

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT & ENVIRONMENT MANAGEMENT PLAN

FOR OBTAINING

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

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

PATTA LAND - FRESH QUARRY

CLUSTER EXTENT – 13.84.11 Ha

THIRU. R.P. RAHUL ROUGH STONE AND GRAVEL QUARRY

Extent – 4.99.39 Ha

Lease Period/Mining Plan Period – 5 Years



Project Proponent

Thiru. R.P.Rahul

S/o.Rajendran,

13-85, Pathittavilai, Chitharal Village, Vilavancode Taluk,

Kanniyakumari District - 629151

PROJECT LOCATION	PROPOSED PRODUCTION
S.F. No 719/1(P), 720/1(P), 720/2,3,4,5,6,7,8,9,10,11,12,13(P),14(P) Extent: 4.99.39 Ha Vadaku Ariyanayagipuram – II Village, Cheranmahadevi Taluk, Tirunelveli District.	As per ToR For Five Year Production: 10,67,645 m ³ of Rough stone, 83,680 m ³ of Gravel Peak Production = 2,73,005 m ³ of Rough Stone Proposed Depth = 47m bgl
ToR obtained vide ToR Identification No – TO23B0108TN5277464N Dated-13.03.2024	
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/2225/RA 0276 Phone: 0427-2431989, Email: infogeoexploration@gmail.com Web: www.gemssalem.com 	Laboratory GLOBAL LAB AND CONSULTANCY SERVICES Approved by ISO:9001:2015, NABL, FSSAI, Experts in QHSE S.F No:92/3A2, Geetha Nagar, Alagapuram Pudur, Salem-636016.
<u>Baseline Monitoring Period</u> March – May 2024	
JUNE 2024	

UNDERTAKING

I Thiru.R.P.Rahul – Proprietor of Thiru.R.P.Rahul Rough Stone and Gravel Quarry given undertaking that this EIA & EMP report prepared for our Rough stone quarry situated in S.F.No 719/1(P), 720/1(P), 720/2,3,4,5,6,7,8,9,10,11,12,13(P),14(P), over an extent of 4.99.39 Ha in Vadakku Ariyanagipuram - II Village, Cheranmahadevi Taluk and Tirunelveli District based on the ToR issued by the State Level Environmental Impact Assessment Authority (SEIAA), Tamil Nadu vide Letter No TO23B0108TN5277464N Dated-13.03.2024 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



R.P.Rahul

Place : Tirunelveli

Dated :

DECLARATION

I Dr. M. Ifthikhar Ahmed – EIA Co Ordinator declare that the EIA & EMP report for the Thiru R.P. Rahul Rough stone & Gravel quarry in S.F. No 719/1(P), 720/1(P), 720/2,3,4,5,6,7,8,9,10,11,12, 13(P), 14(P), over an extent of 4.99.39 Ha in Vadakku Ariyanayagipuram Village, Cheranmahadevi Taluk and Tirunelveli District has been prepared by Geo Exploration and Mining Solutions, Salem, Tamil Nadu.

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

Signature of the EIA Co Ordinator



Dr. M. Ifthikhar Ahmed

Managing Partner

M/s. Geo Exploration and Mining Solutions

Place : Salem

Dated :

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

PROPOSED QUARRY					
CODE	Name of the Owner	Mineral	S.F. Nos	Extent in Ha	Status
P1	Thiru.R.P.Rahul	Rough Stone	719/1(P), 720/1(P), 720/2,3,4,5, ,6,7,8,9,10, 11,12, 13(P), 14(P),	4.99.39	ToR Identification No – TO23B0108TN5277464N Dated-13.03.2024
TOTAL EXTENT				4.99.39	
EXISTING QUARRIES					
CODE	Name of the Owner	Mineral	S.F. Nos	Extent in Ha	Status
E-1	Thiru.T.Satheesan	Rough Stone	708/3A(P), 709(P)	4.95.0	08.02.2023-07.02.2028
E-2	Thiru.M.Sivaprasath	Rough Stone	723(P) & 724/3(P)	3.89.72	26.02.2021 – 25.02.2026
TOTAL EXTENT				8.84.72	
ABANDONED QUARRIES					
Nil					
TOTAL CLUSTER EXTENT				13.84.11	

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

TERMS OF REFERENCE (ToR) COMPLIANCE

TOR Identification No. TO23B0108TN5277464N Dated-13.03.2024

Specific Terms of Reference for (Mining of Minerals)		
1. Mining		
1.1	1. The PP shall furnish the letter received from DFO concerned stating the proximity details of Reserve Forests, Protected Areas, Sanctuaries, Tiger reserve etc., upto a radius of 25 km from the proposed site.	Kolundhumalai R.F – 10.95 Km – South Kalakad Mundanthurai Tiger Reserve – 16 Km - South It will submit DFO letter to SEIAA Presentation
	2. If Kalakad Mundanthurai Tiger Reserve is located within a distance of 10.0km, the PP shall obtain and submit NBWL Clearance, as per the MoEF &CC Office Memorandum no. FC-11/119/2020-FC dated 17th May, 2022.	Kalakad Mundanthurai Tiger Reserve – 16 Km - South
	3. The structures within the radius of (i) 50 m, (ii) 100 m, (iii) 200 m and (iv) 300 m & 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.	Detailed in structure in 300m radius in chapter-3 socio economic environment,
	4. Since the waterbodies are situated nearby, the PP shall carry out the intensive scientific assessment on the hydrogeological condition of the quarry to consider the decision on rerouting of the Odai passing through the proposed lease area.	50m Safety for the Odai passing in East side. Tank – 560m – NE
	5. The Project Proponent shall furnish the revised EMP based on the study carried out on impact of the dust & other environmental impacts due to proposed quarrying operations on the nearby agricultural lands for remaining life of the mine in the format prescribed by the SEAC considering the cluster situation.	Detailed in chapter-10 revised EMP
	6. Detailed study report on flora and fauna in and nearby the quarry site.	Detailed in chapter-3 study in Ecology and biodiversity.
	7. The Proponent shall develop greenbelt and garland drain around the boundary of the proposed quarry and the photographs indicating the same shall be shown during the EIA appraisal.	Fencing and greenbelt photo attached in the EIA Report,

SEAC STANDARD CONDITIONS		
2.1	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	It is a fresh lease area, at present the area is virgin. There is no pit.
	i. original pit dimension of the existing quarry	It is a fresh lease area, at present the area is virgin. There is no pit.
	ii. Quantity achieved vs EC approved quantity	
	iii. Balance quantity as per Mineable Reserve calculated	
	iv. Mined out Depth as on date vs EC permitted depth	
	v. Details of illegal/Illicit Mining carried out, if any	Non Illigal
	vi. Non-Compliance / violation in the quarry during the past working	Non violence
	vii. Quantity of material mine out outside the mine lease area (or) in the adjacent quarry/field	-
viii. condition of safety / benches	Addressed in the Mining Plan by providing adequate safety and making bench formations.	

ix. Revised/Modified Mining Plan showing the benches of not exceeding 6 m height and ultimate depth of not exceeding 50m.	Ultimate pit = Pit : 277m(L) x 208m(W) x 47m(D) (BGL) (as per ToR)
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.	The letter detailing habitations around the proposed mining is obtained from Vadakku Ariyanayagipuram-II Village , dated 25.10.2023 enclosed as Annexure – 3
3.The PP shall submit a detailed hydrological report indicating the impact of proposed quarrying operations on the waterbodies like lake, water tanks, etc are located within 1km of the proposed quarry.	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. 4
4.The proponent shall carry out Bio diversity study through reputed institution and the same shall be included in EIA Report.	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
5.The DFO letter stating that the proximity distance of Reserve Forests, Protected Areas, Sanctuaries, Tiger reserve etc., up to a radius of 25 km from the proposed site.	Request to consider the secondary source data detailing the nearest reserve forest from Tamil Nadu Geographical Information System (TNGIS). The Nearest Reserve Forest Kolundhumalai R.F – 10.95 Km – South
6.In the case of proposed lease in an existing (or old) quarry where the benches are not formed (or) partially formed as per the approved Mining Plan, the Project Proponent (PP) shall the PP shall carry out the scientific studies to assess the slope stability of the working benches to be constructed and existing quarry wall, by involving any one of the reputed Research and Academic Institutions - CSIR-Central Institute of Mining & Fuel Research / Dhanbad, NIRI/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.	It is a fresh lease area, at present the area is virgin. There is no pit.
7.However, in case of the fresh/virgin quarries, the Proponent shall submit a conceptual 'Slope Stability Plan' for the proposed quarry during the appraisal while obtaining the EC, when the depth of the working is extended beyond 30 m below ground level.	Proposed depth is 47m Bgl.(As per ToR)
8. The PP shall furnish the affidavit stating that the blasting operation in the proposed quarry is carried out by the statutory competent person as per the MMR 1961 such as blaster, mining mate, mine foreman, II/I Class mines manager appointed by the proponent.	The PP affirms that post execution of Quarry Lease Deed the application for Notice of Opening of the Mine along with Notice of Appointment of Competent Person shall be submitted to Director General Mines Safety, Chennai as per MMR, 1961. And ensure the quarry is operated under the Competent Person Employed.
9.The PP shall present a conceptual design for carrying out only controlled blasting operation involving line drilling and muffle blasting in the proposed quarry such that the blast-induced ground vibrations are controlled as well as no fly rock travel beyond 30 m from the blast site.	The details of design for carrying out controlled blasting operation involving line drilling and muffle blasting to minimize blast-induced ground vibrations and controlled fly rock travel beyond 30 m from the blast site is detailed in Chapter 4.
10.The EIA Coordinators shall obtain and furnish the details of quarry/quarries operated by the proponent in the past, either in the same location or elsewhere in the State with video and photographic evidences.	The PP has submitted self-declaration affidavit that there are no other quarries applied or existing in his name elsewhere in the state.
11.If the proponent has already carried out the mining activity in the proposed mining lease area after 15.01.2016, then the proponent shall furnish the following details from AD/DD mines,	It is a fresh lease area, at present the area is virgin. There is no pit.

12. What was the period of the operation and stoppage of the earlier mines with last work permit issued by the AD/DD mines?	
13. Quantity of minerals mined out.	
c) Highest production achieved in any one year	
d) Detail of approved depth of mining.	
e) Actual depth of the mining achieved earlier.	
f) Name of the person already mined in that leases area.	
g) If EC and CTO already obtained, the copy of the same shall be submitted.	
h) Whether the mining was carried out as per the approved mine plan (or EC if issued) with stipulated benches.	mining plan depth is 47m bgl (as per Tor)
14. All corner coordinates of the mine lease area, superimposed on a high-resolution Imagery/Toposheet, 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 area).	Satellite imagery of the project area along with boundary coordinates is given in the Chapter No 2,
15. The PP shall carry out Drone video survey covering the cluster, green belt, fencing etc.,	The Drone Video of the project site is taken covering the Greenbelt and Fencing around the Project and enclosed as soft copy as CD.
16. The proponent shall furnish photographs of adequate fencing, green belt along the periphery including replantation of existing trees & safety distance between the adjacent quarries & water bodies nearby provided as per the approved mining plan.	As per the recommendations during SEAC ToR Presentation of the proposal and commitment of PP a count of 2500 Nos 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. As well the pp has provided wire fencing as recommended all along the boundary of the lease applied area.
17. The Project proponent shall provide the details of mineral reserves and mineable reserves, planned production capacity, proposed working methodology justifications, with the anticipated impacts of the mining operations on the surrounding environment and the remedial measures for the same.	Details of mineral reserves and mineable reserves, planned production capacity, proposed working methodology justifications are provided in Chapter 2. The anticipated impacts of the mining operations on the surrounding environment and the remedial measures for the same are provided in Chapter 4.
18. The Project proponent shall provide the Organization chart indicating the appointment of various statutory officials and other competent persons to be appointed as per the provisions of Mines Act, 1952 and the MMR, 1961 for carrying out the quarrying operations scientifically and systematically in order to ensure safety and to protect the environment.	The Organization chart indicating the appointment of various statutory officials and other competent persons to be appointed as per the provisions of Mines Act, 1952 and the MMR, 1961 for carrying out the quarrying operations scientifically and systematically in order to ensure safety and to protect the environment.
19. The Project Proponent shall conduct the hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies such as rivers' tanks, canals, ponds etc. within 1 km (radius) along with the collected water level data for both monsoon and non-monsoon seasons from the PWD / TWAD so as to assess the impacts on the wells due to mining activity. Based on actual monitored data' it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be Provided.	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.
20. The proponent shall furnish the baseline data for the environmental and ecological parameters with regard to surface water/ground water quantity, air	Baseline Data were collected for Summer season March 2024 to May 2024 Details in Chapter No. 3.

quality, soil quality & flora/fauna including Traffic/vehicular movement study.	
21.The Proponent shall carry out the Cumulative impact study due to mining operations carried out in the quarry specifically with reference to the specific environment in terms of soil, health, biodiversity, air pollution, water pollution, climate change and flood control & health impacts. Accordingly, the Environment Management plan should be prepared keeping the concerned quarry and the surrounding habitations in the mind.	Cumulative impact study has been carried out covering proposed and existing quarries in the cluster and results related to air pollution, water pollution, & health impacts have been given in chapter No. 7, Based on the results, environmental management plan has been prepared and given in Chapter No. 10.
22.Rain water harvesting management with recharging details along with water balance (both monsoon & non-monsoon) be submitted.	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.
23.Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass pre operational, 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. 3, Table No 3.3
24.Details of the land for storage of Overburden/Waste Dumps (or) Rejects outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be provided.	Not applicable
25.Proximity to Areas declared as 'Critically Polluted' (or) the Project areas which attracts the court restrictions for mining operations, should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the TNPCB (or) Dept. of Geology and Mining should be secured and furnished to the effect that the proposed mining activities could be considered.	Not Applicable. Project area / Study area is not declared in 'Critically Polluted' Area and does not come under 'Aravalli Range.
26.Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.	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.
27.Impact on local transport infrastructure due to the Project should be indicated.	Traffic density survey was carried out to analyze 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
28.A tree survey study shall be carried out (nos., name of the species, age, diameter etc.,) both within the mining lease applied area & 300m buffer zone and its management during mining activity.	As per the recommendations during SEAC ToR Presentation of the proposal and commitment of PP a count of 2500Nos 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.
29.A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific.	Noted & agreed. Mine closure plan is detailed in Chapter:4.
30.As a part of the study of flora and fauna around the vicinity of the proposed site, the EIA coordinator shall strive to educate the local students on the importance	Noted, it will submit final EIA/EMP report.

of preserving local flora and fauna by involving them in the study, wherever possible.	
31.The purpose of green belt around the project is to capture the fugitive emissions. Carbon sequestration and to attenuate the noise generated, in addition to improving the aesthetics. A wide range of indigenous plant species should be planted as given in the appendix 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.	As per the recommendations during SEAC ToR Presentation of the proposal and commitment of PP a count of 2500 Nos 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.
32.Taller/one year old Saplings raised in appropriate size of bags; preferably eco-friendly bags should be planted as per the advice of local forest authorities / botanist / 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.	Detailed in chapter-3 Ecology biodiversity studies.
33.A Disaster management Plan shall be prepared and included in the EIA/EMP Report.	Disaster management Plan is detailed in Chapter-7
34.A Risk Assessment and management Plan shall be prepared and included in the EIA/EMP Report.	A Risk Assessment and management Plan Chapter- 7
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 are discussed in chapter- 10
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.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.	Details are listed in Chapter:3.
38.Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.	No Litigation is pending
39.Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.	Project benefit is given in the Chapter No.8.
40.If any quarrying operations were carried out in the proposed quarrying site for which now the EC is sought, the Project Proponent shall furnish the detailed compliance to EC conditions given in the previous EC with the site photographs which shall duly be certified by MoEF & CC, Regional Office, Chennai (or) the concerned DEE/TNPCB.	Not Applicable. The applied area is a new proposal for Environmental Clearance.
41.The PP shall prepare the EMP for the entire life of mine and also furnish the sworn affidavit stating to abide the EMP for the entire life of mine.	Noted and agreed

42. Concealing any factual information or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this Terms of Reference besides attracting penal provisions in the Environment (Protection) Act, 1986.	Noted and agreed
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Standard Terms of Reference for (Mining of minerals)

S. No	Terms of Reference	Reply
1.1	An EIA-EMP Report shall be prepared for peak capacity (.....MTPA) operation in an ML/project area of.....ha based on the generic structure specified in Appendix III of the EIA Notification, 2006.	Peak Production = 2,73,005m ³ of Rough Stone Proposed Depth = 47m bgl (As per Tor) Project area of 4.99.39Ha.
1.2	An EIA-EMP Report would be prepared for peak capacity operation to cover the impacts and environment management plan for the project specific activities on the environment of the region, and the environmental quality encompassing air, water, land, biotic community, etc. through collection of data and information, generation of data on impacts including prediction modeling for.... MTPA of mineral production based on approved project/Mining Plan for.... MTPA. Baseline data collection can be for any season (three months) except monsoon.	Peak capacity of 2,73,005m ³ operation to cover the impacts and environment management plan in chapter- IV and Chapter-10 covered in project specific activities. Baseline Data were collected for Summer Season March– May 2024 as per CPCB Notification and MoEF & CC Guidelines. Details in Chapter No. III
1.3	Proper KML file with pin drop and coordinate of mine at 500-1000 m interval be provided.	Noted, Google earth image showing lease area with Coordinates of pillars in chapter-II.
1.4	A Study area map of the core zone (project area) and 10 km area of the buffer zone (1: 50,000 scale) clearly delineating the major topographical features such as the land use, surface drainage pattern including rivers/streams/nullahs/canals, locations of human habitations, major constructions including railways, roads, pipelines, major industries, mines, and other polluting sources. In case of ecologically sensitive areas such as Biosphere Reserves/National Parks/WL Sanctuaries/ Elephant Reserves, forests (Reserved/Protected), migratory corridors of fauna, and areas where endangered fauna and plants of medicinal and economic importance found in the 15 km study area should be given. The above details to be furnished in tabular form also.	Land use and land cover of the 10km Radius of study area is discussed in Chapter No. III. Geology map of the project area covering 10km radius Figure No. 2.5, Page No. 20. Geomorphology of the area is given in Chapter No 2 Figure No 2.6, Page No. 20 There are No National Parks, Biosphere Reserves, Wildlife Corridors, and Tiger/Elephant Reserves within 10 km Radius from the periphery of the project area.
1.5	Map showing the core zone delineating the agricultural land (irrigated and un-irrigated, uncultivable land as defined in the revenue records, forest areas (as per records), along with other physical features such as water bodies, etc should be furnished.	Land use and land cover of the study area is discussed in Chapter No. III with Physical features such as waterbodies, odai, canal etc.,
1.6	A contour map showing the area drainage of the core zone and 25 km of the study area (where the water courses of the core zone ultimately join the major rivers/streams outside the lease/project area) should also be clearly indicated in the separate map.	DEM data using Drainage pattern around 10km radius showing streams and lakes etc., discussed in Chapter No. 3.

1.7	Catchment area with its drainage map of 25 km area within and outside the mine shall be provided with names, details of rivers/ riverlet system and its respective order. The map should clearly indicate drainage pattern of the catchment area with basin of major rivers. Diversion of drains/ river need elaboration in form of length, quantity and quality of water to be diverted.	Drainage pattern around 10km radius showing streams and lakes etc., is discussed in Chapter No. 3.
1.8	(Details of mineral reserves, geological status of the study area and the seams to be worked, ultimate working depth and progressive stage-wise working scheme until the end of mine life should be provided on the basis of the approved rated capacity and calendar plans of production from the approved Mining Plan. Geological maps and sections should be included. The Progressive mine development and Conceptual Final Mine Closure Plan should also be shown in figures. Details of mine plan and mine closure plan approval of Competent Authority should be furnished for green field and expansion projects.	Details in chapter-2 showing the land features. And also enclosed Approved mining plan in annexure
1.9	Details of mining methods, technology, equipment to be used, etc., rationale for selection of specified technology and equipment proposed to be used vis-à-vis the potential impacts should be provided.	It is an opencast quarrying operation proposed to operate in Mechanized method. The Rough Stone quarry 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.
1.10	Impact of mining on hydrology, modification of natural drainage, diversion and channeling of the existing rivers/water courses flowing through the ML and adjoining the lease/project and the impact on the existing users and impacts of mining operations thereon.	Impact Studies and Mitigation Measures of Water Environment including Surface Water and Ground Water are discussed in Chapter 4.
1.11	A detailed Site plan of the mine showing the proposed break-up of the land for mining operations such as the quarry area, OB dumps, green belt, safety zone, buildings, infrastructure, Stockyard, township/colony (within and adjacent to the ML), undisturbed area -if any, and landscape features such as existing roads, drains/natural water bodies to be left undisturbed along with any natural drainage adjoining the lease /project areas, and modification of thereof in terms of construction of embankments/bunds, proposed diversion/re-channelling of the water courses, etc., approach roads, major haul roads,	Not Applicable. The details of waste dump management are given in the Chapter No. 4

1.12	Original land use (agricultural land/forestland/grazing land/wasteland/water bodies) of the area should be provided as per the tables given below. Impacts of project, if any on the land use, in particular, agricultural land/forestland/grazing land/water bodies falling within the lease/project and acquired for mining operations should be analyzed. Extent of area under surface rights and under mining rights should be specified. Area under Surface Rights				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 2.5.			
					Description	Present area (Ha)	Area at the end of lease period (Ha)	
	Sno	ML. project Land use	Area under Surface Rights(ha)	Area Under Mining Rights(ha)	Area under Both (ha)			
	1	Agriculture Land						
	2	Forest Land						
	3	Grazing Land						
	4	Settlements						
	5	Others (Specify)						
					Area under quarrying	Nil	4.13.90	
					Infrastructure	Nil	0.02.00	
				Roads	Nil	0.05.00		
				Green Belt	Nil	0.67.00		
				Unutilized Area	4.99.39	0.11.49		
				Grand Total	4.99.39	4.99.39		
1.13	Study on the existing flora and fauna in the study area (10km) should be carried out by an institution of relevant discipline. The list of flora and fauna duly authenticated separately for the core and study area and a statement clearly specifying whether the study area forms a part of the migratory corridor of any endangered fauna should be given. If the study area has endangered flora and fauna, or if the area is occasionally visited or used as a habitat by Schedule-I species, or if the project falls within 15 km of an ecologically sensitive area, or used as a migratory corridor then a Comprehensive Conservation Plan along with the appropriate budgetary provision should be prepared and submitted with EIA-EMP Report; and comments/observation from the CWLW of the State Govt. should also be obtained				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.			
	One-season (other than monsoon) primary baseline data on environmental quality - air (PM10, PM2.5, SOx, NOx and heavy metals such as Hg, Pb, Cr, As, etc), noise, water (surface and groundwater), soil - along with one-season met data coinciding with the same season for AAQ collection period should be provided. The detail of NABL/MoEF&CC certification of the respective laboratory and NABET accreditation of the consultant to be provided.				Baseline Data were collected for Summer season March–May 2024 as per CPCB Notification and MoEF & CC Guidelines.Details in Chapter No. 3.			
	1.14							

1.15	Map (1: 50, 000 scale) of the study area (core and buffer zone) showing the location of various sampling stations superimposed with location of habitats, other industries/mines, polluting sources, should be provided. The number and location of the sampling stations in both core and buffer zones should be selected on the basis of size of lease/project area, the proposed impacts in the downwind (air) / downstream (surface water)/groundwater regime (based on flow). One station should be in the upwind/upstream/non-impact/non-polluting area as a control station. The monitoring should be as per CPCB guidelines and parameters for water testing for both ground water and surface water as per ISI standards and CPCB classification wherever applicable. Observed values should be provided along with the specified standards.	Details in chapter-3 showing the various sampling stations As per CPCB guidelines.
1.16	For proper baseline air quality assessment, Wind rose pattern in the area should be reviewed and accordingly location of AAMSQ shall be planned by the collection of air quality data by adequate monitoring stations in the downwind areas. Monitoring location for collecting baseline data should cover overall the 10km buffer zone i.e., dispersed in 10 km buffer area. In case of expansion, the displayed data of CAAQMS and its comparison with the monitoring data to be provided.	Air Quality Modelling and windrose pattern for prediction of incremental GLC's of pollutant was carried out using AERMOD view 13 Model. Details in Chapter No. 4.
1.17	A detailed traffic study along with presence of habitation in 100 mts distance from both side of road, the impact on the air quality with its proper measures and plan of action with timeline for widening of road. The project will increase the no. of vehicle along the road which will indirectly contribute to carbon emission so what will be the compensatory action plan should be clearly spell out in EIA/ EMP report.	Traffic density survey was carried out to analyses 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-II.
1.18	The socio-economic study to conducted with actual survey report and a comparative assessment to be provided from the census data should be provided in EIA/ EMP report also occupational status & economic status of the study area and what economically project will contribute should be clearly mention. The study should also include the status of infrastructural facilities and amenities present in the study area and a comparative assessment with census data to be provided and to link it with the initialization and quantification of need-based survey for CSR activities to be followed.	Detailed in chapter-3 socio-economic study with occupational status & economic status of the study area. The study should also include the status of infrastructural facilities and amenities present in the study area CSR are discussed under Chapter 8.
1.19	The Ecology and biodiversity study should also indicate the likely impact of change in forest area for surface infrastructural development or mining activity in relation to the climate change of that area and what will be the compensatory measure to be adopted by PP to minimize the impact of forest diversion.	Detailed Ecology and biodiversity study in chapter-3
1.20	Baseline data on the health of the population in the impact zone and measures for occupational health and safety of the personnel and manpower for the mine should be submitted.	Detailed in chapter-4 population in the impact zone and measures for occupational health and safety and proposed occupational health in chapter-X
1.21	Impact of proposed project/activity on hydrological regime of the area shall be assessed and report be submitted. Hydrological studies as per GEC 2015 guidelines to be prepared and submitted.	Noted and agreed

1.22	Impact of mining and water abstraction from the mine on the hydrogeology and groundwater regime within the core zone and 10 km buffer zone including long-term monitoring measures should be provided. Details of rainwater harvesting and measures for recharge of groundwater should be reflected in case there is a declining trend of groundwater availability and/or if the area falls within dark/grey zone.	The ground water table is at 62m below ground level. In these projects, ultimate depth is 57m Bgl It is inferred the quarrying activities in the Cumulative EIA project (Quarry) will not intersect the Ground water table.
1.23	Study on land subsidence including modeling for prediction, mitigation/prevention of subsidence, continuous monitoring measures, and safety issues should be carried out.	Detailed in Chapter-IV Anticipated and mitigation measures of in the study area.
1.24	Detailed water balance should be provided. The break up of water requirement as per different activities in the mining operations, including use of water for sand stowing should be given separately. Source of water for use in mine, sanction of the Competent Authority in the State Govt. and impacts vis-à-vis the competing users should be provided.	Total Water Requirement: 2.0 KLD Discussed under Chapter 2, Table No 2.15, The required water will be met from rainwater accumulated in mine pit (when available) and from the approved water vendors.
1.25	PP shall submit design details of all Air Pollution control equipment (APCEs) to be implemented as part of Environment Management Plan vis-à-vis reduction in concentration of emission for each APCEs	Methodology And Instrument Used For Air Quality Analysis in chapter-3 and Air Pollution control equipment (APCEs) in chapter-10 sub 10.2 Environmental policy.
1.26	PP shall propose to use LNG/CNG based mining machineries and trucks for mining operation and transportation of mineral. The measures adopted to conserve energy or use of renewable sources shall be explored.	Details in Machinery and equipment details in Chapter-2 Table No 2.10
1.27	PP to evaluate the green house emission gases from the mine operation/ washery plant and corresponding carbon absorption plan.	Noted and agreed
1.28	Site specific Impact assessment with its mitigation measures, Risk Assessment and Disaster Preparedness and Management Plan should be provided.	A Risk Assessment and Disaster Preparedness and management Plan Chapter- 7
1.29	Impact of choice of mining method, technology, selected use of machinery and impact on air quality, mineral transportation, handling & storage/stockyard, etc, Impact of blasting, noise and vibrations should be provided.	Detailed in Machinery and technology used Chapter-3 Table 3.17 – Methodology and Instrument Used for Air Quality Analysis Detailed study in chapter-4 Impact of choice of mining method and impact on air quality and blasting and noise and vibrations.
1.30	Impacts of mineral transportation within the mining area and outside the lease/project along with flow-chart indicating the specific areas generating fugitive emissions should be provided. Impacts of transportation, handling, transfer of mineral and waste on air quality, generation of effluents from workshop etc, management plan for maintenance of HEMM and other machinery/equipment should be given. Details of various facilities such as rest areas and canteen for workers and effluents/pollution load emanating from these activities should also be provided.	Traffic density survey was carried out to analyse the impact of Transportation in the study area as per IRC guidelines 1961 and it is inferred that there is no much significant impact due to the proposed transportation from the project area. Details in Chapter 2. 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.

1.31	Details of various facilities to be provided to the workers in terms of parking, rest areas and canteen, and effluents/pollution load resulting from these activities should also be given.	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
1.32	The number and efficiency of mobile/static water jet, Fog cannon sprinkling system along the main mineral transportation road inside the mine, approach roads to the mine/stockyard/siding, and also the frequency of their use in impacting air quality should be provided.	Detailed in chapter-2 for mineral transportation route with approach roads etc., and impacting air quality detailed given chapter-4
1.33	Conceptual Final Mine Closure Plan and post mining land use and restoration of land/habitat to the pre- mining status should be provided. A Plan for the ecological restoration of the mined-out area and post mining land use should be prepared with detailed cost provisions. Impact and management of wastes and issues of re-handling (wherever applicable) and backfilling and progressive mine closure and reclamation should be furnished.	Discussed under Chapter 2. Mine Closure Plan is a part of Approved Mining Plan enclosed as Annexure Volume – 1.
1.34	Adequate greenbelt nearby areas, mineral stock yard and transportation area of mineral shall be provided with details of species selected and survival rate Greenbelt development should be undertaken particularly around the transport route.	Greenbelt Development Plan is discussed under Chapter 4,
1.35	Cost of EMP (capital and recurring) should be included in the project cost and for progressive and final mine closure plan.	The total cost and the details are given in the Chapter No. 10
1.36	Details of R&R. Detailed project specific R&R Plan with data on the existing socio- economic status of the population (including tribals, SC/ST, BPL families) found in the study area and broad plan for resettlement of the displaced population, site for the resettlement colony, alternate livelihood concerns/employment for the displaced people, civic and housing amenities being offered, etc. and costs along with the schedule of the implementation of the R&R Plan should be given.	Not Applicable. There are no approved habitations within a radius of 300 meters. Therefore, R&R Plan / Compensation details for the Project Affected People (PAP) is not anticipated and Not Applicable for this project.
1.37	CSR Plan along with details of villages and specific budgetary provisions (capital and recurring) for specific activities over the life of the project should be given.	CSR are discussed under Chapter 8. And specific budgetary provisions (capital and recurring) for specific activities over the life of the project in chapter-10
1.38	Corporate Environment Responsibility:	CER are discussed under Chapter 8.
1.39	a) The Company must have a well laid down Environment Policy approved by the Board of Directors.	Detailed in chapter-10 The Environment Policy
1.40	b) The Environment Policy must prescribe for standard operating process/procedures to bring into focus any infringements/deviation/violation of the environmental or forest norms/conditions.	
1.41	c) The hierarchical system or Administrative Order of the company to deal with environmental issues and for ensuring compliance with the environmental clearance conditions must be furnished.	The Environment Monitoring Cell discussed under Chapter 6
1.42	d) To have proper checks and balances, the company should have a well laid down system of reporting of non-compliances/violations of environmental norms to the Board of Directors of the company and/or shareholders or stakeholders at large.	The Environment Monitoring Cell discussed under Chapter 6
1.43	e) Environment Management Cell and its responsibilities to be clearly spell out in EIA/ EMP report	The Environment Monitoring Cell discussed under Chapter 6

1.44	f) In built mechanism of self-monitoring of compliance of environmental regulations should be indicated.	The Environment Monitoring Cell discussed under Chapter 6
1.45	Status of any litigations/ court cases filed/pending on the project should be provided.	No litigation is pending in any court against this project
1.46	PP shall submit clarification from DFO that mine does not falls under corridors of any National Park and Wildlife Sanctuary with certified map showing distance of nearest sanctuary.	Kalakad Mundanthurai Tiger Reserve – 16 Km – South It will submit final EIA/EMP report.
1.47	Copy of clearances/approvals such as Forestry clearances, Mining Plan Approval, mine closer plan approval. NOC from Flood and Irrigation Dept. (if req.), etc. wherever applicable	It will submit final EIA/EMP report
1.48	Details on the Forest Clearance should be given as per the format given: Total Mine lease area (ha): Total Forest Land (Ha) : Date of FC : Extent of Forest Land : Balance area for which FC is yet to be obtained: Status of application for diversion of forest Land: If more than one provides details of each FC	Kolundhumalai R.F – 10.95 Km – South Total Mine Lease area 4.99.39ha It will submit final EIA/EMP report
1.49	In case of expansion of the proposal, the status of the work done as per mining plan and approved mine closure plan shall be detailed in EIA/ EMP report.	Enclosed Approved mining plan in Annexure volume-I
1.50	Details on Public Hearing should cover the information relating to notices issued in the newspaper, proceedings/minutes of Public Hearing, the points raised by the general public and commitments made by the proponent and the time bound action proposed with budgets in suitable time frame. These details should be presented in a tabular form. If the Public Hearing is in the regional language, an authenticated English Translation of the same. should be provided.	The outcome of public hearing will be updated in the final EIA/AMP report.
1.51	PP shall carry out survey through drone highlighting the ground reality for at least 10 minutes.	Noted and agreed
1.52	Detailed Chronology of the project starting from the first lease deed allotted/Block allotment/ Land acquired to its No. of renewals, CTO /CTE with details of no. renewals, previous EC(s) granted details and its compliance details, NOC details from various Govt bodies like Forest NOC(s), CGWA permissions, Power permissions, etc as per the requisites respectively to be furnished in tabular form.	Noted and agreed
1.53	The first page of the EIA/ EMP report must mention the peak capacity production, area, detail of PP, Consultant (NABET accreditation) and Laboratory (NABL / MoEF & CC certification)	As per detailed in front page of Draft EIA/EMP, NABET, NABL certification detailed given in the report.
1.54	The compliances of Tor must be properly cited with respective chapter section and page no in tabular form and also mention sequence of the respective ToR complied within the EIA-EMP report in all the chapters section.	As per Tor compliance each chapter wise page and table, figure no given in the EIA/EMP report.

SPECIFIC CONDITIONS	
Restricting the ultimate depth of mining upto 50m BGL for mining over a period of five years considering the environmental impacts due to the mining, safety precautionary measures of the working personnel and following the principle of the sustainable mining.	Ultimate Pit: 277m(L) x 208m(W) x 47m(D) (BGL) depth is 47m (2m Gravel + 45 m Rough Stone) reduce the two bench (xi and xii)

SEIAA STANDARD CONDITIONS		
<i>Cluster Management committee</i>		
1.	1.Cluster Management Committee shall be framed which must include all the proponents in the cluster as members including the existing as well as proposed quarry.	Cluster Management Committee has been constituted initially with 1proposed and 2 existing quarries
2	2.The members must coordinate among themselves for the effective implementation of EMP as committed including Green Belt Development, Water sprinkling, tree plantation, blasting etc..	The information will be shared to the cluster management committee during the monthly meeting.
3	3.The List of members of the committee formed shall be submitted to AD/Mines before the execution of mining lease and the same shall be updated every year to the AD/Mines.	The list of members of the committee formed will be submitted to AD/Mines before the execution of mining lease.
4	4.Detailed operational Plan must be submitted which must include the blasting frequency with respect to the nearby quarry situated in the cluster, the usage of haul roads by the individual quarry in the form of route map and network.	All the information has been discussed in Chapter No.2
5	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	6.The Cluster Management Committee shall form Environmental Policy to practice sustainable mining in a scientific and systematic manner in accordance with the law. The role played by the committee in implementing the environmental policy devised shall be given in detail.	Environmental policy is described in the EIA report Chapter No. 6 and the same will be followed.
7	7.The committee shall furnish action plan regarding the restoration strategy with respect to the individual quarry falling under the cluster in a holistic manner.	A proper action plan regarding the restoration will be followed by the committee
8	8.The committee shall furnish the Emergency Management plan within the cluster.	The committee will submit the emergency management plan to the respective authority in the stipulated time period.
9	9.The committee shall deliberate on the health of the workers/staff involved in the mining as well as the health of the public.	The risk management plan and disaster management plan will be followed as per the EIA report.
10	10.The committee shall furnish an action plan to achieve sustainable development goals with reference to water, sanitation & safety.	A proper action plan with reference to water, sanitation & safety will be devised and submitted by the committee to the respective authority.
11	11.The committee shall furnish the fire safety and evacuation plan in the case of fire accidents.	The fire safety and evacuation plan will be carried out by as per the respective quarry mines managers
<i>Impact study of mining</i>		
12	Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area covering the entire mine lease period as per precise area communication order issued from reputed research institutions on the following	Details of Soil health is given in Chapter No 3 and biodiversity is given in Chapter No 3. The project will not cause any significant changes in the climate Climatic changes and GHG are described in Chapter No 4. Details of water contamination and impact on aquatic ecosystem is given in Chapter No 4.

	<p>a) Soil health & bio-diversity, physical land chemical features.</p> <p>b) Climate change leading to Droughts, Floods etc.</p> <p>c) Pollution leading to release of Greenhouse gases (GHG), rise in Temperature' & Livelihood of the local people.</p> <p>d) Possibilities of water contamination and impact on aquatic ecosystem health'</p> <p>e) Agriculture, Forestry & Traditional practices.</p> <p>1) Hydrothermal/Geothermal effect due to destruction in the Environment'</p> <p>g) Bio-geochemical processes and its foot prints including environmental stress'</p> <p>h) Sediment geochemistry in the surface steams.</p>	Hydrothermal/ Geothermal effects due to destruction in the environment, Bio geochemical process and sediment geo chemistry given in the Chapter No 7.
Agriculture & Agro-Biodiversity		
13	Impact on surrounding agricultural fields around the proposed mining Area.	As the proposed lease area is dominantly surrounded by mining land, barren land, and fallow land, the impact on the surrounding agricultural fields if present will be low. With proper mitigation measures, the project will be carried out to reduce the impact further to the level of negligence.
14	Impact on soil flora & vegetation around the project site.	The vegetation details have been provided in chapter III. There is no schedule I species of animals observed within study area as per Wildlife Protection Act, 1972 and no species falls in vulnerable, endangered or threatened category as per IUCN. There is no endangered red list species found in the study area.
15	Details of type of vegetations including no. of trees & shrubs within the proposed mining area and. If so, transplantation of such vegetations all along the boundary of the proposed mining area shall committed mentioned in EMP.	The vegetation details have been provided in chapter III. There is no schedule I species of animals observed within study area as per Wildlife Protection Act, 1972 and no species falls in vulnerable, endangered or threatened category as per IUCN. There is no endangered red list species found in the study area
16	The Environmental Impact Assessment should study the biodiversity, the natural ecosystem, the soil micro flora. fauna and soil seed banks and suggest measures to maintain the natural Ecosystem.	Details are discussed in Chapter No.3
17	Action should specifically suggest for sustainable management of the area and restoration of ecosystem for flow of goods and services.	The Eco System of the area will be retained during the mining operation by the way of planting trees in the boundary barrier and un utilized areas. After completion of mining operation, the quarried-out pit will be facilitated to collect the rainwater to pit act as temporary reservoir.
18	The project proponent shall study and furnish the impact of project on plantations in adjoining patta lands. Horticulture, Agriculture and livestock.	The project area is bounded by dry barren land on all the sides.
Forest		
19	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 (Kolundhumalai R.F – 10.95 Km – South). The mining operation will not cause any significant impact to the Reserve Forest and Wild life Sanctuaries.
20	The Environmental Impact Assessment should study impact on forest, vegetation, endemic, vulnerable and endangered indigenous flora and fauna.	chapter 3 details of Ecology and Biodiversity, and 4 endemic vulnerable and endangered indigenous flora and fauna.
21	The Environmental Impact Assessment should study impact on standing trees and the existing trees should be numbered and action suggested for protection.	chapter 3 details of Ecology and Biodiversity
22	The Environmental Impact Assessment should study impact on protected areas, Reserve Forests, National Parks, Corridors and Wildlife pathways, near project site.	Anticipated Environment Impact and Mitigation measures are detailed in Chapter No.4
Water Environment		
23	Hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water	Hydro-geological study considering the contour map of the water table detailing Chapter-3

	bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) so as to assess the impacts on the nearby waterbodies due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided, covering the entire mine lease period.	
24	Erosion Control measures.	Garland drainage structures will be constructed around the lease area to control the erosion, as discussed in Section 4.3 under Chapter 4.
25	Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area on the nearby villages, water-bodies/ Rivers. & any ecological fragile areas.	In the EIA report Chapter No. IV enumerate the anticipated impact due to the project and mitigation measures
26	The project proponent shall study impact on fish habitats and the food WEB/ food chain in the water body and Reservoir.	Detailed under Chapter 3.
27	The project proponent shall study and furnish the details on potential fragmentation impact on natural environment by the activities.	Details are given in the Chapter No 4.
28	The project proponent shall study and furnish the impact on aquatic plants and animals in water bodies and possible scars on the landscape, damages to nearby caves, heritage site, and archaeological sites possible land form changes visual and aesthetic impacts.	Detailed discussed in the chapter 4
29	The Terms of Reference should specifically study impact on soil health, soil erosion, the soil, physical, chemical components and microbial components.	Details of impact on soil environment is detailed in Chapter No.4.
30	The Environmental impact Assessment should study on wetlands, water bodies, rivers streams, lakes and farmer sites.	<ul style="list-style-type: none"> ➤ The nearest water bodies from the project area are an 50m Safety for the Odai passing in East side ➤ Tank – 560m – NE
Energy		
31	The measures taken to control Noise, Air, Water, Dust Control and steps adopted to efficiently utilize the Energy shall be furnished.	Details in Chapter 3 environmental monitoring details.
Climate Change		
32	The Environmental Impact Assessment shall study in detail the carbon emission and also suggest the measures to mitigate carbon emission including development of carbon sinks and temperature reduction including control of other emission and climate mitigation activities.	Details of carbon emission and mitigation activities are given in the Chapter No.4
33	The Environmental impact Assessment should study impact on climate change, temperature rise, pollution and above soil & below soil carbon stock.	The project will not cause significant impact on climatic change. Description about the project and climatic changes is described in Chapter No.4.
Mine Closure Plan		
34	Detailed Mine Closure Plan covering the entire mine lease period as per precise area communication order issued.	Details in Chapter 2 – detailed in mine closure plan with attached approved mining plan in Annexure.
EMP		
35	Detailed Environment Management Plan along with adaptation, mitigation & remedial strategies covering the entire mine lease period as per precise area communication order issued.	Details in EMP in chapter 10
36	The Environmental Impact Assessment should hold detailed study on EMP with budget for green belt development and mine closure plan including disaster management plan.	Detailed Environment Management Plan for the project to mitigate the anticipated impacts described under Chapter 4 is discussed under Chapter 10.
Disaster Management Plan		

38	To furnish disaster management plan and disaster mitigation measures in regard to all aspects to avoid/reduce vulnerability to hazards & to cope with disaster/untoward accidents in & around the proposed mine lease area due to the proposed method of mining activity & its related activities covering the entire mine lease period as per precise area communication order issued.	Disaster management Plan details in Chapter-7
Others		
39	The project proponent shall furnish VAO certificate with reference to 300m radius regard to approved habitations. schools. Archaeological sites. Structures. railway lines, roads. Water bodies such as streams, odai, vaari, canal, channel. river, lake pond, tank etc.	The letter detailing habitations around the proposed mining is obtained from Vadakku Ariyanayagipuram-II Village enclosed as Annexure – 3
40	As per the MoEF & CC office memorandum tr.No.22-651201 7-1A.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.	Noted and agreed
41	The project proponent shall study and furnish the possible pollution due to plastic and microplastic on the environment. The ecological risks and impacts of plastic & microplastics on aquatic environment and fresh water systems due to activities, contemplated during mining may be investigated and reported.	Details of plastic management is in chapter -7

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1.INTRODUCTION

1.0 PREAMBLE

Project History: -

- The project proponent Thiru.R.P.Rahul has applied for Quarry Lease application in Department of geology and Mining Tirunelveli
- Proponent applied for Rough stone quarry letter on 13.09.2019.
- Precise area communication letter was issued by the Assistant Director, Department of Geology and Mining Tirunelveli vide RC.No. M2/35382/2019 Dated.28.08.2023.
- The Mining plan has been prepared by the Qualified person and got approval by the Assistant Director, Department of Geology and Mining Tirunelveli vide Letter Rc. No. M2/35382/2019 Dated.19.09.2023.
- The Mining plan has been approved for the quantity of 11,49,795 m³ of Rough stone & 83,680 m³ of Gravel upto the depth of 57 m Bgl for the period of Five years.

As per the EIA Notification, 2006 and subsequent amendments and OM The proposal falls in the B1 Category (Cluster quarries - 1 proposal and 2 Existing quarries forming Cluster Category {Total Extent of the Cluster is 13.84.11 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/433058/2023 Dated 12.06.2023 and the ToR Was Granted vide Identification No TO23B0108TN5277464N Dated:13.03.2024

As per Obtained ToR the depth was restricted upto 47 for 5 years and Revised Reserves For First Five Year Production is 10,67,645 m³ of Rough stone & 83,680 m³ of Gravel

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

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

1.1 PURPOSE OF THE REPORT

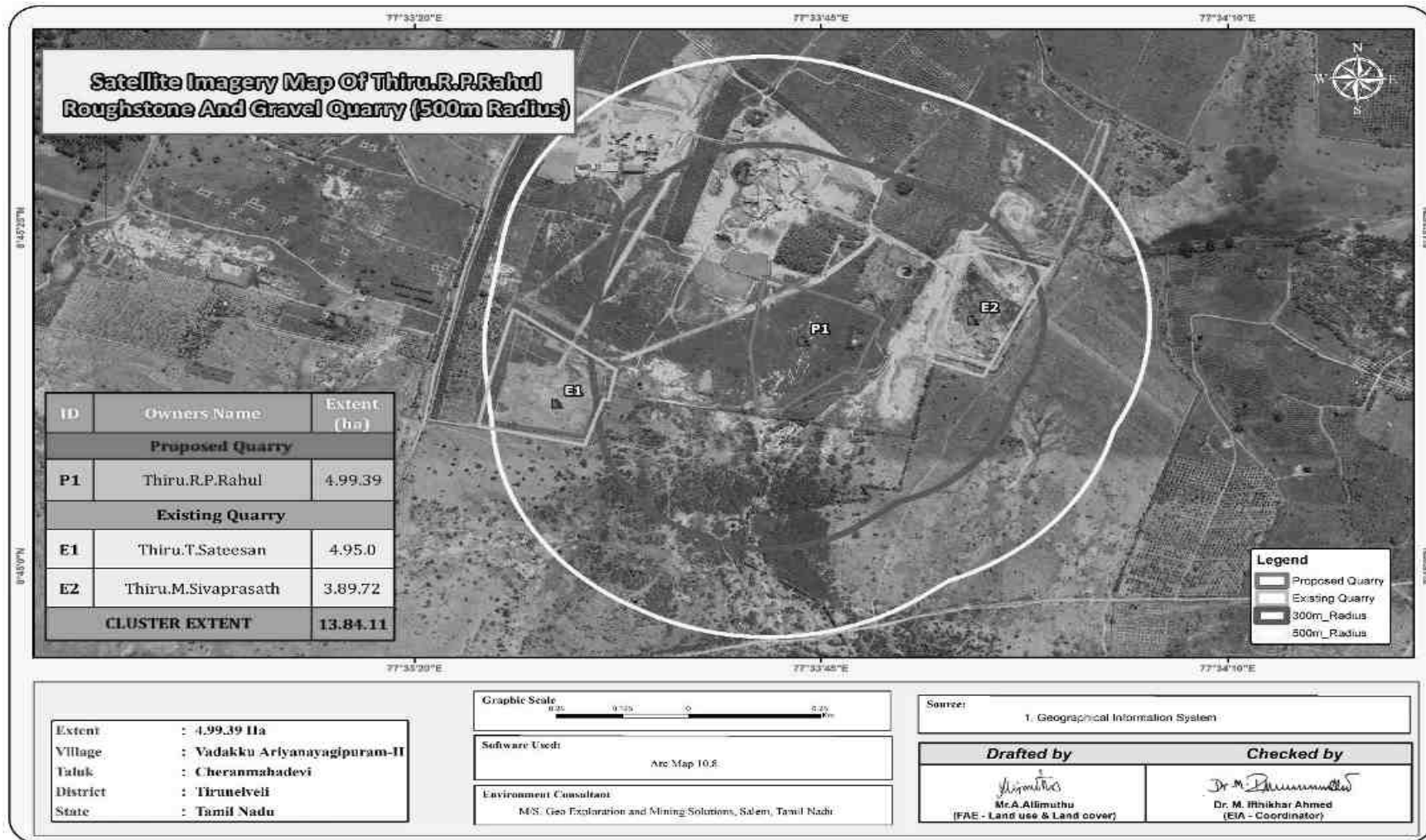
The Ministry of Environment and Forests, Govt. of India, through its EIA notification S.O. 1533(E) of 14th September 2006 and its subsequent amendments as per Gazette Notification S.O. 1889 of 20th April 2022, Mining Projects are classified under two categories i.e. A (> 250 Ha) and B (≤ 250 Ha), and 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 PROPONENTS

1.2.1 Identification of Project Proponent

TABLE 1.1: DETAILS OF PROJECT PROPONENT

Name of the Project Proponent	Thiru.R.P.Rahul Rough Stone and Gravel Quarry
Address	Thiru.R.P.Rahul S/o.Rajendran, 13-85, Pathittavilai, Chitharal Village, Vilavancode Taluk, Kanniyakumari District – 629 151
Mobile	8300339460
Email	kkrnbluemetal@gmail.com
Status	Individual

1.2.2 Identification of Project

TABLE 1.2: SALIENT FEATURES OF THE PROPOSED PROJECT

Name of the Project	Thiru.R.P.Rahul Rough Stone and Gravel Quarry	
S.F. No.	719/1(P), 720/1(P), 720/2,3,4,5,6,7,8,9,10,11,12,13(P),14(P)	
Extent	4.99.39 ha	
Village Taluk and District	Vadakku Ariyanayagipuram - II Village, Cheranmahadevi Taluk, Tirunelveli District.	
Land Type	Patta Land	
Toposheet No	57-H/09	
Latitude between	08° 45' 11.0397"N to 08° 45' 21.3753"N	
Longitude between	77° 33' 40.6252"E to 77° 33' 48.8609"E	
Elevation of the area	100 m AMSL	
Lease period	5 Years	
Mining Plan period	5 years	
Proposed Depth of Mining as per ToR	47m Bgl (2m Gravel + 45m Rough Stone)	
Geological Resources	Rough Stone in m ³	Gravel
	27,46,645	99,878
Mineable Reserves	11,49,795	83,680
For Five Year Production as per ToR	10,67,645	83,680
Peak Production	2,73,005	33,696
Ultimate Pit Dimension	277m (L) x 208m (W) x 57m(D) (2m Gravel + 55m Rough Stone)	
Water Level in the region	62 m bgl	
Method of Mining	Opencast Mechanized Mining Method involving small drilling and Controlled blasting using Slurry Explosives	
Topography	The lease applied area is Plain Terrain. The area has gentle sloping towards Southern side and altitude of the area is 100 m above from Mean sea level. The area is covered by 2m thickness of gravel followed by massive charnockite which is clearly inferred from the outcrop.	
Machinery proposed	Wagon Drill Machine	2 Nos
	Jack Hammer	4 Nos
	Compressor	1 Nos
	Excavator with Bucket and Rock Breaker	2 Nos
	Tippers	5 Nos
	Water Sprinkling Tanker	1 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.	
Proposed Manpower Deployment	33 Nos	
Project Cost	Rs. 4,32,45,000/-	
6 months once compliance Monitoring Cost (EMP)	Rs. 3,80,000/-	
CER Cost	Rs. 5,00,000/-	
	Odai	50m East (Safety Distance Provided)
	Tank	400m NE
	Channel	4.0 km SW
	Thamirabarani River	4.5km SW
	Vitruirunthan Lake	9.0km SW
Greenbelt Development Plan	Proposed to plant 2500 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	2.0 KLD	
Nearest Habitation	1.2 km – South East	
Nearest Reserve Forest	Kolundhumalai R.F – 10.95 Km – South	
Nearest Wild Life Sanctuary	Kalakad Mundanthurai Tiger Reserve – 16 Km - South	

Source: Approved Mining & Land Documents.

1.3 BRIEF DESCRIPTION OF THE PROJECT

1.3.1 Nature and Size of the Project

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

The peak production of Rough stone is 2,73,005 m³ maximum in a year (182m³ per day/ 15Tippers per day considering 12m³ per load). The depth of the mining is 47m Bgl

1.3.2 Location of the Project

- The project site is located in Vadakku Ariyanayagipuram - II Village, Cheranmahadevi Taluk and Tirunelveli District.
- 13km Northwest of Tirunelveli, 7.3 km NorthWest of Cheranmahadevi and 3.8 km Northeast side of Vadakku Ariyanayagipuram - II Village.

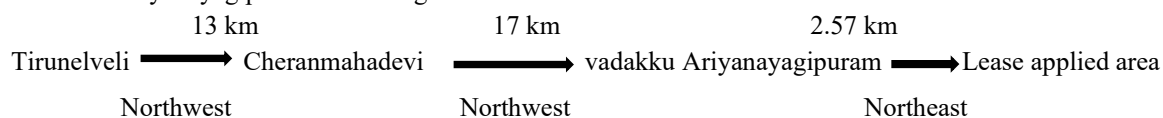
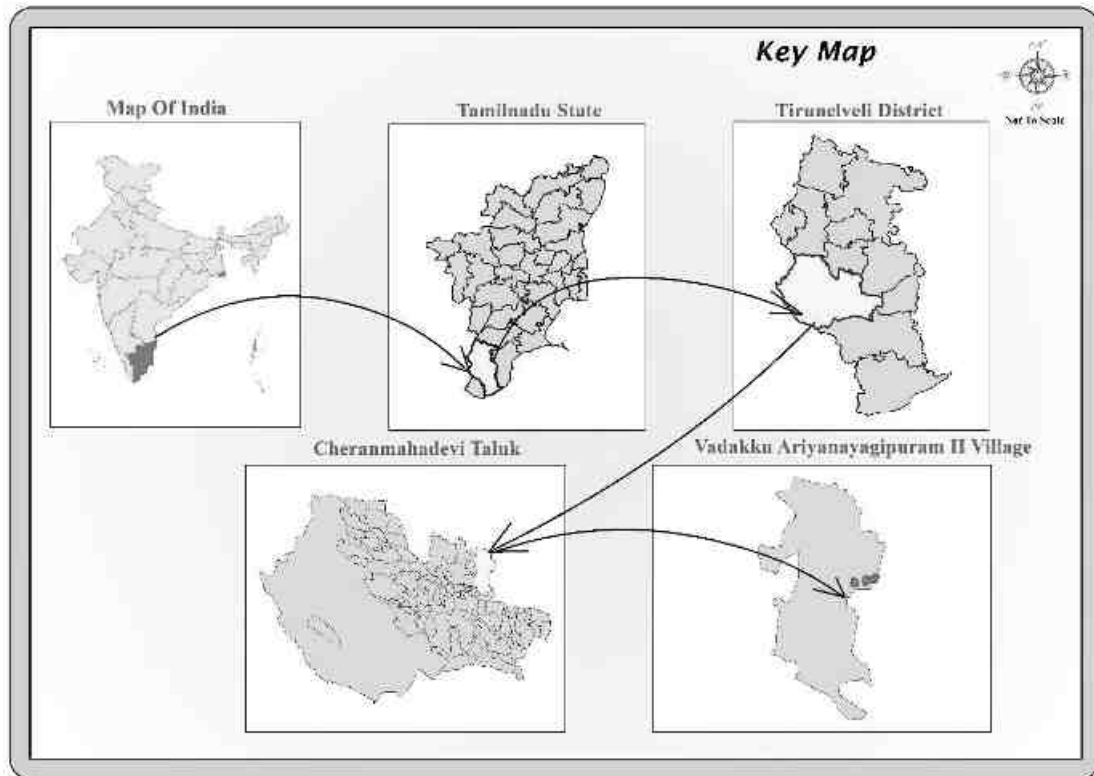


FIGURE 1.2 LOCATION MAP OF THE PROJECT SITE



Source: Survey of India Toposheet 57-H/14

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

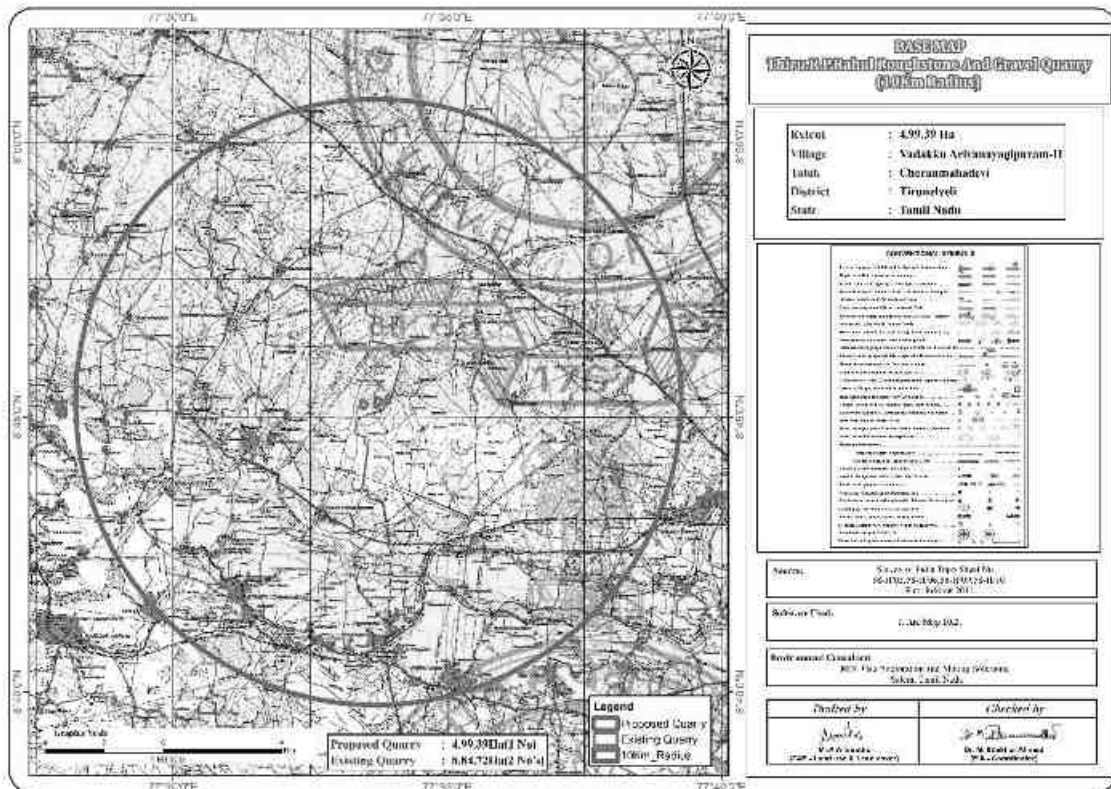
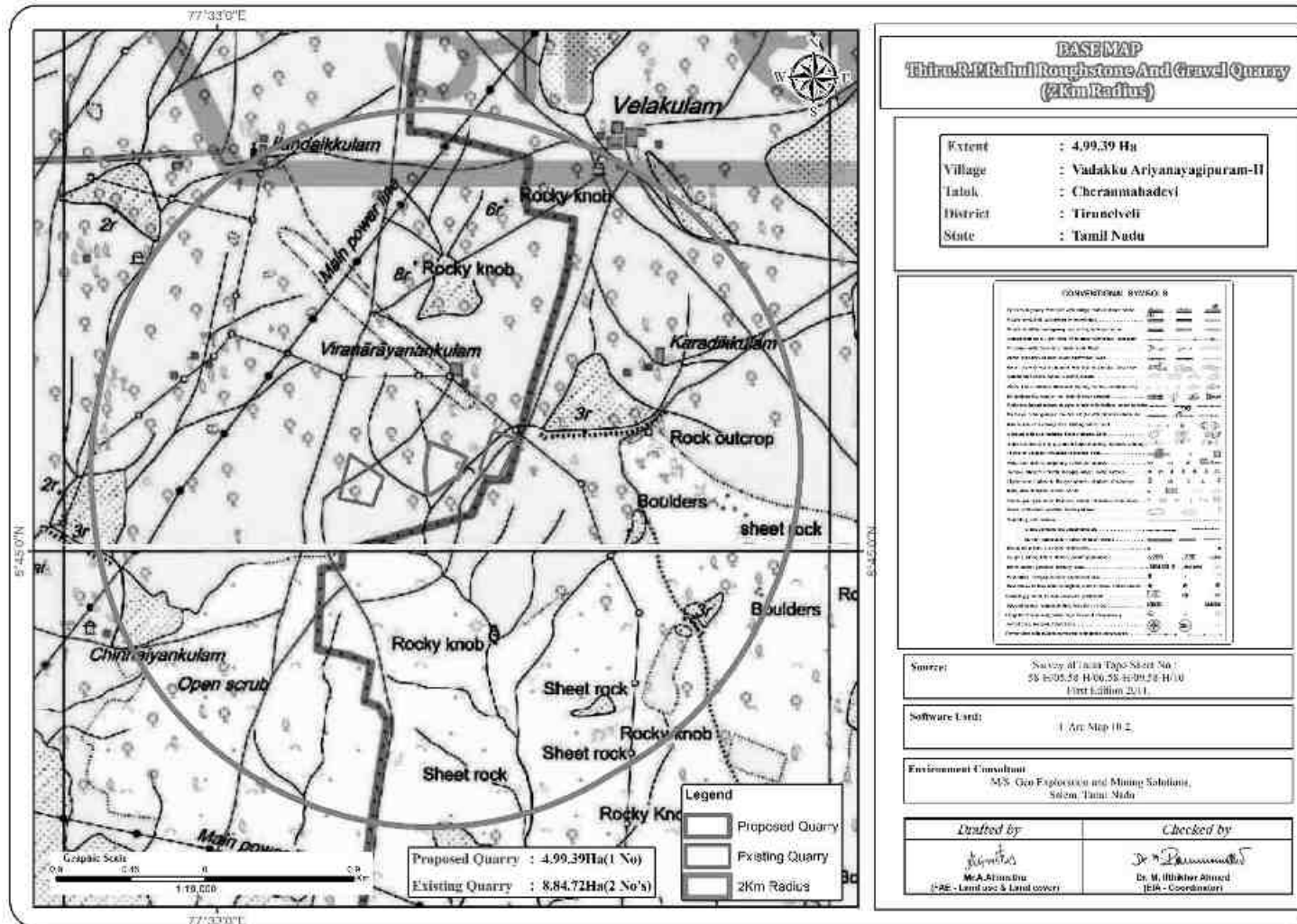


FIGURE 1.4: TOPOSHEET MAP OF THE STUDY AREA 2KM RADIUS



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 –

- Proponent applied for Rough stone quarry letter on 13.09.2019
- Precise Area Communication Letter was issued by the Assistant Director Department of Geology and Mining, Tirunelveli Rc. No M2/35382/2019, Dated: 28.08.2023.
- The Mining Plan was prepared by Recognized Qualified Person and approved by Assistant Director, Geology and Mining, Tirunelveli, vide Rc. No M2/35382/2019, Dated: 19.09.2023
- The proposed project falls under “B1” Category as per Order Dated: 04.09.2018 & 13.09.2018 passed by Hon'ble National Green tribunal, New Delhi in O.A. No. 173 of 2018 & O.A. No, 186 of 2016 and MoEF & CC Office Memorandum F. No. L-11011/175/2018-IA-II (M) Dated: 12.12.2018
- Proponent applied for ToR for Environmental Clearance vide online Proposal No. SIA/TN/MIN/454785/2023. dated: 08.12.2023.

SCOPING:

- The proposal was placed in 441th SEAC meeting held on 31.06.2024 and the committee recommended for issue of ToR.
- The proposal was considered in 698th SEIAA meeting held on 19.02.2024 and issued ToR vide Identification No: TO23B0108TN5277464N Dated 13.03.2024

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 Tor Identification No. TO23B0108TN5277464N Dated 13.03.2024. The Details of the ToR Compliance is given in the Page No.

1.6 POST ENVIRONMENT CLEARANCE MONITORING

The proponent shall submit a half-yearly compliance report in respect of stipulated Environmental Clearance terms and conditions to MoEF & CC Regional Office & SEIAA after grant of EC on 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 summer season (March 2024 – May 2024) for various environmental components so as to assess the anticipated impacts of the cluster quarry projects on the environment and suggest suitable mitigation measures for likely adverse impacts due to the proposed project.

TABLE 1.3: ENVIRONMENT ATTRIBUTES

Sl.No.	Attributes	Parameters	Source and Frequency
1	Ambient Air Quality	PM 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)	8 locations – data monitored once for 24 hours during EIA study
6	Soil Characteristics	Physical and Chemical Parameters	Once at 6 locations during study period
7	Land use	Existing land use for different categories	Based on Survey of India topographical sheet and satellite imagery and primary survey.
8	Socio-Economic Aspects	Socio-economic and demographic characteristics, worker characteristics	Based on primary survey and secondary sources data like census of India 2011.

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

Source: Field Monitoring Data

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

- Application for Quarrying Lease as per Tamil Nadu Minor Mineral Concession Rules, 1959.
- Obtained Precise Area Communication Letter as per Tamil Nadu Minor Mineral Concession Rules, 1959 for Preparation of Mining Plan and obtaining Environmental Clearance.
- The Mining Plan has been approved under Rule 41 & 42 as amended of Tamil Nadu Minor Mineral Concession Rules, 1959.
- Tor Identification No. TO23B0108TN5277464N Dated 13.03.2024

2. PROJECT DESCRIPTION

2.0 GENERAL

The Proposed Rough Stone Quarries requires Environmental Clearance. There are 1 proposed, and 2 existing quarries forming a cluster; calculated as per MoEF & CC Notification S.O. 2269(E) Dated 1st July 2016 and the total extent of cluster is 13.84.11 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 site is located in Vadakku Ariyanayagipuram - II Village, Cheranmahadevi Taluk and Tirunelveli District.

13km Northwest of Tirunelveli, 7.3 km North West of Cheranmahadevi and 3.8 km Northeast side of Vadakku Ariyanayagipuram - II Village.

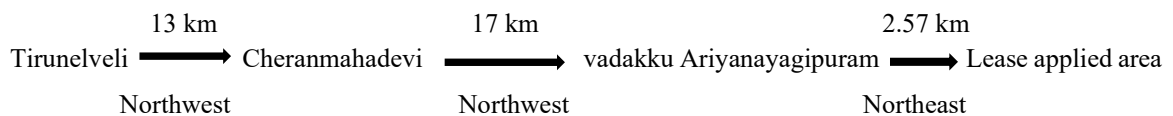


TABLE 2.1: SITE CONNECTIVITY

Nearest Roadway	NH44-Kanniyakumari - Bengaluru - 18 km-NE SH41A -Mukkoodal – Tirunelveli - 4 km-SW
Nearest Village	vadakku Ariyanayagipuram – 2.57 km- SW
Nearest Town	Mukkoodal – 8 km-NW
Nearest Railway Station	Cheranmahadevi Railway station - 8.5km -SW
Nearest Airport	Thoothukudi Airport - 67.0km -E
Seaport	Thoothukudi – 79 km – E

TABLE 2.2: CO-ORDINATES – PROJECT BOUNDARY

Corner Nos.	Latitude	Longitude
1	8 ^o 45'21.3753" N	77 ^o 33'41.5390" E
2	8 ^o 45'19.7673" N	77 ^o 33'45.8430" E
3	8 ^o 45'19.4242" N	77 ^o 33'46.7613" E
4	8 ^o 45'19.3034" N	77 ^o 33'46.9781" E

5	8 ⁰ 45'19.0013" N	77 ⁰ 33'47.5202" E
6	8 ⁰ 45'18.6515" N	77 ⁰ 33'48.1478" E
7	8 ⁰ 45'18.2540" N	77 ⁰ 33'48.8609" E
8	8 ⁰ 45'17.5583" N	77 ⁰ 33'48.4634" E
9	8 ⁰ 45'16.3910" N	77 ⁰ 33'47.9328" E
10	8 ⁰ 45'14.8925" N	77 ⁰ 33'47.3613" E
11	8 ⁰ 45'14.2002" N	77 ⁰ 33'47.1788" E
12	8 ⁰ 45'14.3991" N	77 ⁰ 33'46.4945" E
13	8 ⁰ 45'11.0397" N	77 ⁰ 33'41.7538" E
14	8 ⁰ 45'11.3863" N	77 ⁰ 33'41.1058" E
15	8 ⁰ 45'16.1051" N	77 ⁰ 33'40.6252" E
Datum: UTM-WGS84, Zone 43 North		

FIGURE 2.1: TOPOGRAPHICAL VIEW OF PROJECT AREA

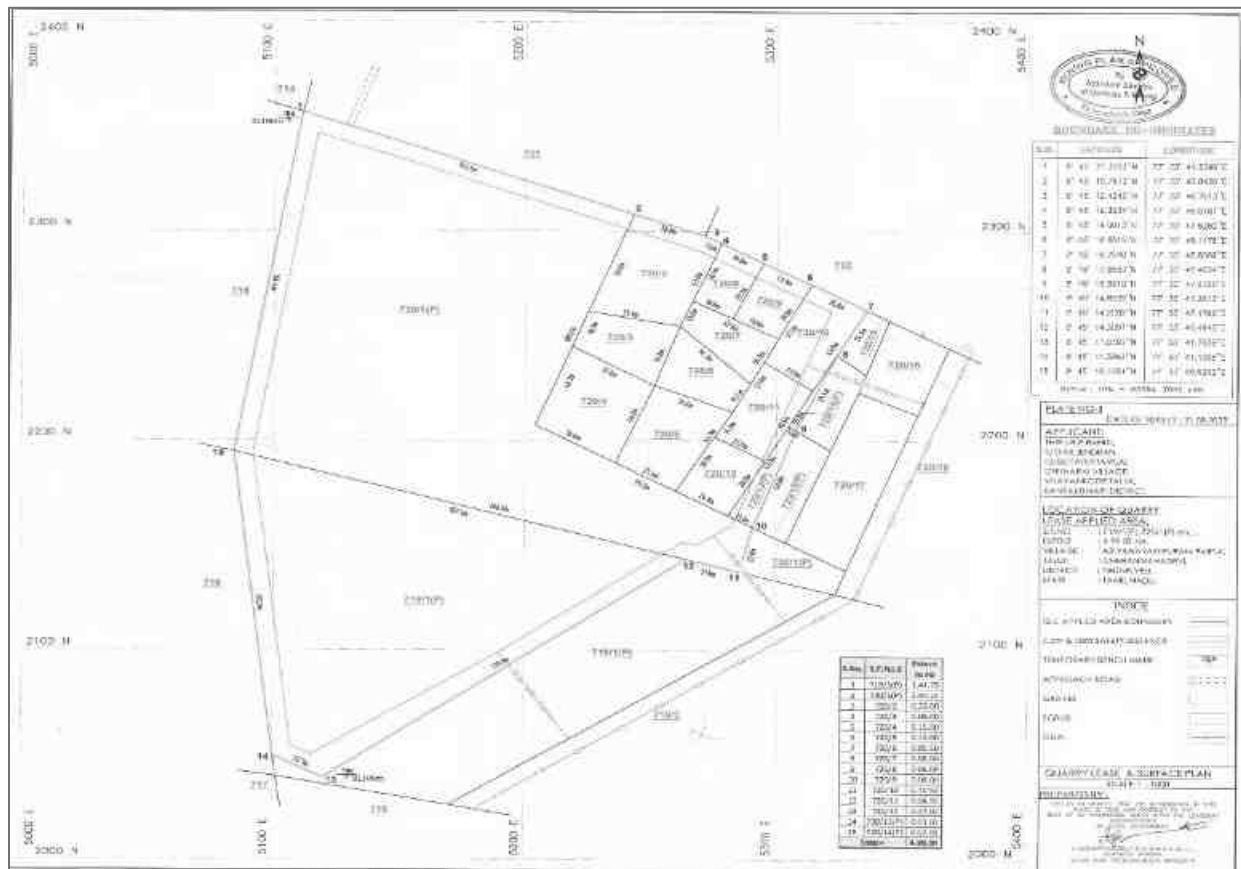


FIGURE 2.2: GOOGLE IMAGE OF THE PROJECT AREA



Source: Google Earth Imagery

FIGURE 2.3: QUARRY LEASE PLAN / SURFACE PLAN



Source: Approved Mining Plan

FIGURE 2.4: VILLAGE MAP SUPERIMPOSED ON GOOGLE EARTH IMAGE

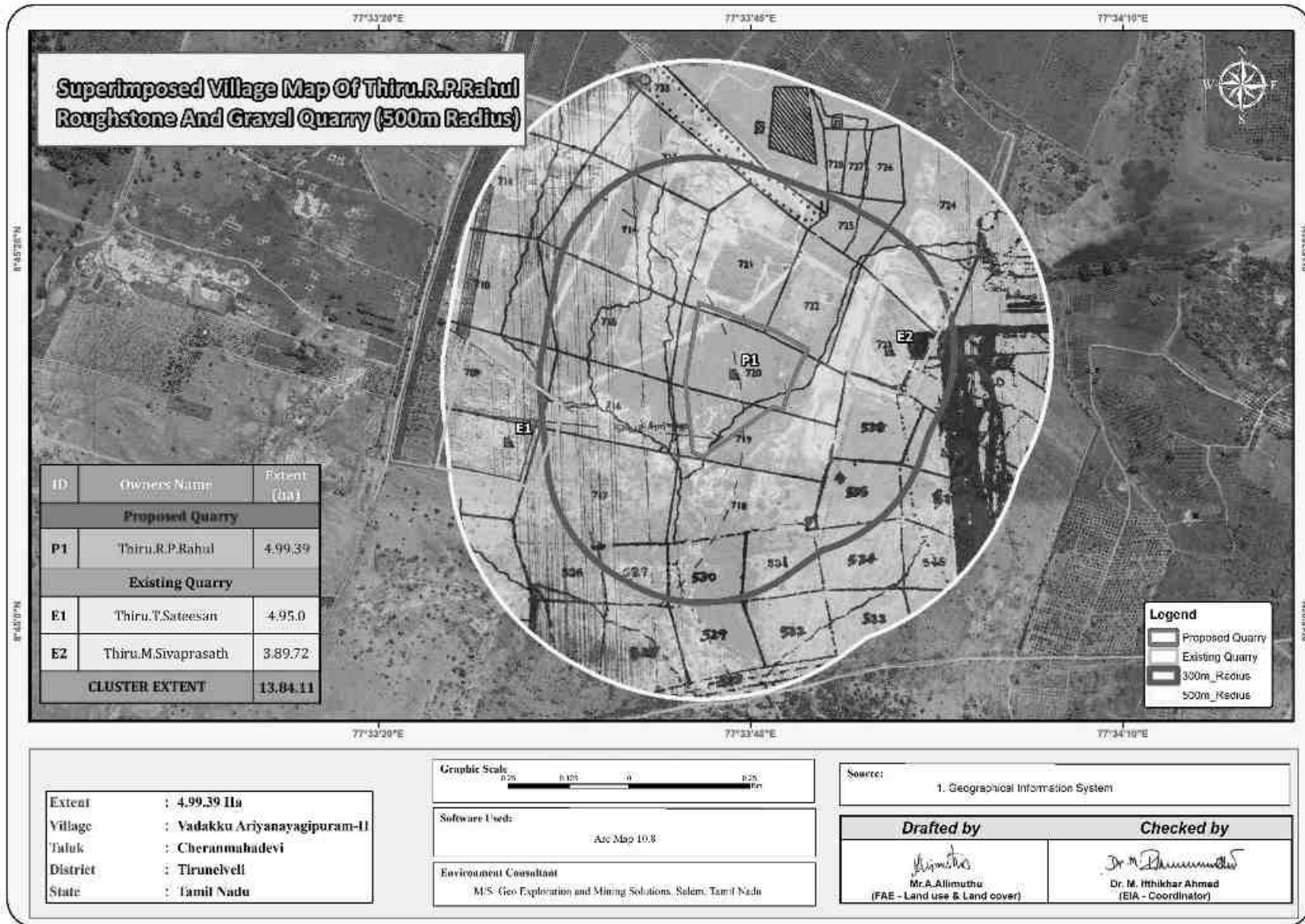


FIGURE 2.5: IMAGE SHOWING SURFACE FEATURES AROUND 10 KM RADIUS

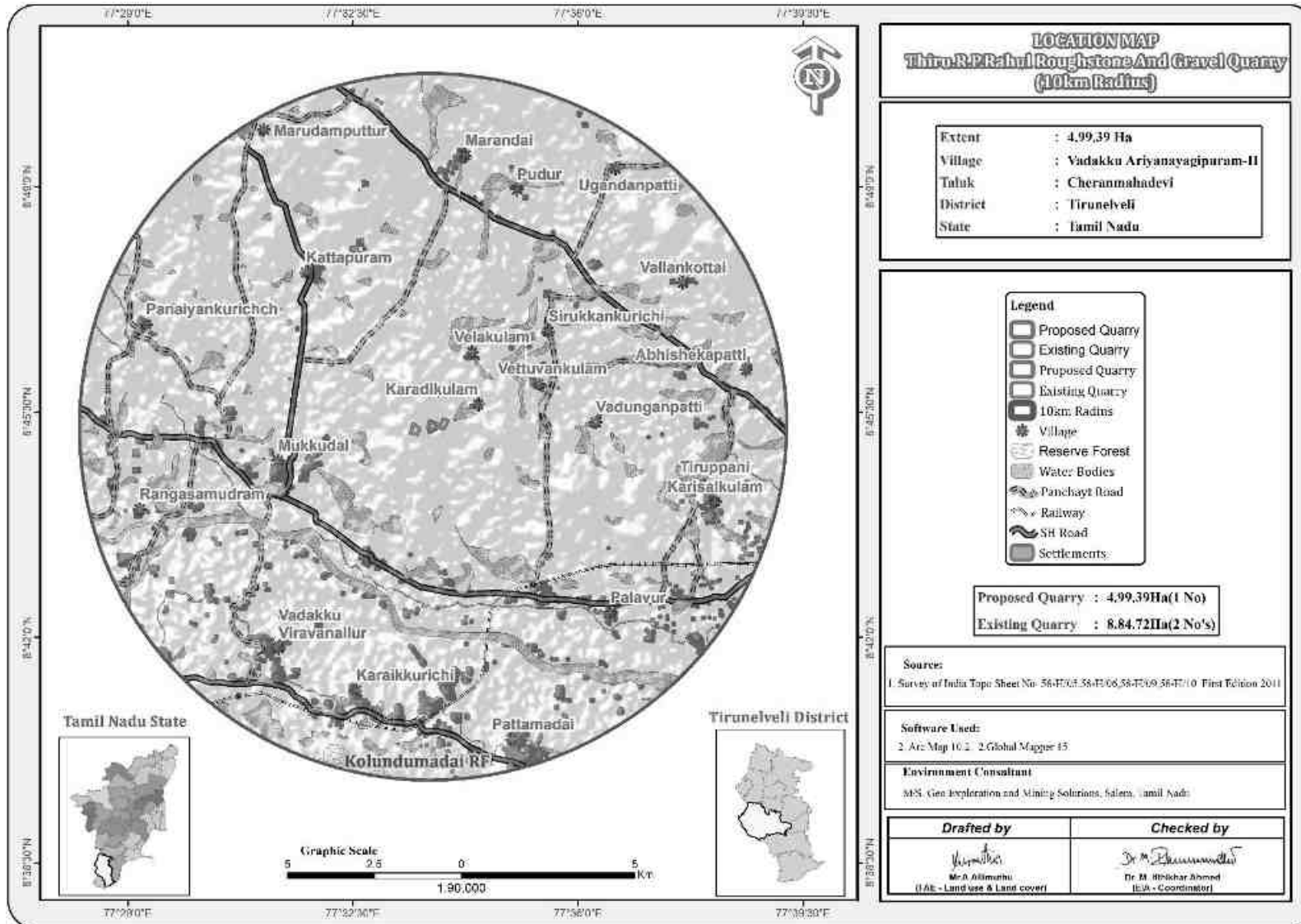
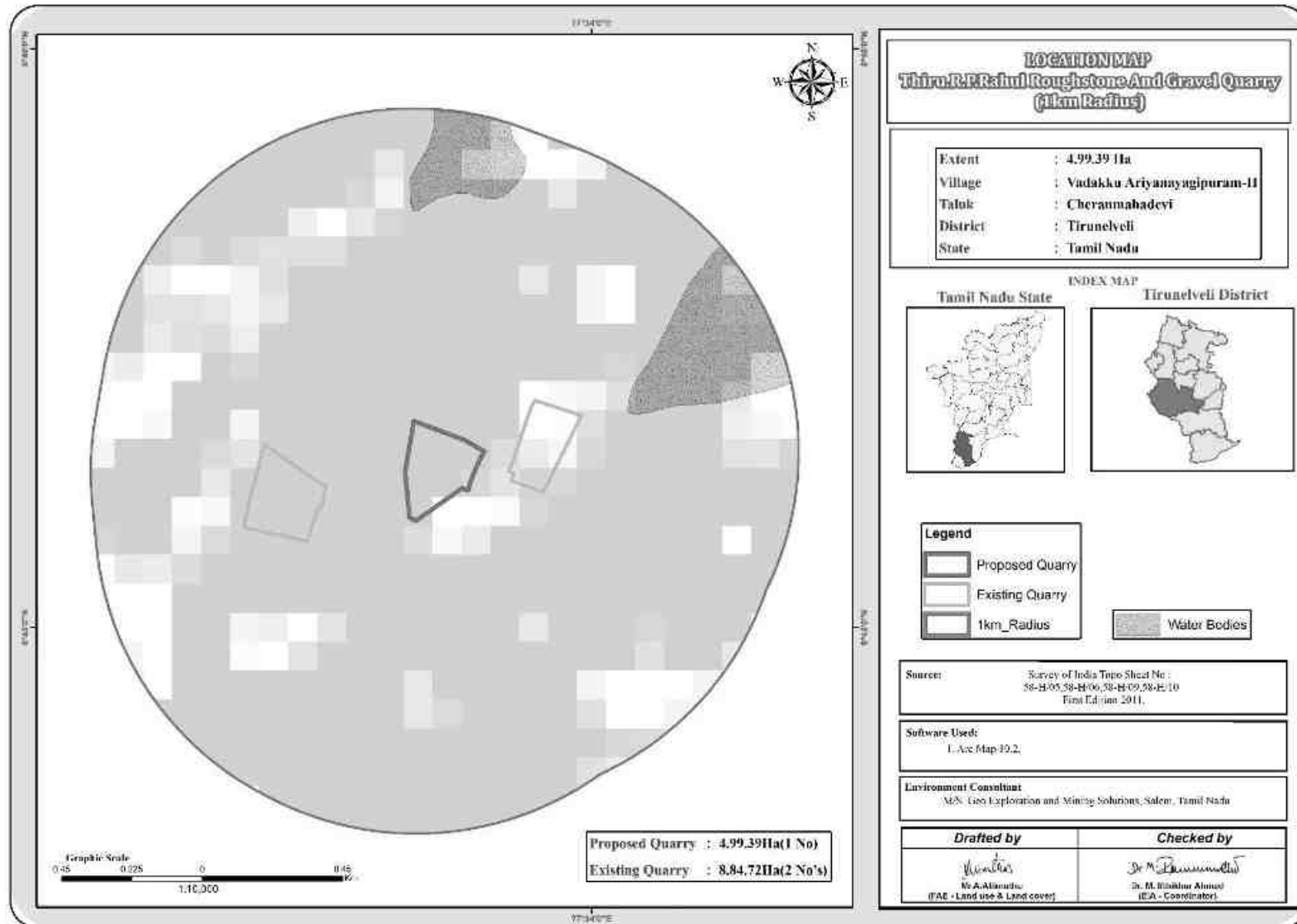


FIGURE 2.6: IMAGE SHOWING SURFACE FEATURES AROUND 1 KM RADIUS



2.2.1 Project Area

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

TABLE 2.3: LAND USE PATTERN

Description	Present area (Ha)	Area at the end of this quarrying period (Ha)
Area under quarrying	Nil	4.13.90
Infrastructure	Nil	0.02.00
Roads	Nil	0.05.00
Green Belt	Nil	0.67.00
Unutilized Area	4.99.39	0.11.49
Grand Total	4.99.39	4.99.39

Source: Approved Mining Plan

2.2.2 Size or Magnitude of Operation

TABLE 2.4: RESOURCES AND RESERVES

PARTICULARS	DETAILS	
	Rough Stone	Gravel in m ³
Geological Resources	27,46,645	99,878
Mineable Reserves	11,49,795	83,680
Production for five-year plan period	10,67,645	83,680
Peak Production	2,73,005	33,696
Mining Plan Period / Lease Applied Period	5 Years	
Number of Working Days	300 Days	
Production per day	711	93
No of Lorry loads (12m ³ per load)	59	7
Proposed Depth of Mining as per ToR	47m (2m Gravel + 45 m Rough Stone)	

Source: Approved mining plan.

2.3 GEOLOGY

2.3.1 Regional Geology

Tirunelveli district represents a well-developed lithopackage of meta-sedimentary sequence inter banded with charnockite Group of rocks. The rock types exposed are of quartzite, calc-granulite, garnet-biotite-sillimanite gneiss, garnet quartzo-feldspathic gneiss and garnet-biotite-cordierite gneiss belonging to Khondalite Group of rock. Charnockite and pyroxene Granulite are the Charnockite Group. Hornblende-biotite gneiss belongs to Migmatitic Complex. Besides, basic intrusive (pyroxenite) and acid intrusive (granite) are noticed. The younger intrusive are represented by pegmatite and quartz veins. Evidence of development of incipient / patchy charnockite along the shear plane is noticed in the district along the Western Ghat high hills

2.3.2 Stratigraphy of the area: -

Age	Group	Lithology
Holocene to Recent	Alluvium Colluvium	Red Soil
		Coastal Sand
		Clay
		River Alluvium

		Laterite Red Teri Kankar Tuffaceous Kankar Shell LimeStone Calcareous Sandstone
Mio-Pliocene	Panamparai Sandstone	Hard, Compact, Calcareous Sandstone Shell Limestone
Precambrian	Crystalline Complex	Charnockite Mixed Composite Gneiss Peliticgneiss Calc-Granulite Quartzite

Rock type found in the area belong to the Khondalite and Charnockite groups and Migmatite Complex of Easter Ghats Super group (Archaean Age), which are unconformably overlain by Tertiary and Quaternary sediments. Garnet-biotite-sillimanite gneiss, quartzite, calc-granulite and limestone of Khondalite group with epidiorite occurring as narrow linear bands. Charnockite group is represented by acid variants. These rock types occur as xenoliths within the Migmatite Complex occupies a major part of the area, comprising medium grained hornblende-biotite gneiss and garnet-biotite gneiss. Gypsum, limestone, beach sand, kankar and shell limestone are the Economic minerals of the district.

Crystalline Limestone, Multi color dimension stone, rough stone/gravel, garnet and ilmenite sand are notable economic importance minerals of found in Tirunelveli District. Minor occurrences of graphite, mica and gemstone are also reported in the district. Mining activities based on rough stone (mostly charnockite) are majorly concentrated in Alangulam, Ambasamudram, Nanguneri, Palayamkottai, Radhapuram, Sankarankoil, Shenkottai, Sivagiri, Tenkasi, Tirunelveli, and Veerakeralamputhur Taluks in the district under operation for production of construction materials and earth fill as gravel.

Source: <https://tirunelveli.nic.in/document-category/geology-and-mining/>

2.3.3. Geology of the lease area

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 plain terrain. The area has gentle slope towards Southern side. The altitude of the area is 98 m (max) above mean sea level. The area is covered by 2 m (avg) thickness of Gravel Formation. Massive Charnockite is found after 2 m (Gravel Formation) which is clearly inferred from the nearby existing quarry pit.

2.3.4 Hydrogeology

Aquifer Systems:

The district is underlain by both porous and fissured formations. The important aquifer systems in the district are constituted by unconsolidated & semiconsolidated formations and weathered and fractured crystalline rocks.

The porous formations in the district include sandstones and clays of Recent to subrecent and Tertiary age (Quaternary). The Recent formations comprising mainly sands, clays and gravels are confined to major drainage courses in the district. The maximum thickness of alluvium is 45.0 m bgl, whereas the average thickness is about 25.0 m. Ground water occurs under water table and confined conditions in these formations and is being developed by means of dug wells and filter points. The productive zones are encountered in the depth range of 29.5 to 62 m bgl.

Alluvium, which forms a good aquifer system along the Vaippar and Gundar river bed which is one of the major sources of water supply to the villages

The water-bearing properties of crystalline formations which lack primary porosity depend on the extent of development of secondary intergranular porosity. The occurrence and movement of ground water in these rocks are under unconfined conditions in the joints & fissures and dependent on the nature and extent of pores and interconnection of fractures zones. The morpho-tectonic analysis of the crystalline tract indicates the presence of deep seated tensile and shear fractures particularly along the fold axes. These tension joints and fractures and shear fractures at deeper depth of 30 to 100 m have been acting as conduits for ground water movement.

Aquifer Parameters

The thickness of aquifer in this district is highly erratic and varies between 15 m to 20 m below ground level. The inter granular Porosity is essentially dependent on the intensity and degree of weathering and fracture development in the bed rock. As discussed earlier deep weathering has developed in Gneissic formations and moderate weathering in Charnockite formations. The range of aquifer parameters in hard rock and sedimentary formations are given below:

FIGURE 2.7: REGIONAL GEOLOGY MAP

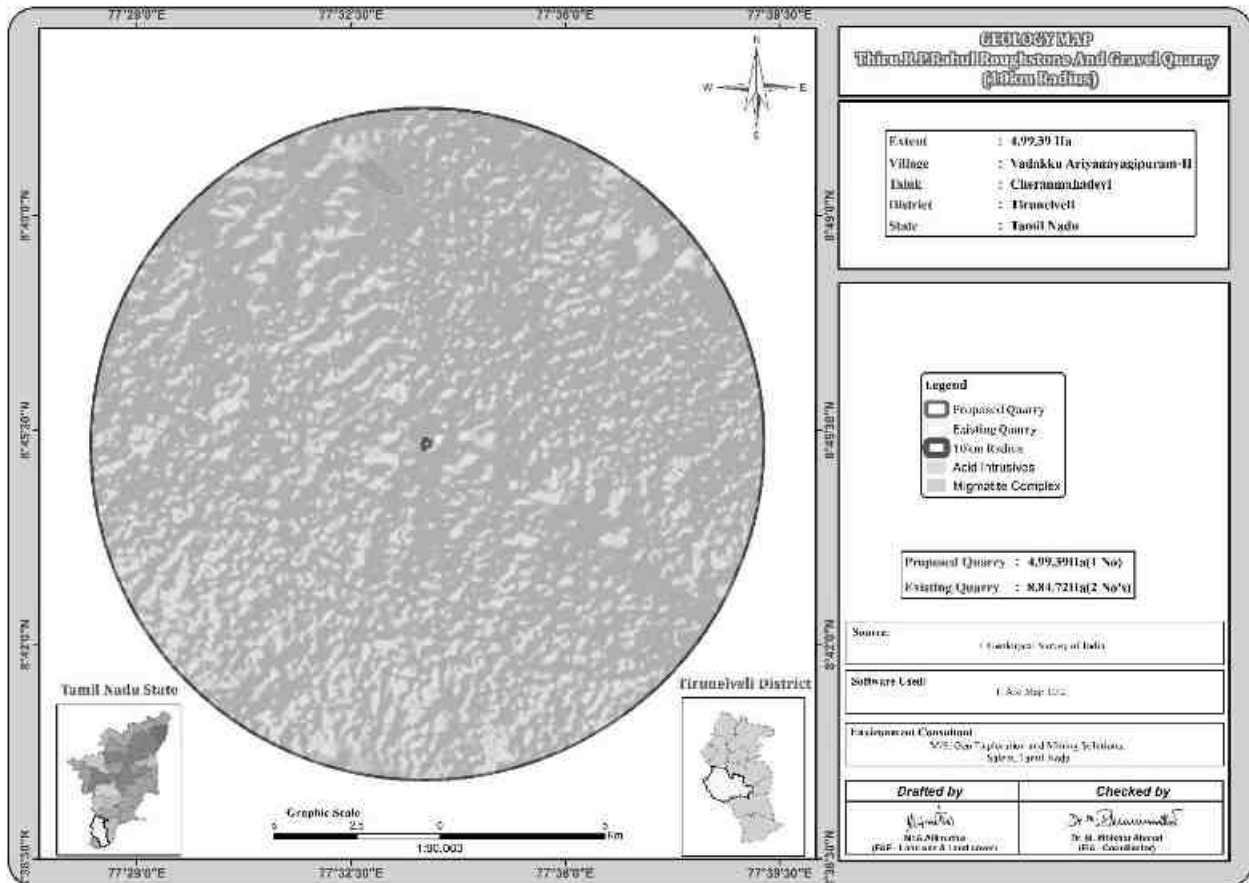
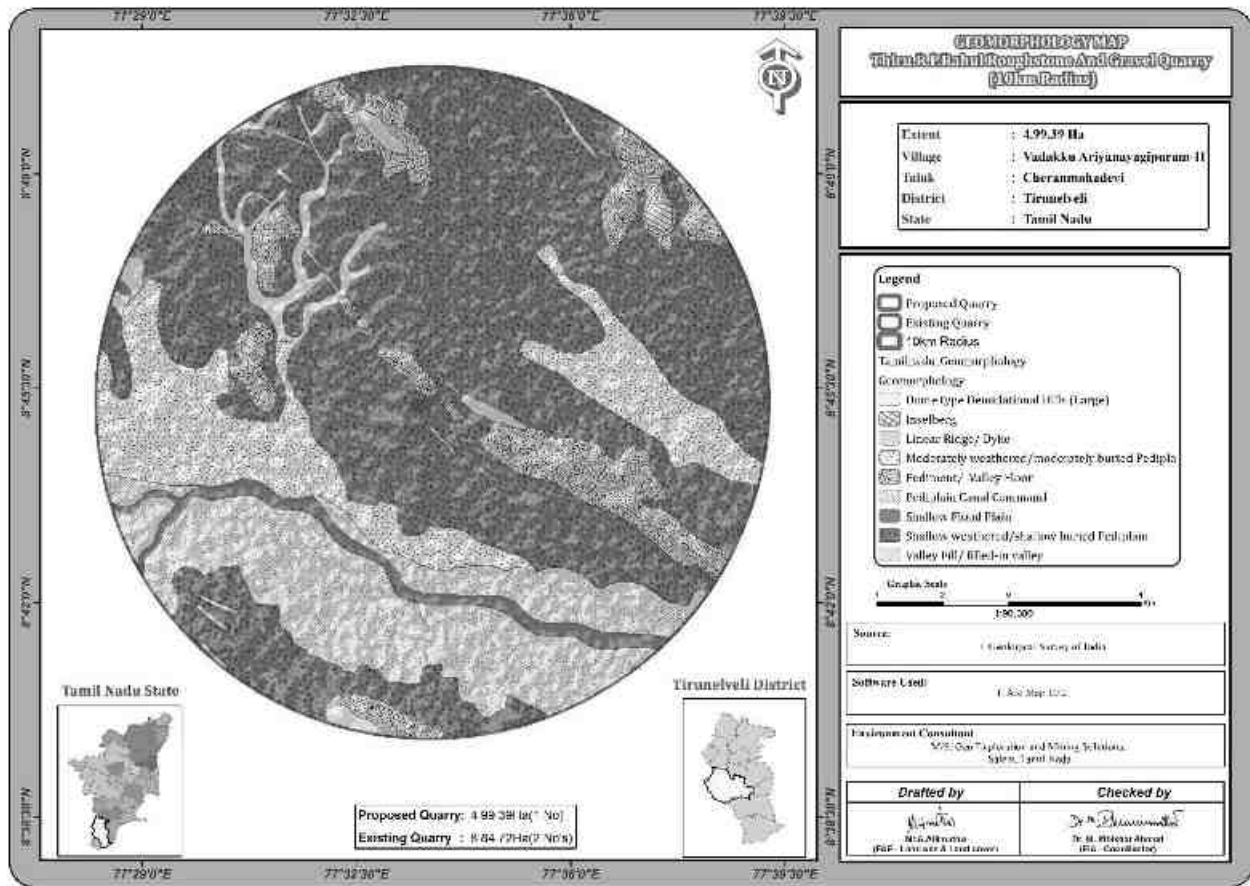


FIGURE 2.8: GEOMORPHOLOGY MAP



2.4 RESOURCES AND RESERVES

The Resources and Reserves of Rough Stone and Gravel were calculated based on Cross-Section Method by plotting sections to cover the maximum lease area. Based on the availability of Geological Resources the Mineable Reserves are calculated by considering excavation system of bench formation and leaving essential safety distance of 7.5 m (Safety Barrier all around the applied area) and safety distance as per precise area communication letter and deducting the locked up reserves during bench formation (Also called as Bench Loss) and the Mineable Reserves is calculated considering there is no waste / overburden / side burden (100% Recovery Anticipated).

TABLE 2.5: RESOURCES AND RESERVES

Description	Rough Stone m ³	Gravel m ³
Geological Resource in m ³	27,46,645	99,878
Mineable Resource in m ³	11,49,795	83,680
Year wise production for five-year plan period as per ToR	10,67,645	83,680

Source: Approved Mining Plan

TABLE 2.6: YEAR-WISE PRODUCTION PLAN AS PER ToR FOR 10 YEARS

YEAR	ROUGH STONE (m ³)	Gravel (m ³)
I	2,26,075	33,696
II	2,36,535	24,960
III	2,09,280	25,024
IV	2,73,005	-
V	1,22,750	-
TOTAL	10,67,645	83,680

Source: Approved Mining Plan

Disposal of Waste

In this Proposed Quarry no waste is anticipated, quarried out materials (Rough stone) will be utilized (100%).

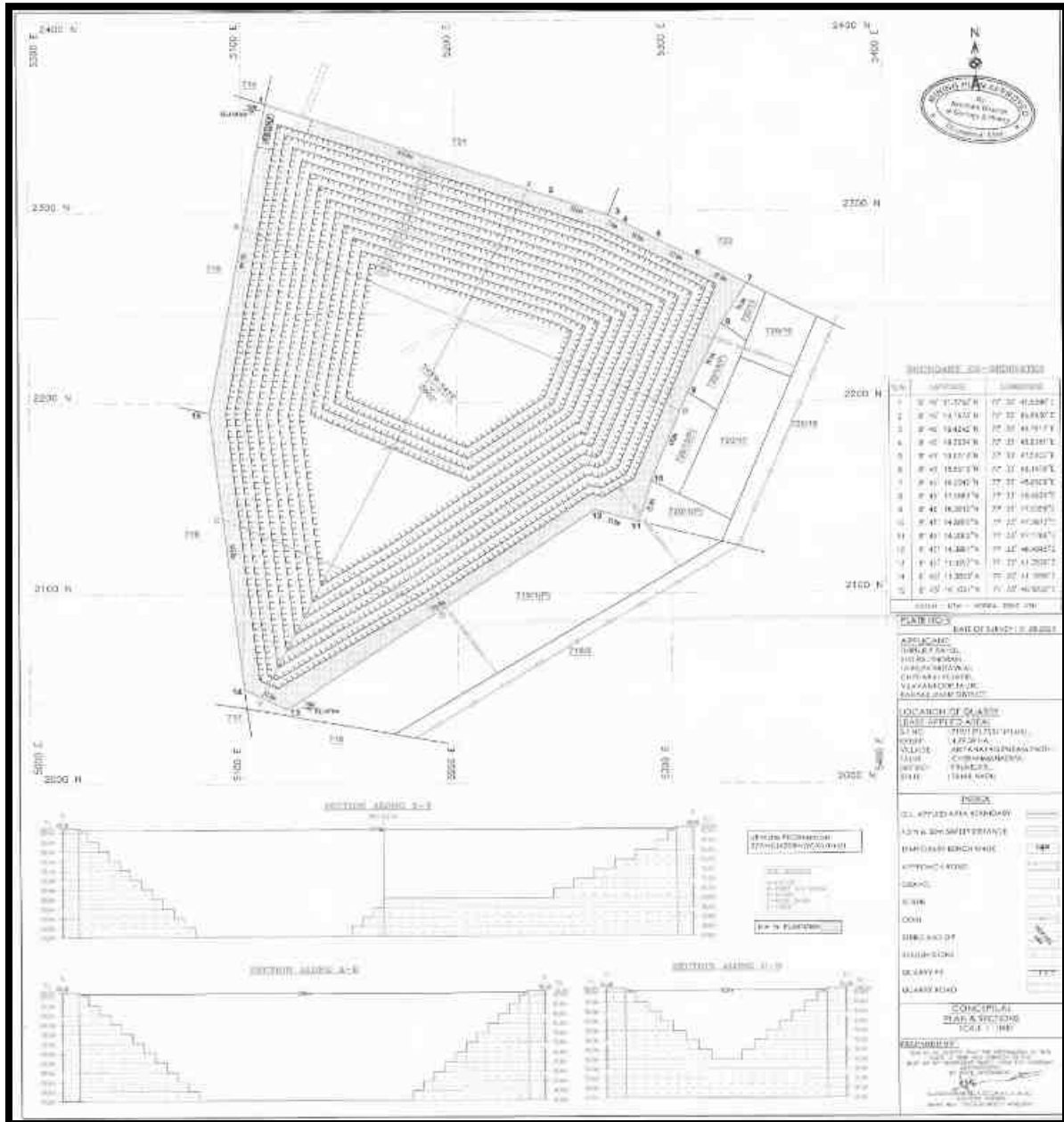
The ultimate pit size is designed based on certain practical parameters such as economical depth of mining, safety zones, permissible area, etc.

TABLE 2.7: ULTIMATE PIT DIMENSION

Pit	Length (Max) (m)	Width (Max) (m)	Depth (Max)
I	277	208	57m

Source: Approved Mining Plan

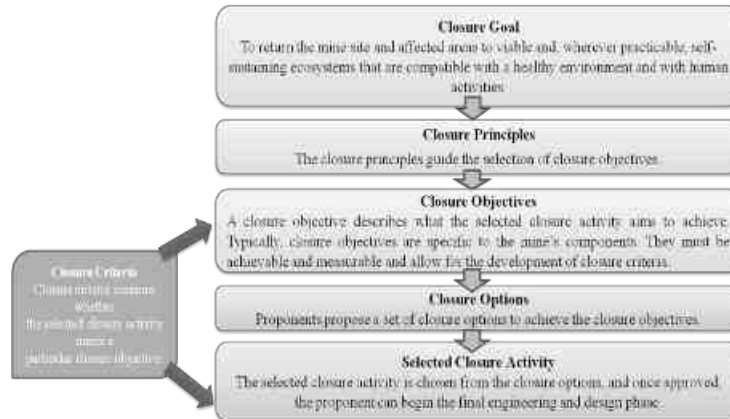
FIGURE 2.10: CLOSURE PLAN AND SECTIONS



Source: Approved Mining Plan

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

Closure Objectives



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

Closure Planning & Options Considerations in Mine Design –

- The closure of mine is well planned at the initial stage of planning & design consideration by the internal and external stake holders
- Construction of 2m height bund all along the mine pit boundary and ensure its stability all time & construction of garland drain along the natural slope to avoid sliding and collection of soil to the pit & surface runoff during rainfall
- After complete exploitation of mineral, the lowest bench foot wall side will be maintained as plain surface without any sump pits to avoid any accidents
- All the sharp edges will be dressed to smoother face before the closure of mine and ensure no loose debris on hanging wall side
- The project proponent as a part of social responsibilities assures to supply the stored mine pit water to the nearby villages after effective treatment process as per the standards of TNPCB & TWAD
- Native species will be planted in 3 row patterns on the boundary barriers and 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-meter height bench with a bench width not less than the bench height. Bench slope will be maintained as 60°.

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

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

2.5.1 Drilling & Blasting Parameters

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

Spacing	–	1.2m
Burden	–	1.0 m
Depth of hole	–	1.5 m
Charge per hole	–	0.50 – 0.75kg
Powder factor	–	8.0 tonnes/kg
Diameter of hole	–	32 mm
Total Volume	=	10,67,645 m ³
	=	10,67,645/5
	=	2,13,529/300
	=	712 * 2.6
	=	1851 Tonnes per day
Therefore, Number of Holes per day	=	1851/8
	=	231 Kg of Explosive Used
	=	231*2
	=	463 Holes

Explosives per hole = ½ kg hence 232 kg of Explosives will be utilized maximum considering the 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 2.8 PROPOSED MACHINERY DEPLOYMENT

S.NO.	TYPE	NOS	SIZE/CAPACITY	MOTIVE POWER
1	Wagon Drill Machine	2	3m – 9m	Diesel Drive
2	Jack hammers	4	1.2m to 2.0m	Compressed air
3	Compressor	1	400psi	Diesel Drive
4	Excavator with Bucket and Rock Breaker	2	300 HP	Diesel Drive
5	Truck	5	35 Tonnes	Diesel Drive
6	Water Sprinkling Tanker	1	16000 litres	Diesel Drive

Source: Approved Mining Plan

2.6 GENERAL FEATURES

2.6.1 Existing Infrastructures

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

2.6.2 Drainage Pattern

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

2.6.3 Traffic Density

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

Traffic density measurements were performed at two locations

1. Vadakku Ariyanayagipuram Village Road
2. Alangulam To Tirunelveli State Highway

Traffic density measurement was made continuously for 24 hours by visual observation and counting of vehicles under three categories, viz., Heavy motor vehicles, light motor vehicles and two/three wheelers. As traffic densities on the roads are high, two skilled persons were deployed simultaneously at each station during each shift- one person on either direction for counting the traffic. At the end of each hour, fresh counting and recording was undertaken.

