.9 mg/l
Iron as Fe	IS 3025 Part 53:2003 (1,10 phenanthroline method)	0.38 mg/l
Residual Free Chlorine	IS 3025 Part 26:2021	BDL (DL:0.1 mg/l)
Fluoride as F	APHA 24th Edn. 2023:4500 F,D	0.34 mg/l
Nitrate as NO_3	IS 3025 Part 34:1988 (Chromotropic acid method)	2.1 mg/l
Copper as Cu	IS 3025 Part 65:2022	BDL (DL:0.01 mg/l)
Manganese as Mn	IS 3025 Part 65:2022	BDL (DL:0.02 mg/l)
Mercury as Hg	IS 3025 Part 65:2022	BDL (DL:0.0005 mg/l)
Cadmium as Cd	IS 3025 Part 65:2022	BDL (DL:0.001 mg/l)
Selenium as Se	IS 3025 Part 65:2022	BDL (DL:0.005 mg/l)

...Contd....2

NOTE: Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders will be liable for legal action. Unless otherwise stated the submitted results in this test report refer only to the sample(s) tested and such sample(s) are retained for 15 days only from the completion date of testing .. except in case of regulatory samples, which will be retained for a specific period as per statutory requirement; while perishable & environmental testing related remnant samples will be discarded consequent upon completion of testing. Samples are not drawn by us unless otherwise stated. This document cannot be reproduced except in full, without prior written approval of the laboratory. This report is for the exclusive use of Chennai Mettex Lab's customer and is provided in accordance with the agreement between Chennai Mettex Lab and its Customer.

CHENNAI METTEX LAB PRIVATE LIMITED®

Jothi Complex, 83, M.K.N. Road, Guindy, Chennai - 600 032, Tamil Nadu, INDIA
Phone : +91 44 22323163, 22311034, 42179490, 42179491 I CIN : U74999TN2008PTC069459
Email : test@mettexlab.com I Web : www.mettexlab.com

Lab No: 2709103/003 T.C No: CML/26-27/T019596 Dated : 27.05.2026

TEST	PROTOCOL	RESULTS
Aluminium as Al	IS 3025 Part 65:2022	BDL (DL:0.005 mg/l)
Lead as Pb	IS 3025 Part 65:2022	BDL (DL:0.005 mg/l)
Zinc as Zn	IS 3025 Part 65:2022	BDL(DL : 0.05 mg/l)
Total Chromium as Cr	IS 3025 Part 65:2022	BDL(DL : 0.02 mg/l)
Boron as B	IS 3025 Part 65:2022	BDL(DL : 0.05 mg/l)
Mineral Oil	IS 3025 Part 39-2021	BDL(DL : 0.01 mg/l)
Phenolic compounds as C_6H_5OH	IS 3025 Part 43/Sec 1 - 2022	BDL (DL:0.0005 mg/l)
Anionic Detergents (as MBAS)	IS 3025 Part 68:2019	BDL (DL:0.01 mg/l)
Cyanide as CN	IS 3025 Part 27/Sec 1-2021 (Colorimetric method)	BDL (DL:0.01 mg/l)
Barium as Ba	IS 3025 Part 65:2022	BDL(DL:0.05 mg/l)
Ammonia (as total ammonia-N)	IS 3025 Part 34-1988 (Nesslerization method)	BDL (DL:0.01 mg/l)
Sulphide as H_2S	IS 3025 Part 29-2022	BDL (DL:0.01 mg/l)
Molybdenum as Mo	IS 3025 Part 65:2022	BDL (DL:0.02 mg/l)
Total Arsenic as As	IS 3025 Part 65:2022	BDL (DL:0.005 mg/l)
Total Suspended Solids	IS 3025 Part 17 -2022	BDL (DL:1.0 mg/l)
Discipline: Biological	**Group:** Water	
Total Coliform	APHA 24th Edn. 2023-9221 B	150 MPN/100ml
Escherichia coli	APHA 24th Edn. 2023-9221 F	< 1.8 MPN/100ml
Note : APHA – American Public Health Association, BDL – Below Detection Limit, DL – Detection Limit, MPN – Most Probable Number,< 1.8 MPN/100ml can be taken as "No Microbial Growth".		

End of Report

For Chennai Mettex Lab Private Limited

Reviewed & Authorised by
B. ARUNAN
Technical Manager
Authorised Signatory

Reviewed & Authorised by
V. SELVAKUMAR
Technical Manager
Authorised Signatory

NOTE: Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders will be liable for legal action. Unless otherwise stated the submitted results in this test report refer only to the sample(s) tested and such sample(s) are retained for 15 days only from the completion date of testing .. except in case of regulatory samples, which will be retained for a specific period as per statutory requirement; while perishable & environmental testing related remnant samples will be discarded consequent upon completion of testing. Samples are not drawn by us unless otherwise stated. This document cannot be reproduced except in full, without prior written approval of the laboratory. This report is for the exclusive use of Chennai Mettex Lab's customer, and is provided in accordance with the agreement between Chennai Mettex Lab and its Customer.

CHENNAI METTEX LAB PRIVATE LIMITED®

Jothi Complex, 83, M.K.N. Road, Guindy, Chennai - 600 032, Tamil Nadu, INDIA
Phone : +91 44 22323163, 22311034, 42179490, 42179491 I CIN : U74999TN2008PTC069459
Email : test@mettexlab.com I Web : www.mettexlab.com

TEST REPORT

ISSUED TO: M/s. Concretia Rock Products Pvt Ltd - Madurai

Site Address: M/s. Kachaikatty Rough Stone & Gravel Quarry 1174/2,3,4B,5B, 1192/1,2, 1193/6A & 6B, 1196/1A, 1196/3, 1196/4 & 1196/5A, Kachaikatty Village, Vadipatty Taluk & Madurai District, Tamil Nadu.

