

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT & ENVIRONMENT MANAGEMENT PLAN

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

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

Total Extent of Cluster – 7.36.50 Ha

Lease Period – 20 Years

M/S.A.G.GRANITES (PRIVATE) LIMITED BLACK GRANITE QUARRY

At

Project Proponent
M/s.A.G.Granites Pvt Limited,
Tmt.R.Shanthi - Director,
Muthu gounder Colony,
Harur, Dharmapuri District,
Tamilnadu State – 636 903

PROJECT LOCATION	PROPOSED PRODUCTION
S.F.No.65 (Part-2), Extent: 3.21.5 ha Kilpachar Village, Thandrapattu Taluk, Tiruvannamalai District, Tamil Nadu State.	Reserves: 15,335 m ³ of ROM (Granite Recovery @ 10% is 1,534 m ³) Annual Peak Production Capacity 5,970 0m ³ of ROM Proposed Depth = 20m (5m AGL + 15m BGL)

Complied as per ToR Obtained Vide
File.No.13259, ToR Identification No.TO26B0108TN5258198N Dated.05.03.2026.

Environmental Consultant	Laboratory
 GEO EXPLORATION AND MINING SOLUTIONS  Old No. 260-B, New No. 17, Advaita Ashram Road, Alagapuram, Salem – 636 004, Tamil Nadu, India  Accredited for sector 1 Category ‘A’ ,31 & 38 Category ‘B’ Certificate No: NABET/EIA/2225/RA0276 Phone: 0427-2431989, Email: ifthiahmed@gmail.com, geothangam@gmail.com Web: www.gemssalem.com	ENVIRONMENTAL LAB CHENNAI METTEX LAB PRIVATE LIMITED (Approved by AAI, AGMARK, APEDA, BIS, EIC FSSAI, GAFTA, IOPEPC, MOEF & TEA BOARD) Jothi Complex, 83, M.K.N Road, Guindy, Chennai – 600 032 

Baseline Monitoring Period: December 2025 – February 2026

April 2026

UNDERTAKING

I Tmt.R.Shanthi – Director of M/s. A.G.Granites Pvt Ltd given undertaking that this Draft EIA & EMP report prepared for our Black Granite Quarry situated in S.F.No 65(Part-2) over an extent of 3.21.5 Ha in Kilpachar Village, Thandrapattu Taluk, Tiruvannamalai District, Tamil Nadu State based on the Transfer in ToR obtained vide issued by the State Level Environmental Impact Assessment Authority (SEIAA), Tamil Nadu vide File.No.13259, ToR Identification No.TO26B0108TN5258198N Dated.05.03.2026.

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

Signature of the Project Proponent

M/s.A.G.Granites Pvt Ltd



Tmt.R.Shanthi

Place : Tiruvannmalai

Dated :

DECLARATION

I Dr. M. Ifthikhar Ahmed – EIA Co Ordinator declare that the Draft EIA & EMP report prepared for our Black Granite Quarry situated in S.F.No 65(Part-2) over an extent of 3.21.5 Ha in Kilpachar Village, Thandrampattu Taluk, Tiruvannamalai 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 :

DECLARATION

I Dr. M. Ifthikhar Ahmed – EIA Co Ordinator declare that the EIA & EMP report for the Black Granite quarry S.F. No 65(Part-2), over an extent of 3.21.5 Ha in Kilpachar Village, Thandrapattu Taluk, Tiruvannamalai 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:

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 M/s.A.G.Granites Pvt Ltd Black Granite Quarry over an Extent of 3.21.5 ha in Kilpachar Village, Thandrapattu Taluk, Tiruvannamalai 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/25-28/RA0424 Dated: 25-08-2025

Validity:

Valid till 06.08.2028

DECLARATION BY EXPERTS CONTRIBUTING TO THE EIA/EMP

This EIA/EMP for M/s.A.G.Granites Pvt Ltd Black Granite Quarry over an Extent of 3.21.5 ha in Kilpachar Village, Thandrapattu Taluk, Tiruvannamalai 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:



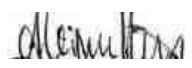
Period of Involvement: **Oct 2023 to till date**

Associated Team Member with EIA Coordinator:

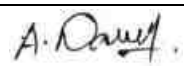
1. Mr.A.Naveen
2. Mr. M. Shaik Nawas

FUNCTIONAL AREA EXPERTS ENGAGED IN THE PROJECT

Sl. No.	Functional Area	Involvement	Name of the Expert/s	Signature
1	AP	▪ Identification of different sources of air pollution due to the proposed mine activity ▪ Prediction of air pollution and propose mitigation measures / control measures	Mr. A. Jagannathan	
2	WP	▪ Suggesting water treatment systems, drainage facilities ▪ Evaluating probable impacts of effluent/waste water discharges into the receiving environment/water bodies and suggesting control measures.	Dr. M. Ifthikhar Ahmed	
3	HG	▪ Interpretation of ground water table and predict impact and propose mitigation measures. ▪ Analysis and description of aquifer Characteristics	Mr. L. Jayaraj	
4	GEO	▪ Field Survey for assessing the regional and local geology of the area. ▪ Preparation of mineral and geological maps. ▪ Geology and Geo morphological analysis/description and Stratigraphy/Lithology.	Mr. B. Vengadagiri	
5	SE	▪ Revision in secondary data as per Census of India, 2011. ▪ Impact Assessment & Preventive Management Plan ▪ Corporate Environment Responsibility.	Mr. A. Allimuthu	

6	EB	- Collection of Baseline data of Flora and Fauna. - Identification of species labelled as Rare, Endangered and threatened as per IUCN list. - Impact of the project on flora and fauna. - Suggesting species for greenbelt development.	Mr. Panneer Selvam	
7	RH	- Identification of hazards and hazardous substances - Risks and consequences analysis - Vulnerability assessment - Preparation of Emergency Preparedness Plan - Management plan for safety.	Mr. N. Senthilkumar	
8	LU	- Construction of Land use Map - Impact of project on surrounding land use - Suggesting post closure sustainable land use and mitigative measures.	Mr. A. Allimuthu	
9	NV	- Identify impacts due to noise and vibrations - Suggesting appropriate mitigation measures for EMP.	Mr. A. Jagannathan	
10	AQ	- Identifying different source of emissions and propose predictions of incremental GLC using AERMOD. - Recommending mitigations measures for EMP	Mr. N. Senthilkumar	
11	SC	Assessing the impact on soil environment and proposed mitigation measures for soil conservation	Dr. M. Ifthikhar Ahmed	
12	SHW	- Identify source of generation of non-hazardous solid waste and hazardous waste. - Suggesting measures for minimization of generation of waste and how it can be reused or recycled.	Mr. A. Jagannathan	

LIST OF TEAM MEMBERS ENGAGED IN THIS PROJECT

Sl.No.	Name	Functional Area	Involvement	Signature
1	Mr. M. Shaik Nawas	AQ; NV; SC	- Site Visit with FAE - Provide inputs & Assisting FAE with sources of Air Pollution, its impact and suggest control measures - Analyse & provide inputs and assist FAE with meteorological data, emission estimation, AERMOD modelling and suggesting control measures - Assist FAE and provide inputs on impacts due to proposed mine activity and suggest mitigation measures - Assist FAE with prediction modelling - Provide inputs & Assisting FAE with soil conservation methods and identifying impacts	
2	Mr. A. Naveen	LU	- Site Visit with FAE - Assisting FAE in preparation of land use maps	

NABET CERTIFICATE



National Accreditation Board for Education and Training

Certificate of Accreditation

Geo Exploration and Mining Solutions, Salem

No. 17, Advaita Ashram Road, Fairlands, Salem, Tamil Nadu – 636 004

Geo Exploration and Mining Solutions, Salem is Re-Accredited (RA3) as Category-A organization under the QCI-NABET Scheme for Accreditation of EIA Consultant Organizations (Version 3), for the preparation of EIA/EMP reports in the sectors listed below, as per the specified categories

S. No	Sector Description	Sector (as per)		Cat.
		NABET	MoEFCC	
1.	Mining of minerals including opencast / underground mining	1	1 (a) (i)	A
2.	Mineral beneficiation	7	2 (b)	A
3.	Industrial estates/ parks/ complexes/areas, export processing Zones (EPZs), Special Economic Zones (SEZs), Biotech Parks, Leather Complexes	31	7 (c)	A
4.	Building and construction projects	38	8 (a)	B

Note: Names of approved experts and sectors are mentioned in RAAC minutes dated August 21, 2025, posted on QCI-NABET website.

The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in QCI-NABET's letter of accreditation bearing no QCI/NABET/ENV/ACQ/25/3827 dated August 25, 2025. The accreditation needs to be renewed before the expiry date by Geo Exploration and Mining Solutions, Salem following due process of assessment.

Valid up to
August 06, 2028

Issue Date
August 25, 2025



Certificate No.
NABET/EIA/25-28/RA 0424

Varinder Kanwar
Prof (Dr) Varinder S Kanwar
(CEO – NABET)

For the updated List of Accredited EIA Consultant Organizations with approved Sectors please refer to QCI-NABET website.

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

APPLIED PROPOSED QUARRY				
CODE	Name of the Owner	S.F. Nos	Extent	Status
P-1	M/s.A.G.Granites Pvt Ltd	65 Part - 2	3.21.5 Ha	File.No.13259, ToR Identification No.TO26B0108TN52 58198N Dated.05.03.2026.
		Total	3.21.5 Ha	
EXISTING QUARRY				
E-1	M/s.A.G.Granites Pvt Ltd	65 Part – 1	4.15.0 Ha	30.12.2024 – 29.12.2044.
		Total	4.15.0 Ha	
TOTAL CLUSTER EXTENT			7.36.50 Ha Cluster Quarry	

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

TERMS OF REFERENCE (ToR) COMPLIANCE

M/s.A.G.Granites Pvt Ltd

“ToR issued vide File.No.13259, ToR Identification No.TO26B0108TN5258198N Dated.05.03.2026.”

ADDITIONAL CONDITIONS		
1	The PP shall submit details of the Existing Pit Letter obtained from the concerned authority along with the EIA report	Reserves: 70,375m ³ of ROM (Granite Recovery @ 40% is 28,150m ³) Granite waste @60% recovery 42,225 m ³ Annual Peak Production Capacity 15,650m ³ of ROM
2	A Cluster Management Committee (CMC) shall be constituted including all the mines in the cluster as Committee Members for the effective management of the mining operation in the cluster through systematic & scientific approach with appointment of required statutory personnel. appropriate environmental management, system of maintaining the haul roads and village/panchayat roads, authorized blasting operation, Monitoring system of the environmental & other statutory compliances & its reporting status, etc. The PP shall submit the following details in the form of an Affidavit during the EIA appraisal: (i) Copy of the agreement forming CMC. (ii) The Organisation chart of the Committee with defining the role of the members (iii)The ‘Standard Operating Procedures’ (SoP) executing the planned activities.	Noted and Agreed
3	The PP shall ensure the installation of CCTV at the proposed quarry site and ensure its inclusion during the EIA presentation.	Noted and Agreed CCTV will be installed before the lease execution

Annexure-1

1	In the case of existing/operating mines, a letter obtained from the concerned AD (Mines) shall be submitted and it shall include the following: (i) Original pit dimension (ii) Quantity achieved Vs EC Approved Quantity (iii) Balance Quantity as per Mineable Reserve calculated. (iv) Mined out Depth as on date Vs EC Permitted depth (v) Details of illegal/illicit mining (vi) Violation in the quarry during the past working. (vii) Quantity of material mined out outside the mine lease area (viii) Condition of Safety zone benches (ix) Revised/Modified Mining Plan showing the benches of not exceeding 6 m height and ultimate depth of not exceeding 50m.	Noted and Agreed It is a Fresh lease
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.	VAO letter stating the details of habitations, temples etc., is enclosed as Annexure
3	The proponent is requested to carry out a survey and enumerate on the structures located within the radius of (i) 50 m, (ii) 100 m, (iii) 200 m and (iv) 300 m (v) 500m shall be enumerated with details such as dwelling houses with number	Structure Map included in the Draft EIA Report chapter - 3.

	of occupants, whether it belongs to the owner (or) not, places of worship, industries, factories, sheds, etc with indicating the owner of the building, nature of construction, age of the building, number of residents, their profession and income, etc.	
4	The PP shall submit a detailed hydrological report indicating the impact of proposed quarrying operations on the Waterbodies like lake, water tanks, etc are located within 1 km of the proposed quarry.	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
5	The Proponent shall carry out Bio diversity study through reputed Institution and the same shall be included in EIA Report.	Biodiversity study has been carried out by Functional Area Expert by the NABET accredited consultant. The detailed study is given in the Chapter No.3
6	The DFO letter stating that the proximity distance of Reserve Forests, Protected Areas, Sanctuaries, Tiger reserve etc., up to a radius of 25 km from the proposed site.	Noted and agreed
7	In the case of proposed lease in an existing (or old) quarry where the benches are not formed (or) partially formed as per the approved Mining Plan, the Project Proponent (PP) shall the pp shall carry out the scientific studies to assess the slope stability of the working benches to be constructed and existing quarry wall, by involving any one of the reputed Research and Academic Institutions - CSIR-Central Institute of Mining & Fuel Research / Dhanbad, NIRM/Bangalore, Division of Geotechnical Engineering-IIT-Madras, NIT-Dept of Mining Engg, Surathkal, and Anna University chennai-cEG Campus. The PP shall submit a copy of the aforesaid report indicating the stability status of the quarry wall and possible mitigation measures during the time of appraisal for obtaining the EC.	Noted and agreed
8	However, in case of the fresh/virgin quarries, The Proponent shall submit a conceptual 'Slope Stability Assessment' for the proposed quarry during the appraisal while obtaining the EC, when the depth of the proposed working is extended beyond 30 m below ground level.	For the first five years plan period the mining operation is proposed to carry out upto the depth of 20m bgl. It is ensured that the slope stability will be carried out after 30m bgl.
9	The PP shall furnish the affidavit stating that the blasting operation in the proposed quarry is carried out by the statutory competent person as per the MMR 1961 such as blaster, mining mate, mine foreman, II/I Class mines manager appointed by the proponent.	Proponent given affidavit stating that the blasting will be carried out under the supervision of Competent person.
10	The PP shall present a conceptual design for carrying out only controlled blasting operation involving line drilling and muffle blasting in the proposed quarry such that the blast-induced ground vibrations are controlled as well as no fly rock travel beyond 30 m from the blast site.	Noted and agreed
11	The EIA Coordinators shall obtain and furnish the details of quarry/quarries operated by the proponent in the past, either in the same location or elsewhere in the State with video and photographic evidences.	M/s. A.G. Granites P Ltd – S.F.No. 65(Part - 1), Extent – 4.15.0 Ha, Lease Period – 30.12.2024 – 29.12.2044. Order.No.G.O.(3D).No.25 Natural Resources (MMB.1) Department, Dated.23.12.2024

12	If the proponent has already carried out the mining activity in the proposed mining lease area after 15.01.2016, then the proponent shall furnish the following details from AD/DD, mines	It is a fresh lease Application
13	What was the period of the operation and stoppage of the earlier mines with last work permit issued by the AD/DD mines?	It is a fresh lease Application
14	Quantify of minerals mined out A. Highest production achieved in any one year B. Detail of approved depth of mining. C. Actual depth of the mining achieved earlier. D. Name of the person already mined in that leases area. E. If EC and CTO already obtained, the copy of the same shall be submitted. F. Whether the mining was carried out as per the approved mine plan (or EC if issued) with stipulated benches.	It is a fresh lease Application
15	All corner coordinates of the mine lease area, superimposed on a High-Resolution Imagery/Topo sheet. Topographic sheet, geomorphology, lithology and geology of the mining lease area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).	Satellite imagery of the project area along with boundary coordinates is given in the Chapter No 2, Figure No.2.2, , Page No.11. Geomorphology of the area is given in Chapter No 2, Figure No.2.9, Page No.21 Land use pattern of the project area is tabulated in the Chapter No.2. Table no 2.3, Pg.No.18 Land use pattern of the Study area is tabulated in the Chapter No.2, Table no 2.3, Pg.No.17.
16	The PP shall carry out Drone video survey covering the cluster, green belt, fencing, etc..	Noted and agreed
17	The proponent shall furnish photographs of adequate fencing, green belt along the periphery including replantation of existing trees & safety distance between the adjacent quarries & water bodies nearby provided as per the approved mining plan.	The area has been fenced and plantation activities carried out within the project site.
18	The Project Proponent shall provide the details of mineral reserves and mineable reserves, planned production capacity, proposed working methodology with justifications, the anticipated impacts of the mining operations on the surrounding environment, and the remedial measures for the same.	The details of mineral reserves have been provided in Chapter No 1, Total Mineable Reserves ROM - 62,240 m ³ Granite Recovery – 6,224 m ³ Production for first five years MP period ROM - 15,335 m ³ Granite Recovery - 1,534 m ³ Peak production - 5,970 m ³ of ROM
19	The Project Proponent shall provide the Organization chart indicating the appointment of various statutory officials and other competent persons to be appointed as per the provisions of the Mines Act 1952 and the MMR, 1961 for carrying out the quarrying operations scientifically and systematically in order to ensure safety and to protect the environment.	Total Employment is 31 Nos inclusive of Competent persons. Mines Manager & Foreman Details are given in the Chapter No.2. Page No.28.
20	The Project Proponent shall conduct the hydro-geological study considering the contour map of	The hydro-geological study was conducted to evaluate the possible impact on the ground water

	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) alongwith 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.	table. No significant impacts are anticipated on the water bodies around the project area. Details are discussed under Chapter No. 3,
21	The proponent shall furnish the baseline data for the environmental and ecological parameters with regard to surface water/ground water quality, air quality, soil quality & flora/fauna including traffic vehicular movement study.	Baseline Data were collected for One Season (Winter) Dec 2025 – Feb 2026 as per CPCB Notification and MoEF & CC Guidelines. Details in Chapter No. 3
22	The Proponent shall carry out the Cumulative impact study due to mining operations carried out in the quarry specifically with reference to the specific environment in terms of soil health, biodiversity, air pollution, water pollution, climate change and flood control & health impacts- Accordingly, the Environment Management plan should be prepared keeping the concerned quarry and the surrounding habitations in the mind.	The Cumulative impact study due to mining operations is explained in chapter - 7
23	Rain water harvesting management with recharging details along with water balance (both) monsoon & non-monsoon) be submitted.	Noted and agreed
24	Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and Cother ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.	Land use and land cover of the study area is discussed in Chapter No. 3. Land use plan of the project area showing pre-operational, operational and post-operational phases are discussed in Chapter No. 2, Table No 2.3, Page No. 17.
25	Details of the land for storage of Overburden/Waste Dumps (or) Rejects outside the mine lease, such as extent of land area, distance from mine lease, its land use. R&R issues, if any. should be provided.	The details of Dump and disposal of Granite waste is discussed in the Chapter No.4 Page No. 96.
26	Proximity to Areas declared as 'Critically Polluted' (or) the Project areas which attracts the court restrictions for mining operations, should also be indicated and where so required. clearance certifications from the prescribed Authorities, such as the TNPCB (or) Dept of Geology and Mining should be secured and furnished to the effect that the proposed mining activities could be considered.	Not Applicable. Project area / Study area is not declared in 'Critically Polluted' Area and does not come under 'Aravalli Range.
27	Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.	Part of the working pit will be allowed to collect rain water during the spell of rain will be used for greenbelt development and dust suppression. The Mine Closure Plan is prepared for converting the excavated pit into rain water harvesting structure and serve as water reservoir for the project village during draught season.

28	Impact on local transport infrastructure due to the Project should be indicated.	Transportation details mentioned in Chapter -2
29	A tree survey study shall be carried out (nos., name of the species, age, diameter etc..) both within the mining lease applied area & 300m buffer zone and its management during mining activity.	Details of the trees in the buffer zone given in Chapter No.3.
30	A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific.	After the completion of mining operation, the part of the quarried-out land will be utilized as temporary storage reservoir. The details are given in the Chapter No.4
31	As a part of the study of flora and fauna around the vicinity of the proposed site, the EIA coordinator shall strive to educate the local students on the importance of preserving local flora and fauna by involving them in the study, wherever possible.	Noted and agreed
32	The purpose of green belt around the project is to capture the fugitive emissions, carbon sequestration and to attenuate the noise generated, in addition to improving the aesthetics. A wide range of indigenous plant species should be planted as given in the appendix-I in consultation with the DFO, & Tamil Nadu Agriculture University. The plant species with dense/moderate canopy of native origin should be chosen. Species of small/medium/tall trees alternating with shrubs should be planted in a mixed manner.	Noted & agreed. It is proposed to plant a 1400 nos of trees in the 7.5m safety barrier and village roads.
33	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.	It is an Fresh Lease. No trees within the project site. During the course of mining operation it is proposed to plant 1400 Nos of Trees in the safety barrier and Village roads.
34	A Disaster management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.	Disaster management Plan details in Chapter-7
35	A Risk Assessment and management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.	A Risk Assessment and management Plan Chapter- 7
36	Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.	Occupational Health impacts chapter- 10
37	Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.	No Public Health Implications anticipated due to this project. Details of CER are discussed under Chapter 8, Page No. 148-149.

38	The Socio-economic studies should be carried out within a 5 km buffer zone from the mining activity. Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.	It is explained in Chapter -3
39	Details of litigation pending against the project, if any, with direction /Order passed by any Court of Law against the Project should be given.	No, Litigation against the project
40	Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.	Noted and agreed
41	If any quarrying operations were carried out in the proposed quarrying site for which now the EC is sought, the Project Proponent shall furnish the detailed compliance to EC conditions given in the previous EC with the site photographs which shall duly be certified by MoEF&CC. Regional Office, Chennai (or) the concerned DEE/TNPCCB.	It is a Fresh lease
42	The PP shall prepare the EMP for the entire life of mine and also furnish the sworn affidavit stating to abide the EMP for the entire life of mine.	The EMP prepared for the life of the mine.
43	Concealing any factual information or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this Terms of Conditions besides attracting penal provisions in the Environment (Protection) Act, 1986.	Noted & agreed.
NORMAL CONDITIONS-Annexure-B		
<i>Cluster Management committee</i>		
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 formed with mutual agreement with the proponents including Existing and Proposed quarry at present are framed.
2	The members must coordinate among themselves for the effective implementation of EMP as committed including Green Belt Development, Water sprinkling, tree plantation, blasting etc..	As per the committee agreement proponents will co ordinate for the Greenbelt development, Water sprinkling and tree plantation activities combinedly.
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 formation of committee with list of members has been submitted to the AD mines office, Tiruvannamalai and the same will be update in every year
4	Detailed operational Plan must be submitted which must include the blasting frequency with respect to the nearby quarry situated in the cluster, the usage of haul roads by the individual quarry in the form of route map and network.	As per the committee agreement the blasting frequency will be discussed and carryout by the Mines Manager appointed by the proponents and the same will be updated in the committee minutes. Transport details in chapter-2
5	The committee shall deliberate on risk management plan pertaining to the cluster in a holistic manner especially during natural	Details discussed in chapter 7 of Draft EIA report

	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.	Details discussed in chapter 6 of Draft EIA report
7	The committee shall furnish action plan regarding the restoration strategy with respect to the individual quarry falling under the cluster in a holistic manner.	Noted & agreed
8	The committee shall furnish the Emergency Management plan within the cluster.	Details discussed in chapter 7.
9	The committee shall deliberate on the health of the workers/staff involved in the mining as well as the health of the public.	Details discussed in chapter 10.
10	The committee shall furnish an action plan to achieve sustainable development goals with reference to water, sanitation & safety.	Noted & agreed
11	The committee shall furnish the fire safety and evacuation plan in the case of fire accidents.	Detailed discussed in chapter 7.
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 & 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.	Details of Soil health is given in Chapter No 3 and biodiversity is given in Chapter No 3. The project will not cause any significant changes in the climate Climatic changes and GHG are described in Chapter No 4. Details of water contamination and impact on aquatic ecosystem is given in Chapter No 4. Hydrothermal/ Geothermal effects due to destruction in the environment, Bio geochemical process and sediment geo chemistry given in the Chapter No 7.
Agriculture & Agro-Biodiversity		
13	Impact on surrounding agricultural fields around the proposed mining Area.	Detailed discussed in chapter 4.
14	Impact on soil flora & vegetation around the project site.	Detailed discussed in chapter 4.
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 area is proposed Fresh Lease & Few Shrubs present with in lease.
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 in Chapter 3

17	Action should specifically suggest for sustainable management of the area and restoration of ecosystem for flow of goods and services.	Noted & agreed
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 dry barren land no agriculture activities carried out. This is proposed Fresh lease area.
Forest		
19	The project proponent shall detail study on impact of mining on Reserve forests free ranging wildlife.	Nearest Reserve Forest is Ponnaiyar R.F. – 90m – North
20	The Environmental Impact Assessment should study impact on forest, vegetation, endemic, vulnerable and endangered indigenous flora and fauna.	The area is surrounded by quarried land and Barren land. Details of flora and fauna studies given in the Chapter No.3.
21	The Environmental Impact Assessment should study impact on standing trees and the existing trees should be numbered and action suggested for protection.	No major trees within the project area
22	The Environmental Impact Assessment should study impact on protected areas, Reserve Forests, National Parks, Corridors and Wildlife pathways, near project site.	Noted & agreed. Cauvery South Wildlife Sanctuary – 86.5km – NW Cauvery North Wildlife Sanctuary – 91.5km – NW
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.	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.
24	Erosion Control measures.	Noted & agreed
25	Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area on the nearby villages, water-bodies/ Rivers. & any ecological fragile areas.	Details in Chapter 2
26	The project proponent shall study impact on fish habitats and the food WEB/ food chain in the water body and Reservoir.	Noted & agreed
27	The project proponent shall study and furnish the details on potential fragmentation impact on natural environment by the activities.	Noted & agreed
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.	No Archaeological site near the project area, no proposal for the disposal of mine pit water in the nearby water bodies
29	The Terms of Reference should specifically study impact on soil health, soil erosion, the soil, physical, chemical components and microbial components.	Details in Chapter 3 Soil environment.
30	The Environmental Impact Assessment should study on wetlands, water bodies, rivers, streams,	Discussed in the Draft EIA/EMP Report in Chapter No.3

	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.	It is explained in Chapter 4
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.	Discussed in the Draft EIA/EMP Report in Chapter No.3.
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 mine closure plan
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.	Detailed under 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.	Project Cost = Rs 3,30,69,000/- CER Cost = Rs 5,00,000/ Disaster Management plan & mine closure plan is discussed in chapter no.4 & 7
Risk Assessment		
37	To furnish risk assessment and management plan including anticipated vulnerabilities during operational and post operational phases of Mining.	Detailed under Chapter 7
Disaster Management Plan		
38	To furnish disaster management plan and disaster mitigation measures in regard to all aspects to avoid/reduce vulnerability to hazards & to cope with disaster/unfavorable accidents in & around the proposed mine lease area due to the proposed method of mining activity & its related activities covering the entire mine lease period as per precise area communication order issued.	Details in Study 7.3 Disaster Management Plan 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.	VAO certificate is attached as Annexure
40	As per the MoEF& CC office memorandum F.No.22-65/2017-1A.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 carbon emission and mitigation activities are given in the Chapter No.4

STANDARD TERMS OF REFERENCE		
1	Year-wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification 1994 came into force, w.r.t. the highest production achieved prior to 1994.	Not applicable. This is Not a violation category project. This proposal falls under B1 Category (Cluster Condition).
2	A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given.	The applied land for quarrying is a Government Land. Document is enclosed along with Approved Mining Plan as Annexure 1.
3	All documents including approved mine plan, EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee.	Noted & agreed.
4	All corner coordinates of the mine lease area, superimposed on a High-Resolution Imagery/toposheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).	Map showing – Project area is superimposed on Satellite imagery is enclosed in Figure No. 2.1 Project area boundary coordinates superimposed on Toposheet – Figure No. 1.3 Surface Features around the project area covering 10km radius – Figure No. 2.2 Geology map of the project area covering 10km radius - Figure No. 2.7. Geomorphology Map of the Study Area covering 10 km radius – Figure No. 2.8.
5	Information should be provided in Survey of India Toposheet in 1:50,000 scale indicating geological map of the area, geomorphology of land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics.	Map showing – chapter-2 Geology map of the project area covering 10km radius Geomorphology Map of the Study Area covering 10 km radius
6	Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority.	The applied area was inspected by the officers of Department of Geology along with revenue officials and found that the land is fit for quarrying under the policy of State Government.
7	It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of	The proponent has framed their Environmental Policy and the same is discussed in the Chapter No 10.1.

	Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating process/procedures to bring into focus any infringement/deviation/ violation of the environmental or forest norms/conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large, may also be detailed in the EIA Report.	
8	Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided.	It is an opencast quarrying operation proposed to operate in Mechanized method. The Granite formation is a hard, compact and homogeneous body. The height and width of the bench will be maintained as 5m with 90° bench angles. Quarrying activities will be carried out under the supervision of Competent Persons like Mines Manager, Mines Foreman and Mining Mate. Necessary permissions will be obtained from DGMS after obtaining Environmental Clearance.
9	The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc., should be for the life of the mine / lease period.	Noted & agreed. The study area considered for this study is 10 km radius and all data contained in the EIA report such as waste generation etc., is for the Life of the Mine / lease period.
10	Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.	Land use and land cover of the study area is discussed in Chapter No. 3. Land use plan of the project area showing pre-operational, operational and post-operational phases are discussed in Chapter No. 2, Table No 2.3.
11	Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given.	Not Applicable. There is no waste anticipated during this quarry operation. The entire quarried out Granite will be transported to the needy customers. No Dumps is proposed outside the lease area.
12	Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be	Not Applicable. There is no Forest Land involved in the proposed project area. The proposed project area is a Government land. Ponnaiyar R.F. – 90m – North from the Study Area.

	desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.	
13	Status of forestry clearance for the broken-up area and virgin forestland involved in the Project including deposition of Net Present Value (NPV) and compensatory afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.	Not Applicable. Ponnaiyar R.F. – 90m – North from the Study Area.
14	Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.	Not Applicable. The project doesn't attract Recognition of Forest Rights Act, 2006.
15	The vegetation in the RF / PF areas in the study area, with necessary details, should be given.	Ponnaiyar R.F. – 90m – North from the Study Area.
16	A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly, detailed mitigative measures required, should be worked out with cost implications and submitted.	Not Applicable.
17	Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves/(existing as well as proposed), if any, within 10 KM of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished.	Not Applicable. There are No National Parks, Biosphere Reserves, Wildlife Corridors, and Tiger/Elephant Reserves within 10 km Radius from the periphery of the project area. Cauvery South Wildlife Sanctuary – 86.5km – NW
18	A detailed biological study of the study area [core zone and buffer zone (10 KM radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled-I fauna found in the study area, the necessary plan along with budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost.	Detailed biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] was carried out and discussed under Chapter No. 3. There is no schedule I species of animals observed within study area as per Wildlife Protection Act 1972 as well as no species is in vulnerable, endangered or threatened category as per IUCN. There is no endangered red list species found in the study area.
19	Proximity to Areas declared as 'Critically Polluted' or the Project areas likely to come under the 'Aravalli Range', (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities,	Not Applicable. Project area / Study area is not declared in 'Critically Polluted' Area and does not come under 'Aravalli Range'.

	such as the SPCB or State Mining Department should be secured and furnished to the effect that the proposed mining activities could be considered.	
20	Similarly, for coastal Projects, A CRZ map duly authenticated by one of the authorized agencies demarcating LTL, HTL, CRZ area, location of the mine lease w.r.t CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority).	Not Applicable. The project doesn't attract The C. R. Z. Notification, 2018.
21	R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need-based sample survey, family-wise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be clearly brought out whether the village(s) located in the mine lease area will be shifted or not. The issues relating to shifting of village(s) including their R&R and socio-economic aspects should be discussed in the Report.	Not Applicable. There are no approved habitations 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.
22	One season (non-monsoon) [i.e. March-May (Summer Season); October-December (post monsoon season) ; December-February (winter season)]primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM10, particularly for free silica, should be given.	Baseline Data were collected for One Season Winter) Dec 2025 – Feb 2026 as per CPCB Notification and MoEF & CC Guidelines. Details in Chapter No. 3.
23	Air quality modelling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of mineral. The details of the model used and input parameters used for modelling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site,	Air Quality Modelling for prediction of incremental GLC's of pollutant was carried out using AERMOD view. Details in Chapter No. 4.

	location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.	
24	The water requirement for the Project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the Project should be indicated.	Total Water Requirement: 9.0 KLD Discussed under Chapter 2, Table No 2.15 .
25	Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.	Not Applicable. Water for dust suppression, greenbelt development and domestic use will be sourced from accumulated rainwater/seepage water in mine pits and purchased from local water vendors through water tankers on daily requirement basis. Drinking water will be sourced from the approved water vendors.
26	Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.	Part of the working pit will be allowed to collect rain water during the spell of rain will be used for greenbelt development and dust suppression. The Mine Closure Plan is prepared for converting the excavated pit into rain water harvesting structure and serve as water reservoir for the project village during draught season.
27	Impact of the Project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided.	Impact Studies and Mitigation Measures of Water Environment including Surface Water and Ground Water are discussed in Chapter 4.
28	Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. The Report inter-alia, shall include details of the aquifers present and impact of mining activities on these aquifers. Necessary permission from Central Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished.	Not Applicable. The ground water table The Ground water depth occurrence in this area is 104 - 109 m below ground level. The ultimate depth of quarry is 43m agl. This proposal of 109m below ground level will not intersect the ground water table, which is inferred from the hydro-geological carried out at the project site. Discussed under Chapter 3.
29	Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion proposed, if any, and the impact of the same on the hydrology should be brought out	Odai - 270m West Tank - 470m NW Pamban Stream -790m SE Tank - 1.8km East Thenpennai River - 4.6km NW Sathanur Reservoir - 9km NW
30	Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and Bgl. A schematic diagram may also be provided for the same.	Highest elevation of the project area is 131 m AMSL. Ultimate depth of the mine is 20m BGL Water level of the area is 250 - 255 m BGL
31	A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and	Greenbelt Development Plan is discussed under Chapter 4, Page No.123.

	submitted, keeping in mind, the same will have to be executed up front on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution.	
32	Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those outside the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as State Government) should be covered. Project Proponent shall conduct Impact of Transportation study as per Indian Road Congress Guidelines.	Traffic density survey was carried out to analyse the impact of Transportation in the study area as per IRC guidelines 1961 and it is inferred that there is no significant impact due to the proposed transportation from the project area. Details in Chapter 2
33	Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.	Infrastructure & other facilities will be provided to the Mine Workers after the grant of quarry lease and the same has been discussed in the Chapter No.2 Page No.32.
34	Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report.	Discussed under Chapter 2. Mine Closure Plan is a part of scheme of Mining Plan enclosed as Annexure Volume – 1.
35	Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.	Occupational Health Impacts of the project and preventive measures are detailed under Chapter 4,
36	Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.	No Public Health Implications anticipated due to this project. Details of CER are discussed under Chapter 8,
37	Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.	No Negative Impact on Socio Economic Environment on the Study Area is anticipated and this project shall benefit the Socio-Economic Environment by ways of employment for 31 people directly and 100 people indirectly. Details in Chapter 3 and Benefits of chapter-8

38	Detailed environmental management plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project.	Detailed Environment Management Plan for the project to mitigate the anticipated impacts described under Chapter 4 is discussed under Chapter 10, Page No. 151 – 156.
39	Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project.	The outcome of public hearing will be updated in the final EIA/AMP report.
40	Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.	No litigation is pending in any court against this project.
41	The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.	Project Cost is Rs. 6,16,62,873/- CER Cost is Rs 5,00,000/-
42	A Disaster management Plan shall be prepared and included in the EIA/EMP Report.	Details in Chapter 7.
43	Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.	Details in Chapter 8.
44	Besides the above, the below mentioned general points are also to be followed: -	
a	Executive Summary of the EIA/EMP Report	Enclosed as separate booklet.
b	All documents to be properly referenced with index and continuous page numbering.	All the documents are properly referenced with index and continuous page numbering.
c	Where data are presented in the Report especially in Tables, the period in which the data were collected and the sources should be indicated.	List of Tables and source of the data collected are indicated.
d	Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF & CC/NABL accredited laboratories. All the original analysis/testing reports should be available during appraisal of the Project	Baseline monitoring reports are enclosed with This report in Chapter 3. Original Baseline monitoring reports will be submitted in the final EIA report during appraisal.
e	Where the documents provided are in a language other than English, an English translation should be provided.	Not Applicable.
f	The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted.	Will be enclosed along with Final EIA /EMP Report.

g	While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF&CC vide O.M. No. J-11013/41/2006-IA. II(I) Dated: 4th August, 2009, which are available on the website of this Ministry, should be followed.	Noted & agreed. Instructions issued by MoEF & CC O.M. No. J-11013/41/2006-IA. II (I) Dated: 4th August, 2009 are followed.
h	Changes, if any made in the basic scope and project parameters (as submitted in Form-I and the PFR for securing the TOR) should be brought to the attention of MoEF&CC with reasons for such changes and permission should be sought, as the TOR may also have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH again with the revised documentation	Noted & agreed.
i	As per the circular no. J-11011/618/2010-IA. II(I) Dated: 30.5.2012, certified report of the status of compliance of the conditions stipulated in the environment clearance for the existing operations of the project, should be obtained from the Regional Office of Ministry of Environment, Forest and Climate Change, as may be applicable.	Not Applicable.
j	The EIA report should also include (i) surface plan of the area indicating contours of main topographic features, drainage and mining area, (ii) geological maps and sections and (iii) sections of the mine pit and external dumps, if any, clearly showing the land features of the adjoining area.	Detailed Chapter-2 Lease plan & Geological plan and Year wise production plan

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CHAPTER – 1: INTRODUCTION

1.0 Preamble

The project proponent M/s.A.G.Granites Pvt Ltd Black Granite Quarry Extent 3.21.5 Ha in S.F.No 65(Part-2), Kilpachar Village, Thandrapattu Taluk, Tiruvannamalai District, Tamil Nadu State.

- Proponent applied for Black Granite Quarry on 23.09.2025
- The Mining plan was prepared for the period of 5 Years. The Mining Plan was approved by the State Geology and Mining Department, Guindy, Chennai vide letter Rc.No. 11441/MM4/2025, Dated.01.01.2026
- The Mining plan has been approved for the quantity of 15,335 m³ of ROM (Granite Recovery @ 10% is 1,534 m³) 8,580 m³ of Weathered Rock and 4,290 m³ of Topsoil up to the depth of 20m(5m AGL + 15m BGL).

As per the EIA Notification, 2006 and subsequent amendments and OM The proposal falls in the B1 Category (cluster quarries - 1 applied proposal quarry and 1 Existing quarries forming Cluster Category {Total Extent of the Cluster is 7.36.50 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/5641542026 Dated 07.01.2026 and the ToR Was Granted vide File.No.13259, ToR Identification No.TO26B0108TN5258198N Dated.05.03.2026

Based on the ToR Baseline Monitoring study has been carried out for one season i.e., **December 2025 – February 2026** 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. 3977 (E) of 14th August 2018, Mining Projects are classified under two categories i.e., A (> 100 Ha) and B ($\leq$ 100 Ha), and Schematic Presentation of Requirements on Environmental Clearance of Minor Minerals including cluster situation in Appendix–XI.

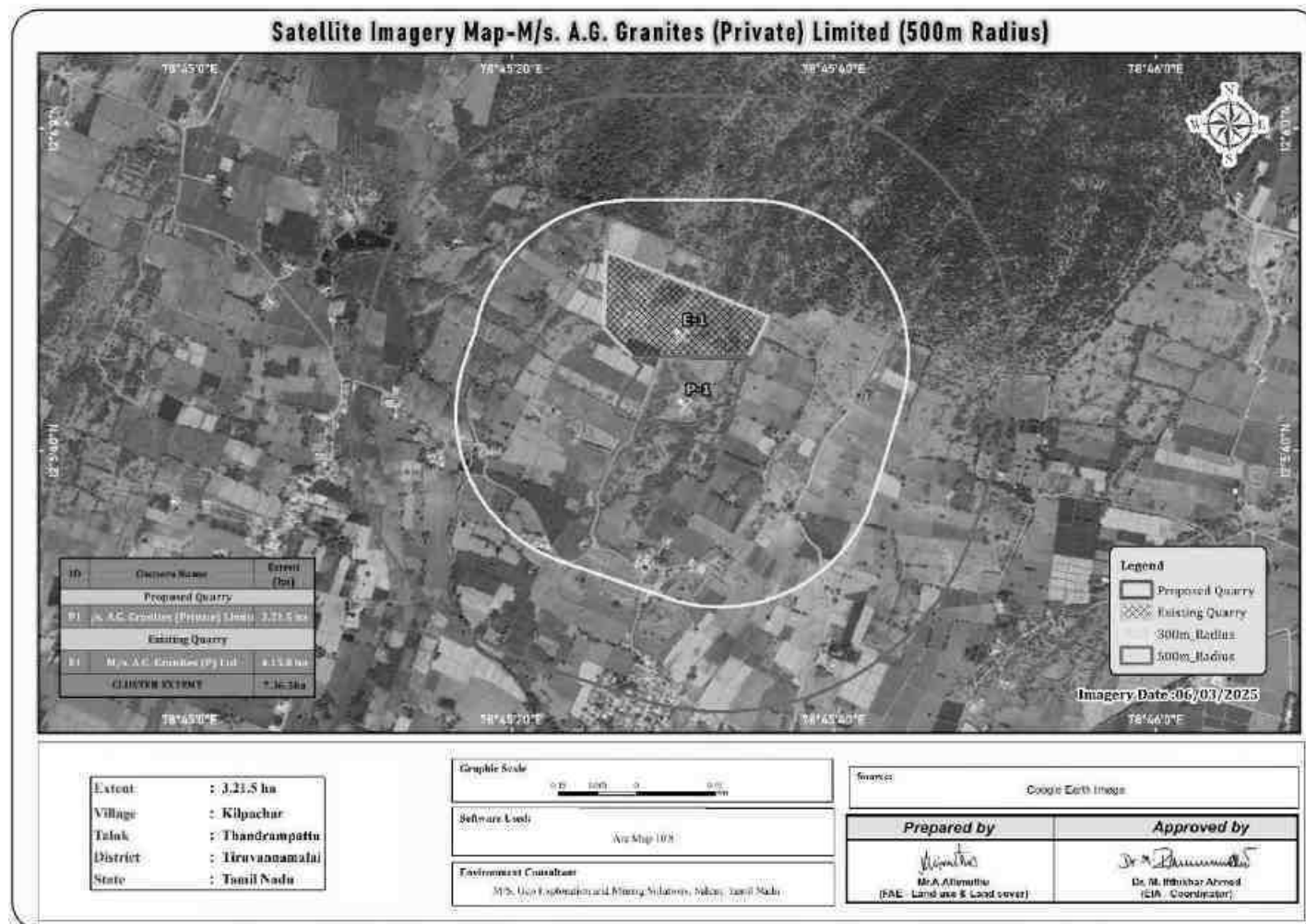
Now, as per Order Dated: 04.09.2018 & 13.09.2018 passed by Hon'ble National Green Tribunal, New Delhi in O.A. No. 173 of 2018 & O.A. No, 186 of 2016 and MoEF & CC Office Memorandum F. No. L-11011/175/2018-IA-II (M) Dated: 12.12.2018 clarified the requirement for EIA, EMP and therefore, Public Consultation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

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

Application to The Member Secretary of the Tamil Nadu Pollution Control Board (TNPCB) to conduct Public Hearing in a systematic, time bound and transparent manner ensuring widest possible public participation at the project site or in its close proximity in the district was submitted vide Ref: Nil.

“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”

Figure1.0: Cluster Quarries Map (500m Radius)



1.2 Identification of Project and Project Proponent**1.2.2 Identification of Project Proponent****TABLE 1.3: DETAILS OF PROJECT PROPONENT**

PROPOSAL	
Name of the Project Proponent	M/s.A.G.Granites Pvt Ltd – Tmt. R.Shanthi - Director
Address	Muthu Gounder Colony, Harur, Dharmapuri District
Mobile	+91 9894455389
EMail	-
Aadhar No	5795 4210 3091
Status	Government Land

Source: Approved Mining Plan of the respective projects

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 Hydraulic Excavator, Eco-friendly Diamond Wire Saw Cutting and minor amount of blasting only for removal of overburden and weathered portions.

On the basis of available reserves the life of the mine is computed and approved as 20 Years.

Proposed production for the Mining Plan Period (5 years) is described below–

Proposed Project

Total Mineable Recoverable Reserves of Granite @ 10%	=	6,224 m ³
Average Production per year @ 10%	=	1,534 m ³ /5 Years = 306 m ³
Estimated Life of the quarry	=	6224 m ³ / 306 m ³
Life of the quarry	=	20 Years

Table 1.4: Resources and Reserves of Project

Description	ROM in m³	Granite recovery @10 % in m³	Granite waste @90% in m³	Weathered Rock in m³	Side Burden in m³	Top Soil in m³	Depth (m)
Geological Resources	81,040	8,104	72,936	54,252	3,07,480	27,126	20
Mineable Reserves	62,240	6,224	56,016	16,380	18,060	8,190	20
Year wise Production for Five years	15,335	1,534	13,801	8,580	12,625	4,290	20

Source: Approved First Scheme of mining plan.

Table 1.5: Salient Features of the Proposed Projects

Name of the Quarry	M/s.A.G.Granites (Private) Limited Black Granite quarry
SF.no	65 (Part-2),
Extent	3.21.5 Ha
Village & Taluk	Kilpachar Village, Thandrapattu Taluk
Lease period	20 years
Life of the Mine	20 years
Land use classification	It is a Government Land, Classified as Kallankuthu and the entire land is covered by Granite boulders and sheet rock.
Proposed Depth for five years plan period	20m(5m AGL + 15m BGL)
Ultimate depth of Mining	20m(5m AGL + 15m BGL)
Ultimate Pit Dimension	117m (L) X 80m (W) X 20m (D)
Toposheet No	57 L/16
Latitude between	12°05'40.09"N to 12°05'45.76"N

Longitude between		78°45'26.42"E to 78°45'34.71"E
Topography		The area is Exhibits Undulated terrain. The gradient is gentle towards South west side and altitude of the area is 250 - 255m above from MSL. The area is concealed under reddish gravelly soil having an average thickness of 1m, 2m weathered rock and followed by fresh black granite..
Ground water level		The water level is found to occur at a depth of 104 m - 109m in rainy season below from the ground level.
Machinery proposed	Mine Manager	1
	Geologist	1
	Mine Foreman	1
	Blaster/Mate	1
	Excavator - Operator	1
	Wire Saw Operator	1
	Tipper Driver	2
	Water Sprinkler Driver	1
	Jack Hammer Drillers	12
	Security	1
	Helper	4
	Co-Operator & Cleaner	5
Proposed manpower deployment		31
Project cost		Rs.6,01,57,873/-
EMP Cost		Rs. 15,05,000/-
Total Project Cost		Rs. 6,16,62,873/-
CER cost		Rs. 5,00,000/-
Nearby Water Bodies		• Odai 270m West • Tank 470m NW • Pamban Stream 790m SE • Tank 1.8km East • Thenpennai River 4.6km NW • Sathanur Reservoir 9km NW
Nearest Habitation		420m-S
Nearest Reserve Forest		Ponnaiyar R.F. – 90m – North
Nearest Wild Life Sanctuary		Cauvery South Wildlife Sanctuary – 86.5km – NW Cauvery North Wildlife Sanctuary – 91.5km – NW

Source: Approved First scheme of mining plan.

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 Granite is 5,970 m³ maximum in a year (20m³ per day/ 2 Tippers per day considering 12m³ per load). The depth of the mining is 20m.

1.3.2 Location of the Project

- The area is located in *S.F.Nos. 65 (Part-2), of Kilpachar Village, Thandarampattu Taluk, Tiruvannamalai District,, Tamilnadu.*
- The entire quarry lease area falls in the Government land, the area is situated in almost Undulated terrain.
- The Altitude of the area is ranges from **250 - 255m above from MSL**
- The area is mentioned in GSI Topo sheet No. **57 L/16**
- The Latitude between of **12°05'40.09"N to 12°05'45.76"N**
- The Longitude between of **78°45'26.42"E to 78°45'34.71"E** on WGS 1984 datum.

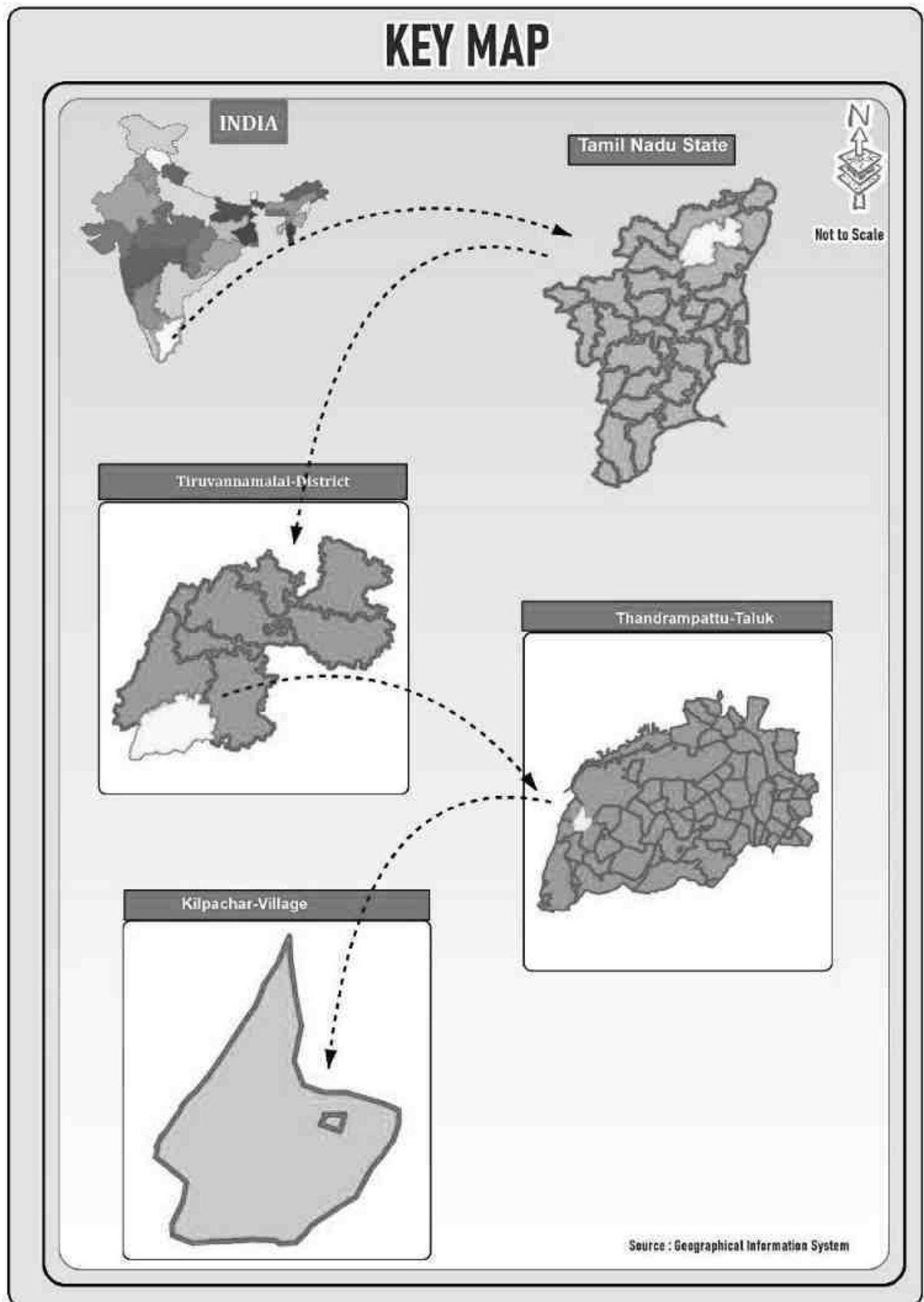
Figure 1.1: Key Map Showing the Location of the Project Site

Figure 1.2: Toposheet Map of the Study Area 10 Km Radius

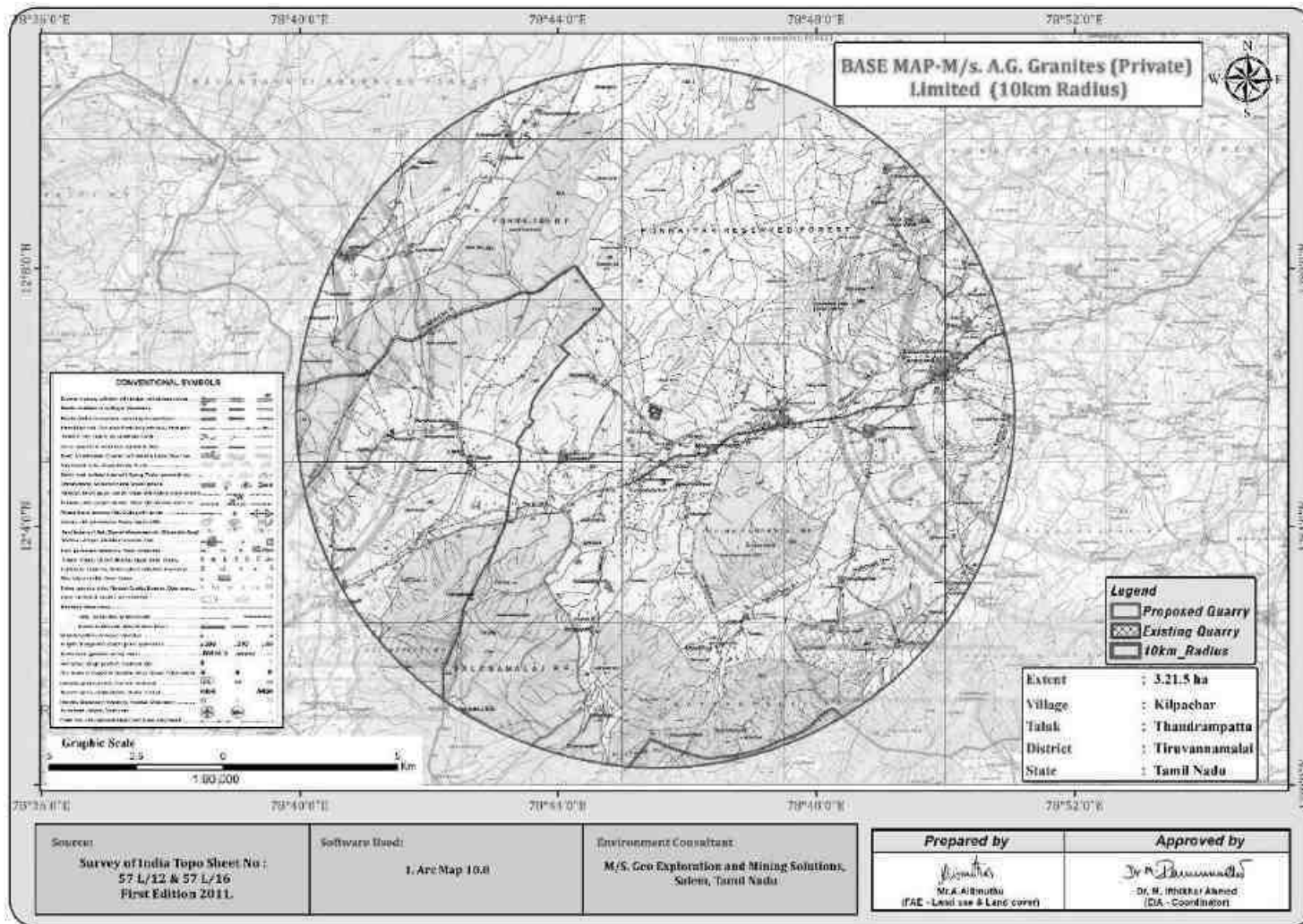
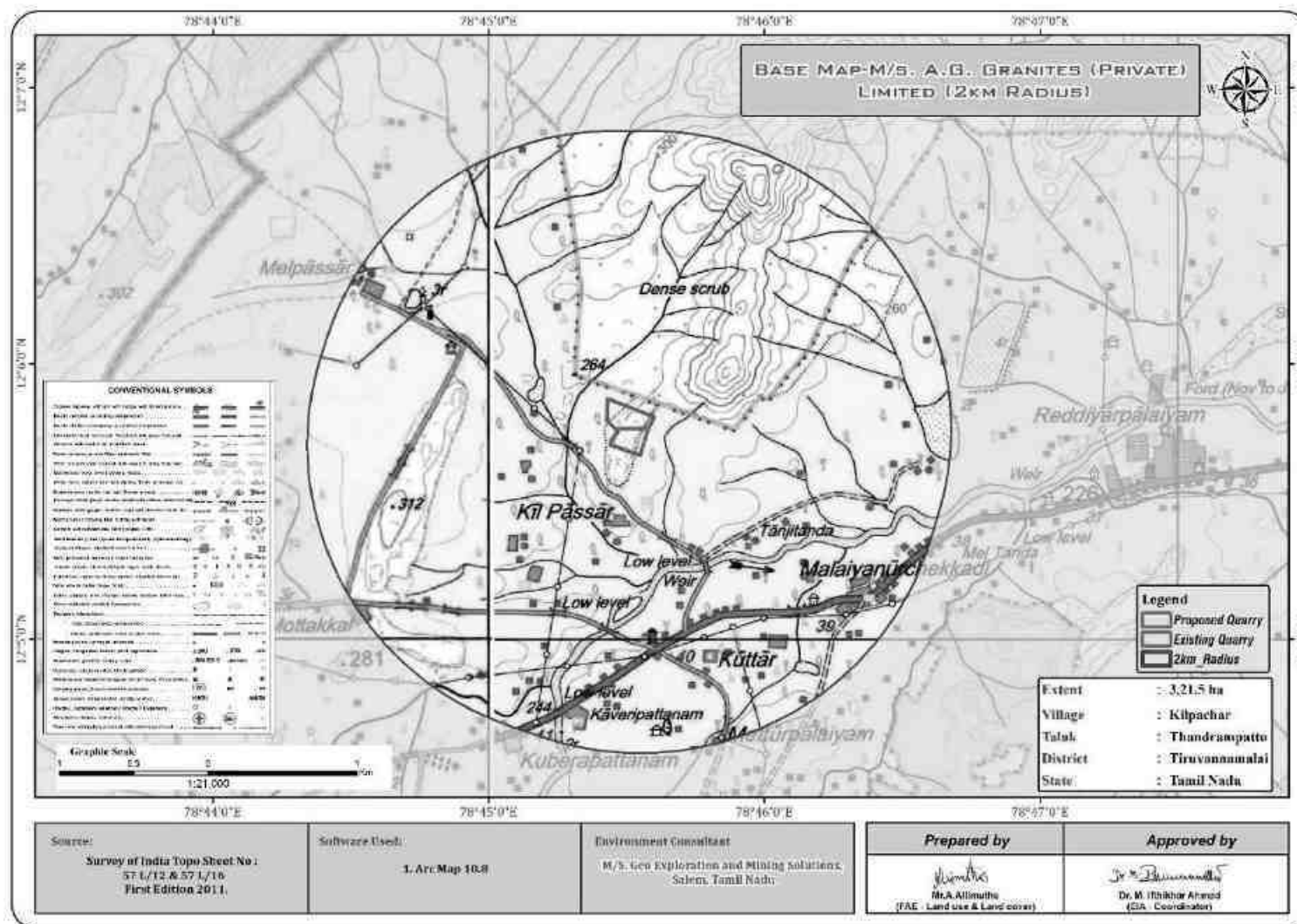


Figure 1.3: Toposheet Map of the Study Area 2 Km Radius



1.4 Environmental Clearance

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

1. Screening,
2. Scoping
3. Public consultation &
4. Appraisal

SCREENING

- ☞ Proponent applied for Black Granite Quarry on 23.09.2025.
- ☞ Precise area communication letter has been obtained from State Geology and Mining Department, Guindy, Chennai vide Lettre .No. 1920/MMB-1/2025-1 Dated.17.12.2025
- ☞ The Mining plan was prepared for the period of 5 Years. The Mining Plan was approved by the State Geology and Mining Department, Guindy, Chennai vide letter Letter Rc.No. 11441/MM4/2025, Dated.01.01.2026. The Mining plan period is for Five Years
- ☞ Proponent applied for ToR to get Environmental Clearance vide online Proposal No. SIA/TN/MIN/564154/2026 Dated 07.01.2026

SCOPING

- The proposal was placed in 675th SEAC meeting held on 04.02.2026 and the committee recommended for issue of ToR.
- The proposal was considered in 970th SEIAA meeting held on 26.02.2026 and issued ToR vide

File.No.13259, Tor Identification.No. TO26B0108TN5258198N

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.

The report has been prepared using the following references:

- Guidance Manual of Environmental Impact Assessment for Mining of Minerals, Ministry of Environment and Forests, February, 2010
- EIA Notification, 14th September, 2006
- ToR vide File.No.13259, Tor Identification.No. TO26B0108TN5258198N Dated.05.03.2026.
- In addition, other relevant standards for individual activities such as Sampling and Testing of Environmental attributes have been followed

1.5 Post Environment Clearance Monitoring

The proposed project 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.

1.6 Generic Structure of EIA Document

The overall contents of the EIA report follow the list of contents prescribed in the EIA Notification 2006 and the “Environmental Impact Assessment Guidance Manual for Mining of Minerals” published by MoEF & CC. A brief description of each Chapter is presented in Table No. 1.8.

TABLE 1.6 – STRUCTURE OF THE EIA REPORT

S. No	Chapters	Title	Particulars
1	Chapter 1	Introduction	Presents, an Introduction along with Scope and Objective of this EIA/EMP Studies
2	Chapter 2	Project Description	Presents the Technical Details of the Project
3	Chapter 3	Description of Environment	Presents the Baseline Status for various Environmental Parameters in the Study Area for One Season (3 Months)

4	Chapter 4	Anticipated Environmental Impacts and Mitigation Measures	Presents the Identification, Prediction and Evaluation of overall Environmental Impacts due to the Proposed Projects Activities. Also presents Proposed Mitigation Measures.
5	Chapter 5	Analysis of Alternatives (Technology & Site)	Presents Analysis of alternatives with respect to site
6	Chapter 6	Environment Monitoring Programme	Present details of post project environment monitoring
7	Chapter 7	Additional Studies	Presents Public Consultation, Risk Assessment and Disaster Management Plan
8	Chapter 8	Project Benefits	Presents project benefits as: Improvements in the Physical Infrastructure, Social Infrastructure Employment Potential –Skilled; Semi-Skilled and Unskilled etc.,
9	Chapter 9	Cost Benefit Analysis	Environmental Cost Benefit Analysis has not been recommended at Scoping Stage – thus no analysis carried out separately in this EIA/EMP Report.
10	Chapter 10	Environmental Management Plan	Description of the administrative aspects to ensure the Mitigation Measures are implemented and their effectiveness monitored, after approval of the project.
11	Chapter 11	Summary & Conclusion	Summary of the EIA Report
12	Chapter 12	Disclosure of Consultants Engaged	Disclosure of the Consultants

1.7 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 for each individual lease. A detailed account of the emission sources, emissions control equipment, background Air quality levels, Meteorological measurements, Dispersion model and all other aspects of pollution like effluent discharge, Dust generation etc., have been discussed in this report. The baseline monitoring study has been carried out during the Summer season December 2025 – February 2026 for various environmental components so as to assess the anticipated impacts of the cluster quarry projects on the environment and suggest suitable mitigation measures for likely adverse impacts due to the proposed project.

TABLE 1.7 – ENVIRONMENT ATTRIBUTES

Sl.No.	Attributes	Parameters	Source and Frequency
1	Ambient Air Quality	PM ₁₀ , PM _{2.5} , SO ₂ , NO ₂	24 hourly samples twice a week for three months at 7 locations
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, Tiruvannamalai
3	Water quality	Physical, Chemical and Bacteriological parameters	Grab samples were collected at 4 ground water and 2 surface water locations 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)	At 7 locations data monitored once for 24 hours during EIA study.
6	Soil Characteristics	Physical and Chemical Parameters	Once at 6 locations during study period
7	Land use	Existing land use for different categories	Based on Survey of India topographical sheet and satellite imagery and primary survey.
8	Socio-Economic Aspects	Socio-economic and demographic characteristics, worker characteristics	Based on primary survey and secondary sources data like census of India 2011.
9	Hydrology	Drainage pattern of the area, nature of streams, aquifer characteristics, recharge and discharge areas	Based on data collected from secondary sources as well as hydro-geology study report prepared.
10	Risk assessment and Disaster Management Plan	Identify areas where disaster can occur by fires and explosions and release of toxic substances	Based on the findings of Risk assessment done for the mining associated activities

Source: Field Monitoring Data

The data has been collected as per the requirement of the ToR issued by SEIAA – TN and Standard ToR

Published by MoEF & CC.

1.7.1 Regulatory Compliance & Applicable Laws/Regulations

- 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 of Black granite quarry has been approved under Rule 41 & 42 as amended of Tamil Nadu Minor Mineral Concession Rules, 1959
- ToR vide File.No.13259, Tor Identification.No. TO26B0108TN5258198N Dated.05.03.2026.

2. PROJECT DESCRIPTION

2.0 General

Applied Proposed Quarry in Kilpachar Village, Thandrapattu Taluk, Tiruvannamalai District and Tamil Nadu State falls under Cluster Situation as per MoEF & CC Notification S.O. 2269(E) Dated 1st July 2016 and the total extent of cluster is 7.36.50 ha consisting of three quarries. As the extent of cluster is 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 located in Kilpachar Village, Thandrapattu Taluk, Tiruvannamalai District and Tamil Nadu State. The proposed projects are site specific and there is no additional area required for this project. There is no effluent generation/discharge from the proposed quarry.

Black Colour granite quarry operation will be carried out by opencast mechanized method involving Eco-friendly Diamond Wire Saw Cutting, Heavy earth moving machineries like Excavators Trucks for Granite exploitation. Shot hole drilling with controlled blasting using slurry explosives for removal of overburden and Weathered portions during initial stage of quarry operation.

2.2 Location of the Project

- The area is located in ***S.F.Nos. 65 (Part-2), of Kilpachar Village, Thandrapattu Taluk, Tiruvannamalai District, Tamil Nadu State.***
- The entire quarry lease area falls in the Patta land, the area is situated in almost plain terrain.
- The Altitude of the area is ranges from **131m above from MSL**
- The area is mentioned in GSI Topo sheet No. **58-J/ 01**
- The Latitude between of **12°05'40.09"N to 12°05'45.76"N**
- The Longitude between of **78°45'26.42"E to 78°45'34.71"E** on WGS 1984 datum.

Table 2.1: Site Connectivity to the Project Area

Nearest Roadway	NH179B- Tiruvannamalai – Harur - 19.5km - NW SH6A - Thandrapattu – Harur – 1.3km - South
Nearest Village	420m-South
Nearest Town	Thanipadi -4.0km – NE
Nearest Railway Station & Railway Line	Tiruvannamalai Railway Station- 38.2km – NE
Nearest Airport	Banagalore Airport- 160 km-NW
Seaport	Chennai -200km-NE
Interstate Boundary	66 km – NW – Andhra Pradesh boundary

Source: Survey of India Toposheet

Table 2.2: Boundary Co-Ordinates of Proposed Project

Boundary Pillar No.	Latitude	Longitude
1	12°05'45.76" N	78°45'34.71" E
2	12°05'41.03" N	78°45'33.29" E
3	12°05'40.09" N	78°45'32.96" E
4	12°05'42.28" N	78°45'26.42" E
5	12°05'43.29" N	78°45'26.76" E
6	12°05'45.17" N	78°45'28.06" E
7	12°05'45.77" N	78°45'27.50" E

Figure 2.1: Photographs of the Project Area

Figure 2.2: FENCING AND PLANTATION PHOTOGRAPHS

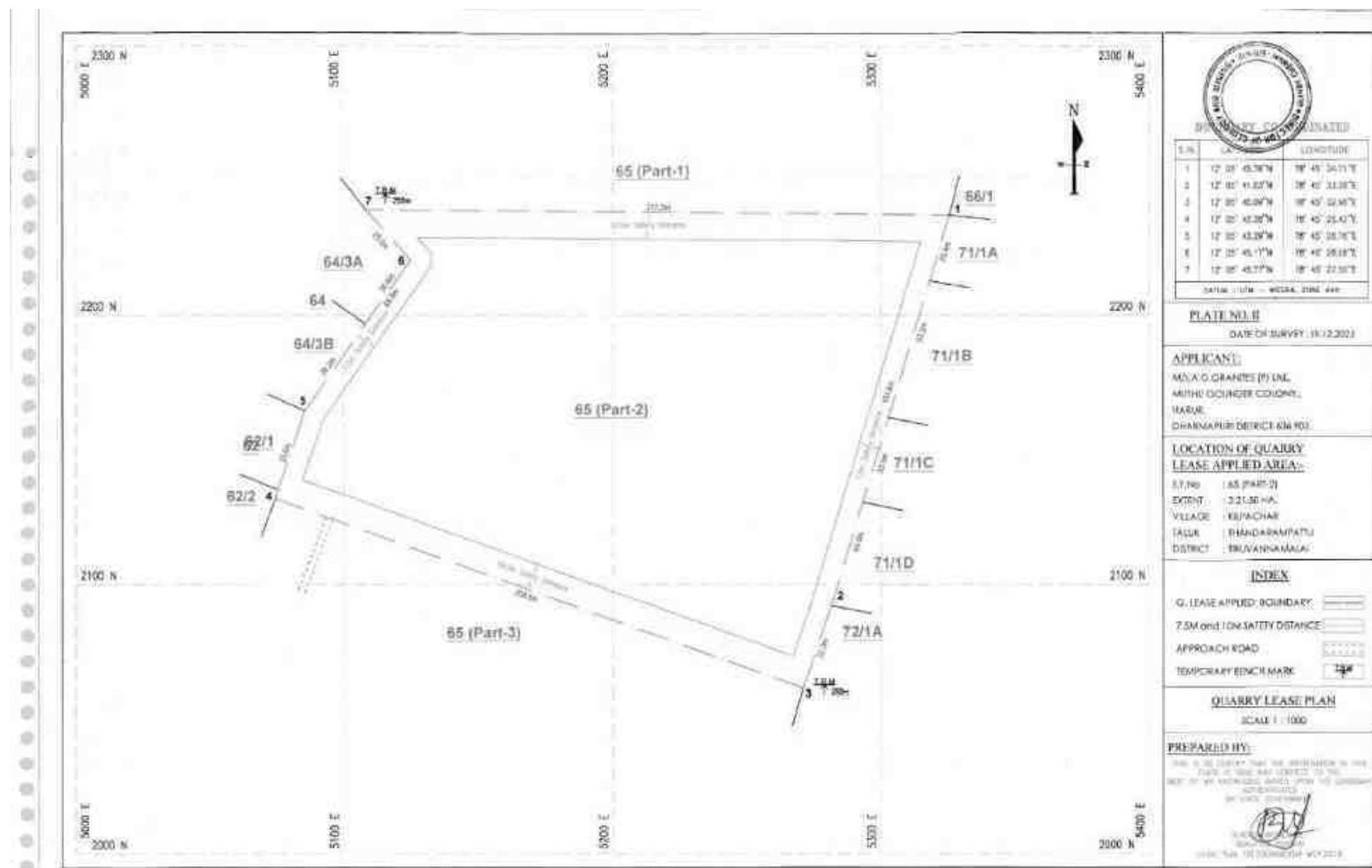






Figure 2.3: Google Image Showing Project Area

Figure 2.4: Quarry Lease Plan



Source: Approved mining plan.

Figure 2.5: Image Showing Surface Features Around 10 Km Radius

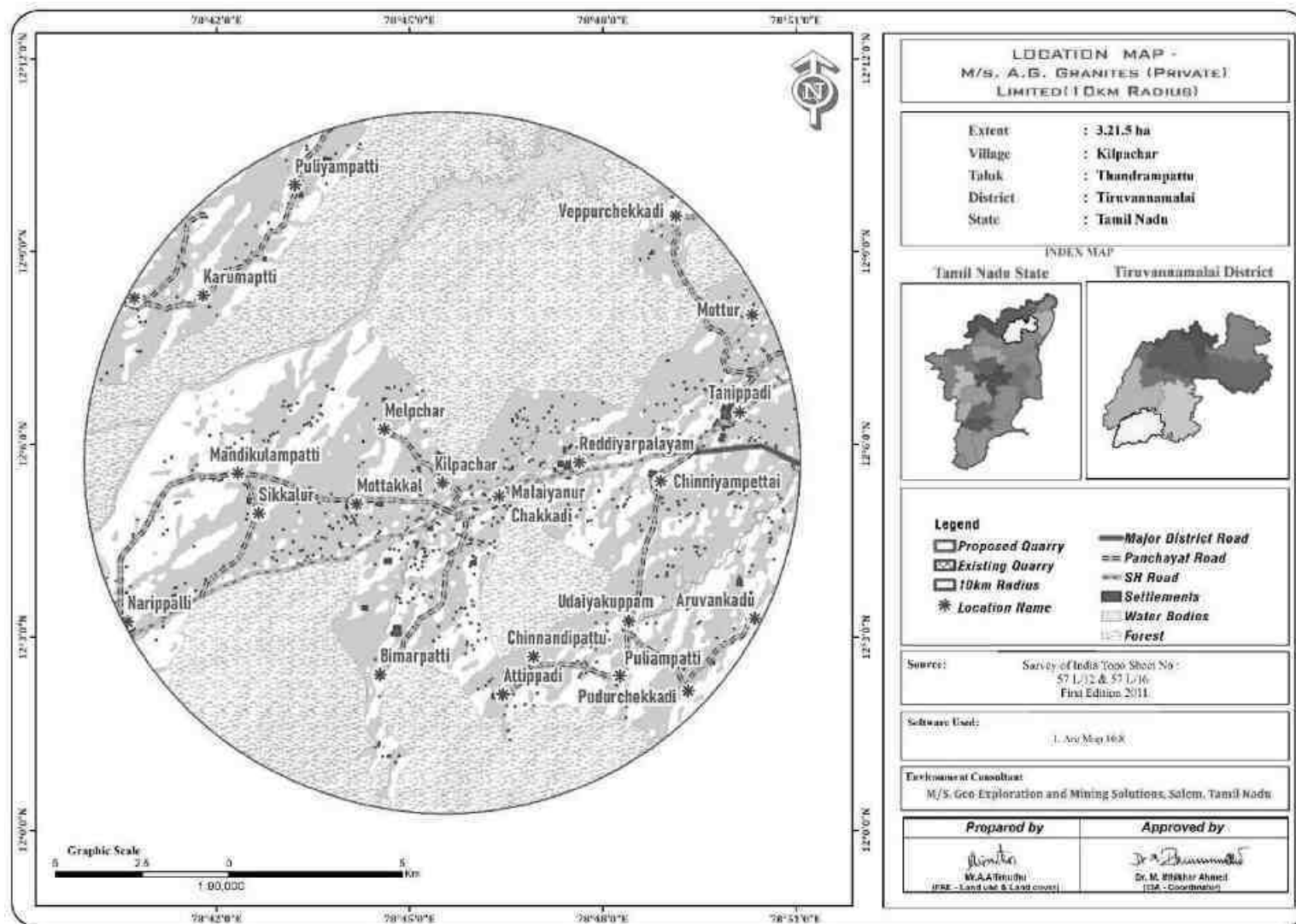


Figure 2.6: Image Showing Surface Features Around 5km Radius

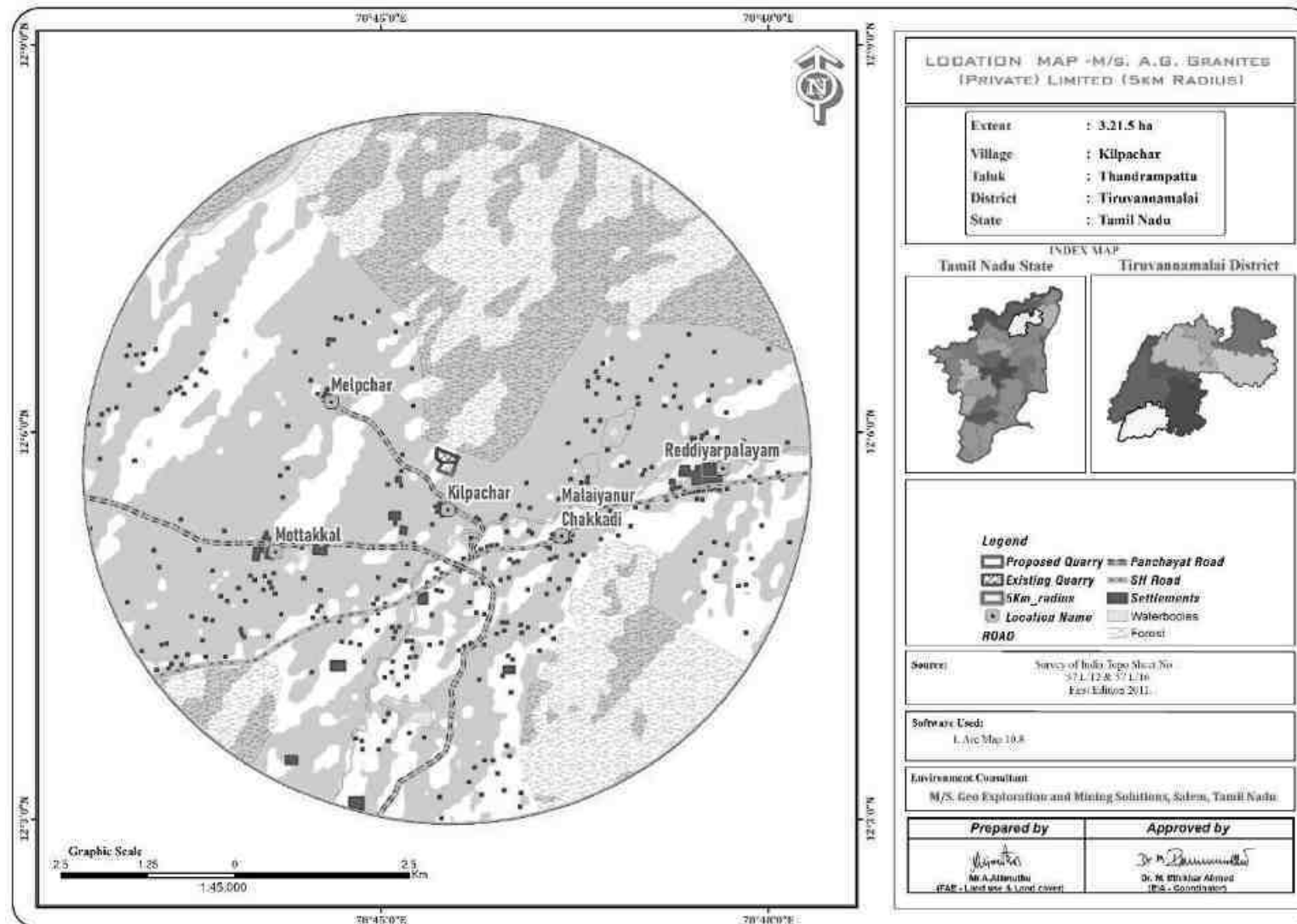
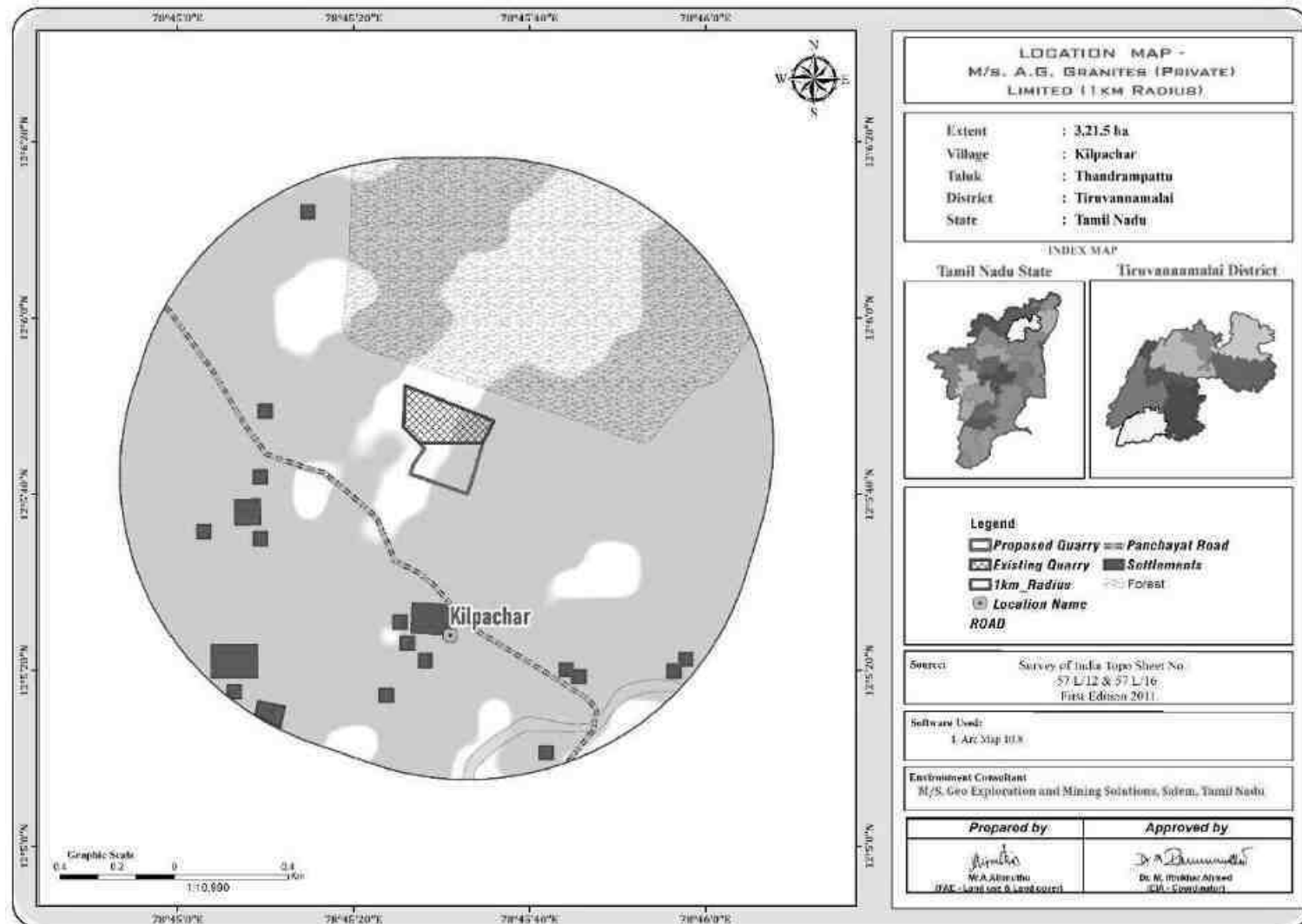


Figure 2.7: Image Showing Surface Features Around 1 Km Radius



2.2.1 Project Area

- The Topography of the Proposed Project is Plain topography, with Granite outcrops, which is site specific, Non – Captive use, opencast Mechanized quarry.
- There is No beneficiation or processing proposed inside the project area.
- Elevation is 250 - 255 m above from MSL, showing gentle gradient towards Southeastern
- There is Ponnaiyar R.F. – 90m – North forest land involved in the proposed project area.