TABLE.2.9: TRAFFIC SURVEY LOCATIONS

Station Code	Road Name	Distance and Direction	Type of Road
TS1	Vadakku Ariyanayagipuram Village Road	3.3km NW	Panchayat Road
TS2	Alangulam To Tirunelveli State Highway	5Km NW	State Highway

Source: On-site monitoring by GEMS FAE & TM

TABLE 2.10: EXISTING TRAFFIC VOLUME

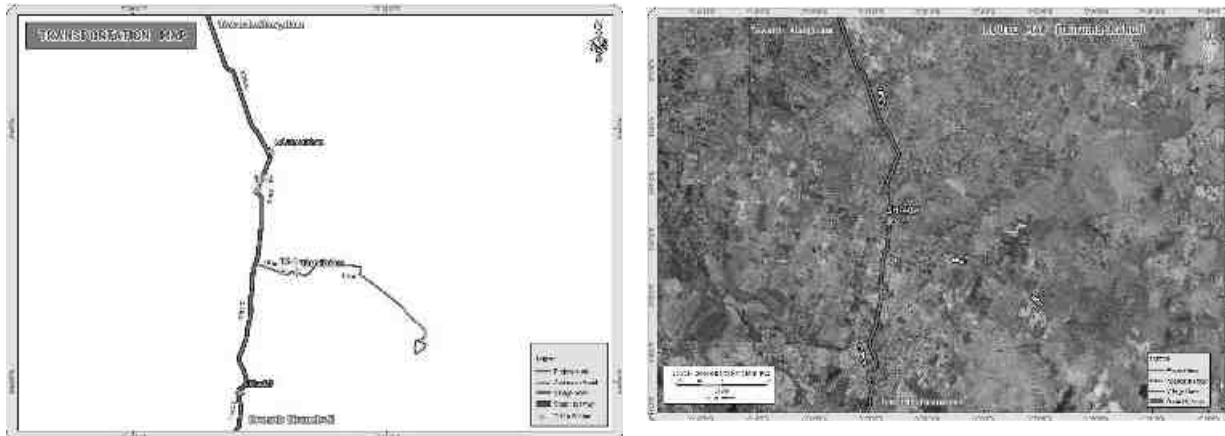
Station code	HMV		LMV		2/3 Wheelers		Total PCU
	No	PCU	No	PCU	No	PCU	
TS1	175	525	75	75	150	75	750
TS2	225	675	125	125	200	100	900

Source: On-site monitoring by GEMS FAE & TM

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

TABLE 2.11: ROUGH STONE & GRAVEL HOURLY TRANSPORTATION REQUIREMENT

Transportation of Rough Stone & Gravel per day		
Capacity of trucks	No. of Trips per day	Volume in PCU
20 tonnes	59	177

FIGURE.2.11: MINERAL TRANSPORTATION ROUTE MAP**Proposed Transportation Route:**

1. The Rough stone will be transported to the needy customer from the Project Site
2. Existing approach road is located on the West side this road connecting in the Vadakku Ariyanayagipuram Village Road (Total Stretch of the approach road = 1 km)
3. Vadakku Ariyanayagipuram Village Road connecting in the State Highway (40A) at a distance of 4km the total Stretch of the Transportation route is about 5 km from the project site.
4. No Major Habitation, Schools in the proposed transportation route.

TABLE 2.12: SUMMARY OF TRAFFIC VOLUME

Route	Existing Traffic volume in PCU	Incremental traffic due to the project	Total traffic volume	Hourly Capacity in PCU as per IRC – 1960 guidelines
Vadakku Ariyanayagipuram Village Road	750	177	927	1200
Alangulam To Tirunelveli State Highway	900	177	1077	1500

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 1,200 PCU in hour and Major district road can handle 1500 PCU in hour hence there will not be any conjunction due to this proposed transportation.

2.6.4 Mineral Beneficiation and Processing

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

2.7 PROJECT REQUIREMENT

2.7.1 Water Source & Requirement

Detail of water requirements in KLD as given below:

TABLE 2.13: WATER REQUIREMENT FOR THE PROJECT

Purpose	Quantity	Source
Dust Suppression	1.0 KLD	From Existing bore wells from nearby area
Green Belt	0.6 KLD	From Existing bore wells from nearby area
Sanitation & Drinking	0.4 KLD	From existing, bore wells and drinking water will be sourced from Approved water vendors.
Total	2.0 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

Gravel:

Per hour Excavator will consume = 10 liters / hour

Per hour Excavator will excavate = 60m³ of Gravel

Gravel quantity = 83,680/60 = 1,395hours

Diesel consume = 1,395hours x 10liters

Total diesel consumption = 13,950Liters of HSD will be utilized for Gravel

Rough stone:

Per hour Excavator will consume	= 16 liters / hour
Per hour Excavator will excavate	= 20m ³ of Rough stone
Rough stone quantity	= 11,49,795/20 = 57,490hours
Diesel consume	= 57,490hours x 16 liters
Total diesel consumption	= 9,19,840 Liters of HSD will be utilized for Rough stone
Total diesel consumption	= 9,33,790 Liters of HSD will be utilized for five years.

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 4,36,25,000 Crores.**

Description	Amount(Rs)
Operational cost	4,32,45,000
Emp cost	3,80,000
Total Project cost	4,36,25,000

Source: Approved mining Plan

2.8 EMPLOYMENT REQUIREMENT:

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

TABLE 2.14: PROPOSED MANPOWER DEPLOYMENT

Designation	No of persons
Mines Foreman	1
Mate/Blaster	1
Excavator and wagon drill operator	4
Tipper's driver	5
Jack hammer operator	8
Security	2
Helper	3
Cleaner & Co-operator	9
Total	33

Source: Approved Mining Plan & Pre-Feasibility report.

2.9 PROJECT IMPLEMENTATION SCHEDULE

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

TABLE 2.15: EXPECTED TIME SCHEDULE

Sl.No.	Particulars	Time Schedule (In Month)					Remarks if any
		1 st	2 nd	3 rd	4 th	5 th	
1	Environmental Clearance						
2	Consent to Operate						
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 2024 – May 2024 with CPCB guidelines for the following attributes –

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

Environmental data has been collected with reference to cluster quarries by GLOBAL LAB AND CONSULTANCY SERVICES Approved by ISO: 9001:2015, NABL, FSSAI, **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 summer season i.e., March – May 2024.

Study Methodology

- The project area was surveyed in detail with the help of Total Station Survey instruments and pillars were marked. The boundary coordinates were superimposed on the satellite imagery to understand the relief of the area, besides Land use pattern of the area was studied through the Bhuvan (ISRO)
- Soil samples were collected and analysed for relevant physio-chemical characteristics in order to assess the impact due to mining activities and to recommend saplings for Greenbelt development.
- Ground water samples were collected from the existing bore wells, Surface water was collected from water bodies in the buffer zone and analysed as per CPCB Guidelines.
- An onsite meteorological station was setup in cluster area, to collect data about wind speed, wind direction, temperature, relative humidity, rainfall and general weather conditions were recorded throughout the study period.
- Air quality Data were collected by installation of Respiratory Dust Samplers (RDS) for Fugitive dust, PM₁₀ and SO₂, 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	1 Hourly Continuous Mechanical/Auto matic Weather Station	1	Site specific primary data& Secondary Data from IMD Station
*Ambient Air Quality	PM10 PM2.5 SO2 NOX Fugitive Dust	24 hourly twice a week (March to May 2024)	7 (2 core & 5 buffer)	IS 5182 Part 1-23 National Ambient Air Quality Standards, CPCB
*Noise Levels	Ambient Noise	Hourly observation for 24 Hours per location	8 (2 core & 6 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 Quadrante & 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 Global Lab and Consultancy Services in association with GEMS

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

3.1 LAND ENVIRONMENT

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

3.1.1 Land Use/ Land Cover

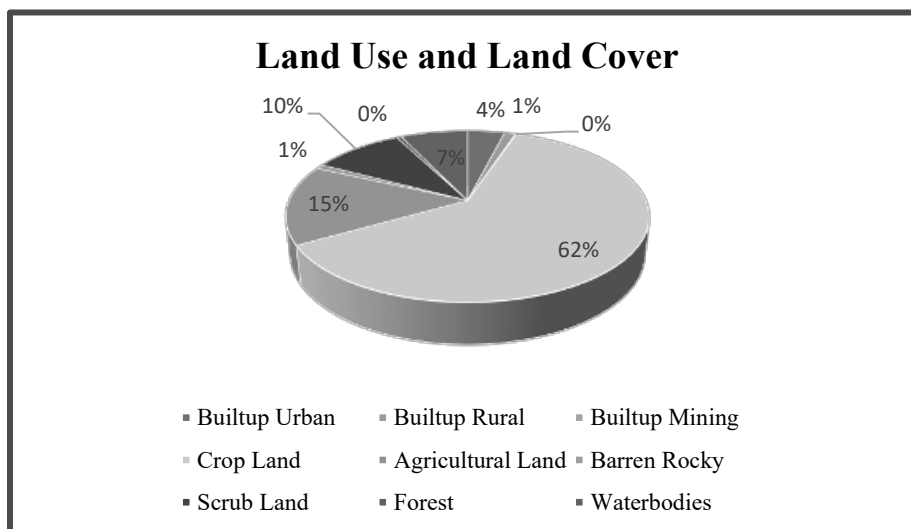
A visual interpretation technique has been adopted for land use classification based on the keys suggested in the chapter – V of the guidelines issued by NNRMS Bangalore & Level III classification with 1:50,000 scale for the preparation of land use mapping. Land use pattern of the area was studied through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

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

S.No	CLASSIFICATION	AREA in HA	AREA in %
BUILTUP			
1	Builtup Urban	1275.17	3.94
2	Builtup Rural	379.81	1.17
3	Builtup Mining	35.74	0.11
AGRICULTURAL LAND			
4	Crop Land	19918.08	61.55
5	Agricultural Land	4874.43	15.06
BARREN/WASTE LANDS			
7	Barren Rocky	286.54	0.89
8	Scrub Land	3115.73	9.63
FOREST			
9	Forest	165.37	0.51
WETLANDS/ WATER BODIES			
10	Waterbodies	2308.47	7.13
TOTAL		32359.33	100.00

Source: Survey of India Toposheet and Landsat Satellite Imagery

FIGURE 3.1: PIE DIAGRAM OF LAND USE AND LAND COVER



From the above table, pie diagram and land use map it is inferred that the majority of the land in the study area is Agriculture and crop land 76.61% followed by Built-up Lands – 5.22%, Scrub land – 9.63%, and Water bodies 7.13%.

The total mining area within the study area is 35.74 ha i.e., 0.11%. The cluster area of 13.84.11 ha contributes about 2.58% 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 side, the Northeast side of the area is existing Rough stone quarry. The North, South and West of the area having dry agricultural lands.

3.1.3 Drainage Pattern of the Area

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

3.1.4 Seismic Sensitivity

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

3.1.5 Environmental Features in the Study Area

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

FIGURE 3.2: PHYSIOGRAPHIC MAP 10KM RADIUS

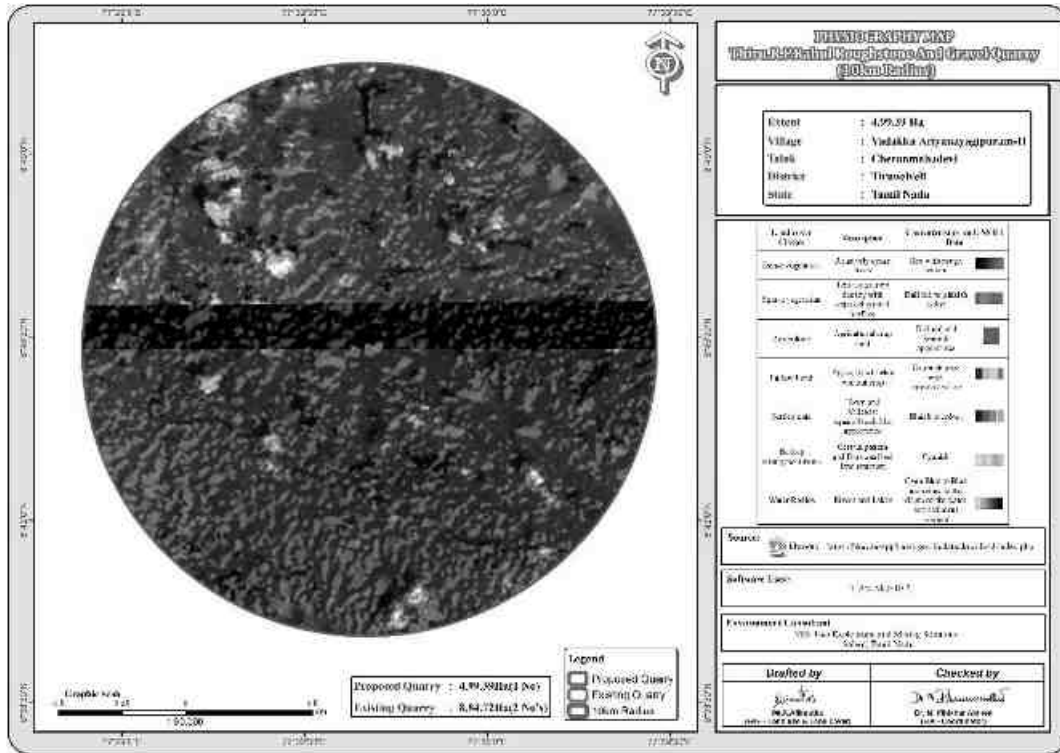


FIGURE 3.3: LAND USE LAND COVER MAP 10KM RADIUS

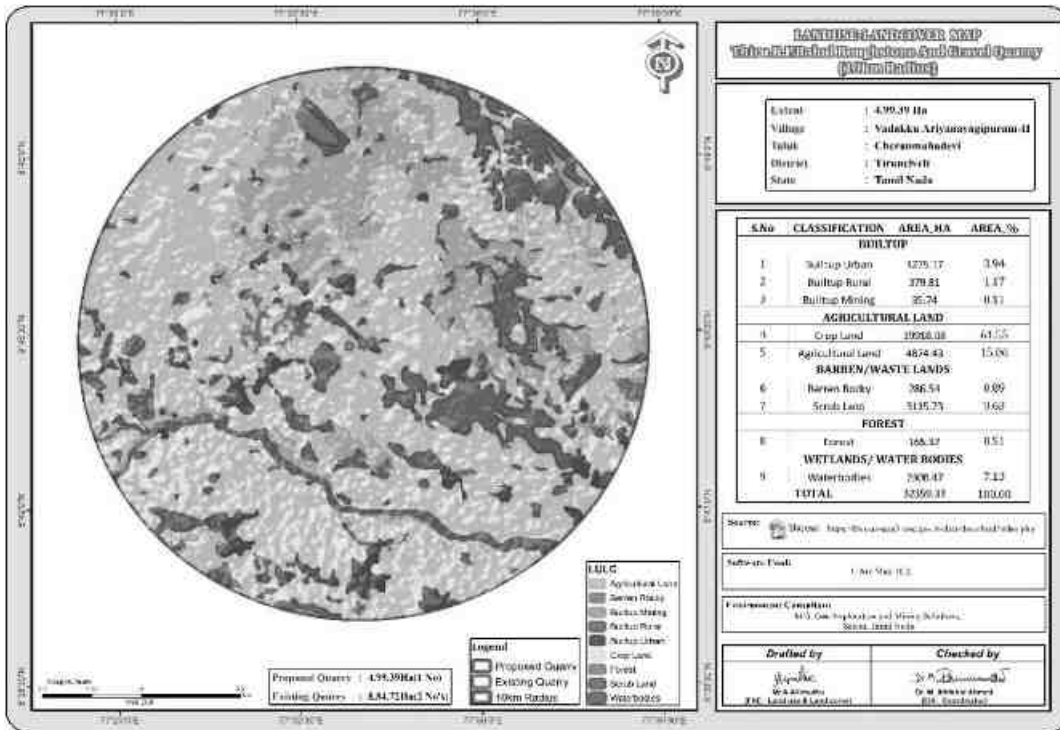


TABLE 3.3: DETAILS OF ENVIRONMENT SENSITIVITY AROUND THE CLUSTER

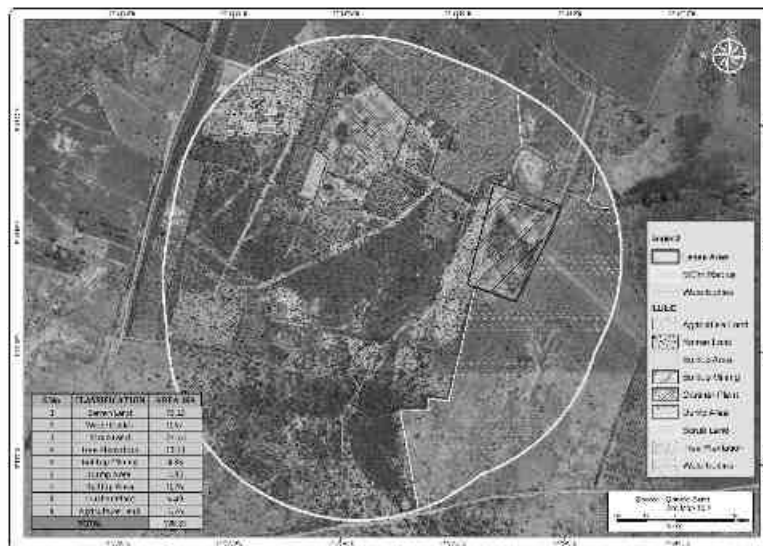
S. No	Sensitive Ecological Features	Name	Arial Distance in km from Cluster
1	National Park / Wild life Sanctuaries	None	Nil within 10Km Radius
2	Reserve Forest	Kolundumalai R. F	9.25 Km South west
3	Tiger Reserve/ Elephant Reserve/ Biosphere Reserve	Kalakkad Wildlife Sanctuary	16 km-South west
4	Critically 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

Sl.No	NAME	DISTANCE & DIRECTION
1	Odai	50m E
2	Tank	450m NE
3	Odai	3.4 Km NW
4	Thamirabarani River	4.5 Km SW
5	Pappakudi Periyakulam	6 Km W
6	Maranthai Kulam	7.5 Km N

Source: Village Cadastral Map and Field Survey

FIGURE 3.4: LAND USE LAND COVER MAP 500m RADIUS

Land use Landcover of the area within 500m radius were studied in detailed that the majority of the land within 500m is Barren land (73.26) followed by agriculture land and Mining areas are contributing majority of the land use.

3.1.6 Soil Environment

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

The objective of the soil sampling is -

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

TABLE 3.5: SOIL SAMPLING LOCATIONS

S. No	Location Code	Monitoring Locations	Distance & Direction	Coordinates
1	S-1	Core Zone	Project Area	8°45'14.46"N 77°33'45.74"E
2	S-2	Vadaku ariyanagipuram	3.5km SW	8°43'26.89"N 77°32'47.56"E
3	S-3	Udayampuli	5.5km NW	8°47'53.84"N 77°32'21.33"E
4	S-4	Singamparai	2.8km West	8°45'13.61"N 77°32'7.65"E
5	S-5	Sidaparappanallur	5.3km NE	8°47'16.08"N 77°35'59.55"E
6	S-6	Near Nadukkalur	4.8km SE	8°43'18.08"N 77°35'31.08"E

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

Methodology –

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

TABLE 3.6: METHODOLOGY OF SAMPLING COLLECTION

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

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

Soil Testing Result –

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

FIGURE 3.5: SOIL SAMPLING LOCATIONS AROUND 10 KM RADIUS

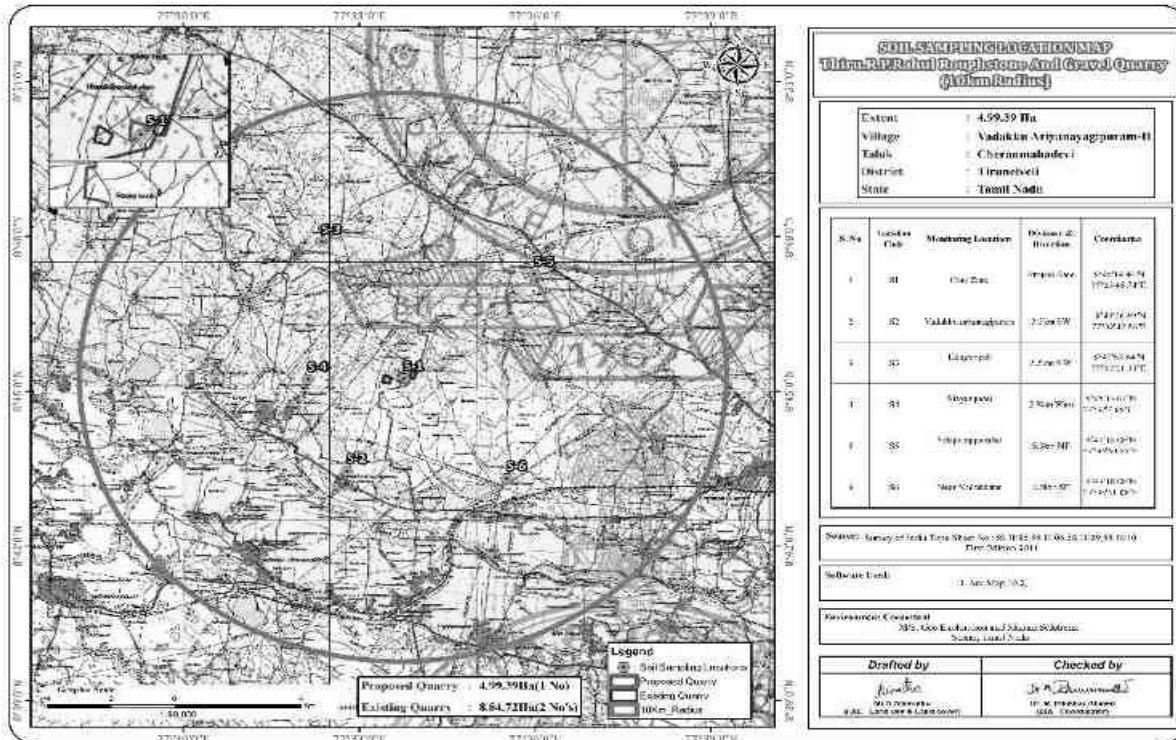


FIGURE 3.6: SOIL MAP

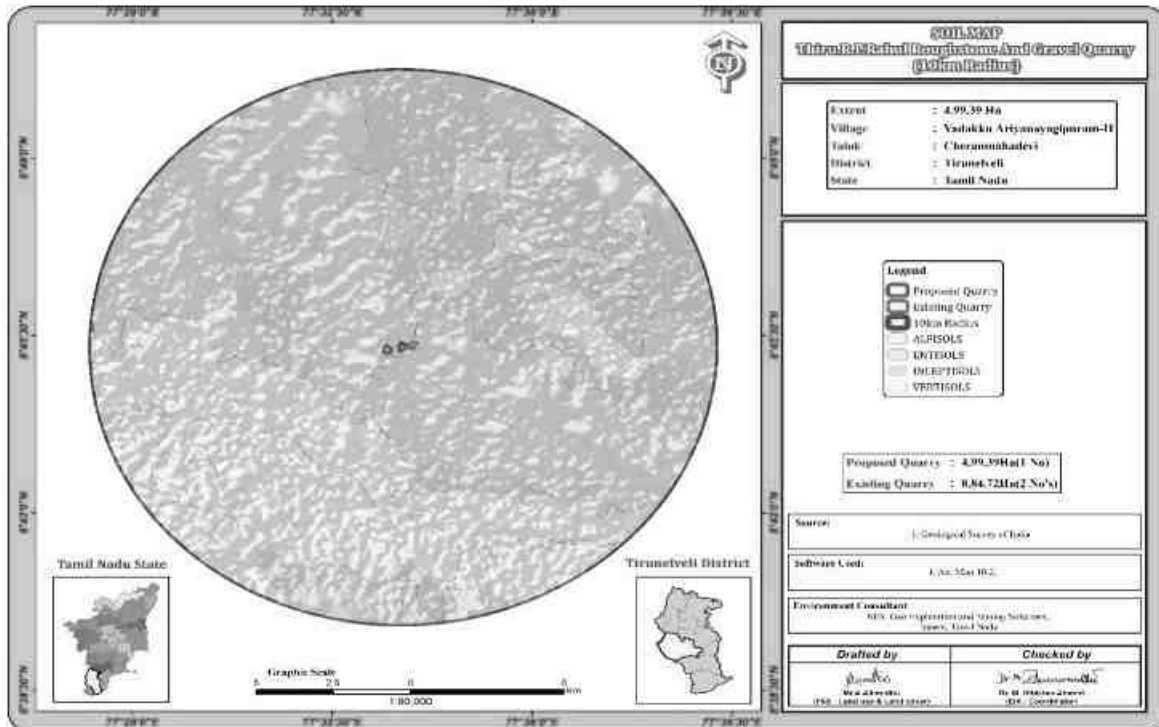


TABLE 3.7: SOIL QUALITY OF THE STUDY AREA

Sl. No	Test Parameters	Test Method	Unit	S1 Core Zone	S2 Vadaku ariyanagipur am	S3 Udayampu li	S4 Singamparai	S5 Sidaparappanal lur	S5 Near Nadukkalur
1	Organic Matter	GLCS/SOP/S/ 003	%	1.05	1.2	1.02	0.84	1.4	0.84
2	pH	IS 2720	-	7.82	7.32	7.6	7.3	6.91	7.43
3	Specific Electrical Conductivity	IS 14767	µs/cm	368	473	412	336	289	358
4	Available Phosphorous	GLCS/SOP/S/ 005	mg/kg	13.4	15	13.5	14.4	14.1	13.5
5	Available Potassium	GLCS/SOP/S/ 026	meq/l	1.43	1.8	1.2	0.85	0.87	1.7
6	Exchangeable Calcium (as Ca)	GLCS/SOP/S/ 020	meq/100 g	2.3	2.6	2.9	2.2	3.2	2.6
7	Exchangeable Magnesium (as Mg)	GLCS/SOP/S/ 021	meq/100 g	1.8	2.5	3.3	2.8	2.6	2.8
8	Sulphate as SO4	GLCS/SOP/S/ 009	mg/100g	13.2	15.5	13	14.7	16	16
7	Cation Exchange Capacity	GLCS/SOP/S/ 024	meq/100 g	16.3	16.8	5.2	14	15.3	17.8
8	Bulk Density	GLCS/SOP/S/ 017	g/cc	1.04	1.29	15	1.09	1.04	1.03
9	Texture Sand	GLCS/SOP/S/ 015	%	32.25	31.88	36.25	27.50	25.3	25
10	Texture Silt	GLCS/SOP/S/ 015	%	43.50	42.87	37.75	38.75	46.8	45
11	Texture Clay	GLCS/SOP/S/ 015	%	24.35	25.25	26	33.75	27.9	30
12	Water Holding Capacity	GLCS/SOP/S/ 016	%	53.4	45	47.2	49	49.4	47.6
13	Available Nitrogen as N	GLCS/SOP/S/ 029	Kg/ha	326	401	226	339	276	339
14	Chloride as (Cl) in Saturation Extract	GLCS/SOP/S/ 004	meq/l	4.6	3.8	5.2	3.8	3.7	5.2
15	Texture	GLCS/SOP/S/ 015	-	Sandy Clay Loom	Sandy Clay Loom	Sandy Clay Loom	Sandy Clay Loom	Sandy Clay Loom	Sandy Clay Loom

16	Permeability	By Permeameter	%	48.6	46.9	45	46	47.2	46
17	Manganese	USEPA Method	mg/kg	18	18.5	13	15.4	19	13
18	Zinc	USEPA Method	mg/kg	13	15	10	14	12	14
19	Cadmium as Cd	USEPA Method	mg/kg	7	3.5	5	6	5	6
20	Chromium as Cr	USEPA Method	mg/kg	14	7.6	10	7	7	7
21	Copper as Cu	USEPA Method	mg/kg	6	6	3	4	4	7.5
22	Lead as Pb	USEPA Method	mg/kg	1.5	0.98	3	5	3	4
23	Iron as Fe	USEPA Method	mg/kg	20	24.5	21	19	20	16
24	Organic Carbon	GLCS/SOP/S/003	%	0.61	0.71	0.59	0.49	0.83	0.49
25	Boron as B	USEPA Method	mg/kg	2.4	BDL (DL:0.5)	BDL (DL:0.5)	0.72	BDL (DL:0.5)	0.94

Source: Sampling Results by GLCS Lab Private Limited.

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

The physical properties of the soil samples were examined for texture, bulk density, porosity and water holding capacity. The soil texture found in the study area is Clay (25.25 % 33.75%) to Sandy Loam Soil and Bulk Density of Soils in the study area varied between 1.03-15 g/cc. The Water Holding Capacity of the soil samples is found to be medium i.e., ranging from 45.0 – 53.4 %.

Chemical Characteristics –

- The nature of soil is slightly alkaline to strongly alkaline with pH range 6.91 – 7.82
- The available Nitrogen content range between 226 – 401mg/kg
- The available Phosphorus content range between 13.5– 15 mg/kg
- The available Potassium range between 0.85 mg/kg to 1.8 mg/kg

Observation:

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

3.2 WATER ENVIRONMENT

The water resources, both surface and groundwater play a significant role in the development of the area. The purpose of this study is to assess the water quality characteristics for critical parameters and evaluate the impacts on agricultural productivity, domestic community usage, recreational resources and aesthetics in the vicinity. The water samples were collected and transported as per the norms in pre-treated sampling cans to laboratory for analysis.

3.2.1 Surface Water Resources:

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

3.2.2 Ground Water Resources:

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

3.2.3 Methodology

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

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

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

TABLE 3.8: WATER SAMPLING LOCATIONS

S.NO	CODE	LOCATIONS	DISTANCE & DIRECTION	CO-ORDINATES
SURFACE WATER				
1	SW-1	Thamirabarani River	4.5km SW	8°43'40.20"N 77°31'37.48"E
2	SW-2	Tank Near Vettuvankulam	2.8km NE	8°45'56.48"N 77°35'11.13"E
GROUND WATER				
3	WW-1	Near Project Area	260m South	8°45'2.99"N 77°33'39.59"E
4	WW-2	Udayampuli	5.0km NW	8°47'47.22"N 77°32'25.23"E
5	BW-1	Near Project Area	430m NW	8°45'29.46"N 77°33'30.15"E
6	BW-2	Nadukkalur	5.5km SE	8°42'35.59"N 77°35'16.86"E

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

FIGURE 3.8: WATER SAMPLING LOCATIONS AROUND 10 KM RADIUS

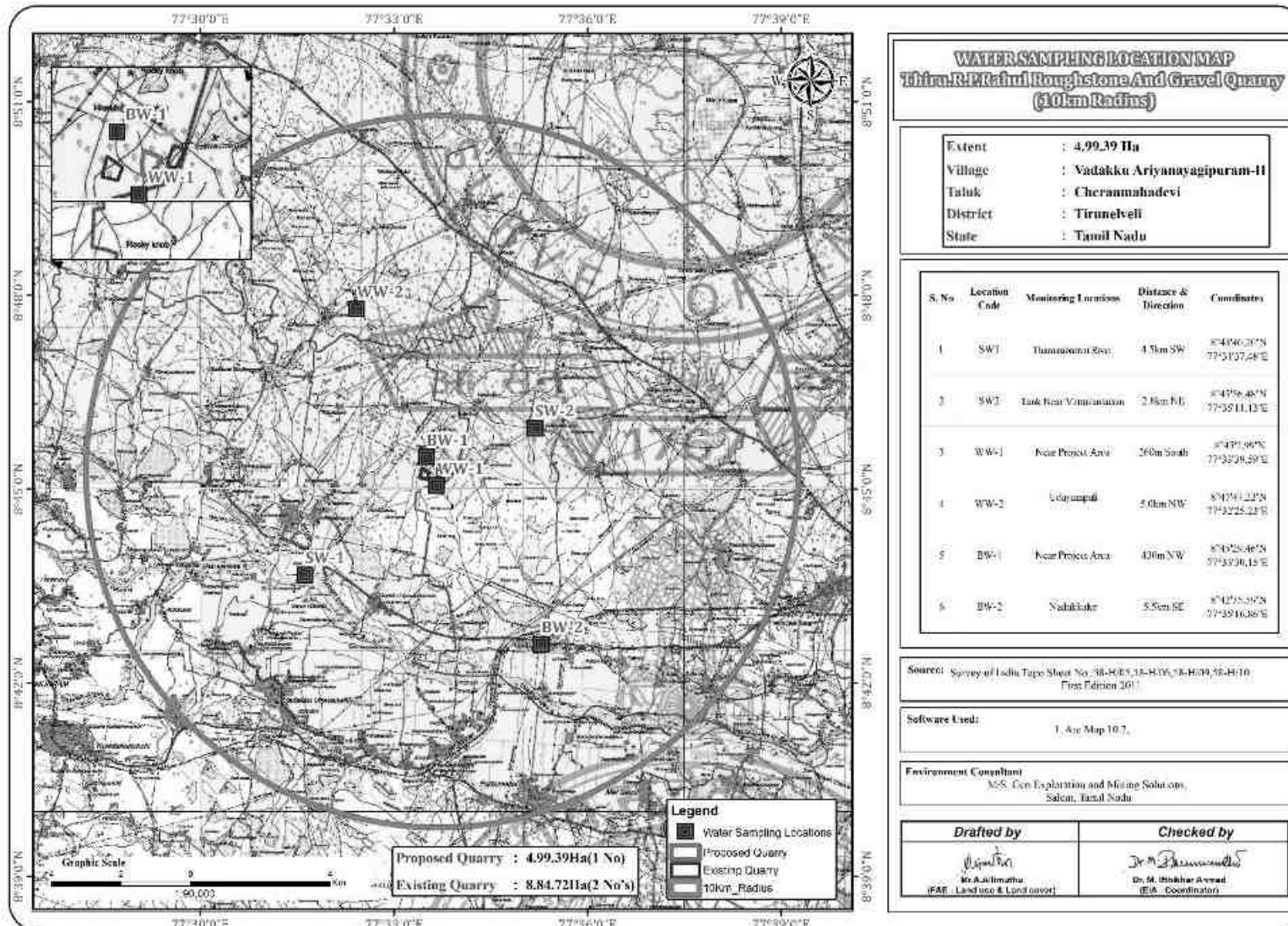


TABLE 3.9: GROUND WATER SAMPLING RESULTS

Sl. No.	Test Parameters	Test Method	Unit	WW1 Near Project Area	WW2 Udayampuli	BW1 Near Project Area	BW2 Nadukkalur
1	Color	IS 3025 PART 4	Hazen	< 5	< 5	< 5	< 5
2	Odor	IS 3025 PART 5	-	Agreeable	Agreeable	Agreeable	Agreeable
3	pH	IS 3025 PART 11	-	7.08	7.26	7.56	7.80
4	Electrical Conductivity	IS 3025 PART 14	µS/cm	1267	1766	2078	2465
5	Turbidity	IS 3025 PART 10	NTU	<1	<1	<1	<1
6	Total Dissolved Solids	IS 3025 PART 16	mg/l	824	1148	1352	1605
7	Total Suspended Solids	IS 3025 PART 17	mg/l	BDL(DL:2)	BDL(DL:2)	BDL(DL:2)	BDL(DL:2)
8	Total Alkalinity	IS 3025 PART 23	mg/l	390	480	620	750
9	Total Hardness as CaCO ₃	IS 3025 PART 21	mg/l	540	570	720	840
10	Calcium as Ca	IS 3025 PART 40	mg/l	104	100	140	160
11	Magnesium as Mg	IS 3025 PART 46	mg/l	68	78	90	107
12	Chloride as Cl ⁻	IS 3025 PART 32	mg/l	130	150	260	325
13	Sulphate as SO ₄ ⁻	IS 3025 PART 24	mg/l	54	47	126	62
14	Iron as Fe	IS 3025 PART 53	mg/l	0.21	0.12	0.38	0.12
15	Boron as B	IS 3025 PART 57	mg/l	BDL(DL:0.1)	BDL(DL:0.1)	BDL(DL:0.1)	BDL(DL:0.1)
16	Free Residual Chlorine as Cl ₂	IS 3025 PART 26	mg/l	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:1.0)
17	Fluoride as F	GLCS/SOP/W/015	mg/l	0.16	0.67	0.13	0.25
18	Nitrate as NO ₃	IS 3025 PART 34	mg/l	BDL(DL :2.0)	BDL(DL :2.0)	BDL(DL :2.0)	BDL(DL :2.0)
19	Manganese as Mn	IS 3025 PART 59	mg/l	BDL(DL:0.1)	BDL(DL:0.1)	BDL(DL:0.1)	BDL(DL:0.1)
20	Total Coliforms	IS 15185	Per 100ml	Absent	Absent	Absent	Absent

21	<i>Escherichia coli</i>	IS 15185	Per 100ml	Absent	Absent	Absent	Absent
22	Arsenic as As	GLCS/SOP/W/62	mg/l	BDL(DL:0.002)	BDL(DL:0.002)	BDL(DL:0.002)	BDL(DL:0.002)
22	Ammonia (NH ₃)	IS 3025 PART 34	mg/l	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:1.0)
23	Zinc as Zn	GLCS/SOP/W/62	mg/l	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)
24	Aluminium as Al	GLCS/SOP/W/62	mg/l	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)
25	Cadmium as Cd	GLCS/SOP/W/62	mg/l	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)
26	Molybdenum as Mo	GLCS/SOP/W/62	mg/l	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)
27	Selenium	GLCS/SOP/W/62	mg/l	BDL(DL:0.002)	BDL(DL:0.002)	BDL(DL:0.002)	BDL(DL:0.002)
28	Lead as Pb	GLCS/SOP/W/62	mg/l	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)
29	Barium as Ba	GLCS/SOP/W/62	mg/l	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.002)
30	Anionic Surfactants	IS 13428 Annex K	mg/l	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:1.0)
31	Cyanide	IS 3025 PART 27	mg/l	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.01)
32	Phenolic Compounds	IS 3025 PART 43	mg/l	BDQ(DL:0.1)	BDQ(DL:0.1)	BDQ(DL:0.1)	BDL(DL:0.01)
33	Chromium as Cr	GLCS/SOP/W/62	mg/l	BDL(DL:0.1)	BDL(DL:0.1)	BDL(DL:0.1)	BDL(DL:0.01)
34	Sulphide	GLCS/SOP/W/66	mg/l	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:0.01)
35	Copper as Cu	GLCS/SOP/W/62	mg/l	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.002)
36	Mercury as Hg	GLCS/SOP/W/62	mg/l	BDL(DL:0.002)	BDL(DL:0.002)	BDL(DL:0.002)	BDL(DL:0.01)

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

TABLE 3.10: SURFACE WATER SAMPLING RESULTS

Sl. No.	TEST PARAMETERS	TEST METHOD	UNIT	SW1 Thamirabarani River	SW2 Tank Near Vettuvankulam
1	Odor	IS 3025 PART 5	-	Agreeable	Agreeable
2	pH	IS 3025 PART11	-	7.86	7.62
3	Electrical Conductivity	IS 3025 PART14	µS/cm	2068	1969
4	Turbidity	IS 3025 PART10	NTU	12	6
5	Total Dissolved Solids	IS 3025 PART16	mg/l	1344	1280
6	Total Alkalinity as CaCO ₃	IS 3025 PART 23	mg/l	640	560
7	Total Hardness as CaCO ₃	IS 3025 PART 21	mg/l	780	680
8	Calcium as Ca	IS 3025 PART40	mg/l	140	128
9	Magnesium as Mg	IS 3025 PART 46	mg/l	105	87
10	Chloride as Cl ⁻	IS 3025 PART 32	mg/l	190	210
11	Sulphate as SO ₄ ⁻	IS 3025 PART24	mg/l	264	93
12	Iron as Fe	IS 3025 PART 53	mg/l	0.32	0.38
13	Boron as B	IS 3025 PART 57	mg/l	BDL(DL:0.1)	BDL(DL:0.1)
14	Free Residual Chlorine as Cl ₂	IS 3025 PART 26	mg/l	BDL(DL:1.0)	BDL(DL:1.0)
15	Fluoride as F	GLCS/SOP/W/015	mg/l	0.19	0.21
16	Manganese as Mn	IS 3025 PART 59	mg/l	BDL(DL:0.1)	BDL(DL:0.1)
17	Nitrate as NO ₃	IS 3025 PART 34	mg/l	BDL(DL :2.0)	BDL(DL :2.0)
18	Dissolved Oxygen	IS 3025 PART 38	mg/l	5.3	6.1
19	Bio-Chemical Oxygen Demand @ 27°C for 3 days	IS 3025 PART 44	mg/l	6	3
20	Chemical Oxygen Demand	IS 3025 PART 58	mg/l	20	10
21	Total Coliforms	IS 1622-1981	MPN/100ml	280	350
22	<i>Escherichia coli</i>	IS 1622-1981	MPN/100ml	27	26
23	Total Suspended Solids	IS 3025 PART 17	mg/l	BDL(DL:2)	8
24	Phenolic Compounds	IS 3025 PART 43	mg/l	BDL(DL:0.1)	BDL(DL:0.1)
25	Anionic Surfactants	IS 13428 ANNEX K	mg/l	BDL(DL:0.05)	BDL(DL:0.05)
26	Cyanide	IS 3025 PART 27	mg/l	BDL(DL:0.02)	BDL(DL:0.02)
27	Sulphide	GLCS/SOP/W/66	mg/l	BDL(DL:1)	BDL(DL:1)
28	Copper as Cu	GLCS/SOP/W/62	mg/l	BDL(DL:0.01)	BDL(DL:0.01)
29	Mercury (Hg)	GLCS/SOP/W/62	mg/l	BDL(DL:0.002)	BDL(DL:0.002)
30	Cadmium as Cd	GLCS/SOP/W/62	mg/l	BDL(DL:0.01)	BDL(DL:0.01)
31	Selenium	GLCS/SOP/W/62	mg/l	BDL(DL:0.002)	BDL(DL:0.002)

32	Aluminium as Al	GLCS/SOP/W/62	mg/l	BDL(DL:0.01)	BDL(DL:0.01)
33	Lead as Pb	GLCS/SOP/W/62	mg/l	BDL(DL:0.01)	BDL(DL:0.01)
34	Zinc as Zn	GLCS/SOP/W/62	mg/l	BDL(DL:0.01)	BDL(DL:0.01)
35	Chromium as Cr	GLCS/SOP/W/62	mg/l	BDL(DL:0.1)	BDL(DL:0.1)
36	Barium as Ba	GLCS/SOP/W/62	mg/l	BDL(DL:0.01)	BDL(DL:0.01)
37	Molybdenum as Mo	GLCS/SOP/W/62	mg/l	BDL(DL:0.01)	BDL(DL:0.01)
38	Arsenic as As	GLCS/SOP/W/62	mg/l	BDL(DL:0.002)	BDL(DL:0.002)
39	Ammonia as NH ₃	IS 3025 PART 34	mg/l	BDL(DL:1.0)	BDL(DL:1.0)

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

3.2.4 Interpretation & Conclusion

Surface Water

The pH varied from 7.62– 7.86 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 1280-1344mg/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 187-424 mg/l, sulphates varied from 190 - 210 mg/l.

Ground Water

The pH of the water samples collected ranged from 7.08 – 7.80 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 824 -1605mg/l in all samples. Total hardness varied between 540- 840 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 100m. The maximum depth proposed out of proposed projects is 47m 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 9 open well and 8 borewells.

The average water level in the open well is varies from = 11.0 m to 13.0 m bgl

The water level in the bore well is varies from = 56 m to 58 m bgl

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

The water level in the area is above 100 m 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: SUMMER SEASON WATER LEVEL OF OPEN WELLS 1 KM RADIUS

S.NO	LABEL	LATITUDE	LONGITUDE	Mar 24	Apr 24	May 24
1	OW-1	8° 45' 49.144"N	77° 33' 38.81"E	11	11.6	12.2
2	OW-2	8° 45' 49.153"N	77° 33' 56.66"E	11.5	12.1	12.7
3	OW-3	8° 45' 44.172"N	77° 34' 11.50"E	11.4	12	12.6
4	OW-4	8° 45' 31.405"N	77° 34' 23.22"E	11.2	11.8	12.4
5	OW-5	8° 45' 06.966"N	77° 34' 14.91"E	11.7	12.3	12.9
6	OW-6	8° 45' 29.664"N	77° 32' 59.30"E	11.6	12.2	12.8
7	OW-7	8° 45' 02.407"N	77° 33' 13.18"E	11.3	11.9	12.5
8	OW-8	8° 44' 56.888"N	77° 34' 04.28"E	11.1	11.7	12.3
9	OW-9	8° 44' 57.389"N	77° 33' 33.55"E	11.8	12.4	13

Source: Onsite monitoring data

FIGURE 3.9: OPEN WELL CONTOUR MAP Mar 2024 – May 2024

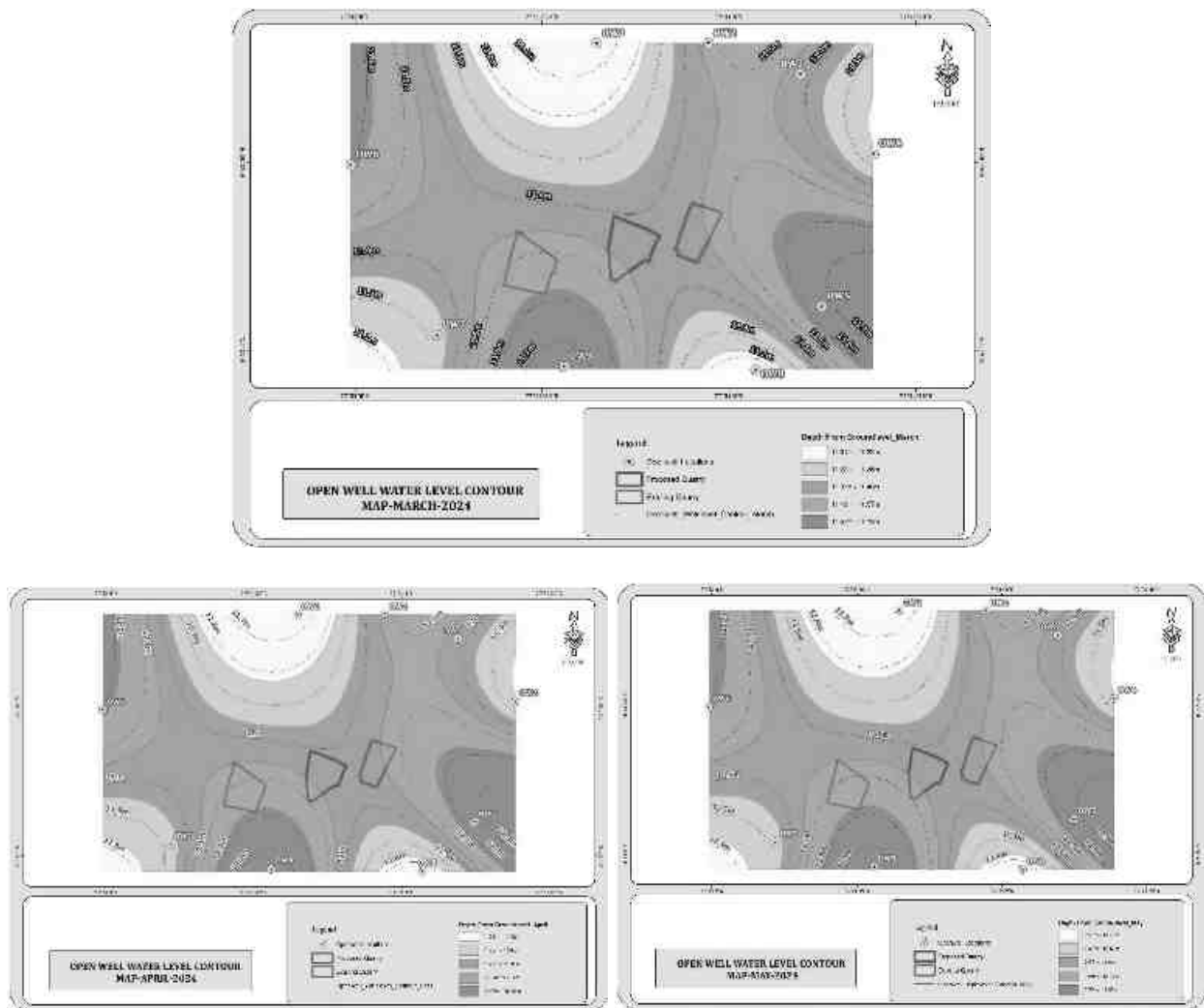


TABLE 3.12: SUMMER SEASON WATER LEVEL OF BOREWELLS 1 KM RADIUS

S.NO	LABEL	LATITUDE	LONGITUDE	Mar 24	Apr 24	May 24
1	BW1	8° 45' 32.222"N	77° 33' 39.54"E	56	56.6	57.2
2	BW2	8° 45' 50.209"N	77° 34' 18.38"E	56.3	56.9	57.5
3	BW3	8° 45' 23.793"N	77° 34' 23.17"E	56.1	56.7	57.3
4	BW4	8° 45' 39.458"N	77° 33' 27.95"E	56.6	57.2	57.8
5	BW5	8° 45' 18.501"N	77° 33' 14.50"E	56.4	57	57.6
6	BW6	8° 44' 44.842"N	77° 33' 07.92"E	56.8	57.4	58
7	BW7	8° 44' 27.592"N	77° 33' 42.92"E	56.5	57.1	57.7
8	BW8	8° 44' 41.459"N	77° 34' 29.55"E	56.2	56.8	57.4

Source: Onsite monitoring data

FIGURE 3.10: BOREWELL CONTOUR MAP – Mar 2024 – May 2024

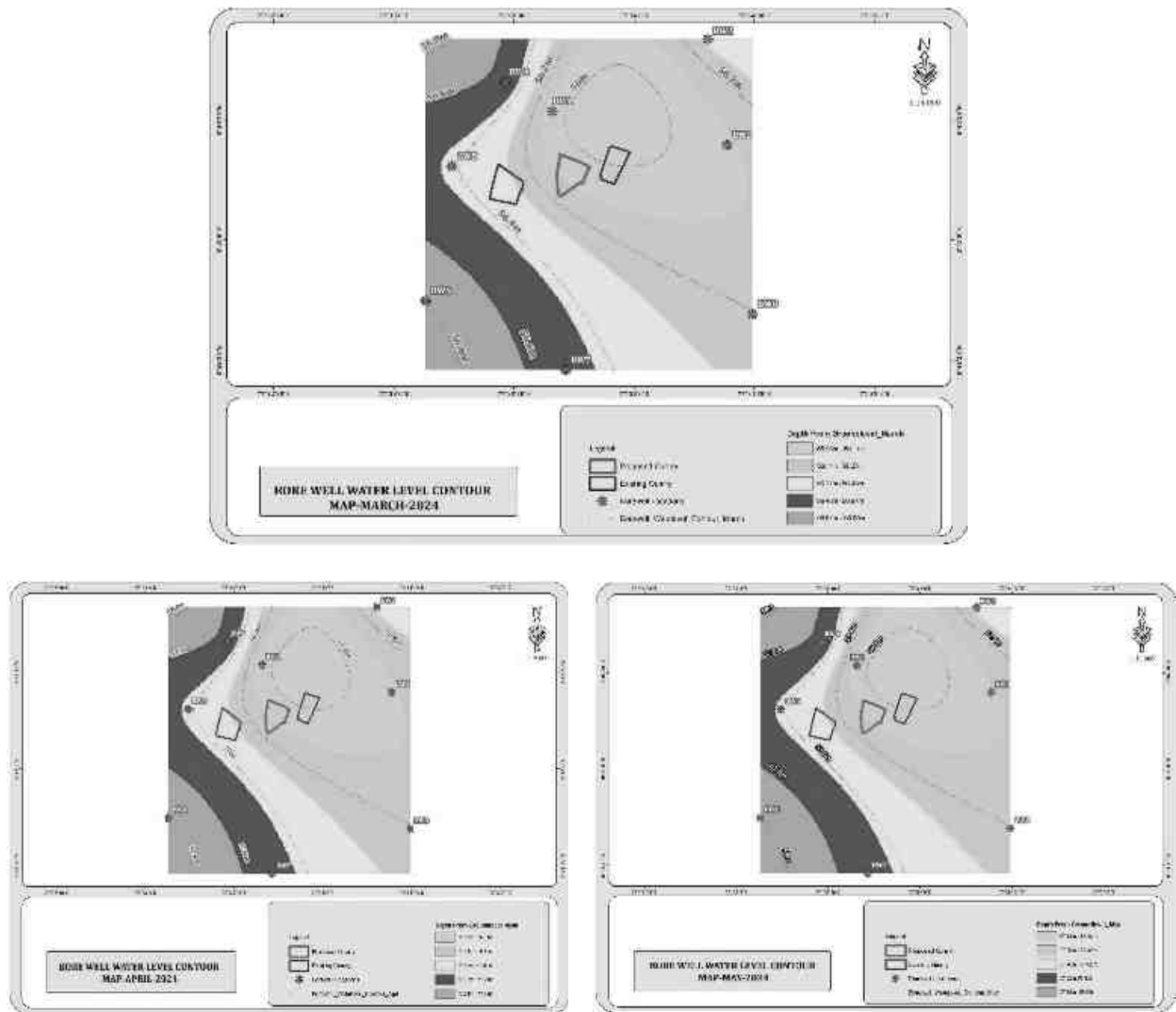
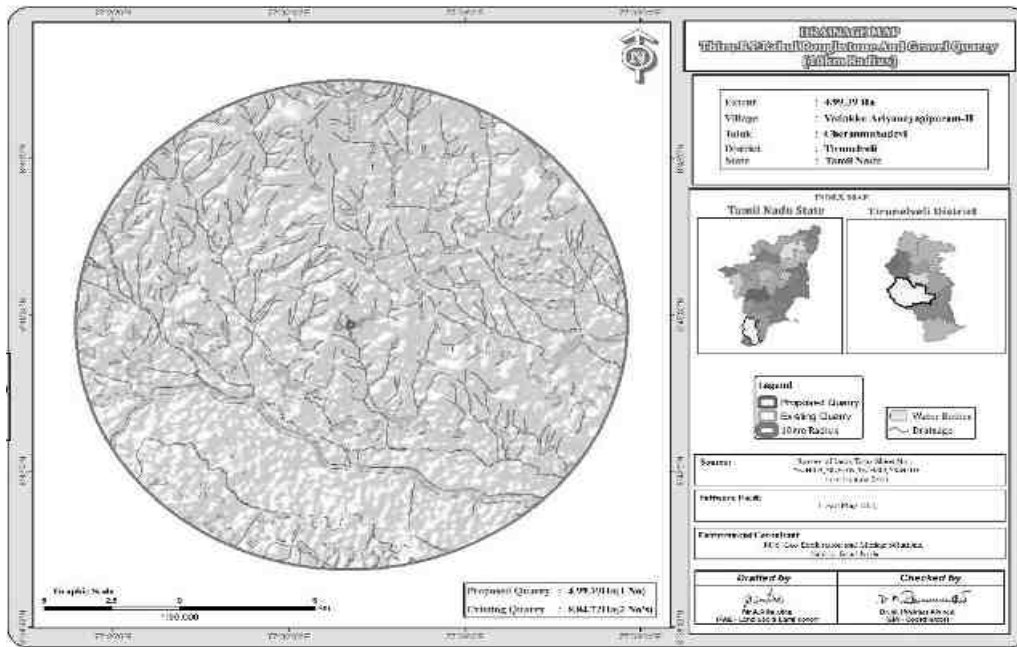
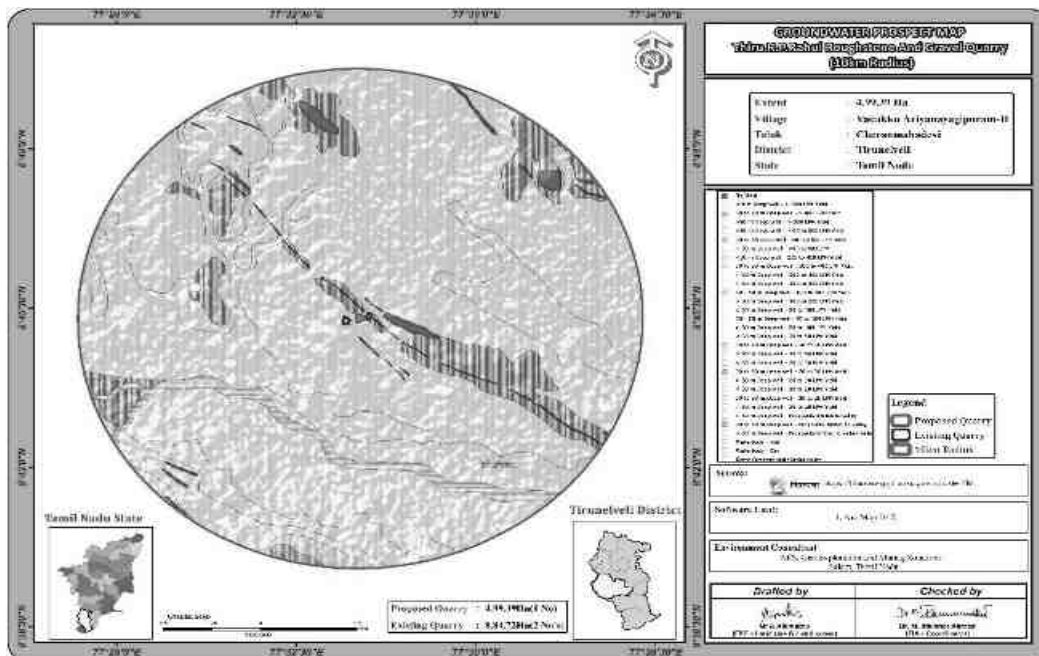


FIGURE 3.11: DRAINAGE MAP AROUND 10 KM RADIUS FROM PROJECT SITE



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

FIGURE 3.12: GROUND WATER PROSPECT MAP



Remarks: Water table in the area is 100m as per the Bhuvan Data

Geophysical Resistivity Survey

3.2.5.1 Methodology and Data Acquisition

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

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

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

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

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,

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

ρ_r = Resistivity of Rocks

ρ_w = Resistivity of water in pores of rock

F = Formation Factor

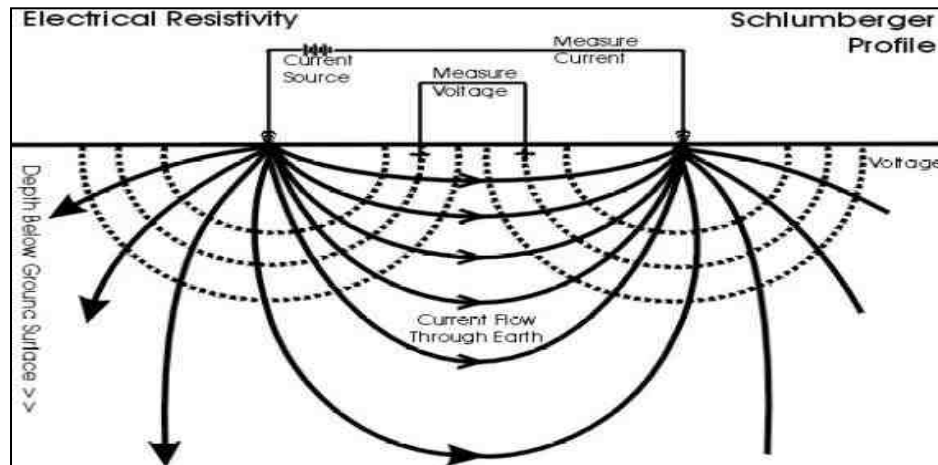
\emptyset = Fractional pore volume

A = Constants with values ranging from 0.5 to 2.5

3.2.5.2 Survey Layout

The field equipment deployed for the study is in a deep resistivity meter with a model of SSR – MP – AT. This Signal stacking Resistivity meter is a high-quality data acquisition system incorporating several innovation features for Earth resistivity. In the presence of random earth Noises the signal to noise ration can be enhanced by \sqrt{N} where N is the number of stacked readings. This SSR meter in which running averages of measurements [1, (1+2)/2, (1+2+3)/3. ... (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 47m bgl. Hence there is no possibilities of water table intersection during the entire mine life period besides it is also inferred topographically that there are no major water bodies intersecting the project area.

3.2.5.4 Geophysical Data Interpretation

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

It is inferred that the existing quarries in the surrounding area reaches maximum of 15m and the water table is not intersected, only the seepage water during rainy season encountered from the upper layer and it will be used for the Greenbelt development, Dust suppression and quarrying operation.

3.3 AIR ENVIRONMENT

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

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

3.3.1 Meteorology & Climate

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

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

Climate

- The atmospheric conditions prevailing in this region are of a tropical nature. When compared with winter, the summers have much more rainfall. The climate here is classified as Aw by the Köppen-Geiger. In Tirunelveli, the mean yearly temperature amounts to 27.5 °C | 81.4 °F. The annual rainfall is 968 mm | 38.1 inch.
- This region, situated near the equator line, is characterized by difficult-to-define summer seasons. It is recommended that the optimal period for embarking on a journey would be during January, February, March, June, July, August, September, November, December.
- The month with the least amount of precipitation is February exhibiting a mere 32 mm | 1.3 inch rainfall. In November, the precipitation reaches its peak, with an average of 251 mm | 9.9 inch.
- The month of May boasts the highest average temperature, with a recorded maximum of 29.9 °C | 85.8 °F. At 24.5 °C | 76.1 °F on average, December is the coldest month of the year.

<https://en.climate-data.org/asia/india/tamil-nadu/tirunelveli-2784/#climate-graph>

Rainfall

TABLE 3.13: RAINFALL DATA

Actual Rainfall in mm					Normal Rainfall in mm
2017	2018	2019	2020	2021	
1127.0	1137.8	1057.7	790.2	1569.3	985

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

TABLE 3.14: METEOROLOGICAL DATA RECORDED AT SITE

S. No	Parameters		Mar-2024	Apr-2024	May-2024
1	Temperature (°C)	Max	32.19	33.15	29.12
		Min	26.18	28.18	25.08
		Avg.	29.18	30.66	27.1
2	Relative Humidity (%)	Avg.	54.53	63	79.59
3	Wind Speed (m/s)	Max	4.33	4.16	4.41
		Min	1.5	1.52	1.55
		Avg.	2.91	2.84	2.98
4	Cloud Cover (OKTAS)		0-8	0-8	0-8
5	Wind direction		ENE,E	S,ENE	WSW,W

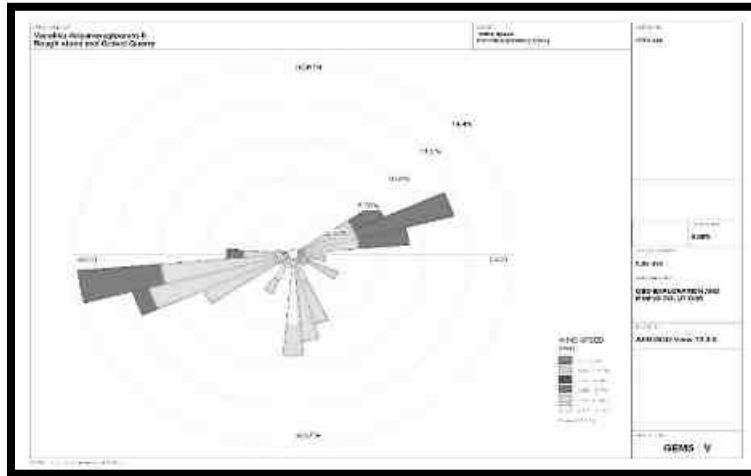
Source: On-site monitoring/sampling by GLCS lab Private Limited in association with GEMS

Correlation between Secondary and Primary Data

The meteorological data collected at the site is almost similar to that of secondary data collected from IMD Tirunelveli Agro. A comparison of site data generated during the three months with that of IMD, Tirunelveli Agro reveals the following.

Wind rose diagram of the study site is depicted in Figure. 3.14. Predominant downwind direction of the area during study season is East-North-East to East South East.

FIGURE 3.13: WINDROSE DIAGRAM



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

1. Predominant winds were from ENE, E, WSW
2. Wind velocity readings were recorded between 0.50 to 5.70m/s
3. Calm conditions prevail of about 0 % of the monitoring period
4. Temperature readings ranging from 25.08 to 33.15 °C
5. Relative humidity ranging from 54.53 to 79.59 %
6. The monitoring was carried out continuously for three months.

3.3.2 Methodology and Objective

The prime objective of the ambient air quality study is to assess the existing air quality of study area and its conformity to NAAQS. The observed sources of air pollution in the study area are industrial, traffic and domestic activities. The baseline status of the ambient air quality has been established through a scientifically designed ambient air quality monitoring network considering the followings:

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

3.3.3 Sampling and Analytical Techniques

TABLE 3.15: METHODOLOGY AND INSTRUMENT USED FOR AAQ ANALYSIS

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

Source: Sampling Methodology followed by GLCS 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/m ³)	Annual Avg.* 24 hours**	50.0 80.0	20.0 80.0
2	Nitrogen Dioxide (µg/m ³)	Annual Avg. 24 hours	40.0 80.0	30.0 80.0
3	Particulate matter (size less than 10µm) PM ₁₀ (µg/m ³)	Annual Avg. 24 hours	60.0 100.0	60.0 100.0
4	Particulate matter (size less than 2.5 µm) PM _{2.5} (µg/m ³)	Annual Avg. 24 hours	40.0 60.0	40.0 60.0

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

*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 to May 2024. The baseline data of ambient air has been generated for PM₁₀, PM_{2.5}, Sulphur Dioxide (SO₂) & Nitrogen Dioxide (NO₂) 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 3.15 for assessment of the existing ambient air quality. Details of the sampling locations are as per given below.

TABLE 3.17: AMBIENT AIR QUALITY (AAQ) MONITORING LOCATIONS

S. No	Location Code	Monitoring Locations	Distance & Direction	Coordinates
1	AAQ-1	Core Zone	Project Area NE Corner	8°45'18.06"N 77°33'48.23"E
2	AAQ-2	Core Zone	Project Area SW Corner	8°45'11.51"N 77°33'41.32"E
3	AAQ-3	Near Existing Quarry	270m NE	8°45'24.71"N 77°33'54.79"E
4	AAQ-4	Vadaku ariyanagipuram	3.5km SW	8°43'27.26"N 77°32'45.95"E
5	AAQ-5	Udayampuli	5.5km NW	8°47'53.72"N 77°32'21.81"E
6	AAQ-6	Singamparai (House)	2.8km West	8°45'12.36"N 77°32'6.58"E
7	AAQ-7	Sidaparappanallur (House)	5.3km NE	8°47'16.37"N 77°36'1.10"E

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

FIGURE 3.14: AIR QUALITY MONITORING PHOTOGRAPHS

FIGURE 3.15: AMBIENT AIR QUALITY LOCATIONS AROUND 10 KM RADIUS

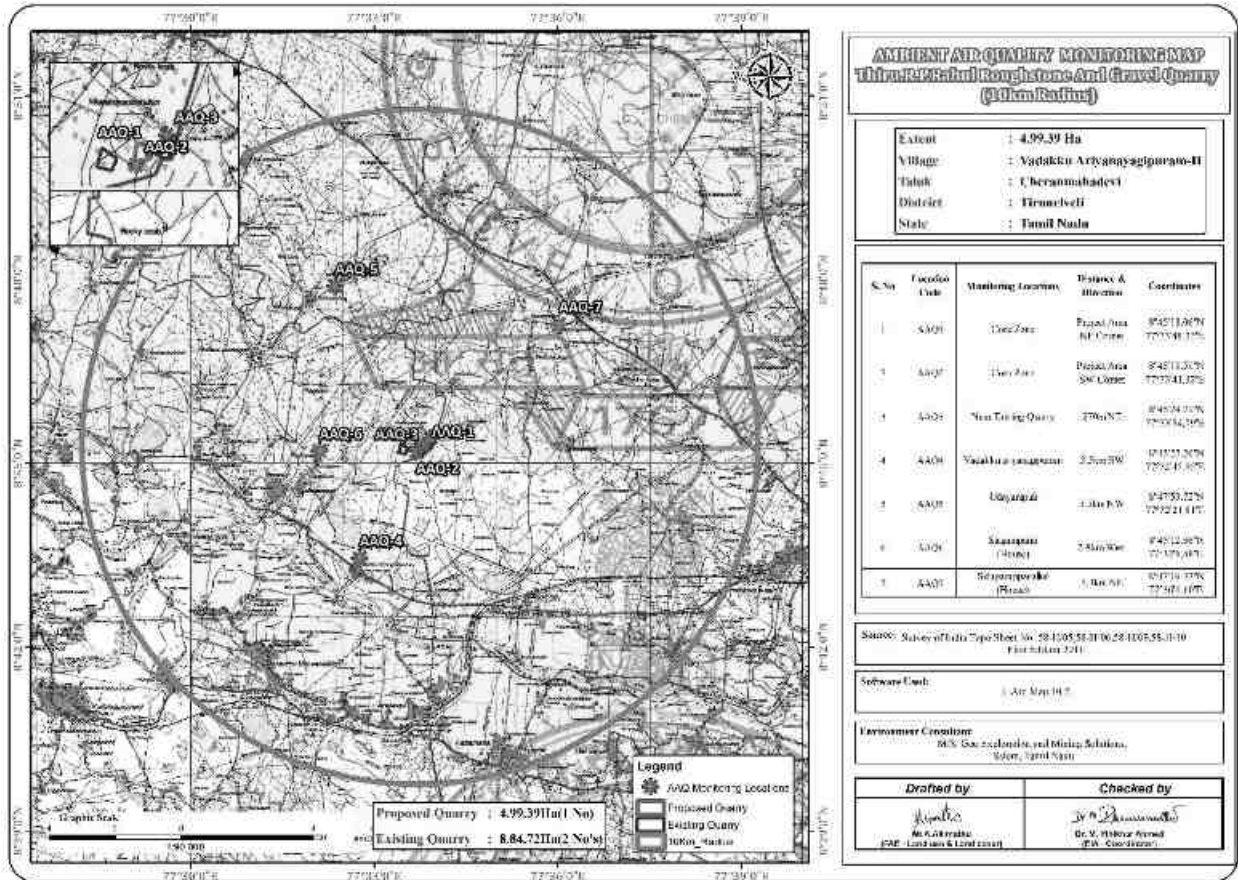


TABLE 3.18: SUMMARY OF AAQ 1 to AAQ 7

PM10	AAQ1	AAQ2	AAQ3	AAQ4	AAQ5	AAQ6	AAQ7
Arithmetic Mean	48.4	48.5	47.4	47.7	47.9	47.9	47.4
Minimum	46.2	46.7	45.2	45.4	44.8	45.5	45.2
Maximum	50.3	50.5	50.3	49.8	50.5	50.0	50.9
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	22.9	23.0	21.9	22.2	47.9	47.5	21.8
Minimum	21.6	21.2	20.8	20.8	20.8	20.4	20.0
Maximum	24.1	24.1	23.3	24.1	24.1	24.1	23.3
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	5.9	5.9	5.8	5.8	6.1	5.4	5.5
Minimum	4.2	4.2	4.4	4.5	4.3	4.1	4.4
Maximum	7.4	7.6	7.4	7.4	7.4	7.3	6.7
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	21.9	21.4	20.9	20.5	20.2	20.5	20.6
Minimum	18.6	18.7	17.5	17.7	17.8	18.2	18.5
Maximum	25.6	24.7	24.9	24.1	22.4	23.6	24.4
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

1	Parameter	PM _{2.5}	PM ₁₀	SO ₂	NO ₂
2	No. of Observations	260	260	260	260
3	98 th Percentile Value	50.5	24.1	7.4	24.8
4	Arithmetic Mean	48.2	22.6	6.1	21.4
5	Geometric Mean	48.2	22.6	6.0	21.3
6	Standard Deviation	1.4	1.0	1.0	1.9
7	Minimum	46.1	21.2	4.5	18.9
8	Maximum	50.5	24.1	7.4	24.8
9	NAAQ Norms*	100.0	60.0	80.0	80.0
	% Values exceeding Norms*	0.0	0.0	0.0	0.0

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

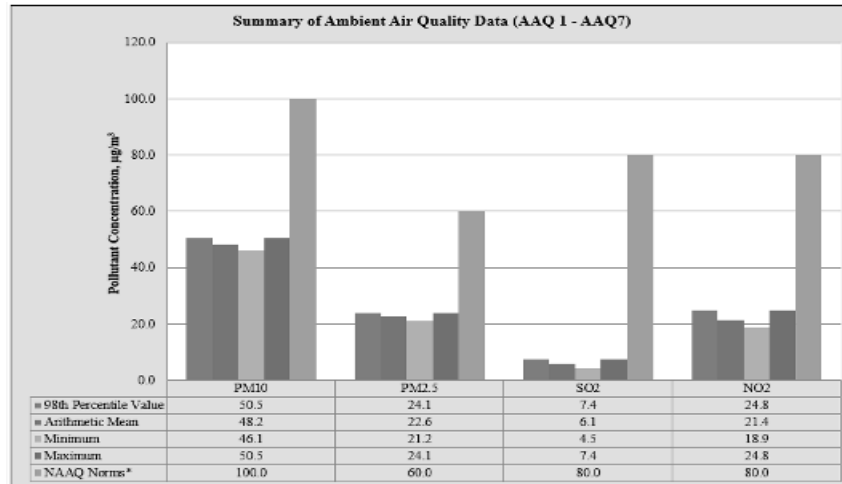


FIGURE 3.17: BAR DIAGRAM OF PARTICULATE MATTER PM_{2.5}

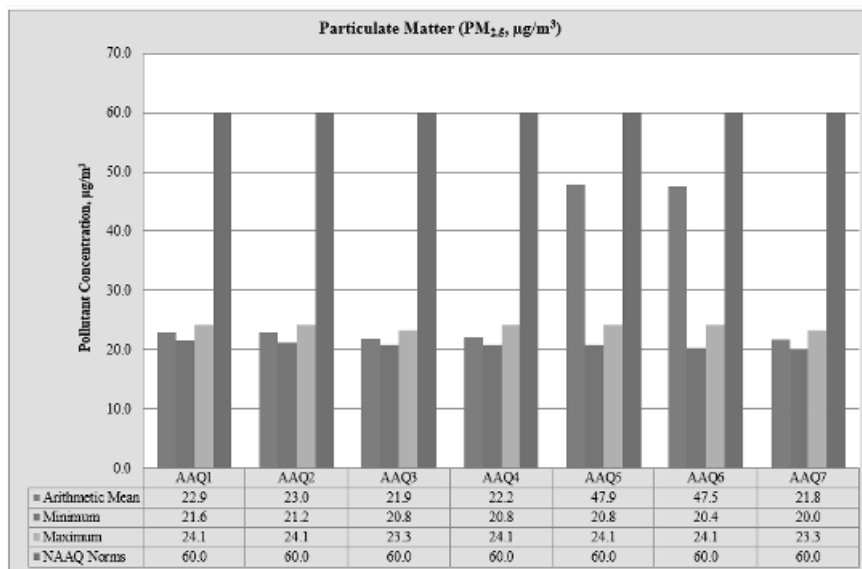


FIGURE 3.18: BAR DIAGRAM OF PARTICULATE MATTER PM₁₀

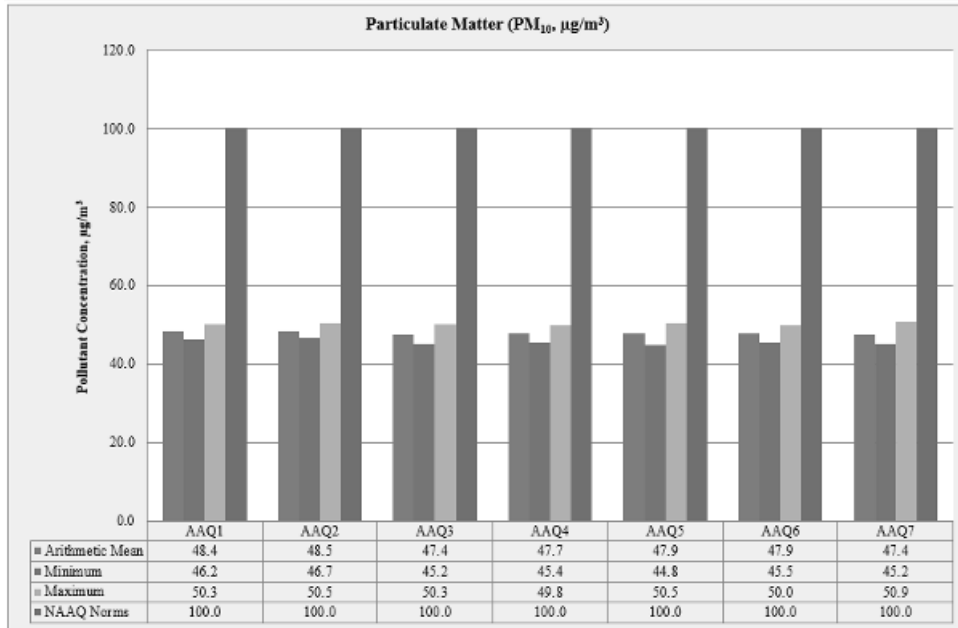


FIGURE 3.19: BAR DIAGRAM OF GASEOUS POLLUTANT SO₂

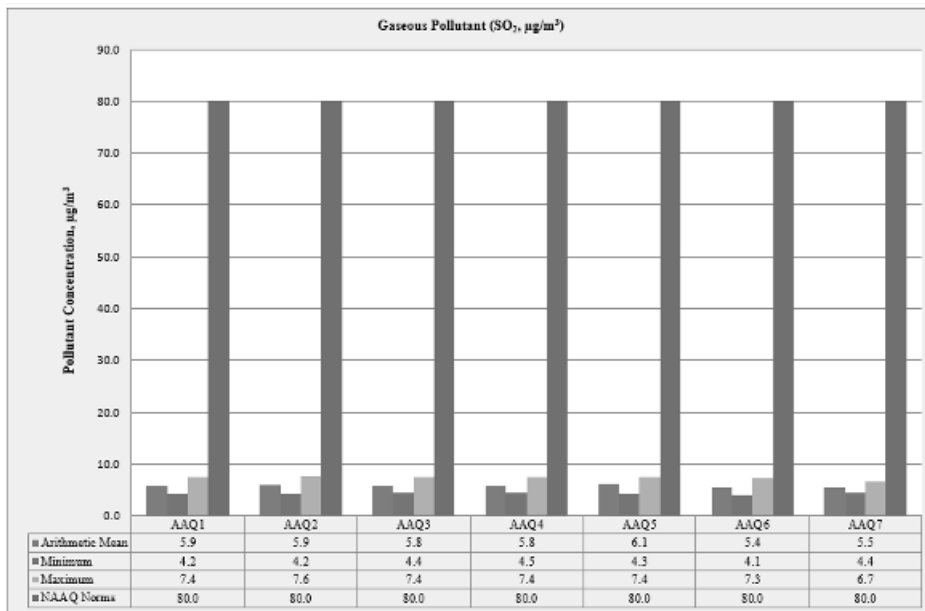
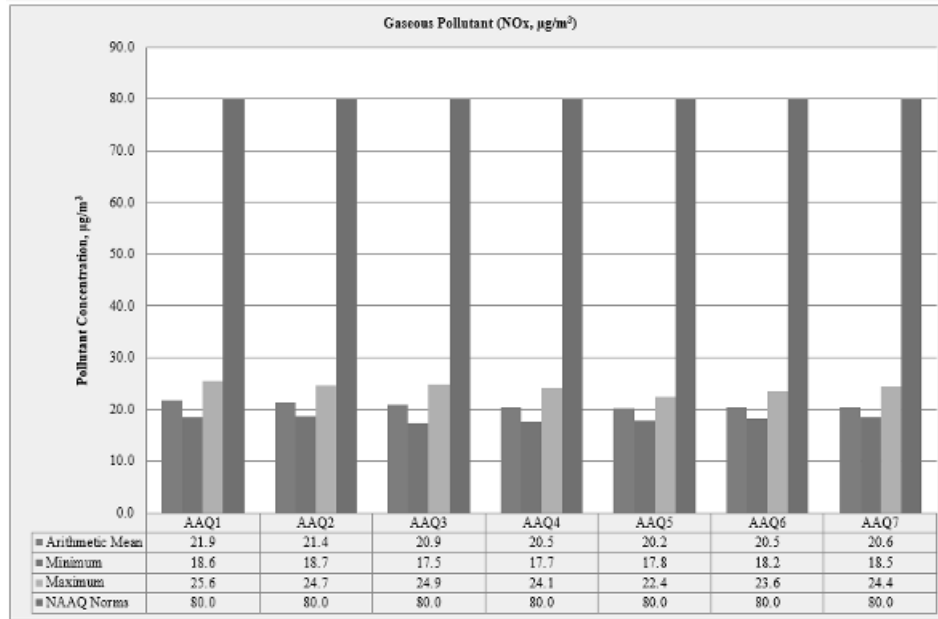


FIGURE 3.20: BAR DIAGRAM OF GASEOUS POLLUTANT NO_x

3.3.6 Interpretations & Conclusion

As per monitoring data, PM₁₀ ranges from 44.8 µg/m³ to 50.9 µg/m³, PM_{2.5} data ranges from 20.0 µg/m³ to 24.1 µg/m³, SO₂ ranges from 4.1 µg/m³ to 7.6 µg/m³ and NO₂ data ranges from 17.5 µg/m³ to 25.6 µg/m³. 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 Eight (8) 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 3.20: DETAILS OF SURFACE NOISE MONITORING LOCATIONS

S. No	Location Code	Monitoring Locations	Distance & Direction	Coordinates
1	N1	Core Zone	Project Area NE Corner	8°45'18.52"N 77°33'47.11"E
2	N2	Core Zone	Project Area SW Corner	8°45'11.58"N 77°33'42.17"E
3	N3	Near Existing Quarry	270m NE	8°45'24.59"N 77°33'54.48"E
4	N4	Vadaku ariyanagipuram	3.5km SW	8°43'26.54"N 77°32'45.99"E
5	N5	Udayampuli	5.5km NW	8°47'54.10"N 77°32'22.60"E
6	N6	Singamparai (House)	2.8km West	8°45'10.77"N 77°32'5.78"E
7	N7	Sidaparappanallur (House)	5.3km NE	8°47'16.89"N 77°35'59.98"E
8	N8	Near Nadukkalur	4.8km SE	8°43'17.90"N 77°35'30.70"E

Source: On-site monitoring/sampling by GLCS 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 L_{eq} , 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,

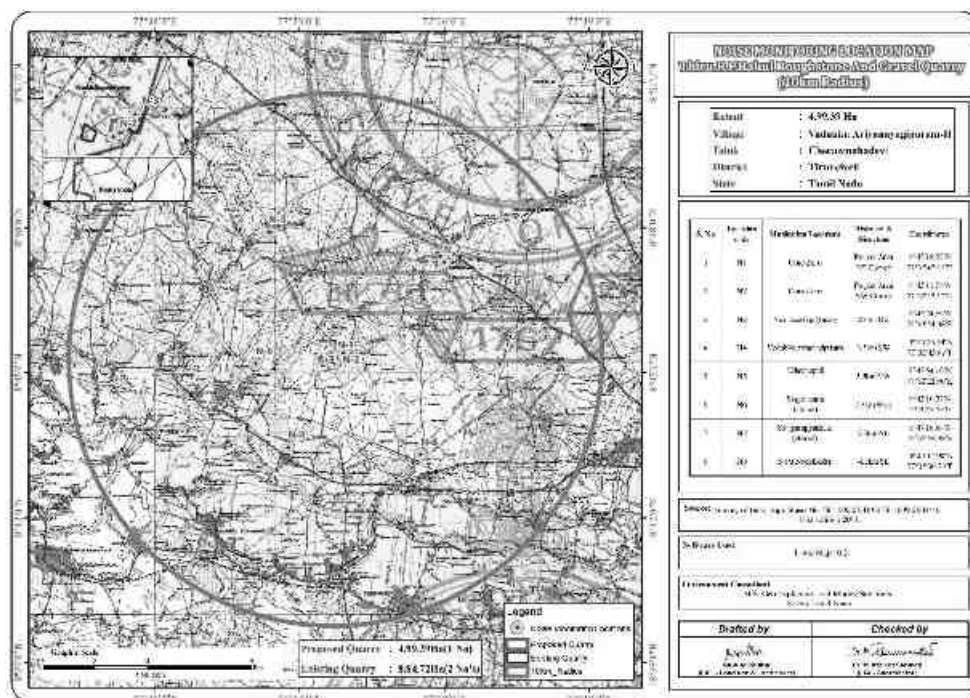
$$L_{eq} = 10 \log L / T \sum (10L_n/10)$$

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

T = Time interval of observation

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

FIGURE 3.21: NOISE MONITORING STATIONS AROUND 10 KM RADIUS



3.4.3 Analysis of Ambient Noise Level in the Study Area

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

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

Day time: 6:00 hours to 22.00 hours.

Night time: 22:00 hours to 6.00 hours.

TABLE 3.21: AMBIENT NOISE QUALITY RESULT

S. No	Locations	Noise level (dB (A) Leq)		Ambient Noise Standards
		Day Time	Night Time	
1	Core Zone	46.81	38.31	Industrial Day Time- 75 dB (A) Night Time- 70 dB (A)
2	Core Zone	46.3	37.5	
3	Near Existing Quarry	51.38	40.72	Residential Day Time– 55 dB (A) Night Time- 45 dB (A)
4	Vadaku ariyanagipuram	46.13	39.42	
5	Udayampuli	51.20	37.63	
6	Singamparai (House)	51.86	39.36	
7	Sidaparappanallur (House)	53.89	39.59	
8	Near Nadukkalur	52.72	39.77	

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

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

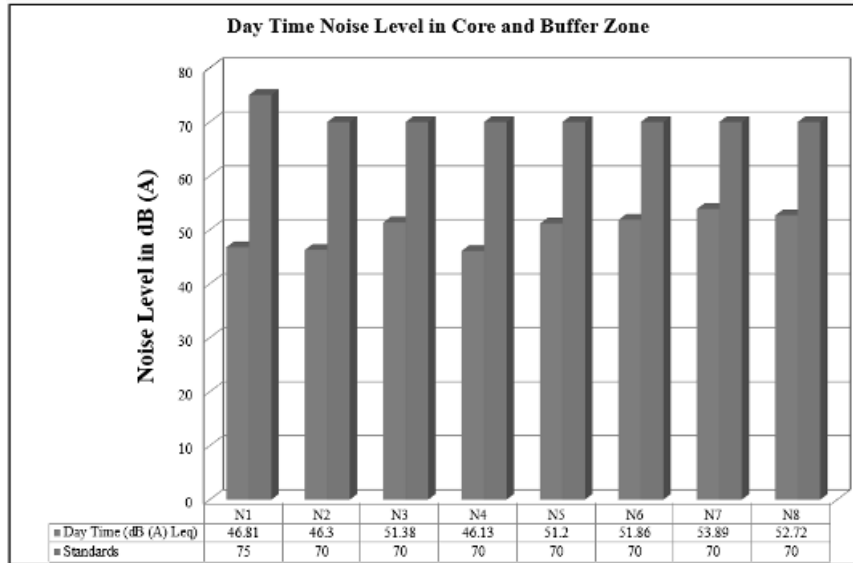
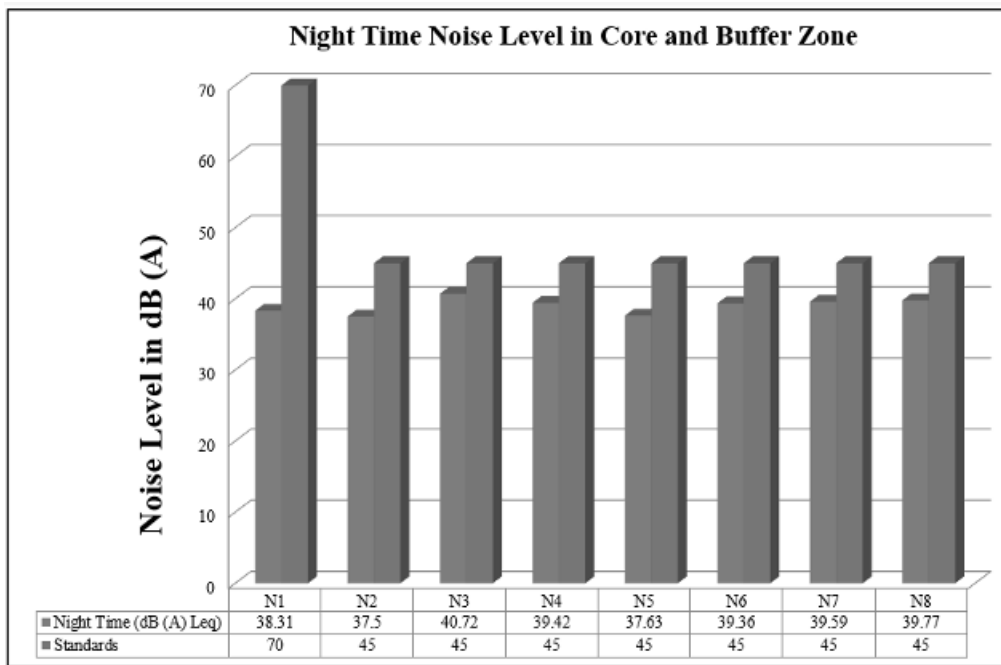


FIGURE 3.23: NIGHT TIME NOISE LEVELS IN CORE AND BUFFER ZONE



3.4.4 Interpretation & Conclusion:

Ambient noise levels were measured at 8 (Eight) locations around the proposed project area. Noise levels recorded in core zone during day time were from 46.3 – 46.81 dB (A) Leq and during night time were from 37.5 – 38.31 dB (A) Leq. Noise levels recorded in buffer zone during day time were from 46.13 – 53.89 dB (A) Leq and during night time were from 37.63 – 40.72 dB (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

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

The main objective of the present study is to assess the current ecology & and biodiversity scenario during primary field survey carried out within 10 km radius impact zone in and around the Vadakku Ariyanayagipuram-II Rough stone and gravel quarry (ML Area: 4.99.39 ha) to understand the presence and behaviour of the floral and faunal diversity of the study area with respect to terrestrial flora and fauna with special emphasis on Rare, Endangered and Threatened species & carry out Environmental Management Plan. The plan will identify and address the impacts, where these are adverse in nature, and thereafter design mitigation measures to manage such impacts in a manner as to conserve the environment and ecology of the area.

The present study was carried out in two separate headings for floral and faunal community. The aspects to be covered in the study for the project are given in Table No 3.22.

Table No: 3.22: Aspect to be covered in the study area

Aspect of Environment	Impacts
A. Terrestrial Ecology	Impacts on terrestrial flora and fauna
	Impacts on Rare-Endangered-Threatened (RET) wildlife
B. Aquatic Ecology	Impacts on aquatic fauna/flora
	Impacts on spawning and breeding grounds for aquatic species

3.5.2. Objectives of Biological Studies

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

3.5.2.1. Field surveys

The field visit was carried out to understand and assess the impacts of mining activities on flora & and fauna and natural habitats and prediction after the enhancement of the production capacity of the mine. We

evaluated the distribution and abundance of flora and fauna in the study area through primary and secondary data sources.

3.5.2.2. Floral Study

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

3.5.3. Methodology of Sampling

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

Nocturnal faunal species were searched by locating their calls during night time and by searching along the forest shrubs areas, dense dry bushes, below the stones, water bodies. During the study, to know more about the seasonal presence of flora and faunal species, information was obtained from local people and forest department.

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

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

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

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

1. Forest working plan
2. Schedule I to V: Indian Wildlife (Protection) Act, 1972

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

3.5.3.1. Sampling

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

3.5.3.2. Sampling Size

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

3.5.3.3. Timing of Study

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

3.5.3.4. Observations from Sampling

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

3.5.3.5. Field Equipment's/ References

Following tools/equipment were used for conducting phytosociological study.

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

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

3.5.4. Part I Field Sampling Techniques (Fauna Sampling)

3.5.4.1. Transect walk – Birds

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

3.5.4.2. Modified Pollard Walk – for Butterflies

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

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

VES is a time-constrained sampling technique (Campbell and Christman, 1982; Corn and Bury, 1990). It needs a systematic search through an area or habitat for a prescribed time period (Campbell and Christman,

1982). The result of VES is measured against the time spent on search. VES technique is one of the simplest methods, and an appropriate technique for both inventory and monitoring Herpetofauna (Heyer et al. 1994).

3.5.4.4. Observational methods- Mammals

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

3.5. Flora

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.

3.5.1. Flora Composition in the Core Zone

Core zone flora sampling was conducted between 8.00 am to 10.00 am in two locations. The proposed applied area exhibits plain terrain, we used with quadrat sampling methods. Taxonomically a total of 21 species belonging to 14 families have been recorded from the core zone mining lease area. Based on the habitat classification of the enumerated plants the majority of species were Herbs 7, followed by Shrubs 6, Trees 3, climber 3 and Grass 2. Details of flora with the scientific names were mentioned in Table No. 3.23. The result of the core zone of flora studies shows that Fabaceae and Lamiaceae are the main dominating species in the study area mentioned in Table No.3.23. No species were found as threatened category.

Table No: 3.23. Flora in the Core zone of area, Vadakku Ariyanayagipuram-II Village, Rough stone and gravel quarry (Primary data)

Sl.No	English Name	Vernacular Name	Scientific Name	Family Name
Trees				
1.	Neem or Indian lilac	Vembu maram	<i>Azadirachta indica</i>	Meliaceae
2.	Velvet mesquite	Mullu Maram	<i>Prosopis juliflora</i>	Fabaceae
3.	Jujube Trees	Elantha Pazham	<i>Ziziphus Mauritiana</i>	Rhamnaceae
Shrubs				
4.	West Indian Lantana	Unni chedi	<i>Lantana camara</i>	Verbenaceae
5.	Milk Weed	Erukku	<i>Calotropis gigantea</i>	Apocynaceae
6.	Bush Morning Glory	Neiveli Kattamani	<i>Ipomoea carnea</i>	Convolvulaceae
7.	Puriging nut	Kattamanakku	<i>Jatropha curcas</i>	Euphorbiaceae
8.	Indian mallow	Thuthi	<i>Abutilon indicum</i>	Meliaceae
9.	Triangular spruge	Chaturakalli	<i>Euphorbia antiquorum</i>	Euphorbiaceae
Herbs				
10.	Common leucas	Thumbai	<i>Leucas aspera</i>	Lamiaceae
11.	Cleome viscosa	Nai kadugu	<i>Celome viscosa</i>	Capparidaceae
12.	Fish poison	Kolinchi	<i>Tephrosia purpurea</i>	Fabaceae
13.	Coat buttons	Thatha poo	<i>Tridax procumbens</i>	Asteraceae
14.	Holy basil	Thulasi	<i>Ocimum tenuiflorum</i>	Lamiaceae

15.	Indian doab	Arugampul	<i>Cynodon dactylon</i>	Poaceae
16.	Indian nettle	Nayuruvi	<i>Achyranthes aspera</i>	Amaranthaceae
Climber				
17.	Stemmed vine	Perandai	<i>Cissus quadrangularis</i>	Vitaceae
18.	Stinking passionflower	Poonai puduku chedi	<i>Passiflora foetida</i>	Passifloraceae
19.	Ivy gourd	Kovai	<i>Coccinia grandis</i>	Cucurbitaceae
Grasses				
20.	Windmill grass	Chevvarakupul	<i>Chloris barbata</i>	Amaranthaceae
21.	Eragrostis	Pullu	<i>Eragrostis ferruginea</i>	Poaceae

Sources: Species observation in the field study



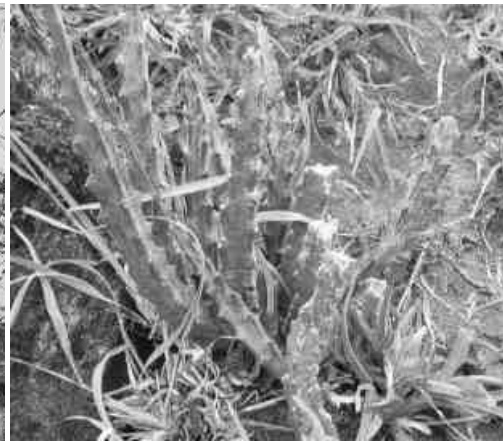
a. *Tridax procumbens*



b. *Ocimum tenuiflorum*



e. *Calotropis gigantea*



f. *Euphorbia antiquorum*

Fig No: 3.24. Flora species observation in the Core zone area

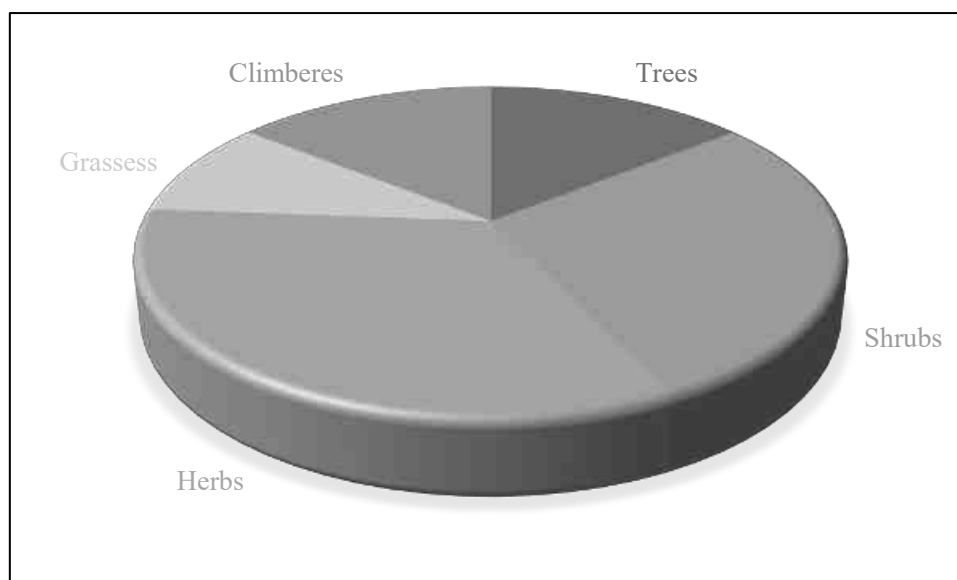


Fig No. 3.25: Graph Showing % Distribution of Floral Life Forms - Core Zone

The trees surveys were conducted around 300m radius from the proposed project site cluster are of Vadakku Ariyanayagipuram-II village. This is the standard scientific method followed by various workers in respect of phytosociological studies (Cotton and Curtis 1956; Ralhan et al. 1982; Saxena and Sing 1982; Nayak et al. 2000; Lu et al. 2004; Nautiyal 2008). While sampling, circumference at breast Height (CBH) of tree species was measured at 1.30m from ground level, along with the name of the species, phenology (flowering, fruiting, and flushes), and uses. After surveying areas, a detailed trees inventory has been compiled. A list of all plants from the study area was prepared and their habitats were recorded. The species of trees were documented during this base line survey. The dominant plant species growing in this area were *Cocos nucifera* *Prosopis juliflora*, etc. Please refer the Table No.3.24.

Table No: 3.24. Tree survey around 300m radius from the proposed project site (Primary data)

S.No	English Name	Vernacular Name	Scientific Name	No of trees
Trees				
1.	Acacia Nilotica	Karuvelammaram	<i>Vachellianilotica</i>	4
2.	Mesquite	Mullumaram	<i>Prosopis juliflora</i>	12
3.	Neem	Vembu	<i>Azadirachta indica</i>	12
4.	Millettia Pinnata	Pongam oiltree	<i>Pongamia pinnata</i>	2
5.	Asian Palmyra palm	Panai maram	<i>Borassus flabellifer</i>	21
6.	Coconut	Thennai maram	<i>Cocos nucifera</i>	30

(Sources: Species observation in the field study)

Table No: 3.25. Flora in Buffer Zone of Vadakku Ariyanayagipuram-II, Rough stone and gravel quarry (Primary data & Secondary data)

Sl.No	English Name	Vernacular Name	Scientific Name	Family Name
Trees				
1.	White-bark acacia	Velvelam	<i>Acacia leucophloea</i>	Mimosaceae
2.	Coconut	Thennai maram	<i>Cocos nucifera</i>	Areaceae
3.	Neem or Indian lilac	Vembu	<i>Azadirachta indica</i>	Meliaceae
4.	Frywood	Vaagai	<i>Albizia lebbek</i>	Mimosaceae
5.	Indian plum	Elanthai maram	<i>Ziziphus mauritiana</i>	Rhamnaceae
6.	Pongamia pinnata	Pongam	<i>Millettia pinnata</i>	Fabaceae
7.	Oil cake tree	Wunja	<i>Albizia amara</i>	Fabaceae
8.	Eucalyptus	Thailam maram	<i>Eucalyptus tereticornis</i>	Myrtaceae
9.	Velvet mesquite	Velikatthaan	<i>Prosopis juliflora</i>	Fabaceae
10.	River tamarind	Savunda	<i>Leucaenaleucocephala</i>	Fabaceae
11.	Sacred Tree	Flame of Forest	<i>Butea monosperma</i>	Fabaceae
12.	Madras thorn	Kudukapuli	<i>Pithecellobium dulce</i>	Fabaceae
13.	Portia tree	Poovarasam	<i>Thespesia Populnea</i>	Malvaceae
14.	Royal poinciana	Cemmayir Konra	<i>Delonix regia</i>	Fabaceae
15.	Lemon	Ezhumuchaipalam	<i>Citrus lemon</i>	Rutaceae
16.	Jamun Fruit Plant	Naval maram	<i>Syzygium cumini</i>	Myrtaceae
17.	Gum arabic tree	Karuvelam	<i>Accacia nilotica</i>	Fabaceae
18.	Kassod Tree	ManjalKonrai	<i>Cassia siamea</i>	Fabaceae
19.	Common guava	Koyya	<i>Psidium guajava</i>	Myrtaceae
20.	Monkey pod tree	Kondraimaram	<i>Samaneasaman</i>	Fabaceae
21.	Senna siamea	Manjal Konnai	<i>Sennasiamea</i>	Fabaceae

22.	Asian Palmyra palm	Panai maram	<i>Borassus flabellifer</i>	Arecaceae
23.	Bamboo	Moongil	<i>Bambusoideae</i>	Poaceae
24.	Teak	Thekku	<i>Tectona grandis</i>	Verbenaceae
25.	Banyan	Alamaram	<i>Ficus benghalensis</i>	Moraceae
26.	Kapok tree	Ilavamaram	<i>Ceibapentandra</i>	Malvaceae
27.	Otaheite Gooseberry	Nellai	<i>Phyllanthus acidus</i>	Phyllanthaceae
28.	Common fig	Athi Maram	<i>Ficus Carica</i>	Anacardiaceae
29.	Horsetail She-oak	Savukku maram	<i>Casuarina equisetifolia</i>	Casuarinaceae
30.	Tamarind	Puliyamaram	<i>Tamarindus indica</i>	Legumes
31.	Moringa	Murungai Maram	<i>Moringa oleifera</i>	Moringaceae
32.	Phoenix sylvestris	Pereatchai	<i>Phoenix sylvestris</i>	Arecaceae
33.	Creamy peacock flower	Perungondrai	<i>Delonix elata</i>	Fabaceae
34.	Mango	Manga	<i>Mangifera indica</i>	Anacardiaceae
35.	Curry tree	Karuveppilai	<i>Murraya koenigii</i>	Rutaceae
36.	Papaya	Pappali maram	<i>Carica papaya</i>	Caricaceae
37.	Banana tree	Vazhaimaram	<i>Musa acuminata</i>	Musaceae
38.	Jack fruit	Palamaram	<i>Artocarpus heterophyllus</i>	Moraceae
39.	Singapore Cherry	Ten pazham	<i>Muntingia calabura</i>	Malvaceae
Shrubs				
1.	Common Wireweed	Arivalmanai poondu	<i>Sida acuta</i>	Malvaceae
2.	Bush Morning Glory	Neiveli Kattamani	<i>Ipomoea carnea</i>	Convolvulaceae
3.	Chinese chastetree	Nochi	<i>Vitex negundo</i>	Lamiaceae
4.	Wild jujube	Nari-y-ilantai	<i>Zizyphus nummularia</i>	Rhamnaceae
5.	Malabar nut	Adhatoda	<i>Justicia adhatoda</i>	Acanthaceae
6.	Fish poison	Kolinchi	<i>Tephrosia purpurea</i>	Fabaceae

7.	Jackal jujube	Surai Ilantai	<i>Ziziphus oenoplia</i>	Rhamnaceae
8.	Milk Weed	Erukku	<i>Calotropis gigantea</i>	Apocynaceae
9.	Peacock Flower	Mayil Kontai	<i>Caesalpinia pulcherrima</i>	Fabaceae
10.	<i>Solanum pubescens</i>	Malaisundai	<i>Solanum pubescens Willd</i>	Solanaceae
11.	Night shade plan	Sundaika	<i>Solanum torvum</i>	Solanaceae
12.	Mesquite	Seemai karuvelam	<i>Prosopis juliflora</i>	Fabaceae
13.	Triangular spruge	Chaturakalli	<i>Euphorbia antiquorum</i>	Euphorbiaceae
14.	Yellow elder	Manjarali Sonnapatti	<i>Tecoma stans</i>	Bignoniaceae
15.	Henna Tree	Maruthani	<i>Lawsonia inermis</i>	Lythraceae
16.	<i>Martynia annua</i>	Thael kodukkukaai	<i>Martynia annua</i>	Martyniaceae
17.	Devil's trumpet	Umathai	<i>Datura metel</i>	Solanaceae
18.	Jhahrberi	Narielandai	<i>Ziziphus nummularia</i>	Rhamnaceae
19.	Castor bean	Amanakku	<i>Ricinus communis</i>	Euphorbiaceae
20.	Shoe flower	Chemparuthi	<i>Hibiscu rosa-sinensis</i>	Malvaceae
21.	Bellyache bush	Kaatamanaku	<i>Jatropagossypifolia</i>	Euphorbiaceae
22.	Blue snakeweed	Seemai nayarooovi	<i>Stachytarpheta indica</i>	Verbenaceae
23.	Touch-me-not	Thottalchinungi	<i>Mimosa pudica</i>	Mimosaceae
24.	Indian mallow	Thuthi	<i>Abutilon indicum</i>	Meliaceae
25.	Apple of sodom	Vellerukku	<i>Calotropis procera</i>	Asclepiadaceae
26.	Avaram	Avarai	<i>Senna auriculata</i>	Fabaceae
27.	Indian Oleander	Arali	<i>Nerium indicum</i>	Apocynaceae
28.	West Indian Lantana	Unni chedi	<i>Lantana camara</i>	Verbenaceae
Herbs				
1.	Septicweed	Kattuttakarai	<i>Senna occidentalis</i>	Fabaceae
2.	Red Pea Eggplant	Vellai tuduvalai	<i>Solanum trilobatum</i>	Solanaceae

3.	Bladder Cherry	Kupanti	<i>Physalis minima</i>	Solanaceae
4.	Chamber bitter	Malai Kizhanelli	<i>Phyllanthus urinaria L.</i>	Euphorbiaceae
5.	Indian Whitehead	Vella ragu	<i>Enicostema axillare</i>	Gentianaceae
6.	Carrot grass	Vishapoondu	<i>Parthenium hysterophorus</i>	Asteraceae
7.	Porcupine flower	Kundan	<i>Barleria prionitis</i>	Acanthaceae
8.	Shaggy Button Weed	Nattai-churi	<i>Borreria hispida</i>	Rubiaceae
9.	Billygoat weed	Pumpillu	<i>Ageratum conyzoides</i>	Asteraceae
10.	Green amaranth	Kuppaikeerai	<i>Amaranthus viridis</i>	Amaranthaceae
11.	Aloe barbadensis	Katrazhai	<i>Aloe vera</i>	Asphodelaceae
12.	Indian Mercury	Kuppamani	<i>Acalypha indica</i>	Euphorbiaceae
13.	False daisy	Karisalankanni	<i>Eclipta prostrata</i>	Asteraceae
14.	Indian nettle	Nayuruvi	<i>Achyranthes aspera</i>	Amaranthaceae
15.	Indian doab	Arugampul	<i>Cynodon dactylon</i>	Poaceae
16.	Rough cocklebur	Marul-umattai	<i>Xanthium strumarium</i>	Asteraceae
17.	Monarch redstem	Kalluruvi	<i>Ammannia baccifera</i>	Lythraceae
18.	Riceweeds	Seruppada	<i>Coldenia procumbens</i>	Boraginaceae
19.	Cracker plant	Kiranti nayan	<i>Ruellia tuberosa</i>	Acanthaceae
20.	East Indian globe thistle	kottai-k-karantai	<i>Sphaeranthus indicus</i>	Asteraceae
21.	Mountain knotgrass	Sirupulai	<i>Aerva lanata</i>	Amaranthaceae
22.	Tickweed	Nai kadugu	<i>Celome viscosa</i>	Capparidaceae
23.	Frog fruit	Poduthalai	<i>Phyla nodiflora</i>	Poduthalai
24.	Common leucas	Thumbai	<i>Leucas aspera</i>	Lamiaceae
25.	Fish poison	Kollukkai Vela	<i>Tephrosia purpurea</i>	Fabaceae
26.	Pig weed	Mukkarattai Keerai	<i>Boerheavia diffusa</i>	Nyctaginaceae
27.	Asthma-plant	Amman pacharisi	<i>Euphorbia hirta</i>	Euphorbiaceae

28.	Poor land flatsedg	Kunnakora	<i>Cyperus compressus</i>	Cyperaceae
29.	Marsh Barbel	Neermulli	<i>Hygrophila auriculata</i>	Acanthaceae
30.	Bhringaraj	Karisalankanni	<i>Eclipta alba</i>	Asteraceae
31.	Spiny amaranth	Mullukkirai	<i>Amaranthus spinosus</i>	Amaranthaceae
32.	Holy basil	Thulasi	<i>Ocimum tenuiflorum</i>	Lamiaceae
33.	Indian Turnsole	Thek kodukku	<i>Heliotropium indicum</i>	Boraginaceae
34.	Tridax daisy	Thatha poo	<i>Tridax procumbens</i>	Asteraceae
35.	Globe Amaranth	Vaadamalli	<i>Gomphrena globosa</i>	Amaranthaceae
36.	Rushfoil	Reilpoondu	<i>Croton sparsiflorus</i>	Euphorbiaceae
37.	Gale of the wind	Keelanceeli	<i>Phyllanthus niruri</i>	Phyllanthaceae
Climber/ Creepers				
1.	Balloon vine	Mudakathan	<i>Cardiospermum halicacabum</i>	Sapindaceae
2.	Ivy gourd	Kovai	<i>Coccinia grandis</i>	Cucurbitaceae
3.	Bitter apple	Peikkumatti	<i>Citrullus colocynthis</i>	Cucurbitaceae
4.	Wild water lemon	Poonai puduku chedi	<i>Passiflora foetida</i>	Passifloraceae
5.	Stemmed vine	Perandai	<i>Cissus quadrangularis</i>	Vitaceae
6.	Butterfly pea	Sangu poo	<i>Clitoria ternatea</i>	Fabaceae
7.	Bitter melon	Paagarkaai	<i>Momordica charantia</i>	Cucurbitaceae
8.	Rosary pea	Kundumani	<i>Abrus precatorius</i>	Fabaceae
9.	Madras Pea Pumpkin	Musumuskkai	<i>Mukia mederaspatna</i>	Cucurbitaceae
10.	Bottle gourd	Churakka	<i>Lagenaria siceraria</i>	Cucurbitaceae
Grass				
1.	Great brome	Thodappam	<i>Bromus diandrus</i>	Poaceae
2.	Common needle grass	-	<i>Aristida adscensionis</i>	Poaceae
3.	Windmill grass	Chevvarakupul	<i>Chloris barbata</i>	Amaranthaceae

4.	Eragrostis	Pullu	<i>Eragrostis ferruginea</i>	Poaceae
5.	Narrowleaf cattail	Sambu	<i>Typha angustifolia</i>	Typhaceae
6.	Water grass	Mukkutikorei	<i>Bulbostylis barbatta</i>	Cyperaceae
7.	Finger grass	Kuruthupillu	<i>Chloris dolichostachya</i>	Poaceae
8.	Umbrella-sedge	Vattakorai	<i>Cyperus difformis</i>	Cyperaceae
9.	Marvel grass	Marvel grass	<i>Dichanthium annulatum</i>	Poaceae
10.	Tropical crabgrass	Crab grass	<i>Digetaria adscendens</i>	Poaceae
11.	Purple love grass	Bunchgrass	<i>Eragrostis spectabilis</i>	Poaceae

(Sources:

Species observation in the field study

Global Biodiversity Information Facility

Road side flora of Pazhavor, Tirunelveli district, Tamil Nadu, South India

Medicinal flora diversity in Tirunelveli coastal villages

An assessment of tree species diversity in Tirunelveli Corporation Area, Tamil Nadu

A Study on the Floral Diversity of Suthamalli Pond, Tirunelveli District, Tamilnadu, India.