T.C Date : 27.05.2026

T.C No : CML/26-27/T019597

Date Of Receipt : 16.05.2026

Analysis Commenced On: 16.05.2026

Analysis Completed On : 27.05.2026

Cust. Ref : SRF Dated : 15.05.2026

Lab No : 2709103/004

Sample Description : **Well Water (WW- 2) - Vittankulam**
(as stated by customer)

TEST	PROTOCOL	RESULTS
Discipline: Chemical	**Group:** Water	
Colour	IS 3025 Part 4:2021	1 Hazen
Odour	IS 3025 Part 5:2018	Agreeable
pH at 25°C	IS 3025 Part 11:2022 (electrometric method)	7.41
Conductivity @ 25°C	IS 3025 Part 14:2013	1023 µmhos/cm
Turbidity	IS 3025 Part 10:2023	1 NTU
Total Dissolved Solids	IS 3025 Part 16:2023	893.0 mg/l
Total Hardness as $CaCO_3$	IS 3025 Part 21:2009 (EDTA titrimetric method)	168.0 mg/l
Calcium as Ca	IS 3025 Part 40:1991 (EDTA titrimetric method)	44.8 mg/l
Magnesium as Mg	IS 3025 Part 46:2023	13.6 mg/l
Total Alkalinity as $CaCO_3$	IS 3025 Part 23:2023	156.0 mg/l
Chloride as Cl	IS 3025 Part 32:1988 (Argentometric Method)	192.0 mg/l
Sulphate as SO_4	IS 3025 Part 24/Sec 1-2022	35.6 mg/l
Iron as Fe	IS 3025 Part 53:2003 (1,10 phenanthroline method)	0.32 mg/l
Residual Free Chlorine	IS 3025 Part 26:2021	BDL (DL:0.1 mg/l)
Fluoride as F	APHA 24th Edn. 2023:4500 F,D	0.31 mg/l
Nitrate as NO_3	IS 3025 Part 34:1988 (Chromotropic acid method)	2.5 mg/l
Copper as Cu	IS 3025 Part 65:2022	BDL (DL:0.01 mg/l)
Manganese as Mn	IS 3025 Part 65:2022	BDL (DL:0.02 mg/l)
Mercury as Hg	IS 3025 Part 65:2022	BDL (DL:0.0005 mg/l)
Cadmium as Cd	IS 3025 Part 65:2022	BDL (DL:0.001 mg/l)
Selenium as Se	IS 3025 Part 65:2022	BDL (DL:0.005 mg/l)

...Contd...2

NOTE: Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders will be liable for legal action. Unless otherwise stated the submitted results in this test report refer only to the sample(s) tested and such sample(s) are retained for 15 days only from the completion date of testing .. except in case of regulatory samples, which will be retained for a specific period as per statutory requirement; while perishable & environmental testing related remnant samples will be discarded consequent upon completion of testing. Samples are not drawn by us unless otherwise stated. This document cannot be reproduced except in full, without prior written approval of the laboratory. This report is for the exclusive use of Chennai Mettex Lab's customer, and is provided in accordance with the agreement between Chennai Mettex Lab and its Customer.

CHENNAI METTEX LAB PRIVATE LIMITED®

Jothi Complex, 83, M.K.N. Road, Guindy, Chennai - 600 032, Tamil Nadu, INDIA
Phone : +91 44 22323163, 22311034, 42179490, 42179491 I CIN : U74999TN2008PTC069459
Email : test@mettexlab.com I Web : www.mettexlab.com

TEST	PROTOCOL	RESULTS
Aluminium as Al	IS 3025 Part 65:2022	BDL (DL:0.005 mg/l)
Lead as Pb	IS 3025 Part 65:2022	BDL (DL:0.005 mg/l)
Zinc as Zn	IS 3025 Part 65:2022	BDL(DL : 0.05 mg/l)
Total Chromium as Cr	IS 3025 Part 65:2022	BDL(DL : 0.02 mg/l)
Boron as B	IS 3025 Part 65:2022	BDL(DL : 0.05 mg/l)
Mineral Oil	IS 3025 Part 39-2021	BDL(DL : 0.01 mg/l)
Phenolic compounds as C_6H_5OH	IS 3025 Part 43/Sec 1 - 2022	BDL (DL:0.0005 mg/l)
Anionic Detergents (as MBAS)	IS 3025 Part 68:2019	BDL (DL:0.01 mg/l)
Cyanide as CN	IS 3025 Part 27/Sec 1-2021 (Colorimetric method)	BDL (DL:0.01 mg/l)
Barium as Ba	IS 3025 Part 65:2022	BDL(DL:0.05 mg/l)
Ammonia (as total ammonia-N)	IS 3025 Part 34-1988 (Nesslerization method)	BDL (DL:0.01 mg/l)
Sulphide as H_2S	IS 3025 Part 29-2022	BDL (DL:0.01 mg/l)
Molybdenum as Mo	IS 3025 Part 65:2022	BDL (DL:0.02 mg/l)
Total Arsenic as As	IS 3025 Part 65:2022	BDL (DL:0.005 mg/l)
Total Suspended Solids	IS 3025 Part 17 -2022	BDL (DL:1.0 mg/l)
Discipline: Biological	**Group:** Water	
Total Coliform	APHA 24th Edn. 2023-9221 B	150 MPN/100ml
Escherichia coli	APHA 24th Edn. 2023-9221 F	< 1.8 MPN/100ml
Note : APHA – American Public Health Association, BDL – Below Detection Limit, DL – Detection Limit, MPN – Most Probable Number,< 1.8 MPN/100ml can be taken as "No Microbial Growth".		

End of Report

For Chennai Mettex Lab Private Limited

Reviewed & Authorised by
B. ARUNAN
Technical Manager
Authorised Signatory

Reviewed & Authorised by
V. SELVAKUMAR
Technical Manager
Authorised Signatory

NOTE: Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders will be liable for legal action. Unless otherwise stated the submitted results in this test report refer only to the sample(s) tested and such sample(s) are retained for 15 days only from the completion date of testing., except in case of regulatory samples which will be retained for a specific period as per statutory requirement; while perishable & environmental testing related remnant samples will be discarded consequent upon completion of testing. Samples are not drawn by us unless otherwise stated. This document cannot be reproduced except in full, without prior written approval of the laboratory. This report is for the exclusive use of Chennai Mettex Lab's customer, and is provided in accordance with the agreement between Chennai Mettex Lab and its Customer.

CHENNAI METTEX LAB PRIVATE LIMITED®

Jothi Complex, 83, M.K.N. Road, Guindy, Chennai - 600 032, Tamil Nadu, INDIA
Phone : +91 44 22323163, 22311034, 42179490, 42179491 I CIN : U74999TN2008PTC069459
Email : test@mettexlab.com I Web : www.mettexlab.com

TEST REPORT

ISSUED TO: M/s. Concretia Rock Products Pvt Ltd - Madurai

Site Address: M/s. Kachaikatty Rough Stone & Gravel Quarry 1174/2,3,4B,5B, 1192/1,2, 1193/6A & 6B, 1196/1A, 1196/3, 1196/4 & 1196/5A, Kachaikatty Village, Vadipatty Taluk & Madurai District, Tamil Nadu.