Table 2.3: Land Use Pattern of Proposed Project

<i>Description</i>	<i>Present Area (Ha)</i>	<i>Area to be Required at the present Scheme period(ha)</i>	<i>Area to be Required at the end of lease period (ha)</i>
Area under Quarry	Nil	0.47.95	0.99.46
Waste dump	Nil	0.28.83	0.87.78#
Infrastructure	Nil	0.02.00	0.02.00
Roads	Nil	0.02.00	0.04.00
Green Belt	Nil	0.20.42	0.58.31
Stocking Blocks	3.21.50	2.20.30	0.69.95
Grand Total	3.21.50	3.21.50	3.21.50

Source: First Scheme of Approved mining plan

2.2.2 Size or Magnitude of Operation

Table 2.4: Operational Details

Description	Details
Geological Resources ROM	81,040
Granite Recovery (10 % in m ³)	8,104
Granite Waste (90 % in m ³)	72,936
Weathered rock(m ³)	54,252
Side Burden(m ³)	3,07,480
Top Soil in m ³	27,126
Mineable Reserves ROM	62,240
Granite Recovery (10 % in m ³)	6,224
Granite Waste (90 % in m ³)	56,016
Weathered rock (m ³)	16,380
Side Burden (m ³)	18,060
Top Soil in m ³	8,190
Proposed Production for five years plan period ROM	15,335
Granite Recovery (10% in m ³)	1,534
Granite Waste (90 % in m ³)	13,801
Weathered rock(m ³)	8,580
Top Soil in m ³	4,290
Number of Working Days	300
Production of ROM per day in five-year plan period	10
Production of Granite per day	1
Total Waste per day (Granite waste)	9
No of Lorry Loads per day for Transportation to Granite cutting units	1
No of Lorry loads for dump	1

Source: First Scheme of Approved mining plan

2.3 GEOLOGY

2.3.1 Regional Geology

Tiruvannamalai District mainly comprises of rocks of Archaean age. The type of rocks found in the district are Charnockite, Granitic gneiss, Epidote Hornblende Gneiss, Amphibolite, Pyroxenite, Dunite, Migmatites, Banded Magnetite Quartzite, Shale and Clay. Dolerite dykes (Black Granite) are also noticed cutting across the country rocks.

The hard rock terrain comprises predominantly of Charnockite and Khondalite groups and their migmatitic derivatives, supra-crustal sequences of Sathyamangalam and Kolar groups and Peninsular Gneissic Complex (Bhavani Group), intruded by ultramafic-mafic complexes, basic dykes, granites and syenites. The sedimentary rocks of the coastal belt include fluviatile, fluvio-marine and marine sequences, such as Gondwana Supergroup (Carboniferous to Permian and Upper Jurassic to Lower Cretaceous), marine sediments of Cauvery basin (Lower Cretaceous to Paleogene), Cuddalore /Pannambarai Formation (Mio-Pliocene) and sediments of Quaternary and Recent age.

The Charnockite Group comprises pyroxene granulite and charnockite. The pyroxene granulite is dark grey, medium grained granulitic rock with typical salt and pepper texture, seen on the weathered surface. It consists of diopside, hypersthene, plagioclase, hornblende, biotite and quartz. Charnockite is the predominant rock in the area. It is grey, medium to coarse grained, greasy looking with foliation seen prominently on the weathered surface. It is essentially made of smoky or grey quartz, pale grey microcline and hypersthene as major minerals with plagioclase, hornblende and biotite as accessories.

Migmatite Complex is represented by hornblende-biotite gneiss, granitic gneiss and pink migmatite. This Complex is a group of banded felsic rocks of varying mineralogical composition that are formed due to the influx of quartzofeldspathic material into high grade metamorphic rocks. Two types of migmatite are seen in the district, one is grey and the other is pink. Next to charnockite, migmatite gneiss is the second most extensive rock. The migmatite gneiss consists of quartz, k-feldspar, plagioclase, hornblende and biotite in varying proportions.

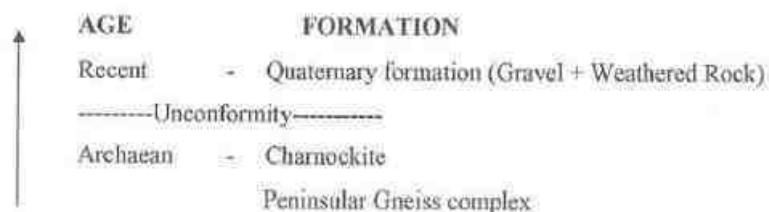
Source: District Survey Report for Minor Minerals Tiruvannamalai District – May 2019.

<https://tiruvannamalai.nic.in/document/district-survey-report-rough-stone/>

Exploration :

No Exploration is required, the Black Granite formation is clearly inferred from the existing quarry pit situated on the south side.

The General Geological sequence of the area is given below:



2.3.2 Local Geology:-

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

2.3.3 Hydrogeology

Cheyyar River which originates from Jawadhu Hills, flows in a southern direction at first, and turns south-east near Chengam after flowing through Polur, Vandavasi and Cheyyartaluks. Palar rising near Nandidurg in Mysore enters Vellore district passing through Gudiyatham, Walajah and Arakonamtaluks before entering into Cheyyartaluk of Tiruvannamalai district and there after enters into Kancheepuram district. Pennaiyar and South Pennaiyar originate from Nandidurg of Karnataka. They pass through Dharmapuri district and enter southern part of Chengamtaluk before entering in to Viluppuram district. Finally, the river enters into the Bay of Bengal at Cuddalore. The river is dry for the most part of the year. Water flows during the monsoon season when it is fed by the southwest monsoon in catchment area and the northeast monsoon in Tamil Nadu. A dam has been constructed across this river at Sathanur which is a picnic spot in this district. Sathanur Reservoir provides drinking water to Tiruvannamalai town and the water is used for irrigation when the reservoir is filled with surplus water.

The origin, occurrence and movement of groundwater are controlled by geological setup of a terrain. During the study it is inferred that the entire cluster area is a Hard rock terrain and the low resistance encountered at the depth between 57m, hence it is assumed that the possibility of Ground water occurrence will be below this level and it also proved that this hard batholith above 50m will not encounter any subsurface water.

There is a possibility of seepage water from the surface levels i.e., below 30m, this surface water will be collected in the mine pits and later used for dust suppression and afforestation. In the geophysical study it has been clearly inferred that the depth of the quarrying operation will not intersect the ground water table.

Figure 2.7: Regional Geology Map

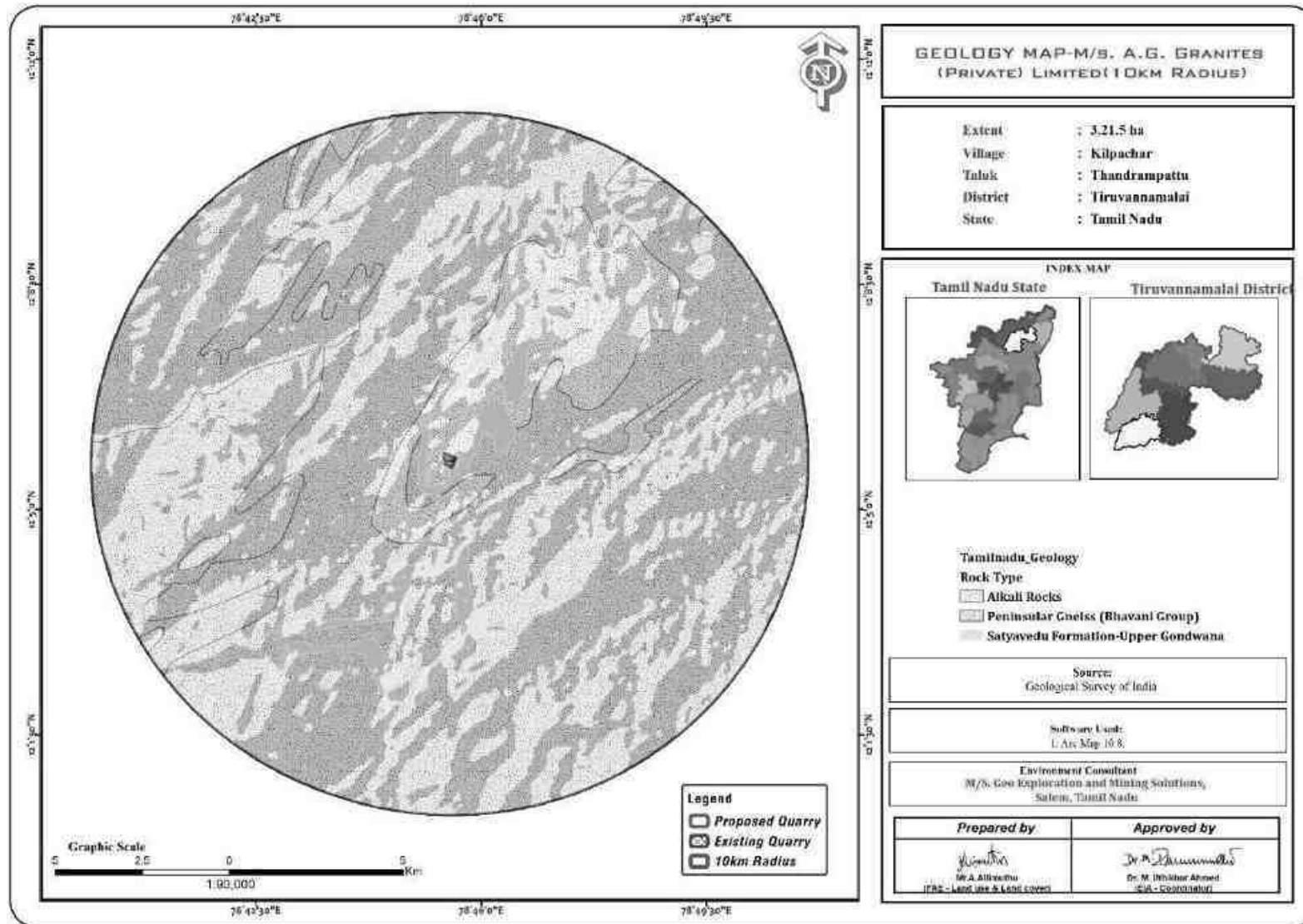


Figure 2.8: Geomorphology Map of The Study Area

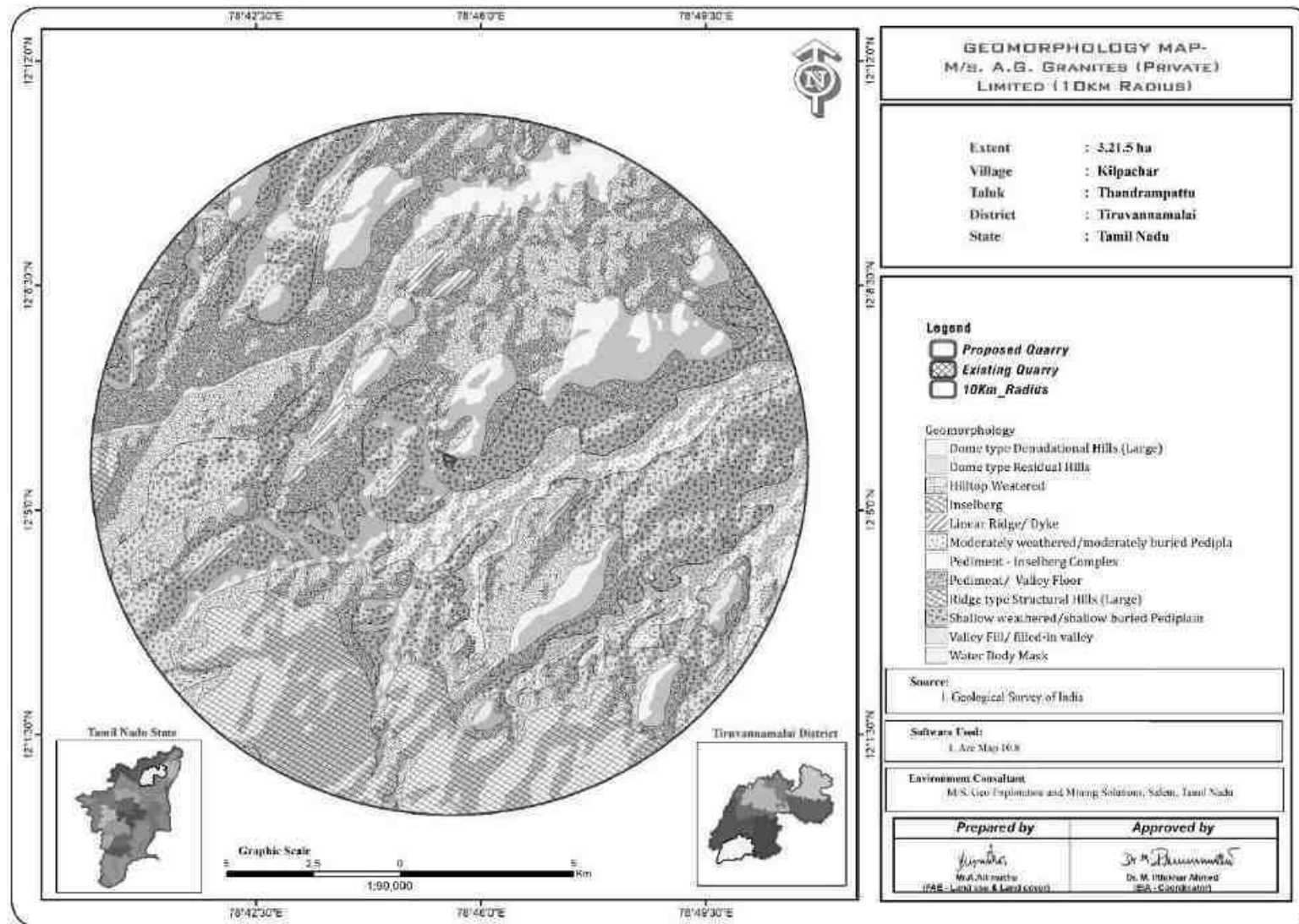


Figure 2.9: Surface Plan

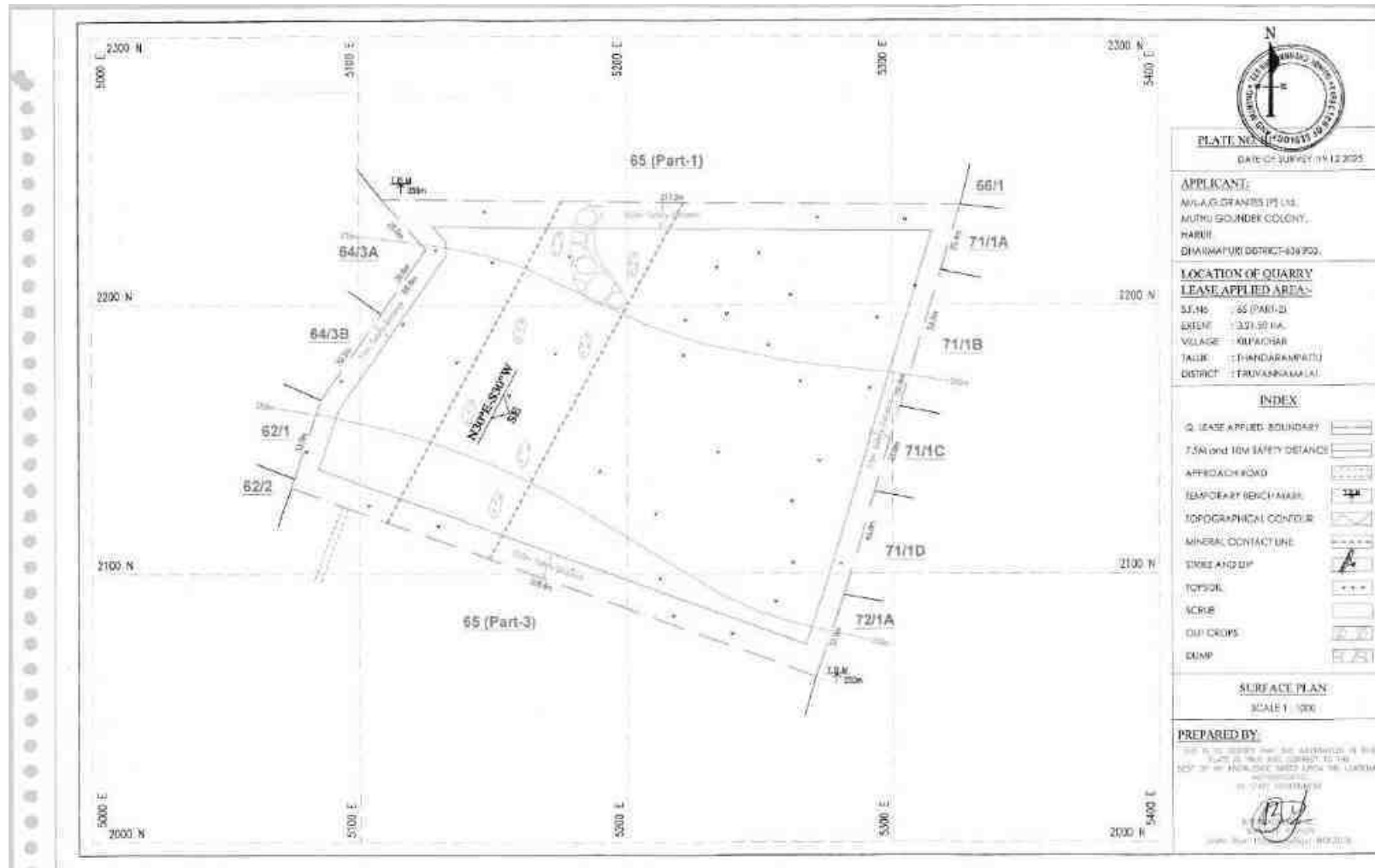
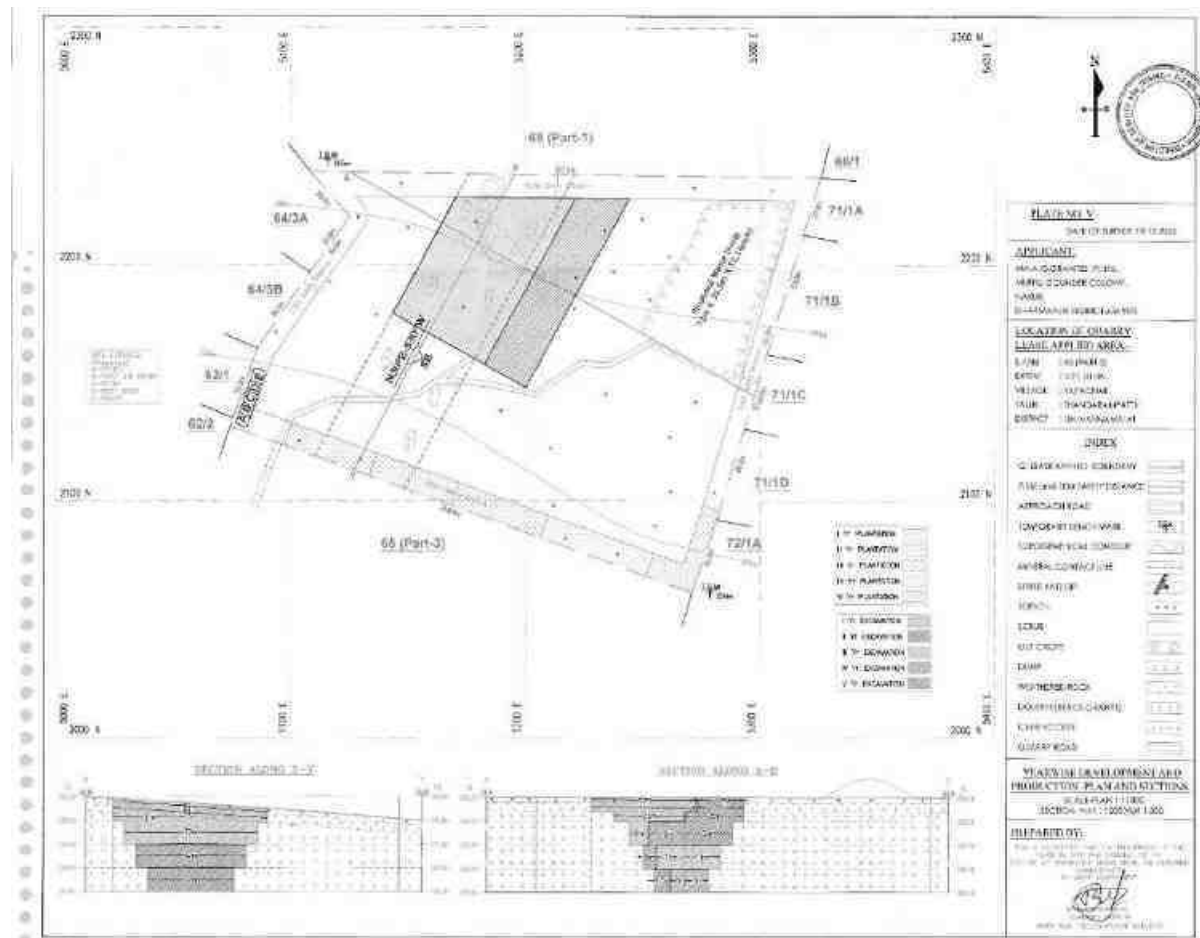


Figure 2.10: Year-Wise Development Production Plan and Section



Source: First Scheme of Approved mining plan

2.4 Resources and Reserves

Black Granite (Dolerite) is occurring beneath the surface, Granite outcrops are visible in some places within the project area.

Table 2.5 Resources, Reserves

Details	ROM (Ts)	Granite Recovery @ 10% (Ts)	Granite Waste @ 90% (Ts)	Side burden (Ts)	Weathered Rock (Ts)	Topsoil (Ts)
Geological Resources	2,51,224	25,122	2,26,102	8,45,570	1,08,504	54,252
Mineable Reserves	1,92,944	19,294	1,73,650	49,665	32,760	16,380

Source: First Scheme of Approved mining plan

Table 2.6 Year wise Production for First five years plan

Year	ROM (Ts)	Recovery @ 10% (Ts)	Granite Waste @ 90% (Ts)	Sideburden (Ts)	Weathered Rock (Ts)	Topsoil (Ts)
I	12,834	1,283	11,551	-	11,880	5,940
II	18,507	1,851	16,656	19,938	5,280	2,640
III	8,742	874	7,868	9,694	-	-
IV	3,728	373	3,355	5,088	-	-
V	3,728	373	3,355	-	-	-
Total	47,539	4,754	42,785	34,720	17,160	8,580

Source: First Scheme of Approved mining plan

Stacking of Granite Rejects and Disposal of Waste

Top soil:

There will be generation of topsoil is about 8,580 m³ up to depth for 1m during this Mining Plan Period, the same will be preserved all along the safety barrier and utilized for construction of bund and afforestation purpose.

Granite Waste:

Granite waste forms nearly 90% of ROM and the total quantity of granite waste in the next five years will be around 2,56,075 m³ (Granite waste 1,73,650 m³ + side burden 1,73,650 m³ + weathered rock 32,760 m³)

Disposal:

As and when there is accumulation of waste, the same is loaded into the tipper by loading machines and dumped in the respective places ear-marked for the purpose.

Conceptual Mining Plan/ Final Mine Closure Plan

Conceptual mining plan is prepared with an object of long-term systematic development of benches, lay outs, selection of permanent ultimate pit limit, depth of quarrying and ultimate pit, selection of sites for construction of infrastructure etc. The ultimate pit size is designed based on certain practical parameters such as economical depth of quarrying, safety zones, permissible area etc.,

Table 2.7 Ultimate Pit Dimensio

Length In m	Width in m	Depth in m
117	80	20

Source: First Scheme of Approved mining plan

2.5 Method of Mining

- The method of mining is Opencast mechanized method
- Eco-friendly dimensional wire saw cutting for liberation and splitting up of blocks from parent sheet rocks
- Splitting of rock body of considerable volume from the parent rock formation by carefully avoiding visibly seen defects such as patches veins, etc., is done by adopting the method of “Diamond wire cutting” along the horizontal as well as two vertical sides on the front face of the formation.
- Jackhammer drilling with 32mm dia, this huge portion is further split into several blocks of required dimensions, only slurry explosives are used for secondary fragmentation and handling of waste.
- Hydraulic Excavator coupled with tippers is deployed for the formation of benches and loading
- There is no mineral processing or ore beneficiation proposed
- Proposed bench height is 5m and 5m width with 60° slope
- The waste material generated during quarrying activity includes rock fragments of different sizes, and waste chips during dressing of the blocks. The waste materials are taken in tippers and proposed to be dumped in the respective approved places ear-marked for the purpose and the same will be utilized for backfilling in the northern side of the lease area during conceptual stage.

2.5.1 Drilling

Drilling will be carried out as per parameters given below:-

Spacing - 1m, Burden - 0.8m, Depth of hole - 1.5m

2.5.2 Blasting

Blasting will be done as per details below: -

- (i) Controlled blasting parameter: -
- Spacing – 1m
 - Burden – 0.8 m
 - Depth of hole – 1.5 m
 - Charge per hole – 125 gms
 - Powder factor – 7.0 tonnes/kg
 - Dia of hole – 32 mm

Details of blasting design and parameters are discussed in approved mining plan.

2.5.3 Extent of Mechanization

Table 2.8: Machinery Details Proposed

Drilling Equipment's					
Type	No of Unit	Dia of Hole mm	Size capacity	Make	Motive Power
Jack Hammer	4	32	1.2m to 6m	Atlas Copco	Compressed air
Compressor	1	-	450/150psi	Atlas Copco	Diesel drive
Diamond Wire Saw	2	-	20m³/day	optima	Diesel Generator
Diesel Generator	1	-	125kva	Powerica	Diesel
Loading Equipment					
Type	No of Unit	Capacity	Make	Motive Power	
Excavator	1	350	Kobelco	Diesel Drive	
Haulage within the Mine & Transport Equipment					
Type	No of Unit	Capacity	Make	Motive Power	
Tipper	2	20 tonnes	Tata	Diesel Drive	
Water Sprinkling Tanker	1	10,000 Litres	TATA	Diesel Drive	

Source: First Scheme of 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 Odai - 270m West, Tank - 470m NW, Pamban Stream - 790m SE, Tank - 1.8km East, Thenpennai River - 4.6km NW, Sathanur Reservoir - 9km NW water bodies within the project area, hence there is no requirement of stream or canals diversion.

2.6.3 Traffic Density

The traffic survey conducted based on the transportation route of material, the Black granite will be transported mainly through the Panchayat Road Kilpachar-Melpachar located 1km SE side of the area and Kilpachar-Melpachar Panchayat Road -1.3 km- NW side.

Traffic density measurements were performed at Two locations

1. Kilpachar-Melpachar Panchayat Road -1 km-SE
2. Kilpachar-Melpachar Panchayat Road -1.3 km-NW

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

Figure. 2.11: Mineral Transportation Route Map

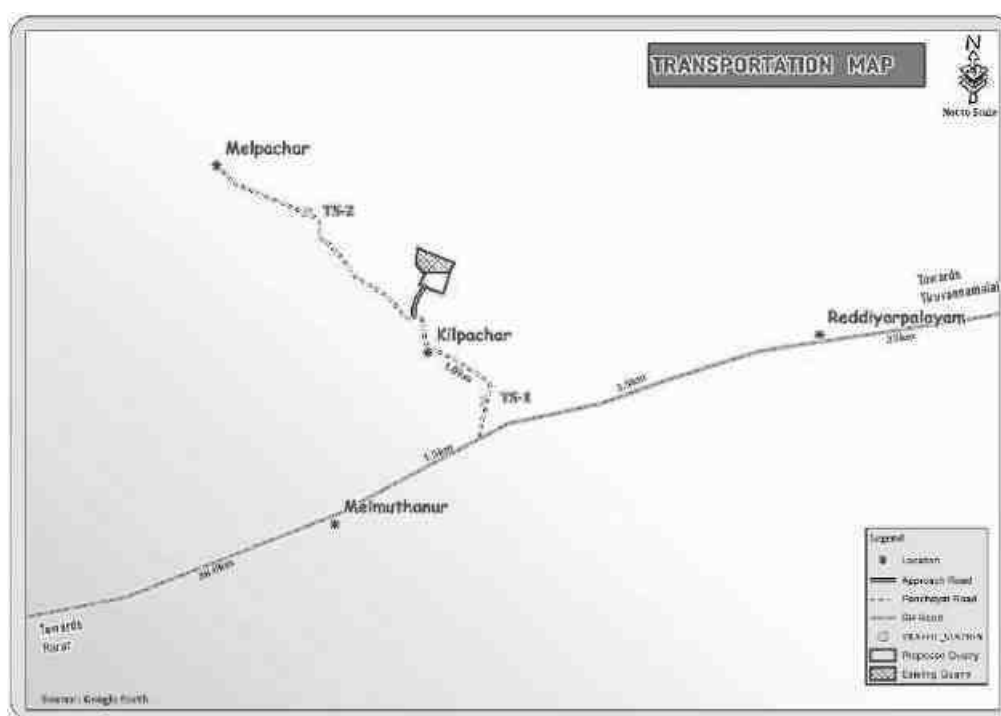


Table.2.9: Traffic Survey Locations

Station Code	Road Name	Distance and Direction	Type of Road
TS1	Kilpachar-Melpachar Panchayat Road -	1 km-SE	Panchayat Road
TS2	Kilpachar-Melpachar Panchayat Road	1.3 km-NW	Panchayat Road

Source: On-site monitoring by GEMS FAE & TM

Table 2.10: Existing Traffic Volume

Station Code	HMV		LMV		2/3 Wheelers		Total PCU
	Number	PCU	Number	PCU	Number	PCU	
TS1	100	300	100	100	150	60	460
TS2	175	525	150	150	200	100	725

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: Granite Hourly Transportation Requirement

Transportation of Granite per day			
Capacity of Trucks	No of trips per day	Volume in PCU	PCU considering 8 Hours
20Ts	2	6	6

Source: Data analysed from Approved Mining plan

Table 2.12: Summary of Traffic Volume

Route	Existing Traffic Volume in PCU	Incremental Traffic Due to the project in PCU	Total Traffic Volume in PCU	Hourly Capacity in PCU as per IRC - 1960
Peelvadi to Keelapiyur Panchayat Road	460	6	466	1200
Keelapiyur to Valikandapuram	725	6	731	1500

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

Due to this project 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 this 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
Domestic & Drinking purpose	0.5KLD	From Approved Water vendors.
Dust Suppression	4.5KLD	From nearby tank
Green Belt	2.0KLD	From nearby tank
Wire Saw Cutting	2.0KLD	From nearby tank
Total	9.0 KLD	

Source: Prefeasibility report

2.7.2 Power and Other Infrastructure Requirement

The project does not require power supply for the mining operations. 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.

The temporary infrastructures such as Mine Office, First Aid Room, Rest Shelter etc., will be constructed within the project area before commencing the quarry operation. No workshops are proposed inside the project area hence there will not be any process effluent generation from the proposed lease area. Domestic effluent from the mine office will be discharged to septic tank and soak pit. 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

No raw material will be required for production of Black granite quarry. The final product will be sent to consumer based on their demand. The mode of transportation of raw material and finished product will be by road. Tippers/ trucks will be used for transportation to the end users.

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

Per hour Excavator will consume	=	16 liters / hour
Per hour Excavator will excavate	=	10m ³
For 62,240 m ³ (for this Scheme period)	=	62,240/10
Diesel 6,224 working hours	=	6,224 hours x 16 liters
	=	99,584 liters of HSD for five years Mining plan period

_Source: Prefeasibility report

2.8 Employment Requirement:

The skilled, competent qualified statutory persons will be engaged for quarrying operation, preference will be given to the local community.

Table 2.14: Employment Potential

S.No	Description	Numbers
1	Mines Manager	1
2	Geologist	1
3	Mine Foreman	1
4	Mines Mate/Blaster	1
5	Excavator – Operator	1
6	Wire Saw Operator	1
7	Tipper Driver	2
8	Water Sprinkling Driver	1
9	Jack Hammer Drillers	12
10	Security	1
11	Helper	4
12	Co Operator & Cleaner	5
Total		31

Source: First Scheme of Approved mining plan

2.9 Project Implementation Schedule

The commercial operation will commence after the grant of Environmental Clearance. CTO will be obtained from the Tamil Nadu State Pollution Control Board. The conditions imposed during the Environmental Clearance will be complied before the start of mining operation.

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						Production Start Period
Time line may vary; subjected to rules and regulations /& other unforeseen circumstances							

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

Table 2.16 Capital Cost Estimation

S.No	Description	Cost
1	Project Cost	Rs. 6,16,62,873/-

Source: First Scheme of Approved mining plan

3. DESCRIPTION OF ENVIRONMENT

3.0 General

This chapter presents a regional background to the baseline data at the very onset, which will help in better appreciation of micro-level field data, generated on several environmental and ecological attributes of the study area. The baseline environment quality represents the background environmental scenario of various environmental components such as Land, Water, Air, Noise, Biological and Socio-economic status of the study area. Field monitoring studies to evaluate the base line status of the project site were carried out covering December 2025 – February 2026 with CPCB guidelines. Environmental data has been collected with reference to cluster quarries CHENNAI METTEX LAB PRIVATE LIMITED, – **An accredited by ISO/IEC 17025:2017 (NABL) Laboratory**, for the below attributes-

for the below attributes –

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

Study Area

An area of 10 km radius (aerial distance) from the periphery of the cluster is considered for EIA study. The data collection has been used to understand the existing environment scenario around the cluster against which the potential impacts of the project can be assessed. The study area has been divided into two zones viz core zone and buffer zone where core zone is considered as cluster quarries area and buffer zone taken as 10km radius from the periphery of the Cluster quarries. Both Core zone and Buffer zone is taken as the study area.

Study Period

The baseline study was conducted during the Post monsoon i.e., December 2025 – February 2026.

Study Methodology

- 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, exchangeable Cations, nutrients & micro nutrients etc., in order to assess the impact due to mining activities and to recommend saplings for Greenbelt development.
- Ground water samples were collected during the study period from the existing bore wells, while surface water was collected from ponds in the buffer zone. The samples were analysed for parameters necessary to determine water quality (based on IS: 10500:2012 criteria) and those which are relevant from the point of view of environmental impact of the proposed mines.
- An onsite meteorological station was setup in project area, to collect data about wind speed, wind direction, temperature, relative humidity, rainfall and general weather conditions were recorded throughout the study period.
- In order to assess the Ambient Air Quality (AAQ), samples of ambient air 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/Automatic 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 (Oct–Dec2023)	7 (1 core & 6 buffer)	IS 5182 Part 1-23 National Ambient Air Quality Standards, CPCB
*Noise Levels	Ambient Noise	Hourly observation for 24 Hours per location	7 (1 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 Quadrate & Transect Study Secondary Data – Forest Working Plan
Socio Economic Aspects	Socio–Economic Characteristics, Population Statistics and Existing Infrastructure in the study area	Site Visit & Census Handbook, 2011	Study Area	Primary Survey, census handbook & need based assessments.

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

* All monitoring and testing are 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

To study the land use pattern of the core as well as a buffer zone, land use/land cover details have been identified/ maps have been prepared in accordance with the **Standard ToR point no. 4 & 10 Stating:** Point No. 4 All corner coordinates of the mine lease area, superimposed on a High-Resolution Imagery/ topo sheet. Topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).

Point No. 10. Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary. National park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted.

Current vintage data of Indian Remote Sensing Satellite ResourceSat1 LISSIII (False Color Composite) has been used for Land Use / Land Cover study. Satellite image has been procured from National Remote Sensing Centre, Hyderabad.

3.1.2 OBJECTIVE

The objectives of the LULC study are as follow:

- ☞ To develop the Land use & Land cover map using land coordinates of the quarry area (Core Zone) and 10 km radius from the quarry site (Buffer area).
- ☞ To Identify and mark the important Land use and Land cover features using the primary and secondary data collected.
- ☞ To evaluate the impacts on existing land use/cover features of the buffer area by the Existing and Proposed Project activities.
- ☞ To identify the mitigative measures for the sustainable use of land and to protect the buffer zone from the adverse impacts.

Technical specification of Satellite imagery Data Used:

Current vintage data of Indian Remote Sensing Satellite RESOURCESAT1 (LISS-III) digital FCC (False Color Composite) has been used for preparation of Land use/ Land cover thematic map of study area. Satellite image has been procured from National Remote Sensing Centre, Hyderabad. Survey of India Toposheet as a reference map on 1:50,000 scale has been used for preparation of base layer data like road, rail network; village for geo-referencing of satellite image.

Satellite Image - Resourcesat1-LISSIII, 23.5m Resolution

Satellite Data Source - NRSC, Hyderabad

Satellite Vintage - 14th Sept 2022, Swath 141km wide.

SOI Toposheet No - 58J/01

Software Used - ArcGIS 10.8

The satellite image (FCC color 3,2,1) of the buffer zone is given in 3.1

The spatial resolution and the spectral bands in which the sensor collects the remotely sensed data are two important parameters for any land use survey. Resourcesat1-LISSIII, 23m Resolution of 23.5m and a 141 km wide swath of the earth in 23.5m resolution covering wide areas the data is collected in 4 visible bands namely band number and Resolution.

TABLE 3.2: Resourcesat1-LISSIII SENSOR characteristics

Band Number	Description	Wavelength	Resolution
Band 1	Green	0.52-0.59 μm	23.5 meters
Band 2	Red	0.62-0.68 μm	23.5meters
Band 3	NIR	0.77-0.86 μm	23.5meters
Band 4	SWIR	1.55-1.70 μm	70meters

Source: NRSC, Hyderabad

3.1.3 METHODOLOGY

The land use / land cover map is prepared by adopting the interpretation techniques of the Satellite image in combination with collateral data such as Survey of India topographical maps. Image classification is done by using visual interpretation techniques and digital classification using any of the image processing software. The various activities for preparation of LULC include pre-processing, rectification, image enhancements and classifying the satellite data for assessing the change in land use land cover due to proposed developmental activities.

- ☞ Preliminary/primary data collection of the study area
- ☞ Satellite data procurement from NRSC
- ☞ Secondary data collection from authorized bodies
- ☞ Survey of India Toposheet (SOI)
- ☞ Mine Layout
- ☞ Cadastral / Khasra map
- ☞ GPS Coordinates of Lease Boundary
- ☞ Processing of satellite data using ArcGIS 10.8 and preparing the Land Use & Land cover maps (e.g. Mine area, Existing Quarries, Settlements, Agriculture land, Non agriculture land, water bodies, etc.) by Digital Image Processing (DIP) technique.
- ☞ Geo-Referencing of the Survey of India Toposheet
- ☞ Geo-Referencing of satellite Imagery with the help of Geo-Referenced Toposheets
- ☞ Enhancement of the Satellite Imagery
- ☞ Base Map layer creation (Roads, Railway, Village Names, and other Secondary data, etc.)
- ☞ Data analysis and Classification using Digital interpretation techniques.
- ☞ Ground truth studies or field Verification.
- ☞ Error fixing / Reclassification
- ☞ Final Map Generation.

The land use/Land cover Map of the buffer zone is given in 3.4(b).

Land Use Pattern of the Buffer Zone (Study area)

Details of the same are given in Table – 3.3 and the map is shown in Figure – 3.2

TABLE: 3.3 LAND USE / LAND COVER DETAILS OF STUDY AREA

		10km Radius		2km Radius	
S.No	CLASSIFICATION	AREA_HA	AREA_%	AREA_HA	AREA_%
	BUILTUP				
1	Builtup Urban	435.33	1.35	68.02	5.17
2	Builtup Mining	21.00	0.07	7.40	0.56
	AGRICULTURAL LAND				
3	Crop Land	10055.91	31.27	508.60	38.64
4	Fallow Land	4579.76	14.24	121.85	9.26
	FOREST				
5	Forest	12533.67	38.98	286.32	21.75
	BARREN/WASTE LANDS				
6	Barren Land	2136.78	6.65	249.18	18.93
	WETLANDS/ WATER BODIES				

7	Waterbodies	2392.25	7.44	75.02	5.70
TOTAL		32154.70	100.00	1316.39	100.00

Source: Bhuvan, NRSC.

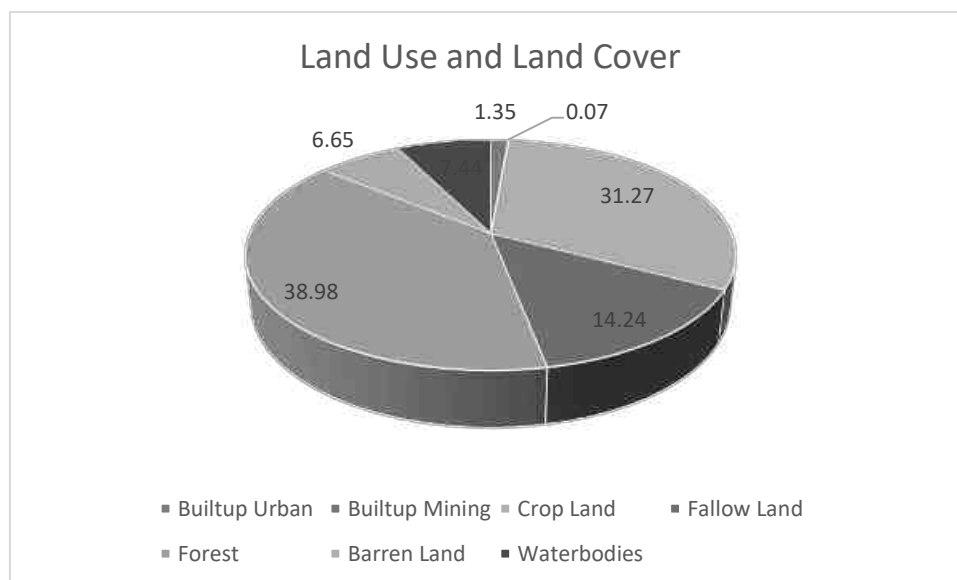


FIGURE 3.1: CHART SHOWING LANDUSE/LANDCOVER ANALYSIS USING LISS III Data

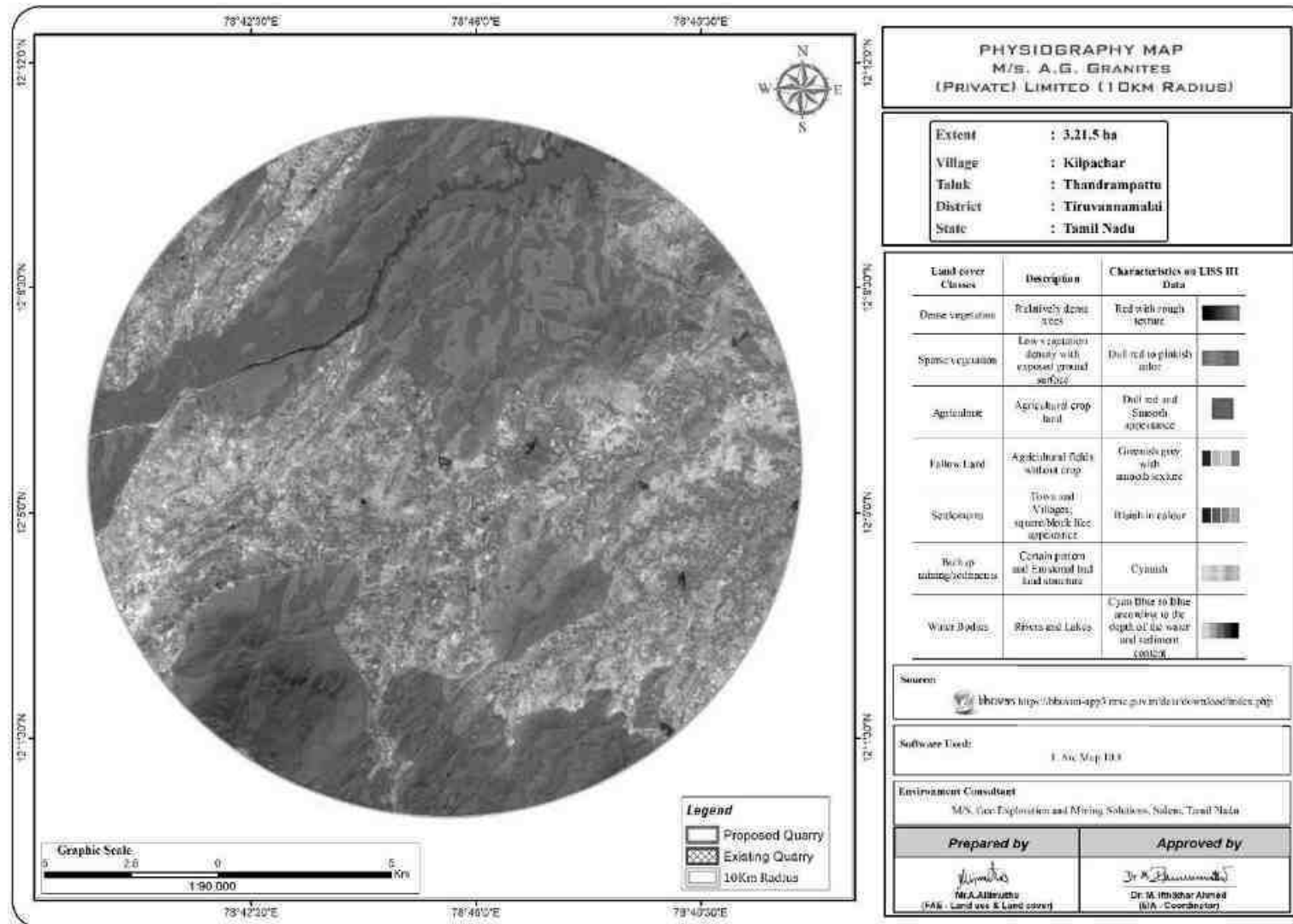


FIGURE 3.2: MAP SHOWING FALSE COLOR COMPOSITE (3,2,1) SATELLITE IMAGERY OF THE STUDY AREA

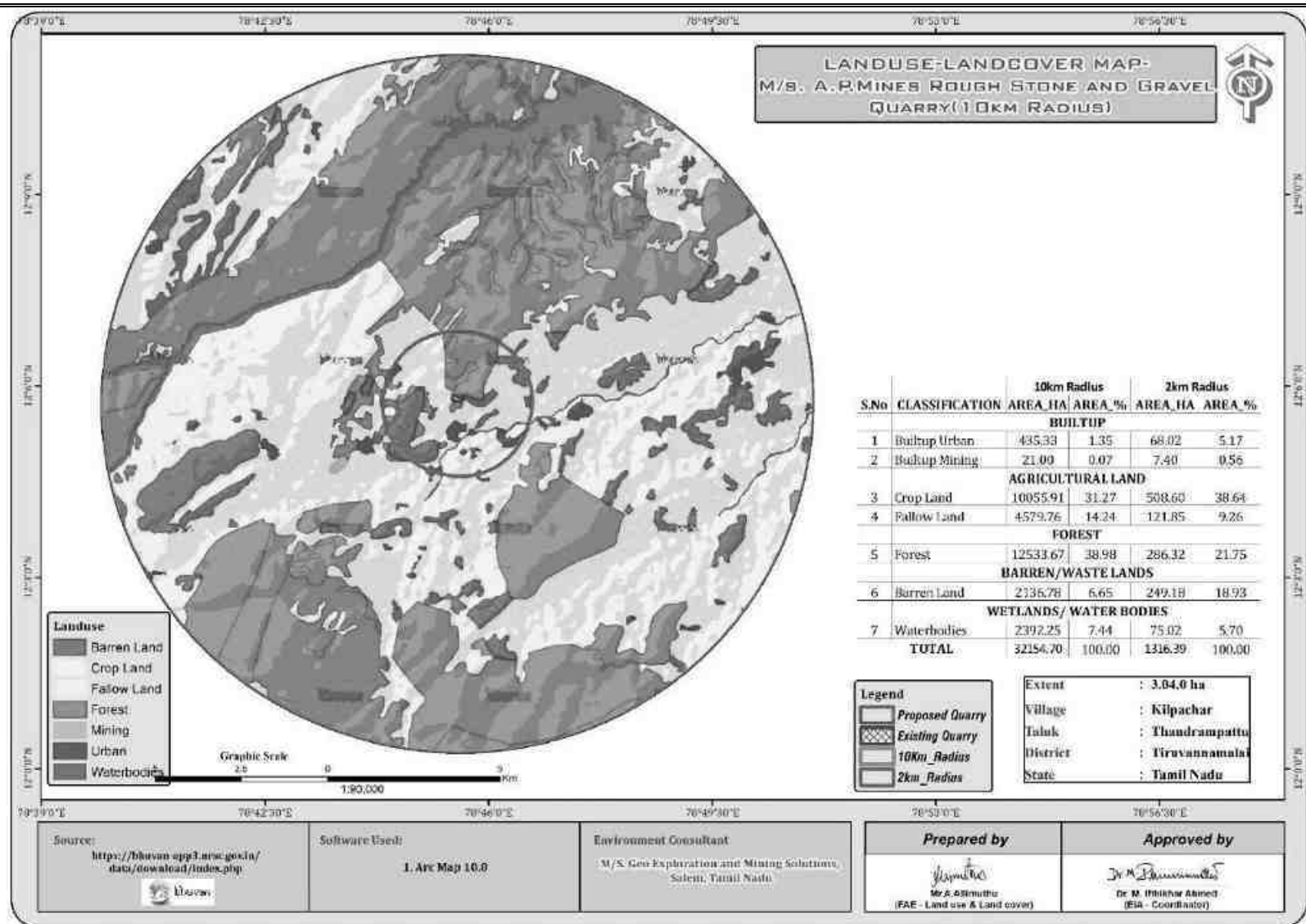


FIGURE 3.3: LAND USE LAND COVER MAP 10KM RADIUS

3.1.4 Interpretation

- ☞ The 10 km radius study area mainly comprises of crop land & Fallow land accounting of 31.27% & 14.24% of the total study area.
- ☞ Water Bodies such as ponds/ lakes comprises of 7.44% of the core and buffer area. .
- ☞ 0.07% of the total study area is occupied by the mine area. The area occupied by Mainly Black granite of the total buffer area. As also observed within the primary survey, the 10 km buffer area is also occupied by the medium scaled granite and marble and small Brick kiln industries also located in the study area.

3.1.5 TOPOGRAPHY

The project area is almost Undulated Terrain having gentle slope towards Southwest side. The altitude of the area is 250 - 255m AMSL The area is concealed under reddish gravelly soil having an average thickness of 1m, 2m weathered rock and followed by fresh black granite.

3.1.5.1 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.

3.1.5.2 Seismic Sensitivity

The proposed project site falls in the seismic Zone II (Least active), 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.

3.1.5.3 Environmental Features in the Study Area

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

Table 3.3: Details of Environment Sensitivity around the Cluster

No	Sensitive Ecological Features	Name	Arial Distance in km from Cluster
1	National Park / Wild life Sanctuaries	Cauvery South Wildlife Sanctuary	86.5km – NW
		Cauvery North Wildlife Sanctuary	91.5km – NW
2	Reserve Forest	Ponnaiyar R.F	90m – North
3	Lake Reservoir	Odai	270m-SW
		Tank	470m-NW
4	Tiger Reserve/ Elephant Reserve/ Biosphere Reserve	None	Nil within 10KM Radius
5	Critically Polluted Areas	Coimbatore - SIDCO Industrial Complex	Around 145.0 km-W
6	Mangroves	None	Nil within 10 km Radius
7	Mountains/Hills	None	Nil within 10 km Radius
8	Notified Archaeological Sites	Sathanur Dam	12.5km – NE
		Then Pennai River	4.7km – NW

		Chennanoor Archaeological Excavation Site	32.0km – NW
9	Industries/ Thermal Power Plants	None	Nil within 10 km Radius
10	Defence Installation	None	Nil within 10 km Radius

Source: Survey of India Toposheet

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 3.4 and Figure 3.3.

Table 3.4: Soil Sampling Locations

S. No	Location Code	Monitoring Locations	Distance (km) and Direction	Coordinates
1	S-1	Core Zone	Project Area	12° 5'45.42"N 78°45'28.86"E
2	S-2	Kilpasar (Agriculture Land)	410m South	12° 5'28.10"N 78°45'27.79"E
3	S-3	Melpasar (Agriculture Land)	1.8km NW	12° 6'15.43"N 78°44'37.30"E
4	S-4	Reddiarpalayam (Agriculture Land)	2.8km East	12° 5'29.36"N 78°47'5.65"E
5	S-5	Beemarapatti (Residential Land)	6.2km SW	12° 2'28.18"N 78°44'31.28"E
6	S-6	Manthikulampatti (Barren Land)	5.5km SW	12° 5'32.52"N 78°42'22.11"E

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

The objective of the soil sampling is -

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

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 3.5.

Table 3.5: Methodology of Sampling Collection

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

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

Soil Testing Result

The samples were analysed as per the standard methods prescribed in “Soil Chemical Analysis (M.L. Jackson, 1967) & Department of Agriculture, Cooperation & Farmers Welfare, Ministry of Agriculture & Farmers Welfare, Government of India”.

Figure 3.4: Soil Sampling Locations Around 10 Km Radius

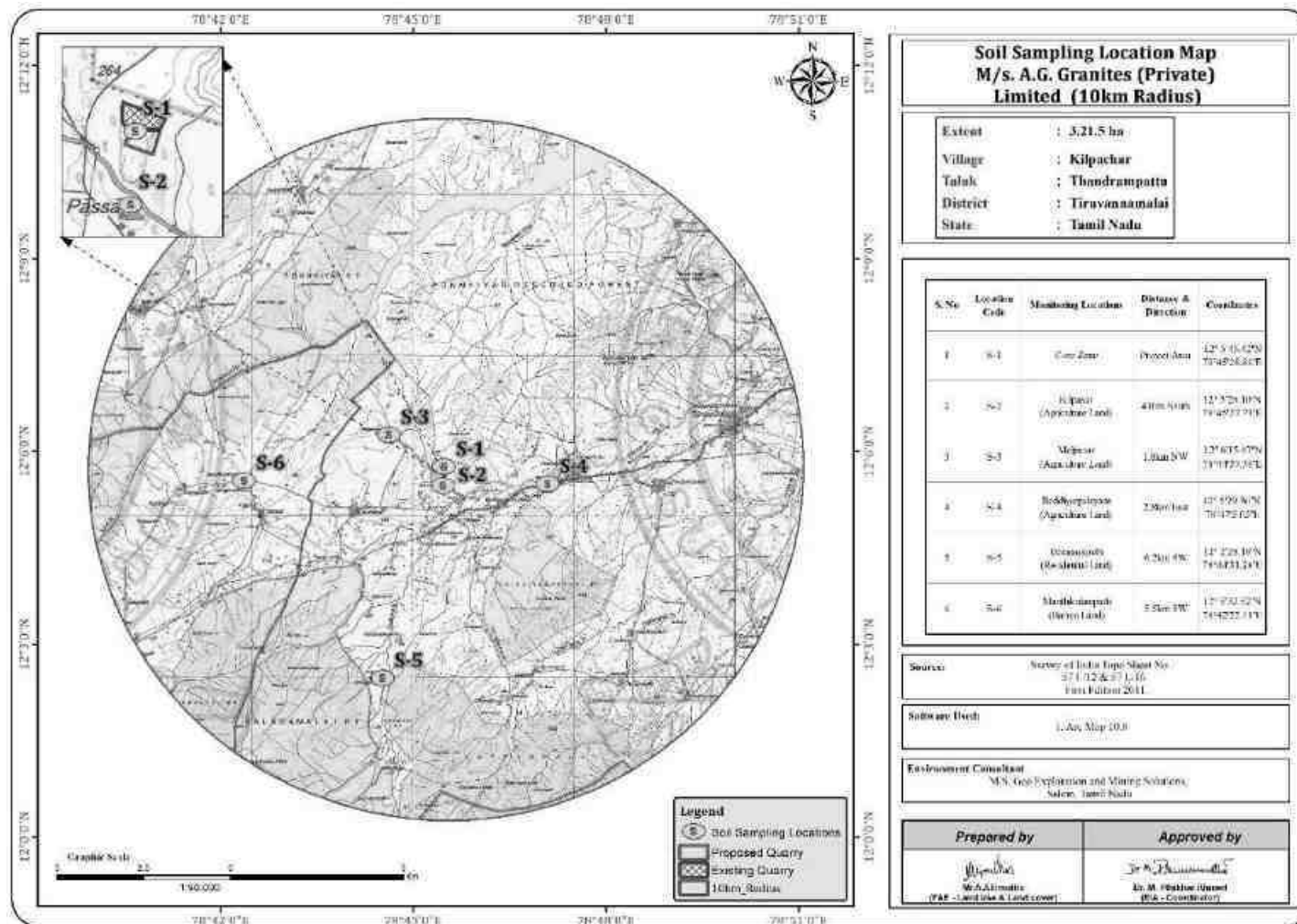


Figure 3.5: Soil Map

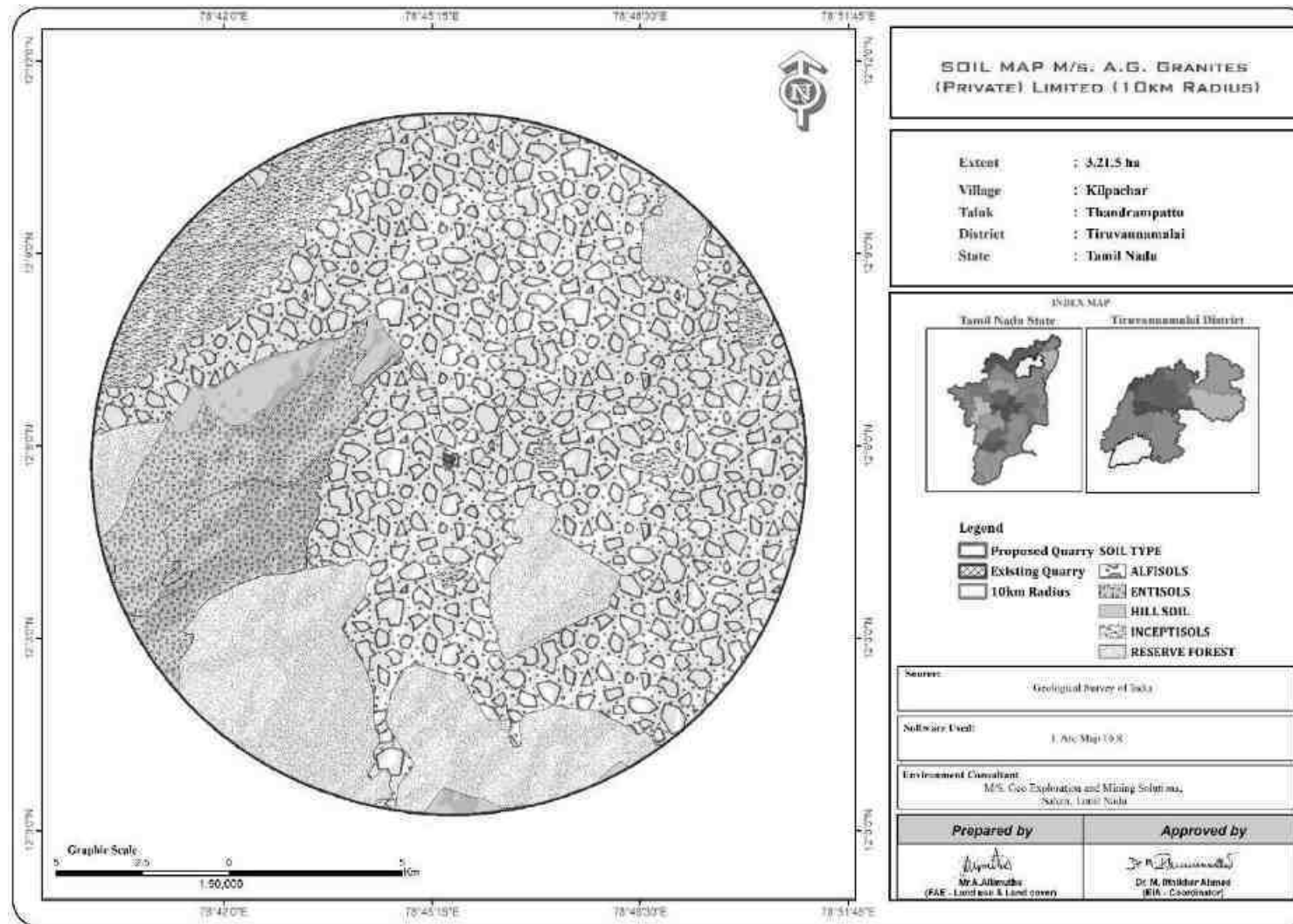


Table 3.6: Soil Quality of the Study Area

S. No	Test Parameters	Protocols	S1	S2	S3	S4	S5	S6
01	pH @ 25°C	IS 2720 Part 26 - 1987 (Reaff:2016)	7.10	6.8	6.89	6.25	6.93	6.62
02	Conductivity @ 25°C	IS 14767 - 2000 (Reaff : 2016)	261 µmhos/cm	245 µmhos/cm	229 µmhos/cm	371.0 µmhos/cm	295 µmhos/cm	270 µmhos/cm
03	Texture :							
	Clay	Gravimetric Method	27.7 %	28.3 %	29.8 %	30.0 %	28.3 %	30.1 %
	Sand		37.1 %	37.8 %	39.5 %	36.2 %	37.9%	36.9 %
	Silt		35.2 %	33.9 %	30.7 %	33.8 %	33.8%	33.1 %
04	Water Holding Capacity	By Gravimetric Method	42.3 %	44.1%	46.5 %	47.8 %	46.6 %	39.9 %
05	Bulk Density	By Cylindrical Method	1.02 g/cm ³	0.99 g/cm ³	0.99 g/cm ³	0.98 g/cm ³	1.32 g/cm ³	1.04 g/cm ³
06	Porosity	By Gravimetric Method	39.1 %	46.7 %	35.7 %	41.3 %	42.2 %	37.8 %
07	Calcium as Ca	USEPA 3050 B – 1996 & USEPA 6010 C - 2000	57.8 mg/kg	50.7 mg/kg	46.6 mg/kg	47.6 mg/kg	44.2 mg/kg	71.6 mg/kg
08	Magnesium as Mg		23.6 mg/kg	25.9 mg/kg	20.8 mg/kg	26.6 mg/kg	22.5 mg/kg	30.1 mg/kg
09	Manganese as Mn		28.3 mg/kg	21.3 mg/kg	19.6 mg/kg	27.7 mg/kg	22.8 mg/kg	25.9 mg/kg
10	Zinc as Zn		1.37 mg/kg	2.61 mg/kg	2.45 mg/kg	6.78 mg/kg	2.36 mg/kg	3.23 mg/kg
11	Boron as B		1.03 mg/kg	3.62 mg/kg	1.17 mg/kg	2.32 mg/kg	1.14/kg	1.37 mg/kg
12	Chloride as Cl	APHA 23 rd Edn 2019 4500 Cl B	178 mg/kg	98.0 mg/kg	83.8 mg/kg	161.8 mg/kg	106 mg/kg	99. mg/kg
13	Total Soluble Sulphate as SO ₄	IS 2720 Part 27 : 1977 (Reaff:2015)	0.02 %	0.016 %	0.023 %	0.024 %	0.014 %	0.019 %
14	Potassium as K	USEPA 3050 B – 1996 & USEPA 6010 C - 2000	22.1 mg/kg	26.8 mg/kg	18.7 mg/kg	29.3 mg/kg	28.7 mg/kg	25.7 mg/kg
15	Total Phosphorus as P	IS 10158 : 1982 (Reaff: 2019)	1.29 mg/kg	2.72 mg/kg	5.13 mg/kg	5.24 mg/kg	2.61 mg/kg	2.21 mg/kg
16	Total Nitrogen as N	IS 14684 : 1999 (Reaff:2019)	218 mg/kg	399 mg/kg	325 mg/kg	486.5 mg/kg	262.8 mg/kg	312.7 mg/kg

17	Cadmium as Cd	USEPA 3050 B – 1996 & USEPA 6010 C - 2000	BDL (DL : 1.0 mg/kg)	BDL (DL : 1.0 mg/kg)	BDL (DL : 1.0 mg/kg)	BDL (DL : 1.0 mg/kg)	BDL (DL : 1.0 mg/kg)	BDL (DL : 1.0 mg/kg)
18	Total Chromium as Cr		BDL (DL : 1.0 mg/kg)	BDL (DL : 1.0 mg/kg)	BDL (DL : 1.0 mg/kg)	BDL (DL : 1.0 mg/kg)	BDL (DL : 1.0 mg/kg)	BDL (DL : 1.0 mg/kg)
19	Copper as Cu		BDL (DL : 1.0 mg/kg)	BDL (DL : 1.0 mg/kg)	BDL (DL : 1.0 mg/kg)	BDL (DL : 1.0 mg/kg)	BDL (DL : 1.0 mg/kg)	BDL (DL : 1.0 mg/kg)
20	Lead as Pb		1.06 mg/kg	1.22 mg/kg	1.03 mg/kg	1.57 mg/kg	1.97 mg/kg	1.27 mg/kg
21	Iron as Fe		6.63 mg/kg	7.21 mg/kg	6.98 mg/kg	7.21 mg/kg	5.03 mg/kg	7.98 mg/kg
22	Organic Matter	IS : 2720 Part 22: 1972 (Reaff: 2015)	2.03 %	2.60 %	2.37 %	3.46 %	2.51 %	2.27 %
23	Organic Carbon	IS : 2720 Part 22: 1972 (Reaff: 2015)	1.18 %	1.51 %	1.38 %	2.01 %	1.46 %	1.32 %
24	Cation Exchange Capacity	USEPA 9080 – 1986	26.9 meq/100g of soil	27.8 meq/100g of soil	26.9 meq/100g of soil	32.9 meq/100g of soil	26.1 meq/100g of soil	26.7 meq/100g of soil

Source: Sampling Results by Chennai Mettlex Lab Private Limited.

Interpretation & Conclusion

The physical properties of the soil samples were examined for texture, bulk density and water holding capacity. The soil texture found in the study area is Clay Loam Soil and Bulk Density of Soils in the study area varied between 0.99 – 1.32 g/cc. The Water Holding Capacity between 39.9%-47.8%.

- The nature of soil is slightly alkaline to strongly alkaline with pH range 6.25 - 7.10
- The available Nitrogen content range between 218 to 486.5 kg/hc
- The available Phosphorus content range between 1.29 to 5.24 Mg/Kg
- The available Potassium range between 18.7 to 29.3 meq/l
- Whereas, the micronutrient as zinc (Zn) were found in the range of 5.03 to 7.98 mg/kg;

3.2 Water Environment

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

3.2.1 Surface Water Resources:

The study area is studded with few tanks that serve as the source of drinking water and also their surplus feeds adjoining tanks. 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 freshwater for couple of months after rainy season.

Table 3.7: Water Bodies in the Buffer Zone

Sl.No.	Water Bodies	Distance
1	Odai	270m West
2	Tank	470m NW
3	Pamban Stream	790m SE
4	Tank	1.8km East
5	Thenpennai River	4.6km NW
6	Sathanur Reservoir	9km NW

Source: Survey of India Toposheet

3.2.3 Methodology

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

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

Two(2) surface water and four (4) ground water samples were collected from the study area and were analysed for physio-chemical, heavy metals and bacteriological parameters in order to assess the effect of mining and other activities on surface and ground water. The samples were analysed as per the procedures specified by CPCB, IS-10500:2012 and 'Standard methods for the Examination of Water and

Wastewater’ published by American Public Health Association (APHA). The water sampling locations are given in Table 3.8 and shown as Figure 3.6.