Ethnomedicinal Uses of Plants in the Plains Area of the Tirunelveli-District, Tamilnanu, India

Diversity, Conservation Status and Medicinal Plants of the Family Euphorbiaceae in Tirunelveli Hills, Southern India

Diversity, Conservation Status and Medicinal Plants of the Family Euphorbiaceae in Tirunelveli Hills, Southern India

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

Buffer zone flora sampling was conducted between 10.00 am to 4.00 pm in eight different locations in 10 km radius as per the ToR. The most important and widely used methods for a general assessment is belt transect/quadrant methods. The study area was divided according to habitat types followed the random sampling methods in the selected area. For plant biodiversity study in the ecosystems, the quadrat methods were followed. The proposed applied area is exhibiting plain topography. Similar habitats may be found in the buffer area as well, although there is a wider variety of plants there than in the core zone area. The floral (107) varieties among them Trees 39, Herbs 37, Shrubs 28, Climbers/Creepers 10, and Grasses 11 were identified. The result of the buffer zone of flora studies shows that Fabaceae and Cucurbitaceae, Euphorbiaceae is the main dominating species in the study area mentioned in Table No.3.56. 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. The total number of different plant life forms under trees, shrubs, herbs, and climbers is shown in Table No. 3.26 and their % distribution is shown in Figure No. 3.26.

Table No: 3.26. Number of floral life forms in the Study Area

S. No	Plant Life Form	Number of Species
1	Trees	39
2	Shrubs	28
3	Herbs	37
4	Climber/ Creeper	10
6	Grasses	11
Total No. of Species		125

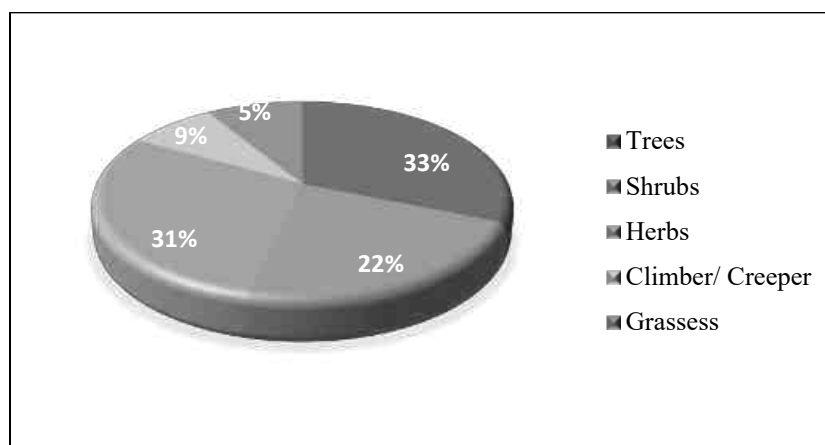


Fig No. 3.26: Graph Showing % Distribution of Floral Life Forms (Buffer Zone)



a. *Ziziphus Mauritiana*



b. *Azadirachta indica*



c. *Euphorbia hirta*



d. *Leucas aspera*



e. *Ocimum tenuiflorum*



f. *Cissus quadrangularis*



g. *Senna auriculata*



h. *Euphorbia antiquorum*



i. *Solanum torvum*



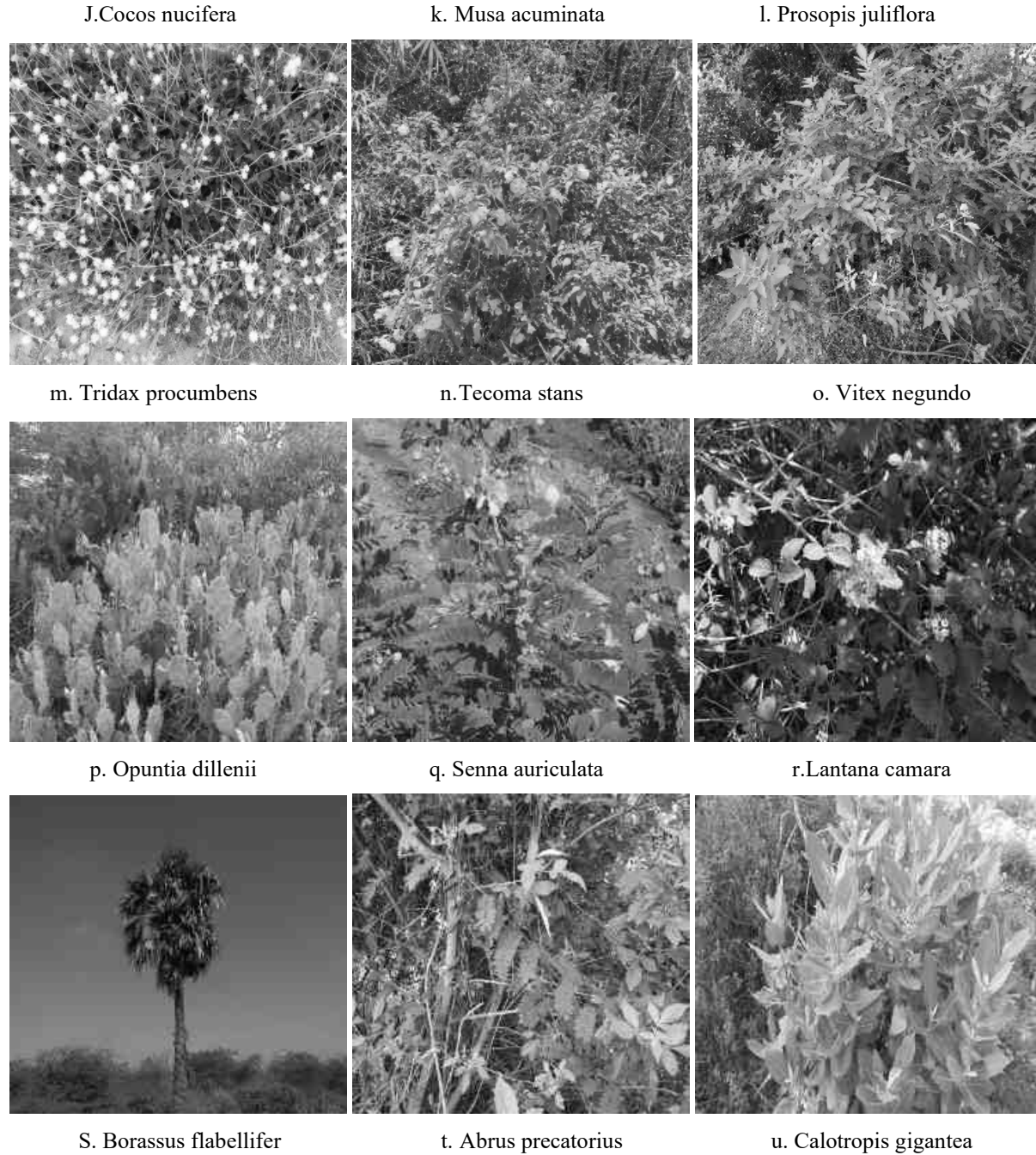


Fig No: 3.27. Flora species observation in the Buffer zone area

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

The Kolundumadai R.F. is located about 9.3km on the south side. No protected (PF) forests either in the mine lease area or in the buffer zone. No forest land is involved in any manner. Hence, no certificate from the DFO is required. 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.

Kalakadu Wildlife sanctuary is located about 16.2km on the SW and Koothankulam - Kodankulam bird's sanctuary is located about 35.2km on the SE. Thus, no ecological sensitive area is involved in any manner.

Hence' submission of clearance from the National Board of Wildlife does not arise because it is located away from the proposed project site. here 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 10km 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.

3.7. 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 and the Indian Wildlife Protection Act, 1972. There are no rare, endangered, threatened (RET), and endemic species present in the core area.

3.7.1. Fauna Composition in the Core Zone (Primary data)

Core zone fauna samplings were conducted between 6.00 am to 8.00 am in three locations. A total of 19 varieties of species were observed in the Core zone of Vadakku Ariyanayagipuram-II During the study, it was found that the faunal diversity in the core site was limited to Butterflies, insects, and some species of mammals & and reptiles among them numbers Insects/Butterflies 8, Reptiles 3, Mammals 3, and Avian 12. The core site has avifauna species like crow, Black drongo, Koel, etc. None of these species are threatened or endemic in the study area and surroundings. There is no Schedule I species and 16 species are under Schedule IV according to the Indian Wildlife Act 1972. There are no critically endangered, endangered, vulnerable, and endemic species were observed.

Table No: 3.27. Fauna in the Core zone of Vadakku Ariyanayagipuram-II Village, Rough stone and gravel quarry (Primary data)

SI. No	Common Name	Scientific Name	Schedule list WLPC 1972
Insects/Butterflies			
1.	Common Tiger	<i>Danaus genutia</i>	NL
2.	Red-veined darter	<i>Sympetrum fonscolombii</i>	NL
3.	Tawny coster	<i>Danaus chrysippus</i>	Schedule IV
4.	House fly	<i>Musca domestica</i>	-
5.	Dragonfly	<i>Agriansp</i>	-
6.	Striped tiger	<i>Danaus plexippus</i>	Schedule IV
7.	Grey pansy	<i>Junonia atlites</i>	LC
8.	Common Tiger	<i>Danaus genutia</i>	LC
Reptiles			
1.	Oriental garden lizard	<i>Calotes versicolor</i>	NL

2.	Indian forest skink	<i>Sphenomorphus indicus</i>	NL
3.	House lizards	<i>Hemidactylus flaviviridis</i>	Schedule IV
Mammals			
1.	Indian Field Mouse	<i>Mus booduga</i>	Schedule IV
2.	Asian Small Mongoose	<i>Herpestes javanicus</i>	Schedule (Part II)
3.	Squirrel	<i>Funambulus palmarum</i>	Schedule IV
Aves			
1.	Rose-ringed parakeet	<i>Psittacula krameri</i>	Schedule IV
2.	Common myna	<i>Acridotheres tristis</i>	Schedule IV
3.	Small-blue kingfisher	<i>Alcedo atthis</i>	Schedule IV
4.	Pond heron	<i>Ardeolagravii</i>	Schedule IV
5.	Common quail	<i>Coturnix coturnix</i>	Schedule IV
6.	Asian koel	<i>Eudynamis scolopacea</i>	Schedule IV
7.	Red-vented Bulbul	<i>Pycnonotus cafer</i>	Schedule IV
8.	Cattle egret	<i>Bubulcus ibis</i>	Schedule IV
9.	Koel	<i>Eudynamis</i>	Schedule IV
10.	Black drongo	<i>Dicrurus macrocercus</i>	Schedule IV
11.	House crow	<i>Corvus splendens</i>	Schedule V
12.	Shikra	<i>Accipiter badius</i>	Schedule IV

(Sources: Species observation in the field study)

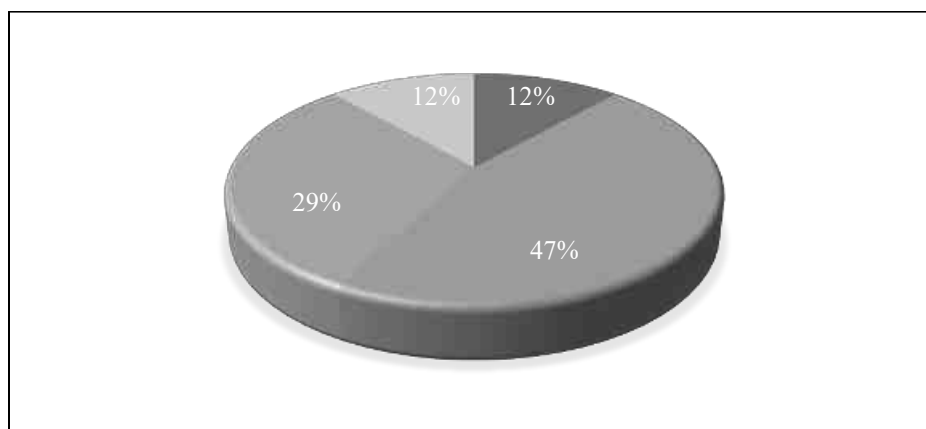


Fig No. 3.28. Graph Showing % Distribution of Fauna Life Forms (Core Zone)

3.9. Inventory of Faunal Diversity in the Buffer Zone

As animals, especially vertebrates move from place to place in search of food, shelter, mate or other biological needs, separate lists for core and buffer areas are not feasible however, a separate list of fauna pertaining to core and buffer zone are listed separately. Though there are no reserved 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 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 (10km) the proposed mine lease area. Kalakadu Wildlife sanctuary is located about 16.2km on the SW and Koothankulam – Kodankulam bird's sanctuary is located about 35.2km on the SE. It is evident from the available records, reports, and circumstantial evidence that the entire study area including the core and buffer areas were free from any endangered animals. There were no resident birds other than common bird species such as Cattle egret, Asian Koel, House crow, Black drangos, Crows, Rose-ringed Parakeet etc.

The list of Mammals (*directly sighted animals & Secondary data) is given in table No.3.28. The list of bird species recorded during the field survey and literature from the study area are given in Table 3.29. The list of reptilian species recorded during the field survey and literature from the study area is given in Table 3.30. The list of insect species recorded during the field survey and literature from the study area are given in Table 3.31. The list of Butterflies species recorded during the field survey and literature from the study area are given in Table 3.32. It is apparent from the list that none of the species either spotted or reported is included in Schedule I of the Wildlife Protection Act. Similarly, none of them comes under the REET category.

Taxonomically a total of 76 species recorded were from the buffer zone area. Based on habitat classification the majority of species were birds 33, followed by Butterflies 20, Reptiles 8, Insects 14, Mammals 5, and Amphibians 4. There are two Schedule II species, and 57 species are under Schedule IV according to the Indian Wildlife Act 1972. A total of 33 species of bird were sighted in the study area. There are no critically endangered, endangered, vulnerable, and endemic species were observed. There are no impacts on nearby fauna species.

Dominant species are mostly birds, butterflies, and insects, and four amphibians was observed during the extensive field visit Sphaerotheca breviceps, Euphylyctis hexadactylus, Bufomelanostictus, etc. There is no Schedule I Species in the study area. There are no critically endangered, endangered, vulnerable, and endemic species were observed.

Table No. 3.28. List of Fauna & Their Conservation Status,

Mammals: (*directly sighted animals & Secondary data)

S.No	Scientific name	Common name	Family	IUCN/WPA Schedule
1.	<i>Funambulus palmarum</i>	Indian Palm squirrel	Squirrel	LC – IV
2.	<i>Herpates edwardrii</i>	Indian grey mongoose	Mongoose	LC – IV
3.	<i>Lepus nigricollis</i>	Hare	Leporids	LC – IV
4.	<i>Rattus norvegicus</i>	Field mouse	Murids	LC – IV
5.	<i>Rattus rattus</i>	House rat	Murids	LC – IV

Table No. 3.29. Listed birds (Primary data & Secondary data)

SI. No	Scientific Name	Common Name	Family	Schedule list WLP 1972
1.	<i>Psittaculakrameria</i>	Rose-ringed Parakeet	Psittaculidae	Schedule IV

2.	<i>Tachybaptusruficollis</i>	Little grebe	Podicipedidae	Schedule IV
3.	<i>Pycnonotus cafer</i>	Red-vented Bulbul	Pycnonotidae	Schedule IV
4.	<i>Alcedo atthis</i>	Small blue Kingfisher	Alcedinidae	Schedule IV
5.	<i>Leptocoma zeylonica</i>	Purple Sunbird	Nectariniidae	Schedule IV
6.	<i>Leptocoma zeylonica</i>	Purple-rumped Sunbird	Nectariniidae	Schedule IV
7.	<i>Dicrurus macrocercus</i>	Two-tailed Sparrow	Dicruridae	Schedule IV
8.	<i>Ardeacineria</i>	Grey heron	Ardeidae	Schedule IV
9.	<i>Bubulcus ibis</i>	Cattle egret	Ardeidae	Schedule IV
10.	<i>Acridotheres tristis</i>	Common myna	Sturnidae	Schedule IV
11.	<i>Coracias benghalensis</i>	Indian roller	Coraciidae	Schedule IV
12.	<i>Nycticorax nycticorax</i>	Night heron	Ardeidae	Schedule IV
13.	<i>An thus rufulus</i>	Paddyfield Pipit	Motacillidae	Schedule IV
14.	<i>Pycnonotus jocosus</i>	Red-whiskered Bulbul	Pycnonotidae	Schedule IV
15.	<i>Egretta garzetta</i>	Little Egret	Ardeidae	Schedule IV
16.	<i>Merops orientalis</i>	Green Bee-eater	Meropidae	Schedule IV
17.	<i>Francolinus pondicerianus</i>	Grey Francolin	Phasianidae	Schedule IV
18.	<i>Tringa ochropus</i>	Green Sandpiper	Scolopacidae	Schedule IV
19.	<i>Motacilla cinerea</i>	Grey Wagtail	Motacillidae	Schedule IV
20.	<i>Passer domesticus</i>	House Sparrow	Passeridae	Schedule IV
21.	<i>Dicrurus macrocercus</i>	Black Drongo	Dicruridae	Schedule IV
22.	<i>Lanius cristatus</i>	Brown Shrike	Laniidae	Schedule IV
23.	<i>Streptopeliachinensis</i>	Spotted dove	Columbidae	Schedule IV
24.	<i>Accipiter badius</i>	Shikra	Accipitridae	Schedule IV
25.	<i>Eudynamysscolopacea</i>	Asian koel	Cuculidae	Schedule IV
26.	<i>Halcyon smyrnensis</i>	White-breasted kingfisher	Alcedinidae	Schedule IV
27.	<i>Dicrurus leucophaeus</i>	Ashy Drongo	Dicruridae	Schedule IV
28.	<i>Columba livia</i>	Rock Pigeon	Columbidae	Schedule IV
29.	<i>Corvus splendens</i>	House crow	Corvidae	Schedule V
30.	<i>Corvus macrorhynchos</i>	Jungle crow	Corvidae	Schedule IV
31.	<i>Copsychus saularis</i>	Robin	Muscicapidae	Schedule IV
32.	<i>Ardeolagrayii</i>	Pond heron	Ardeidae	Schedule IV
33.	<i>Coturnix coturnix</i>	Common quail	Phasianidae	Schedule IV

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

Table No. 3.30. List of Reptiles either spotted or reported from the study area

SI. No	Scientific Name	Common Name	Family	Schedule list WLP 1972
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1.	<i>Calotes versicolor</i>	Common Garden lizard	Agamid lizards	LC – IV
2.	<i>Bangarus caeruleus</i>	Common krait	Elapidae	LC – II
3.	<i>Hemidactylus flaviviridis</i>	House gecko	Geckos	LC – IV
4.	<i>Ahaetulla nasuta</i>	Common Green Snake	Colubridae	LC – IV
5.	<i>Lissemys punctata</i>	Indian mud turtle	Softshell turtles	LC – IV
6.	<i>Naja naja</i>	Indian Cobra	Elapid snakes	LC – II
7.	<i>Ptyas mucosus</i>	Common rat snake	Colubrid Snakes	LC – IV
8.	<i>Varanus benegaiensis</i>	Udumbu	Varanidae	LC – IV

Table No. 3.31. List of insects either spotted or reported from the study area

SI. No	Scientific Name	Common Name	Family	Schedule list WLP 1972
1.	<i>Agrion sp & Petalura sp</i>	Dragon fly	Anisoptera	LC - IV
2.	<i>Apis indica</i>	Honey bee	Apidae	LC - IV
3.	<i>Aranea sp</i>	Spider	Crambidae	LC - IV
4.	<i>Carausius sp</i>	Stick insect	Lonchodinae	LC - IV
5.	<i>Coccinella septempunctata</i>	Lady bird beetle	Coccinellidae	LC - IV
6.	<i>Hamitermes silvestri</i>	Termite	----	LC - IV
7.	<i>Hieroglyphus sp</i>	Grasshopper	Acrididae	LC - IV
8.	<i>Scorpion</i>	Palamnaeus swammerdam	Scorpionoidea	LC - IV
9.	<i>Centipede</i>	Scolopendra	House Centipedes	LC - IV
10.	<i>Cicada sp</i>	Cicade	Cicadidae	LC - IV

Table No. 3.32. List of Butterflies identified from the project site and their conservation status

SI. No	Scientific Name	Common Name	IUCN Conservation Status
1.	<i>Danaus genutia</i>	Striped Tiger	LC
2.	<i>Danaus chrysippuschrysippus</i>	Plain Tiger	LC
3.	<i>Acraea terpsicore</i>	Tawny Coster	LC
4.	<i>Papiliopolytespolytes</i>	Common Mormon	LC
5.	<i>Papiliopolytesromulus</i>	Common Mormon	LC
6.	<i>Papiliodemoleusdemoleus</i>	Lime Butterfly	LC
7.	<i>Hypolimnasmisippus</i>	DanaidEggfly	LC
8.	<i>Junoniahierta</i>	Yellow Pansy	LC
9.	<i>Junonialemonias</i>	Lemon Pansy	LC
10.	<i>Euchrysops pandava</i>	Plain cupid	LC

11.	<i>Phalantaphalantha</i>	Common Leopard	LC
12.	<i>Junonia iphita iphita</i>	Chocolate pansy	LC
13.	<i>Terias hecabe</i>	Common grass yellow	LC
14.	<i>Junonia orythia</i>	Blue pansy	LC
15.	<i>Junonia lemonias</i>	Lime pansy	LC
16.	<i>Euploea core</i>	Common Crow	LC
17.	<i>Melanitisledaleda</i>	Common Evening Brown	LC
18.	<i>Jamidescelenocelena</i>	Common Cerulean	LC
19.	<i>Evereslacturnus</i>	Indian Cupid	LC
20.	<i>Pachlioptaaristolochiae</i>	Common Rose	LC

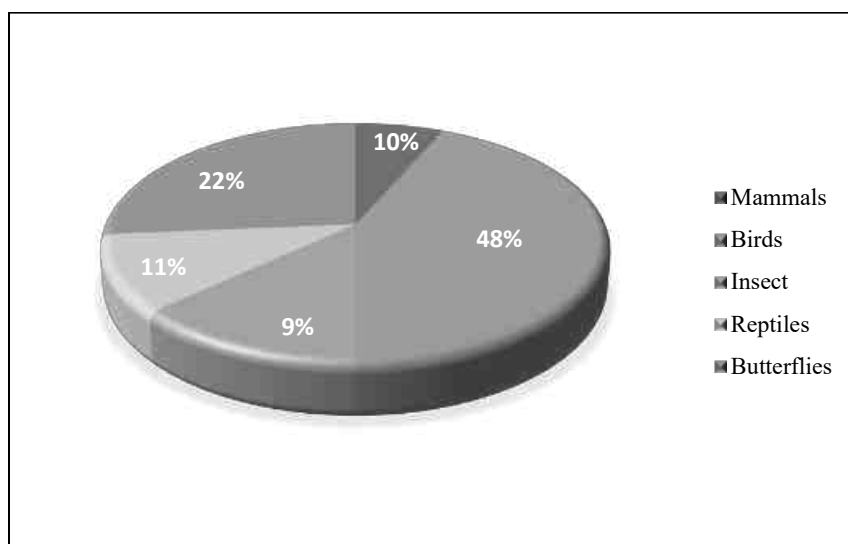


Fig No: 3.29. Distribution Of Faunal Communities (Buffer Zone)

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

The study area is marked with moderate population of flora and fauna. With reference to the Wildlife Protection Act 1972 total number of wildlife tabulated in this study can be characterized as given in the Table No 3.64.

Table No: 3.33 Characterization of Fauna in the Study Area (As Per W.P Act, 1972)

S. No	Schedule of Wildlife Protection Act 1972	No. of species	Remark
1.	Schedule I	0	-
2.	Schedule II	2	-
3.	Schedule III	0	-

4.	Schedule IV	57	-
5.	Schedule V	1	-
6.	Schedule VI	0	-

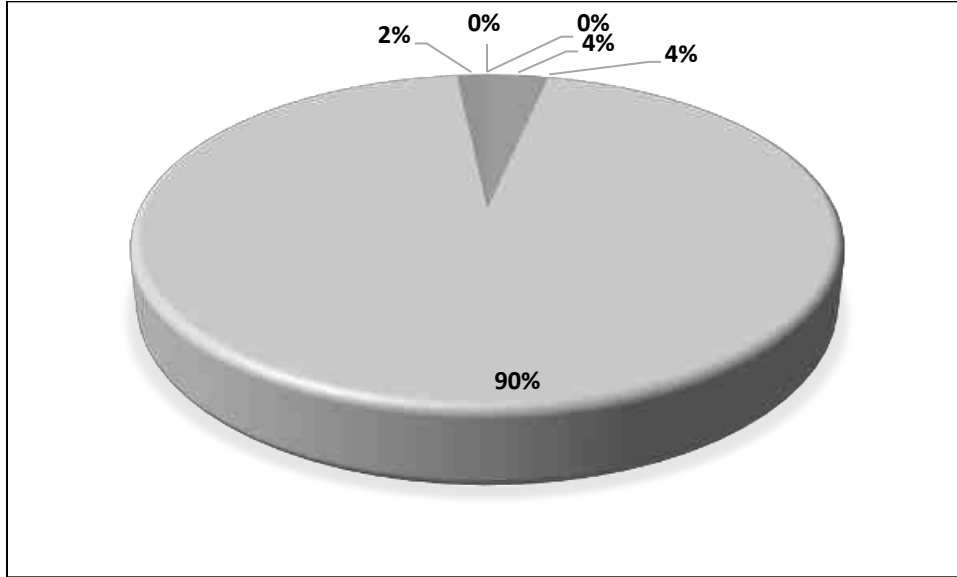


Fig No: 3.30. Schedule Of Wildlife Protection Act 1972

Table No: 3.34. Description of Flora & Fauna

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

A comprehensive Central Legislation Namely Wild Life (Protection) Act was enforced in 1972 to provide protection to wild animals. Schedule-I of this act contains the list of rare and endangered species, which are completely protected throughout the country. The list of wild animals and their conservation status as per Wild Life Act (1972) presented in Table 3.34 are the species recorded/reported from the study area, out of which 2 species belongs to schedule-II, 1 species belongs to Schedule-V and rest of the species belongs to schedule-IV of Wildlife Protection Act, 1972. And there is no Invasive alien species (IAP) in the study area.

3.10. Aquatic Ecology

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

3.10.1. 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.

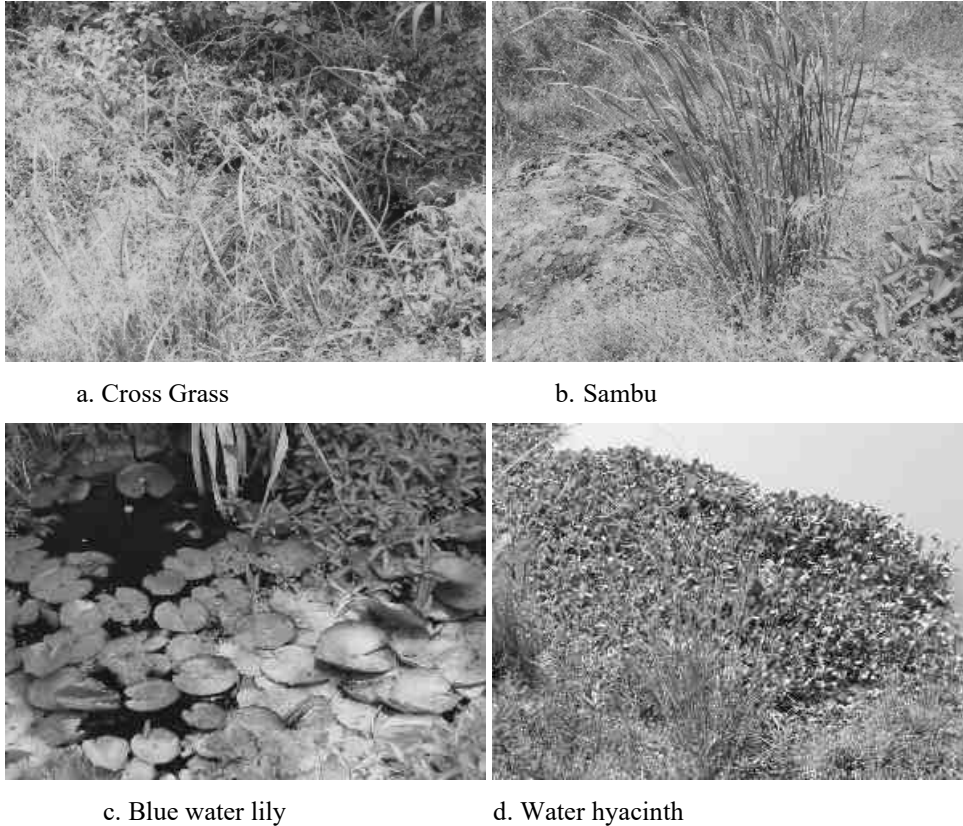
3.10.2. Macrophytes

The macrophytes observed within the study area are tabulated in Table No. 3.35.

Table No.3.35 Description of Macrophytes

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

Sources: Species observation in the field study



(Sources: Species observation in the field study)

Figure No: 3.31. List of aquatic plants in the study area

3.10.3. Aquatic Faunal Diversity

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

Table No. 3.36. Amphibians Observed/Recorded from the Study Area

Sl. No	Common Name/English Name	Scientific Name	Schedule list WLPA 1972	IUCN Red List data
1.	Indian Burrowing frog	<i>Sphaerotheca breviceps</i>	Schedule IV	LC
2.	Green pond frog	<i>Euphlyctis hexadactylus</i>	Schedule IV	LC
3.	Indian Toad	<i>Bufo melanostictus</i>	Schedule IV	LC
4.	Skipper	<i>Euphlyctiscynophlyctis</i>	Schedule IV	LC

*Status assigned by the IUCN, where – CR – Critically Endangered; EN – Endangered; LC – Least Concern; NT – Near Threatened; VU – Vulnerable, DA – Data Deficient, NE – Not Evaluated

3.10.4. Other Aquatic Fauna

3.10.4.1. 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, Snakehead murrel, etc. Species of fish reported in the study area are given in table 3.37.

Table 3.37. Based on Actual Sighting, based on inputs from locals and Perused from Secondary Data

S.No	Common name	Scientific name	Family
1.	Ponthia	<i>Puntius sophore</i>	Cyprinidae
2.	Silver scabbardfish	<i>Lepidopus caudatus</i>	Trichiuridae
3.	-	<i>Cyprinus carpio</i>	Cyprinidae
4.	Catla	<i>Catla Catla</i>	Cyprinidae
5.	Rohu	<i>Labeo rohita</i>	Cyprinidae
6.	Catfish	<i>Siluriformes</i>	-
7.	Snakehead murrel	<i>Channa striata</i>	-
8.	Eel fish	<i>Electrophorus electricus</i>	Gymnotidae

a. 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	Kalakadu Wildlife sanctuary is located about 16.2km on the SW
2.	Reserved Forests	The Kolundumadai R.F. is located about 9.3km on the south side.
3.	Wildlife Corridors & Routes	Koothankulam – Kodankulam bird's sanctuary is located about 35.2km on the SE. Thus, no ecological sensitive area is involved in any manner. Hence, no NBWL Clearance is required.
4.	Wetlands / Water bodies	-
5.	Ramsar Site	Nil
6.	Important Bird Habitats	Nil
7.	Breeding/nesting areas of endangered species	Not present
8.	Mangroves	None

There are no critically endangered, endangered, vulnerable and endemic species were observed. As the rainfall in the area is scanty and as no toxic wastes are produced or discharged on account of mining, the proposed mining activity is not going to have any additional and adverse impacts on these RET species. There are no ecologically sensitive areas or protected areas within the 10 Km radius. Hence no specific conservation for conservation of any RET species or Wildlife is envisaged. 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. There is no Schedule I species in study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] The proposed project is not going to have any direct or indirect adverse impact on the species mentioned above.

3.9. 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.

[Invasive Alien Species | IUCN](#)

[Biodiversity of Butterflies at Ambasamudram Taluk, Tirunelveli District, Tamil Nadu Dates](#)

<https://ebird.org/region/IN-TN-TI>

[Amphibian diversity and distribution in KMTR \(Southern Western Ghats\) of Tirunelveli district, Tamil Nadu](#)

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

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

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

3.6 SOCIO ECONOMIC ENVIRONMENT

The major developmental activities in Mining sector are required for economic development as well as creation of employment opportunities (direct and indirect) and to meet the basic/modern needs of the society, which ultimately results in overall improvement of the quality of life through upliftment of social, economic, health, education and nutritional status in the project region, state as well as the country. In this manner all developmental projects have direct as well as indirect relationships with socioeconomic aspects, which also include public acceptability for new/proposed developmental projects.

The study of these parameters helps in identification, prediction and evaluation of the likely impacts on the socio economics and parameters of human interest due to the project.

3.6.1 Objectives

The primary objectives of the Social Impact Assessment study are:

- To assess the impact on socio-economic environment due to the project
- Understanding the baseline socio-economic environment obtaining in the impact zone.
- Identifying the key stakeholders who are likely to be impacted by the establishment of the proposed project.
- Predicting the positive and negative impacts of the project on the socioeconomic environment in the area.
- Suggesting mitigation measures to minimize the negative impacts.

3.6.2 Scope of Work

In keeping with its objectives, the scope of the study extends to:

- Making a reconnaissance of the villages and human settlements within the 10km radius from the proposed project site.
- Understanding the overall socio-economic profile of the impact area.
- Assessing the baseline socio-economic environment prevailing in the impact area focusing the core and buffer zones.
- Identifying key economic sectors and major sources of livelihood in the study area.
- Understanding social structures and lifestyles of people in the area who are likely to be affected the most by the proposed project.
- Assessing physical and social infrastructure facilities accessible to inhabitants in the project impact area.
- Predicting the likely socio-economic impacts as a consequence of establishing the project.
- Suggesting adverse impact mitigation measures in line with the felt needs, aspirations and expectations of the project affected population.
- Preparing an appropriate Socio-Economic Environment Management Plan.

3.6.3 Approach & Methodology

The basic approach for carrying out the SIA is focused on:

- Zeroing-in on the project impact area, covering all the villages and other habitations falling within the 10 km radius from the project site.
- Collecting basic information with respect to constituent villages in terms of census village code, name of the Tehsil in which a particular village falls, number of households, population level (as per Census 2011) and growth of village population during the last decade, distance from the proposed project site etc.
- Identifying critical knowledge/information gaps which impede an objective and reliable assessment of the socio-economic impacts of the project.
- Zeroing-in on the data/information to be collected for a fair impact assessment and deciding upon the sources and means to collecting the same.
- Identifying the key stakeholders and potential respondents for collecting the required information.
- Drawing a sampling frame and sample size specifying villages and number of households to be contacted for primary data/information collection and agencies to be contacted for eliciting information on various aspects relevant to the study.

3.6.4 Methodology

- The Social Impact Assessment (SIA) of the proposed project is relied on a judicious mix of Secondary (i.e., Census 2011, Govt. Dept., Maps and Literature Research) and Primary data (i.e., Field survey and Interview / Interactions) collected from different sources.
- Various socio-economic aspects considered for impact assessment include livelihoods, relocation and rehabilitation, incomes, employment, skills, education, health and overall lifestyles. The cultural aspects considered are archaeological, historical, religious and aesthetic places of importance, arts and crafts etc.

The SIA was carried out in the three distinct stages:

- Desktop review / research
- Field Survey
- Data Analysis & its interpretation

3.6.5 Project Impact Zones

The geographical area for impact assessment extends over 10kms. Radius from the project site and comprises of 14 census Villages and towns. To facilitate a more realistic and objective assessment, the 14 villages / towns Panchayat are categorized into three zones:

- Core zone (within 0 -3 Kms.) Radial distance from the project site)
- Buffer zone (> 3 – 7 Kms.)

- Transition/Outer zone (> 7 – 10 Kms.)

It is obvious from the above data that only 4no. of villages fall in core impact zone, accounting for just 9 % of the total population in the study area. 15 no. of villages accounting for 29% of the total population fall in buffer impact zone, while 17 no. of villages accounting for 63% of the total population fall in transition zone.

Impact Zone	No of village	in %
0-3km	4	9
3-7km	15	29
7-10km	17	63
Total	36	100%

Source: census 2011.

Given the nature of the project, its socio-economic impacts will be more pronounced on the people inhabiting the core and buffer impact zones rather than on the transition zone. Hence the study focus was more on the socio-economic conditions obtaining among the households in the core and buffer zones.

3.6.6 Collection of Data from Secondary Sources

Data from secondary sources were collected on following aspects:

- Demographic profile of the area
- Economic profile of the area

Table 3.38 Type of Information and Sources

Information	Source
Demography	District Census Handbook, Govt. of India
Economic profile of the area	Census of India, Tamil Nadu State

b) Data Presentation and Analysis

The data collected were presented in a suitable, concise form i.e., tabular or diagrammatic or graphic form for further analysis. These tabulated data were interpreted and analyzed with the help of various qualitative techniques and ideographic approaches.

3.7 Background Information of the Area

Tamil Nadu is the 11th largest states in India in terms of area. The state is the seventh most populous state in the country and its main language Tamil has origins that date back to 500 BC. Chennai is the capital of Tamil Nadu and lies on the eastern coast line of India. Tamil Nadu is famous for its wonderful temples and monuments that have been built 1000s of years ago and has places that have been marked as heritage sites by the United Nations. In a 180-degree paradigm shift, this state with a rich historical importance is also one of the fastest developing centres for technology and trade.

The State can be divided broadly into two natural divisions (a) the Coastal plains of South India and (b) the hilly western area. Parallel to the coast and gradually rising from it is the broad strip of plain country. It can further be subdivided into coromandal plains comprising the districts of Kancheepuram, Tirunelveli, Cuddalore and Vellore. The alluvial plains of the Cauvery Delta extending over Thanjavur and part of Tiruchirapally districts and dry southern plains in Madurai, Dindigul, Ramanathapuram, Sivaganga, Virudhnagar, Tirunelveli and Tuticorin districts. It extends a little beyond Western Ghats in Kanyakumari District. The Cauvery Delta presents some extremely distinctive physical and human

features, its power being a main factor in the remarkable growth, the towns of Tamilnadu have witnessed.

3.8 Geography of the Area

Tamil Nadu is one of the 28 states of India, located in the southernmost part of the country. It extends from 8°4'N to 13°35'N latitudes and from 76°18'E to 80°20'E longitudes. Its extremities are

- in eastern - Point Calimere
- in western - hills of Anaimalai
- in northern - Pulicat lake
- in southern - Cape Comorin

It covers an area of 1,30,058 sq.km and 11th largest state in India. It covers 4% of the area of our country. Tamil Nadu is bounded by the Bay of Bengal in the east, Kerala in the west, Andhra Pradesh in the north, Tamil Nadu in the northwest and Indian Ocean in the south. Gulf of Mannar and Palk Strait separate Tamil Nadu from the Island of Sri Lanka, which lies to the southeast of India.

Already we have learnt that the state of Tamil Nadu had only 13 districts at the time of its formation. After that, the state was reorganised several times for the administrative convenience. At present there are 37 districts in Tamil Nadu, including the newly created districts such as Kallakurichi, Tenkasi, Chengalpet, Ranipet and Tirupathur.

3.9 Population Growth Rate

In 1991, there were only 21 districts in the State of Tamil Nadu. In 2001, eight new districts were created by reorganising the territorial jurisdiction. The nine districts are – Tirunelveli, Namakkal, Tirunelveli, Perambalur, Viluppuram, Thiruvarur, Nagapattinam, and Theni. The population and its growth trend are important economic factors in a developing economy.

Year	Tamil Nadu	India
1941	11.91	14.22
1951	14.66	13.31
1961	11.85	21.51
1971	22.30	24.80
1981	17.50	24.66
1991	15.39	23.86
2001	11.19	21.34
2011	15.61	5.96
2021	5.96	1.0

3.10 Tirunelveli District

The Tirunelveli District is located in the world map, between 08° 8' and 09° 23' latitude and 77° 09' and 77° 54' longitude. The total geographical area of the district is 3876.06 sq. km.

On acquisition from the Nawab of Arcot in 1801, the British named it as Tinnevely district though their headquarters was first located in Palayamkottai the adjacent town, where they had their military headquarters during their operations against the Palayakars. Two reasons may be attributed for naming it after Tirunelveli. One is because, it was and is the chief town of the district and the other is that it was already called as Tirunelveli Seemai under the Nayaks and Nawabs. Both Tirunelveli and Palayamkottai grew as the twin towns of the district.

The district is surrounded by the State of Kerala, Gulf of Mannar and the districts of Virudhunagar, Thoothukudi, Tenkasi and Kanniyakumari.

3.11 Study Area

Detailed socio-economic survey was conducted in the study area (Core and buffer zone) within 10 km radius of the area at Vadakku Ariyanayagipuram – II Village, Cheranmahadevi Taluk, Tirunelveli District. In order to determine the impact of the proposed project on nature and inhabitant. To get an overview of the villagers and their perspectives about this proposed activity, different demographic parameters and social aspects such population density, sex ratio, literacy rate, worker ratio etc. has been identified, analyzed, studied together. These impacts may be beneficial or disadvantageous. If disadvantageous anticipated suggestions measures are advocated in order to have collective development.

3.12 Demographic pattern of 10km study area characteristics a comparative analysis

Table 3.39 shows the socio-economic profile of the study area as compared to district, state and national level socio-economic profile

Particular	India	Tamil Nadu	Tirunelveli District	Study Area (10km Radius)
Area (in sq. km.)	3,287,263	130058	3876	328
Population Density/ sq. Km.	368	554	794	381
No. of Households	249454252	13357027	815528	33979
Population	1210569573	72147030	3077233	125040
Male	623121843	36137975	1520912	61351
Female	587447730	36009055	1556321	63689
Scheduled Tribes	104281034	794697	10270	168
Scheduled Castes	201378086	14438445	569714	24692
Literacy Rate	72.99%	80%	73.87 %	74%

Particular	India	Tamil Nadu	Tirunelveli District	Study Area (10km Radius)
Sex Ratio (Females per 1000 Males)	943	996	1023	1033

Source: Census of India, 2011

Table no 3.12.1 show demographic pattern of India, Tamil Nadu, Tirunelveli District & Study area (10km Radius). In India had total area of 3.2sqkm, State of Tamil Nadu area was 130058 sqkm, District of Tirunelveli area was 3876 sqkm and study area is about 328 sqkm. Population density is total population per sqkm. So, India population density was 368sqkm, state of Tamil Nadu density was 554 sqkm, District had density about 794 sqkm and study area density is about 381sqkm. As per Census 2011,

The study area has population density 381 persons per sq.km of total population about 125040 as per census 2011. There were about 49.07 percent male and 50.93% female population. Study area has literate rate is about 83.22%. District had about 74% of literate rate as per census 2011.

3.13 Population Distribution and Composition of Study Area

The population as per 2011 Census records is 125040 (for 10 km radius buffer zone). Total no. of household is 2832,9846, 21301 respectively, in primary, secondary and tertiary zone. Sex ratio is 1055, 1047 and 1032 (females per 1000 males) observed in primary, secondary and tertiary zone respectively. SC population distribution is 1491, 5402 and 17799 respectively in primary, secondary and tertiary zone. ST population distribution is 0, 87,81 respectively in primary, secondary and tertiary. Average household size is 4. Zone wise Demographic profile of study area is given in the table 3.40 below:

Source: <https://censusindia.gov.in/census.website/data/census-tables>

Table 3.40 Zone wise Demographic Profile of Study Area

Zone	No. of Villages	Total Household	Total Population	Male Population	%	Female Population	%
Primary Zone (0 - 3 Km)	4	2832	10690	5202	48.66	5488	51.34
Secondary Zone (3 - 7 Km)	15	9846	36011	17594	48.86	18417	51.14

Tertiary Zone (7 - 10 km)	17	21301	78339	38555	49.22	39784	50.78
Study Area (0-10 km)	36	33979	125040	61351	49.07	63689	50.93

Source: Census of India, 2011

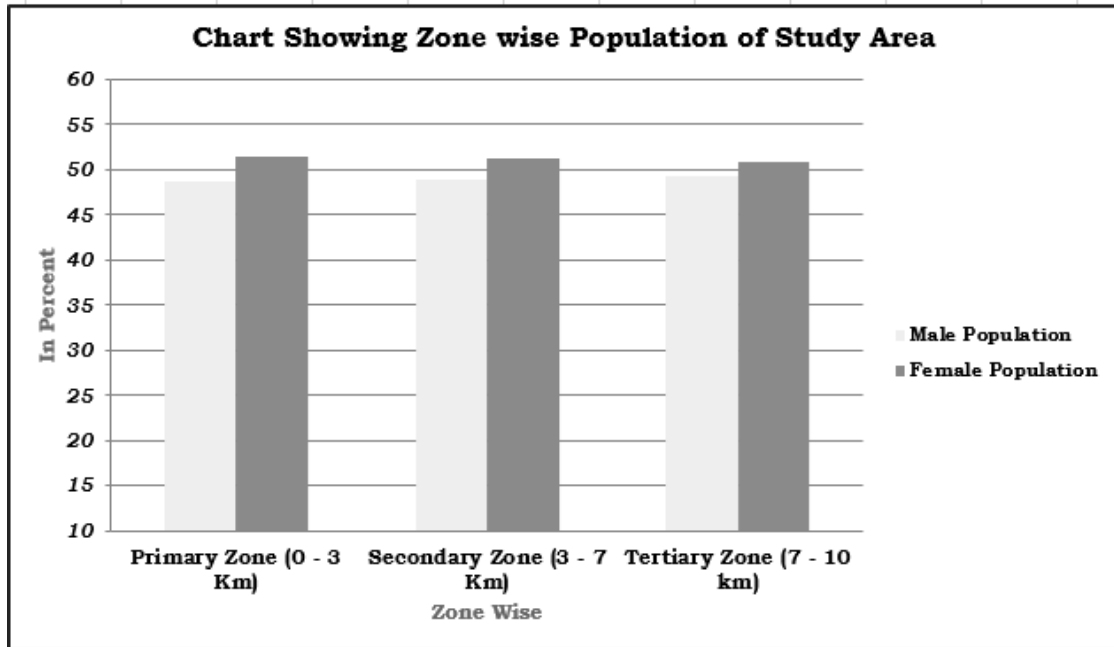


Figure 3.32 Population of study area

- ✓ Above table identifies the presence of villages and their subsequent population divided under three zones from plant boundary (i.e., Primary, secondary and tertiary zone)
- ✓ Primary zone has 4 villages where as much as 2832households with 10690 populations are located. Mostly lying on Built-up land for their livelihood and substance.
- ✓ Secondary and tertiary zone both comprise of 15 and 17villages having a total population of 36011 and 78339 respectively.

Table 3.41 Village wise Demographic Profile of the Study Area (Core and Buffer Zone)

0-3km																														
Sno	Name	No.of Households	Total population	Total Male	Total Female	Sex Ratio	Population below 6	Male below 6	Female below 6	Child Sex Ratio	SC population	SC Male	SC Female	ST population	ST Male	ST Female	Literate population	Male Literate	Female Literate	Total Lite.rate (%)	Male Lite rate (%)	Female Lite.rate (%)	Total workers	Total Workers Rate (%)	Main workers	MainWorkers Rate (%)	Marginal workers	Marginal Workers Rate (%)	Nonworkers	Non Workers Rate (%)
1	Velarkulam	195	687	340	347	1021	92	50	42	840	245	117	128	0	0	0	532	277	255	89.41	95.52	83.61	360	52.40	350	50.95	10	1.46	327	47.60
2	Sivaniyarkulam	15	59	29	30	1034	7	6	1	167	0	0	0	0	0	0	36	19	17	69.23	82.61	58.62	31	52.54	31	52.54	0	0.00	28	47.46
3	Vadakku Ariyanayakipuram	2208	8426	4081	4345	1065	952	465	487	1047	1157	561	596	0	0	0	6333	3274	3059	84.73	90.54	79.29	4198	49.82	3991	47.37	207	2.46	4228	50.18
4	Sanganhiradu	414	1518	752	766	1019	205	108	97		89	41	48	0	0	0	988	539	449	75.25	83.70	67.12	930	61.26	908	59.82	22	1.45	588	38.74
Total		2637	10003	4862	5488	1129	1256	629	627	997	245	719	772	0	0	0	7889	4109	3780	90.191	97.071	77.76	5519	55.17	5280	52.78	239	2.39	5171	51.69
3-7km																														
Sno	Name	No.of Households	Total population	Total Male	Total Female	Sex Ratio	Population below 6	Male below 6	Female below 6	Child Sex Ratio	SC population	SC Male	SC Female	ST population	ST Male	ST Female	Literate population	Male Literate	Female Literate	Total Lite.rate (%)	Male Lite rate (%)	Female Lite.rate (%)	Total workers	Total Workers Rate (%)	Main workers	MainWorkers Rate (%)	Marginal workers	Marginal Workers Rate (%)	Nonworkers	Non Workers Rate (%)
1	Odaimarichan	759	2714	1333	1381	1036	297	150	147	980	3	2	1	0	0	0	1992	1056	936	82.42	89.26	75.85	1603	59.06	1510	55.64	93	3.43	1111	40.94
2	Udayampuli	737	2735	1348	1387	1029	330	150	180	1200	84	33	51	0	0	0	1885	1062	823	78.38	88.65	68.19	1572	57.48	1543	56.42	29	1.06	1163	42.52
3	Karuvanallur	142	483	247	236	955	49	29	20	690	275	135	140	0	0	0	291	174	117	67.05	79.82	54.17	302	62.53	275	56.94	27	5.59	181	37.47
4	Sidaparpanallur	420	1606	801	805	1005	181	94	87	926	475	230	245	0	0	0	1020	568	452	71.58	80.34	62.95	840	52.30	792	49.32	48	2.99	766	47.70
5	Sirukkankurichi	159	612	316	296	937	80	43	37	860	0	0	0	0	0	0	444	259	185	83.46	94.87	71.43	309	50.49	302	49.35	7	1.14	303	49.51
6	Vettuvankulam	411	1596	782	814	1041	198	97	101	1041	331	160	171	0	0	0	1119	606	513	80.04	88.47	71.95	765	47.93	726	45.49	39	2.44	831	52.07
7	Thiruppani Nelliapuram	0	0	0	0	#DIV/o!	0	0	0	#DIV/o!	0	0	0	0	0	0	0	0	0	#DIV/o!	#DIV/o!	#DIV/o!	0	#DIV/o!	0	#DIV/o!	0	#DIV/o!	0	#####
8	Thuvarasi	13	42	23	19	826	4	0	4	#DIV/o!	2	2	0	0	0	0	32	22	10	84.21	95.65	66.67	25	59.52	25	59.52	0	0.00	17	40.48
9	Vaduganpatti	101	380	186	194	1043	42	28	14	500	172	75	97	0	0	0	303	150	153	89.64	94.94	85.00	186	48.95	142	37.37	44	11.58	194	51.05
10	Melkallur	287	1153	569	584	1026	163	84	79	940	238	119	119	0	0	0	701	393	308	70.81	81.03	60.99	619	53.69	345	29.92	274	23.76	534	46.31
11	Palavoor	515	1925	947	978	1033	222	108	114	1056	378	180	198	0	0	0	1298	718	580	76.22	85.58	67.13	1055	54.81	1018	52.88	37	1.92	870	45.19
12	Pappakudi	1855	6651	3227	3424	1061	679	342	337	985	1302	620	682	87	48	39	4610	2468	2142	77.19	85.55	69.39	3484	52.38	3133	47.11	351	5.28	3167	47.62
13	Arasankulam	127	467	222	245	1104	75	40	35	875	70	32	38	0	0	0	281	150	131	71.68	82.42	62.38	279	59.74	272	58.24	7	1.50	188	40.26
14	Terku Ariyanayakipuram	183	664	319	345	1082	60	27	33	1222	400	196	204	0	0	0	372	216	156	61.59	73.97	50.00	413	62.20	400	60.24	13	1.96	251	37.80
15	Mukkudal (TP)	4137	14983	7274	7709	1060	1664	853	811	951	1672	811	861	0	0	0	11741	6023	5718	88.15	93.80	82.89	7765	51.83	7294	48.68	471	3.14	7218	48.17
Total		9846	36011	17594	18417	1047	4044	2045	1999	978	5402	2595	2807	87	48	39	26089	13865	12224	81.61	89.17	74.45	19217	53.36	17777	49.37	1440	4.00	16794	46.64
7-10km																														

Sno	Name	No.of Households	Total population	Total Male	Total Female	Sex Ratio	Population below 6	Male below 6	Female below 6	Child Sex Ratio	SC population	SC Male	SC Female	ST population	ST Male	ST Female	Literate population	Male Literate	Female Literate	Total Lite.rate (%)	Male Lite rate (%)	Female Lite.rate (%)	Total workers	Total Workers Rate (%)	Main workers	MainWorkers Rate (%)	Marginal workers	Marginal Workers Rate (%)	Nonworkers	Non Workers Rate (%)
1	Marandai	1016	3741	1777	1964	1105	437	225	212	942	1876	886	990	0	0	0	2533	1306	1227	1208.00	84.15	70.03	1925	51.46	1760	47.05	165	4.41	1816	48.54
2	Maruthamputhur	1857	6696	3341	3355	1004	770	420	350	833	257	131	126	0	0	0	4378	2335	2043	2318.00	79.94	67.99	3829	57.18	3421	51.09	408	6.09	2867	42.82
3	Pudur	386	1328	665	663	997	167	96	71	740	59	31	28	0	0	0	812	439	373	516.00	77.15	63.01	769	57.91	730	54.97	39	2.94	559	42.09
4	Vallankottai	340	1258	627	631	1006	131	61	70	1148	1240	616	624	0	0	0	941	503	438	317.00	88.87	78.07	761	60.49	755	60.02	6	0.48	497	39.51
5	Sethurayanpudur	276	931	453	478	1055	98	45	53	1178	535	254	281	3	1	2	708	379	329	223.00	92.89	77.41	505	54.24	437	46.94	68	7.30	426	45.76
6	Abishekapatti	150	514	250	264	1056	55	29	26	897	89	40	49	0	0	0	409	208	201	105.00	94.12	84.45	253	49.22	195	37.94	58	11.28	261	50.78
7	Tulukarkulam	153	543	262	281	1073	65	33	32	970	258	131	127	0	0	0	353	191	162	190.00	83.41	65.06	299	55.06	27	4.97	272	50.09	244	44.94
8	Sengulam	187	721	363	358	986	84	45	39	867	178	91	87	0	0	0	524	291	233	197.00	91.51	73.04	415	57.56	271	37.59	144	19.97	306	42.44
9	Kapaliparai	452	1597	797	800	1004	190	106	84	792	793	406	387	0	0	0	953	533	420	644.00	77.13	58.66	873	54.66	766	47.96	107	6.70	724	45.34
10	Sattupattu	260	886	425	461	1085	64	32	32	1000	19	11	8	0	0	0	683	357	326	203.00	90.84	75.99	604	68.17	537	60.61	67	7.56	282	31.83
11	Rengasamudram	706	2381	1189	1192	1003	242	127	115	906	689	340	349	0	0	0	1581	886	695	800.00	83.43	64.53	1425	59.85	1251	52.54	174	7.31	956	40.15
12	Cheranmadevi (TP)	4756	18327	9120	9207	1010	1862	1012	850	840	3970	1950	2020	13	6	7	14921	7759	7162	3406.00	95.70	85.70	7604	41.49	7258	39.60	346	1.89	10723	58.51
13	Veeravanallur (TP)	5317	19585	9491	10094	1064	1819	913	906	992	3468	1672	1796	50	23	27	15466	7994	7472	4119.00	93.19	81.32	8742	44.64	7288	37.21	1454	7.42	10843	55.36
14	Kodaganallur	1026	3770	1855	1915	1032	402	209	193	923	897	419	478	0	0	0	2500	1375	1125	1270.00	83.54	65.33	1893	50.21	1849	49.05	44	1.17	1877	49.79
15	Thiruppani Karisalkulam	839	3052	1477	1575	1066	353	182	171	940	1121	541	580	0	0	0	2122	1135	987	930.00	87.64	70.30	1592	52.16	1399	45.84	193	6.32	1460	47.84
16	Kondanagaram	563	2055	1022	1033	1011	224	111	113	1018	527	264	263	2	2	0	1362	759	603	693.00	83.32	65.54	1043	50.75	877	42.68	166	8.08	1012	49.25
17	Suttamalli	3017	10954	5441	5513	1013	1129	595	534	897	1823	904	919	13	6	7	8692	4527	4165	2262.00	93.42	83.65	4990	45.55	4259	38.88	731	6.67	5964	54.45
Total		15856	58508	28760	29748	1034	5984	3144	2840	903	17799	8687	9112	81	38	43	58938	30977	27961	112.21	120.93	103.91	9629	16.46	33080	56.54	3308	5.65	40817	69.76
Grand total		28339	104522	51216	53653	1048	11284	5818	5466	939	23446	12001	12691	168	86	82	92916	48951	43965	99.65	107.83	91.24	34365	32.88	56137	53.71	4987	4.77	62782	60.07

Source: Village Wise Demographic Profile of the Study Area, *Census of India, 2011*.

3.14 Gender and Sex Ratio

Sex ratio is used to describe the number of females per 1000 of males. Sex ratio is a valuable source for finding the population of women in India and what is the ratio of women to that of men in India. In the Population Census of 2011, it was revealed that the population ratio in India 2011 is 940 females per 1000 of males. The study area has 1038 females per 1000 males. Gender and sex ratio determine the Human Development Index (HDI) of an area thereby understanding the status of women in that region. Following table entails information about sex ratio of 36 villages lying in study area (buffer zone) as primary, secondary and tertiary zone.

Table 3.42 Sex ratio of the study area

S. No.	Buffer Zone	Sex Ratio of Study area Female/ 1000 Male
1	Primary Zone (0-3 km)	1055
2	Secondary zone (3-7 km)	1047
3	Tertiary Zone (7-10 km)	1032

Source: Census of India, 2011

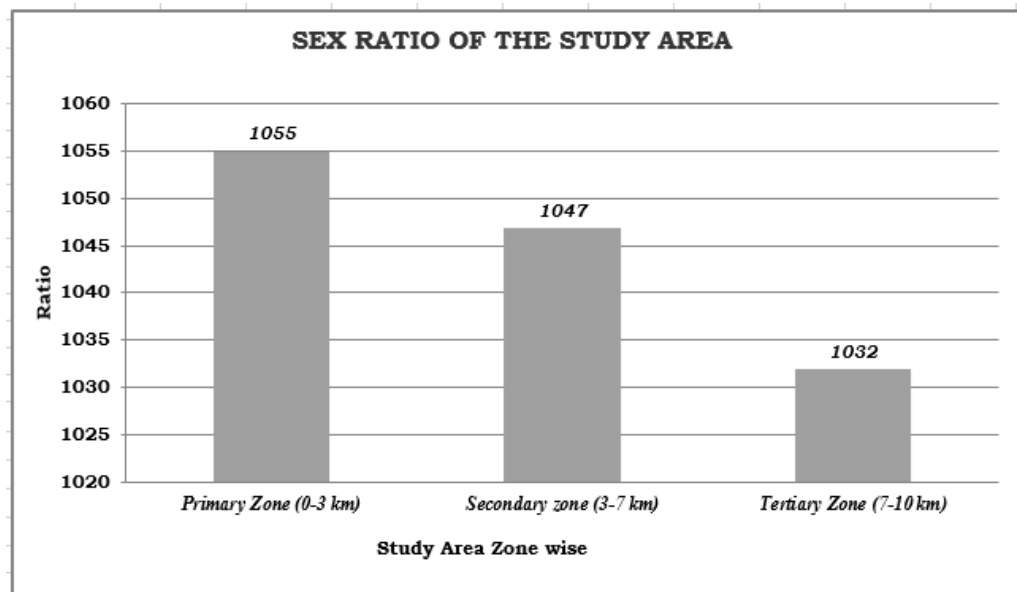


Figure 3.33 Sex Ratio within 10 Km study area

Child Sex Ratio: -

Table 3.42(a) Child Sex ratio of the study area

S. No.	Buffer Zone	Child Sex Ratio of Study area Female/ 1000 Male
1	Primary Zone (0-3 km)	997
2	Secondary zone (3-7 km)	978

3	Tertiary Zone (7-10 km)	908
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Source: Census of India, 2011

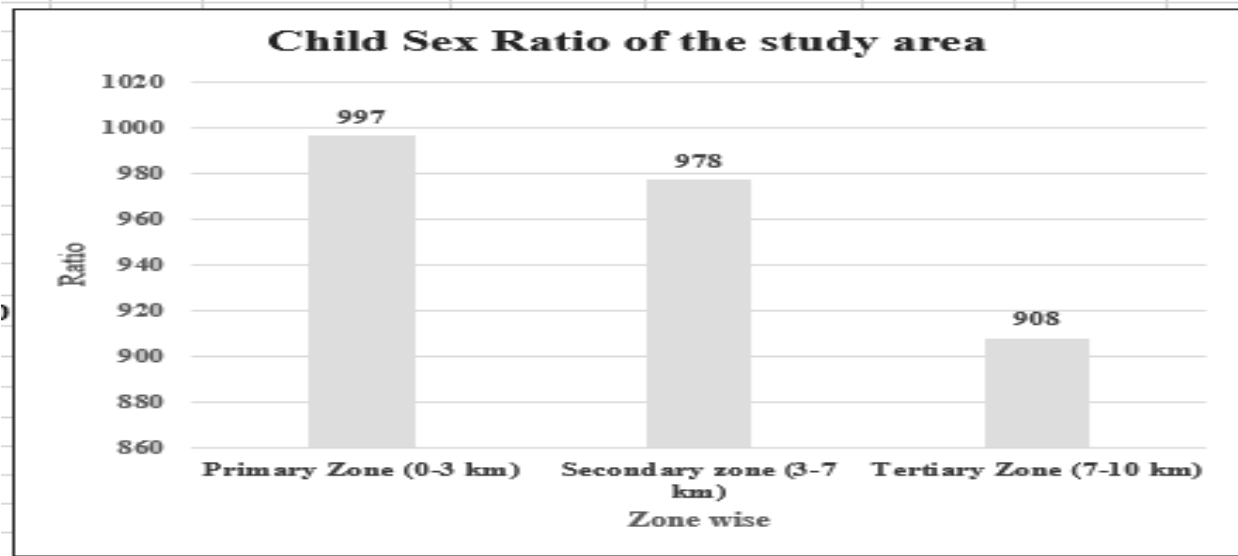


Figure 3.33 (a) Child Sex Ratio within 10 Km study area

3.15 Literacy Rate in Study Area

Literacy Rate is the percentage of people in a country with the ability to read and write. The analysis of the literacy levels is done in the study area. The 10 km radius of study area demonstrates a literacy rate of 83.22% as per census data 2011. The male literacy rate in the study area indicates 89.92% whereas the female literacy rate, which is an important indicator for social change, is observed to be 76.85% as per the census data 2011. This needs to focus on the region and enhance further development focusing on education. (Table no 3.43).

Table 3.43 Literacy Rate of the Study Area

Zone	No. of Villages	Male Literacy Population	Male literacy Rate	Female Literacy Population	Female literacy Rate	Total Literacy	Total Literacy Rate
Primary Zone (0 - 3 Km)	2	4109	89.85	3780	77.76	7889	83.62
Secondary Zone (3 - 7 Km)	6	13865	89.17	12224	74.45	26089	81.61
Tertiary Zone (7 - 10 Km)	7	30977	90.28	27961	77.81	58938	83.90
Study Area (0-10km)	15	48951	89.92	43965	76.85	92916	83.22

Source: Census of India, 2011

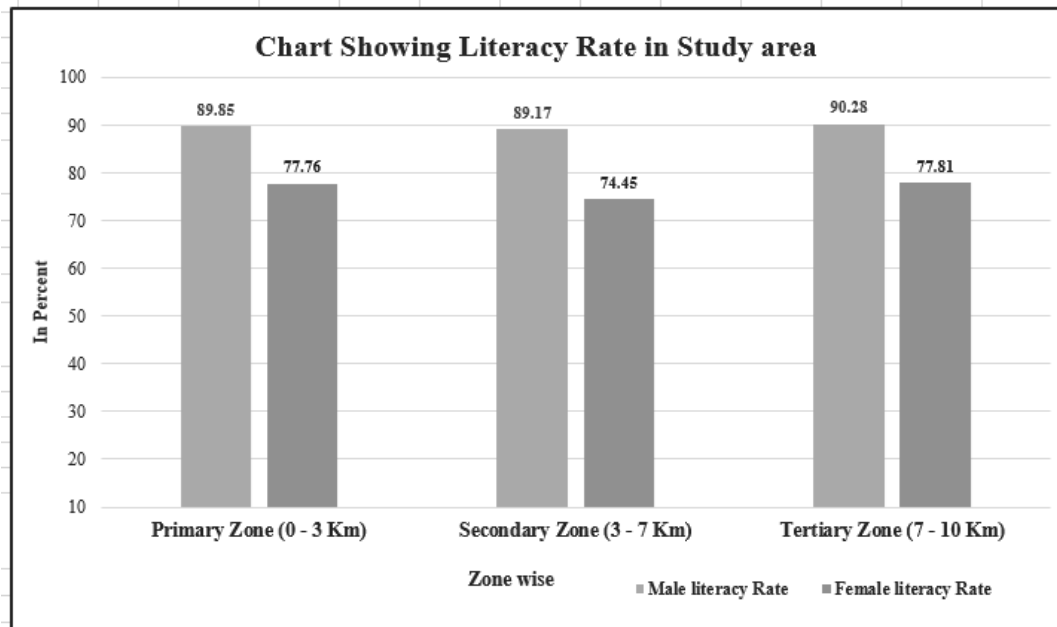


Figure 3.34 Gender wise Literacy Rate in the study area

3.16 Family Size

Size of family also describes about family functioning, resource consumption, total income generated and their expenditure pattern. Census 2011 data suggests that most of these households have a family size of up to 4 members, knowing the size of family also give fair understanding of relating how much resource consumption is being incurred, and annual income being generated and spent.

3.17 Vulnerable Group

While developing an action plan, it is very important to identify the population who fall under the marginalized and vulnerable groups and special attention has to be given towards these groups while making action plans. Special provisions should be made for them. In the observed villages schedule caste (SC) population is 19.75% and Schedule Tribe population 0.13%, Other Population is 80.12% in total study area.

Table 3.44 Vulnerable groups of the study area

Zone	No. of Villages	Vulnerable Groups					
		SC Population	%	ST Population	%	Other Population	%
Primary Zone (0 - 3 Km)	4	1491	13.95	0	0.00	9199	86.05
Secondary Zone (3 - 7 Km)	15	5402	15.00	87	0.24	30522	84.76

Tertiary Zone (7 - 10 Km)	17	17799	22.72	81	0.10	60459	77.18
Total area (10km)	36	24692	19.75	168	0.13	100180	80.12

Source: Census of India, 2011

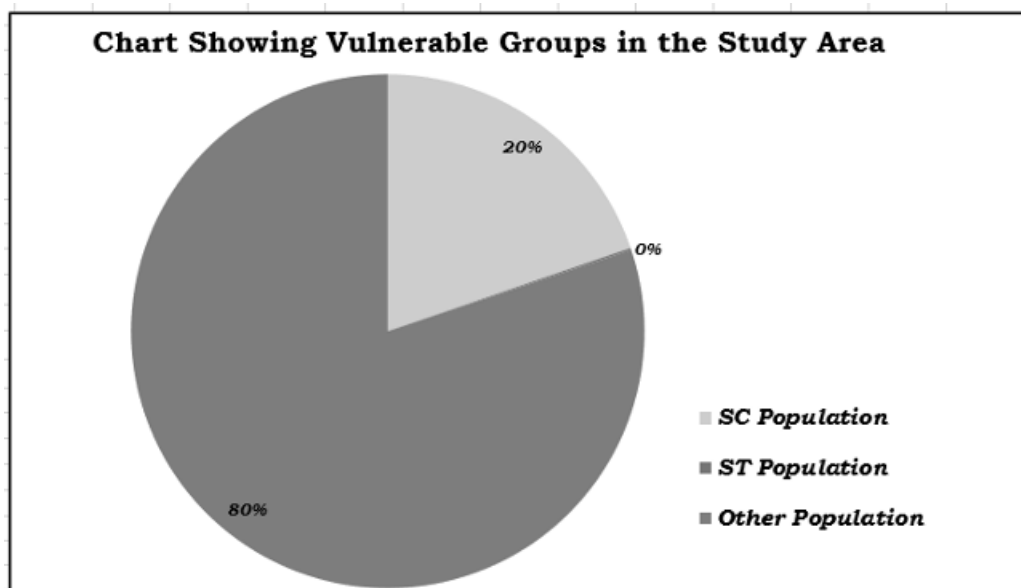


Figure 3.35 vulnerable groups

3.18 Economic Activities

The economy of an area is defined by the occupational pattern and income level of the people in the area. The occupational structure of residents in the study area is studied with reference to work category. The population is divided occupation wise into three categories, viz., Total workers, Main workers and non-workers. The main workers include cultivators, agricultural laborers, those engaged in household industry and other services. The non-workers include those engaged in unpaid household duties like, students, retired persons, dependents, beggars, wanderers etc. besides Institutional intimates or all other non-workers who do not fall under the above categories.

Table 3.45 shows the work force of the study area

Zone	No. of Villages	Total Workers	%	Main Workers	%	Marginal workers	%	Non-Workers	%
Primary Zone (0 - 3 Km)	4	5519	51.63	5280	49.39	2252	21.07	5171	48.37
Secondary Zone (3 - 7 Km)	15	19217	53.36	17777	49.37	7415	20.59	16794	46.64
Tertiary Zone (7 - 10 Km)	17	37522	47.90	33080	42.23	16759	21.39	40817	52.10
Study Area (10 Km)	36	62258	49.79	56137	44.90	26426	21.13	62782	50.21

Source: Census of India, 2011

The above table shows that out of the total working population, the percentage of main workers is 44.9 % while 21.13% are marginal workers. Number of working populations is 49.79% and non-working population is 50.21% in the study area. As per the data obtained from the survey (as mentioned previously in occupational structure) most of these people are employed for major period of the year. Also, to mention the natural environment also restricts the people in finding stable business is performed for only certain months. Thus, proposed project will act as possible exposure for them to get enroll and earn sustain livelihood.

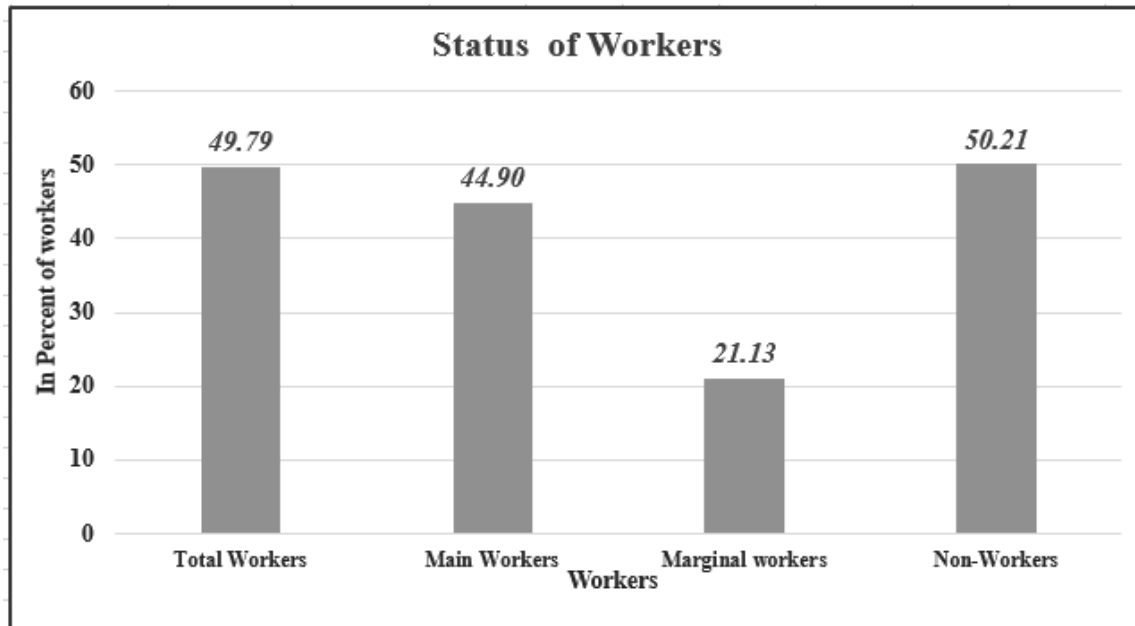


Figure 3.36 Working population in the study area

3.19 Infrastructure Base

A better network of physical infrastructure facilities (built up and roads, irrigation, power and social infrastructure support, viz. health and Education, water and sanitation are essential for the development of the rural economy.

A review of infrastructural facilities available in the area has been done based on the information from baseline survey & census data of the study area. Infrastructural facilities available in the area are described in the subsequent sections.

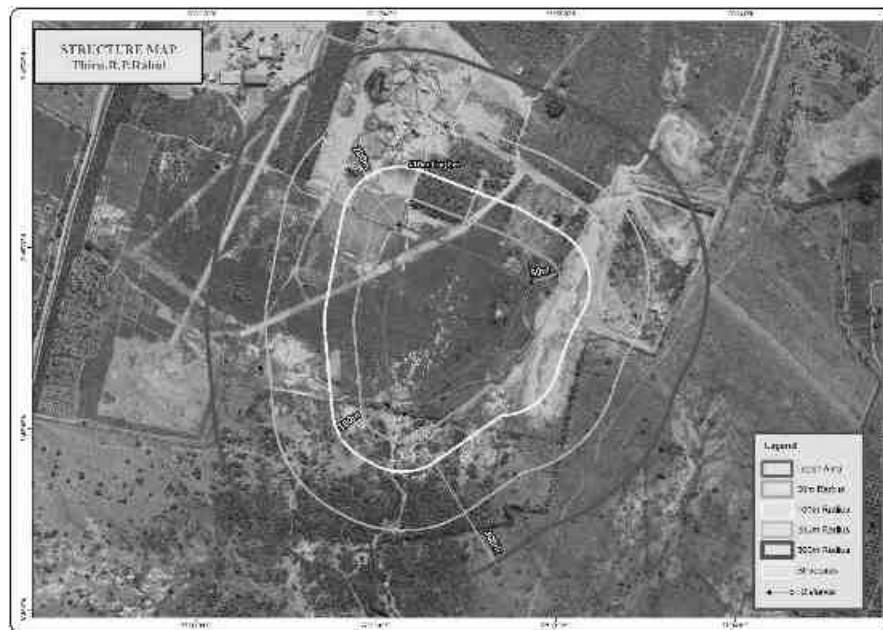
- Administrative offices are located in Tamil Nadu, Tirunelveli district (17km-E) from site which by local transport.
- Lake, River, Pond etc., around 10 km radius from mine lease boundary.

3.20 Structure Study In 300m Radius

There are few structures within the radius of 500m from the project site, the details of the structures are given below:

TABLE 3.46: STRUCTURES IN 300m RADIUS

0-50m radius – No Structures							
50 – 100m – No Structures							
100-300m – 8 Nos							
Structure Numbers	Type of Structure	Usage Purpose	Commercial / industry / residential / farm house / Govt. building	Occupants of Building/ Structure	Structure belongs to owner	Structure Not belongs to owner	Remarks
1.	Crusher – 110m NW	To make size reduced stone	Industrial	Nil	No	Yes	Total Employment – 5 members No stay

FIGURE 3.37: STRUCTURE MAP 500m RADIUS

3.21 Interpretation

Based on the data, following inferences could be drawn:

- Total literacy rate in the study area is 83%.
- The study area had average educational facilities. The overall status depicts that the education is limited to primary and middle level.
- The schedule tribe community forms 0.13% and Scheduled Caste forms 20% of the total population of study area.
- The Other Population forms 80% of the total population of study area.
- The study area is well connected by District/Village Road.
- The study area not well health facilities of primary level.
- Considering the above facts, the Existing project will boost the socio-economic development activities in the area and hence will leave positive impact.
- The study area has mobile connectivity.

3.22 Recommendation and Suggestions

The village development plans are made in consultation with the community through Gram Sabha; these appear to address the needs of the community. However, it may be noted that at the implementation stage these plans often are fraught with problem of inadequate funds, lack of proper planning, corruption, vested interests and political

agendas. Hence while ascertaining the scope for convergence with the government activities, care must be taken to ascertain realistic possibilities for implementation.

- **Women empowerment**– Home based income generation activities, vocational training programs and common education centre for increasing the literacy rate.
- **Education** – Free uniform, construction of common rooms and library, computer education and physical education, additional schools for girls, furniture and equipment in schools, up-gradation of existing school infrastructure.
- **Agriculture/livestock** – Infrastructure such as agricultural practices, electricity connections, assistance with buying improved tools and equipment, capacity building, supply and/or knowledge of better variety of seeds, pasture land development and trainings on animal husbandry & facility of veterinary doctor.
- **Health** – Improvements in sanitary conditions of villages, assistance with construction of latrines, improvement in drainage system, health camps and awareness campaigns for diseases like Covid-19, malaria, typhoid, tuberculosis, yellow fever and pneumonia. Repairing of PHCs and Anganwadi centers.
- **People with disability** – Establishment of center for special education, sensitization of the community towards disabled and awareness on Government schemes.
- 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.
- **Connectivity** –Transport connectivity to easiness accessibility to the region.

3.23 Conclusion

To evaluate the impacts of Proposed quarry project on the surrounding area, it is vital to assess the baseline status of the environmental quality in the locality of the site. Hence it can be concluded that the present environment status of the study area will not be affected by the project as **Thiru.R.P.Rahul Roughstone and gravel quarry** will adopt adequate control measures to protect the surrounding environment and will contribute in development of the study areas.

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:

4.1.2 Anticipated Impact

- 4.13.90 Ha of the land will be under mining sine the Permanent or temporary change on land use and land cover will occur
- Movement of heavy vehicles sometimes cause problems to agricultural land, human habitations due to dust, noise and it also causes traffic hazards.
- Due to degradation of land by pitting the aesthetic environment of the core zone may be affected.
- Earthworks during the rainy season increase the potential for soil erosion and sediment laden water entering the water ways.
- If no due care is taken wash off from the exposed working area may choke the water course & can also causes the siltation of water course

4.1.2 Mitigation Measures

- The 4.13.90 Ha of the land will be converted into temporary reservoir which will full fill the water scarcity in the drought season and the nearby agriculture land will benefitted by the supply of water
- About 2100 Nos of trees will be planted in the lease area and approach road will retain the eco system
- The mining activity will be gradual confined in blocks and excavation will be undertaken progressively along with other mitigative measures like phase wise development in the production
- Construction of garland drains all around the quarry pits and construction of silt trap at strategic location in lower elevations to prevent erosion due to surface runoff during rainfall and also to collect the storm water for various uses within the proposed area.
- Green belt development along the boundary within safety zone. The small quantity of water stored in the mined-out pit will be used for greenbelt.
- Thick plantation will be carried out on unutilized area, top benches of mined out pits, on safety barrier, etc.,
- Fencing will be constructed before starting the mining operation and it will be maintained in the conceptual stage Security will be posted round the clock, to prevent inherent entry of the public and cattle.

4.1.3 Soil Environment

4.1.4 Impact on Soil Environment

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

4.1.5 Mitigation Measures

- Garland drains will be constructed all around the project boundary to prevent surface flows from entering the quarry. And will be discharged into vegetated natural drainage lines, or as distributed flow across an area stabilised against erosion.
- Sedimentation ponds - Run-off from working areas will be routed towards sedimentation ponds (Silt pond). These trap sediment and reduce suspended sediment loads before runoff is discharged from the quarry site. Sedimentation ponds should be designed based on runoff, retention times, and soil characteristics. There may be a need to provide a series of sedimentation ponds to achieve the desired outcome.
- Retain vegetation – Retain existing or re-plant the vegetation at the site wherever possible.
- Monitoring and maintenance – Weekly monitoring and daily maintenance of erosion control systems so that they perform as specified specially during rainy season.

4.1.6 Waste Dump Management

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

4.2 WATER ENVIRONMENT

4.2.1 Anticipated Impact

- The major sources of water pollution normally associated due to mining and allied operations are:
 - Generation of waste water from vehicle washing.
 - Washouts from surface exposure or working areas
 - Domestic sewage
 - Disturbance to drainage course in the project area
 - Mine Pit water discharge
- Increase in sediment load during monsoon in downstream of lease area
- This being a mining project, there will be no process effluent. Waste from washing of machinery may result in discharge of Oil & grease, suspended solids.

- The sewage from soak pit may percolate to the ground water table and contaminate it.
- Surface drainage may be affected due to Mining
- Abstraction of water may lead to depletion of water table
- 2.0 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 judiciously utilize the rainwater as part of rainwater harvesting system.
- Periodic (every 6 month once) analysis of quarry pit water and ground water quality in nearby villages.
- Domestic sewage from site office & urinals/latrines provided in ML is discharged in septic tank followed by soak pits.
- Waste water discharge from mine will be treated in settling tanks before using for dust suppression and tree plantation purposes.
- De-silting will be carried out before and immediately after the monsoon season.

4.3 AIR ENVIRONMENT

4.3.1. Anticipated Impact

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

4.3.1.1. Modelling of Incremental Concentration from all Proposed Projects

Wind erosion of the exposed areas and the air borne particulate matter generated by quarrying operation, and transportation are mainly PM₁₀ & PM_{2.5} and emissions of Sulphur dioxide (SO₂) & Oxides of Nitrogen (NO_x) due to excavation/loading equipment and vehicles plying on haul roads are the cause of air pollution in the project area.

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

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

AERMOD Software.

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

4.3.2.1 Emission Estimation

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

The general equation for emissions estimation is:

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

Where:

E = emissions;

A = activity rate;

EF = emission factor, and

ER =overall emission reduction efficiency, %

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

4.3.2 Frame work of Computation & Model details

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

Impact was predicted over the distance of 10 km around the source to assess the impact at each receptor separately at the various locations and maximum incremental GLC value at the project site. Maximum impact of PM₁₀ was observed close to the source due to low to moderate wind speeds. Incremental value of PM₁₀ was superimposed on the base line data monitored at the proposed site to predict total GLC of PM₁₀ due to combined impacts

TABLE 4.1: ESTIMATED EMISSION RATE

PM ₁₀			
Activity	Source type	Value	Unit
Drilling	Point Source	0.139657856	g/s
Blasting	Point Source	0.012851130	g/s
Mineral Loading	Point Source	0.049648703	g/s
Haul Road	Line Source	0.002529758	g/s/m
Overall Mine	Area Source	0.085943308	g/s
SO ₂			
Activity	Source type	Value	Unit
Overall Mine	Area Source	0.003250964	g/s
NO _x			
Overall Mine	Area Source	0.000368742	g/s

FIGURE 4.1: AERMOD TERRAIN MAP

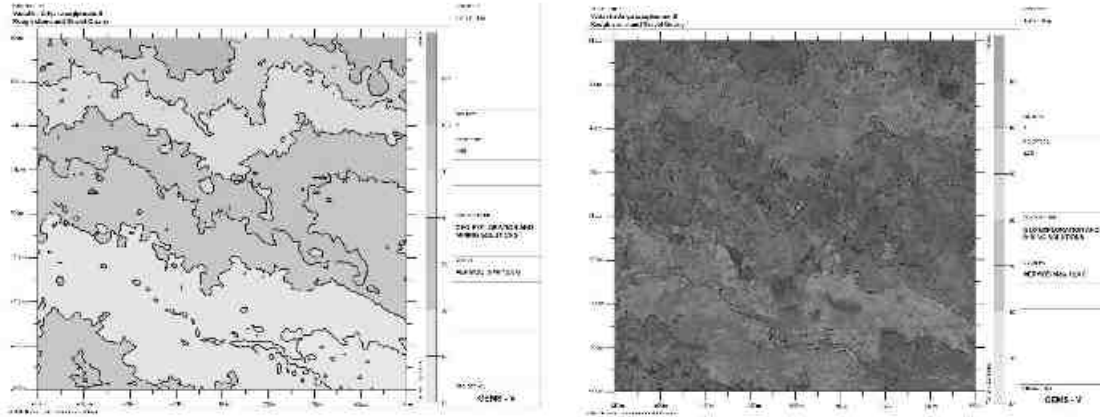


FIGURE 4.2: PREDICTED INCREMENTAL CONCENTRATION OF PM₁₀

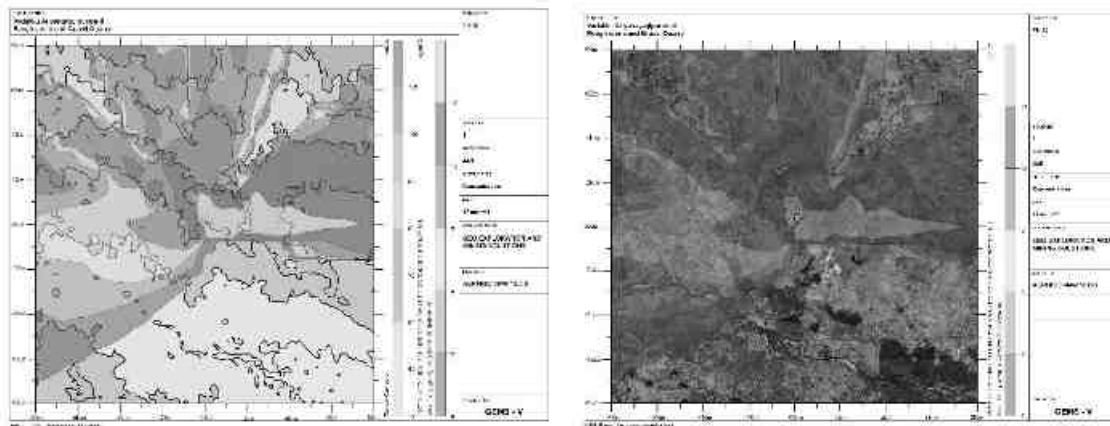


FIGURE 4.3: PREDICTED INCREMENTAL CONCENTRATION OF PM_{2.5}

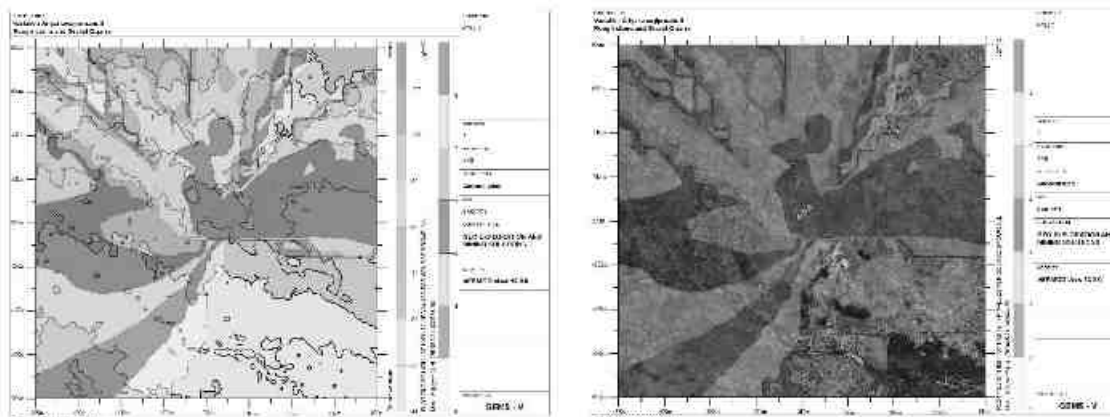


FIGURE 4.4: PREDICTED INCREMENTAL CONCENTRATION OF NO_x

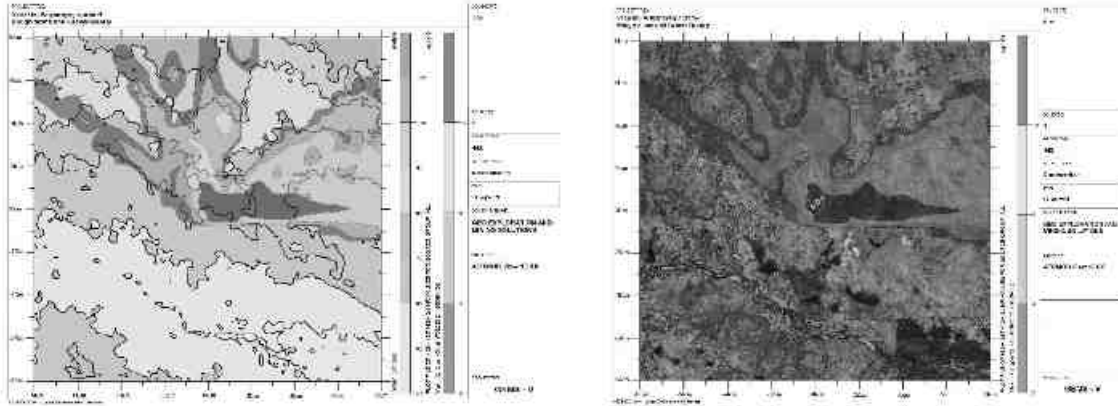


FIGURE 4.5: PREDICTED INCREMENTAL CONCENTRATION OF SO₂

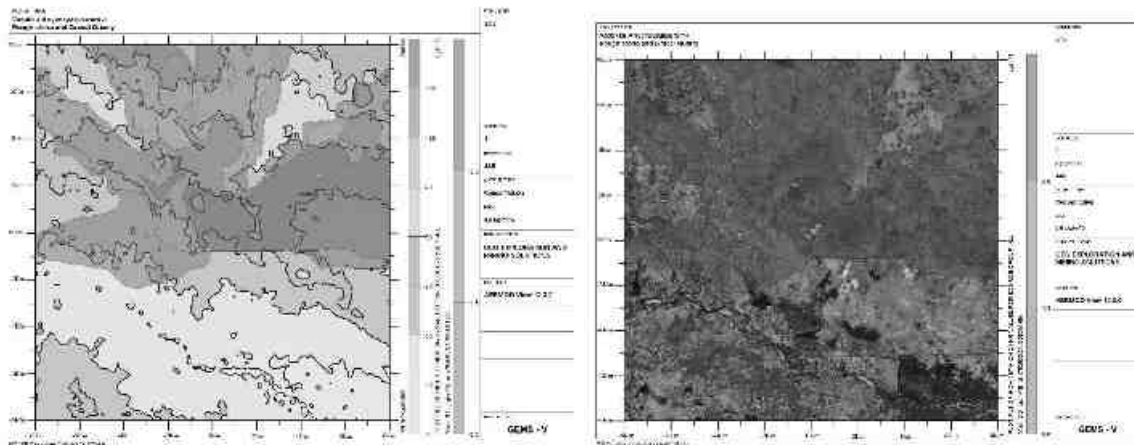
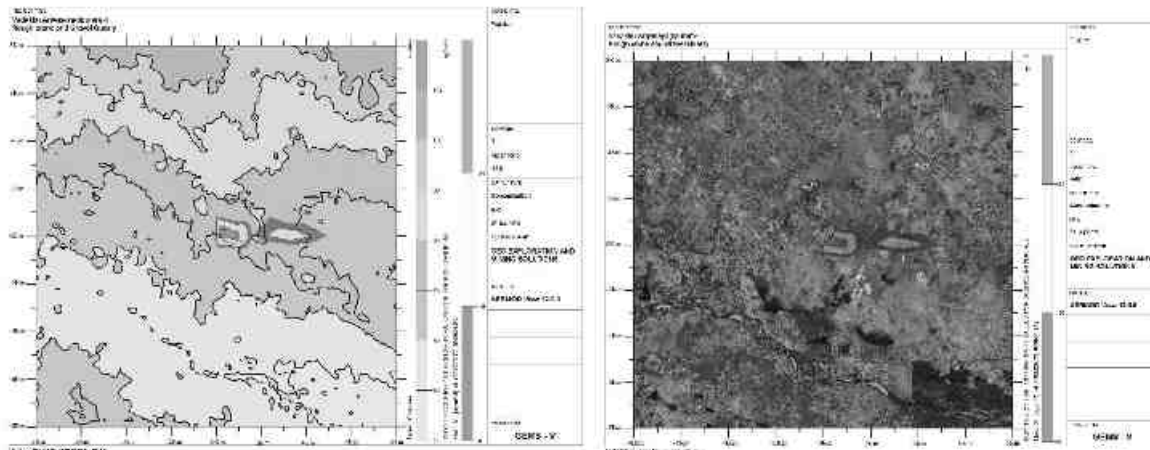


FIGURE 4.6: PREDICTED INCREMENTAL CONCENTRATION OF FUGITIVE DUST



4.3.2.1 Model Results

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

TABLE 4.2: INCREMENTAL & RESULTANT GLC OF PM₁₀

Station Code	Location	X Coordinate (m)	Y Coordinate (m)	Average Baseline PM ₁₀ (µg/m ³)	Incremental value of PM ₁₀ due to mining (µg/m ³)	Total PM ₁₀ (µg/m ³)
AAQ1	8°45'18.06"N 77°33'48.23"E	126	15	48.4	17.91	66.3
AAQ2	8°45'11.51"N 77°33'41.32"E	-87	-134	48.5	16.7	65.2
AAQ3	8°45'24.71"N 77°33'54.79"E	327	266	47.4	17.55	65.0
AAQ4	8°43'27.26"N 77°32'45.95"E	-1791	-3367	47.7	1	48.7
AAQ5	8°47'53.72"N 77°32'21.81"E	-2535	4871	47.9	14	61.9
AAQ6	8°45'12.36"N 77°32'6.58"E	-3002	-110	47.9	11.39	59.3
AAQ7	8°47'16.37"N 77°36'1.10"E	4215	3716	47.4	8.42	55.8

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

Station Code	Location	X Coordinate (m)	Y Coordinate (m)	Average Baseline PM _{2.5} (µg/m ³)	Incremental value of PM _{2.5} due to mining (µg/m ³)	Total PM _{2.5} (µg/m ³)
AAQ1	8°45'18.06"N 77°33'48.23"E	126	15	22.9	9.97	32.9
AAQ2	8°45'11.51"N 77°33'41.32"E	-87	-134	23.0	9.23	32.2
AAQ3	8°45'24.71"N 77°33'54.79"E	327	266	21.9	9.66	31.5
AAQ4	8°43'27.26"N 77°32'45.95"E	-1791	-3367	22.2	2.22	24.4
AAQ5	8°47'53.72"N 77°32'21.81"E	-2535	4871	47.9	8	55.9
AAQ6	8°45'12.36"N 77°32'6.58"E	-3002	-110	47.5	6.19	53.7
AAQ7	8°47'16.37"N 77°36'1.10"E	4215	3716	21.8	4.06	25.9

TABLE 4.4: INCREMENTAL & RESULTANT GLC OF SO₂

Station Code	Location	X Coordinate (m)	Y Coordinate (m)	Average Baseline SO ₂ (µg/m ³)	Incremental value due to mining (µg/m ³)	Total SO ₂ (µg/m ³)
AAQ1	8°45'18.06"N 77°33'48.23"E	126	15	5.9	3.49	9.4
AAQ2	8°45'11.51"N 77°33'41.32"E	-87	-134	5.9	3.11	9.1
AAQ3	8°45'24.71"N 77°33'54.79"E	327	266	5.8	3.28	9.1
AAQ4	8°43'27.26"N 77°32'45.95"E	-1791	-3367	5.8	0	5.8
AAQ5	8°47'53.72"N 77°32'21.81"E	-2535	4871	6.1	2.7	8.8
AAQ6	8°45'12.36"N 77°32'6.58"E	-3002	-110	5.4	1.3	6.7
AAQ7	8°47'16.37"N 77°36'1.10"E	4215	3716	5.5	0.61	6.1

TABLE 4.5: INCREMENTAL & RESULTANT GLC OF NOX

Station Code	Location	X Coordinate (m)	Y Coordinate (m)	Average Baseline NO _x (µg/m ³)	Incremental value due to mining (µg/m ³)	Total NO _x (µg/m ³)
AAQ1	8°45'18.06"N 77°33'48.23"E	126	15	21.9	12.79	34.7
AAQ2	8°45'11.51"N 77°33'41.32"E	-87	-134	21.4	11	32.4
AAQ3	8°45'24.71"N 77°33'54.79"E	327	266	20.9	12.34	33.2
AAQ4	8°43'27.26"N 77°32'45.95"E	-1791	-3367	20.5	0	20.5
AAQ5	8°47'53.72"N 77°32'21.81"E	-2535	4871	20.2	6.54	26.8
AAQ6	8°45'12.36"N 77°32'6.58"E	-3002	-110	20.5	0	20.5
AAQ7	8°47'16.37"N 77°36'1.10"E	4215	3716	20.6	0	20.6

From the resultant of cumulative concentration i.e., Background + Incremental Concentration of pollutant in all the receptor locations without effective mitigation measures are still within the prescribed NAAQ limits of 100, 80 & 80 µg/m³ for PM₁₀, SO₂ & NO_x respectively. By adopting suitable mitigation measures, the pollutant levels in the atmosphere can be further being controlled.

4.3.4. Mitigation Measures

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

Advantages of Wet Drilling: -

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

Blasting –

- Establish time of blasting to suit the local conditions and water sprinkling on blasting face
- Avoid blasting i.e., when temperature inversion is likely to occur and strong wind blows towards residential areas
- Controlled blasting includes Adoption of suitable explosive charge and short delay detonators, adequate stemming of holes at collar zone and restricting blasting to a particular time of the day i.e. at the time lunch hours, controlled charge per hole as well as charge per round of hole
- Before loading of material water will be sprayed on blasted material
- Dust mask will be provided to the workers and their use will be strictly monitored

Haul Road & Transportation –

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

- 2500 Nos of trees will be planted through this project in the lease area and village roads (Approach Road) to prevent the generation of dust due to movement of dumpers/trucks
- Green belt of adequate width will be developed around the project areas

Occupational Health –

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

4.4 NOISE ENVIRONMENT

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

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

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

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

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

Where:

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

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

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

4.4.1 Anticipated Impact

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

- Source data
- Receptor data
- Attenuation factor

Source data has been computed taking into account of all the machinery and activities used in the mining process. Same has been listed in Table 4-8.

TABLE 4.7: ACTIVITY AND NOISE LEVEL PRODUCED BY MACHINERY

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

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

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

TABLE 4.8: PREDICTED NOISE INCREMENTAL VALUES

Location ID	N1	N2	N3	N4	N5	N6	N7	N8
Maximum Monitored Value (Day) dB(A)	54.7	53.4	62.3	55.2	62.8	62.30	65.60	61.70
Incremental Value dB(A)	66.1	56.6	51.5	29.2	25.3	31.2	25.6	26.48
Total Predicted Noise level dB(A)	66.4	58.3	62.6	55.2	62.8	62.3	65.6	61.7

The incremental noise level is found within the range of 56.6 dB (A)-66.1dB (A) in Core Zone and 25.3-51.5dB (A) in Buffer zone. The noise level at different receptors in buffer zone is lower due to the distance involved and other topographical features adding to the noise attenuation. The resultant Noise level due to monitored values and calculated values at the receptors are based on the mathematical formula considering attenuation due to Green Belt as 4.9 dB (A) the barrier effect. From the above table, it can be seen that the ambient noise levels at all the locations are within permissible limits of Industrial area (core zone) & Residential area (buffer zone) as per THE NOISE POLLUTION (REGULATION AND CONTROL) RULES, 2000 (The Principal Rules were published in the Gazette of India, vide S.O. 123(E), dated 14.2.2000 and subsequently amended vide S.O. 1046(E), dated 22.11.2000, S.O. 1088(E), dated 11.10.2002, S.O. 1569 (E), dated 19.09.2006 and S.O. 50 (E) dated 11.01.2010 under the Environment (Protection) Act, 1986.).

4.4.2 Mitigation Measures

The following noise mitigation measures are proposed for control of Noise

- Usage of sharp drill bits while drilling which will help in reducing noise;
- Secondary blasting will be totally avoided and hydraulic rock breaker will be used for breaking boulders;
- Controlled blasting with proper spacing, burden, stemming and optimum charge/delay will be maintained;
- Proper maintenance, oiling and greasing of machines will be done every week to reduce generation of noise;
- Provision of sound insulated chambers for the workers working on machines (HEMM) producing higher levels of noise;
- Silencers / mufflers will be installed in all machineries;
- Green Belt/Plantation will be developed around the project area and along the haul roads. The plantation minimizes propagation of noise;
- Personal Protective Equipment (PPE) like ear muffs/ear plugs will be provided to the operators of HEMM and persons working near HEMM and their use will be ensured through training and awareness.
- Regular medical check-up and proper training to personnel to create awareness about adverse noise level effects

4.4.3 Ground Vibrations

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

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

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

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

Where –

V = peak particle velocity (mm/s)

K = site and rock factor constant

Q = maximum instantaneous charge (kg)

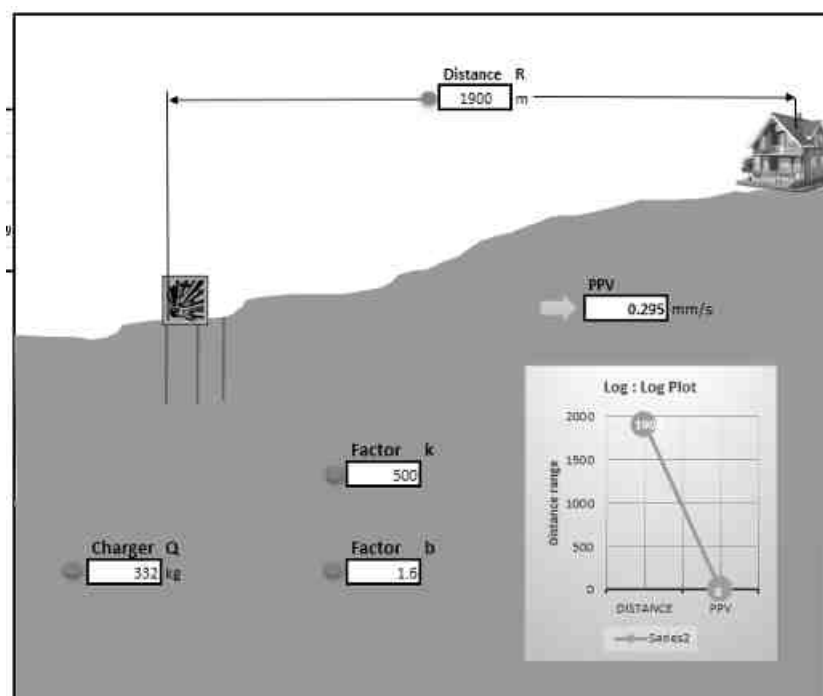
B = constant related to the rock and site (usually 1.6)

R = distance from charge (m)

TABLE 4.9: PREDICTED PPV VALUES DUE TO BLASTING

Location ID	Maximum Charge in kgs	Nearest Habitation in m	PPV in m/ms
P1	332	1.9 Km-NW	0.295

FIGURE 4.6: GROUND VIBRATION PREDICTION



From the above graph, the total charge for blast of 332 kg and it will be used as 30kgs per shot, there will be ten set of blasting 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. However, as per statutory requirement control measures will be adopted to avoid the impacts due to ground vibrations and fly rocks due to blasting.