T.C Date : 27.05.2026
T.C No : CML/26-27/T019598
Date Of Receipt : 16.05.2026
Analysis Commenced On: 16.05.2026
Analysis Completed On : 27.05.2026

Cust. Ref : SRF Dated : 15.05.2026
Lab No : 2709103/005
Sample Description : **Bore Water (BW- 1) – Near Project Area**
(as stated by customer)

TEST	PROTOCOL	RESULTS
Discipline: Chemical	**Group:** Water	
Colour	IS 3025 Part 4:2021	1 Hazen
Odour	IS 3025 Part 5:2018	Agreeable
pH at 25°C	IS 3025 Part 11:2022 (electrometric method)	7.65
Conductivity @ 25°C	IS 3025 Part 14:2013	892.0 µmhos/cm
Turbidity	IS 3025 Part 10:2023	1 NTU
Total Dissolved Solids	IS 3025 Part 16:2023	517.0mg/l
Total Hardness as $CaCO_3$	IS 3025 Part 21:2009 (EDTA titrimetric method)	156.0 mg/l
Calcium as Ca	IS 3025 Part 40:1991 (EDTA titrimetric method)	33.6 mg/l
Magnesium as Mg	IS 3025 Part 46:2023	17.5 mg/l
Total Alkalinity as $CaCO_3$	IS 3025 Part 23:2023	126.8mg/l
Chloride as Cl	IS 3025 Part 32:1988 (Argentometric Method)	169.5 mg/l
Sulphate as SO_4	IS 3025 Part 24/Sec 1-2022	29.8 mg/l
Iron as Fe	IS 3025 Part 53:2003 (1,10 phenanthroline method)	0.26 mg/l
Residual Free Chlorine	IS 3025 Part 26:2021	BDL (DL:0.1 mg/l)
Fluoride as F	APHA 24th Edn. 2023:4500 F,D	0.28 mg/l
Nitrate as NO_3	IS 3025 Part 34:1988 (Chromotropic acid method)	2.6 mg/l
Copper as Cu	IS 3025 Part 65:2022	BDL (DL:0.01 mg/l)
Manganese as Mn	IS 3025 Part 65:2022	BDL (DL:0.02 mg/l)
Mercury as Hg	IS 3025 Part 65:2022	BDL (DL:0.0005 mg/l)
Cadmium as Cd	IS 3025 Part 65:2022	BDL (DL:0.001 mg/l)
Selenium as Se	IS 3025 Part 65:2022	BDL (DL:0.005 mg/l)

...Contd....2

NOTE: Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders will be liable for legal action. Unless otherwise stated the submitted results in this test report refer only to the sample(s) tested and such sample(s) are retained for 15 days only from the completion date of testing., except in case of regulatory samples, which will be retained for a specific period as per statutory requirement; while perishable & environmental testing related remnant samples will be discarded consequent upon completion of testing. Samples are not drawn by us unless otherwise stated. This document cannot be reproduced except in full, without prior written approval of the laboratory. This report is for the exclusive use of Chennai Mettex Lab's customer, and is provided in accordance with the agreement between Chennai Mettex Lab and its Customer.

CHENNAI METTEX LAB PRIVATE LIMITED®

Jothi Complex, 83, M.K.N. Road, Guindy, Chennai - 600 032, Tamil Nadu, INDIA
Phone : +91 44 22323163, 22311034, 42179490, 42179491 I CIN : U74999TN2008PTC069459
Email : test@mettexlab.com I Web : www.mettexlab.com

Lab No: 2709103/005 T.C No: CML/26-27/T019598 Dated : 27.05.2026

TEST	PROTOCOL	RESULTS
Aluminium as Al	IS 3025 Part 65:2022	BDL (DL:0.005 mg/l)
Lead as Pb	IS 3025 Part 65:2022	BDL (DL:0.005 mg/l)
Zinc as Zn	IS 3025 Part 65:2022	BDL(DL : 0.05 mg/l)
Total Chromium as Cr	IS 3025 Part 65:2022	BDL(DL : 0.02 mg/l)
Boron as B	IS 3025 Part 65:2022	BDL(DL : 0.05 mg/l)
Mineral Oil	IS 3025 Part 39-2021	BDL(DL : 0.01 mg/l)
Phenolic compounds as C_6H_5OH	IS 3025 Part 43/Sec 1 - 2022	BDL (DL:0.0005 mg/l)
Anionic Detergents (as MBAS)	IS 3025 Part 68:2019	BDL (DL:0.01 mg/l)
Cyanide as CN	IS 3025 Part 27/Sec 1-2021 (Colorimetric method)	BDL (DL:0.01 mg/l)
Barium as Ba	IS 3025 Part 65:2022	BDL(DL:0.05 mg/l)
Ammonia (as total ammonia-N)	IS 3025 Part 34-1988 (Nesslerization method)	BDL (DL:0.01 mg/l)
Sulphide as H_2S	IS 3025 Part 29-2022	BDL (DL:0.01 mg/l)
Molybdenum as Mo	IS 3025 Part 65:2022	BDL (DL:0.02 mg/l)
Total Arsenic as As	IS 3025 Part 65:2022	BDL (DL:0.005 mg/l)
Total Suspended Solids	IS 3025 Part 17 -2022	BDL (DL:1.0 mg/l)
Discipline: Biological	**Group:** Water	
Total Coliform	APHA 24th Edn. 2023-9221 B	120 MPN/100ml
Escherichia coli	APHA 24th Edn. 2023-9221 F	< 1.8 MPN/100ml
Note : APHA – American Public Health Association, BDL – Below Detection Limit, DL – Detection Limit, MPN – Most Probable Number,< 1.8 MPN/100ml can be taken as "No Microbial Growth".		

End of Report

For Chennai Mettex Lab Private Limited

Reviewed & Authorised by
B. ARUNAN
Technical Manager
Authorised Signatory

Reviewed & Authorised by
V. SELVAKUMAR
Technical Manager
Authorised Signatory

NOTE: Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders will be liable for legal action. Unless otherwise stated the submitted results in this test report refer only to the sample(s) tested and such sample(s) are retained for 15 days only from the completion date of testing ., except in case of regulatory samples, which will be retained for a specific period as per statutory requirement; while perishable & environmental testing related remnant samples will be discarded consequent upon completion of testing. Samples are not drawn by us unless otherwise stated. This document cannot be reproduced except in full, without prior written approval of the laboratory. This report is for the exclusive use of Chennai Mettex Lab's customer, and is provided in accordance with the agreement between Chennai Mettex Lab and its Customer.