Table 3.8: Water Sampling Locations

S. No	Location Code	Monitoring Locations	Distance & Direction	Coordinates
1	SW-1	Thenpennai River	4.6km NW	12° 7'50.74"N 78°44'1.12"E
2	SW-2	Tank Near Reddiarpalayam	2km East	12° 5'40.49"N 78°46'38.94"E
3	OW-1	Near Project Area	140m SW	12° 5'41.95"N 78°45'21.71"E
4	OW-2	Beemarapatti	6.0km SW	12° 2'33.27"N 78°44'24.41"E
5	BW-1	Near Project Area	220m South	12° 5'33.49"N 78°45'29.16"E
6	BW-2	Manthikulampatti	5.4km SW	12° 5'35.98"N 78°42'26.88"E

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

Figure 3.6: Water Sampling Locations Around 10 Km Radius

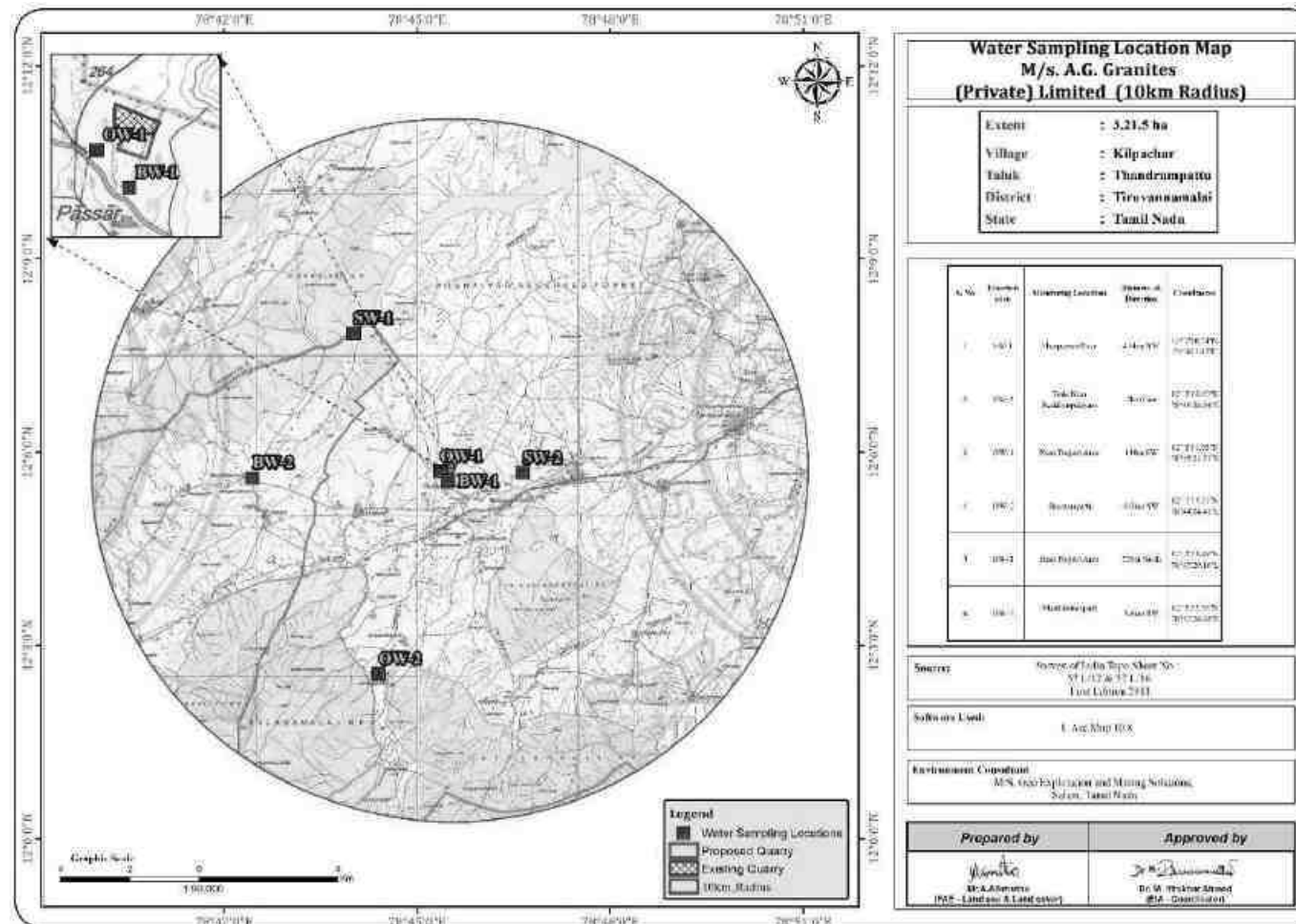


Table 3.9: Ground Water Sampling Results

TEST	PROTOCOL	OW1	OW2	BW1	BW2
Discipline: Chemical		Group: Water			
Colour	IS 3025 Part 4:1983 (Reaff:2017)	5	5 Hazen	5 Hazen	5 Hazen
Odour	IS 3025 Part 5:2018	Agreeable	Agreeable	Agreeable	Agreeable
pH at 25°C	IS 3025 Part 11:1983 (Reaff:2017)	7.12	7.56	7.30	7.13
Conductivity @ 25°C	IS 3025 Part 14:2013 (Reaff:2019)	975.0 µmhos/cm	961.0 µmhos/cm	950.0 µmhos/cm	860.0 µmhos/cm
Turbidity	IS 3025 Part 10:1984 (Reaff:2017)	1 NTU	1 NTU	1 NTU	1 NTU
Total Dissolved Solids	IS 3025 Part 16:1984 (Reaff:2017)	565.0 mg/l	557.0 mg/l	551.0 mg/l	499.0 mg/l
Total Hardness as CaCO ₃	IS 3025 Part 21:2009 (Reaff:2019)	160.0 mg/l	168.0 mg/l	152.0 mg/l	140.0 mg/l
Calcium as Ca	IS 3025 Part 40:1991 (Reaff:2019)	36.8 mg/l	41.6 mg/l	38.4 mg/l	32.0 mg/l
Magnesium as Mg	IS 3025 Part 46:1994 (Reaff:2019)	16.5 mg/l	15.5 mg/l	13.6 mg/l	13.6 mg/l
Total Alkalinity as CaCO ₃	IS 3025 Part 23:1986 (Reaff:2019)	150.1 mg/l	142.8 mg/l	137.5 mg/l	123.5 mg/l
Chloride as Cl	IS 3025 Part 32:1988 (Reaff:2019)	189.8 mg/l	189.8 mg/l	185.6 mg/l	156.8 mg/l
Sulphate as SO ₄	IS 3025 Part 24:1986 (Reaff:2019)	41.8 mg/l	44.5 mg/l	39.7 mg/l	37.9 mg/l
Iron as Fe	IS 3025 Part 53:2003 (Reaff:2019)	0.30 mg/l	0.31 mg/l	0.26 mg/l	0.32 mg/l
Residual Free Chlorine	IS 3025 Part 26:1986 (Reaff:2019)	BDL (DL:0.1 mg/l)	BDL (DL:0.1 mg/l)	BDL (DL:0.1 mg/l)	BDL (DL:0.1 mg/l)
Fluoride as F	APHA 23 rd Edn. 2017:4500 F,D	0.46 mg/l	0.27 mg/l	0.22 mg/l	0.22 mg/l
Nitrate as NO ₃	IS 3025 Part 34:1988 (Reaff:2019)	7.1 mg/l	6.8 mg/l	BDL (DL:1.0 mg/l)	BDL (DL:1.0 mg/l)
Copper as Cu	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)
Manganese as Mn	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.02 mg/l)	BDL (DL:0.02 mg/l)	BDL (DL:0.02 mg/l)	BDL (DL:0.02 mg/l)
Mercury as Hg	USEPA 200.8	BDL (DL:0.0005 mg/l)	BDL (DL:0.0005 mg/l)	BDL (DL:0.0005 mg/l)	BDL (DL:0.0005 mg/l)
Cadmium as Cd	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.001 mg/l)	BDL (DL:0.001 mg/l)	BDL (DL:0.001 mg/l)	BDL (DL:0.001 mg/l)
Selenium as Se	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)	BDL (DL:0.005 mg/l)	BDL (DL:0.005 mg/l)	BDL (DL:0.005 mg/l)
Aluminium as Al	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)	BDL (DL:0.005 mg/l)	BDL (DL:0.005 mg/l)	BDL (DL:0.005 mg/l)
Lead as Pb	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)	BDL (DL:0.005 mg/l)	BDL (DL:0.005 mg/l)	BDL (DL:0.005 mg/l)
Zinc as Zn	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.05 mg/l)	BDL(DL : 0.05 mg/l)	BDL(DL : 0.05 mg/l)	BDL(DL : 0.05 mg/l)
Total Chromium as Cr	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.02 mg/l)	BDL(DL : 0.02 mg/l)	BDL(DL : 0.02 mg/l)	BDL(DL : 0.02 mg/l)

Boron as B	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.05 mg/l)	BDL(DL : 0.05 mg/l)	BDL(DL : 0.05 mg/l)	BDL(DL : 0.05 mg/l)
Mineral Oil	IS 3025 Part 39:1991 (Reaff. 2019)	BDL(DL : 0.01 mg/l)	BDL(DL : 0.01 mg/l)	BDL(DL : 0.01 mg/l)	BDL(DL : 0.01 mg/l)
Phenolic compounds as C ₆ H ₅ OH	IS 3025 Part 43:1992(Reaff: 2019)	BDL (DL:0.0005 mg/l)	BDL (DL:0.0005 mg/l)	BDL (DL:0.0005 mg/l)	BDL (DL:0.0005 mg/l)
Anionic Detergents (as MBAS)	IS 13428 – 2005 (Reaff:2019) (Annex K)	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)
Cyanide as CN	IS 3025 Part 27:1986 (Reaff. 2019)	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)
Barium as Ba	IS 3025 Part 44:1993 (Reaff:2019)	BDL(DL:0.05 mg/l)	BDL(DL:0.05 mg/l)	BDL(DL:0.05 mg/l)	BDL(DL:0.05 mg/l)
Ammonia (as total ammonia-N)	IS 3025 Part 58:2006 (Reaff:2017)	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)
Sulphide as H ₂ S	IS 3025 Part 38:1989 (Reaff:2019)	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)
Molybdenum as Mo	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.02 mg/l)	BDL (DL:0.02 mg/l)	BDL (DL:0.02 mg/l)	BDL (DL:0.02 mg/l)
Total Arsenic as As	IS 3025 Part 34:1988 (Reaff. 2019)	BDL (DL:0.005 mg/l)	BDL (DL:0.005 mg/l)	BDL (DL:0.005 mg/l)	BDL (DL:0.005 mg/l)
Total Suspended Solids	IS 3025 Part 29:1986 (Reaff: 2019)	BDL (DL:1.0 mg/l)	BDL (DL:1.0 mg/l)	BDL (DL:1.0 mg/l)	BDL (DL:1.0 mg/l)
Discipline: Biological		Group: Water			
Total Coliform	APHA 23 rd Edn. 2017:9221B	211 MPN/100ml	133 MPN/100ml	131 MPN/100ml	141 MPN/100ml
<i>Escherichia coli</i>	APHA 23 rd Edn. 2017:9221F	< 1.8 MPN/100ml	< 1.8 MPN/100ml	< 1.8 MPN/100ml	< 1.8 MPN/100ml
Note : APHA – American Public Health Association, BDL – Below Detection Limit, DL – Detection Limit, MPN – Most Probable Number, < 1.8 MPN/100ml can be taken as “No Microbial Growth”.					

Table 3.10: Surface Water Sampling Results

TEST	PROTOCOL	SW1	SW2
Discipline: Chemical		Group: Water	
Colour	IS 3025 Part 4:1983 (Reaff:2017)	5 Hazen	6 Hazen
Odour	IS 3025 Part 5:2018	Agreeable	Agreeable
pH at 25°C	IS 3025 Part 11:1983 (Reaff:2017)	8.02	7.99
Conductivity @ 25°C	IS 3025 Part 14:2013 (Reaff:2019)	1068 µmhos/cm	1111.0 µmhos/cm
Turbidity	IS 3025 Part 10:1984 (Reaff:2017)	3 NTU	5 NTU
Total Dissolved Solids	IS 3025 Part 16:1984 (Reaff:2017)	630.0 mg/l	644.0 mg/l
Total Hardness as CaCO ₃	IS 3025 Part 21:2009 (Reaff:2019)	204.0 mg/l	192.0 mg/l
Calcium as Ca	IS 3025 Part 40:1991 (Reaff:2019)	48.1 mg/l	57.7 mg/l
Magnesium as Mg	IS 3025 Part 46:1994 (Reaff:2019)	20.4 mg/l	11.6 mg/l
Total Alkalinity as CaCO ₃	IS 3025 Part 23:1986 (Reaff:2019)	189.5 mg/l	185.2 mg/l
Chloride as Cl	IS 3025 Part 32:1988 (Reaff:2019)	212.3 mg/l	218.6 mg/l
Sulphate as SO ₄	IS 3025 Part 24:1986 (Reaff:2019)	42.6 mg/l	42.1 mg/l
Iron as Fe	IS 3025 Part 53:2003 (Reaff:2019)	0.49 mg/l	0.33 mg/l
Residual Free Chlorine	IS 3025 Part 26:1986 (Reaff:2019)	BDL (DL:0.1 mg/l)	BDL (DL:0.1 mg/l)
Fluoride as F	APHA 23 rd Edn. 2017:4500 F,D	0.39 mg/l	0.27 mg/l
Nitrate as NO ₃	IS 3025 Part 34:1988 (Reaff:2019)	16.1 mg/l	14.3 mg/l
Copper as Cu	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)
Manganese as Mn	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.02 mg/l)	BDL (DL:0.02 mg/l)
Mercury as Hg	USEPA 200.8	BDL (DL:0.0005 mg/l)	BDL (DL:0.0005 mg/l)
Cadmium as Cd	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.001 mg/l)	BDL (DL:0.001 mg/l)
Selenium as Se	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)	BDL (DL:0.005 mg/l)
Aluminium as Al	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)	BDL (DL:0.005 mg/l)
Lead as Pb	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)	BDL (DL:0.005 mg/l)
Zinc as Zn	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.05 mg/l)	BDL(DL : 0.05 mg/l)
Total Chromium as Cr	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.02 mg/l)	BDL(DL : 0.02 mg/l)

Boron as B	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL : 0.05 mg/l)	BDL(DL : 0.05 mg/l)
Mineral Oil	IS 3025 Part 39-1991 (Reaff. 2019)	BDL(DL : 0.01 mg/l)	BDL(DL : 0.01 mg/l)
Phenolic compounds as C ₆ H ₅ OH	IS 3025 Part 43-1992(Reaff: 2019)	BDL (DL:0.0005 mg/l)	BDL (DL:0.0005 mg/l)
Anionic Detergents (as MBAS)	IS 13428 – 2005 (Reaff:2019) (Annex K)	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)
Cyanide as CN	IS 3025 Part 27-1986 (Reaff. 2019)	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)
BOD @ 27°C for 3 days	IS 3025 Part 44:1993 (Reaff:2019)	15.9 mg/l	14.9 mg/l
Chemical Oxygen Demand	IS 3025 Part 58:2006 (Reaff:2017)	51.2 mg/l	46.8 mg/l
Dissolved Oxygen	IS 3025 Part 38:1989 (Reaff:2019)	7.5 mg/l	6.9 mg/l
Barium as Ba	IS 3025 Part 65:2014 (Reaff:2019)	BDL(DL:0.05 mg/l)	BDL(DL:0.05 mg/l)
Ammonia (as total ammonia-N)	IS 3025 Part 34-1988 (Reaff. 2019)	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)
Sulphide as H ₂ S	IS 3025 Part 29-1986 (Reaff: 2019)	BDL (DL:0.01 mg/l)	BDL (DL:0.01 mg/l)
Molybdenum as Mo	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.02 mg/l)	BDL (DL:0.02mg/l)
Total Arsenic as As	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)	BDL (DL:0.005 mg/l)
Total Suspended Solids	IS 3025 Part 17 -1984 (Reaff:2017)	12.3 mg/l	32.4
Discipline: Biological		Group: Water	
Total Coliform	APHA 23 rd Edn. 2017:9221B	1218 MPN/100ml	1121 MPN/100ml
<i>Escherichia coli</i>	APHA 23 rd Edn. 2017:9221F	206 MPN/100ml	187 MPN/100ml
Note : APHA – American Public Health Association, BDL – Below Detection Limit, DL – Detection Limit, MPN – Most Probable Number			

3.2.4 Interpretation & Conclusion

Surface Water

Ph:

The pH varied from 7.99-8.02 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 630 - 644 mg/l, the TDS mainly composed of carbonates, bicarbonates, Chlorides, phosphates and nitrates of calcium, magnesium, sodium and other organic matter.

Other parameters:

Chloride varied between 212.3 mg/l- 218.6 mg/l. Nitrates varied from BDL(DL:2.0) while sulphates varied from 42.1 to 42.6 mg/l.

Ground Water

The pH of the water samples collected ranged from 7.12 to 7.56 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 499-565mg/l in all samples. Total hardness varied between 140 - 168 mg/l. 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 59-63m bgl. The maximum depth proposed out of proposed projects is 20m

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 ten open well and eight borewells.

The average water level in the open well is varies from = 9.4m to 13.4m bgl

The water level in the bore well is varies from = 64.8 to 68.2m 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 59-63m hence there is no possibilities of water table intersection during the entire mine life period besides it is also inferred topographically that there are no major water bodies intersecting the project area.

3.2.6 Ground Water Resources:

Tiruvannamalai district is underlain entirely by Archaean Crystalline formations with Recent alluvial deposits occurring along the river and streams courses and colluvium of valley-fills. The important aquifer systems in the district are constituted by weathered, fissured and fractured crystalline rocks and the recent alluvial deposits. Ground water occurs under phreatic conditions. The maximum saturated thickness of these aquifers is up to 5 m depending upon the topographic conditions. The study area falls in the Tiruvannamalai which is categorized as Safe (< 70%) as per G.O (MS) No 113 dated 09.06.2016.

There are Seven open wells within the radius of 1km Most of the wells are almost in dry conditions: - The details of the well and depth in Post monsoon is described below:

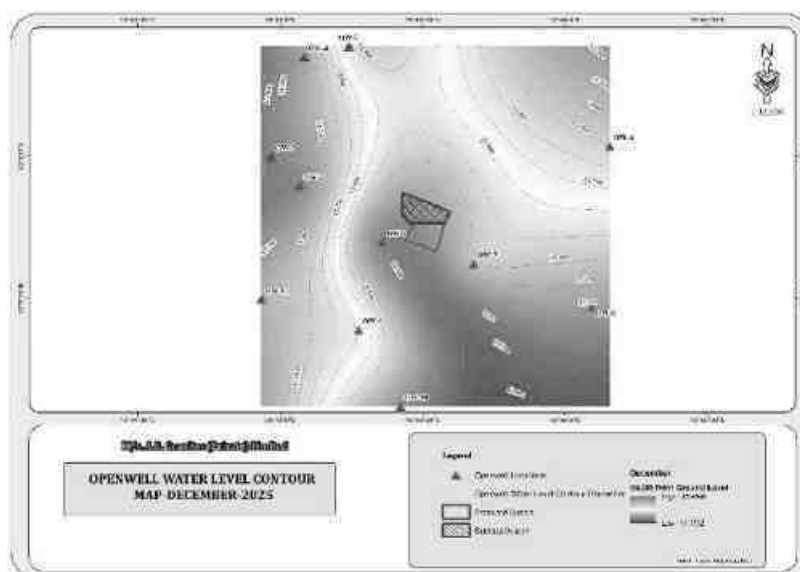
Table 3.11: Details of Borewell & Water Level In 1km Radius

S.No	Label	Longitude	Latitude	Dec-25	JAN26	FEB26
1	BW1	78° 45' 29.2847" E	12° 05' 33.3374" N	103.9	104.7	105.1
2	BW2	78° 45' 53.2262" E	12° 05' 40.4274" N	103.6	104.4	104.8
3	BW3	78° 46' 04.3160" E	12° 05' 26.6574" N	104.4	105.2	105.6
4	BW4	78° 45' 26.0979" E	12° 05' 23.0313" N	103.4	104.2	104.6
5	BW5	78° 45' 20.4341" E	12° 05' 08.4758" N	103.8	104.6	105
6	BW6	78° 45' 07.8230" E	12° 05' 42.0780" N	103.7	104.5	104.9
7	BW7	78° 44' 51.4999" E	12° 06' 00.8799" N	104.6	105.4	105.8
8	BW8	78° 45' 14.0121" E	12° 06' 24.7463" N	104.8	105.6	106

Source: Data obtained by the FAE & Team Members

Table 3.12: Details of Open well & Water Level in 1km Radius

S.No	Label	Longitude	Latitude	Dec-25	JA26	FE26
1	OW-1	78° 45' 21.6432" E	12° 05' 41.8645" N	12	12.8	13.4
2	OW-2	78° 45' 04.2211" E	12° 05' 53.7607" N	13.4	14.2	14.8
3	OW-3	78° 44' 58.2189" E	12° 05' 59.9259" N	13.4	14.2	14.8
4	OW-4	78° 45' 05.2175" E	12° 06' 20.8687" N	13.2	14	14.6
5	OW-5	78° 45' 14.6207" E	12° 06' 23.1246" N	12.5	13.3	13.9
6	OW-6	78° 46' 09.5103" E	12° 06' 02.0303" N	12.9	13.7	14.3
7	OW-7	78° 45' 40.7902" E	12° 05' 37.1715" N	12.4	13.2	13.8
8	OW-8	78° 46' 05.7253" E	12° 05' 28.1327" N	12.2	13	13.6
9	OW-9	78° 45' 16.6407" E	12° 05' 23.3453" N	12.7	13.5	14.1
10	OW-10	78° 45' 25.4349" E	12° 05' 07.3775" N	12.1	12.9	13.5
11	OW-11	78° 44' 56.1234" E	12° 05' 29.8485" N	13.1	13.9	14.5

Figure 3.7: Winter Season Water Level of Bore Well 1 Km Radius**December 2025****January – 2026****February 2026****Figure 3.8: Winter Water Level of Open Well 1 Km Radius****December 2025**

January – 2026



February -2026

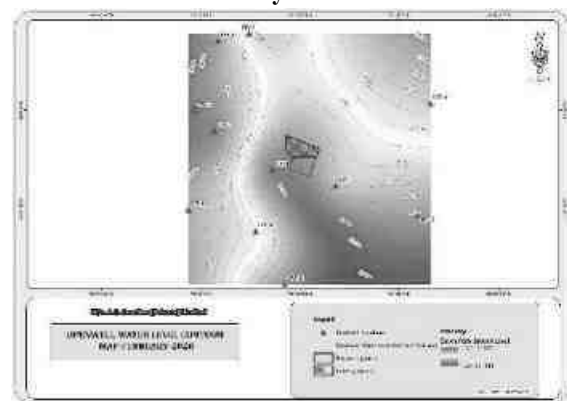


Figure 3.9: Drainage Map Around 10 Km Radius from Project Site

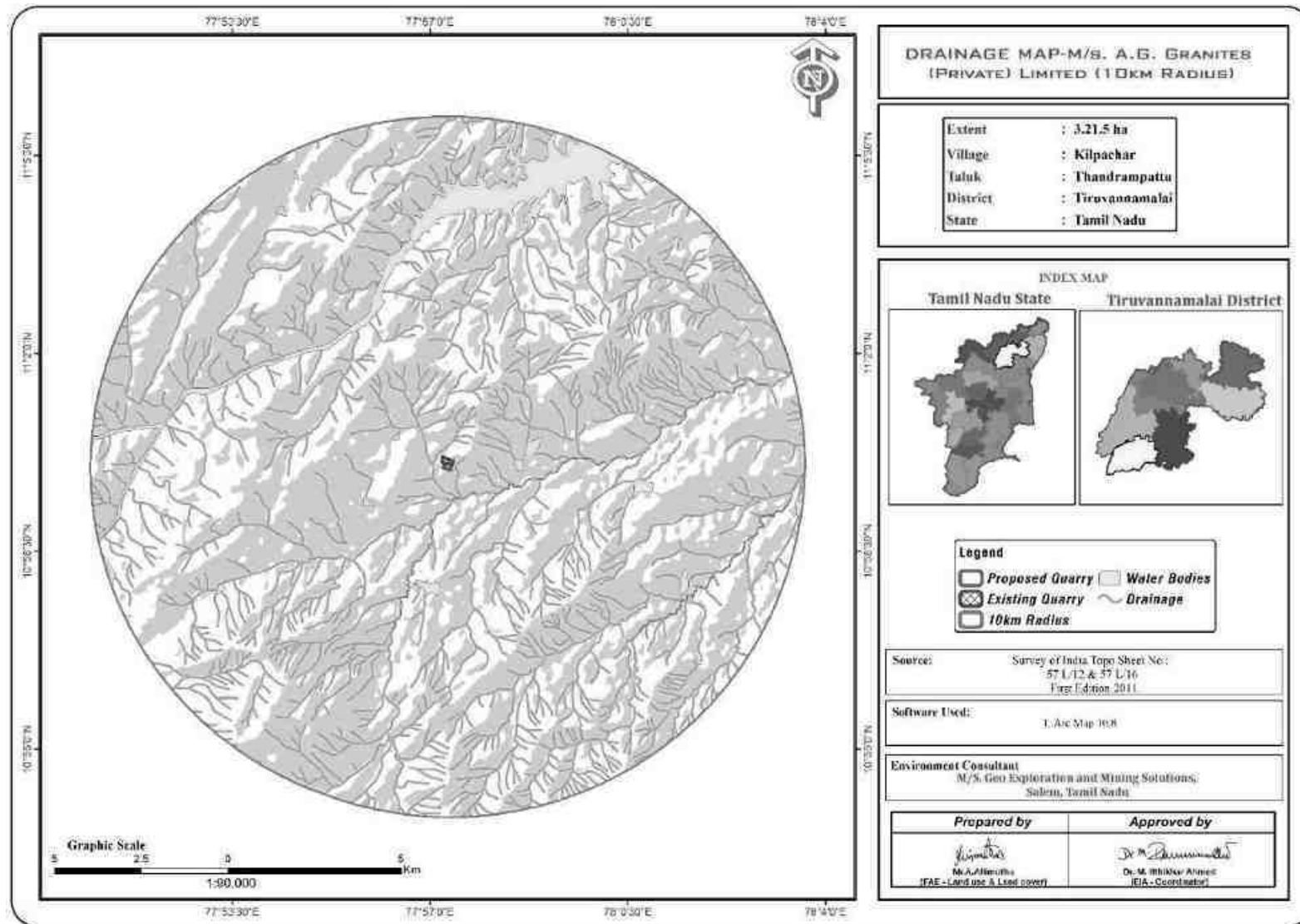
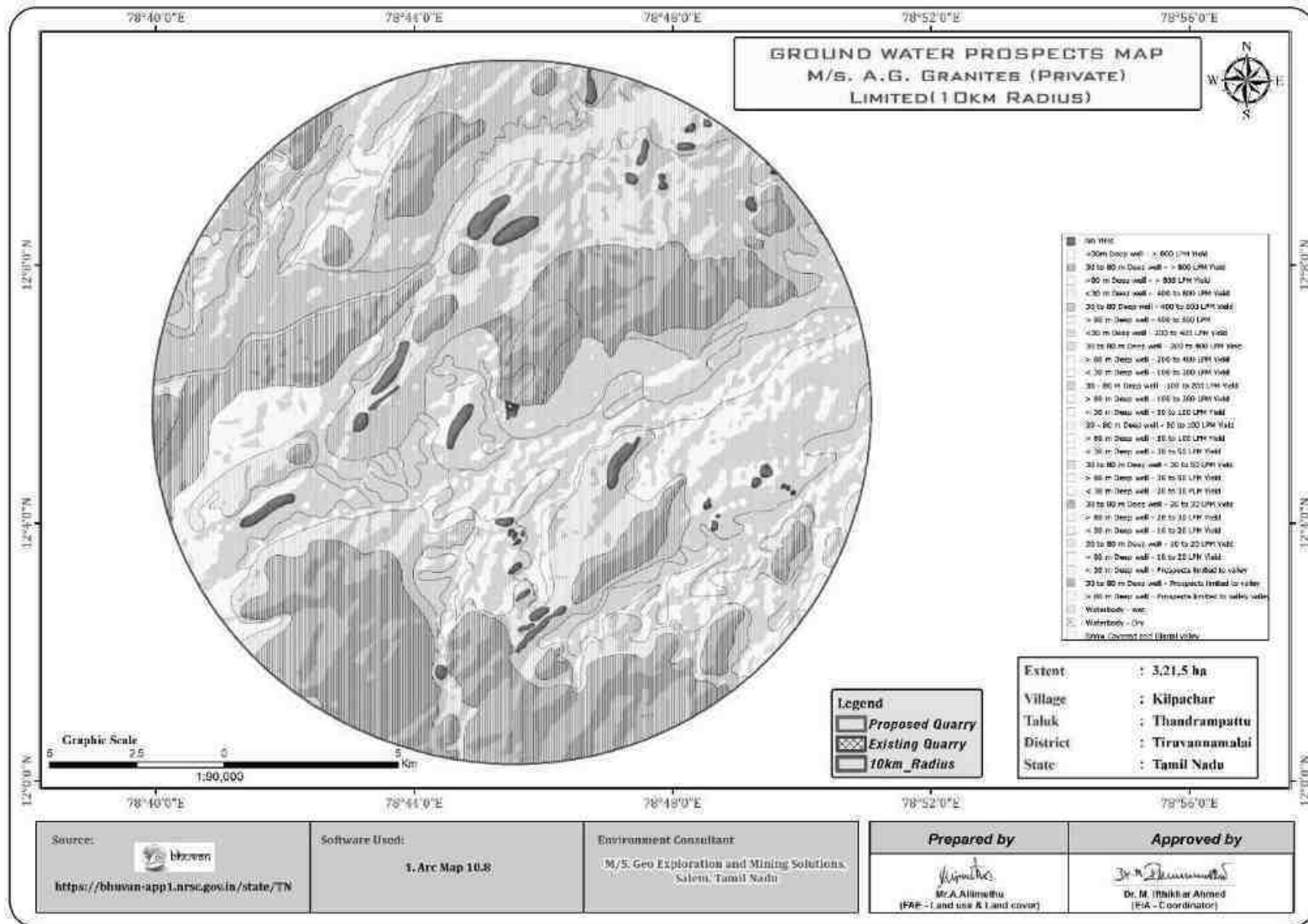


Figure 3.10: Ground Water Prospect Map



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 sources of air pollution in the region are mostly due to vehicular traffic, dust arising from unpaved village road and domestic & agricultural activities. 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.

This section describes the identification of sampling locations, methodology adopted during the monitoring period and sampling frequency.

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 climatic conditions of Tiruvannamalai are characterized by a tropical climate. In Tiruvannamalai, the quantity of rainfall during summers surpasses that of winters. This location is classified as Aw by Köppen and Geiger. The average annual temperature is 27.4 °C | 81.3 °F in Tiruvannamalai. The rainfall here is around 811 mm | 31.9 inch per year.
- Tiruvannamalai are in the middle of our planet and the summers are not easy to define. The optimal period to plan a visit would be during the months of January, February, March, September, December.
- In terms of precipitation, the month with the lowest amount of rainfall is February, recording a mere 7 mm | 0.3 inch in its entirety. This denotes an exceptionally dry period within that particular time frame. On average, the highest amount of rainfall occurs during October with a mean value of 154 mm | 6.1 inch.
- The month that experiences the highest temperatures throughout the year is referred to as May, where an average temperature of 31.3 °C | 88.4 °F prevails. On average, the month of January is considered to be the coldest time of year with temperatures averaging at around 23.3 °C | 73.9 °F.
- <https://en.climate-data.org/asia/india/tamil-nadu/tiruvannamalai-24067/>

Rainfall

Table 3.13: Rainfall Data

Actual Rainfall in mm					Normal Rainfall in mm
2017	2018	2019	2020	2021	
1251.3	799.2	1071.9	1034.5	1592.5	985

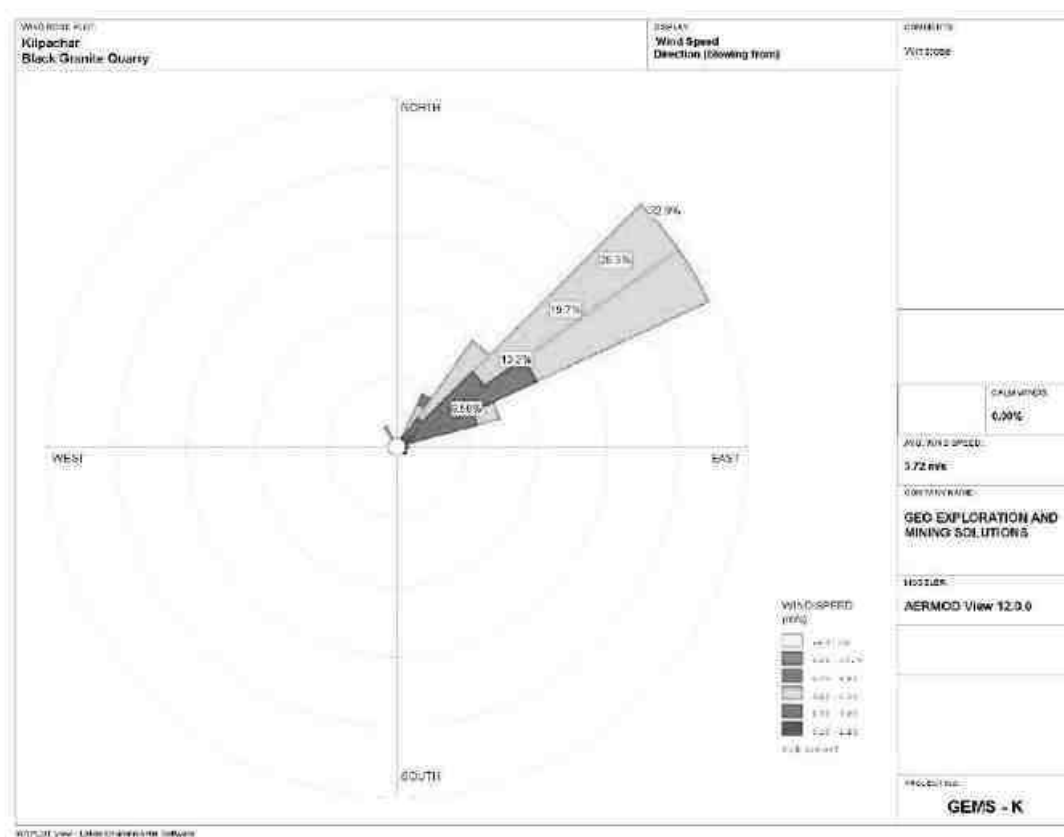
Source: <https://www.twadboard.tn.gov.in/content/tiruvannamalai>

Table 3.14: Meteorological Data Recorded at Site

S.No	Parameters		Dec-2025	Jan-2026	Feb-2026
1	Temperature ($^{\circ}\text{C}$)	Max	24.44	23.68	27.75
		Min	19.46	21.28	21.49
		Avg	21.95	22.48	24.62
2	Relative Humidity (%)	Avg	82.79	76.27	62.73
3	Wind Speed (m/s)	Max	5.05	5.71	4.79
		Min	2.09	2.37	2.58
		Avg	3.57	4.04	3.68
4	Cloud Cover (OKTAS)		0-8	0-8	0-8
5	Wind Direction		NE,ENE	NE,ENE	NE,ENE

Correlation between Secondary and Primary Data

The meteorological data collected at the site is almost similar to that of secondary data collected from IMD station. A comparison of site data generated during the three months with that of IMD, Wind rose diagram of the study site is depicted in Figure. 3.12. Predominant downwind direction of the area during study season is East - East to North East.

Figure 3.11: Windrose Diagram

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

- Predominant winds were from NE, NW
- Wind velocity readings were recorded between 5.70 - 8.80 m/s
- Temperature readings ranging from 21.95 – 24.62°C
- Relative humidity ranging from 62.73 – 82.79%

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

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 Chennai Mettix Lab Private Limited & CPCB Notification

Table 3.15: 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 December 2025 – February 2026. 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.

It was ensured that the equipment was placed preferably at a height of at least 3 ± 0.5 m above the ground level at each monitoring station, for negating the effects of wind-blown ground dust. The equipment was placed at 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 3.6.1 for assessment of the existing ambient air quality. Details of the sampling locations are as per given below.

Table 3.16: Ambient Air Quality (AAQ) Monitoring Locations AAQ1-AAQ7

S. No	Location Code	Monitoring Locations	Distance & Direction	Coordinates
1	AAQ-1	Core Zone	Project Area	12° 5'41.95"N 78°45'27.92"E
2	AAQ-2	Existing Quarry	90m NE	12° 5'48.20"N 78°45'35.63"E
3	AAQ-3	Kilpasar	410m South	12° 5'27.50"N 78°45'27.61"E
4	AAQ-4	Melpasar	1.8km NW	12° 6'16.29"N 78°44'36.18"E
5	AAQ-5	Reddiarpalayam	2.8km East	12° 5'33.75"N 78°47'3.63"E
6	AAQ-6	Beemarapatti	6.2km SW	12° 2'28.05"N 78°44'32.24"E
7	AAQ-7	Manthikulampatti (school)	5.5km SW	12° 5'31.48"N 78°42'23.57"E

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

Figure 3.12: Ambient Air Quality Locations Around 10 Km Radius

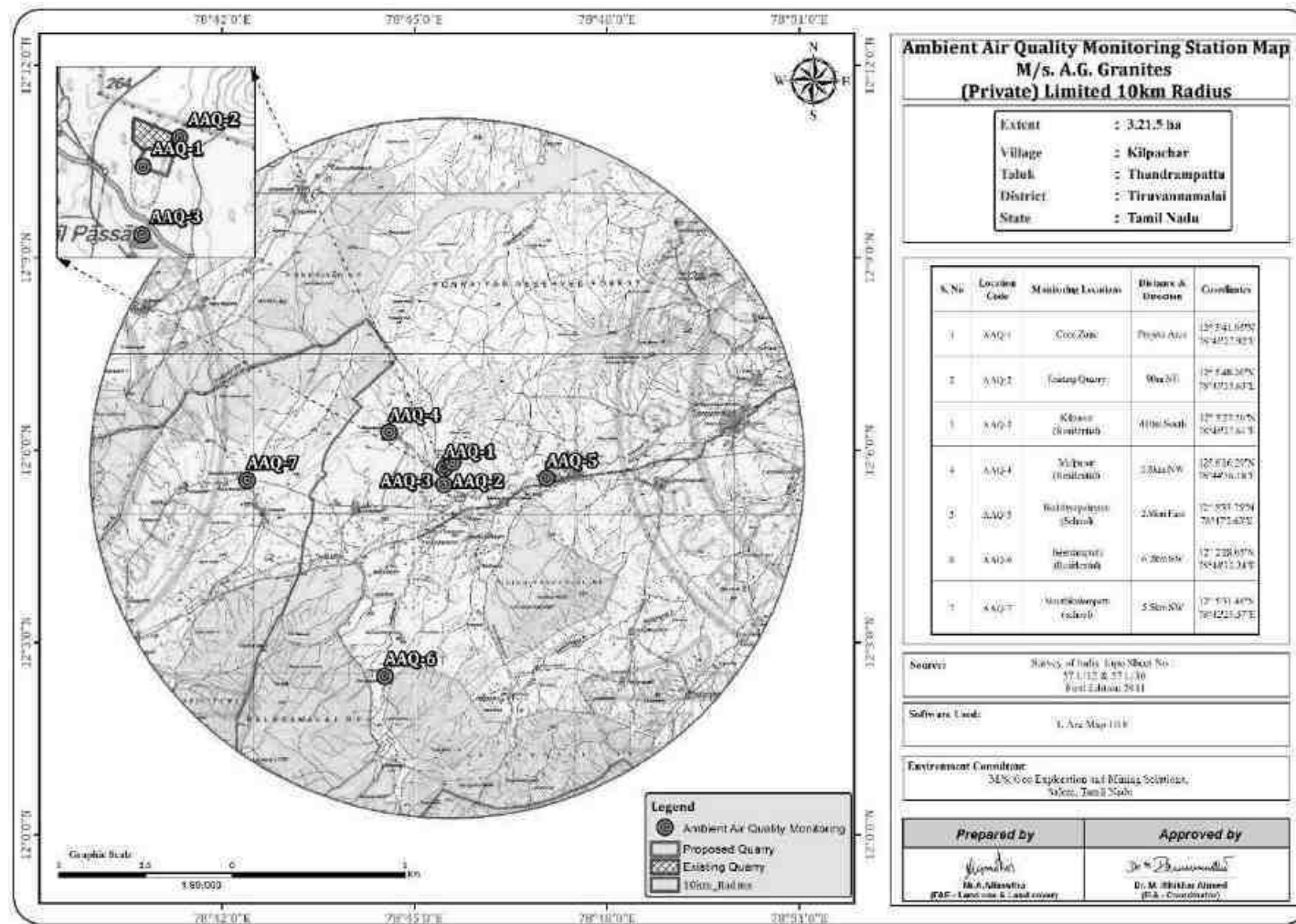


Table 3.25: Abstract of Ambient Air Quality Data

1	Parameter	PM10	PM2.5	SO ₂	NO ₂
2	No. of Observations	260	260	260	260
3	10 th Percentile Value	33.3	18.0	5.1	17.3
4	20 th Percentile Value	34.7	19.4	5.4	17.6
5	30 th Percentile Value	35.9	20.2	5.6	17.9
6	40 th Percentile Value	38.6	21.1	5.8	18.5
7	50 th Percentile Value	39.2	21.6	5.9	18.9
8	60 th Percentile Value	40.2	22.2	6.1	20.0
9	70 th Percentile Value	40.6	22.6	6.4	21.4
10	80 th Percentile Value	41.5	23.2	6.8	22.2
11	90 th Percentile Value	42.2	23.9	7.0	24.0
12	95 th Percentile Value	42.6	24.5	7.3	25.0
13	98 th Percentile Value	43.5	25.0	7.5	25.5
14	Arithmetic Mean	39.3	22.0	6.3	20.8
15	Geometric Mean	39.2	21.9	6.2	20.6
16	Standard Deviation	3.4	2.2	0.8	3.0
17	Minimum	33.3	18.0	5.1	17.3
18	Maximum	43.5	25.0	7.5	25.5
19	NAAQ Norms*	100.0	60.0	80.0	80.0
	% Values exceeding Norms*	0.0	0.0	0.0	0.0

Legend: PM_{2.5}-Particulate Matter size less than 2.5 µm; PM₁₀-Respirable Particulate Matter size less than 10 µm; SO₂-Sulphur dioxide; NO₂-Nitrogen Dioxide; CO-Carbon monoxide; O₃-Ozone; NH₃-Ammonia; Pb-Particulate Lead; As-Particulate Arsenic; Ni-Particulate Nickel; C₆H₆-Benzene & BaP- Benzo (a) pyrene in particulate phase levels were monitored below their respective detectable limits.

* NAAQ Norms-National Ambient Air Quality Norms-Revised as per GSR 826(E) dated 16.11.2009 for Industrial, Residential, Rural and other Area.

Table 3.26: Summary of Ambient Air Quality Data (AAQ1-AAQ7)

PM10	AAQ1	AAQ2	AAQ3	AAQ4	AAQ5	AAQ6	AAQ7
Arithmetic Mean	40.1	40.8	40.5	41.2	35.7	36.0	36.1
Minimum	30.5	34.2	32.8	39.6	32.2	32.1	32.2
Maximum	42.6	43.5	43.6	43.5	40.0	39.9	40.0
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	19.0	18.3	22.6	22.0	21.1	21.3	23.0
Minimum	17.3	16.8	20.1	19.1	19.0	19.0	21.0
Maximum	24.1	23.0	25.1	24.7	23.0	23.3	25.0
NAAQ Norms	60.0	60.0	60.0	60.0	60.0	60.0	60.0
SO ₂	AAQ1	AAQ2	AAQ3	AAQ4	AAQ5	AAQ6	AAQ7
Arithmetic Mean	5.5	5.6	6.4	5.7	8.5	6.2	6.3
Minimum	4.7	5.1	5.1	4.5	5.1	5.0	5.1
Maximum	6.4	6.2	7.5	7.0	64.0	7.2	7.5
NAAQ Norms	80.0	80.0	80.0	80.0	80.0	80.0	80.0
NO ₂	AAQ1	AAQ2	AAQ3	AAQ4	AAQ5	AAQ6	AAQ7
Arithmetic Mean	18.7	24.0	18.3	18.4	18.3	20.3	20.7
Minimum	17.5	21.5	16.2	16.8	16.2	16.9	19.0
Maximum	22.0	25.8	24.8	24.0	24.9	22.1	23.0
NAAQ Norms	80.0	80.0	80.0	80.0	80.0	80.0	80.0

FIGURE 3.13: BAR DIAGRAM OF SUMMARY OF AIR QUALITY MODEL(AAQ1-AAQ7)

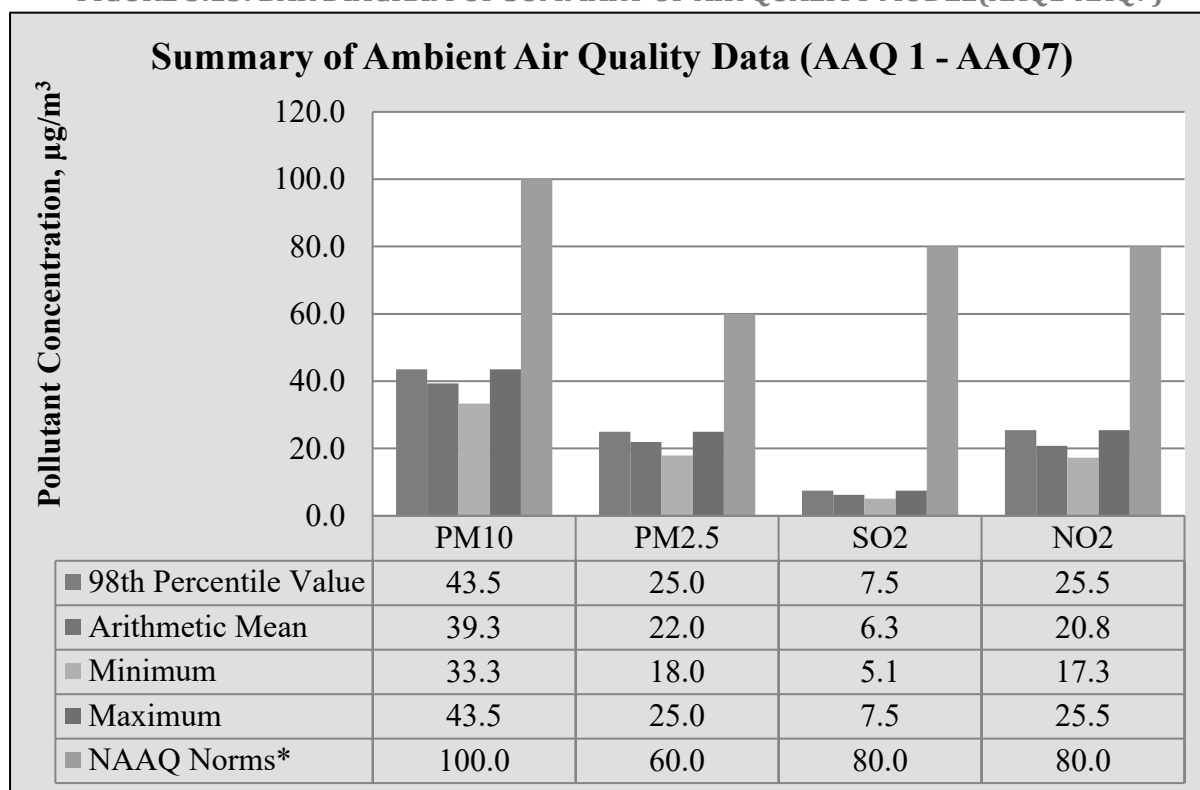


FIGURE 3.14 : BAR DIAGRAM OF PARTICULATE MATTER (PM2.5)

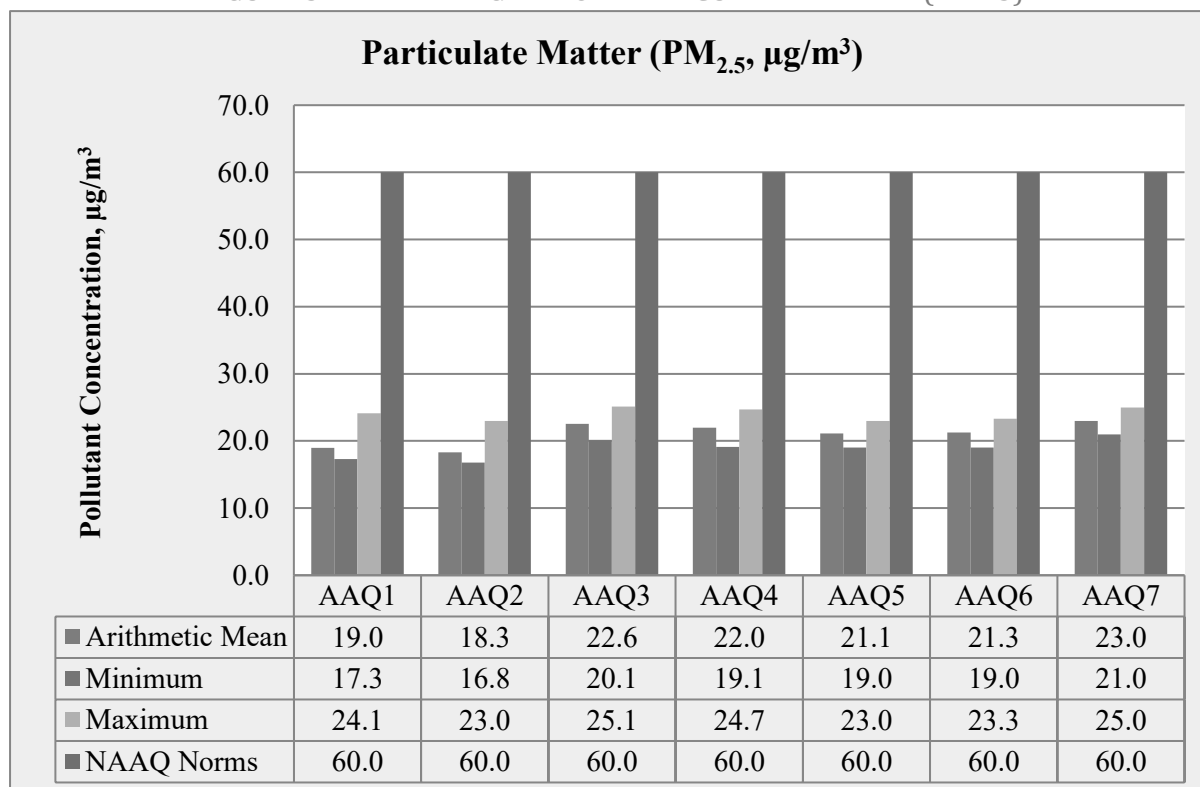


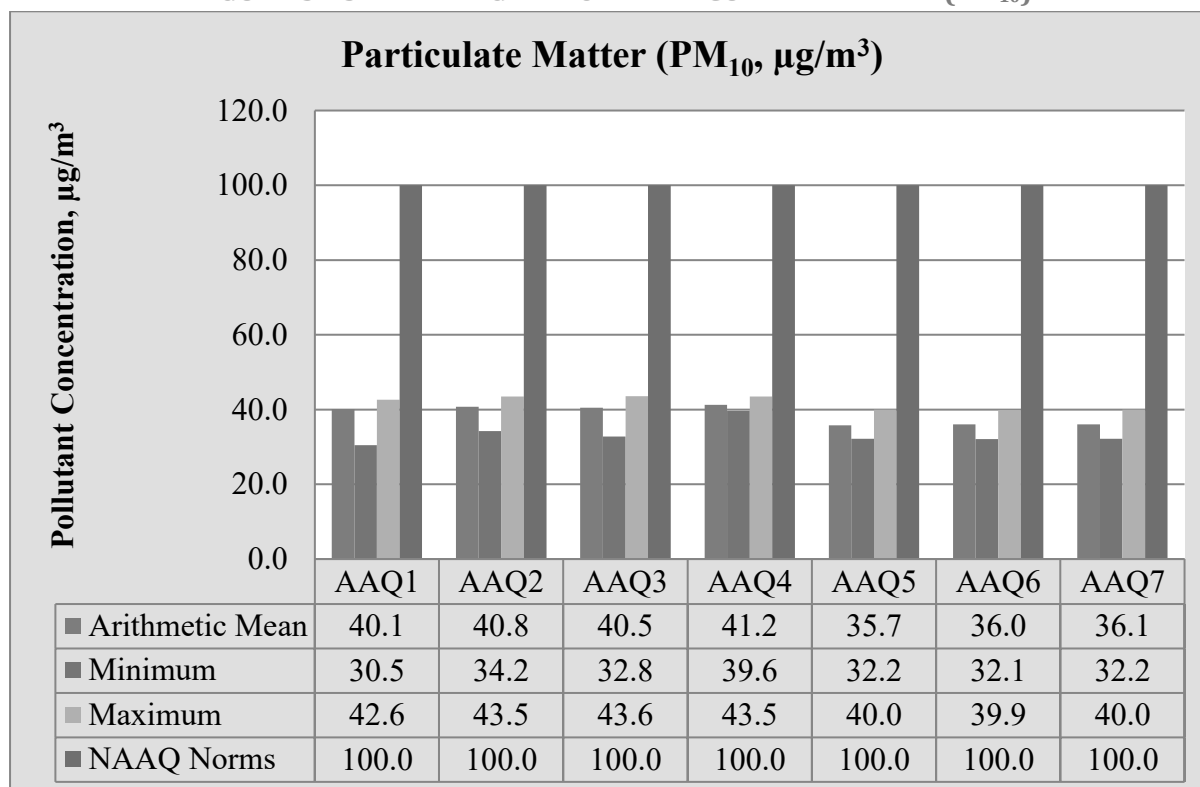
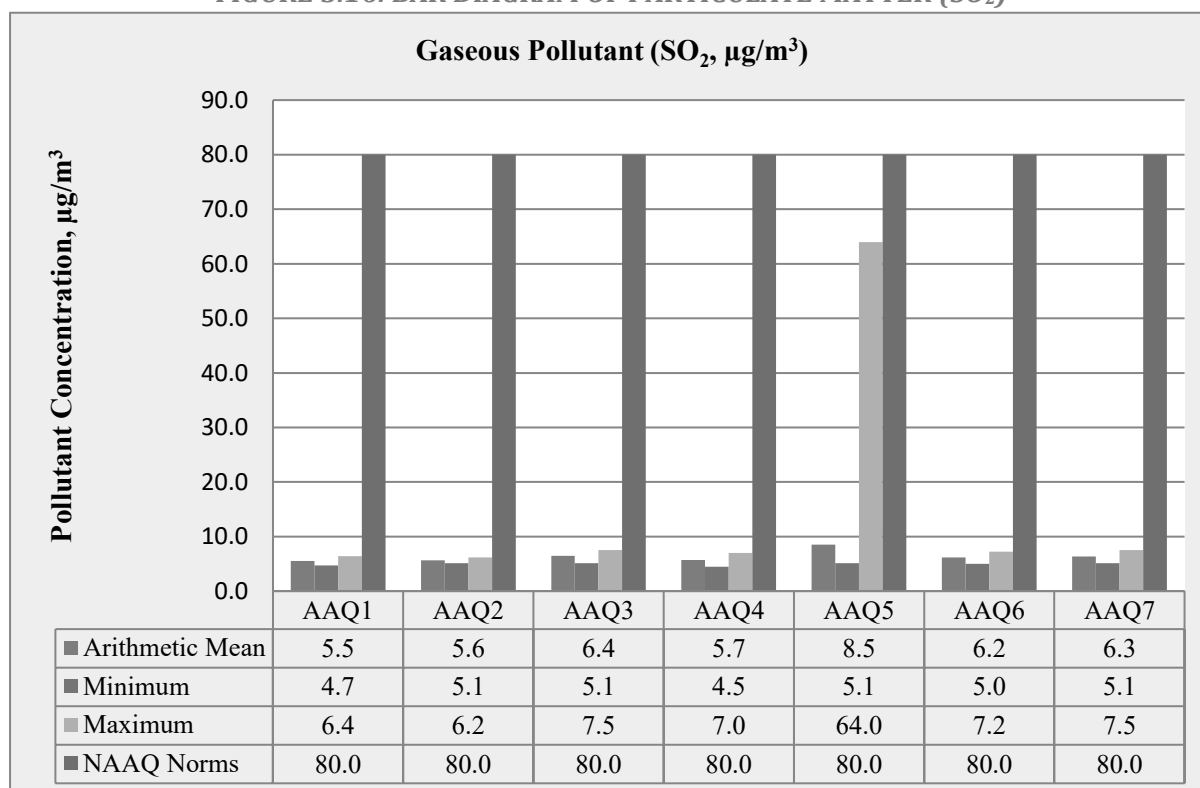
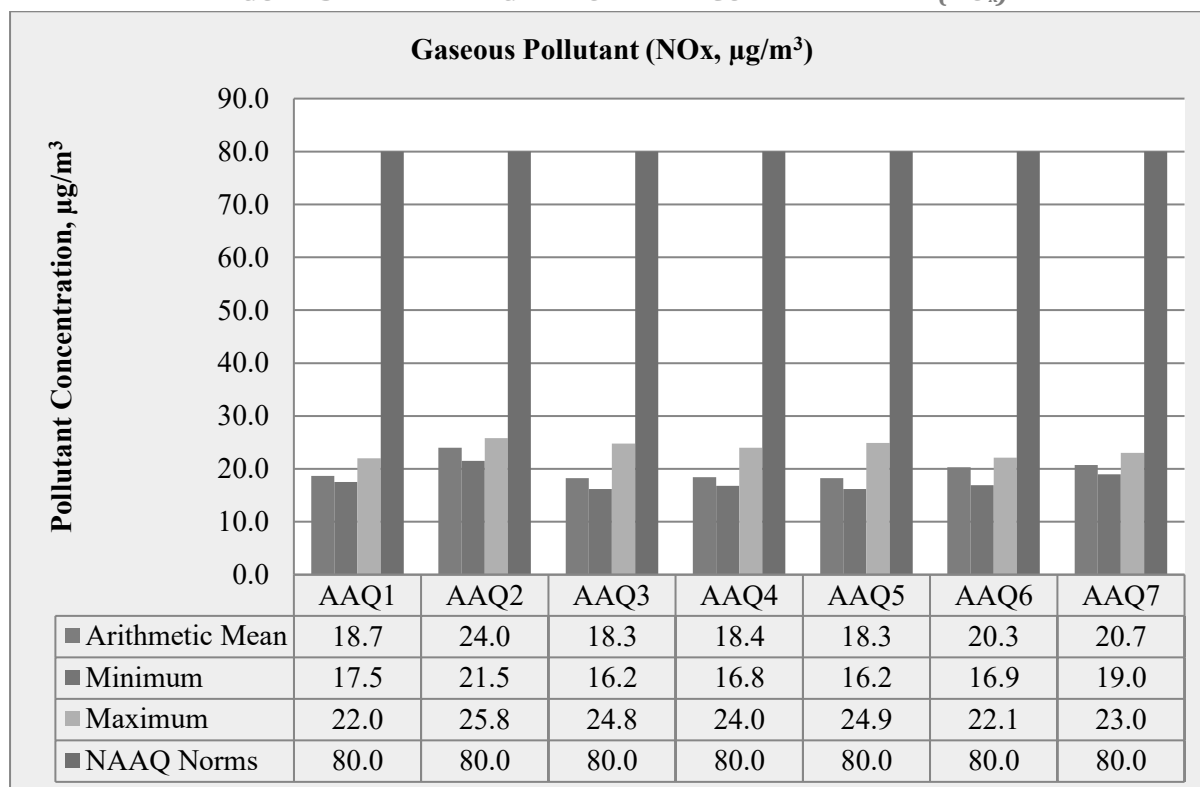
FIGURE 3.15: BAR DIAGRAM OF PARTICULATE MATTER (PM₁₀)**FIGURE 3.16: BAR DIAGRAM OF PARTICULATE MATTER (SO₂)**

FIGURE 3.17: BAR DIAGRAM OF PARTICULATE MATTER (NO_x)

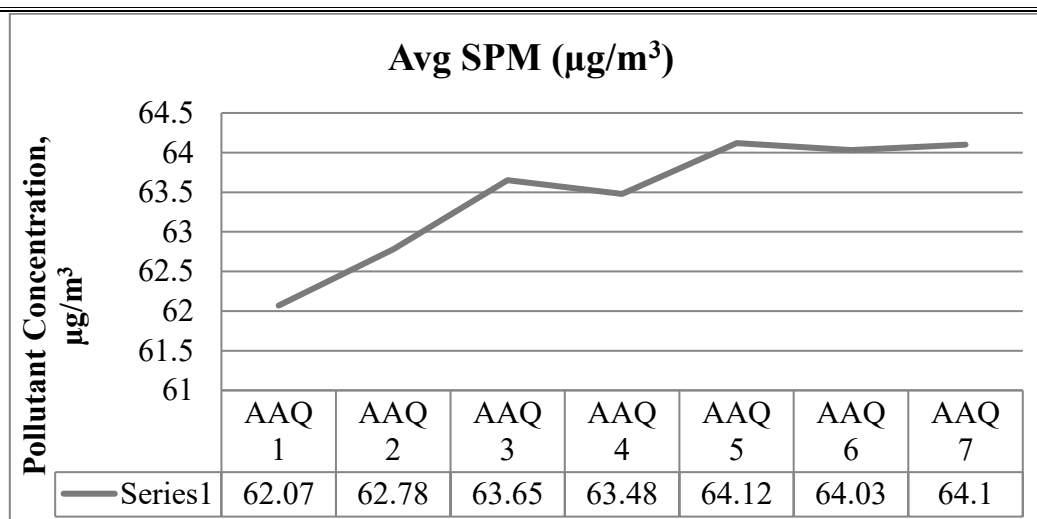
3.3.7 FUGITIVE DUST EMISSION –

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

Table 3.27: Average Fugitive Dust Sample Values In mg/m³

AAQ Locations	Avg SPM (µg/m ³)
AAQ 1	60.31
AAQ 2	61.61
AAQ 3	62.95
AAQ 4	62.89
AAQ 5	62.86
AAQ 6	63.45
AAQ 7	63.91

Source: Onsite monitoring/ sampling by KGS Labs Private Limited

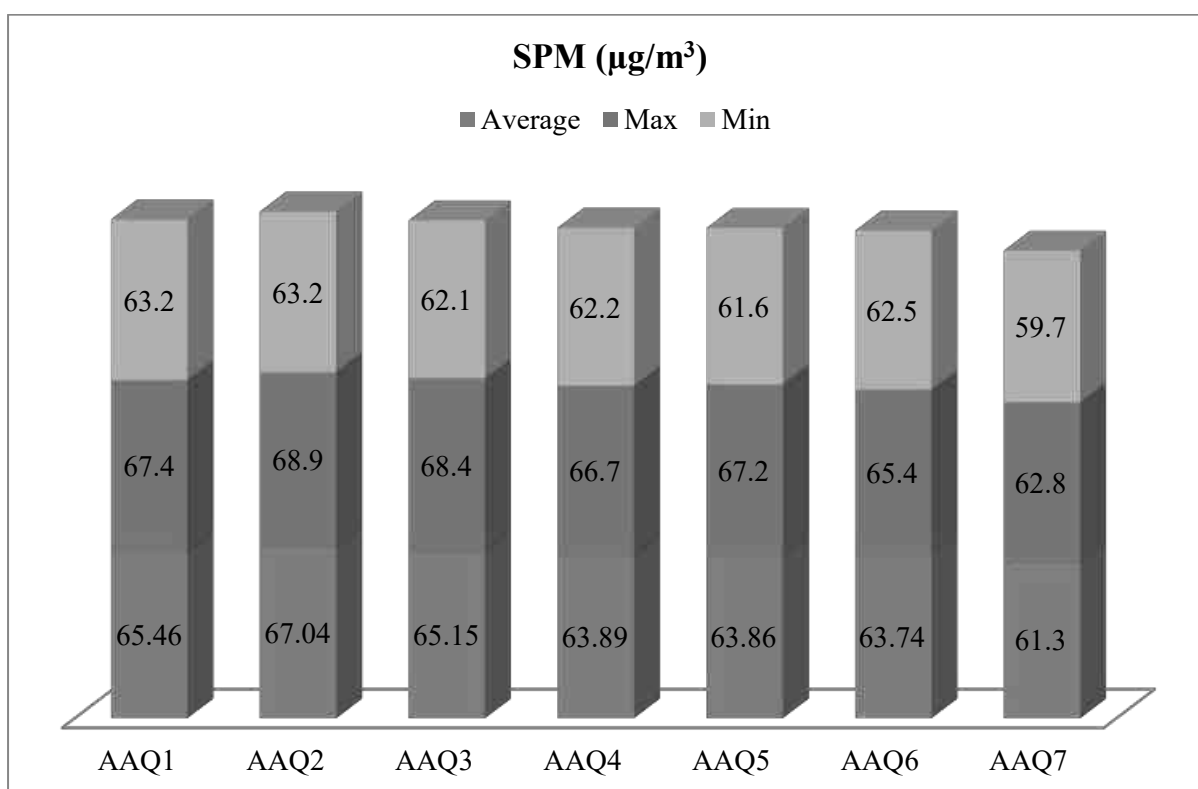


Source: Line Diagram of Table 3.25

Table 3.28 : Fugitive Dust sample values in $\mu\text{g}/\text{m}^3$ –

SPM ($\mu\text{g}/\text{m}^3$)	AAQ1	AAQ2	AAQ3	AAQ4	AAQ5	AAQ6	AAQ7
Average	62.07	62.78	63.65	63.48	64.12	64.03	64.1
Min	60.1	60.5	61	61.2	62	62	62.1
Max	64.9	64.9	66.4	65.4	66	66	66.5

Source: Field Data's



Source: Bar Diagram of table 3.26

3.3.6 Interpretations & Conclusion

As per monitoring data, PM₁₀ ranges from 33.3 µg/m³ to 43.5 µg/m³, PM_{2.5} data ranges from 18.0 µg/m³ to 25.0 µg/m³, SO₂ ranges from 5.1 µg/m³ to 7.5 µg/m³ and NO₂ data ranges from 17.3 µg/m³ to 25.5 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 Seven (7) locations. The noise level monitoring locations were carried out by covering commercial, residential, rural areas within the radius of 10 km. A noise monitoring methodology was chosen such that it best suited the purpose and objectives of the study.

Table 3.29: Details of Noise Monitoring Locations

S. No	Location code	Monitoring Locations	Distance & Direction	Coordinates
1	N-1	Core Zone	Project Area	12° 5'42.78"N 78°45'26.92"E
2	N-2	Existing Quarry	90m NE	12° 5'48.52"N 78°45'35.02"E
3	N-3	Kilpasar	410m South	12° 5'27.84"N 78°45'27.20"E
4	N-4	Melpasar	1.8km NW	12° 6'16.12"N 78°44'35.84"E
5	N-5	Reddiarpalayam	2.8km East	12° 5'33.42"N 78°47'3.63"E
6	N-6	Beemarapatti	6.2km SW	12° 2'27.99"N 78°44'31.77"E
7	N-7	Manthikulampatti	5.5km SW	12° 5'31.73"N 78°42'23.94"E

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

3.4.2 Method of Monitoring

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

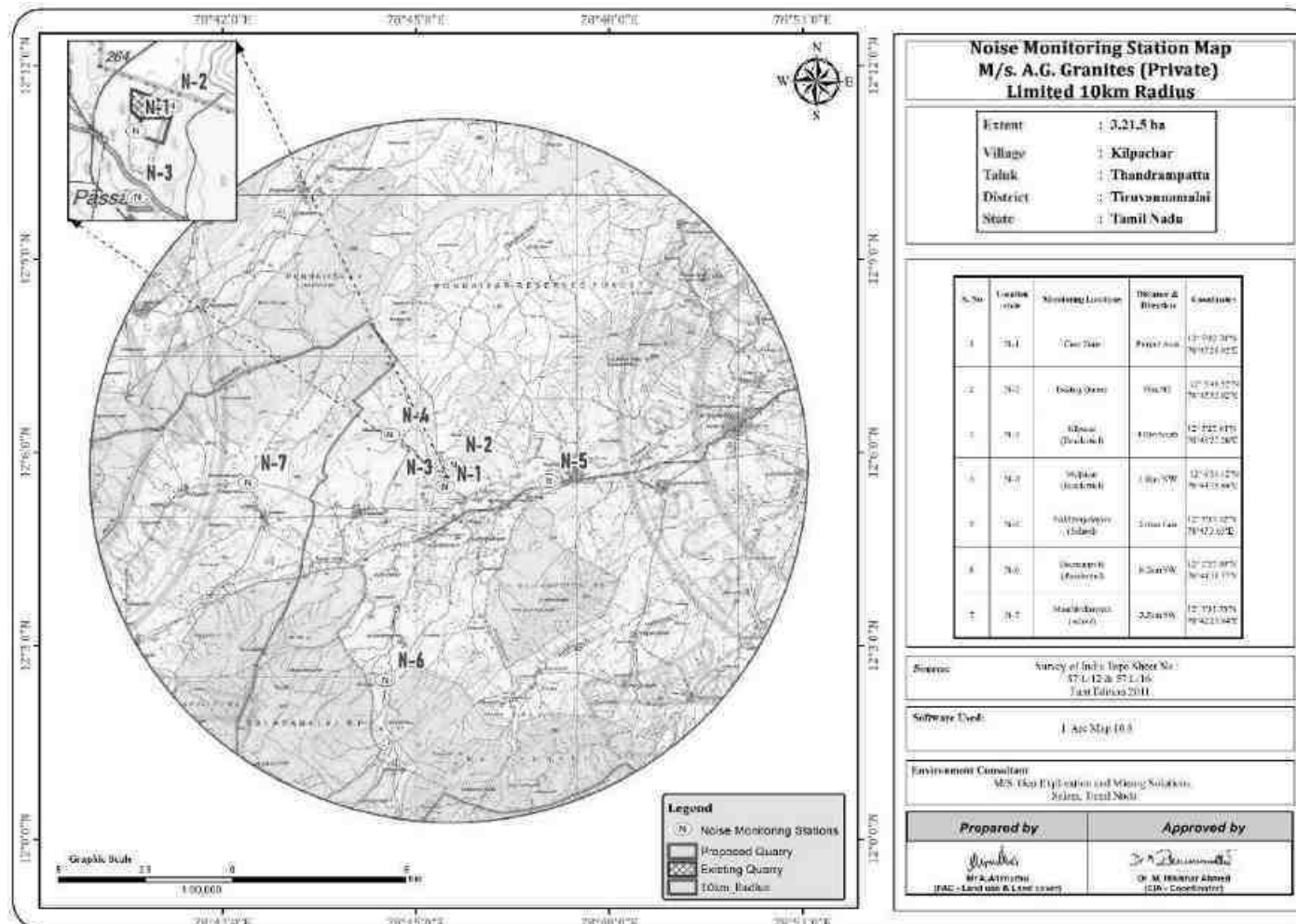
Measured noise levels, displayed as a function of time, is useful for describing the acoustical climate of the community. Noise levels recorded at each station with a time interval of about 60 minutes are computed for equivalent noise levels. Equivalent noise level is a single number descriptor for describing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

$$Leq = 10 \log L / T \sum (10L_n/10)$$

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

T = Time interval of observation

Figure 3.18: Noise Monitoring Stations Around 10 Km Radius



3.4.3 Analysis of Ambient Noise Level in the Study Area

The Digital Sound pressure level have 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 3.28

Day time: 6:00 hours to 22.00 hours.

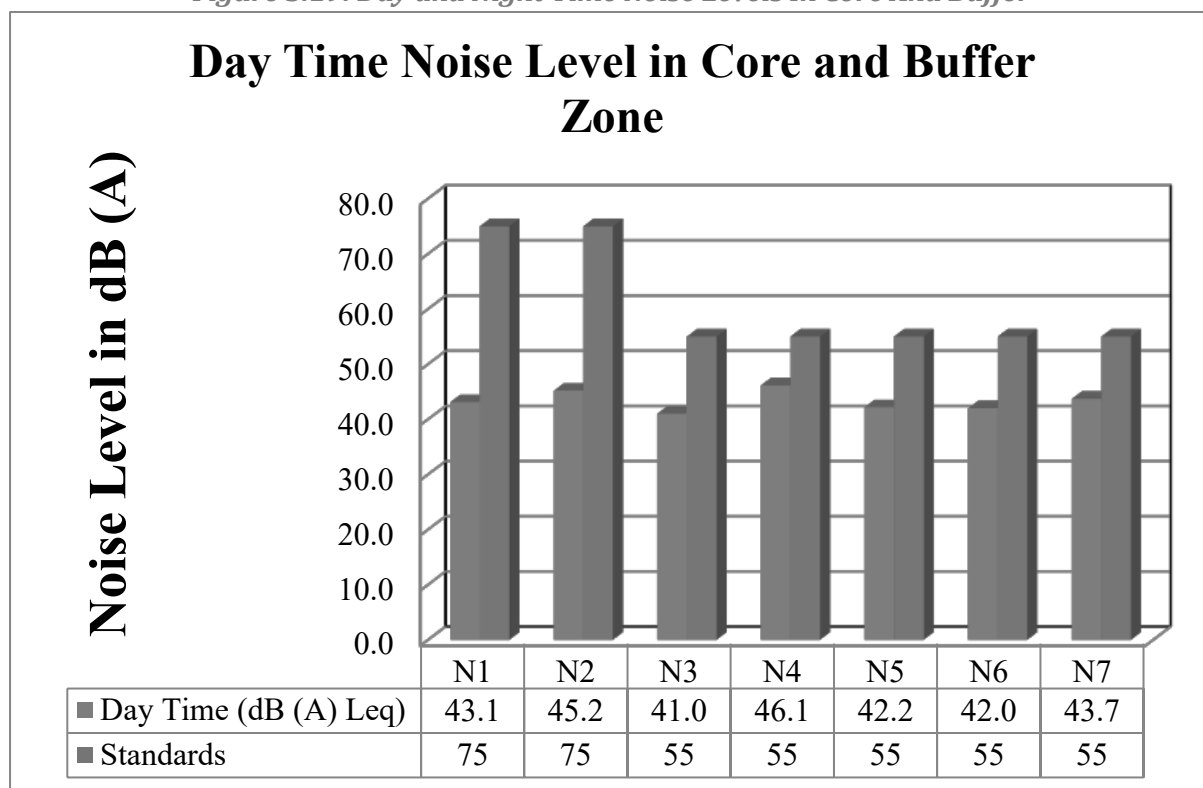
Night time: 22:00 hours to 6.00 hours.

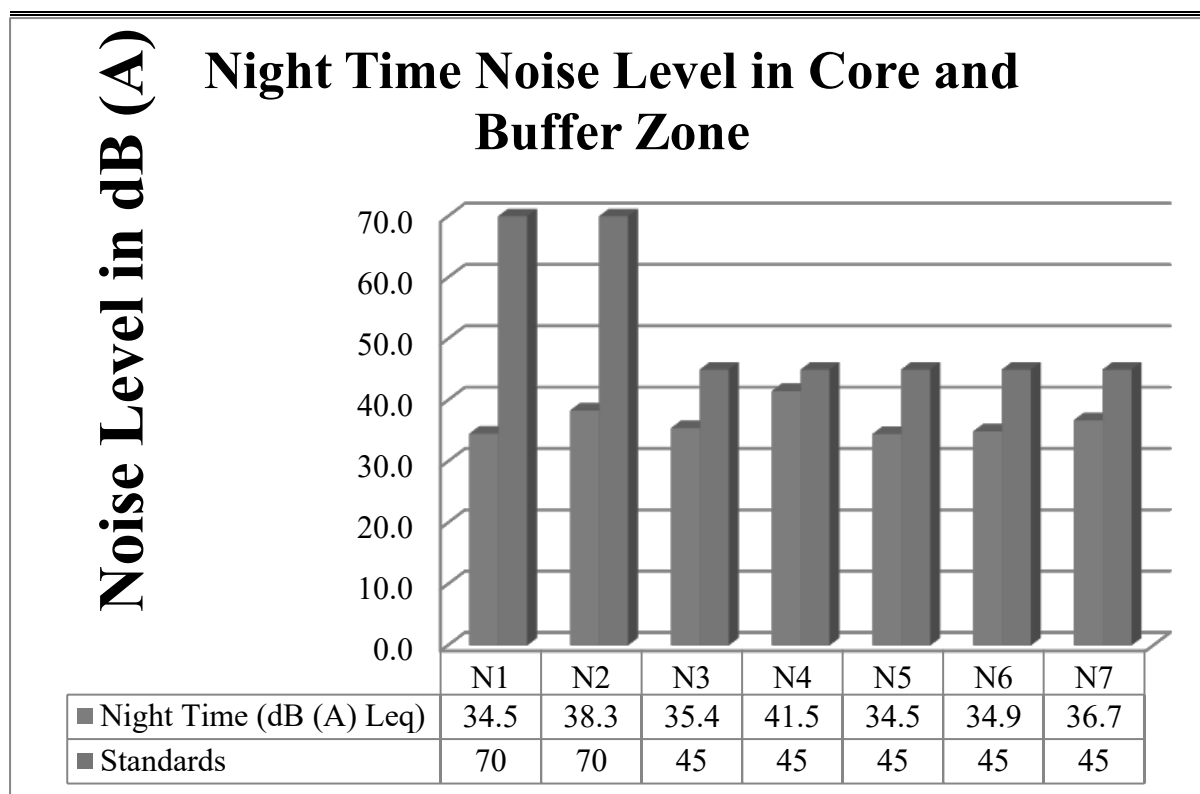
Table 3.30: Ambient Noise Quality Result

S. No	Locations	Noise level (dB (A) Leq)		Ambient Noise Standards
		Day Time	Night Time	
1	Core Zone	43.1	34.5	Industrial Day Time- 75 dB (A) Night Time- 70 dB (A)
2	Existing Quarry	45.2	38.3	
3	Kilpasar (Residential)	41.0	35.4	
4	Melpasar (Residential)	46.1	41.5	Residential Day Time- 55 dB (A) Night Time- 45 dB (A)
5	Reddiarpalayam (School)	42.2	34.5	
6	Beemarpatti (Residential)	42.0	34.9	
7	Manthikulampatti (school)	43.7	36.7	

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

Figure 3.19: Day and Night Time Noise Levels In Core And Buffer





3.4.4 Interpretation & Conclusion:

Ambient noise levels were measured at 7 locations around the proposed and existing project area. Noise levels recorded in core zone during day time were from 43.1 – 45.2 dB (A) Leq and during night time were from 34.5 – 38.3 dB (A) Leq. Noise levels recorded in buffer zone during day time were from 41.0 – 46.1 dB (A) Leq and during night time were from 34.5 – 41.5 dB (A) Leq.

3.5 Biological Environment

3.5.1. Study area Ecology

The study of the biological environment is one of the important aspects of Environmental Impact Assessments. The biotic component comprises both plant and animal communities which interact within the community and between themselves but also with abiotic i.e. physical and chemical components of the environment. A general ecological survey was carried out in the study area of 10 km radius around the Mine area. The study Area is not part of any National Park, Sanctuary, Biosphere Reserve, Wildlife Corridors, Migratory Path, etc. The primary data was generated by preparing a general checklist of all plants encountered in the study area. The species of vegetation found were identified and listed according to their families. The division of core and buffer zone is the best way to study the pattern of biodiversity for environmental impact assessment.

3.5.2. Objectives of Biological Studies

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

g) Devise management & conservation measures for biodiversity.

3.5.3. Methodology of Sampling

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.

The faunal elements (animal species) of core and buffer zone were identified by direct sightings or indirect evidences viz. pug marks, skeletal remains, scats and droppings etc. (Jayson and Easa 2004). Standard binocular was used for the observations. The authenticity of faunal elements occurrence was confirmed by interaction with the local people. Avifauna identification was done with pictorial descriptions of published literature. Information pertaining to existence of any migratory corridors and paths were obtained from local inhabitants. The status of each faunal element was determined and the Wildlife schedule category was ascertained as per the IUCN-Red Data Book and Indian wildlife (Protection) Act, 1972.

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

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

3.5.3.1. 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. Equipment/ References

- 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

3.5.4.1. Transect walk – Birds

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

3.5.4.2. Modified Pollard Walk – for Butterflies

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

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

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

3.5.4.4. Observational methods- Mammals

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

3.5.4.5. Multiple Stage Quadrat – Vegetation

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

3.5.5. Flora

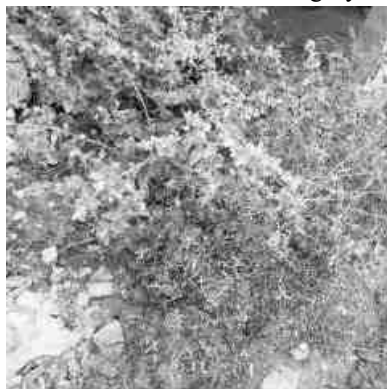
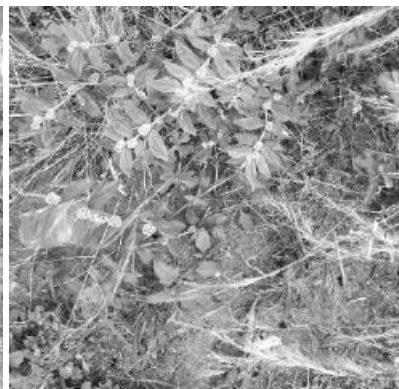
The quadrat sampling technique was used for sampling vegetation. Sampling quadrats of the regular shape of dimensions 10 × 10 m, 5 × 5 m, and 1 × 1 m, were nested within each other and were defined as the units for sampling the area and measuring the diversity of trees, Shrubs, and herbs respectively.