4.4.3.1 Mitigation Measures

- It is proposed to carry out blasting operation 30kg per round so that the vibration will be minimal
- The mining operation will be carried out without deep hole drilling, 25mm small dia cartridge will be utilized for the blasting
- The blasting operations in the project site without deep hole drilling and blasting using delay detonators, which reduces the ground vibrations;
- Proper quantity of explosive, suitable stemming materials and appropriate delay system will be adopted to avoid overcharging and for safe blasting;
- Adequate safe distance from blasting will be maintained as per DGMS guidelines;
- Blasting shelter will be provided as per DGMS guidelines;
- Blasting operations will be carried out only during day time;
- The charge per delay will be minimized and preferably a greater number of delays will be used per blasts;
- During blasting, other activities in the immediate vicinity will be temporarily stopped;
- Drilling parameters like depth, diameter and spacing will be properly designed to give proper blast;
- A fully trained explosives blast man (Mining Mate, Mines Foreman, 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.
- The detonators will be connected in a predetermined sequence to ensure that only one charge is detonated at any one time and a NONEL or similar type initiation system will be used.
- The detonation delay sequence shall be designed so as to ensure that firing of the holes is in the direction of free faces so as to minimise vibration effects.
- Appropriate blasting techniques shall be adopted such that the predicted peak particle velocity shall not exceed 8 mm/s.
- Vibration monitoring will be carried out every 6 months to check the efficacy of blasting practices

4.5 IMPACT ON THE BIOLOGICAL ENVIRONMENT

4.5.1. Anticipated Impact on agricultural land associated with flora

1. Dust particle settle on neighbouring agricultural land & coconut farms it is located about 150m on the west side. Mostly dust emission from nearby crusher unit and during operation and minerals are transported in approach roads.
2. Dust deposition on leaf observed on nearby lease boundary local plant species which may result in decline the rate of photosynthesis and retards the plant growth.

4.5.2 Mitigation Measures

4.5.2.1. General Guidelines for Green Belt Development

Drone survey was covered the green belt and fencing as per the terms of references. The green belt and plantation purposes in and around the proposed mine lease area native species, fruit-bearing trees, medicinal plants,

and dense canopy trees should be selected. These species should be tolerant to pollution levels as per Bio- Geography zones of India.

After the operation of mining production capacity, green belt and Plantation species should be in accordance with the Terms and Conditions of the Environmental Clearance Green belt is created not only for the purpose of protecting sensitive areas or maintaining the ecological balance but because they also act as efficient biological filters or sinks for particulate and gaseous emissions, generated by vehicular movements and various industrial and mining activities. Optimally designed green belts can be effective in reducing the impact of fugitive emissions and pollutants accidentally or otherwise released at ground levels.

4.5.3.2. Proposed Green Belt

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

4.5.3.3. Development of Green Belt

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

4.5.3.4. Selection of Plant Species for Green Belt Development

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

- The species should be wind-firm and deep-rooted.
- The species should form a dense canopy.
- Fast-growing plants will be planted
- Species tolerance to air pollution like 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.

4.5.4. Anticipated Impact on Fauna

- Noise generation due to vehicle may affect avifauna.

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

4.5.4.1. Measures for protection and conservation of wildlife species

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

4.5.3. Impact on Aquatic Biodiversity

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

Table No. 4.3. Overall Ecological impact assessments of Vadakku Ariyanayagipuram-II Village, Rough stone and gravel quarry, Chearanmahadevi Taluk, Tirunelveli District.

S.No	Attributes	Assessment
	Activities of the project affect the breeding/nesting sites of birds and animals	No breeding and nesting site was identified in the mining lease site. The fauna sighted mostly migrated from the buffer area.
2	Located near an area populated by rare or endangered species	No Endangered, Critically Endangered, or vulnerable species were sighted in the core mining lease area.
3	Proximity to national park/wildlife sanctuary/reserve forest /mangroves/ coastline/estuary/sea	The Kolundumadai R.F. is located about 9.3km on the south side. Hence, no certificate from the DFO is required. Kalakadu Wildlife sanctuary is located about 16.2km on the SW and Koothankulam - Kodankulam bird's sanctuary is located about 35.2km on the SE. Thus, no ecological sensitive area is involved in any manner. Hence, Doesn't required NBWL Clearance.
4	The proposed project restricts access to waterholes for wildlife	'No '

5	Proposed mining project impact surface water quality that also provides water to wildlife	'No 'scheduled or threatened wildlife animals are sighted regularly core in the core area.
6	Proposed mining project increase siltation that would affect nearby biodiversity areas.	Surface runoff management such as drains is constructed properly so there will be no siltation effect in the nearby mining area.
7	Risk of fall/slip or cause death to wild animals due to project activities.	'No'
8	The project release effluents into a water body that also supplies water to a wildlife.	No water body near to core zone so the chances of water becoming polluted is low.
9	Mining projects affect the forest-based livelihood/ any specific forest product on which local livelihood depended.	'No'
10	The project likely to affect migration routes.	'No 'migration route was observed during the monitoring period.
11	The project is likely to affect the flora of an area, which have medicinal value	'No'
12	Forestland is to be diverted, has carbon high sequestration.	'No 'There was no forest land diverted.
13	The project is likely to affect wetlands, Fish breeding grounds, and marine ecology.	'No'. Wetland was not present in the near core Mining lease area. No breeding and nesting ground is present in the core mining area.

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

TABLE 4.12: RECOMMENDED SPECIES FOR GREENBELT DEVELOPMENT PLAN

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

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

TABLE 4.13: GREENBELT DEVELOPMENT PLAN

Year	No. of tress proposed to be planted	Area to be covered in m ²	Name of the species
I	2500	The safety zone along the boundary barrier has been identified to be utilized for Greenbelt development.	Neem, Pongamia Pinnata etc.,

4.6 SOCIO ECONOMIC

4.6.1 Anticipated Impact

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

4.6.2 Mitigation Measures

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

4.7 OCCUPATIONAL HEALTH AND SAFETY

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

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

4.7.1 Respiratory Hazards

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

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

4.7.2 Noise

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

- No employee will be exposed to a noise level greater than 85 dB(A) for a duration of more than 8 hours per day without hearing protection
- The use of hearing protection will be enforced actively when the equivalent sound level over 8 hours reaches 85 dB(A), the peak sound levels reach 140 dB(C), or the average maximum sound level reaches 110 dB(A)
- Ear muffs provided will be capable of reducing sound levels at the ear to at least 85 dB(A)
- Periodic medical hearing checks will be performed on workers exposed to high noise levels

4.7.3 Physical Hazards

The following measures are proposed for control of physical hazards

- Specific personnel training on work-site safety management will be taken up;
- Work site assessment will be done by rock scaling of each surface exposed to workers to prevent accidental rock falling and / or landslide, especially after blasting activities;

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

4.7.4 Occupational Health Survey

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

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

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

4.8 MINE WASTE MANAGEMENT

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

4.9 MINE CLOSURE

The ultimate depth of the mine is 57 m 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 4.13.90 Ha this land will be converted into temporary water reservoir which will facilitate to collect the rain water
- The stagnant water will be supplied to the nearby agriculture land during drought seasons
- Fencing will be re constructed around the pit after closure, the warning/ danger display board will be placed on all the sides of the project site
- The un utilized area and haul roads will be converted as plantation area, fruit bearing trees will be planted to retain the eco system of the area
- Final Mine closure plan will be prepared and submitted to the concerned authority

Mine closure plan is the most important environmental requirement in mining project. The mine closure plan should cover technical, environmental, social, legal and financial aspects dealing with progressive and post closure activities. The closure operation is a continuous series of activities starting from the decommissioning of the project.

As progressive mine closure is a continuous series of activities, it is obvious that the proposals of scientific mining have included most of the activities to be included in the closure plan. While formulating the closure objectives for the site, it is important to consider the existing or the pre-mining land use of the site; and how the operation will affect this activity.

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

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

4.9.1 Mine Closure Criteria

The criteria involved in mine closure are discussed below:

4.9.1.1 Physical Stability

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

4.9.1.2 Chemical Stability

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

4.9.1.3 Biological Stability

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

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

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

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

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 1 Crushers within the radius of 1km. Most of the quarries in the regions are abandoned and lease expired quarries. Hence this quarry will feed the Rough stone material to the crushing units.

The Rough Stone and Gravel Quarry Project for excavation of Rough Stone, which is site specific. The proposed mining lease areas have following advantages: -

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

5.2 ANALYSIS OF ALTERNATIVE SITE

No alternatives are suggested as all the mine sites are mineral specific

5.3 FACTORS BEHIND SELECTION OF PROPOSED TECHNOLOGY

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

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

5.4 ANALYSIS OF ALTERNATIVE TECHNOLOGY

Open cast mechanized method has been selected for 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.

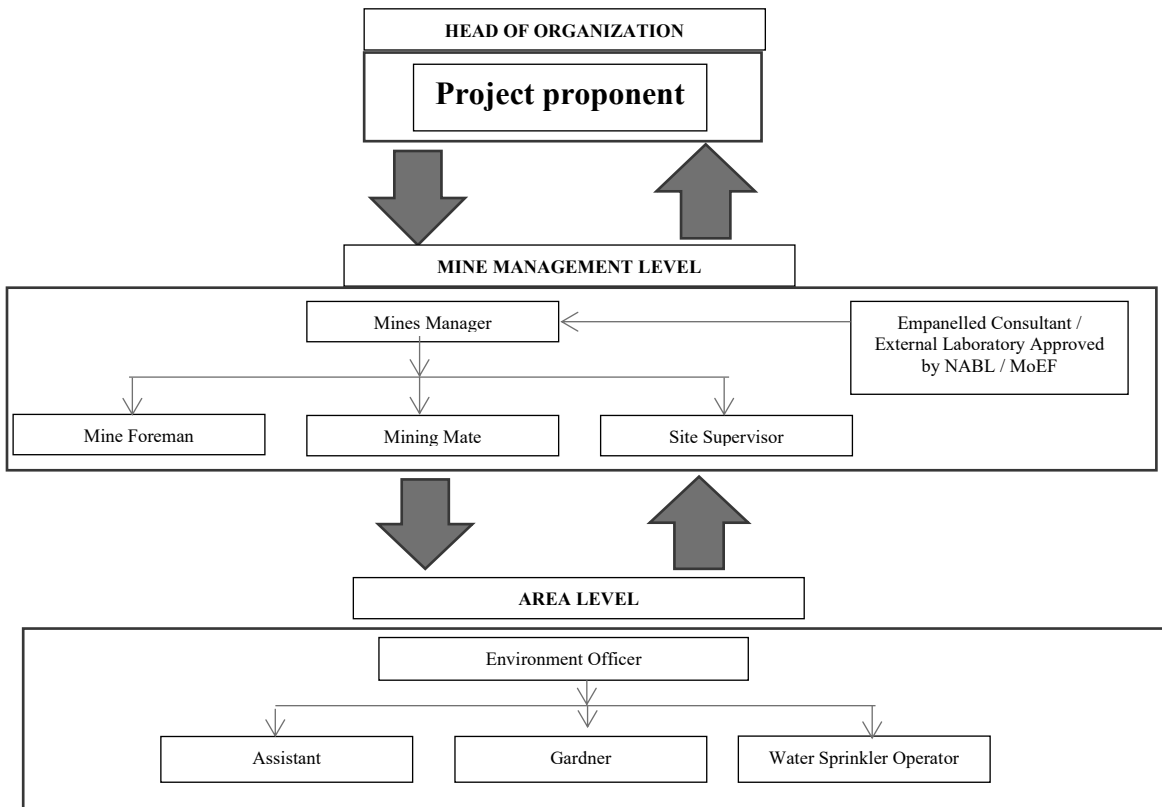
An Environment monitoring cell (EMC) will be constituted to monitor the implementation of EMP and other environmental protection measures in all the proposed quarries.

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 P1

6.2 IMPLEMENTATION SCHEDULE OF MITIGATION MEASURES

The mitigation measures proposed in Chapter-4 will be implemented so as to reduce the impact on the environment due to the operations of the proposed project. Implementation schedule of mitigation measures is given in Table 6.1.

TABLE 6.1 IMPLEMENTATION SCHEDULE

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

6.3 MONITORING SCHEDULE AND FREQUENCY

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

- Air quality;
- Water and wastewater quality;
- Noise levels;
- Soil Quality; and
- Greenbelt Development

The details of monitoring are detailed in Table 6.2

TABLE 6.2: PROPOSED MONITORING SCHEDULE POST EC FOR P1

S.No.	Environment Attributes	Location	Monitoring		Parameters
			Duration	Frequency	
1	Air Quality	2 Locations (1 Core & 1 Buffer)	24 hours	Once in 6 months	Fugitive Dust, PM _{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/- and the recurring cost is Rs 7,60,000/- per annum for this Project.

TABLE 6.3 ENVIRONMENT MONITORING PROGRAM BUDGET

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

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

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

Source: Analysed and Proposed by FAE & EC

7.3 DISASTER MANAGEMENT PLAN

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

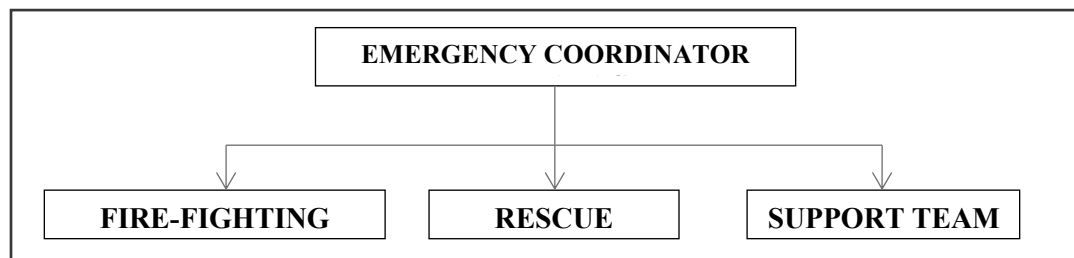
The Disaster Management Plan is aimed to ensure safety of life, protection of environment, protection of installation, restoration of production and salvage operations in this same order of priorities.

The objective of the Disaster Management Plan is to make use of the combined resources of the mine and the outside services to achieve the following:

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

In case a disaster takes place, despite preventive actions, disaster management will have to be done in line with the descriptions below. There is an organization proposed for dealing with the emergency situations and the coordination among key personnel and their team has been shown in Fig 7.1.

FIGURE 7.1: DISASTER MANAGEMENT TEAM LAYOUT



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

TABLE 7.2: PROPOSED TEAMS TO DEAL WITH EMERGENCY SITUATION

DESIGNATION	QUALIFICATION
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 carry out rescue operation of trapped personnel. The people trained in first aid and fire-fighting shall be included in search and rescue team.

(f) Emergency security controller

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

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

PROPOSED QUARRY					
CODE	Name of the Owner	Mineral	S.F. Nos	Extent in Ha	Status
P1	Thiru.R.P.Rahul	Rough Stone	719/1(P), 720/1(P), 720/2,3,4,5,6,7, 8,9,10,11,12, 13(P), 14(P),	4.99.39	ToR Identification No – TO23B0108TN5277464N Dated-13.03.2024
TOTAL EXTENT				4.99.39	
EXISTING QUARRIES					
CODE	Name of the Owner	Mineral	S.F. Nos	Extent in Ha	Status
E-1	Thiru.T.Satheesan	Rough Stone	708/3A(P), 709(P)	4.95.0	08.02.2023-07.02.2028
E-2	Thiru.M.Sivaprasath	Rough Stone	723(P) & 724/3(P)	3.89.72	26.02.2021 – 25.02.2026
TOTAL EXTENT				8.84.72	
ABANDONED QUARRIES					
Nil					
TOTAL CLUSTER EXTENT				13.84.11	

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

TABLE 7.5: SALIENT FEATURES OF PROPOSAL “P1”

Name of the Project	Thiru.R.P.Rahul Rough Stone and Gravel Quarry	
S.F. No.	719/1(P), 720/1(P), 720/2,3,4,5,6,7,8,9,10,11,12,13(P),14(P)	
Extent	4.99.39 ha	
Village Taluk and District	Vadakku Ariyanayagipuram - II Village, Cheranmahadevi Taluk, Tirunelveli District.	
Land Type	Patta Land	
Toposheet No	57-H/09	
Latitude between	08° 45' 11.0397"N to 08° 45' 21.3753"N	
Longitude between	77° 33' 40.6252"E to 77° 33' 48.8609"E	
Elevation of the area	100 m AMSL	
Lease period	5 Years	
Mining Plan period	5 years	
Proposed Depth of Mining as per ToR	47m Bgl (2m Gravel + 45m Rough Stone)	
Geological Resources	Rough Stone in m ³	Gravel
	27,46,645	99,878
Mineable Reserves	11,49,795	83,680
For Five Year Production as per ToR	10,67,645	83,680
Peak Production	2,73,005	33,696
Ultimate Pit Dimension	277m (L) x 208m (W) x 57m(D) (2m Gravel + 55m Rough Stone)	
Water Level in the region	62 m bgl	
Method of Mining	Opencast Mechanized Mining Method involving small drilling and Controlled blasting using Slurry Explosives	
Topography	The lease applied area is Plain Terrain. The area has gentle sloping towards Southern side and altitude of the area is 100 m above from Mean sea level. The area is covered by 2m thickness of gravel followed by massive charnockite which is clearly inferred from the outcrop.	
Machinery proposed	Wagon Drill Machine	2 Nos
	Jack Hammer	4 Nos
	Compressor	1 Nos
	Excavator with Bucket and Rock Breaker	2 Nos
	Tippers	5 Nos
	Water Sprinkling Tanker	1 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.	
Proposed Manpower Deployment	33 Nos	
Project Cost	Rs. 4,32,45,000/-	
6 months once compliance Monitoring Cost (EMP)	Rs. 3,80,000/-	
CER Cost	Rs. 5,00,000/-	
	Odai	50m East (Safety Distance Provided)
	Tank	400m NE

	Channel	4.0 km SW
	Thamirabarani River	4.5km SW
	Vitruirunthan Lake	9.0km SW
Greenbelt Development Plan	Proposed to plant 2500 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	2.0 KLD	
Nearest Habitation	1.2 km – South East	
Nearest Reserve Forest	Kolundhumalai R.F – 10.95 Km – South	
Nearest Wild Life Sanctuary	Kalakad Mundanthurai Tiger Reserve – 16 Km - South	

Source: Approved Mining Plan

TABLE 7.6: SALIENT FEATURES OF PROPOSAL “E1”

Name of the Quarry	Thiru. T.Satheesan Rough Stone & Gravel Quarry	
S.F.Nos	708/3A (P) & 709(P)	
Extent	4.95.0 Ha	
Lease Period	5 Years	
Toposheet No	58-H/09	
Latitude between	08°45'09.03"N - 08°45'19.05"N	
Longitude between	77°33'24.03"E - 77°33'32.51"E	
Production quantity	Rough Stone in m ³	Gravel m ³
	11,01,720	84,376
Depth of the quarry	42m Bgl	
Proposed Manpower Deployment	48	
Project Cost	Rs.1,43,58,000/-	
CER Cost	Rs 5,00,000/-	

Source: Approved Mining Plan

TABLE 7.7: SALIENT FEATURES OF PROPOSAL “E2”

Name of the Quarry	Thiru. M.Sivaprasath Rough Stone & Gravel Quarry		
S.F.Nos	723(P) & 724/3(P)		
Extent	3.89.72 Ha		
Toposheet No	58-H/09		
Lease period	5 Years		
Latitude between	08°45'14"N - 08°45'24"N		
Longitude between	77°33'51"E - 77°33'59"E		
Production quantity	Rough Stone in m ³	Weathered Rock m ³	Gravel m ³
	7,26,845	31,124	64,262
Depth of the quarry	38m Bgl		
Method of Mining	Opencast Mechanized Mining Method involving drilling and blasting		
Proposed Manpower Deployment	25		
Project Cost	Rs.95,74,000/-		
CER Cost	Rs 5,00,000/-		

Source: Approved Mining Plan

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

Air Environment –

Calculating the Cumulative Load of Mining within the cluster is as shown in table 7.10 & 7.11.

TABLE 7.8: CUMULATIVE PRODUCTION LOAD OF ROUGH STONE

Quarry	Production for five-year plan period	Per Year Production in m ³	Per Day Production in m ³	Number of Lorry Load Per Day
P1	10,67,645	2,13,529	712	60
Total	10,67,645	2,13,529	712	60
E1	11,01,720	2,20,344	734	62
E2	7,26,845	1,45,369	485	41
Total	18,28,565	3,65,713	1,219	103
Grand Total	28,96,210	5,79,242	1,931	163

TABLE 7.9: CUMULATIVE PRODUCTION LOAD OF GRAVEL

Quarry	Production for Two-year plan period	Per Year Production in m ³	Per Day Production in m ³	Number of Lorry Load Per Week
P1	83,680	27,893	93	8
Total	83,680	27,893	93	8
E1	84,376	28,125	94	8
E2	64,262	21,420	72	6
Total	1,48,638	49,545	166	14
Grand Total	2,32,318	77,438	259	22

TABLE 7.9A: CUMULATIVE PRODUCTION LOAD OF WEATHERED ROCK

Quarry	Production for Two-year plan period	Per Year Production in m ³	Per Day Production in m ³	Number of Lorry Load Per Week
P1	-	-	-	-
Total	-	-	-	-
E1	-	-	-	-
E2	31,124	10,374	35	3
Total	31,124	10,374	35	3

On a cumulative basis considering the proposed quarry, it can be seen that the overall production of Rough Stone is 1,931m³ per day and overall production of Gravel is 259 m³ per day with a capacity of 163 trips of Rough Stone per day and 22 Trips per Week of Gravel and weathered rock 3 Trips per day from the cluster.

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

TABLE 7.10: EMISSION ESTIMATION FROM QUARRIES WITHIN 500 METER RADIUS

EMISSION ESTIMATION FOR QUARRY "P1"				
	Activity	Source type	Value	Unit
Estimated Emission Rate for PM ₁₀	Drilling	Point Source	0.139657856	g/s
	Blasting	Point Source	0.012851130	g/s
	Mineral Loading	Point Source	0.049648703	g/s
	Haul Road	Line Source	0.002529758	g/s/m
	Overall Mine	Area Source	0.085943308	g/s
Estimated Emission Rate for SO ₂	Overall Mine	Area Source	0.003250964	g/s

Estimated Emission Rate for NOx	Overall Mine	Area Source	0.000368742	g/s
EMISSION ESTIMATION FOR QUARRY “E1”				
Estimated Emission Rate for PM ₁₀	Activity	Source type	Value	Unit
	Drilling	Point Source	0.130961777	g/s
	Blasting	Point Source	0.009318312	g/s
	Mineral Loading	Point Source	0.048614252	g/s
	Haul Road	Line Source	0.002520721	g/s/m
	Overall Mine	Area Source	0.083065735	g/s
Estimated Emission Rate for SO ₂	Overall Mine	Area Source	0.002684866	g/s
Estimated Emission Rate for NOx	Overall Mine	Area Source	0.000295903	g/s
EMISSION ESTIMATION FOR QUARRY “E2”				
Estimated Emission Rate for PM ₁₀	Activity	Source type	Value	Unit
	Drilling	Point Source	0.115599440	g/s
	Blasting	Point Source	0.004993363	g/s
	Mineral Loading	Point Source	0.046714653	g/s
	Haul Road	Line Source	0.002508044	g/s/m
	Overall Mine	Area Source	0.072144206	g/s
Estimated Emission Rate for SO ₂	Overall Mine	Area Source	0.001807289	g/s
Estimated Emission Rate for NOx	Overall Mine	Area Source	0.000155608	g/s

Source: Emission Calculation

TABLE 7.11: INCREMENTAL & RESULTANT GLC WITHIN CLUSTER

PM₁₀ in µg/m³	
Background	48.4
Incremental	17.91
Resultant	66.3
NAAQ Norms	100 µg/m³
PM_{2.5} in µg/m³	
Background	22.9
Incremental	9.97
Resultant	32.9
NAAQ Norms	60 µg/ m³
So2 in µg/m³	
Background	5.9
Incremental	3.49
Resultant	9.4
NAAQ Norms	80 µg/ m³
No2 in µg/m³	
Background	21.9
Incremental	12.79
Resultant	34.7
NAAQ Norms	80 µg/ m³

Noise Environment

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

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

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

Where:

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

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

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

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

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

TABLE 7.12: PREDICTED NOISE INCREMENTAL VALUES FROM MINES

Location ID	N1	N2	N3	N4	N5	N6	N7	N8
Maximum Monitored Value (Day) dB(A)	54.7	53.4	62.3	55.2	62.8	62.30	65.60	61.70
Incremental Value dB(A)	66.1	56.6	51.5	29.2	25.3	31.2	25.6	26.48
Total Predicted Noise level dB(A)	66.4	58.3	62.6	55.2	62.8	62.3	65.6	61.7

Source: Lab Monitoring Data

The incremental noise level is found within the range of 25.3 – 51.5 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 near habitations are within permissible limits of Residential Area (buffer zone) as per THE NOISE POLLUTION (REGULATION AND CONTROL) RULES, 2000 (The Principal Rules were published in the Gazette of India, vide S.O.123(E), dated 14.2.2000 and subsequently amended vide S.O. 1046(E), dated 22.11.2000, S.O. 1088(E), dated 11.10.2002, S.O. 1569 (E), dated 19.09.2006 and S.O. 50 (E) dated 11.01.2010 under the Environment(Protection) Act, 1986).

Ground Vibrations

Ground vibrations due to mining activities in the all the 3 Mines within cluster are anticipated due to operation of Mining Machines like Excavators, drilling and blasting, transportation vehicles, etc. However, the major source of ground vibration from the all the 3 mines is blasting. The major impact of the ground vibrations is observed on the domestic houses located in the villages nearby the mine lease area. The kuchha houses are more prone to cracks and damage due to the vibrations induced by blasting whereas RCC framed structures can withstand more ground vibrations. Apart from this, the ground vibrations may develop a fear factor in the nearby settlements nearby the mining areas and may cause injury to persons or damage to the structures. Nearest Habitations from 3 mines respectively are as in below Table 7.21.

TABLE 7.13: NEAREST HABITATION FROM EACH MINE

Location ID	Distance & Direction
Habitation Near P1	1.9 km North West
Habitation Near E1	1.95 km North West
Habitation Near E2	2.07 km North West

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 7.14: GROUND VIBRATIONS AT 3MINES

Location ID	Maximum Charge in kgs	Nearest Habitation in m	PPV in m/ms
P1	300 (10 rounds) 30kg per Round	1.9 km North West	0.043
E1	318(10 rounds) 30kg per Round	1.95 km North West	0.041
E2	208(7 rounds) 30kg per Round	2.07 km North West	0.038

Source: Blasting Calculations

From the above table, the charge per blast is considered as maximum in each mine and the resultant PPV is well below the Peak Particle Velocity of 8 mm/s as per Directorate General of Mines Safety for safe level criteria through Circular No. 7 dated 29/8/1997.

Socio Economic Environment –

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

TABLE 7.15: SOCIO ECONOMIC BENEFITS FROM 3 MINES

Location ID	Project Cost	CER
P1	Rs. 4,32,45,000/-	Rs.5,00,000/-
E1	Rs.1,43,58,000/-	Rs. 5,00,000/-
E2	Rs. 95,74,000/-	Rs 5,00,000/-
Total	Rs. 6,71,77,000 /-	Rs. 15,00,000/-

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

- Proposed Projects shall fund towards CER – **Rs 15,00,000/-**

TABLE 7.16: EMPLOYMENT BENEFITS FROM 3MINES

Description	Employment
P1	33
Total	33
E1	48
E2	25
Total	73
Grand Total	106

A total of 33 people will get employment due to 1 proposed mine in cluster and 73 people are already employed at existing mines.

TABLE 7.17: GREENBELT DEVELOPMENT BENEFITS FROM 3 MINES

CODE	No of Trees proposed to be planted	Survival %	Area Covered Sq.m	Name of the Species
P1	2500	80%	The safety zone along the boundary barrier has been identified to be	Neem, Pinnata, Pongamia, Ashoka, Vilvam etc.,
Total	2500			
E1	2500			
E2	2000			

Total	4,500	utilized for Greenbelt development	
G.Total	7,000		

Based on the Proposed Mining Plans it's anticipated that there shall growth of native species of Neem, Pinnata et., in the Cluster at a rate of 7,000 Trees Planted over a period of 5 Years with Survival Rate of 80%.

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 7.18: 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

8.PROJECT BENEFITS

8.0 GENERAL

The Proposed Project for Quarrying Rough Stone at Vadakku Ariyanayagipuram-II Village aims to produce **11,49,795 m³** Rough Stone over a period of 5 Years and Gravel 83,680 m³ for period of 3 years. This will enhance the socio-economic activities in the adjoining areas and will result in the following benefits.

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

8.1 EMPLOYMENT POTENTIAL

It is proposed to provide employment to about 33 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 is located in Vadakku Ariyanayagipuram-II Village, Cheranmahadevi Taluk and Tirunelveli District of Tamil Nadu and the area have communications, roads and other facilities already well established. The following physical infrastructure facilities will further improve due to proposed mine.

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

8.4 IMPROVEMENT IN SOCIAL INFRASTRUCTURE

Employment is expected during civil construction period, in trade, garbage lifting, sanitation and other ancillary services, Employment in these sectors will be primarily temporary or contractual and involvement of unskilled labour will be more. A major part of the labour force will be mainly from local villagers who are expected to engage themselves both in agriculture and mining activities. This will enhance their income and lead to overall economic growth of the area.

8.5 OTHER TANGIBLE BENEFITS

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

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

CORPORATE SOCIAL RESPONSIBILITY

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

CSR Cost Estimation

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

CORPORATE ENVIRONMENT RESPONSIBILITY

For the existing quarries Allocation for Corporate Environment Responsibility (CER) shall be made as per Government of India, MoEF & CC Office Memorandum F.No.22-65/2017-IA.III, Dated: 01.05.2018.

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

TABLE 8.1 CER – ACTION PLAN

Activity	CER
<ul style="list-style-type: none"> • 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 5,00,000/-

9. ENVIRONMENTAL COST BENEFIT ANALYSIS

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

10. ENVIRONMENTAL MANAGEMENT PLAN

10.0. GENERAL

Environment Management Plan (EMP) aims at the preservation of ecological system by considering in-built pollution abatement facilities at the proposed site. Good practices of Environmental Management plan will ensure to keep all the environmental parameters of the project in respect of Ambient Air quality, Water quality, Socio – economic improvement standards.

Mitigation measures at the source level and an overall environment management plan at the study area are elicited so as to improve the supportive capacity of the receiving bodies. The EMP presented in this chapter discusses the administrative aspects of ensuring that mitigative measures are implemented and their effectiveness monitored after approval of the EIA.

10.1. ENVIRONMENTAL POLICY

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

The Proponent Thiru R.P.Rahul will –

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

Description of the Administration and Technical Setup –

The Environment Monitoring Cell discussed under Chapter 6 will ensure effective implementation of environment management plan and to ensure compliance of environmental statutory guidelines through Mine Management Level of each Proposed Quarry.

The said team will be responsible for:

- Monitoring of the water/ waste water quality, air quality and solid waste generated
- Analysis of the water and air samples collected through external laboratory
- Implementation and monitoring of the pollution control and protective measures/ devices which shall include financial estimation, ordering, installation of air pollution control equipment, waste water treatment plant, etc.
- Co-ordination of the environment related activities within the project as well as with outside agencies
- Collection of health statistics of the workers and population of the surrounding villages
- Green belt development
- Monitoring the progress of implementation of the environmental monitoring programme

- Compliance to statutory provisions, norms of State Pollution Control Board, Ministry of Environment and Forests and the conditions of the environmental clearance as well as the consents to establish and consents to operate.

10.2. LAND ENVIRONMENT MANAGEMENT –

Landscape of the area will be changed due to the quarrying operation, restoration of the land by converting the quarry pit into temporary reservoir and the remaining part of the area (un utilized areas, infrastructure, haul Roads) will be utilized for greenbelt development. There is no major vegetation in the project area during the course of quarrying operation and after completion of the quarrying operation thick plantation will be developed under greenbelt development programme.

TABLE 10.1. PROPOSED CONTROLS FOR LAND ENVIRONMENT

CONTROL	RESPONSIBILITY
Design vehicle wash-down areas so that all runoff water is captured and passed through oil water separators and sediment catchment devices.	Mines Manager
Refueling to be undertaken in a safe location, away from vehicle movement pathways & 100 m away of any watercourse Refueling activity to be under visual observation at all times. Drainage of refueling areas to sumps with oil/water separation	Mine Foreman & Mining Mate
Soil and groundwater testing as required following up a particular incident of contamination.	Mines Manager
At conceptual stage, the mining pits will be converted into Rain Water Harvesting. Remaining area will be converted into greenbelt area	Mines Manager
No external dumping i.e., outside the project area	Mine Foreman
Garland drains with catch pits / settlement traps to be provided all around the project area to prevent run off affecting the surrounding lands.	Mines Manager
The periphery of Project area will be planted with thick plantation to arrest the fugitive dust, which will also act as acoustic barrier.	Mines Manager

Source: Proposed by FAE's & EIA Coordinator

10.3. SOIL MANAGEMENT

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

TABLE 10.2. PROPOSED CONTROLS FOR SOIL MANAGEMENT

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

Source: Proposed by FAE's & EIA Coordinator

10.4. WATER MANAGEMENT

In the proposed quarrying project, no process is involved for the effluent generation, only oil & grease from the machinery wash is anticipated and domestic sewage from mines office. The quarrying operation is proposed upto a depth of 47 m Bgl, the water table in the area is 62 m 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 are carried out in the project area and in surrounding villages to assess the impact due to the mining activities and the efficacy of the adopted noise control measures. Additional noise control measures will be adopted if required as per the observations during monitoring	Mines Manager
Reduce maximum instantaneous charge using delays while blasting	Mining Mate
Change the burden and spacing by altering the drilling pattern and/or delay layout, or altering the hole inclination	Mines Manager
Undertake noise or vibration monitoring	Mines Manager

Source: Proposed by FAE's & EIA Coordinator

10.7. GROUND VIBRATION AND FLY ROCK CONTROL

The Rough stone quarry operation creates vibration due to the blasting and movement of Heavy Earth moving machineries, fly rocks due to the blasting.

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

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 2500 nos. of saplings is proposed to be planted for the Mining plan period in safety barrier of applied mine lease area with survival rate 80%. The greenbelt development plan has been prepared keeping in view the land use changes that will occur due to mining operation in the area.

TABLE 10.7: PROPOSED GREENBELT ACTIVITIES

Year	No. of trees proposed to be planted	Area to be covered in m ²	Name of the species
I	2500	The safety zone along the boundary barrier has been identified to be utilized for Greenbelt development.	Neem, Pongamia, Pinnata, Vilvam etc.,

Source: Approved Mining plan

The objectives of the greenbelt development plan are –

- Provide a green belt around the periphery of the quarry area to combat the dispersal of dust in the adjoining areas,
- Protect the erosion of the soil, Conserve moisture for increasing ground water recharging,
- Restore the ecology of the area, restore aesthetic beauty of the locality and meet the requirement of fodder, fuel and timber of the local community.

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

10.8.2. Species Recommended for Plantation

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

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

TABLE 10.8. RECOMMENDED SPECIES FOR THE PLANTSATION

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

Source: Proposed by FAE's & EIA Coordinator

10.9. OCCUPATIONAL SAFETY & HEALTH MANAGEMENT

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

10.9.1. Medical Surveillance and Examinations –

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

- General Physical Examination and Blood Pressure
- X-ray Chest and ECG
- Sputum test
- Detailed Routine Blood and Urine examination

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

TABLE 10.9. MEDICAL EXAMINATION SCHEDULE

Sl. No	Activities	1 st Year	2 nd Year	3 rd Year	4 th Year	5 th Year
I	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 10.11 gives overall investment on the environmental safeguards and recurring expenditure for successful monitoring and implementation of control measures.

TABLE 10.10: EMP BUDGET FOR PROPOSED PROJECT

	Mitigation Measure	Provision for Implementation	Capital	Recurring
Air Environment	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	49939	49939
	Fixed Water Sprinkling Arrangements + Water sprinkling by own water tankers	Fixed Sprinkler Installation and New Water Tanker Cost for Capital; and Water Sprinkling (thrice a day) Cost for recurring	800000	50000
	Muffle blasting – To control fly rocks during blasting	Blasting face will be covered with sand bags / steel mesh / old tyres / used conveyor belts	0	5000
	Wet drilling procedure / latest eco-friendly drill machine with separate dust extractor unit	Dust extractor @ Rs. 25,000/- per unit deployed as capital & @ Rs. 2500 per unit recurring cost for maintenance -4Units	100000	10000
	No overloading of trucks/tippers/tractors	Manual Monitoring through Security guard	0	5000
	Stone carrying trucks will be covered by tarpaulin	Monitoring if trucks will be covered by tarpaulin	0	10000
	Enforcing speed limits of 20 km/hr within ML area	Installation of Speed Governors @ Rs. 5000/- per Tipper/Dumper deployed - 5 Units	25000	1250
	Regular monitoring of exhaust fumes as per RTO norms	Monitoring of Exhaust Fumes by Manual Labour	0	5000
	Regular sweeping and maintenance of approach roads for at least about 200 m from ML Area	Provision for 2 labours @ Rs.10,000/labour (Contractual) per Hectare	0	99878
	Installing wheel wash system near gate of quarry	Installation + Maintenance + Supervision	50000	20000
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 / Compentent Person	0	0
	Provision for Portable blaster shed	Installation of Portable blasting shelter	50000	2000
	NONEL Blasting will be practiced to control Ground vibration and fly rocks	Rs. 30/- per 6 Tonnes of Blasted Material	0	2775877
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 managment	Provision for garland drain @ Rs. 10,000/- per Hectare with maintenance of Rs. 5,000/- per annum	49939	5000
	2. Progressive Closure Activity Barbed Wire Fencing to quarry area will be provisioned.	Per Hectare fencing Cost @ Rs. 2,00,000/- with Maintenance of Rs 10,000/- per annum	998780	10000
	3. Progressive Closure Activity Green belt development - 500 trees per one hectare - Proposal for 2500Trees - (1300 Inside Lease Area & 1200 Outside Lease Area)	Site clearance, preparation of land, digging of pits / trenches, soil amendmets, transplantation of saplings @ 200 per plant (capital) for plantation inside the lease area and @ 30 per plant maintenance (recurring)	260000	39000
		Avenue Plantation @ 300 per plant (capital) for plantation outside the lease area and @ 30 per plant maintenance (recurring)	360000	36000
	4. Implementation of Final Mine Closure Acty as per Approved Mining Plan on Last Year	Few activities already covered as progressive closure activities as greenbelt development, wire fencing, garland drain. *For Final Closure Activities 15% of the proposed closure cost will be spent during the final mine closure stage - Last Year	129750	0
	5. Contribution towards Green Fund. As per TNMMCR 1959, Rule 35 A	The Contribution towards Green Funds @ 10% of Seigniorage fee are indicated as part of EMP Budge and not necessarily implemented in the Project Site	9608805	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	50000
	Workers will be provided with Personal Protective Equipment's	Provision of PPE @ Rs. 4000/- per employee with recurring based on wear and tear (say, @ Rs. 1000/- per employee) - 33 Employees	132000	33000
	Health check up for workers will be provisioned	IME & PME Health check up @ Rs. 1000/- per employee	0	33000
	First aid facility will be provided	Provision of 2 Kits per Hectare @ Rs. 2000/-	0	9987.8
	Mine will have safety precaution signages, boards.	Provision for signages and boards made	10000	2000
	No parking will be provided on the transport routes. Separate provision on the south side of the hill will be made for vehicles /HEMMs. Flaggers will be deployed for traffic management	Parking area with shelter and flags @ Rs. 50,000/- per hectare project and Rs. 10,000/- as maintenance cost	249695	10000
	Installation of CCTV cameras in the mines and mine entrance	Camera 4 Nos, DVR, Monitor with internet facility	30000	5000
Implementation as per Mining Plan and ensure safe quarry working	Mines Manager (1 st Class / 2 nd Class / Mine Foreman) under regulation 34 / 34 (6) of MMR, 1961 and Mining Mate under regulation 116 of MMR,1961 @ 40,000/- for Manager & @ 25,000/- for Foreman / Mate	0	780000	
CER	As per MoEF &CC OM 22-65/2017-IA.III Dated 25.02.2021	Detailed Description in following slides and Budget allocation is included as per MoeEF & CC OM	500000	0
TOTAL			3685353	4069931.8

*Marked cost is already discussed in the mining plan hence that is not included in the total Environmental Management plan cost Total Cost for the five years.

Year	Total Cost
1st	₹ 77,55,285
2nd	₹ 42,73,428
3rd	₹ 44,87,100
4th	₹ 47,11,455
5th	₹ 50,76,778
Total	263 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

This EIA & EMP report prepared for the proposed Rough Stone and Gravel Quarry project located in S.F. No 719/1(Part), 720/1(Part), 720/2, 3, 4, 5, 6, 7, 8, 9,10,11,12,13(Part)and14(Part), Vadakku Ariyanayagipuram-II Village, Cheranmahadevi Taluk, Tirunelveli District belongs to Thiru. R.P.Rahul the Project falls in the Cluster category consist of 1 Proposed, 2 Existing Quarries falls under “B” category as per MoEF & CC Notification S.O. 3977 (E).

Now, as per Order Dated: 04.09.2018 & 13.09.2018 passed by Hon'ble National Green Tribunal, New Delhi in O.A. No. 173 of 2018 & O.A. No, 186 of 2016 and MoEF & CC Office Memorandum F. No. L-11011/175/2018-IA-II (M) Dated: 12.12.2018 clarified the requirement for EIA, EMP and therefore, Public Consultation for all areas from 5 to 25 ha falling in Category B-1 and appraised by SEAC/ SEIAA as well as for cluster situation.

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

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

The main scope of the EIA study is to quantify the cumulative impact in the study area due to cluster quarries and formulate the effective mitigation measures for each individual leases. A detailed account of the emission sources, emissions control equipment, background Air quality levels, Meteorological measurements, Dispersion model and all other aspects of pollution like effluent discharge, Dust generation etc., have been discussed in this report. The baseline monitoring study has been carried out during the months March – May 2024 for various environmental components so as to assess the anticipated impacts of the cluster quarry projects on the environment and suitable mitigation measures for likely adverse impacts due to the proposed project is suggested individually for the respective proposed project under Chapter 10.

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

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 33 people directly in the proposed projects and indirectly around 50 people.

As discussed, it is safe to say that the proposed quarries are not likely to cause any significant impact to the ecology of the area, as adequate preventive measures will be adopted to keep the various pollutants within the permissible limits. Green belt development around the area will also be taken up as an effective pollution mitigate technique, as well as to serve as biological indicators for the pollutants released from the Thiru.R.P.Rahul Rough Stone Quarry (Extent – 4.99.39 ha).

12. DISCLOSURE OF CONSULTANT

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

Name and address of the consultancy:

GEO EXPLORATION AND MINING SOLUTIONS

No 17, Advaita Ashram Road,

Alagapuram, Salem – 636 004

Tamil Nadu, India

Email: infogeoexploration@gmail.com

Web: www.gemssalem.com

Phone: 0427 2431989.

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

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

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

DECLARATION BY EXPERTS CONTRIBUTING TO THE EIA/EMP

This EIA/EMP for Thiru R.P.Rahul Rough Stone Quarry over an Extent of 4.99.39 ha in S.F. No 719/1(Part), 720/1(Part), 720/2, 3, 4, 5, 6, 7, 8, 9,10,11,12,13(Part)and14(Part), Vadakku Ariyanayagipuram-II Village, Cheranmahadevi Taluk, Tirunelveli District of Tamil Nadu is prepared as per the Generic Structure of EIA Guidelines manual. It is also certified that information furnished in the above EIA study are true and correct to the best of our knowledge.

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

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

Designation: **EIA Coordinator**

Date & Signature:




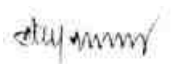

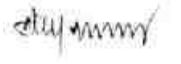







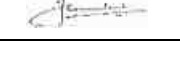






Period of Involvement: **January 2024 to till date**

Associated Team Member with EIA Coordinator:


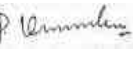

1. Mr. P. Viswanathan
2. Mr. M. Santhoshkumar
3. Mr. S. Ilavarasan

FUNCTIONAL AREA EXPERTS ENGAGED IN THE PROJECT

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

6	EB	<ul style="list-style-type: none"> ▪ Collection of Baseline data of Flora and Fauna. ▪ Identification of species labelled as Rare, Endangered and threatened as per IUCN list. ▪ Impact of the project on flora and fauna. ▪ Suggesting species for greenbelt development. 	Mrs. Amirtham	
			Mr. Alagappa Moses	
7	RH	<ul style="list-style-type: none"> ▪ Identification of hazards and hazardous substances ▪ Risks and consequences analysis ▪ Vulnerability assessment ▪ Preparation of Emergency Preparedness Plan ▪ Management plan for safety. 	Mr. N. Senthilkumar	
			Mr. S. Pavel	
			Mr. J. R. Vikram Krishna	
8	LU	<ul style="list-style-type: none"> ▪ Construction of Land use Map ▪ Impact of project on surrounding land use ▪ Suggesting post closure sustainable land use and mitigative measures. 	Mr. A. Allimuthu	
9	NV	<ul style="list-style-type: none"> ▪ Identify impacts due to noise and vibrations ▪ Suggesting appropriate mitigation measures for EMP. 	Mr. A. Jagannathan	
10	AQ	<ul style="list-style-type: none"> ▪ Identifying different source of emissions and propose predictions of incremental GLC using AERMOD. ▪ Recommending mitigations measures for EMP 	Mr. N. Senthilkumar	
11	SC	<ul style="list-style-type: none"> ▪ Assessing the impact on soil environment and proposed mitigation measures for soil conservation 	Dr. M. Iftikhar Ahmed	
12	SHW	<ul style="list-style-type: none"> ▪ Identify source of generation of non-hazardous solid waste and hazardous waste. ▪ Suggesting measures for minimization of generation of waste and how it can be reused or recycled. 	Mr. A. Jagannathan	
			Mr. J. R. Vikram Krishna	

LIST OF TEAM MEMBERS ENGAGED IN THIS PROJECT

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

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

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 the Cluster EIA/EMP for Thiru R.P.Rahul Rough Stone & Gravel Quarry over an Extent of 4.99.39 ha in Vadakku Ariyanayagipuram-II Village, Cheranmahadevi Taluk, Tirunelveli District of Tamil Nadu. It is also certified that information furnished in the EIA study are true and correct to the best of our knowledge.

Signature& Date:



Name:

Dr. M. Ifthikhar Ahmed

Designation:

Managing Partner

Name of the EIA Consultant Organization:

M/s. Geo Exploration and Mining Solutions

NABET Certificate No & Issue Date:

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

Validity:

Valid till 06.08.2025

ANNEXURE

THIRU. R.P. RAHUL ROUGH STONE AND GRAVEL QUARRY

S.F. Nos: 719/1(P), 720/1(P),
720/2,3,4,5,6,7,8,9,10,11,12,13(P),14(P)

Vadakku Ariyanayagipuram – II Village,

Cheranmahadevi Taluk,

Tirunelveli District.

EXTENT = 4.99.39Ha

ToR obtained vide

ToR Identification: TO23B0108TN5277464N Dated-13.03.2024

Project Proponent

Thiru. R.P.Rahul,

S/o.Rajendran,

13-85, Pathittavilai,

Chitharal Village,

Vilavancode Taluk,

Kanniyakumari District - 629151

LIST OF ANNEXURES

ANNEXURES	DESCRIPTION	PAGE NOS
P1 THIRU. R.P.RAHUL	COPY OF TERMS OF REFERENCE	1A – 14A
	COPY OF 500M RADIUS QUARRIES DETAILS LETTER	15A – 18A
	COPY OF MINING PLAN APPROVED LETTER	19A – 23A
	COPY OF APPROVED MINING PLAN WITH PLATES	24A – 104A
	COPY OF HYDROGEOLOGICAL REPORT	105A – 114A
	COPY OF INSPECTION REPORT	115A – 124A
	COPY OF EXPLOSIVES LETTER	125A – 126A
	COPY OF 300m & VAO ATTESTATION LETTER	127A – 128A
E1 THIRU.T.SATHEESAN	COPY OF ENVIRONMENTAL CLEARANCE	129A – 157A
E2 THIRU. M.SIVAPRASATH	COPY OF ENVIRONMENTAL CLEARANCE	158A – 173A
	COPY OF BASE LINE MONITORING DATA	174A – 247A
	COPY OF CONSULTANT ACCREDITATION CERTIFICATE	248A



File No: 10590

Government of India

Ministry of Environment, Forest and Climate Change
(Issued by the State Environment Impact Assessment
Authority(SEIAA), TAMIL NADU)



Dated 13/03/2024



To,

Rahul R P
RAJENDRAN SREEDHARAN
6-45, KKM, House, Piravankottu Vilai, Vellamcode, Chitharal, Vilavancode, KANNIYAKUMARI,
TAMIL NADU, 629151
rahulrp004@gmail.com

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

Sir/Madam,

This is in reference to your application for Grant of Terms of Reference under the provision of the EIA Notification 2006-regarding in respect of project Thiru. R. P. Rahul, Rough stone and Gravel Quarry Project over an Extent of 4.99.39Ha of Patta lands in S.F.Nos.719/1(Part), 720/1(Part), 720/2, 720/3, 720/4, 720/5, 720/6, 720/7, 720/8, 720/9, 720/10, 720/11, 720/12, 720/13(Part) and 720/14(Part) of Vadakku Ariyanayagipuram-II Village, Cheranmahadevi Taluk, Tirunelveli District, Tamil Nadu State. submitted to Ministry vide proposal number SIA/TN/MIN/454785/2023 dated 08/12/2023.

2. The particulars of the proposal are as below :

(i) TOR Identification No.	TO23B0108TN5277464N
(ii) File No.	10590
(iii) Clearance Type	TOR
(iv) Category	B1
(v) Project/Activity Included Schedule No.	1(a) Mining of minerals Thiru. R. P. Rahul, Rough stone and Gravel Quarry Project over an Extent of 4.99.39Ha of Patta lands in S.F.Nos.719/1(Part), 720/1(Part), 720/2, 720/3, 720/4, 720/5, 720/6, 720/7, 720/8, 720/9, 720/10, 720/11, 720/12, 720/13(Part) and 720/14(Part) of Vadakku Ariyanayagipuram-II Village, Cheranmahadevi Taluk, Tirunelveli District, Tamil Nadu State.
(vii) Name of Project	
(viii) Name of Company/Organization	RAJENDRAN SREEDHARAN
(ix) Location of Project (District, State)	TIRUNELVELI, TAMIL NADU
(x) Issuing Authority	SEIAA

(xii) Applicability of General Conditions	no
(xiii) Applicability of Specific Conditions	no

3. In view of the particulars given in the Para 1 above, the project proposal interalia including Form-1 were submitted to SEIAA for an appraisal by the SEAC 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 11/03/2024. The minutes of the meeting and all the Application and documents submitted [(viz. Form-1, EMP)] are available on PARIVESH portal which can be accessed by scanning the QR Code above.
5. The brief about the salient features of the project along with environment settings, as submitted by the Project proponent in Form-1, EMP Reports/presented during SEIAA are annexed to this EC as Annexure (1).
6. The SEAC, based on information & clarifications provided by the project proponent and after detailed deliberations recommended the proposal for grant of Terms of Reference under the provision of EIA Notification, 2006 and as amended thereof subject to stipulation of specific and general conditions as detailed in Annexure (2).
7. The SEIAA has examined the proposal in accordance with the Environment Impact Assessment (EIA) Notification, 2006 & further amendments thereto and after accepting the recommendations of the SEAC hereby decided to grant Terms of Reference for instant proposal of M/s. Kousic & Co. Blue Metals under the provisions of EIA Notification, 2006 and as amended thereof.
8. The Ministry/SEIAA-TN reserves the right to stipulate additional conditions, if found necessary.
9. The Terms of Reference to the aforementioned project is under provisions of EIA Notification, 2006. It does not tantamount to approvals/consent/permissions etc. required to be obtained under any other Act/Rule/regulation. The Project Proponent is under obligation to obtain approvals /clearances under any other Acts/ Regulations or Statutes, as applicable, to the project.
10. This issues with the approval of the Competent Authority.

Copy To

1. The Additional Chief Secretary to Government, Environment & Forests Department, Govt. of Tamil Nadu, Fort St. George, Chennai - 9
2. The Chairman, Central Pollution Control Board, Parivesh Bhavan, CBD Cum-Office Complex, East Arjun Nagar, New Delhi 110032.
3. The Member Secretary, Tamil Nadu Pollution Control Board, 76, Mount Salai, Guindy, Chennai-600 032.
4. Monitoring Cell, IA Division, Ministry of Environment, Forests & CC, Paryavaran Bhavan, CGO Complex, New Delhi 110003
5. The Commissioner/ Director, Department of Geology & Mining, Guindy.
6. The District Collector, Tirunelveli District.
7. The Assistant Director, Department of Geology & Mining, Tirunelveli District.
8. Stock File.

Annexure 1

Specific Terms of Reference for (Mining Of Minerals)

1. Mining

S. No	Terms of Reference
1.1	<p>1. The PP shall furnish the letter received from DFO concerned stating the proximity details of Reserve Forests, Protected Areas, Sanctuaries, Tiger reserve etc., upto a radius of 25 km from the proposed site.</p> <p>2. If Kalakad Mundanthurai Tiger Reserve is located within a distance of 10.0km, the PP shall obtain and submit NBWL Clearance, as per the MoEF &CC Office Memorandum no. FC-11/119/2020-FC dated 17th May, 2022.</p> <p>3. The structures within the radius of (i) 50 m, (ii) 100 m, (iii) 200 m and (iv) 300 m & 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.</p> <p>4. Since the waterbodies are situated nearby, the PP shall carry out the intensive scientific assessment on the hydrogeological condition of the quarry to consider the decision on rerouting of the Odai passing through the proposed lease area.</p> <p>5. The Project Proponent shall furnish the revised EMP based on the study carried out on impact of the dust & other environmental impacts due to proposed quarrying operations on the nearby agricultural lands for remaining life of the mine in the format prescribed by the SEAC considering the cluster situation.</p> <p>6. Detailed study report on flora and fauna in and nearby the quarry site.</p> <p>7. The Proponent shall develop greenbelt and garland drain around the boundary of the proposed quarry and the photographs indicating the same shall be shown during the EIA appraisal.</p>

2. Seac Standard Conditions

S. No	Terms of Reference
2.1	<p>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:</p> <ul style="list-style-type: none"> (i) Original pit dimension (ii) Quantity achieved Vs EC Approved Quantity (iii) Balance Quantity as per Mineable Reserve calculated. (iv) Mined out Depth as on date Vs EC Permitted depth (v) Details of illegal/illicit mining (vi) Violation in the quarry during the past working. (vii) Quantity of material mined out outside the mine lease area (viii) Condition of Safety zone/benches (ix) Revised/Modified Mining Plan showing the benches of not exceeding 6 m height and ultimate depth of not exceeding 50m. <p>2. Details of habitations around the proposed mining area and latest VAO certificate regarding the location of habitations within 300m radius from the periphery of the site.</p> <p>3. The PP shall submit a detailed hydrological report indicating the impact of proposed quarrying operations on the waterbodies like lake, water tanks, etc are located within 1 km of the proposed quarry.</p> <p>4. The Proponent shall carry out Bio diversity study through reputed Institution and the same shall be included in EIA Report.</p> <p>5. The DFO letter stating that the proximity distance of Reserve Forests, Protected Areas, Sanctuaries, Tiger reserve etc., up to a radius of 25 km from the proposed site.</p> <p>6. In the case of proposed lease in an existing (or old) quarry where the benches are not formed (or) partially formed as per the approved Mining Plan, the Project Proponent (PP) shall the PP shall carry out the scientific studies to assess the slope stability of the working benches to be constructed and existing quarry wall, by involving any one of the reputed Research and Academic Institutions - CSIR-Central Institute of Mining & Fuel Research / Dhanbad, NIRM/Bangalore, Division of Geotechnical Engineering-IIT-Madras, NIT-Dept of Mining Engg, Surathkal, and Anna University</p>

S. No	Terms of Reference
	<p>Chennai-CEG Campus. The PP shall submit a copy of the aforesaid report indicating the stability status of the quarry wall and possible mitigation measures during the time of appraisal for obtaining the EC.</p> <p>7. However, in case of the fresh/virgin quarries, the Proponent shall submit a conceptual 'Slope Stability Plan' for the proposed quarry during the appraisal while obtaining the EC, when the depth of the working is extended beyond 30 m below ground level.</p> <p>8. The PP shall furnish the affidavit stating that the blasting operation in the proposed quarry is carried out by the statutory competent person as per the MMR 1961 such as blaster, mining mate, mine foreman, II/I Class mines manager appointed by the proponent.</p> <p>9. The PP shall present a conceptual design for carrying out only controlled blasting operation involving line drilling and muffle blasting in the proposed quarry such that the blast-induced ground vibrations are controlled as well as no fly rock travel beyond 30 m from the blast site.</p> <p>10. The EIA Coordinators shall obtain and furnish the details of quarry/quarries operated by the proponent in the past, either in the same location or elsewhere in the State with video and photographic evidences.</p> <p>11. If the proponent has already carried out the mining activity in the proposed mining lease area after 15.01.2016, then the proponent shall furnish the following details from AD/DD, mines,</p> <p>12. What was the period of the operation and stoppage of the earlier mines with last work permit issued by the AD/DD mines?</p> <p>13. Quantity of minerals mined out.</p> <ul style="list-style-type: none"> ● Highest production achieved in any one year ● Detail of approved depth of mining. ● Actual depth of the mining achieved earlier. ● Name of the person already mined in that leases area. ● If EC and CTO already obtained, the copy of the same shall be submitted. ● Whether the mining was carried out as per the approved mine plan (or EC if issued) with stipulated benches. <p>14. All corner coordinates of the mine lease area, superimposed on a High-Resolution Imagery/Topo sheet, topographic sheet, geomorphology, lithology and geology of the mining lease area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).</p> <p>15. The PP shall carry out Drone video survey covering the cluster, green belt, fencing, etc.,</p> <p>16. The proponent shall furnish photographs of adequate fencing, green belt along the periphery including replantation of existing trees & safety distance between the adjacent quarries & water bodies nearby provided as per the approved mining plan.</p> <p>17. The Project Proponent shall provide the details of mineral reserves and mineable reserves, planned production capacity, proposed working methodology with justifications, the anticipated impacts of the mining operations on the surrounding environment, and the remedial measures for the same.</p> <p>18. The Project Proponent shall provide the Organization chart indicating the appointment of various statutory officials and other competent persons to be appointed as per the provisions of the Mines Act'1952 and the MMR, 1961 for carrying out the quarrying operations scientifically and systematically in order to ensure safety and to protect the environment.</p> <p>19. The Project Proponent shall conduct the hydro-geological study considering the contour map of the water table detailing the number of groundwater pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds, etc. within 1 km (radius) along with the collected water level data for both monsoon and non-monsoon seasons from the PWD / TWAD so as to assess the impacts on the wells due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided.</p> <p>20. The proponent shall furnish the baseline data for the environmental and ecological parameters</p>

S. No	Terms of Reference
	<p>with regard to surface water/ground water quality, air quality, soil quality & flora/fauna including traffic/vehicular movement study.</p> <p>21. The Proponent shall carry out the Cumulative impact study due to mining operations carried out in the quarry specifically with reference to the specific environment in terms of soil health, biodiversity, air pollution, water pollution, climate change and flood control & health impacts. Accordingly, the Environment Management plan should be prepared keeping the concerned quarry and the surrounding habitations in the mind.</p> <p>22. Rain water harvesting management with recharging details along with water balance (both monsoon & non-monsoon) be submitted.</p> <p>23. Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.</p> <p>24. Details of the land for storage of Overburden/Waste Dumps (or) Rejects outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be provided.</p> <p>25. Proximity to Areas declared as 'Critically Polluted' (or) the Project areas which attracts the court restrictions for mining operations, should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the TNPCB (or) Dept. of Geology and Mining should be secured and furnished to the effect that the proposed mining activities could be considered.</p> <p>26. Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.</p> <p>27. Impact on local transport infrastructure due to the Project should be indicated.</p> <p>28. A tree survey study shall be carried out (nos., name of the species, age, diameter etc..) both within the mining lease applied area & 300m buffer zone and its management during mining activity.</p> <p>29. A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific.</p> <p>30. As a part of the study of flora and fauna around the vicinity of the proposed site, the EIA coordinator shall strive to educate the local students on the importance of preserving local flora and fauna by involving them in the study, wherever possible.</p> <p>31. The purpose of Green belt around the project is to capture the fugitive emissions, carbon sequestration and to attenuate the noise generated, in addition to improving the aesthetics. A wide range of indigenous plant species should be planted as given in the appendix-I in consultation with the DFO, State Agriculture University. The plant species with dense/moderate canopy of native origin should be chosen. Species of small/medium/tall trees alternating with shrubs should be planted in a mixed manner.</p> <p>32. Taller/one year old Saplings raised in appropriate size of bags, preferably ecofriendly bags should be planted as per the advice of local forest authorities/botanist/Horticulturist with regard to site specific choices. The proponent shall earmark the greenbelt area with GPS coordinates all along the boundary of the project site with at least 3 meters wide and in between blocks in an organized manner</p> <p>33. A Disaster management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.</p> <p>34. A Risk Assessment and management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.</p> <p>35. Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.</p>

S. No	Terms of Reference
	<p>36. Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.</p> <p>37. The Socio-economic studies should be carried out within a 5 km buffer zone from the mining activity. Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.</p> <p>38. Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.</p> <p>39. Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.</p> <p>40. If any quarrying operations were carried out in the proposed quarrying site for which now the EC is sought, the Project Proponent shall furnish the detailed compliance to EC conditions given in the previous EC with the site photographs which shall duly be certified by MoEF&CC, Regional Office, Chennai (or) the concerned DEE/TNPCB.</p> <p>41. The PP shall prepare the EMP for the entire life of mine and also furnish the sworn affidavit stating to abide the EMP for the entire life of mine.</p> <p>42. Concealing any factual information or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this Terms of Conditions besides attracting penal provisions in the Environment (Protection) Act, 1986.</p>

Standard Terms of Reference for (Mining of minerals)

1.

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

S. No	Terms of Reference																								
	features such as water bodies, etc should be furnished.																								
1.6	A contour map showing the area drainage of the core zone and 25 km of the study area (where the water courses of the core zone ultimately join the major rivers/streams outside the lease/project area) should also be clearly indicated in the separate map.																								
1.7	Catchment area with its drainage map of 25 km area within and outside the mine shall be provided with names, details of rivers/ riverlet system and its respective order. The map should clearly indicate drainage pattern of the catchment area with basin of major rivers. Diversion of drains/ river need elaboration in form of length, quantity and quality of water to be diverted																								
1.8	(Details of mineral reserves, geological status of the study area and the seams to be worked, ultimate working depth and progressive stage-wise working scheme until the end of mine life should be provided on the basis of the approved rated capacity and calendar plans of production from the approved Mining Plan. Geological maps and sections should be included. The Progressive mine development and Conceptual Final Mine Closure Plan should also be shown in figures. Details of mine plan and mine closure plan approval of Competent Authority should be furnished for green field and expansion projects.																								
1.9	Details of mining methods, technology, equipment to be used, etc., rationale for selection of specified technology and equipment proposed to be used vis-à-vis the potential impacts should be provided.																								
1.10	Impact of mining on hydrology, modification of natural drainage, diversion and channeling of the existing rivers/water courses flowing through the ML and adjoining the lease/project and the impact on the existing users and impacts of mining operations thereon.																								
1.11	A detailed Site plan of the mine showing the proposed break-up of the land for mining operations such as the quarry area, OB dumps, green belt, safety zone, buildings, infrastructure, Stockyard, township/colony (within and adjacent to the ML), undisturbed area -if any, and landscape features such as existing roads, drains/natural water bodies to be left undisturbed along with any natural drainage adjoining the lease /project areas, and modification of thereof in terms of construction of embankments/bunds, proposed diversion/re-channelling of the water courses, etc., approach roads, major haul roads, etc should be indicated.																								
1.12	<p>Original land use (agricultural land/forestland/grazing land/wasteland/water bodies) of the area should be provided as per the tables given below. Impacts of project, if any on the land use, in particular, agricultural land/forestland/grazing land/water bodies falling within the lease/project and acquired for mining operations should be analyzed. Extent of area under surface rights and under mining rights should be specified. Area under Surface Rights</p> <table border="1" data-bbox="335 1691 1468 1971"> <thead> <tr> <th data-bbox="335 1691 630 1758">S.N ML/Project Land use</th> <th data-bbox="630 1691 1212 1758">Area under Surface Rights(ha)</th> <th data-bbox="1212 1691 1468 1758">Area Under Mining Rights(ha)</th> <th data-bbox="1468 1691 1564 1758">Area under Both (ha)</th> </tr> </thead> <tbody> <tr> <td data-bbox="335 1758 630 1803">1 Agricultural land</td> <td></td> <td></td> <td></td> </tr> <tr> <td data-bbox="335 1803 630 1848">2 Forest Land</td> <td></td> <td></td> <td></td> </tr> <tr> <td data-bbox="335 1848 630 1892">3 Grazing Land</td> <td></td> <td></td> <td></td> </tr> <tr> <td data-bbox="335 1892 630 1937">4 Settlements</td> <td></td> <td></td> <td></td> </tr> <tr> <td data-bbox="335 1937 630 1982">5 Others (specify)</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	S.N ML/Project Land use	Area under Surface Rights(ha)	Area Under Mining Rights(ha)	Area under Both (ha)	1 Agricultural land				2 Forest Land				3 Grazing Land				4 Settlements				5 Others (specify)			
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1.13	<p>Study on the existing flora and fauna in the study area (10km) should be carried out by an institution of relevant discipline. The list of flora and fauna duly authenticated separately for the core and study area and a statement clearly specifying whether the study area forms a part of the migratory corridor of any endangered fauna should be given. If the study area has endangered flora and fauna, or if the area is occasionally visited or used as a habitat by Schedule-I species, or if the project falls within 15 km of an ecologically sensitive area, or used as a migratory corridor then a Comprehensive Conservation Plan along with the appropriate budgetary provision should be prepared and submitted with EIA-EMP Report; and comments/observation from the CWLW of the State Govt. should also be obtained and furnished.</p>																		
1.14	<p>One-season (other than monsoon) primary baseline data on environmental quality - air (PM10, PM2.5, SOx, NOx and heavy metals such as Hg, Pb, Cr, As, etc), noise, water (surface and groundwater), soil - along with one-season met data coinciding with the same season for AAQ collection period should be provided. The detail of NABL/ MoEF&CC certification of the respective laboratory and NABET accreditation of the consultant to be provided.</p>																		
1.15	<p>Map (1: 50, 000 scale) of the study area (core and buffer zone) showing the location of various sampling stations superimposed with location of habitats, other industries/mines, polluting sources, should be provided. The number and location of the sampling stations in both core and buffer zones should be selected on the basis of size of lease/project area, the proposed impacts in the downwind (air)/downstream (surface water)/groundwater regime (based on flow). One station should be in the upwind/upstream/non-impact/non-polluting area as a control station. The monitoring should be as per CPCB guidelines and parameters for water testing for both ground water and surface water as per ISI standards and CPCB classification wherever applicable. Observed values should be provided along with the specified standards.</p>																		
1.16	<p>For proper baseline air quality assessment, Wind rose pattern in the area should be reviewed and accordingly location of AAMSQ shall be planned by the collection of air quality data by adequate monitoring stations in the downwind areas. Monitoring location for collecting baseline data should cover overall the 10 km buffer zone i.e. dispersed in 10 km buffer area. In case of expansion, the displayed data of CAAQMS and its comparison with the monitoring data to be provided</p>																		
1.17	<p>A detailed traffic study along with presence of habitation in 100 mts distance from both side of road, the impact on the air quality with its proper measures and plan of action with timeline for widening of road. The project will increase the no. of vehicle along the road which will indirectly contribute to carbon emission so what will be the compensatory action plan should be clearly spell out in EIA/ EMP report.</p>																		
1.18	<p>The socio-economic study to conducted with actual survey report and a comparative assessment to be provided from the census data should be provided in EIA/ EMP report also occupational status & economic status of the study area and what economically project will contribute should be clearly</p>																		

S. No	Terms of Reference
	mention. The study should also include the status of infrastructural facilities and amenities present in the study area and a comparative assessment with census data to be provided and to link it with the initialization and quantification of need based survey for CSR activities to be followed.
1.19	The Ecology and biodiversity study should also indicate the likely impact of change in forest area for surface infrastructural development or mining activity in relation to the climate change of that area and what will be the compensatory measure to be adopted by PP to minimize the impact of forest diversion.
1.20	Baseline data on the health of the population in the impact zone and measures for occupational health and safety of the personnel and manpower for the mine should be submitted.
1.21	Impact of proposed project/activity on hydrological regime of the area shall be assessed and report be submitted. Hydrological studies as per GEC 2015 guidelines to be prepared and submitted
1.22	Impact of mining and water abstraction from the mine on the hydrogeology and groundwater regime within the core zone and 10 km buffer zone including long-term monitoring measures should be provided. Details of rainwater harvesting and measures for recharge of groundwater should be reflected in case there is a declining trend of groundwater availability and/or if the area falls within dark/grey zone.
1.23	Study on land subsidence including modeling for prediction, mitigation/prevention of subsidence, continuous monitoring measures, and safety issues should be carried out.
1.24	Detailed water balance should be provided. The break up of water requirement as per different activities in the mining operations, including use of water for sand stowing should be given separately. Source of water for use in mine, sanction of the Competent Authority in the State Govt. and impacts vis-à-vis the competing users should be provided.
1.25	PP shall submit design details of all Air Pollution control equipment (APCEs) to be implemented as part of Environment Management Plan vis-à-vis reduction in concentration of emission for each APCEs
1.26	PP shall propose to use LNG/CNG based mining machineries and trucks for mining operation and transportation of mineral. The measures adopted to conserve energy or use of renewable sources shall be explored.
1.27	PP to evaluate the green house emission gases from the mine operation/ washery plant and corresponding carbon absorption plan.
1.28	Site specific Impact assessment with its mitigation measures, Risk Assessment and Disaster Preparedness and Management Plan should be provided.
1.29	Impact of choice of mining method, technology, selected use of machinery and impact on air quality, mineral transportation, handling & storage/stockyard, etc, Impact of blasting, noise and vibrations should be provided.
1.30	Impacts of mineral transportation within the mining area and outside the lease/project along with flow-chart indicating the specific areas generating fugitive emissions should be provided. Impacts of transportation, handling, transfer of mineral and waste on air quality, generation of effluents from

S. No	Terms of Reference
	workshop etc, management plan for maintenance of HEMM and other machinery/equipment should be given. Details of various facilities such as rest areas and canteen for workers and effluents/pollution load emanating from these activities should also be provided.
1.31	Details of various facilities to be provided to the workers in terms of parking, rest areas and canteen, and effluents/pollution load resulting from these activities should also be given.
1.32	The number and efficiency of mobile/static water jet, Fog cannon sprinkling system along the main mineral transportation road inside the mine, approach roads to the mine/stockyard/siding, and also the frequency of their use in impacting air quality should be provided.
1.33	Conceptual Final Mine Closure Plan and post mining land use and restoration of land/habitat to the pre- mining status should be provided. A Plan for the ecological restoration of the mined out area and post mining land use should be prepared with detailed cost provisions. Impact and management of wastes and issues of re-handling (wherever applicable) and backfilling and progressive mine closure and reclamation should be furnished.
1.34	Adequate greenbelt nearby areas, mineral stock yard and transportation area of mineral shall be provided with details of species selected and survival rate Greenbelt development should be undertaken particularly around the transport route.
1.35	Cost of EMP (capital and recurring) should be included in the project cost and for progressive and final mine closure plan.
1.36	Details of R&R. Detailed project specific R&R Plan with data on the existing socio- economic status of the population (including tribals, SC/ST, BPL families) found in the study area and broad plan for resettlement of the displaced population, site for the resettlement colony, alternate livelihood concerns/employment for the displaced people, civic and housing amenities being offered, etc and costs along with the schedule of the implementation of the R&R Plan should be given.
1.37	CSR Plan along with details of villages and specific budgetary provisions (capital and recurring) for specific activities over the life of the project should be given.
1.38	Corporate Environment Responsibility:
1.39	a) The Company must have a well laid down Environment Policy approved by the Board of Directors.
1.40	b) The Environment Policy must prescribe for standard operating process/procedures to bring into focus any infringements/deviation/violation of the environmental or forest norms/conditions.
1.41	c) The hierarchical system or Administrative Order of the company to deal with environmental issues and for ensuring compliance with the environmental clearance conditions must be furnished.
1.42	d) To have proper checks and balances, the company should have a well laid down system of reporting of non-compliances/violations of environmental norms to the Board of Directors of the company and/or shareholders or stakeholders at large.
1.43	e) Environment Management Cell and its responsibilities to be clearly spelled out in EIA/ EMP

S. No	Terms of Reference												
	report												
1.44	f) In built mechanism of self-monitoring of compliance of environmental regulations should be indicated.												
1.45	Status of any litigations/ court cases filed/pending on the project should be provided.												
1.46	PP shall submit clarification from DFO that mine does not falls under corridors of any National Park and Wildlife Sanctuary with certified map showing distance of nearest sanctuary.												
1.47	Copy of clearances/approvals such as Forestry clearances, Mining Plan Approval, mine closer plan approval. NOC from Flood and Irrigation Dept. (if req.), etc. wherever applicable.												
1.48	<p>Details on the Forest Clearance should be given as per the format given:</p> <table border="1" data-bbox="331 734 1476 965"> <thead> <tr> <th>Total Project Area (ha)</th> <th>Total ML Forest land (ha)</th> <th>Date of FC</th> <th>Extent of Forest Land</th> <th>Balance area for which FC is yet to be obtained</th> <th>Status of appl For diversion of forest land</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>If more than one provide details of each FC</p>	Total Project Area (ha)	Total ML Forest land (ha)	Date of FC	Extent of Forest Land	Balance area for which FC is yet to be obtained	Status of appl For diversion of forest land						
Total Project Area (ha)	Total ML Forest land (ha)	Date of FC	Extent of Forest Land	Balance area for which FC is yet to be obtained	Status of appl For diversion of forest land								
1.49	In case of expansion of the proposal, the status of the work done as per mining plan and approved mine closure plan shall be detailed in EIA/ EMP report												
1.50	Details on Public Hearing should cover the information relating to notices issued in the newspaper, proceedings/minutes of Public Hearing, the points raised by the general public and commitments made by the proponent and the time bound action proposed with budgets in suitable time frame. These details should be presented in a tabular form. If the Public Hearing is in the regional language, an authenticated English Translation of the same should be provided.												
1.51	PP shall carry out survey through drone highlighting the ground reality for atleast 10 minutes												
1.52	Detailed Chronology of the project starting from the first lease deed allotted/Block allotment/ Land acquired to its No. of renewals, CTO /CTE with details of no. renewals, previous EC(s) granted details and its compliance details, NOC details from various Govt bodies like Forest NOC(s), CGWA permissions, Power permissions, etc as per the requisites respectively to be furnished in tabular form.												
1.53	The first page of the EIA/ EMP report must mention the peak capacity production, area, detail of PP, Consultant (NABET accreditation) and Laboratory (NABL / MoEF & CC certification)												
1.54	The compliances of ToR must be properly cited with respective chapter section and page no in tabular form and also mention sequence of the respective ToR complied within the EIA-EMP report in all the chapter,s section.												

Additional Terms of Reference

SEIAA Conditions:

Specific Conditions:

Restricting the ultimate depth of mining upto 50m BGL for mining over a period of five years considering the environmental impacts due to the mining, safety precautionary measures of the working personnel and following the principle of the sustainable mining.

Standard Conditions:**Cluster Management Committee**

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

Impact study of mining

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

Agriculture & Agro-Biodiversity

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

Forests

19. The project proponent shall detailed study on impact of mining on Reserve forests free ranging wildlife.

20. The Environmental Impact Assessment should study impact on forest, vegetation, endemic, vulnerable and endangered indigenous flora and fauna.

21. The Environmental Impact Assessment should study impact on standing trees and the existing trees should be numbered and action suggested for protection.

22. The Environmental Impact Assessment should study impact on protected areas, Reserve Forests, National Parks, Corridors and Wildlife pathways, near project site.

Water Environment

23. Hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) so as to assess the impacts on the nearby waterbodies due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided, covering the entire mine lease period.

24. Erosion Control measures.

25. Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area on the nearby Villages, Water-bodies/ Rivers, & any ecological fragile areas.

26. The project proponent shall study impact on fish habitats and the food WEB/ food chain in the water body and Reservoir.

27. The project proponent shall study and furnish the details on potential fragmentation impact on natural environment, by the activities.

28. The project proponent shall study and furnish the impact on aquatic plants and animals in water bodies and possible scars on the landscape, damages to nearby caves, heritage site, and archaeological sites possible land form changes visual and aesthetic impacts.

29. The Terms of Reference should specifically study impact on soil health, soil erosion, the soil physical, chemical components and microbial components.

30. The Environmental Impact Assessment should study on wetlands, water bodies, rivers streams, lakes and farmer sites.

Energy

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

Climate Change

32. The Environmental Impact Assessment shall study in detail the carbon emission and also suggest the measures to mitigate carbon emission including development of carbon sinks and temperature reduction including control of other emission and climate mitigation activities.

33. The Environmental Impact Assessment should study impact on climate change, temperature rise, pollution and above soil & below soil carbon stock.

Mine Closure Plan

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

EMP

35. Detailed Environment Management Plan along with adaptation, mitigation & remedial strategies covering the entire mine lease period as per precise area communication order issued.

36. The Environmental Impact Assessment should hold detailed study on EMP with budget for Green belt development and mine closure plan including disaster management plan.

Risk Assessment

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

Disaster Management Plan

38. To furnish disaster management plan and disaster mitigation measures in regard to all aspects to avoid/reduce vulnerability to hazards & to cope with disaster/untoward accidents in & around the proposed mine lease area due to the proposed method of mining activity & its related activities covering the entire mine lease period as per precise area communication order issued.

Others

39. The project proponent shall furnish VAO certificate with reference to 300m radius regard to approved habitations, schools, Archaeological sites, Structures, railway lines, roads, water bodies such as streams, odai, vaari, canal, channel, river, lake pond, tank etc.

40. As per the MoEF& CC office memorandum F.No.22-65/2017-IA.III dated: 30.09.2020 and 20.10.2020 the proponent shall address the concerns raised during the public consultation and all the activities proposed shall be part of the

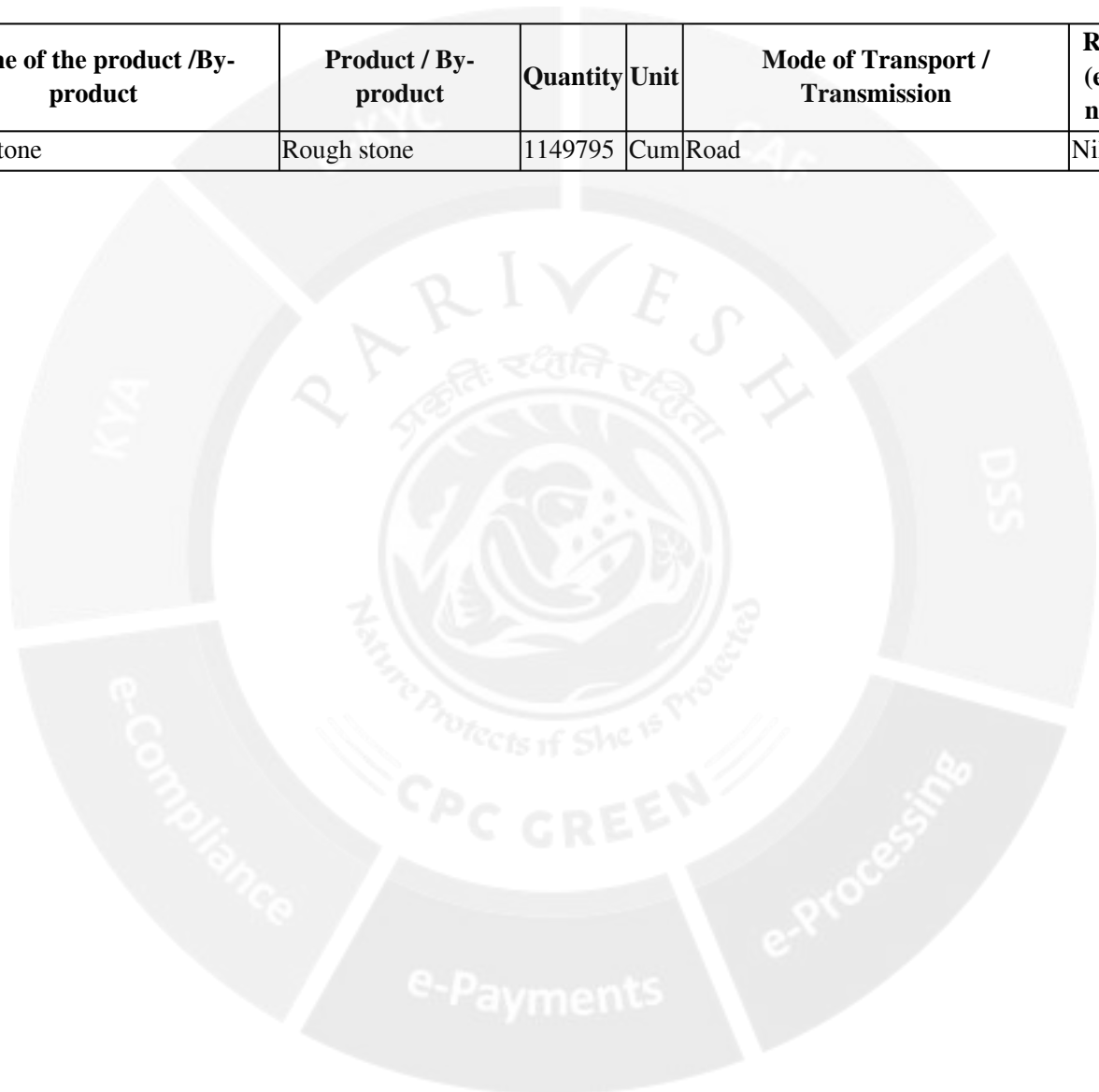
Environment Management Plan.

41. The project proponent shall study and furnish the possible pollution due to plastic and microplastic on the environment. The ecological risks and impacts of plastic & microplastics on aquatic environment and fresh water systems due to activities, contemplated during mining may be investigated and reported.

Annexure 2

Details of Products & By-products

Name of the product /By-product	Product / By-product	Quantity	Unit	Mode of Transport / Transmission	Remarks (eg. CAS number)
Rough stone	Rough stone	1149795	Cum	Road	Nil



Signature Not Verified

Digitally Signed by : A R Rahul Nadh IAS
Member Secretary, SEIAA

Date: 13/03/2024

From

Thiru.L.Suresh., M.Sc.,
Joint Director/
Assistant Director(i/c),
Geology and Mining,
Tirunelveli.

To

Thiru.R.P.Rahul,
S/o.Rajendran,
13-85, Pathittavilai,
Chitharal Village,
Vilavankode Taluk,
Kanniyakumari District.

Rc.No.M2/35382/2019, dated.19.09.2023

Sir,

Sub: Mines and Minerals - Minor Minerals - Roughstone and Gravel - Tirunelveli District - Quarry lease application preferred by Thiru.R.P.Rahul, S/o.Rajendran for quarrying and transportation of Roughstone and Gravel - over an extent of 4.99.39 hectares of patta lands in SF. Nos. 719/1, 720/1, 720/2, 720/3, 720/4, 720/5, 720/6, 720/7, 720/8, 720/9, 720/10, 720/11, 720/12, 720/13 & 720/14 of Vadakku Ariyanayagipuram Part-II Village, Cheranmahadevi Taluk - Certain Particulars requested - for obtaining Environmental Clearance - furnished - reg.

Ref:

1. Quarry lease application preferred by Thiru.R.P.Rahul, dated: 13.09.2019.
2. Precise Area Communication letter in Rc. No.M2/35382/2019, dated. 28.08.2023.
3. Mining Plan Approval letter No. M2/35382/2019, dated.19.09.2023.
4. Letter received from the applicant Thiru.R.P.Rahul, dated.19.09.2023.

Thiru.R.P.Rahul, S/o.Rajendran, 13-85, Pathittavilai, Chitharal Village, Vilavankode Taluk, Kanyakumari District has applied for grant of quarry lease for quarrying and transportation of Roughstone and

Gravel over an extent of 4.99.39 hectares of patta lands in SF. Nos. 719/1(Pt) (1.41.75), 720/1(Pt) (2.44.14), 720/2 (0.22.0), 720/3 (0.08.0), 720/4 (0.15.0), 720/5 (0.12.0), 720/6 (0.05.50), 720/7 (0.08.0), 720/8 (0.06.0), 720/9 (0.06.0), 720/10 (0.10.50), 720/11 (0.08.50), 720/12 (0.07.0), 720/13(Pt) (0.03.0) & 720/14(Pt) (0.02.0) of Vadakku Ariyanayagipuram-II Village, Cheranmahadevi Taluk, Tirunelveli District for a period of 5 years under Rule 19 (1) of Tamil Nadu Minor Mineral Concession Rules, 1959.

2. Based on the recommendations of the Sub Collector, Cheranmahadevi, the Assistant Director of Geology and Mining, Tirunelveli, Executive Engineer, PWD, WRO, Chittar Basin Division, Tenkasi and the Assistant Geologist of Geology and Mining, Tirunelveli the application preferred by Thiru.R.P.Rahul, S/o.Rajendran for grant of quarry lease for quarrying roughstone and gravel in the subject area is considered for grant for a period of 5 years and revised precise area is hereby communicated over an extent of 4.99.39 hectares of patta land in SF. Nos. 719/1(P) (1.41.75), 720/1(P) (2.44.14), 720/2 (0.22.0), 720/3 (0.08.0), 720/4 (0.15.0), 720/5 (0.12.0), 720/6 (0.05.50), 720/7 (0.08.0), 720/8 (0.06.0), 720/9 (0.06.0), 720/10 (0.10.50), 720/11 (0.08.50), 720/12 (0.07.0), 720/13(P) (0.03.0) & 720/14(P) (0.02.0) of Vadakku Ariyanayagipuram Part-II Village, Cheranmahadevi Taluk, Tirunelveli District for a period of 5 years vide reference 2nd cited.

3. The Mining Plan submitted by the lessee, Thiru.R.P.Rahul, S/o.Rajendran for quarrying roughstone has been approved vide this office letter No.M2/35382/2019, dated.19.09.2023 for obtaining Environmental Clearance as per the newly introduced Rule 41 and 42 of Tamil Nadu Minor Mineral Concession Rules, 1959.

4. In the reference 4th cited, Thiru.R.P.Rahul, S/o.Rajendran has requested to furnish certain particulars such as existing / proposed /

abandoned mines within a radial distance of 500 meters from the periphery of the existing mining lease hold area for obtaining environmental clearance from the State Level Environment Impact Assessment Authority, Chennai.

5. The details of quarry leases falling within a radial distance of 500 meters from the subject leasehold area are furnished below:-

Sl. No	Name of the Lessee	Village & SF. No.	Extent - Hects	Lease status
a. Details of Abandoned Quarries				
Nil				
b. Details of Expired Quarries				
Nil				
c. Present Proposed Quarries				
1.	Thiru.R.P.Rahul, S/o.Rajendran, 13-85, Pathittavilai, Chitharal Village, Vilavankode Taluk, Kanniyakumari District.	Vadakku Ariyanayagipuram Part-II (V), SF. Nos. 719/1, 720/1, 720/2, 720/3, 720/4, 720/5, 720/6, 720/7, 720/8, 720/9, 720/10, 720/11, 720/12, 720/13 & 720/14 of	4.99.39	Instant proposal
d. Existing quarry Quarries				
1.	Thiru.T.Satheesan, S/o.Thomson, 12/115, Paruthivilai, Vellamcode, Chitharal, Kanniyakumari District.	Vadakku Ariyanayagipuram Part - II (V), SF. Nos. 708/3A(P) & 709(P)	4.95.0	Proceedings No. M2/30092/2020, dt.08.02.2023 for a period of 5 years from 08.02.2023 to 07.02.2028

2.	Thiru.M.Sivaprasath, S/o.Mohanan, 4/28A, Ambalakadal, Pulhanveedu, Ramavilas, Edavazhikarai, Chilharal, Vilavankode Taluk, Kanyakumari District.	Vadaku Ariyanayagipuram Part - II and SF. Nos. 723(P) & 724/3(P)	3.89.72	Proceedings No. M2/35383/2019. dt.26.02.2021 for a period of 5 years from 26.02.2021 to 25.02.2026
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 Joint Director,
 Assistant Director(i/c),
 Geology and Mining,
 Tirunelveli.


 9/9/23

From

Thiru.L.Suresh.. M.Sc.,
Joint Director/
Assistant Director (i/c),
Geology and Mining,
Tirunelveli.

To

Thiru.R.P.Rahul,
S/o.Rajendran,
13-85, Pathittavilai,
Chitharal Village,
Vilavankode Taluk,
Kanniyakumari District.

Rc.No.M2/35382/2019 dated.19.09.2023

Sir,

Sub: Mines and Minerals - Minor Minerals - Roughstone and Gravel - Tirunelveli District - Cheranmahadevi Taluk - Vadakku Ariyanayagipuram-II Village - SF. Nos. 719/1, 720/1, 720/2, 720/3, 720/4, 720/5, 720/6, 720/7, 720/8, 720/9, 720/10, 720/11, 720/12, 720/13 & 720/14 - over an extent of 4.99.39 hectares of patta lands - Quarry lease application preferred by Thiru.R.P.Rahul - Revised precise area communicated - Mining plan submitted - Approval accorded - Reg.

- Ref :**
1. Quarry lease application preferred by Thiru.R.P.Rahul, dated: 13.09.2019.
 2. Inspection report of the Assistant Director of Geology and Mining, Tirunelveli Dated: 12.10.2019.
 3. Executive Engineer, PWD, WRO, Chittar Basin Division, Tenkasi letter No. 157M/வபி/இவஅ.1/கோ.11A/2020, dt.22.07.2020.
 4. The Sub - Collector, Cheranmahadevi Letter No. B4/5972/2019, dated. 27.09.2019 & 21.08.2020.
 5. Precise area communication letter in Rc. No. M2/35382/2019, dated.27.08.2020.
 6. Inspection report of the Assistant Geologist of Geology and Mining, Tirunelveli, dated. 17.08.2023.

7. Revised Precise area communication letter in
Rc. No. M2/35382/2019, dated. 28.08.2023,

8. Representation dated.19.09.2023 received
from the applicant.

Thiru.R.P.Rahul, S/o.Rajendran, 13-85, Pathittavilai, Chitharal
Village, Vilavankode Taluk, Kanyakumari District has applied for grant
of quarry lease for quarrying and transportation of Roughstone and
Gravel over an extent of 4.99.39 hectares of patta lands in SF. Nos.
719/1(P1) (1.41.75), 720/1(P1) (2.44.14), 720/2 (0.22.0), 720/3 (0.08.0),
720/4 (0.15.0), 720/5 (0.12.0), 720/6 (0.05.50), 720/7 (0.08.0), 720/8
(0.06.0), 720/9 (0.06.0), 720/10 (0.10.50), 720/11 (0.08.50), 720/12 (0.07.0),
720/13(P1) (0.03.0) & 720/14(P1) (0.02.0) of Vadakku Ariyanayagipuram-
II Village, Cheranmahadevi Taluk, Tirunelveli District for a period of 5
years under Rule 19 (1) of Tamil Nadu Minor Mineral Concession Rules,
1959.

2. Based on the recommendations of the Sub Collector,
Cheranmahadevi, the Assistant Director of Geology and Mining,
Tirunelveli, Executive Engineer, PWD, WRO, Chittar Basin Division, Tenkasi
and the Assistant Geologist of Geology and Mining, Tirunelveli the
application preferred by Thiru.R.P.Rahul, S/o.Rajendran for grant of
quarry lease for quarrying roughstone and gravel in the subject area
was considered for grant for a period of 5 years and revised precise
area was communicated over an extent of 4.99.39 hectares of patta
land in SF. Nos. 719/1(P) (1.41.75), 720/1(P) (2.44.14), 720/2 (0.22.0),
720/3 (0.08.0), 720/4 (0.15.0), 720/5 (0.12.0), 720/6 (0.05.50), 720/7
(0.08.0), 720/8 (0.06.0), 720/9 (0.06.0), 720/10 (0.10.50), 720/11 (0.08.50),
720/12 (0.07.0), 720/13(P) (0.03.0) & 720/14(P) (0.02.0) of Vadakku
Ariyanayagipuram Part-II Village, Cheranmahadevi Taluk, Tirunelveli
District.

3. In response to the revised precise area communicated, the applicant has submitted three copies of draft Mining Plan duly prepared by a Qualified Person and requested for approval of the same vide reference 8th cited.

4. The draft Mining Plan submitted in respect of the precise area communicated have been verified with reference to field conditions. All the conditions stipulated in the precise area communicated have been incorporated in the Mining Plan. The required safety distance of 7.5 meters to the adjacent patta lands and 50 meters to the stream located on eastern and western side of the applied area have been clearly demarcated.

5. In exercise of the powers vested under sub rule (2) and (5) of Rule 41 of Tamil Nadu Minor Mineral Concession Rules, 1959, I hereby approve the mining plan subject to the following conditions:-

- i. The mining plan is approved without prejudice to any other order or direction from any court of contempt jurisdiction.
- ii. 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.
- iii. The approval of the mining plan does not in any way imply the approval of the Government in terms of any other provisions of the Mines and Minerals (Development and Regulation) Act 1957, or any other connected laws including Forest (Conservation) Act, 1980, Forest Conservation Rules, 1981, Environment Protection Act, 1980, Indian Explosives Act, 1884 (Central Act IV of 1884) and the Rules made there under and the Tamil Nadu Minor Mineral Concession Rules, 1959.

- iv. Quarrying operations should be carried out in accordance with the Approved Mining Plan.
- v. The applicant is entitled for production of 11,49,795 cbm of Roughstone, 83,680 cbm of Gravel upto a depth of 57 meters for a period of 5 years as per the Mining Plan.
- vi. A safety distance of 7.5 meters shall be provided for the adjacent patta lands.
- vii. As per the applicant request, 50 meters safety distance to be maintained to the nilaviyal odai in his own patta land in SF. Nos. 715 & 716 which is located on the western side of the applied area.
- viii. Boundary stones should be erected in the applied area.
- ix. Wastages of roughstone, earth, etc., from the quarry should not be dumped in the areas of the nilaviyal odai.
- x. There should not be any disturbance to the water flowing in the nilaviyal odai adjacent to the applied area.
- xi. Water from the nilaviyal odai should not be drawn directly or indirectly.
- xii. Public Works Department officials should be allowed to inspect at any time to the quarry site.
- xiii. If the vehicles coming to the applied area intend to cross the nilaviyal odai applicant has to apply for permission from the public works department to build a bridge to cross it.
- xiv. A safety distance of 7.5 meters shall be maintained to the adjoining patta lands.
- xv. 50 meters safety distance to be provided to the stream located on eastern side of the applied area.

xvi. No hindrance shall be caused to the adjoining pattadars' lands while carrying out quarrying operations.

6. As directed by the Joint Director/Assistant Director(i/c) of Geology and Mining, Tirunelveli in the reference 7th cited, you are hereby requested to produce Environmental Clearance obtained from the State Level Environment Impact Assessment Authority (SEIAA), Chennai as applicable under Rule 42 of Tamil Nadu Minor Mineral Concession Rules, 1959 for grant of quarry lease, in respect of the precise area communicated.

Encl: Approved Mining plan.


Joint Director
Assistant Director(i/c).
Geology and Mining.
Tirunelveli.
14/12/2024


MINING PLAN APPROVED
By
Assistant Director
Geology & Mining
Tirunelveli Dist

**MINING PLAN AND PROGRESSIVE
CLOSURE PLAN FOR VADAKKU
ARIYANAYAGIPURAM-II
ROUGH STONE AND GRAVEL QUARRY**

(PREPARED UNDER RULES 41 & 42 AS AMENDED IN TAMILNADU MINOR MINERAL CONCESSION RULES, 1959)

Patta Land / Mining Plan Period = Five Years

IN

LOCATION OF THE QUARRY LEASE APPLIED AREA

EXTENT : 4.99.39ha
S.F.NOS : 719/1(P), 720/1(P), 720/2(P), Etc.,,
VILLAGE : VADAKKU ARIYANAYAGIPURAM-II
TALUK : CHERANMAHADEVI
DISTRICT : TIRUNELVELI
STATE : TAMIL NADU

FOR

APPLICANT

THIRU. R. P. RAHUL,

S/o. Rajendran,

13-85, Pathittavilai, Chitharal Village,

Vilavancode Taluk,

Kanniyakumari District,

Tamil Nadu State – 629 151.

PREPARED BY

A. JAGANNATHAN, B.E., F.C.C., M.M.E.A., M.I.E.,

Qualified Person

(Under Rule 15(I)(a) and (I)(b) of MCR, 2016)

Regd. Off. No.17, Advaita Ashram Road,

Alagapuram, Salem District – 636 004.

Cell: +91 94422 78601 & 94433 56539

E-mail: infogeoexploration@gmail.com



R. P. RAHUL,
S/o. Rajendran,
No. 13-85, Pathittavilai, Chitharal Village,
Vilavankode Taluk,
Kanniyakumari District,
Tamil Nadu State – 629 151.

CONSENT LETTER FROM APPLICANT

The Mining Plan and Progressive Quarry Closure Plan in Respect of Vadakku Ariyanayagipuram-II Rough stone and Gravel Quarry over an extent 4.99.39 Hectares of Patta lands in S.F.Nos.719/1(Part), 720/1(Part), 720/2, 720/3, 720/4, 720/5, 720/6, 720/7, 720/8, 720/9, 720/10, 720/11, 720/12, 720/13(Part) and 720/14(Part), Vadakku Ariyanayagipuram-II Village, Cheranmahadevi Taluk, Tirunelveli District, Tamil Nadu State has been prepared by **A. JAGANNATHAN, B.E., F.C.C., M.M.E.A., M.I.E.,**

Qualified Person

I request to the Joint Director, Assistant Director (i/c), Department of Geology and Mining, Tirunelveli District to make further correspondence regarding the modification of the Mining Plan with the said Qualified Person at his following address.

A. JAGANNATHAN, B.E., F.C.C., M.M.E.A., M.I.E.,

No. 17, Advaita Ashram Road,
Alagapuram, Salem District – 636 004.
Cell: +91 94422 78601 & 94433 56539

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

Signature of the Applicant

R. P. Rahul

Place: Kanniyakumari

Date: 30.08.2023

R. P. RAHUL,
S/o. Rajendran,
No. 13-85, Pathittavilai, Chitharal Village,
Vilavankode Taluk,
Kanniyakumari District,
Tamil Nadu State – 629 151.



DECLARATION OF THE APPLICANT

The Mining Plan and Progressive Quarry Closure Plan in Respect of Vadakku Ariyanayagipuram-II Rough stone and Gravel Quarry for over an extent 4.99.39 Hectares of Patta lands in S.F.Nos.719/1(Part), 720/1(Part), 720/2, 720/3, 720/4, 720/5, 720/6, 720/7, 720/8, 720/9, 720/10, 720/11, 720/12, 720/13(Part) and 720/14(Part), Vadakku Ariyanayagipuram-II Village, Cheranmahadevi Taluk, Tirunelveli District, Tamil Nadu State has been prepared in full consultation with me.

I have understood its contents and agree to implement the same in accordance with Laws, Rules and Act applicable to Quarry.

Signature of the Applicant

R. P. Rahul

Place: Kanniyakumari

Date: 08.09.2023



CERTIFICATE

Certified that I am, **A. JAGANNATHAN, B.E., F.C.C., M.M.E.A., M.I.E.**, having an office at No.17, Advaita Ashram Road, Alagapuram, Salem – 636 004, holding a Bachelor Degree in Engineering (B.E. Mining) from Madras University, Chennai and I worked in the field of Mining Engineer in a role of Mines Manager.

Rule 15(I)(a) and (b) of Minerals (Other than Atomic and Hydro Carbons Energy Minerals) Concession Rules, 2016 stipulates the eligibility for preparing Mining plans as “(I)(a) a degree in mining engineering or a post-graduate degree in geology granted by a university established” and (I)(b) “Professional experience of five years of working in a supervisory capacity in the field of mining after obtaining the degree”. Since my qualification and experience are satisfied the Rule (I)(a) and (I)(b) of 15 of the said Rules, I am eligible to prepare Mining Plans for both Major and Minor Minerals.

Accordingly, I am prepared this Mining Plan and Progressive Quarry Closure Plan in Respect of Vadakku Ariyanayagipuram-II Rough Stone and Gravel Quarry for over an extent 4.99.39 Hectares of Patta lands in S.F.Nos.719/1(Part), 720/1(Part), 720/2, 720/3, 720/4, 720/5, 720/6, 720/7, 720/8, 720/9, 720/10, 720/11, 720/12, 720/13(Part) and 720/14(Part), Vadakku Ariyanayagipuram-II Village, Cheranmahadevi Taluk, Tirunelveli District for **Thiru. R. P. Rahul**, S/o. Rajendran, residing at No. 13-85, Pathittavilai, Chitharal Village, Vilavankode Taluk, Kanniyakumari District, Tamil Nadu State – 629 151. Since the Mining Plan is prepared as per the provisions contained in Rule 15(I)(a) and (I)(b) of Minerals (Other than Atomic and Hydro Carbons Energy Minerals) Concession Rules, 2016.

Signature of the Qualified Person


A. Jagannathan, B.E., F.C.C., M.M.E.A., M.I.E.,

Place: Salem

Date: 08.09.2023



A. JAGANNATHAN, B.E., F.C.C., M.M.E.A., M.I.E.,

Regd. Off. No. 17, Advaita Ashram Road,

Alagapuram, Salem District – 636 004.

Cell: +91 94422 78601 & 94433 56539

CERTIFICATE FROM THE QUALIFIED PERSON

This is to certify that the Provisions of under Rules 41 & 42 as per the Amended under Tamil Nadu Minor Mineral Concession Rules, 1959 have been observed in the preparation of Mining Plan and Progressive Quarry Closure Plan for Vadakku Ariyanayagipuram-II Rough stone and Gravel Quarry for over an extent 4.99.39 Hectares of Patta lands in S.F.Nos.719/1(Part), 720/1(Part), 720/2, 720/3, 720/4, 720/5, 720/6, 720/7, 720/8, 720/9, 720/10, 720/11, 720/12, 720/13(Part) and 720/14(Part), Vadakku Ariyanayagipuram-II Village, Cheranmahadevi Taluk, Tirunelveli District, Tamil Nadu State has been prepared for

THIRU. R. P. RAHUL,

S/o. Rajendran,

No. 13-85, Pathittavilai, Chitharal Village,

Vilavankode Taluk,

Kanniyakumari District,

Tamil Nadu State – 629 151.

Whenever specific permissions/ exemptions/ relaxations and approvals are required, the Applicant will approach the concerned authorities of the Joint Director, Assistant Director (i/c), Department of Geology and Mining, Tirunelveli District, Tamil Nadu State for such permissions/ exemptions/ relaxations and approvals.

It is also certified that information furnished in the above Mining Plan are true and correct to the best of my knowledge.

Signature of the Qualified Person


A. Jagannathan, B.E., F.C.C., M.M.E.A., M.I.E.,

Place: Salem

Date: 08.09.2023



A. JAGANNATHAN, B.E., F.C.C., M.M.E.A., M.I.E.,

Regd. Off. No. 17, Advaita Ashram Road,

Alagapuram, Salem District – 636 004.

Cell: +91 94422 78601 & 94433 56539

CERTIFICATE FROM THE QUALIFIED PERSON

Certified that the Provisions of Mines Act, Rules and Regulations and Orders made there under have been observed in the preparation of Mining Plan and Progressive Quarry Closure Plan for Vadakku Ariyanayagipuram-II Rough stone and Gravel Quarry for over an extent 4.99.39 Hectares of Patta lands in S.F.Nos.719/1(Part), 720/1(Part), 720/2, 720/3, 720/4, 720/5, 720/6, 720/7, 720/8, 720/9, 720/10, 720/11, 720/12, 720/13(Part) and 720/14(Part), Vadakku Ariyanayagipuram-II Village, Cheranmahadevi Taluk, Tirunelveli District, Tamil Nadu State has been prepared for

THIRU. R. P. RAHUL,

S/o. Rajendran,

No. 13-85, Pathittavilai, Chitharal Village,

Vilavankode Taluk,

Kanniyakumari District,

Tamil Nadu State – 629 151.

Whenever specific permissions/ exemptions/ relaxations and approvals are required, the Applicant will approach the concerned authorities of Director of Mines Safety (DMS), No.5, II Street, Block-AA, Anna Nagar, Chennai-40, Tamil Nadu State for such permissions / exemptions / relaxations and approvals.

It is also certified that information furnished in the Mining Plan are true and correct to the best of my knowledge.

Signature of the Qualified Person


A. Jagannathan, B.E., F.C.C., M.M.E.A., M.I.E.,

Place: Salem

Date: 08.09.2023



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**MINING PLAN ALONG WITH PROGRESSIVE QUARRY CLOSURE PLAN
FOR VADAKKU ARIYANAYAGIPURAM-II ROUGH STONE AND GRAVEL**

QUARRY.



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

1.0 INTRODUCTION AND EXECUTIVE SUMMARY

This Mining Plan and Environment Management Plan are prepared for **Thiru. R. P. Rahul**, S/o. Rajendran, residing at No. 13-85, Pathittavilai, Chitharal Village, Vilavankode Taluk, Kanniyakumari District, Tamil Nadu State – 629 151.

The applicant applied for Rough stone and Gravel Quarry for over an extent 4.99.39 Hectares of Patta lands in S.F.Nos.719/1(Part), 720/1(Part), 720/2, 720/3, 720/4, 720/5, 720/6, 720/7, 720/8, 720/9, 720/10, 720/11, 720/12, 720/13(Part) and 720/14(Part), Vadaku Ariyanayagipuram-II Village, Cheranmahadevi Taluk, Tirunelveli District, Tamil Nadu State under Rules 19(1) of Tamil Nadu Minor Mineral Concession Rules, 1959.

The application was processed by the Joint Director, Assistant Director (i/c), Department of Geology and Mining, Tirunelveli District and passed a Precise Area Communication letter vide **Roc.No.M2/35382/2019, Dated: 28.08.2023** to submit Mining Plan and obtain Environmental Clearance from the State Level Environment Impact Assessment Authority, Tamil Nadu State with the conditions to provide (Please refer Annexure No. I):

1. A safety distance of 7.5 meters should be provided to the adjoining patta lands.
2. 50 meters safety distance to be provided to the stream located on Eastern and Western side of the applied area.
3. No hindrance shall be caused to the adjoining pattadars lands while carrying out quarrying operations.
4. Environmental Clearance should be obtained from the State Level Environment Impact Assessment Authority, Chennai.

In order to ensure compliance of the order of the Honourable Supreme Court Dated: 27.02.2012 in I.A.No.12.13.2011 in Special Leave Petition SLP (C) No 19628-19629/2009, it has been now decided that all mining projects of minor minerals including their renewal irrespective of sizes of the lease would hence forth require prior environmental clearance mining project within the lease applied area up to less than 100ha including projects or minor mineral with lease applied area less then 5ha would be treated as category B as defined in the EIA notification 2006 and will be considered by the state notified by MoEF as prescribed procedure under EIA notification 2006.