CHENNAI METTEX LAB PRIVATE LIMITED®

Jothi Complex, 83, M.K.N. Road, Guindy, Chennai - 600 032, Tamil Nadu, INDIA
Phone : +91 44 22323163, 22311034, 42179490, 42179491 I CIN : U74999TN2008PTC069459
Email : test@mettexlab.com I Web : www.mettexlab.com

TEST REPORT

ISSUED TO: M/s. Concretia Rock Products Pvt Ltd - Madurai

Site Address: M/s. Kachaikatty Rough Stone & Gravel Quarry 1174/2,3,4B,5B, 1192/1,2, 1193/6A & 6B, 1196/1A, 1196/3, 1196/4 & 1196/5A, Kachaikatty Village, Vadipatty Taluk & Madurai District, Tamil Nadu.

T.C Date : 27.05.2026

T.C No : CML/26-27/T019599

Date Of Receipt : 16.05.2026

Analysis Commenced On: 16.05.2026

Analysis Completed On : 27.05.2026

Cust. Ref : SRF Dated : 15.05.2026

Lab No : 2709103/006

Sample Description : **Bore Water (BW-2) – Ellaiyur**
(as stated by customer)

TEST	PROTOCOL	RESULTS
Discipline: Chemical	**Group:** Water	
Colour	IS 3025 Part 4:2021	1 Hazen
Odour	IS 3025 Part 5:2018	Agreeable
pH at 25°C	IS 3025 Part 11:2022 (electrometric method)	7.65
Conductivity @ 25°C	IS 3025 Part 14:2013	831.5 µmhos/cm
Turbidity	IS 3025 Part 10:2023	1 NTU
Total Dissolved Solids	IS 3025 Part 16:2023	482.0 mg/l
Total Hardness as $CaCO_3$	IS 3025 Part 21:2009 (EDTA titrimetric method)	136.0 mg/l
Calcium as Ca	IS 3025 Part 40:1991 (EDTA titrimetric method)	28.8 mg/l
Magnesium as Mg	IS 3025 Part 46:2023	15.5mg/l
Total Alkalinity as $CaCO_3$	IS 3025 Part 23:2023	118.4 mg/l
Chloride as Cl	IS 3025 Part 32:1988 (Argentometric Method)	153.6 mg/l
Sulphate as SO_4	IS 3025 Part 24/Sec 1-2022	28.8 mg/l
Iron as Fe	IS 3025 Part 53:2003 (1,10 phenanthroline method)	0.25 mg/l
Residual Free Chlorine	IS 3025 Part 26:2021	BDL (DL:0.1 mg/l)
Fluoride as F	APHA 24th Edn. 2023:4500 F,D	0.21 mg/l
Nitrate as NO_3	IS 3025 Part 34:1988 (Chromotropic acid method)	2.3 mg/l
Copper as Cu	IS 3025 Part 65:2022	BDL (DL:0.01 mg/l)
Manganese as Mn	IS 3025 Part 65:2022	BDL (DL:0.02 mg/l)
Mercury as Hg	IS 3025 Part 65:2022	BDL (DL:0.0005 mg/l)
Cadmium as Cd	IS 3025 Part 65:2022	BDL (DL:0.001 mg/l)
Selenium as Se	IS 3025 Part 65:2022	BDL (DL:0.005 mg/l)

...Contd....2

NOTE: Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders will be liable for legal action. Unless otherwise stated the submitted results in this test report refer only to the sample(s) tested and such sample(s) are retained for 15 days only from the completion date of testing ., except in case of regulatory samples, which will be retained for a specific period as per statutory requirement; while perishable & environmental testing related remnant samples will be discarded consequent upon completion of testing. Samples are not drawn by us unless otherwise stated. This document cannot be reproduced except in full, without prior written approval of the laboratory. This report is for the exclusive use of Chennai Mettex Lab's customer, and is provided in accordance with the agreement between Chennai Mettex Lab and its Customer.

CHENNAI METTEX LAB PRIVATE LIMITED®

Jothi Complex, 83, M.K.N. Road, Guindy, Chennai - 600 032, Tamil Nadu, INDIA
Phone : +91 44 22323163, 22311034, 42179490, 42179491 I CIN : U74999TN2008PTC069459
Email : test@mettexlab.com I Web : www.mettexlab.com

TEST	PROTOCOL	RESULTS
Aluminium as Al	IS 3025 Part 65:2022	BDL (DL:0.005 mg/l)
Lead as Pb	IS 3025 Part 65:2022	BDL (DL:0.005 mg/l)
Zinc as Zn	IS 3025 Part 65:2022	BDL(DL : 0.05 mg/l)
Total Chromium as Cr	IS 3025 Part 65:2022	BDL(DL : 0.02 mg/l)
Boron as B	IS 3025 Part 65:2022	BDL(DL : 0.05 mg/l)
Mineral Oil	IS 3025 Part 39-2021	BDL(DL : 0.01 mg/l)
Phenolic compounds as C_6H_5OH	IS 3025 Part 43/Sec 1 - 2022	BDL (DL:0.0005 mg/l)
Anionic Detergents (as MBAS)	IS 3025 Part 68:2019	BDL (DL:0.01 mg/l)
Cyanide as CN	IS 3025 Part 27/Sec 1-2021 (Colorimetric method)	BDL (DL:0.01 mg/l)
Barium as Ba	IS 3025 Part 65:2022	BDL(DL:0.05 mg/l)
Ammonia (as total ammonia-N)	IS 3025 Part 34-1988 (Nesslerization method)	BDL (DL:0.01 mg/l)
Sulphide as H_2S	IS 3025 Part 29-2022	BDL (DL:0.01 mg/l)
Molybdenum as Mo	IS 3025 Part 65:2022	BDL (DL:0.02 mg/l)
Total Arsenic as As	IS 3025 Part 65:2022	BDL (DL:0.005 mg/l)
Total Suspended Solids	IS 3025 Part 17 -2022	BDL (DL:1.0 mg/l)
Discipline: Biological	**Group:** Water	
Total Coliform	APHA 24th Edn. 2023-9221 B	140 MPN/100ml
Escherichia coli	APHA 24th Edn. 2023-9221 F	< 1.8 MPN/100ml
Note : APHA – American Public Health Association, BDL – Below Detection Limit, DL – Detection Limit, MPN – Most Probable Number,< 1.8 MPN/100ml can be taken as "No Microbial Growth".		