Table No: 3.53. Flora in the Core Zone of M/s.A.G.Granites Pvt Ltd Black Granite Quarry

Sl.No	English Name	Vernacular Name	Scientific Name	Family Name
Trees				
1.	White Bark Acacia	Vela maram	<i>Vachellia leucophloea</i>	Fabaceae
2.	Neem or Indian lilac	Vembu maram	<i>Azadirachta indica</i>	Meliaceae
3.	Singapore Cherry	Ten pazham	<i>Muntingia calabura</i>	Malvaceae
4.	Millettia Pinnata	Pongam oiltree	<i>Pongamia pinnata</i>	Fabaceae
5.	Bitter Albizia	Arappu Tree	<i>Albizia amara</i>	Fabaceae
Shrubs				
1.	West Indian Lantana	Unni chedi	<i>Lantana camara</i>	Verbenaceae
2.	Avaram	Avarai	<i>Senna auriculata</i>	Fabaceae
3.	Yellow elder	Manjarali	<i>Tecoma stans</i>	Bignoniaceae
4.	Milk Weed	Erukku	<i>Calotropis gigantea</i>	Apocynaceae
Herbs				
1.	Common leucas	Thumbai	<i>Leucas aspera</i>	Lamiaceae
2.	Ban Tulsi	Milagai poondur	<i>Croton sparsiflorus</i>	Euphorbiaceae
3.	Coat buttons	Thatha poo	<i>Tridax procumbens</i>	Asteraceae
4.	Indian mallow	Thuthi	<i>Abutilon indicum</i>	Meliaceae
5.	Asthma-plant	Amman pacharisi	<i>Euphorbia hirta</i>	Euphorbiaceae
6.	Devil's thorn	Nerunji	<i>Tribulus terrestris</i>	Zygophyllales
7.	Fish poison	Kolunchi	<i>Tephrosia purpurea</i>	Fabaceae
8.	Pignut	Nattapoochedi	<i>Hyptis suaveolens</i>	Lamiaceae
9.	Flannel Weed	Sida mutti	<i>Sida cordifolia</i>	Malvaceae
10.	Indian nettle	Nayuruvi	<i>Achyranthes aspera</i>	Amaranthaceae
Climber				
1.	Stemmed vine	Perandai	<i>Cissus quadrangularis</i>	Vitaceae
Grasses				
1.	Eragrostis	Pullu	<i>Eragrostis ferruginea</i>	Poaceae
2.	Great brome	Thodappam	<i>Bromus diandrus</i>	Poaceae

3.5.5.1. Flora Composition in the Core Zone

Taxonomically a total of 21 species belonging to 14 families have been recorded from the core mining lease area. The proposed area applied area is situated on plain terrain. Based on the habitat classification of the enumerated plants the majority of species were Herbs 11 followed by Trees 5, Shrubs 3, Climber 1, and Grasses 2. Details of flora with the scientific name were mentioned in Table No. 3.53. The result of the core zone of flora studies shows that Fabaceae and Poaceae, Apocynaceae are the main dominating species in the study area mentioned in Table No.3.53. No species found as threatened category.

a. *Tecoma stans*b. *Abutilon indicum*c. *Euphorbia hirta*d. *Azadirachta indica*e. *Senna auriculata*f. *Calotropis gigantea*

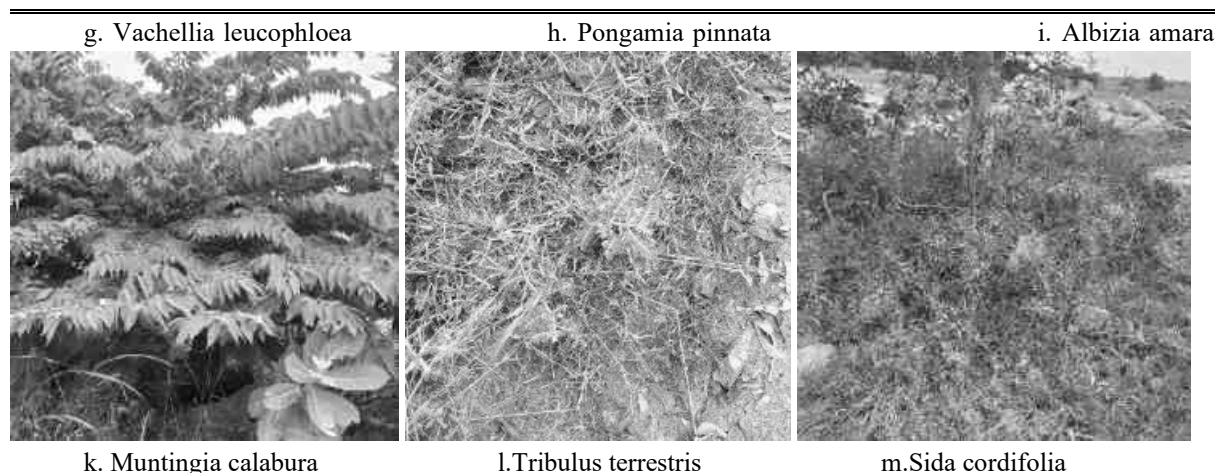


Fig No: 3.33. Flora species observation in the core zone area

Table No: 3.54. Flora in the Buffer zone of study area.

S.No	English Name	Vernacular Name	Scientific Name	Family Name
Trees				
1.	Millettia Pinnata	Pongam oiltree	<i>Pongamia pinnata</i>	Fabaceae
2.	White Bark Acacia	Vela maram	<i>Vachellia leucophloea</i>	Fabaceae
3.	Asian Palmyra palm	Panai maram	<i>Borassus flabellifer</i>	Arecaceae
4.	Lemon	Ezhumuchaipalam	<i>Citrus lemon</i>	Rutaceae
5.	Gooseberry	Arai nelli	<i>Phyllanthus acidus</i>	Euphorbiaceae
6.	Neem or Indian lilac	Vembu	<i>Azadirachta indica</i>	Meliaceae
7.	Indian plum	Elanthai maram	<i>Ziziphus mauritiana</i>	Rhamnaceae
8.	Coconut	Thennai maram	<i>Cocos nucifera</i>	Arecaceae
9.	Gum arabic tree	Karuvelam	<i>Acacia nilotica</i>	Mimosaceae
10.	Drumstick tree	Karimurungai	<i>Moringa oleifera</i>	Moraginaceae
11.	Banana tree	Vazhaimaram	<i>Musa</i>	Musaceae
12.	Senna siamea	Manjal Konnai	<i>Sennasiamea</i>	Fabaceae
13.	Banyan tree	Alamaram	<i>Ficus benghalensis</i>	Moraceae
14.	Creamy Peacock Flower	Vadanarayani	<i>Delonix elata</i>	Fabaceae
15.	Beauty leaf	Punnai	<i>Calophyllum inophyllum</i>	Calophyllaceae
16.	Umbrella thorn	Kodaivelam	<i>Acacia planifrons</i>	Mimosaceae
17.	Indian fig tree	Athi	<i>Ficus recemosa</i>	Moraceae
18.	Jujube	Ilanthai	<i>Ziziphus jujubha</i>	Rhamnaceae
19.	Oil cake tree	Arappu	<i>Albizia amara</i>	Mimosaceae
20.	Giant thorny bamboo	Perumungil	<i>Bambusa bambos</i>	Poaceae
21.	Woman's tongue	Vagai	<i>Albizia lebeck</i>	Mimosaceae
22.	Tamarind	Puliyamaram	<i>Tamarindus indica</i>	Legumes
23.	Rain Tree	Thoongu moonji	<i>Albizia saman</i>	Mimosaceae
24.	Muntingia calabura	Singapore cherry	<i>Muntingiacalabura</i>	Malvaceae
25.	Chinesh cheery	Thenpazham	<i>Muntingia calabura</i>	Tiliaceae
26.	Chebolic myrobalan	Kadukkai	<i>Terminalia chebula</i>	Combretaceae
27.	Indian fir tree	Nettilinkam	<i>Polylathia longifolia</i>	Annonaceae
28.	Indian bael	Vilvam	<i>Aegle marmelos</i>	Rutaceae
29.	Indian Mulberry	Manjanati	<i>Morinda coreia</i>	Rubiaceae
30.	Henna	Marudaani	<i>Lawsonia inermis</i>	Lythraceae
31.	Eucalyptus	Eucalyptus	<i>Eucalyptus globules</i>	Myrtaceae
32.	Manilkara zapota	Sapota	<i>Manilkara zapota</i>	Sapotaceae
33.	Black plum	Navalmaram	<i>Syzygium cumini</i>	Myrtaceae

34.	Mango	Manga	<i>Mangifera indica</i>	Anacardiaceae
35.	Jack fruit	Palamaram	<i>Artocarpus heterophyllus</i>	Moraceae
36.	Curry tree	Karivembu	<i>Murraya kintia</i>	Rubiaceae
37.	Robber-thorn tree	Anaimullu	<i>Acacia horrida</i>	Mimosaceae
38.	Teak	Thekku	<i>Tectona grandis</i>	Verbenaceae
39.	Indian gooseberry	Nelli	<i>Emblica officinalis</i>	Phyllanthaceae
40.	Chinese chaste tree	Nochi	<i>Vitex negundo</i>	Verbenaceae
41.	Madras Thorn	Kuduka puli	<i>Pithecellobium dulce</i>	Mimosaceae
42.	Noni	Nuna maram	<i>Morinda citrifolia</i>	Rubiaceae
43.	Five leaf chastera	Nochi	<i>Vitex negundo</i>	Lamiaceae
44.	Papaya	Pappali maram	<i>Carica papaya L</i>	Caricaceae
45.	Peepal	Arasanmaram	<i>Ficus religiosa</i>	Moraceae
46.	Monoon longifolium	Nettilingam	<i>Polyalthia longifolia</i>	Annonaceae
47.	Guava	Koyya	<i>Psidium guajava</i>	Myrtaceae
48.	custard apple	Seethapazham	<i>Annona reticulata</i>	Annonaceae
49.	Curry tree	Velipparuthi	<i>Murraya koenigii</i>	Asclepiadaceae
50.	Bamboo	Moonghil	<i>Bambusa bambo</i>	Poaceae
Shrubs				
1.	Shoe flower	Chemparuthi	<i>Hibiscu rosa-sinensis</i>	Malvaceae
2.	Avaram	Avarai	<i>Senna auriculata</i>	Fabaceae
3.	Touch-me-not	Thottalchinungi	<i>Mimosa pudica</i>	Mimosaceae
4.	Coffee senna	Kattuttakarai	<i>Senna occidentalis</i>	Fabaceae
5.	Rosy Periwinkle	Nithyakalyani	<i>Cathranthus roseus</i>	Apocynaceae
6.	Peacock Flower	Mayil Kontai	<i>Caesalpinia pulcherrima</i>	Fabaceae
7.	Chrozophora tinctoria	Puramuttai	<i>Chrozophora rotleri</i>	Euphorbiaceae
8.	Milk Weed	Erukku	<i>Calotropis gigantea</i>	Apocynaceae
9.	Triangular spruge	Chaturakalli	<i>Euphorbia antiquorum</i>	Euphorbiaceae
10.	Yellow elder	Manjarali	<i>Tecoma stans</i>	Bignoniaceae
11.	Tiger nail	Eli verandi	<i>Martynia annua</i>	Martyniaceae
12.	Jackal jujube	Surai Iltantai	<i>Ziziphus oenopia</i>	Rhamnaceae
13.	Rough cocklebu	Ottarachedi	<i>Xanthium strumarium</i>	Asteraceae
14.	Datura metel	Umaththai	<i>Datura metel</i>	Solanaceae
15.	Castor oil plant	Amanakku	<i>Ricinus communis</i>	Euphorbiaceae
16.	Plumeria alba	Malaialali	<i>Plumeria alba</i>	Appocynaceae
17.	Senna alata	Seemaigaththi	<i>Cassia alata</i>	Caesalpinaceae
18.	Pinwheelflower	Nandiar vattai	<i>Tabernaemontana coronaria</i>	Apocynaceae
19.	Flame of the Woods	Idlipoo	<i>xoracoc cineia</i>	Rubiaceae
20.	Puriging nut	Kattamanakku	<i>Jatropha curcas</i>	Euphorbiaceae
21.	Giant reed	Naanal	<i>Arunudo donax</i>	Poaceae
22.	Malabar nut	Adathodai	<i>Justicia adhatoda</i>	Acanthaceae
23.	Indian Oleander	Arali	<i>Nerium indicum</i>	Apocynaceae
24.	Triangular spruge	Chaturakalli	<i>Euphorbia antiquorum</i>	Euphorbiaceae
25.	Indian mallow	Thuthi	<i>Abutilon indicum</i>	Meliaceae
26.	Prickly pear	Nagathali	<i>Opuntia</i>	Cactaceae
27.	Solanum pubescens	Malaisundai	<i>Solanum pubescens Willd</i>	Solanaceae
28.	Hygrophila spinosa	Neermulli	<i>Hydrophila auriculata</i>	Acanthaceae
29.	Ipomoea cornea	Neivelikattamanaku	<i>Ipomoea carnea</i>	Convolvulaceae
30.	Night shade plan	Sundaika	<i>Solanum torvum</i>	Solanaceae
31.	Ceylon Date Palm	Icham	<i>Phoenix pusilla</i>	Arecaceae
Herbs				

1.	Common leucas	Thumbai	<i>Leucas aspera</i>	Lamiaceae
2.	Holy basil	Thulasi	<i>Ocimum tenuiflorum</i>	Lamiaceae
3.	Flannel Weed	Sida mutti	<i>Sida cordifolia</i>	Malvaceae
4.	Aloes	Katrashai	<i>Aloe</i>	Liliaceae
5.	European black nightshade	Manathakkali	<i>Solanumnigrum</i>	Solanaceae
6.	Sessile joyweed	Ponnanganni	<i>Alternanthera sessilis</i>	Amaranthaceae
7.	Indian doab	Arugampul	<i>Cynodon dactylon</i>	Poaceae
8.	Cat's claw	Thael Kodukku	<i>Martynia annua</i>	Pedaliaceae
9.	Poor land flatsedg	Kunnakora	<i>Cyperus compressus</i>	Cyperaceae
10.	Goatweed	Pumpillu	<i>Ageratum conyzoides</i>	Asteraceae
11.	Mexican prickly poppy	Eli-yotti	<i>Argemone mexicana</i>	Papaveraceae
12.	Gotu kola	Vallarai	<i>Centella asiatica</i>	Apiaceae
13.	Pink Blumea	Suvattru mullangi	<i>Blumea mollis</i>	Asteraceae
14.	Chinese Spinach	Thandukeerai	<i>Amaranthus tricolor</i>	Amaranthaceae
15.	Tridax daisy	Veetukaayapoond	<i>Tridax procumbens</i>	Asteraceae
16.	Creeping chaffweed	Adai otti	<i>Alternanthera pungens</i>	Amaranthaceae
17.	Digeria muricata	Thoiya keera	<i>Digeria muricata</i>	Amaranthaceae
18.	Indian Copperleaf	Kuppaimeni	<i>Acalypha indica</i>	Euphorbiaceae
19.	Cyperus difformis	Kudai koori	<i>Cyperus difformis</i>	Cyperaceae
20.	Mountain knotgrass	Thengaipoo kirai	<i>Aerva lanata</i>	Amaranthaceae
21.	Riceweeds	Seruppada	<i>Coldenia procumbens</i>	Boraginaceae
22.	Goatweed	Kallurukki	<i>Scoparia dulcis</i>	Plantaginaceae
23.	East Indian globe thistle	kottai-k-karantai	<i>Sphaeranthus indicus</i>	Asteraceae
24.	False daisy	Karisilanganni	<i>Eclipta prostrata</i>	Asteraceae
25.	Chocolate weed	Punnakku poond	<i>Melochia corchorifolia</i>	Sterculiaceae
26.	Marsh barbel	Neermulli	<i>Hygrophila auriculata</i>	Acanthaceae
27.	Black Mustard Seed	Kaduku	<i>Brassica juncea</i>	Brassicaceae
28.	Slender amaranth	Sirukeerai	<i>Amaranthus polygonoides</i>	Amaranthaceae
29.	Prickly chaff flower	Nayuruv	<i>Achyranthes aspera</i>	Amaranthaceae
30.	Cleome viscosa	Nai kadugu	<i>Cleome viscosa</i>	Capparidaceae
31.	Carrot grass	Partiniyam	<i>Parthenium hysterophorus</i>	Asteraceae
32.	Punarnava	Mukkirattai	<i>Boerhaavia diffusa</i>	Nyctaginaceae
33.	Prickly amaranth	Mullukkeerai	<i>Amaranthus spinosus</i>	Amaranthaceae
34.	Tomato	Thakkali	<i>Solanum lycopersicum</i>	Solanaceae
35.	False daisy	Karisalankanni	<i>Eclipta alba</i>	Asteraceae
36.	Chilli	Milakai	<i>Capsicum annuum</i>	Solanaceae
37.	Red Spiderling	Mukirattai	<i>Boerhavia diffusa</i>	Nyctaginaceae
38.	Porcupine flower	Kundan	<i>Barleria prionitis</i>	Acanthaceae
39.	Billygoat weed	Pumpillu	<i>Ageratum conyzoides</i>	Asteraceae
Climbers				
1.	Ivy gourd	Kovai	<i>Coccinia grandis</i>	Cucurbitaceae
2.	Balloon vine	Mudakkotan	<i>Cardiospermum helicacabum</i>	Sapindaceae
3.	Stemmed vine	Perandai	<i>Cissus quadrangularis</i>	Vitaceae
4.	Pointed gourd	Kovakkai	<i>Trichosanthes dioica</i>	Cucurbitaceae
5.	Rosary pea	Kuntumani	<i>Abrus precatorius L</i>	Fabaceae
6.	Indian sarsaparilla	Nannari	<i>Hemidesmus indicus</i>	Asclepiadaceae
7.	Coral vine	Kodi rose	<i>Antigonon leptopus</i>	Polygonaceae
8.	Butterfly-pea	Sangupoo	<i>Clitoria ternata</i>	Fabaceae
9.	Wild jasmine	Malli	<i>Jasminum augustifolium</i>	Oleaceae

10.	Bottle Guard	Sorakkai	<i>Lagenaria siceraria</i>	Cucurbitaceae
11.	Bitter gourd	Pavakkai	<i>Momordica charantia</i>	Cucurbitaceae
Creepers				
1.	Ground Spurge	Sithrapaalavi	<i>Euphorbia prostrata</i>	Euphorbiaceae
2.	<i>Ipomoea reniformis</i> chois	Elikkathilai	<i>Merremia gangetica</i>	Convolvulaceae
3.	Bitter Apple	Thumattikai	<i>Cucumis callosus</i>	Cucurbitaceae
4.	Merremia	Muthiyar koontha	<i>Merremia tridentata</i>	Convolvulaceae
5.	Frog fruit	Poduthalai	<i>Phyla nodifolia</i>	Verbenaceae
Grasses				
1.	Apluda	Kattu kanchippul	<i>Apluda mutica</i>	Poaceae
2.	Nut grass	Korai	<i>Cyperus rotundus</i>	Poaceae
3.	Eragrostis	Pullu	<i>Eragrostis ferruginea</i>	Poaceae
4.	Jungle rice	Kuthirai vaal Kattu arusi	<i>Echinochloa colona</i>	Poaceae
5.	Windmill grass	Chevvarakupul	<i>Chloris barbata</i>	Amaranthaceae
6.	Finger grass	Kuruthupillu	<i>Chloris dolichostachya</i>	Poaceae
7.	Umbrella-sedge	Vattakorai	<i>Cyperus difformis</i>	Cyperaceae
8.	Marvel grass	Marvel grass	<i>Dichanthium annulatum</i>	Poaceae

*E- Economical, M- Medicinal, EM- Both Economical and Medicinal, NE- Not evaluated.

Source:

Nair.N.C and A.N. Henry, Flora of Tamil Nadu 1983, Series 1, Botanical Survey of India, Southern Circle.

3.5.6. Flora Composition in the Buffer Zone

The buffer region has a similar type of habitat, but it has a wider variety of vegetation than the core zone area. The proposed lease area has plain terrain. There are 144 different species identified in the buffer zone. Among the identified, floral (144) species were 50 trees, 39 herbs, 31 shrubs, 11 climbers, 5 Creepers, and 8 grasses. According to the findings of the buffer zone flora studies, the dominant species in the study area are Fabaceae, Asteraceae, and Euphorbiaceae, as shown in Table No.3.54. 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. Details of flora with the scientific name were mentioned in Table No.3.54.

A list of floral species has been prepared based on a primary survey (site observations) and discussion with local people. The total number of different plant life forms under trees, shrubs, herbs, and climbers is shown in Table 3.55 and their % distribution is shown in Figure 3.34.

Table 3.55: Number of floral life forms in the Study Area

S. No	Plant Life Form	Number of Species
1	Trees	50
2	Shrubs	31
3	Herbs	39
4	Climber	11
5	Creepers	5
6	Grasses	8
Total No. of Species		144

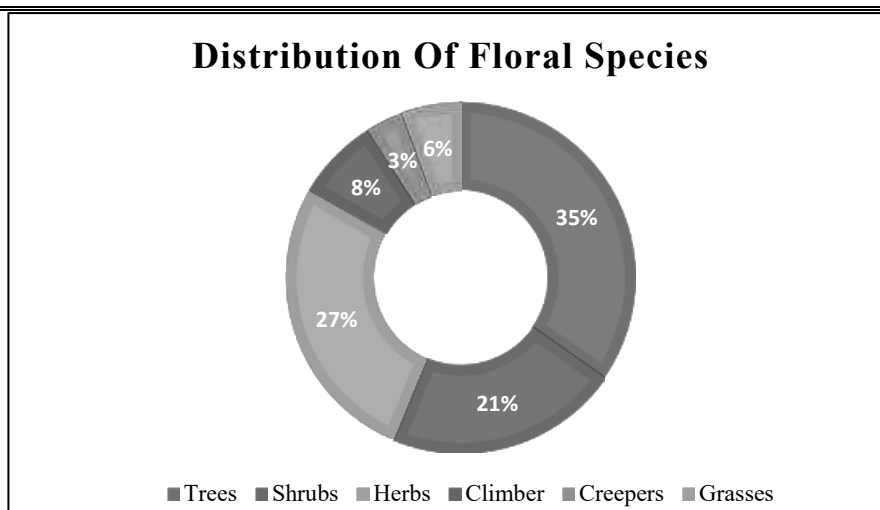


Fig No. 3.34: Graph showing % distribution of floral life forms

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

There are neither reserved (RF) nor protected (PF) forests either in the mine lease area or in the buffer zone. Thus, no forest land is involved in any manner. Hence, no certificate from the Forest department is required. There are no protected or ecologically sensitive areas such as National parks or Important Bird Areas (IBAs), or Wetlands or migratory routes of fauna or water bodies or human settlements within the proposed mine lease area. There are no Biosphere reserves or wildlife sanctuaries or National parks or Important Bird Areas (IBAs), or migratory routes of fauna. Thus, the area under study (Mine lease area and the 10 Km buffer zone) is not ecologically sensitive. It is away from the proposed project site.

Thus, no forest land is involved in any manner. Hence, no certificate from the Forest department is required. There are no impacts due to this mining activity. There are neither forests nor forest dwellers nor forest-dependent communities in the mine lease area. There shall be no forest-impacted families (PF) or people (PP). Thus, the rights of Traditional Forest Dwellers will not be compromised on account of the project.

3.6. Fauna

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

3.6.1. Fauna Composition in the Core Zone

During the study, it was found that the faunal diversity in the core site was limited to Butterflies, insects, and some species of mammals & reptiles among them numbers Insects 5, Reptiles 6, Mammals 3, and Avian 8. The core site has avifauna species like the crow, Common myna, Koel, etc. None of these species are threatened or endemic in the study area and surroundings. There is no Schedule I species and nine species are under Schedule IV according to the Indian Wildlife Act 1972. There are no critically endangered, endangered, vulnerable, and endemic species were observed.

Table No: 3.56. Fauna in the Core zone of M/s.A.G.Granites Pvt Ltd Black Granite Quarry

Sl. No	Common Name	Scientific Name	Schedule list WLPC 1972
Insects			
1.	Common Tiger	<i>Danaus genutia</i>	Schedule IV
2.	Tawny coster	<i>Danaus chrysippus</i>	Schedule IV
3.	Striped tiger	<i>Danaus plexippus</i>	Schedule IV
4.	House fly	<i>Musca domestica</i>	-
5.	Dragonfly	<i>Agriansp</i>	-
Reptiles			
1.	Oriental garden lizard	<i>Calotes versicolor</i>	NL
2.	Indian forest skink	<i>Sphenomorphus indicus</i>	NL

3.	Common krait	<i>Bungarus caeruleus</i>	LC
4.	Rat snake	<i>Ptyas mucosa</i>	Schedule IV
5.	House lizards	<i>Hemidactylus flaviviridis</i>	Schedule IV
6.	Green vine snake	<i>Ahaetulla nasuta</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.	Asian koel	<i>Eudynamis scolopacea</i>	Schedule IV
4.	Koel	<i>Eudynamis</i>	Schedule IV
5.	Black drongo	<i>Dicrurus macrocercus</i>	Schedule IV
6.	House crow	<i>Corvus splendens</i>	Schedule IV
7.	Cattle egret	<i>Bubulcus ibis</i>	Schedule IV
8.	Asian green bee-eater	<i>Merops orientalis</i>	Schedule IV

(Sources: Species observation in the field study)

3.6.2. Fauna Composition in the Buffer Zone

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

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

The list of Mammals (*directly sighted animals & Secondary data) is given in table No.3.57. The list of bird species recorded during the field survey and literature from the study area are given in Table 3.58. The list of reptilian species recorded during the field survey and literature from the study area is given in Table 3.59. The list of insect species recorded during the field survey and literature from the study area are given in Table 3.60. The list of Butterflies species recorded during the field survey and literature from the study area are given in Table 3.61. 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 73 species were identified from the project site. Based on habitat classification the majority of species were Insects 4, followed by birds 35, Reptiles 9, Mammals 5, Amphibians 5, and Butterflies 15. A total of 35 species of bird were sighted in the study area. There are no critically endangered, endangered, vulnerable, and endemic species were observed. There are no impacts on nearby fauna species.

Dominant species are mostly birds and buffer flies, and five Amphibians were observed during the extensive field visit *Duttaphrynus melanostictus*, *Rana tiger*, *Euphlyctis hexadactylus* and, *Hoplobatrachus tigerinus*. There is no schedule I Species in the study area. There are no critically endangered, endangered, vulnerable, and endemic species were observed.

**Table 3.57. List of Fauna & Their Conservation Status,
Mammals: (*directly sighted animals & Secondary data)**

SI. No	Scientific Name	Common Name	Schedule
1.	<i>Funambulus palmarum</i>	Indian palm squirrel	Schedule IV
2.	<i>Mus booduga</i>	Indian Field Mouse	Schedule IV
3.	<i>Herpestes javanicus</i>	Asian Small Mongoose	Schedule (Part II)
4.	<i>Lepus nigricollis</i>	Indian hare	Schedule (Part II)

5.	<i>Rattus norvegicus</i>	Brown rat	Schedule IV

Table 3.58. Listed birds

Sl. No	Scientific Name	Common Name/English Name	Schedule list wildlife Protection act 1972
1.	<i>Turdoides striata</i>	Jungle babbler	Schedule IV
2.	<i>Lonchura Malabarica</i>	Indian Silver Bill	Schedule IV
3.	<i>Saxicoloides fulicatus</i>	Indian robin	Schedule IV
4.	<i>Psittacula krameri</i>	Rose Ringed Parakeet	Schedule IV
5.	<i>Turdoides caudata</i>	Common Babbler	Schedule IV
6.	<i>Eudynamys</i>	Asian Koel	Schedule IV
7.	<i>Hirundo rustica</i>	Barn Swallow	Schedule IV
8.	<i>Bubulcus ibis</i>	Cattle egret	Schedule IV
9.	<i>Columba livia</i>	Blue Rock Pigeon	Schedule IV
10.	<i>Acridotheres tristis</i>	Common myna	Schedule IV
11.	<i>Corvus splendens</i>	House crow	Schedule IV
12.	<i>Ploceus philippinus</i>	Baya Weaver	Schedule IV
13.	<i>Coracina melanoptera</i>	Black Headed Cuckoo Shrike	Schedule IV
14.	<i>Merops orientalis</i>	Small Bee Eater	Schedule IV
15.	<i>Cinnyris asiaticus</i>	Purple sunbird	Schedule IV
16.	<i>Nycticorax nycticorax</i>	Night Heron	Schedule IV
17.	<i>Apus affinis</i>	House Swift	Schedule IV
18.	<i>Cuculus micropterus</i>	Indian Cuckoo	Schedule IV
19.	<i>Passer domesticus</i>	House sparrow	Schedule IV
20.	<i>Psittacula eupatria</i>	Alexandrine Parakeet	Schedule IV
21.	<i>Motacilla maderaspatensis</i>	White Browed Wagtail	Schedule IV
22.	<i>Streptopelia chinensis</i>	Spotted Dove	Schedule IV
23.	<i>Dicaeum erythrorhynchus</i>	Tickell's Flowerpecker	Schedule IV
24.	<i>Pycnonotus cafer</i>	Red- Vented Bulbul	Schedule IV
25.	<i>Cypsiurus balasiensis</i>	Asian Palm Swift	Schedule IV
26.	<i>Halcyon smyrnensis</i>	White Throated Kingfisher	Schedule IV
27.	<i>Ardeola grayii</i>	Indian Pond Heron	Schedule IV
28.	<i>Dicrurus macrocercus</i>	Black drongo	Schedule IV
29.	<i>Turdoides affinis</i>	White Headed Babbler	Schedule IV
30.	<i>Ploceus philippines</i>	Weaver bird	Schedule IV
31.	<i>Dicrurus macrocercus</i>	Two-tailed Sparrow	Schedule IV
32.	<i>Dicrurus leucophaeus</i>	Ashy Drongo	Schedule IV
33.	<i>Merops philippinus</i>	Blue-Tailed Bee Eater	Schedule IV
34.	<i>Coracias benghalensis</i>	Indian Roller	Schedule IV
35.	<i>Nectarinia zeylonica</i>	Purple Rumped Sunbird	NL

Reference: Studies on the Abundance and Distribution of Birds in Three Different Habitats of Tiruvannamalai District, South India

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

Table 3.59. List of Reptiles either spotted or reported from the study area.

(*indicates direct observations & Secondary data)

Sl. No	Scientific Name	Common Name/English Name	Schedule list wildlife Protection act 1972
1.	<i>Calotes versicolor</i>	Oriental garden lizard	NL
2.	<i>Hemidactylus flaviviridis</i>	House lizards	Schedule IV
3.	<i>Naja naja</i>	Indian cobra	Sch II (Part II)

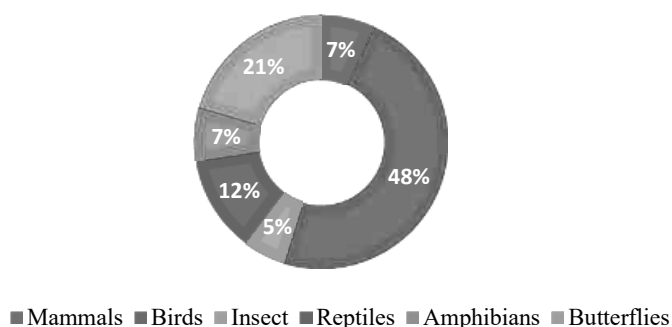
4.	<i>Ahaetulla nasuta</i>	Green vine snake	Schedule IV
5.	<i>Ptyas mucosa</i>	Rat snake	Sch IV (Part II)
6.	<i>Bungarus caeruleus</i>	Common krait	Schedule IV
7.	<i>Mabuya carinatus</i>	Common skink	NL
8.	<i>Vipera russeli</i>	Russell's viper	Sch II (Part II)
9.	<i>Nerodia piscator</i>	Fresh water snake	Sch III (Part II)

Table 3.60. List of Dragonflies and Damselflies spotted or reported from the study area

SI. No	Scientific Name	Common Name	IUCN Conservation Status
1.	<i>Brachythemis contaminata</i>	Ditch jewe	LC
2.	<i>Diplocodes trivialis</i>	Ground skimmer	LC
3.	<i>Trithemis aurora</i>	Crimson marsh glider	LC
4.	<i>Trithemis pallidinervis</i>	Long legged marsh skimmer	-

**Table.3.61. List of Butterflies reported from the study area
(*indicates direct observations & Secondary data)**

SI. No	Scientific Name	Common Name	Schedule
1.	<i>Danaus chrysippuschrysippus</i>	Plain Tiger	Schedule IV
2.	<i>Danaus genutia</i>	Striped Tiger	Schedule IV
3.	<i>Junoniahierta</i>	Yellow Pansy	Schedule IV
4.	<i>Tirumala limniacae</i>	Blue Tiger	Schedule IV
5.	<i>Papiliodemoleusdemoleus</i>	Lime Butterfly	Schedule IV
6.	<i>Phalanta phalantha</i>	Common leopard	Schedule IV
7.	<i>Papiliopolytespolytes</i>	Common Mormon	Schedule IV
8.	<i>Eurema hecabe</i>	Common grass yellow	Schedule IV
9.	<i>Zizeeria knysna</i>	Dark Crass Blue	Schedule IV
10.	<i>Parantica aglea</i>	Glassy Tiger	Schedule IV
11.	<i>Euploea core</i>	Common Crow	Schedule IV
12.	<i>Junonialemonias</i>	Lemon Pansy	Schedule IV
13.	<i>Hypolimnasmisippus</i>	Danaid Eggfly	Schedule IV
14.	<i>Acraea terpsicore</i>	Tawny Coster	Schedule IV
15.	<i>Euchrysops cnejus</i>	Gram Blue	LC

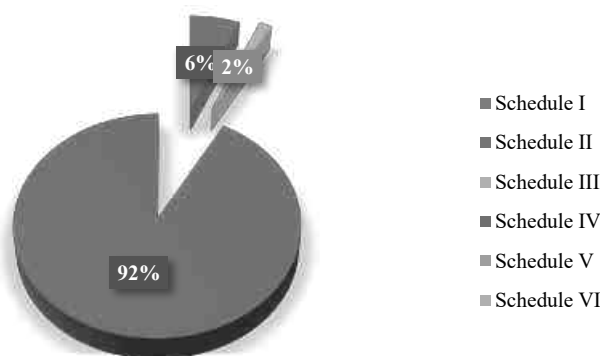
Distribution Of Faunal Communities**Fig No. 3.36: Diagram showing % distribution of faunal life forms**

The study area is marked with moderate population of flora and fauna. With reference to the Wildlife Protection Act 1972 total number of wildlife tabulated in this study can be characterized as given in the Table 3.62.

Table No: 3.62. 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	4	-
3.	Schedule III	1	-
4.	Schedule IV	54	-
5.	Schedule V	0	-
6.	Schedule VI	0	-

Fig No: 3.37. Schedule of Wildlife Protection Act 1972**Table 3.63: 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	-

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 animals and their conservation status as per Wild Life Act (1972) presented in Table 3.63 are the species recorded/reported from the study area, out of which 4 species belongs to schedule-II, 1 species belongs to schedule-III, no species belongs to schedule-V and rest of the species belongs to schedule-IV of Wildlife protection Act, 1972.

3.7. Aquatic Ecology

Mining activities will not disturb the aquatic ecology as there is no effluent discharge proposed from the Black Granite Quarry. There is no natural perennial surface water body within the mine lease area, like wetlands, rivers streams, lakes, and farmer sites. Kaveri River is located about 7.5km on the north side. Aquatic weeds are found to be growing everywhere in 10 km radius area, in every water bog, pond, etc. Typha angustata can be found growing all along the drains of villages, small water-logged depressions, and agricultural fields lacking water but containing enough moisture to support its growth. And where water is present, Eichhornia crassipes has taken its roots and covers the entire water surface by its sprawl and invasion.

3.7.1. Objectives of Aquatic Studies

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

3.7.2. Macrophytes

The macrophytes observed within the study area are tabulated in Table 3.64.

Table No.3.64. Description of Macrophytes

S.No	Scientific name	Common Name	IUCN Red List of Threatened Species
1.	<i>Cyperus exaltatus</i>	Tall Flat Sedge	LC
2.	<i>Carex cruciata</i>	Cross Grass	NA
3.	<i>Aponogeton natans</i>	Floating laceplant	NA
4.	<i>Hydrilla verticillata</i>	Water thymes	LC
5.	<i>Eichornia crassipes</i>	Water hyacinth	NA
6.	<i>Chrysopogon aciculatus</i>	Golden false beard grass	NA
7.	<i>Marsilea quadrifolia</i>	Water clover	LC

3.7.3. Aquatic Faunal Diversity

Amphibian species like the common Indian Burrowing frog, and Indian Pond Frog, Indian Toad, Indian Bull Frog, Common Tree Frog were sighted near the water bodies located in the study area.

Table no. 3.65. Amphibians Observed/Recorded from the Study Area

Sl. No	Scientific Name	Common Name	IUCN Red List data
1.	<i>Duttaphrynus melanostictus</i>	Common Indian Toad	IV
2.	<i>Rana tiger</i>	Common Frog	NA
3.	<i>Euphlyctis hexadactylus</i>	Indian Pond Frog	LC
4.	<i>Hoplobatrachus tigerinus</i>	Indian Bull Frog	IV/LC
5.	<i>Polypedates maculatus</i>	Common Tree Frog	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

3.7.4. Fishes

Fish is commonly found in all types of natural water bodies and very common source of food in Eastern South India. The local fishermen were enquired and also the secondary resources were reviewed to collect information on the fishes found in the study area. Few common species are; Catla (Catla catla), Dwarf panchax (Aplocheilichthys parvus), Tank goby (Glossogobius aureus), Ticto barb (Pethia ticto), Greenstripe barb (Puntius vittatus), Roho (Labeo rohita) and Pool barb (Puntius sophore) etc., Species of fish reported in the study area are given in table 3.66.

Table 3.66. Based on Actual Sighting, based on inputs from locals and Perused from Secondary Data

S.No	Scientific name	Common name	Family
1.	<i>Pethia ticto</i>	Ticto barb	Cyprinidae
2.	<i>Glossogobius aureus</i>	Tank goby	Gobiidae
3.	<i>Labeo rohita</i>	Rohu	Cyprinidae
4.	<i>Siluriformes</i>	Catfish	Diplomystidae
5.	<i>Aplocheilichthys parvus</i>	Dwarf panchax	Aplocheilichthys
6.	<i>Puntius vittatus</i>	Greenstripe barb	Cyprininae
7.	<i>Puntius sophore</i>	Pool barb	Cyprinidae
8.	<i>Catla Catla</i>	Catla	Cyprinidae

3.7.5. Findings/Results

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

Records of threatened species in the area

No threatened species were observed

Endangered Species as per Wildlife (Protection) Act

No Endangered fauna was recorded in the project area.

Endemic Species of the Project areas

No endemic species were observed in the project area.

Migratory species of the Project areas

No migratory fauna observed in project area.

Migratory corridors and Flight paths

No migratory corridors and Flight paths were observed in project area.

Breeding and spawning grounds

No breeding and spawning grounds were earmarked for the wildlife fauna in project area.

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.

3.7. Conclusion

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

3.8 Socio Economic Environment

There is no habitation/ village within the radius of 10km from the project area. Socio-economic study is an essential part of environmental study. It includes demographic structure of the area, provision of basic amenities viz., housing, education, health and medical services, occupation, water supply, sanitation, communication, transportation, prevailing diseases pattern as well as feature like temples, historical monuments etc., at the baseline level. This will help in visualizing and predicting the possible impact depending upon the nature and magnitude of the project.

It is expected that the Socio-Economic Status of the area will substantially improve because of this proposed project. As the proposed project will provide direct and indirect employment and improve the infrastructural facilities in that area and, thus, improve their standard of living.

3.8.1 Objectives of the Study

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

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

3.8.2 Scope of Work

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

3.8.3 Administrative Setup of Tiruvannamalai District

Tiruvannamalai district is divided into 12 taluks. The taluks are further divided into 18 blocks, which further divided into 860 villages. In 2011, Tiruvannamalai had population of 24,64,875 of which male and female were 12,35,889 and 12,28,986 respectively. In 2001 census, Tiruvannamalai had a population of 21,86,125 of which males were 10,95,859 and remaining 10,90,266 were females. Tiruvannamalai District population constituted 3.42 % of total Maharashtra population. In 2001 census, this figure for Tiruvannamalai District was at 3.50 % of Maharashtra population.

There was change of 12.75 % in the population compared to population as per 2001. In the previous census of India 2001, Tiruvannamalai District recorded increase of 7.01 % to its population compared to 1991.

3.8.4 Study area

As per Census 2011, the village code of Kilpasar is 632002. The village covers a total geographical area of 349.5 hectares and falls under the 606708 pincode. Tiruvannamalai is the nearest town, located about 40 km away.

Kilpasar village is governed under the Panchayati Raj system, with a Sarpanch serving as the elected head. For political representation, the village falls under the Chengam Vidhan Sabha (Assembly) constituency and the Tiruvannamalai Lok Sabha (Parliamentary) constituency.

Table 3.38: Population Characteristics

Particulars	Total	Male	Female
Total Population	1,342	704	638
Child Population (0–6 yrs)	207	104	103
Scheduled Castes (SC)	131	60	71
Scheduled Tribes (ST)	724	389	335
Literate Population	717	412	305
Illiterate Population	625	292	333

Table 3.42: Population Characteristics Core and Buffer zone around 5km Radius

Sno	Village Name	TRU	No_HH	TOT_P	TOT_M	TOT_F	P_SC	M_SC	F_SC	P_ST	P_LIT	M_LIT	F_LIT	P_ILL	M_ILL	F_ILL
1	Athipadi	Rural	309	1291	644	647	32	16	16	883	598	340	258	693	304	389
2	Chinniyampettai	Rural	1247	5692	2831	2861	834	411	423	0	2799	1566	1233	2893	1265	1628
3	Kilpasar	Rural	319	1342	704	638	131	60	71	724	717	412	305	625	292	333
4	Malayanoorchakkadi	Rural	814	3309	1690	1619	777	405	372	1056	1835	1069	766	1474	621	853
5	Melmuthanur	Rural	787	3218	1674	1544	45	18	27	2049	1545	925	620	1673	749	924
6	Melpasar	Rural	389	1648	850	798	0	0	0	229	821	496	325	827	354	473
7	Mothakkal	Rural	782	3279	1690	1589	548	275	273	0	1788	1057	731	1491	633	858
8	Reddiapalayam	Rural	1229	5531	2806	2725	1100	543	557	74	3125	1799	1326	2406	1007	1399

Source: census 2011**Table 3.43: Occupational Characteristics Core and Buffer zone around 10km Radius**

Sn o	Village Name	TOT_WOR K_P	TOT_WOR K_M	TOT_WOR K_F	MAINWOR K_P	MAINWOR K_M	MAINWOR K_F	MAIN_C L_P	MAIN_A L_P	NON_WOR K_P	NON_WOR K_M	NON_WOR K_F
1	Athipadi	798	400	398	156	81	75	96	33	493	244	249
2	Chinniyampetta i	2973	1681	1292	1975	1295	680	1136	607	2719	1150	1569
3	Kilpasar	749	409	340	240	206	34	93	103	593	295	298
4	Malayanoorcha kkadi	1934	1029	905	1655	899	756	959	580	1375	661	714
5	Melmuthanur	1723	892	831	1534	823	711	655	704	1495	782	713
6	Melpasar	1003	516	487	957	501	456	645	243	645	334	311
7	Mothakkal	1480	939	541	1302	858	444	411	606	1799	751	1048
8	Reddiapalayam	2506	1456	1050	1904	1239	665	794	742	3025	1350	1675

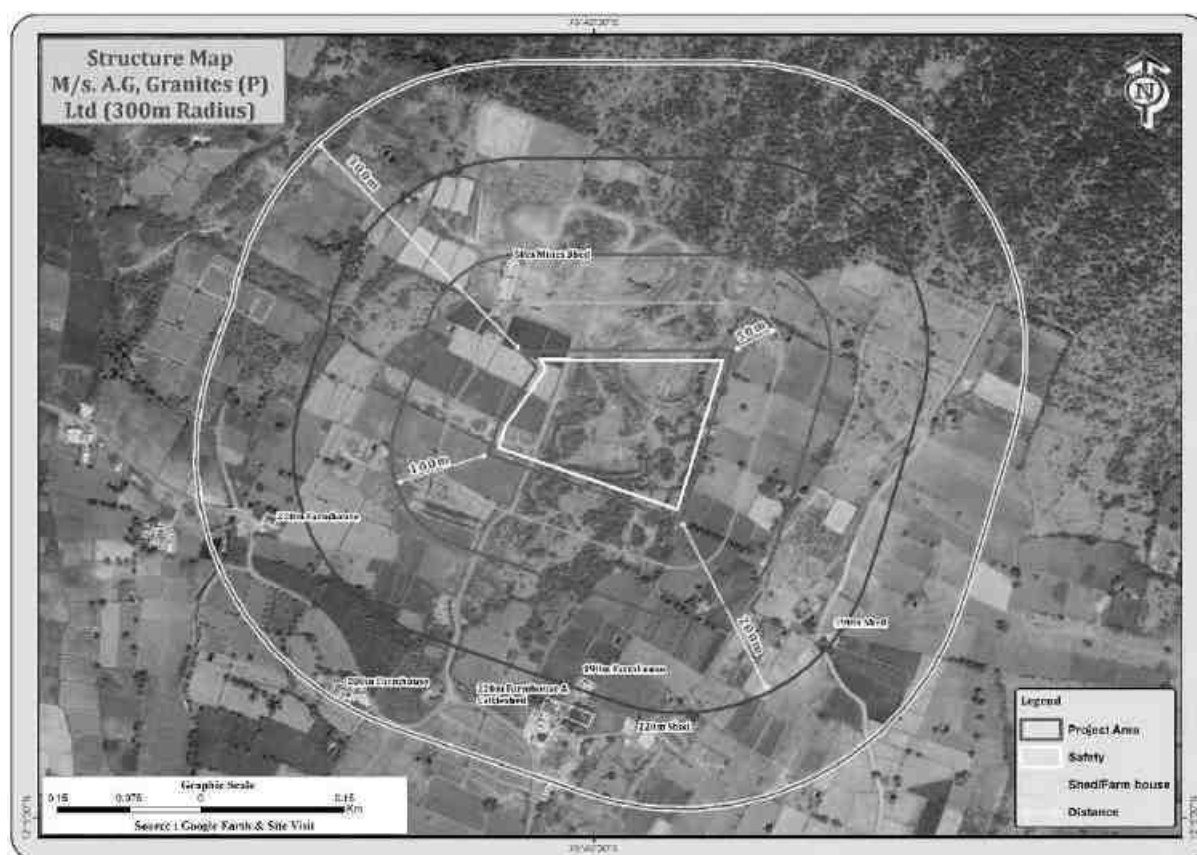
Source: census 2011

3.8.6 Basic Amenities

A better network of physical infrastructure facilities (well-built roads, rail links, irrigation, power and telecommunication, information technology, market-network and social infrastructure support, viz. health and education, water and sanitation, veterinary services and co-operative) is essential for development of the rural economy.

A review of infrastructure facilities available in the area has been given on the basis of field survey. In this study the villages which fall within 10 km radius around the site has been covered. Infrastructure facilities available in the area are presented below.

All basic amenities Education (higher education, colleges, medical college, transport facilities, railway station, bus station area available in the district headquarters Tiruvannamalai



3.8.7 Interpretation

Based on the data, following inferences could be drawn:

- The study area had average educational facilities. The overall status depicts that the education is limited to primary and middle level.
- The study area is well connected by NH/SH/Village Road.
- The study area not well health facilities of primary level.
- Considering the above facts, the proposed project will boost the socio-economic development activities in the area and hence will leave positive impact.
- The study area has mobile connectivity.

3.8.8 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 centre 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.

3.8.9 Conclusion

To evaluate the impacts of proposed granite 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 M/s.A.G.Granites Pvt Ltd Black Granite Quarry will adopt adequate control measures to protect the surrounding environment and will contribute in development of the study areas.

Socio Economic/ demographic status of the study area reveals that area further require improvement in the Economy and Infrastructure Development of the area. Hence it can be concluded that the present baseline environment status of the study area will not be affected by the proposed project. 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.

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

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

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

4.1 Land Environment

4.1.1 Anticipated Impact

The main anticipated impact on the Land Environment due to quarrying operation is change in Landscape, change in Land – use Pattern. M/s.A.G.Granites Pvt Ltd Black Granite Quarry area is calculated as per MoEF & CC Notification – S.O. 2269 (E) Dated: 01.07.2016) including proposed quarry. The proposed project area is proponent own patta land, no forest land involved in this lease applied area. The ultimate depth of the proposed project is quarrying is varying from 30m below the ground level and will not intersect the ground water table. The project is site specific.

4.1.2 Mitigation measures

Due to the quarrying activities in the project the land use pattern will be altered. In order to minimize the adverse effects, the following control measures will be implemented:

- In the Opencast Method of Mining the degradation of land is insignificant, after completion of the quarrying operation the land, the land will be partially backfilled with dumped material and part of the area will be allowed to collect rainwater which will act as temporary reservoir, this Granite waste, overburden not produce any toxic effluents in the form of solid, liquid or gas.
- Top Soil will be removed and utilized for greenbelt development in the safety barrier.
- The periphery of the mining lease area will be converted to a greenbelt to prevent Noise and sound propagation to the nearby lands.
- Construction of garland drains all around the quarry pit and construction of check dam at strategic location in lower elevations to prevent soil erosion due to surface runoff during rainfall and also to collect the storm water for various uses within the proposed area.
- Barbed wire fencing will be re constructed at the conceptual stage, Security will be posted round the clock, to prevent inherent entry of the public and cattle.

4.1.1.2 Soil Environment

4.1.1.3 Impact on Soil Environment

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

4.1.1.4 Mitigation measures for Soil Conservation

- The top soil will be preserved in the safety barrier and kept in moisture condition. The preserved top soil will be utilized for greenbelt development in the safety barrier and utilized for plantation on the top bench.
- Garland drains will be constructed around the project area to arrest any soil from the quarry area being carried away by the rainwater. This will also avoid the soil erosion and siltation in the mining pits and maintaining the stability of the benches.

4.1.1.5 Waste Dump Management

4.1.1.6 Anticipated Impact

Solid waste is in the form of Granite waste which does not produce any toxic effluent during dumping. Garland drains will be constructed around the waste dump to prevent the rainwater entering into the quarrying pit besides this garland drain will also help in facilitating the rainwater to the natural gradient.

There will be generation of topsoil is about 2,970 m³ up to depth for 1m during this Scheme period, the same will be preserved all along the safety barrier and utilized for construction of bund and afforestation purpose. Granite waste forms nearly 90% of ROM and the total quantity of granite waste in the next five years will be around 90,456 m³ (Granite waste 56,016 m³ + side burden 18,060 m³ + weathered rock 8,190 m³) the same will be dumped on the Northeast with dimensions of L 73m X W 39.5m X H 12.14m(h).

4.1.1.7 Mitigation measures

- Retaining wall with weep hole, Garland drain will be provided around the dump areas.
- Proper angle of repose to be maintained.
- Grasses to be done over the dump areas for stability.
- Soil erosion may also be accelerated on areas where the overburden from the ore excavation operation will be dumped. As there is neither a toxic effluent nor solid waste from the mine, quality of soil is not expected to be adversely affected.

4.2 Water Environment (Impact & Mitigation Measures)

4.2.1 Anticipated Impact on Surface and ground water

The impact due to mining on the water quality is expected to be insignificant because of no use of chemicals or hazardous substances during quarrying process. For the quarrying activity water will be utilized for wire saw cutting (which will be recycled), water sprinkling on haul roads and greenbelt development encountered at the depth between 55- 50 m. The maximum depth proposed out of proposed projects is 20m BGL for the entire period. 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.

4.2.2 Mitigation measures

The following mitigation measures are suggested for water management

The quarrying operation will be carried out well above the water table. There is no intersection of surface water bodies (Streams, Canal, Odai etc.,) in the proposed project area. During rainy season rain water will be collected in the quarry pit and later used for greenbelt development and for the water sprinkling in the haul roads. There is no proposal for discharging of quarry pit water outside the project area.

There is no proposal Granite processing or workshop within the project area thus there is no effluent anticipated in the mine.

Detail of water requirements in KLD as given below:

Table 4.1 Water Requirement for the Project

Purpose	Quantity	Source
Domestic & Drinking purpose	0.5KLD	From Approved Water vendors.
Dust Suppression	4.5KLD	From nearby tank
Green Belt	2.0KLD	From nearby tank
Wire Saw Cutting	2.0KLD	From nearby tank
Total	9.0 KLD	

Source: Prefeasibility report

- With respect to Turbidity, Total Iron and Silica, Pre-treatment methods like settling or filtration, Water Softening (Ion Exchange) shall be adopted to make it fit for drinking purposes. But it can be used for other domestic purposes
- Rainwater will be collected in sump in the mining pit 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 onwards 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
- Construction of garland drains to divert surface run-off into the quarrying area
- Retaining walls with weep hole will be constructed around the dump to arrest silt wash off
- Periodic analysis of quarry pit water and ground water quality in nearby villages
- Domestic sewage from site office & urinals/latrines provided in ML is discharged in septic tank followed by soak pits
- Wastewater discharge from mine will be treated in settling tanks before using for dust suppression and tree plantation purposes
- De-silting will be carried out before and immediately after the monsoon season
- Regular monitoring and analysing the quality of water in open well, bore wells and surface water

4.3 Air Environment (Impact & Mitigation Measures)

The air borne particulate matter is the main air pollutant in this opencast mining. The mining operation will be carried out by Diamond wire saw cutting, jackhammer drilling (35mm dia) and Hydraulic Excavators will be utilized for handling of Granite waste.

4.3.1. Anticipated Impact

The air borne particulate matter generated by quarrying operation, and transportation. The emissions of Sulphur dioxide (SO₂), Oxides of Nitrogen (NO_x) due to excavation/loading equipment and vehicles plying on haul roads are marginal. Loading - unloading and transportation of Granite and overburden, wind erosion of the exposed area and movement of light vehicles will be the main polluting source in the mining activities releasing Particulate Matter (PM₁₀) affecting Ambient Air of the area. Prediction of impacts on air environment has been carried out taking into consideration proposed production (ROM) on air environment and net increase in emissions by Open pit source modelling in AERMOD Software.

4.3.2 AERMOD Frame work of Computation & details

By using the above-mentioned inputs, ground level concentrations due to the quarrying activities have been estimated to know the incremental concentration in ambient air quality and impact in the study area. The effect of air pollutants upon receptors are influenced by concentration of pollutants and their dispersion in the atmosphere. Air quality modelling is an important tool for prediction, meet the regulatory standards and to apply mitigation measures to reduce impact caused by quarrying activities. PM₁₀ was 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.

4.3.2.1 Emission Rate

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 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 4-2.

Table 4.2: Estimated Emission Rate for Quarry

Emission Estimation for quarry P1				
	Activity	Source type	Value	Unit
Estimated Emission Rate for PM ₁₀	Drilling	Point Source	0.082666434	g/s
	Blasting	Point Source	0.000933814	g/s
	Mineral Loading	Point Source	0.045975617	g/s
	Haul Road	Line Source	0.002504229	g/s/m
	Overall Mine	Area Source	0.065360780	g/s
Estimated Emission rate for SO ₂	Overall Mine	Area Source	0.001365381	g/s
Estimated Emission rate for NO _x	Overall Mine	Area Source	0.000097557	g/s

Source: Emission calculator

4.3.2.2 Frame work of Computation & Model details

By using the above-mentioned inputs, ground level concentrations due to the quarrying activities have been estimated to know the incremental concentration in ambient air quality and impact in the study area. The effect of air pollutants upon receptors are influenced by concentration of pollutants and their dispersion in the atmosphere. Air quality modelling is an important tool for prediction, planning and evaluation of air pollution control activities besides identifying the requirements for emission control to meet the regulatory standards and to apply mitigation measures to reduce impact caused by quarrying activities. PM₁₀ was the major pollutant occurred during quarrying activities. The prediction included the impact of Excavation, Drilling, Blasting, 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.

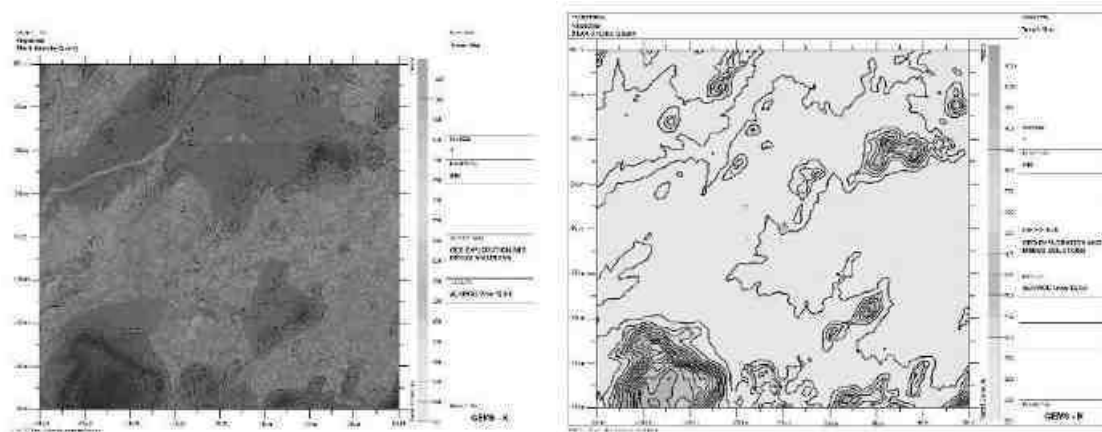
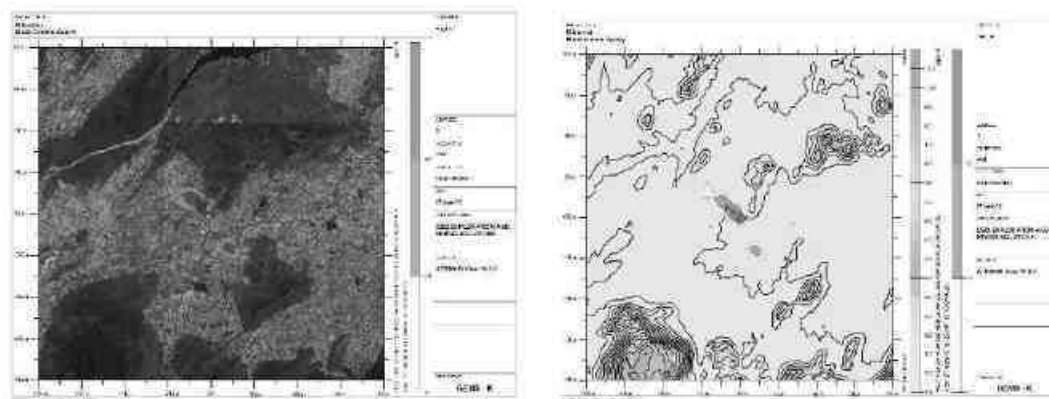
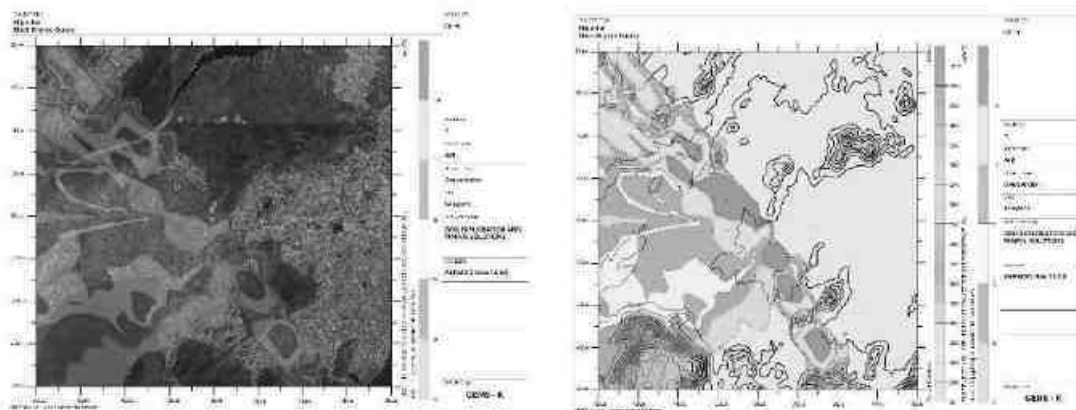
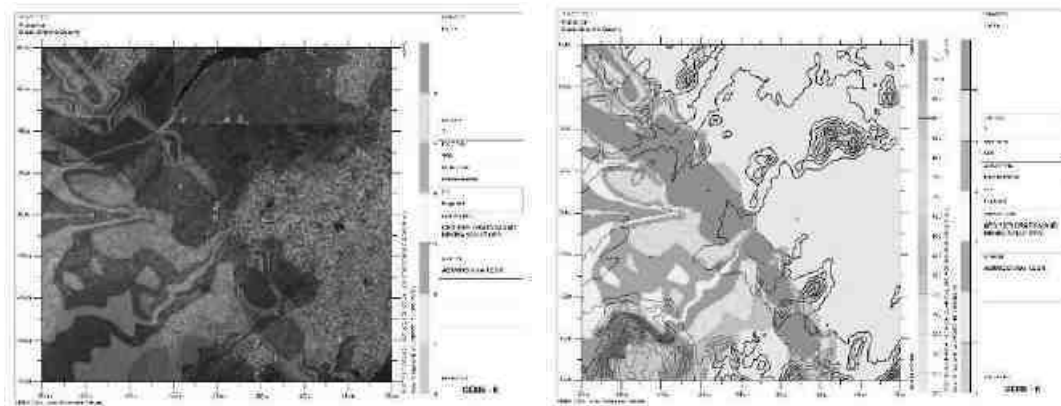
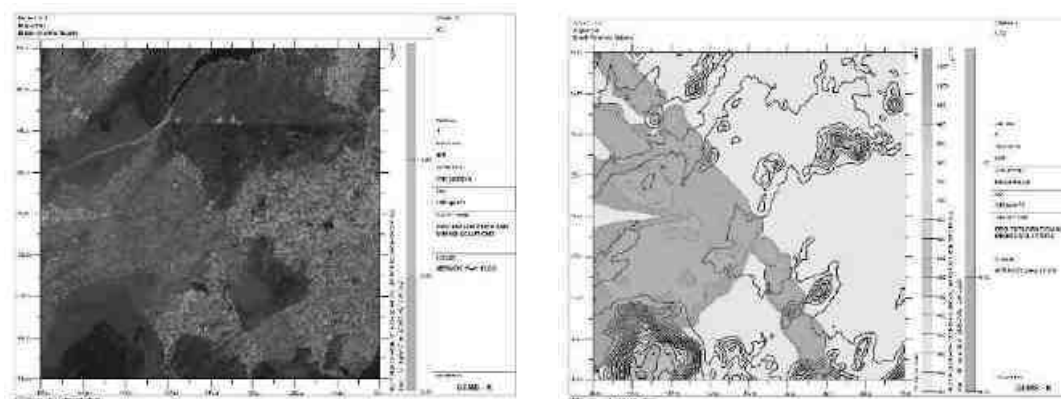
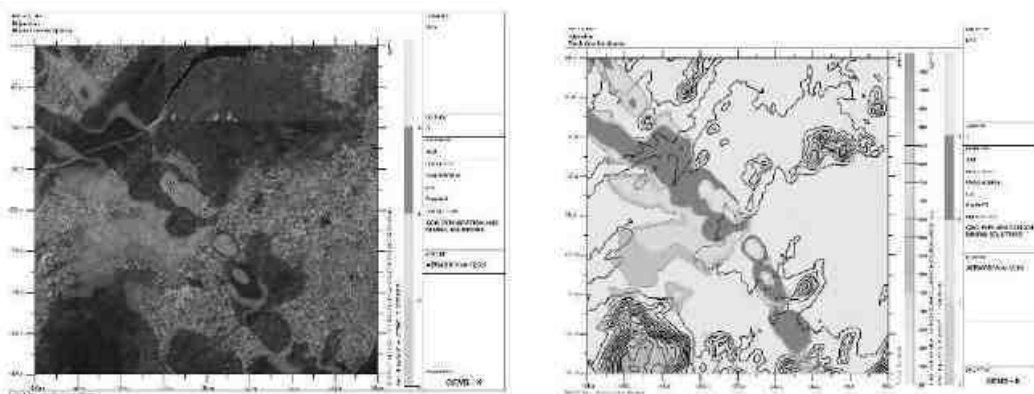
Figure 4.1: AERMOD Terrain Map**Figure 4.2: Predicted Incremental Concentration of Fugitive Dust****Figure 4.3: Predicted Incremental Concentration of PM₁₀**

Figure No 4.4: Predicted Incremental Concentration Of $PM_{2.5}$ **Figure No 4.5: Predicted Incremental Concentration Of SO_2** **Figure No 4.6: Predicted Incremental Concentration of NO_x** 

4.3.2.4 Model Results

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

Table 4.3: Incremental & Resultant GLC of Fugitive Dust

Station Code	Location	X Coordinate (m)	Y Coordinate (m)	Average Baseline Fugitive (µg/m ³)	Incremental value of Fugitive due to mining (µg/m ³)	Total Fugitive (µg/m ³) (5+6)
AAQ1	12° 5'41.95"N 78°45'27.92"E	-84	-23	60.31	27.00	87.31
AAQ2	12° 5'48.20"N 78°45'35.63"E	50	201	61.61	20.00	81.61
AAQ3	12° 5'27.50"N 78°45'27.61"E	-94	-492	62.95	0	62.95
AAQ4	12° 6'16.29"N 78°44'36.18"E	-1659	1025	62.89	6.00	68.89
AAQ5	12° 5'33.75"N 78°47'3.63"E	2834	-292	62.86	0	62.86
AAQ6	12° 2'28.05"N 78°44'32.24"E	-1780	-6046	63.45	0	63.45
AAQ7	12° 5'31.48"N 78°42'23.57"E	-5709	-363	63.91	0	63.91

Table 4.4: 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) (5+6)
AAQ1	12° 5'41.95"N 78°45'27.92"E	-84	-23	40.1	14.87	54.97
AAQ2	12° 5'48.20"N 78°45'35.63"E	50	201	40.8	14.49	55.29
AAQ3	12° 5'27.50"N 78°45'27.61"E	-94	-492	40.5	13.00	53.5
AAQ4	12° 6'16.29"N 78°44'36.18"E	-1659	1025	41.2	14.21	55.41
AAQ5	12° 5'33.75"N 78°47'3.63"E	2834	-292	35.7	0	35.7
AAQ6	12° 2'28.05"N 78°44'32.24"E	-1780	-6046	36.0	0.32	36.32
AAQ7	12° 5'31.48"N 78°42'23.57"E	-5709	-363	36.1	4.00	40.1

Table 4.5: 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 ₁₀ (µg/m ³) (5+6)
AAQ1	12° 5'41.95"N 78°45'27.92"E	-84	-23	19.0	6.93	25.93
AAQ2	12° 5'48.20"N 78°45'35.63"E	50	201	18.3	6.64	24.94
AAQ3	12° 5'27.50"N 78°45'27.61"E	-94	-492	22.6	6.11	28.71
AAQ4	12° 6'16.29"N 78°44'36.18"E	-1659	1025	22.0	6.38	28.38
AAQ5	12° 5'33.75"N 78°47'3.63"E	2834	-292	21.1	0	21.1
AAQ6	12° 2'28.05"N 78°44'32.24"E	-1780	-6046	21.3	0.90	22.2
AAQ7	12° 5'31.48"N 78°42'23.57"E	-5709	-363	23.0	2.65	25.65

Table 4.6: Incremental & Resultant GLC OF SO₂

Station Code	Location	X Coordinate (m)	Y Coordinate (m)	Average Baseline SO ₂ (µg/m ³)	Incremental value of SO ₂ due to mining (µg/m ³)	Total PM ₁₀ (µg/m ³) (5+6)
AAQ1	12° 5'41.95"N 78°45'27.92"E	-84	-23	5.5	1.89	7.39
AAQ2	12° 5'48.20"N 78°45'35.63"E	50	201	5.6	1.87	7.47
AAQ3	12° 5'27.50"N 78°45'27.61"E	-94	-492	6.4	1.82	8.22
AAQ4	12° 6'16.29"N 78°44'36.18"E	-1659	1025	5.7	1.85	7.55
AAQ5	12° 5'33.75"N 78°47'3.63"E	2834	-292	8.5	0	8.5
AAQ6	12° 2'28.05"N 78°44'32.24"E	-1780	-6046	6.2	0	6.2
AAQ7	12° 5'31.48"N 78°42'23.57"E	-5709	-363	6.3	0.73	7.03

Table 4.7: Incremental & Resultant GLC OF NO_x

Station Code	Location	X Coordinate (m)	Y Coordinate (m)	Average Baseline NO _x (µg/m ³)	Incremental value of NO _x due to mining (µg/m ³)	Total PM ₁₀ (µg/m ³) (5+6)
AAQ1	12° 5'41.95"N 78°45'27.92"E	-84	-23	18.7	9.71	28.41
AAQ2	12° 5'48.20"N 78°45'35.63"E	50	201	24.0	9.40	33.4
AAQ3	12° 5'27.50"N 78°45'27.61"E	-94	-492	18.3	8.00	26.3
AAQ4	12° 6'16.29"N 78°44'36.18"E	-1659	1025	18.4	9.10	27.5
AAQ5	12° 5'33.75"N 78°47'3.63"E	2834	-292	18.3	0	18.3
AAQ6	12° 2'28.05"N 78°44'32.24"E	-1780	-6046	20.3	0	20.3
AAQ7	12° 5'31.48"N 78°42'23.57"E	-5709	-363	20.7	0	20.7

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, 60, 80 & 80 µg/m³ for PM₁₀, PM_{2.5}, SO₂ & NO_x respectively. By adopting suitable mitigation measures, the pollutant levels in the atmosphere can be further being controlled.

4.3.3. Mitigation Measures

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

Advantages of Wet Drilling:

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

Blasting

- Blasting will be carried out only to remove the overburden and weathered portion
- Establish time of blasting to suit the local conditions and water sprinkling on blasting face
- 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

Haul Road & Transportation –

- Water will be sprinkled on haul roads, Loading Points twice a day to avoid dust generation during transportation
- Transportation of material will be carried out during day time and material will be covered with tarpaulin
- The speed of tippers plying on the haul road will be limited below 20 km/hr to avoid generation of dust.
- Main source of gaseous pollution will be from vehicle used for transportation of mineral; therefore, weekly maintenance of machines improves combustion process & makes reduction in the pollution.
- The un-metalled haul roads will be compacted weekly before being put into use.
- Over loading of tippers will be avoided to prevent spillage.
- It will be ensured that all transportation vehicles carry a valid PUC certificate.
- Grading of haul roads and service roads to clear accumulation of loose materials.

Green Belt –

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

Occupational Health –

- Dust mask will be provided to the workers and their use will be strictly monitored

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

4.4 Noise Environment

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

Predictions have been carried out to compute the noise level at various distances around the working pit due to these major noise-generating sources.

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

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

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

Where:

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.

$$Lp_{total} = 10 \log \{10^{(Lp_1/10)} + 10^{(Lp_2/10)} + 10^{(Lp_3/10)} + \dots\}$$

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 considering of all the machinery and activities used in the mining process. Same has been listed in Table 4-8.

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

Table 4.8: Predicted Noise Incremental Values

Location ID	N1	N2	N3	N4	N5	N6	N7
Maximum Monitored Value (Day) dB(A)	49.7	55.8	44.9	55.8	45.3	45.1	52.4
Incremental Value dB(A)	60.1	60.1	47.8	34.7	31.3	24.3	24.9
Total Predicted Noise level dB(A)	60.5	61.5	49.6	55.8	45.5	45.1	52.4
NAAQ Standards	Industrial Day Time- 75 dB (A) & Night Time- 70 dB (A) Residential Day Time- 55 dB (A) & Night Time- 45 dB (A)						

The incremental noise level is found within the range of 49.7 dB (A) in Core Zone and 44.9 - 55.8 dB (A) in Buffer zone. The noise level at different receptors in buffer zone is lower due to the distance 33.3 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 for Control of Noise

The following noise mitigation measures are proposed for control of Noise

- Usage of sharp drill bits while drilling which will help in reducing noise;
- Secondary blasting will be totally avoided and hydraulic rock breaker are utilized for breaking boulders;
- Controlled blasting with proper spacing, burden, stemming and optimum charge/delay will reduce noise;
- The blasting will be carried out during favourable atmospheric condition and less human activity timings by using nonelectrical initiation system;
- Proper maintenance, oiling and greasing of machines will be done every week to reduce generation of noise;
- Provision of sound insulated chambers for the workers working on machines (HEMM) producing higher levels of noise;
- Silencers / mufflers will be installed in all machineries;
- Green Belt will be developed around the project areas and along the haul roads. The plantation minimizes propagation of noise;
- Personal Protective Equipment (PPE) like ear muffs/ear plugs will be provided to the operators of HEMM and persons working near HEMM and their use will be ensured 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 mining activities in the project area 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 proposed mine is moving of Heavy Earth Moving Machineries vibration due to blasting is very minimal since the blasting will not carried out frequently in this type of Granite quarry operation. 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 project area is located 550m South West. The ground vibrations due to the blasting in proposed mine 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

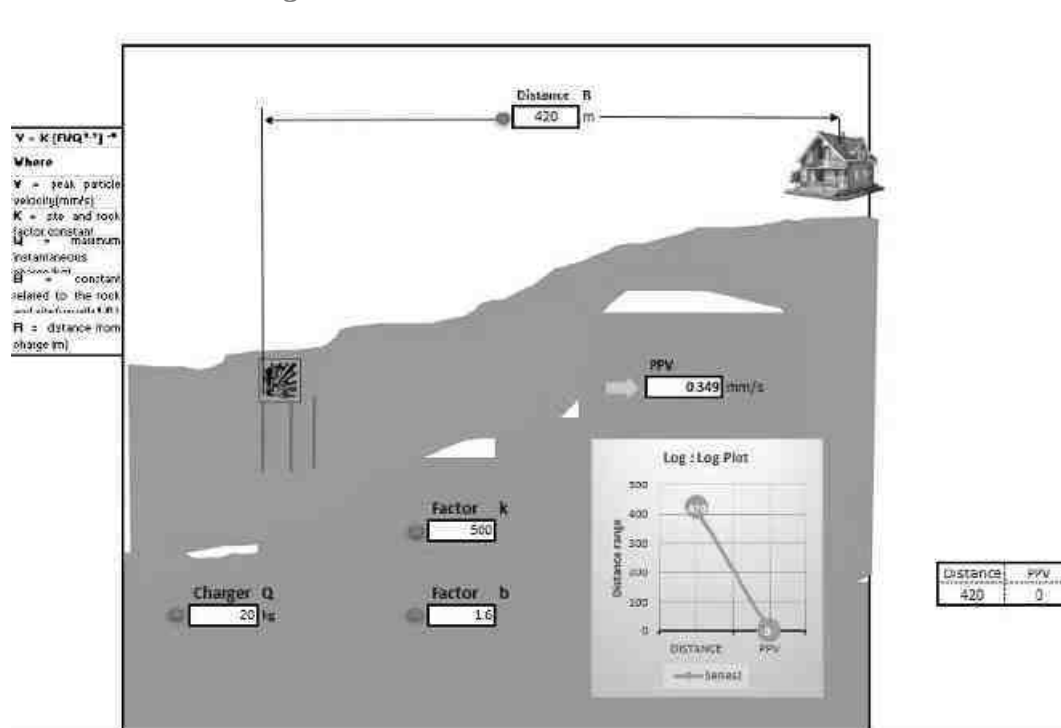
Q = maximum instantaneous charge (kg)

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

Maximum Charge in kgs	Nearest Habitation in m	PPV in m/ms
20	420	0.349

Figure No 4.7: Ground Vibration Prediction

From the above graph, the charge per blast of 20kg 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. It should be ensured that the explosives used for blasting at one blast should not exceed more than 100kg at any point of time. 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 for Control of Vibration

- The blasting operations in the mine are proposed to be carried out by jackhammer drilling and blasting using delay detonators, which reduces the ground vibrations;
- Proper quantity of explosive, suitable stemming materials and appropriate delay system should be adopted to avoid overcharging and for safe blasting;
- Adequate safe distance from blasting should 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 shall 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.

4.5 Biological Environment

Mining activities generally result in deforestation, land degradation, and water, air, and noise pollution which directly or indirectly affect the faunal and floral status of the mine area. However, the occurrence and magnitude of these impacts are entirely dependent upon the project location, mode of operation, and technology involved. Existing roads will be used; new roads will not be constructed to reduce the impact on flora. Wildlife is not commonly found in the lease area and its immediate environments because of the lack of vegetal cover and surface water.

4.5.1. Anticipated Impact on Flora

- None of the plants will be cut during the operational phase of the mine.

- There shall be negligible air emissions or effluents from the project site. During the loading of the truck, dust generation will be likely. This shall be a temporary effect and not anticipated to affect the surrounding vegetation significantly.
- Most of the land in the buffer area is undulating terrain with croplands, grass patches, and small shrubs. Hence, there will be no effect on the flora of the region.

4.5.1.1. Mitigation Measures

The project site should have land to develop a greenbelt in and around the limits of the mine, along roads, and another vacant area. The main objective of the green belt is to provide a barrier between the source of pollution and the surrounding areas. Although the project will not lead to any tree cutting, it is proposed to improve the greenery of the locality through plantation services. To avoid dust emissions, the mined materials will be covered with tarpaulin during transportation.

4.5.1.2. Selection of Plant Species for Green Belt Development

The selection of plant species for the green belt development depends on various factors such as climate, elevation, and soil. The plants should exhibit the following desirable characteristics in order to be selected for plantation.

- 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	<i>Aegle marmelos</i>	Vilva Maram
2	<i>Albizia lebbeck</i>	Vaagai maram
3	<i>Cassia fistula</i>	Konrai tree
4	<i>Lannea coromandelica</i>	Othiyam
5	<i>Limonia acidissima</i>	Vila maram
6	<i>Syzygium cumini</i>	Naval maram
7	<i>Toona ciliata</i>	Santhana Vembu
8	<i>Ficus hispida</i>	Aththi maram
9	<i>Borassus flabellifer</i>	Panai-maram
Species suitable for abatement of noise and dust pollution		
1	<i>Azadirachta indica</i>	Vembhu maram
2	<i>Ficus religiosa</i>	Arasan maram
3	<i>Ficus hispida</i>	Aththi maram
4	<i>Bombax ceiba</i>	Mul Elavu
5	<i>Syzygium cumini</i>	Naval maram
6	<i>Tamarindus indica</i>	Puliyamaram
7	<i>Mangifera indica</i>	Manga maram
8	<i>Harwickia binata</i>	Anjan maram

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

4.5.2. Anticipated Impact on Fauna

- No rare, endemic & endangered species are reported in the buffer zone. However, during the course of mining, the management will practice the scientific method of mining with a proper Environmental

Management Plan including pollution control measures especially for air and noise, to avoid any adverse impact on the surrounding wildlife.