In the above circumstances the applicant through his consultant is hereby preparing the Mining Plan, Environmental Management Plan and Progressive Quarry Closure Plan for approval and subsequent submission of Form-I, Form-IM and Pre-feasibility report to obtain environmental clearance from the Competent Authority, Tamil Nadu State, Rough Stone and Gravel quarry. This mining plan is prepared by considering the Rules 41 & 42 as Amended in Tamil Nadu Minor Mineral Concession Rules, 1959 and as per the EIA Notification 2006 and its subsequent Amendment and judgments till 2023.

Short Notes of Mining Plan:

- a. Village Panchayat - Vadakku Ariyanayagipuram-II
- b. Panchayat Union - Pappakudi
- c. The Geological Resources are 27,46,645m³ of Rough Stone, and 99,878m³ of Gravel formation in the entire area.
- d. The Total Mineable Reserves are 11,49,795m³ of Rough Stone, and 83,680m³ of Gravel in the entire area.
- e. The proposed quantity of reserves/ (level of production) to be mined are 11,49,795m³ of Rough Stone for five years and 83,680m³ of Gravel for first three years in the entire area.
- f. Total extent of the lease applied area = 4.99.39ha
- g. Topography of the area = The area exhibits plain topography
- h. Proposed Depth of mining = 57m (2m Gravel + 55m Rough Stone) below ground level
- i. This Mining Plan period = Five years
- j. It is a fresh lease applied area, at present the area is Virgin. Hence there is no pit.
- k. Method of mining / level of mechanization - Opencast mechanized method - the quarry operation involves Wagon Drill machine and Hand Jack hammer is proposed to drilling and blasting, Excavators are used for Loading and Trucks for transportation.
- l. Type of machineries proposed in the quarrying operation is given below:
 - Excavators attached with 0.90m³ Bucket and rock breaker.
 - Wagon Drill machine - 110mm,
 - Jack hammer, Compressor (Diesel drive) (4 Jack hammer capacity)
 - Trucks.
- m. No trees will be uprooted due to this quarrying operation.
- n. The approach road from the main road to quarry will be constructed and maintained in good condition for the haulage of quarry materials and machineries.
- o. There is No Export of this Rough Stone and Gravel.

- p. Topo sketch covering 10km and 1km radius around the proposed area with all markings of habitations, water bodies including streams, rivers, roads, major structure like bridges, wells, archaeological importance, places of worships are marked and enclosed as Plate Nos. IA & IB.
- q. The lease applied area is about 4.99.39ha bounded by fifteen corners, the corners are designated as 1-15 Clockwise from the Northwestern corner the Co – ordinates for the all the corners are clearly marked in the Quarry Lease and Surface Plan enclosed as Plate No.II.
- r. The plans of proposed quarrying area showing the dimensions of the pit, their proposed depth and maximum area of proposed quarrying are enclosed as Plate Nos. III and V.
- s. General conditions will not be applicable for the proposed area. The area applied for lease is 10Km away from the,
- Interstate Boundary,
 - Protected area under wild life protection ACT, 1972,
 - Critically polluted areas as identified by CPCB,
 - Notified Eco sensitive areas.
- t. There is no waste anticipated during this quarry operation, hence waste dump is not proposed.
- u. Around 33 employees are deploying in the quarrying operation.
- v. Total Cost of the project is about Rs.4,44,98,000/-.
- w. Infrastructures around the lease applied area given in the table below:

TABLE-I

Particulars	Location	Approximate aerial distance and direction from lease applied area
Nearest Post Office	Singamparai	3km – SW
Nearest Govt. School	Vadakku Ariyanayagipuram	4km – SW
Nearest Dispensary	Mukkoodal	4km – SW
Nearest Town	Mukkoodal	4km – SW
Nearest Police Station	Mukkoodal	4km – SW
Nearest Govt. Hospital	Mukkoodal	4km – SW
Nearest D.S.P. Office	Cheranmahadevi	8.5km – South
Nearest Railway Station	Cheranmahadevi	8.5km – South
Nearest Railway Line	Tirunelveli to Tenkasi	5km – SE
Nearest National Highway	Kanniyakumari to Bengaluru (NH-44)	18km – NE
Nearest State Highway	Mukkoodal to Tirunelveli (SH-41A)	4km –South
Nearest Major District Road	Mukkoodal to Kadayam (MDR-922)	4km – West
Nearest Airport	Thoothukudi	67km – East
Nearest Seaport	Thoothukudi	51.5km – East
District Head quarters	Tirunelveli	16km – SE

2.0 GENERAL INFORMATION

2.1 a) Name of the Applicant : Thiru. R. P. Rahul,
S/o. Rajendran,

b) Address of the Applicant (With Phone No and Aadhaar No)

Address : No. 13-85, Pathittavilai,
Chitharal Village,
Vilavankode Taluk,
Kanniyakumari District.

State with Pin Code : Tamil Nadu – 629 151

Mobile No : +91 83003 39460

Aadhaar No : 4716 5108 6793 (Annexure No. IX)

Email ID : kkmbluemetal@gmail.com



c) Status of the Applicant (Individual / Company / Firm):

The applicant is an Individual.

2.2 a) Mineral which the Applicant intends to mine:

The Applicant intends to quarry Rough Stone and Gravel only.

b) Precise area communication letter details received from the Competent Authority of the Government:

The precise area communication letter was received from the Joint Director, Assistant Director (i/c), Department of Geology and Mining, Tirunelveli District vide **Roc.No.M2/35382/2019, Dated: 28.08.2023.**

c) Period of permission / lease to be granted:

Five Years.

d) Name and address of the Qualified Person who preparing the Mining Plan:

Name : **A. Jagannathan, B.E., F.C.C., M.M.E.A., M.I.E.,**
Qualified Person (Under Rule 15(I)(a) and (I)(b) of MCR, 2016)

Address : Reg. No.17, Advaita Ashram Road,
Alagapuram, Salem District – 636 004.

Telephone : 0427- 2431989 (Office)

Mobile No. : +91 94422 78601 & 94433 56539

Email : infogeoexploration@gmail.com

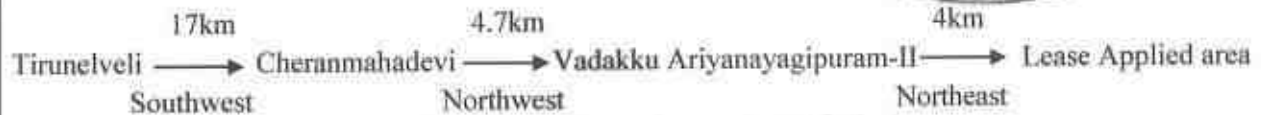
(Refer Annexure Nos. X & XI).



3.0 LOCATION

a) Details of the area with location map:

The lease applied area is about 16km Northwest side of Tirunelveli town, 8.5km Northern side of Cheranmahadevi town and 4km Northeast side of Vadakku Ariyanayagipuram-II hamlets.



Location Map of the Lease Applied Area

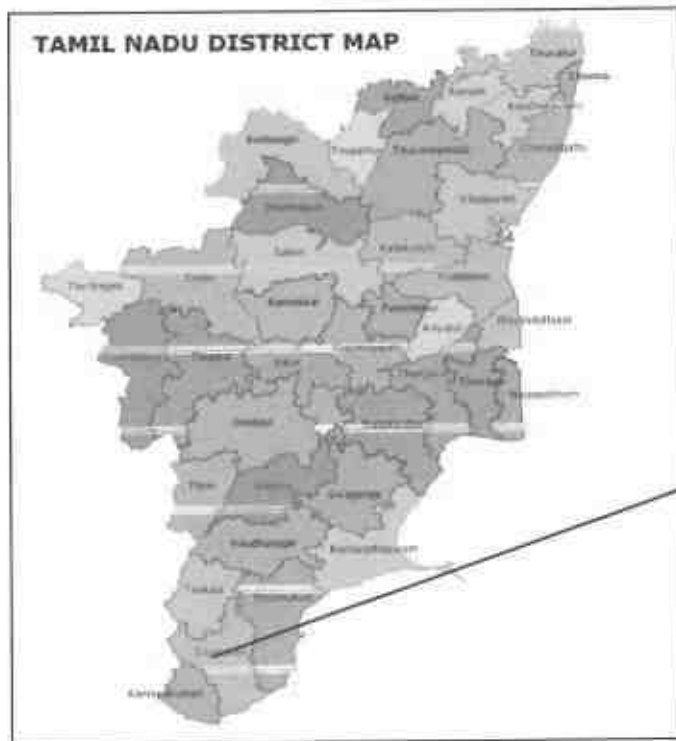


TABLE - 2

District	Taluk	Village	S.F. Nos.	Area (Ha.)	Patta No.
Tirunelveli	Cheranmahadevi	Vadaku Ariyanayagipuram-II	719/1(P)	1.41.75	2269
			720/1(P)	2.44.14	
			720/2	0.22.00	
			720/3	0.08.00	
			720/4	0.15.00	
			720/5	0.12.00	
			720/6	0.05.50	
			720/7	0.08.00	
			720/8	0.06.00	
			720/9	0.06.00	
			720/10	0.10.50	
			720/11	0.08.50	
			720/12	0.07.00	
			720/13(P)	0.03.00	
720/14(P)	0.02.00				
Total Extent				4.99.39	

b) Classification of the area (Ryotwari/ Poramboke / others):

It is Patta lands classified as Punsei (Barren land) which is not fit for vegetation/ Cultivation.

c) Ownership / Occupancy of the applied area (surface right):

It is a Patta land. Registered in the name of the Tmt. R. Preetha vide Patta No. 2269 (Refer Annexure No. IV to VI). The applicant has obtained consent from the pattadar for the period of twenty years from 10.12.2019 to 09.12.2039 (Refer Annexure No. VII).

d) Topo sheet No. with latitude and longitude:

The lease applied area falls in the Topo sheet No: 57 H/09 Latitude between: 08°45'11.0397"N to 08°45'21.3753"N and Longitude between: 77°33'40.6252"E to 77°33'48.8609"E on WGS datum-1984. Please refer the Plate Nos. I to II.

e) Existence of public road / Railway line, if any nearby and approximate distance:

The approach (metal) road is situated on the western side which connects the Village Road at a distance of 790m on the Northern side of the lease applied area.

Multiple road access is available from the quarry to state highways and National Highway, no villages are enrooted hence the traffic density is not much more due to the transportation of Rough Stone.

The approach road from the quarry will be constructed and the same will be utilized for haulage and maintained during the entire lease period.

The Nearest Railway line is Tirunelveli to Tenkasi which is about 5km on the Southeastern side of the lease applied area.

PART - A**4.0 GEOLOGY AND MINERAL RESERVES****4.1 Brief description of the Topography and general Geology of the area (with plans):**

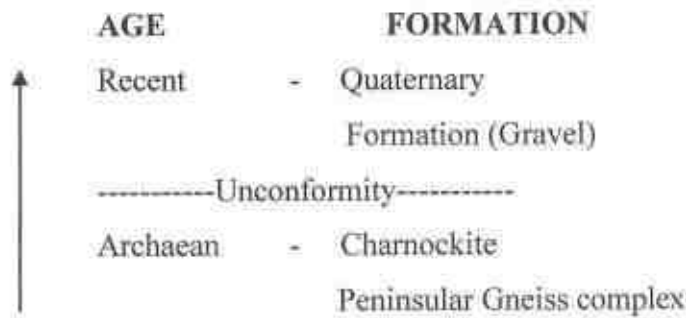
The lease applied area is exhibiting plain terrain. The area has gentle sloping towards Southern side and altitude of the area is 100m above from Mean Sea Level. The area is covered by 2m thickness of Gravel followed by Massive Charnockite which is clearly inferred from the outcrop. The Water table is found at 62m and average annual rainfall is about 985mm.

Topographical View of lease applied area



Peninsular gneiss forms the oldest rock formations, in which the massive formation of Charnockite lies over with rich accumulation of recent quaternary formation. On regional scale of the Charnockite body is N45°W – S45°E with dipping towards SW60°.

The general geological sequences of the rocks in this area are given below:



4.2 Details of exploration already carried out if any:

State Geology and Mining Department, Govt. of Tamil Nadu has carried out the Regional prospecting and exploration in these areas during 1992 to 1993.

Geological Survey of India has carried out detailed mapping in Tirunelveli District. Besides, the Qualified Person and his team members made a detailed geological study of the proposed area. The Rough Stone formation is clearly inferred from the outcrop.



4.3 Estimation of Reserves:

a) Geological reserves with geological sections on a scale of 1:1000-1:2000

As far as Rough Stone (Charnockite) is concerned, the only practical method is the systematic geological mapping and delineation of Rough Stone within the field and careful evaluation of body luster, physical properties, engineering properties and commercial aspects etc.,

Totally three sections have been drawn, two sections along the strike direction as (A-B & C-D) Width wise and another cross section drawn perpendicular to strike as (X-Y) Length wise to cover the maximum area considered for lease upto 57m depth.

The Topographical, Geological plan and sections demarcated the commercial marketable Rough Stone (Charnockite) deposit has been prepared in 1:1000 scale (please refer the Geological Plan and Sections Plate No. III). As the sale of Rough Stone is in terms of cubic meters (Volume) only and not in terms of tonnage.

Estimation of Geological Resources (Plate No. III):

The Geological Resources of Rough Stone and Gravel are calculated up to a maximum depth of 57m (2m Gravel + 55m Rough Stone) below ground level. **The total Geological resources are calculated by area method.** The total available geological resources are given below:

Total Extent of the area	=	4.99.39 Ha
Area in square meter	=	4.99.39 X 10,000 = 49,939m ²
Gravel	=	2m below ground level
	=	49,939m ² X 2m Depth
	=	99,878m³ of Gravel
Rough Stone	=	55m below ground level
	=	49,939m ² X 55m Depth
	=	27,46,645m³ of Rough Stone

Total Geological Resources of Gravel Formation	:	99,878m³
Total Geological Resources of Rough Stone	:	27,46,645m³

Estimation of Mineable Reserves:

The Mineable reserves are calculated after leaving the safety distance and bench loss to a maximum depth of 57m below ground level.

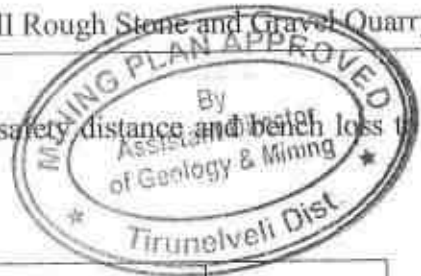


TABLE - 3

Section	Bench	Length (m)	Width (m)	Depth (m)	Rough stone (m ³)	Gravel (m ³)
XY-AB	i	141	208	2	-	58656
	ii	138	202	5	139380	-
	iii	133	191	5	127015	-
	iv	128	181	5	115840	-
	v	123	171	5	105165	-
	vi	118	161	5	94990	-
	vii	113	151	5	85315	-
	viii	108	140	5	75600	-
	ix	103	130	5	66950	-
	x	93	120	5	55800	-
	xi	83	110	5	45650	-
	xii	73	100	5	36500	-
Total					948205	58656
XY-CD	i	136	92	2	-	25024
	ii	133	85	5	56525	-
	iii	127	73	5	46355	-
	iv	118	61	5	35990	-
	v	108	50	5	27000	-
	vi	98	38	5	18620	-
	vii	89	26	5	11570	-
	viii	79	14	5	5530	-
Total					201590	25024
Grand Total					1149795	83680

The mineable reserves have been computed as 11,49,795m³ of Rough Stone at the rate of 100% recovery and 83,680m³ of Gravel upto a maximum depth of 57m below ground level.

5.0 MINING**5.1 Method of mining (opencast / underground):**

Open cast Mechanized Mining is being carried out with 5.0 meter vertical benches with a bench width is not less than the bench height.

However, as far as the quarrying of Rough Stone is concerned, observance of the provisions of Regulation 106 (2) (b) is available with Director of Mines Safety. If the applicant/lessee intends to modify the dimensions of benches, relaxation and permission are available with Director of Mines Safety under 106 (2) (b) of Metalliferous Mines Regulations, 1961. In such a scenario if there is any drastic change in the Resources and Reserves a modified plan will be submitted to the concerned authority for necessary relaxation, clearance and permission. The relaxation will be applied and obtained after the execution of lease deed / commencement of quarry operation.

5.2 Mode of working (mechanized, semi mechanized, manual):

The Rough Stone is proposed to quarry at 5m bench height & width with conventional Opencast Mechanized Method.

The quarry operation involves Drilling, Blasting, Rock breaking, Excavation, Loading and Transportation of Rough Stone to the needy crusher.

The production of Rough Stone in this quarry involves the following method which is typical for Rough Stone quarrying in contrast to other major mineral mining.

Splitting of rock mass by considerable volume from the parent rock mass by drilling with Wagon drill machine and Hand Jack Hammer drilling and blasting, the liberated Rough stone will be loaded into the Trucks by hydraulic excavators are used for loading the Rough Stone from pithead to the needy crushers.

Occasionally hydraulic excavators are attached with rock breakers for fragmentation of large boulders to avoid secondary blasting. The primary boulders thus splitted are removed from the pits by excavators and further made to smaller sizes by rock breakers attached in excavators. It is a conventional opencast mechanized method of mining.

5.3 Proposed Bench Height and Width:

The Charnockite is hard and compact rock, the bench height is proposed 5.0 meter vertical bench the width of the bench is not less than the Height.

5.4 Indicate the overburden / mineral production expected pit wise as detailed below (composite plan and section showing pit layout, dumps, disposal of waste if any etc.):

The overburden in the form of Gravel, the Gravel will be directly loaded into Truck for the filling and levelling of low lying areas, this will be done only after obtaining permission and paying necessary seigniorage fees to the Government. The excavated Rough stone will be directly loaded into Truck to the needy customers. The Composite year wise Development and production plan and sections indicating the Pit lay out, Greenbelt development are shown in Plate No. III.



Year wise development and Production

TABLE - 4

Year	Section	Bench	Length (m)	Width (m)	Depth (m)	* (m ³)	(m ³)
I	XY-AB	i	81	208	2		33696
		ii	75	202	5	75750	-
		iii	65	191	5	62075	-
		iv	55	181	5	49775	-
		v	45	171	5	38475	-
Total						226075	33696
II	XY-AB	i	60	208	2	-	24960
		ii	63	202	5	63630	-
		iii	64	191	5	61120	-
		iv	64	181	5	57920	-
		v	63	171	5	53865	-
Total						236535	24960
III	XY-AB	iii	4	191	5	3820	-
		iv	9	181	5	8145	-
		v	15	171	5	12825	-
	XY-CD	i	136	92	2	-	25024
		ii	133	85	5	56525	-
		iii	127	73	5	46355	-
		iv	118	61	5	35990	-
		v	108	50	5	27000	-
vi	98	38	5	18620	-		
Total						209280	25024
IV	XY-AB	vi	118	161	5	94990	-
		vii	113	151	5	85315	-
		viii	108	140	5	75600	-
	XY-CD	vii	89	26	5	11570	-
		viii	79	14	5	5530	-
Total						273005	
V	XY-CD	ix	103	130	5	66950	-
		x	93	120	5	55800	-
		xi	83	110	5	45650	-
		xii	73	100	5	36500	-
Total						204900	
Grand Total						1149795	83680

The Recoverable reserves have been computed as 11,49,795m³ of Rough Stone at the rate of 100% recovery for five years and 83,680m³ of Gravel in for three years upto a depth of 57m below ground level for a mining period.

The applicant ensures the total quantity proposed in the benches will not exceed during the quarrying operation. Besides the Rough Stone locked up in benches will be exploited after obtaining necessary permission from the office of **Director of Mine Safety, Chennai region** by submitting relevant documents, appropriate safety plans and its Mitigation measures.

One lorry load	=	12m ³ (approx.)
Total No of Working days	=	300 Days per year
Total Rough Stone to be removed during this plan period	=	11,49,795m ³
Hence total lorry loads per day	=	11,49,795m ³ /12m ³
	=	95,816 lorry loads
	=	95,816/5 years
	=	19,163/300 Days
Rough Stone	=	64 lorry loads per day
Total Gravel to be removed during first three years	=	83,680m ³
Hence total lorry loads per day	=	83,680m ³ /12m ³
	=	6,973 lorry loads
	=	6,973 /3 years
	=	2,324/300 Days
Gravel	=	8 lorry loads per day
Working hours = 8.30 am to 5.30 pm (with 12.30-1.30 pm lunch break)		

5.5 Machineries to be used:

For Mining:

The following machineries are utilized for the development and production work at this quarry.

TABLE - 5

I. DRILLING MACHINE:

S. No.	Type	Nos	Dia Hole mm	Size Capacity	Motive power
1	Wagon Drill Machine	2	110	3m to 9m	Diesel Drive
2	Hand Jack hammer	4	32	1.2m to 2.0m	Air Compression
3	Compressor	1	-	400 psi	Diesel Drive

II. EXCAVATION & LOADING EQUIPMENT:

S. No.	Type	Nos	Capacity	Motive Power
1	Excavator with Bucket and Rock Breaker	2	300	Diesel Drive

III. HAULAGE WITHIN THE MINE & TRANSPORT EQUIPMENT:

S. No.	Type	Nos	Capacity	Motor Power
1	Truck	5	35 tonnes	Diesel Drive
2.	Water Sprinkling Tanker	1	16000 litres	Diesel Drive

5.6 Disposal of Overburden/Waste:

The overburden in the form of Gravel, the Gravel will be directly loaded into Truck for the filling and levelling of low lying areas. The excavated Rough Stone (100%) will be directly loaded into Truck to the needy customers. There is no Waste anticipated during this plan period hence, disposal of waste does not arise.

5.7 Brief note on conceptual mining plan for the entire lease period base on the geological, mining and Environment considerations:

Conceptual mining plan is prepared with an object of long term systematic development of benches, layouts, selection of permanent structures, depth of quarrying and ultimate pit dimensions, selection of sites for construction of infrastructure, etc.,

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

As the applicant has applied quarry lease for five years, the ultimate pit limit (dimension) at the end of this mining plan period is given below:

TABLE - 6

Length (m) (max)	Width (m) (max)	Depth (m) (max)
277	208	57m below ground level

Greenbelt has proposed on the safety zone and approach roads by planting tree saplings of native species. All the base line information studies like Air quality monitoring, Noise and vibration monitoring, Water analysis studies will be carried out every year as per the MoEF&CC Norms. (Please refer Plate Nos. III & IV).

It is proposed to engage any local institution to monitor the EIA and EMP during the course of quarrying operation after the grant of quarry lease.

There is no waste anticipated during the entire life of quarry. Hence, backfilling is not possible in this quarry. After completion of quarry operation the quarried out pit will be allowed to collect the seepage and rainwater, the water storage will be kept as temporary reservoir for charging the nearby wells and to be utilize for green belt development. The quarry area will be fenced with barbed wire fencing also safety bund constructed around the quarry to prevent inadvertent entry of public and cattle (Refer Plate No. IV and V). The Conceptual Mining is based upon the entire ROM proposed for the life of the Mine.



6.0 **BLASTING**

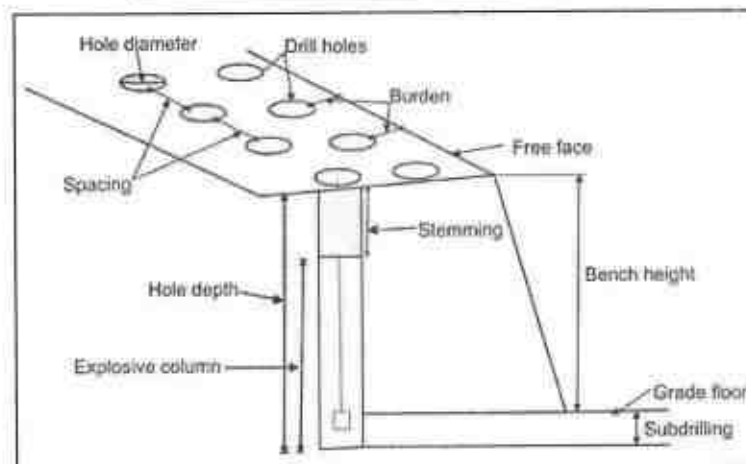
6.1 **Blasting pattern:**

Selection of drilling pattern for blasting varies with the type and size of the drills used, depth of hole, kind of rock, quantity, rapidity of the explosives and amount of stemming. The quarrying operation is proposed to be carried out by Mechanized Opencast Method in conjunction with conventional method of mining using Wagon drill machine and Jack hammer drilling and blasting of shattering effect for loosening the Rough Stone with NONEL initiation. Wagon Drilling will be proposed for primary Drilling and blasting for splitting the boulders from parent rock mass followed by rock breaker attached with excavator for secondary fragmentation of large size boulders. If the boulders found huge size jack hammer drill will be deployed for secondary drilling and blasting. Nonel initiation provides a reasonably good solution to fly rock problem. The main objectives of Nonel Blasting are to reduce the ground vibration, noise, flyrock generated due to blasting operations.

DRILLING AND BLASTING PARAMETERS ARE AS FOLLOWS:

Depth of Each hole	:	6.5m
Spacing between holes	:	2.5m
Burden for hole	:	2.0m
Diameter of hole	:	110mm
Inclination of holes	:	80° from horizontal
Use of delay detonators	:	Millisecond relays
Fuse	:	Non-Electric Detonators
Hole pattern	:	Single row pattern

BLASTING PATTERN DRAWING



6.2 **Type of explosives to be used:**

85mm dia Slurry explosives with Non-Electric Detonators 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.

6.3 Measures proposed to minimize ground vibration due to blasting:

The quarry is situated more than 300m from the nearby villages. Controlled blasting measures is being adopt for minimizing ground vibration and fly rock.

Wagon and Hand jackhammer drilling & 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.

NONEL Delay detonators:

Delay blasting (millisecond delays) permits to divide the shot in to smaller charges, which are detonated in a predetermined millisecond sequence at specific time intervals.

The major advantages of delay blasting are:

- Reduction of ground vibration.
- Reduction in air blast.
- Reduction in over break.
- Improved fragmentation.
- Better control of fly-rock.

Blasting program for the production per day:

No of Holes	= 23 Holes
Yield	= 1955 Tons
Powder factor	= 6 Tons/Kg of explosives
Total explosive required	= 345 Kg slurry explosives
Charge/ hole	= 15 Kg
Blasting at day time only	= 12.00 – 12.30p.m (whenever required)

6.4 Storage and safety measures to be taken while blasting:

The applicant will engage authorized explosive agency to carry out the small amount of blasting and it will be supervised by competent and statutory foreman/Permit Mines Manager. The explosives agencies should be having the valid Blaster certificate. He will blast holes in the quarry site. After the completion of Blasting the Explosive Agencies will take it out back the remaining quantity of Explosives. The Competent Qualified Statutory personnel of the applicant will maintain the records of Explosives as per the Indian Explosives Act.

**7.0 MINE DRAINAGE****7.1 Depth of water table (based on nearby wells and water bodies):**

The Water Table in the area is 62m, which is observed from the nearby existing private boreholes. The lease area is fully covered by Massive Charnockite formation. Hence, the Ground Water problem will not arise. If water seepage may occur due to the fracture, the same will be used for Greenbelt. Anyhow, Garland drain will be constructed all along the boundary to prevent surface run-off water entering into the quarry.

TABLE - 7

Type	Distance & Direction	Location
Bore Well	125m Northern side	08°45'23.41"N 77°33'47.82"E

7.2 Arrangements and places where the mine water is finally proposed to be discharged:

The quarry operations are confined well above the water table during the entire lease period. If water is encountered at due to rain water and seepage, the same will be pumped out by 5HP water pumps to the Greenbelt development areas. Besides, the water will also be used for dust suppression on haul roads during Haulage of machineries.

8.0 OTHER PERMANENT STRUCTURES (also shown in the map)**TABLE - 8**

S. No.	Salient Features Present around site	Prescribed safety distance	If any present within Prescribed distance it's actual distance and direction from the area
8.1	Railways, Highways	50m	None of the above situated within 50m radius. Nearest National Highway is Kanniyakumari to Bengaluru (NH-44) – 18km – NE Nearest State Highway is Mukkoodal to Tirunelveli (SH-41A) – 4km – South Nearest Major District Road is Mukkoodal to Kadayam (MDR-922) – 4km – West Nearest Railway Line is Tirunelveli to Tenkasi – 5km – SE
8.2	Water Bodies (River, Pond, Lake, Odai, Canal)	50m	There is an Odai passing on the Eastern side, a safety distance of 50m has been provided to the Odai. Another geographical Odai recorded in S.F.Nos. 715 and 716 in the



			village records but no odar found in the field. anyhow the land owner has given Affidavit to divert the geographical odar more than 50m away from the lease applied area (Refer Annexure No, VIII and Plate No. II). There is no River, Pond, Lake, Canal located within 50m radius of the lease applied area.															
8.3	Village Road	10m	No village road is passing within 10m radius of the lease applied area.															
8.4	Habitation / Village, Archaeological / historical monuments & Places of worships	300m	There is no habitation/ archaeological/ historical monument/ place of worship located within 300m radius of the area (Refer Plate No IB).															
8.5	Housing area, EB line (HT & LT Line)	50m	There is no EB (HT & LT) line or Housing area located within 50m radius of the area (Refer Plate No II).															
8.6	Adjacent Patta lands / Govt. Land	7.5m/10m	<table border="1"> <thead> <tr> <th>Direction</th> <th>Classification</th> <th>Safety Distance</th> </tr> </thead> <tbody> <tr> <td>North</td> <td>Patta land</td> <td>7.5m</td> </tr> <tr> <td>East</td> <td>Patta land</td> <td>50m to the Odai</td> </tr> <tr> <td>South</td> <td>Patta land</td> <td>7.5m</td> </tr> <tr> <td>West</td> <td>Patta land</td> <td>7.5m (Refer Annexure- VIII)</td> </tr> </tbody> </table> (Refer Plate No. II).	Direction	Classification	Safety Distance	North	Patta land	7.5m	East	Patta land	50m to the Odai	South	Patta land	7.5m	West	Patta land	7.5m (Refer Annexure- VIII)
Direction	Classification	Safety Distance																
North	Patta land	7.5m																
East	Patta land	50m to the Odai																
South	Patta land	7.5m																
West	Patta land	7.5m (Refer Annexure- VIII)																
8.7	Boundaries of the permitted area	7.5m/10m	The boundaries of the lease applied area are as follows: North - S.F.Nos.721 and 722 East - S.F.Nos.720/1(P), 13(P), 14(P), 15 and 719/1(P) South - S.F.No. 719/1(P) West - S.F.Nos. 715 and 716 (Refer Plate No. II).															
8.8	Reserve forest	60m	There is no forest located within 60m radius of the lease applied area (Refer Plate No. IA and IB).															
8.9	Protected area / Eco sensitive area/ Wild Life Sanctuary/ State Border	10km	There is no ECO sensitive Zone/ Wild Life Sanctuary/ Critically Polluted Area/ HACA/ CRZ located within 10km radius of the area. (Refer Plate No. IA).															



9.0 EMPLOYMENT POTENTIAL & WELFARE MEASURES

9.1 Employment potential (skilled, semi-skilled, un skilled)

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

a. Skilled labour:

Mine Foreman	:	1
Blaster/mate	:	1
Excavator and Wagon Drill Operator	:	4
Tipper Drivers	:	5
Jack hammer operator	:	8

b. Semi-skilled:

Security	:	2
----------	---	---

c. Unskilled:

Labour & Helper	:	3
Co-operator and Cleaner	:	9
Total	:	33

The above manpower is adequate to meet out the production schedule and the machinery strength envisaged in the mining plan and to comply with the statutory provisions of the Mines Safety Regulations. It is been ensured that the labour will not be employed less than 18 years, **No child labour** will engaged or entertained for any kind of quarrying operations. All the labours engaged for quarrying operations will be insured during the quarry lease period.

9.2 Welfare Measures:

a. Drinking Water:

Packaged drinking water is available from the nearby water vendors in Mukkoodal which is about 4km on the Southwestern side of the lease applied area.

b. Sanitary Facilities:

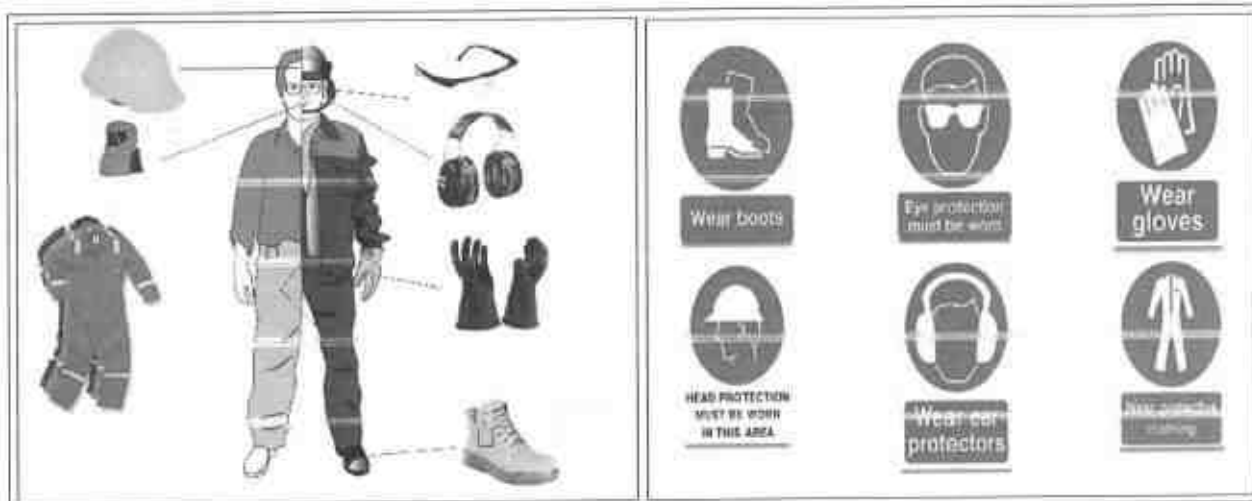
Hygienic modern Sanitary Facilities will be constructed as semi-permanent structure and it will be maintained periodically as hygienic.

c. First aid facility:

First aid kits are kept in Mines office room, in case of such eventuality is the victim will be given first aid immediately at the site by the competent and statutory foreman/permit manager/mate will be in charge of first aid and injured person will be taken to the hospital by the applicant vehicle. Hospital is available in Mukkoodal located at a distance of 4km on the Southwest side.

d. Labour Health:

Periodically medical check-up related to occupational health safety will be conducted to all the workers in applicant own cost.

**e. Precautionary safety measures to the labourers:**

- Helmets,
- Mine Goggles,
- Ear plugs,
- Ear muffs,
- Dust mask,
- Reflector jackets,
- Safety Shoes

All personnel protective devices will be provided as per the specification approved by Director of mines safety. Periodically medical check-up will be conducted for all workers for any mine health related problems. Proper training and vocational education will be given by qualified and experienced safety officer to all the employees about the safety and systematic Rough Stone quarrying operations. The drillers and workers will be sent for vocational training periodically, to carry out the quarrying operations scientifically and to safe guard the men and machinery and to create awareness about conventional opencast quarrying operations.

PART - B**10.0 ENVIRONMENT MANAGEMENT PLAN****10.1 Existing Land use pattern:**

The quarry lease applied area exhibits plain topography. The area is a dry barren land devoid of Agriculture. The lease applied area did not utilize any specific purpose. At present the area is virgin.

LAND USE TABLE - 9

Description	Present area in (Ha)
Area under Quarrying	Nil
Infrastructure	Nil
Roads	Nil
Green Belt	Nil
Unutilized Area	4.99.39
Grand Total	4.99.39

10.2 Water Regime:


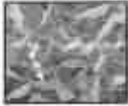






It is a simple opencast quarry operation. The quality of water will not be affected due to this quarrying operation. During rainy season the water table in the adjacent area may raise up. The subject area is a hard batholithic formation hence, the water table will not encounter from adjacent lands. However, mitigation measures will be carried out like Garland drains constructed on all sides of quarry pit to avoid surface run-off rain water entering into the pit.

The waste water discharged to water bodies will be met the standard prescribed under the Environment (Protection) Act - 1986 by The Ministry of Environment, Forest and Climate change.






10.3 Flora and Fauna:

TABLE - 10

List of Flora

S. No.	Name of the plant (Scientific)	Family Name	Common Name	Habit	Picture
1.	<i>Borassus flabellifer</i>	Arecaceae	Palm, Panai	Tree	
2.	<i>Azadirachta indica</i>	Meliaceae	Neem, Vembu	Tree	
3.	<i>Cocos nucifera</i>	Arecaceae	Coconut, Thennai	Tree	
4.	<i>Tectona grandis</i>	Lamiaceae	Teak	Tree	
5.	<i>Eucalyptus obliqua</i>	Myrtaceae	Eucalyptus	Tree	
6.	<i>Calotropis gigantea</i>	Apocynaceae	Erukku	Shrub	
7.	<i>Prosopis juliflora</i>	Fabaceae	Seemai karuvelam	Tree	
8.	<i>Acacia nilotica</i>	Fabaceae	Karuvelam	Tree	

List of Fauna

S. No.	Scientific Name	Common Name	Picture
1.	<i>Capra aegagrus hircus</i>	Goat	
2.	<i>Bos taurus</i>	Cow	
3.	<i>Corvus levaillantii</i>	Crow	
4.	<i>Oryctolagus cuniculus</i>	Rabbit	
5.	<i>Funambulus palmarum</i>	Indian palm squirrel	

10.4 Climatic Conditions:

The area receives rainfall of about 985mm/annum and the rainy season is mainly from Oct - Dec during monsoon. The summer is hot with maximum temperature of 42°C and winter encounters a minimum temperature of 21°C.

**10.5 Human settlement:**

There are few villages located in this area within 5km radius; the approximate distance and population are given below:

TABLE – 11

S. No	Name of the Village	Approximate distance & Direction from lease applied area	Approximate population
1.	Vadakku Ariyanayagipuram	4km – SW	8,500
2.	Mukkoodal	4km – SW	15,000
3.	Ilanthaikulam	2km – NW	800
4.	Velarkulam	2km – NE	700

Basic human welfare Amenities such as Health Centre, Schools, Communication Facilities, and Commercial Centres etc., are available at Mukkoodal located at a distance of 4km on the Southwestern side of the area.

10.6 Plan for air, dust suppression:

The air quality will be affected by the Suspended Particulate Matter (SPM) generated by the drilling, blasting, loading, unloading and transportation during the Rough Stone quarry operation. The following Mitigations measures will be adopted to arrest the dust at the source:

- Compaction, gradation and drainage on both sides for haulage road.
- Fixed water sprinkling arrangements by own water tankers with sprinkler.
- Wet drilling with latest eco friendly drill machine with separate dust extractor unit.
- Muffle blasting on overburden and waste to control fly rocks during blasting.
- Enforcing speed limits of 20km/hr within quarry area.
- Regular monitoring of exhaust fumes as per RTO norms.
- All personnel protective equipment like Nose-mask, earplug/ muffs will be provided to the Workers.
- Vegetations will be formed on the non-quarrying area.
- Avoiding spillages during the transportation.

Air quality will be monitored periodically as per Norms and Mitigate measures carried out to prevent dust and Air propagation in to air. The estimated budget for dust suppression would be around **Rs.52,000/year**.

10.7 Plan for Noise level control:

The noise level increased due to the Drilling, Blasting, Excavation and Transportation.

Engineering Noise control:

Noise will be created due to the usage of Machineries and Vehicles. The following Care and techniques will be proposed to control the Noise and Vibration.

- Selection of new low noise equipment and modifications of older equipment.
- Proper maintenance at done with regular interval by the Oiling and greasing for the machineries and vehicles to control the Source of noise during operation and transportation.
- NONEL blasting will be practiced to control Noise, ground vibration and fly rocks.
- Transporting vehicles are enforcing the speed limits of 20km/hour within quarry area and 40km/hour from despatch to destination to reduce Noise level.
- All personnel protective equipment like earplug/ muffs will be provided to the Workers.
- Selection of new low – noise equipments for the Rough stone quarry operation.
- Modifications of older equipments.
- Developing Green belts which act as Acoustic barrier, pollution absorbent and noise controller.
- Sentries with flags & whistle will be posted in village road junction and populated area to control and regulate traffic.

Hence, ground vibration and noise pollution i.e., minimal and restricted within the quarry working area.

Noise level monitoring and other Mitigation measures will be carried out to reduce Noise and Vibration. The estimated budget for Noise level monitoring would be around **Rs.2,000/Year**.

10.8 Environment impact assessment statement describing impact of mining on the next five years:

In the mining plan proposed for a production of Rough Stone is involve deep hole drilling and blasting. Such limited mining activity is not likely to cause any impact adversely on the environment. As far as pollution of air, water and noise concerned, the Environment impact studies will be conducted as per EIA notification issued by MoEF&CC. It is B2 Category mine. The estimated budget would be around **Rs.3,80,000/-**.

10.9 Proposal for waste management:

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





10.10 Proposal for reclamation of land affected during mining activities and at the end of mining (refilling / fencing etc.):

In the mining plan only to a maximum depth of 57m below ground level has been envisaged as workable depth for safe & economic mining during entire lease applied area. There is no waste generated hence, backfilling is not possible. After completion of quarry operation, the quarry pit will be allowed to collect the seepage and rainwater, the water storage will be kept as temporary reservoir for charging the nearby wells and to be utilize for green belt development. The quarry area will be fenced with Barbed wire fencing also safety bund constructed around the quarry to prevent inadvertent entry of public and cattle. The barbed wire fencing cost would be around Rs.2,70,000/-.

10.11 Programme of Greenbelt development (indicate extend, number, name of species to be afforested):

The safety zone all along the boundary barrier has been identified to be utilized for Greenbelt development. It is proposed to plan 150 tree saplings inside the quarry lease applied area and 500 tree saplings in the haul road during the first year of the plan period and 450 tree sapling in the quarried out top benches and maintain atleast 1300 plants during the entire life of the quarry. Manuring and tree gaurds will be provided by company to safeguard and maintain the plants. Appropriate native species of tree sapling will be planted in a phased manner as described below.

TABLE – 12

Years	No. of trees proposed to be planted	Area (m ²).	Survival %	Name of the species	No. of trees expected to be grown
I	150	1340	80	Neem,	120
II	150	1340	80	Pongamia	120
III	150	1340	80	pinnata,	120
IV	150	1340	80	Mantharai,	120
V	150	1340	80	Nuna, Vaagai,	120

Nearly 6,700m² area in the safety zone is proposed to use under Greenbelt by planting 750 Number of tree saplings during the plan period with an anticipated survival rate of 80% (Please refer Plate No. III). The estimated budget for plantation and maintenance of Greenbelt development would be around Rs.1,50,000/- for the period of five years.

The Greenbelt Development will be formed in the quarried out top benches with 450 tree saplings and 500 tree saplings on Haul road. The cost would be around Rs.1,90,000/-.

10.12 Proposed financial estimate / budget for (EMP) environment management:

Budget Provision for the entire quarrying period:

TABLE – 13

S. No.	Monitory and Analysis Description	Rate per location	No. of location	Total Charges/ six months	Total Charges/ year
1	Ambient air quality monitoring	6500	4	26000	52000
2	Noise level monitoring	250	4	1000	2000
3	Ground vibration monitoring	1000	2	2000	4000
4	Water sampling and analysis	9000	1	9000	18000
Total EMP Cost/ year					76,000

The EMP cost would be around Rs.3,80,000/- for the period of five years.

A. Project / investment / Operational cost		By Cost (Rs.)						
i) Land cost	The Land value as per the Government Guideline land cost is about, <table border="1" data-bbox="609 360 1083 472"> <thead> <tr> <th>Extent</th> <th>Cost/Ha</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>4.99.39</td> <td>4,94,500</td> <td>24,69,484</td> </tr> </tbody> </table> Total Land Cost = Rs. 24,69,484/- i.e., Rs. 24,70,000/- (Source: https://tnreginet.gov.in/portal/)	Extent	Cost/Ha	Total	4.99.39	4,94,500	24,69,484	24,70,000
Extent	Cost/Ha	Total						
4.99.39	4,94,500	24,69,484						
ii) Machinery to be used	The following machineries are proposed to meet out the productions. <ul style="list-style-type: none"> i. Excavator (2 Nos.) ii. Wagon Drill Machine (2Nos.) iii. Rock breaker (2 Nos.) iv. Trucks (4 Nos.) v. Compressor (1 No.) vi. Hand jack hammer and loose tools (4 Nos) vii. Water Sprinkling Tanker (1 No.) <p style="text-align: right;">Total</p>	1,12,00,000 1,00,00,000 4,00,000 1,50,00,000 7,50,000 2,00,000 15,00,000 3,90,50,000						
iii) Refilling/ Fencing	Fencing will be constructed around the quarry pit to prevent the inadvertent entry of public and cattle, the cost would be around.	2,70,000						
iv) Labourers shed	Labour sheds will be constructed as semi-permanent structure. The cost would be around	5,00,000						
v) Sanitary facility	Adequate latrine and urinal accommodation shall be provided at conveniently accessible places the cost would be around	1,00,000						
vi) Others items	First aid room & accessories	50,000						
vii) Drinking water facility for the labourers	Packaged drinking water will be provided for all the Labours. Drinking water will be readily available at conveniently accessible points during the whole of the working shift the cost would be around	1,00,000						
viii) Sanitary arrangement	The latrine and urinal will keep clean and sanitary condition. The maintenance cost would be around	60,000						
ix) Safety kit	All the Safety kit such as Helmet, Earmuffs, Goggles, Reflector Jackets, Safety shoes etc., will be provided to the workers by the applicant own cost which would be around	50,000						





x) Water sprinkling	Water will be sprinkled in the haul roads by own water sprinklers, since no cost arrived.	
xi) Garland drains Construction	Construction of garland drains to divert surface runoff from virgin area away from mining area	2,55,000
xii) Greenbelt etc.	Green belt development under safety zone during this Plan period (750 sapling x Rs. 200/- per sapling).	1,50,000
	Green belt development on around the quarried out top benches during this plan period (450 sapling x Rs. 200/- per sapling).	90,000
	Greenbelt development and maintenance will be carried out on Haul road (500 sapling x Rs. 200/- per sapling).	1,00,000
	Total Operational Cost	4,32,45,000
B. EMP Cost: (Per year)		
	Air Quality monitoring	52,000
	Water Quality Sampling	18,000
	Noise Monitoring	2,000
	Ground Vibration test	4,000
	Total Cost	76,000
Total EMP Cost for the five years period is Rs.3,80,000/-		
	Description	Amount (Rs.)
	A. Operational Cost	4,32,45,000
	B. EMP Cost	3,80,000
	Total Project Cost (A+ B)	4,36,25,000
	The applicant indents to involve corporate environment responsibilities (CER) activity like Books to the library, Water Purifier, plantation, Sanitary Facilities and other requirement to the Vadakku Ariyanayagipuram Govt. School at 2.0% from the total project cost. The Cost would be around Rs. 8,73,000/- .	8,73,000
	Total Cost	4,44,98,000
The Total cost would be around four crore forty four lakhs and ninety eight thousand only.		



11.0 PROGRESSIVE QUARRY CLOSURE PLAN

11.1 Introduction:

The Progressive Quarry Closure Plan for Rough Stone and Gravel quarry over an extent 4.99.39 Hectares of Patta lands in S.F.Nos.719/1(Part), 720/1(Part), 720/2, 720/3, 720/4, 720/5, 720/6, 720/7, 720/8, 720/9, 720/10, 720/11, 720/12, 720/13(Part) and 720/14(Part), Vadakku Ariyanayagipuram-II Village, Cheranmahadevi Taluk, Tirunelveli District, Tamil Nadu State has been prepared for **Thiru. R. P. Rahul**, S/o. Rajendran, residing at No. 13-85, Pathittavilai, Chitharal Village, Vilavankode Taluk, Kanniyakumari District, Tamil Nadu State – 629 151.

11.2 Present Land use pattern:

LAND USE TABLE – 14

Description	Present area in (ha)
Area under Quarrying	Nil
Infrastructure	Nil
Roads	Nil
Green Belt	Nil
Unutilized Area	4.99.39
Grand Total	4.99.39

11.3 Method of Mining:

Open cast Mechanized Mining is being carried out with 5.0 meter vertical bench with a bench width is not less than the bench height for Rough Stone.

However, as far as the quarrying of Rough Stone is concerned, observance of the provisions of Regulation 106 (2) (b) is available with Director of Mines Safety. If the applicant/lessee intends to modify the dimensions of benches, relaxation and permission are available with Director of Mines Safety under 106 (2) (b) of Metalliferous Mines Regulations, 1961. In such a scenario if there is any drastic change in the Resources and Reserves a modified plan will be submitted to the concerned authority for necessary relaxation, clearance and permission. The relaxation will be applied and obtained after the execution of lease deed / commencement of quarry operation.

11.4 Mineral Processing Operations:

The quarried out Rough Stone will be transported by the 35tons capacity Truck to the needy crushers. Splitting of rock mass of considerable volume from the parent rock mass by Jack hammer drilling and blasting, hydraulic excavators are used for loading the Rough Stone from pithead to the needy crushers.

11.5 Reasons for closure:

As the mineral is not going to be exhausted during the proposed plan period no immediate closure is planned and sufficient reserves are available to carry on the activities. The reason for closure will be discussed in the ensuing mining plan.

11.6 Statutory obligations:

The applicant ensures to comply all the conditions were imposed while granting the precise area communication letter before the execution of lease deed and during the course of quarry operations.

**11.7 Progressive quarry closure plan preparation:**

Name and address of the Qualified Person who prepared the progressive closure plan and name and address of the executing agency who is involved in the Preparation of progressive quarry closure plan.

Name : **A. JAGANNATHAN, B.E., F.C.C., M.M.E.A., M.I.E.,**
Qualified Person
(As per Rule 15(I)(a) and (I)(b) of MCR, 2016)

Address : Reg. No.17, Advaita Ashram Road,
Alagapuram, Salem District – 636 004.

Telephone : 0427- 2431989 (Office)

Cell No : +91 94422 78601 & 94433 56539

Applicant will himself implement the closure plan; no outside agency will be involved.

11.8 Review of Implementation of Mining Plan including Progressive Closure Plan upto the Final Closure Plan:

Mining Plan and Progressive quarry closure plan are being submitted for the first time. It will be reviewed after five years plan period and review of implementation will be given in ensuing scheme of mining or Final Mine Closure Plan.

11.9 Closure Plan:**(i) Mined Out Land:**

At the end of mining plan period, about 4.13.9ha of area will be mined out. Land use at various stages is given in the table below:

LAND USE TABLE – 15

Description	Present area in (ha)	Area at the end of this quarrying period (ha)
Area under Quarrying	Nil	4.13.90
Infrastructure	Nil	0.02.00
Roads	Nil	0.05.00
Green Belt	Nil	0.67.00
Unutilized Area	4.99.39	0.11.49
Grand Total	4.99.39	4.99.39

**(ii) Water quality management:**

Following control measures will be adopted for controlling water pollution:

- Construction of garland drains to divert surface run-off from virgin area away from mining area.
- Construction of check dams / gully plugs at strategic places to arrest silt wash off from broken up area.
- Collection of surface run-off from broken up area in mine pits for settling and only properly settled excess water from mine pit will be discharged to nearby users. The storm water/ mine water will be used for dust suppression, greenbelt development, etc.
- Periodic analysis of mine pit water and ground water quality in nearby villages.
- The quarried-out pit will be allowed to collect rain and seepage water which will act as a reservoir for storage. This water storage will enhance the static level and ground water recharge of nearby wells and it will be used for agriculture purpose to the nearby agriculture lands.
- Domestic sewage from site office & urinals/latrines provided in QL is discharged in septic tank followed by soak pits.

(iii) Air Quality Management:

The proposed mining method is not likely to produce much of dust and fugitive emissions to cause damage to ambient air quality of the area. Workers will be provided with personnel protective equipment like face-mask, earplug/ muffs.

For air pollution management at the progressive quarry closure plan, greenbelt will be developed to prevent and control air pollution.

(iv) Top Soil and Waste Management:

There is no topsoil or waste generated during the proposed plan period. The entire quarried out Rough Stone and Gravel is utilized (100%). Hence, waste management does not arise.

(v) Disposal of mining machinery:

All the Machineries will be purchased fresh, the same has been maintained in good condition during entire life of quarry. After completion of quarry operation all machineries will be utilized at another quarry area or sold out to the second hand. Hence, disposal or decommissioning of mining machinery does not arise.

**(vi) Safety & Security:**

Safety measures will be implemented to prevent access in the excavation area an authorized persons as per Mine Act 1952, MMR 1961.

- Safety measures will be implemented as per Mine Act 1952, MMR 1961, and Mines Rules 1955.
- Provisions of MMR 1961 shall be strictly followed and all roads shall be wider than the height of the bench or equal to the height of the bench and have a gradient of not more than 1 in 16.
- The bench height will be 5.0m.
- Width of working bench will be kept about 5.0m for ease of operations and provide sufficient room for the movement of equipments.
- Protective equipment like dust masks, ear-plugs/ muffs and other equipments shall be provided for use by the work persons.
- Notices giving warning to prevent inadvertent entry of persons shall be displayed at all conspicuous places and in particular near mine entries.
- Danger signs shall be displayed near the excavations and proper signal by siren alarm will be provide before blasting time to prevent any accident.
- Security guards will be posted.
- In the event of temporary closer, approaches will be fenced off and notice displayed.
- Installation of CCTV cemasas in the quarry and entrance of the quarry.
- Monitoring of Quarrying operation by external agency as directed by authorities

(vii) Disaster Management and Risk Assessment:

This should deal with action plan for high risk accidents like landslides, subsidence, flood, fire, seismic activities, tailing dam failures etc. and emergency plan proposed for quick evacuation, ameliorative measures to be taken etc. The capability of applicant to meet such eventualities and the assistance to be required from the local authorities should be described.

- The mechanized mining activities in the area may involve any high risk accident due to side falls/collapse, flying stones due to blasting etc.
- The complete mining operation will be carried out under the Management and control of experienced and qualified Mines Manager having Certificate of Competency to manage the mines granted by DGMS.
- All the provisions of Mines Act 1952, MMR 1961 and Mines Rules 1955, TNMMCR 1959 and other laws applicable to mine will be strictly complied with.
- During heavy rainfall the mining activities will be suspended.
- All persons in supervisory capacity will be provided with proper communication facilities.
- Competent persons will be provided FIRST AID kits which they will always carry.
- The Greenbelt Development will be formed in around the quarried out top benches and panchayat road of the lease applied area.

Environmental Monitoring Cell:

A dedicated team nominated by the mine manager or Agent will monitor and maintain the environmental compliances of the quarry as per the approved Environment Management Plan and report the Compliance to the Mine Manager half yearly.

**Disaster Management Cell:**

The Competent Qualified Statutory managers appointed by the applicant as per the Director of Mines Safety will be responsible for Disaster Management. It care any eventualities his mobile number will be displayed and he will take all the precautions and safety measures as per Mines and Minerals (Development and Regulations) Act, 1957.

(viii) Care and Maintenance during Temporary Discontinuance:

In case of any temporary discontinuance due to court order or due to statutory requirement or any other unforeseen circumstance following measures shall be taken for care, maintenance and monitoring of conditions.

- Notice of temporary discontinuance of work in mine shall be given to the DGMS as per the MMR 1961.
- All the mining machinery shall be shifted to a safe place.
- Entrance to the mine or part of the mine, to be discontinued shall be fenced off. Fencing shall be as per the circular 11/1959 from DGMS.
- Security Guards shall be posted for the safety and to prevent any unauthorized entry to the area.
- Carry out regular maintenance of the facilities/area detailed below in such a way as would have been done as if the mines were operation:
 - Quarry roads and approach roads,
 - Fencing on approach roads,
 - Checking and maintenance of machines and equipment,
 - Drinking water arrangements,
 - Quarry office, first aid stations etc.
- Competent persons shall inspect the area regularly.
- Air, water and other environmental monitoring shall be carried out as per CPCB and IBM Guideline.
- Care and upkeep of plantation shall be carried out on regular basis.
- Status of the working and status monitoring for re-opening of the mines shall be discussed daily.

In case of discontinuance due to any natural calamities/abnormal conditions, quarrying operation will be restarted as early as possible after completing rescue work, restoring safety and security, repairs of roads etc.

**(ix) Economic Repercussion of Closure of Quarry and manpower Retrenchments:**

The quarry lease is granted for a period of maximum five years only. As per the production Programme envisaged, there will be no effect on the man power as the majority of persons belong to nearby villages and will have an option either to be available for employment for the next contract/ lease or do the agriculture in their fields.

(x) Time Scheduling for Abandonment:

The lease applied area has enormous potential for continuance of operations even after expiry of the lease period. The details of time schedule of all abandonment will be given at the time of final closure plan.

(xi) Abandonment Cost:

As at present mining is not going to be closed so abandonment cost could not be assessed. However, based on the progressive quarry closure activities during the plan period, cost is assessed as given below:

LAND USE TABLE – 16


ACTIVITY		YEAR					RATE	AMOUNT (Rs.)
		I	II	III	IV	V		
Plantation under safety zone	Nos.	150	150	150	150	150	Rs. 200 Per sapling	1,50,000
	Cost	30000	30000	30000	30000	30000		
Plantation in the quarried out top benches and approach road	Area	Haul Road	-	Top benches			Rs. 300 Per Meter	1,90,000
	Nos.	500	-	150	150	150		
	Cost	1,00,000	-	30,000	30,000	30,000		
Wire Fencing - 900m		2,70,000	-	-	-	-	@300 Rs Per Meter	2,70,000
Garland drain - 850m		2,55,000	-	-	-	-	@300 Rs Per Meter	2,55,000
TOTAL								8,65,000

12.0 ANY OTHER DETAILS INTEND TO FURNISH BY THE APPLICANT

This Mining Plan for Rough Stone (Charnockite) and Gravel are under Rules 41 & 42 as per the Amended under Tamil Nadu Minor Mineral Concession Rules, 1959. The provisions of the Mines Act, Rules and Regulations and orders made there under shall be complied within the quarrying operation, so that the safety of the mine, machinery and person will be well protected. Permission, relaxation or exemption wherever required for the safe and scientific quarrying of the deposit will be obtained from the Department of Mines Safety. Any violation pointed out by the inspecting authorities shall be rectified and modified after scrutiny comments as per the guidelines of the Concerned Department and Authorities.

I hereby ensure that the information provided is correct to best of my knowledge and experience, some of the information contained in this report has been provided by external sources and by the applicant and is presented as the form as submitted by the applicant. The information is not intended to serve as legal advice related to the individual situation. I do not owe and specifically disclaim any liability resulting from the use during the course of quarrying operations after the grant of lease. The document may be scrutinized by the competent authority before approval.

Prepared by


A. Jagannathan, B.E., F.C.C., M.M.E.A., M.I.E.,
Qualified Person

Place: Salem

Date: 08.09.2023

DONATE RED


SPREAD GREEN

SAVE BLUE

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

Letter Roc.No. M2/35362/2019

Dated 19.09.2023


Regional Joint Director /
Assistant Director (I/C)
Geology and Mining
Tirunelveli

2023
19/09/23



From

Thiru.L.Suresh.,
Joint Director/
Assistant Director (i/c),
Geology and Mining,
Tirunelveli.

To

Thiru.R.P.Rahul,
S/o.Rajendran,
13-85, Pathittavilai, Chitharal Village,
Vilavankode Taluk,
Kanyakumari District.

Roc.No.M2/35382/2019

Dated.28.08.2023

Sir,

Sub: Mines and Quarries - Minor Minerals -
Roughstone and Gravel - Tirunelveli District -
Cheranmahadevi Taluk - Vadakku
Ariyanayagipuram-II Village - SF. Nos. 719/1,
720/1, 720/2, 720/3, 720/4, 720/5, 720/6, 720/7,
720/8, 720/9, 720/10, 720/11, 720/12, 720/13 &
720/14 - over an extent of 4.99.39 hectares of
patta lands - Quarry lease application
preferred by Thiru.R.P.Rahul - Revised precise
area communicated - Approved Mining Plan -
Called for - Reg.

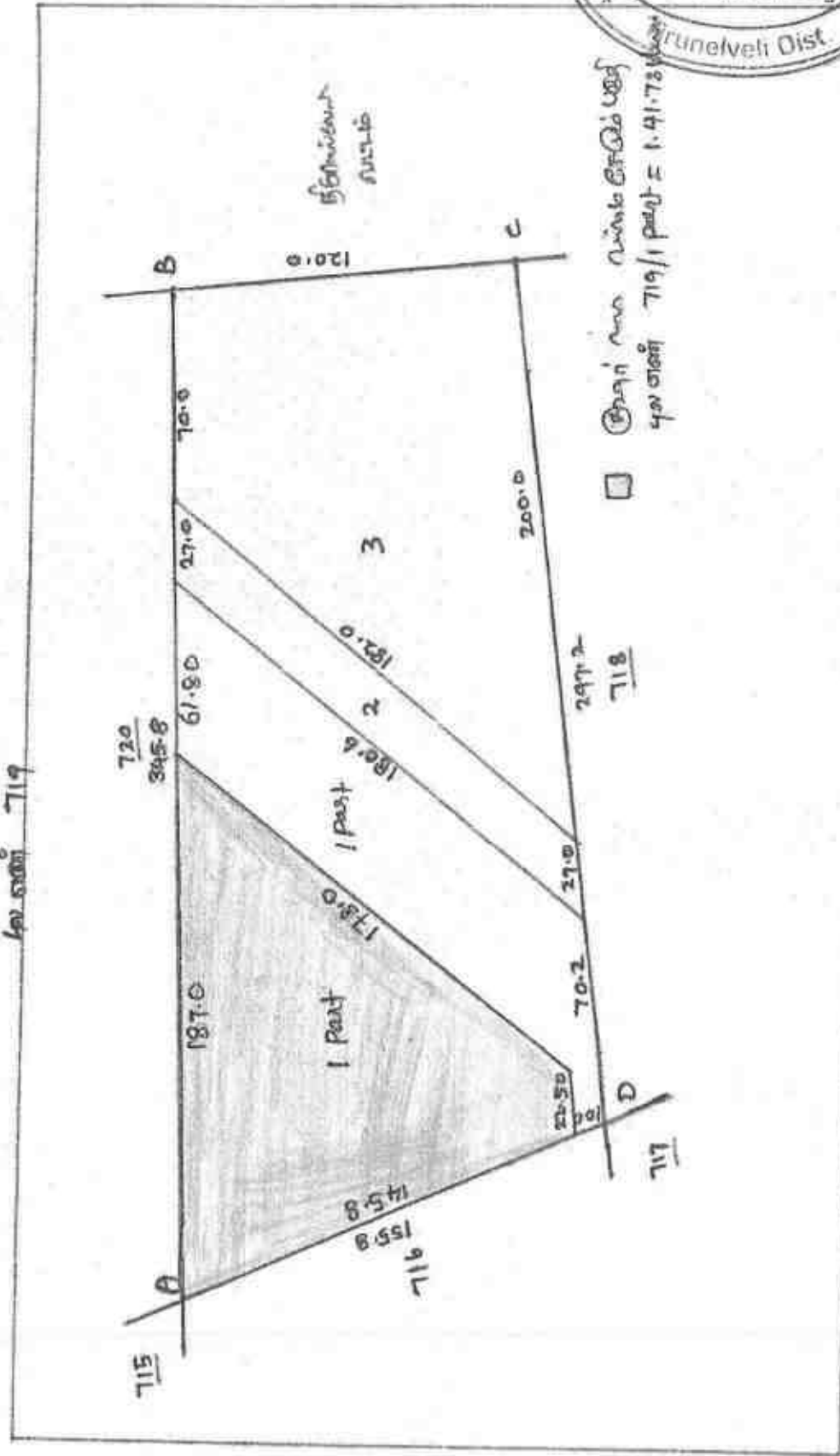
- Ref:**
1. Quarry lease application preferred by Thiru.R.P.Rahul, dated: 13.09.2019.
 2. The Sub - Collector, Cheranmahadevi Letter No. B4/5972/2019, dated. 27.09.2019 & 21.08.2020.
 3. Inspection report of the Assistant Director of Geology and Mining, Tirunelveli Dated: 12.10.2019.
 4. Executive Engineer, PWD, WRO, Chittar Basin Division, Tenkasi letter No. 157M/ வபி /இவஅ.1/ கோ.11A/ 2020, dt.22.07.2020.
 5. Precise area communication letter in Rc. No. M2/35382/2019, dated.27.08.2020.
 6. Representation dated.11.08.2023 received from the applicant.

ANNEXURE



பிளாட்: 719/1
 பகுதி: 1, 2, 3, 4

பகுதி: 1, 2, 3, 4
 பிளாட்: 719/1



பிளாட்: 719/1
 பகுதி: 1, 2, 3, 4

Lease Applied Area-



சென்னை (அரசாங்கம்)

பெரிய நகரம், திருவள்ளூர்

பெரிய நகரம், 720

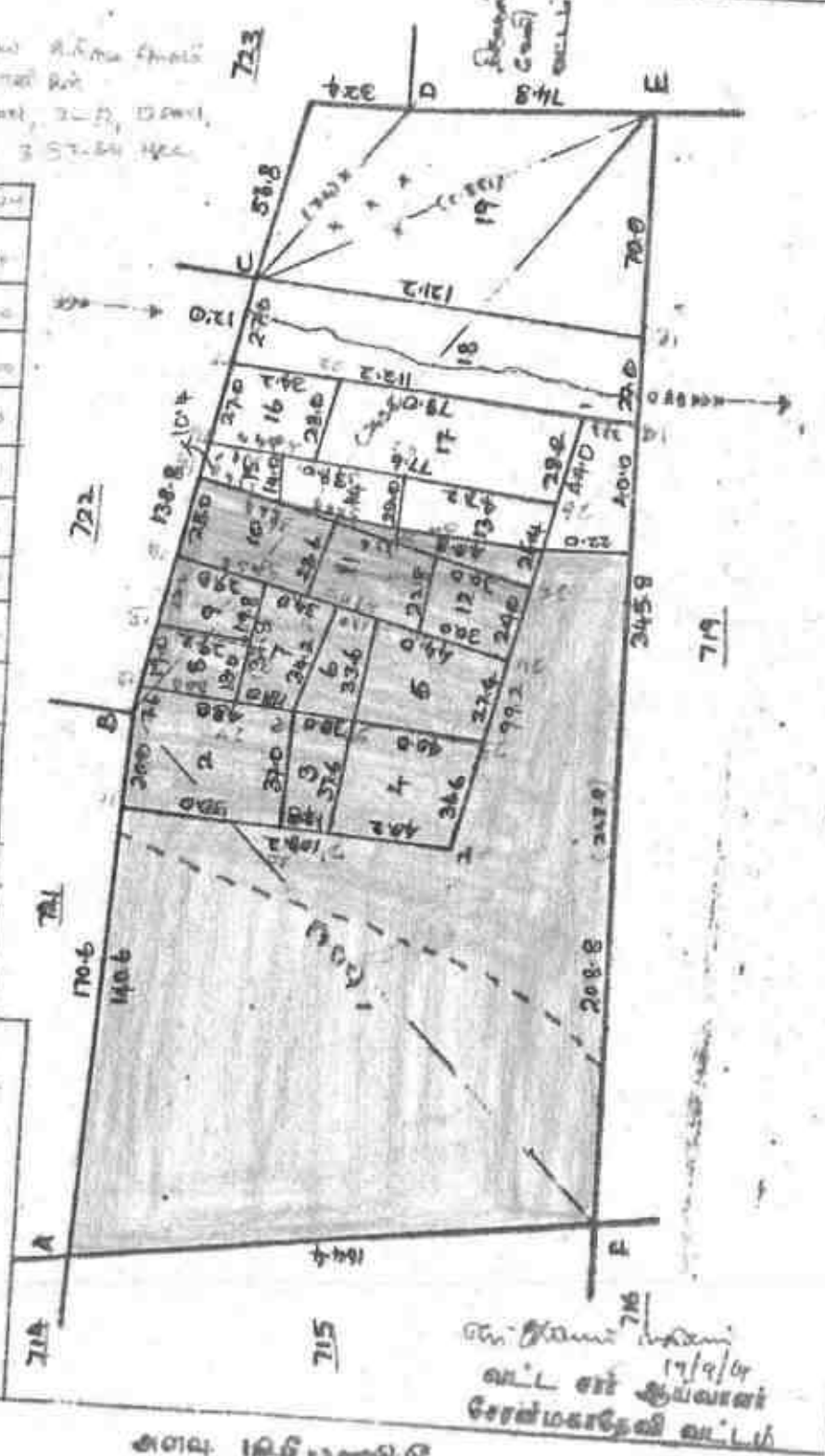
பெரிய நகரம்

5 ஏ. ஏ. 10-8

பெரிய நகரம் அளவுகள்
 1000 மீட்டர்
 720/1000, 2-12, 13000,
 34000 = 3 சதுர ஏக்கர்.

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5000	1000
6000	1000
7000	1000
8000	1000
9000	1000
10000	1000
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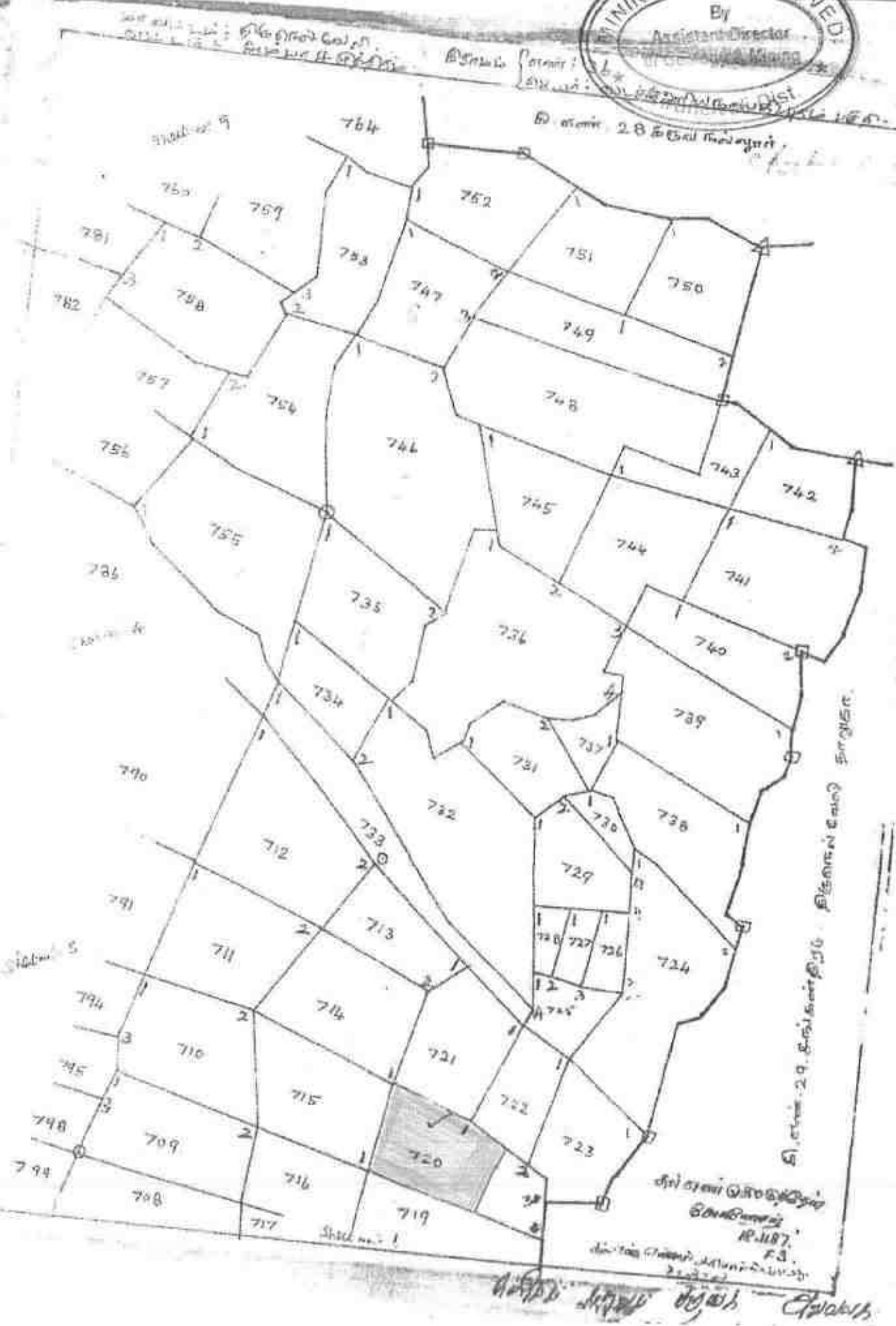
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2136	F
4000	A
3658	B
1630	C
1740	D
894	E



பெரிய நகரம்
 17/9/04
 பெரிய நகரம்
 பெரிய நகரம்



பெரிய நகரம்



Lease Applied Area- 



9/6/23, 3:03 PM

வட்டாட்சியர் அலுவலக இணைய சேவை - நில உரிமை விபரங்கள்



தமிழ்நாடு அரசு
வருவாய்த் துறை

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

மாவட்டம் : திருநெல்வேலி

வட்டம் : சேரன்மகாதேவி

வருவாய் கிராமம் : வடக்கு அரியநாயகிபுரம்-2

பட்டா எண் : 2269

உரிமையாளர்கள் பெயர்

I. ராஜேந்திரன்

மனைவி

பிர்தா



புல எண்	உட்பிரிவு	புன்செய்		நுள்செய்		மற்றவை		குறிப்புரைகள்
		பரப்பு	தீர்வை	பரப்பு	தீர்வை	பரப்பு	தீர்வை	
		ஹெக்ட - ஏர்	ரூ - பை	ஹெக்ட - ஏர்	ரூ - பை	ஹெக்ட - ஏர்	ரூ - பை	
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719	3	1 - 70.00	1.55	--	--	--	--	2019/0103/29/197883- --- 05-09-2019
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720	13	0 - 10.50	0.09	--	--	--	--	2019/0103/29/197883- --- 05-09-2019
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720	19	0 - 72.00	0.65	--	--	--	--	2019/0103/29/197883- --- 05-09-2019
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720	3	0 - 8.00	0.07	--	--	--	--	2019/0103/29/197883- --- 05-09-2019
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720	6	0 - 5.50	0.06	--	--	--	--	2019/0103/29/197883- --- 05-09-2019
720	7	0 - 8.00	0.07	--	--	--	--	2019/0103/29/197883- --- 05-09-2019

70 A



9/6/23, 3:03 PM

வட்டாட்சியர் அலுவலக இணைய சேவை நில உரிமை விவரங்கள்

720	8	0 - 6.00	0.06	--	--	*	2019/0103/29/197883-05-09-2019
720	9	0 - 6.00	0.06	--	--	--	2019/0103/29/197883-05-09-2019
723	-	4 - 6.50	3.70	--	--	--	2019/0103/29/197883-05-09-2019
		13 - 42.50	13.22				

குறிப்பு 2 :



- மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் <https://eservices.tn.gov.in> என்ற இணைய தளத்தில் 29/15/482/02269/160249 என்ற குறிப்பு எண்ணை உள்ளிடு செய்து உறுதி செய்துகொள்ளவும்.
- இத் தகவல்கள் 06-09-2023 அன்று 02:59:11 PM நேரத்தில் அச்சடிக்கப்பட்டது.
- கைப்பேசி கேமராவின் 2D barcode படிப்பான் மூலம் படித்து 3G/GPRS வழி இணையதளத்தில் சரிபார்க்கவும்



Table 1: Mining Plan Details (Left Column)

Sl. No.	Name of the Mine	Area (Acres)	Depth (Feet)	Production (Tons)	Remarks
1
2
3

Handwritten notes in Tamil: *பொருள் தரக்கூடிய பகுதி*

Signature: *[Signature]*

Official Stamp: *[Stamp]*

Table 2: Mining Plan Details (Right Column)

Sl. No.	Name of the Mine	Area (Acres)	Depth (Feet)	Production (Tons)	Remarks
1
2
3



Sl. No.	Area	Category	Sub-Category	Area (Ha)	Area (Acres)	Area (Sq. Ft.)	Area (Sq. Yds.)	Area (Sq. M)	Area (Sq. Km)
74	24	24	24	0.1	0.2	1089	1089	0.0001	0.0001
75	24	24	24	0.1	0.2	1089	1089	0.0001	0.0001
76	24	24	24	0.1	0.2	1089	1089	0.0001	0.0001
77	24	24	24	0.1	0.2	1089	1089	0.0001	0.0001
TOTAL FOR SURVEY NUMBER 113									
78	24	24	24	0.1	0.2	1089	1089	0.0001	0.0001
79	24	24	24	0.1	0.2	1089	1089	0.0001	0.0001
80	24	24	24	0.1	0.2	1089	1089	0.0001	0.0001
TOTAL FOR SURVEY NUMBER 114									
81	24	24	24	0.1	0.2	1089	1089	0.0001	0.0001
82	24	24	24	0.1	0.2	1089	1089	0.0001	0.0001
TOTAL FOR SURVEY NUMBER 115									
83	24	24	24	0.1	0.2	1089	1089	0.0001	0.0001
84	24	24	24	0.1	0.2	1089	1089	0.0001	0.0001
85	24	24	24	0.1	0.2	1089	1089	0.0001	0.0001
TOTAL FOR SURVEY NUMBER 116									
86	24	24	24	0.1	0.2	1089	1089	0.0001	0.0001
87	24	24	24	0.1	0.2	1089	1089	0.0001	0.0001
88	24	24	24	0.1	0.2	1089	1089	0.0001	0.0001
89	24	24	24	0.1	0.2	1089	1089	0.0001	0.0001
90	24	24	24	0.1	0.2	1089	1089	0.0001	0.0001
91	24	24	24	0.1	0.2	1089	1089	0.0001	0.0001
92	24	24	24	0.1	0.2	1089	1089	0.0001	0.0001
93	24	24	24	0.1	0.2	1089	1089	0.0001	0.0001
94	24	24	24	0.1	0.2	1089	1089	0.0001	0.0001
95	24	24	24	0.1	0.2	1089	1089	0.0001	0.0001
96	24	24	24	0.1	0.2	1089	1089	0.0001	0.0001
97	24	24	24	0.1	0.2	1089	1089	0.0001	0.0001
98	24	24	24	0.1	0.2	1089	1089	0.0001	0.0001
99	24	24	24	0.1	0.2	1089	1089	0.0001	0.0001
100	24	24	24	0.1	0.2	1089	1089	0.0001	0.0001
TOTAL FOR SURVEY NUMBER 117									
101	24	24	24	0.1	0.2	1089	1089	0.0001	0.0001
102	24	24	24	0.1	0.2	1089	1089	0.0001	0.0001
TOTAL FOR SURVEY NUMBER 118									
103	24	24	24	0.1	0.2	1089	1089	0.0001	0.0001
104	24	24	24	0.1	0.2	1089	1089	0.0001	0.0001
TOTAL FOR SURVEY NUMBER 119									
105	24	24	24	0.1	0.2	1089	1089	0.0001	0.0001
106	24	24	24	0.1	0.2	1089	1089	0.0001	0.0001
TOTAL FOR SURVEY NUMBER 120									
107	24	24	24	0.1	0.2	1089	1089	0.0001	0.0001
108	24	24	24	0.1	0.2	1089	1089	0.0001	0.0001
109	24	24	24	0.1	0.2	1089	1089	0.0001	0.0001
110	24	24	24	0.1	0.2	1089	1089	0.0001	0.0001
111	24	24	24	0.1	0.2	1089	1089	0.0001	0.0001
112	24	24	24	0.1	0.2	1089	1089	0.0001	0.0001
113	24	24	24	0.1	0.2	1089	1089	0.0001	0.0001
114	24	24	24	0.1	0.2	1089	1089	0.0001	0.0001
115	24	24	24	0.1	0.2	1089	1089	0.0001	0.0001
116	24	24	24	0.1	0.2	1089	1089	0.0001	0.0001
117	24	24	24	0.1	0.2	1089	1089	0.0001	0.0001
118	24	24	24	0.1	0.2	1089	1089	0.0001	0.0001
119	24	24	24	0.1	0.2	1089	1089	0.0001	0.0001
120	24	24	24	0.1	0.2	1089	1089	0.0001	0.0001
TOTAL FOR SURVEY NUMBER 121									
121	24	24	24	0.1	0.2	1089	1089	0.0001	0.0001

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உ. எண். 36, வடக்கு அரியலூர்



1*	2	3	4	5	6	7	8	9	10	11	12
715	...	715	ஈ	4	...	8-5	7	0 91	5 15.5	4 69	507 எ. முத் மதயர் (1), எ. எம் (2).
716	...	716	ஈ	4	...	8-5	7	0 91	3 99.5	3 64	564 1978 செ. செம்பகத் தேவர் (1), இ. செம்பகத் தேவர் (2), இ. பம்பகத் தேவர் (3).
717	1	717-1	ஈ	4	...	8-5	7	0 91	4 32.0	3 94	74 203 மா. இசை யம்மாள்.
	2	-2	ஈ	4	0 10.5
	3	-3	ஈ	4	...	8-5	7	0 91	2 24.5	2 04	681 1979 செ. செம்பகத் தேவர் மற்றும் ஆறு புள்ளிகள்.*
									6 67.0	5 98	
718	1	718-1	ஈ	4	...	8-5	7	0 91	0 46.0	0 41	664 1954 செ. செம்பகத் தேவர், மற்றும் ஆறு புள்ளிகள்.*
	2	-1	ஈ	4	...	8-5	7	0 91	0 97.0	0 89	664 1954 செ. செம்பகத் தேவர் மற்றும் ஆறு புள்ளிகள்.*
	3	-1	ஈ	4	...	8-5	7	0 91	2 94.0	2 68	664 1954 செ. செம்பகத் தேவர், மற்றும் ஆறு புள்ளிகள்.*
									4 37.0	3 98	
719	1	719-1	ஈ	4	...	8-5	7	0 91	2 19.5	2 99	664 1954 செ. செம்பகத் தேவர், மற்றும் ஆறு புள்ளிகள்.*
	2	-1	ஈ	4	...	8-5	7	0 91	0 36.0	0 33	664 1954 செ. செம்பகத் தேவர், மற்றும் ஆறு புள்ளிகள்.*

* விவரம் பக்கம் 10-ல் காண்க.
செ. செம்பகத் தேவர்
மற்றும் ஆறு
புள்ளிகள்.*



சீ. என். 26- லட்சத்தியாயதராயபுரம்.

1	2	3	4	5	6	7	8	9	10	11	
719	3	719-புர	ஈ	4	...	8-5	7	0 91	1 70-0	1 55	664 1954 செ. செல்வசுந்தரன் தேவர், மற்றும் ஆறு சுவாமிநாதர்.
									4 23-5	4 87	
(720)	1	720-புர	ஈ	4	...	8-5	7	0 91	2 46-0	2 23	664 1954 செ. செல்வசுந்தரன் தேவர், மற்றும் ஆறு சுவாமிநாதர்.
	2	-புர	ஈ	4	...	8-5	7	0 91	0 22-0	0 20	486 1595 சா. யூசுபு கான் (1), சா. சந்திரமணி(2).
	3	-புர	ஈ	4	...	8-5	7	0 91	0 08-0	0 07	250 149 செ. பாலசுந்தரன் தேவர்.
	4	-புர	ஈ	4	...	8-5	7	0 91	0 15-0	0 14	419 1429 ச. சைவசுந்தரன் தேவர்.
	5	-புர	ஈ	4	...	8-5	7	0 91	0 12-0	0 11	62 165 ச. சந்திரமணி நல்லாள்
	6	-புர	ஈ	4	...	8-5	7	0 91	0 05-5	0 06	406 1595 சா. யூசுபு கான் (1), சா. சந்திரமணி(2)
	7	-புர	ஈ	4	...	8-5	7	0 91	0 08 0	0 07	250 149 செ. பாலசுந்தரன் தேவர்.
	8	-புர	ஈ	4	...	8-5	7	0 91	0 06-0	0 06	9 123 ச. சந்திரமணி.
	9	-புர	ஈ	4	...	8-5	7	0 91	0 06-0	0 06	487 1596 செ. முருகசுந்தரன் தேவர் (1), செ. செல்வசுந்தரன் தேவர் (2).
	10	-புர	ஈ	4	...	8-5	7	0 91	0 10-5	0 09	486 1595 சா. யூசுபு கான் (1), சா. சந்திரமணி நல்லாள் (2).
	11	-புர	ஈ	4	...	8-5	7	0 91	0 08-5	0 07	674 875 சா. யூசுபு கான் மற்றும் சுவாமிநாதர்.
	12	-புர	ஈ	4	...	8-5	7	0 91	0 07-0	0 06	410 1401 செ. செல்வசுந்தரன் தேவர்.



13										4.87	
14			8-5	7	0	91	0	07	0	06	323
15			8-5	7	0	91	0	11	0	08	419
16			8-5	7	0	91	0	02	0	05	452
19			8-5	7	0	91	0	22	0	05	1954
21			8-5	7	0	91	0	01	0	20	664
22			8-5	7	0	91	0	18	0	13	1953
3			8-5	7	0	91	0	10	0	09	1895
4			8-5	7	0	91	0	23	5	21	1428
5			8-5	7	0	91	0	02	0	06	1954

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சூழ்நிலை மீட்டும், 22.18/2019



தமிழ்நாடு தமிழ்நாடு TAMILNADU ரூ. 1000

10/12/2019

பிதிசா, திருநெல்.

AN 384784

S. Valliammal
 ச. வள்ளியம்மாள்
 முத்திரைத்தாள் விழ்பனையாள்
 உரிமம் எண் : 4197
 முக்கூடல்.



குத்தகை ஆவணம்

2019ம் ஆண்டு டிசம்பர் மாதம் 10ம் தேதி

கன்னியாகுமரி மாவட்டம் விளவங்கோடு தாலுகா 13-85 பத்திட்டவிளை
 சிதறால் என்ற முகவரியில் வசிக்கும் ராஜேந்திரன் அவர்கள் குமாரர் கைபேசி எண்
 8300339480 ஆதார் அட்டை எண் 4716 5108 6793 உள்ளவருமான ராகுல் (இவர்
 இந்த ஆவணத்தில் குத்தகை பெறுபவர் என்று அழைக்கப்படுவார்)

குத்தகை பெறுபவர்

குத்தகை கொடுப்பவர்

புதிதில் 2019 த. வரு. திட்டம் 2218

ஆவணம் 14 தாள்களைக் கொண்டது

வசூலிகள்

புதிது ஆவணம்





தமிழ்நாடு தமிழ்நாடு TAMILNADU ரூ.1000

10/12/2019

பிள்ளை, சிந்தாமல்.

AN 384785

S. Vallianal

சு. வள்ளியம்மாள்
முத்திரைத்தாள் விடுபடலானாள்
உரிமம் எண் : 4147
முக்கூடல்

2

ஷ கன்னியாகுமரி மாவட்டம் விளவங்கோடு தாலுகா 13-85 பத்திட்டினை சிதறால் என்ற முகவரியில் வசிக்கும் ராஜேந்திரன் அவர்கள் மனைவி கைபேசி எண் 9443450371 ஆதார் அட்டை எண் 2927 8628 /7462 உள்ளவருமான பிற்தா (இவர் இந்த ஆவணத்தில் குத்தகை கொடுப்பவர் என்று அழைக்கப்படுவார்) குத்தகை கொடுப்பவரும் குத்தகை பெறுபவரும் சேர்ந்து பிறப்பித்துக்கொண்ட குத்தகை ஆவணம்

Rehul

குத்தகை பெறுபவர்

Rehul

குத்தகை கொடுப்பவர்

1 நூதம் 2019 வருடம் 2248
ஆலணம் 14 நாள்களாகக் கொண்டது
2 வருட தரம்

Rehul
பதிவு அலுவலர்





என்னவென்றால் இதன் தரையில் கண்ட பொத்தா குத்தகை கொடுப்பவருக்கு முக்கூல சார்பதிவாளர் அனுவலகம் 1 புத்தகம் 1480/2019 றானா திரைய ஆவணம் மூலம் பாத்தியப்பட்டு 2269 நம்பர் தனிப்பட்ட ஏற்பாடும் குத்தகை கொடுப்பவர் சர்வகதந்திரமாய் தனித்த நிலமையில் அனுபவித்தா வருகிறதாகும். மேற்கண்ட விபரப்படி குத்தகை கொடுப்பவருக்கு உரிமைப்பட்ட இதன் தரையில் சொத்தை குத்தகை பெறுபவருக்கு குத்தகை கொடுப்பவத் குத்தகைக்கு கொடுக்க தர்மானித்தம் பரஸ்பரம்பேசி மனப்பூர்வமாக சம்மதித்து கீழ்க்கண்ட நிபந்தனைகளின்படி நடப்பதாய் சம்மதித்து இந்த குத்தகை ஆவணத்தை கையெழுத்து செய்து பிறப்பிவித்துக்கொண்டோம்.

நிபந்தனை விபரம்

1. இந்த குத்தகை ஆவணம் 20 வருடங்கள் அமுலில் இருக்கும்.
2. இந்த குத்தகைக்கு முன் பணம் கொடுக்கவோ வாங்கவோ இல்லை.
3. குத்தகை பெறுபவர் வருஷம் ஒன்றுக்கு வாடகை ரூபாய் 12,000/- (ரூபாய் பணிரெண்டாயிரம்) வீதம் குத்தகை கொடுப்பவருக்கு கொடுத்து ரசீது பெற்றுக்கொள்ள வேண்டும். இந்த குத்தகையின் 20 ஆண்டு கால மொத்த குத்தகை ரூபாய் 2,40,000/- (ரூபாய் இரண்டு இலட்சத்து நாற்பதாயிரம்) ஆகும்.

Rehul

குத்தகை பெறுபவர்

Rehul

குத்தகை கொடுப்பவர்

புத்தகம் 2019 நவம்பர் 2218
ஆவணம் 14 தாள்களைக் கொண்டது
3 தாள்கள்
பதிவு அலுவலர்





4

4. இந்த குத்தகை 10.12.2019 தேதியிலிருந்து 10.12.2039 தேதி வரை உள்ள 20 வருட காலத்திற்கு கீழ்க்கண்ட தபசில் சொத்தை குத்தகை பெறுபவர் கைவசம் வைத்து அனுபவித்து அதில் கல் குவாரி தொழிலுக்குத் தேவையான கல் ஜல்லி மற்றும் கிராவல் மண் ஆகியவற்றை அரசு அனுமதி பெற்று கல்குவாரி அமைத்து அரசு அனுமதிக்கும் காலம் வரை விதிகளுக்கு உட்பட்டு குவாரி தொழில் செய்து கொள்ளலாம்.

5. குத்தகை பெறுபவரும் குத்தகை பெறுபவரின் அனுமதி பெறுபவரும் குத்தகை சொத்துக்களை எந்தவித தடங்கல் இன்றி அனுபவித்துக் கொள்ளலாம்.

6. குத்தகை சொத்துக்களின் அனுபவ தேவைகளுக்கு ஏற்ப விண்ணப்பிக்க குத்தகை பெறுபவருக்கு உரிமை உண்டு விண்ணப்பங்களுக்கு குத்தகை கொடுப்பவர் அனுமதி தேவையில்லை.

7. குத்தகை கொடுப்பவருக்கு குத்தகை தரும் சொத்துக்கள் உள்பட தன் சொத்துக்களுக்கு வெளியாரிடமும் உள்ள வழிதடம் போன்ற உரிமைகள் குத்தகை பெறுபவருக்கு உண்டு.

8. இந்த குத்தகை ஆவணத்தை பரஸ்பரம் தனிப்பட்டு குத்தகை பெறுபவரோ குத்தகை கொடுப்பவரோ ரத்து செய்ய உரிமை இல்லை.

9. குத்தகை கொடுப்பவருக்கு குத்தகை நிலங்களை குத்தகைக்கு கொடுக்க முழுஉரிமையும் அதிகாரமும் உண்டு. பின்னிட்டு இது தொடர்பாக ஏதேனும் வில்லங்கங்கள் ஏற்பட்டால் அதை அவர் செலவிலும் முயற்சியிலும் தீர்த்து வைக்க வேண்டியது வில்லங்கங்கள் தீர்க்கப்படாவிட்டால் குத்தகை பெறுபவரின் இழப்பிற்கு குத்தகை கொடுப்பவர் பொறுப்பாவார்.

Rehul

குத்தகை பெறுபவர்

[Signature]

குத்தகை கொடுப்பவர்

புதுச்சேரி 2019 க டிசம்பர் 22 18
ஆவணம் 14 எண்ணிக்கைகொண்டது
4 பகுதிகள்

[Signature]
பதிவு அலுவலர்





10. குத்தகை கொடுப்பவர் தபசில் சொத்துக்களுக்கு உண்டான நில தீர்வைகளையும் வரிகளையும் செலுத்திக்கொள்ளவேண்டும்.

11. மேற்படி குத்தகை காலம் முடிந்தவுடன் குத்தகை பெறுபவர் அவர் செலவில் மாற்றி தபசில் சொத்தை முதல் இருந்த நிலயில் குத்தகை கொடுப்பவரிடம் ஒப்படைத்து விடவேண்டியது.

12. குத்தகை பெறுபவர் குத்தகைக்கு பெறும் நிலத்தை தவிர மீதமுள்ள நிலத்தில் எவ்விதமான ஆக்கிரமிப்பும் செய்யக்கூடாது.

தபசில்

1. திருநெல்வேலி மாவட்டம் சேரன்மகாதேவி வட்டம் சேரன்மகாதேவி பதிவு மாவட்டம் முக்கூடல் சட்டி வடக்கு அரியநாயகிபுரம் கிராமம் பகுதி 2ல் அயன் புன்செய் சர்வே 719/1 நம்பர் ஹெக்டேர் 2.19.50ல் வடமேற்கடைய கீழ்கண்ட எல்கைக்குட்பட்ட ஏக்கர் 3 செண்டு 50க்கு சமமான ஹெக்டேர் 1.41.64ம் பூராவும் இதற்கு எல்கை

வடக்கு சர்வே 720 நம்பர் நிலம்

கிழக்கு சர்வே 719/1 நம்பரிலுள்ள மீதநிலம்

தெற்கு சர்வே 719/1 நம்பரிலுள்ள மீதநிலம்

மேற்கு சர்வே 716 நம்பர் நிலம்

இதற்குள்பட்டது.

Rehul

குத்தகை பெறுபவர்

[Signature]

குத்தகை கொடுப்பவர்

பதிவு எண் 2019 காலத்தின் 2218 த
அலகம் 14 நாட்களில் கொண்டு
5 வருடம்

[Signature] பதிவு அலுவலர்





2. ஷூ முக்கூடல் சப்ர ஷூ வடக்கு அரியநாயகிபுரம் கிராமம் பகுதி *2
அயன் புன்செய் சர்வே 720/1 நம்பர் ஏக்கர் 6 செண்டு 8ம்

அயன் புன்செய் சர்வே 720/2 நம்பர் செண்டு 54ம்

அயன் புன்செய் சர்வே 720/3 நம்பர் செண்டு 19ம்

அயன் புன்செய் சர்வே 720/4 நம்பர் செண்டு 37ம்

அயன் புன்செய் சர்வே 720/5 நம்பர் செண்டு 29ம்

அயன் புன்செய் சர்வே 720/6 நம்பர் செண்டு 13ம்

அயன் புன்செய் சர்வே 720/7 நம்பர் செண்டு 19ம்

அயன் புன்செய் சர்வே 720/8 நம்பர் செண்டு 14ம்

அயன் புன்செய் சர்வே 720/9 நம்பர் செண்டு 14ம்

அயன் புன்செய் சர்வே 720/10 நம்பர் செண்டு 26ம்

அயன் புன்செய் சர்வே 720/11 நம்பர் செண்டு 21ம்

அயன் புன்செய் சர்வே 720/12 நம்பர் செண்டு 17ம்

அயன் புன்செய் சர்வே 720/13 நம்பர் செண்டு 8ம்

அயன் புன்செய் சர்வே 720/14 நம்பர் செண்டு 5ம்

Rohul

குத்தகை பெறுபவர்

[Signature]

குத்தகை கொடுப்பவர்

புகழ்நாள் 2019 ம் வருடத்திய 2218 ம்
முடிவானம் 14 நாளைக்கொண்டுவர
6 சபா தாள்

[Signature]
பதிவு அலுவலர்





ஆக ஒரே சேர்ந்தரணையாக உள்ள ஏக்கர் 8 ரெண்டு 84க்கு சமமான ஷோர் 3.57.75ம் பூராவும் இதற்கு எல்லை

வடக்கு சர்வே 721, 722 நம்பர் நிலங்கள்

கிழக்கு சர்வே 720/13, 720/14 நம்பரிலுள்ள மீத நிலங்களும் சர்வே 720/15, 720.16, 720/17 நம்பர் நிலங்கள்

தெற்கு சர்வே 719 நம்பர் நிலம்

மேற்கு சர்வே 715 நம்பர் நிலம்

இதற்குள்பட்டது.

Rachul
குத்தகை பெறுபவர்

[Signature]
குத்தகை கொடுப்பவர்

சாட்சிகள்

M. Sathiraj. 5/10 மனோவர் குளப்படியம்
12/88 வனாந் தாலை.

R சந்திரசூர்ன் 5/10 வனா காமாநிசுரூர்
செட்டி

சுரேஷ்யாநிசுரூர் ச. கதிநெண்ணி

க. கதிநெண்ணி
3/16/2019 ஆ. ஏ. அணையா நாடா
மாநில ஆய்வு அமுத்தர்
செட்டி - A/638/CMD/00
தொலைபேசி - 627 601

1 மார்ச் 2019 இடம் 2218
காலம் 14 நாட்கள்
7 நாட்கள்

[Signature]
பதிவு அலுவலர்
83 A



தமிழக அரசு
வருவாய்த் துறை

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

மாவட்டம் : திருநெல்வேலி

வட்டம் :

சேர்மகாதேவி
வருவாய் கிராமம் : வடக்கு அரியநாயகிபுரம் பகுதி-
2
பட்டா எண் : 2269

உரிமையாளர்கள் பெயர்

1.	ராஜேந்திரன்		மனைவி		பிர்தா	
	நன்செய்		புன்செய்		மற்றவை	
	பரப்பு	தீர்வை	பரப்பு	தீர்வை	பரப்பு	தீர்வை

புல எண்	உட்பிரிவு	ஹெக்ட - ஏர்	ரூ - பை	ஹெக்ட - ஏர்	ரூ - பை	ஹெக்ட - ஏர்	ரூ - பை
715	-	--	--	5 - 15.50	4.69	--	--
716	-	--	--	3 - 99.50	3.64	--	--
719	1	--	--	2 - 19.50	2.99	--	--
719	2	--	--	0 - 36.00	0.33	--	--
719	3	--	--	1 - 70.00	1.55	--	--
720	1	--	--	2 - 46.00	2.23	--	--
720	10	--	--	0 - 10.50	0.09	--	--
720	11	--	--	0 - 8.50	0.07	--	--
720	12	--	--	0 - 7.00	0.06	--	--
720	13	--	--	0 - 10.50	0.09	--	--
720	14	--	--	0 - 7.00	0.06	--	--
720	15	--	--	0 - 3.50	0.06	--	--
720	16	--	--	0 - 10.00	0.09	--	--
720	17	--	--	0 - 22.00	0.20	--	--
720	18	--	--	0 - 31.00	0.28	--	--
720	19	--	--	0 - 72.00	0.65	--	--
720	2	--	--	0 - 22.00	0.20	--	--
720	3	--	--	0 - 8.00	0.07	--	--
720	4	--	--	0 - 15.00	0.14	--	--
720	5	--	--	0 - 12.00	0.11	--	--
720	6	--	--	0 - 5.50	0.06	--	--



புத்தகம் 2019
ஆவணம் 14
8
பதிவு அலுவலர்

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மலுவலக இணைய சேவை .

<https://eservices.tn.gov.in/eservices/online/MineralExtract>

720	7	--	--	0 - 8.00	0.07
720	8	--	--	0 - 6.00	0.06
720	9	--	--	0 - 6.00	0.06
723	-	--	--	4 - 6.50	3.70



22 - 57.50 21.55

குறிப்பு 2 :	
	1. மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் http://eservices.tn.gov.in என்ற இணைய தளத்தில் 29/15/482/02269/160249 என்ற குறிப்பு எண்ணை உள்விட்டு செய்து உறுதி செய்துகொள்ளவும்.
	2. இத் தகவல்கள் 07-09-2019 அன்று 02:09:56 PM நேரத்தில் அச்சடிக்கப்பட்டது.
	3. கைப்பேசி கேமராவின் 2D barcode படப்பான் மூலம் படித்து 3G/GPRS வழி இணையதளத்தில் சரிபார்க்கவும்

Rahul

[Signature]

பதிவு செய்த நாள்: 2019 மார்ச் 14
 ஆவணம்: 14
 9



[Signature]
 அலுவலர்



12218/2019

தலைப்பின்றி திருநெல்வேலி

R. S. Subhira
M. Subhira

திரு. கவிநாதன் தலைமுறை 12218 கண்ணாடி பதிவு, முக்கடை (1) திருநெல்வேலி திருநெல்வேலி இற்கடம் 12218

திரு. கடலவராஜா தலை முறை தேவர் 12218 கண்ணாடி பதிவு, முக்கடை (1) திருநெல்வேலி திருநெல்வேலி இற்கடம் 12218

2019 ஆம் ஆண்டு செம்பர் மாதம் 10ம் நாள்

கலா செ
என்பதிவாளர்
முக்கடை

R/முக்கடை/புத்தகம்-1/2218/2019 எண்ணாகப் பதிவு செய்யப்பட்டது

கலா செ
என்பதிவாளர்

நாள் 10/12/2019
முக்கடை

2019 ம் ஆண்டு 2218
ஆவணம் 14 நாள் கணக்கொண்டது
11 வது நாள்
பதிவு அலுவலர்






 பெயர்: ராஜேந்திரன்
 Prathe Rajendran
 பிறந்த நாள்: DOB: 26/11/1974
 பாலினம் / Female

2927 8628 7462

ஆதார் - சாதாரண மனிதனின் அதிகாரம்


 பெயர்: சிவா பிரசாத் மோகனன்
 Siva Prasad Mohanan
 பிறந்த நாள்: DOB: 29/05/1989
 பாலினம்: MALE

6319 0338 1065
 VID: 8164 8390 3321 8790

எனது ஆதார், எனது அடையாளம்


 மக்கள்
 UIDAI
 மக்கள் அடையாள அமைதி
 Ministry of India

முகவரி:
 வீடு: ராஜேந்திரன், 13-85
 பத்தித்தவிலை, சிதறால்.
 விவாகode, சிதறால்.
 கன்னியாகுமரி, தமிழ் நாடு
 629151

Address:
 WC: Rajendran, 13-85,
 PATHITTAVILAI, CHITHARAL.
 Villavancode, Chitharal,
 Kanyakumari, Tamil Nadu,
 629151

2927 8628 7462




 மக்கள்
 UIDAI
 மக்கள் அடையாள அமைதி
 Ministry of India

முகவரி:
 S/O: மோகனன், 4/28A, ராமா விলাசம் வீடு
 பத்தித்தவிலை, சிதறால்.
 விவாகode, சிதறால்.
 கன்னியாகுமரி, தமிழ் நாடு - 629151

Address:
 S/O: Mohanan, 4/28A, RAMA VILASAM
 HOUSE PATHITTAVILAI, AMPALAKADAI,
 CHITHARAL, EDAVAZHICKARAI, Villavancode,
 Kanyakumari,
 Tamil Nadu - 629151



1647
 1810 300 1947
 help@uidai.gov.in
 www.uidai.gov.in
 P.O. Box No. 1647,
 Bangalore-560 001

Rachul

[Signature]

2019
 14
 12

சாதாரண மனிதனின் அதிகாரம்
 சாதாரண மனிதனின் அதிகாரம்
 சாதாரண மனிதனின் அதிகாரம்

[Signature]



GOVERNMENT OF KERALA
 CIVIL SUPPLIES AND CONSUMER PROTECTION DEPARTMENT



NPHH
 333417711535

മിസ്രിപ്പി കമ്പോളം (കുറുപ്പി) (മിസ്രിപ്പി കമ്പോളം)
 പേര്: മിസ്രിപ്പി കമ്പോളം (മിസ്രിപ്പി കമ്പോളം)
 വില: 2010/152
 വില: 2010/152
 പ്രകാരം, പ്രകാരം, പ്രകാരം
 മിസ്രിപ്പി കമ്പോളം (മിസ്രിപ്പി കമ്പോളം)
 677001

Rehul



മിസ്രിപ്പി കമ്പോളം (മിസ്രിപ്പി കമ്പോളം)
 പേര്: മിസ്രിപ്പി കമ്പോളം (മിസ്രിപ്പി കമ്പോളം)
 വില: 2010/152
 വില: 2010/152
 പ്രകാരം, പ്രകാരം, പ്രകാരം
 മിസ്രിപ്പി കമ്പോളം (മിസ്രിപ്പി കമ്പോളം)
 677001

മിസ്രിപ്പി കമ്പോളം (മിസ്രിപ്പി കമ്പോളം)
 പേര്: മിസ്രിപ്പി കമ്പോളം (മിസ്രിപ്പി കമ്പോളം)
 വില: 2010/152
 വില: 2010/152
 പ്രകാരം, പ്രകാരം, പ്രകാരം
 മിസ്രിപ്പി കമ്പോളം (മിസ്രിപ്പി കമ്പോളം)
 677001

[Signature]

R. R. R. R.

1 ഏപ്രിൽ 2019 ന് 2218
 ചുവടെ 14
 13
 [Signature]
 [Text]






TNDG 5472
 TN72V20120002287
 22.12.2016
 0812
 UNION OF INDIA
 Tirunelveli Dist.
 TN72V20120002287
 16-04-2012
 17-04-2012
 10-10-2014
 01-04-1990
 SUDALAIRAJA M
 MANI THEVAR

Address:
 150 KANNANULAM
 THIRUVARJALAPURAM
 MADHURAM, TIRUNELVELI, TN 627111
 Holder's Signature
 Signature of issuing authority
 DO TIRUNELVELI

Rachul

[Signature]

M. Sudakim

2019
 14
 14




பொபது/நீஆது

அனுப்புநர்

பொறி.C.மணிகண்டராஜன், பி.இ.,
உதவிசெயற்பொறியாளர் பொபது/நீஆது,
நம்பியாறு வடிநில உபகோட்டம், சி
நாங்குநேரி - 627 108.

பெறுநர்

சார் ஆட்சியர்,
சேரன்மகாதேவி.

கடித எண். கோ.16-1/உசெபொ(நா)/2020 / நாள். .06.2020

அய்யா,

- பொருள்** : கனிமமும் சுரங்கமும் - திருநெல்வேலி மாவட்டம் - சேரன்மகாதேவி வட்டம் - வடக்கு அரியநாயகிபுரம் பகுதி - 2 - புல எண்: 719/1, 720/1, 720/2, 720/3, 720/4, 720/5, 720/6, 720/7, 720/8, 720/9, 720/10, 720/11, 720/12, 720/13 மற்றும் 720/14-ல் சாதாரண கற்கள் எடுக்க குத்தகை உரிமம் கோரி திரு.R.P.ராகுல் என்பவர் விண்ணப்பித்தது - தடையில்லாச்சான்று வழங்குவது - தொடர்பாக.
- பார்வை** : 1. மாவட்ட ஆட்சித்தலைவர், திருநெல்வேலி மாவட்டம், திருநெல்வேலி அவர்களின் ந.க.எண். எம்2/35382/2019 நாள்: 17.06.2020.
2. செயற்பொறியாளர், நீஆஅ/பொபது, சிற்றாறு வடிநில கோட்டம், தென்காசி (இ) குடியிருப்பு அவர்களின் மே.கு.எண். 337S/இவஅ-1/கோ-11A/2020 நாள்: 19.06.2020.