End of Report

For Chennai Mettex Lab Private Limited

Reviewed & Authorised by
B. ARUNAN
Technical Manager
Authorised Signatory

Reviewed & Authorised by
V. SELVAKUMAR
Technical Manager
Authorised Signatory

NOTE: Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders will be liable for legal action. Unless otherwise stated the submitted results in this test report refer only to the sample(s) tested and such sample(s) are retained for 15 days only from the completion date of testing., except in case of regulatory samples, which will be retained for a specific period as per statutory requirement; while perishable & environmental testing related remnant samples will be discarded consequent upon completion of testing. Samples are not drawn by us unless otherwise stated. This document cannot be reproduced except in full, without prior written approval of the laboratory. This report is for the exclusive use of Chennai Mettex Lab's customer, and is provided in accordance with the agreement between Chennai Mettex Lab and its Customer.

CHENNAI METTEX LAB PRIVATE LIMITED®

Jothi Complex, 83, M.K.N. Road, Guindy, Chennai - 600 032, Tamil Nadu, INDIA
Phone : +91 44 22323163, 22311034, 42179490, 42179491 I CIN : U74999TN2008PTC069459
Email : test@mettexlab.com I Web : www.mettexlab.com

TEST REPORT

ISSUED TO: M/s. Concretia Rock Products Pvt Ltd - Madurai

Site Address: M/s. Kachaikatty Rough Stone & Gravel Quarry 1174/2,3,4B,5B, 1192/1,2, 1193/6A & 6B, 1196/1A, 1196/3, 1196/4 & 1196/5A, Kachaikatty Village, Vadipatty Taluk & Madurai District, Tamil Nadu.

T.C Date : 27.05.2026
T.C No : CML/26-27/T019600
Date Of Receipt : 16.05.2026
Analysis Commenced On: 16.05.2026
Analysis Completed On : 27.05.2026

Cust. Ref : SRF Dated : 15.05.2026
Lab No : 2709104/001
Sample Description : **Soil – 1 – Core Zone - Project Area**
(as stated by customer)

S. No	Test Parameters	Protocols	Results
01	pH @ 25°C	IS 2720 Part 26 - 1987 (Reaff:2016)	4.56
02	Conductivity @ 25°C	IS 14767 - 2000 (Reaff : 2016)	278 µmhos/cm
03	**Texture :**		
	Clay	Gravimetric Method	29.5 %
	Sand		37.9 %
	Silt		32.6 %
04	Water Holding Capacity	By Gravimetric Method	35.3 %
05	Bulk Density	By Cylindrical Method	1.02 g/cm^3
06	Porosity	By Gravimetric Method	32.8 %
07	Calcium as Ca	USEPA 3050 B – 1996 & USEPA 6010 C - 2000	61.5 mg/kg
08	Magnesium as Mg		31.3 mg/kg
09	Manganese as Mn		34.6 mg/kg
10	Zinc as Zn		3.02 mg/kg
11	Boron as B		2.19 mg/kg
12	Chloride as Cl	APHA 23rd Edn 2019 4500 Cl B	68.7 mg/kg
13	Total Soluble Sulphate as SO_4	IS 2720 Part 27 : 1977 (Reaff:2015)	0.023 %
14	Potassium as K	USEPA 3050 B – 1996 & USEPA 6010 C - 2000	29.8 mg/kg
15	Total Phosphorus as P	IS 10158 : 1982 (Stannous chloride method)	5.79 mg/kg
16	Total Nitrogen as N	IS 14684 : 1999	334.5 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		1.96 mg/kg
21	Iron as Fe		3.34 mg/kg
22	Organic Matter	IS : 2720 Part 22: 1972	1.94 %
23	Organic Carbon	Methods of analysis of soils, plants, waters and fertilizers by HLS Tandon	1.24 %
24	Cation Exchange Capacity	USEPA 9080 – 1986	26.6 meq/100g of soil

End of Report

For Chennai Mettex Lab Private Limited

Reviewed & Authorised by
V. SELVAKUMAR
Technical Manager
Authorised Signatory

NOTE: Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be liable for legal action. Unless otherwise stated the submitted results in this test report refer only to the sample(s) tested and such sample(s) are retained for a specific period from completion date of testing ... except in case of regulatory samples, which will be retained for a specific period as per statutory requirement; while perishable samples will be disposed off immediately. Testing related remnant samples will be discarded consequent upon completion of testing. Samples are not drawn by us unless otherwise stated. This document cannot be reproduced except in full, without prior written approval of the laboratory. This report is for the exclusive use of Chennai Mettex Lab's customer, and is provided in accordance with the agreement between Chennai Mettex Lab and its Customer.

CHENNAI METTEX LAB PRIVATE LIMITED®

Jothi Complex, 83, M.K.N. Road, Guindy, Chennai - 600 032, Tamil Nadu, INDIA
Phone : +91 44 22323163, 22311034, 42179490, 42179491 I CIN : U74999TN2008PTC069459
Email : test@mettexlab.com I Web : www.mettexlab.com

TEST REPORT

ISSUED TO: M/s. Concretia Rock Products Pvt Ltd - Madurai

Site Address: M/s. Kachaikatty Rough Stone & Gravel Quarry 1174/2,3,4B,5B, 1192/1,2, 1193/6A & 6B, 1196/1A, 1196/3, 1196/4 & 1196/5A, Kachaikatty Village, Vadipatty Taluk & Madurai District, Tamil Nadu.