- Fencing around the mine lease area to restrict the entry of stray animals.
- Green belt development will be carried out which will help in minimizing adverse impact on the flora found in the area.

4.5.2.1. Mitigation Measures

- A suitable plan for the conservation of Schedule-I Species have been prepared and the necessary fund for implementation for the same will be made.
- All the preventive measures will be taken for the growth & development of fauna.
- Creating and developing awareness for nature and wildlife in the adjoining villages.
- The workers shall be trained to not harm any wildlife, should it come near the project site. No work shall be carried out after 6.00 pm.
- Topsoil has a large number of seeds of native plant species in the mining area.
- Checks and controls the movement of vehicles in and out of the mine.
- Undertaking mitigative measures for a conducive environment for the flora and fauna in consultation with Forest Department.
- A dust suppression system will be installed within the mine and periphery of the mine.

4.5.3. Impact on Aquatic Biodiversity

Mining activities will not disturb the aquatic ecology as there is no effluent discharge proposed from the Black Granite Quarry. There is no natural perennial surface water body within the mine lease area, like wetlands, rivers streams, lakes, and farmer sites. There is no impact on fish habitats and the food WEB/ food chain in the water body and Reservoir. Kindly refer the Chapter 3, clause No 3.7. Aquatic biodiversity is observed in the study area.

4.5.4. Impacts on Bird Fauna:

The project does not involve any tree felling or removal of vegetation. Therefore, there may not be loss of nesting and roosting habitat of avian fauna.

4.5.5. Impacts on wildlife

There is no National Park, Wildlife Sanctuary, Biosphere Reserve, Wildlife corridors and Tiger/Elephant Reserve found within 10 km radius of the project site.

4.5.6. Impact Assessment on Biological Environment

This chapter highlights the various impacts on ecology and biodiversity due to mining activity. The major adverse impacts due to pre-mining and mining phases are loss of habitat, biodiversity, rare flora and fauna, fisheries and other aquatic life, migration of wildlife, and overall disruption of the ecology of the area. During the post-mining phase after land restoration, ecology may effectively improve. A detail of impact and assessments was mentioned in Table No.4.2.

4.5.6.1. Anticipated Environmental Impacts and Mitigation Measures of Kilpachar Village, Black Granite Quarry, Tiruvannamalai District, Tamil Nadu.

Details of anticipated issues for the next operation period were summarized with possible impacts and mitigation measures to meet the problem (Table No.4.2.).

Table No: 4.2. Anticipated impact of Ecology and Biodiversity in Kilpachar Village, Black Granite Quarry

S. No	Aspect Description	Likely Impacts on Ecology and Biodiversity (EB)	Impact Consequence Probability Description Justification	Significance	Mitigation Measures
Pre-mining phase					
1	Uprooting of vegetation of lease area	Site specific loss of common floral diversity (Direct impact)	The site possesses Common floral (not tree) species. Clearance of these species will not result in loss of flora.	Less severe	No immediate action is required. However, a Greenbelt /plantation will be

		Site specific loss of associated faunal diversity (Partial impact)	The site supports only common species, which use a wide variety of habitats of the buffer zone reserve forest area. So, there is no threat of Faunal diversity		developed on the project site and on the periphery of the project boundary, which will improve the floral and faunal diversity of the project area.
		Loss of Habitat (Direct impact)	Site does not for unique / critical habitat structure for unique flora or fauna.		
Mining phase					
2	Excavation of mineral using machine and labours, transportation Activities will Generate noise.	Site-specific disturbance to normal faunal movements at the site due to noise. (Partial impact)	Site does not form unique / critical habitat structure for unique flora or fauna.	Less severe	-Mining activity should not be operated after 5PM. -Excavation of dump and transportation work should stop before 7PM.
3	Vehicular movement for transportation of materials will result in the generation of dust (Particulate matter) due to haul roads and emission of Sulphur Dioxide, Nitrogen Dioxide, Carbon monoxide, etc.	Impact on Surrounding agriculture and associated fauna due to deposition of dust and emission of CO. (Indirect impact)	Impact is less as the agricultural land is far from the core area.	Less severe	All vehicles will be certified for appropriate Emission levels. More plantations have been suggested Upgrade the vehicles with alternative fuels such biodiesel, methanol, and biofuel around the mining area.

Table 4.13: Greenbelt development plan

Plantation Details	Required	1 st Year
No. of plants	1400	1400
Yearly %	100 %	100 %

Within the safety barrier can plant 650 Nos of trees in two rows with 3m spacing interval
 Remaining 2,290 Nos of trees proposed to plant in the Village roads for a length of 3,440m.

Table 4.14: Preparation of green belt details

Source: Approved Scheme of Mining Plan

ACTIVITY	YEAR					RATE	AMOUNT (Rs.)
	I	II	III	IV	V		
Plantation (In Nos.)	1400	-	-	-	-	@200 Rs Per sapling	2,80,000/-
Barbed Wire Fencing (In Mtrs) 750 Mtrs	2,25,000	-	-	-	-	@300 Rs Per Meter	2,25,000
Garland drain (In Mtrs) 300Mtrs	90,000	-	-	-	-	@300 Rs Per Meter	90,000

TOTAL	5,95,000/-

4.5.2.2.1. Species Recommendation for Plantation granted in the district

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

- Natural growth of existing species and survival rate of various species.
- Suitability of a particular plant species for a particular type of area.
- Creating of biodiversity.
- Fast growing, thick canopy copy, perennial and evergreen large leaf area.
- Efficient in absorbing pollutants without major effects of natural growth.
- The following species may be considering primary for plantation best suited for the prevailing climate condition in the area.

Table 4.15: Recommended Species to Plant in the Greenbelt

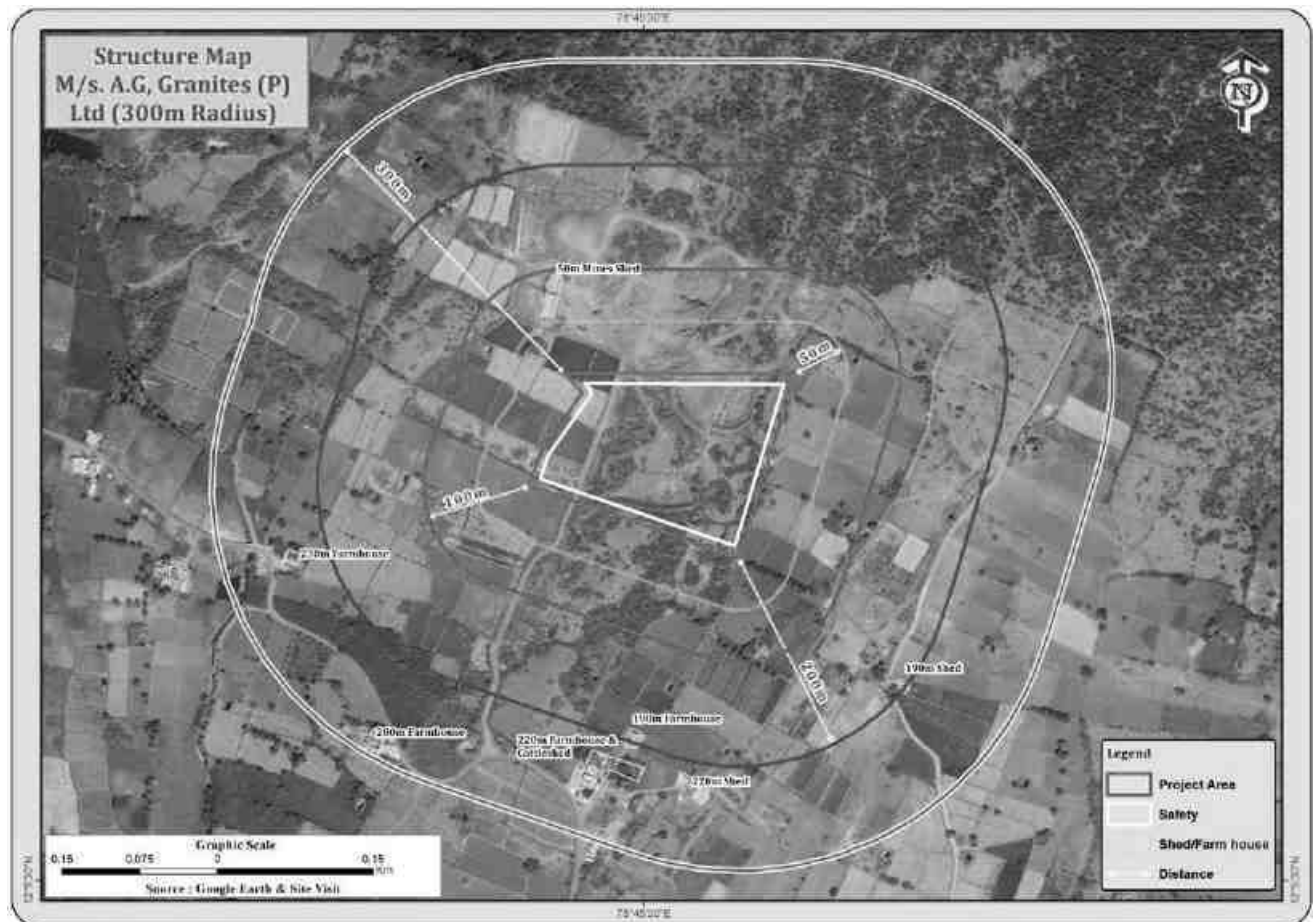
<i>Sl.No</i>	<i>Name of the plant (Botanical)</i>	<i>Family Name</i>	<i>Common Name</i>	<i>Habit</i>
1	<i>Azadirachta indica</i>	Meliaceae	Neem, Vembu	Tree
2	<i>Albiziafalcatoria</i>	Fabaceae	Tamarind, Puliyamaram	Tree
3	<i>Polyalthialongifolia</i>	Annonaceae	Kattumaram	Tree
4	<i>Borassus Flabellifer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

4.6 Socio Economic

The socio-economic impacts of mining are many. Impacts of a mine project may be positive or Negative. The adverse impacts attribute to physical displacement due to land acquisition, which is followed by loss of livelihood, mental agony, changes in social structure, and risk to food security etc., People are also directly affected due to pollution. Social Impact Assessment (SIA) is a process of analysis, monitoring and managing the social consequences of a project. Study on Socio-economic status has already been carried out using primary socio-economic survey for generating the baseline data of Socio-economic status.

4.6.1 Anticipated Impact

From the primary Socio-economic survey & through secondary data available from established literature and census data 2011, it is found that there would be positive impact on Socio-economic condition of the nearby area. There is no habitation within 300 m of the proposed mining lease area. Therefore, no major impact is anticipated on the nearby habitation during the entire life of the mine.

FIGURE.4.8 GOOGLE IMAGE SHOWING STRUCTURE MAP 300M RADIUS

4.6.2 Mitigation Measures

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

4.7 Occupational Health and Safety

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

- Respiratory hazards
- Noise
- Physical hazards
- 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

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

4.7.3 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/ Silicosis 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.

4.7.5 Post COVID Health Management Plan for Workers

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

- Temperature will be checked to all the workers while arriving to work on each day
- If any persons/employees have fever of 100.4 or higher, chills, shortness of breath will be sent to Hospital and the persons will be employed after fourteen days
- All the persons inside the mine area instructed to wear fabric or disposable pleated masks covering Nose and Mouth
- Social distancing of 6 feet will be maintained all the time
- Temporary Hand washing points will be installed near the working places, workers will be initiated to Wash hands frequently with soap and water for a minimum of 20 seconds and advised to avoid touching face. This is an essential contagion-control mechanism

4.7.6 Plastic Waste Management

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

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

Action Plan:

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

4.8 Mine Closure

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

Objective of Mine closure

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

4.8.1 Mine Closure criteria

The criteria involved in mine closure are discussed below:

4.8.1.1 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.,

4.8.1.2 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.

4.8.1.3 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 (Annexure I)

5. ANALYSIS OF ALTERNATIVES (TECHNOLOGY AND SITE)

5.1 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.

The quarrying operation like drilling, blasting, excavation, loading & transportation are being carried out. The site has been selected based on geological investigation and exploration as below:

- Transportation facility for materials & manpower
- Overall impact on environment and mitigation feasibility
- Socio – economic background.

Enough infrastructures exists and lesser resources are required to be deployed. Since, any further construction for infrastructure is not required and hence does not affect the environment considerably. The mineral deposits are site specific in nature; hence question of seeking alternate site does not arise for this project.

6. ENVIRONMENTAL MONITORING PROGRAMME

6.0 General

The monitoring and evaluation of environmental parameters indicates potential changes occurring in the environment, which paves way for implementation of rectifying measures wherever required to maintain the status of the natural environment. Evaluation is also a very effective tool to judge the effectiveness or deficiency of the measures adopted and provides insight for future corrections.

The main objective of environmental monitoring is to ensure that the obtained results in respect of environmental attributes and prevailing conditions during operation stage are in conformity with the prediction during the planning stage. In case of substantial deviation from the earlier prediction of results, this forms as base data to identify the cause and suggest remedial measures. Environmental monitoring is mandatory to meet compliance of statutory provisions under the Environment (Protection) Act, 1986, relevant conditions regarding monitoring covered under EC orders issued by the SEIAA 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 Project Proponent. A comprehensive monitoring mechanism has been devised for monitoring of impacts due to proposed project; Environmental protection measures like dust suppression, control of noise and blast vibrations, maintenance of machinery and vehicles, housekeeping in the mine premises, plantation, implementation of Environmental Management Plan and environmental clearance conditions will be monitored by the 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 Mine Management.

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

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. 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).

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

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

6.3 Monitoring Schedule and Frequency

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

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

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

The details of monitoring are detailed in Table 6.2

Table 6.2: Monitoring Schedule for the Project Area

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, PM2.5, PM10, SO2 and NOx.
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 for M/s.A.G.Granites Pvt Ltd Black Granite Quarry is Rs. 3,80,000 for conducting Air Quality, Meteorology, Water Quality, Hydrology, Soil Quality, Noise Quality Vibration Study, Greenbelt.

Table 6.3: Environmental Monitoring Budget

Sl.No.	Parameter	No of Location	Recurring Cost per annum
1	Air Quality	4	Rs 2,60,000/-
2	Noise Level	4	Rs 10,000/-
3	Ground Vibration	2	Rs 20,000/-
4	Water sampling	1	Rs 90,000/-
	Total		Rs 3,80,000

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 Mine Management level and 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 will submit the periodical reports to

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

CHAPTER – 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 are incorporated after Public Hearing.

- Public Consultation
- Risk Assessment
- Disaster Management Plan

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. Risk Assessment is all about prevention of accidents and to take necessary steps to prevent it from happening. Factors of risks involved due to human induced activities in connection with mining & allied activities with detailed analysis of causes and control measures for the mine is given in below Table 7.4.

Table 7.1 Risk Assessment

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; ▪ Entry of unauthorized persons will be prohibited; ▪ Firefighting and first-aid provisions in the mine office complex and mining area; ▪ Provisions of all the safety appliances such as safety boot, helmets, goggles etc. will be made available to the employees and regular check for their use ▪ Working of quarry, as per approved plans and regularly updating the mine plans; ▪ Cleaning of mine faces shall be daily done in order to avoid any overhang or undercut; ▪ Handling of explosives, charging and firing shall be carried out by competent persons only under the supervision of a Mine Manager; ▪ Maintenance and testing of all mining equipment as per manufacturer guidelines.

2	OB / Waste Dump	Sliding of benches Height and slope of the benches Drainage facilities	▪ Dumps benches are maintained with proper 3 m height and 37° slope to prevent slope failure and terraced. ▪ Dumping in the waste dump in layers and dozing daily. ▪ Vegetation of the top and slopes of the dump to prevent erosion and providing water drainage channels ▪ Providing proper drainage facilities in mine and dump area. ▪ Construction of retaining wall around dump area to stop sliding of material. ▪ Garland drain to be made around OB dump area
3	Drilling& Wire Saw Cutting	Due to improper and unsafe practices Due to high pressure of compressed air, hoses may burst Drill Rod may break	▪ Safe operating procedure established for drilling (SOP) will be strictly followed. ▪ Only trained operators will be deployed. ▪ No drilling shall be commenced in an area where shots have been fired until the blaster/blasting foreman has made a thorough Examination of all places, ▪ Drill& Wire saw operator shall examine the drilling and wire saw equipment and satisfy himself ▪ Drilling & cutting operations shall not be carried on simultaneously on the benches at places directly one above the other. ▪ Periodical preventive maintenance and replacement of worn-out accessories in the compressor and drill equipment and wire saw equipment as per operator manual. ▪ All drills and wire saw unit shall be provided with wet drilling and cutting arrangement and it shall be maintained in efficient working in condition. ▪ Operator shall regularly use all the personal protective equipment.
4	Blasting	Fly rock, ground vibration, Noise and dust. Improper charging, stemming & Blasting/fining of blast holes Vibration due to movement of vehicles	▪ The maximum charge per delay and by optimum blast hole pattern, vibrations will be controlled within the permissible limit and blast can be conducted safely. ▪ SOP for Charging, Stemming & Blasting/Firing of Blast Holes will be followed by blasting crew during initial stage of operation ▪ Shots are fired during daytime only. ▪ All holes charged on any one day shall be fired on the same day. ▪ The danger zone is and will be distinctly demarcated (by means of red flags)
5	Transportation	Potential hazards and unsafe workings contributing to accident and injuries Overloading of material While reversal & overtaking of vehicle	▪ 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.

		Operator of truck leaving his cabin when it is loaded.	▪ Not allow any unauthorized person to ride on the vehicle nor allow any unauthorized person to operate the vehicle. ▪ Concave mirrors should be kept at all corners ▪ All vehicles should be fitted with reverse horn with one spotter at every tipping point ▪ Loading according to the vehicle capacity ▪ Periodical maintenance of vehicles as per operator manual
6	Natural calamities	Unexpected happenings	▪ Escape Routes will be provided to prevent inundation of storm water ▪ Garland drains will be provided at the toe of dump ▪ Fire Extinguishers & Sand Buckets
7	Failure of Mine Benches and Pit Slope	Slope geometry, Geological structure	Ultimate or over all pit slope shall be below 60° and each bench height shall be 5m height.

7.3 Disaster Management Plan

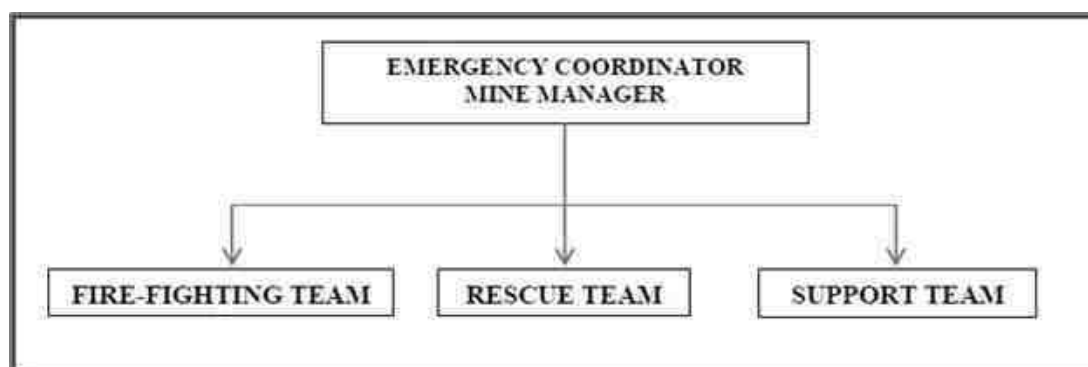
The Disaster Management Plan is aimed to ensure safety of life, protection of environment, protection of installation, restoration of production and salvage operations in this same order of priorities.

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

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

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

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



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 7.5.

Table 7.2: Proposed Teams to Deal with Emergency Situation

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

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

Roles and responsibilities of emergency team –

(a) Emergency coordinator (EC)

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

(b) Incident controller (IC)

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

(c) Communication and advisory team

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

(d) Roll call coordinator

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

(e) Search and rescue team

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

(f) Emergency security controller

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

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 Type of Fire Extinguishers

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

Alarm system to be followed during disaster

On receiving the message of disaster from Site Controller, fire-fighting team, the mine control room attendant will sound siren wailing for 5 minutes. Incident controller will arrange to broadcast disaster message through public address system.

On receiving the message of "Emergency Over" from Incident Controller the emergency control room attendant will give "All Clear Signal", by sounding alarm straight for 2 minutes.

The features of alarm system will be explained to one and all to avoid panic or misunderstanding during disaster.

In order to prevent or take care of hazard / disasters if any the following control measures have been adopted.

- All safety precautions and provisions of Metalliferous Mines Regulations (MMR), 1961 is strictly followed during all mining operations.
- Observance of all safety precautions for blasting and storage of explosives as per MMR 1961.
- Entry of unauthorized persons into mine & allied areas is completely prohibited.
- Firefighting and first-aid provisions in the mines office complex and mining area are provided.
- Provisions of all the safety appliances such as safety boot, helmets, goggles, dust masks, ear plugs and ear muffs etc. are made available to the employees and the use of same is strictly adhered to through regular monitoring.
- Training and refresher courses for all the employees working in hazardous premises.
- Working of mine, as per approved plans and regularly updating the mine plans.
- Cleaning of mine faces is regularly done.
- Handling of explosives, charging and blasting are carried out only by qualified persons following SOP.
- Checking and regular maintenance of garland drains and earthen bunds to avoid any inflow of surface water in the mine pit.
- Provision of high-capacity standby pumps with generator sets with enough quantity of diesel for emergency pumping especially during monsoon.
- A blasting SIREN is used at the time of blasting for audio signal.
- Before blasting and after blasting, red and green flags are displayed as visual signals.
- Checking of blasting area for any un-blasted hole or material.
- Warning notice boards indicating the time of blasting and NOT TO TRESPASS are displayed at prominent places.
- Regular maintenance and testing of all mining equipment were carried out as per manufacturer's guidelines.

7.4 Cumulative Impact Study

There are Proposed applied and nearby proposed quarries within a radius of 500 meters from the proposed project area. The list of quarries is as below –

Table 7.4: List of Quarries within 500 Meter Radius from this Proposal

APPLIED PROPOSED QUARRY				
CODE	Name of the Owner	S.F. Nos	Extent	Status
P-1	M/s.A.G.Granites Pvt Ltd	65 Part - 2	3.21.5 Ha	File.No.13259, ToR Identification No.TO26B0108TN52 58198N Dated.05.03.2026.
		Total	3.21.5 Ha	
EXISTING QUARRY				
E-1	M/s.A.G.Granites Pvt Ltd	65 Part – 1	4.15.0 Ha	30.12.2024 – 29.12.2044.
		Total	4.15.0 Ha	
TOTAL CLUSTER EXTENT			7.36.50 Ha Cluster Quarry	

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

Table 7.5: Salient Features of Proposed Projects “P1”

Name of the Quarry		M/s.A.G.Granites (Private) Limited Black Granite quarry
SF.no		65 (Part-2),
Extent		3.21.5 Ha
Village & Taluk		Kilpachar Village, Thandrapattu Taluk
Lease period		20 years
Life of the Mine		20 years
Land use classification		It is a Government Land, Classified as Kallankuthu and the entire land is covered by Granite boulders and sheet rock.
Proposed Depth for five years plan period		20m(5m AGL + 15m BGL)
Ultimate depth of Mining		20m(5m AGL + 15m BGL)
Ultimate Pit Dimension		117m (L) X 80m (W) X 20m (D)
Toposheet No		57 L/16
Latitude between		12°05'40.09"N to 12°05'45.76"N
Longitude between		78°45'26.42"E to 78°45'34.71"E
Topography		The area is Exhibits Undulated terrain. The gradient is gentle towards South west side and altitude of the area is 250 - 255m above from MSL. The area is concealed under reddish gravelly soil having an average thickness of 1m, 2m weathered rock and followed by fresh black granite..
Ground water level		The water level is found to occur at a depth of 104 m - 109m in rainy season below from the ground level.
Machinery proposed	Mine Manager	1
	Geologist	1
	Mine Foreman	1
	Blaster/Mate	1
	Excavator - Operator	1
	Wire Saw Operator	1
	Tipper Driver	2
	Water Sprinkler Driver	1
	Jack Hammer Drillers	12
	Security	1
	Helper	4
	Co-Operator & Cleaner	5

Proposed manpower deployment	31
Project cost	Rs.6,01,57,873/-
EMP Cost	Rs. 15,05,000/-
Total Project Cost	Rs. 6,16,62,873/-
CER cost	Rs. 5,00,000/-
Nearby Water Bodies	• Odai 270m West • Tank 470m NW • Pamban Stream 790m SE • Tank 1.8km East • Thenpennai River 4.6km NW • Sathanur Reservoir 9km NW
Nearest Habitation	420m-S
Nearest Reserve Forest	Ponnaiyar R.F. – 90m – North
Nearest Wild Life Sanctuary	Cauvery South Wildlife Sanctuary – 86.5km – NW Cauvery North Wildlife Sanctuary – 91.5km – NW

Table 7.6: Salient Features of Existing Quarry “P2”

Name of the Quarry		M/s.A.G.Granites (Private) Limited Black Granite quarry
SF.no		65 (Part-1),
Extent		4.15.0 Ha
Village & Taluk		Kilpachar Village, Thandrapattu Taluk
Lease period		20 years
Life of the Mine		20 years
Land use classification		It is a Government Land, Classified as Kallankuthu and the entire land is covered by Granite boulders and sheet rock.
Proposed Depth for five years plan period		47m
Ultimate depth of Mining		47m
Ultimate Pit Dimension		112m (L) X 118m (W) X 47m (D). 143m (L) X 81m (W) X 45m (D).
Toposheet No		57 L/16
Latitude between		12°05'45.69430"N to 12°05'52.44602"N
Longitude between		78°45'25.79138"E to 78°45'35.97803"E
Topography		The area is Exhibits Undulated terrain. The gradient is gentle towards Western side and altitude of the area is 258 - 265m above from MSL. The area is concealed under reddish gravelly soil having an average thickness of 1m, 2m weathered rock and followed by fresh black granite..
Ground water level		The water level is found to occur at a depth of 104 m - 109m in rainy season below from the ground level.
Machinery proposed	Mine Manager	1
	Mine Foreman	1
	Operator	3
	Skilled Labour	6
	Semi Skilled	12
	Unskilled	6
Proposed manpower deployment		29
Project cost		Rs.4,85,66,000/-
EMP Cost		Rs. 3,80,000/-
Total Project Cost		Rs.4,85,66,000/-
CER cost		Rs. 5.00.000/-

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 Movement of HEMM and operating of machineries in the cluster.

Air Environment –

Calculating the Cumulative Load of Mining within the cluster is as shown in table 7.8

Table 7.7: Cumulative Production Load of Granite

Quarry	Mineable Reserves ROM In m ³	Mineable Reserves of Granite	Proposed production ROM for five-year period	Production of ROM Per Day	Proposed production Granite for five-year period	Production of Granite Per day in m ³	Weathered rock in Production m ³	Weathered rock per day in m ³	Topsoil in Production m ³	Topsoil per day in m ³	Number of Lorry loads per day (ROM)
P1	62,240	6,224	15,335	10	1,534	1	8,580	14	4,290	8	1
Total	62,240	6,224	15,335	10	1,534	1	8,580	14	4,290	8	1
P2	1,21,821	18,273	30,420	20	4,563	3	7,616	25	4,189	13	2
Total	1,21,821	18,273	30,420	20	4,563	3	7,616	25	4,189	13	2
Grand Total	1,84,061	24,497	45,755	30	6,097	4	16,116	39	8,479	21	3

Source: Approved mining Plan, Scheme of Approved Mining plan of Respective mines and PFR Report ,form1.

On a cumulative basis considering all the 1 Proposed quarry and 1 Existing Quarry it can be seen that the overall production of Granite ROM per day is 6,097m³ and overall production of Granite is 4m³ per day No of Lorry loads per day is 3.

Based on the above production quantities the emissions due to various activities in all the 3quarries 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 7.9.

Table 7.9: 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	0.082666434	g/s
	Blasting	Point Source	0.000933814	g/s
	Mineral Loading	Point Source	0.045975617	g/s
	Haul Road	Line Source	0.002504229	g/s/m
	Overall Mine	Area Source	0.065360780	g/s
Estimated Emission rate for SO ₂	Overall Mine	Area Source	0.001365381	g/s
Estimated Emission rate for NO _x	Overall Mine	Area Source	0.000097557	g/s
Emission Estimation for quarry P2				
	Activity	Source type	Value	Unit
Estimated Emission Rate for PM ₁₀	Drilling	Point Source	0.072303938	g/s
	Blasting	Point Source	0.000477996	g/s
	Mineral Loading	Point Source	0.042877119	g/s
	Haul Road	Line Source	0.002493144	g/s/m
	Overall Mine	Area Source	0.069843478	g/s
Estimated Emission rate for SO ₂	Overall Mine	Area Source	0.000729507	g/s
Estimated Emission rate for NO _x	Overall Mine	Area Source	0.000064058	g/s

Source: Emission Calculations.

Table 7.10: Incremental & Resultant GLC within Cluster

PM ₁₀ in µg/m ³	
Location	CORE
Background	42.0
Highest Incremental	18.82
Resultant	60.8
NAAQ standard	100 µg/m ³

PM _{2.5} in µg/m ³	
Location	CORE
Background	20.9
Highest Incremental	9.83
Resultant	30.7
NAAQ standard	60 µg/m ³
SO ₂ in µg/m ³	
Location	CORE
Background	5.5
Highest Incremental	1.49
Resultant	6.9
NAAQ standard	80 µg/m ³
NO _x in µg/m ³	
Location	CORE
Background	20.8
Incremental	13.58
Resultant	34.4
NAAQ standard	80 µg/m ³

Noise Environment –

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

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

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

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.

$$Lp_{total} = 10 \log \{10^{(Lp_1/10)} + 10^{(Lp_2/10)} + 10^{(Lp_3/10)} + \dots\}$$

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 considering of all the machinery and activities used in the mining process.

Table 7.11: Predicted Noise Incremental Values from Cluster

Location ID	Background Value (Day) dB(A)	Incremental Value dB(A)	Total Predicted dB(A)	Residential Area Standards dB(A)
Habitation Near P1	49.7	47.6	51.8	55
Habitation Near P2	55.8	47.6	56.4	

The incremental noise level is found within the range of 51.8 – 56.4 dB (A) in Core Zone. The noise level at different receptors in buffer zone is lower due to the distance involved and other topographical features adding to the noise attenuation. The resultant Noise level due to monitored values and calculated values at the receptors are based on the mathematical formula considering attenuation due to Green Belt as 4.9 dB (A) the barrier effect. From the above table, it can be seen that the ambient noise levels at all the locations near habitations are within permissible limits of Residential Area (buffer zone) as per THE NOISE POLLUTION (REGULATION AND CONTROL) RULES, 2000 (The Principal Rules were published in the Gazette of India, vide S.O. 123E, dated 14.2.2000 and subsequently amended vide S.O. 1046E, dated 22.11.2000, S.O. 1088E, dated 11.10.2002, S.O. 1569E, dated 19.09.2006 and S.O. 50E dated 11.01.2010 under the Environment (Protection) Act, 1986.).

Socio Economic Environment –

The 3 mines shall create employment to 81 people and revenue will be created to government

Table 7.12: Socio Economic Benefits from Quarries

Location code	Employment	Project Cost	CER
P1	31	Rs.6,01,57,873	5,00,000
P2	29	Rs.4,99,25,000/-	5,00,000
Total	60	Rs. 11,00,82,873/-	10,00,000/-

A total of 60 people getting and will get employment from these cluster 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 by all the mines.

As per para 6 (II) of the office memorandum, all the mines being a green field project & Capital Investment is $\leq$ 100 crores, they shall contribute 2% of Capital Investment towards CER as per directions of EAC/SEAC and the total CER amount from the 3 Quarries is Rs 50,00,000/-

CHAPTER – 8: PROJECT BENEFITS

8.0 General

There is one applied proposed project for M/s.A.G.Granites Pvt Ltd Black Granite Quarry aims to Proposed production 15,335 (ROM for five year period) for Life of Mine of 20 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
- To meet out the demand supply gap of Granite and enhance the foreign exports

8.1 Employment Potential

It is proposed to provide employment to about 31 persons for carrying out mining operations and give preference to the local people in providing employment. 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 than negative 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 and Existing mine is located in Kilpachar Village, Thandampattu Taluk, and Tiruvannamalai District of Tamil Nadu and the area have communications, roads and other facilities already well established. The following physical infrastructure facilities will further improve due to proposed mine.

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

8.4 Improvement in Social Infrastructure

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

8.5 Other Tangible Benefits

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

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

8.5.1 Corporate Social Responsibility

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

Under this programme, the project proponent will take-up following programmes for social and economic development of villages within 10 km of the project site. For this purpose, separate budget will be provided every year. For finalization of these schemes, proponent will interact with LSG. The schemes will be selected from the following broad areas –

- Health Services
- Social Development
- Infrastructure Development
- Education & Sports
- Self-Employment

8.5.2 CSR Cost Estimation

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

8.5.3 Corporate Environment Responsibility–

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

As per para 6 (II) of the office memorandum, being a green field project & Capital Investment is ≤ 100 crores, **M/s.A.G.Granites (Private) Limited** shall contribute 2% of Capital Investment towards CER as per directions of EAC/SEAC.

Table 8.1: CER – Action Plan

Code	CER
P1	Rs 5,00,000/-
Total	Rs 5,00,000/-

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

CHAPTER – 9: ENVIRONMENTAL COST BENEFIT ANALYSIS

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

CHAPTER - 10: ENVIRONMENTAL MANAGEMENT PLAN- M/S.A.G.GRANITES PVT LTD BLACK GRANITE QUARRY

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

The Proponent will – **M/s.A.G.Granites Pvt Ltd Black Granite Quarry**

- Allocate necessary resources to ensure the implementation of the environmental policy
- Meet the requirements of all laws, acts, regulations, and standards relevant to its operations and activities
- Implement a program to train employees in general environmental issues and individual workplace environmental responsibilities
- 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

10.1.1 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 the proposed existing quarry.

The said team will be responsible for:

- Analysis of the water and air samples collected through external laboratory.
- Monitoring of the water/ waste water quality, air quality and solid waste generated.
- 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. Aesthetic of the Environment will not be affected. There is no major vegetation in the project area during the course of quarrying operation and after completion of the quarrying operation thick plantation will be developed under greenbelt development programme.

Table 10.1: Proposed Controls for Land Environment

Control	Responsibility
Designing vehicle wash-down system so that all washed water is captured and passed through grease and oil separators.	Mines Manager
Refueling will be carried out in a safe location, away from vehicle movement pathways	Mine Foreman & Mining Mate
No external dumping i.e., outside the project area	Mine Foreman
Greenbelt on dumps and its maintenance	Environment Officer
Garland drains with catch pits to be provided all around the project area to prevent run off affecting the surrounding lands.	Environment Officer
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
Thick plantation using native flora species will be carried out on the backfilled area.	Mines Manager
There will be formation of a small surface water body in the mined-out area, which can be used for watering the greenbelt at the conceptual stages.	Environment Officer

10.3 Soil Management

10.3.1 Top Soil Management –

It is anticipated to remove 2,970 m³ of topsoil and preserve it to facilitate greenbelt development on the backfilled area during mine closure.

10.3.2 Overburden / Waste and Side Burden Management –

- It is anticipating to remove 94,665 m³ of waste (Granite waste@ 90%) which will temporarily store at predetermined places as per mining plan and will be backfilled during mine closure.

Table 10.2: Proposed Controls for Soil Management

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

10.4 Water Management

Water is a key component in mining projects as it is required for, and affected by, mining activities. Effective water management is important for a variety of reasons including: uninterrupted operation of the mine, compliance with operational permissions and applicable legislation, and minimization of effects on the receiving environment.

This section focuses on actions for avoidance, mitigation, and control, as well as a water management monitoring program –

- To protect water-related resources, and avoid harmful impacts;
- To supply and retain water for mine operations;
- to Define water-related environmental control structures; and
- To manage water to ensure that any discharges are following the applicable water quality levels and guidelines.

Table 10.3: Proposed Controls for Water Environment

Control	Responsibility
To maximize the reuse of pit water for water supply	Mines Manager
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	Environment Officer
Natural drains/nallahs/brooklets outside the project area should not be disturbed at any point of mining operations Safety distance of 50m will be always maintained from the odai and oorani	Mines Manager
Mine pit water is used for dust suppression and greenbelt development utilization of mine pit water is optimal and effective ways	Environment Officer
Ensure there is no process effluent generation or discharge from the project area into water bodies	Environment Officer
Domestic sewage generated from the project area will be disposed in septic tank and soak pit system	Mines Manager
Fast growing grasses, small plants and bushes will be grown on the overburden dumps to control soil erosion and siltation	Mines Manager
Retention walls and garland drains will be constructed around toe of waste dumps to arrest silt wash off from dumps during monsoon	Environment Officer
Rainwater harvesting measures will be adopted in the project area and in nearby villages to maintain and enhance the ground water table of the area	Environment Officer
Regularly assess and modify Water Management Plan to adapt to changing work plans and site conditions	Environment Officer
Familiarize all site personnel with the purpose and content of the Water Management Plan, and their responsibilities in its implementation	Environment Officer
Water management and sediment control structures and facilities will be regularly inspected and maintained according to the monitoring schedules	Environment Officer
Monthly or after rainfall, inspection for performance of water management structures and systems	Environment Officer
Conduct ground water and surface water monitoring for parameters specified by State Pollution Control Board (SPCB)	Mines Manager

Source: Proposed by FAE's & EIA Coordinator

10.5 Air Quality Management

The proposed mining 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 water sprinkling on working face	Mines Manager
Develop thick Greenbelt with tall growing trees and thick foliage cover all along the boundary of the project (7.5 Meter Buffer Zone) to arrest dust spreading outside the project area and to be maintained. This plantation cover will also act as an acoustic barrier	Environment Officer
Daily maintenance of haul roads and daily water sprinkling to minimize the generation of fugitive dust due to movement of heavy earth moving machineries on it	Mines Manager
Handle the waste from the mine pit to respective dumps and backfilling during closure process, fugitive dust is anticipated. this fugitive emission can be controlled by well-maintained machineries, well maintained haul roads water sprinkling on haul roads twice a day. Besides it is also advised not to handle the waste during high windy periods	Mines Manager & Environment Officer
Wet drilling procedure /drills with dust extractor system to control dust generation during drilling at source itself to be implemented	Environment Officer
Plantation will be carried out on surface dumps, backfilled area and top benches of the mined out area	Environment Officer
Water reservoir will be developed in the left over mined out pit, which will serve as additional surface water resources for the nearby villages	Environment Officer
Maintenance as per operator manual of the equipment and machinery in the mines to minimizing air pollution and noise generation	Mines Manager
Over loading of trucks should be avoided	Mines Manager
All the mining equipment and trucks has been controlled with emission norms	Environment Officer
The village roads used for mineral transport will be maintained weekly and monthly basis to avoid fugitive dust emissions	Mines Manager
Dust mask are provided to the workers working in high dust generating areas and continue to provide the same	Mines Manager
Weekly and Monthly maintenance of deployed machineries, to reduce gaseous emission	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	Environment Officer
Monitor meteorological conditions (temperature, wind, rainfall)	Environment Office

Source: Proposed by FAE's & EIA Coordinator

10.6 Noise Management

There will be intermittent noise levels due to vehicular movement, trucks loading, drilling and blasting, cutting activities. No mining activities are planned during night time.

Table 10.5: Proposed Controls for Noise Environment

Control	Responsibility
A thick greenbelt to be developed all along the Buffer Zone (7.5 Meters) of the project area to attenuate the noise and the same will be maintained	Mines Manager
Plantation activities to be carried out on surface dumps and infrastructure facilities, these plantations will help in attenuating the noise levels	Environment Officer
Preventive maintenance of mining machinery and replacement of worn-out accessories to control noise generation	Mines Manager
Deployment of mining equipment with an inbuilt mechanism to reduce noise	Environment Officer
Provision of earmuff / ear plugs to workers working in noise prone zones in the mines	Environment Officer
Provision of effective silencers for mining machinery and transport vehicles	Environment Officer
Provision of sound proof AC operator cabins to HEMM	Environment Officer
Sharp drill bits are used to minimize noise from drilling	Environment Officer
Controlled blasting technologies are adopted by using delay detonators to minimize noise from blasting	Mines Manager
Annual ambient noise level monitoring to be 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	Environment Officer
Undertake noise or vibration monitoring in response to a complaint (from any sensitive receptor).	Mines Manager
Change the burden and spacing by altering the drilling pattern and/or delay layout, or altering the hole inclination during initial stage of operation	Mines Manager
If a noise or vibration complaint is received, follow the complaints and inquiries	Environment Officer
Undertake noise or vibration monitoring half yearly	Environment Officer

Source: Proposed by FAE's & EIA Coordinator

10.7 Ground Vibration and Fly Rock Control**Table 10.6: Proposed Controls for Ground vibration & Fly rocks**

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 during initial stage 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
Prior to blasting within 500 meters of the lease boundary, establish a fly rock exclusion zone within adjacent properties and check with landholders that the area is not occupied by humans, blast clearance zones are applied for all blasts.	Environment Officer
Undertake vibration monitoring	Environment Officer

Source: Proposed by FAE's & EIA Coordinator

10.8 Biological Environment Management

The mine management 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 mined out area, backfilled area, etc., the water reservoir will be developed in lower benches of the mined-out area at conceptual stage will be used for the maintenance of green belt after the closure of mine.

Following control measures are proposed for its management and will be the responsibility of the environment officer.

- Greenbelt development all along the safety barrier of the project area
- 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 constructing a sprinkler near the newly planted area.
- Year wise plantation should 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.

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.

10.8.1 Species Recommended for Plantation

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

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

Table 10.7: Recommended Species to Plant in the Greenbelt

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

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 in mines are fugitive dust and noise. Safety of employees during mining operation and maintenance of mining equipment will be taken care as per Mines Act 1952 and Rule 29 of Mines Rules 1955. To avoid any adverse effect on the health of workers due to dust, noise and vibration sufficient measures have been provided.

10.9.1 Medical Surveillance and Examinations –

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

The health status of workers in the mine shall be regularly monitored under an occupational surveillance program. Under this program, all the employees are subjected to a detail's 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 above tests keep upgrading the database of medical history of the employees.

10.9.2 Proposed Occupational Health and Safety Measures –

- Providing a clean working environment that is conducive to safety & health annually
- Employee involvement and commitment in the implementation of health and safety guidelines
- Implementing safety and health management system and assessing the effectiveness through periodic audits
- Setting of safety and health objectives based on comprehensive strategic plans and measure performance against these plans
- Provision of necessary standard personal protective equipment's (PPE)
- Ensuring that all employees at all levels receive appropriate training and are competent to carry out their duties and responsibilities.
- Provision of rest shelters for mine workers with amenities like drinking water, fans, toilets urinals, canteen etc.,
- Rotation of workers exposed to noisy areas.
- Daily dust suppression on haul roads to prevent fugitive dust emission into the air.
- First-aid facility at the mine office.

10.9.3 Health and Safety Training Programme

The company shall 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 an Environmental Consultants to provide periodical training to all the employ to carry out the mining operation in and eco-friendly manner.

Table 10.8: List of Periodical Trainings Proposed for employees

Course	Personnel	Frequency	Duration	Instruction
New-hire Training	All new hires exposed to mine hazards	Once	One week	Employee rights, Supervisor, responsibilities, Self-rescue Respiratory devices, Transportation controls, Communication systems, Escape and emergency evacuation, Ground control hazards, Occupational health hazards, Electrical hazards, First aid, Explosives.
Task Training Like Drilling, Blasting, Stemming, safety, Slope stability, Dewatering, Haul road maintenance,	Employees assigned to new work tasks	Before new Assignments	Variable	Task-specific health & safety procedures and SOP for various mining activity. Supervised practice in assigned work tasks.
Refresher Training	All employees who received new-hire training	Yearly	One week	Required health and safety standards Transportation controls Communication systems Escape ways, emergency evacuations, Fire warning Ground control hazards First aid, Electrical hazards Accident prevention Explosives, Respirator devices
Hazard Training	All employees exposed to mine hazards	Once	Variable	Hazard recognition and avoidance Emergency evacuation procedures Health standards, Safety rules, Respiratory devices

Source: Proposed by FAE's & EIA Coordinator as per DGMS Norms

Budgetary Provision for Environmental Management –

Adequate budgetary provision has been made by the Company for execution of Environmental Management Plan. The Table 5.2 and 5.3 give overall investment on the environmental safeguards and recurring expenditure for successful monitoring and implementation of control measures (including reclamation).

Table 10.9: Capital and Recurring Cost of EMP

Activities	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	48900	48900
	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	0
	Wet drilling procedure / latest eco-friendly drill machine with separate dust extractor unit	Dust extractor @ Rs. 25,000/- per unit deployed as capital & @ Rs. 2500 per unit recurring cost for maintenance - 4 Units	75000	7500
	No overloading of trucks/tippers/tractors	Manual Monitoring through Security guard	0	5000
	Stone carrying trucks will be covered by tarpaulin	Monitoring if trucks will be covered by tarpaulin	0	10000
	Enforcing speed limits of 20 km/hr within ML area	Installation of Speed Governors @ Rs. 5000/- per Tipper/Dumper deployed - 2 Units	10000	500
	Regular monitoring of exhaust fumes as per RTO norms	Monitoring of Exhaust Fumes by Manual Labour	0	5000
	Regular sweeping and maintenance of approach roads for at least about 200 m from ML Area	Provision for 2 labours @ Rs.10,000/labour (Contractual) per Hectare	0	97800
	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 / Competent Person	0	0
	Provision for Portable blaster shed	Installation of Portable blasting shelter	50000	2000
	NONEL Blasting will be practiced to control Ground vibration and fly rocks	Rs. 30/- per 6 Tonnes of Blasted Material	0	42025
Waste Management	Waste management (Spent Oil, Grease etc.,)	Provision for domestic waste collection and disposal through authorized agency	5000	20000
		Installation of dust bins	5000	2000
	Bio toilets will be made available outside mine lease on the land of owner itself	Provision made in Operating Cost	0	0
Mine Closure	1. Progressive Closure Activity - Surface Runoff management	Provision for garland drain @ Rs. 10,000/- per Hectare with maintenance of Rs. 5,000/- per annum	48900	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	978000	10000
	3. Progressive Closure Activity Green belt development - 500 trees per one hectare - Proposal for 2450 Trees - (570 Inside Lease Area & 680 Outside Lease Area)	Site clearance, preparation of land, digging of pits / trenches, soil amendments, transplantation of saplings @ 200 per plant (capital) for plantation inside the lease area and @ 30 per plant maintenance (recurring)	114000	17100

		Avenue Plantation @ 300 per plant (capital) for plantation outside the lease area and @ 30 per plant maintenance (recurring)	204000	20400
	4. Implementation of Final Mine Closure Activity as per Approved Mining Plan on Last Year	Few activities already covered as progressive closure activities as greenbelt development, wire fencing, garland drain. *For Final Closure Activities 20% of the proposed closure cost will be spent during the final mine closure stage - Last Year	90200	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	14666150	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) - 31 Employees	152000	38000
	Health check up for workers will be provisioned	IME & PME Health check up @ Rs. 1000/- per employee	0	38000
	First aid facility will be provided	Provision of 2 Kits per Hectare @ Rs. 2000/-	0	9780
	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	244500	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
Start Rating	Monitoring of Granite Quarrying Operation by Anna University	Star Rating @ Rs. 1,00,000/- per Year will be deposited in the First Year	500000	0
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			3835300	1297005

In order to implement the environmental protection measures, an amount of Rs. 38.35lakhs as capital cost and recurring cost as Rs. 12.97 lakhs as recurring cost is proposed considering present market price considering present market scenario.

Year Wise Break Up	
1st Year	₹ 5,132,305
2nd Year	₹ 1,361,855
3rd Year	₹ 1,429,948
4th Year	₹ 1,501,445
5th Year	₹ 1,576,517
Total	₹110 Lakhs

CHAPTER – 11: SUMMARY AND CONCLUSIONS

M/s.A.G.Granites Pvt Ltd Black Granite Quarry 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.

A detailed Draft EIA/ EMP Report is prepared for public and other stakeholders' suggestions and a Final EIA/ EMP Report will be prepared based on the outcome of Public Consultation.

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

The main scope of the EIA study is to quantify the cumulative impact in the study area due to cluster quarries and formulate the effective mitigation measures for each individual leases. A detailed account of the emission sources, emissions control equipment, background Air quality levels, Meteorological measurements, Dispersion model and all other aspects of pollution like effluent discharge, Dust generation etc., have been discussed in this report. The baseline monitoring study has been carried out during the months December 2025 – February 2026 for various environmental components so as to assess the anticipated impacts of the cluster quarry projects on the environment and suitable mitigation measures for likely adverse impacts due to the proposed project is suggested individually for the respective proposed project under Chapter 10.

The project proponent ensures to obtain necessary clearances and quarrying will be carried out as per rules and regulations. The Mining Activity will be carried out in a phased manner as per the approved mining plan after obtaining EC, CTO from TNPCB, execution of lease deed and obtaining DGMS Permission and working will be carried out under the supervision of Competent Persons employed.

Overall, the EIA report has predicted that the project will comply with all environment standards and legislation after commencement of the project and operational stage mitigation measures are implemented.

Mining operations has positive impact on environment and socio economy such as landscape improvement, water as by-product, economy development and better public services, providing and supply of Grey Granite Quarry as per market demand.

Sustainable and modern mining leads us to see positive impact of mining operation and providing consistent employment for nearly 31 people directly in the cluster and indirectly around 100 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 M/s.A.G.Granites Pvt Ltd Black Granite Quarry.

12. DISCLOSURE OF CONSULTANTS

M/s.A.G.Granites Pvt Ltd Black Granite Quarry have engaged M/s Geo Exploration and Mining Solutions, an Accredited Organization under Quality Council of India – National Accreditation Board for Education & Training, New Delhi, for carrying out the EIA Study as per the ToR Issued.

Name and address of the consultancy:

GEO EXPLORATION AND MINING SOLUTIONS

No 17, 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.Thangaraju.P	In-house	1	A	HG GEO	A A
2	Dr. M. Ifthikhar Ahmed	In-house	1 38	A B	SC	A
3	Mr. Devanathan.D	In-house	-	-	AP EB	B A
4	Mrs. Jisha parameswaran	In-house	-	-	SHW	B
5	Mr. Govindasamy.P	In-house	-	-	WP	B
6	Mr.Viswanathan.P	In-house	-	-	LU	B
7	Mr.Senthilkumar.N	Empanelled			AQ	B
8	Mrs. Sasikala.T	Empanelled	-	-	SE	B
9	Mr.Vikram Krishna J.R	Empanelled	-	-	NV RH	A A

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

DECLARATION BY EXPERTS CONTRIBUTING TO THE EIA/EMP

Declaration by experts contributing to the Draft EIA/EMP for M/s.A.G.Granites Pvt Ltd Black Granite Quarry (Extent 3.21.5 Ha) in Kilpachar Village, Thandrapattu Taluk, Tiruvannamalai District, Tamil Nadu State. It is also certified that information furnished in the above EIA study are true and correct to the best of our knowledge.

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

Name: **Dr.Thangaraju.P**

Designation: **EIA Coordinator**

Date & Signature:

Period of Involvement: **August 2023 to till date**

Associated Team Member with EIA Coordinator

1. Mr. M Abdul Niyaas
2. Mr.Shaik Nawas

FUNCTIONAL AREA EXPERTS ENGAGED IN THE PROJECT

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

7	RH	- Identification of hazards and hazardous substances - Risks and consequences analysis - Vulnerability assessment - Preparation of Emergency Preparedness Plan - Management plan for safety.	Mr. J. R. Vikram Krishna	
8	LU	- Construction of Land use Map - Impact of project on surrounding land use - Suggesting post closure sustainable land use and mitigative measures.	Mr.P.Viswanathan	
9	NV	- Identify impacts due to noise and vibrations - Suggesting appropriate mitigation measures for EMP.	Mr. J. R. Vikram Krishna	
10	AQ	- Identifying different source of emissions and propose predictions of incremental GLC using AERMOD. - Recommending mitigations measures for EMP	Mr. N. Senthilkumar	
11	SC	Assessing the impact on soil environment and proposed mitigation measures for soil conservation	Dr. M. Ifthikhar Ahmed	
12	SHW	- Identify source of generation of non-hazardous solid waste and hazardous waste. - Suggesting measures for minimization of generation of waste and how it can be reused or recycled.	Mrs.Jisha Parameswaran	

LIST OF TEAM MEMBERS AS FUNCTIONAL AREA EXPERT

Sl.No.	Name	Functional Area Proposed	F AE /Mentor	Involvement	Signature
1	Mr.Shaik Nawas	SC	Dr. M. Ifthikhar Ahmed	- 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	

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 Draft EIA/EMP for M/s.A.G.Granites Pvt Ltd Black Granite Quarry (Extent 3.21.5 Ha) in Kilpachar Village, Thandrampattu Taluk, Tiruvannamalai District, Tamil Nadu State. It is also certified that information furnished in the EIA study are true and correct to the best of our knowledge.

Signature & Date:

Name:

Dr. M. Ifthikhar Ahmed

Designation:

Managing Partner

Name of the EIA Consultant Organization:

M/s. Geo Exploration and Mining Solutions

NABET Certificate No & Issue Date:

NABET/EIA/25-28/RA0424 Dated: 25.08.2025

Validity:

Valid till 06.08.2028

ANNEXURE

M/S.A.G.GRANITES (PRIVATE) LIMITED BLACK GRANITE QUARRY

S.F. Nos: 65 (Part-2),

Kilpachar Village,

Thandrapattu Taluk,

Tiruvanamalai District

EXTENT = 3.21.5 Ha

ToR obtained

ToR Identification: TO26B0108TN5258198N Dated.05.03.2026.

Project Proponent

M/s.A.G. Granites Pvt Limited,

Tmt.R.Shanthi - Director,

Muthu gounder Colony,

Harur, Dharmapuri District,

Tamilnadu State – 636 903

LIST OF ANNEXURES

ANNEXURES	DESCRIPTION	PAGE NOS
P1- M/S. AG GRANITES	COPY OF TERMS OF REFERENCE	1A - 23A
	COPY OF APPROVAL LETTER	24A-31A
	COPY OF 500m RADIUS LETTER	32A-33A
	COPY OF APPROVED MINING PLAN WITH PLATES	34A-138A
	COPY OF 300m & VAO ATTESTATION LETTER	139A
	COPY OF LAB DATA	140A-168A
	COPY OF DISTRICT SURVEY REPORT	169A-253A
	COPY OF CONSULTANT ACCREDITATION CERTIFICATE	254AA



File No: 13259
Government of India
Ministry of Environment, Forest and Climate Change
(Issued by the State Environment Impact Assessment Authority(SEIAA),
TAMIL NADU)



Dated: 05/03/2026



To,

Ramasamy M
AG GRANITES PRIVATE LIMITED
Muthu Gounder Colony, Harur, Harur, DHARMAPURI - 636903 TAMIL NADU.
sriponnusamy19@gmail.com

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

Sir/Madam,

Sub: SEIAA, Tamil Nadu – Proposed Black Granite (Dolerite) quarry over an area of 3.21.5 ha of in S.F.No's: 65(Part - 2) of Kilpachar Village, Thandrapattu Taluk, Tiruvannamalai District, Tamil Nadu by M/s. A.G. Granites (Private) Limited- under project category – “B1” and Schedule S.No. 1(a) – ToR issued along with Public Hearing- preparation of EIA report – Regarding.

Ref: 1. Online proposal No. SIA/TN/MIN/564154/2026, Dated: 07/01/2026.

2. Your application submitted for Terms of Reference dated: 07.01.2026

3. Minutes of the 675th SEAC -I Meeting held on 04.02.2026.

4. Minutes of the 970th Authority meeting held on 26.02.2026

2. The particulars of the proposal are as below:

(i) TOR Identification No.	TO26B0108TN5258198N
(ii) File No.	13259
(iii) Clearance Type	TOR
(iv) Category	B1
(v) Project/Activity Included Schedule No.	1(a) Mining of minerals
(vii) Name of Project	Black Granite Quarry Belongs to M/s. A.G. Granites (Private) Limited
(viii) Name of Company/Organization	AG GRANITES PRIVATE LIMITED
(ix) Location of Project (District, State)	TIRUVANNAMALAI, TAMIL NADU
(x) Issuing Authority	SEIAA
(xi) Applicability of General Conditions	no
(xii) Applicability of Specific Conditions	no

1. In view of the particulars given in the Para 1 above, the project proposal inter alia including Form-1 (Part A and B) were submitted to the SEIAA for an appraisal by the SEAC under the provision of EIA notification 2006 and its subsequent amendments.
2. The above-mentioned proposal has been considered by SEIAA in the meeting held on 26.02.2026. The minutes of the meeting and all the Application and documents submitted [viz. Form-1 Part A, Part B] are available on PARIVESH portal which can be accessed by scanning the QR Code above.
3. The State Expert Appraisal Committee (SEAC), based on the information & clarifications provided by the project proponent and after detailed deliberations on all technical aspects recommended the proposal for grant of Terms of Reference with public hearing under the provision of EIA Notification, 2006 and as amended thereof subject to the stipulation of specific and general conditions as detailed in Annexure (2).
4. The SEIAA has examined the proposal in accordance with the Environment Impact Assessment (EIA) Notification, 2006 & further amendments thereto and after accepting the recommendations of the SEAC hereby decided to issue the following Terms of Reference with public hearing for instant proposal of M/s. A.G. Granites (Private) Limited under the provisions of EIA Notification, 2006 and as amended thereof.
5. The Ministry/SEIAA-TN reserves the right to stipulate additional conditions, if found necessary.
6. The Terms of Reference with public hearing to the aforementioned project is under provisions of EIA Notification, 2006. It does not tantamount to approvals/consent/permissions etc. required to be obtained under any other Act/Rule/regulation. The Project Proponent is under obligation to obtain approvals /clearances under any other Acts/Regulations or Statutes, as applicable, to the project.
7. This issues with the approval of the Competent Authority.
8. The TORs with public hearing prescribed shall be valid for a period of three years from the date of issue, for submission of the EIA/EMP report as per OMNo.J-11013/41/2006-IA-II(I)(part) dated 29th August, 2017.

Copy To

- The Secretary, Ministry of Mines, Government of India, Shastri Bhawan, New Delhi.
2. The Additional Chief Secretary to Government, Environment and Forests Department, Tamil Nadu.
3. The Additional Chief Secretary to Government, Natural Resources Department, Tamil Nadu.
4. The Chairman, Central Pollution Control Board, Parivesh Bhawan, CBD-Cum-Office Complex, East Arjun Nagar, New Delhi-110 032.
5. The Chair Person, TNPC Board, 76, Mount Salai, Guindy, Chennai-32
6. The District Collector, Tiruvannamalai District
7. The Commissioner of Geology and Mines, Guindy, Chennai-32
8. The Assistant Director, Department of Geology & Mining, Tiruvannamalai District
9. EI Division, Ministry of Environment & Forests, Paryavaran Bhawan, New Delhi.
10. Integrated Regional office of MoEF&CC, Sastri Bhawan, Nungambakkam, Chennai
11. File Copy

Annexure 1

Specific Terms of Reference s for (Mining Of Minerals)

1. Seac Conditions - Site Specific

S. No	Terms of Reference
1.1	1. The PP shall submit details of the Existing Pit Letter obtained from the concerned authority along with the EIA report. 2. A Cluster Management Committee (CMC) shall be constituted including all the mines in the cluster as Committee Members for the effective management of the mining operation in the cluster through systematic & scientific approach with appointment of required statutory personnel,

S. No	Terms of Reference
	appropriate environmental management, system of maintaining the haul roads and village/panchayat roads, authorized blasting operation, Monitoring system of the environmental & other statutory compliances & its reporting status, etc. The PP shall submit the following details in the form of an Affidavit during the EIA appraisal: (i) Copy of the agreement forming CMC. (ii) The Organisation chart of the Committee with defining the role of the members (iii) The 'Standard Operating Procedures' (SoP) executing the planned activities. 3. The PP shall ensure the installation of CCTV at the proposed quarry site and ensure its inclusion during the EIA presentation.

2. Seac Standard Conditions

S. No	Terms of Reference
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: (i) Original pit dimension (ii) Quantity achieved Vs EC Approved Quantity (iii) Balance Quantity as per Mineable Reserve calculated. (iv) Mined out Depth as on date Vs EC Permitted depth (v) Details of illegal/illicit mining (vi) Violation in the quarry during the past working. (vii) Quantity of material mined out outside the mine lease area (viii) Condition of Safety zone/benches (ix) Revised/Modified Mining Plan showing the benches of not exceeding 6 m height and ultimate depth of not exceeding 50m. 2. Details of habitations around the proposed mining area and latest VAO certificate regarding the location of habitations within 300m radius from the periphery of the site. 3. The proponent is requested to carry out a survey and enumerate on the structures located within the radius of (i) 50 m, (ii) 100 m, (iii) 200 m and (iv) 300 m (v) 500m shall be enumerated with details such as dwelling houses with number of occupants, whether it belongs to the owner (or) not, places of worship, industries, factories, sheds, etc with indicating the owner of the building, nature of construction, age of the building, number of residents, their profession and income, etc. 4. The PP shall submit a detailed hydrological report indicating the impact of proposed quarrying operations on the waterbodies like lake, water tanks, etc are located within 1 km of the proposed quarry. 5. The Proponent shall carry out Bio diversity study through reputed Institution and the same shall be included in EIA Report. 6. The DFO letter stating that the proximity distance of Reserve Forests, Protected Areas, Sanctuaries, Tiger reserve etc., up to a radius of 25 km from the proposed site. 7. In the case of proposed lease in an existing (or old) quarry where the benches are not formed (or) partially formed as per the approved Mining Plan, the Project Proponent (PP) shall the PP shall carry out the scientific studies to assess the slope stability of the working benches to be constructed and existing quarry wall, by involving any one of the reputed Research and Academic Institutions - CSIR-Central Institute of Mining & Fuel Research / Dhanbad, NIRM/Bangalore, Division of Geotechnical Engineering-IIT-Madras, NIT-Dept of Mining Engg, Surathkal, and Anna University Chennai-CEG Campus. The PP shall submit a copy of the aforesaid report indicating the stability status of the quarry wall and possible mitigation measures during the time of appraisal for obtaining the EC. 8. However, in case of the fresh/virgin quarries, the Proponent shall submit a conceptual 'Slope Stability Plan' for the proposed quarry during the appraisal while obtaining the EC, when the depth

S. No	Terms of Reference
	of the working is extended beyond 30 m below ground level. 9. The PP shall furnish the affidavit stating that the blasting operation in the proposed quarry is carried out by the statutory competent person as per the MMR 1961 such as blaster, mining mate, mine foreman, II/I Class mines manager appointed by the proponent. 10. The PP shall present a conceptual design for carrying out only controlled blasting operation involving line drilling and muffle blasting in the proposed quarry such that the blast-induced ground vibrations are controlled as well as no fly rock travel beyond 30 m from the blast site. 11. The EIA Coordinators shall obtain and furnish the details of quarry/quarries operated by the proponent in the past, either in the same location or elsewhere in the State with video and photographic evidences. 12. If the proponent has already carried out the mining activity in the proposed mining lease area after 15.01.2016, then the proponent shall furnish the following details from AD/DD, mines, 13. What was the period of the operation and stoppage of the earlier mines with last work permit issued by the AD/DD mines? 14. Quantity of minerals mined out. · Highest production achieved in any one year · Detail of approved depth of mining. · Actual depth of the mining achieved earlier. · Name of the person already mined in that leases area. · If EC and CTO already obtained, the copy of the same shall be submitted. · Whether the mining was carried out as per the approved mine plan (or EC if issued) with stipulated benches. 15. All corner coordinates of the mine lease area, superimposed on a High-Resolution Imagery/Topo sheet, topographic sheet, geomorphology, lithology and geology of the mining lease area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone). 16. The PP shall carry out Drone video survey covering the cluster, green belt, fencing, etc., 17. The proponent shall furnish photographs of adequate fencing, green belt along the periphery including replantation of existing trees & safety distance between the adjacent quarries & water bodies nearby provided as per the approved mining plan. 18. The Project Proponent shall provide the details of mineral reserves and mineable reserves, planned production capacity, proposed working methodology with justifications, the anticipated impacts of the mining operations on the surrounding environment, and the remedial measures for the same. 19. The Project Proponent shall provide the Organization chart indicating the appointment of various statutory officials and other competent persons to be appointed as per the provisions of the Mines Act'1952 and the MMR, 1961 for carrying out the quarrying operations scientifically and systematically in order to ensure safety and to protect the environment. 20. The Project Proponent shall conduct the hydro-geological study considering the contour map of the water table detailing the number of groundwater pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds, etc. within 1 km (radius) along with the collected water level data for both monsoon and non-monsoon seasons from the PWD / TWAD so as to assess the impacts on the wells due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. 21. The proponent shall furnish the baseline data for the environmental and ecological parameters with regard to surface water/ground water quality, air quality, soil quality & flora/fauna including traffic/vehicular movement study. 22. The Proponent shall carry out the Cumulative impact study due to mining operations carried out in the quarry specifically with reference to the specific environment in terms of soil health, biodiversity, air pollution, water pollution, climate change and flood control & health impacts. Accordingly, the Environment Management plan should be prepared keeping the concerned quarry

S. No	Terms of Reference
	and the surrounding habitations in the mind. 23. Rain water harvesting management with recharging details along with water balance (both monsoon & non-monsoon) be submitted. 24. Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given. 25. Details of the land for storage of Overburden/Waste Dumps (or) Rejects outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be provided. 26. Proximity to Areas declared as 'Critically Polluted' (or) the Project areas which attracts the court restrictions for mining operations, should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the TNPCB (or) Dept. of Geology and Mining should be secured and furnished to the effect that the proposed mining activities could be considered. 27. Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided. 28. Impact on local transport infrastructure due to the Project should be indicated. 29. A tree survey study shall be carried out (nos., name of the species, age, diameter etc.,) both within the mining lease applied area & 300m buffer zone and its management during mining activity. 30. A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific. 31. As a part of the study of flora and fauna around the vicinity of the proposed site, the EIA coordinator shall strive to educate the local students on the importance of preserving local flora and fauna by involving them in the study, wherever possible. 32. The purpose of Green belt around the project is to capture the fugitive emissions, carbon sequestration and to attenuate the noise generated, in addition to improving the aesthetics. A wide range of indigenous plant species should be planted as given in the appendix-I in consultation with the DFO, State Agriculture University. The plant species with dense/moderate canopy of native origin should be chosen. Species of small/medium/tall trees alternating with shrubs should be planted in a mixed manner. 33. Taller/one year old Saplings raised in appropriate size of bags, preferably ecofriendly bags should be planted as per the advice of local forest authorities/botanist/Horticulturist with regard to site specific choices. The proponent shall earmark the greenbelt area with GPS coordinates all along the boundary of the project site with at least 3 meters wide and in between blocks in an organized manner 34. A Disaster management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period. 35. A Risk Assessment and management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period. 36. Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed. 37. Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations. 38. The Socio-economic studies should be carried out within a 5 km buffer zone from the mining activity. Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative

S. No	Terms of Reference
	dimensions may be given with time frames for implementation. 39. Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given. 40. Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc. 41. If any quarrying operations were carried out in the proposed quarrying site for which now the EC is sought, the Project Proponent shall furnish the detailed compliance to EC conditions given in the previous EC with the site photographs which shall duly be certified by MoEF&CC, Regional Office, Chennai (or) the concerned DEE/TNPCB. 42. The PP shall prepare the EMP for the entire life of mine and also furnish the sworn affidavit stating to abide the EMP for the entire life of mine. 43. Concealing any factual information or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this Terms of Conditions besides attracting penal provisions in the Environment (Protection) Act, 1986.

3. Seiaa Specific Conditions :

S. No	Terms of Reference
3.1	After detailed discussions, the Authority accepts the recommendation of SEAC-I and decided to grant Terms of Reference (ToR) along with Public Hearing for the RoM of 47,539 MT of Black Granite which includes recovery of 4754 MT @ 10% and 42,785 MT of Rejects @ 90% for an ultimate depth of mining of 20m and the annual peak production of Granite Recovery @ 10% is 1851 MT as per the approved mining plan, under cluster for undertaking the combined Environment Impact Assessment Study and preparation of separate Environment Management Plan subject to the conditions as recommended by SEAC & normal conditions & the SEIAA Standard conditions.

4. Seiaa Standard Conditions :

S. No	Terms of Reference
4.1	<u>Cluster Management Committee</u> - 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. - 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 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. - 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. - The committee shall deliberate on risk & emergency management plan, fire safety & evacuation plan and sustainable development goals pertaining to the cluster in a holistic manner especially during natural calamities like intense rain and the mitigation measures considering the inundation of the cluster and evacuation plan. - The Cluster Management Committee shall form Environmental Policy to practice sustainable mining in a scientific and systematic manner in accordance with the law. The role played by the committee in implementing the Environmental policy devised shall be given in detail in the EIA Report.

S. No	Terms of Reference
	7. The committee shall furnish action plan regarding the restoration strategy with respect to the individual quarry falling under the cluster in a holistic manner. 8. The committee shall deliberate on the health of the workers/staff involved in the mining as well as the health of the public in the vicinity. <u>Agriculture & Agro-Biodiversity</u> 9. Impact on surrounding agricultural fields around the proposed mining Area. 10. Impact on soil flora & vegetation around the project site. 11. Details of type of vegetation including no. of trees & shrubs within the proposed mining area and. If so, transplantation of such vegetation all along the boundary of the proposed mining area shall committed mentioned in EMP. 12. The Environmental Impact Assessment should study the agro-biodiversity, agro- forestry, horticultural plantations, the natural ecosystem, the soil micro flora, fauna and soil seed banks and suggest measures to maintain the natural Ecosystem. 13. Action should specifically suggest for sustainable management of the area and restoration of ecosystem for flow of goods and services. 14. The project proponent shall study and furnish the impact of project on plantations in adjoining patta lands, Horticulture, Agriculture and livestock. <u>Forests</u> 15. The project proponent shall detailed study on impact of mining on Reserve forests and free ranging wildlife. 16. The Environmental Impact Assessment should study impact on forest, vegetation, endemic, vulnerable and endangered indigenous flora and fauna. 17. The Environmental Impact Assessment should study impact on standing trees and the existing trees should be numbered and action suggested for protection. 18. The Environmental Impact Assessment should study impact on protected areas, Reserve Forests, National Parks, Corridors and Wildlife pathways, near project site. <u>Water Environment</u> 19. Hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) so as to assess the impacts on the nearby waterbodies due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided, covering the entire mine lease period. 20. Erosion Control measures. 21. Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area on the nearby Villages, Water-bodies/ Rivers, & any ecological fragile areas. 22. The project proponent shall study impact on fish habitats and the food WEB/ food chain in the water body and Reservoir. 23. The project proponent shall study and furnish the details on potential fragmentation impact on natural Environment, by the activities. 24. The project proponent shall study and furnish the impact on aquatic plants and animals in water bodies and possible scars on the landscape, damages to nearby caves, heritage site, and archaeological sites possible land form changes visual and aesthetic impacts. 25. The Terms of Reference should specifically study impact on soil health, soil erosion, the soil physical, chemical components and microbial components. 26. The Environmental Impact Assessment should study on wetlands, water bodies, rivers streams, lakes and farmer sites. 27. The EIA shall include the impact of mining activity on the following: - Hydrothermal/Geothermal effect due to destruction in the Environment. - Bio-geochemical processes and its foot prints including Environmental stress. - Sediment geochemistry in the surface streams. <u>Energy</u>

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

Standard Terms of Reference for (Mining of minerals)

1.

S. No	Terms of Reference
1.1	Year-wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification 1994 came into force, w.r.t. the highest production achieved prior to 1994

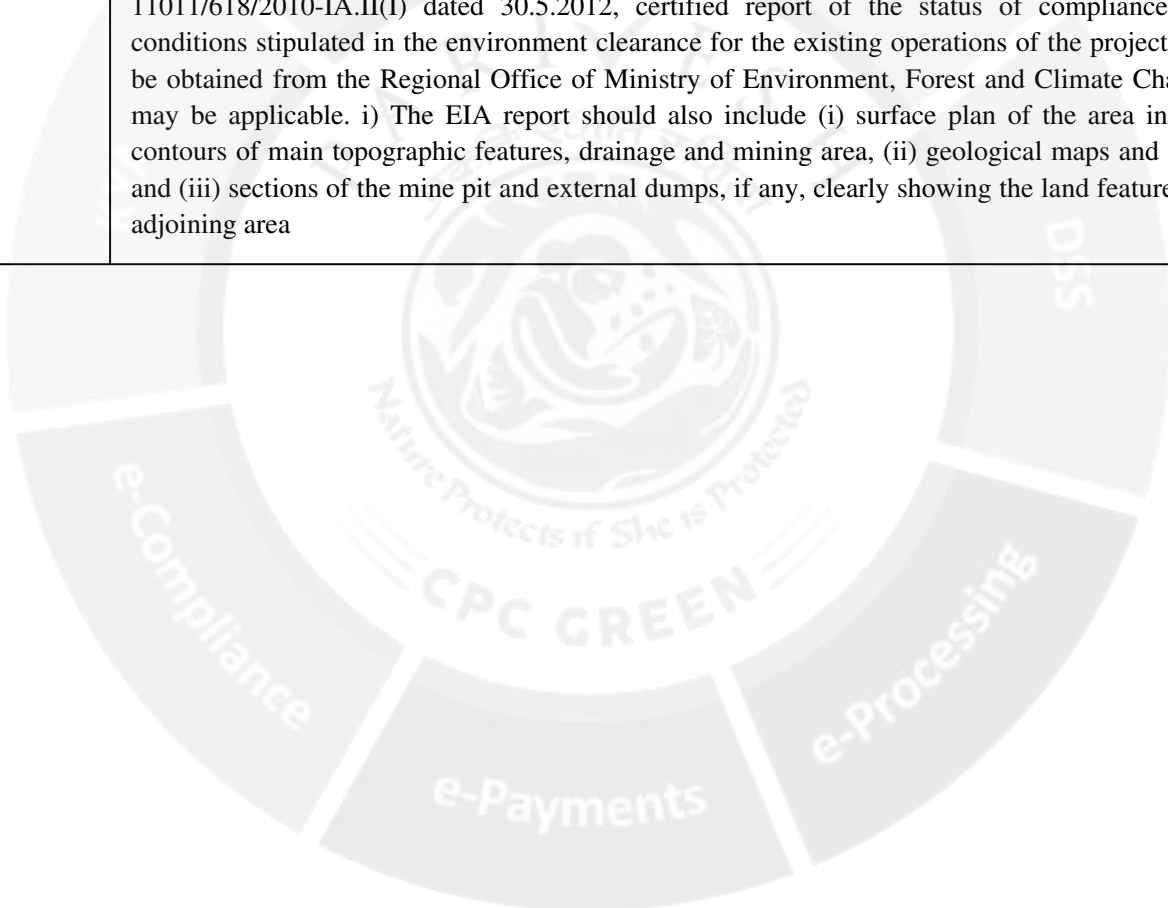
S. No	Terms of Reference
1.2	A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given
1.3	All documents including approved mine plan, EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee
1.4	All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery/toposheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone)
1.5	Information should be provided in Survey of India Toposheet in 1:50,000 scale indicating geological map of the area, geomorphology of land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics
1.6	Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority
1.7	It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating process/procedures to bring into focus any infringement/deviation/ violation of the environmental or forest norms/ conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large, may also be detailed in the EIA Report
1.8	Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided
1.9	The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc. should be for the life of the mine / lease period
1.10	Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given
1.11	Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given
1.12	A Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it

S. No	Terms of Reference
	would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees
1.13	Status of forestry clearance for the broken up area and virgin forestland involved in the Project including deposition of net present value (NPV) and compensatory afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished
1.14	Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated
1.15	The vegetation in the RF / PF areas in the study area, with necessary details, should be given
1.16	A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly, detailed mitigative measures required, should be worked out with cost implications and submitted
1.17	Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves/(existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished
1.18	A detailed biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled- I fauna found in the study area, the necessary plan alongwith budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost
1.19	Proximity to Areas declared as Critically Polluted or the Project areas likely to come under the Aravali Range, (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Dept. Should be secured and furnished to the effect that the proposed mining activities could be considered
1.20	Similarly, for coastal Projects, A CRZ map duly authenticated by one of the authorized agencies demarcating LTL, HTL, CRZ area, location of the mine lease w.r.t CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority)
1.21	R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need based sample survey, family-wise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be clearly brought out whether the village(s) located in

S. No	Terms of Reference
	the mine lease area will be shifted or not. The issues relating to shifting of village(s) including their R&R and socio-economic aspects should be discussed in the Report
1.22	One season (non-monsoon) [i.e. March-May (Summer Season); October-December (post monsoon season) ; December-February (winter season)]primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM10, particularly for free silica, should be given
1.23	Air quality modeling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of mineral. The details of the model used and input parameters used for modeling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map
1.24	The water requirement for the Project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the Project should be indicated
1.25	Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided
1.26	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
1.27	Impact of the Project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided
1.28	Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. The Report inter-alia, shall include details of the aquifers present and impact of mining activities on these aquifers. Necessary permission from Central Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished
1.29	Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion proposed, if any, and the impact of the same on the hydrology should be brought out
1.30	Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and bgl. A schematic diagram may also be provided for the same
1.31	A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating

S. No	Terms of Reference
	the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution
1.32	Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those outside the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as State Government) should be covered. Project Proponent shall conduct Impact of Transportation study as per Indian Road Congress Guidelines
1.33	Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report
1.34	Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report
1.35	Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed
1.36	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
1.37	Measures of socio economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation
1.38	Detailed environmental management plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project
1.39	Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project
1.40	Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given
1.41	The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out
1.42	A Disaster management Plan shall be prepared and included in the EIA/EMP Report
1.43	Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc

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



STANDARD TERMS OF REFERENCE

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

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

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

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

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

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

modification / diversion proposed, if any, and the impact of the same on the hydrology should be brought out.