மேற்க்காணும் பார்வையில் கண்ட மாவட்ட ஆட்சித்தலைவர், திருநெல்வேலி மாவட்டம், திருநெல்வேலி அவர்களின் கடித எண் (1)-ன் வாயிலாக, சார் ஆட்சியர் சேரன்மகாதேவி மற்றும் செயற்பொறியாளர், பொபது/நீஆது, சிற்றாறு வடிநில கோட்டம், தென்காசி ஆகியோர் இணைந்து கூட்டு புல தணிக்கை செய்து அறிக்கை சமர்ப்பிக்க அறிவுறுத்தியதின் பேரில் 15.07.2020 அன்று செயற்பொறியாளர், பொபது/நீஆது, சிற்றாறு வடிநில கோட்டம், தென்காசி காணொலி காட்சி (Video Conferencing) கூட்ட கலந்தாய்வு இருந்ததால் சார் ஆட்சியர் சேரன்மகாதேவி மற்றும் உதவிசெயற்பொறியாளர், பொபது/நீஆது, நம்பியாறு வடிநில உபகோட்டம், நாங்குநேரி ஆகியோருடன் இணைந்து சேரன்மகாதேவி வட்டம், வடக்கு அரிய நாயகிபுரம் பகுதி -2 கிராமம், புல எண்.719/1 மற்றும் 720/1-ல் கல்குவாரி அமைக்க குத்தகை உரிமம் வழங்க கோரியது தொடர்பான கூட்டு புல தணிக்கை 15.07.2020 அன்று கூட்டு புல தணிக்கை செய்யப்பட்டது.

புல தணிக்கை செய்யப்பட்டதில், குவாரி செய்ய உத்தேசித்துள்ள புலத்தில் இருந்து சுமார் 300மீட்டர் தொலைவில் எவ்வித குடியிருப்பும் இல்லை. புலத்தில் இருந்து 50மீட்டர் தொலைவில் நீர்நிலை மற்றும் நீர்நிலைபுறம்போக்கு நிலங்கள் இல்லை, புலத்தில் இருந்து சுமார் 4.00 கி.மீ தூரத்தில் தென்மேற்கு பக்கமாக கடனா காங்கேயன் கால்வாய் மூலம் பாசனம் பெறும் மாறன்குளம் உள்ளது. குவாரி அமைய உள்ள இடத்தில் நிலவியல் ஓடை இருப்பதாக கிராம தணக்குகையில் உள்ளதால், நிலவியல் ஓடைக்கு பாதிப்பு ஏற்படா வண்ணம் 50மீ நிலத்தை விட்டுகொடுக்க வருவாய் வட்டாட்சியர், சேரன்மகாதேவி அவர்களுக்கு உறுதியொழி பத்திரம் கொடுக்கப்பட்டதின் பேரில் புல எண்.719 மற்றும் 720ல் 4.99.39 ஹெக்டேர் நிலத்திற்கு குத்தகை உரிமம் வழங்க பரிந்துரை செய்து அறிக்கை சமர்ப்பிக்கப்படுகிறது.



தகனைகள்:

1. மனுதாரர் கோரியுள்ள புல எண்.719 மற்றும் 720-ல் குவாரி தளமானது நிலவியல் ஓடை அமைய உள்ள புல எண்.715 மற்றும் 716-ன் எல்லையிலிருந்து 50மீ தொலைவில் அமைக்கப்பட வேண்டும்.
2. குவாரி அனுமதிக்கப்படும் தளத்தில் எல்லைக்கல் ஊன்றப்பட வேண்டும்.
3. குவாரி தளத்திலிருந்து ஓடைக்கு தானாக வடிந்தோடும் தண்ணீருக்கு எவ்வித இடையூறல் தடைகளோ இருத்தல் கூடாது.
4. குவாரிக்கு வரும் வாகனங்கள் ஓடையைக்கடந்து செல்ல நேரிட்டால் அதற்கு பாலம் அமைப்பதற்கு தனியாக பொதுப்பணித்துறையின் மூலம் உரிய ஆவணங்களுடன் விண்ணப்பித்து அனுமதி பெற்றுக் கொள்ள வேண்டும்.
5. குவாரி தளத்தினை பொதுப்பணித்துறை அதிகாரிகளின் ஆய்வுக்கு எந்நேரமும் அனுமதிக்கப்பட வேண்டும்.
6. குவாரியிலிருந்து அள்ளப்படும் மண் அல்லது கழிவுகள் ஓடையின் நீர்போக்கு பகுதிகளில் கொட்டக்கூடாது.
7. ஓடையிலிருந்து எந்த சூழ்நிலையிலும் தண்ணீர் உறிஞ்சுவது நேரடியாகவோ அல்லது மறைமுகமாகவோ செய்யக்கூடாது.

இணைப்பு:-

கூட்டு புலதணிக்கை
குறிப்பு

M. Murthy
15/7/20
As/c.

உதவிசெயற்பொறியாளர் பொதுநீ.ஆது,
நம்பியாறு வடிநில உபகோட்டம்,
நாங்குநேரி - 627 108.



இந்திய அரசாங்கம்
Government of India

வழக்கு எண் /
Case No. P

மின்சார்பு / DCO 01/09/1995
சுற்றுலா / Tourism

4716 5108 6793

எனது ஆதார், எனது அடையாளம்

இந்திய அரசாங்கம் - சுற்றுலா அமைச்சு
யாழ்ப்பாணம் - யாழ்ப்பாணம்
யாழ்ப்பாணம் - யாழ்ப்பாணம்
யாழ்ப்பாணம் - யாழ்ப்பாணம்

Address: 670, Government Road,
PATTINAVILAL, TRICHY,
Tamil Nadu, 620001
Tamil Nadu, India
Phone: 0431-2333333

4716 5108 6793

www

272m
19766641
32



आयकर विभाग
INCOME TAX DEPARTMENT

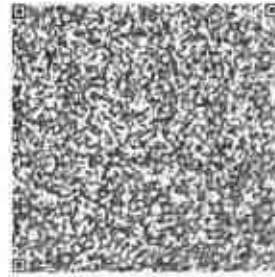


भारत सरकार
GOVT. OF INDIA



नाम / Name
RAHUL R P

स्थायी लेखा संख्या कार्ड
Permanent Account Number Card
BUTPR4050H



पिता का नाम / Father's Name
RAJENDRAN

जन्म की तारीख / Date of Birth
01/09/1995

हस्ताक्षर / Signature

In case this card is lost / found, kindly inform / return to :

Income Tax PAN Services Unit, UTITSL
Plot No. 3, Sector 11, CBD Belapur,
Navi Mumbai - 400 614.

इस कार्ड के खोने/पाने पर कृपया सूचित करें/लौटाएं :
आयकर पैन सेवा यूनिट, UTITSL
प्लॉट नं: ३, सेक्टर ११, सी.बी.डी.बेलापुर,
नवी मुंबई-४०० ६१४.

Aaykar Sampark Kendras

For Income Tax Related
Queries call Toll Free No.

1961

or

18001801961

604



UNIVERSITY OF MADRAS

FACULTY OF ENGINEERING

The Senate of the *University of Madras* hereby makes known that A. Jaganathan has been admitted to the Degree of Bachelor of Engineering Mining Branch, he having been certified by duly appointed Examiners to be qualified to receive the same at the Examination held in the month of January in the year 1965. He was placed in the Second Class.

Given under the seal of the University.

Senate House,
October 14, 1965

[Signature]
Registrar, University of Madras.

A. S. Muralidharan
[Signature]
Vice-Chancellor.

ATTESTED XEROX COPY

[Signature]
9/19/2005
VS. SARAVAMAN, M. Com., B.L.
Advocate & Notary Public
(Salem & Tirumakal District)

[Signature]



बर्न स्टैंडर्ड कंपनी लिमिटेड
(भारत सरकार का एक उपक्रम)
प्लॉट नं. No: 585
पेनम 636 005

TNGST. No. 2800006
CST. No. 408514/Slm/13-8-58
IAC. No. 147
AN ISO 9001-2000 COMPANY



Telephone: General 2341403/4/5/6
Sales: 2341406, Purchase: 2341402
Fax : 91-427-2341407
Telegram : PURN Salem
E-mail : slm_burnstd@sancharnet.in
BURN STANDARD CO. LTD.,
(A Subsidiary of BBUNL) (A Govt. of India U/T)
Post Bag. No. 565, SALEM - 636 005.

S/LB/cert/

01.10.2005

SERVICE CERTIFICATE

This is to certify that Shri A.Jaganathan, B.E., (Mining Engineer), was employed with us from from 01.08.1987. He has worked in different capacities and has resigned from the services of the company on 10.04.1984. At the time resignation he was working as Manager (Mines).

For Burn Standard Co. Ltd.,

S. Jason Soundararajan
S. Jason Soundararajan
DGM (Frel & Admn)

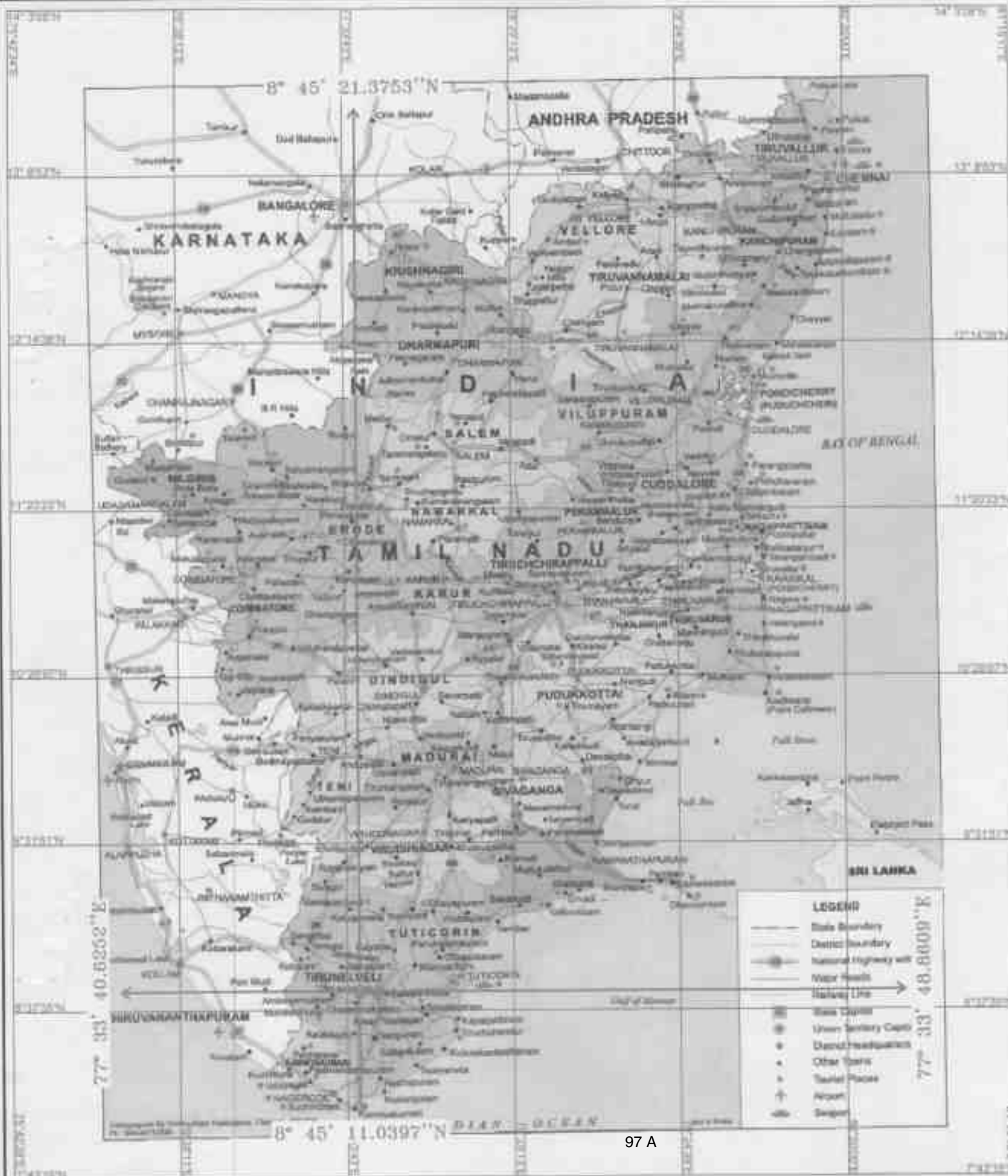


PLATE NO:1

DATE OF SURVEY : 31.08.2023

APPLICANT:

THIRU.R.P.RAHUL
S/O.RAJENDRAN
13-85.PATHITAVILAI
CHITHARAI VILLAGE,
VILAVANKODE TALUK,
KANYAKUMARI DISTRICT.

**LOCATION OF QUARRY
LEASE APPLIED AREA:**

S.F.NO : 719/1(P).720/1(P),etc.
EXTENT : 4.99.39 HA.
VILLAGE : ARIYANAYAGIPURAM PART-II
TALUK : CHERANMAHADEVI
DISTRICT : TIRUNELVELI
STATE : TAMIL NADU.

INDEX

Q. L.A. AREA : ●

TOPO SHEET NO. : 58 H/08

LATITUDE : 8°45'11.0397''N to 8°45'21.3753''N

LONGITUDE : 77°33'40.8252''E to 77°33'48.8609''E

LOCATION PLAN

SCALE 1:24,00,000

PREPARED BY:

THIS IS TO CERTIFY THAT THE INFORMATION IN THE
PLATE IS TRUE AND CORRECT TO THE
BEST OF MY KNOWLEDGE BASED UPON THE LEASHEEP
AUTHENTICATED
BY STATE GOVERNMENT

[Signature]
K. JAGANNATHAN, B.E., C.E., M.E.A., R.E.,
QUALIFIED PERSON
Under Rule 170(xv) of the Mines Act, 1952

PLATE NO: I-A

DATE OF SURVEY : 31.08.2023

APPLICANT:

THIRU.R.F. RAHUL
S/O. RAJENDRAN,
13-85, PATHITAVILAI,
CHITHARAI VILLAGE,
VILAVANKODE TALUK,
KANYAKUMARI DISTRICT.



LOCATION OF QUARRY

LEASE APPLIED AREA:

S.F. NO : 719/1(P), 720/1(P) etc..
EXTENT : 4.99.39 HA.
VILLAGE : ARIYANAYAGPURAM PART-II,
TALUK : CHERANMAHADEVI,
DISTRICT : TIRUNELVELI,
STATE : TAMIL NADU.

INDEX

CONVENTIONAL SYMBOLS

Contour lines showing the elevation	---	---	---
Water bodies (river, stream, lake)	~	~	~
High road	==	==	==
Low road	- - -	- - -	- - -
Boundary of the quarry lease	---	---	---
...

TOPO SKETCH OF QUARRY LEASE APPLIED AREA FOR 10km RADIUS

SCALE - 1:100000

PREPARED BY :

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[Signature]

A. JAGANNATHAN, J.C.T., M.B.E.A., M.I.T.,
QUALIFIED PERSON
Order No. 15033/Gen/247/MCR/2014





8° 50' 46.67"N



77° 28' 13.65"E

77° 39' 15.83"E

8° 39' 46.74"N

TOPO SHEET NO. : 58 H/29
LATITUDE : 8°45'11.0397"N to 8°45'21.3753"N
LONGITUDE : 77°33'40.8252"E to 77°33'48.8608"E
10KM RADIUS : 
Q.L. APPLIED AREA : 

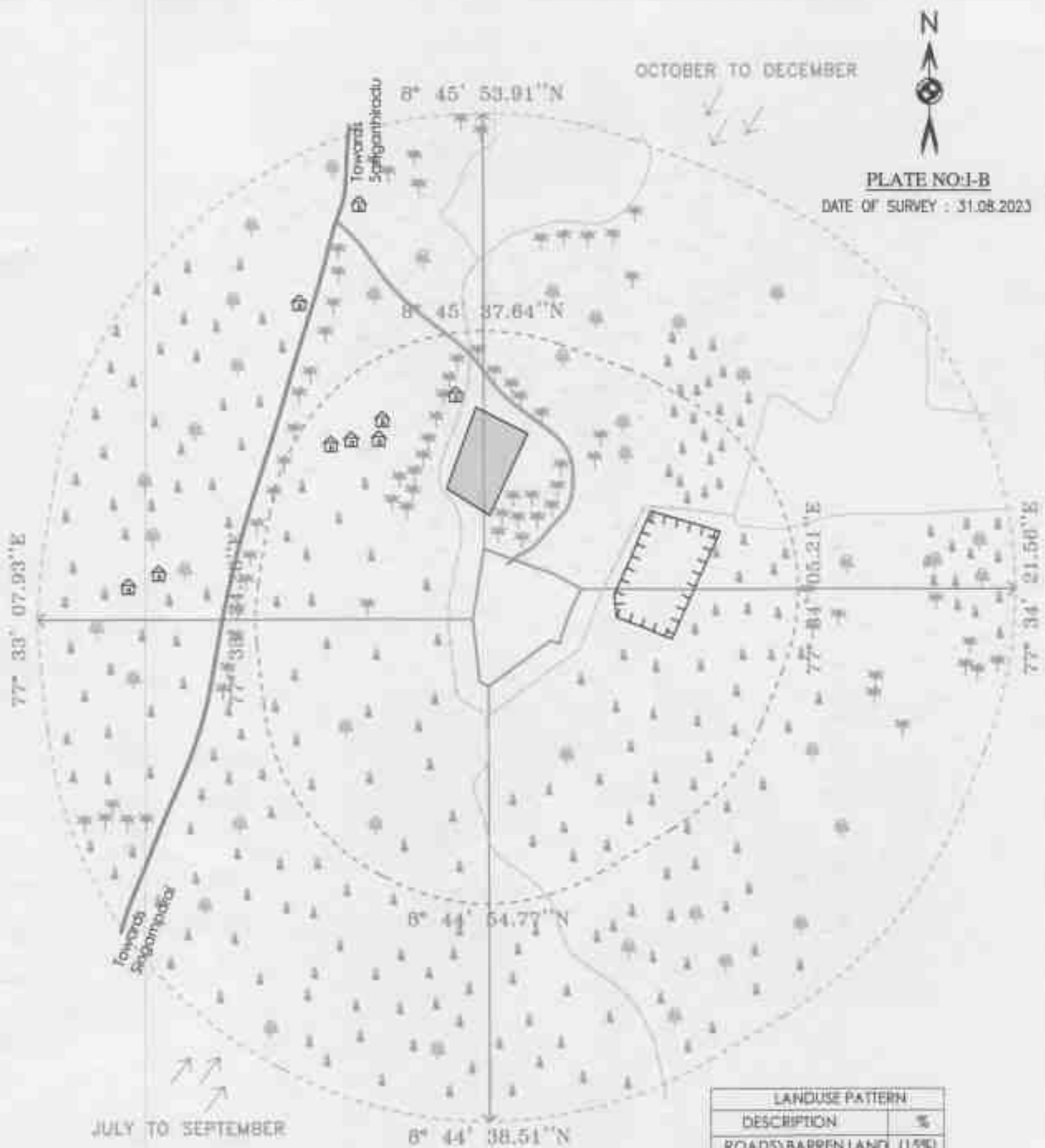


PLATE NO:J-B

DATE OF SURVEY : 31.08.2023

1Km Radius : 
 500m Radius : 
 Q.L.Applied Area : 
 TOPO SHEET NO. : 
 LATITUDE : 8° 45' 53.91'' N to 8° 44' 38.51'' N
 LONGITUDE : 77° 33' 07.93'' E to 77° 34' 21.58'' E



APPLICANT:
 THIRU.R.P.RAHUL
 S/O.RAJENDRAN,
 13-85.PATHITAVILAL
 CHITHARAI VILLAGE,
 VILAVANKODE TALUK,
 KANYAKUMARI DISTRICT.

LOCATION OF QUARRY
LEASE APPLIED AREA:
 S.F.NO : 719/1(P),720/1(P),etc..
 EXTENT : 4.99.39 HA.
 VILLAGE : ARYANAYA GIPURAM PART-II
 TALUK : CHERANMAHADEVI,
 DISTRICT : TIRUNELVELI,
 STATE : TAMIL NADU.

INDEX

- APPROACH ROAD 
- VILLAGE ROAD 
- HABITATION 
- TREES 
- SEASONAL AGRICULTURAL LAND 
- PIT 
- WIND DIRECTION 
- ODAI 
- TANK 
- CRISHER PLANT 
- BARREN LAND 

ENVIRONMENTAL AND LANDUSE PLAN (FOR 1Km RADIUS)

SCALE- 1:10,000

PREPARED BY:
 THIS IS TO CERTIFY THAT THE INFORMATION IN THIS PLATE IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE BASED UPON THE LEGENDARY AUTHENTICATED BY STATE GOVERNMENT.

 A JAGANNATHAN, B.E., P.C.E., M.N.C.A., M.E.C., QUALIFIED PERSON
 Under Rule 15(D)(a)(ii)(b) of MOC 2019

LANDUSE PATTERN	
DESCRIPTION	%
ROADS\BARREN LAND	(15%)
HABITATION	(01%)
TREES	(15%)
SEASONAL AGRI LAND	(60%)
PIT\TANK\ODAI	(15%)



PLATE NO: I-C

DATE OF SURVEY : 31.08.2025

APPLICANT

By
Assistant Director
of Geology & Mining
THIRU.R.P. RAHUL,
S/O. RAJENDRAN,
13-85, PATHITTA VIL,
Chirunelveli Dist
CHITHARAI VILLAGE,
VILAVANKODE TALUK,
KANYAKUMARI DISTRICT.

LOCATION OF QUARRY

LEASE APPLIED AREA:

S.F.NO : 719/1(P), 720/1(P), etc.,
EXTENT : 4.99.39 HA.
VILLAGE : ARIYANAYAGIPURAM PART-II,
TALUK : CHERANMAHADEVI,
DISTRICT : TIRUNELVELI,
STATE : TAMIL NADU.

INDEX

Q.L. APPLIED AREA



VILLAGE ROAD



MAJOR ROAD



APPROACH ROAD




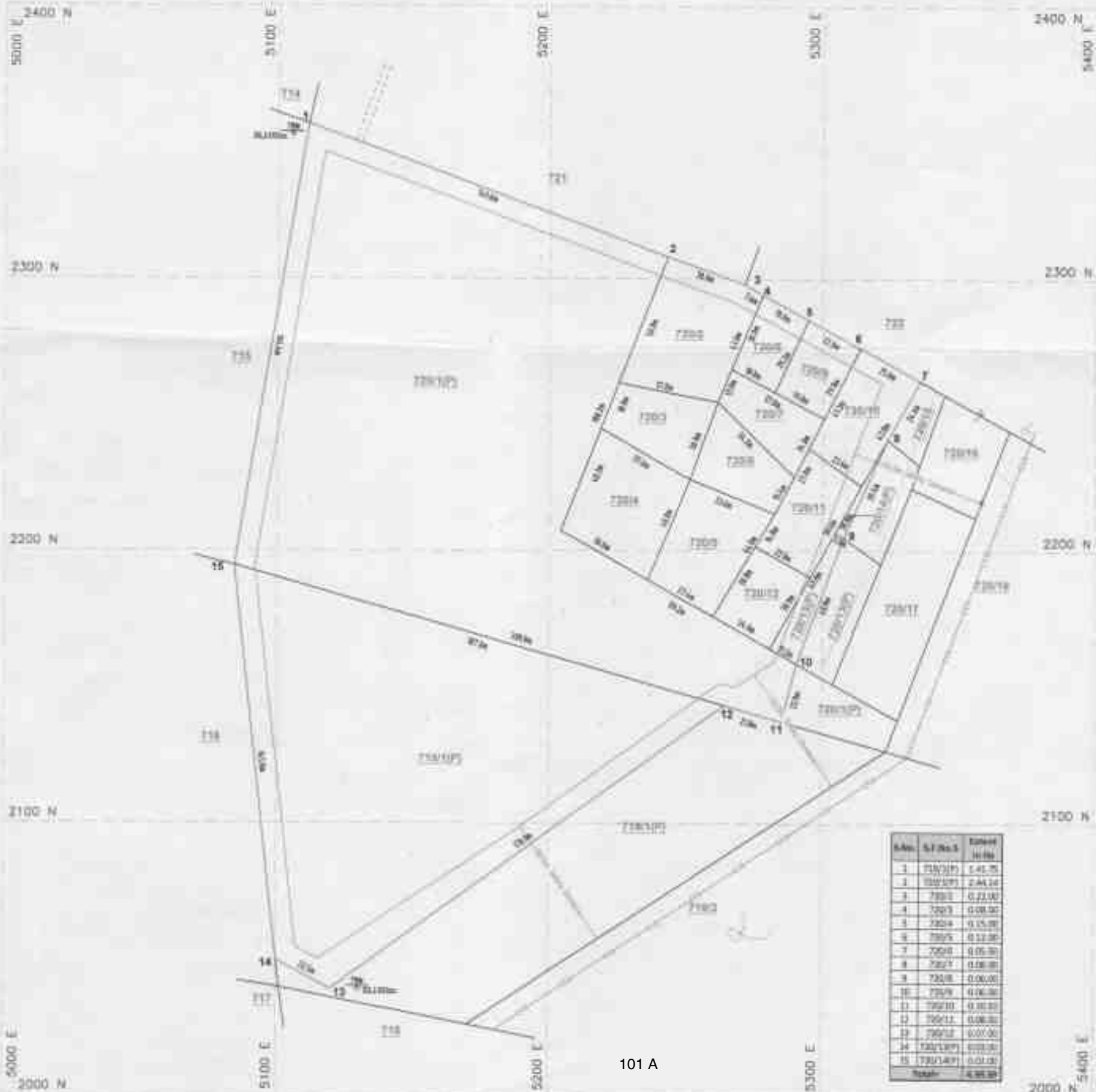
ROUTE MAP

Not To Scale

PREPARED BY :

THIS IS TO CERTIFY THAT THE INFORMATION IN THIS
PLATE IS TRUE AND CORRECT TO THE
BEST OF MY KNOWLEDGE BASED UPON THE LEASEMAP
AUTHENTICATED
BY STATE GOVERNMENT


A. JAGANATHAN, B.E., F.C.C., M.M.E.A., M.I.E.,
QUALIFIED PERSON
Under Rule 15(i)(c) and (b) of MCR, 2016



BOUNDARY CO-ORDINATED

S.N.	LATITUDE	LONGITUDE
1	8° 45' 21.5712" N	77° 32' 41.5280" E
2	8° 45' 18.7622" N	77° 32' 45.8430" E
3	8° 45' 18.4342" N	77° 32' 46.7612" E
4	8° 45' 15.3034" N	77° 32' 46.8261" E
5	8° 45' 14.0017" N	77° 32' 47.0221" E
6	8° 45' 14.6615" N	77° 32' 46.1481" E
7	8° 45' 14.0244" N	77° 32' 46.8821" E
8	8° 45' 13.5817" N	77° 32' 46.4651" E
9	8° 45' 14.3817" N	77° 32' 47.8221" E
10	8° 45' 14.8822" N	77° 32' 47.3812" E
11	8° 45' 14.3022" N	77° 32' 47.1281" E
12	8° 45' 14.3821" N	77° 32' 46.4641" E
13	8° 45' 11.8221" N	77° 32' 41.7221" E
14	8° 45' 11.3821" N	77° 32' 41.1221" E
15	8° 45' 14.1021" N	77° 32' 43.8221" E

SCALE: 1/1000 - UTM - WGS84, ZONE 43B

STATE NO: 11
DATE OF SURVEY: 21/08/2020

APPLICANT:
THIRU P. RAJESH
S/O K. JENDRAH
1345 PADHITHAVAI
CHITHARAI VELAGE,
VELAYANODE TALUK,
ARANYAKUDUR DISTRICT.

LOCATION OF QUARRY LEASE APPLIED AREA:
S.NO: 111 (PT. 7201) (Pt. 4)
EXTN: 4.89.39 HA.
VELAGE: ARYANAKUDUR, PART A
TALUK: CHITHARAI
DISTRICT: TRICHY
DATE: 13/08/2020

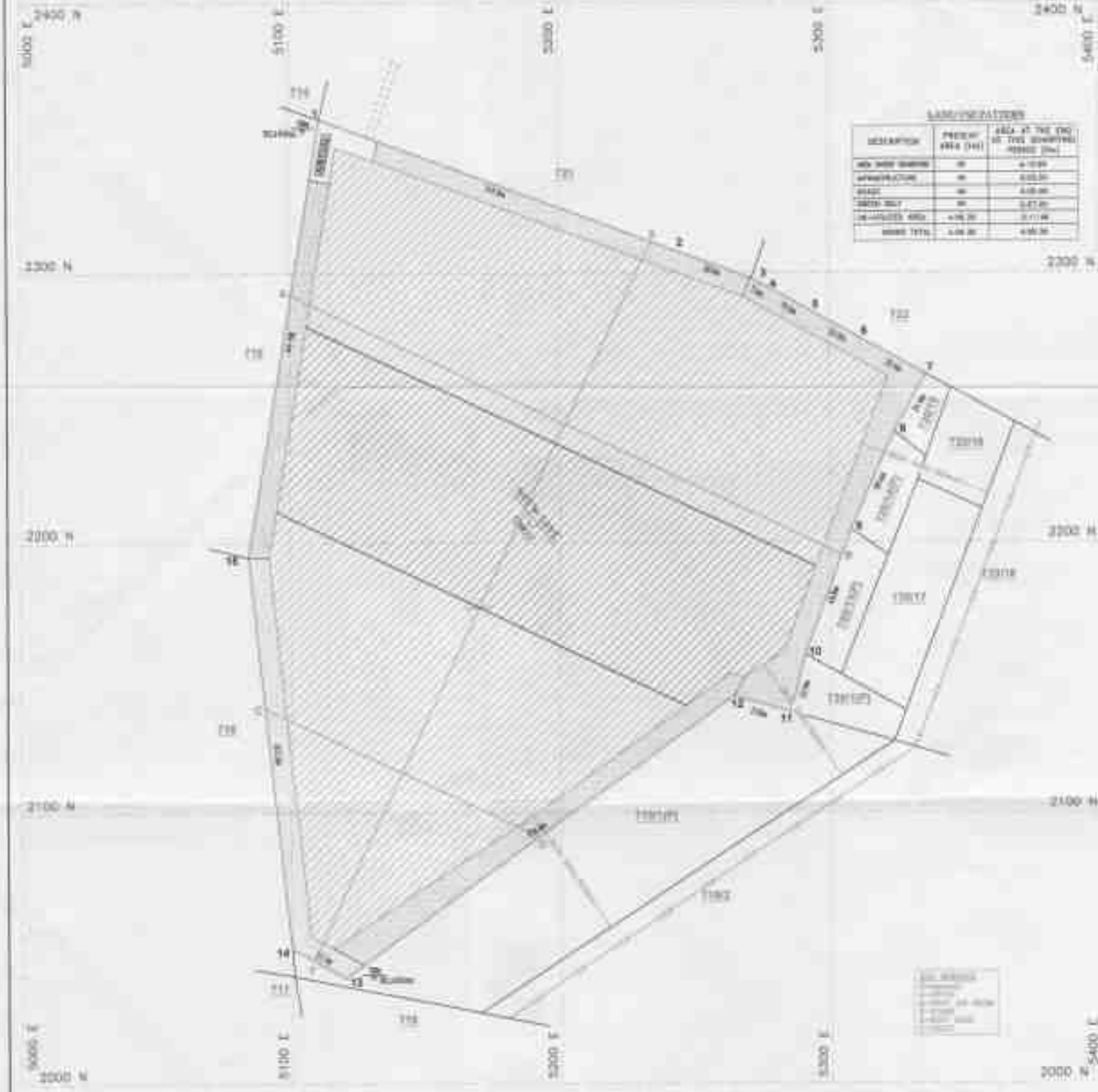
INDEX

Q.L. APPLIED AREA BOUNDARY	—————
7.5M & 10M SAFETY DISTANCE	—————
TEMPORARY BENCH MARK	⊕
APPROACH ROAD	—————
GRAVE	⊕
SCREW	⊕
QUA	⊕

QUARRY LEASE & SURFACE PLAN
SCALE: 1:1000

PREPARED BY:
M. S. SURESH
S/O M. S. SURESH
1345 PADHITHAVAI
CHITHARAI VELAGE,
VELAYANODE TALUK,
ARANYAKUDUR DISTRICT.

S.No.	S.T. No. 1	Area in Ha.
1	7201(P)	1.45.75
2	7202(P)	2.44.14
3	7203	0.22.00
4	7204	0.08.30
5	7205	0.15.00
6	7206	0.12.30
7	7207	0.05.30
8	7208	0.08.00
9	7209	0.00.00
10	7210	0.06.30
11	7211	0.05.00
12	7212	0.08.00
13	7213	0.07.00
14	7214(P)	0.03.00
15	7215(P)	0.01.00
Total		6.88.00



LAND-USE

DESCRIPTION	PRECISE AREA (HA)	AREA AT THE END OF THE QUARRY (HA)
NEW ROAD NETWORK	0.21	4.75
INFRASTRUCTURE	0.00	0.00
ROAD	0.00	0.00
ROADS BUILT	0.00	0.00
UNDEVELOPED AREA	4.79	0.00
TOTAL TOTAL	5.00	4.75



BOUNDARY COORDINATES

LINE	LATITUDE	LONGITUDE
1	0° 42' 24.2000"N	77° 32' 41.3000"E
2	0° 42' 24.2000"N	77° 32' 40.8000"E
3	0° 42' 24.2000"N	77° 32' 40.3000"E
4	0° 42' 24.2000"N	77° 32' 40.8000"E
5	0° 42' 24.2000"N	77° 32' 41.3000"E
6	0° 42' 24.2000"N	77° 32' 41.8000"E
7	0° 42' 24.2000"N	77° 32' 42.3000"E
8	0° 42' 24.2000"N	77° 32' 42.8000"E
9	0° 42' 24.2000"N	77° 32' 43.3000"E
10	0° 42' 24.2000"N	77° 32' 43.8000"E
11	0° 42' 24.2000"N	77° 32' 44.3000"E
12	0° 42' 24.2000"N	77° 32' 44.8000"E
13	0° 42' 24.2000"N	77° 32' 45.3000"E
14	0° 42' 24.2000"N	77° 32' 45.8000"E
15	0° 42' 24.2000"N	77° 32' 46.3000"E

Scale: 1:50000

PLATE NO. 4
DATE OF SURVEY: 11/26/2008

APPLICANT:
MUSCATI GROUP
SAGRA JAWHAR
THIRUVAITHIYALAI
CROWN VILLAGE
VILVAHINDI TOWER
AKKADIMAR DISTRICT

LOCATION OF QUARRY
LEASE APPLIED AREA:
SITE NO: 175/1/5/12/17/1/1/1
SITE: 4.79 HA
VILLAGE: ARIVAYALARIPURAM PART B
TALUK: CHIRAYANAPURAM
DISTRICT: THIRUVARUR
STATE: TAMIL NADU

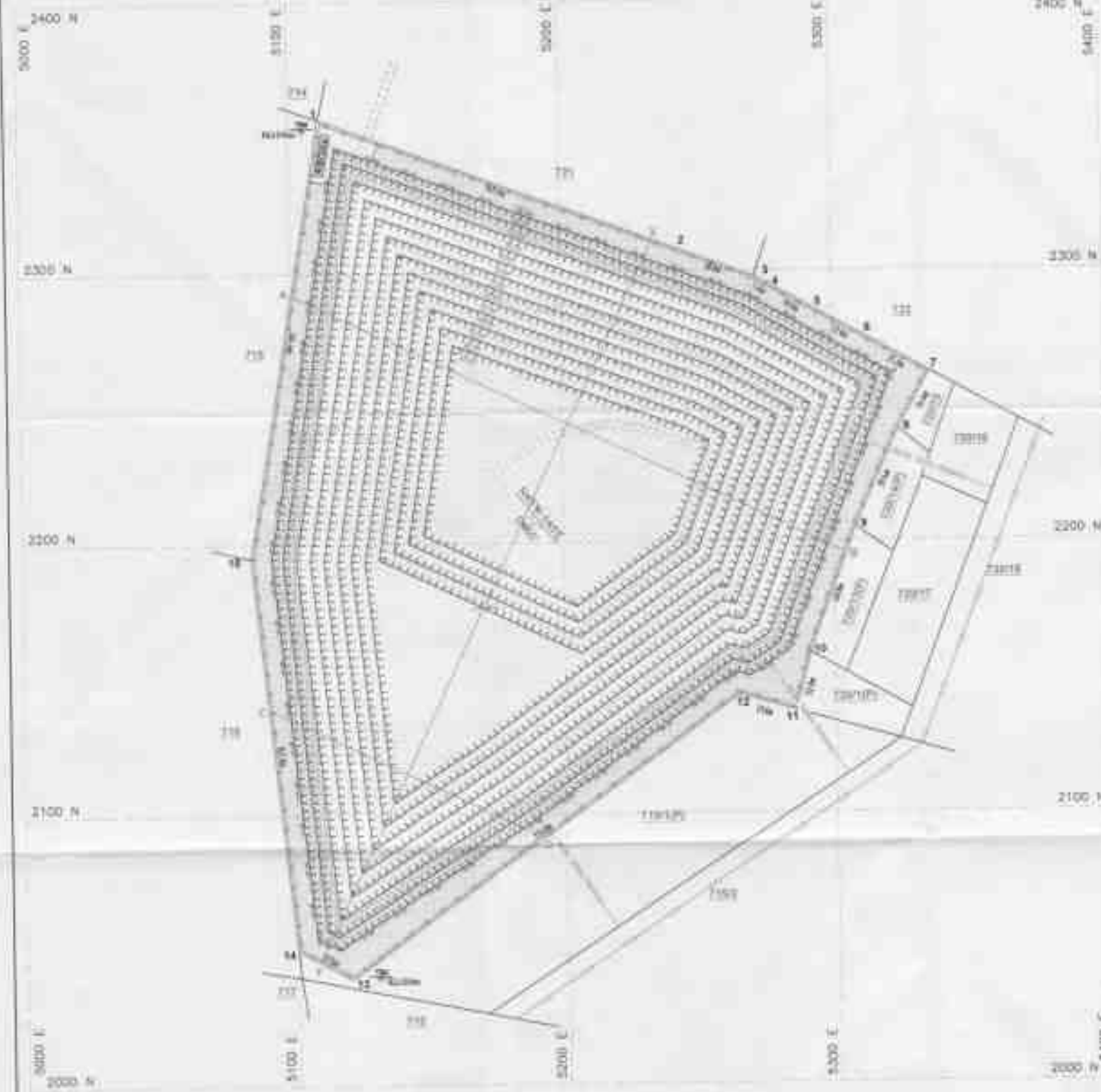
TOOLS
SIL: APPLIED AREA BOUNDARY
FERN & SH: SAFETY SERVICE
SURVEYING INSTRUMENTS: 34
APPROXIMATE ROAD

TOPOGRAPHY GEOLOGICAL
REARVIEW DEVELOPMENT & PRODUCTION PLAN & SECTIONS
SCALE: 1:500

REVISIONS



- 1. N. ELEVATION
- 2. N. ELEVATION
- 3. N. ELEVATION
- 4. N. ELEVATION
- 5. N. ELEVATION
- 6. N. ELEVATION
- 7. N. ELEVATION
- 8. N. ELEVATION
- 9. N. ELEVATION
- 10. N. ELEVATION
- 11. N. ELEVATION
- 12. N. ELEVATION
- 13. N. ELEVATION
- 14. N. ELEVATION
- 15. N. ELEVATION



BOUNDARY CO-ORDINATES

S.N.	Latitude	Longitude
1	5° 47' 21.2500\"N	77° 22' 41.2200\"E
2	5° 47' 16.5000\"N	77° 22' 45.8000\"E
3	5° 47' 10.0000\"N	77° 22' 46.7000\"E
4	5° 47' 02.5000\"N	77° 22' 46.7000\"E
5	5° 47' 00.0000\"N	77° 22' 45.0000\"E
6	5° 47' 00.0000\"N	77° 22' 42.5000\"E
7	5° 47' 00.0000\"N	77° 22' 41.0000\"E
8	5° 47' 00.0000\"N	77° 22' 40.0000\"E
9	5° 47' 00.0000\"N	77° 22' 40.0000\"E
10	5° 47' 00.0000\"N	77° 22' 40.0000\"E
11	5° 47' 00.0000\"N	77° 22' 41.0000\"E
12	5° 47' 00.0000\"N	77° 22' 41.0000\"E
13	5° 47' 00.0000\"N	77° 22' 41.0000\"E
14	5° 47' 00.0000\"N	77° 22' 41.0000\"E
15	5° 47' 00.0000\"N	77° 22' 41.0000\"E

PLATE NO. 103

DATE OF SHEET: 12-08-2024
APPLICANT
 HREESH BIRBA
 DO KALSHRAMA
 TRACHYPTALKA
 CHIMPAU VILLAGE
 HANAVARDE TALUKA
 HANAVARDE DISTRICT

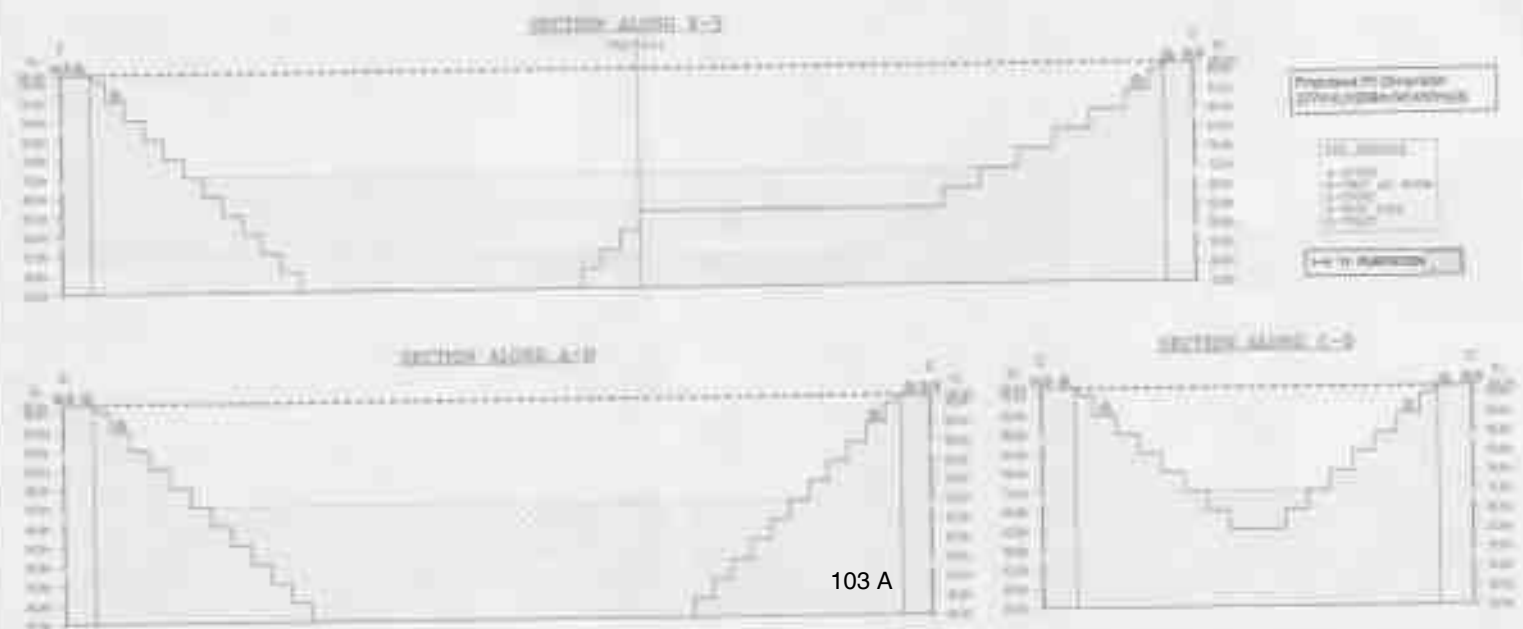
LOCATION OF QUARRY
QUARRY AREAS
 STATE: KARNATAKA
 DISTRICT: CHAMARAJANUR
 VILLAGE: HANAVARDE
 TALUKA: HANAVARDE
 DISTRICT: HANAVARDE
 STATE: KARNATAKA

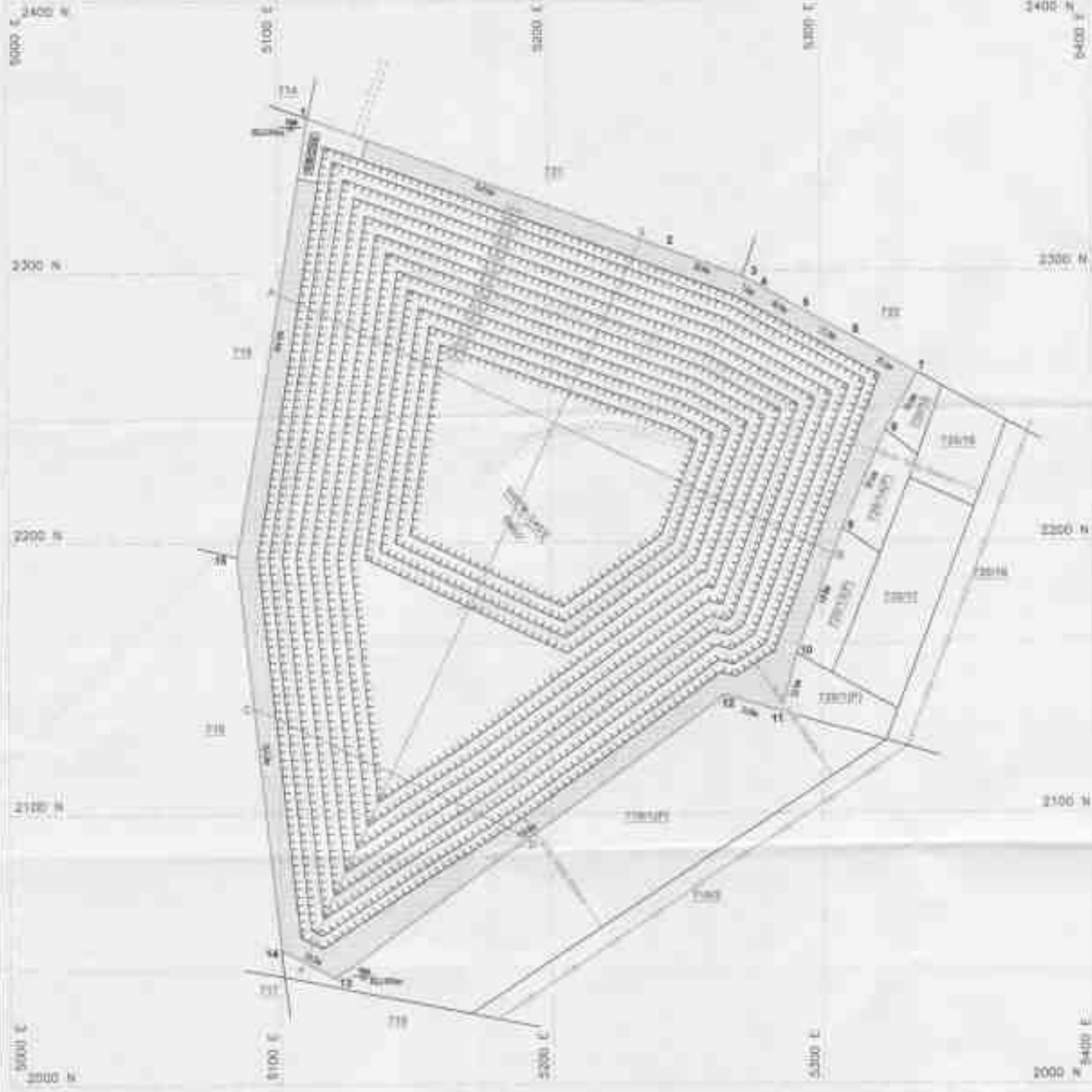
KEY

QUARRY AREA BOUNDARY	[Symbol]
1:24 & 3:04 SLOPE INDICATOR	[Symbol]
EMPHASIS BENCH MARK	[Symbol]
APPROACH ROAD	[Symbol]
DOH	[Symbol]
WIRE AND PIPE	[Symbol]
QUARRY PIT	[Symbol]
QUARRY ROAD	[Symbol]
WELL	[Symbol]
NEEDLE LANTERN	[Symbol]
WELL SERVICE PIPE	[Symbol]
PROTECTIVE CURBING PIPE	[Symbol]
RAIN WATER SCRAPE	[Symbol]
REINFORCED CONCRETE	[Symbol]
BRICK	[Symbol]
PROPOSED DRAINAGE CHANNEL	[Symbol]

PROGRESSIVE QUARRY CLOSURE PLAN & SECTIONS
 SCALE: 1:500

APPROVED BY
 [Signature]
 PROJECT ENGINEER
 DEPARTMENT OF MINES & GEOLGICAL SURVEY
 HANAVARDE DISTRICT





INDUSTRIAL CO-ORDINATES

LINE	CORNER	COORDINATE
1	E	812007N
2	E	813007N
3	E	814007N
4	E	815007N
5	E	816007N
6	E	817007N
7	E	818007N
8	E	819007N
9	E	820007N
10	E	821007N
11	E	822007N
12	E	823007N
13	E	824007N
14	E	825007N
15	E	826007N

DATE: 1/10/11 BY: W. HARRIS, D. H. H.

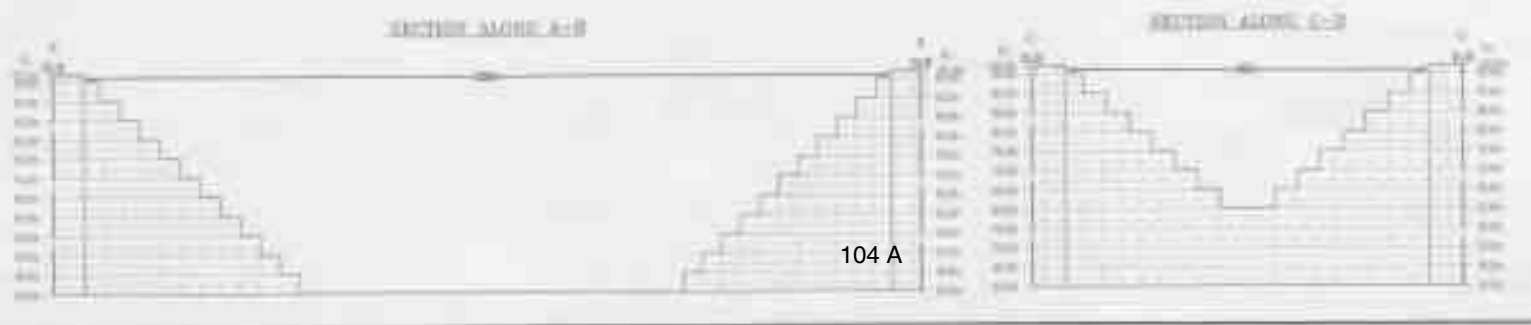
PLATE BOOK
 DATE OF SURVEY: 11/08/11
APPLICANT:
 THE F. FRANK
 VEGANZORAN
 THE PARTIAL
 CHIRAKI PLAGE
 VEYANHOE TRUK
 KAYEYORAN DISTRICT

LOCATION OF QUARRY
EDGE APPLIED AREA
 LEAD: 1747PL/1207PL/10
 ROAD: 4812/14
 PLACE: ARYANAT/KOPURAN TRAKA
 TRUK: CHIRAKAWHON
 DISTRICT: CHIRAKI
 CODE: 1446 NOL

- KEY**
- ALL APPLIED AREA BOUNDARY
 - 1:24 & 1:2400 SCALE
 - ROADWAY BRICK MARK
 - APPROXIMATE
 - GRADE
 - CONC
 - DOH
 - DRILL AND SP
 - ROUGH WORK
 - QUARRY W
 - QUARRY ROAD

CONCEPTUAL PLAN & SECTIONS
 SCALE: 1:1000

REMARKS:
 THE QUARRY IS TO BE OPERATED IN ACCORDANCE WITH THE REGULATIONS OF THE MINISTRY OF LANDS AND SURVEY, GOVERNMENT OF GUYANA.
 THE QUARRY IS TO BE OPERATED IN ACCORDANCE WITH THE REGULATIONS OF THE MINISTRY OF LANDS AND SURVEY, GOVERNMENT OF GUYANA.



Hydrogeological Report

Rough Stone and Gravel Quarry Over an
extent of 4.99.39Ha of Patta lands in S.F.Nos.719/1(Part),
720/1(Part), 720/2, 720/3, 720/4, 720/5, 720/6, 720/7,
720/8, 720/9, 720/10, 720/11, 720/12, 720/13(Part) and
720/14(Part) of Vadakku Ariyanayagipuram-II Village,
Cheranmahadevi Taluk, Tirunelveli District, Tamil Nadu State.

HYDROGEOLOGICAL REPORT FOR VADAKKU

ARIYANAYAGIPURAM-II ROUGH STONE AND GRAVEL QUARRY

1. INTRODUCTION

NAME OF THE APPLICANT WITH ADDRESS-

Name of the applicant : **Thiru. R. P. Rahul,**
S/o. Rajendran,
Address : No. 13-85, Pathittavilai,
Chitharal Village, Vilavankode Taluk,
Kanniyakumari District.
State with Pin Code : Tamil Nadu – 629 151
Mobile No : +91 83003 39460
Aadhaar No : 4716 5108 6793 (Annexure No. IX)
Email ID : kkmbluemetal@gmail.com

DETAILS OF THE AREA

Land Classification : Patta land
Survey No : 719/1(Part), 720/1(Part), 720/2, 720/3, 720/4,
720/5, 720/6, 720/7, 720/8, 720/9, 720/10,
720/11, 720/12, 720/13(Part) and 720/14(Part)
Extent : 4.99.39Ha
Village : Vadakku Ariyanayagipuram-II
Taluk : Cheranmahadevi,
District : Tirunelveli

The Client requires detailed information on ground water occurrences at proposed project site of Rough stone and gravel quarry. The objective of the present study is to assess the availability of groundwater and comment on aspects of depth to potential aquifers, aquifer availability and type, possible yields and water quality. For this purpose all available hydrogeological information of the areas has been analyzed, and a geophysical survey was done.

The investigations involved hydrogeological, geophysical field investigations and a detailed study in which the available relevant geological and hydrogeological data were collected, analyzed, collated and evaluated within the context of the Client's requirements. The data sources consulted were mainly:

- a) Central Ground Water Board (CGWB) Data
- b) State & District Geological and Hydrogeological Reports and Maps.
- c) Technical reports of the area by various organizations.

2. SCOPE OF THE WORKS –

The scope of works includes:

- ❖ Site visits to familiarize with the project areas. Identify any issues that might impact the Ground Water Scenario due to proposed mining activities.
- ❖ To obtain, study and synthesize background information including the geology, hydrogeology and existing borehole data, for the purpose of improving the quality of assessment and preparing comprehensive hydrogeological reports,
- ❖ To carry out hydrogeological evaluation and geophysical investigations in the selected sites in order to determine potential for groundwater at project site.
- ❖ To prepare hydrogeological survey reports in conformity with the provisions of the rules and procedure outlined by the Central Ground Water Board (CGWB), by Assessment of water quality and potential infringement of National standards, Assessment of availability of groundwater and Impact of proposed activity on aquifer, water quality and other abstractors.

3. BACKGROUND INFORMATION

Geographical information of the study area-

The investigated site falls in the Toposheet No: **58 H/09** Latitude between 08°45'11.0397"N to 08°45'21.3753" and Longitude between 77°33'40.6252"E to 77°33'48.8609"E on WGS datum-1984.

GEOMORPHOLOGY

Tirunelveli district is bordered by Western Ghats (Ridge and valley complex) in the West. A major part of the district constitutes a plain terrain with a gentle slope toward East and Southeast, except for the hilly terrain in the west the general elevation of the area varies from less than 10 to 1408 m msl (Tulukkarparai hill range)

The prominent geomorphic units identified in the district is Structural Hill, Bazada Zone, Valley Fill, Flood Plain, Pediment, Shallow buried pediment, Deep buried pediment and Coastal Plain.

SOILS

Soils in the area have been classified into i) Deep Red soil ii) Red Sandy Soil. iii) Block Cotton Soil. iv) Saline Coastal Alluvium, and v) River Alluvium. Major parts of the

area are covered by Deep Red soil and are found in Sivakasi, Tenkasi, Senkottai and Sankarankoil blocks and it is suitable for cultivating coconut and palmyrah trees. Red sandy soil also in reddish yellow in colour and are found in Nanguneri, Ambasamudram, and Radhapuram blocks and it is suitable for cultivating groundnut, millets and pulses etc., The Block Cotton Soil is found in Tirunelveli, Palayankottai and Sankarankoil blocks, and it is suitable for cultivating Paddy, Ragi, and Cholam etc., The Saline Coastal Alluvium are dark grey to deep brown in colour and spread over the Nanguneri and Radhapuram blocks. The River alluvial soils occur along the river courses of Tamrabarani and Chittar River covering in the blocks Tirunelveli and Palayankottai and it is suitable for cultivating Groundnut, Chillies and Cumbu.

RAINFALL AND CLIMATE

The district receives the rain under the influence of both southwest and northeast monsoons. The northeast monsoon chiefly contributes to the rainfall in the district. Rainfall data from IMD stations over the period 1901-2000 were utilized and a perusal of the data shows that the normal annual rainfall over the district is 879 mm. It is the maximum around Senkottai, Sankarankoil and all along the coast and it decreases towards inland. The areas around Ambasamudram, Tirunelveli and Kadayanallur receive minimum rainfall.

The district enjoys a Sub tropical climate. The period from May to June is generally hot and dry. The weather is pleasant during the period from December to January. The relative humidity is on an average between 79 and 84%. The mean minimum temperature is 22.9°C and mean maximum daily temperature is 33.5°C respectively.

4. GEOLOGY

Regional Geology of Tirunelveli district

Southern Granulite Terrain (SGT) of Tamil Nadu lying south of Palaghat-Cauvery shear zone has been divided into two major tectonic blocks by the Madurai block and Nagercoil-Trivandrum Block in the south. It is separated by WNW-ESE trending Achankovil-Tambaraparani Lineament. Tirunelveli and Thothukudi are significantly the only districts in the state to witness the geology and structure of both the blocks.

Tirunelveli district represents a well-developed lithopackage of meta-sedimentary sequence inter banded with charnockite Group of rocks. The rock types exposed are of quartzite, calc-granulite, garnet-biotite-sillimanite gneiss, garnet quartzo-feldspathic gneiss and garnetbiotite- cordierite gneiss belonging to Khondalite Group of rock. Charnockite and pyroxene granulite are the Charnockite Group. Hornblende-biotite gneiss belongs to Migmatitic Complex. Besides, basic intrusive (pyroxenite) and acid intrusive (granite) are

noticed. The younger intrusive are represented by pegmatite and quartz veins. Evidence of development of incipient / patchy charnockite along the shear plane is noticed in the district along the Western Ghat high hills.

Tirunelveli and Madurai district the major band of crystalline limestone with lenses of calc-gneiss and calc-ganulite associated with gneisses and quartzite bands to the north of Talaiyuttu around Seliyanur-Nellaitiruttu in Tirunelveli district. Tungsten upto 600 ppm has been recorded in crystalline limestone from the area. A Calc tufa occurrence in the areas of Uttumalai and Reddiyarpatti shows 35% of CaO and is restricted to a few patches with total areal extent of 2.85 Sq.km.

Stratigraphic Sequence of Tirunelveli District

↑	Recent-SubRecent		Soil and alluvium, calcrete
			Quartz and pegmatite vein
			Incipient charnockite
	700-550 Ma	Younger intrusive	Acidic intrusive – Granite Basic intrusive (Pyroxenite, Ultramafic/mafic rocks)
	2200-2550 Ma	Migmatite Group	Hornblende-biotite gneiss
2600 Ma	Charnockite Group	Meta gabbro (older Intrusive) Charnockite Pyroxene granulite	
	Khondalite Group	Garnet-biotite-quartzofeldspathic gneiss, Garnet-biotite gneiss Garnet –biotite –Sillimanite gneiss ± cordierite gneiss, Crystalline limestone, Calc granulite Quartzite.	

Tirunelveli district, bulk of crystalline limestone for cement industry comes from Ramayyanpatti, Talaiyuttuand Pandapalli village. Limestone and kankar deposit near Vijayapatti in the district. Gypsum associated with kankar is reported from a few localities in the salt pans, located along the east coast between Veppalodai and Ayyanapuram in the district. Minor graphite occurrences are located in Kurinjankulam and Palakottai Hill. Rough stone (mostly charnockite and Hbl-bt gneiss) are majorly concentrated in Alangulam, Radhapuram, Nanguneri, Manur and Sankarankovil Taluks in the district.

Rich deposits of garnet and ilmenite sand occurs along the coast part of Radhapuram Taluk, in Tirunelveli district. Vijayapatti, Kuttankuzhi and Idindakarai areas show notable garnet and ilmenitesands occurrences. Red garnet sand occurs significantly along Nambiarriver. The main sources of the heavy minerals are found to garnetiferrous quartzo-feldspathic gneiss and garnet biotites illimanite gneiss of Khondalite Group of rocks.

5. GEOPHYSICAL INVESTIGATION METHODS

A variety of methods are available to assist in the assessment of geological sub-surface conditions. The main emphasis of the fieldwork undertaken was to determine the thickness and composition of the sub-surface formations and to identify water-bearing zones. This information was principally obtained in the field using, and vertical electrical soundings (VES). The VES probes the resistivity layering below the site of measurement. This method is described below.

Resistivity Method

Vertical electrical soundings (VES) were carried out to probe the condition of the sub-surface and to confirm the existence of deep groundwater. The VES investigates the resistivity layering below the site of measurement.

Basic Principles

The electrical properties of rocks in the upper part of the earth's crust are dependent upon the lithology, porosity, and the degree of pore space saturation and the salinity of the pore water. Saturated rocks have lower resistivity than unsaturated and dry rocks. The higher the porosity of the saturated rock, or the higher the salinity of the saturating fluids, the lower is the resistivity. The presence of clays and conductive minerals also reduces the resistivity of the rock.

The resistivity of earth materials can be studied by measuring the electrical potential distribution produced at the earth's surface by an electric current that is passed through the earth. Current is moved through the subsurface from one current electrode to the other and the potential difference is recorded as the current passes. From this information, resistivity values of various layers are acquired and layer thickness can be identified.

The apparent resistivity values determined are plotted as a log function versus the log of the spacing between the electrodes. These plotted curves identify thickness of layers. If there are multiple layers (more than 2), the acquired data is compared to a master curve to determine layer thickness.

This method is least influenced by lateral in-homogeneities and capable of providing higher depth of investigation.

The resistance R of a certain material is directly proportional to its length L and cross-sectional area A , expressed as:

$$R = R_s * L/A \text{ (in Ohm)}$$

Where R_s is known as the specific resistivity (characteristic of the material and independent of its shape or size)

With Ohm's Law,

$$R = dV/I \text{ (Ohm)}$$

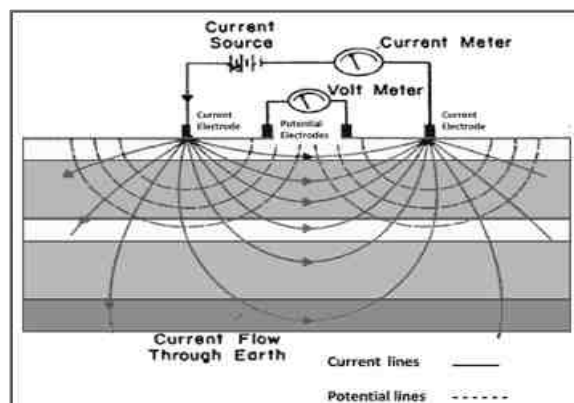
Where dV is the potential difference across the resistor and I is the electric current through the resistor. The specific resistivity may be determined by:

$$R_s = (A/L) * (dV/I) \text{ (in Ohm m)}$$

Vertical Electrical Sounding (VES)

When carrying out a resistivity sounding, current is led into the ground by means of two electrodes. With two other electrodes, situated near the center of the array, the potential field generated by the current is measured. From the observations of the current strength and the potential difference, and taking into account the electrode separations, the ground resistivity can be determined. During a resistivity sounding, the separation between the electrodes is step-wise increased (known as a Schlumberger Array), thus causing the flow of current to penetrate greater depths. When plotting the observed resistivity values against depth on double logarithmic paper, a resistivity graph is formed, which depicts the variation of resistivity with depth. This graph can be interpreted with the aid of a computer, and the actual resistivity layering of the subsoil is obtained. The depths and resistivity values provide the hydro geologist with information on the geological layering and thus the occurrence of groundwater.

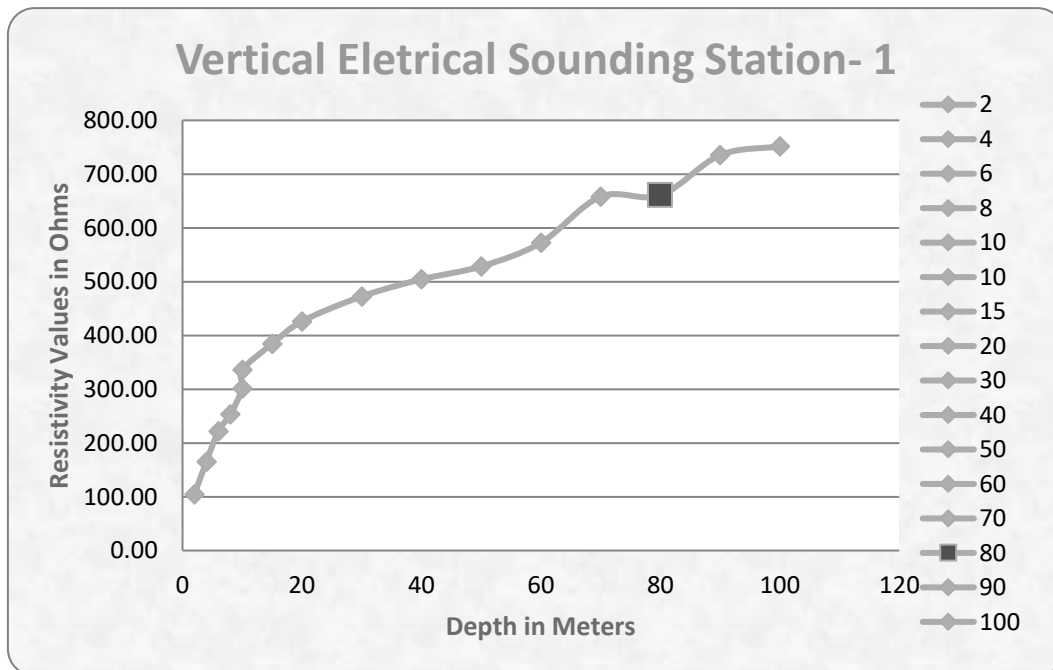
Vertical Electrical sounding method



S

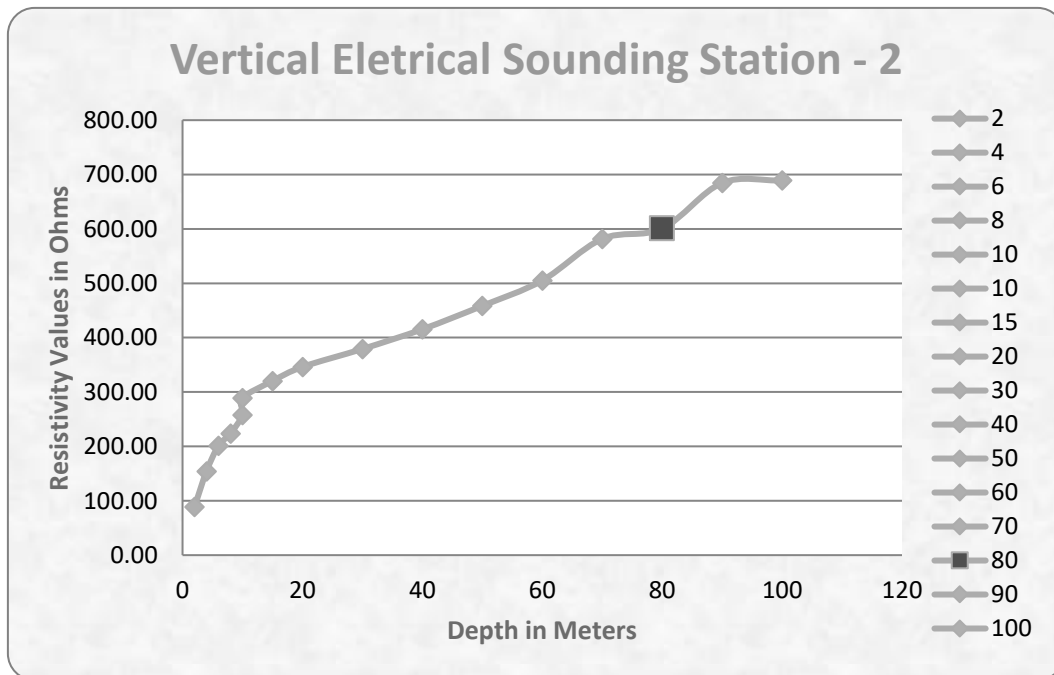
Vertical Electrical Sounding and Graphs

Vertical Electrical Sounding Station - 1					
GPS Coordinates - 08°45'11.3863"N 77°33'41.1058"E					
S.No	Ab/2(m)	Mn/2(m)	Geometrical Factor (G)	Resistance Value in Ohms [R]	Apparent Resistance in Ohms
1	2	1	4.73	22.25	104.7975
2	4	1	23.55	7.02	165.321
3	6	1	54.75	4.08	221.4485
4	8	1	98.91	2.56	253.2096
5	10	1	155.45	1.94	300.0185
6	10	5	23.56	14.26	335.823
7	15	5	62.8	6.11	383.708
8	20	5	118.75	3.62	426.255
9	30	5	274.75	1.75	480.8125
10	40	5	494.55	1.02	504.441
11	50	5	778.15	0.68	528.462
12	60	5	1120.55	0.49	550.0495
13	70	5	1533.75	0.43	658.2225
14	80	5	2005.75	0.32	640.56
15	90	5	2537.55	0.29	735.3095
16	100	5	3132.15	0.24	751.716



◆ Above the Vertical electrical sounding graphs purple color is major fracture zone

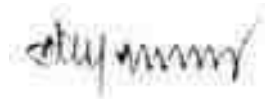
Vertical Electrical Sounding Station - 2					
GPS Coordinates 08°45'.18.2540"N 77°33'48.8609"E					
S.No	Ab/2(m)	Mn/2(m)	Geometrical Factor (G)	Resistance Value in Ohms [R]	Apparent Resistance in Ohms
1	2	1	4.75	22.24	104.7504
2	4	1	23.65	7.01	165.0855
3	6	1	54.90	4.02	220.899
4	8	1	98.91	2.55	252.2205
5	10	1	155.40	1.92	298.464
6	10	5	23.55	14.25	335.5875
7	15	5	62.8	6.12	384.336
8	20	5	117.75	3.63	427.4325
9	30	5	275.75	1.72	472.57
10	40	5	494.55	1.02	504.441
11	50	5	777.15	0.68	528.462
12	60	5	1120.55	0.5	561.275
13	70	5	1530.75	0.43	658.2225
14	80	5	2004.75	0.32	640.56
15	90	5	2535.55	0.28	709.954
16	100	5	3142.15	0.24	751.716



◆ Above the Vertical electrical sounding graphs purple color is major fracture zone

6. Conclusion

Based on the available information and the geophysical investigations it is concluded that the project area is considered to have moderate groundwater potential. Where the minor fractures are observed hence, shallow aquifers are expected about 70m-75m BGL and Productive aquifers are expected between 62m depth. The ultimate pit limit as per the approved mining plan depth is **57m** below ground level which will have no impact on the Ground Water.



Dr. P. Thangaraju, M.Sc., Ph.D.,
Govt. Approved Hydro Geologist
M/s. Geo Exploration and Mining Solutions,
Regd. Office: No. 17, Advaita Ashram Road,
Alagapuram, Salem – 636 004, Tamil Nadu
Mobile: +91 - 94433 56539
E-Mail: infogeoexploration@gmail.com

கூட்டு புலதணிக்கை குறிப்பு

வட்டம்	:	சேரன்மகாதேவி
கிராமம்	:	வடக்கு அரியநாயகிபுரம் பகுதி - 2
புல எண்	:	719/1 மற்றும் 720/1
கூட்டு புல தணிக்கை நாள்	:	15.07.2020

சேரன்மகாதேவி வட்டம், வடக்கு அரிய நாயகிபுரம் பகுதி -2 கிராமம், புல எண்.719/1 மற்றும் 720/1-ல் கல்குவாரி அமைக்க குத்தகை உரிமம் வழங்க கோரியது தொடர்பான கூட்டு புல தணிக்கை 15.07.2020 அன்று மேற்கொள்ளப்பட்டது. குவாரி செய்ய உத்தேசித்துள்ள புலத்தில் இருந்து சுமார் 300மீட்டர் தொலைவில் எவ்வித குடியிருப்பும் இல்லை. புலத்தில் இருந்து 50மீட்டர் தொலைவில் நீர்நிலை மற்றும் நீர்நிலைபுறம்போக்கு நிலங்கள் இல்லை, புலத்தில் இருந்து சுமார் 4.00 கி.மீ தூரத்தில் தென்மேற்கு பக்கமாக கடனா காங்கேயன் கால்வாய் மூலம் பாசனம் பெறும் மாறன்குளம் உள்ளது. குவாரி அமைய உள்ள இடத்தில் நிலவியல் ஓடை இருப்பதாக கிராம கணக்குகளில் உள்ளதால், நிலவியல் ஓடைக்கு பாதிப்பு ஏற்படா வண்ணம் 50மீ நிலத்தை விட்டுகொடுக்க வருவாய் வட்டாட்சியர், சேரன்மகாதேவி அவர்களுக்கு உறுதிமொழி பத்திரம் கொடுக்கப்பட்டதின் பேரில் புல எண்.719 மற்றும் 720ல் 4.99.39 ஹெக்டேர் நிலத்திற்கு குத்தகை உரிமம் வழங்க பரிந்துரை செய்து அறிக்கை சமர்ப்பிக்கப்படுகிறது.

1. மனுதாரர் கோரியுள்ள புல எண்.719 மற்றும் 720-ல் குவாரி தளமானது நிலவியல் ஓடை அமைய உள்ள புல எண்.715 மற்றும் 716-ன் எல்லையிலிருந்து 50மீ தொலைவில் அமைக்கப்பட வேண்டும்.
2. குவாரி அனுமதிக்கப்படும் தளத்தில் எல்லைக்கல் ஊன்றப்பட வேண்டும்.
3. குவாரி தளத்திலிருந்து ஓடைக்கு தானாக வடிந்தோடும் தண்ணீருக்கு எவ்வித இடையூறல் தடைகளோ இருத்தல் கூடாது.
4. குவாரிக்கு வரும் வாகனங்கள் ஓடையைக்கடந்து செல்ல நேரிட்டால் அதற்கு பாலம் அமைப்பதற்கு தனியாக பொதுப்பணித்துறையின் மூலம் உரிய ஆவணங்களுடன் விண்ணப்பித்து அனுமதி பெற்றுக் கொள்ள வேண்டும்.
5. குவாரி தளத்தினை பொதுப்பணித்துறை அதிகாரிகளின் ஆய்வுக்கு எந்நேரமும் அனுமதிக்கப்பட வேண்டும்.
6. குவாரியிலிருந்து அள்ளப்படும் மண் அல்லது கழிவுகள் ஓடையின் நீர்ப்போக்கு பகுதிகளில் கொட்டக்கூடாது.
7. ஓடையிலிருந்து எந்த சூழ்நிலையிலும் தண்ணீர் உறிஞ்சுவது நேரடியாகவோ அல்லது மறைமுகமாகவோ செய்யக்கூடாது.

15-7-20

AB 115/AN.

கன்னியாகுமரி மாவட்டம், விளவங்கோடு வட்டம், பத்திட்டவிளை சிதறால் கிராமம், 13-85, ஊர் முகவரியைச் சேர்ந்த திரு.ராகுல் த.பெராஜேந்திரன் என்பவராகிய நான் அளிக்கும் வாக்குமூலம்.

நான் மேற்கண்ட முகவரியில் வசித்து வருகிறேன். சேரன்மகாதேவி வட்டம், வடக்கு அரியநாயகிபுரம் கிராமம் புல எண்கள் 719/1, 720/1, 720/2, 720/3, 720/4, 720/5, 720/6, 720/7, 720/8, 720/9, 720/10 மற்றும் 720/14-ல் மொத்த விஸ்தீரணம் 4.99.39 ஹெக்டேர் பரப்பில் சாதாரண கற்கள் வெட்டி எடுக்க குத்தகை உரிம கோரியது தொடர்பாக 19.08.2020 அன்று சார் ஆட்சியர் அலுவலகத்தில் நேரடி விசாரணைக்கு ஆஜராகியுள்ளேன். மேற்படி சேரன்மகாதேவி வட்டம், வடக்கு அரியநாயகிபுரம் கிராமம் புல எண்கள் 719/1, 720/1, 720/2, 720/3, 720/4, 720/5, 720/6, 720/7, 720/8, 720/9, 720/10 மற்றும் 720/14-ல் எனது பெயரில் உள்ளது. இதில் சாதாரண கற்கள் வெட்டி எடுக்க எனது தாயார் திருமதி.பிரிதா என்பவரிடமிருந்து 20 வருடத்திற்கு குத்தகை பெற்றுள்ளேன். மேலும் சேரன்மகாதேவி சார் ஆட்சியர் மற்றும் சிற்றாறு வடிநில உபகோட்ட செயற்பொறியாளர் கூட்டுப் புலத்தணிக்கையில் நிலவியல் ஓடை உள்ளதாக தெரிவித்துள்ளதால் நிலவியல் ஓடைக்கு பாதிப்பு ஏற்படா வண்ணம் 50மீ நிலத்தை விட்டுக் கொடுக்க சேரன்மகாதேவி வருவாய் வட்டாட்சியரிடம் ஏற்கனவே உறுதிமொழி பத்திரம் அளிக்கப்பட்டுள்ளது. மேலும் கீழ்க்கண்ட நிபந்தனைகளுக்கும் கட்டுப்படுகிறேன்.

1. புல எண் 719 மற்றும் 720-ல் குவாரி உத்தேசிக்கப்பட்டுள்ள நிலத்தின் அருகில் அமையவுள்ள புல எண் 715 மற்றும் 716-ன் எல்லையிலிருந்து 50 மீ தொலைவில் குவாரி செய்யப்படும் என உறுதி கூறுகிறேன்.
2. குவாரி அனுமதிக்கப்படும் தளத்தில் எல்லைக்கல் நட்டு தனியாக வண்ணம் தீட்டப்படும்.
3. குவாரி தளத்திலிருந்து ஓடைக்கு தானாக வடிந்தோடும் தண்ணீருக்கு எவ்வித இடையூறல் தடைகளோ செய்ய மாட்டேன்.
4. குவாரிக்கு வரும் வாகனங்கள் ஓடையைக் கடந்து செல்ல நேரிட்டால் அதற்கு பாலம் அமைப்பதற்கு தனியாக பொதுப்பணித்துறையின் மூலம் உரிய ஆவணங்களுடன் விண்ணப்பித்து அனுமதி பெற்றுக் கொள்கிறேன்.
5. குவாரி தளத்தினை பொதுப்பணித்துறை அதிகாரிகளின் ஆய்வுக்கு எந்நேரமும் வந்து செல்ல தடையேதும் தெரிவிக்க மாட்டேன்.
6. குவாரியிலிருந்து அள்ளப்படும் மண் அல்லது கழிவுகள் ஓடையின் நீர்போக்கு பகுதியில் கொட்ட மாட்டேன்.
7. ஓடையிலிருந்து எந்த சூழ்நிலையிலும் தண்ணீர் உறிஞ்சுவது நேரடியாகவோ அல்லது மறைமுகமாகவோ செய்ய மாட்டேன் என்பதை இதன் மூலம் தெரிவித்துக் கொள்கிறேன்.

நான் மேல்கூறிய அனைத்தும் உண்மை என்று உறுதி கூறுகிறேன். பின்னர் தவறுகள் ஏதும் கண்டுபிடிக்கப்பட்டால் சட்டப்படியான அனைத்து நடவடிக்கைகளுக்கும் கட்டுப்படுவேன் என உறுதி அளிக்கிறேன்.

/படித்துப் பார்த்தேன் / சென்னபடி சரி/

Rachuk
19/8/20

/என் முன்பாக/

[Signature]
4/8/2020

சென்னை

பெருநர்

திரு. பா. சந்திரன், பி.எஸ்.சி.,
வருவாய் வட்டாட்சியர்
சேரன்மகாதேவி .

மாவட்ட ஆட்சித் தலைவர்,
திருநெல்வேலி.

ந.க.இ1/3742/2019 நாள்: 24.09.2019

ஆய்வா,

பொருள் கணிமீழும் கரங்கமும் - சேரன்மகாதேவி வட்டம் - வடக்கு அரியநாயகிபுரம் பகுதி-2 கிராமம் புல எண்கள். 719/1, 720/1, 720/2, 720/3, 720/4, 720/5, 720/6, 720/7, 720/8, 720/9, 720/10, 720/11, 720/12, 720/13 மற்றும் 720/14ல் மொத்த விஸ்தீரணம் 4.99.39 ஹெக்டேர் பரப்பில் சாதாரண கற்கள் வெட்டி எடுக்க குத்தகை உரிமம் வேண்டி திரு. R. ராகுல் என்பவர் விண்ணப்பம் செய்தது - அறிக்கை அனுப்புகல் - தொடர்பாக

- பார்வை
1. திருநெல்வேலி மாவட்ட ஆட்சித் தலைவர் அவர்களின் ந.க. எம்2/35382/2019 நாள். 13.09.2019.
 2. சேரன்மகாதேவி சார் ஆட்சியர் அவர்களின் ந.க. ஆ4/5972/19, நாள். 16.09.2019.
 3. இயல்புவசை ந.க. இ1/3742/2019, நாள். 17.09.2019.
 4. முக்கூடல் வருவாய் ஆய்வாளர் அறிக்கை நாள். 21.09.2019.

சேரன்மகாதேவி வட்டம், வடக்கு அரியநாயகிபுரம் பகுதி-2 கிராமம் புல எண்கள் 719/1(P), 720/1(P), 720/2 முதல் 720/12 வரை மற்றும் 720/13(P) 720/14(P) ஆகிய புல எண்களில் 4.99.39 ஹெக்டேர் பரப்பளவில் சாதாரண கற்கள் வெட்டி எடுக்க குத்தகை உரிமம் வழங்கக் கோரி திரு. R. ராகுல் என்பவர் விண்ணப்பம் செய்தது தொடர்பாக தலப்பார்வை செய்து முக்கூடல் வருவாய் ஆய்வாளர் கீழ்க்கண்டவாறு அறிக்கை செய்துள்ளார்.

மனுதாரர் குத்தகை உரிமம் கோரியுள்ள வடக்கு அரியநாயகிபுரம் பகுதி-2 கிராமம் புல எண்கள் கிராமக்கணக்கின்படி கீழ்க்கண்டவாறு உள்ளது.

வ.எண்.	புல எண்.	விஸ்தீரணம் (ஹெக்டேரில்)	பட்டா எண்.	உரிமையாளர் விபரம்
1.	719/1	2.19.50	2669	ராஜேந்திரன் மனைவி பிரீதா
2.	720/1	2.46.00		
3.	720/2	0.22.00		
4.	720/3	0.08.00		
5.	720/4	0.15.00		
6.	720/5	0.12.00		
7.	720/6	0.05.50		
8.	720/7	0.08.00		
9.	720/8	0.06.00		
10.	720/9	0.06.00		
11.	720/10	0.10.50		
12.	720/11	0.08.50		
13.	720/12	0.07.00		
14.	720/13	0.10.50		
15.	720/14	0.07.00		

மேற்படி புல எண்கள் மட்டா எண். 2259ன்படி ராஜேந்திரன் மனைவி பிரீதா என்பவர் வெளியில் கிராமக்கணக்கின்படி தூக்கலாகியுள்ளது. மனுதாரர் சம்பந்தப்பட்ட மட்டாதாரிடமிருந்து குத்தகை உரியம் பெறும் வகைக்கு சம்பந்த பத்திரம் பெற்றுள்ளார். மேற்படி புல எண்களின் நான்குமால் எல்லைகள் கீழ்க்கண்டவாறு

புல எண். 719/1க்கு நான்குமால் எல்லை

வடக்கு — புல எண். 720

தெற்கு — புல எண். 718

கிழக்கு — புல எண். 719(P)

மேற்கு — புல எண். 716

புல புல எண். 720-க்கு நான்குமால் எல்லை

வடக்கு — புல எண். 721, 722

தெற்கு — புல எண். 719

கிழக்கு — புல எண். 720/13 (P), 14(P), 15

மேற்கு — புல எண். 715

இதில் கீழ்க்கண்ட புல எண்களில் கீழ்க்கண்ட விஸ்தீரணங்களில் கறிகள் வெட்டி ஏடுகளை மனுதாரர் குத்தகை உரியம் கோரியுள்ளார்.

வ.எண்.	புல எண்.	விஸ்தீரணம் (ஹெக்டே.ரில்)	மட்டா எண்.	உரிமையாளர் பெயர்
1.	719/1(P)	1.41.75	2569	ராஜேந்திரன் மனைவி பிரீதா
2.	720/1(P)	2.44.14		
3.	720/2	0.22.00		
4.	720/3	0.08.00		
5.	720/4	0.15.00		
6.	720/5	0.12.00		
7.	720/6	0.05.50		
8.	720/7	0.08.00		
9.	720/8	0.06.00		
10.	720/9	0.06.00		
11.	720/10	0.10.50		
12.	720/11	0.08.50		
13.	720/12	0.07.00		
14.	720/13(P)	0.03.00		
15.	720/14(P)	0.02.00		
	ஆக மொத்தம்	4.99.39		

மேற்படி புல எண்களில் குவாரி அமைப்பதற்கு ஊர்ப்பொதுமக்களிடமிருந்து ஆட்சேபனை எதுவும் வரப்பெறாதது என "அ1" விளம்பரம் செய்யப்பட்டதில் ஊர்ப்பொதுமக்களிடமிருந்து ஆட்சேபனை எதுவும் வரப்பெறவில்லை. குவாரி செய்ய உத்தேசித்துள்ள புலத்திலிருந்து சுமார் 300மீ தொலைவில் எவ்வித குடியிருப்புகளும் இல்லை. பிரஸ்தாப புலத்திலிருந்து சுமார் 50மீ தொலைவில் நரிநிலை புறம்போக்கு எதுவும் இல்லை. சாலை, இருப்புபாதை, மின் இணைப்புகள் எதுவும் இல்லை. பிரஸ்தாப புலத்திலிருந்து சுமார் 50மீ தொலைவில் புராதான சின்னங்களோ, நினைவு சின்னங்களோ, கோவில், மதாதி, கிறிஸ்தவ ஆலயங்கள் இல்லை. மேலும் விவசாயப் பரப்புகள் எதுவும் இல்லை. பிரஸ்தாப நிலம் தடையாணை புகைச்சத்தில் இடம் பெறவில்லை. மேலும் அரசுக்கு சிறப்பு ஒதுக்கீடு எதுவும் செய்யப்படவில்லை. பிரஸ்தாப புலத்தின் அருகில் வனவிலங்கு சரணாலயம் எதுவும் இல்லை எனவும் பிரஸ்தாப புலத்திலிருந்து கணியங்களை கொண்டு செல்ல பாறை வசதி உள்ளது எனவும், பாறை குவாரி செய்யும் புல எண்ணுக்கு பாத்தியப்பட்ட திரு ராஜேந்திரன் மனைவி பிரீதா என்பவருக்கு பாத்தியப்பட்ட நிலம் எனவும் மேற்படி பாறை வடக்கு அரியநாயகிப்புறத்தில் தொடங்கி மாநாடுவகு செய்றும் மெயின்ரோடு வரை உள்ளது எனவும் வருவாய் ஆய்வாளர், முக்கூடல் அலுவலகத்தில் தெரிவிக்கப்பட்டுள்ளது.

இந்தேர்வு தொடர்பாக பிரஸ்தாப நிலம் 719 மற்றும் 720 ஆகியவை 23.09.19 அன்று செயல்பட்டது. குவாரி அமைவு உள்ள புலத்திலிருந்து 300 மீ தொலைவில் குடியிருப்புகள் எதுவும் இல்லை. மேற்படி புலத்திலிருந்து 50 மீ தொலைவில் நரிநிலை எதுவும் இல்லை. புராதன சின்னங்களோ, கட்டிடங்களோ விலை உயர்ந்த மரங்களோ பொய்யில்லை. மேற்படி நிலங்கள் தரிக நிலமாக உள்ளது. மேற்படி புலமானது தடையாணை மீட்டலில் இடம் பெறவில்லை. அரசுக்கு சிறப்பு ஒதுக்கீடு எதுவும் செய்யப்படவில்லை என்பதால் மேற்படி புலத்தில் கல்குவாரி அமைக்க குத்தகை உரிமம் வழங்க பரிந்துரை செய்து அறிக்கை செய்கிறேன் என்பதை பணிபுடன் தெரிவித்துக் கொள்கிறேன்.

இத்துடன் வருவாய் ஆய்வாளர் அறிக்கை, கிராம நிர்வாக அலுவலர் வாக்குமூலம், "அ1" விளம்பரம், பொதுமக்கள் வாக்குமூலம், கூட்டுவரைபடம், கிராமக்கனாக்கு நகல் இணைத்து அனுப்பியுள்ளேன் என்பதையும் பணிபுடன் தெரிவித்துக் கொள்கிறேன்.

முனைப்பு: மேற்சொன்னவாறு

ஒம்/- பா.சந்திரன்
 வருவாய் வட்டாட்சியர்
 சேரன்மகாதேவி
 வட்டாட்சியருக்காக

/உண்மைநகல்/

23/9/19

புலத்தணிக்கை குறிப்பு

வட்டம்	:	சேரன்மகாதேவி
கிராமம்	:	வடக்கு அரியநாயகிபுரம் பகுதி-2
புல எண்	:	719/1, 720/1 முதல் 720/14
விஸ்தீரணம்	:	4.99.39 ஹெக்டேர்
புலத்தணிக்கை நாள்	:	23.09.2019

சேரன்மகாதேவி வட்டம், வடக்கு அரியநாயகிபுரம் பகுதி-2 கிராமம், புல எண். 719/1, 720/1 முதல் 720/14-ல் 4.99.39 ஹெக்டேர் பார்பளவில் கல்குவாரி அமைக்க குத்தகை உரிமம் வழங்கக் கோரியது தொடர்பான புலத்தணிக்கையில் பிரஸ்தாப நிலம் 23.09.2019 அன்று பார்வையிடப்பட்டது. பிரஸ்தாப நிலத்தில் குவாரி அமைப்பது தொடர்பாக "அ1" விளம்பரம் செய்யப்பட்டதில் பொதுமக்களிடமிருந்து எவ்வித ஆட்சேபணையும் வரப்பெறவில்லை. குவாரி செய்ய உத்தேசித்துள்ள புலத்திலிருந்து சுமார் 300 மீ தொலைவில் எவ்வித குடியிருப்புகளும் இல்லை. பிரஸ்தாப புலத்தில் இருந்து சுமார் 50மீ தொலைவில் நிநினைல புறம்போக்கு, சாலை, இருப்புப்பாதை, மின் இணைப்புகள் ஏதும் இல்லை. சுமார் 500மீ தொலைவில் புராதான சின்னங்களோ நினைவுச் சின்னங்களோ, மருதிகளோ, விலை உயர்ந்த மரங்களோ, வனவிலங்கு சரணாலயங்களோ எதுவும் இல்லை. பிரஸ்தாப நிலம் தடையாணை புத்தகத்தில் இடம் பெறவில்லை. மேலும் அரசுக்கு சிறப்பு ஒதுக்கீடு எதுவும் இல்லை. புல எண். 719 மற்றும் 720ல் 4.99.39 ஹெக்டேர் நிலத்திற்கு குத்தகை உரிமம் வழங்க பரிந்துரை செய்கிறேன்.

வருவாய் வட்டாட்சியர்
சேரன்மகாதேவி

அனுப்புநர்:

திருமதி.ஷில்பா பிரபாகர் சதீஷ், இ.ஆ.ப.,
மாவட்ட ஆட்சித்தலைவர்,
திருநெல்வேலி.

பெறுநர்:

சார் ஆட்சியர்,
சேரன்மகாதேவி.

ந.க.எண். எம்2/35382/2019, நாள். 13.09.2019

அய்யா,

பொருள்: கனிமமும் சுரங்கமும் - திருநெல்வேலி மாவட்டம் -
சேரன்மகாதேவி வட்டம் - வடக்கு அரியநாயகிபுரம்
கிராமம் - பட்டா புல எண்கள். 719/1, 720/1, 720/2,
720/3, 720/4, 720/5, 720/6, 720/7, 720/8, 720/9,
720/10, 720/11, 720/12, 720/13 & 720/14 - ல் மொத்த
விஸ்தீரணம் 4.99.39 ஹெக்டேர் பரப்பில் சாதாரண
கற்கள் வெட்டி எடுக்க குத்தகை உரிமம் வழங்கக்
கோரி - திரு.R.ராகுல் என்பவர் விண்ணப்பித்தது -
அறிக்கை அனுப்பக் கேட்டல் - தொடர்பாக.

பார்வை: திரு.R.ராகுல் என்பவரது விண்ணப்ப நாள்.
13.09.2019.

திருநெல்வேலி மாவட்டம், சேரன்மகாதேவி வட்டம், வடக்கு அரியநாயகிபுரம்
கிராமம், பட்டா புல எண்கள்: 719/1, 720/1, 720/2, 720/3, 720/4, 720/5, 720/6, 720/7,
720/8, 720/9, 720/10, 720/11, 720/12, 720/13 & 720/14 - ல் மொத்த விஸ்தீரணம்
4.99.39 ஹெக்டேர் பரப்பில் சாதாரண கற்கள் வெட்டி எடுக்க குத்தகை உரிமம்
வழங்கக் கோரி திரு.R.ராகுல் என்பவர் விண்ணப்பித்துள்ளார். மேற்படி விண்ணப்பம்
மற்றும் தொடர்புடைய ஆவணங்களின் நகல்கள் இத்துடன் அனுப்பப்படுகிறது.
விண்ணப்பப் புலத்தில் மனுதாரருக்கு குத்தகை உரிமம் வழங்குவது தொடர்பாக
தங்களது முன்மொழிவினை கீழ்க்காணும் விபரங்களுடன் விரிவான விசாரணை
அறிக்கையினை அனுப்பி வைக்குமாறு கேட்டுக் கொள்கிறேன்.

நிபந்தனைகள்

1. குடியிருப்பிலிருந்து 300 மீட்டர் தொலைவில் இருக்க வேண்டும்.
2. இருப்புப்பாதை, சாலை, மின் இணைப்புகள் மற்றும் நீர்நிலையிலிருந்து 50 மீட்டர் தூரத்தில் இருக்க வேண்டும்.
3. புராதனச் சின்னங்கள், நினைவுச் சின்னங்கள், ஆகியவற்றிலிருந்து வரையறுக்கப்பட்ட பாதுகாப்பு இடைவெளி 50 மீட்டர் இருத்தல் வேண்டும்.
4. குவாரி செய்து கனிமம் கொண்டு வர பாதை வசதி இருக்க வேண்டும். அணுகு பாதை மற்றும் நில வகைப்பாடு பற்றிய விபரம் குறிப்பிடப்பட வேண்டும்.
5. விண்ணப்பதாரருக்கு நிலத்தில் முழு உரிமை இருக்க வேண்டும்.

6. விண்ணப்ப புலத்தின் நான்கு மால்களும், வகைபாடு ஆகியவற்றோடு காட்டும் வரைபடம் கிராம நிர்வாக அலுவலர், அளவர் மற்றும் வட்டாட்சியர் கையொப்பத்துடன் இரண்டு பிரதிகள் அனுப்பப்பட வேண்டும்.
7. விண்ணப்ப புல எண் தடை ஆணை புத்தகத்தில் குறிப்பிட்டுள்ளதா என்றும் அரசு வகைக்கு சிறப்பு ஒதுக்கீடு ஏதேனும் செய்யப்பட்டுள்ளதா என்றும் குறிப்பிடப்பட வேண்டும்.
8. கிராமத்தில் A-1 அறிவிப்பு பிரசுரிக்கப்பட வேண்டும் மற்றும் மேற்கண்ட இடத்தில் குத்தகை உரிமம் வழங்கிட பொதுமக்கள் ஆட்சேபனை உள்ளதா என்ற விபரம் அறிக்கையில் இடம் பெற வேண்டும்.
9. விண்ணப்ப புலத்தில் ஏற்கனவே சுற்குடைவு செய்யப்பட்ட குழி/குழிகள் இருப்பின் பழைய குழி/குழிகளின் நீளம், அகலம் மற்றும் ஆழம் ஆகியவற்றின் விபரங்களை உள் மற்றும் புற அளவுகளுடன் வரைபடத்தில் குறித்து மேலொப்பமிட்டு அனுப்பப்பட வேண்டும்.
10. விண்ணப்பபுலம் ஒன்றுக்கு மேற்பட்டதாக இருப்பின் கூட்டு வரைபடம் தயார் செய்து மேற்கண்ட விபரங்களுடன் மேலொப்பமிட்டு அனுப்பப்பட வேண்டும்.
11. தனியரிடமிருந்து கனிம பாக்கி மற்றும் வருவாய் வசூல் சட்டத்தின்படி வசூலிக்கப்பட வேண்டிய நிலுவைத் தொகை ஏதேனும் உள்ளதா என்பதற்கு அறிக்கை செய்ய கேட்டுக்கொள்ளப்படுகிறது.
12. பாதுகாக்கப்பட்ட வனப்பகுதி / வனவிலங்குகள் / மான் சரணாலயம் ஏதும் அருகிலிருப்பின் அதற்கான பாதுகாப்பு இடைவெளி உள்ளதா? என்றும் குறிப்பிடப்பட வேண்டும்.

இணைப்பு: மனு மற்றும்
ஆவணங்களின் நகல்கள்.

ஓம்/-XXXXX
மாவட்ட ஆட்சித்தலைவருக்காக
திருநெல்வேலி

//உண்மை நகல்//

தனித்துவான வட்டாட்சியர் (கனிமம்)
திருநெல்வேலி.
31/09/19
2019

நகல்:

1. வட்டாட்சியர்,
சேரன்மகாதேவி.

திரு. R.ராகுல்
த/பெ.ராஜேந்திரன்,
13-85, பத்திட்ட விலை,
சிதறால் கிராமம்,
விளவங்கோடு தாலுகா,
கன்னியாகுமரி மாவட்டம்.

அனுப்புகள்

பெறுதல்

திரு. பா. சந்திரன், பி.எஸ்.சி.,
வருவாய் வட்டாட்சியர்
சேரன்மகாதேவி.

மாவட்ட ஆட்சித் தலைவர்,
திருநெல்வேலி.

ந.க.இ1/3742/2019

நாள்:20.12.2019

அய்யா,

பொருள் கனிமழும் கரங்கழும் - சேரன்மகாதேவி வட்டம் - வடக்கு அரியநாயகிபுரம் பகுதி-2 கிராமம் புல எண்கள். 719/1, 720/1, 720/2, 720/3, 720/4, 720/5, 720/6, 720/7, 720/8, 720/9, 720/10, 720/11, 720/12, 720/13 மற்றும் 720/14ல் மொத்த விஸ்தீரணம் 4.99.39 ஹெக்டேர் பரப்பில் சாதாரண கற்கள் வெட்டி எடுக்க குத்தகை உரிமம் வேண்டி திரு. R. ராகுல் என்பவர் விண்ணப்பம் செய்தது — குறைநிலவர்த்தி அறிக்கை அனுப்புகல் - தொடர்பாக

- பார்வை
1. திருநெல்வேலி மாவட்ட ஆட்சித் தலைவர் அவர்களின் ந.க. எம்2/35382/2019 நாள். 13.09.2019.
 2. சேரன்மகாதேவி சார் ஆட்சியர் அவர்களின் ந.க. ஆ4/5972/19, நாள். 16.09.2019.
 3. இவ்வலுவலக ந.க. இ1/3742/2019, நாள். 17.09.2019.
 4. முக்கூடல் வருவாய் ஆய்வாளர் அறிக்கை நாள். 21.09.2019.
 5. சேரன்மகாதேவி வட்டாட்சியர் அவர்களின் ந.க. இ1/3742/19, நாள். 24.09.2019.
 6. திருநெல்வேலி மாவட்ட ஆட்சித் தலைவர் அவர்களின் குறிப்பாணை எண்.எம்2/35382/2019 நாள்:09.12.19
 7. திருமதி பிரீத்தா க/பெ ராஜேந்திரன் உறுதிமொழி பத்திரம் நாள்:17.12.19

சேரன்மகாதேவி வட்டம், வடக்கு அரியநாயகிபுரம் பகுதி-2 கிராமம் புல எண்கள் 719/1(P), 720/1(P), 720/2 முதல் 720/12 வரை மற்றும் 720/13(P) 720/14(P) ஆகிய புல எண்களில் 4.99.39 ஹெக்டேர் பரப்பளவில் சாதாரண கற்கள் வெட்டி எடுக்க குத்தகை உரிமம் வழங்கக் கோரி திரு. R. ராகுல் என்பவர் விண்ணப்பம் செய்தது தொடர்பாக பார்வை 5-ல் கண்டவாறு அறிக்கை அனுப்பப்பட்டது.

இந்நேர்வு தொடர்பாக திருநெல்வேலி மாவட்ட ஆட்சித் தலைவர் அவர்கள் கடந்த 06.12.2019 அன்று புலத்தணிக்கையின் போது பிரஸ்தாப புலஎண்களில் நிலவியல் ஒடை கிராம வரைபடத்தில் குறிப்பிடப்பட்டுள்ளது என்றும், மேற்படி ஒடையினை சேதப்படுத்துமால் சாதாரண கற்கள் வெட்டி கொண்டு செல்ல போதுமான இடைவெளி விட்டு தெளிவான வரைபட த்துடன் கூடிய அறிக்கையினை சமர்ப்பிக்கும்மாறு பார்வை 6-ல் காணும் கடிதத்தில் அறிவுறுத்தப்பட்டுள்ளது.

சேரன்மகாதேவி வட்டம், வடக்கு அரியநாயகிபுரம் பகுதி-2 கிராமப் புல எண்கள் 719/1(P), 720/1(P), 720/2 முதல் 720/12 வரை மற்றும் 720/13(P) 720/14(P) ஆகிய புல எண்களில் 4.99.39 ஹெக்டேர் பரப்பளவில் சாதாரண கற்கள் வெட்டி எடுக்க குத்தகை உரிமம் வழங்கக் கோரியுள்ள திரு.ராகுல் என்பவரின் தாயார் திருமதி. பிரீதா க/பெ.ராஜேந்திரன் என்பவர் தனக்குச் சொந்தமான புலஎண்கள் 715 மற்றும் 716-ல் நிலவியல் ஓடை செல்கிறது என்பது கிராம கணக்கில் உள்ளது என்றும் ஆனால் பூமியில் நிலவியல் ஓடை இல்லை எனவும், ஓடை இருந்ததற்கான எந்த தடயமும், அறிகுறியும் இல்லை என்றும், பிற்காலத்தில் ஓடை செல்லும் பாதைக்கு குவாரி பணி இடையூறாக இருக்கும் பட்சத்தில் தனக்குச் சொந்தமான புலஎண் 715 மற்றும் 716 ஆகியவற்றிற்கு மேல்புறம் நிலவியல் ஓடை செல்வதற்கு ஏதுவாக மேற்குப் பகுதியில் 50 மீட்டர் நிலத்தை விட்டுக் கொடுக்க சம்மதம் தெரிவித்தும், தனது மகன் ராகுல் த/பெ.ராஜேந்திரன் என்பவருக்கு கிடைக்க வேண்டிய அனைத்து வித அனுமதியும் வழங்குவதற்கு தான் முழு சம்மதம் தெரிவித்தும், உறுதி மொழி பத்திரம் அளித்துள்ளார். இது தொடர்பாக வடக்கு அரியநாயகிபுரம் பகுதி-2 கிராம நிர்வாக அலுவலரிடமும் வாக்குமூலம் பெறப்பட்டுள்ளது. தற்போது புல எண் 715 மற்றும் 716 ஆகியவற்றில் 50 மீட்டர் நிலவியல் ஓடை அமைப்பதற்கு இசைவு தெரிவித்ததின் பேரில் குறுவட்ட அளவரால் வரைபடம் தயார் செய்யப்பட்டு இத்துடன் இணைக்கப்பட்டுள்ளது.

எனவே, மனுதாரர் திரு. ராகுல் த/பெ.ராஜேந்திரன் என்பவருக்கு சேரன்மகாதேவி வட்டம், வடக்கு அரியநாயகிபுரம் பகுதி-2 கிராமப் புல எண்கள் 719/1(P), 720/1(P), 720/2 முதல் 720/12 வரை மற்றும் 720/13(P) 720/14(P) ஆகிய புல எண்களில் 4.99.39 ஹெக்டேர் பரப்பளவில் சாதாரண கற்கள் வெட்டி எடுக்கும் வகைக்கு உரிமம் வழங்க பரிந்துரை செய்கிறேன் என்பதை பணிவுடன் தெரிவித்துக் கொள்கிறேன்.

இணைப்பு:

1. கிராம நிர்வாக அலுவலர் வாக்குமூலம்
2. குறுவட்ட அளவர் வரைபடம்
3. உறுதிமொழி பத்திரம்

சுருவாய வட்டம் தயார்
சேரன்மகாதேவி

20/12/19



EL
Sri Ramajayam

☎ 04632 - 261234,
261381
Cell: 94431-61389

SRI SELVAM TRADING COMPANY

5/43, Kadambur Road, KAYATHAR - 628 952

Thoothukudi Dist

E-Mail: Sriselvam.711@gmail.com

Date 25.10.2023

To

Thiru.R.P.Rahul,
S/o.Rajendran,
13-85, Pathitavilai,
Chitharal Village,
Vilavankode Taluk,
Kanniyakumari District.

Ref. Your Letter dated

Sub: Regarding blasting work using explosives in your proposed quarry.

Sir,

We are having explosives licence in Form 22 holding No: E/HQ/TN/22/127(E33387) situated in survey S.F.No. 112, 113/1, 113/2, 117/1 & 117/2 Kayathar Village, Kayathar Taluk, Thoothukudi district. Our office function at Address – M/s. Sri Selvam Trading Company, No. 5/43, Kadambur Road, Kayathar, Thoothukudi District -628952

We are enacting 2 Explosives vans for transporting detonators and class 2 separately for our Magazine to our work site and well experienced and licensed blasters and shot firer for safe blasting work since 2 years without untoward incident.