T.C Date : 27.05.2026
T.C No : CML/26-27/T019601
Date Of Receipt : 16.05.2026
Analysis Commenced On: 16.05.2026
Analysis Completed On : 27.05.2026

Cust. Ref : SRF Dated : 15.05.2026
Lab No : 2709104/002
Sample Description : **Soil – 2 – Project Area**
(as stated by customer)

S. No	Test Parameters	Protocols	Results
01	pH @ 25°C	IS 2720 Part 26 - 1987 (Reaff:2016)	6.69
02	Conductivity @ 25°C	IS 14767 - 2000 (Reaff : 2016)	251.0 µmhos/cm
03	**Texture :**		
	Clay	Gravimetric Method	29.2 %
	Sand		37.6 %
	Silt		33.2 %
04	Water Holding Capacity	By Gravimetric Method	41.3 %
05	Bulk Density	By Cylindrical Method	1.15 g/cm^3
06	Porosity	By Gravimetric Method	29.3 %
07	Calcium as Ca	USEPA 3050 B – 1996 & USEPA 6010 C - 2000	5.5 mg/kg
08	Magnesium as Mg		21..4 mg/kg
09	Manganese as Mn		29.6 mg/kg
10	Zinc as Zn		3.47 mg/kg
11	Boron as B		1.18 mg/kg
12	Chloride as Cl	APHA 23rd Edn 2019 4500 Cl B	71.5 mg/kg
13	Total Soluble Sulphate as SO_4	IS 2720 Part 27 : 1977 (Reaff:2015)	0.022 %
14	Potassium as K	USEPA 3050 B – 1996 & USEPA 6010 C - 2000	29.1 mg/kg
15	Total Phosphorus as P	IS 10158 : 1982 (Stannous chloride method)	4.31mg/kg
16	Total Nitrogen as N	IS 14684 : 1999	296.0 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		1.62 mg/kg
21	Iron as Fe		3.34 mg/kg
22	Organic Matter	IS : 2720 Part 22: 1972	2.27 %
23	Organic Carbon	Methods of analysis of soils, plants, waters and fertilizers by HLS Tandon	1.32%
24	Cation Exchange Capacity	USEPA 9080 – 1986	26.8 meq/100g of soil

End of Report

For Chennai Mettex Lab Private Limited

Reviewed & Authorised by
V. SELVAKUMAR
Technical Manager
Authorised Signatory

NOTE: Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders will be liable for legal action. Unless otherwise stated the submitted results in this test report refer only to the sample(s) tested and such sample(s) are retained for 7 days from the completion date of testing., except in case of regulatory samples, which will be retained for a specific period as per statutory requirement; while perishable & environmental testing related remnant samples will be discarded consequent upon completion of testing. Samples are not drawn by us unless otherwise stated. This document cannot be reproduced except in full, without prior written approval of the laboratory. This report is for the exclusive use of Chennai Mettex Lab's customer, and is provided in accordance with the agreement between Chennai Mettex Lab and its Customer.

CHENNAI METTEX LAB PRIVATE LIMITED®

Jothi Complex, 83, M.K.N. Road, Guindy, Chennai - 600 032, Tamil Nadu, INDIA
Phone : +91 44 22323163, 22311034, 42179490, 42179491 I CIN : U74999TN2008PTC069459
Email : test@mettexlab.com I Web : www.mettexlab.com

TEST REPORT

ISSUED TO: M/s. Concretia Rock Products Pvt Ltd - Madurai

Site Address: M/s. Kachaikatty Rough Stone & Gravel Quarry 1174/2,3,4B,5B, 1192/1,2, 1193/6A & 6B, 1196/1A, 1196/3, 1196/4 & 1196/5A, Kachaikatty Village, Vadipatty Taluk & Madurai District, Tamil Nadu.

T.C Date : 27.05.2026
T.C No : CML/26-27/T019602
Date Of Receipt : 16.05.2026
Analysis Commenced On: 16.05.2026
Analysis Completed On : 27.05.2026

Cust. Ref : SRF Dated : 15.05.2026
Lab No : 2709104/003

Sample Description : **Soil – 3 – Katchaikatti (Agriculture Land)**
(as stated by customer)

S. No	Test Parameters	Protocols	Results
01	pH @ 25°C	IS 2720 Part 26 - 1987 (Reaff:2016)	6.96
02	Conductivity @ 25°C	IS 14767 - 2000 (Reaff : 2016)	326.4 µmhos/cm
03	**Texture :**		
	Clay	Gravimetric Method	28.8 %
	Sand		37.6 %
	Silt		33.6 %
04	Water Holding Capacity	By Gravimetric Method	37.3%
05	Bulk Density	By Cylindrical Method	0.95 g/cm^3
06	Porosity	By Gravimetric Method	36.9 %
07	Calcium as Ca	USEPA 3050 B – 1996 & USEPA 6010 C - 2000	66.5 mg/kg
08	Magnesium as Mg		27.4 mg/kg
09	Manganese as Mn		33.5 mg/kg
10	Zinc as Zn		4.81 mg/kg
11	Boron as B		1.91 mg/kg
12	Chloride as Cl	APHA 23rd Edn 2019 4500 Cl B	66.5 mg/kg
13	Total Soluble Sulphate as SO_4	IS 2720 Part 27 : 1977 (Reaff:2015)	0.032%
14	Potassium as K	USEPA 3050 B – 1996 & USEPA 6010 C - 2000	23.8 mg/kg
15	Total Phosphorus as P	IS 10158 : 1982 (Stannous chloride method)	3.18 mg/kg
16	Total Nitrogen as N	IS 14684 : 1999	296.8 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		1.11 mg/kg
21	Iron as Fe		2.98 mg/kg
22	Organic Matter	IS : 2720 Part 22: 1972	268 %
23	Organic Carbon	Methods of analysis of soils, plants, waters and fertilizers by HLS Tandon	1.56 %
24	Cation Exchange Capacity	USEPA 9080 – 1986	23.6 meq/100g of soil

End of Report

For Chennai Mettex Lab Private Limited

Reviewed & Authorised by
V. SELVAKUMAR
Technical Manager
Authorised Signatory

NOTE: Any unauthorised alteration, forgery or falsification of the content or appearance of this document is punishable and will be liable for legal action. Unless otherwise stated the submitted results in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days from the completion date of testing., except in case of regulatory samples, which will be retained for a specific period as per statutory requirement; while perishable samples and testing related remnant samples will be discarded consequent upon completion of testing. Samples are not drawn by us unless otherwise stated. This document cannot be reproduced except in full, without prior written approval of the laboratory. This report is for the exclusive use of Chennai Mettex Lab's customer, and is provided in accordance with the agreement between Chennai Mettex Lab and its Customer.