- 30) Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and bgl. A schematic diagram may also be provided for the same.
- 31) A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution.
- 32) Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those outside the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as State Government) should be covered. Project Proponent shall conduct Impact of Transportation study as per Indian Road Congress Guidelines.
- 33) Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.
- 34) Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report.
- 35) Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.
- 36) Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.
- 37) Measures of socio-economic significance and influence to the local community

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

- 38) Detailed Environmental Management Plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project.
- 39) Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project.
- 40) Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.
- 41) The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.
- 42) A Disaster management Plan shall be prepared and included in the EIA/EMP Report.
- 43) Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.
- 44) Besides the above, the below mentioned general points are also to be followed: -
 - a) Executive Summary of the EIA/EMP Report
 - b) All documents to be properly referenced with index and continuous page numbering.
 - c) Where data are presented in the Report especially in Tables, the period in which the data were collected and the sources should be indicated.
 - d) Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF&CC/NABL accredited laboratories. All the original analysis/testing reports should be available during appraisal of the Project.
 - e) Where the documents provided are in a language other than English, an English translation should be provided.
 - f) The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted.
 - g) While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF&CC vide O.M. No. J-11013/41/2006-IA.II(I) dated 4th August, 2009, which are available on the website of this Ministry, should be followed.

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

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

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

1. Project name and location (Village, District, State, Industrial Estate (if applicable).
2. Process description in brief, specifically indicating the gaseous emission, liquid effluent and solid and hazardous wastes.
3. Measures for mitigating the impact on the environment and mode of discharge or disposal.
4. Capital cost of the project, estimated time of completion.
5. The proponent shall furnish the contour map of the water table detailing the number of wells located around the site and impacts on the wells due to mining activity.
6. A detailed study of the lithology of the mining lease area shall be furnished.
7. Details of village map, "A" register and FMB sketch shall be furnished.
8. Detailed mining closure plan for the proposed project approved by the Geology of Mining department shall be submitted along with EIA report.
9. Obtain a letter /certificate from the Assistant Director of Geology and Mining standing that there is no other Minerals/resources like sand in the quarrying area within the approved depth of mining and below depth of mining and the same shall be furnished in the EIA report.

10. EIA report should strictly follow the Environmental Impact Assessment Guidance Manual for Mining of Minerals published February 2010.
11. Detail plan on rehabilitation and reclamation carried out for the stabilization and restoration of the mined areas.
12. The EIA study report shall include the surrounding mining activity, if any.
13. Modeling study for Air, Water and noise shall be carried out in this field and incremental increase in the above study shall be substantiated with mitigation measures.
14. A study on the geological resources available shall be carried out and reported.
15. A specific study on agriculture & livelihood shall be carried out and reported.
16. Impact of soil erosion, soil physical chemical and biological property changes may be assumed.
17. Site selected for the project - Nature of land - Agricultural (single/double crop), barren, Govt./ private land, status of its acquisition, nearby (in 2-3 km.) water body, population, within 10km other industries, forest, eco-sensitive zones, accessibility, (note - in case of industrial estate this information may not be necessary)
18. Baseline environmental data - air quality, surface and ground water quality, soil characteristic, flora and fauna, socio-economic condition of the nearby population
19. Identification of hazards in handling, processing and storage of hazardous material and safety system provided to mitigate the risk.
20. Likely impact of the project on air, water, land, flora-fauna and nearby population
21. Emergency preparedness plan in case of natural or in plant emergencies
22. Issues raised during public hearing (if applicable) and response given
23. CER plan with proposed expenditure.
24. Occupational Health Measures
25. Post project monitoring plan
26. The project proponent shall carry out detailed hydro geological study through intuitions/NABET Accredited agencies.
27. A detailed report on the green belt development already undertaken is to be furnished and also submit the proposal for green belt activities.
28. The proponent shall propose the suitable control measure to control the fugitive emissions during the operations of the mines.
29. A specific study should include impact on flora & fauna, disturbance to migratory pattern of animals.
30. Reserve funds should be earmarked for proper closure plan.

31. A detailed plan on plastic waste management shall be furnished. Further, the proponent should strictly comply with, Tamil Nadu Government Order (Ms) No.84 Environment and forests (EC.2) Department dated 25.06.2018 regarding ban on one time use and throw away plastics irrespective of thickness with effect from 01.01.2019 under Environment (Protection) Act, 1986. In this connection, the project proponent has to furnish the action plan.

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

- a. A note confirming compliance of the TOR, with cross referencing of the relevant sections / pages of the EIA report should be provided.
- b. All documents may be properly referenced with index, page numbers and continuous page numbering.
- c. Where data are presented in the report especially in tables, the period in which the data were collected and the sources should be indicated.
- d. While preparing the EIA report, the instructions for the proponents and instructions for the consultants issued by MoEF& CC vide O.M. No. J-11013/41/2006-IA.II (I) dated 4th August, 2009, which are available on the website of this Ministry should also be followed.
- e. The consultants involved in the preparation of EIA/EMP report after accreditation with Quality Council of India (QCI)/National Accreditation Board of Education and Training (NABET) would need to include a certificate in this regard in the EIA/EMP reports prepared by them and data provided by other organization/Laboratories including their status of approvals etc. In this regard circular no F. No.J -11013/77/2004-IA-II(I) dated 2nd December, 2009, 18th March 2010, 28th May 2010, 28th June 2010, 31st December 2010 & 30th September 2011 posted on the Ministry's website <http://www.moef.nic.in/> may be referred.
 - After preparing the EIA (as per the generic structure prescribed in Appendix-III of the EIA Notification, 2006) covering the above-mentioned points, the proponent will take further necessary action for obtaining environmental clearance in accordance with the procedure prescribed under the EIA Notification, 2006.
 - The final EIA report shall be submitted to the SEIAA, Tamil Nadu for obtaining Environmental Clearance.

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



DIRECTORATE OF GEOLOGY AND MINING

From

Thiru D. Mohan, I.A.S.,
Director of Geology and Mining,
Guindy,
Chennai - 600 032:

To

M/s. A.G.Granites (Pvt). Ltd.,
Muthu Gounder Colony, Harur,
Tiruvannamalai District,
Tamil Nadu - 636903

Rc.No.11441/MM4/2025, dated 01.01.2026

Sir,

Sub: Mines and Minerals - Minor Mineral - Black Granite -
Tiruvannamalai district - Thandampattu taluk -
Kilpachar village - over an extent of 3.21.5 ha of
Government Poramboke land - S.F.No. 65 (Part- 2) -
Quarry lease application preferred by M/s. A.G.
Granites (Pvt.) Ltd., Dharmapuri - Precise area
communicated by the Government - Mining Plan
submitted by M/s. A.G. Granites (Pvt.) Ltd.,
Dharmapuri - Recommended and forwarded by the
Deputy Director (G&M), Tiruvannamalai - Approval
accorded.

Ref: 1. Tiruvannamalai District Gazette Extraordinary
Publication in English and Tamil No.07 dated
03.09.2025.
2. e-Auction Application of Highest Bidder
M/s.A.G.Granites (Pvt) Ltd., Muthu Gounder
Colony, Harur, Dharmapuri District dated
23.09.2025.
3. Commissioner of Geology and Mining Note File No.
9825/MM4/2025, dated 13.11.2025.
4. Government letter Rc.No.1920/MMB.2/2025-1,
dated 17.12.2025.
5. Mining Plan submitted by M/s. A.G.Granites (Pvt)
Ltd., dated 22.12.2025.
6. Deputy Director, Geology and Mining,
Tiruvannamalai letter Rc.No.649/Mines/2025,
dated 29.12.2025.

Kind attention is invited to the references cited above.

2) An Extra-ordinary District Gazette Notification No. 07 dated
03.09.2025 in Rc.No.585/mines/2025 dated 29.08.2025 had been
published by the District Collector, Tiruvannamalai inviting

applications through e-Auction for the grant of Black granite quarry leases in Government Poramboke lands in Tiruvannamalai district.

3) M/s. A.G. Granites (Private) Ltd., Harur, Dharmapuri has quoted the highest amount in live auction for an extent of 3.21.5 hects., in S.F.No.65 (Part- 2) of Kilpachar Village, Thandarampattu Taluk, Tiruvannamalai District. Subsequently on remittance of the 100% of the quoted amount M/s. A.G. Granites (Private) Ltd., Dharmapuri has been selected as the highest bidder and proposal to declare them as successful bidder was sent with recommendation to the Government vide reference 3rd cited.

4) The Government vide reference 4th cited has declared M/s A.G. Granites (Private) Limited, Dharmapuri District as Successful Bidder and communicated the precise area for Quarrying Black Granite over an extent of 3.21.5hects., of Government Land in S.F.No.65 (Part-2) of Kilpachar Village. Thandarampattu Tahuk, Tiruvannamalai District subject to certain conditions with directions to furnish Approved mining plan through the Director of Geology and mining and to produce environmental clearance obtained from the competent authority.

5) In this regard, M/s. A.G. Granites (Private) Ltd., Dharmapuri has submitted 5 copies of Draft mining Plan for approval through the Deputy Director of Geology and Mining, Tiruvannamalai vide reference 5th cited.

6) In the reference 6th cited, the Deputy Director (G&M), Tiruvannamalai had recommended and forwarded the mining plan submitted by M/s. A.G.Granites (Private) Ltd., Dharmapuri. The report and mining plan submitted by the Deputy Director (G&M), Tiruvannamalai were scrutinized and the following are observed.

- i. M/s. A.G.Granites (Private) Ltd., has submitted five copies of draft Mining Plan for approval incorporating the

conditions mentioned in the Government Letter reference 4th cited.

- ii. The applied area falls in the Survey of India Topo Sheet No.57L/16 with co-ordinates, Longitude from 78°45'26.42" E to 78°45'34.71" E and Latitude from 12°05'40.09" N to 12°05'45.76" N.
- iii. The Mining Plan prepared is as per the norms and the trend of Black Granite dyke is clearly demarcated in the plan.
- iv. Tentative Scheme of Mining and annual program and plan for excavation on the precise area from year to year for five years are enclosed in the mining plan. Environment management plan and Progressive mine closure plan are provided in the mining plan.
- v. In the mining plan, the Recovery percentage is fixed as 10%.
- vi. The Geological Resource and Mineable Reserves are calculated up to scientifically and economically workable depth of 20m from surface level with 10% recovery Mineable Reserves are derived by deducting the mineral locked up in the area covered under safety distance and bench losses.

S. No	Reserves	Black Granite			Development		
		ROM (MT)	Recovery @ 10% (MT)	Mineral Reject @ 90% (MT)	Side Burden (MT)	Weathered Rock (MT)	Topsoil (MT)
1.	Geological resources	2,51,224	25,122	2,26,102	8,45,570	1,08,504	54,252
2.	Mineable reserves	1,92,944	19,294	1,73,650	49,665	32,760	16,380

vii. The Mineable reserve is 19,294 MT (@10% recovery up to a maximum depth of 20m). The average rate of production is 951MT per year. Year Wise Development and Production for the First Five Years are provided in the mining plan is given as below,

Year	Production			Development		
	ROM (MT)	Recovery @10% (MT)	Mineral Reject @ 90% (MT)	Side Burden (MT)	Weathered Rock (MT)	Top Soil (MT)
1	12,834	1,283	11,551	0	11,880	5,940
2	18,507	1,851	16,656	19,938	5,280	2,640
3	8,742	874	7,868	9,694	0	0
4	3,728	373	3,355	5,088	0	0
5	3,728	373	3,355	0	0	0
Total	47,539	4,754	42,785	34,720	17,160	8,580

viii. In the mining plan, it has been proposed that the waste material will be dumped on Northeastern side of the lease applied area.

ix. Deputy Director (G&M), Tiruvannamalai has recommended and forwarded the Mining plan for approval subject to the following conditions.

- All conditions imposed in the precise area communication letter should be scrupulously followed.
- If there is any considerable change in recovery percentage during the course of mining operation, modified mining plan has to be submitted for approval.
- If any relaxation is obtained from the Director General of Mine Safety with regard to dimension of the benches and if such relaxation results in drastic changes in the reserves a modified mining plan has to be submitted for approval.

- d) Dumps are to be placed only in the area earmarked in the mining plan.
- e) The mining operations shall be carried out in such a manner so as to ensure systematic development and conservation of granite deposits and protection of environment.
- f) Restoration and Reclamation and rehabilitation of lands affected by mining operations should be completed before the conclusion of mining operations and abandonment of granite quarry.

5) In view of the above, based on the recommendation of the Deputy Director (G&M), Tiruvannamalai, the field authority, the Mining Plan submitted by M/s. A.G.Granites (Private) Ltd., is hereby approved subject to the following conditions in addition to the conditions stipulated in the precise area communication issued by the Government.

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

- iii. This mining plan including progressive mine closure plan is approved without prejudice to any other order or direction from any court of competent jurisdiction.
- iv. Provisions of the Mines Act, 1952 and the Rules and Regulations made there under including submission of notice of opening, appointment of manager and other statutory officials as required under Mines Act, 1952 shall be complied with.
- v. Provisions made under Mines and Minerals (Development & Regulation) Act, 1957, MMDR Amendment Act, 2015 and Granite conservation and Development Rules, 1999 made there under shall be complied with.
- vi. Environment Clearance should be obtained from the competent authority in respect of the subject area as per rule 42 of Tamil Nadu Minor Mineral Concession Rules, 1959 and as per the notification of the Ministry of Environment and Forest and any other clearances if any.
- vii. If there is any considerable change in recovery percentage during the course of mining operation, modified mining plan has to be submitted for approval.
- viii. If any relaxation is obtained from the Director General of Mine Safety with regard to dimension of the benches and if such relaxation results in drastic changes in the reserves a modified mining plan has to be submitted for approval.
- ix. The applicant company shall submit scheme of mining, mine closure plan and other statutory requirements within the time stipulated for submission of the above, as per rules.
- x. The Mining operations shall be carried out in such a manner so as to ensure systematic development and

conservation of granite deposits and protection of environment.

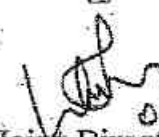
- xi. Granite waste if needed should be disposed only in accordance with the G.O.(Ms)No.5 Natural Resources (MME.1) Dept., dated 26.10.2023, and SOP vide letter No.6588/MME.1/2022-6, dated 13.12.2023.
- xii. Restoration, Reclamation, and Rehabilitation of lands affected by mining operations should be completed before the conclusion of mining operations and abandonment of granite quarry.
- xiii. The quarrying operation should be restricted only in the area granted lease.
- xiv. If anything is found to be concealed as required by the Granite Conservation and Development Rules, 1999 and Tamil Nadu Minor Mineral Concession Rules, 1959 and proposal for rectification has not been made, the approval shall be deemed to have been withdrawn with immediate effect.
- xv. No blasting and transportation of materials in vehicles should be carried out from 6.00 PM to 6.00AM.
- xvi. No hindrance shall be caused to the adjacent Patta lands and Government poramboke lands if any while quarrying and transportation of granite.
- xvii. The applicant company shall strictly adhere to the statutory and safety requirements and the applicant company should ensure the periodical medical checkup to the quarry workers to safeguard them from quarry related diseases.
- xviii. The applicant M/s. A.G.Granites (Private) Ltd., should carry out DGPS survey and erection of RCC boundary pillars as per the norms stipulated in the EOI notification in Rc.No.2921/MM4/2019 dated.01.02.2018 and subsequent corrigendum dated 13.08.2019.

xix. Non adherence to any condition set-out above, the approval shall be deemed to have been withdrawn with immediate effect.

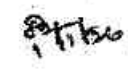
Encl.: 2 Copies Approved
Mining Plan

Sd/- D.Mohan
Director of Geology and Mining

/Forwarded by order/


02.01.2026
Joint Director

Copy to:

- 
1. The Additional Chief Secretary to Government (FAC), Natural Resources Department, 4th Floor, Secretariat, Chennai-9.
 2. The Director of Mines Safety, 3rd Floor, Left Wing, New Additional Building, CGO Complex, Shastri Bhawan, Nungambakkam, Chennai - 06.
 3. The District Collector, Thiruvannamali District.

From

Dr.S.Vediappan, M.Sc., Ph.D.,
Deputy Director,
Geology and Mining,
Tiruvannamalai - 4.

To

M/s.A.G.Granites (P) Ltd.,
Muthu Gounder Colony,
Harur, Dharumapuri District.

Rc.No.649/Mines/2025 dated:05.01.2026.

Sub: Mines and minerals - Minor mineral - Rule 8, Tamil Nadu Minor Mineral Concession Rule 1959 - Black Granite - Tiruvannamalai District - Thandarampattu Taluk - Kilpachar Village - Over an Extent of 3.21.5 hectares of Government poromboke Land in SF.No.65(Part-2) - Tender cum Auction - Highest tender amount offered by M/s.A.G. Granites Private Ltd., Harur, Dharmapuri District - Details of quarries located in 500m radius- requested - furnished - reg.

Ref: M/s.A.G. Granites Pvt. Limited, Harur, Dharmapuri District letter dated: 05.01.2026.

In the reference cited, M/s.A.G. Granites Pvt. Limited declared as highest bidder and precise area has been issued by the Government to quarry Black Granite in SF.No.65 (Part - 2) of Government land over an extent of 3.21.5 Hects., of Kilpachar village, Thandarampattu Taluk has requested to furnish the details of quarries located within 500 meters radius from the proposed quarry.

In this regard, the followings are furnished.

i). Existing quarries

Sl. No.	Name of the Lessee and address	GO. No. & Date	Taluk & Village	S.F.No.	Extent in ha	Period of lease
1	M/s.A.G.Granites (P) Ltd., Muthu Gounder Colony, Harur, Dharumapuri District.	G.O.(3D).No.25 Natural Resources (MMB.1) Department Dated:23.12.2024	Thandarampattu & Kilpachar	65 (Part-1)	4.15.0 Hects.,	30.12.2024 To 29.12.2044

ii). Abandoned quarries

Sl. No	Name of the Owner (Tvl)	Village & S.F. Nos.	Extent in Hect.	Lease Period	Remarks
...Nil...					

iii). Present Proposed quarries

Sl. No.	Name of the Lessee and address	GO No. & Date.	Village & Taluk	S.F.No.	Extent in ha
1	M/s.A.G.Granites (P) Ltd., Muthu Gounder Colony, Harur, Dharumapuri District.	—	Thandarampattu & Kilpachar	65 (Part-2)	3.21.5 Hects.,


Deputy Director,
Geology and Mining,
Tiruvannamalai.


05/1/26

**MINING PLAN ALONG WITH
PROGRESSIVE QUARRY CLOSURE PLAN FOR
KILPACHAR BLACK GRANITE (DOLERITE) QUARRY**

(Under Rule 8 of Tamil Nadu Minor Mineral Concession Rules, 1959 and Rule 12, 13
& 16 of Granite Conservation and Development Rules, 1999)
Government Land/ Lease Period: 20 Years

IN

LOCATION OF THE QUARRY LEASE APPLIED AREA

EXTENT	:	3.21.5 HECTARES
S.F.Nos.	:	65(PART-2)
VILLAGE	:	KILPACHAR
TALUK	:	THANDARAMPATTU
DISTRICT	:	TIRUVANNAMALAI
STATE	:	TAMIL NADU

FOR

APPLICANT/LESSEE

M/s. A.G. GRANITES (PRIVATE) LIMITED,

Muthu Gounder Colony,

Harur,

Dharmapuri District,

Tamil Nadu State – 636 903.

Mobile No. +91 98944 55389

E-mail ID: tpt@ammangranites.com.

PREPARED BY

B. VENGADAGIRI, M.Sc.,

Qualified Person

(As per Rule 15(I)(a) and (b) of MCR 2016)

No.105, 5th Cross,

Alagapuram

Salem District

Tamil Nadu – 636 010.

Mobile No. +91 86953 32233.

E-mail: vengatb6@gmail.com



ABBREVIATIONS

• EC	-	Environmental Clearance
• EIA	-	Environmental Impact Assessment
• EMP	-	Environment Management Plan
• ToR	-	Terms of Reference
• SEIAA	-	State Level Environment Impact Assessment Authority
• MoEF&CC	-	Ministry of Environment, Forest and Climate changes
• MSL	-	Mean Sea Level
• CPCB	-	Central Pollution Control Board
• TNPCB	-	Tamil Nadu Pollution Control Board
• FMB	-	Field Measurement Book
• S.F.No.	-	Survey Field Number
• GSI	-	Geological Survey of India
• DMS	-	Director of Mines Safety
• DGMS	-	Director General of Mines Safety
• MMR	-	Metalliferous Mines Regulations
• MCR	-	Minerals (Other than Atomic and Hydro Carbons Energy Minerals) Concession Rules
• TNMMCR	-	Tamil Nadu Minor Mineral Concession Rules
• EMP	-	Environment Management Plan
• NGT	-	National Green Tribunal
• NONEL	-	Non Electric
• CRZ	-	Coastal Regulatory Zone
• HACA	-	Hill Area Conservation Authority
• QP	-	Qualified Person
• KLD	-	Kilo liters per day
• MT	-	Metric Tonne

M/s. A.G. GRANITES (PRIVATE) LIMITED,

Muthu Gounder Colony,

Harur,

Dharmapuri District,

Tamil Nadu State – 636 903.

Mobile No. +91 98944 55389

E-mail ID: tpt@ammangranites.com



CONSENT LETTER FROM APPLICANT

The Mining Plan and Progressive Quarry Closure Plan in respect of Kilpachar Black Granite quarry over an extent of 3.21.5 Hectares of Government Poramboke land in S.F.No. 65(Part-2) of Kilpachar Village, Thandarampattu Taluk, Tiruvannamalai District, Tamil Nadu State has been prepared by

B. VENGADAGIRI, M.Sc.,

Qualified Person

I have entrusted the works to prepared the Mining Plan based upon the production requirements to meet as per the Mines Acts, Rules, Regulations and Amendments as on date. We request to the Commissioner, Department of Geology and Mining, Chennai to make further correspondence regarding the corrections of the mining Plan with the said Qualified Person at his following address.

B. VENGADAGIRI, M.Sc.,

No.105, 5th Cross,

Alagapuram

Salem District

Tamil Nadu – 636 010.

Mobile No. +91 86953 32233.

I hereby undertake that all the responsibilities of contents in the mining plan and if any corrections made in the mining plan by the Qualified Person may be deemed to have been made with our knowledge and consent and shall be acceptable to me and binding on me in all respects. If there is any substantial change during operation, we will carry out a Modified Mining plan and seek its approval from concerned Authorities.

Signature of the applicant
M/s. A.G. Granites (Private) Limited,
For AG GRANITES PVT. LTD.

(R. SHANTHI)
SHANTHI RAMASAMY
Director Director

Place: Dharmapuri

Date: 18.12.2025

M/s. A.G. GRANITES (PRIVATE) LIMITED,

Muthu Gounder Colony,

Harur,

Dharmapuri District,

Tamil Nadu State - 636 903.

Mobile No. +91 98944 55389

E-mail ID: tpt@ammangranites.com.



DECLARATION OF APPLICANT

The Mining Plan and Progressive Quarry Closure Plan in respect of Kilpachar Black Granite quarry over an extent of 3.21.5 Hectares of Government Poramboke land in S.F.No. 65(Part-2) of Kilpachar Village, Thandarampattu Taluk, Tiruvannamalai District, Tamil Nadu State has been prepared in full consultation with me by

B. VENGADAGIRI, M.Sc.,

Qualified Person

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

Signature of the applicant
M/s. A.G. Granites (Private) Limited,
For AG GRANITES PVT. LTD.

(R. SHANTHIRAMASAMY
Director Director

Place: Dharmapuri

Date: 22.12.2025

CERTIFICATE FROM THE QUALIFIED PERSON

Certified that I, **B. VENGADAGIRI, M.Sc.**, residing at No.105, 5th Cross, Alagapuram, Salem District, Tamil Nadu – 636 010 holding a Post Graduate Degree in Geology (M.Sc., Applied Geology) from Annamalai University, Chidambaram and I worked in the field of Mining in a role of Geologist.

Rule 15(I)(a) and (b) of Minerals (Other than Atomic, Hydro Carbons Energy Minerals) Concession Rules 2016 stipulates the eligibility for preparing Mining plans as "(I)(a) 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 prepared this Mining Plan along with Progressive Quarry Closure Plan in respect of Kilpachar Black Granite quarry over an extent of 3.21.5 Hectares of Government Poramboke land in S.F.No. 65(Part-2) of Kilpachar Village, Thandarampattu Taluk, Tiruvannamalai District, Tamil Nadu State for **M/s. A.G. Granites (Private) Limited**, having an office at Muthu Gounder Colony, Harur, Dharmapuri District, Tamil Nadu State – 636 903. Since the Mining Plan is prepared as per the provisions contained in Rule 15(I)(a) and (I)(b) of Minerals (Other than Atomic, Hydro Carbons Energy Minerals) Concession Rules, 2016.

Signature of the Qualified Person

(B. VENGADAGIRI, M.Sc.,)

Place : Salem

Date : 22.12.2025

B. VENGADAGIRI, M.Sc.,

No.105, 5th Cross,

Alagapuram

Salem District

Tamil Nadu – 636 010.

Mobile No. +91 86953 32233

E-mail ID: vengatb6@gmail.com.



CERTIFICATE FROM THE QUALIFIED PERSON

This is to certify that the Provisions of Granite Conservation and Development Rules, 1999 as amended in Tamil Nadu Minor Mineral Concession Rules, 1959 have been observed in the preparation of Mining Plan and Progressive Quarry Closure Plan for Kilpachar Black Granite quarry over an extent of 3.21.5 Hectares of Government Poramboke land in S.F.No. 65(Part-2) of Kilpachar Village, Thandarampattu Taluk, Tiruvannamalai District, Tamil Nadu State has been prepared for

M/s. A.G. GRANITES (PRIVATE) LIMITED,

Muthu Gounder Colony,

Harur,

Dharmapuri District,

Tamil Nadu State – 636 903.

Mobile No. +91 98944 55389

E-mail ID: tpt@ammangranites.com.

Whenever specific permissions/exemptions/ relaxations and approvals are required, the applicant will approach the concerned authorities of Commissioner of Geology and Mining, Government of Tamil Nadu, Guindy, Chennai- 600 032 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


(B. VENGADAGIRI, M.Sc.,)

Place: Salem

Date: 22.12.2025

B. VENGADAGIRI, M.Sc.,

No.105, 5th Cross,

Alagapuram

Salem District

Tamil Nadu – 636 010.

Mobile No. +91 86953 32233

E-mail ID: vengatb6@gmail.com.



CERTIFICATE FROM THE QUALIFIED PERSON

Certified that the Provisions of Mines Act, Rules and Regulations made there under have been observed in the preparation of Mining Plan and Progressive Quarry Closure Plan for Kilpachar Black Granite quarry over an extent of 3.21.5 Hectares of Government Poramboke land in S.F.No. 65(Part-2) of Kilpachar Village, Thandarampattu Taluk, Tiruvannamalai District, Tamil Nadu State has been prepared for

M/s. A.G. GRANITES (PRIVATE) LIMITED,

Muthu Gounder Colony,

Harur,

Dharmapuri District,

Tamil Nadu State – 636 903.

Mobile No. +91 98944 55389

E-mail ID: tpt@ammangranites.com.

Whenever specific permissions/exemptions/ relaxations and approvals are required, the applicant will approach the concerned authorities of the Director General of Mines Safety (DGMS), No. 5, IInd Street, Block – AA, Anna Nagar, Chennai, Tamil Nadu for such permissions/ exemptions /relaxations and approvals.

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

Signature of the Qualified Person

(B. VENGADAGIRI, M.Sc.,)

Place: Salem

Date: 22.12.2025

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MINING PLAN ALONG WITH PROGRESSIVE QUARRY CLOSURE PLAN FOR KILPACHAR BLACK GRANITE QUARRY

(Under Rule 8 of Tamil Nadu Minor Mineral Concession Rules, 1959 and 12, 13 and 16 of Granite Conservation and Development Rules, 1999)

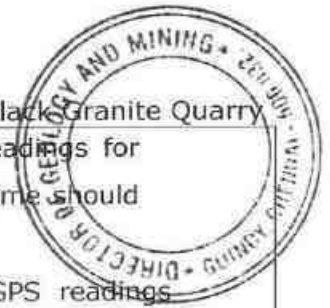
INTRODUCTION AND EXECUTIVE SUMMARY:

The company **M/s. A.G. Granites (Private) Limited**, having an office at Muthu Gounder Colony, Harur, Dharmapuri District, Tamil Nadu State – 636 903 has entrusted and given consent to preparation of Mining plan and Progressive Mine Closure Plan as per the provisions of Mines Act, Rules, Regulations and as amended till date.

The Black Granite quarry lease applied area is a Government Poramboke land. The company has preferred the application under Rule 8 of Tamil Nadu Minor Mineral Concession Rules, 1959.

After paid the whole bid amount, the application was examined, Scrutinized, Inspected and processed by the Natural Resources (MMB.1) Department, Secretariat, Chennai through the Commissioner, Department of Geology and Mining, Guindy, Chennai the area has awarded to the successful bidder of M/s. A.G. Granites (Private) Limited, through Tender Cum Auction for over an extent of **3.21.5 Hectares of Government Poramboke land in S.F.No. 65(Part-2) of Kilpachar Village, Thandarampattu Taluk, Tiruvannamalai District** (Refer Annexure Nos. I and II) and passed a precise area communication vide **Letter No.1920/MMB.1/ 2025-1, Dated: 17.12.2025** under Rule 8(17)(d) of Tamil Nadu Minor Mineral Concession Rules, 1959 for submission of approved Mining plan within 90 days and obtain Environmental Clearance from the State Level Environment Impact Assessment Authority, Tamil Nadu under rule 42 of Tamil Nadu Minor Mineral Concession Rules, 1959 with the following conditions to provide (Refer Annexure No. I):-

1. A safety distance of 7.5 meters and 10 meters should be provided to the adjacent patta and Government Porambolee lands, respectively.
2. All conditions stipulated in the District Gazette No.07 Extra ordinary notification dated 03.09.2025 should be adhered by the lessee.
3. Environmental clearance should be obtained from the State Level Environmental Impact Assessment Authority before granting quarry lease as per rule 42 of the Tamil Nadu Minor Mineral Concession Rules, 1959.
4. The applicant firm should fence the lease granted area with Barbed wire before the execution of the lease deed as follows:
 - ❖ The pillar post shall be firmly grounded with concrete foundation of height not less than 2 meters with a distance between two pillars shall not be more than 3 meters.



- ❖ The applicant firm shall incorporate the DGPS readings for the entire boundary pillars of the area and the same should be clearly shown in the mining plan.
 - ❖ A soft copy of the digitalized map with the DGPS readings should be submitted in the CD form to the Assistant Director, Tiruvannamalai and the Commissioner of Geology and Mining.
5. The District administration and Geology and Mining Department should ensure the conditions imposed in G.O. (Ms) No.79, Industries (MMC.1) Department, dated 06.04.2015.
 6. Child labourers should not be engaged in the quarry works.
 7. The applicant firm should use mild explosives during quarrying
 8. As per rule 12(v) of Mineral (Other than Atomic and Hydro Carbons Energy Minerals) Concession Rules, 2016, the applicant firm shall at their own expenses erect, maintain and keep in repair all the boundary pillars.
 9. The waste material generated during the time of quarrying should be dumped only within the leasehold area that will be earmarked for the purpose In the mining plan as per Rule 31 of the Granite Conservation Development and Regulations, 1999.
 10. The applicant shall strictly adhere to the statutory and safety requirements.
 11. Quarrying shall be done as per the approved Mining Plan and that the mining plan is approved without prejudice to any other law applicable to the quarry lease from time to time whether such laws are made by the Central Government, State Government or any other authority.
 12. Quarrying activity should be carried out from 07.00 AM to 05.00 PM only.
 13. If any violation is found during quarrying operation, the penal provisions of the Tamil Nadu Minor Mineral Concession Rules, 1959 and other rules and act in force will attract.
 14. All the quarry labourers should be registered with the Labour Welfare Board of Government of Tamil Nadu and to be enrolled in the Group Insurance Scheme.

This Mining Plan along with Progressive quarry closure Plan is prepared in full consent with **M/s. A.G. Granites (Private) Limited**, having an office at Muthu Gounder Colony, Harur, Dharmapuri District, Tamil Nadu State – 636 903, in respect of Kilpachar Black Granite quarry over an extent of 3.21.5 Hectares of Government Poramboke land in S.F.No. 65(Part-2) of Kilpachar Village, Thandampattu Taluk, Tiruvannamalai District. This mining plan is prepared under Rules 8 and 41 of Tamil Nadu Minor Mineral Concession Rules, 1959 and Rules 12, 13 and 16 of Granite Conservation and Development Rules, 1999 with obtained full consent as per the application and Production schedule in preparation of Mining plan as per the provisions of Mines Act, Rules, Regulations as on date.

This Mining plan has been prepared after carrying the field investigation, geological survey, collection of Primary & secondary data, geological attributes, environmental setting and estimated the Resources & Reserves, depth of mining as identified in the field with best our knowledge and experience without any geological exploration. This mining plan is prepared by considering as amended Rule 42 of Tamil Nadu Minor Mineral Concession Rules, 1959 and as per the EIA Notification 2006 and its subsequent Amendments.

The company ensures to comply all the condition stipulated by the Government before the execution of lease deed and during the course of quarrying operations.

In order to ensure compliance of the order of the Honorable Supreme Court Dated: 27.02.2012 in I.A.No.12-13 of 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 is require prior environmental clearance. As per amendment in EIA Notification 2006 vide S.O. 1886(E), Dated:20.04.2022 "All mining lease area in respect of minor mineral mining leases and $\leq$ 250 ha mining lease area in respect of major mineral mining lease other than coal" would be treated as category B and will be considered by the state notified by Ministry of Environment, Forest and Climate Change as prescribed procedure under EIA notification 2006.

The field investigation was carried out by the Qualified Person and his Team as on 19.12.2025.

1.0 GENERAL INFORMATION:

1.1	Name and address of the applicant:	M/s. A.G. Granites (Private) Limited, Muthu Gounder Colony, Harur, Dharmapuri District, Tamil Nadu State - 636 903									
	Contact No.	+91 98944 55389									
	E-mail ID	tpt@ammangranites.com									
	Aadhaar No.	5795 4210 3091 (Refer annexure No. IX)									
1.2	Status of the applicant:	M/s. A.G. Granites (Private) Limited, is a Private Limited company incorporated with the two directors. The details of directors are given table below (Refer annexure Nos. VII). <u>Table - 1</u> <table border="1"> <thead> <tr> <th>S.No.</th><th>Name</th><th>Designation</th></tr> </thead> <tbody> <tr> <td>1.</td><td>Thiru. M. Ramasamy, S/o. Muthu Gounder.</td><td>Managing Director</td></tr> <tr> <td>2.</td><td>Tmt. R. Shanthi, W/o. M. Ramasamy.</td><td>Director</td></tr> </tbody> </table> Tmt. R. Shanthi is the Director and she is an authorized person for signing all the documents on behalf of this company (Refer annexure Nos. VIII and IX).	S.No.	Name	Designation	1.	Thiru. M. Ramasamy, S/o. Muthu Gounder.	Managing Director	2.	Tmt. R. Shanthi, W/o. M. Ramasamy.	Director
S.No.	Name	Designation									
1.	Thiru. M. Ramasamy, S/o. Muthu Gounder.	Managing Director									
2.	Tmt. R. Shanthi, W/o. M. Ramasamy.	Director									

Mining Plan and PQCP

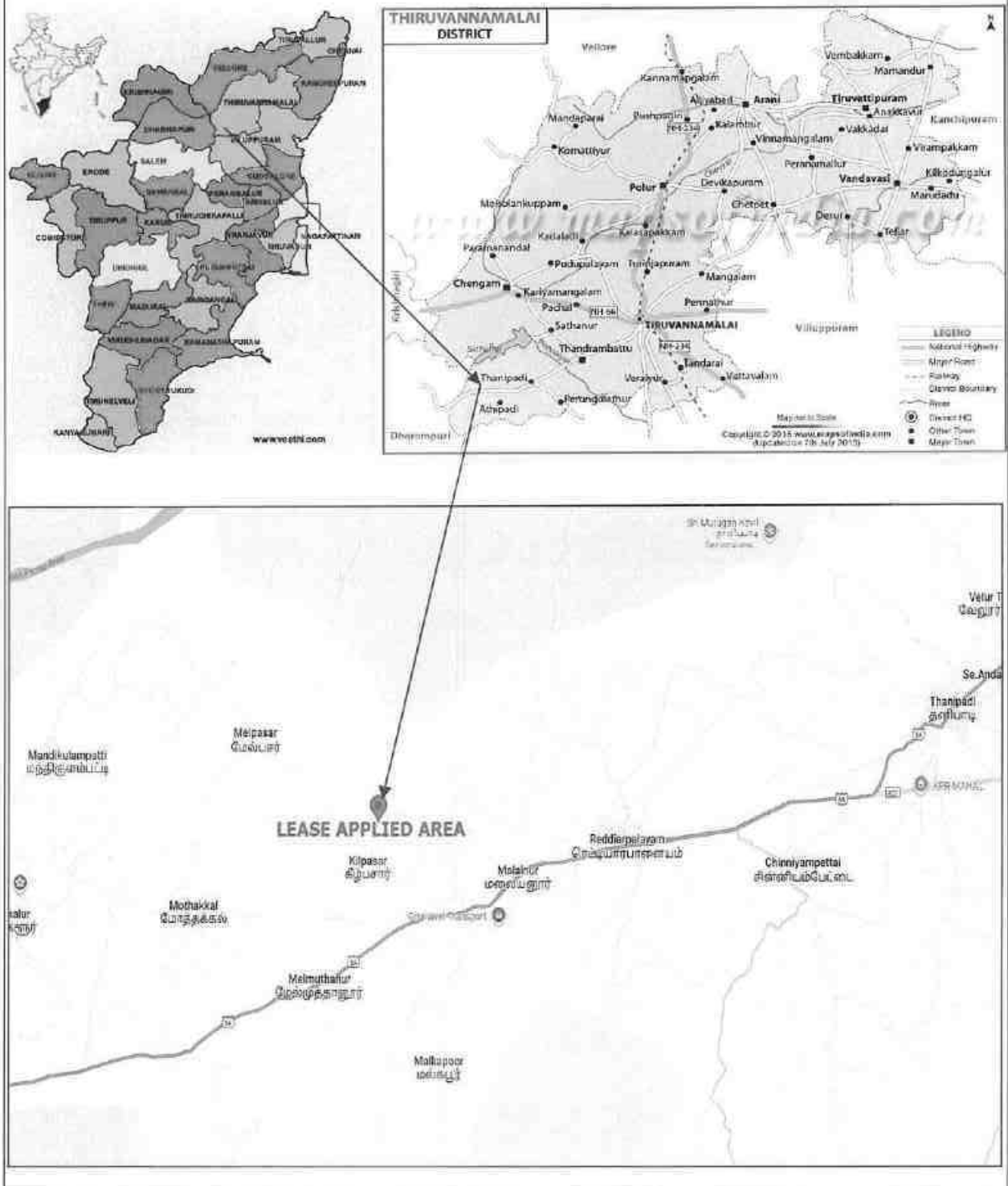
Kilpachar Black Granite Quarry



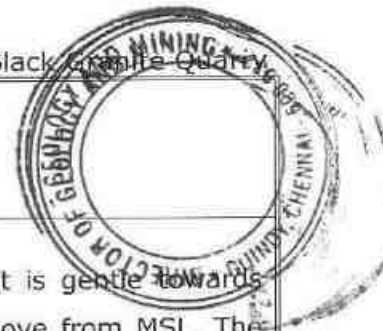
1.3	Mineral which the applicant intends to mine:	Black Granite
1.4	Period for which the mining area is required:	Twenty years as mentioned in Precise area Communication letter.
1.5	Name and address of the Qualified Person who prepared the mining plan:	B. VENGADAGIRI, M.Sc., Qualified Person (As per Rule 15(I)(a) and (b) of MCR 2016) Address : No.105, 5th Cross Alagapuram Salem District Tamil Nadu – 636 010 Mobile No. : +91-86953 32233 E-mail ID : vengatb6@gmail.com (Refer Annexure No. X and X-A).
1.6	Name and address of the prospecting agency:	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 of the commercial granite deposits of Tamil Nadu. Besides, the Qualified Person and his team members made a detailed geological study of the area and demarcated clearly the Black granite deposit with a mine surveyor. The granite formation is clearly visible right from the outcrops. No detailed prospecting carried out. <u>Address of the prospecting Agency:</u> STATE GEOLOGICAL DEPARTMENT O/o The Commissioner of Geology and Mining Thiru Ve Ka Industrial Estate, Guindy, Chennai – 32.
1.7	Reference no. Date of grant/ Precise Area Communication received from the State Government:	The Precise area Communication letter has been issued from the Natural Resources (MMB.1) Department, Secretariat, Chennai vide Letter No.1920/MMB.1/ 2025-1, Dated: 17.12.2025, (Refer Annexure No. I).

2.0 LOCATION AND ACCESSIBILITY:

The lease applied area is located about 37km Southwestern side of Tiruvannamalai town, 21.5km Southwestern side of Thandarampattu town and 500m Northern side of Kilpachar Village (Please refer plate No- I, IA and IB).

Location Map of the Lease Applied area

2.1	Details of the area:	a) Extent (Ha.)	3.21.5		
		b) Survey Numbers	S.F. No.	Extent (Ha.)	Classification
			65 (Part-2)	3.21.5	Barren land
		Source: As per the FMB, and 'A' register record furnished by the company.			
		c) Village	Kilpachar		
		d) Taluk	Thandarampattu		
		e) District	Tiruvannamalai		
2.2	Whether the area recorded to be in Forest Department:	The area does not falls under forest land of any category. It is a Revenue Poramboke land.			
2.3	Ownership / Occupancy and Classification of the area:	It is Government Poramboke land, Classified as Barren land (Please refer Annexure No. V and VI).			
2.4	Existence of public road / Railway line, if any nearby and approximate distance:	The approach road is available on the Southern side, which is connects to Kilpachar – Melpachar Village road located at 250m on the Southern side of the area. There is no other patta lands are encountered for the haulage of Black Granite (Please refer Plate No.I to IC). Road access is available from the quarry to state highways and National Highway, the traffic density is not much more due to the transportation of quarried out material. The Nearest Railway line is Vellore - Viluppuram which is located about 38.1km on the Northeastern side of the area as per the GSI Toposheet and Google Map.			
2.5	Toposheet No. with Latitude and Longitude:	The area is marked in the Survey of India, Topo Sheet No. 57 L/16. The area lies between the Latitudes of 12°05'40.09"N to 12°05'45.76"N and Longitudes of 78°45'26.42"E to 78°45'34.71"E on WGS datum-1984. (Plate No. I & II) (Please refer Plate Nos. I to II as per the GSI Toposheet).			

**PART - A****3.0 GEOLOGY AND EXPLORATION:****3.1 Topography:**

The area is situated in undulated terrain. The gradient is gentle towards Southwest and altitude of the area is about 250m - 255m above from MSL. The area is concealed under reddish gravelly soil having an average thickness of 1m, 2m Weathered rock and followed by fresh Black Granite. The Black granite is clearly visible right from the outcrops and detached boulders with The black granite is observed with Spheroidal weathering and cuboidal joints (which is the characteristic feature of the Dolerite). The Dolerite dyke is intruded between the batholithic formations of Charnockite.

3.2 Regional Geology & Geological Succession:

The hard rock terrain of Archaean to Late proterozoic comprises of predominantly Granite, Gneiss, Charnockite group of rocks and their magmatic derivatives, supracrustal sequences intruded by ultramafic complexes, basic dykes, granites.

The northern part of Tamil Nadu, north of Noyil - Cauvery River is characterized by the occurrences of a number of Dolerite dykes in contrast to the areas south of Noyil - Cauvery River where the dykes are absent. The dolerite dykes in general trending is in WNW- ESE and NNE - SSE directions and rarely in N-S and NNW - SSE directions.

In central part of Tamil Nadu, ENE - WNW to NE- SW trending dolerite dykes (Black granite) are seen transecting the Charnockite in Kalrayan & Kolli Hills. Palaeo magnetic studies of some of these dykes indicate Mid-Proterozoic age.

Due to emplacement of Dolerite Dykes along narrower plains of weakness, the rock on solidification develops cracks and fractures mostly along the contacts with the country rocks. The dolerite dykes are mostly emplaced as "swarms" in an area.

Granites were formed from molten rock referred to as "Magma" formed at great depths within the crust of the earth. During the cooling process, some of the minerals grow into larger crystals of colours peculiar to those minerals or get aligned along certain preferred directions giving rise to beautiful colors and patterns. Such rocks that were formed at great depths during the Archaean age are now exposed at the surface of the earth as a result of the combined actions of wind, air, sun and water and weathering and denudation over the past several million years.

The granitic group ranges in composition from Granite, through grandiorities to adamellite, augite-diorite, monzonite, etc. and contains inclusions of hornblende rocks. To what extent they represent intrusive of different ages is yet to be determined, but their very complex nature is unquestionable since they include composite gneisses, migmatites, granitised older crystalline rocks and true granites with their aplitic and quartz vein systems.

The black granite is a basic igneous rock formed from ultramafic magmas by partial melting. The composition of the rock is plagioclase (Labradorite) and pyroxene (Augite). The texture is ophitic i.e., large oligoclase of Augite enclose the laths of plagioclase feldspar. The colour is termed as Leucocratic. Free silica is rare or absent. The rock is holocrystalline, black colour, hardness-5 to 6, prismatic cleavage.

STRATIGRAPHY OF TIRUVANNAMALAI:

ROCK TYPE	GROUP	AGE
Soil		Pleistocene to Recent
----- Unconformity -----		
Quartz and Pegmatite vein	Migmatite Complex	Late Archaean to Proterozoic
Dolerite dykes		
Ultrabasic complex		
Hornblende Biotite gneiss		
Granite Gneiss		
Charnockite	- Charnockite group -	Late Archaean

3.2.1 Geology of the lease applied area:

In the Tiruvannamalai district of Tamil Nadu is characterized by the occurrences of Numerous Dolerite dykes. The dolerite dykes are general trending in NNE- SSW direction and some places in NNW- SSE directions.

The black granite is clearly visible right from the outcrops and detached boulders along the linear strike direction and rest of the area concealed under reddish soil having an average thickness of 1m, 2m Weathered rock totally overburden in the area having an average thickness of 3m and followed by fresh black granite.

The Charnockite forms the country rock of the area with trending of NE-SW with almost vertical dipping and "Black Granite" (Dolerite) Intruded between the batholithic formation of pre-existing country rock of Charnockite concordantly with trending of **N30°E – S30°W** with dipping towards SE with an average **width of 40m** which stretches about the entire area (Please refer Plate No-III and IV).

The black granite (Dolerite dyke) rock is sub-ophitic brownish black in color, equigranular, fine to medium grained texture. The color of the rock changes depending upon the texture of the rock. The Dykes is fine grained at the contact of country rock. The Dolerite is composed of laths of plagioclase embedded in the plates of Augite (Ophitic texture), Apatite, magnetite and pyrite forms the secondary mineral.

It is inferred that the minor strike and dip joints are observed at the surface level which may not have a good recovery, the strike and dip joints may reduce in deep seated conditions. Taking in to consideration of the above geological factors, over burden and side burden wastage during quarrying, other flaw and patches etc., the average recovery percentage without exploration has been assumed and estimated as 10% from the ROM upto a depth of 20m (1m Topsoil + 2m weathered rock + 17m Black Granite).

The Physical attitude of the Black Granite deposit of this area is given below:-

Strike Direction	- N30°E – S30°W
Dip amount and direction	- SE
Black Granite Strike Length	- 137m
Width	- 40m.
Proposed Depth (Including OB - 3m)	- 20m

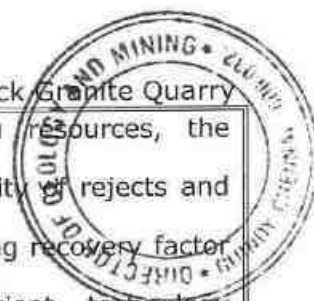
3.3**Details of Exploration:****3.3.1. Already Carried Out:**

As far as Black Granite deposits are concerned, the only practical method is the systematic geological mapping and delineation of commercial Black Granite bodies within the field and careful evaluation of body luster, physical properties, engineering properties, commercial aspects, etc.,

Such an exploration study has already been conducted regionally in this area by the Geological Survey of India (GSI) in the year 1966 and Department of Geology and Mining of Tamil Nadu in year 1992 to 1993.

Based on the valuable geological information and by the field investigation carried out by the QP and his team, the estimation of geological resources, mineable reserve is arrived and assumed based upon the anticipated waste saleable granite blocks and present market scenario.

	3.3.2 Proposed study to be carried out:	Even though the depth persistence of the Black Granite stone may be beyond 20m from the Petrogenetic character of the rock, only 20m (1m Topsoil + 2m Weathered rock + 17m Black granite) depth persistent has been taken as economically viable (at present scenario considering for the entire lease Period and not for the entire life of the mine) to calculate categories of proved, probable and possible reserves. The recovery of saleable Black Granite stones has been taken as 10% and if the recovery percentage is good or bad, it may enhance or decrease respectively. This estimation is based upon the machenaries available in the market at present scenario and the market demand for this type of granite. No definite programs for future exploration have been proposed. The quarrying activities for the next five years with deep cut as envisaged in the mining plan may render additional data as may be required for future planning. The attributes of the geological formation with respect to the saleable granite and waste ratio will be discussed in the ensuing scheme period.
3.4	Method of Estimation of Reserves:	The Geological plan demarcating the commercially marketable granite body has been prepared in 1:1000 Scale, totally two sections have been drawn, one along the strike direction as (X-Y) length wise and another cross section drawn Perpendicular to strike as (A-B) width wise; Which is suitably chosen to cover the maximum area in the scale of 1:1000 (Please refer Plate No. IV). The cross sectional area for the depth persistence of 20m has been worked out for each section. The cross sectional area multiplied by its length x breadth x Depth gives the volume (insitu) in the area wise. The sum total of the insitu reserves available within the block gives the geological resources of the quarry lease applied area.



From the Total Geological insitu resources, the quantity of saleable granite stones, quantity of rejects and waste generation are estimated by applying recovery factor as 10% by its volume. High efficient technology machineries, quarry masters, Market demand significantly determine the recovery percentage of granite quarries. The estimated recovery is based on today market scenario and available technology. This estimated recovery has been considered as only normative recovery.

When the market demands, the company may take necessary steps to deploy a quarry masters with latest innovative machineries technology. So the recovery enhancement may raise to the peak production resulting more than 10%. During the operation the method of quarry, deployment of men and machineries will not have any significant impact on the Environment.

It is worth mentioning the recovery anticipate the normative production has been scientifically converted into commercial production resulting in the decrease dump of waste inside the quarry. Due to the micro fractures, flaws, patches, xenoliths, required dimension, dressing, etc., the recovery in the granite may not be 100% of the R.O.M.

As the sale of Black Granite stone are in terms of Metric Tonne as in the case of major industrial mineral, the geological resources, Mineable reserves and quantity of waste generated etc are given in terms of Metric Tonne.

The details of estimation of geological resources and mineable reserves with reference to the geological plan & cross sections and conceptual plan and sections as shown in Plate No. IV, IX respectively has been furnished.

3.5 Estimation of geological resources and grade:

Maximum Length : 137m
 Maximum Width : 198m (Black Granite 40m + Side Burden 158m)
 Maximum Depth : 20m (Including OB 3m)

Table - 2

GEOLOGICAL RESOURCES												
Section	Bench	Length (m)	Width (m)	Depth (m)	ROM (m³)	Bulk Density	ROM (MT)	Recovery @ 10% (MT)	Mineral Reject @ 90% (MT)	Side Burden (MT)	Weathered Rock (MT)	Topsoil (MT)
XY-AB	i	137	198	1	-	2	-	-	-	-	-	54252
	i	137	198	2	-	2	-	-	-	-	108504	-
	i	41	20	2	1640	3.1	5084	508	4576	-	-	-
		41	60	2	-	2.75	-	-	-	-	13530	-
	ii	123	40	5	24600	3.1	76260	7626	68634	-	-	-
		123	140	5	-	2.75	-	-	-	-	236775	-
	iii	137	40	5	27400	3.1	84940	8494	76446	-	-	-
		137	158	5	-	2.75	-	-	-	-	297632.5	-
	iv	137	40	5	27400	3.1	84940	8494	76446	-	-	-
		137	158	5	-	2.75	-	-	-	-	297632.5	-
	Total					81040		251224	25122	226102	845570	108504

Total Geological Resources in ROM = 2,51,224 MT
 Total Recoverable Resources @ 10% = 25,122 MT
 Mineral Reject @ 90% (MR) = 2,26,102 MT
 Weathered Rock (WR) = 1,08,504 MT
 Side Burden (SB) = 8,45,570 MT
 Total Waste (MR + WR + SB) = 10,80,176 MT
 Topsoil = 54,252 MT
 Granite : waste ratio = 1:47



The Geological resources are estimated based on the geological cross sections up to the economically workable depth of 20m below from the existing ground profile at the rate of 10% recovery yields 25,122 MT and 2,51,224 MT of ROM. At the end of the final year the company is advised to approach the competent authorities for quarrying the granite below the proposed depth for which the provision is available for the preparation of modified mining plan as per the rule 16 (3) of GCDR, 1999.

3.6 **Tentative Mineable Reserves and Grade:**

Maximum Length : 117m

Maximum Width : 70m (Black Granite + SB)

Maximum Depth : 20m

Table – 3

Section	Bench	Length (m)	Width (m)	Depth (m)	ROM (m ³)	Bulk Density	ROM (MT)	Recovery @ 10% (MT)	Mineral Reject @ 90% (MT)	Side Burden (MT)	Weathered Rock (MT)	Topsoil (MT)
XY-AB	i	117	70	1	-	2	-	-	-	-	-	16380
	i	117	70	2	-	2	-	-	-	-	32760	-
	i	31	20	2	1240	3.1	3844	384	3460	-	-	-
		31	30	2	-	2.75	-	-	-	5115	-	-
	ii	111	40	5	22200	3.1	68820	6882	61938	-	-	-
		111	20	5	-	2.75	-	-	-	30525	-	-
	iii	102	40	5	20400	3.1	63240	6324	56916	-	-	-
		102	10	5	-	2.75	-	-	-	14025	-	-
	iv	92	40	5	18400	3.1	57040	5704	51336	-	-	-
		Total					192944	19294	173650	49665	32760	16380



Tentative Mineable Reserves ROM	=	1,92,944 MT
Total Recoverable Reserves @ 10%	=	19,294 MT
Mineral Reject @ 90% (MR)	=	1,73,650 MT
Weathered Rock (WR)	=	32,760 MT
Side Burden (SB)	=	1,73,650 MT
Total Waste (MR + WR + SB)	=	2,56,075 MT
Topsoil	=	16,380 MT
Granite : waste ratio	=	1:13

The mineable reserves are estimated by deducting the mineral locked up area under safety distance and bench loss. Hence the remaining area is taken for estimation of mineable reserves upto 20m depth.

The Black Granite body occurring in this area exhibits more or less uniform colour and texture. If any variation occurs during quarrying, such as cracks, joints, patches, colour variations etc, the defective area will be removed by chiseling. The formation is almost uniform and no gradational change is noticed except some shears joints and cracks.





4.0 MINING:		
4.1	Method of mining (opencast / underground)	Opencast method.
4.2	4.2.1. Mode of working (mechanized, manual)	It is a conventional mechanized quarrying operation. The mining of granite dimensional stones are concerned, observance of the provisions of Regulation 106(2) (a) and (b) is available with Director General of Mines Safety. If the company intends to modify the dimensions of benches, relaxation and permission are available with Director General of Mines Safety under 106 (2) (a) and (b) of Metalliferous Mines Regulations, 1961. If any relaxation is required the company may apply to the Director of Mines Safety for which the provisions of relaxation of working on benches is possible as per the Regulation of Mines and Minerals (Development and Regulation) Act, 1957. This relaxation will be applied and obtained after the execution of lease/Commencement of quarry operation. In such a scenario if there is any drastic change in the Resources and Reserves a modified plan will be submitted to the competent authority for necessary relaxation, clearance and permission. The production of Black Granite dimension stone in this quarry involves the following method which is typical for granite stone quarrying in contrast to other major mineral mining. Splitting of rock mass of considerable volume from the parent rock formation by carefully avoiding visibly seen defects such as patches veins, etc., is done by adopting the method of "diamond wire saw cutting" along the horizontal as well as two vertical sides on the front face of the formation. This liberation of huge volume of granite body from the parent sheet rock is called "primary cutting". This huge portion is further split in to several blocks of desirable dimensions. The blocks thus splitted are removed from the pit to the dressing yard by using Crawler crane for further dressing. Removing the defective portions and dressing them in to the dimension blocks are done manually using feather and wedges and chiseling respectively by the experienced skilled labours or by innovative machineries. The defect free, dimensional stone of different sizes as approved in the market are thus produced by the method as described above, and the process is continuously monitored by company's experienced quality control Statutory personnel. The waste material generated during quarrying activity includes rock fragments of different sizes, and also during dressing of the blocks. As and when there is accumulation of waste, the same is loaded into the tipper by loading machines and dumped in the respective places ear-marked for the purpose (Plate. No.

VI).

The quarried out topsoil will be preserved along the safety zone and utilized for formation of bund and green belt purpose (green belt).



4.2.2 Extent of Mechanization:

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

Table - 4

I. DRILLING AND CUTTING MACHINE

S.No.	Type	Nos	Dia Hole mm	Size Capacity	Make	Motive power
1	Jack hammer	4	32	1.2m to 6m	Atlas Copco	Compressed air
2	Compressor	1	-	400psi	Atlas Copco	Diesel drive
3	Diamond Wire saw	2	-	20m ³ /day	Optima	Diesel Generator
4	Diesel Generator	1	-	250kva	Kirloskar	Diesel

Table - 5

II. LOADING EQUIPMENT

S.No.	Type	No.	Capacity	Make	Motive Power
1	Excavator	1	350	KOBELCO	Diesel Drive

III. HAULAGE WITHIN THE QUARRY & TRANSPORT EQUIPMENT

Table - 6

S.No.	Type	Nos	Capacity	Make	Motive Power
1	Tipper	2	20 MT	TATA	Diesel Drive
2	Water Sprinkling Tanker	1	10,000 Liters	TATA	Diesel Drive

IV. TRANSPORT FROM THE QUARRY HEAD TO DESTINATION

Transportation from quarry head to customer destination is done by truck or by trailers.

V. MISCELLANEOUS:

Apart from the above the following tools and tackles are required for quarry operation.

For operation

The operation of granite quarry requires the following loose tools material and have to be kept sufficiently in stock for non - interruption of the quarry work.

Drill rods - 0.3m, 0.5m, 0.75m, 1.65m, 2.25m, 3m, 3.6m, 5m upto 9m.

2. Steel Alloy chains of sufficient length of 10m, 12m, 16m, 18m etc., sizes.

3. 'D' shackles to link the chain lengths.

4. Rubber hose of required length.

5. Hose clamps to link the compressor delivery hoses.

6. Feather and wedges of 6" and 12" dia sizes utilize for splitting the block from the mother rock. This is an important tool in the operation of a quarry.

7. Crow bars.



8. Spades.
9. Sludge Hammer.
10. Iron Pans.
11. Pitcher Hammer.
12. Chisels.
13. Consumables, such as diesel, Hydraulic oil, grease, abrasive wheels, welding machines etc.,
14. Stock of essential spare parts of machinery.
15. Explosive as per the licensed quantity.
16. Diamond Wire required length.
16. Besides diamond wire saw equipment and new innovative machine specifically for granite with accessories are required to liberate the rock from to parent body to minimize damage and to obtain good recovery.

Splitting the sheet rock by Diamond wire sawing which increases substantial recovery potential. Hence it is proposed to adopt "Diamond wire saw cutting" for best recovery. The above machineries are adequate to meet out the development and production schedule drawn out during this mining plan period.

4.3	Proposed bench height & width	5m Height and Width. Under the regulation 106 (2) (a) of the Metalliferous Mines Regulation 1961, in all open cast mining, the bench height should not exceed, 6.0 meter and bench width should not be less than bench height of the vertically cut face. In accordance with the Regulation 106 (2) (b) of the Metalliferous Mines Regulations 1961, in all open cast working where the ore body forms hard rock, the working faces and sides should be adequately benched and sloped; a bench height not exceeding 6m and a bench width not less than the bench height has to be maintained. The slope angle of such benches and sides should not exceed 60° from horizontal. However, observance of these statutory provisions in granite dimensional stone quarrying is difficult to maintain the 60° slope due to the field difficulties and technical reasons as below: 1. Recovery of the granite stone is to be as undamaged rectangular dimensional blocks. In the attempt to form the benches and sides with the above statutory parameters haphazard blasting may be involved. In which case the commercial granite body may get spoiled inevitably due



		to generation of blasting cracks. 2. In the exercise of forming the benches with 60° slope within the granite deposit, the portion confined within the 60° as well as its complimentary part in the extricated block will become as mineral waste while shaping them into rectangular blocks. 3. The granite industry need blocks as huge as a few cubic meter volumes with measurements up to 3m x 2m x 2m. Production of such huge blocks in turn increases the recovery and reduces the mineral waste during dressing. Blocks of smaller size of certain varieties of granite are now marketable and have a good commercial value. 4. Formation of too many benches with more height and the width equal to the height may lead to mineral lock up. Hence, in order to avoid granite waste and to facilitate economical mining operations, it is proposed to obtain relaxation to the provisions of Regulation 106 (2) (b) upto a bench parameter of 5m height & 5m width with vertical faces. Such a provision of relaxation of the Regulation has been provided within the regulation 106 (2) (b). The entire terrain is made up of hard rock, compact sheet and possess high stability on slope even at higher vertical angles. The same will be inspected by the Director of Mines Safety and permission to be obtained under Regulation 106(2)(b) of the Metalliferous Mines Regulation, 1961. The overall pit slope angle as proposed will always be maintained from 40° to 50° in order to have a safe movement of men and machinaries working in the quarry. Hence, the slope stability of the quarry is well within the prescribed standards. Gradient of the ramps is proposed in such a way that it is not steeper than 1 in 10 and its length shall be more than 50m at one stretch.
4.4	Indicate proposed rate of production when the mine is fully developed, and the expected life of the mine and the year from which effected (composite plan and section showing pit layout, dumps, disposal of waste if any etc.):	

YEAR WISE DEVELOPMENT AND PRODUCTION FOR THE FIRST FIVE YEARS:

Total Length = 66m
 Maximum Width = 65m
 Maximum Depth = 20m

Table - Z

Section	Year	Bench	Length (m)	Width (m)	Depth (m)	ROM (m ³)	Bulk Density	ROM (MT)	Recovery @ 10% (MT)	Mineral Reject @ 90% (MT)	Side Burden (MT)	Weathered Rock (MT)	Topsoil (MT)
XY-AB	I	i	66	45	1	-	2	-	-	-	-	-	5940
		i	66	45	2	-	2	-	-	-	-	11880	-
		i	31	30	2	1860	3.1	5766	576	5190	-	-	-
		ii	57	8	5	2280	3.1	7068	707	6361	-	-	-
		Total				4140	-	12834	1283	11551	-	11880	5940
	II	i	66	20	1	-	2	-	-	-	-	-	2640
		i	66	20	2	-	2	-	-	-	-	5280	-
		i	31	25	2	-	2.75	-	-	-	4263	-	-
		ii	57	16	5	4560	3.1	14136	1414	12722	-	-	-
		ii	57	20	5	-	2.75	-	-	-	15675	-	-
	III	iii	47	6	5	1410	3.1	4371	437	3934	-	-	-
		Total				5970	-	18507	1851	16656	19938	5280	2640
		iii	47	12	5	2820	3.1	8742	874	7868	-	-	-
	IV	iv	37	15	5	-	2.75	-	-	-	9694	-	-
		Total				2820	-	8742	874	7868	9694	-	-
		iv	37	6.5	5	1203	3.1	3728	373	3355	-	-	-
	V	v	37	10	5	-	2.75	-	-	-	5088	-	-
		Total				1202.5	-	3728	373	3355	5088	-	-
		iv	37	6.5	5	1203	3.1	3728	373	3355	-	-	-
	Grand Total					1202.5	-	3728	373	3355	-	-	-
Grand Total						15335	-	47539	4754	42785	34720	17160	8580



Total Proposed Reserves in ROM	=	47,539 MT
Total Recoverable Reserves @ 10%	=	4,754 MT
Mineral Reject @ 90% (MR)	=	42,785 MT
Weathered Rock (WR)	=	17,160 MT
Side Burden (SB)	=	34,720 MT
Total Waste (MR + WR + SB)	=	94,665 MT
Topsoil	=	8,580 MT
Granite : waste ratio	=	1:20



**Estimated Life of Quarry**

Mineable Reserves in ROM	=	1,92,944 MT
Mineable Reserves @ 10%	=	19,294 MT
Average production per year @ 10%	=	4,754/5 years = 951 MT
Estimated Life of the Quarry	=	19,294/ 951 MT
	=	20 years.

The average annual production per year would be 951 MT at the rate of 10% recovery. The **Annual peak production capacity in the quarry is estimated as 1,851 MT @ 10% recovery in 18,507 MT of ROM.** The proposed production schedule is arrived as per requirement by the company and the EIA and EMP will be prepared for an annual peak production.

Based on the above, and taking into consideration of the available Mineable reserves, **the life of quarry will be about 20 years** (considering all the safety factors) at 10% recovery, if the quarry is being worked out continuously with an average annual production of 951 MT. This calculation is based on the plan approved by Director of Mines Safety leaving Benches and Safety barriers. If the annual production increases considerably and consistently a modified mining plan will be prepared under Granite Conservation and Development Rules 1999 the same will be submitted to the relevant authorities for subsequent clearance and approval.

The proposed year wise quantum of excavation and the details of estimation of production quantity and generation of wastes are furnished with reference to the year wise development and production plan. More details of the year wise production parameters are explained with bench length, width and height in Plate No. V.

4.5 Attach a note furnishing a conceptual mining plan for the entire lease period based on the geological, mining and environmental considerations.

Conceptual mining plan is prepared with an object of long term systematic development of benches; lay out, selection of permanent ultimate pit limit, depth of quarrying and ultimate pit, selection of sites for construction of infrastructure, etc.,

The ultimate pit size is designed based on certain practical parameters such as economical depth of quarrying, safety zones, permissible area, etc.,
The ultimate pit dimension of the quarry is given below.

ULTIMATE PIT DIMENSIONS

Table – 8

Maximum Dimensions in meters		
Length	Width	Depth
117	80	20 (5m AGL + 15m BGL) (R.L. 255m – 235m)

However, during extraction of blocks each bench will be of 5m height with vertical slope for proper dimension cutting. The quantum of excavation is estimated to be 2,91,749 MT (ROM 1,92,944 MT + Topsoil 16,380 MT + Weathered rock 32,760 MT + Side Burden 49,665 MT) to a depth of 20m. The generation of total waste is estimated about 2,56,075 MT (Mineral Reject 1,73,650 MT + Weathered rock 32,760 MT + Side Burden 49,665 MT) and marketable Black Granite as 19,294 MT.

The excavated waste (94,665 MT) will be proposed to dump on the Northeastern side with dimension of (L)73m x (W)39.5m x (H)12.14m during the first five years, which will be act as temporary waste dump. The applied area is a Government land, after end of the lease period if the mineral reserves available and Market persist there will be a chance for announcement of another quarry Tender by the State Government as to develop and conserve mineral reserves. If the company obtained the permission from the competent authorities to dump the waste in the non mining zone the attributes of the waste dump will be discussed in the ensuing scheme period. The Conceptual Mining is based upon the entire ROM proposed for the life of the Mine.

As per G.O.(Ms)No.04, Natural Resources (MMC.1) Department, Dated: 22.08.2023 and G.O.(Ms).No.41 Natural Resources (MMB.1) Department, Dated: 07.05.2025, if permission is granted for removal of waste from competent authorities, the waste material will be supplied to the needy crusher to making the M-Sand, building and road construction



		material after paying the seniorage fee and obtained necessary clearance and approval from concerned department for handling the waste. After completion of quarry operation the pit will be allowed to collect seepage and rain water which will act as a temporary reservoir. This activity will be carried out only after obtaining permission from the competent authorities and local community. If the mined out pit is been allowed to behave as a reservoir the same will be done after due procedure for the protection of reservoir. If permission not obtained for handling of waste and the competent authority will be directed to backfilling, the same will be carried out nearly existing ground profile with entire waste material and spread out the preserved topsoil over the backfilled area to facilitate green belt development purpose. The quarry area will be fenced with barbed wire fencing also safety bund formed around the quarry to prevent inadvertent entry of public and cattle. (Please refer plate No. IX).

5.0 BLASTING:

5.1	Broad blasting parameters like charge per hole, blasting pattern, charge per delay, maximum number of holes blasted in a round, manner and sequence of firing, etc.	In general for granite quarrying does not involved deep hole drilling and heavy blasting, only secondary blasting is proposed with Jackhammer drilling by 35mm dia hole for removal of overburden and secondary fragmentation for handling the wastes. The granite industry needs blocks for about 3m x 2m x 2m for International buyers hence small blocks blasting pattern is not followed. The blasting pattern depends upon the texture of the rocks in the case of granite quarrying which in-turn depends upon the bedding plane, presence of fractures, fissures and cracks hence it is difficult to decide the definite particular pattern of holes in each blast. Now-a-days Diamond wire saws are used for splitting the blocks from parent sheet mass. It is a new innovative Eco-friendly splitting technique without involving blasting. This is increase the recovery percentage of granite blocks and reduces from induce fissures due to blasting. Besides those are noise free Eco friendly machineries. Hence, it is difficult to pronounce a definite pattern of holes with regard to spacing, burden and depth for secondary fragmentation. Hence, only blasting is proposed.

		for secondary fragmentation for handling the wastes and not for production of granite blocks.
5.2	Type of explosives used / to be used.	In granite quarries, only diamond wiresaw machines are deployed for liberating the granite blocks from parent sheet mass. The waste thus generated after diamond wiresaw cutting will be fragmented by using low intensity explosives. This explosives are used only for size reduction to handle the waste from pit mouth to waste dumps. The aim is to recovery as large block as possible. During future development of quarrying, removal of over burden will be done by blasting with explosives that will be used are NONEL and 25mm Slurry explosives are proposed in 35mm dia holes drilled by Jackhammer.
5.3	Powder factor in ore and overburden/waste / development heading / stope.	Hence only low intense explosives like NONEL and Gelatin Sticks are used. Nonel initiation provides reasonably good solution to fly rock problem. The main objectives of Nonel Blasting are to reduce the ground vibration, noise, flyrocks generated due to blasting operations. The overall cost of blasting in NONEL is very less and ecofriendly compared to electrical blasting and hence it optimizes the usage of explosives.
5.4	Whether secondary blasting is needed, if so describe it briefly	Blasting is proposed for secondary fragmentation for handling the large size waste blocks and removal of waste as development work not for production.
5.5	Storage of explosives (like capacity and type of explosive magazine).	Authorized explosive dealers supply the explosive at site as per the day's requirement. However, portable magazine 'M' type has been proposed to install in the ear marked places, and the company is advised to get necessary license from Controller of Explosives (Petroleum and Explosives safety Organization) for storing explosives in the above area after the grant of quarry lease. Splitting within the sheet rock is affected by diamond wire sawing which increases substantial recovery potential. Hence it is proposed to follow diamond wire saw cutting for better recovery and conservation of granite dimensional stone. The blasting and quarrying operation is advised to handle by competent qualified statutory personnels approved by the DGMS and competent authorities. The Competent Qualified Statutory personnel appointed by the company will maintain the records of Explosives as per the Indian Explosives Act, Mines Act and EP Act.

**6.0 MINE DRAINAGE:**

6.1	Likely depth of water table based on observations from nearby wells and water bodies.	Water level is found at a depth of 404m - 109m, which is observed from the nearby bore wells with water level indicator.
6.2	Workings expected to be _____ m. above / reach below water table by the year _____.	The quarry operations are confined to well above the water table. The quarry operation is proposed to a depth of 20m only below from the existing ground level.
6.3	Quantity and quality of water likely to be encountered, the pumping arrangements and places where the mine water is finally proposed to be discharged	The Black granite consisting of no chemical effluent and toxic elements, hence there will be effluent discharge from Granite quarry is non-toxic. Hence the quality of water would not be affected by mining activities. Anyhow, Garland drain will be constructed all along the boundary to prevent surface run-off water entering into the quarry pit. If seepage water may encounter during rainy season, the same will be pumped out from the pit to settling tank through the garland drain by 5 HP motor pumps. After settling of particles from the drained water, the same will be utilized for Greenbelt development and water sprinkling on dust prone areas through the water sprinkler.

7.0 STACKING OF MINERAL REJECTS AND DISPOSAL OF WASTE:

7.1	Indicate briefly the nature and quantity of top soil, overburden / waste and mineral rejects likely to be generated during the next five years:	Table - 9				
		Year	Overburden		Mineral Reject (MT)	Side Burden (MT)
			Top soil (MT)	Weathered rock (MT)		
		I	5,940	11,880	11,551	-
		II	2,640	5,280	16,656	19,938
		III	-	-	7,868	9,694
		IV	-	-	3,355	5,088
		V	-	-	3,355	-
Total		8,580	17,160	42,785	34,720	

7.2	Land Chosen for Disposal of Waste with proposed justification.	Topsoil:
		The excavated topsoil will be spread out all along the boundary barrier and utilized for construction of bund and afforestation purpose.
		Waste:
		The total waste to be produced during the first five years will be proposed to dump on the Northeastern side. The dimension of waste dump is given table below (Refer Plate No. V).

Table - 10

Period	Length(m)	Width(m)	Height(m)
1 st Five years	73	39.5	12.14
End of Lease	154	87	10.3

7.3	Attach a note indicating the manner of disposal and configuration, sequence of build up of dumps along with the proposals for the stacking of sub-grade ore, to be indicated year wise.	There is no subgrade mineral. As and when there is accumulation of mineral reject, the same is loaded into the tipper by loading machines and dumped in the respective places earmarked for the purpose. The waste management plan with reference to the quantum of waste generated is shown in quarry layout and Afforestation plan (Plate No.VI). There is no slurry anticipated in the quarry operation. Besides the granite waste does not produce any toxic effluent in the form of solid, liquid or gas

8.0 USE OF THE MINERAL:

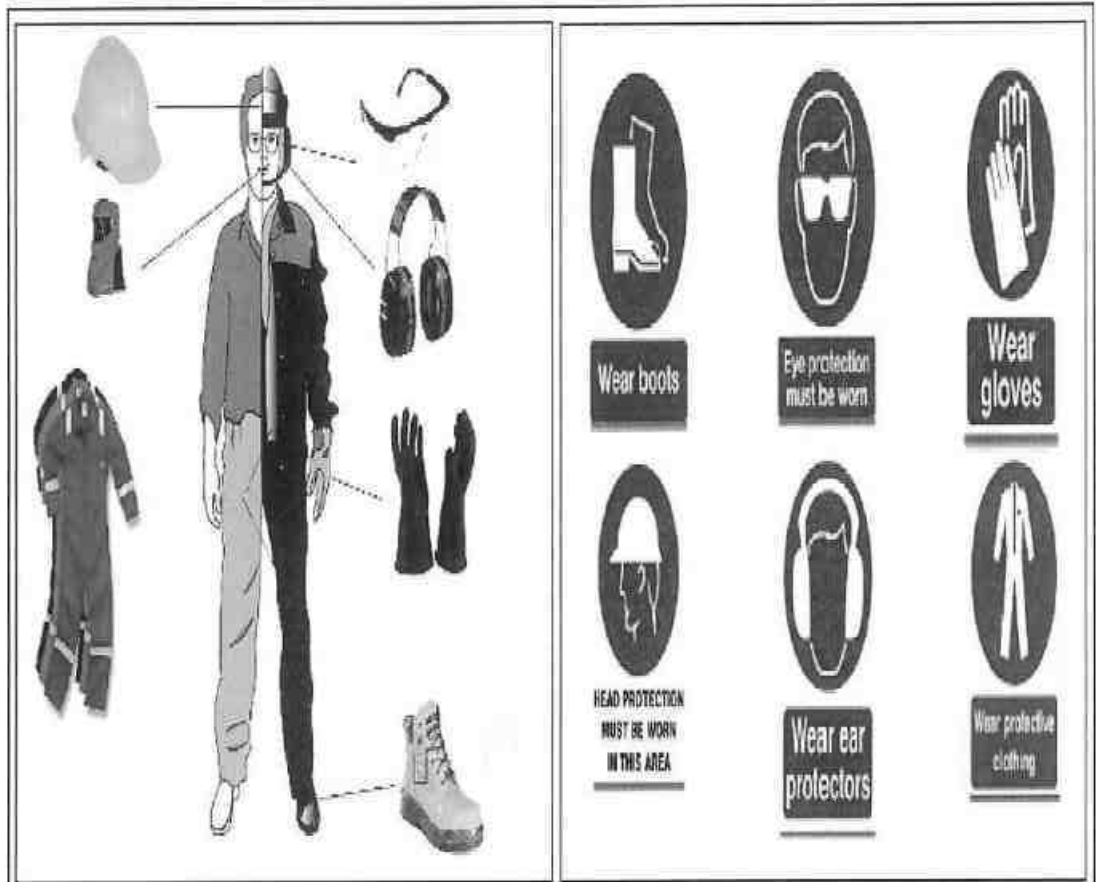
8.1	Describe briefly the end-use of the mineral (sale to intermediary parties, captive consumption, export, Industrial use).	No captive use, the quarried out Black Granite blocks will be sold to the needy customers through out the contry in the form of required dimentional blocks. No processing is proposed in the applied area. The quarried out Black Granite blocks are either exported as rough blocks or processed in designated factories as value added products such as slabs, tiles, fancy items and, precision surface plates for construction and engineering application.
8.2	Indicate physical and chemical specifications stipulated by buyers.	No chemical parameters specified by the buyers, but the buyers are preferred Gang saw size blocks of dimensional stone such as having measurements of 3m x 2m x 2m.
8.3	Give details in case blending of different grades of ores is being practiced or is to be practiced at the mine to meet specifications stipulated by buyers.	Not Applicable.