We are willing to undertake work on contract basis at your SF.No. 719/1, 720/1, 720/2, 720/3, 720/4, 720/5, 720/6, 720/7, 720/8, 720/9, 720/10, 720/11, 720/12, 720/13 & 720/14 (4.99.39) hectares, Vadaku Ariyanaygipuram-II Village, Cheranmahadevi Taluk, Tirunelveli district

Thanking You,


For Sri Selvam Trading Company,

Enclosure:

1. Licence Copy

125 A



Under Rule 10(3) of Explosives Rules, 2008
 LIC HUSSAIN, Dy. Controller of Explosives, Chennai on 20/12/2020

अनुज्ञापि प्रल्प एल. ई. 3 | LICENCE FORM E-3
 (विस्फोटक नियम, 2008 का अनुच्छेद 3 के भाग 3 के अनुच्छेद 3(क) से (घ) बाखर।)
 (See article 3(a) to (d) of Part 3 of Schedule IV of Explosives Rules, 2008)

यह अनुज्ञापि के लिए एक समय पर वर्ग 1, 2, 3, 4, 5 या वर्ग 7 के विस्फोटक या किसी भी वर्गों में वर्ग 6 के विस्फोटक रखने के लिए
 Licence to possess (a) for explosives of class 1, 2, 3, 4, 5, 6 or 7 in a magazine

अनुज्ञापि सं. (Licence No.): E/SC/TN/22/746(E112263)
 वार्षिक वार्षिक शुल्क (Annual Fee Rs): 8600/-



1. Licence is hereby granted to:

Mr. Sri Selvan Stores (अधिभोगी) / Occupier: K. Ananthanarasimhan, 9, Chinnai Pillayarankal Street, Kayathur, Tenkasi District, THOOTHUKKUDI, State-Tamil Nadu, Pincode - 629552

को अनुज्ञापि अनुज्ञा की जाती है।

2. अनुज्ञापि की प्रकृति: Status of licensee: **Partnership Firm**

3. अनुज्ञापि निम्नलिखित प्रयोजनों के लिए विधिमार्ग है।

Licence is valid only for the following purpose

4. अनुज्ञापि विस्फोटकों के निम्नलिखित प्रकार, प्रकार और मात्रा के लिए विधिमार्ग है।

Licence is valid for the following kinds and quantity of explosives: - (क) (a)

क्र. सं.	नाम और विवरण	वर्ग और मात्रा	उप-प्रकार	मात्रा कितने एक समय में
Sr. No.	Name and Description	Class & Quantity	Sub-division	Quantity at any one time
1	Nitrate Mixture	2, 0	0	4000 Kg
2	Safety Fuse	3, 1	0	10000 Mtrs
3	Detonating Fuse	3, 2	0	20000 Mtrs
4	Electric and its Ordinary Detonators	3, 3	0	44000 Nos

(क) किसी एक क्लॉस में मात्रा से अधिक कितने कितने विस्फोटक को भण्डारण (अनुच्छेद 3(क) और (घ) के अधीन अनुज्ञापि के लिए)

(b) Quantity of explosives as to purchased in a calendar month applicable for licence in a calendar month

3 times as above.

5. निम्नलिखित रेखाचित्र (रेखाचित्रों) से अनुज्ञापि परिसर की पृष्ठ होती है।

The licensed premises shall conform to the following drawings

6. अनुज्ञापि परिसर निम्नलिखित पते पर स्थित हैं। The licensed premises are situated at following address

Survey No. 41/1, 41/2, 41/3, 41/4, 41/5, 41/6, 41/7, 41/8, 41/9 and 42/2, राम (Tones Village) Meerankulam Part-2
 जिला (District) THOOTHUKKUDI राज्य (State) Tamil Nadu
 पिनकोड (Pincode) 629552

रेखाचित्र सं. (Drawing No): E/SC/TN/22/746(E112263)
 दिनांक (Date): 24/09/2020

7. अनुज्ञापि परिसर में निम्नलिखित सुविधाएं अर्जित हैं।

The licensed premises consist of following facilities

One RCC magazine

8. अनुज्ञापि समय-समय पर सहायक विस्फोटक अधिनियम, 1984 और उसके अधीन विरचित विस्फोटक नियम, 2008 के उपबंधों, शर्तों और उचित शर्तों और निम्नलिखित

The licence is granted subject to the provision of Explosives Act 1984 as amended from time to time and the Explosives Rules, 2008 framed there under and the conditions, additional conditions and the following Annexures

1. उपरोक्त क्रम सं. 3 में उल्लिखित रेखाचित्र (राम, निर्माण सभ्य और अन्य विवरण दर्शाते करते हुए।
 Drawings showing site, construction and other details as stated in serial No. 5 above

2. अनुज्ञापि प्राधिकारी द्वारा हस्ताक्षरित इस अनुज्ञापि की शर्तों और अतिरिक्त शर्तों।
 Conditions and Additional Conditions of this licence signed by the licensing authority.

3. दूरी प्रल्प सं-2: Distance Form DS-2

9. यह अनुज्ञापि तारीख 31 मार्च 2025 तक विधिमार्ग रहेगी। This licence shall remain valid till 31st day of March 2025.

यह अनुज्ञापि, अधिनियम या उसके अधीन विरचित नियमों या अनुसूची V के भाग 4 के प्रो. निर्दिष्ट सेट-VII के अधीन तथा उपरोक्त इस अनुज्ञापि की शर्तों का अधिग्रहण करने
 This licence is liable to be suspended or revoked for any violation of the Act or Rules framed there under or the conditions of this licence as set forth under Set VIII.

यदि अनुज्ञापि परिसर योजना का उससे संलग्न उपबंध में दर्शाते विवरण के अनुसंधान नहीं पाए जाने पर निलंबित या प्रतिबंधित की जा सकती है, जहां यह लागू हो।
 Licence may be suspended or revoked if the licensed premises are not found conforming to the description shown in the plans and Annexure attached hereto

तारीख: The Date - 24/09/2020

संयुक्त मुख्य विस्फोटक नियंत्रक | Joint Chief Controller of Explosives
 South Circle, Chennai

मनीनीकरण के पुनर्ग्रहण के लिए जगह
 Space for Endorsement of Renewal

नवीकरण की तारीख
 Date of Renewal

समाप्ति की तारीख
 Date of Expiry


अनुज्ञापन प्राधिकारी का हस्ताक्षर और स्टाम्प
 Signature of licensing authority and stamp

कानूनी चेतावनी: विस्फोटकों का गलत ढंग से चलाय या उनका दुरुल्योग विधि के अधीन गंभीर दंडित अपराध होगा।
Statutory Warning: Mishandling and misuse of explosives shall constitute serious criminal offence under the law.

சீண்டி

25/10/2023

சீண்டி கிராமம், சேன்மகாதேவி வட்டம்,
 வடக்கு அரியநாயகியுடம் பகுதி-II கிராமம், 4வது பகுதி
 719/1(P), 720/1(P), 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13 (P) மற்றும்
 720/14(P) - 4,99.39 ஏக்கர்கள் நிலம் பட்டியலில்
 - R.P. ரூபில் S/O ரூபலங்கிரன் பெயரில்
 உள்ளது. மேற்படி 4வது பகுதி 719/1(P), 720/1, +
 720/14(P) உள்ள - 4,99.39 ஏக்கர்கள் நிலத்தை
 சீண்டி 300 கட்டிகள் சிற்றூரில், குடியிருப்பதில்,
 கோயில்கள், வளர்ச்சி, சுகம் அளிப்பதை
 சீண்டி சிங்கப்படுகிறது.


 கிராம நிர்வாக அலுவலர்
 வடக்கு அரியநாயகியுடம்-II
 சேன்மகாதேவி வட்டம்

TOPOGRAPHICAL VIEW OF VADAKKU ARIYANAYAGIPURAM-II
ROUGH STONE AND GRAVEL QUARRY LEASE APPLIED AREA





Name of the Applicant : R. P. Rahul,
S/o. Rajendran,,
Address : No. 13-85, Pathittavilai, Chitharal Village,
Vilavankode Taluk,
Kanniyakumari District,
Tamil Nadu State – 629 151.

LOCATION DETAILS

Extent : 4.99.39ha
S.F. Nos. : 719/1(P), 720/1(P),2,3,4,5,6,7,8,9,10,11,12,13(P) and 720/14(P)
Village : Vadakku Ariyanayagipuram-II
Taluk : Cheranmahadevi
District : Tirunelveli
State : Tamil Nadu

Signature of the applicant


(R. P. Rahul)


(Village Administrative Officer)
வடக்கு அரியநாயகிபுரம்-II
Attestation
சேரன்மகாதேவி வட்டம்
25/10/23



Government of India
Ministry of Environment, Forest and Climate Change
(Issued by the State Environment Impact Assessment
Authority(SEIAA), Tamil Nadu)

To,

The Applicant
SATHEESAN THOMSAN
No:12/115,Paruthivilai,Vellamcode, Chitharal -629151

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/263649/2022 dated 23 Jun 2022. The particulars of the environmental clearance granted to the project are as below.

- | | |
|--|---|
| 1. EC Identification No. | EC23B001TN127606 |
| 2. File No. | 9139 |
| 3. Project Type | New |
| 4. Category | B2 |
| 5. Project/Activity including Schedule No. | 1(a) Mining of minerals |
| 6. Name of Project | T.Satheesan, S.F.Nos. 708/3A (Part) and 709 (Part) North Ariyanayagipuram Part - II Village, Cheranmahadevi Taluk, Tirunelveli District |
| 7. Name of Company/Organization | SATHEESAN THOMSAN |
| 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: 20/01/2023

(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.

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

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

ENVIRONMENTAL CLEARANCE

Lr. No. SEIAA-TN/F.No.9139/EC.No:5456/2022, Dated: 14.12.2022

Sir/Madam,

Sub: SEIAA-TN - Proposed Rough Stone and Gravel over an extent of 4.95.0Ha located at S.F.No. 708/3A (Part) and 709 (Part) North Ariyanayagipuram Part - II Village, Cheranmahadevi Taluk, Tirunelveli District, Tamil Nadu by T. Sathesan - under Category "B2" of Item 1(a) "Mining of Minerals Projects" of the Schedule to the EIA Notification, 2006 issue of Environmental Clearance - Regarding.

- Ref:**
1. Online Proposal No. SIA/TN/MIN/263649/2022 Dt. 25.03.2022.
 2. Your Application for Environmental Clearance dated: 31.03.2022.
 3. Minutes of the 289th SEAC Meeting held on 24.06.2022.
 4. Minutes of the 534th SEIAA Meeting held on 20.07.2022.
 5. Minutes of the 332nd SEAC Meeting held on 25.11.2022.
 6. Minutes of the 577th SEIAA Meeting held on 14.12.2022 & 15.12.2022.

Details of Minor Mineral Activity: -

This has reference to your application 1st & 2nd 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.


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S. No.	Particulars	Details furnished
1.	Name of the Owner/Firm	T.Satheesan S/o. Thomson No. 12/115, Paruthivilai, Vellamcode, Chithara Kanniyakumari -- 629 151.
2.	Type of quarrying	Rough stone and gravel
3.	S.F No. Of the quarry site	708/3A (Part) and 709 (Part)
4.	Village in which situated	North Ariyanayagipuram Part - II Village
5.	Taluk in which situated	Cheranmahadevi
6.	District in which situated	Tirunelveli
7.	Extent of quarry (in ha.)	4.95.01ha (patta land)
8.	Period of quarrying proposed	5 years
9.	Type of mining	Opencast Mechanized Method
10.	Production (Quantity in m ³)	11,01,720m ³ of rough stone & 84,376m ³ of Gravel
11.	Depth of quarrying	42m (2m Gravel + 40m Rough Stone)
12.	Latitude & Longitude of all corners of the quarry site	08°45'09.03"N to 08°45'19.05"N 77°33'24.03"E to 77°33'32.51"E
13.	Top Sheet No.	58-H/09
14.	Man Power requirement	48 Nos.
15.	Precise area approved by Assistant Director with date	Re.No.M2/30092/2020, Dated: 15.02.2022
16.	Mining Plan approved by Assistant Director, Dept of G&M with date	Re.No. M2/30092/2020, Dated: 07.03.2022
17.	Assistant Director, Department of G&M with date 500m cluster letter	Re.No. M2/30092/2020, Dated: 07.03.2022
18.	Water requirement:	2.8 KLD
	1. Drinking & Domestic	1.0 KLD
	2. Dust suppression	1.0 KLD

	3. Green Belt	0.8 KLD
19.	Power requirement a. Domestic Purpose b. Industrial purpose	TNEB 8,95,436 Liters of HSD for the entire period of life
20.	Depth of water table	58m – 62m
21.	EMP cost	Capital Cost - Rs. 31,10,500 Recurring Cost – Rs. 13,20,900
22.	CER cost	5 lakhs As per SEAC Minutes
23.	Project Cost (Excluding EMP)	Rs. 1,43,58,000
24.	VAO certificate regarding habitation within 300m radius	Letter Dated: 03.03.2022
25.	Validity: This Environmental Clearance is granted for the production of 11,01,720m ³ of rough stone & 84,376m ³ of Gravel for the period of 5 Years from the date of execution of the mining lease for an ultimate depth of mining up to 42m BGL.	

The Proponent has furnished affidavit in stamp paper attested by the Notary stating that

I, T.Satheesan, S/o. Thomson, residing at No. 12/115, Paruthivilai, Vellameode, Chitharal, Kanniyakumari District, Tamil Nadu State – 629 151, solemnly declare and sincerely affirm that:

I have apply for getting Environment Clearance to SEIAA, Tamil Nadu for quarry lease for quarrying of **Rough stone and Gravel Quarry** over an extent of **4.95.0** Hectares of patta lands in **S.F.No. 708/3A (Part) and 709 (Part)** of **North Ariyanayagipuram Part - II Village, Cheranmahadevi Taluk, Tirunelveli District, Tamil Nadu.**

I. I swear to state and confirm that within 10km area of the quarry site, I have applied for environment clearance, none of the following is situated.

- Protected areas notified under the wild life (Protection) Act, 1972,
- Critically polluted areas as notified by the central pollution control board constituted under water (Prevention and Control of Pollution) Act, 1974,
- Eco-Sensitive areas as notified.


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- d. Interstate boundaries within 10km radius from the boundary of the proposed site.
2. I will spend the amount of Rs.5,00,000/- towards Corporate Environment Responsibility (Revised CER) for the following activities to the Panchayat Union Middle class school, Tirunelveli District before commencement of quarrying activities.

Sl. No.	Description	CER Cost INR
1	Renovation of Existing Toilets for Boys and Girls	Rs.5,00,000/-
2	Providing Drinking water facilities	
3	Plantation along the School Boundary 250 Nos	
4	Providing Bench's, Tisks tables sports equipment in the School	

3. The following quarries are located within the radius of 500m from the periphery of my quarry.

S. No.	Name of the Lessee	Village and S.F.No.	Extent Hects	Lease Status
1. Existing Quarries				
--- NIL ---				
2. Abandoned Quarries				
--- NIL ---				
3. Proposed Quarries				
1.	Thiru.T.Satheesan,	North Ariyanayagipuram Part - II Village, S.F.Nos. 708/3A(P) and 709 (P)	4.95.0	Proposed
Total			4.95.0	

4. There will not be hindrance or disturbance to the people living during quarrying and transportation.

5. There is no approved habitation within 300m 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 laborers working in my quarry site.
8. The approach road from the main road to quarry road will be constructed and maintained in a good condition for the haulage of Rough stone and Gravel.
9. I will not engage any child labor in my quarry site and I 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 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.

Mine Closure Budget

ACTIVITY	YEAR					RATE	AMOUNT (INR)
	I	II	III	IV	V		
Plantation under safety Zone (In Nos.)	52	52	52	52	52	@100 Rs Per Sapling	Rs. 2,000
Plantation Cost	5,200	5,200	5,200	5,200	5,200		Rs. 80,000
Plantation in quarried out top benches and approach road (In Nos.)	160	160	160	160	160	@300 Rs Per Meter	Rs. 2,67,000
Plantation Cost	16,000	16,000	16,000	16,000	16,000		
Wire Fencing (In Mtrs) 890 Mtrs	2,67,000	-	-	-	-		


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Garland drain (In Mtrs) 800 Mtrs	2,40,000	-	-	-	-	@300 Rs Per Meter	Rs. 2,40,000
TOTAL							Rs. 6,13,000

Details of 500M radius Proposed quarry:

The Project Proponent has submitted a copy of the letter obtained from Assistant Director, Geology and Mining, Tirunelveli District in his letter Re.No. M2/30092/2020, Dated: 07.03.2022 has stated that the details of other quarries (Proposed / Existing / Abandoned Quarries) within a radius 500m from the boundary of the proposed quarry site as follows:

Sl. No.	Name of the Lessee	Village and S.F.No.	Extent - Hects	Lease Status
1. Abandoned Quarries				
- NIL -				
2. Existing Quarries				
- NIL -				
3. Proposed Quarries				
1.	Thiru.T.Satheesan, S/o. Thomson, 12/115, Paruthivilai, Vellameode, Chitharal, Kanniyakumari District.	708/3A(P) and 709 (P)	4.95.0	Proposed Quarry.
Total extent of proposed quarries			4.95.0	

Appraisal by SEAC

Proposed Rough stone & Gravel quarry lease over an extent of 4.95.0 Ha in S.F.No 708/3A (Part) and 709 (Part), North Ariyanayagipuram Part – II Village, Cheranmahadevi Taluk, Tirunelveli District, Tamil Nadu by Thiru. T.Satheesan- For Environmental Clearance.


The proposal was placed for appraisal in the 289th meeting of SEAC held on 24.06.2022. The details of the project furnished by the proponent are given in the website (parivesh.nic.in).

The SEAC noted the following:

1. The project proponent, Thiru. T.Satheesan has applied for Environmental Clearance for the proposed Rough stone & Gravel quarry lease over an extent of 4.95.0 Ha in S.F.No 708/3A (Part) and 709 (Part), North Ariyanayagipuram Part – II Village, Cherammahadevi Taluk, Tirumelveli District, Tamil Nadu.
2. The project/activity is covered under Category "B2" of Item 1(a) "Mining of Mineral Projects" of the Schedule to the EIA Notification, 2006.
3. As per the mining plan, the lease period is for 5 years. The mining plan is for the period of 5 years. The total production for 5 years not to exceed 1101720 m³ Rough stone and 84376 m³ of Gravel. The annual peak production 234960 m³ Rough stone (3rd year) and 38208 m³ of Gravel (1st year) with ultimate depth of 42 m BGL.

Based on the presentation made by the proponent SEAC recommended for grant of Environmental Clearance for the proposed quarry to produce 1101720 m³ Rough stone and 84376 m³ of Gravel with an Annual peak production of 234960 m³ Rough stone and 38208 m³ of Gravel by maintaining the ultimate depth of 42 m, subject to the standard conditions as per the **Annexure I** 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.**
2. The mine manager and other statutory competent persons such as blaster (or) mine mate shall be appointed before the commencement of mining operation.
3. 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 40 m below ground level.
4. Further, the PP shall carry out the scientific studies to assess the slope stability of the benches of the proposed quarry when the depth of the quarry touches 40 m, by involving a reputed Research / Academic Institution such as NIRM, IITs, NITs, Anna University-CEG Campus, Chennai, and any CSIR Laboratories etc. A copy of such scientific study report shall be submitted to the SEIAA, IRO/MoEF & CC-Chennai, TNPCB,


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AD/Mines-DGM and Director of Mines Safety, Chennai Region as a part of Environmental Compliance.

5. The PP shall ensure that only controlled blasting operation involving NONEL initiation system and muffle blasting shall be carried out in the quarry such that no fly rock travel beyond 30 m from the blast site.
6. The PP shall install the fencing to a height of 3 m around the quarry limit to ensure that the fugitive dust is not allowed to propagate into the surroundings.
7. The PP shall also develop green belt around the boundary of the quarry by planting not less than 200 trees every year.
8. 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.
9. As accepted by the Project proponent the CER cost is Rs. 5 lakhs and the amount shall be spent for the committed activities, Panchayat Union Middle Class School, Tirunelveli District as committed, before obtaining CTO from TNPCB.

Subsequently, the proposal was placed in 534th Authority meeting held on 18.07.2022. The Authority noted that there is a nearby water drain and drainage paths running adjacent to the site. Further, there are agricultural lands adjacent to the site. Hence in this regard the PP shall submit the following necessary reports as follows,

1. Detailed study shall be carried out in regard to assess the impact of mining around the proposed mine lease area from reputed Research and Academic Institution such as NIRM, IITs, NITs, Anna University Chennai-CEG Campus, and any CSIR Laboratories etc on the following
 - a. Soil health & bio-diversity.
 - b. Climate change leading to Droughts, Floods etc.
 - c. Pollution leading to release of Greenhouse gases (GHG), rise in Temperature, & Livelihood of the local people.
 - d. Possibilities of water contamination and impact on aquatic ecosystem health.
 - e. Agriculture, Forestry & Traditional practices.
 - f. Hydrothermal/Geothermal effect due to destruction in the Environment.
 - g. Bio-geochemical processes and its foot prints including environmental stress.
 - h. Sediment geochemistry in the surface streams.
2. 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 water bodies 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 project life (or) subject to a maximum of thirty years, whichever is earlier.

3. 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.
4. To furnish risk assessment and management plan including anticipated vulnerabilities during operational and post operational phases of Mining.
5. Detailed Mine Closure Plan covering the project life.
6. Detailed Environment Management Plan includes adaptation, mitigation & remedial strategies covering the project life.

PP has furnished replies to all the points raised by SEIAA and the same was placed in the 332nd SEAC meeting held on 25.11.2022. SEAC carefully examined the replies and decided to reiterate its recommendation already made in the 289th SEAC meeting held on 24.06.2022. All the conditions recommended will also remain unchanged.

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 Metalliferous 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 &


MEMBER SECRETARY
SEIAA-TN

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.
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 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.


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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.
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 complied 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.


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Appendix - I
List of Native Trees Suggested for Planting

No	Scientific Name	Tamil Name	Tamil Name
1	<i>Asplenium nidus</i>	Vilvam	விளவம்
2	<i>Adiantum species</i>	Mangudi	மங்குடி
3	<i>Albizia lebbek</i>	Vaagai	வாகை
4	<i>Albizia amara</i>	Udu	உடு
5	<i>Eucalyptus purpurea</i>	Mariyamam	மரியமம்
6	<i>Eucalyptus rostrata</i>	Aadu	ஆடு
7	<i>Eucalyptus imrayna</i>	Servadi	செவாடி
8	<i>Eucalyptus arillata</i>	Kalliyaru	கல்லியூர்
9	<i>Eucalyptus saligna</i>	Pandu	பாண்டு
10	<i>Eucalyptus tereticornis</i>	Marakkantham	மாக்காந்து
11	<i>Eucalyptus globulus</i>	Sadu, Servaduru	சாடு, செவாடூர்
12	<i>Calophyllum inophyllum</i>	Pandu	பாண்டு
13	<i>Cassia fistula</i>	Serakambai	செரகாம்பை
14	<i>Cassia rostrata</i>	Serapattai	செராபட்டை
15	<i>Chloroxylon swietenia</i>	Pannamandu	பாண்டமடு
16	<i>Chloroxylon tomentosum</i>	Kongi, Marudhara	காங்கி, மரூடறா
17	<i>Cordia alliodora</i>	Neyyab	நெய்யாப்
18	<i>Cordia alliodora</i>	Mayalingam	மையலிங்கம்
19	<i>Dillenia indica</i>	Ura, Uru	உரா, உரு
20	<i>Dillenia pentagyna</i>	Saravu, Sarudhi	சரவூர், சரூதி
21	<i>Diospyros virginiana</i>	Karungali	காருங்கலி
22	<i>Diospyros discolor</i>	Vayyaru	வையூர்
23	<i>Ficus religiosa</i>	Kallidai	கல்லிடை
24	<i>Hibiscus tiliaceus</i>	Aathipparamam	ஆதிப்பரமம்
25	<i>Hibiscus tiliaceus</i>	Anbu	அன்பு
26	<i>Hibiscus tiliaceus</i>	Ayuthi	ஆயுதி
27	<i>Lantana camara</i>	Odhanai	ஓடனை
28	<i>Lepanoglossum indicum</i>	Poo Marudhi	பூ மரூதி
29	<i>Lepanoglossum indicum</i>	Nedumankulam	நெடும்ங்குளம்
30	<i>Lantana camara</i>	Vila maran	வில்லிமரன்
31	<i>Linnæa glabra</i>	Pirappattai	பிராபட்டை
32	<i>Melastoma leucophaea</i>	Mangudi	மங்குடி
33	<i>Melastoma leucophaea</i>	Ukkudai	உக்கடை
34	<i>Mimosa pudica</i>	Mangudi	மங்குடி
35	<i>Mimosa pudica</i>	Kadambai	காடம்பை
36	<i>Mimosa pudica</i>	Neyyab	நெய்யாப்
37	<i>Mimosa pudica</i>	Vellai Venu	வெலை வெணு
38	<i>Platanus spiciata</i>	Sadu	சாடு
39	<i>Platanus spiciata</i>	Pandam	பாண்டம்

40	<i>Platanus spiciata</i>	Murrai	முரை
41	<i>Platanus spiciata</i>	Narumthai	நாரமுதை
42	<i>Platanus spiciata</i>	Melapattanam	மேலாபட்டணம்
43	<i>Platanus spiciata</i>	Venu maran	வெணுமரன்
44	<i>Platanus spiciata</i>	Vengai	வெங்கை
45	<i>Platanus spiciata</i>	Venkatagiri, Tada	வெங்கடகிரி, தாடா
46	<i>Platanus spiciata</i>	Pularu	புலாறு
47	<i>Platanus spiciata</i>	Karpala	காற்பலா
48	<i>Platanus spiciata</i>	Ura Maran	உரா மரன்
49	<i>Sapindus saponaria</i>	Manipalayam, Sappudai	மாணிபாளையம், சாப்புடை
50	<i>Tamarix indica</i>	Aadu	ஆடு
51	<i>Strychnos nuxvomica</i>	Pirai maran	பிரை மரன்
52	<i>Strychnos nuxvomica</i>	Yethi	யேதி
53	<i>Strychnos nuxvomica</i>	Theerthang Kottai	தீர்த்தங்குளம், கோட்டை
54	<i>Strychnos nuxvomica</i>	Narai	நரை
55	<i>Ternstroemia indica</i>	Thandir	தாண்டிர
56	<i>Ternstroemia indica</i>	Ven marudhu	வெணுமரூது
57	<i>Ternstroemia indica</i>	Saradhana vendra	சாடாநா வெண்டிரா
58	<i>Thespesia populifera</i>	Pandu	பாண்டு
59	<i>Thespesia populifera</i>	Vadu	வாடு
60	<i>Wrightia religiosa</i>	Veyyathai	வையாத்தை
61	<i>Podocarpus indicus</i>	Kudakkappudi	கூடகாப்புடி

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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.

3. 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 activities do not disturb the vegetation and wildlife in the adjoining reserve forests and areas around.
4. The proponent shall ensure that the operations do not result in loss of soil biological properties and nutrients.
5. The activity should not result in CO₂ release and temperature rise and add to micro-climate alterations.
6. The proponent shall ensure that the activity does not disturb the water bodies and natural flow of surface and ground water, nor cause any pollution, to water sources in the area.
7. The proponent shall ensure that the activities undertaken do not result in carbon emission, and temperature rise, in the area.
8. 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.
9. The proponent shall ensure that the activities do not disturb the agro biodiversity and agro farms. Actions to be taken to promote agro forestry, mixed plants to support biodiversity conservation in the mine restoration effort.
10. The proponent shall ensure that activity does not deplete the indigenous soil seed bank and disturb the mycorrhizal fungi, soil organism, soil community nor result in eutrophication of soil and water.

11. 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
12. Bio remediation using microorganisms should be carried out to restore the soil environment to enable carbon sequestration.
13. 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.
14. 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 Odal, Water bodies, Dams in the vicinity.
15. The proponent shall ensure that in the green belt development more indigenous trees species (Appendix as per the SEAC Minutes) to be planted.
16. The proponent shall ensure the area is restored and rehabilitated with native trees as recommended in SEAC Minutes (in Appendix).
17. The proponent shall ensure that the mine restoration is done using mycorrhizal VAM, vermin-composting, Biofertilizers to ensure soil health and biodiversity conservation.
18. The proponent shall ensure that the topsoil is protected and used in planting activities in the area.
19. 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.
20. The proponent shall ensure that topsoil to be utilized for site restoration and Green belt alone within the proposed area.
21. 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.
22. 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.


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Directions for Reclamation of mine sites

1. 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.
2. 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.
3. 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.
4. For mining area reclamation plot culture experiments to be done to identify/ determine suitable species for the site.
5. 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.
6. Soil and moisture conservation and water harvesting structures to be used where ever possible for early amelioration and restoration of site.
7. 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.

8. 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 species should be collected, preserved and used in restoring the site.
9. 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.
10. 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.
11. 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 reestablishing 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 ecofriendly. Integration of rehabilitation strategies with mining plan will enable speedy restoration.
12. 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 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 resorted to restore the site by adding soil humas and mycorrhiza.
13. Action taken for restoration of the site should be specifically mentioned in the EC compliances.



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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.


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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 inflation 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, Gol 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.


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- 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.
 - 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.
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.


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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/odol
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.
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.


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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.
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.
 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.


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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, Tirunelveli District
8. The Commissioner of Geology and Mines, Guindy, Chennai-32
9. EI Division, Ministry of Environment & Forests, Paryavaran Bhawan, New Delhi.
10. File Copy

Signature Not Verified

Digitally signed by Thiru.Deepak
S.Bilgi
Member Secretary
Date: 1/20/2023 7:31:47 PM
Page 29 of 29



Thiru. K.V. GIRIDHAR, I.F.S.,
MEMBER SECRETARY

STATE LEVEL ENVIRONMENT IMPACT
ASSESSMENT AUTHORITY – TAMIL NADU

3rd Floor, Panagal Maaligai,
No.1, Jeenis Road, Saidapet,
Chennai - 600015.
Phone No. 044-24359973
Fax No. 044-24359975

ENVIRONMENTAL CLEARANCE

Lr. No.SEIAA-TN/F.No.8001/EC.No: 4529/2020 dated: 22.02.2021

To

Thiru.M.Sivaprasanth
No.4/28-A, Ambalakadai, Puthanveeda
Ramavilas, Edavazhirkarai, Chitharal
Vilanvankode Taluk
Kanniyakumari District - 629 151

Sir/Madam,

Sub: SEIAA-TN – Proposed for the Rough Stone & Jelly Gravel quarry lease over an Extent of 3.89.72Ha at S.F.No.723(P) & 724/3(P) of Ariyanayagipuram-II Village, Cheranmahadevi Taluk, Tirunelveli District, Tamil Nadu by Thiru.M.Sivaprasanth – issue of Environmental Clearance – Regarding.

Ref: Online Proposal No. SIA/TN/MIN/180836/2020, Dated: 27.10.2020.
Your Application for Environmental Clearance dated: 06.11.2020.
Minutes of the 196th SEAC meeting held on 29.01.2021.
Minutes of the 425th SEIAA meeting held on 15.02.2021.

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.

1	Name of Project Proponent and address	Thiru.M.Sivaprasanth No.4/28-A, Ambalakadai, Puthanveeda
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		Ramavilas, Edavazhirkarai, Chitharal Vilanvankode Taluk Kanniyakumari District - 629 151
2	Location of the Proposed Activity	
	Survey Number	723(P) & 724/3(P)
	Latitude and Longitude	08°45'14"N to 08°45'24"N & 77°33'51"E to 77°33'59"E
	Village	Ariyanayagipuram-II
	Taluk	Cherammahadevi
	District	Tirunelveli
3	Proposed Activity	
	i. Minor mineral	Rough Stone, Jelly & Gravel Quarry
	ii. Mining Lease Area	3.89.72Ha
	iii. Approved quantity	726845 cu.m of Rough Stone &64262cu.m of Gravel Quarry & 31124cu.m of Weathered Rock
	iv. Depth of Mining	38m (2 Gravel + 1m Weathered Rock + 35m Rough Stone)
	v. Type of mining	Opencast Semi Mechanized Method of Mining
	vi. Category(B1/B2)	B2
	vii. Precise area communication approved by the Assistant Director, with date	Re.No.M2/35383/2019, dt.21.08.2020
	viii. Mining plan approval by Assistant Director of Geology and Mining	Re.No.M2/35383/2019, dt: 08.09.2020.
	ix. Scheme of Mining period	5 Years
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:-	25Nos



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6	Utilities	
	i. Source of Water :	Water Vendors & Existing Borehole
	ii. Quantity of Water Requirement in KLD:-	3.0 KLD
	a. Domestic & Drinking purpose	0.5 KLD
	b. Green Belt & Dust Suppression	1.5 KLD 1.0 KLD
	iii. Power Requirement:	
	a. Domestic Purposes	TNEB
	b. Industrial Purposes	6,64,396 Liters of HSD
7	Cost	
	i. Project Cost	Rs. 95.74 Lakhs
	ii. EMP Cost	Rs. 5.15 Lakhs
8	Validity:	
	This Environmental Clearance is granted for the production of 726845cu.m of Rough Stone & 64262cu.m of Gravel Quarry & 31124cu.m of Weathered Rock Quarry for the period of 5 Years from the date of execution of the mining lease.	

The Proponent has furnished affidavit in Hundred Rupees stamp paper attested by the Notary stating that

The Proponent, Thiru.M.Sivaprasanth, No.4/28-A, Ambalakadai, Puthanveeda, Ramavilas, Edavazhirkarai, Chitharal, Vilanvankode Taluk, Kanniyakumari District - 629 151, solemnly declare and sincerely affirm that:

I have applied for getting prior Environmental Clearance to SEIAA, Tamil Nadu for quarry lease for quarrying of Rough Stone, Jelly & Gravel Quarry over an extent of 3.89.72Ha at S.F.No.723(P) & 724/3(P) of Ariyanayagipuram-II Village, Cheranmahadevi Taluk, Tirunelveli District.

1. I swear to state and confirm that within 10km area of the quarry site, I have applied for Environmental Clearance, none of the following is 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 within 10kms radius.




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- d) Interstate Boundaries within 10km radius from the boundary of the proposed site.
2. I will complete the following Corporate Environment Responsibility (CER) activities before commencement of the quarrying activities

CER Activity	Project Cost (Rs.in Laks)	CER Cost 2.0% of Project Cost (Rs.in Laks)
1. The applicant intends to involve corporate environment responsibilities (CER) activity like Water Purifier and medicine storage rack facilities to the dispensary at 2.0% from the total Project Site.	95.74	1.92
Total cost Allocation	95.74	1.92

2. The total area of following quarries are located within 500m radius from the periphery of our quarry.

Proposed Quarry

Sl.No.	Name and Address of the applicant	Village & Taluk	S.F. No's	Extent (Hect)	Classification of Land
1.	M.Sivaprasath	Vadakku Ariyanayagipuram-II Village, Cheranmahadevi Taluk	723(P) & 724/3(P)	3.89.72	Patta Land

Existing Quarry

Sl.No.	Name and Address of the applicant	Village & Taluk	S.F. No's	Extent (Hect)	Classification of Land
Nil					

Abandoned Quarry

Sl.No.	Name and Address of the applicant	Village & Taluk	S.F. No's	Extent (Hect)	Classification of Land
Nil					

1. There will not be hindrance or disturbance to the people living no crouted/nearby our quarry site while transporting the mineral material and due to quarrying activities.
2. There is no approved habitation within radius of 300m radius from the periphery of our quarry.
3. We swear that greenbelt will be carried out during the course of quarrying operation and maintained.




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4. The required insurance will be taken in the name of the labourers working in our quarry site.
5. 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.
6. We will not engage any child labour in our quarry site and I aware that engaging child labour is punishable under the law.
7. All types of safety/ Personal protective equipment will be provided to all the labourers working in our quarry.
8. No permanent structures, temples etc., are located within 500m radius from the periphery of our quarry.

I ensure to do all the social and Environment commitment as mentioned in the mining plan to the best of my knowledge.

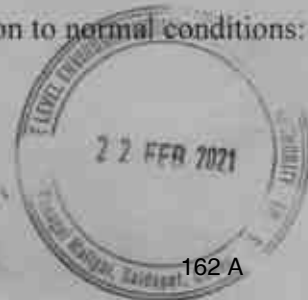
Details of 500M radius Proposed quarry:

The Project Proponent has submitted a copy of the letter obtained from the Assistant Director, Department of Geology & Mining, Tirunelveli District in his letter Rc.No.M2/35383/2019, dt.21.10.2020 has stated that the details of other quarries (Proposed / Existing / Abandoned Quarries) within a radius 500m from the boundary of the proposed quarry site as follows:

Sl. No	Name of the Lessee	Village & SF. No.	Extent Hectares
1.	Existing Quarries	Nil	
2.	Abandoned Quarries	Nil	
3.	Proposed Quarries		
1.	Thiru.M.Sivaprasanth S/o. Mohanan, No.4/28-A, Ambalakadai, Puthanveeda Ramavilas. Edavazhirkarai, Chitharal Vilanvankode Taluk Kanniyakumari District - 629 151	Vadakku Ariyanayagipuram-II and S.F.No. 723/1(P) & 724/3(P)	3.89.72

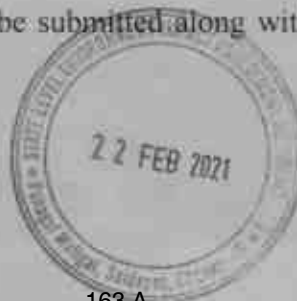
Appraisal by SEAC:-

The project proposal was placed in the 196th SEAC meeting on 29.01.2021. Based on the presentation made and documents furnished by the Project proponent, SEAC decided to recommend the proposal to SEIAA for grant of Environmental Clearance subject to the following conditions in addition to normal conditions:



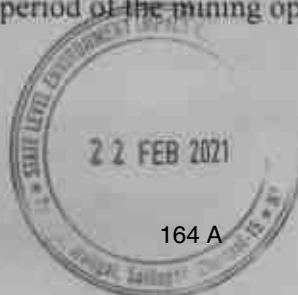

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1. The proponent shall obtain clarification from AD/Mines regarding the exact area and part of the survey number of mine lease area before placing the subject in SEIAA.
2. Considering the Environment point of view, committee decided to restrict the proposed ultimate depth of mining to 38m (2m Gravel+ 1m weathered rock+35m Rough stone) and the same was accepted by the proponent. Hence the restricted proposed quantity that shall be mined as per the approved mining plan is Rough stone: 726845m³.
3. Odai and a Tank are located adjacent to the project site. Hence a safety distance of 50m from the said water bodies shall be left vacant without any activity.
4. The proponent should carry out the quarrying as per the approved mining plan with a bench height of 5m and width of 5m.
5. Fugitive emission modeling studies to be carried out and report shall be submitted.
6. 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.
7. Proponent shall ensure that the Noise level is monitored during mining operation at the project site and adequate noise level reduction measures undertaken.
8. 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.
9. Sign board of adequate size shall be erected at an appropriate place adjacent to the quarry with necessary information pertaining to the quarry in native language.
10. The proponent shall develop an adequate green belt 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.
11. Greenbelt needs to be developed up to a width of 7.5m along the periphery of the mine area so that at the closure time the trees would have grown well. Geotagged Photograph of the greenbelt grown shall be submitted along with the half yearly compliance report submitted to SEIAA




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12. Groundwater quality monitoring shall be conducted once in every six months and the report should be submitted to TNPCB.
13. After mining is completed, Proper leveling should be done by the Project proponent & Environmental Management Plan furnished by the Proponent should be strictly followed.
14. The Project proponent shall, after ceasing mining operations, undertake regressing 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.
15. Proper barrier to reduce noise level, dust pollution and to hold down any possible fly material (debris) should be established by providing green belt and/or metal sheets along the boundary of the quarrying site and suitable working methodology to be adopted by considering the wind direction.
16. The operation of the quarry should not affect the agriculture activities & water bodies near the project site and a 50m width from water body is left vacant without any activity.
17. Transportation of the quarried materials shall not cause any hindrance to the Village people/Existing Village road.
18. The Project Proponent shall comply with the mining and other relevant rules and regulations where ever applicable.
19. 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.
20. The recommendation for the issue of Environmental Clearance is subject to the outcome of the Hon'ble N6T, Principal Bench, New Delhi in O.A No.186 of 2015 (M.A.No.350/2016) and O.A. No.200/2015 and O.A.No.580/2016 (M.A.No.1182/2016) and O.A.No.102/2017 and O.A.No.404/2016 (M.A.No.758/2016, M.A.No.920/2016, M.A. No.1122/2016, M.A.No.12/2017 & M.A.No.843/2017) and O.A.No.405/2016 and O.A.No.520 of 2016 (M.A.No.981/2016, M.A.No.982/2016 & M. A.No.384/2017).
21. Prior clearance from Forestry & Wild Life including clearance from committee of the National Board for Wild life as applicable shall be obtained before starting the quarrying operation, if the project site attracts the NBWL clearance.
22. 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.




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23. The mine closure plan submitted by the project proponent shall be strictly followed after the lapse of the mine.
24. As per the MoEF&CC Office Memorandum F.No.22-55/2017-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

Discussion by SEIAA and the Remarks:-

The proposal was placed in the 425th Meeting held on 15.02.2021. After detailed discussion, 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 38m (2m Gravel+1m weathered Rock + 35m Rough Stone) and the production quantity is restricted to 726845 cu.m of Rough stone, 64262cu.m of gravel & 31124 cu.m of weathered Rock for 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 to TNPCB, mentioning CER activities as committed. The CER activities 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.



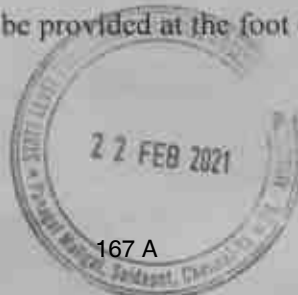
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3. NOC from the Standing committee of the NBWL shall be obtained, if protected areas are located within 10 Km from the proposed project site.
4. The project proponent shall comply the conditions laid down in the Section V, Rule 36 of Tamil Nadu Minor 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.
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.




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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.
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.




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- 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.
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.




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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.
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.



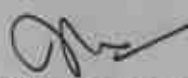

MEMBER SECRETARY
SEIAA-TN

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. 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




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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.




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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 Act, 2002 and




MEMBER SECRETARY
SEIAA-TN

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 Additional Chief 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, 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, Tirunelveli District
8. The Commissioner of Geology and Mines, Guindy, Chennai-32
9. E1 Division, Ministry of Environment & Forests, Paryavaran Bhawan, New Delhi.
10. Spare.



TEST REPORT

ULR-TC606024000004000F

Report Number: GLCS/TR/023/2024-25

Report Date: 15.05.2024

Issued To: Thiru R.P.Rahul, S/o, Rajendran, 13-85, Pathillavilai, Chitharal Village, Vilavankode Taluk, Kanyakumari district.		Site Address: Rough Stone and Gravel Quarry, Lease Area – 4.99.39 Ha. S.F.No:719/1,720/1,720/2,720/3,720/4,720/5,720/6, 720/7,720/8,720/9,720/10,720/11,720/12,720/13,& 720/14 of Vadakku Ariyanayagipuram –II Village, Cheranmahandevi Taluk, Tirunelveli District.		
Attention	-	Sampling Condition	Good - Active	
TRF No	002	Sampled by	Laboratory	
Sample Name	Noise Level Monitoring	Sampling Method	GLCS/SOP/N/014	
Sample Description	Ambient Noise	Sample Code	GLCS/023	
Sampling Time	Every 60 minutes	Sample Receipt Date	01.04.2024	
Sampling Date	29.03.2024 -30.03.2024	Date of Analysis	01.04.2024	
Location Name	AN1- Project Area SW Corner	Date of Completion	12.04.2024	
Location Co-ordinates		8°45'18.52"N 77°33'47.11"E		
S. No	Time(Hrs)	Min dB(A)	Max dB(A)	Leq dB(A)
1	06.50	34.6	42.6	40.23
2	07.50	34.6	48.6	45.76
3	08.50	37.6	48.5	45.83
4	09.50	38.5	51.6	48.80
5	10.50	40.5	52.6	49.85
6	11.50	41.6	51.9	49.28
7	12.50	42.8	53.4	50.75
8	13.50	43.1	54.7	51.98
9	14.50	42.6	53.4	50.74
10	15.50	42.8	53.1	50.48
11	16.50	41.4	50.3	47.82
12	17.50	40.6	49.5	47.02
13	18.50	39.5	48.4	45.92
14	19.50	38.4	46.6	44.20
15	20.50	37.6	43.2	41.25



For Global Lab and Consultancy Services LLP

Page 1 of 2


Authorised Signatory
L. SUDHAPRIYA
 Technical Manager

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TEST REPORT

ULR-TC606024000004000F

Report Number: GLCS/TR/023/2024-25

Report Date: 15.05.2024

Issued To: Thiru R.P.Rahul, S/o, Rajendran, 13-85,Pathillavilai, Chitharal Village, Vilavankode Taluk, Kaniyakumari district.		Site Address: Rough Stone and Gravel Quarry, Lease Area – 4.99.39 Ha. S.F.No:719/1,720/1,720/2,720/3,720/4,720/5,720/6, 720/7,720/8,720/9,720/10,720/11,720/12,720/13,& 720/14 of Vadakku Ariyanayagipuram –II Village, Cheranmahandevi Taluk, Tirunelveli District.	
Attention	-	Sampling Condition	Good - Active
TRF No	002	Sampled by	Laboratory
Sample Name	Noise Level Monitoring	Sampling Method	GLCS/SOP/N/014
Sample Description	Ambient Noise	Sample Code	GLCS/023
Sampling Time	Every 60 minutes	Sample Receipt Date	01.04.2024
Sampling Date	29.03.2024 - 30.03.2024	Date of Analysis	01.04.2024
		Date of Completion	12.04.2024

S. No	Time(Hrs)	Min dB(A)	Max dB(A)	Leq dB(A)
16	21.50	36.6	40.7	39.12
17	22.50	35.5	40.5	38.68
18	23.50	35.1	41.4	39.30
19	00.50	34.3	39.5	37.64
20	01.50	33.6	40.3	38.13
21	02.50	33.8	40.3	38.17
22	03.50	33.9	41.5	39.19
23	04.50	34.1	40.2	38.14
24	05.50	33.5	39.2	37.22
		Day Mean dB(A)		46.81
		Night Mean dB(A)		38.31

Limits as per The Noise Pollution (Regulation & Control) Rules, 2010 of MoEFCC / CPCB (Industrial)	Day Time : 75 dB (A)
	Night Time : 70dB (A)

Note: MoEFCC – Ministry of Environment Forest and Climate Change; CPCB – Central Pollution Control Board.



For Global Lab and Consultancy Services LLP

Authorised Signatory
L. SUDHAPRIYA
Technical Manager

*****End of Report*****
Page 2 of 2

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TEST REPORT

ULR-TC606024000004001F

Report Number: GLCS/TR/024/2024-25

Report Date: 15.05.2024

Issued To: Thiru R.P.Rahul, S/o, Rajendran, 13-85,Pathillavilai, Chitharal Village, Vilavankode Taluk, Kanyakumari district.		Site Address: Rough Stone and Gravel Quarry, Lease Area – 4.99.39 Ha. S.F.No:719/1,720/1,720/2,720/3,720/4,720/5,720/6, 720/7,720/8,720/9,720/10,720/11,720/12,720/13,& 720/14 of Vadakku Ariyanayagipuram –II Village, Cheranmahandevi Taluk, Tirunelveli District.		
Attention	-	Sampling Condition	Good - Active	
TRF No	002	Sampled by	Laboratory	
Sample Name	Noise Level Monitoring	Sampling Method	GLCS/SOP/N/014	
Sample Description	Ambient Noise	Sample Code	GLCS/024	
Sampling Time	Every 60 minutes	Sample Receipt Date	01.04.2024	
Sampling Date	29.03.2024 - 30.03.2024	Date of Analysis	01.04.2024	
Location Name	AN2- Project Area NE Corner	Date of Completion	12.04.2024	
Location Co-ordinates		8°45'11.58"N 77°33'42.17"E		
S. No	Time(Hrs)	Min dB(A)	Max dB(A)	Leq dB(A)
1	06.30	32.9	43.7	41.04
2	07.30	34.5	44.6	41.99
3	08.30	41.2	51.6	48.97
4	09.30	39.5	48.4	45.92
5	10.30	41.5	52.3	49.64
6	11.30	42.6	51.7	49.19
7	12.30	42.7	50.9	48.50
8	13.30	41.5	53.4	50.66
9	14.30	42.9	51.9	49.40
10	15.30	40.3	51.7	48.99
11	16.30	39.6	47.9	45.49
12	17.30	38.5	46.8	44.39
13	18.30	37.1	48.9	46.17
14	19.30	36.9	47.3	44.67
15	20.30	38.2	46.8	44.35



For Global Lab and Consultancy Services LLP

Page 1 of 2

(Signature)
Authorised Signatory
L. SUDHAPRIYA
 Technical Manager

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TEST REPORT

ULR-TC606024000004001F

Report Number: GLCS/TR/024/2024-25

Report Date: 15.05.2024

Issued To: Thiru R.P.Rahul, S/o, Rajendran, 13-85, Pathillavilai, Chitharal Village, Vilavankode Taluk, Kaniyakumari district.		Site Address: Rough Stone and Gravel Quarry, Lease Area – 4.99.39 Ha. S.F.No:719/1,720/1,720/2,720/3,720/4,720/5,720/6, 720/7,720/8,720/9,720/10,720/11,720/12,720/13,& 720/14 of Vadakku Ariyanayagipuram –II Village, Cheranmahandevi Taluk, Tirunelveli District.	
Attention	-	Sampling Condition	Good - Active
TRF No	002	Sampled by	Laboratory
Sample Name	Noise Level Monitoring	Sampling Method	GLCS/SOP/N/014
Sample Description	Ambient Noise	Sample Code	GLCS/024
Sampling Time	Every 60 minutes	Sample Receipt Date	01.04.2024
Sampling Date	29.03.2024 - 30.03.2024	Date of Analysis	01.04.2024
		Date of Completion	12.04.2024

S. No	Time(Hrs)	Min dB(A)	Max dB(A)	Leq dB(A)
16	21.30	35.6	44.3	41.84
17	22.30	34.6	42.8	40.40
18	23.30	33.3	41.5	39.10
19	00.30	32.9	39.5	37.35
20	01.30	31.5	38.1	35.95
21	02.30	30.9	39.4	36.96
22	03.30	32.6	37.5	35.71
23	04.30	32.7	36.4	34.93
24	05.30	32.6	36.5	34.97
Day Mean dB(A)				46.3
Night Mean dB(A)				37.5
Limits as per The Noise Pollution (Regulation & Control) Rules, 2010 of MoEFCC / CPCB (Industrial)				Day Time : 75 dB (A)
				Night Time : 70 dB (A)

Note: MoEFCC – Ministry of Environment Forest and Climate Change; CPCB – Central Pollution Control Board.



For Global Lab and Consultancy Services LLP

*****End of Report*****

Page 2 of 2

Authorised Signatory
L. SUDHAPRIYA
Technical Manager

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TEST REPORT

ULR-TC606024000004002F

Report Number: GLCS/TR/025/2024 -25

Report Date: 15.05.2024

Issued To: Thiru R.P.Rahul, S/o, Rajendran, 13-85, Pathillavilai, Chitharal Village, Vilavankode Taluk, Kanyakumari district.		Site Address: Rough Stone and Gravel Quarry, Lease Area – 4.99.39 Ha. S.F.No:719/1,720/1,720/2,720/3,720/4,720/5,720/6, 720/7,720/8,720/9,720/10,720/11,720/12,720/13,& 720/14 of Vadakku Ariyanayagipuram –II Village, Cheranmahandevi Taluk, Tirunelveli District.		
Attention	-	Sampling Condition	Good - Active	
TRF No	002	Sampled by	Laboratory	
Sample Name	Noise Level Monitoring	Sampling Method	GLCS/SOP/N/014	
Sample Description	Ambient Noise	Sample Code	GLCS/025	
Sampling Time	Every 60 minutes	Sample Receipt Date	01.04.2024	
Sampling Date	29.03.2024 - 30.03.2024	Date of Analysis	01.04.2024	
Location Name	AN3- Near Existing Quarry	Date of Completion	12.04.2024	
Location Co-ordinates		8°45'24.59"N 77°33'54.48"E		
S. No	Time(Hrs)	Min dB(A)	Max dB(A)	Leq dB(A)
1	6.10	36.9	45.6	43.14
2	7.10	38.1	50.1	47.36
3	8.10	40.5	56.3	53.40
4	9.10	42.6	57.4	54.53
5	10.10	41.9	60.5	57.55
6	11.10	42.5	62.3	59.33
7	12.10	43.5	61.4	58.46
8	13.10	42.7	59.9	56.97
9	14.10	41.9	61.1	58.14
10	15.10	41.4	57.8	54.89
11	16.10	40.6	57.9	54.97
12	17.10	39.8	55.5	52.61
13	18.10	38.5	54.3	51.40
14	19.10	37.4	50.2	47.41
15	20.10	36.3	45.6	43.07



For Global Lab and Consultancy Services LLP

Page 1 of 2

Authorised Signatory

L. SUDHAPRIYA
Technical Manager

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TEST REPORT

ULR-TC606024000004002F

Report Number: GLCS/TR/025/2024-25

Report Date: 15.05.2024

Issued To: Thiru R.P.Rahul, S/o, Rajendran, 13-85, Pathillavilai, Chitharal Village, Vilavankode Taluk, Kanyakumari district.		Site Address: Rough Stone and Gravel Quarry, Lease Area – 4.99.39 Ha. S.F.No:719/1,720/1,720/2,720/3,720/4,720/5,720/6, 720/7,720/8,720/9,720/10,720/11,720/12,720/13,& 720/14 of Vadakku Ariyanayagipuram –II Village, Cheranmahandevi Taluk, Tirunelveli District.	
Attention	-	Sampling Condition	Good - Active
TRF No	002	Sampled by	Laboratory
Sample Name	Noise Level Monitoring	Sampling Method	GLCS/SOP/N/014
Sample Description	Ambient Noise	Sample Code	GLCS/025
Sampling Time	Every 60 minutes	Sample Receipt Date	01.04.2024
Sampling Date	29.03.2024 - 30.03.2024	Date of Analysis	01.04.2024
		Date of Completion	12.04.2024

S. No	Time(Hrs)	Min dB(A)	Max dB(A)	Leq dB(A)
16	21.10	34.5	42.5	40.13
17	22.10	33.9	42.6	40.14
18	23.10	34.2	41.8	39.49
19	0.10	33.6	43.6	41.00
20	1.10	34.1	42.9	40.43
21	2.10	33.6	42.5	40.02
22	3.10	34.1	45.6	42.89
23	4.10	33.9	43.2	40.67
24	5.10	34.8	43.6	41.13
Day Mean dB(A)				51.38
Night Mean dB(A)				40.72

Limits as per The Noise Pollution (Regulation & Control) Rules, 2010 of MoEFCC / CPCB (Industrial)

Day Time : 75 dB (A)
Night Time : 70 dB (A)

Note: MoEFCC – Ministry of Environment Forest and Climate Change; CPCB – Central Pollution Control Board.

For Global Lab and Consultancy Services LLP



*****End of Report*****

Page 2 of 2


Authorised Signatory
L. SUDHAPRIYA
Technical Manager

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TEST REPORT

ULR-TC606024000004003F

Report Number: GLCS/TR/026/2024 -25

Report Date: 15.05.2024

Issued To: Thiru R.P.Rahul, S/o, Rajendran, 13-85,Pathillavilai, Chitharal Village, Vilavankode Taluk, Kanyakumari district.		Site Address: Rough Stone and Gravel Quarry, Lease Area – 4.99.39 Ha. S.F.No:719/1,720/1,720/2,720/3,720/4,720/5,720/6, 720/7,720/8,720/9,720/10,720/11,720/12,720/13,& 720/14 of Vadakku Ariyanayagipuram –II Village, Cheranmahandevi Taluk, Tirunelveli District.		
Attention	-	Sampling Condition	Good - Active	
TRF No	002	Sampled by	Laboratory	
Sample Name	Noise Level Monitoring	Sampling Method	GLCS/SOP/N/014	
Sample Description	Ambient Noise	Sample Code	GLCS/026	
Sampling Time	Every 60 minutes	Sample Receipt Date	01.04.2024	
Sampling Date	29.03.2024 - 30.03.2024	Date of Analysis	01.04.2024	
Location Name	AN4- Vadakku Ariyanagipuram	Date of Completion	12.04.2024	
Location Co-ordinates		8°43'26.54"N 77°32'45.99"E		
S. No	Time(Hrs)	Min dB(A)	Max dB(A)	Leq dB(A)
1	6.50	36.6	44.1	41.80
2	7.50	38.1	47.3	44.78
3	8.50	39.4	51.1	48.37
4	9.0	39.6	48.1	45.66
5	10.50	41.5	43.2	42.43
6	11.50	40.6	51.2	48.55
7	12.50	42.6	53.6	50.92
8	13.50	43.5	55.2	52.47
9	14.50	42.1	53.9	51.17
10	15.50	41.8	52.7	50.03
11	16.50	40.5	50.1	47.54
12	17.50	39.7	48.7	46.20
13	18.50	38.5	47.4	44.92
14	19.50	37.8	46.9	44.39
15	20.50	36.5	44.2	41.87

For Global Lab and Consultancy Services LLP



Page 1 of 2

Authorised Signatory
L. SUDHAPRIYA
 Technical Manager

Note: The test results are only to the sample submitted for test. Any Correction of the test report on full or part shall invalidate the report. Samples are not drawn by us unless otherwise stated. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. Perishable samples will be discarded immediately after reporting. We do not accept any liability with regard to origin or source from which the samples are extracted. The Laboratory is not responsible for authenticity of photocopied test reports. Any holder of this report is advised that information contained here on reflects the laboratory's finding at the time of its intervention only and within the limits of client instructions. The authenticity of the test report's issued by us can be verified by submitting on E-mail request 180-A report number and report date along with report copy.

TEST REPORT

ULR-TC606024000004003F

Report Number: GLCS/TR/026/2024-25

Report Date: 15.05.2024

Issued To: Thiru R.P.Rahul, S/o, Rajendran, 13-85, Pathillavilai, Chitharal Village, Vilavankode Taluk, Kanyakumari district.		Site Address: Rough Stone and Gravel Quarry, Lease Area – 4.99.39 Ha. S.F.No:719/1,720/1,720/2,720/3,720/4,720/5,720/6, 720/7,720/8,720/9,720/10,720/11,720/12,720/13,& 720/14 of Vadakku Ariyanayagipuram –II Village, Cheranmahandevi Taluk, Tirunelveli District.	
Attention	-	Sampling Condition	Good - Active
TRF No	002	Sampled by	Laboratory
Sample Name	Noise Level Monitoring	Sampling Method	GLCS/SOP/N/014
Sample Description	Ambient Noise	Sample Code	GLCS/026
Sampling Time	Every 60 minutes	Sample Receipt Date	01.04.2024
Sampling Date	29.03.2024 - 30.03.2024	Date of Analysis	01.04.2024
		Date of Completion	12.04.2024

S. No	Time(Hrs)	Min dB(A)	Max dB(A)	Leq dB(A)
16	21.50	35.2	44.4	41.88
17	22.50	34.9	43.6	41.14
18	23.50	34.7	42.7	40.33
19	0.50	33.6	41.5	39.14
20	1.50	32.9	40.4	38.10
21	2.50	33.1	42.1	39.60
22	3.50	32.9	40.5	38.19
23	4.50	32.5	41.3	38.83
24	5.50	33.8	42.5	40.04
Day Mean dB(A)				46.13
Night Mean dB(A)				39.42
Limits as per The Noise Pollution (Regulation & Control) Rules, 2010 of MoEFCC / CPCB (Residential)				Day Time : 55 dB (A)
				Night Time : 45 dB (A)

Note: MoEFCC – Ministry of Environment Forest and Climate Change; CPCB – Central Pollution Control Board.



For Global Lab and Consultancy Services LLP

*****End of Report*****
Page 2 of 2

Authorised Signatory
L. SUDHAPRIYA
Technical Manager

Note: The test results are only to the sample submitted for test. Any Correction of the test report on full or part shall invalidate the report. Samples are not drawn by us unless otherwise stated. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. Perishable samples will be discarded immediately after reporting. We do not accept any liability with regard to origin or source from which the samples are extracted. The Laboratory is not responsible for authenticity of photocopied test reports. Any holder of this report is advised that information contained here on reflects the laboratory's finding at the time of its intervention only and within the limits of client instructions. The authenticity of the test report's issued by us can be verified by submitting on E-mail request with report number and report date along with report copy.

TEST REPORT

ULR-TC606024000004004F

Report Number: GLCS/TR/027/2024 -25

Report Date: 15.05.2024

Issued To: Thiru R.P.Rahul, S/o, Rajendran, 13-85, Pathillavilai, Chitharal Village, Vilavankode Taluk, Kanyakumari district.		Site Address: Rough Stone and Gravel Quarry, Lease Area – 4.99.39 Ha. S.F.No:719/1,720/1,720/2,720/3,720/4,720/5,720/6, 720/7,720/8,720/9,720/10,720/11,720/12,720/13,& 720/14 of Vadakku Ariyanayagipuram –II Village, Cheranmahandevi Taluk, Tirunelveli District.		
Attention	-	Sampling Condition	Good - Active	
TRF No	002	Sampled by	Laboratory	
Sample Name	Noise Level Monitoring	Sampling Method	GLCS/SOP/N/014	
Sample Description	Ambient Noise	Sample Code	GLCS/027	
Sampling Time	Every 60 minutes	Sample Receipt Date	01.04.2024	
Sampling Date	29.03.2024 - 30.03.2024	Date of Analysis	01.04.2024	
Location Name	AN5- Udayampuli	Date of Completion	12.04.2024	
Location Co-ordinates		8°47'54.10"N 77°32'22.60"E		
S. No	Time(Hrs)	Min dB(A)	Max dB(A)	Leq dB(A)
1	6.30	33.2	39.6	37.49
2	7.30	36.6	42.3	40.32
3	8.30	38.5	51.2	48.42
4	9.30	37.3	54.6	51.67
5	10.30	41.5	56.3	53.43
6	11.30	42.8	60.5	57.56
7	12.30	43.4	62.8	59.84
8	13.30	41.9	61.5	58.54
9	14.30	40.5	60.3	57.33
10	15.30	40.7	59.8	56.84
11	16.30	39.9	61.4	58.42
12	17.30	38.4	57.5	54.54
13	18.30	36.6	53.6	50.68
14	19.30	35.5	51.2	48.31
15	20.30	34.7	48.5	45.67



For Global Lab and Consultancy Services LLP

Page 1 of 2


Authorised Signatory
L. SUDHAPRIYA
Technical Manager

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TEST REPORT

ULR-TC606024000004004F

Report Number: GLCS/TR/027/2024-25

Report Date: 15.05.2024

Issued To: Thiru R.P.Rahul, S/o, Rajendran, 13-85, Pathillavilai, Chitharal Village, Vilavankode Taluk, Kanyakumari district.		Site Address: Rough Stone and Gravel Quarry, Lease Area – 4.99.39 Ha. S.F.No:719/1,720/1,720/2,720/3,720/4,720/5,720/6, 720/7,720/8,720/9,720/10,720/11,720/12,720/13,& 720/14 of Vadakku Ariyanayagipuram –II Village, Cheranmahandevi Taluk, Tirunelveli District.	
Attention	-	Sampling Condition	Good - Active
TRF No	002	Sampled by	Laboratory
Sample Name	Noise Level Monitoring	Sampling Method	GLCS/SOP/N/014
Sample Description	Ambient Noise	Sample Code	GLCS/027
Sampling Time	Every 60 minutes	Sample Receipt Date	01.04.2024
Sampling Date	29.03.2024 - 30.03.2024	Date of Analysis	01.04.2024
		Date of Completion	12.04.2024

S. No	Time(Hrs)	Min dB(A)	Max dB(A)	Leq dB(A)
16	21.30	34.2	42.6	40.18
17	22.30	32.6	41.7	39.19
18	23.30	31.9	40.4	37.96
19	0.30	32.6	38.9	36.80
20	1.30	33.9	38.2	36.56
21	2.30	34.4	39.6	37.74
22	3.30	33.6	39.1	37.17
23	4.30	35.1	38.9	37.40
24	5.30	34.7	40.1	38.19
Day Mean dB(A)				51.20
Night Mean dB(A)				37.63
Limits as per The Noise Pollution (Regulation & Control) Rules, 2010 of MoEFCC / CPCB (Residential)				Day Time : 55 dB (A)
				Night Time : 45 dB (A)

Note: MoEFCC – Ministry of Environment Forest and Climate Change; CPCB – Central Pollution Control Board.

For Global Lab and Consultancy Services LLP



*****End of Report*****

Page 2 of 2


Authorised Signatory
L. SUDHAPRIYA
Technical Manager

Note: The test results are only to the sample submitted for test. Any Correction of the test report on full or part shall invalidate the report. Samples are not drawn by us unless otherwise stated. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. Perishable samples will be discarded immediately after reporting. We do not accept any liability with regard to origin or source from which the samples are extracted. The Laboratory is not responsible for authenticity of photocopied test reports. Any holder of this report is advised that information contained here on reflects the laboratory's finding at the time of its intervention only and within the limits of client instructions. The authenticity of the test report's issued by us can be verified by submitting on E-mail request with report number and report date along with report copy.

TEST REPORT

ULR-TC606024000004005F

Report Number: GLCS/TR/028/2024 -25

Report Date: 15.05.2024

Issued To: Thiru R.P.Rahul, S/o, Rajendran, 13-85, Pathillavilai, Chitharal Village, Vilavankode Taluk, Kanyakumari district.		Site Address: Rough Stone and Gravel Quarry, Lease Area – 4.99,39 Ha. S.F.No:719/1,720/1,720/2,720/3,720/4,720/5,720/6, 720/7,720/8,720/9,720/10,720/11,720/12,720/13,& 720/14 of Vadakku Ariyanayagipuram –II Village, Cheranmahandevi Taluk, Tirunelveli District.		
Attention	-	Sampling Condition	Good - Active	
TRF No	002	Sampled by	Laboratory	
Sample Name	Noise Level Monitoring	Sampling Method	GLCS/SOP/N/014	
Sample Description	Ambient Noise	Sample Code	GLCS/028	
Sampling Time	Every 60 minutes	Sample Receipt Date	01.04.2024	
Sampling Date	29.03.2024 - 30.03.2024	Date of Analysis	01.04.2024	
Location Name	AN6- Singamparai (House)	Date of Completion	12.04.2024	
Location Co-ordinates		8°45'10.77"N 77°32'5.78"E		
S. No	Time(Hrs)	Min dB(A)	Max dB(A)	Leq dB(A)
1	6.15	35.1	43.9	41.43
2	7.15	37.4	46.1	43.64
3	8.15	38.5	53.6	50.72
4	9.15	40.9	55.6	52.73
5	10.15	40.5	60.2	57.24
6	11.15	43.5	62.3	59.35
7	12.15	44.1	60.7	57.78
8	13.15	45.6	59.5	56.66
9	14.15	43.9	60.1	57.19
10	15.15	43.2	61.2	58.26
11	16.15	42.8	53.7	51.03
12	17.15	42.9	53.4	50.76
13	18.15	41.5	52.3	49.64
14	19.15	41.9	53.7	50.97
15	20.15	40.6	51.7	49.01



For Global Lab and Consultancy Services LLP

Page 1 of 1


Authorised Signatory
L. SUDHAPRIYA
 Technical Manager

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TEST REPORT

ULR-TC606024000004005F

Report Number: GLCS/TR/028/2024-25

Report Date: 15.05.2024

Issued To: Thiru R.P.Rahul, S/o, Rajendran, 13-85, Pathillavilai, Chitharal Village, Vilavankode Taluk, Kanyakumari district.		Site Address: Rough Stone and Gravel Quarry, Lease Area – 4.99.39 Ha. S.F.No:719/1,720/1,720/2,720/3,720/4,720/5,720/6, 720/7,720/8,720/9,720/10,720/11,720/12,720/13,& 720/14 of Vadakku Ariyanayagipuram –II Village, Cheranmahandevi Taluk, Tirunelveli District.	
Attention	-	Sampling Condition	Good - Active
TRF No	002	Sampled by	Laboratory
Sample Name	Noise Level Monitoring	Sampling Method	GLCS/SOP/N/014
Sample Description	Ambient Noise	Sample Code	GLCS/028
Sampling Time	Every 60 minutes	Sample Receipt Date	01.04.2024
Sampling Date	29.03.2024 - 30.03.2024	Date of Analysis	01.04.2024
		Date of Completion	12.04.2024

S. No	Time(Hrs)	Min dB(A)	Max dB(A)	Leq dB(A)
16	21.15	38.5	45.6	43.36
17	22.15	37.4	44.1	41.93
18	23.15	36.9	44.3	42.02
19	0.15	35.5	39.6	38.02
20	0.15	34.6	38.1	36.69
21	0.15	34.9	40.5	38.55
22	0.15	33.8	40.9	38.66
23	0.15	34.1	39.8	37.82
24	0.15	35.2	38.5	37.16
Day Mean dB(A)				51.86
Night Mean dB(A)				39.36

Limits as per The Noise Pollution (Regulation & Control) Rules, 2010 of MoEFCC / CPCB (Residential)	Day Time : 55 dB (A)
	Night Time : 45 dB (A)

Note: MoEFCC – Ministry of Environment Forest and Climate Change; CPCB – Central Pollution Control Board.

For Global Lab and Consultancy Services LLP



*****End of Report*****

Page 2 of 2

Authorised Signatory

L. SUDHAPRIYA
Technical Manager

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TEST REPORT

ULR-TC606024000004006F

Report Number: GLCS/TR/029/2024 -25

Report Date: 15.05.2024

Issued To: Thiru R.P.Rahul, S/o, Rajendran, 13-85, Pathillavilai, Chitharal Village, Vilavankode Taluk, Kanyakumari district.		Site Address: Rough Stone and Gravel Quarry, Lease Area – 4.99.39 Ha. S.F.No:719/1,720/1,720/2,720/3,720/4,720/5,720/6, 720/7,720/8,720/9,720/10,720/11,720/12,720/13,& 720/14 of Vadakku Ariyanayagipuram –II Village, Cheranmahandevi Taluk, Tirunelveli District.		
Attention	-	Sampling Condition	Good - Active	
TRF No	002	Sampled by	Laboratory	
Sample Name	Noise Level Monitoring	Sampling Method	GLCS/SOP/N/014	
Sample Description	Ambient Noise	Sample Code	GLCS/029	
Sampling Time	Every 60 minutes	Sample Receipt Date	01.04.2024	
Sampling Date	29.03.2024 - 30.03.2024	Date of Analysis	01.04.2024	
Location Name	AN7- Sidaparappanallur (House)	Date of Completion	12.04.2024	
Location Co-ordinates		8°47'16.89"N 77°35'59.98"E		
S. No	Time(Hrs)	Min dB(A)	Max dB(A)	Leq dB(A)
1	6.10	36.9	51.5	48.64
2	7.10	39.1	52.6	49.78
3	8.10	40.2	53.6	50.78
4	9.10	41.7	55.9	53.05
5	10.10	42.3	60.1	57.16
6	11.10	44.9	61.9	58.98
7	12.10	43.2	62.3	59.34
8	13.10	43.9	65.6	62.62
9	14.10	42.5	64.3	61.32
10	15.10	41.9	62.7	59.73
11	16.10	38.2	61.5	58.51
12	17.10	37.6	59.5	56.52
13	18.10	36.9	57.4	54.43
14	19.10	36.1	54.3	51.35
15	20.10	35.7	50.1	47.24

For Global Lab and Consultancy Services LLP



Page 1 of 2

Authorised Signatory

L. SUDHAPRIYA
Technical Manager

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TEST REPORT

ULR-TC606024000004006F

Report Number: GLCS/TR/029/2024-25

Report Date: 15.05.2024

Issued To: Thiru R.P.Rahul, S/o. Rajendran, 13-85, Pathillavilai, Chitharal Village, Vilavankode Taluk, Kaniyakumari district.		Site Address: Rough Stone and Gravel Quarry, Lease Area – 4.99.39 Ha. S.F.No:719/1,720/1,720/2,720/3,720/4,720/5,720/6, 720/7,720/8,720/9,720/10,720/11,720/12,720/13,& 720/14 of Vadakku Ariyanayagipuram –II Village, Cheranmahandevi Taluk, Tirunelveli District.	
Attention	-	Sampling Condition	Good - Active
TRF No	002	Sampled by	Laboratory
Sample Name	Noise Level Monitoring	Sampling Method	GLCS/SOP/N/014
Sample Description	Ambient Noise	Sample Code	GLCS/029
Sampling Time	Every 60 minutes	Sample Receipt Date	01.04.2024
Sampling Date	29.03.2024 - 30.03.2024	Date of Analysis	01.04.2024
		Date of Completion	12.04.2024

S. No	Time(Hrs)	Min dB(A)	Max dB(A)	Leq dB(A)
16	21.10	33.5	48.8	45.92
17	22.10	34.7	43.2	40.76
18	23.10	34.9	42.6	40.27
19	0.10	33.4	41.6	39.20
20	1.10	32.5	43.5	40.82
21	2.10	33.2	40.2	37.98
22	3.10	32.8	38.5	36.52
23	4.10	33.4	39.8	37.69
24	5.10	34.2	38.9	37.16
Day Mean dB(A)				53.89
Night Mean dB(A)				39.59

Limits as per The Noise Pollution (Regulation & Control) Rules, 2010 of MoEFCC / CPCB (Residential)	Day Time : 55 dB (A)
	Night Time : 45 dB (A)

Note: MoEFCC – Ministry of Environment Forest and Climate Change; CPCB – Central Pollution Control Board.

For Global Lab and Consultancy Services LLP



(Signature)
Authorised Signatory
L. SUDHAPRIYA
Technical Manager

*****End of Report*****

Page 2 of 2

Note: The test results are only to the sample submitted for test. Any Correction of the test report on full or part shall invalidate the report. Samples are not drawn by us unless otherwise stated. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. Perishable samples will be discarded immediately after reporting. We do not accept any liability with regard to origin or source from which the samples are extracted. The Laboratory is not responsible for authenticity of photocopied test reports. Any holder of this report is advised that information contained here on reflects the laboratory's finding at the time of its intervention only and within the limits of client instructions. The authenticity of the test report's issued by us can be verified by submitting on E-mail request with report number and report date along with report copy.



TEST REPORT

ULR-TC606024000004007F

Report Number: GLCS/TR/030/2024 -25

Report Date: 15.05.2024

Issued To: Thiru R.P.Rahul, S/o, Rajendran, 13-85, Pathillavilai, Chitharal Village, Vilavankode Taluk, Kanyakumari district.		Site Address: Rough Stone and Gravel Quarry, Lease Area – 4.99.39 Ha. S.F.No:719/1,720/1,720/2,720/3,720/4,720/5,720/6, 720/7,720/8,720/9,720/10,720/11,720/12,720/13,& 720/14 of Vadakku Ariyanayagipuram –II Village, Cheranmahandevi Taluk, Tirunelveli District.		
Attention	-	Sampling Condition	Good - Active	
TRF No	002	Sampled by	Laboratory	
Sample Name	Noise Level Monitoring	Sampling Method	GLCS/SOP/N/014	
Sample Description	Ambient Noise	Sample Code	GLCS/030	
Sampling Time	Every 60 minutes	Sample Receipt Date	01.04.2024	
Sampling Date	29.03.2024 - 30.03.2024	Date of Analysis	01.04.2024	
Location Name	AN8- Near Nadukkalur	Date of Completion	12.04.2024	
Location Co-ordinates		8°43'17.90"N 77°35'30.70"E		
S. No	Time(Hrs)	Min dB(A)	Max dB(A)	Leq dB(A)
1	6.45	40.9	52.6	49.87
2	7.45	42.9	54.6	52.16
3	8.45	43.6	56.6	53.80
4	9.45	44.2	58.5	55.65
5	10.45	45.5	61.5	58.60
6	11.45	44.7	59.5	56.63
7	12.45	43.6	60.4	57.48
8	13.45	44.9	61.7	58.78
9	14.45	42.5	60.3	57.36
10	15.45	42.7	59.8	56.87
11	16.45	42.6	56.6	53.76
12	17.45	41.9	55.1	52.29
13	18.45	39.5	51.3	48.57
14	19.45	39.1	50.4	47.70
15	20.45	38.6	49.5	46.83

For Global Lab and Consultancy Services LLP



Page 1 of 2


Authorised Signatory
L. SUDHAPRIYA
Technical Manager

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TEST REPORT

ULR-TC606024000004007F

Report Number: GLCS/TR/030/2024-25

Report Date: 15.05.2024

Issued To: Thiru R.P.Rahul, S/o, Rajendran, 13-85, Pathillavilai, Chitharal Village, Vilavankode Taluk, Kanyakumari district.		Site Address: Rough Stone and Gravel Quarry, Lease Area – 4.99.39 Ha. S.F.No:719/1,720/1,720/2,720/3,720/4,720/5,720/6, 720/7,720/8,720/9,720/10,720/11,720/12,720/13,& 720/14 of Vadakku Ariyanayagipuram –II Village, Cheranmahandevi Taluk, Tirunelveli District.	
Attention	-	Sampling Condition	Good - Active
TRF No	002	Sampled by	Laboratory
Sample Name	Noise Level Monitoring	Sampling Method	GLCS/SOP/N/014
Sample Description	Ambient Noise	Sample Code	GLCS/030
Sampling Time	Every 60 minutes	Sample Receipt Date	01.04.2024
Sampling Date	29.03.2024 - 30.03.2024	Date of Analysis	01.04.2024
		Date of Completion	12.04.2024

S. No	Time(Hrs)	Min dB(A)	Max dB(A)	Leq dB(A)
16	21.45	36.6	48.5	45.76
17	22.45	35.7	46.9	44.21
18	23.45	34.6	41.9	39.63
19	0.45	33.9	42.8	40.32
20	1.45	33.2	39.4	37.32
21	2.45	32.9	41.6	39.14
22	3.45	33.1	37.9	36.13
23	4.45	32.9	39.5	37.35
24	5.45	32.4	40.5	38.12
Day Mean dB(A)				52.72
Night Mean dB(A)				39.77

Limits as per The Noise Pollution (Regulation & Control) Rules, 2010 of MoEFCC / CPCB (Industrial)

Day Time : 75 dB (A)

Night Time : 70 dB (A)

Note: MoEFCC – Ministry of Environment Forest and Climate Change; CPCB – Central Pollution Control Board.

For Global Lab and Consultancy Services LLP



(Signature)
Authorised Signatory
L. SUDHAPRIYA
 Technical Manager

*****End of Report*****

Page 2 of 2

Note: The test results are only to the sample submitted for test. Any Correction of the test report on full or part shall invalidate the report. Samples are not drawn by us unless otherwise stated. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. Perishable samples will be discarded immediately after reporting. We do not accept any liability with regard to origin or source from which the samples are extracted. The Laboratory is not responsible for authenticity of photocopied test reports. Any holder of this report is advised that information contained here on reflects the laboratory's finding at the time of its intervention only and within the limits of client instructions. The authenticity of the test report's issued by us can be verified by submitting on E-mail request with report number and report date along with report copy.

TEST REPORT

ULR-TC606024000004472F

Report Number: GLCS/TR/503/2024-25(1)

Report Date: 31.05.2024

Issued To: Thiru R.P.Rahul, S/o, Rajendran, 13-85, Pathillavilai, Chitharal Village, Vilavankode Taluk, Kaniyakumari district.		Site Address: Rough Stone and Gravel Quarry, Lease Area – 4.99.39 Ha. S.F.No:719/1,720/1,720/2,720/3,720/4,720/5,720/6, 720/7,720/8,720/9,720/10,720/11,720/12,720/13,& 720/14 of Vadakku Ariyanayagipuram –II Village, Cheranmahandevi Taluk, Tirunelveli District.	
Attention	-	Sample Receipt Condition	Ambient – Good
Customer Ref No	206	Sample Quantity	2Liters
Sample Name	Surface Water -1	Sampled by	Laboratory
Sample Description	Liquid	Sampling Method	GLCS/SOP/W/028
Sample Code	GLCS /503	Sample Receipt Date	15.04.2024
Location Name	SW-1 – Thamirabarani River	Date of Analysis	15.04.2024
Sampling Date	12.04.2024	Date of Completion	29.04.2024
Location Co-ordinates	8°43'40.20"N 77°31'37.48"E		

Sl. No.	TEST PARAMETERS	TEST METHOD	UNIT	RESULTS
1	Odor	IS 3025 PART 5 -2018	-	Agreeable
2	pH	IS 3025 PART 11 -2022	-	7.86
3	Electrical Conductivity	IS 3025 PART 14 -2013 (RA 2019)	µS/cm	2068
4	Turbidity	IS 3025 PART 10 -2023	NTU	12
5	Total Dissolved Solids	IS 3025 PART 16 -2023	mg/l	1344
6	Total Alkalinity as CaCO ₃	IS 3025 PART 23 -2023	mg/l	640
7	Total Hardness as CaCO ₃	IS 3025 PART 21-2009 (RA 2019)	mg/l	780
8	Calcium as Ca	IS 3025 PART 40 -1991 (RA 2019)	mg/l	140

For Global Lab and Consultancy Services LLP



Page 1 of 3

Authorised Signatory
L. SUDHAPRIYA
Technical Manager

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TEST REPORT

ULR-TC606024000004472F

Report Number: GLCS/TR/503/2024-25(1)

Report Date: 31.05.2024

Sl. No.	TEST PARAMETERS	TEST METHOD	UNIT	RESULTS
9	Magnesium as Mg	IS 3025 PART 46 -2023	mg/l	105
10	Chloride as Cl ⁻	IS 3025 PART 32-1988(RA2019)	mg/l	190
11	Iron as Fe	IS 3025 PART 53 - 2024	mg/l	0.32
12	Boron as B	IS 3025 PART 57 - 2021	mg/l	BDL (DL:0.1)
13	Free Residual Chlorine as Cl ₂	IS 3025 PART 26 - 2021	mg/l	BDL (DL:1.0)
14	Fluoride as F	GLCS/SOP/W/015 Issue No:1 2016	mg/l	0.19
15	Manganese as Mn	IS 3025 PART 59 - 2006	mg/l	BDL (DL:0.1)
16	Nitrate as NO ₃	IS 3025 PART 34 -1988(RA2019)	mg/l	BDL (DL:2)
17	Dissolved Oxygen	IS 3025 PART 38 -1989(RA2019)	mg/l	5.3
18	Bio-Chemical Oxygen Demand @ 27°C for 3 days	IS 3025 PART 44 -2023	mg/l	6
19	Ammonia as NH ₃	IS 3025 PART 34 -1988(RA2019)	mg/l	BDL (DL:1)

Note: BDL – Below Detection Limit, DL – Detection Limit.

For Global Lab and Consultancy Services LLP


Authorised Signatory
L. SUDHAPRIYA
Technical Manager



Page 2 of 3

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TEST REPORT

ULR-TC606024000004472F

Report Number: GLCS/TR/503/2024-25(1)

Report Date: 31.05.2024

Issued To: Thiru R.P.Rahul, S/o, Rajendran, 13-85, Pathillavilai, Chitharal Village, Vilavankode Taluk, Kanyakumari district.		Site Address: Rough Stone and Gravel Quarry, Lease Area – 4.99.39 Ha. S.F.No: 719/1, 720/1, 720/2, 720/3, 720/4, 720/5, 720/6, 720/7, 720/8, 720/9, 720/10, 720/11, 720/12, 720/13, & 720/14 of Vadakku Ariyanayagipuram –II Village, Cheranmahandevi Taluk, Tirunelveli District.	
Attention	-	Sample Receipt Condition	Good
Customer Ref No	206	Sample Quantity	250 ml
Sample Name	Surface Water -1	Sampled by	Laboratory
Sample Description	Liquid	Sampling Method	GLCS/M/SOP-05
Sample Code	GLCS /503	Date of Analysis	15.04.2024
Location Name	SW-1 – Thamirabarani River	Date of Completion	22.04.2024
Sample Receipt Date	15.04.2024	Location Co-ordinates	8°43'40.20"N 77°31'37.48"E

Sl. No	TEST PARAMETERS	TEST METHOD	UNIT	RESULTS
1	Total Coliforms	IS: 1622 – 1981(Reaffirmed 2019)	MPN/100ml	280
2	Escherichia coli	IS: 1622 – 1981(Reaffirmed 2019)	MPN/100ml	27

Note: MPN- Most Probable Number..

For Global Lab and Consultancy Services LLP



*****End of Report*****

Page 3 of 3


Authorised Signatory
L. DINESHKUMAR
Technical Manager-Microbiology

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TEST REPORT

Report Number: GLCS/TR/503/2024-25(2)

Report Date: 31.05.2024

Issued To: Thiru R.P.Rahul, S/o, Rajendran, 13-85,Pathillavilai, Chitharal Village, Vilavankode Taluk, Kaniyakumari district.		Site Address: Rough Stone and Gravel Quarry, Lease Area – 4.99.39 Ha. S.F.No:719/1,720/1,720/2,720/3,720/4,720/5,720/6, 720/7,720/8,720/9,720/10,720/11,720/12,720/13,& 720/14 of Vadakku Ariyanayagipuram –II Village, Cheranmahandevi Taluk, Tirunelveli District.	
Attention	-	Sample Receipt Condition	Ambient – Good
Customer Ref No	206	Sample Quantity	2Liters
Sample Name	Surface Water -1	Sampled by	Laboratory
Sample Description	Liquid	Sampling Method	GLCS/SOP/W/028
Sample Code	GLCS /503	Sample Receipt Date	15.04.2024
Location Name	SW-1 – Thamirabarani River	Date of Analysis	15.04.2024
Sampling Date	12.04.2024	Date of Completion	29.04.2024
Location Co-ordinates	8°43'40.20"N 77°31'37.48"E		

Sl. No.	TEST PARAMETERS	TEST METHOD	UNIT	RESULTS
1	Color	IS: 3025 PART 4 -2021	CU	<5
2	Total Suspended Solids	IS 3025 PART 17 -2022	mg/l	18
3	Phenolic Compounds	IS 3025 PART 43 Sec 1 2022	mg/l	BDL (DL:0.1)
4	Anionic Detergents	IS 13428 ANNEX K	mg/l	BDL (DL:0.05)
5	Cyanide	IS 3025 PART 27 Sec1 2021	mg/l	BDL (DL:0.02)
6	Sulphide	GLCS/SOP/W/66 Issue No:1 2022	mg/l	BDL (DL:1)
7	Copper as Cu	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.01)
8	Mercury (Hg)	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.002)
9	Cadmium as Cd	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.01)
10	Selenium	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.002)
11	Aluminium as Al	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.01)
12	Lead as Pb	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.01)
13	Zinc as Zn	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.01)
14	Chromium	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.01)
15	Barium as Ba	GLCS/SOP/W/62 Issue No:1 2022	mg/l	0.2
16	Molybdenum as Mo	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.01)
17	Arsenic as As	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.002)
18	Chemical Oxygen Demand	IS 3025 PART 58 -2023	mg/l	30
19	Sulphate as SO ₄ ⁻²	IS 3025 PART 24- Sec 1 2022	mg/l	75

Note : BDL – Below Detection Limit, DL – Detection Limit.



For Global Lab and Consultancy Services LLP

*****End of Report*****

Page 1 of 1

Authorised Signatory

L. SUDHAPRIYA
Technical Manager

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TEST REPORT

ULR-TC606024000004473F

Report Number: GLCS/TR/504/2024-25(1)

Report Date: 31.05.2024

Issued To: Thiru R.P.Rahul, S/o, Rajendran, 13-85,Pathillavilai, Chitharal Village, Vilavankode Taluk, Kaniyakumari district.		Site Address: Rough Stone and Gravel Quarry, Lease Area – 4.99.39 Ha. S.F.No:719/1,720/1,720/2,720/3,720/4,720/5,720/6, 720/7,720/8,720/9,720/10,720/11,720/12,720/13,& 720/14 of Vadakku Ariyanayagipuram –II Village, Cheranmahandevi Taluk, Tirunelveli District.	
Attention	-	Sample Receipt Condition	Ambient – Good
Customer Ref No	206	Sample Quantity	2Liters
Sample Name	Surface Water -2	Sampled by	Laboratory
Sample Description	Liquid	Sampling Method	GLCS/SOP/W/028
Sample Code	GLCS /504	Sample Receipt Date	15.04.2024
Location Name	SW-2 Tank Near Vettuvankulam	Date of Analysis	15.04.2024
Sampling Date	12.04.2024	Date of Completion	29.04.2024
Location Co-ordinates	8°45'56.48"N 77°35'11.13"E		

Sl. No.	TEST PARAMETERS	TEST METHOD	UNIT	RESULTS
1	Odor	IS 3025 PART 5 -2018	-	Agreeable
2	pH	IS 3025 PART 11 -2022	-	7.62
3	Electrical Conductivity	IS 3025 PART 14 -2013 (RA 2019)	µS/cm	1969
4	Turbidity	IS 3025 PART 10 -2023	NTU	6
5	Total Dissolved Solids	IS 3025 PART 16 -2023	mg/l	1280
6	Total Alkalinity as CaCO ₃	IS 3025 PART 23 -2023	mg/l	560
7	Total Hardness as CaCO ₃	IS 3025 PART 21-2009 (RA 2019)	mg/l	680
8	Calcium as Ca	IS 3025 PART 40 -1991 (RA 2019)	mg/l	128

For Global Lab and Consultancy Services LLP



Page 1 of 3

Authorised Signatory
L. SUDHAPRIYA
Technical Manager

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TEST REPORT

ULR-TC606024000004473F

Report Number: GLCS/TR/504/2024-25(1)

Report Date: 31.05.2024

Sl. No.	TEST PARAMETERS	TEST METHOD	UNIT	RESULTS
9	Magnesium as Mg	IS 3025 PART 46 -2023	mg/l	87
10	Chloride as Cl ⁻	IS 3025 PART 32-1988(RA2019)	mg/l	210
11	Iron as Fe	IS 3025 PART 53 - 2024	mg/l	0.38
12	Boron as B	IS 3025 PART 57 - 2021	mg/l	BDL (DL:0.1)
13	Free Residual Chlorine as Cl ₂	IS 3025 PART 26 - 2021	mg/l	BDL (DL:1.0)
14	Fluoride as F	GLCS/SOP/W/015 Issue No:1 2016	mg/l	0.21
15	Manganese as Mn	IS 3025 PART 59 - 2006	mg/l	BDL (DL:0.1)
16	Nitrate as NO ₃	IS 3025 PART 34 -1988(RA2019)	mg/l	BDL (DL:2.0)
17	Dissolved Oxygen	IS 3025 PART 38 -1989(RA2019)	mg/l	6.1
18	Bio-Chemical Oxygen Demand @ 27°C for 3 days	IS 3025 PART 44 -2023	mg/l	3
19	Ammonia as NH ₃	IS 3025 PART 34 -1988(RA2019)	mg/l	BDL (DL:1.0)

Note: BDL – Below Detection Limit, DL – Detection Limit.

For Global Lab and Consultancy Services LLP



Authorised Signatory
L. SUDHAPRIYA
Technical Manager



Page 2 of 3

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TEST REPORT

ULR-TC606024000004473F

Report Number: GLCS/TR/504/2024-25(1)

Report Date: 31.05.2024

Issued To: <i>Thiru R.P.Rahul,</i> S/o, Rajendran, 13-85, Pathillavilai, Chitharal Village, Vilavankode Taluk, Kanyakumari district.		Site Address: <i>Rough Stone and Gravel Quarry,</i> Lease Area – 4.99.39 Ha. S.F.No:719/1,720/1,720/2,720/3,720/4,720/5,720/6, 720/7,720/8,720/9,720/10,720/11,720/12,720/13,& 720/14 of Vadakku Ariyanayagipuram –II Village, Cheranmahandevi Taluk, Tirunelveli District.	
Attention	-	Sample Receipt Condition	Good
Customer Ref No	206	Sample Quantity	250 ml
Sample Name	Surface Water -2	Sampled by	Laboratory
Sample Description	Liquid	Sampling Method	GLCS/M/SOP-05
Sample Code	GLCS /504	Date of Analysis	15.04.2024
Location Name	SW-2 Tank Near Vettuvankulam	Date of Completion	22.04.2024
Sample Receipt Date	15.04.2024	Location Co-ordinates	8°45'56.48"N 77°35'11.13"E

Sl. No	TEST PARAMETERS	TEST METHOD	UNIT	RESULTS
1	Total Coliforms	IS: 1622 – 1981(Reaffirmed 2019)	MPN/100ml	350
2	Escherichia coli	IS: 1622 – 1981(Reaffirmed 2019)	MPN/100ml	26

Note: MPN- Most Probable Number.

For Global Lab and Consultancy Services LLP



*****End of Report*****

Page 3 of 3


Authorised Signatory
L. DINESHKUMAR
Technical Manager-Microbiology

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TEST REPORT

Report Number: GLCS/TR/504/2024-25(2)

Report Date: 31.05.2024

Issued To: Thiru R.P.Rahul, S/o, Rajendran, 13-85, Pathillavilai, Chitharal Village, Vilavankode Taluk, Kanyakumari district.		Site Address: Rough Stone and Gravel Quarry, Lease Area – 4.99.39 Ha. S.F.No:719/1,720/1,720/2,720/3,720/4,720/5,720/6, 720/7,720/8,720/9,720/10,720/11,720/12,720/13,& 720/14 of Vadakku Ariyanayagipuram –II Village, Cheranmahandevi Taluk, Tirunelveli District.	
Attention	-	Sample Receipt Condition	Ambient – Good
Customer Ref No	206	Sample Quantity	2Liters
Sample Name	Surface Water -2	Sampled by	Laboratory
Sample Description	Liquid	Sampling Method	GLCS/SOP/W/028
Sample Code	GLCS /504	Sample Receipt Date	15.04.2024
Location Name	SW-2 Tank Near Vettuvankulam	Date of Analysis	15.04.2024
Sampling Date	12.04.2024	Date of Completion	29.04.2024
Location Co-ordinates	8°45'56.48"N 77°35'11.13"E		

Sl. No.	TEST PARAMETERS	TEST METHOD	UNIT	RESULTS
1	Color	IS: 3025 PART 4 -2021	CU	<5
2	Total Suspended Solids	IS 3025 PART 17 -2022	mg/l	8
3	Phenolic Compounds	IS 3025 PART 43 Sec 1 2022	mg/l	BDL (DL:0.1)
4	Anionic Detergents	IS 13428 ANNEX K	mg/l	BDL (DL:0.05)
5	Cyanide	IS 3025 PART 27 Sec1 2021	mg/l	BDL (DL:0.02)
6	Sulphide	GLCS/SOP/W/66 Issue No:1 2022	mg/l	BDL (DL:1)
7	Copper as Cu	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.01)
8	Mercury (Hg)	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.002)
9	Cadmium as Cd	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.01)
10	Selenium	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.002)
11	Aluminium as Al	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.01)
12	Lead as Pb	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.01)
13	Zinc as Zn	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.01)
14	Chromium	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.01)
15	Barium as Ba	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.01)
16	Molybdenum as Mo	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.01)
17	Arsenic as As	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.002)
18	Chemical Oxygen Demand	IS 3025 PART 58 -2023	mg/l	10
19	Sulphate as SO ₄ ⁻	IS 3025 PART 24- Sec 1 2022	mg/l	93

Note : BDL – Below Detection Limit, DL – Detection Limit.



For Global Lab and Consultancy Services LLP

Authorised Signatory

L. SUDHAPRIYA
Technical Manager

*****End of Report*****

Page 1 of 1

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TEST REPORT

ULR-TC606024000004474F

Report Number: GLCS/TR/505/2024-25(1)

Report Date: 31.05.2024

Issued To: Thiru R.P.Rahul, S/o, Rajendran, 13-85, Pathillavilai, Chitharal Village, Vilavankode Taluk, Kaniyakumari district.		Site Address: Rough Stone and Gravel Quarry, Lease Area – 4.99.39 Ha. S.F.No:719/1,720/1,720/2,720/3,720/4,720/5,720/6, 720/7,720/8,720/9,720/10,720/11,720/12,720/13,& 720/14 of Vadakku Ariyanayagipuram –II Village, Cheranmahandevi Taluk, Tirunelveli District.	
Attention	-	Sample Receipt Condition	Ambient – Good
Customer Ref No	206	Sample Quantity	2Liters
Sample Name	Well Water -1	Sampled by	Laboratory
Sample Description	Liquid	Sampling Method	GLCS/SOP/W/028
Sample Code	GLCS /505	Sample Receipt Date	15.04.2024
Location Name	Near Project Area	Date of Analysis	15.04.2024
Sampling Date	12.04.2024	Date of Completion	27.04.2024
Location Co-ordinates	8°45'2.99"N 77°33'39.59"E		

Sl. No.	TEST PARAMETERS	TEST METHOD	UNIT	RESULTS
1	Odor	IS 3025 PART 5 -2018	-	Agreeable
2	pH	IS 3025 PART 11 -2022	-	7.08
3	Electrical Conductivity	IS 3025 PART 14 -2013 (RA 2019)	µS/cm	1267
4	Turbidity	IS 3025 PART 10 -2023	NTU	<1
5	Total Dissolved Solids	IS 3025 PART 16 -2023	mg/l	824
6	Total Alkalinity as CaCO ₃	IS 3025 PART 23 -2023	mg/l	390
7	Total Hardness as CaCO ₃	IS 3025 PART 21-2009 (RA 2019)	mg/l	540
8	Calcium as Ca	IS 3025 PART 40 -1991 (RA 2019)	mg/l	104

For Global Lab and Consultancy Services LLP



Page 1 of 3

Authorised Signatory
L. SUDHAPRIYA
Technical Manager

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TEST REPORT

ULR-TC606024000004474F

Report Number: GLCS/TR/505/2024-25(1)

Report Date: 31.05.2024

Sl. No.	TEST PARAMETERS	TEST METHOD	UNIT	RESULTS
9	Magnesium as Mg	IS 3025 PART 46 -2023	mg/l	68
10	Chloride as Cl ⁻	IS 3025 PART 32-1988(RA2019)	mg/l	130
11	Iron as Fe	IS 3025 PART 53 - 2024	mg/l	0.21
13	Boron as B	IS 3025 PART 57 - 2021	mg/l	BDL (DL:0.1)
14	Free Residual Chlorine as Cl ₂	IS 3025 PART 26 - 2021	mg/l	BDL (DL:1.0)
15	Fluoride as F	GLCS/SOP/W/015 Issue No:1 2016	mg/l	0.16
16	Manganese as Mn	IS 3025 PART 59 - 2006	mg/l	BDL (DL:0.1)
17	Nitrate as NO ₃	IS 3025 PART 34 -1988(RA2019)	mg/l	BDL (DL :2.0)
18	Total Suspended Solids	IS 3025 PART 17 -2022	mg/l	BDL (DL :2)

Note: BDL – Below Detection Limit, DL – Detection Limit.

For Global Lab and Consultancy Services LLP


 Authorised Signatory
L. SUDHAPRIYA
 Technical Manager

Page 2 of 3

Note: The test results are only to the sample submitted for test. Any Correction of the test report on full or part shall invalidate the report. Samples are not drawn by us unless otherwise stated. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. Perishable samples will be discarded immediately after reporting. We do not accept any liability with regard to origin or source from which the samples are extracted. The Laboratory is not responsible for authenticity of photocopied test reports. Any holder of this report is advised that information contained here on reflects the laboratory's finding at the time of its intervention only and within the limits of client instructions. The authenticity of the test report's issued by us can be verified by submitting on E-mail request with report number and report date along with report copy.

TEST REPORT

ULR-TC606024000004474F

Report Number: GLCS/TR/505/2024-25(1)

Report Date: 31.05.2024

Issued To: Thiru R.P.Rahul, S/o, Rajendran, 13-85, Pathillavilai, Chitharal Village, Vilavankode Taluk, Kanyakumari district.		Site Address: Rough Stone and Gravel Quarry, Lease Area – 4.99.39 Ha. S.F.No:719/1,720/1,720/2,720/3,720/4,720/5,720/6, 720/7,720/8,720/9,720/10,720/11,720/12,720/13,& 720/14 of Vadakku Ariyanayagipuram –II Village, Cheranmahandevi Taluk, Tirunelveli District.	
Attention	-	Sample Receipt Condition	Good
Customer Ref No	206	Sample Quantity	250 ml
Sample Name	Well Water -1	Sampled by	Laboratory
Sample Description	Liquid	Sampling Method	GLCS/M/SOP-05
Sample Code	GLCS /505	Date of Analysis	15.04.2024
Location Name	Near Project Area	Date of Completion	16.04.2024
Sample Receipt Date	15.04.2024	Location Co-ordinates	8°45'2.99"N 77°33'39.59"E

Sl. No	TEST PARAMETERS	TEST METHOD	UNIT	RESULTS
1	Total Coliforms	IS: 15185 - 2016(Reaffirmed 2021)	Per 100ml	Absent
2	Escherichia coli	IS: 15185 - 2016(Reaffirmed 2021)	Per 100ml	Absent

For Global Lab and Consultancy Services LLP



*****End of Report*****

Page 3 of 3


Authorised Signatory
L. DINESHKUMAR
Technical Manager-Microbiology

Note: The test results are only to the sample submitted for test. Any Correction of the test report on full or part shall invalidate the report. Samples are not drawn by us unless otherwise stated. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. Perishable samples will be discarded immediately after reporting. We do not accept any liability with regard to origin or source from which the samples are extracted. The Laboratory is not responsible for authenticity of photocopied test reports. Any holder of this report is advised that information contained here on reflects the laboratory's finding at the time of its intervention only and within the limits of client instructions. The authenticity of the test report's issued by us can be verified by submitting on E-mail request with report number and report date along with report copy.

TEST REPORT

Report Number: GLCS/TR/505/2024-25(2)

Report Date: 31.05.2024

Issued To: Thiru R.P.Rahul, S/o, Rajendran, 13-85, Pathillavilai, Chitharal Village, Vilavankode Taluk, Kaniyakumari district.		Site Address: Rough Stone and Gravel Quarry, Lease Area – 4.99.39 Ha. S.F.No:719/1,720/1,720/2,720/3,720/4,720/5,720/6, 720/7,720/8,720/9,720/10,720/11,720/12,720/13,& 720/14 of Vadakku Ariyanayagipuram –II Village, Cheranmahandevi Taluk, Tirunelveli District.	
Attention	-	Sample Receipt Condition	Ambient – Good
Customer Ref No	206	Sample Quantity	2Liters
Sample Name	Well Water -1	Sampled by	Laboratory
Sample Description	Liquid	Sampling Method	GLCS/SOP/W/028
Sample Code	GLCS /505	Sample Receipt Date	15.04.2024
Location Name	Near Project Area	Date of Analysis	15.04.2024
Sampling Date	12.04.2024	Date of Completion	29.04.2024
Location Co-ordinates	8°45'2.99"N 77°33'39.59"E		

Sl. No.	TEST PARAMETERS	TEST METHOD	UNIT	RESULTS
1	Color	IS: 3025 PART 4 -2021	CU	<5
2	Phenolic Compounds	IS 3025 PART 43 Sec 1 2022	mg/l	BDL (DL:0.1)
3	Anionic Detergents	IS 13428 ANNEX K	mg/l	BDL (DL:0.05)
4	Cyanide	IS 3025 PART 27 Sec1 2021	mg/l	BDL (DL:0.02)
5	Sulphide	GLCS/SOP/W/66 Issue No:1 2022	mg/l	BDL (DL:1)
6	Copper as Cu	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.01)
7	Mercury (Hg)	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.002)
8	Cadmium as Cd	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.01)
9	Selenium	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.002)
10	Aluminium as Al	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.01)
11	Lead as Pb	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.01)
12	Zinc as Zn	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.01)
13	Chromium	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.01)
14	Barium as Ba	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.01)
15	Molybdenum as Mo	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.01)
16	Arsenic as As	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.002)
17	Ammonia as NH ₃	IS 3025 PART 34 -1988(RA2019)	mg/l	BDL (DL:1.0)
18	Sulphate as SO ₄	IS 3025 PART 24- Sec 1 2022	mg/l	54

Note : BDL – Below Detection Limit, DL – Detection Limit. For Global Lab and Consultancy Services LLP



*****End of Report*****

Page 1 of 1

Authorised Signatory

L. SUDHAPRIYA
Technical Manager

Note: The test results are only to the sample submitted for test. Any Correction of the test report on full or part shall invalidate the report. Samples are not drawn by us unless otherwise stated. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. Perishable samples will be discarded immediately after reporting. We do not accept any liability with regard to origin or source from which the samples are extracted. The Laboratory is not responsible for authenticity of photocopied test reports. Any holder of this report is advised that information contained here on reflects the laboratory's finding at the time of its intervention only and within the limits of client instructions. The authenticity of the test report's issued by us can be verified by submitting on E-mail request with report number and report date along with report copy.

TEST REPORT

ULR-TC606024000004475F

Report Number: GLCS/TR/506/2024-25(1)

Report Date: 31.05.2024

Issued To: Thiru R.P.Rahul, S/o, Rajendran, 13-85, Pathillavilai, Chitharal Village, Vilavankode Taluk, Kanyakumari district.		Site Address: Rough Stone and Gravel Quarry, Lease Area – 4.99.39 Ha. S.F.No:719/1,720/1,720/2,720/3,720/4,720/5,720/6, 720/7,720/8,720/9,720/10,720/11,720/12,720/13,& 720/14 of Vadakku Ariyanayagipuram –II Village, Cheranmahandevi Taluk, Tirunelveli District.	
Attention	-	Sample Receipt Condition	Ambient – Good
Customer Ref No	206	Sample Quantity	2Liters
Sample Name	Well Water -2	Sampled by	Laboratory
Sample Description	Liquid	Sampling Method	GLCS/SOP/W/028
Sample Code	GLCS /506	Sample Receipt Date	15.04.2024
Location Name	Udayampuli	Date of Analysis	15.04.2024
Sampling Date	12.04.2024	Date of Completion	29.04.2024
Location Co-ordinates	8°47'47.22"N 77°32'25.23"E		

Sl. No.	TEST PARAMETERS	TEST METHOD	UNIT	RESULTS
1	Odor	IS 3025 PART 5 -2018	-	Agreeable
2	pH	IS 3025 PART 11 -2022	-	7.26
3	Electrical Conductivity	IS 3025 PART 14 -2013 (RA 2019)	µS/cm	1766
4	Turbidity	IS 3025 PART 10 -2023	NTU	<1
5	Total Dissolved Solids	IS 3025 PART 16 -2023	mg/l	1148
6	Total Alkalinity as CaCO ₃	IS 3025 PART 23 -2023	mg/l	480
7	Total Hardness as CaCO ₃	IS 3025 PART 21-2009 (RA 2019)	mg/l	570
8	Calcium as Ca	IS 3025 PART 40 -1991 (RA 2019)	mg/l	100

For Global Lab and Consultancy Services LLP



Page 1 of 3


Authorised Signatory
L. SUDHAPRIYA
 Technical Manager

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TEST REPORT

ULR-TC606024000004475F

Report Number: GLCS/TR/506/2024-25(1)

Report Date: 31.05.2024

Sl. No.	TEST PARAMETERS	TEST METHOD	UNIT	RESULTS
9	Magnesium as Mg	IS 3025 PART 46 -2023	mg/l	78
10	Chloride as Cl ⁻	IS 3025 PART 32-1988(RA2019)	mg/l	150
11	Iron as Fe	IS 3025 PART 53 - 2024	mg/l	0.12
13	Boron as B	IS 3025 PART 57 - 2021	mg/l	BDL (DL:0.1)
14	Free Residual Chlorine as Cl ₂	IS 3025 PART 26 - 2021	mg/l	BDL (DL:1.0)
15	Fluoride as F	GLCS/SOP/W/015 Issue No:1 2016	mg/l	BDL (DL:0.1)
16	Manganese as Mn	IS 3025 PART 59 - 2006	mg/l	BDL (DL:0.1)
17	Nitrate as NO ₃	IS 3025 PART 34 -1988(RA2019)	mg/l	BDL (DL :2.0)
18	Total Suspended Solids	IS 3025 PART 17 -2022	mg/l	BDL (DL:2.0)

Note: BDL – Below Detection Limit, DL – Detection Limit.