CHENNAI METTEX LAB PRIVATE LIMITED®

Jothi Complex, 83, M.K.N. Road, Guindy, Chennai - 600 032, Tamil Nadu, INDIA
Phone : +91 44 22323163, 22311034, 42179490, 42179491 I CIN : U74999TN2008PTC069459
Email : test@mettexlab.com I Web : www.mettexlab.com

TEST REPORT

ISSUED TO: M/s. Concretia Rock Products Pvt Ltd - Madurai

Site Address: M/s. Kachaikatty Rough Stone & Gravel Quarry 1174/2,3,4B,5B, 1192/1,2, 1193/6A & 6B, 1196/1A, 1196/3, 1196/4 & 1196/5A, Kachaikatty Village, Vadipatty Taluk & Madurai District, Tamil Nadu.

T.C Date : 27.05.2026
T.C No : CML/26-27/T019603
Date Of Receipt : 16.05.2026
Analysis Commenced On: 16.05.2026
Analysis Completed On : 27.05.2026

Cust. Ref : SRF Dated : 15.05.2026
Lab No : 2709104/004
Sample Description : **Soil – 4 Kattankulam (Agriculture Land)**
(as stated by customer)

S. No	Test Parameters	Protocols	Results
01	pH @ 25°C	IS 2720 Part 26 - 1987 (Reaff:2016)	6.12
02	Conductivity @ 25°C	IS 14767 - 2000 (Reaff : 2016)	269.5 µmhos/cm
03	**Texture :**		
	Clay	Gravimetric Method	29.4 %
	Sand		33.8 %
	Silt		36.8 %
04	Water Holding Capacity	By Gravimetric Method	36.8 %
05	Bulk Density	By Cylindrical Method	1.02 g/cm^3
06	Porosity	By Gravimetric Method	32.3 %
07	Calcium as Ca	USEPA 3050 B – 1996 & USEPA 6010 C - 2000	55.5 mg/kg
08	Magnesium as Mg		22.6 mg/kg
09	Manganese as Mn		26.7 mg/kg
10	Zinc as Zn		6.98 mg/kg
11	Boron as B		1.82 mg/kg
12	Chloride as Cl	APHA 23rd Edn 2019 4500 Cl B	66.1 mg/kg
13	Total Soluble Sulphate as SO_4	IS 2720 Part 27 : 1977 (Reaff:2015)	0.019 %
14	Potassium as K	USEPA 3050 B – 1996 & USEPA 6010 C - 2000	22.3 mg/kg
15	Total Phosphorus as P	IS 10158 : 1982 (Stannous chloride method)	2.58 mg/kg
16	Total Nitrogen as N	IS 14684 : 1999	326.8 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		1.23 mg/kg
21	Iron as Fe		2.01 mg/kg
22	Organic Matter	IS : 2720 Part 22: 1972	2.26 %
23	Organic Carbon	Methods of analysis of soils, plants, waters and fertilizers by HLS Tandon	1.31 %
24	Cation Exchange Capacity	USEPA 9080 – 1986	23.9 meq/100g of soil

End of Report

For Chennai Mettex Lab Private Limited

Reviewed & Authorised by
V. SELVAKUMAR
Technical Manager
Authorised Signatory

NOTE: Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be liable for legal action. Unless otherwise stated the submitted results in this test report refer only to the sample(s) tested and such sample(s) are retained for 15 days only from the completion date of testing., except in case of regulatory samples, which will be retained for a specific period as per statutory requirement; while perishable & environmental testing related remanant samples will be discarded consequent upon completion of testing. Samples are not drawn by us unless otherwise stated. This document cannot be reproduced except in full, without prior written approval of the laboratory. This report is for the exclusive use of Chennai Mettex Lab's customer, and is provided in accordance with the agreement between Chennai Mettex Lab and its Customer.

CHENNAI METTEX LAB PRIVATE LIMITED®

Jothi Complex, 83, M.K.N. Road, Guindy, Chennai - 600 032, Tamil Nadu, INDIA
Phone : +91 44 22323163, 22311034, 42179490, 42179491 I CIN : U74999TN2008PTC069459
Email : test@mettexlab.com I Web : www.mettexlab.com

TEST REPORT

ISSUED TO: M/s. Concretia Rock Products Pvt Ltd - Madurai

Site Address: M/s. Kachaikatty Rough Stone & Gravel Quarry 1174/2,3,4B,5B, 1192/1,2, 1193/6A & 6B, 1196/1A, 1196/3, 1196/4 & 1196/5A, Kachaikatty Village, Vadipatty Taluk & Madurai District, Tamil Nadu.

T.C Date : 27.05.2026
T.C No : CML/26-27/T019604
Date Of Receipt : 16.05.2026
Analysis Commenced On: 16.05.2026
Analysis Completed On : 27.05.2026

Cust. Ref : SRF Dated : 15.05.2026
Lab No : 2709104/005
Sample Description : Soil – 5 – Ellaiyur (Barren Land)
(as stated by customer)

S. No	Test Parameters	Protocols	Results
01	pH @ 25°C	IS 2720 Part 26 - 1987 (Reaff:2016)	5.31
02	Conductivity @ 25°C	IS 14767 - 2000 (Reaff : 2016)	321.1 µmhos/cm
03	**Texture :**		
	Clay	Gravimetric Method	28.0 %
	Sand		41.2 %
	Silt		30.8%
04	Water Holding Capacity	By Gravimetric Method	36.2 %
05	Bulk Density	By Cylindrical Method	1.02 g/cm^3
06	Porosity	By Gravimetric Method	33.2 %
07	Calcium as Ca	USEPA 3050 B – 1996 & USEPA 6010 C - 2000	56.9 mg/kg
08	Magnesium as Mg		32.6 mg/kg
09	Manganese as Mn		22.8 mg/kg
10	Zinc as Zn		2.19 mg/kg
11	Boron as B		2.20 mg/kg
12	Chloride as Cl	APHA 23rd Edn 2019 4500 Cl B	58.6 mg/kg
13	Total Soluble Sulphate as SO_4	IS 2720 Part 27 : 1977 (Reaff:2015)	0.019 %
14	Potassium as K	USEPA 3050 B – 1996 & USEPA 6010 C - 2000	27.7 mg/kg
15	Total Phosphorus as P	IS 10158 : 1982 (Stannous chloride method)	4.18 mg/kg
16	Total Nitrogen as N	IS 14684 : 1999	253.5 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		2.02 mg/kg
21	Iron as Fe		3.0 mg/kg
22	Organic Matter	IS : 2720 Part 22: 1972	2.15 %
23	Organic Carbon	Methods of analysis of soils, plants, waters and fertilizers by HLS Tandon	1.25 %
24	Cation Exchange Capacity	USEPA 9080 – 1986	28.1 meq/100g of soil

End of Report

For Chennai Mettex Lab Private Limited

Reviewed & Authorised by
V. SELVAKUMAR
Technical Manager
Authorised Signatory

NOTE: Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders will be liable for legal action. Unless otherwise stated the submitted results in this test report refer only to the sample(s) tested and such sample(s) are retained for ... days from the completion date of testing ... except in case of regulatory samples, which will be retained for a specific period as per statutory requirement, while perishable samples ... testing related remnant samples will be discarded consequent upon completion of testing. Samples are not drawn by us unless otherwise stated. This document cannot be reproduced except in full, without prior written approval of the laboratory. This report is for the exclusive use of Chennai Mettex Lab's customer, and is provided in accordance with the agreement between Chennai Mettex Lab and its Customer.