**9.0 OTHERS:****Describe briefly the following:**

9.1	Site Services.	The simple methods adopted and the limited scale of activities involved in granite dimensional stone quarrying does not require High Tension Electric Power supply or huge workshop facilities. The quarry office, storeroom, first aid room, Rest room, Hygienic modern Sanitary etc. are proposed to be constructed in semi-permanent structures within the lease applied area (Please refer Plate No. VI). The quarrying operation is restricted to one general shift during day time only. Major Machinery repair works are attended at Thanipadi town (8km-NE) and minor repairs are carried out by the Company's personnel at the quarry site itself.
9.1.1 Welfare measures: a) Drinking water: Packaged Drinking water will be brought from the water venders in the Reddiyarpalayam Village which is located at 3.4km on the Eastern side of the area. b) 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 will be in charge of first aid and injured person will be taken to the hospital by the company's vehicle. c) Labors Health: Periodically medical check-up related to occupational health safety will be conducted to all the workers in company's own cost as per the directions of DGMS.		

**d) Precautionary safety measures to the Workers:**

All Personal Protective Device with Safety Helmets, Mine Goggles, Ear Plugs, Ear Muffs, Nose Mask, Reflector Jackets and Safety Shoes will be provided to the workers as per the specification of Director of Mine Safety. Besides also conducting pre medical checkup for all workers for any health related problems proper training and induction will be given to quarrying personal to create awareness of conventional Eco friendly quarrying operations. Also the company ensure to registered in ongoing Labour Welfare Board insurance scheme to all the workers working under its control.



- Helmets,
- Reflector Jackets,
- Dust mask,
- Mine Goggles,
- Ear plugs,
- Ear muffs,
- Safety Shoes,

Table - 11

S.No.	Description- Nearest	Particulars	Serial Distance & Direction
1	National Highway	Tindivanam – Harur (NH – 179B)	19.5km – NW
2	State Highways	Thandarampattu – Harur (SH – 6A)	1.3km – South
3	Railway station	Tiruvannamalai	38.2km – NE
4	Airport	Salem	83.3km – SW
5	Habitation	420m – South	
6	Town	Thanipadi	4km – NW
7	Government School	Kilpachar P.U. Primary School	560m – South
8	Government Hospital	Thanipadi	8.6km – NE
		Reddiyarpalayam- PHC	2.8km – SE
9	Reserved Forest	Ponnaiyur R.F. – 140m – North (Refer Plate No. IA).	
10	Defense Installation/Historical Monuments/ Archaeological	Nil within 500m radius.	
11	Nearby Water Bodies	Odai – 130m – NE	
12	Interstate Boundary	Around 66.6 km – NW (Andhra Pradesh State Boundary)	
13	Critically Polluted areas identified by the CPCB	Around 112 km – NE (Ranipet – SIPCOT)	
14	Protected areas Notified under wildlife (Protection) Act, 1972.	Cauvery South Wild life Sanctuary – 86.5 km – NW	
15	Applicability of CRZ, Notification 2011 as amended.	Not Applicable	
16	Applicability of Hill Area Conservation Authority (HACA) Clearance.	Not Applicable	
17	Housing area, EB line (HT & LT Line)	There is no EB-LT/HT line or Housing area situated within 50m radius.	
18	Boundaries of the permitted area.	The boundaries of the permitted areas are as follows (Refer Plate No. II): North - S.F.No. 65(Part-1). East - S.F.Nos. 71 and 72. South - S.F.No. 65(Part-3) West - S.F.Nos. 62 and 64.	
19	Adjacent Patta lands / Govt. Land	Direction	Safety Distance
		North	Govt land 10m (Adjacent Existing Quarry)
		East	Patta land 7.5m
		South	Govt land 10m
		West	Patta land 7.5m
(Refer Plate No. II):			

**STRUCTURE WITHIN 100m**

Number of Structures - 2 No.

Table - 12

Number of Structure	Type of Structure	Usage Purpose	Commercial / industry/ residential/ farm house/ Govt. building	Occupants of Building/ Structure	Remarks
2	Shed	Labour's rest shed- Adjacent quarry lease	Industrial purpose	No resident	Nil

STRUCTURE WITHIN 100 -200m

Number of Structures - 1 No.

Number of Structure	Type of Structure	Usage Purpose	Commercial / industry/ residential/ farm house/ Govt. building	Occupants of Building/ Structure	Remarks
1	Shed	Storage of Agriculture products	Farm House	No resident	-

STRUCTURE WITHIN 200 -300m

Number of Structures - 8 Nos.

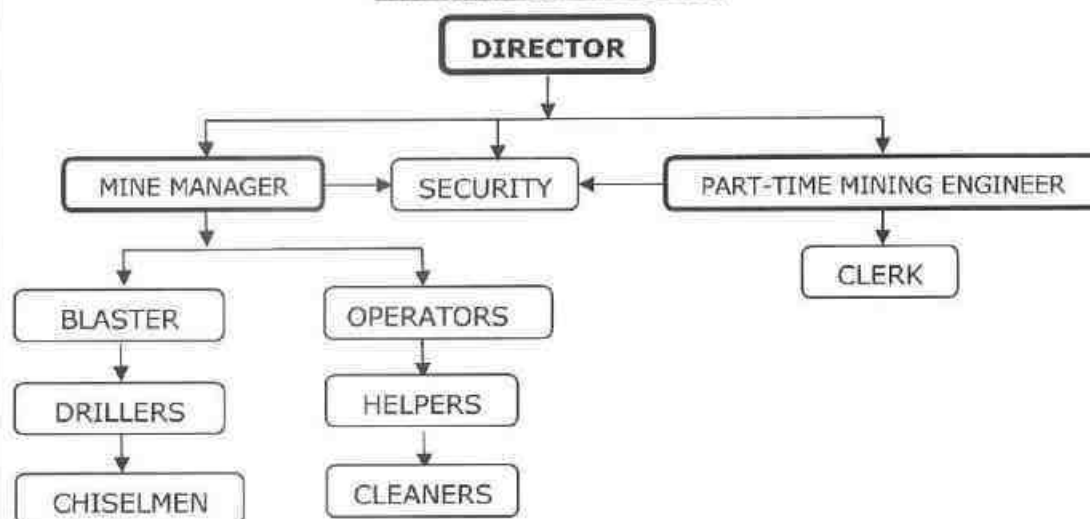
Number of Structure	Type of Structure	Usage Purpose	Commercial / industry / residential / farm house / Govt. building	Occupants of Building/ Structure	Remarks
8	Shed	Storage of Agriculture products	Farm House	No resident	-

9.2**Employment Potential:**

The following manpower for machinaries as well as for operational activities are proposed to carry out the day-to-day quarrying activities at the peak production capacity and also to comply with the statutory provisions of the metalliferous mines regulations, 1961.

Table - 13

Designation	Present Employment position	Employees Requirement	Total
a) Supervisory category			
Mine Manager	-	1	1
Geologist	-	1	1
Mine Foreman	-	1	1
Blaster/Mate	-	1	1
b) Skilled labour			
Excavator - Operator	-	1	1
Wire Saw Operator	-	1	1
Tipper Driver	-	2	2
Water sprinkler Driver	-	1	1
Jack-Hammer Drillers	-	12	12
c) Unskilled			
Security	-	1	1
Helper	-	4	4
Co-operator and Cleaner	-	5	5
Total	-	31	31

ORGANIZATION CHART

The above manpower is adequate to meet out the peak production schedule and the machinery strength envisaged in the mining plan and also to comply with the statutory provisions of the Mines Safety Regulations.

The proposed output per man shift:

Table - 14

Annual Peak Production @ 10%		1,851 MT
No. of days likely to be worked		300 days
Average production per day		6.169 MT
OMS =	Daily Production/Daily employment	$6.169/31 = 0.199$ MT

10.0 MINERAL PROCESSING:

10.1	If processing / beneficiation of the ore or minerals mined is planned to be conducted on site or adjacent to the extraction area, briefly describe the nature of the processing / beneficiation.	No mineral processing/beneficiation involved. The exploited blocks are carefully examined for any natural defects such as joints, cracks, xenoliths, secondary Pegmatitic growth, etc, and such defects is removed manually using feather and wedges and the blocks are then shaped into perfect rectangular dimensional stone blocks by manual chiseling.
10.2	Explain the disposal method for tailings or waste from the processing plant (quantity and quality of tailings proposed to be discharged, size and capacity of tailing pond , toxic effect of such tailings, if any, with process adopted to neutralise any such effect before their disposal and dealing of excess water from the tailing dam).	Not applicable.
10.3	A flow sheet or schematic diagram of the processing procedure should be attached.	Not applicable.
10.4	Specify quantity and type of chemicals to be used in the processing plant.	Not applicable.
10.5	Specify quantity and type of chemicals to be stored on site / plant.	Not applicable.
10.6	Indicate quantity (cu.m. per day) of water required for mining and processing and sources of supply of water. Disposal of water and extent of recycling.	Wire Saw Cutting (Recycle and Reuse) - 2.0 KLD Water Sprinkling for dust suppression - 4.5 KLD Green belt Development - 2.0 KLD Drinking & Domestic purpose - 0.5 KLD Total - 9.0 KLD Source: Storage Rain Water in mine pit & nearby Water suppliers.

PART – B**11.0 ENVIRONMENTAL MANAGEMENT PLAN:****11.1 Baseline Information:**

The EMP is prepared based on the Mines act, Rules & amendment from by state & central government. If the SEIAA/SEAC instructed the modification and alter the EMP the outcome of their recon would be final and the company is instructed to followed the EIA / EMP for its compliance as per the CPCB / TNPCB Norms.

a) Existing land use pattern indicating the area already degraded due to quarrying / pitting, dumping, roads, processing plant, workshop, township etc., in a tabular form.

Table – 15

Description	Area at present (ha)	Utilized (%)
Area under Quarry	Nil	-
Waste dumps	Nil	-
Infrastructure	Nil	-
Road	Nil	-
Green Belt	Nil	-
Unutilized	3.21.5	100
Grand Total	3.21.5	100

b) Water regime:

Ground water level is about 104m - 109m depth below ground level. The quarrying is restricted up to 20m below ground level, hence the quarry operation will not intersect the ground water.

Garland drains will be constructed all along the boundary barriers to prevent the surface water flow inside the quarry and also to divert the surface water flow to the nearby natural drains.

There is no major surface water body like river, reservoir or lake present within 50m radius of the area.

c) Flora and Fauna:

Groundnut, maize, cereals, Neem, Cocos nucifera, thorny bushes, Cissus quadrangularis, shrubs are observed around the area. No plants of botanical interest or scheduled fauna are recorded within the impact zone.

d) Climatic conditions:

The area receives rainfall of about 1020mm/per annum and the rainy season is mainly from Oct - Jan during North East, monsoon. The summer is hot with maximum temperature of 42°C and winter encounters a minimum temperature of 24°C.

	e) Human settlement:	Nearest habitation is 420m – South. There are few villages located within the 5km radius Table – 16 <table><tr><th>S.No</th><th>Name of the Village</th><th>Direction</th><th>Approximate Distance</th><th>Approximate population</th></tr><tr><td>1.</td><td>Reddiyarpalayam</td><td>East</td><td>3.2km</td><td>5,600</td></tr><tr><td>2.</td><td>Kilpachar</td><td>South</td><td>0.5km</td><td>1,400</td></tr><tr><td>3.</td><td>Melpachar</td><td>NW</td><td>1.8km</td><td>1,800</td></tr><tr><td>4.</td><td>Mothakkal</td><td>SW</td><td>2.7km</td><td>3,300</td></tr></table>	S.No	Name of the Village	Direction	Approximate Distance	Approximate population	1.	Reddiyarpalayam	East	3.2km	5,600	2.	Kilpachar	South	0.5km	1,400	3.	Melpachar	NW	1.8km	1,800	4.	Mothakkal	SW	2.7km	3,300
S.No	Name of the Village	Direction	Approximate Distance	Approximate population																							
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3.	Melpachar	NW	1.8km	1,800																							
4.	Mothakkal	SW	2.7km	3,300																							
	f) Public buildings, Monuments and Places of Worships:	There is no public building, place of worship or archaeological or Historical monument within 300m radius of the area.																									
	g) Weather the area falls under notified area under water (Prevention and Control of Pollution) act, 1974:	The area falls under notified area under water (Prevention and Control of Pollution) Act, 1974.																									
11.2	Attach an Environmental Impact Assessment Statement describing the impact of mining and beneficiation on environment on the following over the next five years:	The mining plan is proposed for very small production of granite dimensional stone without involving deep hole drilling and heavy blasting. Such limited quarrying activity is not likely to cause any significant impact adversely on environment as far as pollution of air, water and noise is concerned. If any significant variation found during the Half year compliance, the Environment Management Plan will be altered accordingly. Anyhow, the impacts are anticipated due to the mining operations and its mitigation measures are given below:																									
11.3	Attach an Environmental Management Plan:																										

Environment	Anticipated impact	Mitigation measures (EMP)
Land Environment	i. Topography of the area will change due to mining activity. ii. Soil quality and agriculture land on surrounding land environment will impact due to: a) Dust propagation during quarry operation like drilling, blasting, loading, unloading and movement of men, Vehicle and machineries. b) Vehicular and machineries emissions. c) Propagation of foreign material like polythene bag, jute bag, Plastic water and drinks containers and undecomposed waste materials dumping. iii. Inappropriate dumping of mined out soil and waste will impact the Soil quality of non-mining area.	i. Backfilling is only mitigation measure for topographical changes. But the applied area is a Government land, after end of the lease period if the mineral reserves available there will be a chance for announcement of another quarry Tender by the State Government as to develop and conserve mineral reserves. If permission is granted by the state Government for disposal of waste to the crushing unit, there is no possibility of Backfilling. The mined out pits will act as a water reservoir. ii. The excavated benches shall be developed for plantation with grasses and herbs of local species to improve aesthetic of the area and to prevent any soil erosion and landslide. iii. Mining benches will not exceed beyond the approved height and width. i. Quarried out topsoil will be preserved separately in non-mining area (safety barriers) also grass cover and plantation will be forming to sustain the quality and quantity of soil and soil based organisms. ii. Regular water sprinkling on dust prone area like haul road and other active area to arrest dust generation. iii. Green belt will be developed in the safety barriers with thick long leave plants to prevent dust and vehicular emissions propagations. iv. Wet drilling with dust extractor unit will be carried out and quarry material will be handled under wet condition to minimize the dust generation. v. Non-Degradable materials like polythene bag, useless articles, plastic water and cool drink containers will not be allowed to litter and no ill managed dumping will be used for filling the excavated pits. vi. The waste material will be properly dumped in area earmarked for the purpose only to sustain the quality of soil on non-mining area.
Water Environment	i. Alteration of natural flow direction of surface run off rain water during rainy season due to modification of topography. ii. Inappropriate dumping of waste material shall affect the natural flow direction of surface run off rain water. iii. Contamination of surface water due to dust generation and	i. Garland drain with check dam and settling tank will be constructed around the quarry to prevent surface run off rain water entering pit. ii. The waste material will be properly dumped on area earmarked for the purpose only and retaining wall with weep holes will be constructed around the dump.

	vehicle emission due to quarry operation and movement of machinery and Vehicles. iv. Contamination of surface water during rainy season due to quarry operation and movement of machinery and Vehicles. v. A small amount of water will be contaminated due to utilization of water for wire saw cutting.	iii. Mining will be completely stopped during the monsoon for free flow of surface run off and allowing natural recharge of groundwater. iv. The pit water due to rain and seepage will be utilized for water sprinkling on the haul Roads and plantations after settling of silt. v. Septic tanks and soak pits will be provided for the disposal of domestic/ washroom effluents. The sewage water will be collected from the soak pit and disposed to the authorized wastewater treatment plant. vi. The contaminated water during wire saw cutting will be collected in a sump and the same will be recycled to reduce the water consumption.
Air Environment	In surface mining operations, the source of air pollution may cause deterioration of air quality due to the fugitive dust emissions from drilling, blasting, scooping, loading- unloading and its transportation. Drilling/blasting and loading of quarry material would be associated with the fugitive dust generation in the active area whereas fugitive emission during transportation would affect the areas/villages situated adjacent to the road side. Another source of air pollution would be emission from the drilling machinery and excavators/Trucks/vehicles to be used for loading.	i. Regular water sprinkling to the haul road to arrest the dust generation. ii. Green belt will be developed in the safety barrier which will be act as an acoustic barrier, the plants with thick long leaves will arrest the fugitive dust, sound and vehicular emissions on the surrounding environments. iii. Diamond wire saw cutting method does not produce dust. Anyhow, during development wet drilling with dust extractor unit will be carried out to minimize the dust generation. iv. Controlled blasting with Nonel initiation by Proper blasting techniques will be followed for effective rock fragmentation during development to reduce the fine dust propagation. v. Quarry material will be handled under wet condition during loading and unloading to minimize the dust generation of proposition, besides loaded materials are covered by Tarpaulin during transportation until reaches its destination. vi. Provision of dust filters/ mask (PPE) to workers working at dust prone areas. vii. Vehicular emission as a result of combustion of diesel generates particulate matter (PM_{10} & $PM_{2.5}$), Nitrogen oxides and Sulphur dioxide (NO_2 & SO_2). High quality diesel will be used in the motor vehicles to control these pollutants. viii. PUC (Pollution under control) certified vehicles will be used for transportation.



		ix. CPCB Prescribed emission standards for the vehicles would be followed. x. All vehicles and their exhausts would be well maintained and regularly tested for pollutant concentrations.
Noise and Vibration	In the present mining activity for building material, noise will be generated from drilling machinery, blasting and vehicular movement. Noise level in the working environment is compared with the standards prescribed by Central Pollution Control Board as adopted and enforced by the Govt. of India through Noise Pollution (Regulation and Control) Rules, 2000.	i. Selection of new low - noise equipments under BS-VI for the quarry operation. ii. Green belt will be developed along the boundary barrier, which will act as acoustic barrier to arrest the noise propagation on the environment. iii. The noise levels shall be maintained within the permissible levels by involving all the noise regulating measures in vehicles and drilling/blasting operations. iv. Diamond wire saw cutting is proposed for mining activity, which is eco-friendly noise and vibration free machine. Anyhow, to ensure minimum vibrations and noise due to blasting during mine development, NONEL delay blasting is proposed for development works to control the Noise, Vibration and fly rock. v. Personnel Protective Equipment (PPE) like earmuffs and earplugs shall be provided to the employees whose in critical operation like drilling, blasting and excavation as occupational safety measures. vi. Proper maintenance done with regular interval by the Oiling and greasing for the machineries and vehicles to control the Source of noise during operation and transportation. vii. Transporting vehicles are enforcing the speed limits of 25km/hour within quarry area and not exceed 40km per hour from quarry to destination for reduce Noise and vibration level. viii. There would be restrictions on mining activity and vehicular movement during night hours.
Biological Environment	No plants of botanical interest or animals of zoological interest recorded within 500m radius. The anticipated impacts on biological environment as follows: i. Disrupt the living insects in the overburden due to mining activity also which will induce the diversity of existing ecosystem. ii. Natural habitats of the existing faunas will change due to	i. The barbed wire fencing and safety bund will be constructed around the quarry to prevent inadvertent entry of public and cattle. ii. The natural habitats of the existing flora and fauna will not be disturbed by adopting well maintained machineries, equipments and diamond wire saw cutting for mining. iii. Fruit bearing trees will also be planted to survive the existing Faunas.



	the noise and vibration during operation. iii. Mining may drive away the nearby residents from their habitat. iv. Deposition of dust on the plant and crop leaves is affecting the photosynthesis, Pollination, growth ratio and agriculture productivity.	iv. There is no proposal for cutting any trees within the proposed area. v. Water sprinkling on haul roads would be arrest the dust generation, thus avoiding damage to the crops and plants.
Socio Economic Environment	Any activity during mining will have adverse impact on Environment, careful mitigation measures are proposed to balance the impact on the existing environment and the company is always instruct to carry out safe, sustainable, eco-friendly mining operations at all times. The following positive impact on the society due to this mining activity. i. It is proposed to provide employment to about 35 persons for carrying out mining operations and give preference for employment to the local peoples. In addition, there will be opportunity for indirect employment to many people in the form of contractual jobs, business opportunities, service facilities etc. ii. 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 and their economic status will be enhanced. iii. Improvement of Physical structure like Road Transport facilities, Communications, Medical, Educational and social benefits will be made available to the nearby civilian in addition to the workmen employed in the mine. iv. The continuation of opportunity for the employments, the nearby villages, living peoples and their life style would be improved. v. The company is advised to invest the CER cost (@ 2% from the total Project Cost) to develop the local Panchayat.	i. Preference employment will be given to the local community. This quarrying activity will also indirectly provide employment to the local community by the way of petty shops, hotels, etc. ii. The CER activity proposed by the company will enhance the requirement of the local community. iii. The improvement of physical structure like road transport facilities, medical, social benefits will get enhanced. iv. There will be a positive enhancement of lifestyle of the nearby village.



11.4 Monitoring schedule for different Environmental Components after commencement of mining and other related activities:

i) Environmental impact assessment statement describing impact of mining on the next five years:

The mining plan is proposed for very small production of granite dimensional stone without involving deep hole drilling and heavy blasting. Such limited quarrying activity is not likely to cause any impact adversely on environment. As far as pollution of air, water and noise concerned, the environmental impact studies will be conducted as per EIA notification issued by MoEF& CC. It is B Category mine. The compliance monitoring will be carried out for every six months as prescribed by the MOEF&CC and with state competent authorities.

ii) Proposal for waste management:

The total waste to be produced during this mining plan period will be around 94,665 MT proposed to dump on the Northeastern side with maximum dimension of (L) 73m x (W) 39.5m x (Height) 12.14m. The quarried out topsoil 8,580 MT will be preserved all along the safety zone and utilized for green belt purpose.

The waste management plan with reference to the quantum of waste generated is shown in quarry layout plan (Please refer Plate No.VI). The maintenance of machineries & fueling will be carried out as per the TNPCB Norms and the waste will be disposed in manner.

iii) Proposal for reclamation of land affected during mining activities and at the end of mining (refilling / fencing etc.):

In the proposed mining plan only 20m depth has been envisaged as workable depth for safe & economic quarrying for the entire lease period. The applied area is a Government land, after end of the lease period if the mineral reserves available and Market persist as to develop and conserve mineral reserves, there will be a chance for announcement of another quarry Tender by the State Government. If permission is granted for removal of waste, the waste material will be supplied to needy crusher for convert to the M-Sand, building and road construction material from competent authorities after paying the seniorage fee. After completion of quarry operation the quarry pit will be allowed to collect the seepage and rain water which will act as a temporary reservoir. If permission not obtained for handling of waste also if any direction given by the concerned authority for backfilling with waste the same will be carried out nearly existing ground profile with entire waste material and spread out the preserved topsoil over the backfilled area to facilitate green belt development purpose.

The quarry area will be fenced with barbed wire fencing also safety bund formed around the quarry to prevent inadvertent entry of public and cattle (Refer plate No. VII and IX).

iv) programme of afforestation, year wise for the initial five years indicating the number of plants with name of species to be afforested under different areas in hectares:

The safety barrier along the Southern side lease boundary has been identified and utilized for green belt development with 2,042m² area by not less than 1m height saplings with an anticipated survival rate of 80% for first five years and will be maintain atleast 1,500 plants at the end of life of the quarry. Appropriate species of trees will be identified and planted in a phased manner as described below. The Green belt development will be carried out in the first 5 year plan period.

Table – 17

Year	No. of trees proposed to be planted		Area to be covered in applied area (m ²)	Name of the species
	Safety zone	Approach Road		
I	100	100	409	Poovarasu, Sarakondrai, Mookuchali maram, Mamaram, Thespesia populnea, Nuna, Mantharai, etc.,
II	100	100	409	
III	100	-	408	
IV	100	-	408	
V	100	-	408	

11.5 Proposed financial estimate / budget:

The Financial Estimate for Quarry operations and Environment Management Plan (EMP).

Table – 18

A. Machineries and Equipment Cost		
S.No.	Description	Approximate Cost (Rs.)
1.	Land Cost – It is a Government land, the tender cost is	4,68,75,873
2.	Labour Shed	5,00,000
3.	Sanitary Facility (Already Constructed)	1,00,000
4.	Excavator (1 No.)	50,00,000
5.	Tipper (2 No.)	50,00,000
6.	Wire Saw (2 No.)	8,00,000
7.	Diesel Generator (1 No.)	7,50,000
8.	Compressor with loose tools (1 No.)	7,50,000
9.	Jack Hammer (4 Nos.)	2,00,000
10.	Drinking Water Facility (2 ltr/Day/Person)	1,32,000
11.	CCTV arrangements	50,000
Total Machineries and Equipment Cost		6,01,57,873

B. Proposed financial estimate / budget for (EMP) Environmental Management Plan:

Budget Provision for the first five years period

B. EMP Cost:		Cost (Rs.)
1	Environmental Monitoring Program (Air Quality, Water Quality Sampling, Noise and Ground vibration test) Rs. 50,000/ year.	2,50,000
2	Water will be sprinkled in the haul roads by own water sprinkler for dust suppression. The cost would be around.	6,00,000
3	Fencing will be construct to prevent inadvertent entry of public and cattle, the cost is (750m length x Rs. 300/- per meter).	2,25,000
4	Construction of Garland drain with check dam to prevent surface run-off rain water entering to the quarry pit, the construction cost is around (Total Peripheral length 300m x Rs. 300/meter).	90,000
5	First aid room & accessories	50,000
6	Dust extractor unit for Jackhammer (4 Nos.).	1,00,000
7	Safety Kits for workers (Personnel Protective Equipment).	50,000
8	Greenbelt development for dust suppression	1,00,000
	& Noise control measures	40,000
Total EMP Cost		15,05,000

The EMP cost for the five years plan period would be around **Rs. 15,05,000/-**

Total Cost of the Project including EMP Cost	
Description	Cost (Rs.)
A. Machineries and Equipment Cost	6,01,57,873
B. EMP Cost	15,05,000
Total Project Cost (A+B)	6,16,62,873
C. The company will ensure to carry out the Corporate Environment Responsibilities (CER) activity as recommended by the concerned authority.	

(Total project cost including EMP cost is about rupees six crore sixteen lakh and sixty two thousand eight hundred and seventy three only).

**12.0 PROGRESSIVE QUARRY CLOSURE PLAN:****12.1 Introduction:**

The Progressive Quarry Closure Plan for Black Granite quarry lease applied area over an extent of 3.21.5 Hectares of Government Poramboke land in F.No. 65 (part-2) of Kilpachar Village, Thandarampattu Taluk, Tiruvannamalai District, Tamil Nadu State has been prepared for **M/s. A.G. Granites (Private) Limited**, having an office at Muthu Gounder Colony, Harur, Dharmapuri District, Tamil Nadu State – 636 903.

12.2 Present Land use pattern:

Land Use Table – 19

Description	Present area in (Ha)
Area under Quarry	Nil
Dump	Nil
Infrastructure	Nil
Roads	Nil
Green Belt	Nil
Unutilized	3.21.5
Grand Total	3.21.5

12.3 Reasons for closure:

Immediate closure is not planned due to sufficient reserves are available for the entire life of quarry. Hence, the reason for closure will be discussed in Final Mine Closure Plan.

12.4 Statutory obligations:

The company ensures to comply all the conditions stipulated in the precise area communication letter before grant of quarry lease and during the course of quarry operations as per the DGMS, Department of Geology and Mines, Labour Enforcement officer, controller of Explosives etc., circulars, Norms, Rules, Regulations and Act.

12.5 Progressive quarry closure plan preparation:

Name and address of the Qualified Person who prepared the progressive closure plan and executing agency who is involved in the Preparation of progressive quarry closure plan.

Name : **B. VENGADAGIRI, M.Sc.,**
 Qualified Person (Under Rule 15(1)(a) and (1)(b) of MCR, 2016)

Address : No.105, 5th Cross, Alagapuram
 Salem District

State with PIN Code : Tamil Nadu – 636 010.

Mobile : +91 86953 32233

Email : vengatb6@gmail.com

The company will himself implement the closure plan; no outside agency will be involved.



12.6 Review of Implementation of Mining Plan including Progressive Closure Plan upto the Final Closure Plan:

The Mining Plan and Progressive quarry closure plan are being submitted for the first time. Hence, review of implementation of progressive quarry closure does not arise at present. However, if any work done for progressive quarry closure during this Mining Plan period, it will be discuss an ensuing Scheme period.

12.7 Mine Closure Plan:

(i) Mined Out Land:

At the end of mining plan period the quarry operation carried out to a depth of 20m in an area 0.47.95Ha only out of 0.99.46 Ha of total mineable area. When the remaining reserves will be completely exhausted, the mine closure plan will be prepared and submitted to the competent authority to obtain approval and the same will be implemented. Land use and land cover at various stages is given in the table below. At present the area is virgin.

Land use pattern

Table - 20

Description	Present Area (Ha)	Area required during Mining plan period (Ha)	Area at the end of life of quarry (Ha)
Area Under Quarry	Nil	0.47.95	0.99.46
Waste dump	Nil	0.28.83	0.87.78#
Site Services	Nil	0.02.00	0.02.00
Roads	Nil	0.02.00	0.04.00
Green Belt	Nil	0.20.42	0.58.31
Unutilized Area/ Stock	3.21.50	2.20.30	0.69.95
Grand Total	3.21.50	3.21.50	3.21.50

If permission is granted for disposal of waste from the State Government, there will not be waste dump presence within the lease area.

(ii) Disposal of mining machinery:

All the Machineries will be purchased afresh, the same has been maintained in good condition during entire life of quarry if required the machinaries will be replaced or repaired. 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.

(iii) Safety & Security:

Safety measures will be implemented to prevent access in the excavation area and 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 if the company intends to increase the height of the bench, necessary permission will be obtained from the concerned authority and implemented.
- Width of working bench will be kept about 5.0m for ease of operations and provide sufficient room for the movement of equipments.
- Personnel Protective equipment like dust masks, ear-plugs/ muffs and other equipments shall be provided for use by the working personnel.
- Notices giving warning to prevent inadvertent entry of persons shall be displayed at all conspicuous places and in particular near mine entries. Sufficient caution and sign boards will be kept in and around the quarry to induct public for awareness.
- Blasting will be carried out in a specific time after giving sufficient caution to the public such as danger signs shall be displayed near the excavations and siren alarm signal will be provide before small amount of blasting time for precautionary action of accident (blasting is carried out only for secondary fragments and not to liberate the Granite body from the parent rock mass).
- Security guards will be posted to prevent inadvertent entry of public.
- In the event of temporary closer, approaches will be fenced off and notice displayed.
- Installation of CCTV cameras in the quarry and entrance of the quarry.
- Monitoring of Quarrying operation by accredited external agency as directed by authorities.



(iv) 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 company 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.
- 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 temporarily 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.

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 competent authority from time to time.

Disaster Management Cell:

The Competent Qualified Statutory managers appointed by the company as per the Director of Mines Safety will be responsible for Disaster Management. It care of 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.



(v) 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:

Mine roads and approach roads,

Fencing on approach roads,

Checking and maintenance of machines and equipment,

Drinking water arrangements,

Mine 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 Guideline.
- Care and upkeep of plantation shall be carried out on regular basis.
- Status of the working and status monitoring for re-opening of the mines shall be discussed daily.

In case of discontinuance due to any natural calamities/abnormal conditions, mining operation will be restarted as early as possible after completing rescue work, restoring safety and security, repairs of roads etc.

(vi) Economic Repercussion of Closure of Quarry and manpower Retrenchments:

The quarry lease is granted for a period of twenty years only. As per the production Program 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.

(vii) 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.

**(viii) Abandonment Cost:**

As at present mining is not going to be closed so abandonment cost could not be assessed. However, based on the progressive quarry closure activities during the plan period, cost is assessed as given below:

Table - 21

ACTIVITY		YEAR					RATE	Cost (Rs.)
		I	II	III	IV	V		
Plantation proposed under safety zone	Nos.	100	100	100	100	100	Rs.200 Per sapling	1,00,000
	Cost	20,000	20,000	20,000	20,000	20,000		
Plantation proposed in the Haul road	Nos.	100	100	-	-	-		40,000
	Cost	20,000	20,000	-	-	-		
Barbed wire fencing 750 Mtrs		2,25,000	-	-	-	-	Rs. 300 Per Meter	2,25,000
Garland drain 300 Mtrs		90,000	-	-	-	-	Rs. 300 Per Meter	90,000
TOTAL								4,55,000

13.0 MINERAL CONSERVATION AND DEVELOPMENT:

The mining plan proposed has fully covered all the aspects of Granite Conservation and development rules 1999, with a future plan to extend the proposed working of the quarry to the maximum possible workable depth of the deposit. Extreme care is taken to ensure proper supervision of quality control of the Granite dimensional stone aimed at the recovery of the maximum saleable quality and quantity of granite dimensional stones suitable for full utilization of the consumers.

Care is been taken for each process just to safeguard the material quarried in an economical and efficient manner by adopting systematic and scientific quarrying with the consultation and supervision of well experienced quarry persons.

14.0 STATUTORY COMPLIANCE TO BE FOLLOWED DURING THE COURSE & CLOSURE OF QUARRY LEASE:

The company should ensure to carryout that the quarry operation in accordance to the Approved scheme of Mining and as per TNMMCR, 1959, GCDR, 1999, Mine Act 1952 & as per MMR 1961

The conditions in the nutshell as follows.

1. The quarry operation should be fenced with the barbed wire and three tier Greenbelt has to be carried out all along the boundary barriers and should be maintained till the end of the life of the mine.
2. The quarry operation should be carried out as per the regulation 3,4,5 of MMR 1961 as prescribed in the form I, II, III, IVA, IVB, IVC, V, VI.
3. Statutory competent qualified person as per regulation 39, 40, 41, 42, 43, 44, 47, 48 of MMR 1961 should be appointed to carryout day today quarrying operation in scientific & systematic manner.
4. Blasting has to be carried out during the designated timing as per the approved mining plan with sufficient warning all around the mines by only the Qualified blaster as indicated in the regulations 153, 154, 156, 160, 166, 167, 169 of MMR 1961.
5. During the Quarrying operations the benches has to be maintained and haul roads should be maintained as per the regulations 60, 61, 62, 65, 66, 95, 96, 105, 106, 110, 115, 118, 124 of MMR 1961. When the quarry attains 30mts depth from the general ground profile a slope stability study should be carried out with competent authorized agencies only.
6. All PPE should be provided to the employees and periodic Medical Examination has to be carried out as per the regulation 124, 127, 177, 178, 181, 183, 185, 188, 190, 191A of MMR 1961.
7. The company should submit the quarterly, half yearly & Annual returns to the concerned Authorities as per regulation 3, 4, 5, 9 & 10 MMR 1961 on time and HYCR self-compliance reports should be submitted to the State Pollution control Board.
8. Periodical Hydrology & Hydrogeological Studies has to be carried out during the course of quarrying operation. If any significant seepages is inferred, the company should carry out a comprehensive Hydrogeological studies to ensure the impact of agricultural activities in and around the mine (Open well & Tube well). If the impact is noticed considerably the quarry had to be continued only after obtaining permission clearances and approval from the competent regulatory authorities.
9. The company should utilize green energy / Solar energy as far as possible for operation of machineries, equipment and illumination in the mine's office, quarry boundaries and avenue roads.
10. The company should ensure all the skilled and semi-skilled workers should be provided trainings in nearby Vocational Training center as per the MVTR 1966 and should be registered in Shram Suvidha portal as directed by the Ministry of labour.
11. The company should carry out the quarrying operation keeping the view of mineral conservation, development and sustainable mining.
12. If the company intends to deviate from the approved scheme of mining, a modified scheme of mining has to be prepared submitted and approved from the concerned authority before making any significant changes in the mining operations.
13. The company should carry out the mining operation in Eco friendly environment with good hygienic conditions to the employees deployed and maintain good harmony with local communities in the impact zone.

The conditions stipulated in the lease deed and Environmental clearance especially the mitigation measures as proposed in EMP to the SEIAA has to be followed during the course of quarrying operation and also to as per the rules of TNMCR 1959, GCDR 1999, Mine act 1952, MMR 1961, Mine Rule 1955, Environment Protection Act 1986 and Indian Explosive act 1884 and Indian Explosive Rules 2008 and all the amendments issued by the concern State and Central Government authorities from time to time.

The provisions of the Mines Act, Rules and Regulations and orders made thereunder shall be complied with, 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, Chennai. As per amendment notification in the EIA notification 2006 is given by Ministry of Environment, Forest and Climate Change vide S.O.1807(E), dated:12.04.2022, the validity of environmental clearance is through out end of lease period. 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.

This Mining Plan and mine design is prepared based on the requirement and full consultation by the company to me. If there is any change in the production schedule, change of technology, change in product mix during the course of operations, the company is advice to prepare a modified mining plan and get approval by the concerned authority for subsequent clearance and approval. The same will be monitored by the inspecting authority of Department of Geology and mining and other Concerned Departments under Rule 25 and sub rule (5)(d) in Rule 36 of Tamil Nadu Minor Mineral Concession Rules, 1959.

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 company and is presented as the form as submitted by the company. 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 approval of mining plan or grant of lease. The document may be scrutinized by the competent authority before approval.

Prepared by


B. VENGADAGIRI, M.Sc.,
Qualified Person

Place: Salem

Date: 22.12.2025.


DIRECTOR
Department of Geology & Mining
Guindy Chennai - 600 032.


31/12/25

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

Letter No. 11441/MM/2025 Dated 01-01-2026

**TOPOGRAPHICAL VIEW OF KILPACHAR BLACK GRANITE
QUARRY LEASE APPLIED AREA**







ANNEXURES



Natural Resources (MMB) Department
Secretariat, Chennai-600 009.



Letter No.1920/MMB.1/2025-1, dated:17.12.2025

From
Thiru.Shunchonngam Jatak Chiru, I.A.S.,
Additional Chief Secretary to Government (FAC).

✓ To
M/s.A.G.Granites (Private) Limited,
Muthu Gounder Colony,
Harur, Dharmapuri District-636 903.

Sir,

Sub: Natural Resources - Mines and Minerals - Minor Mineral - Black Granite - Tiruvannamalai District - Thandarampattu Taluk - Kilpachar village - Over an extent of 3.21.5 hectares of Government Poramboke land in S.F.Nos.65 (Part-2) - Highest Bid amount offered by M/s.A.G.Granites (Pvt) Limited, Dharmapuri - Precise Area Communicated - Balance Lease Amount, Approved mining Plan and Environmental Clearance - Called for.

- Ref:
1. Tiruvannamalai District Gazette Extraordinary Issue No.7 in English and No.7 in Tamil, dated 03.09.2025.
 2. Application of M/s.A.G.Granites (Pvt) Limited, dated 23.09.2025.
 3. From the District Collector, Tiruvannamalai, File Rc.No.649/Mines/2025, dated 28.10.2025.
 4. From the Director of Geology and Mining, File Rc.No.9825/MM4/2025, dated:13.11.2025.

I am directed to invite attention to the reference 1st cited wherein notification was published by the District Collector, Tiruvannamalai, inviting applications for grant of quarry leases in 10 black granite quarries in Tiruvannamalai District through Tender cum Auction with Tender.

2. In the references third and fourth cited, the District Collector Tiruvannamalai and the Director of Geology and Mining have recommended to declare M/s.A.G Granites (Pvt) Limited as Successful bidder and to grant quarry lease for quarrying of Black Granite over an



extent of 3.21.5 hectares of Government poramboke land in S.F.No.65 (Part-2) of Kilpachar Village, Thandampattu Taluk, Tiruvannamalai District for a period of 20 years under rule 8-A of the Tamil Nadu Minor Mineral Concession Rules, 1959. The District Collector, Tiruvannamalai and the Commissioner of Geology and Mining forwarded the quarry lease application of M/s.A.G.Granites (Pvt) Limited with connected records to declare the applicant firm as successful bidder and to grant quarry lease to the subject area for a period of twenty years.

3. The Government, after carefully examined the recommendations of the District Collector, Tiruvannamalai and the Director of Geology and Mining, hereby declare M/s.A.G.Granites (Pvt) Limited as successful bidder for grant of quarry lease for quarrying of Black Granite over an extent of 3.21.5 hectares of Government poramboke land in S.F.No.65 (Part-2) of Kilpachar Village, Thandampattu Taluk, Tiruvannamalai District and the Government hereby communicate the above area recommended by the District Collector, Tiruvannamalai and the Director of Geology and Mining as precise area for grant of quarry lease as per rule 8(17)(d) of the Tamil Nadu Minor Mineral Concession Rules, 1959.

4. I, therefore, request you to remit the balance lease amount in the District Treasury concerned and to submit the original Challan to the Government within a period of one month from the date of receipt of this communication and to furnish the approved Mining Plan for the above-mentioned Precise Area as per rule 12 of the Granite Conservation and Development Rules, 1999 through the Director of Geology and Mining to Government within a period of three months from the date of receipt of this communication as per Rule 8-A(8)(a)(ii) of the Tamil Nadu Minor Mineral Concession Rules, 1959 and also to produce Environmental Clearance obtained from Competent Authority for the above said area for grant of quarry lease subject to the conditions stipulated in the prescribed Act and Rules in addition to the following conditions:-

1. A safety distance of 7.5 metres and 10 metres should be provided to the adjacent patta and Government Poramboke lands, respectively.
2. All conditions stipulated in the District Gazette No.07 Extra ordinary notification dated 03.09.2025 should be adhered by the lessee.
3. Environmental clearance should be obtained from the State Level Environmental Impact Assessment Authority before granting quarry lease as per rule 42 of the Tamil Nadu Minor Mineral Concession Rules, 1959.
4. The applicant firm should fence the lease granted area with barbed wire before the execution of lease deed as follows:-



- The pillar post shall be firmly grounded with concrete foundation of height not less than 2 metres with a distance between two pillars shall not be more than 3 metres.
 - The applicant firm shall incorporate the DGPS readings for the entire boundary Pillars of the area and the same should be clearly shown in the mining plan.
 - A soft copy of the digitalized map with DGPS readings should be submitted in the CD form to the Assistant Director, Tiruvannamalai.
5. The District administration and Geology and Mining Department should ensure the conditions imposed in G.O.(Ms.)No.79 Industries (MMC.1) Department dated 06.04.2015.
 6. Child labourers should not be engaged in the quarry works.
 7. The applicant firm should use mild explosives during quarrying.
 8. As per rule 12(V) of Minerals (other than Atomic & Hydro-carbons Energy Minerals) Concession Rules, 2016, the applicant firm shall at his own expenses erect, maintain and keep in repair all the boundary pillars.
 9. The waste material generated during the time of quarrying should be dumped only within the leasehold area that will be earmarked for the purpose in the mining plan as per Rule 31 of the Granite Conservation Development and Regulations, 1999.
 10. The applicant shall strictly adhere to the statutory and safety requirements.
 11. Quarrying shall be done as per the approved Mining Plan and that the mining plan is approved without prejudice to any other law applicable to the quarry lease from time to time whether such laws are made by the Central Government, State Government or any other authority.
 12. Quarrying activity should be carried out from 07.00 AM to 05.00 PM only.

13. If any violation is found during quarrying operation, the penal provisions of the Tamil Nadu Minor Mineral Concession Rules, 1959 and other rules and act in force will attract.
14. All the quarry labourers should be registered with the Labour Welfare Board of Government of Tamil Nadu and to be enrolled in the Group Insurance Scheme.



Yours faithfully,

M. Prabawathi

17/12/2025

for Additional Chief Secretary to Government (FAC).

DA-18
17/12/25

Copy to:

The Director of Geology and Mining,
Guindy, Chennai- 600 032.
The District Collector,
Tiruvannamalai District,



TIRUVANNAMALAI DISTRICT GAZETTE

EXTRAORDINARY PUBLISHED BY AUTHORITY

TIRUVANNAMALAI, WEDNESDAY, SEPTEMBER 3, 2025.

No. 7]

Aavani 18, Visuvaavasu, Thiruvalluvar Aandu 2056.

NOTIFICATION BY THE COLLECTOR

(Rc.No.585/Mines/2025 Dated:29-08-2025)

E-mail: (minestntvm10@gmail.com)

Notice Inviting Tender (NIT)

"Inviting Application for Grant of Black Granite Quarry Leases in Government Lands"

In exercise of the power conferred by Section 15 of Mines and Mineral (Development & Regulation) Act, 1957 and in accordance with the Rule 8 of the Tamil Nadu Minor Mineral Concession Rules, 1959 read with G.O. Ms. No.21, Natural Resources (MMC.1), 31st July 2024 as amended from time to time notified there under, the District Administration of Tiruvannamalai District, Tamil Nadu has identified 10 (Ten) areas in Tiruvannamalai District for grant of leases to quarry Black Granite through electronic tender /auction (e-tender / auction).

E-tender with forward bidding is invited through the e-tendering portal by District Collector, Tiruvannamalai District for the grant of quarry lease in Government Lands for quarrying "Black Granite" available in Tiruvannamalai District as indicated in the Annexure-I.



The tender process is online at e-portal URL, address <https://intenders.gov.in>. Aspiring bidders may download and go through the tender document available in the site to know the details of e-auction process. Intending bidders are advised to visit the mentioned site regularly till closing date of E-auction for any corrigendum / addendum / amendment.

Prospective bidders are advised to get themselves registered at Tamil Nadu tender portal, obtain 'login ID' & 'password' and go through the instructions available in the Home page after log in to the Tamil Nadu Tender Portal <https://intenders.gov.in>. They should also obtain Digital Signature Certificate (DSC) in parallel which is essentially required for submission of their application.

Application Fee – Rs.10,000 (Non – Refundable) for each quarry

Bid submission start date	: <u>10-09-2025</u> from 11.00 hrs
Bid Submission end date	: <u>24-09-2025</u> up to 16.00 hrs
Financial bid opening and live e-auction date	: Will be intimated later on through Tamil Nadu e-Tender portal

Tiruvannamalai,
29th August 2025.

K. THARPAGARAJ,
District Collector,
Tiruvannamalai.

**ANNEXURE-I**

**List of Areas Identified in Government Lands in Tiruvannamalai District of Tamil Nadu
for Grant of Black Granite Quarry Leases through e-Auction**

Sl. No	Name of the Village	S.F.No.	Total Extent	Extent Proposed for lease (in hect.,)	Classification of land	Lease period
Kilpennathur Taluk						
1	Velanandal	63/1	1.12.0	1.12.0	UAW Kallankuthu	20 Years
		77	1.26.0	1.26.0		
		78 (Part)	2.18.0	1.82.0		
		Total	4.56.0	4.00.0		
2	Velanandal	67 (Part)	1.88.0	1.72.5	UAW	20 Years
Chengam Taluk						
3	Eraiyur	202/2 (Part)	2.13.0	1.35.5	UAW Parai	20 Years
		203/2	0.65.5	0.65.5		
		Total	2.78.5	2.01.0		
Thandarampattu Taluk						
4	Sathanur	286/1(Part)	2.10.0	0.74.0	UAW Parai	20 Years
		304/1	1.67.0	1.67.0		
		Total	3.77.0	2.41.0		
5	T.Velur	176 (Part-1)	67.60.5	3.53.0	UAW-Parai	20 Years
6	T.Velur	176 (Part-2)		3.53.0	UAW-Parai	20 Years
7	T.Velur	176 (Part-3)		3.54.0	UAW-Parai	20 Years
8	Kilpachar	65 (Part-2)	11.11.5	3.21.5	UAW Kallankuthu	20 Years
9	Kilpachar	65 (Part-3)		3.25.0	UAW Kallankuthu	20 Years
10	Appunaicken-palayam	67	4.79.5	4.79.5	UAW Malai	20 Years

Tiruvannamalai,
29th August 2025.

K. THARPAGARAJ,
District Collector,
Tiruvannamalai.

ANNEXURE III

District : Tiruvannamalai

Taluk : Thandarampattu

Village : Kilpachchar

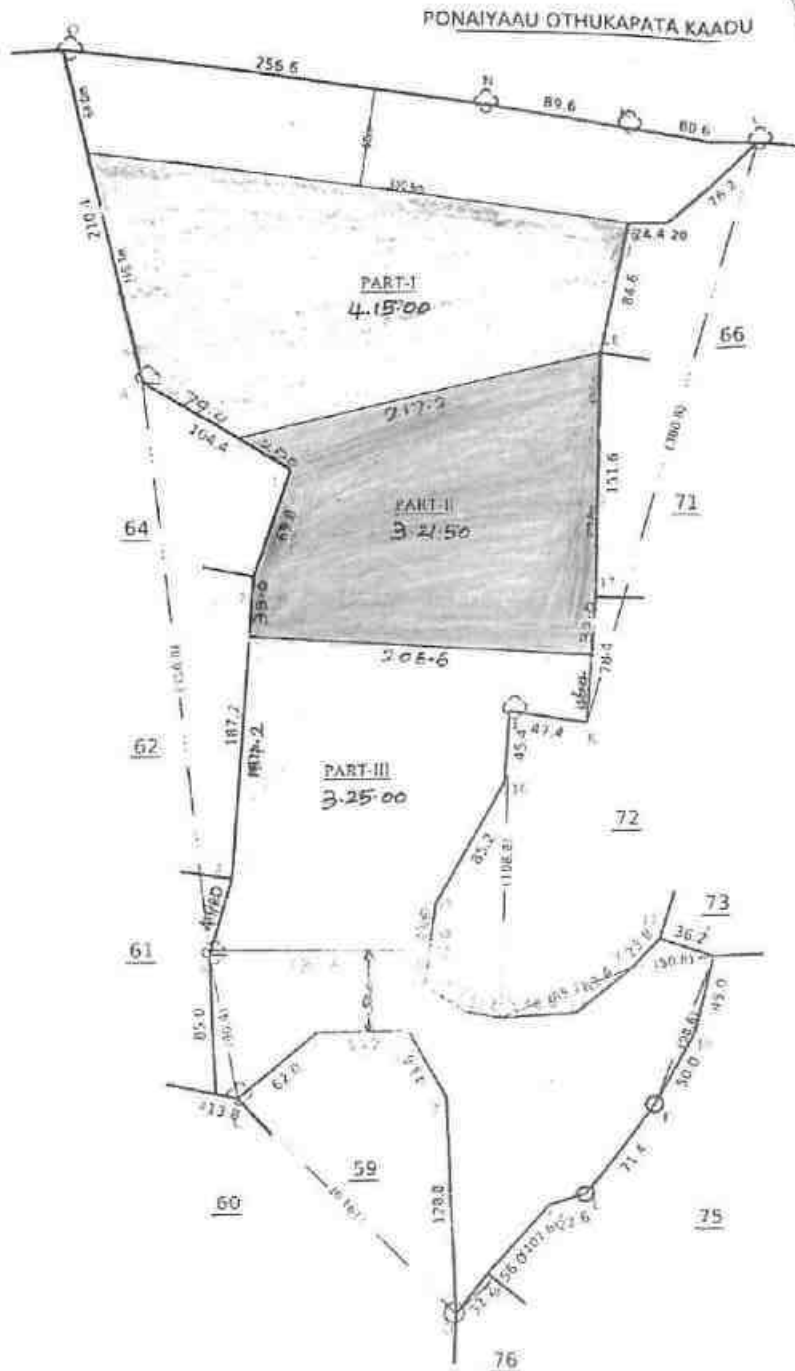
[26]



Survey No : 65

Area : Hect 15 Ares 40 50

Scale : 1 : 2882



- PART-A
- 4.15.00

- PART-B
- 3.21.50

- PART-C
- 3.25.00

10.61.50

Lease Applied Area-

E. S. S. S. S.

Signed By Tahsildar

Name of approver : tahsildar

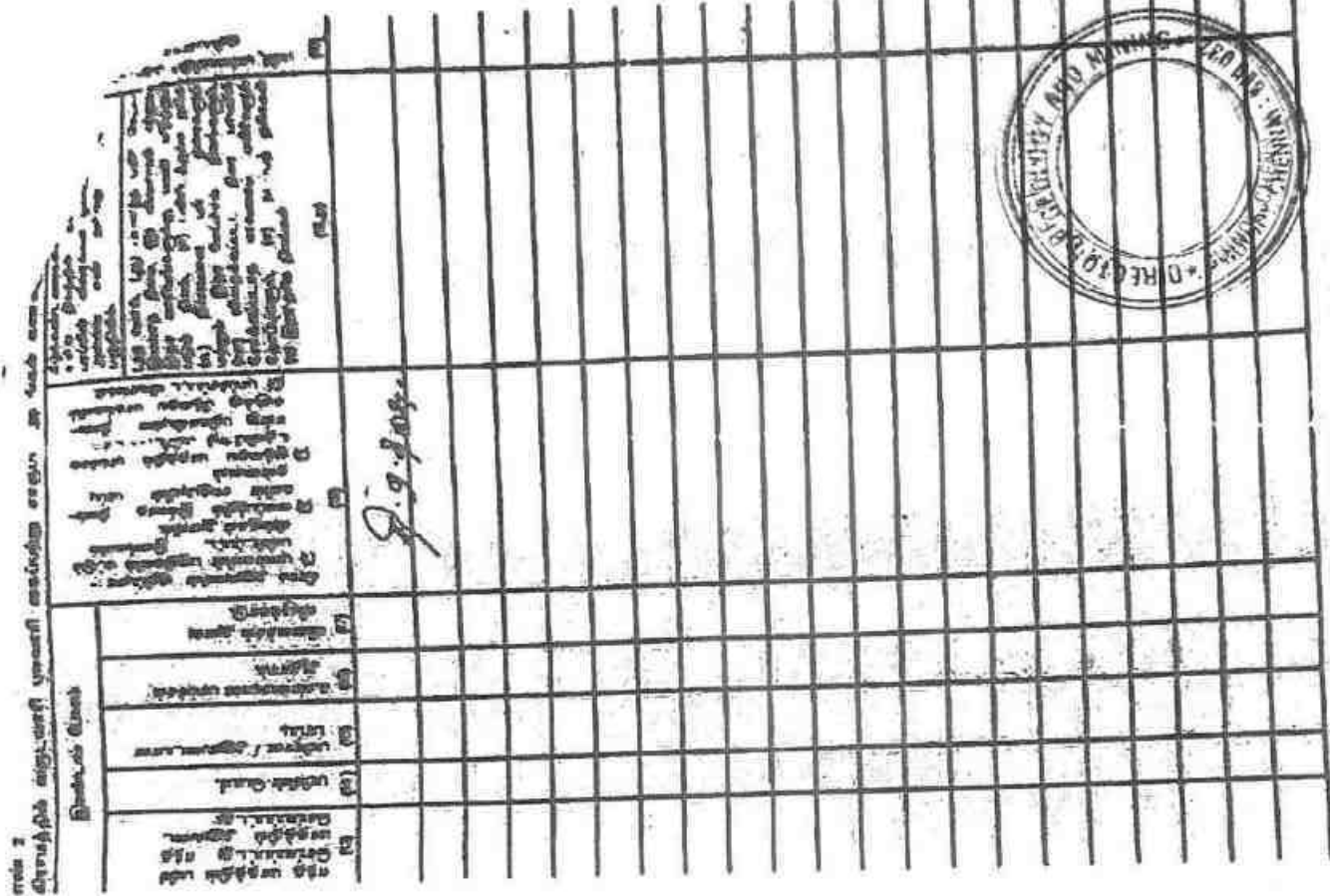
Date of Approval : 16-03-2019



240 h 3

Date of issue: 14-12-2023 10:44:34

Survey and Settlement Department, Government of Tamil Nadu

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1	2	3	4	5	6	7	8	9	10		
										மு. ம.ப. - தொ. சா. சி. - ம.ப.	
65	...	65	அ	தி. ச. த.	...	...	...	15	40.5	...	
66	1	66-1	ர	பு	...	8-5	10	0 91	0 92.0	0 88	48 மீ. சுற்று நாயக்கர்.
	2A	-2A	அ	பு	...	8-5	10	0 91	0 50.0	0 46	
	2B	-2B	அ	பு	...	...	...	...	0 60.0	...	
	3	-3	ர	பு	...	8-5	10	0 91	0 73.0	0 66	116 மீ. முத்து நாயக்கர்.
	(4)	-4	ர	பு	...	8-5	10	0 91	0 41.0	0 74	92 கோ. பம்பாய் அம்மாள்.
								3	16.0	2 14	
67	1	67-1	அ	பு	...	8-5	10	0 91	0 41.5	0 36	
	2A	-2பா	ர	பு	...	8-5	10	0 91	0 45.0	0 96	116 மீ. முத்து நாயக்கர்.
	2B	-2பா	ர	பு	...	8-5	10	0 91	0 71.0	0 85	216 மீ. முத்து நாயக்கர்.
	3	-3	ர	பு	...	8-5	10	0 91	0 75.0	0 69	61 ச. சித்தா.
	4	-4	ர	பு	...	8-5	10	0 91	0 41.5	0 44	234 மீ. முத்து நாயக்கர்.
								3	61.0	3 44	
68	1	68-1	அ	தி. ச. த.	...	...	...	...	0 81.5	...	
	2	-2	ர	பு	...	8-5	10	0 91	2 21.5	2 06	89 மீ. பவுளாம்பாள்.
	3	-3	ர	பு	...	8-5	10	0 91	0 24.5	0 25	110 கோ. மாநி நாயக்கர்.
								3	27.5	2 31	
69	1A	69-1பா	ர	பு	...	8-5	10	0 91	0 05.0	0 06	110 கோ. மாநி நாயக்கர்.
	1B	-1பா	ர	பு	...	8-5	10	0 91	0 54.5	0 51	68 கோ. சாம்பலா நாயக்கர்.

0 விவரப்படுத்தியவைப் பார் கவும்.



MEMORANDUM OF ASSOCIATION
AND
ARTICLES OF ASSOCIATION
OF
AG GRANITES PRIVATE LIMITED

MEMORANDUM OF ASSOCIATION
AG GRANITES PRIVATE LIMITED

INCORPORATED UNDER THE COMPANIES ACT, 1956
(COMPANY LIMITED BY SHARES)



- I. The name of the Company is **AG GRANITES PRIVATE LIMITED**.
- II. The Registered office of the Company will be situated in the State of Tamilnadu.
- III. The Objects for which the Company is established are: -

**(A) MAIN OBJECTS TO BE PURSUED BY THE COMPANY ON ITS
INCORPORATION ARE: -**

1. To carry on the business of manufacturing, processing, trading, sale and export of polished, semi-polished, finished or semi-finished rough blocks, granite slabs, marbles, tombs, monuments and tiles of various designs and dimensions.
2. To acquire, hold, take on lease or otherwise quarries, mines, quarry rights or licenses for manufacture sale or export of various types of granite products.
3. To act as designers, consultants, exporters, inspectors, dealers, distributors of stones, granites, slabs, marbles of all types.
4. To obtain, produce, process, trade, or deal in stones of all types and origin including mica, gypsum, graphite, soap-stone, dolomite, barite, silica, feldspar and natural products from earth.

**(B) THE OBJECTS INCIDENTAL OR ANCILLARY TO THE ATTAINMENT
OF THE MAIN OBJECTS: -**

1. To carry out all public works and enter into all types of private contracts in connection with the main objects.
2. To enter into partnership or into any arrangements for sharing profits, union of interests, co-operation, joint adventure, reciprocal concessions or otherwise, with any person, firm or company carrying on or engaged in any business or undertaking or transaction which may seem capable of being carried on or conducted so as to directly or indirectly benefit the company and to lend money, to guarantee the contracts of or otherwise assist any such persons, firm or company and to take or otherwise acquire and hold shares or securities of any such person, firm or company and to sell, re-issue with or without guarantee or otherwise deal with the same.



3. To enter into collaboration agreements with foreign companies for obtaining technical know-how of industries and of manufacturing processes connected with all type of stone works, granite works and quarry operations relating to any form of use to which these works and operations are employed.
4. To enter into any agreement with any Government, Authorities (municipal, local-body or otherwise) Corporations, companies, or persons, which may seem conducive to the Company's objects and to obtain from any such Government, Authority, corporation, Company or person any contracts, rights, privileges and concessions which the Company may think desirable and to carryout, exercise and comply with any contracts, rights, privileges and concessions.
5. To obtain any Act of Central or State legislature, provisional order or license from any authority for enabling the Company to carry out any of its objects into effect or for effecting any modification of the company's constitutions or for other purpose which may seem expedient and to oppose any proceedings which may seem calculated to prejudice the company's interest.
6. To pay all the costs, charges and expenses of and incidental to the promotion, formation, registration and establishment of the company and the issue of its capital including costs, charges and expenses of negotiations, contracts and arrangements make prior to and in-anticipation of the formation and incorporation of the company.
7. To procure the incorporation, registration or other recognition of the company in any country, state or place and to establish and regulate branches, places of business and agencies for the purpose of Company's business and to apply or join in applying to any Parliament, local, Government, Municipal or other authority or body, Indian or foreign, for any acts of parliament, laws, decrees, concessions, orders, rights or privileges that may seem conducive to any of the company's objects and to oppose any proceedings or application which may seem calculated to prejudice the Company's interests.
8. To undertake, execute and manage any trusts, the undertaking/management whereof may seem desirable, either gratuitously or otherwise.
9. To open one or more accounts of any kind with any bank or banks and to draw, accept, make discount and negotiate promissory notes, hundies, bills of exchange and other negotiable instruments connected with the business of the company.
10. To acquire and undertake the whole or any part of the business of any person, firm or company carrying on any business which these company is authorized to carry on or possessed of property or suitable for the purpose of this company and manage the same or to amalgamate with any other company whose objects include objects similar to those of these company.
11. To lend, advance or deposit moneys belonging to or entrusted to or at the disposal of the company to such persons, firms, companies, body corporates, body of individuals, societies,



- Hindu Undivided Families or institutions and in particular to customers and others, having dealing with the company either with or without security upon such terms as may seem expedient and to guarantee the performance of contracts by such persons, but not to do the business of banking as defined in the Banking Regulation Act, 1949.
12. To borrow money by way of loan or otherwise, accept deposits, incur debts and special obligations for the conduct of any business of the Company and to purchase, construct, develop lease or hire any goods, materials, property or machinery on credit or otherwise for business or purpose of this company.
 13. To sell, mortgage, assign, lease or in any other manner deal with the undertaking or property of the company or part thereof whether movable or immovable for such considerations as the company may think fit.
 14. To improve, manage, work, develop, alter, exchange, lease, mortgage turn to account abandon or otherwise deal with all or any part of the property whether movable or immovable, rights and concessions of the company.
 15. To distribute any of the property of the company amongst the members in specie or kind upon the winding up of the company.
 16. To do all such things as are incidental or are conducive to the attainment of any or all of the above objects in any part of the world, and as principals, agents, contractors, trustees or otherwise, and by or through trustees, agents or otherwise and either along or in conjunction with others.
 17. To make donation, gifts, and charities to such persons, firms, companies, institutions, organizations, funds, trusts, societies, either in cash or otherwise in such cases as may be considered expedient.
 18. To establish, contribute and support in the establishment of associations, institutions and funds calculated to benefit directors, employees or ex-employees of the company and to provide for welfare of the employees, ex-employees, Directors and their dependents in such manner as may seem expedient.
 19. To guarantee the performance of contracts and to undertake financial and commercial obligations, contracts, transactions and operations of all kinds.
 20. To waive or remit in full or in part payment of any dues to the company and to release any person from the discharge of obligations to the company or to give up the rights of the company against any person.
 21. To accept gifts, bequests or donations of money, securities, property-movable or immovable, any rights, concessions or interests therein.



(C) OTHER OBJECTS NOT INCLUDED IN (A) AND (B) ABOVE:

1. To carry on business as agents, brokers, factors, dealers and distributors of all kinds and description.
2. To carry on the business of real estate and property development and for this purpose to purchase or otherwise acquire lands, houses, apartments, buildings, sheds, flats and to sell, lease, hire or let them out on such terms as may seem expedient.
3. To carry on the business of establishing and maintaining hotels, lodging houses, restaurants, cafes, refreshment places, fast food joints, cafeterias and to manufacture, distribute or otherwise deal in sweets, toffees, chocolates, biscuits, bakery and pastry products.
4. To carry on the business of importers and exporters and to provide clearing and forwarding services.
5. To engage in computer, management, primary, secondary, higher secondary, collegiate and professional education, training and development including conducting of classes, seminars and training programs for the employees and their wards.
6. To develop, manufacture, catch buy and sell or export marine and food product including different type of fishes and prawns, and to set up aqua culture farms.

- IV. The liability of the members is limited.
V. The Authorised Capital of the Company is Rs.5, 00,00,000/- (Rupees Five Crores only) divided into 50,00,000/- Equity shares of Rs.10/- (Rupees Ten only) each.
VI. We the several persons whose names and addresses are subscribed hereunto are desirous of being formed into a company in pursuance of the Memorandum of Association and we respectively agree to take the number of shares in the capital of the company set opposite our respective names.



Name, Address, Description and Occupation of The Subscribers	No. of Equity Share Subscribed	Signatures of the Subscribers	Name, Address, Description, Occupation and signature of Witness
1. Mr. M.RAMASAMY, S/o. R.MUTHU GOUNDER, D.No. NIL., MUTHU GOUNDER COLONY, HARUR - 636 903. DHARMAPURI DISTRICT BUSINESS	100 (One Hundred)	Sd/- M.RAMASAMY	The subscriber assembled at Chennai and signed in my presence: Sd/- A.DORAICKANNAN FCA., M.NO.19535 S/o. N.Angappa Mudalier No.149, II Street, Secretariat Colony, Kellys, Chennai - 600 010.
2. MS.SHANTHIRAMASAMY, W/O.M.RAMASAMY, D.No. NIL. MUTHU GOUNDER COLONY, HARUR - 636 903. DHARMAPURI DISTRICT BUSINESS	100 (One Hundred)	Sd/- SHANTHI RAMASAMY	The subscriber assembled at Chennai and signed in my presence: Sd/- A.DORAICKANNAN FCA., M.NO.19535 S/o. N.Angappa Mudalier No.149, II Street, Secretariat Colony, Kellys, Chennai - 600 010.
TOTAL	200(Two Hundred Shares Only)		

Place: Chennai

Date: 30-07-1998.

TRUE COPY
(AS AMENDED CLAUSE V)

For AG. GRANITES PVT LTD.

MANAGING DIRECTOR
(M.RAMASAMY)
17.02.2007

ARTICLES OF ASSOCIATION
OF
AG GRANITES PRIVATE LIMITED



INCORPORATE UNDER THE COMPANIES ACT, 1956
(COMPANY LIMITED BY SHARE)

APPLICATION OF TABLE 'A'

1. The Regulations contained in Table 'A' in the First Schedule to the Companies Act, 1956, shall apply so far as the same is applicable to a Private Company as defined in the Act, except otherwise and to the extent provided in these Articles, apply to this Company, in the same manner as if all such regulations of Table 'A' are specifically contained in these Articles.

INTERPRETATION CLAUSE

2. In these Regulations: -
 - (a) The Act means the Company Act, 1956 as amended from time to time.
 - (b) The Board means the Board of Directors for the time being of the Company.
 - (c) The Seal means the Common Seal of the Company.
 - (d) Members shall mean the members of the Company holding a share or shares of any clause.
 - (e) In writing includes printing, lithography, typewriting and any other usual substitutes for writing.
 - (f) The Regulation shall mean the Articles of Association of "AG GRANITES PRIVATE LIMITED" as originally framed or altered from time to time and shall include the Memorandum of Association of "AG GRANITES PRIVATE LIMITED" where the context so requires.
 - (g) Words importing singular shall include plural and vice versa and words importing the masculine gender shall include feminine gender and words importing persons shall include bodies corporate.

PRIVATE COMPANY



3. The Company is a Private Company with in the meaning of Section 3(1)(c) of the act and accordingly: -
- (a) No invitation shall be issued to the public to subscribe for any shares or Debentures of the Company.
 - (b) The number of members of the Company shall be limited to 50 not including.
 - 1. Persons who are in the employment of the Company.
 - 2. Persons who, having been formerly in the employment of the Company, were members of the Company while in that employment and have continued to be members after the employment ceased.
 - (c) The right to transfer the shares of the Company shall be restricted in the manner and to the extent appearing in these regulations.
 - (d) Prohibits any invitation or acceptance of the deposits from persons, other than its members, directors or their relatives.

SHARES

4(A) SHARE CAPITAL

- (a) The authorised share capital of the Company is Rs.5, 00,00,000/- (Rupees Five crores only) divided into 50,00,000 (Fifty Lakh) Equity shares of Rs.10/- (Rupees Ten only) each capable of being increased or reduced in accordance with the Company's regulations and legislative provision for the time being in force in this behalf, and with power to divide the shares in the capital for the time being into several classes and attach thereto respectively any preferential right, privileges, condition but so that where shares have been issued with any preferential of special rights attached thereto such rights shall not vary (except when the terms of issued otherwise provide) otherwise than provision contained in the Articles.
- (b) The Company in General Meeting, from time to time increase the capital by the creation of new shares of such amount and such terms as may be deemed expedient.
- (c) The new issue of shares, either at premium or at par. May be offered, if so determined in General Meeting before the issue, to the then existing shareholders or any class of them, in favour of any of the offers, Directors may dispose them in the manner they choose.

- (d) The share shall be under the control of the Directors who by a resolution may allot or otherwise dispose off the same to such persons on such conditions and at such times as the directors may think fit.

4(B) CAPITALISATION OF PROFITS

- 
- 1) The Company in General Meeting may upon the recommendation of the Board, resolve that: -
 - a) It is desirable to capitalise any part of the amount for the time being standing to the credit of any of the Company's reserve account, or to the credit of the profit and loss account, otherwise available for distribution; and
 - b) Such sum is accordingly set free for distribution in the manner specific in clause (2) amongst the member who could have been entitled thereto, if distributed, by way of dividend and in the same proportion.
 - 2) The sum of aforesaid shall not be paid in cash be applied subject to the provisions contained in the clause (3) either in or towards:-
 - a) Paying up any amount for the time being unpaid on any shares held by such members respectively;
 - b) Paying up in full, un-issued shares of the Company to be allotted, distributed and credited as fully paid up to and amongst the such members in the proportion aforesaid; or
 - c) Partly in the way specified in the sub-clause (a) and partly in that specified in sub-clause (b)
 - 3) A share premium account and a capital redemption reserve account may, for the purpose of this Article, only be applied in the paying up of un-issued shares to issued to members of the Company as fully paid bonus shares.
 - 4) The Board shall give effect to the resolution passed by the Company in pursuance of this Article.
 - 1) Whether such resolution as aforesaid has been passed, the Board shall: -
 - a) Take all appropriations and applications of the undivided profits resolved to be capitalised thereby and all allotments and issue of fully paid shares, if any; and
 - b) Generally to all act and thing required to give effect thereto.
 - 2) The Board shall have power: -
 - a) To make such provisions for issue of fractional certificates or for payments in cash or otherwise as it thinks fit, in case shares become distributable in fractions and also

- b) To authorise any person to enter, on behalf of all the members entitled thereto into an agreement with the Company providing for allotments to them respectively, credited as fully paid up, or any further shares to which they may be entitled upon such capitalisation or, as the case may require, for the paying up the Company on their behalf, by the application thereto of their respective proportions of the profits resolved to be capitalised, or the amounts or any part of the amounts remaining unpaid on these existing shares.



3. Any agreements made under such authority shall be effective and binding on all such members.

TRANSFER AND TRANSMISSION OF SHARES

5. The person proposing to transfer any shares (hereinafter called the a Proposing Transferor) shall give notice in writing to the company that he desires to transfer the same. Such notice shall specify the sum he may fix as the sale value, which shall in no case exceed the value, determined under clause 7 below and shall constitute the company as his agent for transferring the shares.
6. Share can be transferred only to members of the company, in case members are not willing to buy the shares at the sale value as specified in clause 5, the Board may at its discretion allow transfer to persons who are not members of the company.
7. The Board of directors, if satisfied shall transfer the shares at the value opted by the transferor. If any difference of opinion arises as to the value of a share it shall be ascertained from the Company's Auditors who shall be acting as experts to certify in writing the sum, which in their opinion is the fair value, fixed for affecting the transfer of shares. The transferor shall be bound to transfer the shares at the fair value as foresaid.
8. The Board may, subject to the right of appeal conferred by Section 111 of the Act, decline to register: -
 - a. The transfer of share or shares to a person who they do not approve, or
 - b. Where the result of such registration would make the number of members exceed the limit set out in clause 3 above.
9. (a) On the death of a member, the survivor(s) where the member was a joint holder and his legal representative where he was a sole holder shall be the only person recognized by the company as having any title to his interest in the shares.
(b) Nothing stated above should release the estate of the deceased joint holder from any liability in respect of any shares, which has been jointly held by him with any persons.

DIRECTORS

10. The number of Directors of the Company shall not be less more than twelve and there is no qualification of shares required to be a Directors.

11. The First Directors of the Company shall be the following:

Mr. M.RAMASAMY

Mrs. SHANTHI RAMASAMY

12. The Directors are not liable to retire by rotation.

13. Each Director shall be paid out of the funds of the Company a sitting fee of Rs.250/- or such other sum as the Directors may from time to time fix for each meeting of the Board attended by a Director. Directors are eligible for reimbursement of expenditure incurred by them for attending Board meeting.

14. The Board of Directors may appoint from time to time Managing Director, Joint Managing Director, whole time directors to carry on the business of the Company subject to the superintendence, direction and control of the Board on such remuneration, terms and conditions as they deem fit. The Board may vary the terms of appointment of persons appointed as above or terminate their appointment at its discretion.

15. The business of the company shall be managed by the Board of Directors, who may exercise all powers of the company including the powers of borrowing except such powers as are required by the Act to be exercised by the company at a General Meeting. The Board may delegate from time to time to a committee of the Directors, or to one or more of the Directors/employees such powers, authorities and discretions including granting power of attorney as it deems fit.

THE SEAL

16. The Directors shall provide a common Seal of the company and the seal shall not be affixed except by the authority of a Board resolution and in the presence of at least two Directors, one of whom shall be the Managing Directors, where there is one and who shall sign every instrument on which the seal it affixed in their presence.





MEETINGS

17. Two members entitled to vote and present in person shall be the quorum for a General meeting.
18. One week's notice is to be given for the general Meetings of the company. However shorter notice may be given when agreed to by all the members of the company.
19. Members unable to attend the meeting may appoint proxies to attend the meeting and vote on poll. A person who is not a member cannot be appointed as a proxy and proxies to be valid must be deposited at least 48 hours before the commencement of the meetings.

SECRECY

20. No member shall be entitled to inspect the company's books without the permission of the board or to require discover of any information regarding any details of the company's trading or any matter which is or may be in the nature of a trade secret relating to the conduct of the business of the company and which in the opinion of the Directors will not be expedient in the interest of the members of the company to communicate to the public.

INDEMNITY

21. Subject to the provisions of Sections 201 and 633 of the Act, the Managing Director and every Director, Secretary and other officer or employee of the company shall be indemnified by the company as against all costs, (including costs incurred in any legal proceeding whatsoever) losses and expenses (including traveling) which any such Director, officer or employee of the company may incur or become liable to in the discharge of his duties.



Name, Address, Description and Occupation of The Subscribers	Signatures of the Subscribers	Name, Address, Description, Occupation and signature of Witness
1. Mr. M.RAMASAMY, S/o. R.MUTHU GOUNDER, D.No. NIL., MUTHU GOUNDER COLONY, HARUR - 636 903. DHARMAPURI DISTRICT BUSINESS	M.RAMASAMY	The subscriber assembled at Chennai and signed in my presence: Sd/- A.DORAICANNAN FCA., M.NO.19535 S/o. N.Angappa Mudalier No.149, II Street, Secretariat Colony, Kellys, Chennai - 600 010.
2. MS.SHANTHIRAMASAMY, W/O.M.RAMASAMY, D.No. NIL. MUTHU GOUNDER COLONY, HARUR - 636 903. DHARMAPURI DISTRICT BUSINESS	SHANTHI RAMASAMY	The subscriber assembled at Chennai and signed in my presence: Sd/- A.DORAICANNAN FCA., M.NO.19535 S/o. N.Angappa Mudalier No.149, II Street, Secretariat Colony, Kellys, Chennai - 600 010.

Place: Chennai
Date: 30.07.1998

TRUE COPY

(AS AMENDED ARTICLE 3(d), 4(A)(a-d), 4(B)(1)(a & b), 4(B)(2)(a,b&c), 4(B)(3), 4(B)(4)(1)(a&b), 4(B)(4)(2)(a&b), 4(B)(4)(3).

For AG. GRANITES PVT LTD.


MANAGING DIRECTOR
(M.RAMASAMY)
17.02.2007

**AG GRANITES PVT. LTD.,**

100% Export Oriented Unit

M.G. Colony, HARUR- 636 903, Tamilnadu, India.

GSTIN No : 33

CST No : 4495

**TO WHOMSOEVER IT MAY CONCERN**

This is to state that M/s A G Granites Pvt Ltd is a Pvt limited Company and the Directors are Thiru M.Ramasamy and Tmt Shanthi Ramasamy. Tmt Shanthi Ramasamy is the authorized signatory to sign all documents for applying to the quarry licensing and any other letters / documents for and on behalf of the Company M/s A G Granites Pvt Ltd., M G Colony, Harur, Dharmapuri Dist. - 636903.