For Global Lab and Consultancy Services LLP

Authorised Signatory

L. SUDHAPRIYA
Technical Manager



Page 2 of 3

Note: The test results are only to the sample submitted for test. Any Correction of the test report on full or part shall invalidate the report. Samples are not drawn by us unless otherwise stated. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. Perishable samples will be discarded immediately after reporting. We do not accept any liability with regard to origin or source from which the samples are extracted. The Laboratory is not responsible for authenticity of photocopied test reports. Any holder of this report is advised that information contained here on reflects the laboratory's finding at the time of its intervention only and within the limits of client instructions. The authenticity of the test report's issued by us can be verified by submitting on E-mail request with report number and report date along with report copy.

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TEST REPORT

ULR-TC606024000004475F

Report Number: GLCS/TR/506/2024-25(1)

Report Date: 31.05.2024

Issued To: Thiru R.P.Rahul, S/o, Rajendran, 13-85, Pathillavilai, Chitharal Village, Vilavankode Taluk, Kanyakumari district.		Site Address: Rough Stone and Gravel Quarry, Lease Area – 4.99.39 Ha. S.F.No:719/1,720/1,720/2,720/3,720/4,720/5,720/6, 720/7,720/8,720/9,720/10,720/11,720/12,720/13,& 720/14 of Vadakku Ariyanayagipuram –II Village, Cheranmahandevi Taluk, Tirunelveli District.	
Attention	-	Sample Receipt Condition	Good
Customer Ref No	206	Sample Quantity	250 ml
Sample Name	Well Water -2	Sampled by	Laboratory
Sample Description	Liquid	Sampling Method	GLCS/M/SOP-05
Sample Code	GLCS /506	Date of Analysis	15.04.2024
Location Name	Udayampull	Date of Completion	16.04.2024
Sample Receipt Date	15.04.2024	Location Co-ordinates	8°47'47.22"N 77°32'25.23"E

SI. No	TEST PARAMETERS	TEST METHOD	UNIT	RESULTS
1	Total Coliforms	IS: 15185 - 2016(Reaffirmed 2021)	Per 100ml	Absent
2	Escherichia coli	IS: 15185 - 2016(Reaffirmed 2021)	Per 100ml	Absent

For Global Lab and Consultancy Services LLP



L. Dineshkumar
Authorised Signatory
L. DINESHKUMAR
 Technical Manager-Microbiology

*****End of Report*****

Page 3 of 3

Note: The test results are only to the sample submitted for test. Any Correction of the test report on full or part shall invalidate the report. Samples are not drawn by us unless otherwise stated. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. Perishable samples will be discarded immediately after reporting. We do not accept any liability with regard to origin or source from which the samples are extracted. The Laboratory is not responsible for authenticity of photocopied test reports. Any holder of this report is advised that information contained here on reflects the laboratory's finding at the time of its intervention only and within the limits of client instructions. The authenticity of the test report's issued by us can be verified by submitting on E-mail request with report number and report date along with report copy.

TEST REPORT

Report Number: GLCS/TR/506/2024-25(2)

Report Date: 31.05.2024

Issued To: Thiru R.P.Rahul, S/o, Rajendran, 13-85, Pathillavilai, Chitharal Village, Vilavankode Taluk, Kaniyakumari district.		Site Address: Rough Stone and Gravel Quarry, Lease Area – 4.99.39 Ha. S.F.No:719/1,720/1,720/2,720/3,720/4,720/5,720/6, 720/7,720/8,720/9,720/10,720/11,720/12,720/13,& 720/14 of Vadakku Ariyanayagipuram –II Village, Cheranmahandevi Taluk, Tirunelveli District.	
Attention	-	Sample Receipt Condition	Ambient – Good
Customer Ref No	206	Sample Quantity	2Liters
Sample Name	Well Water -2	Sampled by	Laboratory
Sample Description	Liquid	Sampling Method	GLCS/SOP/W/028
Sample Code	GLCS /506	Sample Receipt Date	15.04.2024
Location Name	Udayampuli	Date of Analysis	15.04.2024
Sampling Date	12.04.2024	Date of Completion	29.04.2024
Location Co-ordinates	8°47'47.22"N 77°32'25.23"E		

Sl. No.	TEST PARAMETERS	TEST METHOD	UNIT	RESULTS
1	Color	IS: 3025 PART 4 -2021	CU	<5
2	Phenolic Compounds	IS 3025 PART 43 Sec 1 2022	mg/l	BDL (DL:0.1)
3	Anionic Detergents	IS 13428 ANNEX K	mg/l	BDL (DL:0.05)
4	Cyanide	IS 3025 PART 27 Sec1 2021	mg/l	BDL (DL:0.02)
5	Sulphide	GLCS/SOP/W/66 Issue No:1 2022	mg/l	BDL (DL:1)
6	Copper as Cu	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.01)
7	Mercury (Hg)	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.002)
8	Cadmium as Cd	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.01)
9	Selenium	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.002)
10	Aluminium as Al	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.01)
11	Lead as Pb	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.01)
12	Zinc as Zn	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.01)
13	Chromium	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.01)
14	Barium as Ba	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.01)
15	Molybdenum as Mo	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.01)
16	Arsenic as As	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.02)
17	Ammonia as NH ₃	IS 3025 PART 34 -1988(RA2019)	mg/l	BDL (DL:1.0)
18	Sulphate as SO ₄ ⁻	IS 3025 PART 24- Sec 1 2022	mg/l	47

Note : BDL – Below Detection Limit, DL – Detection Limit.



For Global Lab and Consultancy Services LLP

Authorised Signatory

L. SUDHAPRIYA
Technical Manager

*****End of Report*****

Page 1 of 1

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TEST REPORT

ULR-TC606024000004476F

Report Number: GLCS/TR/507/2024-25(1)

Report Date: 31.05.2024

Issued To: Thiru R.P.Rahul, S/o, Rajendran, 13-85, Pathillavilai, Chitharal Village, Vilavankode Taluk, Kanyakumari district.		Site Address: Rough Stone and Gravel Quarry, Lease Area – 4.99.39 Ha. S.F.No:719/1,720/1,720/2,720/3,720/4,720/5,720/6,720/7, 720/8,720/9,720/10,720/11,720/12,720/13,& 720/14 of Vadakku Ariyanayagipuram –II Village, Cheranmahandevi Taluk, Tirunelveli District.	
Attention	-	Sample Receipt Condition	Good
TRF No.	206	Sample Quantity	2liters
Sample Name	Borewell Water -1	Sampled by	Laboratory
Sample Description	Liquid	Sampling Method	GLCS/SOP/W/028
Location	Near Project Area		
Sample Code	GLCS /507	Date of Analysis	15.04.2024
Sample Receipt Date	15.04.2024	Date of Completion	29.04.2024
Location Co-ordinates	8°45'29.46"N 77°33'30.15"E		

Sl. No.	TEST PARAMETERS	TEST METHOD	UNIT	RESULTS
1	Odor	IS 3025 PART 5 -2018	-	Agreeable
2	pH	IS 3025 PART 11 -2022	-	7.56
3	Electrical Conductivity	IS 3025 PART 14 -2019	µS/cm	2078
4	Turbidity	IS 3025 PART 10 -2023	NTU	<1
5	Total Dissolved Solids	IS 3025 PART 16 -2023	mg/l	1352
6	Total Suspended Solids	IS 3025 PART 17 -2022	mg/l	BDL (DL :2)

Note: BDL- Below Detection Limit, DL- Detection Limit.

For Global Lab and Consultancy Services LLP



Authorised Signatory
L. SUDHAPRIYA
Technical Manager

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TEST REPORT

ULR-TC606024000004476F

Report Number: GLCS/TR/507/2024-25(1)

Report Date: 31.05.2024

Sl. No.	TEST PARAMETERS	TEST METHOD	UNIT	RESULTS
8	Total Alkalinity	IS 3025 PART 23 -2023	mg/l	620
9	Total Hardness as CaCO ₃	IS 3025 PART 21-2023	mg/l	720
10	Calcium as Ca	IS 3025 PART 40 -2019	mg/l	140
11	Magnesium as Mg	IS 3025 PART 46 -2023	mg/l	90
12	Chloride as Cl ⁻	IS 3025 PART 32-1988(RA2019)	mg/l	260
13	Iron as Fe	IS 3025 PART 53 - 2024	mg/l	0.38
14	Boron as B	IS 3025 PART 57 - 2021	mg/l	BDL (DL:0.1)
15	Free Residual Chlorine as Cl ₂	IS 3025 PART 26 - 2021	mg/l	BDL (DL:1.0)
16	Fluoride as F	GLCS/SOP/W/015 Issue No:1 2016	mg/l	0.13
17	Nitrate as NO ₃	IS 3025 PART 34 -1988(RA2019)	mg/l	BDL (DL :2.0)
18	Manganese as Mn	IS 3025 PART 59 - 2006	mg/l	BDL (DL:0.1)

Note: BDL- Below Detection Limit, DL- Detection Limit

For Global Lab and Consultancy Services LLP


Authorised Signatory
L. SUDHAPRIYA
Technical Manager

Page 2 of 3



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TEST REPORT

ULR-TC606024000004476F

Report Number: GLCS/TR/507/2024-25(1)

Report Date: 31.05.2024

Issued To: Thiru R.P.Rahul, S/o, Rajendran, 13-85, Pathillavilai, Chitharal Village, Vilavankode Taluk, Kanyakumari district.		Site Address: Rough Stone and Gravel Quarry, Lease Area – 4.99.39 Ha. S.F.No:719/1,720/1,720/2,720/3,720/4,720/5,720/6,720/7,720/8,720/9,720/10,720/11,720/12,720/13,&720/14 of Vadakku Ariyanayagipuram –II Village, Cheranmahandevi Taluk, Tirunelveli District.	
Attention	-	Sample Receipt Condition	Good
TRF No.	206	Sample Quantity	250 ml
Sample Name	Borewell Water -1	Sampled by	Laboratory
Sample Description	Liquid	Sampling Method	GLCS/M/SOP-05
Sample Code	GLCS /507	Date of Analysis	15.04.2024
Location	Near Project Area	Date of Completion	16.04.2024
Sample Receipt Date	15.04.2024	Location Co-ordinates	8°45'29.46"N 77°33'30.15"E

Sl. No.	TEST PARAMETERS	TEST METHOD	UNIT	RESULTS
1	Total Coliforms	IS: 15185 - 2016(Reaffirmed 2021)	Per 100ml	Absent
2	<i>Escherichia coli</i>	IS: 15185 - 2016(Reaffirmed 2021)	Per 100ml	Absent



For Global Lab and Consultancy Services LLP

(Signature)
Authorised Signatory

L. DINESHKUMAR
Technical Manager-Microbiology

*****End of Report*****
Page 3 of 3

Note: The test results are only to the sample submitted for test. Any Correction of the test report on full or part shall invalidate the report. Samples are not drawn by us unless otherwise stated. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. Perishable samples will be discarded immediately after reporting. We do not accept any liability with regard to origin or source from which the samples are extracted. The Laboratory is not responsible for authenticity of photocopied test reports. Any holder of this report is advised that information contained here on reflects the laboratory's finding at the time of its intervention only and within the limits of client instructions. The authenticity of the test report's issued by us can be verified by submitting on E-mail request with report number and report date along with report copy.

TEST REPORT

Report Number: GLCS/TR/507/2024-25(2)

Report Date: 31.05.2024

Issued To: Thiru R.P.Rahul, S/o, Rajendran, 13-85, Pathillavilai, Chitharal Village, Vilavankode Taluk, Kaniyakumari district.		Site Address: Rough Stone and Gravel Quarry, Lease Area – 4.99.39 Ha. S.F.No:719/1,720/1,720/2,720/3,720/4,720/5,720/6,720 /7,720/8,720/9,720/10,720/11,720/12,720/13,& 720/14 of Vadakku Ariyanayagipuram –II Village, Cheranmahandevi Taluk, Tirunelveli District.	
Attention	-	Sample Receipt Condition	Good
TRF No.	206	Sample Quantity	2liters
Sample Name	Borewell Water -1	Sampled by	Laboratory
Sample Description	Liquid	Sampling Method	GLCS/SOP/W/028
Location	Near Project Area	Date of Analysis	15.04.2024
Sample Code	GLCS /507	Date of Completion	29.04.2024
Sample Receipt Date	15.04.2024	Location Co-ordinates	8°45'29.46"N 77°33'30.15"E

Sl. No.	TEST PARAMETERS	TEST METHOD	UNIT	RESULTS
1	Color	IS: 3025 PART 4 -2021	CU	< 5
2	Arsenic as As	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.002)
3	Ammonia (NH ₃)	IS 3025 PART 34 -1988(RA2019)	mg/l	BDL (DL:1.0)
4	Zinc as Zn	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.01)
5	Aluminium as Al	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.01)
6	Cadmium as Cd	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.01)
7	Molybdenum as Mo	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.01)
8	Selenium	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.002)
9	Lead as Pb	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.01)

Note : BDL – Below Detection Limit, DL – Detection Limit;

For Global Lab and Consultancy Services LLP



Page 1 of 2

Authorised Signatory
L. SUDHAPRIYA
Technical Manager

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209 A

TEST REPORT

Report Number: GLCS/TR/507/2024-25(2)

Report Date: 31.05.2024

Sl. No.	TEST PARAMETERS	TEST METHOD	UNIT	RESULTS
10	Barium as Ba	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.01)
11	Anionic Detergents	IS 13428 ANNEX K	mg/l	BDL (DL:0.05)
12	Cyanide	IS 3025 PART 27 Sec1 2021	mg/l	BDL (DL:0.02)
13	Phenolic Compounds	IS 3025 PART 43 Sec 1 2022	mg/l	BDQ(DL:0.1)
14	Chromium	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.01)
15	Sulphide	GLCS/SOP/W/66 Issue N0 1 2022	mg/l	BDL (DL:1.0)
16	Copper as Cu	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.01)
17	Mercury as Hg	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.002)
18	Sulphate as SO ₄	IS 3025 PART 24- Sec 1 2022	mg/l	126

Note : BDL – Below Detection Limit, DL – Detection Limit;

For Global Lab and Consultancy Services LLP

Authorised Signatory

L. SUDHAPRIYA

Technical Manager



*****End of Report*****

Page 2 of 2

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TEST REPORT

ULR-TC606024000004477F

Report Number: GLCS/TR/508/2024-25(1)

Report Date: 31.05.2024

Issued To: Thiru R.P.Rahul, S/o, Rajendran, 13-85, Pathillavilai, Chitharal Village, Vilavankode Taluk, Kanyakumari district.		Site Address: Rough Stone and Gravel Quarry, Lease Area – 4.99.39 Ha. S.F.No:719/1,720/1,720/2,720/3,720/4,720/5,720/6,720 /7,720/8,720/9,720/10,720/11,720/12,720/13,& 720/14 of Vadakku Ariyanayagipuram –II Village, Cheranmahandevi Taluk, Tirunelveli District.	
Attention	-	Sample Receipt Condition	Good
TRF No.	206	Sample Quantity	2liters
Sample Name	Borewell Water - 2	Sampled by	Laboratory
Sample Description	Liquid	Sampling Method	GLCS/SOP/W/028
Location	Nadukkalur	Date of Analysis	15.04.2024
Sample Code	GLCS /508	Date of Completion	29.04.2024
Sample Receipt Date	15.04.2024	Location Co-ordinates	8°42'35.59"N 79°35'16.86"E

Sl. No.	TEST PARAMETERS	TEST METHOD	UNIT	RESULTS
1	Odor	IS 3025 PART 5 -2018	-	Agreeable
2	pH	IS 3025 PART 11 -2022	-	7.8
3	Electrical Conductivity	IS 3025 PART 14 -2019	µS/cm	2465
4	Turbidity	IS 3025 PART 10 -2023	NTU	<1
5	Total Dissolved Solids	IS 3025 PART 16 -2023	mg/l	1605
6	Total Suspended Solids	IS 3025 PART 17 -2022	mg/l	BDL (DL :2)

Note: BDL- Below Detection Limit, DL- Detection Limit.

For Global Lab and Consultancy Services LLP



Page 1 of 3


Authorised Signatory
L. SUDHAPRIYA
Technical Manager

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TEST REPORT

ULR-TC606024000004477F

Report Number: GLCS/TR/508/2024-25(1)

Report Date: 31.05.2024

Sl. No.	TEST PARAMETERS	TEST METHOD	UNIT	RESULTS
7	Total Alkalinity	IS 3025 PART 23 -2023	mg/l	750
8	Total Hardness as CaCO ₃	IS 3025 PART 21-2023	mg/l	840
9	Calcium as Ca	IS 3025 PART 40 -2019	mg/l	160
10	Magnesium as Mg	IS 3025 PART 46 -2023	mg/l	107
11	Chloride as Cl ⁻	IS 3025 PART 32-1988(RA2019)	mg/l	325
12	Iron as Fe	IS 3025 PART 53 - 2024	mg/l	0.28
13	Boron as B	IS 3025 PART 57 - 2021	mg/l	BDL (DL:0.1)
14	Free Residual Chlorine as Cl ₂	IS 3025 PART 26 - 2021	mg/l	BDL (DL:1.0)
15	Fluoride as F	GLCS/SOP/W/015 Issue No:1 2016	mg/l	0.25
16	Nitrate as NO ₃	IS 3025 PART 34 -1988(RA2019)	mg/l	BDL (DL :2.0)
17	Manganese as Mn	IS 3025 PART 59 - 2006	mg/l	BDL (DL:0.1)

Note: BDL- Below Detection Limit, DL- Detection Limit

For Global Lab and Consultancy Services LLP



Page 2 of 3

Authorised Signatory
L. SUDHAPRIYA
Technical Manager

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212 A

TEST REPORT

ULR-TC606024000004477F

Report Number: GLCS/TR/508/2024-25(1)

Report Date: 31.05.2024

Issued To: Thiru R.P.Rahul, S/o, Rajendran, 13-85, Pathillavilai, Chitharal Village, Vilavankode Taluk, Kanyakumari district.		Site Address: Rough Stone and Gravel Quarry, Lease Area – 4.99.39 Ha. S.F.No:719/1,720/1,720/2,720/3,720/4,720/5,720/6, 720/7,720/8,720/9,720/10,720/11,720/12,720/13,& 720/14 of Vadakku Ariyanayagipuram –II Village, Cheranmahandevi Taluk, Tirunelveli District.	
Attention	-	Sample Receipt Condition	Good
TRF No.	206	Sample Quantity	250 ml
Sample Name	Borewell Water - 2	Sampled by	Laboratory
Sample Description	Liquid	Sampling Method	GLCS/M/SOP-05
Sample Code	GLCS /508	Date of Analysis	15.04.2024
Sample Receipt Date	15.04.2024	Date of Completion	16.04.2024
Location	Nadukkalur	Location Co-ordinates	8°42'35.59"N 79°35'16.86"E

Sl. No.	TEST PARAMETERS	TEST METHOD	UNIT	RESULTS
1	Total Coliforms	IS: 15185 - 2016(Reaffirmed 2021)	Per 100ml	Absent
2	<i>Escherichia coli</i>	IS: 15185 - 2016(Reaffirmed 2021)	Per 100ml	Absent



For Global Lab and Consultancy Services LLP

*****End of Report*****
Page 3 of 3


Authorised Signatory
L. DINESHKUMAR
Technical Manager-Microbiology

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TEST REPORT

Report Number: GLCS/TR/508/2024-25(2)

Report Date: 31.05.2024

Issued To: Thiru R.P.Rahul, S/o, Rajendran, 13-85,Pathillavilai, Chitharal Village, Vilavankode Taluk, Kaniyakumari district.		Site Address: Rough Stone and Gravel Quarry, Lease Area – 4.99.39 Ha. S.F.No:719/1,720/1,720/2,720/3,720/4,720/5,720/6, 720/7,720/8,720/9,720/10,720/11,720/12,720/13,& 720/14 of Vadakku Ariyanayagipuram –II Village, Cheranmahandevi Taluk, Tirunelveli District.	
Attention	-	Sample Receipt Condition	Good
TRF No.	206	Sample Quantity	2liters
Sample Name	Borewell Water - 2	Sampled by	Laboratory
Sample Description	Liquid	Sampling Method	GLCS/SOP/W/028
Location	Nadukkalur	Date of Analysis	15.04.2024
Sample Code	GLCS /508	Date of Completion	29.04.2024
Sample Receipt Date	15.04.2024	Location Co-ordinates	8°42'35.59"N 79°35'16.86"E

Sl. No.	TEST PARAMETERS	TEST METHOD	UNIT	RESULTS
1	Color	IS: 3025 PART 4 -2021	CU	< 5
2	Arsenic as As	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.002)
3	Ammonia (NH ₃)	IS 3025 PART 34 -1988(RA2019)	mg/l	BDL (DL:1.0)
4	Zinc as Zn	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.01)
5	Aluminium as Al	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.01)
6	Cadmium as Cd	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.01)
7	Molybdenum as Mo	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.01)
8	Selenium	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.002)
9	Lead as Pb	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.01)

Note : BDL – Below Detection Limit, DL – Detection Limit;

For Global Lab and Consultancy Services LLP



Page 1 of 2

Authorised Signatory

L. SUDHAPRIYA
Technical Manager

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214 A

TEST REPORT

Report Number: GLCS/TR/508/2024-25(2)

Report Date: 31.05.2024

Sl. No.	TEST PARAMETERS	TEST METHOD	UNIT	RESULTS
10	Barium as Ba	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.01)
11	Anionic Detergents	IS 13428 ANNEX K	mg/l	BDL (DL:0.05)
12	Cyanide	IS 3025 PART 27 Sec1 2021	mg/l	BDL (DL:0.02)
13	Phenolic Compounds	IS 3025 PART 43 Sec 1 2022	mg/l	BDQ(DL:0.1)
14	Chromium	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.01)
15	Sulphide	GLCS/SOP/W/66 Issue NO 1 2022	mg/l	BDL (DL:1.0)
16	Copper as Cu	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.01)
17	Mercury as Hg	GLCS/SOP/W/62 Issue No:1 2022	mg/l	BDL (DL:0.002)
18	Sulphate as SO ₄	IS 3025 PART 24- Sec 1 2022	mg/l	62

Note : BDL – Below Detection Limit, DL – Detection Limit;

For Global Lab and Consultancy Services LLP


Authorised Signatory
L. SUDHAPRIYA
Technical Manager



*****End of Report*****
Page 2 of 2

Note: The test results are only to the sample submitted for test. Any Correction of the test report on full or part shall invalidate the report. Samples are not drawn by us unless otherwise stated. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. Perishable samples will be discarded immediately after reporting. We do not accept any liability with regard to origin or source from which the samples are extracted. The Laboratory is not responsible for authenticity of photocopied test reports. Any holder of this report is advised that information contained here on reflects the laboratory's finding at the time of its intervention only and within the limits of client instructions. The authenticity of the test report's issued by us can be verified by submitting on E-mail request with report number and report date along with report copy.

TEST REPORT

ULR-TC606024000004466F

Report Number: GLCS/TR/497/2024-25(1)

Report Date: 31.05.2024

Issued To: Thiru R.P.Rahul, S/o, Rajendran, 13-85, Pathillavilal, Chitharal Village, Vilavankode Taluk, Kanyakumari district.		Site Address: Rough Stone and Gravel Quarry, Lease Area – 4.99.39 Ha. S.F.No:719/1,720/1,720/2,720/3,720/4,720/5,720/6, 720/7,720/8,720/9,720/10,720/11,720/12,720/13,&720/14 of Vadakku Ariyanayagipuram –II Village, Cheranmahandevi Taluk, Tirunelveli District.	
Attention	-	Sample Receipt Condition	Ambient – Good
TRF No	206	Sample Quantity	2 kg
Sample Name	Soil - 1	Sampled by	Laboratory
Sample Description	Lumps	Sampling Method	GLCS/SOP/S/014
Location Name	S-1 Core Zone	Date of Analysis	15.04.2024
Sampling Date	12.04.2024 - 13.04.2024	Date of Completion	29.04.2024
Sample Receipt Date	15.04.2024	Location Co-ordinates	8°45'14.46"N 77°33'45.74"E
Sample Code	GLCS / 497		

Sl. No	TEST PARAMETERS	TEST METHOD	UNITS	RESULTS
1	Organic Matter	GLCS/SOP/S/003 Issue No:1 2016	%	1.05
2	pH	IS 2720 PART 26:1987 (RA 2021)	-	7.82
3	Specific Electrical Conductivity	IS 14767 :2000 RA 2021	µS/cm	368
4	Available Phosphorous	GLCS/SOP/S/005 Issue No:1 2016	mg/kg	15.4
5	Soluble Potassium (as K) in saturation extract	GLCS/SOP/S/006 Issue No:1 2016	mg/100g	1.43
6	Exchangeable Calcium (as Ca)	GLCS/SOP/S/020 Issue No:1 2017	meq/100g	2.3

For Global Lab and Consultancy Services LLP



Page 1 of 2

Authorised Signatory
L. SUDHAPRIYA
Technical Manager

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TEST REPORT

ULR-TC606024000004466F

Report Number: GLCS/TR/497/2024-25(1)

Report Date: 31.05.2024

SI. NO	TEST PARAMETER	TEST METHOD	UNITS	RESULTS	
7	Exchangeable Magnesium (as Mg)	GLCS/SOP/S/021 Issue No:1 2017	meq/100g	1.8	
8	Sulphate as SO ₄	GLCS/SOP/S/009 Issue No:1 2016	mg/100g	13.2	
9	Cation Exchange Capacity	GLCS/SOP/S/024 Issue No:1 2017	meq/100g	16.3	
10	Bulk Density	GLCS/SOP/S/017 Issue No:1 2017	g/cc	1.04	
11	Texture	Sand	GLCS/SOP/S/015 Issue No:1 2017	%	32.25
12		Slit	GLCS/SOP/S/015 Issue No:1 2017	%	43.50
13		Clay	GLCS/SOP/S/015 Issue No:1 2017	%	24.35
14	Water Holding Capacity	GLCS/SOP/S/016 Issue No:1 2017	%	53.4	
15	Available Nitrogen as N	GLCS/SOP/S/029 Issue No:1 2016	Kg/ha	326	
16	Chloride (as Cl) in saturation extract	GLCS/SOP/S/004 Issue No:1 2016	meq/l	4.6	

For Global Lab and Consultancy Services LLP



*****End of Report*****
Page 2 of 2


Authorised Signatory
L. SUDHAPRIYA
Technical Manager

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TEST REPORT

Report Number: GLCS/TR/497/2024-25(2)

Report Date: 31.05.2024

Issued To: Thiru R.P.Rahul, S/o, Rajendran, 13-85, Pathillavilai, Chitharal Village, Vilavankode Taluk, Kanyakumari district.		Site Address: Rough Stone and Gravel Quarry, Lease Area – 4.99.39 Ha. S.F.No:719/1,720/1,720/2,720/3,720/4,720/5,720/6, 720/7,720/8,720/9,720/10,720/11,720/12,720/13,& 720/14 of Vadakku Ariyanayagipuram –II Village, Cherānmahandevi Taluk, Tirunelveli District.	
Attention	-	Sample Receipt Condition	Ambient – Good
TRF No	206	Sample Quantity	2 kg
Sample Name	Soil - 1	Sampled by	Laboratory
Sample Description	Lumps	Sampling Method	GLCS/SOP/S/014
Location Name	S-1 Core Zone	Date of Analysis	15.04.2024
Sampling Date	12.04.2024 - 13.04.2024	Date of Completion	29.04.2024
Sample Receipt Date	15.04.2024	Location Co-ordinates	8°45'14.46"N 77°33'45.74"E
Sample Code	GLCS / 497		

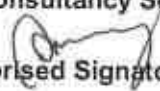
Sl. No	TEST PARAMETERS	TEST METHOD	UNIT	RESULTS
1	Permiability	By Permeameter	%	48.6
2	Manganese as Mn	USEPA 6010D :2014	mg/kg	18
3	Zinc as Zn	USEPA 6010D :2014	mg/kg	13
4	Cadmium as Cd	USEPA 6010D :2014	mg/kg	7
5	Chromium as Cr	USEPA 6010D :2014	mg/kg	14
6	Copper as Cu	USEPA 6010D :2014	mg/kg	6
7	Lead as Pb	USEPA 6010D :2014	mg/kg	1.5
8	Iron as Fe	USEPA 6010D :2014	mg/kg	20
9	Organic Carbon	GLCS/SOP/S/003 Issue No:1 2016	%	0.61
10	Boron as B	USEPA 6010D :2014	mg/kg	2.4

For Global Lab and Consultancy Services LLP



*****End of Report*****

Page 1 of 1


 Authorised Signatory

L. SUDHAPRIYA
 Technical Manager

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218A

TEST REPORT

ULR-TC606024000004467F

Report Number: GLCS/TR/498/2024-25(1)

Report Date: 31.05.2024

Issued To: Thiru R.P.Rahul, S/o, Rajendran, 13-85, Pathillavilai, Chitharal Village, Vilavankode Taluk, Kanyakumari district.		Site Address: Rough Stone and Gravel Quarry, Lease Area – 4.99.39 Ha. S.F.No:719/1,720/1,720/2,720/3,720/4,720/5,720/6, 720/7,720/8,720/9,720/10,720/11,720/12,720/13,& 720/14 of Vadakku Ariyanayagipuram –II Village, Cheranmahandevi Taluk, Tirunelveli District.	
Attention	-	Sample Receipt Condition	Ambient – Good
TRF No	206	Sample Quantity	2 kg
Sample Name	Soil - 2	Sampled by	Laboratory
Sample Description	Lumps	Sampling Method	GLCS/SOP/S/014
Location Name	Vadakku Ariyanagipuram	Date of Analysis	15.04.2024
Sampling Date	12.04.2024 - 13.04.2024	Date of Completion	29.04.2024
Sample Receipt Date	15.04.2024	Location Co-ordinates	8°43'26.89"N 77°32'47.56"E
Sample Code	GLCS / 498		

Sl. No	TEST PARAMETERS	TEST METHOD	UNITS	RESULTS
1	Organic Matter	GLCS/SOP/S/003 Issue No:1 2016	%	1.2
2	pH	IS 2720 PART 26:1987 (RA 2021)	-	7.32
3	Specific Electrical Conductivity	IS 14767 :2000 RA 2021	µS/cm	473
4	Available Phosphorous	GLCS/SOP/S/005 Issue No:1 2016	mg/kg	15
5	Soluble Potassium (as K) in saturation extract	GLCS/SOP/S/006 Issue No:1 2016	mg/100g	1.8
6	Exchangeable Calcium (as Ca)	GLCS/SOP/S/020 Issue No:1 2017	meq/100g	2.6

For Global Lab and Consultancy Services LLP



Page 1 of 2

Authorised Signatory

L. SUDHAPRIYA
Technical Manager

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TEST REPORT

ULR-TC606024000004467F

Report Number: GLCS/TR/498/2024-25(1)

Report Date: 31.05.2024

Sl. NO	TEST PARAMETER	TEST METHOD	UNITS	RESULTS	
7	Exchangeable Magnesium (as Mg)	GLCS/SOP/S/021 Issue No:1 2017	meq/100g	2.5	
8	Sulphate as SO ₄	GLCS/SOP/S/009 Issue No:1 2016	mg/100g	15.5	
9	Cation Exchange Capacity	GLCS/SOP/S/024 Issue No:1 2017	meq/100g	16.8	
10	Bulk Density	GLCS/SOP/S/017 Issue No:1 2017	g/cc	1.29	
11	Texture	Sand	GLCS/SOP/S/015 Issue No:1 2017	%	31.88
12		Silt	GLCS/SOP/S/015 Issue No:1 2017	%	42.87
13		Clay	GLCS/SOP/S/015 Issue No:1 2017	%	25.25
14	Water Holding Capacity	GLCS/SOP/S/016 Issue No:1 2017	%	45	
15	Available Nitrogen as N	GLCS/SOP/S/029 Issue No:1 2016	Kg/ha	401	
16	Chloride (as Cl) in saturation extract	GLCS/SOP/S/004 Issue No:1 2016	meq/l	3.8	

For Global Lab and Consultancy Services LLP



*****End of Report*****
Page 2 of 2


Authorised Signatory
L. SUDHAPRIYA
Technical Manager

Note: The test results are only to the sample submitted for test. Any Correction of the test report on full or part shall invalidate the report. Samples are not drawn by us unless otherwise stated. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. Perishable samples will be discarded immediately after reporting. We do not accept any liability with regard to origin or source from which the samples are extracted. The Laboratory is not responsible for authenticity of photocopied test reports. Any holder of this report is advised that information contained here on reflects the laboratory's finding at the time of its intervention only and within the limits of client instructions. The authenticity of the test report's issued by us can be verified by submitting on E-mail request with report number and report date along with report copy.

220 A

TEST REPORT

Report Number: GLCS/TR/498/2024-25(2)

Report Date: 31.05.2024

Issued To: Thiru R.P.Rahul, S/o, Rajendran, 13-85, Pathillavilai, Chitharal Village, Vilavankode Taluk, Kaniyakumari district.		Site Address: Rough Stone and Gravel Quarry, Lease Area – 4.99.39 Ha. S.F.No:719/1,720/1,720/2,720/3,720/4,720/5,720/6, 720/7,720/8,720/9,720/10,720/11,720/12,720/13,& 720/14 of Vadakku Ariyanayagipuram –II Village, Cheranmahandevi Taluk, Tirunelveli District.	
Attention	-	Sample Receipt Condition	Ambient – Good
TRF No	206	Sample Quantity	2 kg
Sample Name	Soil - 2	Sampled by	Laboratory
Sample Description	Lumps	Sampling Method	GLCS/SOP/S/014
Location Name	Vadakku Ariyanagipuram	Date of Analysis	15.04.2024
Sampling Date	12.04.2024 - 13.04.2024	Date of Completion	29.04.2024
Sample Receipt Date	15.04.2024	Location Co-ordinates	8°43'26.89"N 77°32'47.56"E
Sample Code	GLCS / 498		

Sl. No	TEST PARAMETERS	TEST METHOD	UNIT	RESULTS
1	Permiability	By Permeameter	%	46.9
2	Manganese as Mn	USEPA 6010D :2014	mg/kg	18.5
3	Zinc as Zn	USEPA 6010D :2014	mg/kg	15
4	Cadmium as Cd	USEPA 6010D :2014	mg/kg	3.5
5	Chromium as Cr	USEPA 6010D :2014	mg/kg	7.6
6	Copper as Cu	USEPA 6010D :2014	mg/kg	6
7	Lead as Pb	USEPA 6010D :2014	mg/kg	0.98
8	Iron as Fe	USEPA 6010D :2014	mg/kg	24.5
9	Organic Carbon	GLCS/SOP/S/003 Issue No:1 2016	%	0.71
10	Boron as B	USEPA 6010D :2014	mg/kg	BDL (DL:0.5)

Note: BDL – Below Detection Limit, DL – Detection Limit

For Global Lab and Consultancy Services LLP



*****End of Report*****
Page 1 of

(Signature)
Authorised Signatory
L. SUDHAPRIYA
Technical Manager

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TEST REPORT

ULR-TC606024000004468F

Report Number: GLCS/TR/499/2024-25(1)

Report Date: 31.05.2024

Issued To: Thiru R.P.Rahul, S/o. Rajendran, 13-85, Pathillavilai, Chitharal Village, Vilavankode Taluk, Kaniyakumari district.		Site Address: Rough Stone and Gravel Quarry, Lease Area – 4.99.39 Ha. S.F.No:719/1,720/1,720/2,720/3,720/4,720/5,720/6, 720/7,720/8,720/9,720/10,720/11,720/12,720/13,& 720/14 of Vadaku Ariyanayagipuram –II Village, Cheranmahandevi Taluk, Tirunelveli District.	
Attention	-	Sample Receipt Condition	Ambient – Good
TRF No	206	Sample Quantity	2 kg
Sample Name	Soil - 3	Sampled by	Laboratory
Sample Description	Lumps	Sampling Method	GLCS/SOP/S/014
Location Name	Udayampuli	Date of Analysis	15.04.2024
Sampling Date	12.04.2024 - 13.04.2024	Date of Completion	29.04.2024
Sample Receipt Date	15.04.2024	Location Co-ordinates	8°47'53.84"N 77°32'21.33"E
Sample Code	GLCS / 499		

Sl. No	TEST PARAMETERS	TEST METHOD	UNITS	RESULTS
1	Organic Matter	GLCS/SOP/S/003 Issue No:1 2016	%	1.02
2	pH	IS 2720 PART 26:1987 (RA 2021)	-	7.6
3	Specific Electrical Conductivity	IS 14767 :2000 RA 2021	µS/cm	412
4	Available Phosphorous	GLCS/SOP/S/005 Issue No:1 2016	mg/kg	13.5
5	Soluble Potassium (as K) in saturation extract	GLCS/SOP/S/006 Issue No:1 2016	mg/100g	1.2
6	Exchangeable Calcium (as Ca)	GLCS/SOP/S/020 Issue No:1 2017	meq/100g	2.9

For Global Lab and Consultancy Services LLP



Page 1 of 2

Authorised Signatory

L. SUDHAPRIYA
Technical Manager

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222/A

TEST REPORT

ULR-TC606024000004468F

Report Number: GLCS/TR/499/2024-25(1)

Report Date: 31.05.2024

Sl. NO.	TEST PARAMETER	TEST METHOD	UNITS	RESULTS	
7	Exchangeable Magnesium (as Mg)	GLCS/SOP/S/021 Issue No:1 2017	meq/100g	3.3	
8	Sulphate as SO ₄	GLCS/SOP/S/009 Issue No:1 2016	mg/100g	13	
9	Cation Exchange Capacity	GLCS/SOP/S/024 Issue No:1 2017	meq/100g	5.2	
10	Bulk Density	GLCS/SOP/S/017 Issue No:1 2017	g/cc	15	
11	Texture	Sand	GLCS/SOP/S/015 Issue No:1 2017	%	36.25
12		Slit	GLCS/SOP/S/015 Issue No:1 2017	%	37.75
13		Clay	GLCS/SOP/S/015 Issue No:1 2017	%	26
14	Water Holding Capacity	GLCS/SOP/S/016 Issue No:1 2017	%	47.2	
15	Available Nitrogen as N	GLCS/SOP/S/029 Issue No:1 2016	Kg/ha	226	
16	Chloride (as Cl) in saturation extract	GLCS/SOP/S/004 Issue No:1 2016	meq/l	5.2	

For Global Lab and Consultancy Services LLP



*****End of Report*****
Page 2 of 2

[Signature]
Authorised Signatory
L. SUDHAKRISHNA
Technical Manager

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Committed to Precision

LABORATORY | CONSULTANCY | SUSTAINABILITY

S.F.No.92/3A2, Geetha Nagar,

Alagapuram Pudur,

Salem - 636 016. Tamil Nadu.

Phone: 0427 - 2970989 / +91 70944 53636

E-Mail: lab@glcs.in

Web: www.glcs.in

TEST REPORT

Report Number: GLCS/TR/499/2024-25(2)

Report Date: 31.05.2024

Issued To: Thiru R.P.Rahul, S/o, Rajendran, 13-85,Pathillavilai, Chitharal Village, Vilavankode Taluk, Kanyakumari district.		Site Address: Rough Stone and Gravel Quarry, Lease Area – 4.99.39 Ha. S.F.No:719/1,720/1,720/2,720/3,720/4,720/5,720/6, 720/7,720/8,720/9,720/10,720/11,720/12,720/13,& 720/14 of Vadakku Ariyanayagipuram –II Village, Cheranmahandevi Taluk, Tirunelveli District.	
Attention	-	Sample Receipt Condition	Ambient – Good
TRF No	206	Sample Quantity	2 kg
Sample Name	Soil - 3	Sampled by	Laboratory
Sample Description	Lumps	Sampling Method	GLCS/SOP/S/014
Location Name	Udayampuli	Date of Analysis	15.04.2024
Sampling Date	12.04.2024 - 13.04.2024	Date of Completion	29.04.2024
Sample Receipt Date	15.04.2024	Location Co-ordinates	8°47'53.84"N 77°32'21.33"E
Sample Code	GLCS / 499		

Sl. No	TEST PARAMETERS	TEST METHOD	UNIT	RESULTS
1	Permiability	By Permeameter	%	45
2	Manganese as Mn	USEPA 6010D :2014	mg/kg	13
3	Zinc as Zn	USEPA 6010D :2014	mg/kg	10
4	Cadmium as Cd	USEPA 6010D :2014	mg/kg	5
5	Chromium as Cr	USEPA 6010D :2014	mg/kg	10
6	Copper as Cu	USEPA 6010D :2014	mg/kg	3
7	Lead as Pb	USEPA 6010D :2014	mg/kg	3
8	Iron as Fe	USEPA 6010D :2014	mg/kg	21
9	Organic Carbon	GLCS/SOP/S/003 Issue No:1 2016	%	0.59
10	Boron as B	USEPA 6010D :2014	mg/kg	BDL (DL:0.5)

Note: BDL – Below Detection Limit, DL – Detection Limit.

For Global Lab and Consultancy Services LLP



*****End of Report*****
Page 1 of 1

Authorised Signatory

L. SUDHAPRIYA
Technical Manager

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TEST REPORT

ULR-TC606024000004469F

Report Number: GLCS/TR/500/2024-25(1)

Report Date: 31.05.2024

Issued To: Thiru R.P.Rahul, S/o, Rajendran, 13-85, Pathillavilai, Chitharal Village, Vilavankode Taluk, Kaniyakumari district.		Site Address: Rough Stone and Gravel Quarry, Lease Area – 4.99.39 Ha. S.F.No:719/1,720/1,720/2,720/3,720/4,720/5,720/6, 720/7,720/8,720/9,720/10,720/11,720/12,720/13, & 720/14 of Vadakku Ariyanayagipuram –II Village, Cheranmahandevi Taluk, Tirunelveli District.	
Attention	-	Sample Receipt Condition	Ambient – Good
TRF No	206	Sample Quantity	2 kg
Sample Name	Soil - 4	Sampled by	Laboratory
Sample Description	Lumps	Sampling Method	GLCS/SOP/S/014
Location Name	Singamparai	Date of Analysis	15.04.2024
Sampling Date	12.04.2024 - 13.04.2024	Date of Completion	29.04.2024
Sample Receipt Date	15.04.2024	Location Co-ordinates	8°45'13.61"N 77°32'7.65"E
Sample Code	GLCS / 500		

Sl. No	TEST PARAMETERS	TEST METHOD	UNITS	RESULTS
1	Organic Matter	GLCS/SOP/S/003 Issue No:1 2016	%	0.84
2	pH	IS 2720 PART 26:1987 (RA 2021)	-	7.3
3	Specific Electrical Conductivity	IS 14767 :2000 RA 2021	µS/cm	336
4	Available Phosphorous	GLCS/SOP/S/005 Issue No:1 2016	mg/kg	14.4
5	Soluble Potassium (as K) in saturation extract	GLCS/SOP/S/006 Issue No:1 2016	mg/100g	0.85
6	Exchangeable Calcium (as Ca)	GLCS/SOP/S/020 Issue No:1 2017	meq/100g	2.2

For Global Lab and Consultancy Services LLP



Page 1 of 2

Authorised Signatory

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Technical Manager

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TEST REPORT

ULR-TC606024000004469F

Report Number: GLCS/TR/500/2024-25(1)

Report Date: 31.05.2024

Sl. NO.	TEST PARAMETER	TEST METHOD	UNITS	RESULTS	
7	Exchangeable Magnesium (as Mg)	GLCS/SOP/S/021 Issue No:1 2017	meq/100g	2.8	
8	Sulphate as SO ₄	GLCS/SOP/S/009 Issue No:1 2016	mg/100g	14.7	
9	Cation Exchange Capacity	GLCS/SOP/S/024 Issue No:1 2017	meq/100g	14	
10	Bulk Density	GLCS/SOP/S/017 Issue No:1 2017	g/cc	1.09	
11	Texture	Sand	GLCS/SOP/S/015 Issue No:1 2017	%	27.50
12		Silt	GLCS/SOP/S/015 Issue No:1 2017	%	38.75
13		Clay	GLCS/SOP/S/015 Issue No:1 2017	%	33.75
14	Water Holding Capacity	GLCS/SOP/S/016 Issue No:1 2017	%	49	
15	Available Nitrogen as N	GLCS/SOP/S/029 Issue No:1 2016	Kg/ha	339	
16	Chloride (as Cl) in saturation extract	GLCS/SOP/S/004 Issue No:1 2016	meq/l	3.8	

For Global Lab and Consultancy Services LLP



*****End of Report*****
Page 2 of 2

Authorised Signatory

L. SUDHAPRIYA
Technical Manager

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TEST REPORT

Report Number: GLCS/TR/500/2024-25(2)

Report Date: 31.05.2024

Issued To: Thiru R.P.Rahul, S/o, Rajendran, 13-85,Pathillavital, Chitharal Village, Vilavankode Taluk, Kanyakumari district.		Site Address: Rough Stone and Gravel Quarry, Lease Area – 4.99.39 Ha. S.F.No:719/1,720/1,720/2,720/3,720/4,720/5,720/6, 720/7,720/8,720/9,720/10,720/11,720/12,720/13,& 720/14 of Vadakku Ariyanayagipuram –II Village, Cheranmahandevi Taluk, Tirunelveli District.	
Attention	-	Sample Receipt Condition	Ambient – Good
TRF No	206	Sample Quantity	2 kg
Sample Name	Soil - 4	Sampled by	Laboratory
Sample Description	Lumps	Sampling Method	GLCS/SOP/S/014
Location Name	Singamparai	Date of Analysis	15.04.2024
Sampling Date	12.04.2024 - 13.04.2024	Date of Completion	29.04.2024
Sample Receipt Date	15.04.2024	Location Co-ordinates	8°45'13.61"N 77°32'7.65"E
Sample Code	GLCS / 500		

Sl. No	TEST PARAMETERS	TEST METHOD	UNIT	RESULTS
1	Permiability	By Permeameter	%	46
2	Manganese as Mn	USEPA 6010D :2014	mg/kg	15.6
3	Zinc as Zn	USEPA 6010D :2014	mg/kg	14
4	Cadmium as Cd	USEPA 6010D :2014	mg/kg	6
5	Chromium as Cr	USEPA 6010D :2014	mg/kg	7
6	Copper as Cu	USEPA 6010D :2014	mg/kg	4
7	Lead as Pb	USEPA 6010D :2014	mg/kg	5
8	Iron as Fe	USEPA 6010D :2014	mg/kg	19
9	Organic Carbon	GLCS/SOP/S/003 Issue No:1 2016	%	0.49
10	Boron as B	USEPA 6010D :2014	mg/kg	0.72

For Global Lab and Consultancy Services LLP



*****End of Report*****
Page 1 of 1

Authorised Signatory
L. SUDHAPRIYA
Technical Manager

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TEST REPORT

ULR-TC606024000004470F

Report Number: GLCS/TR/501/2024-25(1)

Report Date: 31.05.2024

Issued To: Thiru R.P.Rahul, S/o, Rajendran, 13-85, Pathillavilai, Chitharal Village, Vilavankode Taluk, Kaniyakumari district.		Site Address: Rough Stone and Gravel Quarry, Lease Area – 4.99.39 Ha. S.F.No:719/1,720/1,720/2,720/3,720/4,720/5,720/6, 720/7,720/8,720/9,720/10,720/11,720/12,720/13,& 720/14 of Vadakku Ariyanayagipuram –II Village, Cheranmahandevi Taluk, Tirunelveli District.	
Attention	-	Sample Receipt Condition	Ambient – Good
TRF No	206	Sample Quantity	2 kg
Sample Name	Soil - 5	Sampled by	Laboratory
Sample Description	Lumps	Sampling Method	GLCS/SOP/S/014
Location Name	Sidaparappanallur	Date of Analysis	15.04.2024
Sampling Date	12.04.2024 - 13.04.2024	Date of Completion	29.04.2024
Sample Receipt Date	15.04.2024	Location Co-ordinates	8°47'16.08"N 77°35'59.55"E
Sample Code	GLCS / 501		

Sl. No	TEST PARAMETERS	TEST METHOD	UNITS	RESULTS
1	Organic Matter	GLCS/SOP/S/003 Issue No:1 2016	%	1.4
2	pH	IS 2720 PART 26:1987 (RA 2021)	-	6.91
3	Specific Electrical Conductivity	IS 14767 :2000 RA 2021	µS/cm	289
4	Available Phosphorous	GLCS/SOP/S/005 Issue No:1 2016	mg/kg	14.1
5	Soluble Potassium (as K) in saturation extract	GLCS/SOP/S/006 Issue No:1 2016	mg/100g	0.87
6	Exchangeable Calcium (as Ca)	GLCS/SOP/S/020 Issue No:1 2017	meq/100g	3.2

For Global Lab and Consultancy Services LLP



Page 1 of 2

Authorised Signatory

L. SUDHAPRIYA
Technical Manager

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228 A

TEST REPORT

ULR-TC606024000004470F

Report Number: GLCS/TR/501/2024-25(1)

Report Date: 31.05.2024

Sl. NO.	TEST PARAMETER	TEST METHOD	UNITS	RESULTS	
7	Exchangeable Magnesium (as Mg)	GLCS/SOP/S/021 Issue No:1 2017	meq/100g	2.6	
8	Sulphate as SO ₄	GLCS/SOP/S/009 Issue No:1 2016	mg/100g	16	
9	Cation Exchange Capacity	GLCS/SOP/S/024 Issue No:1 2017	meq/100g	15.3	
10	Bulk Density	GLCS/SOP/S/017 Issue No:1 2017	g/cc	1.04	
11	Texture	Sand	GLCS/SOP/S/015 Issue No:1 2017	%	25.3
12		Slit	GLCS/SOP/S/015 Issue No:1 2017	%	46.8
13		Clay	GLCS/SOP/S/015 Issue No:1 2017	%	27.9
14	Water Holding Capacity	GLCS/SOP/S/016 Issue No:1 2017	%	49.4	
15	Available Nitrogen as N	GLCS/SOP/S/029 Issue No:1 2016	Kg/ha	276	
16	Chloride (as Cl) in saturation extract	GLCS/SOP/S/004 Issue No:1 2016	meq/l	3.7	

For Global Lab and Consultancy Services LLP



*****End of Report*****
Page 2 of 2


Authorised Signatory
L. SUDHAPRIYA
Technical Manager

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TEST REPORT

Report Number: GLCS/TR/501/2024-25(2)

Report Date: 31.05.2024

Issued To: Thiru R.P.Rahul, S/o, Rajendran, 13-85, Pathillavilai, Chitharal Village, Vilavankode Taluk, Kanyakumari district.		Site Address: Rough Stone and Gravel Quarry, Lease Area – 4.99.39 Ha. S.F.No:719/1,720/1,720/2,720/3,720/4,720/5,720/6, 720/7,720/8,720/9,720/10,720/11,720/12,720/13,& 720/14 of Vadakku Ariyanayagipuram –II Village, Cheranmahandevi Taluk, Tirunelveli District.	
Attention	-	Sample Receipt Condition	Ambient – Good
TRF No	206	Sample Quantity	2 kg
Sample Name	Soil - 5	Sampled by	Laboratory
Sample Description	Lumps	Sampling Method	GLCS/SOP/S/014
Location Name	Sidaparappanallur	Date of Analysis	15.04.2024
Sampling Date	12.04.2024 - 13.04.2024	Date of Completion	29.04.2024
Sample Receipt Date	15.04.2024	Location Co-ordinates	8°47'16.08"N 77°35'59.55"E
Sample Code	GLCS / 501		

Sl. No	TEST PARAMETERS	TEST METHOD	UNIT	RESULTS
1	Permiability	By Permeameter	%	47.2
2	Manganese as Mn	USEPA 6010D :2014	mg/kg	19
3	Zinc as Zn	USEPA 6010D :2014	mg/kg	12
4	Cadmium as Cd	USEPA 6010D :2014	mg/kg	5
5	Chromium as Cr	USEPA 6010D :2014	mg/kg	7
6	Copper as Cu	USEPA 6010D :2014	mg/kg	4
7	Lead as Pb	USEPA 6010D :2014	mg/kg	3
8	Iron as Fe	USEPA 6010D :2014	mg/kg	20
9	Organic Carbon	GLCS/SOP/S/003 Issue No:1 2016	%	0.83
10	Boron as B	USEPA 6010D :2014	mg/kg	BDL (DL:0.5)

Note: BDL – Below Detection Limit, DL – Detection Limit

For Global Lab and Consultancy Services LLP



*****End of Report*****

Page 1 of 1

Authorised Signatory

L. SUDHAPRIYA
Technical Manager

Note: The test results are only to the sample submitted for test. Any Correction of the test report on full or part shall invalidate the report. Samples are not drawn by us unless otherwise stated. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. Perishable samples will be discarded immediately after reporting. We do not accept any liability with regard to origin or source from which the samples are extracted. The Laboratory is not responsible for authenticity of photocopied test reports. Any holder of this report is advised that information contained here on reflects the laboratory's finding at the time of its intervention only and within the limits of client instructions. The authenticity of the test report's issued by us can be verified by submitting an E-mail request with report number and report date along with report copy.

TEST REPORT

ULR-TC606024000004471F

Report Number: GLCS/TR/502/2024-25(1)

Report Date: 31.05.2024

Issued To: Thiru R.P.Rahul, S/o, Rajendran, 13-85, Pathillavilai, Chitharal Village, Vilavankode Taluk, Kanyakumari district.		Site Address: Rough Stone and Gravel Quarry, Lease Area – 4.99.39 Ha. S.F.No:719/1,720/1,720/2,720/3,720/4,720/5,720/6, 720/7,720/8,720/9,720/10,720/11,720/12,720/13,& 720/14 of Vadakku Ariyanayagipuram –II Village, Cheranmahandevi Taluk, Tirunelveli District.	
Attention	-	Sample Receipt Condition	Ambient – Good
TRF No	206	Sample Quantity	2 kg
Sample Name	Soil - 6	Sampled by	Laboratory
Sample Description	Lumps	Sampling Method	GLCS/SOP/S/014
Location Name	Near Nadukkalur	Date of Analysis	15.04.2024
Sampling Date	12.04.2024 - 13.04.2024	Date of Completion	29.04.2024
Sample Receipt Date	15.04.2024	Location Co-ordinates	8°43'18.08"N 77°35'31.08"E
Sample Code	GLCS / 502		

Sl. No	TEST PARAMETERS	TEST METHOD	UNITS	RESULTS
1	Organic Matter	GLCS/SOP/S/003 Issue No:1 2016	%	0.84
2	pH	IS 2720 PART 26:1987 (RA 2021)	-	7.43
3	Specific Electrical Conductivity	IS 14767 :2000 RA 2021	µS/cm	358
4	Available Phosphorous	GLCS/SOP/S/005 Issue No:1 2016	mg/kg	13.5
5	Soluble Potassium (as K) in saturation extract	GLCS/SOP/S/006 Issue No:1 2016	mg/100g	1.7
6	Exchangeable Calcium (as Ca)	GLCS/SOP/S/020 Issue No:1 2017	meq/100g	2.6

For Global Lab and Consultancy Services LLP



Page 1 of 2

Authorised Signatory

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Technical Manager

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231 A



TEST REPORT

ULR-TC606024000004471F

Report Number: GLCS/TR/502/2024-25(1)

Report Date: 31.05.2024

Sl. NO.	TEST PARAMETER	TEST METHOD	UNITS	RESULTS	
7	Exchangeable Magnesium (as Mg)	GLCS/SOP/S/021 Issue No:1 2017	meq/100g	2.8	
8	Sulphate as SO ₄	GLCS/SOP/S/009 Issue No:1 2016	mg/100g	16	
9	Cation Exchange Capacity	GLCS/SOP/S/024 Issue No:1 2017	meq/100g	17.8	
10	Bulk Density	GLCS/SOP/S/017 Issue No:1 2017	g/cc	1.03	
11	Texture	Sand	GLCS/SOP/S/015 Issue No:1 2017	%	25
12		Slit	GLCS/SOP/S/015 Issue No:1 2017	%	45
13		Clay	GLCS/SOP/S/015 Issue No:1 2017	%	30
14	Water Holding Capacity	GLCS/SOP/S/016 Issue No:1 2017	%	47.6	
15	Available Nitrogen as N	GLCS/SOP/S/029 Issue No:1 2016	Kg/ha	339	
16	Chloride (as Cl) in saturation extract	GLCS/SOP/S/004 Issue No:1 2016	meq/l	5.2	

For Global Lab and Consultancy Services LLP



*****End of Report*****

Page 2 of 2

Authorised Signatory

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232/A

TEST REPORT

Report Number: GLCS/TR/502/2024-25(2)

Report Date: 31.05.2024

Issued To: Thiru R.P.Rahul, S/o, Rajendran, 13-85,Pathillavilai, Chitharal Village, Vilavankode Taluk, Kaniyakumari district.		Site Address: Rough Stone and Gravel Quarry, Lease Area - 4.99.39 Ha. S.F.No:719/1,720/1,720/2,720/3,720/4,720/5,720/6, 720/7,720/8,720/9,720/10,720/11,720/12,720/13,& 720/14 of Vadakku Ariyanayagipuram -II Village, Cheranmahandevi Taluk, Tirunelveli District.	
Attention	-	Sample Receipt Condition	Ambient - Good
TRF No	206	Sample Quantity	2 kg
Sample Name	Soil - 6	Sampled by	Laboratory
Sample Description	Lumps	Sampling Method	GLCS/SOP/S/014
Location Name	Near Nadukkalur	Date of Analysis	15.04.2024
Sampling Date	12.04.2024 - 13.04.2024	Date of Completion	29.04.2024
Sample Receipt Date	15.04.2024	Location Co-ordinates	8°43'18.08"N 77°35'31.08"E
Sample Code	GLCS / 502		

Sl. No	TEST PARAMETERS	TEST METHOD	UNIT	RESULTS
1	Permiability	By Permeameter	%	46
2	Manganese as Mn	USEPA 6010D :2014	mg/kg	13
3	Zinc as Zn	USEPA 6010D :2014	mg/kg	14
4	Cadmium as Cd	USEPA 6010D :2014	mg/kg	6
5	Chromium as Cr	USEPA 6010D :2014	mg/kg	7
6	Copper as Cu	USEPA 6010D :2014	mg/kg	7.5
7	Lead as Pb	USEPA 6010D :2014	mg/kg	4
8	Iron as Fe	USEPA 6010D :2014	mg/kg	16
9	Organic Carbon	GLCS/SOP/S/003 Issue No:1 2016	%	0.49
10	Boron as B	USEPA 6010D :2014	mg/kg	0.94

For Global Lab and Consultancy Services LLP



*****End of Report*****
Page 1 of 1

Authorised Signatory
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Web: www.glcs.in

SUMMARY REPORT

Issued To	Thiru R.P.Rahul, S/o, Rajendran, 13-85, Pathillavilai, Chitharal Village, Vilavankode Taluk, Kaniyakumari district.		
Site Location	Rough Stone and Gravel Quarry, Lease Area – 4.99.39 Ha. S.F.No:719/1,720/1,720/2,720/3,720/4,720/5,720/6,720/7,720/8,720/9,720/10,720/11,720/12,720/13,& 720/14 of Vadakku Ariyanayagipuram –II Village, Cheranmahandevi Taluk, Tirunelveli District.		
Sampling Method	GLCS/SOP/AAQ/015	Sample Drawn by	Laboratory
Sample Name	Air Quality Monitoring	Sampling Location	AAQ1 – Project Area SW Corner
Sample Description	Ambient Air Quality Monitoring	Sample Condition	Good
Sample Code	GLCS/12278,12335,12560,12583,12991,016,269,302,443,490,658,680,801,859, 1025,1087,1227,1302,1497,1511,1704,1767,1875,1913,2095,2132.		
Location Coordinates	8°45'11.51"N 77°33'41.32"E		
Report Date	27.06.2024		

Date	Period. hrs	PM10 (µg/m3)	PM2.5 (µg/m3)	SO2 (µg/m3)	NO2 (µg/m3)	O3 (µg/m3)	NH3 (µg/m3)	CO (mg/ m3)
14.03.2024	08.00 – 08.00	47.1	21.6	4.2	21.4	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
15.03.2024	08.10 – 08.10	49.5	23.3	6.6	23.2	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
21.03.2024	08.00 – 08.00	48.1	22.4	5.1	24.4	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
22.03.2024	08.10 – 08.10	48.6	22.5	BDL(DL:4)	20.5	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
28.03.2024	07.30 – 07.30	48.6	21.6	5.5	20.4	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
29.03.2024	07.45 – 07.45	49.6	23.3	4.3	24.1	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
04.04.2024	08.30 – 08.30	50.3	23.3	6.8	21.8	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
05.04.2024	08.40 – 08.40	49.8	24.1	7.4	21.7	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
11.04.2024	09.00 – 09.00	49.6	22.5	4.9	21.3	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
12.04.2024	09.10 – 09.10	47.8	22.9	5.6	19.6	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
18.04.2024	07.00 -07.00	49.3	24.1	6.7	23.2	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
20.04.2024	08.30 – 08.30	49.3	22.5	6.5	23.0	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
25.04.2024	07.30 – 07.30	47.3	22.5	5.7	20.9	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
26.04.2024	07.40 – 07.40	49.8	23.3	4.3	19.9	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
02.05.2024	08.00 -08.00	47.6	22.5	5.6	20.0	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
03.05.2024	08.10 – 08.10	47.2	21.6	7.2	22.0	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
09.05.2024	08.15 – 08.15	47.5	22.5	5.4	18.6	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
10.05.2024	08.25 – 08.25	47.4	23.3	7.2	19.9	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
16.05.2024	09.00 - 09.00	46.2	23.3	5.6	22.0	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
17.05.2024	09.10 – 09.10	49.0	23.7	6.8	23.1	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
23.05.2024	08.00 – 08.00	48.1	23.3	6.0	22.3	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
24.05.2024	08.10 – 08.10	48.8	23.7	5.9	23.2	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
30.05.2024	08.00-08.00	48.8	23.7	6.6	25.6	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
31.05.2024	08.10 – 08.10	47.0	23.3	6.4	21.8	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
06.06.2024	08.00 -0 8.00	47.8	22.0	4.2	22.9	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
07.06.2024	08.10 – 08.10	48.5	23.3	6.0	21.9	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
NAAQ* Standard		<100	<60	<80	<80	<180	<400	<4

Note: BDL: Below Detection Limit; DL: Detection Limit

Remarks: The values observed for the pollutants given above are within the CPCB standards.



Verified by
L. SUDHAPRIYA
Technical Manager



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SUMMARY REPORT

Issued To	Thiru R.P.Rahul, S/o, Rajendran, 13-85,Pathillavilai,Chitharal Village, Vilavankode Taluk, Kaniyakumari district.		
Site Location	Rough Stone and Gravel Quarry, Lease Area - 4.99.39 Ha. S.F.No:719/1,720/1,720/2,720/3,720/4,720/5,720/6,720/7,720/8,720/9,720/10,720/11,720/12,720/13,& 720/14 of Vadakku Ariyanayagipuram -II Village, Cheranmahandevi Taluk, Tirunelveli District.		
Sampling Method	GLCS/SOP/AAQ/015	Sample Drawn by	Laboratory
Sample Name	Air Quality Monitoring	Sampling Location	AAQ1 - Project Area SW Corner
Sample Description	Ambient Air Quality Monitoring	Sample Condition	Good
Sample Code	GLCS/12278,12335,12560,12583,12991,016,269,302,443,490,658,680,801,859, 1025,1087,1227,1302,1497,1511,1704,1767,1875,1913,2095,2132.		
Location Coordinates	8°45'11.51"N 77°33'41.32"E		
Report Date	27.06.2024		

Date	Period. hrs	Ni (ng/m ³)	As (ng/m ³)	C6H6 (µg/m ³)	BaP (ng/m ³)	Pb (µg/m ³)
14.03.2024	08.00 - 08.00	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
15.03.2024	08.10 - 08.10	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
21.03.2024	08.00 - 08.00	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
22.03.2024	08.10 - 08.10	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
28.03.2024	07.30 - 07.30	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
29.03.2024	07.45 - 07.45	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
04.04.2024	08.30 - 08.30	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
05.04.2024	08.40 - 08.40	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
11.04.2024	09.00 - 09.00	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
12.04.2024	09.10 - 09.10	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
18.04.2024	07.00 - 07.00	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
20.04.2024	08.30 - 08.30	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
25.04.2024	07.30 - 07.30	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
26.04.2024	07.40 - 07.40	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
02.05.2024	08.00 - 08.00	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
03.05.2024	08.10 - 08.10	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
09.05.2024	08.15 - 08.15	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
10.05.2024	08.25 - 08.25	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
16.05.2024	09.00 - 09.00	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
17.05.2024	09.10 - 09.10	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
23.05.2024	08.00 - 08.00	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
24.05.2024	08.10 - 08.10	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
30.05.2024	08.00 - 08.00	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
31.05.2024	08.10 - 08.10	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
06.06.2024	08.00 - 08.00	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
07.06.2024	08.10 - 08.10	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
NAAQ* Standard		<20	<6.0	<5.0	<1.0	<1.0

Note: BDL: Below Detection Limit; DL: Detection Limit

Remarks: The values observed for the pollutants given above are within the CPCB standards.



Verified by
L. SUDHAPRIYA
Technical Manager

***** End of Report *****



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SUMMARY REPORT

Issued To	Thiru R.P.Rahul, S/o, Rajendran, 13-85,Pathillavilai, Chitharal Village, Vilavankode Taluk, Kanyakumari district.		
Site Location	Rough Stone and Gravel Quarry, Lease Area - 4.99.39 Ha. S.F.No:719/1,720/1,720/2,720/3,720/4,720/5,720/6,720/7,720/8,720/9,720/10,720/11,720/12,720/13,& 720/14 of Vadakku Ariyanayagipuram -II Village, Cheranmahandevi Taluk, Tirunelveli District.		
Sampling Method	GLCS/SOP/AAQ/015	Sample Drawn by	Laboratory
Sample Name	Air Quality Monitoring	Sampling Location	AAQ 2 - Project Area NE Corner
Sample Description	Ambient Air Quality Monitoring	Sample Condition	Good
Sample Code	GLCS/12279, 12336,12561,12584, 12992,017,270,303,444,491,659,681,802,860, 1026,1088,1228,1303,1498,1512,1705,1768,1876,1914,2096,2133,		
Location Coordinates	8°45'18.06"N 77°33'48.23"E		
Report Date	27.06.2024		

Date	Period. hrs	PM10 (µg/m3)	PM2.5 (µg/m3)	SO2 (µg/m3)	NO2 (µg/m3)	O3 (µg/m3)	NH3 (µg/m3)	CO (mg/ m3)
14.03.2024	08.30 - 08.30	48.3	22.5	6.0	21.6	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
15.03.2024	08.40 - 08.40	49.6	22.4	4.2	18.7	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
21.03.2024	08.25 - 08.25	47.1	23.3	BDL(DL:4)	24.4	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
22.03.2024	08.35 - 08.35	47.6	21.2	5.4	22.7	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
28.03.2024	08.10 - 08.10	49.4	23.7	6.6	21.0	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
29.03.2024	08.20 - 08.20	49.8	22.8	5.3	23.7	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
04.04.2024	09.00 -09.00	49.6	23.7	BDL(DL:4)	21.8	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
05.04.2024	09.10 - 09.10	49.0	22.5	BDL(DL:4)	19.0	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
11.04.2024	09.35 - 09.35	50.5	22.9	7.6	21.2	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
12.04.2024	09.45 - 09.45	49.0	23.7	BDL(DL:4)	22.0	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
18.04.2024	07.35 - 07.35	49.8	23.7	6.6	21.6	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
20.04.2024	09.00 - 09.00	48.1	23.3	4.7	23.2	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
25.04.2024	08.10 - 08.10	48.5	23.3	6.6	21.2	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
26.04.2024	08.20 - 08.20	48.0	22.5	6.3	20.4	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
02.05.2024	08.30 - 08.30	48.6	24.1	6.0	21.2	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
03.05.2024	08.40 - 08.40	48.5	23.3	4.5	19.5	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
09.05.2024	09.00 - 09.00	49.6	23.7	7.2	19.3	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
10.05.2024	09.10 - 09.10	48.8	22.5	6.6	23.2	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
16.05.2024	09.35-09.35	47.4	21.6	4.7	22.2	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
17.05.2024	09.45 - 09.45	47.3	22.5	6.1	18.7	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
23.05.2024	08.30 - 08.30	47.4	22.5	5.0	20.0	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
24.05.2024	08.45 - 08.45	48.6	24.1	6.4	24.7	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
30.05.2024	08.30 - 08.30	47.8	22.8	7.1	22.2	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
31.05.2024	08.40 - 08.40	48.1	23.7	6.3	20.9	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
06.06.2024	08.25 - 08.25	48.6	23.3	5.4	20.7	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
07.06.2024	08.35 - 08.35	46.7	22.5	6.2	20.6	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
NAAQ* Standard		<100	<60	<80	<80	<180	<400	<4

Note: BDL: Below Detection Limit; DL: Detection Limit

Remarks: The values observed for the pollutants given above are within the CPCB standards.



Verified by

L. SUDHAPRIYA
Technical Manager



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SUMMARY REPORT

Issued To	Thiru R.P.Rahul, S/o, Rajendran, 13-85,Pathillavilai,Chitharai Village, Vilavankode Taluk, Kaniyakumari district.		
Site Location	Rough Stone and Gravel Quarry, Lease Area – 4.99.39 Ha. S.F.No:719/1,720/1,720/2,720/3,720/4,720/5,720/6,720/7,720/8,720/9,720/10,720/11,720/12,720/ 13,& 720/14 of Vadakku Ariyanayagipuram-II Village, Cheranmahandevi Taluk, Tirunelveli District.		
Sampling Method	GLCS/SOP/AAQ/015	Sample Drawn by	Laboratory
Sample Name	Air Quality Monitoring	Sampling Location	AAQ 2 – Project Area NE Corner
Sample Description	Ambient Air Quality Monitoring	Sample Condition	Good
Sample Code	GLCS/12279, 12336,12561,12584, 12992,017,270,303,444,491,659,681,802,860, 1026,1088,1228,1303,1498,1512,1705,1768,1876,1914,2096,2133,		
Location Coordinates	8°45'18.06"N 77°33'48.23"E		
Report Date	27.06.2024		

Date	Period. hrs	Ni (ng/m ³)	As (ng/m ³)	C6H6 (µg/m ³)	BaP (ng/m ³)	Pb (µg/m ³)
14.03.2024	08.30 – 08.30	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
15.03.2024	08.40 – 08.40	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
21.03.2024	08.25 – 08.25	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
22.03.2024	08.35 – 08.35	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
28.03.2024	08.10 – 08.10	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
29.03.2024	08.20 – 08.20	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
04.04.2024	09.00 -09.00	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
05.04.2024	09.10 – 09.10	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
11.04.2024	09.35 – 09.35	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
12.04.2024	09.45 – 09.45	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
18.04.2024	07.35 – 07.35	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
20.04.2024	09.00 – 09.00	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
25.04.2024	08.10 – 08.10	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
26.04.2024	08.20 – 08.20	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
02.05.2024	08.30 – 08.30	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
03.05.2024	08.40 – 08.40	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
09.05.2024	09.00 – 09.00	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
10.05.2024	09.10 – 09.10	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
16.05.2024	09.35-09.35	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
17.05.2024	09.45 – 09.45	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
23.05.2024	08.30 – 08.30	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
24.05.2024	08.45 – 08.45	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
30.05.2024	08.30 – 08.30	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
31.05.2024	08.40 – 08.40	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
06.06.2024	08.25 – 08.25	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
07.06.2024	08.35 – 08.35	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
NAAQ* Standard		<20	<6.0	<5.0	<1.0	<1.0

Note: BDL: Below Detection Limit; DL: Detection Limit

Remarks: The values observed for the pollutants given above are within the CPCB standards.



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L. SUDHAPRIYA
Technical Manager

*****End of Report*****
Page 2 of 2



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SUMMARY REPORT

Issued To	Thiru R.P.Rahul, S/o, Rajendran, 13-85, Pathillavilai, Chitharal Village, Vilavankode Taluk, Kanyakumari district.		
Site Location	Rough Stone and Gravel Quarry, Lease Area - 4.99.39 Ha. S.F.No:719/1,720/1,720/2,720/3,720/4,720/5,720/6,720/7,720/8,720/9,720/10,720/11,720/12,720/13,&720/14 of Vadakku Ariyanayagipuram -II Village, Cheranmahandevi Taluk, Tirunelveli District.		
Sampling Method	GLCS/SOP/AAQ/015	Sample Drawn by	Laboratory
Sample Name	Air Quality Monitoring	Sampling Location	AAQ 3 - Near Existing Quarry
Sample Description	Ambient Air Quality Monitoring	Sample Condition	Good
Sample Code	GLCS/12280,12337,12562,12585,12993,018,271,304,445,492,660,682,803,861,1027,1089,121304,1499,1513,1691,1706,1877,1915,2097,2134,		
Location Coordinates	8°45'24.71"N 77°33'54.79"E		
Report Date	27.06.2024		

Date	Period. hrs	PM10 (µg/m3)	PM2.5 (µg/m3)	SO2 (µg/m3)	NO2 (µg/m3)	O3 (µg/m3)	NH3 (µg/m3)	CO (mg/ m3)
14.03.2024	09.10 - 09.10	46.5	21.2	7.4	24.9	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
15.03.2024	09.20 - 09.20	47.2	21.6	BDL(DL:4)	21.6	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
21.03.2024	09.00 - 09.00	46.8	21.6	6.7	19.4	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
22.03.2024	09.10 - 09.10	50.3	21.6	6.8	21.1	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
28.03.2024	08.45 - 08.45	48.2	22.9	BDL(DL:4)	21.2	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
29.03.2024	09.00 - 09.00	48.6	22.5	BDL(DL:4)	19.4	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
04.04.2024	09.35 - 09.35	48.1	22.5	5.0	20.5	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
05.04.2024	09.45 - 09.45	47.4	21.6	4.9	21.5	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
11.04.2024	10.10 - 10.10	47.8	22.0	5.3	21.4	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
12.04.2024	10.20 - 10.20	46.7	21.6	BDL(DL:4)	19.5	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
18.04.2024	08.00 -08.00	48.9	22.5	5.2	21.2	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
20.04.2024	09.35 - 09.35	47.6	21.6	6.0	18.1	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
25.04.2024	08.45 - 08.45	47.6	21.6	6.0	19.7	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
26.04.2024	09.00 -09.00	48.7	21.6	BDL(DL:4)	17.5	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
02.05.2024	09.15 - 09.15	47.0	22.0	5.8	21.5	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
03.05.2024	09.30 - 09.30	46.3	20.8	4.5	18.2	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
09.05.2024	09.30 - 09.30	46.3	23.3	6.7	20.8	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
10.05.2024	09.40 -09.40	45.2	21.6	4.9	22.6	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
16.05.2024	10.10-10.10	46.7	21.2	6.4	20.8	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
17.05.2024	10.20 - 10.20	46.7	21.6	6.4	19.9	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
23.05.2024	09.15 - 09.15	45.7	21.2	BDL(DL:4)	23.6	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
24.05.2024	09.30 - 09.30	46.9	23.3	6.0	19.5	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
30.05.2024	09.15 - 09.15	46.7	21.6	4.8	20.4	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
31.05.2024	09.30 - 09.30	46.9	22.0	6.6	22.7	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
06.06.2024	09.00 - 09.00	50.0	21.2	4.4	22.4	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
07.06.2024	09.10 - 09.10	48.1	22.9	6.0	23.5	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
NAAQ* Standard		<100	<60	<80	<80	<180	<400	<4

Note: BDL: Below Detection Limit; DL: Detection Limit

Remarks: The values observed for the pollutants given above are within the CPCB standards.



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SUMMARY REPORT

Issued To	Thiru R.P.Rahul, S/o, Rajendran, 13-85,Pathillavilai, Chitharal Village, Vilavankode Taluk, Kaniyakumari district.		
Site Location	Rough Stone and Gravel Quarry, Lease Area - 4.99.39 Ha. S.F.No:719/1,720/1,720/2,720/3,720/4,720/5,720/6,720/7,720/8,720/9,720/10,720/11,720/12,720/ & 720/14 of Vadakku Ariyanayagipuram -II Village, Cheranmahandevi Taluk, Tirunelveli District.		
Sampling Method	GLCS/SOP/AAQ/015	Sample Drawn by	Laboratory
Sample Name	Air Quality Monitoring	Sampling Location	AAQ 3 - Near Existing Quarry
Sample Description	Ambient Air Quality Monitoring	Sample Condition	Good
Sample Code	GLCS/12280,12337,12562,12585,12993,018,271,304,445,492,660,682,803,861,1027,1089,1229, 304,1499, 1513,1691,1706,1877,1915,2097,2134,		
Location Coordinates	8°45'24.71"N 77°33'54.79"E		
Report Date	27.06.2024		

Date	Period. hrs	Ni (ng/m ³)	As (ng/m ³)	C6H6 (µg/m ³)	BaP (ng/m ³)	Pb (µg/m ³)
14.03.2024	09.10 - 09.10	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
15.03.2024	09.20 - 09.20	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
21.03.2024	09.00 - 09.00	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
22.03.2024	09.10 - 09.10	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
28.03.2024	08.45 - 08.45	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
29.03.2024	09.00 - 09.00	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
04.04.2024	09.35 - 09.35	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
05.04.2024	09.45 - 09.45	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
11.04.2024	10.10 - 10.10	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
12.04.2024	10.20 - 10.20	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
18.04.2024	08.00 -08.00	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
20.04.2024	09.35 - 09.35	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
25.04.2024	08.45 - 08.45	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
26.04.2024	09.00 -09.00	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
02.05.2024	09.15 - 09.15	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
03.05.2024	09.30 - 09.30	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
09.05.2024	09.30 - 09.30	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
10.05.2024	09.40 -09.40	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
16.05.2024	10.10-10.10	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
17.05.2024	10.20 - 10.20	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
23.05.2024	09.15 - 09.15	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
24.05.2024	09.30 - 09.30	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
30.05.2024	09.15 - 09.15	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
31.05.2024	09.30 - 09.30	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
06.06.2024	09.00 - 09.00	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
07.06.2024	09.10 - 09.10	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
NAAQ* Standard		<20	<6.0	<5.0	<1.0	<1.0

Note: BDL: Below Detection Limit; DL: Detection Limit

Remarks: The values observed for the pollutants given above are within the CPCB standards.



*****End of Report*****

Page 2 of 2

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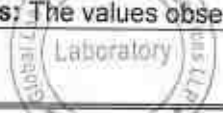
SUMMARY REPORT

Issued To	Thiru R.P.Rahul, S/o, Rajendran, 13-85,Pathillavilai, Chitharal Village, Vilavankode Taluk, Kaniyakumari district.		
Site Location	Rough Stone and Gravel Quarry, Lease Area - 4.99.39 Ha. S.F.No:719/1,720/1,720/2,720/3,720/4,720/5,720/6,720/7,720/8,720/9,720/10,720/11,720/12,720/13,& 720/14 of Vadakku Ariyanayagipuram -II Village, Cheranmahandevi Taluk, Tirunelveli District.		
Sampling Method	GLCS/SOP/AAQ/015	Sample Drawn by	Laboratory
Sample Name	Air Quality Monitoring	Sampling Location	AAQ 4 - Vadakku Ariyanagipuram
Sample Description	Ambient Air Quality Monitoring	Sample Condition	Good
Sample Code	GLCS/12281,12338,12563,12586,12994,019,272,305,446,493,661,683,804,862,1028,1090,1211,1305,1500,1514,1707,1770,1878,1916,2098,2135,		
Location Coordinates	8°43'27.26"N 77°32'45.95"E		
Report Date	27.06.2024		

Date	Period. hrs	PM10 (µg/m3)	PM2.5 (µg/m3)	SO2 (µg/m3)	NO2 (µg/m3)	O3 (µg/m3)	NH3 (µg/m3)	CO (mg/ m3)
14.03.2024	09.45 - 09.45	47.8	21.6	BDL(DL:4)	18.6	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
15.03.2024	10.00 -10.00	48.2	22.9	BDL(DL:4)	20.3	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
21.03.2024	09.40 - 09.40	49.8	23.7	6.8	24.0	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
22.03.2024	09.50 - 09.50	48.7	22.9	6.7	22.7	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
28.03.2024	09.30 - 09.30	47.4	22.5	7.4	22.3	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
29.03.2024	09.40 - 09.40	48.4	22.0	BDL(DL:4)	17.7	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
04.04.2024	10.20 - 10.20	47.7	22.0	BDL(DL:4)	18.7	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
05.04.2024	10.30 - 10.30	47.2	22.0	BDL(DL:4)	21.0	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
11.04.2024	11.00 - 11.00	48.8	21.6	5.0	20.8	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
12.04.2024	11.15 - 11.15	48.0	22.5	BDL(DL:4)	21.5	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
18.04.2024	08.35 - 08.35	48.8	22.0	6.2	21.3	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
20.04.2024	10.20 - 10.20	47.8	21.2	BDL(DL:4)	20.2	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
25.04.2024	09.30 - 09.30	49.5	23.7	6.0	19.5	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
26.04.2024	09.40 - 09.40	47.6	22.8	4.5	20.3	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
02.05.2024	10.50 - 10.50	48.5	21.6	5.2	18.6	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
03.05.2024	11.00 - 11.00	48.1	22.9	5.7	20.1	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
09.05.2024	10.15 - 10.15	45.4	20.8	4.7	19.2	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
10.05.2024	10.25 - 10.25	46.5	22.0	5.4	20.3	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
16.05.2024	11.00-11.00	47.0	22.0	6.2	22.0	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
17.05.2024	11.15 - 11.15	46.1	21.2	6.8	24.1	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
23.05.2024	10.50 - 10.50	47.8	20.8	6.9	21.0	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
24.05.2024	11.00 - 11.00	45.9	21.6	4.5	19.6	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
30.05.2024	10.50 - 10.50	46.0	21.2	5.5	19.2	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
31.05.2024	11.00 - 11.00	46.1	21.6	5.5	18.9	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
06.06.2024	09.40 - 09.40	47.2	22.9	5.6	22.2	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
07.06.2024	09.50 -09.50	49.4	24.1	5.8	19.5	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
NAAQ* Standard		<100	<60	<80	<80	<180	<400	<4

Note: BDL: Below Detection Limit; DL: Detection Limit

Remarks: The values observed for the pollutants given above are within the CPCB standards.



L. SUDHAPRIYA
Verified by Technical Manager

SUMMARY REPORT

Issued To	Thiru R.P.Rahul, S/o, Rajendran, 13-85, Pathillavilai, Chitharal Village, Vilavankode Taluk, Kaniyakumari district.		
Site Location	Rough Stone and Gravel Quarry, Lease Area - 4.99.39 Ha. S.F.No.719/1,720/1,720/2,720/3,720/4,720/5,720/6,720/7,720/8,720/9,720/10,720/11,720/12,720/3, & 720/14 of Vadakku Ariyanayagipuram -II Village, Cheranmahandevi Taluk, Tirunelveli District.		
Sampling Method	GLCS/SOP/AAQ/015	Sample Drawn by	Laboratory
Sample Name	Air Quality Monitoring	Sampling Location	AAQ 4 - Vadakku Ariyanagipuram
Sample Description	Ambient Air Quality Monitoring	Sample Condition	Good
Sample Code	GLCS/12281,12338,12563,12586,12994,019,272,305,446,493,661,683,804,862,1028,1090,123305,1500,1514,1707,1770,1878,1916,2098,2135,		
Location Coordinates	8°43'27.26"N 77°32'45.95"E		
Report Date	27.06.2024		

Date	Period. hrs	Ni (ng/m ³)	As (ng/m ³)	C6H6 (µg/m ³)	BaP (ng/m ³)	Pb (µg/m ³)
14.03.2024	09.45 - 09.45	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
15.03.2024	10.00 - 10.00	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
21.03.2024	09.40 - 09.40	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
22.03.2024	09.50 - 09.50	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
28.03.2024	09.30 - 09.30	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
29.03.2024	09.40 - 09.40	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
04.04.2024	10.20 - 10.20	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
05.04.2024	10.30 - 10.30	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
11.04.2024	11.00 - 11.00	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
12.04.2024	11.15 - 11.15	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
18.04.2024	08.35 - 08.35	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
20.04.2024	10.20 - 10.20	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
25.04.2024	09.30 - 09.30	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
26.04.2024	09.40 - 09.40	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
02.05.2024	10.50 - 10.50	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
03.05.2024	11.00 - 11.00	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
09.05.2024	10.15 - 10.15	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
10.05.2024	10.25 - 10.25	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
16.05.2024	11.00-11.00	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
17.05.2024	11.15 - 11.15	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
23.05.2024	10.50 - 10.50	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
24.05.2024	11.00 - 11.00	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
30.05.2024	10.50 - 10.50	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
31.05.2024	11.00 - 11.00	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
06.06.2024	09.40 - 09.40	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
07.06.2024	09.50 - 09.50	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
NAAQ* Standard		<20	<6.0	<5.0	<1.0	<1.0

Note: BDL/ Below Detection Limit; DL: Detection Limit

Remarks: The values observed for the pollutants given above are within the CPCB standards.

SUMMARY REPORT

Issued To	Thiru R.P.Rahul, S/o. Rajendran, 13-85,Pathillavilai, Chitharal Village, Vilavankode Taluk, Kanyakumari district.		
Site Location	Rough Stone and Gravel Quarry, Lease Area - 4.99.39 Ha. S.F.No:719/1,720/1,720/2,720/3,720/4,720/5,720/6,720/7,720/8,720/9,720/10,720/11,720/12,720/13,& 720/14 of Vadakku Ariyanayagipuram -II Village, Cheranmahandevi Taluk, Tirunelveli District.		
Sampling Method	GLCS/SOP/AAQ/015	Sample Drawn by	Laboratory
Sample Name	Air Quality Monitoring	Sampling Location	AAQ 5 - Udayampuli
Sample Description	Ambient Air Quality Monitoring	Sample Condition	Good
Sample Code	GLCS/12282, 12339,12564,12587,12995,020,273,306,447,494,662,684,805,863, 1029,1091,1231,1306, 1501,1515,1708,1771,1879,1917,2099,2136.		
Location Coordinates	8°47'53.72"N 77°32'21.81"E		
Report Date	27.06.2024		

Date	Period. hrs	PM10 (µg/m3)	PM2.5 (µg/m3)	SO2 (µg/m3)	NO2 (µg/m3)	O3 (µg/m3)	NH3 (µg/m3)	CO (mg/ m3)
14.03.2024	10.20 - 10.20	47.8	22.0	7.0	19.5	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
15.03.2024	10.30 - 10.30	50.5	24.1	6.7	20	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
21.03.2024	10.35 - 10.35	47.0	21.6	5.0	22.4	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
22.03.2024	10.45 - 10.45	50.2	23.7	6.9	22.0	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
28.03.2024	10.15 - 10.15	49.3	23.3	6.9	20.3	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
29.03.2024	10.25 - 10.25	48.0	21.6	6.5	19.2	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
04.04.2024	11.00 - 11.00	48.8	23.7	4.4	19.5	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
05.04.2024	11.15 - 11.15	47.3	21.2	BDL(DL:4)	18.4	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
11.04.2024	11.50 - 11.50	47.6	21.2	5.8	20.6	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
12.04.2024	12.00 - 12.00	49.5	23.3	5.4	20.1	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
18.04.2024	09.10 - 09.10	49.5	23.3	BDL(DL:4)	17.8	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
20.04.2024	11.00 - 11.00	48.7	22.0	4.3	21.0	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
25.04.2024	10.15 - 10.15	46.5	20.8	BDL(DL:4)	20.3	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
26.04.2024	10.25 - 10.25	47.0	21.2	6.5	19.1	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
02.05.2024	11.30 - 11.30	48.8	23.7	5.7	20.1	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
03.05.2024	11.40 - 11.40	48.1	22.5	6.0	19.1	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
09.05.2024	11.00 - 11.00	46.9	21.2	6.5	21.2	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
10.05.2024	11.10 - 11.10	45.9	21.6	5.2	21.4	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
16.05.2024	11.50-11.50	47.8	20.8	7.4	20.9	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
17.05.2024	12.00 - 12.00	49.5	22.9	6.3	21.3	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
23.05.2024	11.30 - 11.30	46.7	21.6	BDL(DL:4)	20.4	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
24.05.2024	11.45 - 11.45	46.6	21.6	7.1	21.2	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
30.05.2024	11.30 - 11.30	44.8	22.0	BDL(DL:4)	19.7	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
31.05.2024	11.40 - 11.40	45.4	21.6	6.6	20.5	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
06.06.2024	10.35-10.35	48.6	23.1	BDL(DL:4)	19.8	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
07.06.2024	10.45 - 10.45	47.8	22.0	6.2	20.6	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
NAAQ* Standard		<100	<60	<80	<80	<180	<400	<4

Note: BDL: Below Detection Limit; DL: Detection Limit

Remarks: The values observed for the pollutants given above are within the CPCB standards.



SUMMARY REPORT

Issued To	Thiru R.P.Rahul, S/o, Rajendran, 13-85,Pathillavilai,Chitharal Village, Vilavankode Taluk, Kanyakumari district.		
Site Location	Rough Stone and Gravel Quarry, Lease Area - 4.99.39 Ha. S.F.No:719/1,720/1,720/2,720/3,720/4,720/5,720/6,720/7,720/8,720/9,720/10,720/11,720/12,720/ 13,& 720/14 of Vadakku Ariyanayagipuram-II Village, Cheranmahandevi Taluk, Tirunelveli District.		
Sampling Method	GLCS/SOP/AAQ/015	Sample Drawn by	Laboratory
Sample Name	Air Quality Monitoring	Sampling Location	AAQ 5 - Udayampuli
Sample Description	Ambient Air Quality Monitoring	Sample Condition	Good
Sample Code	GLCS/12282, 12339,12564,12587,12995,020,273,306,447,494,662,684,805,863, 1029,1091,1231,1306, 1501,1515,1708,1771,1879,1917,2099,2136,		
Location Coordinates	8°47'53.72"N 77°32'21.81"E		
Report Date	27.06.2024		

Date	Period. hrs	Ni (ng/m ³)	As (ng/m ³)	C6H6 (µg/m ³)	BaP (ng/m ³)	Pb (µg/m ³)
14.03.2024	10.20 - 10.20	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
15.03.2024	10.30 - 10.30	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
21.03.2024	10.35 - 10.35	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
22.03.2024	10.45 - 10.45	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
28.03.2024	10.15 - 10.15	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
29.03.2024	10.25 - 10.25	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
04.04.2024	11.00 - 11.00	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
05.04.2024	11.15 - 11.15	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
11.04.2024	11.50 - 11.50	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
12.04.2024	12.00 - 12.00	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
18.04.2024	09.10 - 09.10	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
20.04.2024	11.00 - 11.00	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
25.04.2024	10.15 - 10.15	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
26.04.2024	10.25 - 10.25	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
02.05.2024	11.30 - 11.30	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
03.05.2024	11.40 - 11.40	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
09.05.2024	11.00 - 11.00	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
10.05.2024	11.10 - 11.10	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
16.05.2024	11.50-11.50	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
17.05.2024	12.00 - 12.00	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
23.05.2024	11.30 - 11.30	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
24.05.2024	11.45 - 11.45	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
30.05.2024	11.30 - 11.30	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
31.05.2024	11.40 - 11.40	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
06.06.2024	10.35-10.35	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
07.06.2024	10.45 - 10.45	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
NAAQ* Standard		<20	<6.0	<5.0	<1.0	<1.0

Note: BDL: Below Detection Limit; DL: Detection Limit

Remarks: The values observed for the pollutants given above are within the CPCB standards.



Verified by **SUDHAPRIYA**
Technical Manager

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*****End of Report*****

SUMMARY REPORT

Issued To	Thiru R.P.Rahul, S/o, Rajendran, 13-85, Pathillavilai, Chitharal Village, Vilavankode Taluk, Kaniyakumari district.		
Site Location	Rough Stone and Gravel Quarry, Lease Area - 4.99.39 Ha. S.F.No: 719/1, 720/1, 720/2, 720/3, 720/4, 720/5, 720/6, 720/7, 720/8, 720/9, 720/10, 720/11, 720/12, 720/13, & 720/14 of Vadakku Ariyanayagipuram -II Village, Cheranmahandevi Taluk, Tirunelveli District.		
Sampling Method	GLCS/SOP/AAQ/015	Sample Drawn by	Laboratory
Sample Name	Air Quality Monitoring	Sampling Location	AAQ 6 - Singamparal (House)
Sample Description	Ambient Air Quality Monitoring	Sample Condition	Good
Sample Code	GLCS/12283, 12340, 12565, 12588, 12996, 021, 274, 307, 448, 495, 663, 685, 806, 864, 1030, 1092, 1232, 1307, 1502, 1516, 1709, 1772, 1880, 1918, 2100, 2137.		
Location Coordinates	8°45'12.36"N 77°32'6.58"E		
Report Date	27.06.2024		

Date	Period. hrs	PM10 (µg/m3)	PM2.5 (µg/m3)	SO2 (µg/m3)	NO2 (µg/m3)	O3 (µg/m3)	NH3 (µg/m3)	CO (mg/ m3)
14.03.2024	10.40 - 10.40	46.4	21.2	BDL(DL:4)	19.1	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
15.03.2024	11.00 - 11.00	49.6	22.0	4.7	21	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
21.03.2024	11.15 - 11.15	45.5	20.4	4.5	20.6	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
22.03.2024	11.30 - 11.30	46.8	22.5	4.9	23.0	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
28.03.2024	11.00 - 11.00	50.0	24.1	7.1	22.0	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
29.03.2024	11.10 - 11.10	47.2	20.4	4.9	19.4	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
04.04.2024	11.45 - 11.45	47.6	22.9	4.1	20.5	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
05.04.2024	12.00 - 12.00	49.5	22.5	6.7	23.6	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
11.04.2024	12.30 - 12.30	46.7	20.8	6.4	19.2	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
12.04.2024	12.40 - 12.40	47.6	22.0	4.8	20	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
18.04.2024	09.50 - 09.50	49.0	21.6	6.3	18.4	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
20.04.2024	11.45 - 11.45	46.9	21.2	5.7	20.7	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
25.04.2024	11.00 - 11.00	46.2	21.2	4.9	19.7	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
26.04.2024	11.10 - 11.10	48.8	21.6	5.8	18.2	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
02.05.2024	12.20 - 12.20	46.9	21.2	5.2	22.1	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
03.05.2024	12.30 - 12.30	45.7	21.2	5.9	20.0	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
09.05.2024	11.45 - 11.45	46.0	20.4	5.2	20.6	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
10.05.2024	12.00 - 12.00	47.9	22.4	BDL(DL:4)	20.1	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
16.05.2024	12.30-12.30	48.7	21.2	BDL(DL:4)	20.2	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
17.05.2024	12.40- 12.40	48.2	22.5	6.2	21.2	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
23.05.2024	12.20 - 12.20	45.5	22.0	5.0	19.3	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
24.05.2024	12.30 - 12.30	47.2	23.7	6.3	20.7	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
30.05.2024	12.20-12.20	47.4	22.5	7.3	21.8	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
31.05.2024	12.30 - 12.30	45.8	22.5	4.2	19.0	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
06.06.2024	11.15 - 11.15	49.2	23.7	4.2	21.6	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
07.06.2024	11.30 - 11.30	49.2	23.7	5.0	19.9	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
NAAQ* Standard		<100	<60	<80	<80	<180	<400	<4

Note: BDL: Below Detection Limit; DL: Detection Limit

Remarks: The values observed for the pollutants given above are within the CPCB standards.



Verified by **SUDHAPRIYA**
Technical Manager

SUMMARY REPORT

Issued To	Thiru R.P.Rahul, S/o, Rajendran, 13-85, Pathillavilai, Chitharal Village, Vilavankode Taluk, Kanyakumari district.		
Site Location	Rough Stone and Gravel Quarry, Lease Area - 4.99.39 Ha. S.F.No:719/1,720/1,720/2,720/3,720/4,720/5,720/6,720/7,720/8,720/9,720/10,720/11,720/12,720/13, & 720/14 of Vadakku Ariyanayagipuram - II Village, Cheranmahandevi Taluk, Tirunelveli District.		
Sampling Method	GLCS/SOP/AAQ/015	Sample Drawn by	Laboratory
Sample Name	Air Quality Monitoring	Sampling Location	AAQ 6 - Singamparai (House)
Sample Description	Ambient Air Quality Monitoring	Sample Condition	Good
Sample Code	GLCS/12283,12340,12565,12588,12996,021,274,307,448,495,663,685,806,864,1030,1092,1232,1307,1502,1516,1709,1772,1880,1918,2100,2137,		
Location Coordinates	8°45'12.36"N 77°32'6.58"E		
Report Date	27.06.2024		

Date	Period. hrs	Ni (ng/m ³)	As (ng/m ³)	C6H6 (µg/m ³)	BaP (ng/m ³)	Pb (µg/m ³)
14.03.2024	10.40 - 10.40	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
15.03.2024	11.00 - 11.00	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
21.03.2024	11.15 - 11.15	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
22.03.2024	11.30 - 11.30	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
28.03.2024	11.00 - 11.00	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
29.03.2024	11.10 - 11.10	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
04.04.2024	11.45 - 11.45	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
05.04.2024	12.00 - 12.00	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
11.04.2024	12.30 - 12.30	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
12.04.2024	12.40 - 12.40	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
18.04.2024	09.50 - 09.50	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
20.04.2024	11.45 - 11.45	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
25.04.2024	11.00 - 11.00	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
26.04.2024	11.10 - 11.10	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
02.05.2024	12.20 - 12.20	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
03.05.2024	12.30 - 12.30	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
09.05.2024	11.45 - 11.45	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
10.05.2024	12.00 - 12.00	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
16.05.2024	12.30-12.30	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
17.05.2024	12.40- 12.40	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
23.05.2024	12.20 - 12.20	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
24.05.2024	12.30 - 12.30	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
30.05.2024	12.20-12.20	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
31.05.2024	12.30 - 12.30	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
06.06.2024	11.15 - 11.15	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
07.06.2024	11.30 - 11.30	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
NAAQ* Standard		<20	<6.0	<5.0	<1.0	<1.0

Note: BDL: Below Detection Limit; DL: Detection Limit

Remarks: The values observed for the pollutants given above are within the CPCB standards.



SUMMARY REPORT

Issued To	Thiru R.P.Rahul, S/o, Rajendran, 13-85, Pathillavilai, Chitharal Village, Vilavankode Taluk, Kanyakumari district.		
Site Location	Rough Stone and Gravel Quarry, Lease Area - 4.99.39 Ha. S.F.No:719/1,720/1,720/2,720/3,720/4,720/5,720/6,720/7,720/8,720/9,720/10,720/11,720/12,720/13,& 720/14 of Vadakku Ariyanayagipuram-II Village, Cheranmahandevi Taluk, Tirunelveli District.		
Sampling Method	GLCS/SOP/AAQ/015	Sample Drawn by	Laboratory
Sample Name	Air Quality Monitoring	Sampling Location	AAQ 7 - Sidaparappanallur (House)
Sample Description	Ambient Air Quality Monitoring	Sample Condition	Good
Sample Code	GLCS/12284,12341,12566,12589,12997,022,275,308,449,496,664,686,807,865,1031,1093,1233,1308,1503,1517,1710,1773,1881,1919,2101,2138		
Location Coordinates	8°47'16.37"N 77°36'1.10"E		
Report Date	27.06.2024		

Date	Period. hrs	PM10 (µg/m3)	PM2.5 (µg/m3)	SO2 (µg/m3)	NO2 (µg/m3)	O3 (µg/m3)	NH3 (µg/m3)	CO (mg/ m3)
14.03.2024	11.30 - 11.30	47.1	20.8	6.0	21.9	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
15.03.2024	11.40 - 11.40	48.5	22.5	BDL(DL:4)	20.4	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
21.03.2024	12.10 - 12.10	47.6	22.5	5.0	19.6	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
22.03.2024	12.20 - 12.20	47.6	22.0	6.1	20.7	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
28.03.2024	11.45 - 11.45	50.9	22.9	5.7	24.4	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
29.03.2024	12.00 -12.00	49.3	22.0	4.6	22.1	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
04.04.2024	12.20 - 12.20	48.3	21.6	BDL(DL:4)	19.2	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
05.04.2024	12.50 - 12.50	46.7	20.4	4.7	19.0	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
11.04.2024	13.10 - 13.10	47.6	22.5	4.4	18.9	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
12.04.2024	13.20 - 13.20	46.8	21.2	6.6	19.9	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
18.04.2024	10.30 - 10.30	47.9	22.5	6.0	22.0	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
20.04.2024	12.40 - 12.40	47.2	20.8	BDL(DL:4)	20.3	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
25.04.2024	11.45 - 11.45	47.1	22.5	6.2	20.0	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
26.04.2024	12.00 -12.00	46.4	20.0	5.1	21.0	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
02.05.2024	13.15 - 13.15	47.5	22.0	4.4	20.6	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
03.05.2024	13.30 - 13.30	47.2	21.6	5.1	22.6	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
09.05.2024	12.30 - 12.30	48.4	23.3	5.1	19.4	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
10.05.2024	12.45 - 12.45	45.2	20.0	5.2	20.3	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
16.05.2024	13.10-13.10	46.7	22.9	6.6	23.7	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
17.05.2024	13.20 - 13.20	46.0	21.6	6.0	19.3	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
23.05.2024	13.15 - 13.15	47.5	22.5	5.5	21.1	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
24.05.2024	13.30 - 13.30	47.7	22.8	6.7	18.6	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
30.05.2024	13.30-13.30	46.0	20.4	BDL(DL:4)	19.2	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
31.05.2024	13.30-13.30	47.5	21.2	5.7	21.0	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
06.06.2024	12.10 -12.10	46.8	21.6	5.0	21.4	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
07.06.2024	12.20-12.20	46.3	22.5	BDL(DL:4)	18.5	BDL(DL:5.0)	BDL(DL:5.0)	BDL(DL:1.15)
NAAQ* Standard		<100	<60	<80	<80	<180	<400	<4

Note: BDL: Below Detection Limit; DL: Detection Limit

Remarks: The values observed for the pollutants given above are within the CPCB standards.

Verified by **SIDDHAPRIYA**
Technical Manager



LABORATORY | CONSULTANCY | SUSTAINABILITY

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SUMMARY REPORT

Issued To	Thiru R.P.Rahul, S/o, Rajendran, 13-85, Pathillavilai, Chitharal Village, Vilavankode Taluk, Kanyakumari district.		
Site Location	Rough Stone and Gravel Quarry, Lease Area - 4.99.39 Ha. S.F.No:719/1,720/1,720/2,720/3,720/4,720/5,720/6,720/7,720/8,720/9,720/10,720/11,720/12,720/13,& 720/14 of Vadakku Ariyanayagipuram -II Village, Cheranmahandevi Taluk, Tirunelveli District.		
Sampling Method	GLCS/SOP/AAQ/015	Sample Drawn by	Laboratory
Sample Name	Air Quality Monitoring	Sampling Location	AAQ 7 - Sidaparappanallur (House)
Sample Description	Ambient Air Quality Monitoring	Sample Condition	Good
Sample Code	GLCS/12284,12341,12566,12589,12997,022,275,308,449,496,664,686,807,865,1031,1093, 1233,1308,1503,1517,1710,1773,1881,1919,2101,2138.		
Location Coordinates	8°47'16.37"N 77°36'1.10"E		
Report Date	27.06.2024		

Date	Period. hrs	Ni (ng/m ³)	As (ng/m ³)	C6H6 (µg/m ³)	BaP (ng/m ³)	Pb (µg/m ³)
14.03.2024	11.30 - 11.30	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
15.03.2024	11.40 - 11.40	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
21.03.2024	12.10 - 12.10	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
22.03.2024	12.20 - 12.20	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
28.03.2024	11.45 - 11.45	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
29.03.2024	12.00 -12.00	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
04.04.2024	12.20 - 12.20	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
05.04.2024	12.50 - 12.50	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
11.04.2024	13.10 - 13.10	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
12.04.2024	13.20 - 13.20	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
18.04.2024	10.30 - 10.30	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
20.04.2024	12.40 - 12.40	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
25.04.2024	11.45 - 11.45	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
26.04.2024	12.00 -12.00	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
02.05.2024	13.15 - 13.15	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
03.05.2024	13.30 - 13.30	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
09.05.2024	12.30 - 12.30	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
10.05.2024	12.45 - 12.45	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
16.05.2024	13.10-13.10	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
17.05.2024	13.20 - 13.20	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
23.05.2024	13.15 - 13.15	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
24.05.2024	13.30 - 13.30	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
30.05.2024	13.30-13.30	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
31.05.2024	13.30-13.30	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
06.06.2024	12.10 -12.10	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
07.06.2024	12.20-12.20	BDL (DL:1)	BDL (DL:1)	BDL (DL:1.0)	BDL (DL:0.5)	BDL (DL:0.01)
NAAQ* Standard		<20	<6.0	<5.0	<1.0	<1.0

Note: BDL: Below Detection Limit; DL: Detection Limit

Remarks: The values observed for the pollutants given above are within the CPCB standards.



Verified by
SUDHAPRIYA
Technical Manager

*****End of Report*****



National Accreditation Board for Education and Training



Certificate of Accreditation

Geo Exploration & Mining Solutions, Salem

No. 17, Advaita Ashram Road, Fairlands, Salem – 636 004, Tamilnadu, India.

The organization is accredited as **Category-A** under the QCI-NABET Scheme for Accreditation of EIA Consultant Organization, Version 3: for preparing EIA-EMP reports in the following Sectors –

S.No	Sector Description	Sector (as per)		Cat.
		NABET	MoEFCC	
1	Mining of minerals opencast only	1	1 (a) (i)	A
2	Industrial estates/ parks/ complexes/areas, export processing Zones (EPZs), Special Economic Zones (SEZs), Biotech Parks, Leather Complexes	31	7 (c)	B
3	Building and construction projects	38	8(a)	B

Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in RAAC minutes dated Jan 06, 2023 and posted on QCI-NABET website.

The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in QCI-NABET's letter of accreditation bearing no QCI/NABET/ENV/ACO/23/2684 dated Feb 20, 2023. The accreditation needs to be renewed before the expiry date by Geo Exploration & Mining Solutions, Salem following due process of assessment.

Sr. Director, NABET
Dated: Feb 20, 2023

Certificate No.
NABET/EIA/2225/RA 0276

Valid up to
August 06, 2025

For the updated List of Accredited EIA Consultant Organizations with approved Sectors please refer to the QCI-NABET website.