CHENNAI METTEX LAB PRIVATE LIMITED®

Jothi Complex, 83, M.K.N. Road, Guindy, Chennai - 600 032, Tamil Nadu, INDIA
Phone : +91 44 22323163, 22311034, 42179490, 42179491 I CIN : U74999TN2008PTC069459
Email : test@mettexlab.com I Web : www.mettexlab.com

TEST REPORT

ISSUED TO: M/s. Concretia Rock Products Pvt Ltd - Madurai

Site Address: M/s. Kachaikatty Rough Stone & Gravel Quarry 1174/2,3,4B,5B, 1192/1,2, 1193/6A & 6B, 1196/1A, 1196/3, 1196/4 & 1196/5A, Kachaikatty Village, Vadipatty Taluk & Madurai District, Tamil Nadu.

T.C Date : 27.05.2026
T.C No : CML/26-27/T019605
Date Of Receipt : 16.05.2026
Analysis Commenced On: 16.05.2026
Analysis Completed On : 27.05.2026

Cust. Ref : SRF Dated : 15.05.2026
Lab No : 2709104/006
Sample Description : Soil – 6 - Vittankulam (Agriculture Land)
(as stated by customer)

S. No	Test Parameters	Protocols	Results
01	pH @ 25°C	IS 2720 Part 26 - 1987 (Reaff:2016)	5.22
02	Conductivity @ 25°C	IS 14767 - 2000 (Reaff : 2016)	302.5 µmhos/cm
03	**Texture :**		
	Clay	Gravimetric Method	27.7 %
	Sand		30.6 %
	Silt		41.7 %
04	Water Holding Capacity	By Gravimetric Method	27.9 %
05	Bulk Density	By Cylindrical Method	1.08 g/cm^3
06	Porosity	By Gravimetric Method	27.8 %
07	Calcium as Ca	USEPA 3050 B – 1996 & USEPA 6010 C - 2000	59.6 mg/kg
08	Magnesium as Mg		29.8 mg/kg
09	Manganese as Mn		22.3 mg/kg
10	Zinc as Zn		3.15 mg/kg
11	Boron as B		1.01 mg/kg
12	Chloride as Cl	APHA 23rd Edn 2019 4500 Cl B	60.5 mg/kg
13	Total Soluble Sulphate as SO_4	IS 2720 Part 27 : 1977 (Reaff:2015)	0.017 %
14	Potassium as K	USEPA 3050 B – 1996 & USEPA 6010 C - 2000	25.6 mg/kg
15	Total Phosphorus as P	IS 10158 : 1982 (Stannous chloride method)	3.12 mg/kg
16	Total Nitrogen as N	IS 14684 : 1999	284.5 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		1.31 mg/kg
21	Iron as Fe		2.13 mg/kg
22	Organic Matter	IS : 2720 Part 22: 1972	2.4 %
23	Organic Carbon	Methods of analysis of soils, plants, waters and fertilizers by HLS Tandon	1.4 %
24	Cation Exchange Capacity	USEPA 9080 – 1986	27.1 meq/100g of soil

End of Report

For Chennai Mettex Lab Private Limited

V. SELVAKUMAR
Technical Manager
Authorised Signatory

Reviewed & Authorised by

NOTE: Any unauthorized alteration, forgery or falsification of the content or appearance of this document is subject to which will be liable for legal action. Unless otherwise stated the submitted results in this test report refer only to the sample(s) tested and such sample(s) are retained for days from the completion date of testing ... except in case of regulatory samples, which will be retained for a specific period as per statutory requirement; while perishable in nature testing related remnant samples will be discarded consequent upon completion of testing. Samples are not drawn by us unless otherwise stated. This document cannot be reproduced except in full, without prior written approval of the laboratory. This report is for the exclusive use of Chennai Mettex Lab's customer, and is provided in accordance with the agreement between Chennai Mettex Lab and its Customer.

भारतीय गुणवत्ता परिषद्
QUALITY COUNCIL® OF INDIA
QCI Creating an Ecosystem for Quality

NABET

National Accreditation Board for Education and Training

Certificate of Accreditation

Geo Exploration and Mining Solutions, Salem

No. 17, Advaitha Ashram Road, Fairlands, Salem, Tamil Nadu – 636 004

*Geo Exploration and Mining Solutions, Salem is Re-Accredited (RA3) **as Category-A organization** under the QCI-NABET Scheme for Accreditation of EIA Consultant Organizations (Version 3), for the preparation of EIA/EMP reports in the sectors listed below, as per the specified categories*

S. No	Sector Description	Sector (as per)		Cat.
		NABET	MoEFCC	
1.	Mining of minerals including opencast / underground mining	1	1 (a) (i)	A
2.	Mineral beneficiation	7	2 (b)	A
3.	Industrial estates/ parks/ complexes/areas, export processing Zones (EPZs), Special Economic Zones (SEZs), Biotech Parks, Leather Complexes	31	7 (c)	A
4.	Building and construction projects	38	8 (a)	B

Note: Names of approved experts and sectors are mentioned in RAAC minutes dated August 21, 2025, 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/25/3827 dated August 25, 2025. The accreditation needs to be renewed before the expiry date by Geo Exploration and Mining Solutions, Salem following due process of assessment.

Valid up to
August 06, 2028

Issue Date
August 25, 2025

Certificate No.
NABET/EIA/25-28/RA 0424

Varinder Kanwar
Prof (Dr) Varinder S Kanwar
(CEO – NABET)

For the updated List of Accredited EIA Consultant Organizations with approved Sectors please refer to QCI-NABET website.