CERTIFIED TRUE COPY**For A.G GRANITES PVT LTD.**

M.RAMASAMY

MANAGING DIRECTOR

SHANTHI RAMASAMY

DIRECTOR



இந்திய அடையாளம் அமைச்சு அலுவலகம்

இந்திய அரசாங்கம்
Unique Identification Authority of India
Government of India

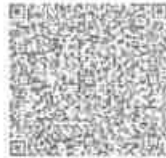
பதிவு அட்டைமொழி / Enrolment No. : 2043/50109/20454

To
Shanthi
சந்தி
W/O: Ramasamy
DNO 17/356
MUTHUGOUNDAR COLONY
HARUR TALUK
Harur,
Harur, Dharmapuri
Tamil Nadu - 635903
9443235606



KH269959952FT

2599958A



உங்கள் ஆதார் எண் / Your Aadhaar No. :

5795 4210 3091

ஆதார் - சாதாரண மனிதனின் அதிகாரம்



இந்திய அரசாங்கம்
Government of India



சந்தி
Shanthi

பிறப்பு தேதி - DOB: 15/01/1994
பாலினம் : Female

5795 4210 3091



ஆதார் - சாதாரண மனிதனின் அதிகாரம்



Government of India



தகவல்

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

INFORMATION

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

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



இந்திய அடையாளம் அமைச்சு அலுவலகம்
Unique Identification Authority of India

முகவர் : கனகாட்சி திருமதி
கனகாட்சி முத்துமணி, சந்தி
அனல், என்.கே. அனல், அனல் திருமதி
அனல் நாடு, அனல்

Address: W/O: Ramasamy,
DNO 17/356,
MUTHUGOUNDAR
COLONY, HARUR TALUK,
Harur, Dharmapuri,
Tamil Nadu, 635903

5795 4210 3091

1947
1800 300 1917

Help@aadhaar.gov.in

www.uidai.gov.in

आयकर विभाग
INCOME TAX DEPARTMENT



भारत सरकार
GOVT. OF INDIA

SHANTHI RAMASAMY

RANGASAMY MUTHU GOUNDER

19/01/1964

Permanent Account Number

APUPS5316Q

Signature



25042005





आयकर विभाग
INCOME TAX DEPARTMENT
भारत सरकार
GOVT. OF INDIA

AG GRANITES PRIVATE LIMITED



04/08/1998

Permanent Account Number

AABCA8132H

50020806

इस कार्ड को खोने पर / खोया हुआ कार्ड मिलने पर
कृपया सूचित करें / सूचित करें :
आयकर सेवा केंद्र, इन्फो, एन एन डी एन
सीबी मॉडल, ट्रेड वर्ल्ड, ए विंग, कर्नाला मिल्स कंपाउंड
एच. डी. मार्ग, लोवर पार्ल, मुंबई - 400 013

If this card is lost / someone's lost card is found,
please inform / return to :

Income Tax PAN Services Unit, NSDL
3rd Floor, Trade World, A Wing,
Karnala Mills Compound,
S. B. Marg, Lower Parel, Mumbai - 400 013.

Tel: 91-22-2499 9650 Fax: 91-22-2495 8664
email: tininfo@nsdl.co.in

அண்ணாமலைப்

ANNAMALAI



UNIVERSITY



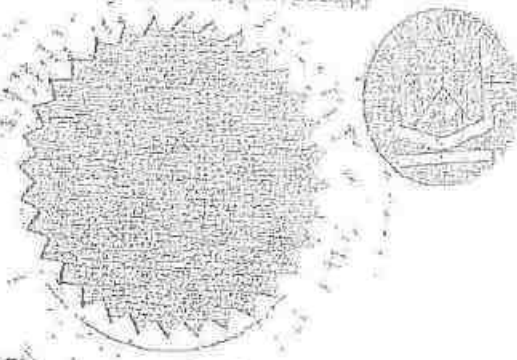
அறிவியற்புலம்
FACULTY OF SCIENCE

Reg. No. : 090895

மே, 2011 இல் பயன்பாட்டு நிலத்தியல்
பரீட்சையில் வெங்கடகிரி பா.
பட்டதாரி தேர்வுகளில் 10.00 சத. அளவிற்கு 6.03 பெற்று
தேர்ச்சியடைந்து முறையாக அமைக்கப்பெற்ற அறிவியல் நிபந்தனை
என அண்ணாமலைப் பல்கலைக்கழக ஆளவை இத்தகைய அறிவிக்கப்பட்டு
இரண்டாம் வகுப்பில்
தேர்ச்சிக்குரியவர்
பெறுவதற்கு உரியவர் ஆகியவற்றை
அறிவிக்கப்பட்டு

The Senate of the ANNAMALAI UNIVERSITY hereby makes known
that VENGATAGIRI B. has been admitted to the
Degree of MASTER OF SCIENCE in APPLIED GEOLOGY,
he/she having secured CGPA of 6.03 out of 10.00 been certified
by duly appointed Examiners at the Examination held in
MAY 2011 as he qualified to receive the same, and that
he/she was placed in SECOND CLASS.

பல்கலைக்கழக முத்திரை வெறுக்கப்பட்டு
Given under the seal of the University



அண்ணாமலைப்பேரவை
Annamalai University

தாள்: 09/11/2011

Dr. M. Ramasubramanian (Academic)
Dr. Controller of Examinations (Academic)

Dr. M. Ramasubramanian
பிரிவாளர்
Registrar

Dr. M. Ramasubramanian
பிரிவாளர்
Vice-Chancellor

ANNEXURE XA



GOVERNMENT OF INDIA
MINISTRY OF LABOUR AND EMPLOYMENT
DIRECTORATE GENERAL OF MINES SAFETY

Certificate of Practical Experience granted by the Manager to a Candidate for a Manager's/ Surveyor's/ Mining foreman/ Mining Mate/ Blasters certificate of competency examination under Metalliferous Mines Regulation, 1961.

I, M.S. Pavel being the Manager of K.Pitchuripatti Multicolour Granite Mine belong to M/s. Anupkumar Lohia do hereby certify that Thiru. N. Venkatasubramanian (whose signature is appended) worked in the above mine from 10.07.2012 to 15.08.2018 and is still working. During his term of work aforesaid, he has obtained practical experience as detailed overleaf. The duties connected with his work have involved continuous attendance at the mine and have been efficiently performed by him.

I believe him to be of good character and a fit and proper candidate to be examined for certificate of competency.

(Signature with date and official seal)

(Mines Management class)
MANAGER (MINE)
MULTICOLOUR GRANITE MINE
K. PITCHURIPATTI,
KARUR - TALUK & DIST.

(Signature of Candidate)

State the name of the mineral works: Multi Colour Granite



S. No.	Particulars of Practical experience (a)	Place of Experience (b) Open cast	Period of Practical experience (c)		Total Experience (e)		
			From	To	Yrs.	Months	Days
1.	As a trainee in drilling operation	Open cast	10.07.2012	24.10.2013	01	03	16
2.	As a trainee in deep hole blasting operation	Open cast	25.10.2013	31.12.2014	01	02	07
3.	Production incharge quality control and supervisor of earth moving Mining Machinery	Open cast	01.01.2015	15.08.2018	3	7	14
GRAND TOTAL					05	1	5
In words: Five years one month and five days					Five	One	Five

In below ground working	In open cast working	In all
Nil	Average monthly output 250m ³	250m ³
Nil	Average daily employment 25Nos	25Nos

Note: The average employment is less because this is mechanized mines having deep hole drilling, blasting and heavy earth moving machinery operation.


(Signature of Candidate)


(Signature with date and official seal)

(Mines Manager, 1st class)
MANAGER (MINES)
MULTICOLOUR GRANITE MINE
K. PITCHAMPATTI,
KARUR - TALUK & DIST.



PLATES

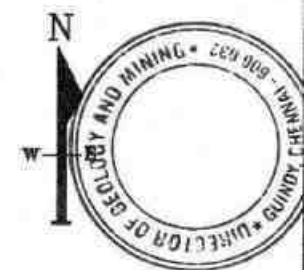
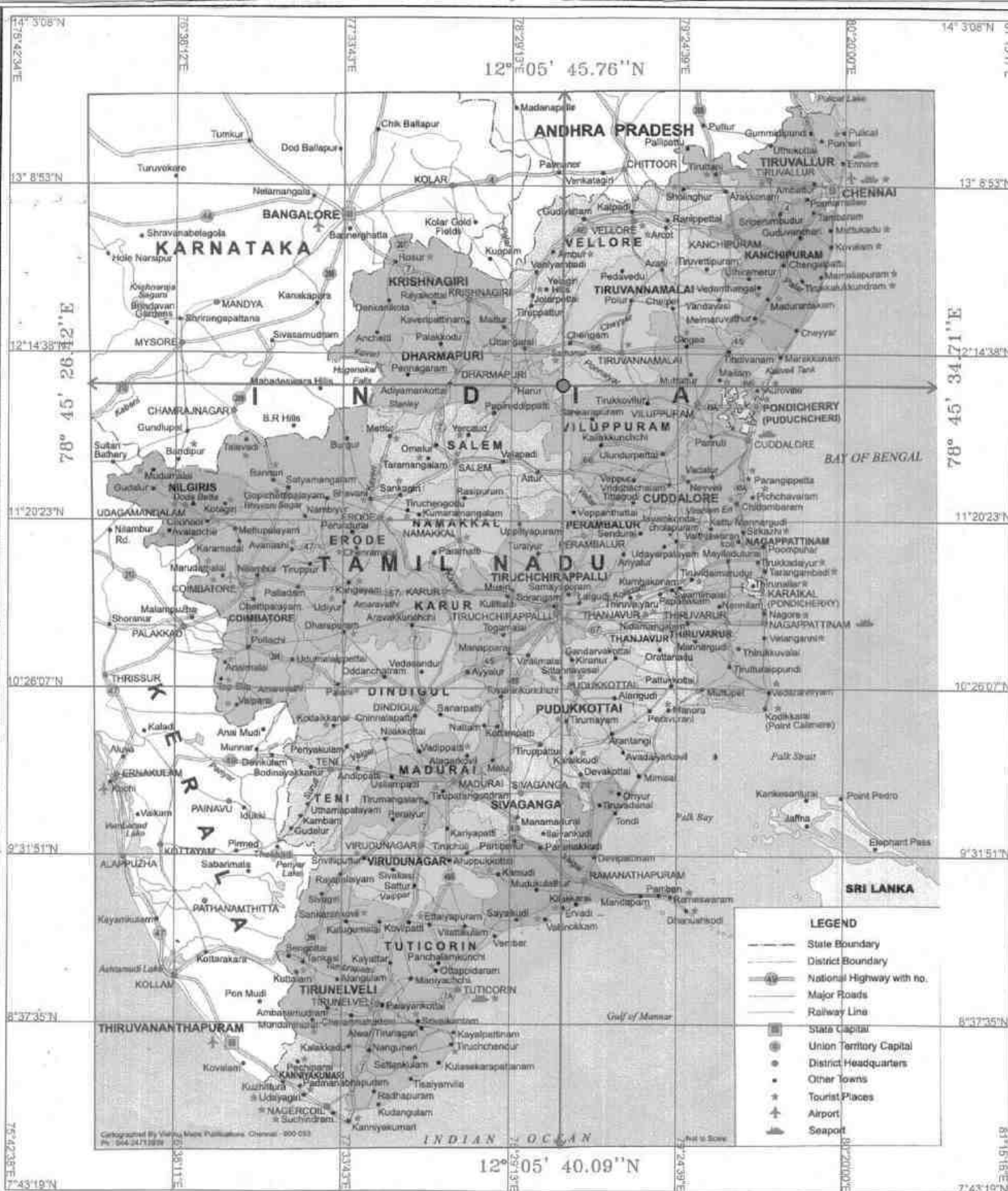


PLATE NO:1

DATE OF SURVEY :19.12.2025

APPLICANT:

M/s.A.G.GRANITES (P) Ltd.,
 MUTHU GOUNDER COLONY,
 HARUR, DHARMAPURI DISTRICT-636 903.

**LOCATION OF QUARRY
 LEASE APPLIED AREA:-**

S.F.No : 65 (PART-2)
 EXTENT : 3.21.50 HA.
 VILLAGE : KILPACHAR
 TALUK : THANDARAMPATTU
 DISTRICT : TIRUVANNAMALAI

INDEX

Q. L.A. AREA : ●

TOPO SHEET NO. : 57 L/16

LATITUDE : 12° 05' 40.09'' N to 12° 05' 45.76'' N

LONGITUDE : 78° 45' 26.42'' E to 78° 45' 34.71'' E

LOCATION PLAN

SCALE 1:24,00,000

PREPARED BY:

THIS IS TO CERTIFY THAT THE INFORMATION IN
 THIS PLATE IS TRUE AND CORRECT TO THE
 BEST OF MY KNOWLEDGE BASED UPON THE
 LEASEMAP AUTHENTICATED
 BY STATE GOVERNMENT

128A
 QUALIFIED PERSON

Under Rule 15(1)(a) and (b) of MCR, 2016

APPLICANT:

M/s.A.G.GRANITES (P) Ltd.
MUTHU GOUNDER COLONY
HARUR, DHARMAPURI DISTRICT - 636 903.

LOCATION OF QUARRYLEASE APPLIED AREA:-

S.F.No : 65 (PART-2)
EXTENT : 3.21.50 HA.
VILLAGE : KILPACHAR
TALUK : THANDARAMPATTU
DISTRICT : TIRUVANNAMALAI

INDEX

Express highway with toll with bridge with drainage down	
Roads, metalled according to importance	
Roads, double carriageway according to importance	
Unmetalled road, Cart track, Pukka track with pass, Foot path	
Streams with bank to bed, unobstructed Canal	
Dams, masonry or rock filled, earthen, V-type	
Water way with water channel with sluice & lock, Tidal way	
Submerged water channel, Swampy, Barren	
Wells, hand, unlined, Tubewell, Spring, Tanka, percolated, etc.	
Embarkments, road or rail, bank, broken ground	
Railways, broad gauge, double, single with station, under construction	
Railways, other gauges, double, single with station, under construction	
Mineral line or railway, K.M. Outcrop with tunnel	
Contours with sub-features, Rocky slopes, Cuts	
Sand features (Bar) (Shore-ridge) (Shore-ridge) (Shore-ridge)	
Towns or Villages, inhabited, deserted, Fort	
Wells, permanent, temporary, Tanka, Artesian	
Temples, Church, Church, Mosque, Math, Temple, Ghat	
Lighthouse, Lightship, Buoy, light, unlighted, Anchorage	
Wind, Wind on hills, Ghat, Stream	
Palms, palm grove, other, Plantain, Coconut, Bamboo, Other trees	
Areas, cultivated, wooded, Surveyed tree	
Boundary, international	
State, international	
District, sub-division, taluk or tehsil, Bound	
Boundary, others, unmetalled, unmetalled	
Height, triangulated, station, spot, approximate	
Boundary, others, unmetalled, unmetalled	
Post office, Telegraph office, Overhead tank	
Post office, Telegraph office, Overhead tank	
Camping ground, Forest reserved, protected	
Special names, administrative, locality or village	
Hospital, Dispensary, Veterinary, Hospital, Dispensary	
Airline, helipad, Tugboat, etc.	
Power line, with pylons, surveyed, with poles, unsurveyed	

KEY PLAN

SCALE- 1:100000

PREPARED BY:

THIS IS TO CERTIFY THAT THE INFORMATION IN
THIS PLATE IS TRUE AND CORRECT TO THE
BEST OF MY KNOWLEDGE BASED UPON THE
LEASEMAP AUTHENTICATED
BY STATE GOVERNMENT

B. VENKATAGIRI
QUALIFIED PERSON

Under Rule 15(i)(a) of MCR, 2016



12° 11' 11.11"N

78° 39' 55.84"E



78° 51' 05.28"E

12° 00' 14.75"N

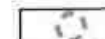
TOPO SHEET NO. : 57 L/16

LATITUDE : 12° 05' 40.09"N to 12° 05' 45.76"N

LONGITUDE : 78° 45' 26.42"E to 78° 45' 34.71"E

10KM RADIUS :

Q.L. APPLIED AREA :



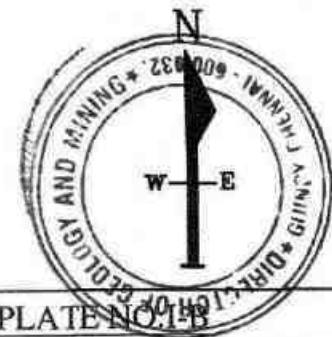


PLATE NO. 13

DATE OF SURVEY : 19.12.2025

APPLICANT:

M/s.A.G.GRANITES (P) Ltd.,
MUTHU GOUNDER COLONY,
HARUR,
DHARMAPURI DISTRICT-636 903.

**LOCATION OF QUARRY
LEASE APPLIED AREA:-**

S.F.No : 65 (PART-2)
EXTENT : 3.21.50 HA.
VILLAGE : KILPACHAR
TALUK : THANDARAMPATTU
DISTRICT : TIRUVANNAMALAI

INDEX

Q.L.APPLIED BOUNDARY

APPROACH ROAD

MAJOR ROAD

VILLAGE ROAD

ROUTE MAP

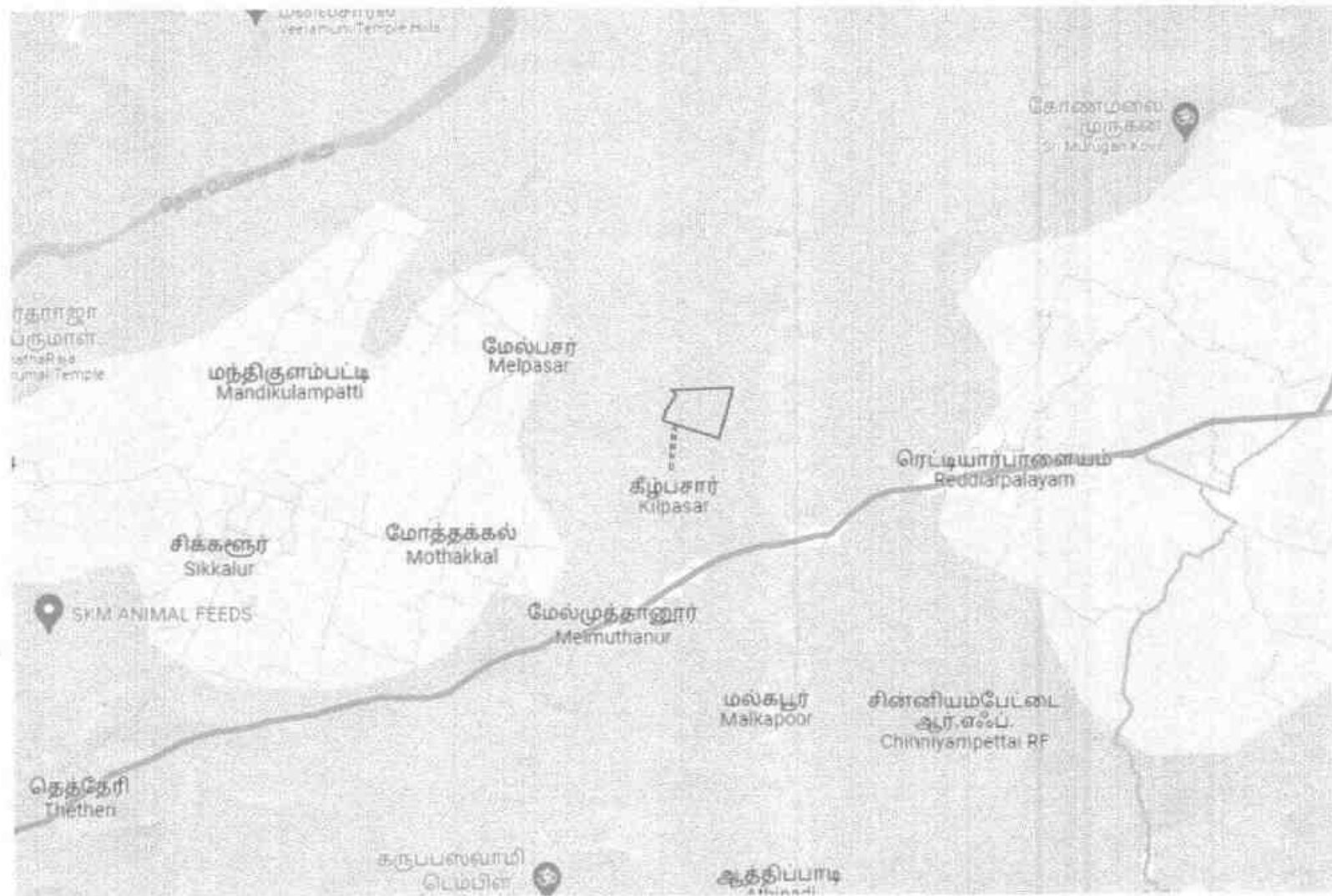
NOT TO SCALE

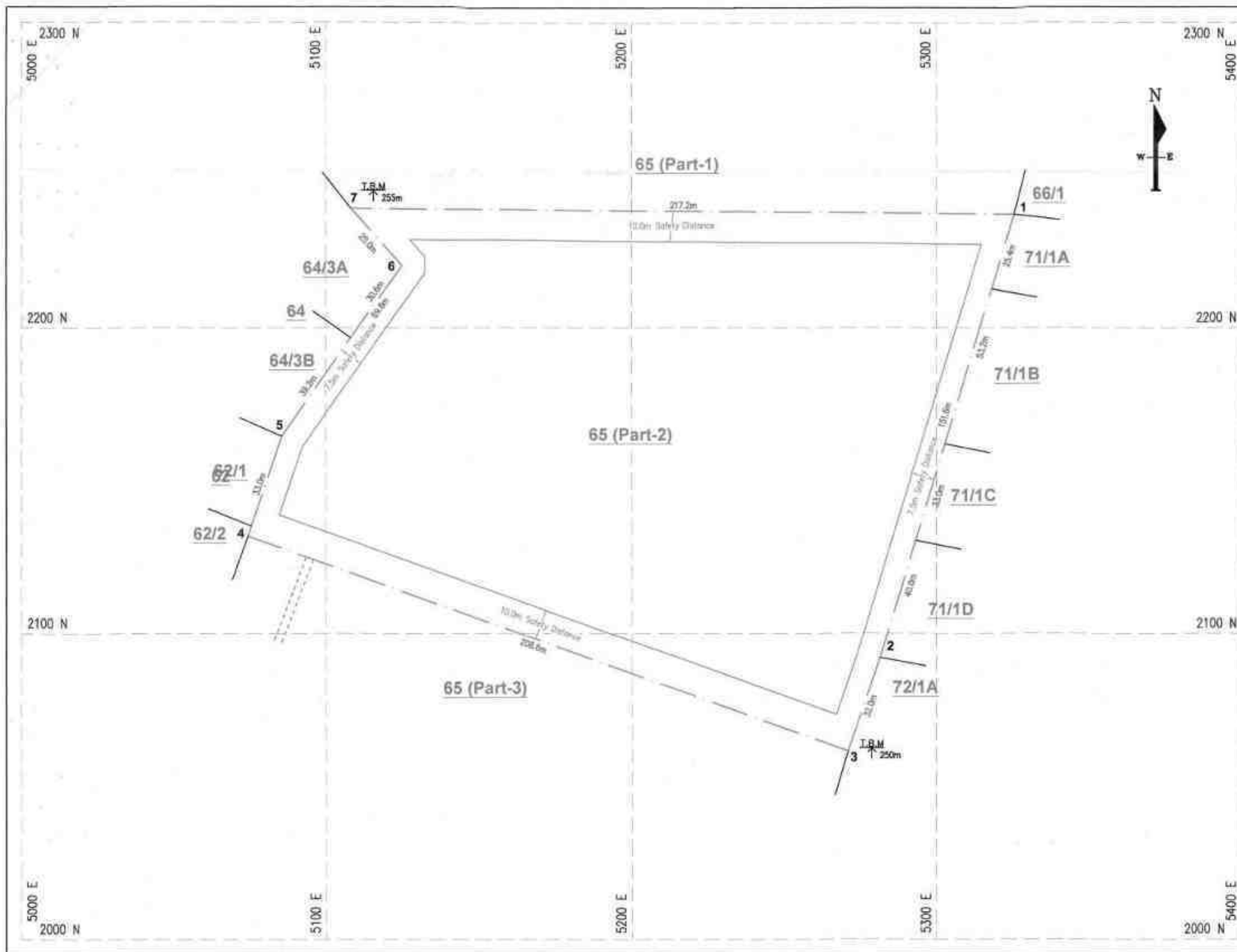
PREPARED BY:

THIS IS TO CERTIFY THAT THE INFORMATION
THIS PLATE IS TRUE AND CORRECT TO THE
BEST OF MY KNOWLEDGE BASED UPON THE
LEASEMAP AUTHENTICATED
BY STATE GOVERNMENT

130 A
BY NGADAGI, M.Sc.,
QUALIFIED PERSON

Under Rule 15(1)(d) and (b) of MCR, 2016





S.N.	LATITUDE	LONGITUDE
1	12° 05' 45.76"N	78° 45' 34.71"E
2	12° 05' 41.03"N	78° 45' 33.29"E
3	12° 05' 40.09"N	78° 45' 32.96"E
4	12° 05' 42.28"N	78° 45' 26.42"E
5	12° 05' 43.29"N	78° 45' 26.76"E
6	12° 05' 45.17"N	78° 45' 28.06"E
7	12° 05' 45.77"N	78° 45' 27.50"E

DATUM : UTM - WGS84, ZONE 44N

PLATE NO. II

DATE OF SURVEY : 19.12.2025

APPLICANT:

M/S.A.G.GRANITES (P) Ltd.,
MUTHU GOUNDER COLONY.,
HARUR,
DHARMAPURI DISTRICT-636 903.

LOCATION OF QUARRY LEASE APPLIED AREA:-

S.F.No : 65 (PART-2)
EXTENT : 3.21.50 HA.
VILLAGE : KILPACHAR
TALUK : THANDARAMPATTU
DISTRICT : TIRUVANNAMALAI

INDEX

Q. LEASE APPLIED BOUNDARY	
7.5M and 10M SAFETY DISTANCE	
APPROACH ROAD	
TEMPORARY BENCH MARK	

QUARRY LEASE PLAN

SCALE 1 : 1000

PREPARED BY:

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PLATE IS TRUE AND CORRECT TO THE
BEST OF MY KNOWLEDGE BASED UPON THE LEASEMAP
AUTHENTICATED
BY STATE GOVERNMENT

131/A

QUALITY PERSON

Under Rule 15(2)(a) and (2)(b) of MCR, 2016

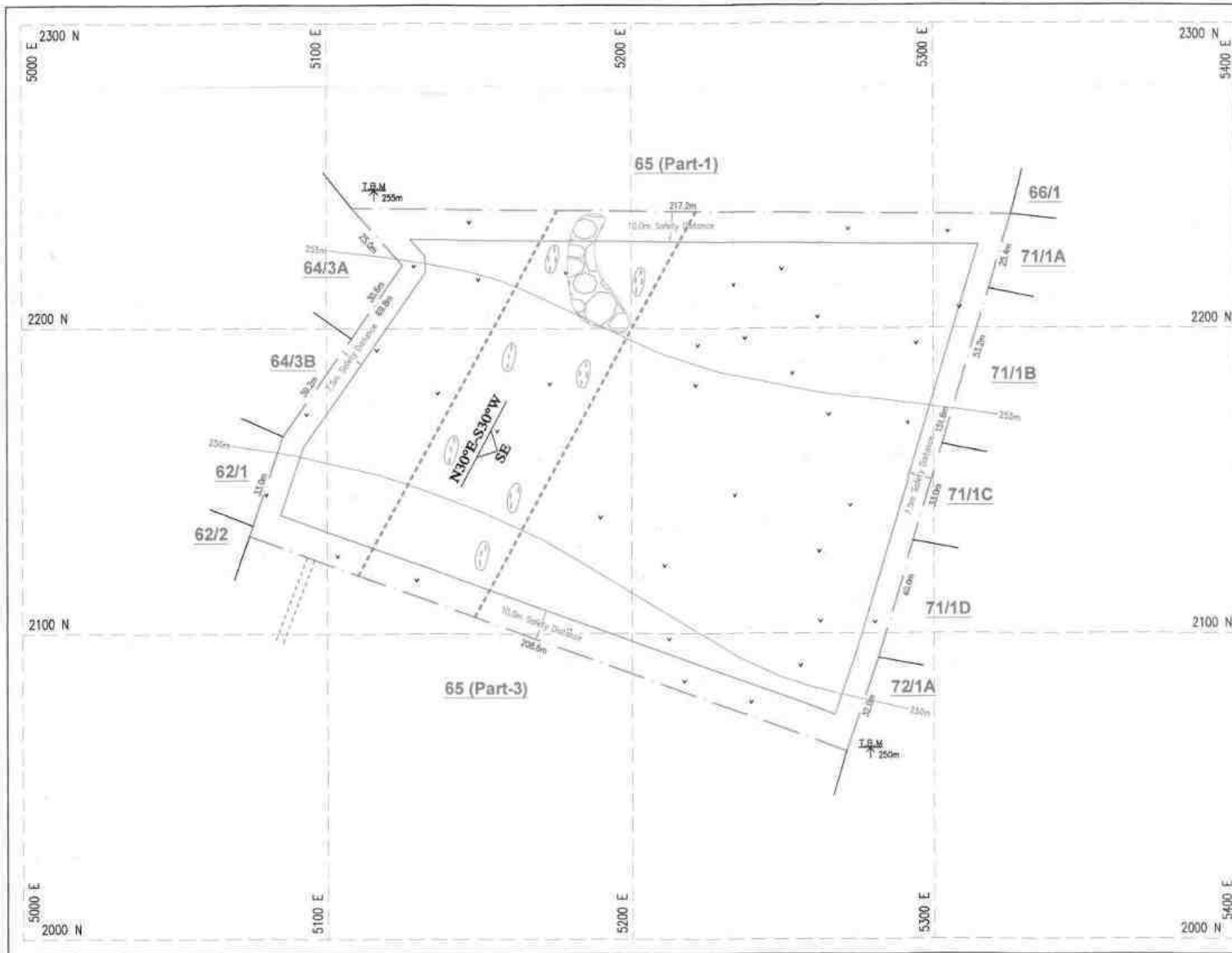


PLATE NO. 11

DATE OF SURVEY: 19.12.2025

APPLICANT:

M/s. A.G. GRANITES (P) Ltd.,
MUTHU GOUNDER COLONY,
HARUR,
DHARMAPURI DISTRICT-636 963.

**LOCATION OF QUARRY
LEASE APPLIED AREA:-**

S.F.No : 65 (PART-2)
EXTENT : 3.21.50 HA.
VILLAGE : KILPACHAR
TALUK : THANDARAMPATTU
DISTRICT : TIRUVANNAMALAI

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Q. LEASE APPLIED BOUNDARY	
7.5M and 10M SAFETY DISTANCE	
APPROACH ROAD	
TEMPORARY BENCH MARK	
TOPOGRAPHICAL CONTOUR	
MINERAL CONTACT LINE	
STRIKE AND DIP	
TOPSOIL	
SCRUB	
OUT CROPS	
DUMP	

SURFACE PLAN

SCALE 1 : 1000

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BY STATE GOVERNMENT

132/A

Under Rule 15(1)(a)(ii) of MCR 2016

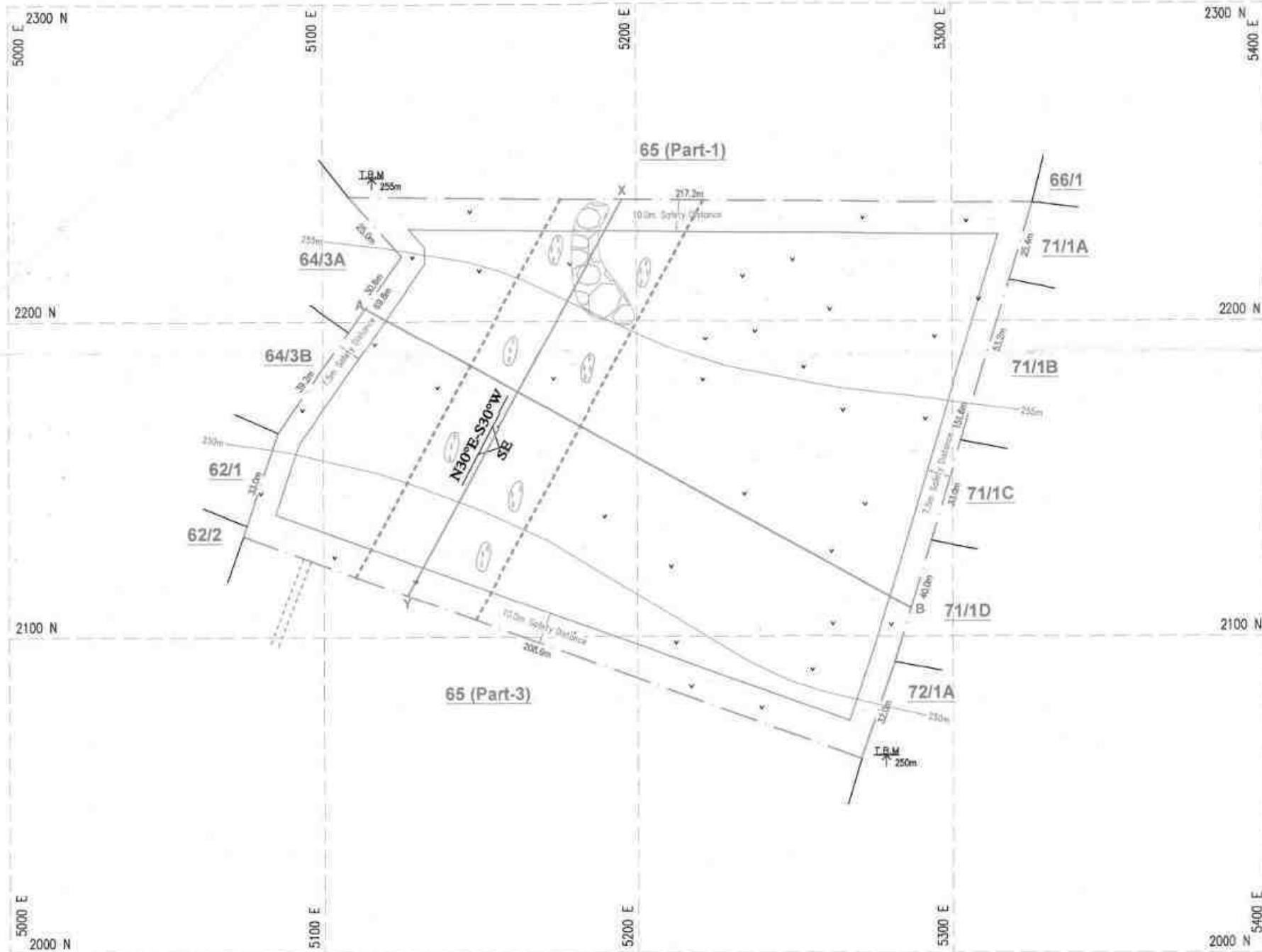


PLATE NO. IV

DATE OF SURVEY : 19.12.2025

APPLICANT:

M/S.A.G.GRANITES (P) Ltd.,
MUTHU GOUNDER COLONY.,
HARUR,
DHARMAPURI DISTRICT-636 903.

LOCATION OF QUARRY LEASE APPLIED AREA:-

S.F.No. : 65 (PART-2)
EXTENT : 3.21.50 HA.
VILLAGE : KILPACHAR
TALUK : THANDARAMPATTU
DISTRICT : TIRUVANNAMALAI

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Q. LEASE APPLIED BOUNDARY	
7.5M and 10M SAFETY DISTANCE	
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MINERAL CONTACT LINE	
STRIKE AND DIP	
TOPSOIL	
SCRUB	
OUT CROPS	
DUMP	
WEATHERED ROCK	
DOLERITE(BLACK GRANITE)	
CHARNOCKITE	

GEOLOGICAL PLAN AND SECTIONS

SCALE-PLAN 1 : 1000

SECTION- Horl : 1000, Vert 1:500

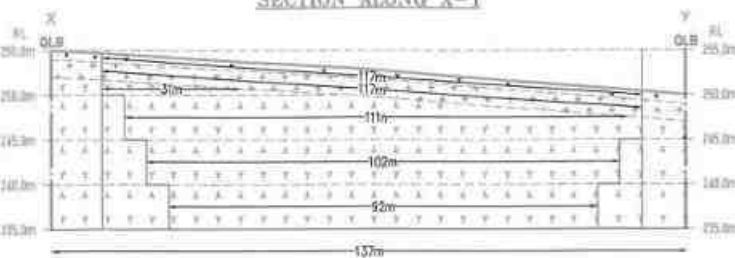
PREPARED BY:

THIS IS TO CERTIFY THAT THE INFORMATION IN THIS
PLATE IS TRUE AND CORRECT TO THE
BEST OF MY KNOWLEDGE BASED UPON THE LEASMAN
AUTHENTICATED
BY STATE GOVERNMENT

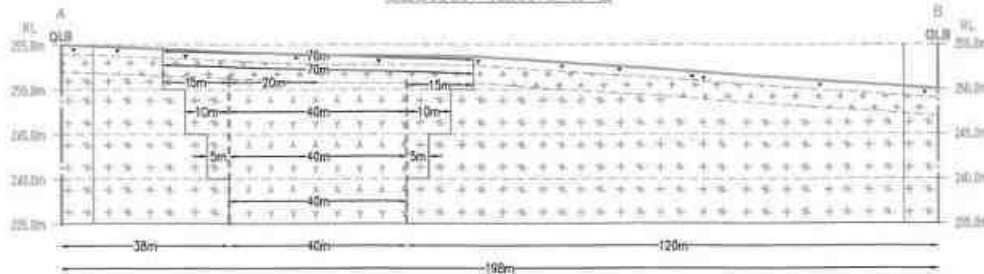
133 A

Under Rule 15(1) of the Mines Act, 1923

SECTION ALONG X-Y



SECTION ALONG A-B



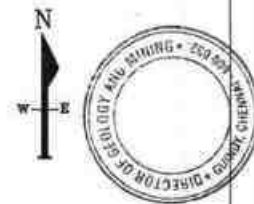
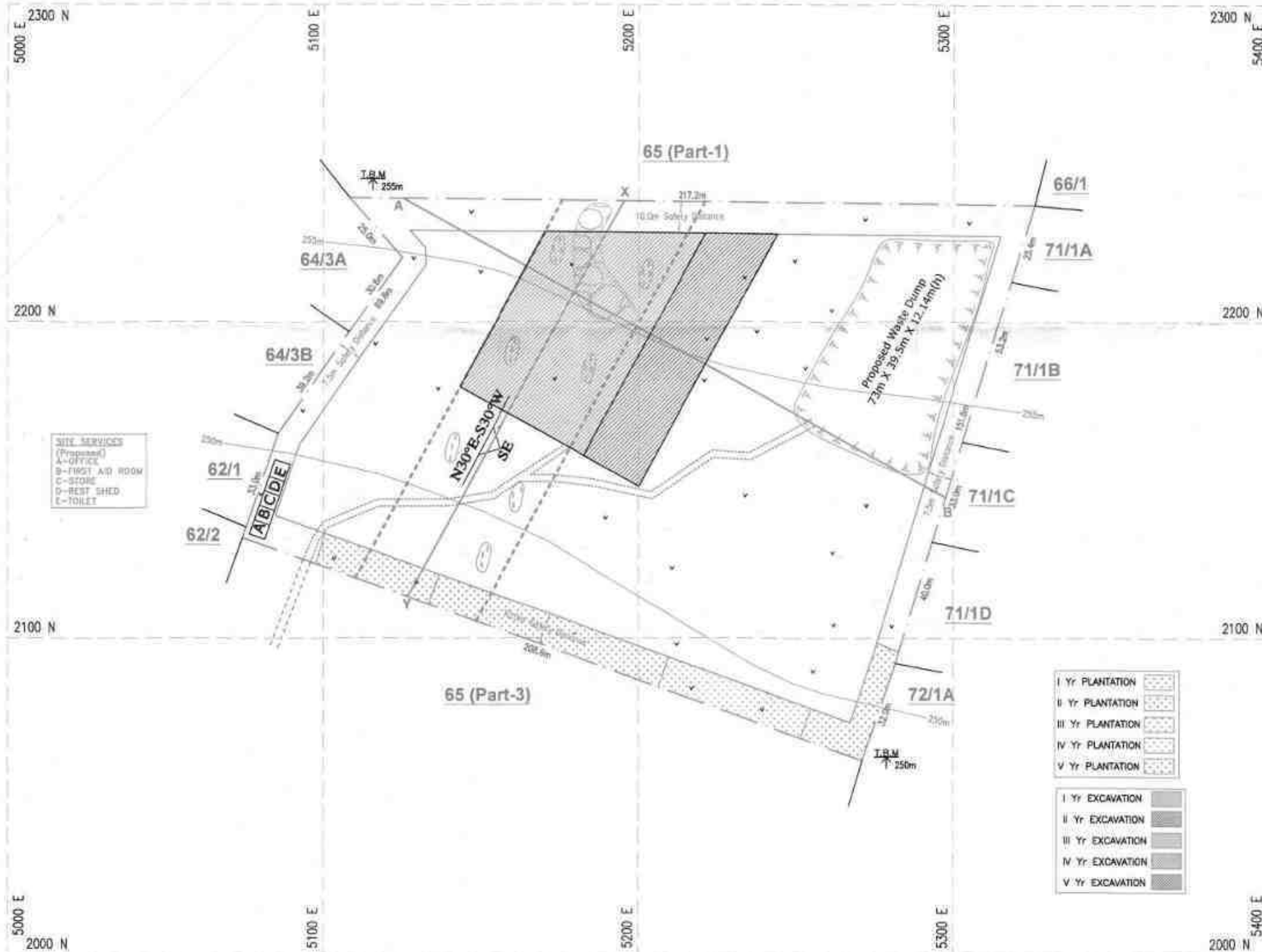


PLATE NO. V

DATE OF SURVEY :19.12.2025

APPLICANT:

M/S.A.G.GRANITES (P) Ltd.,
MUTHU GOUNDER COLONY,,
HARUR,
DHARMAPURI DISTRICT-636 903.

LOCATION OF QUARRY LEASE APPLIED AREA:-

S.F.No : 65 (PART-2)
EXTENT :3.21.50 HA.
VILLAGE : KILPACHAR
TALUK : THANDARAMPATTU
DISTRICT : TIRUVANNAMALAI

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Q. LEASE APPLIED BOUNDARY	
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STRIKE AND DIP	
TOPSOIL	
SCRUB	
OUT CROPS	
DUMP	
WEATHERED ROCK	
DOLERITE(BLACK GRANITE)	
CHARNOCKITE	
QUARRY ROAD	

YEARWISE DEVELOPMENT AND PRODUCTION PLAN AND SECTIONS

SCALE-PLAN 1 : 1000
SECTION- Horiz : 1000, Vert 1:500

PREPARED BY:

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PLATE IS TRUE AND CORRECT TO THE
BEST OF MY KNOWLEDGE (BASED UPON THE LEVEMAP
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BY STATE GOVERNMENT

134 A

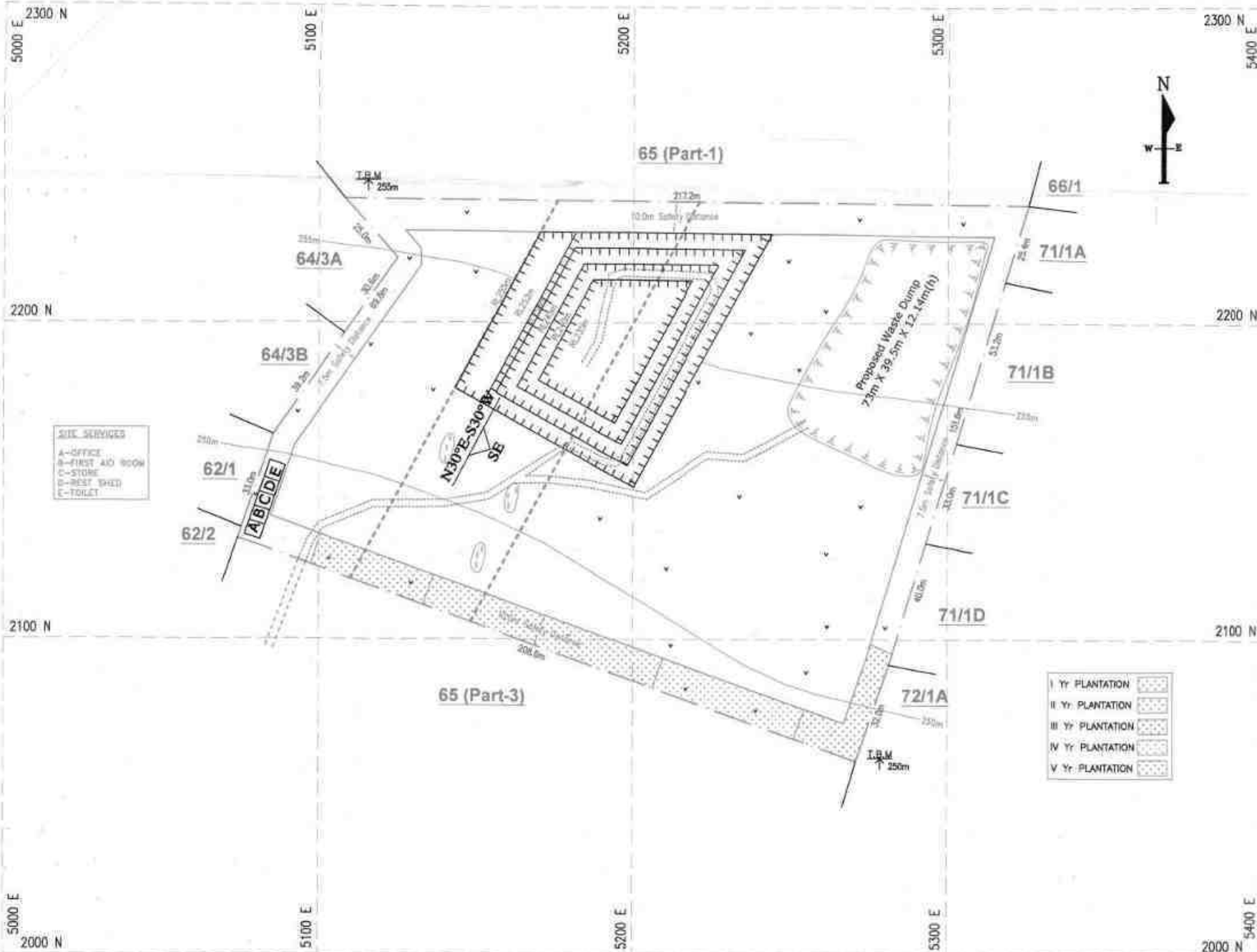


PLATE NO. VI

DATE OF SURVEY: 15.12.2025

APPLICANT:

M/s.A.G.GRANITES (P)
MUTHU GOUNDER COMPANY,
HARUR,
DHARMAPURI DISTRICT-636 002

LOCATION OF QUARRY

LEASE APPLIED AREA:-

S.F.No : 65 (PART-2)
EXTENT : 3.21.50 HA.
VILLAGE : KILPACHAR
TALUK : THANDAMPATTU
DISTRICT : TIRUVANNAMALAI

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Q. LEASE APPLIED BOUNDARY	
7.5M and 10M SAFETY DISTANCE	
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TEMPORARY BENCH MARK	
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MINERAL CONTACT LINE	
STRIKE AND DIP	
TOPSOIL	
SCRUB	
OUT CROPS	
DUMP	
WEATHERED ROCK	
DOLERITE(BLACK GRANITE)	
CHARNOCKITE	
QUARRY ROAD	
QUARRY PIT	

**QUARRY LAYOUT AND
AFFORESTATION PLAN AND SECTIONS**

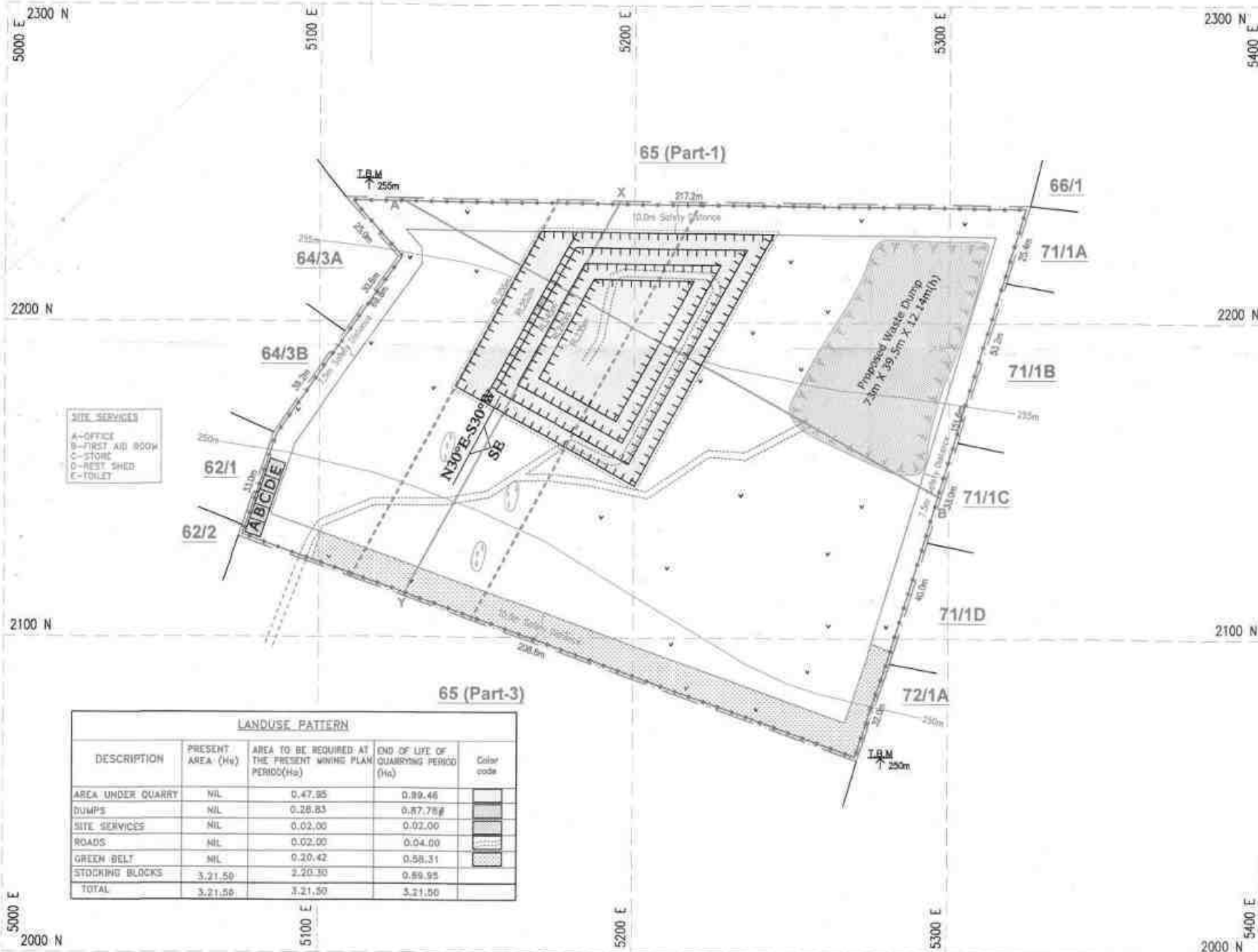
SCALE-PLAN 1 : 1000

PREPARED BY:

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PLATE IS TRUE AND CORRECT TO THE
BEST OF MY KNOWLEDGE BASED UPON THE LEADMAP
AUTHENTICATED
BY STATE GOVERNMENT

135A

Order Rule 150(2) and (3) of MCR-2018



LANDUSE PATTERN				
DESCRIPTION	PRESENT AREA (Ha)	AREA TO BE REQUIRED AT THE PRESENT MINING PLAN PERIOD(Ha)	END OF LIFE OF QUARRYING PERIOD (Ha)	Color code
AREA UNDER QUARRY	NIL	0.47.95	0.89.46	
DUMPS	NIL	0.28.83	0.87.78	
SITE SERVICES	NIL	0.02.00	0.02.00	
ROADS	NIL	0.02.00	0.04.00	
GREEN BELT	NIL	0.20.42	0.58.31	
STOCKING BLOCKS	3.21.50	2.20.30	0.89.95	
TOTAL	3.21.50	3.21.50	3.21.50	

SECTION ALONG X-Y



SECTION ALONG A-B

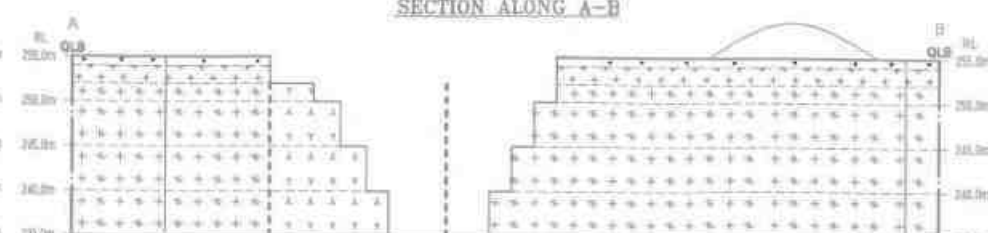


PLATE NO. VII

DATE OF SURVEY :19.12.2025

APPLICANT:

Ms.A.G.GRANITES (P) Ltd.,
MUTHU GOUNDER COLONY,
HARUR,
DHARMAPURI DISTRICT-636 903.

**LOCATION OF QUARRY
LEASE APPLIED AREA:-**

S.F.No : 65 (PART-2)
EXTENT : 3.21.50 HA.
VILLAGE : KILPACHAR
TALUK : THANDARAMPATTU
DISTRICT : TIRUVANNAMALAI

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Q. LEASE APPLIED BOUNDARY	
7.5M and 10M SAFETY DISTANCE	
APPROACH ROAD	
TEMPORARY BENCH MARK	TBM
TOPOGRAPHICAL CONTOUR	
MINERAL CONTACT LINE	
STRIKE AND DIP	
TOPSOIL	
SCRUB	
OUT CROPS	
DUMP	
WEATHERED ROCK	
DOLERITE(BLACK GRANITE)	
CHARNOCKITE	
QUARRY ROAD	
QUARRY PIT	
FENCING	
PROPOSED GARLAND DRAIN	

**PROGRESSIVE QUARRY
CLOSURE PLAN AND SECTIONS**

SCALE-PLAN 1 : 1000
SECTION- Hor 1 : 1000, Vert 1:500

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BY STATE GOVERNMENT

136 A

Q. LEASE APPLIED AREA

Under Rule 150(a) and (b) of MCR 2016

LAND USE PATTERN

DESCRIPTION	AREA IN PERCENTAGE (%)
TREES	20
ROAD/TANK	05
AGRICULTURAL LAND	45
ROAD	05
HABITATION	10
BARREN LAND	05

OCTOBER TO DECEMBER



PLATE NO:VIII

DATE OF SURVEY :19.12.2025

1Km Radius

500m Radius

Q.L.Applied Area

TOPO SHEET NO. : 57 L/16

LATITUDE : 12° 05' 40.09"N to 12° 06' 18.33"N

LONGITUDE : 78° 45' 26.42"E to 78° 45' 34.71"E



APPLICANT:

M/S.A.G.GRANITES (P) Ltd.,
MUTHU GOUNDER COLONY,
HARUR, DHARMAPURI DISTRICT-636 903.

LOCATION OF QUARRY

LEASE APPLIED AREA:-

S.F.No : 65 (PART-2)

EXTENT : 3.21.50 HA.

VILLAGE : KILPACHAR

TALUK : THANDARAMPATTU

DISTRICT : TIRUVANNAMALAI

INDEX

APPROACH ROAD

WIND DIRECTION

TREES

SEASONAL AGRICULTURE LAND

VILLAGE ROAD

TANK

HABITATION

BARREN LAND

RESERVED FOREST

ENVIRONMENTAL &

LANDUSE PLAN For 1Km Radius

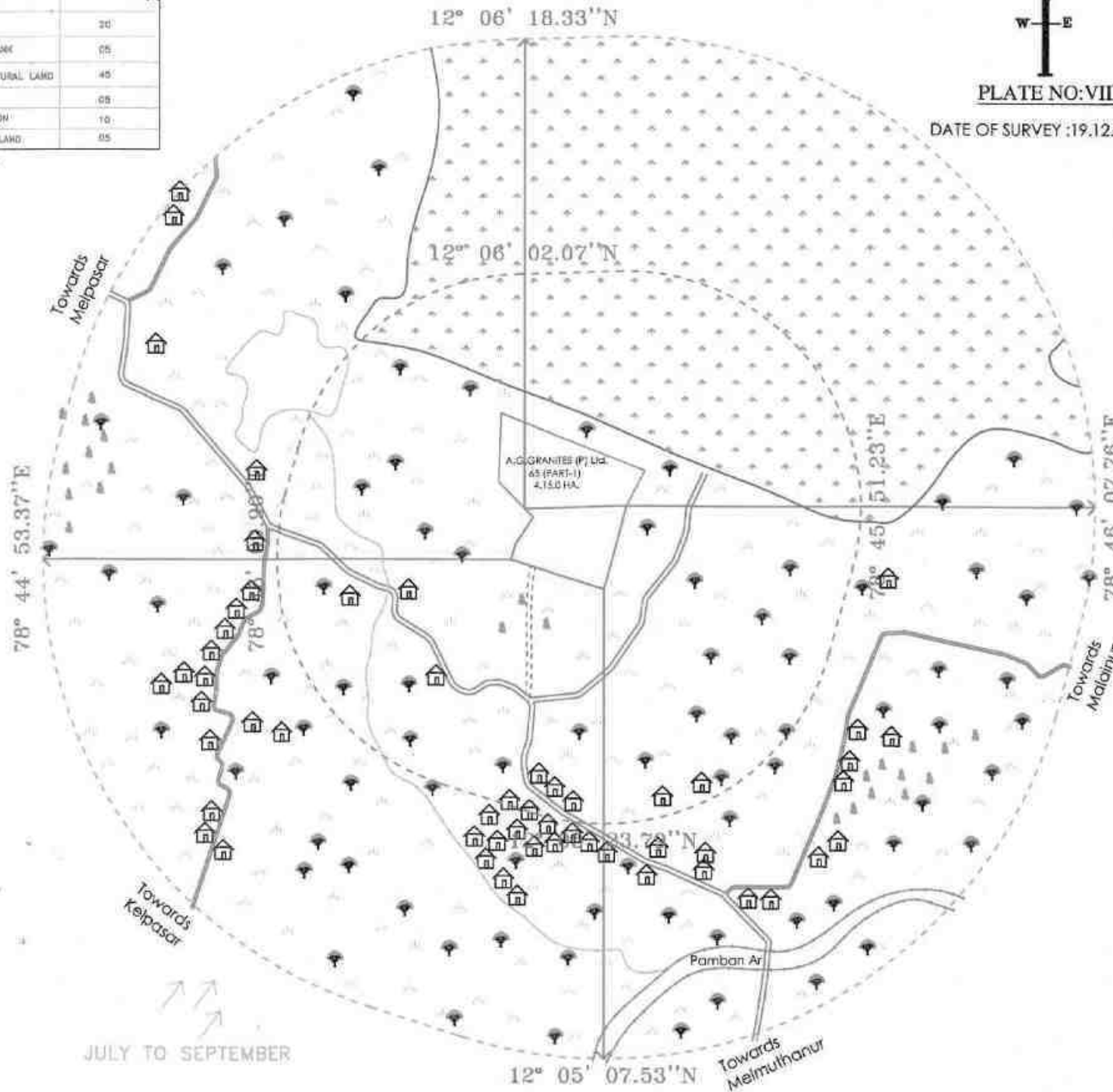
SCALE- 1:10,000

PREPARED BY :

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THIS PLATE IS TRUE AND CORRECT TO THE
BEST OF MY KNOWLEDGE BASED UPON THE
LEASEMAP AUTHENTICATED
BY STATE GOVERNMENT

(Signature) 137 A
B.VENKATACHANDRAN
QUALIFIED PERSON

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



JULY TO SEPTEMBER

திருவண்ணாமலை டீமட்டி துணைமன்றம்
 டீமட்டி திட்டமிட்ட இவ் பள்ளம் 65/2 3.25
 மெட்ரிக்ஸ் மண்டலம் 21781 திட்ட தீர்மானம் ஏற்பட்டது
 திட்டம், மேற்படி பள்ளத்தை திறக்கி மேலா
 300 பேரும் அமைய இயலும்படி உத்தேசி, மேலா
 பள்ளம் கட்டி அதில் இங்குள்ள குடும்ப 65/1 ல்
 உள்ளது. ஏற்பட்டது அதற்குரிய திட்டம் கட்டி,
 மேலா
 05/01/2006.

கிராம நிர்வாக அலுவலர்
 28, சமாதானக்கல் குருப்
 தண்டராம்பட்டு வட்டம்
 திருவண்ணாமலை மாவட்டம்



CHENNAI METTEX LAB PRIVATE LIMITED[®]

Jothi Complex, 83, M.K.N. Road, Guindy, Chennai - 600 032, Tamil Nadu, INDIA
Phone : +91 44 22323163, 22311034, 42179490, 42179491 | CIN : U74999TN2008PTC069459
Email : test@mettexlab.com | Web : www.mettexlab.com

TEST REPORT

ISSUED TO: M/s. A.G. Granites (P) Ltd., (Thiu. M. Ramasamy – Managing Director)
Muthu Gounder Colony, Harur, Dharmapuri District – 636903.

Site Address: S.F. No. 65 (P-1) Kilpachar Village, Thandarampattu Taluk,
Tiruvannamalai District, Tamil Nadu.

Test Certificate No : CML/25-26/T100154 Test Certificate Date : 03.01.2026
Location of Sampling : **AAQ – 1, Project Area - 12° 5'41.95"N 78°45'27.92"E**
Sampling Plan & Procedure : CML/LAB/ENV/SOP/AAQ (IS 5182 & USEPA Compendium)
Sampling Instrument ID & Calibration Due Date: CML/ENV/RDS/027 & 18.11.2026
Sampling Instrument ID & Calibration Due Date: CML/ENV/FDS/012 & 19.11.2026

Ambient Air Monitoring Details		Particulate Pollutant			Gaseous Pollutant					Metals Pollutant			Organic Pollutant	
Parameters		SPM	PM ₁₀	PM _{2.5}	SO ₂	NO ₂	NH ₃	O ₃	CO	Pb	Ni	As	C ₆ H ₆	BaP
NAAQ Norms		200	100	60	80	80	400	180	4	1	20	6	5	1
Unit		µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	mg/m ³	µg/m ³	ng/m ³	ng/m ³	µg/m ³	ng/m ³
Date	Period: hrs	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
01.10.2025	9:00 - 9:00	61.1	39.5	18.9	5.1	19.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
02.10.2025	9:30 - 9:30	62.8	40.4	19.2	5.6	18.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
06.10.2025	9:00 - 9:00	60.8	40.2	18.4	5.1	18.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
07.10.2025	9:30 - 9:30	61.2	40.7	18.8	4.8	18.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
13.10.2025	9:00 - 9:00	61.7	40.5	18.7	5.3	18.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
14.10.2025	9:30 - 9:30	62.5	40.9	19.1	5.8	18.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
22.10.2025	9:00 - 9:00	60.4	41.8	19.4	5.6	18.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
23.10.2025	9:30 - 9:30	63.1	40.5	19.0	5.1	18.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
27.10.2025	9:00 - 9:00	62.0	39.7	18.4	4.8	19.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
28.10.2025	9:30 - 9:30	61.9	39.9	18.9	4.7	19.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
03.11.2025	9:00 - 9:00	62.3	40.5	19.2	5.5	19.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
04.11.2025	9:30 - 9:30	60.5	40.8	19.7	5.1	18.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
10.11.2025	9:00 - 9:00	62.9	41.1	18.8	5.7	18.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
11.11.2025	9:30 - 9:30	64.7	41.9	18.6	5.9	18.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
17.11.2025	9:00 - 9:00	62.1	40.9	18.2	6.1	18.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
18.11.2025	9:30 - 9:30	62.9	41.5	18.7	5.7	18.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
24.11.2025	9:00 - 9:00	62.0	39.8	17.7	5.6	17.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
25.11.2025	9:30 - 9:30	63.2	40.5	17.3	5.4	17.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
01.12.2025	9:00 - 9:00	61.2	41.5	17.6	5.6	17.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
02.12.2025	9:30 - 9:30	60.9	42.5	18.1	5.5	17.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
08.12.2025	9:00 - 9:00	60.1	41.3	17.9	5.8	17.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
09.12.2025	9:30 - 9:30	64.9	40.5	18.4	5.4	18.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
17.12.2025	9:00 - 9:00	61.4	41.3	18.5	5.7	17.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
18.12.2025	9:30 - 9:30	63.6	42.6	18.3	6.1	17.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
28.12.2025	9:00 - 9:00	62.7	31.7	23.5	6.4	22.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
29.12.2025	9:30 - 9:30	61.0	30.5	24.1	5.9	21.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Note: BDL: Below Detection Limit ; DL: Detection Limit ; NH₃: BDL (DL:20); O₃: BDL (DL:20); CO: BDL (DL:1.0); Pb: BDL (DL:0.1); Ni: BDL (DL:1.0); As: BDL (DL:1.0); C₆H₆: BDL (DL:1.0); BaP: BDL (DL:0.1)
Remarks: The values observed for the pollutants given above are within the CPCB standards.

End of Report

For Chennai Mettex Lab Private Limited



Reviewed & Authorised by
V. SELVAKUMAR

Technical Manager

NOTE: Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders will be liable for legal action. Unless otherwise stated the submitted results in this test report refer only to the sample(s) tested and such sample(s) are retained for 15 days only from the completion date of testing, except in case of regulatory samples, which will be retained for a specific period as per statutory requirement; while perishable & environmental testing related remnant samples will be discarded consequent upon completion of testing. Samples are not drawn by us unless otherwise stated. This document cannot be reproduced except in full, without prior written approval of the laboratory. This report is for the exclusive use of Chennai Mettex Lab's customer, and is provided in accordance with the agreement between Chennai Mettex Lab and its Customer.



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Joithi Complex, 83, M.K.N. Road, Guindy, Chennai - 600 032, Tamil Nadu, INDIA
Phone : +91 44 22323163, 22311034, 42179490, 42179491 | CIN : U74999TN2008PTC069459
Email : test@mettexlab.com | Web : www.mettexlab.com

TEST REPORT

ISSUED TO: M/s. A.G. Granites (P) Ltd., (Thiu. M. Ramasamy – Managing Director)
Muthu Gounder Colony, Harur, Dharmapuri District – 636903.

Site Address: S.F. No. 65 (P-1) Kilpachar Village, Thandarampattu Taluk,
Tiruvannamalai District, Tamil Nadu.

Test Certificate No : CML/25-26/T100155

Test Certificate Date : 03.01.2026

Location of Sampling : **AAQ – 2, Near Existing Quarry - 12° 5'48.20"N 78°45'35.63"E**

Sampling Plan & Procedure : CML/LAB/ENV/SOP/AAQ (IS 5182 & USEPA Compendium)

Sampling Instrument ID & Calibration Due Date: CML/ENV/RDS/030 & 18.11.2026

Sampling Instrument ID & Calibration Due Date: CML/ENV/FDS/013 & 19.11.2026

Ambient Air Monitoring Details		Particulate Pollutant			Gaseous Pollutant					Metals Pollutant			Organic Pollutant	
Parameters		SPM	PM ₁₀	PM _{2.5}	SO ₂	NO ₂	NH ₃	O ₃	CO	Pb	Ni	As	C ₆ H ₆	BaP
NAAQ Norms		200	100	60	80	80	400	180	4	1	20	6	5	1
Unit		µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	mg/m ³	µg/m ³	ng/m ³	ng/m ³	µg/m ³	ng/m ³
Date	Period: hrs	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
01.10.2025	9:00 - 9:00	60.5	40.5	17.4	5.5	23.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
02.10.2025	9:30 - 9:30	62.9	41.2	17.5	5.6	25.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
06.10.2025	9:00 - 9:00	63.1	41.5	17.3	5.4	23.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
07.10.2025	9:30 - 9:30	64.9	40.6	17.0	5.8	22.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
13.10.2025	9:00 - 9:00	62.3	42.5	17.2	5.9	25.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
14.10.2025	9:30 - 9:30	64.8	42.1	16.8	5.2	24.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
22.10.2025	9:00 - 9:00	64.2	43.5	17.6	6.2	24.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
23.10.2025	9:30 - 9:30	63.0	43.1	17.2	5.1	25.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
27.10.2025	9:00 - 9:00	62.8	43.5	18.9	6.0	24.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
28.10.2025	9:30 - 9:30	61.5	42.5	19.2	5.3	25.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
03.11.2025	9:00 - 9:00	64.8	40.6	19.5	5.8	23.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
04.11.2025	9:30 - 9:30	63.4	41.2	19.1	6.0	24.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
10.11.2025	9:00 - 9:00	61.2	41.8	18.6	5.3	21.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
11.11.2025	9:30 - 9:30	62.9	40.2	18.5	5.8	22.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
17.11.2025	9:00 - 9:00	63.0	39.6	18.6	6.0	24.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
18.11.2025	9:30 - 9:30	64.5	38.9	18.9	5.7	22.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
24.11.2025	9:00 - 9:00	63.3	40.6	18.2	5.5	21.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
25.11.2025	9:30 - 9:30	61.3	42.5	17.7	5.9	25.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
01.12.2025	9:00 - 9:00	60.5	41.9	17.2	5.2	25.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
02.12.2025	9:30 - 9:30	62.5	40.3	17.8	5.6	24.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
08.12.2025	9:00 - 9:00	61.1	41.2	17.6	5.5	25.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
09.12.2025	9:30 - 9:30	63.8	40.5	18.2	5.2	21.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
17.12.2025	9:00 - 9:00	61.3	41.6	17.3	5.8	23.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
18.12.2025	9:30 - 9:30	62.1	39.5	17.5	5.9	22.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
28.12.2025	9:00 - 9:00	63.9	35.5	22.5	5.3	24.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
29.12.2025	9:30 - 9:30	62.8	34.2	23.0	5.7	25.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Note: BDL: Below Detection Limit ; DL: Detection Limit ; NH₃: BDL (DL:20); O₃: BDL (DL:20); CO: BDL (DL:1.0);

Pb: BDL (DL:0.1); Ni: BDL (DL:1.0); As: BDL (DL:1.0); C₆H₆: BDL (DL:1.0); BaP: BDL (DL:0.1)

Remarks: The values observed for the pollutants given above are within the CPCB standards.

End of Report

For Chennai Mettex Lab Private Limited



Reviewed & Authorised by
V. SELVAKUMAR
Technical Manager
Authorised Signatory

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TEST REPORT

ISSUED TO: M/s. A.G. Granites (P) Ltd., (Thiu. M. Ramasamy – Managing Director)
Muthu Gounder Colony, Harur, Dharmapuri District – 636903.

Site Address: S.F. No. 65 (P-1) Kilpachar Village, Thandarampattu Taluk,
Tiruvannamalai District, Tamil Nadu.

Test Certificate No : CML/25-26/T100156 Test Certificate Date : 03.01.2026
Location of Sampling : **AAQ – 3, Kilpasar (Residential) - 12° 5'27.50"N 78°45'27.61"E**
Sampling Plan & Procedure : CML/LAB/ENV/SOP/AAQ (IS 5182 & USEPA Compendium)
Sampling Instrument ID & Calibration Due Date: CML/ENV/RDS/031 & 18.11.2026
Sampling Instrument ID & Calibration Due Date: CML/ENV/FDS/014 & 19.11.2026

Ambient Air Monitoring Details		Particulate Pollutant			Gaseous Pollutant					Metals Pollutant			Organic Pollutant	
Parameters		SPM	PM ₁₀	PM _{2.5}	SO ₂	NO ₂	NH ₃	O ₃	CO	Pb	Ni	As	C ₆ H ₆	BaP
NAAQ Norms		200	100	60	80	80	400	180	4	1	20	6	5	1
Unit		µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	mg/m ³	µg/m ³	ng/m ³	ng/m ³	µg/m ³	ng/m ³
Date	Period: hrs	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
01.10.2025	9:00 - 9:00	61.9	40.4	20.1	5.8	18.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
02.10.2025	9:30 - 9:30	63.4	41.5	21.8	5.1	18.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
06.10.2025	9:00 - 9:00	64.8	41.1	21.0	6.9	18.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
07.10.2025	9:30 - 9:30	64.0	40.6	22.5	5.6	17.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
13.10.2025	9:00 - 9:00	63.3	40.9	22.2	6.1	17.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
14.10.2025	9:30 - 9:30	64.1	40.3	20.9	6.9	17.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
22.10.2025	9:00 - 9:00	64.4	41.2	22.0	7.0	17.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
23.10.2025	9:30 - 9:30	62.1	41.7	23.2	6.5	18.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
27.10.2025	9:00 - 9:00	64.9	42.2	22.2	6.2	18.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
28.10.2025	9:30 - 9:30	64.2	41.5	23.5	6.8	17.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
03.11.2025	9:00 - 9:00	63.9	42.3	22.6	7.1	17.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
04.11.2025	9:30 - 9:30	62.0	43.6	23.5	6.9	17.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
10.11.2025	9:00 - 9:00	64.0	41.2	23.0	7.1	17.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
11.11.2025	9:30 - 9:30	64.1	40.6	25.1	6.3	17.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
17.11.2025	9:00 - 9:00	63.1	40.3	24.6	5.4	17.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
18.11.2025	9:30 - 9:30	62.2	41.5	23.2	6.8	16.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
24.11.2025	9:00 - 9:00	63.9	41.1	24.0	5.3	17.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
25.11.2025	9:30 - 9:30	64.9	42.2	22.9	6.9	17.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
01.12.2025	9:00 - 9:00	65.3	39.9	22.2	6.3	16.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
02.12.2025	9:30 - 9:30	66.4	40.2	20.9	5.5	17.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
08.12.2025	9:00 - 9:00	63.0	40.6	21.5	6.2	17.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
09.12.2025	9:30 - 9:30	63.2	39.9	20.1	6.4	16.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
17.12.2025	9:00 - 9:00	61.0	40.3	24.0	7.5	16.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
18.12.2025	9:30 - 9:30	62.5	41.5	23.5	7.3	23.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
28.12.2025	9:00 - 9:00	64.5	33.9	22.1	6.5	24.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
29.12.2025	9:30 - 9:30	63.8	32.8	23.9	7.2	23.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Note: BDL: Below Detection Limit ; DL: Detection Limit ; NH₃: BDL (DL:20); O₃: BDL (DL:20); CO: BDL (DL:1.0);
Pb: BDL (DL:0.1); Ni: BDL (DL:1.0); As: BDL (DL:1.0); C₆H₆: BDL (DL:1.0); BaP: BDL (DL:0.1)
Remarks: The values observed for the pollutants given above are within the CPCB standards.

End of Report

For Chennai Mettex Lab Private Limited



Reviewed & Authorised by
V. SELVAKUMAR
Technical Manager

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TEST REPORT

ISSUED TO: M/s. A.G. Granites (P) Ltd., (Thiu. M. Ramasamy – Managing Director)
Muthu Gounder Colony, Harur, Dharmapuri District – 636903.

Site Address: S.F. No. 65 (P-1) Kilpachar Village, Thandarampattu Taluk,
Tiruvannamalai District, Tamil Nadu.

Test Certificate No : CML/25-26/T100157 Test Certificate Date : 03.01.2026
Location of Sampling : **AAQ – 4, Melpasar (Residential)- 12° 6'16.29"N 78°44'36.18"E**
Sampling Plan & Procedure : CML/LAB/ENV/SOP/AAQ (IS 5182 & USEPA Compendium)
Sampling Instrument ID & Calibration Due Date: CML/ENV/RDS/032 & 18.11.2026
Sampling Instrument ID & Calibration Due Date: CML/ENV/FDS/030 & 19.11.2026

Ambient Air Monitoring Details		Particulate Pollutant			Gaseous Pollutant					Metals Pollutant			Organic Pollutant	
Parameters		SPM	PM ₁₀	PM _{2.5}	SO ₂	NO ₂	NH ₃	O ₃	CO	Pb	Ni	As	C ₆ H ₆	BaP
NAAQ Norms		200	100	60	80	80	400	180	4	1	20	6	5	1
Unit		µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	mg/m ³	µg/m ³	ng/m ³	ng/m ³	µg/m ³	ng/m ³
Date	Period:hrs	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
01.10.2025	9:00 - 9:00	63.3	39.6	21.1	5.9	17.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
02.10.2025	9:30 - 9:30	64.0	40.5	22.6	6.3	17.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
06.10.2025	9:00 - 9:00	63.7	40.2	23.7	5.4	17.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
07.10.2025	9:30 - 9:30	62.7	41.5	20.8	4.7	18.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
13.10.2025	9:00 - 9:00	63.5	41.3	24.5	4.6	17.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
14.10.2025	9:30 - 9:30	64.6	40.8	20.8	5.2	18.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
22.10.2025	9:00 - 9:00	65.4	39.9	23.3	5.8	18.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
23.10.2025	9:30 - 9:30	64.8	41.5	22.6	5.6	18.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
27.10.2025	9:00 - 9:00	63.0	41.8	21.2	5.0	19.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
28.10.2025	9:30 - 9:30	63.2	42.6	23.0	5.2	17.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
03.11.2025	9:00 - 9:00	64.0	41.8	21.1	4.5	18.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
04.11.2025	9:30 - 9:30	63.9	42.5	20.8	5.8	18.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
10.11.2025	9:00 - 9:00	64.2	41.9	20.6	5.2	18.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
11.11.2025	9:30 - 9:30	63.0	43.5	23.5	6.1	18.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
17.11.2025	9:00 - 9:00	64.3	42.6	23.9	6.4	17.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
18.11.2025	9:30 - 9:30	63.1	42.5	22.7	4.6	17.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
24.11.2025	9:00 - 9:00	64.9	41.5	20.3	5.8	17.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
25.11.2025	9:30 - 9:30	62.5	40.6	19.1	6.5	16.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
01.12.2025	9:00 - 9:00	63.3	41.5	22.3	6.3	17.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
02.12.2025	9:30 - 9:30	61.5	41.5	19.6	5.1	17.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
08.12.2025	9:00 - 9:00	62.8	40.6	21.8	6.9	18.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
09.12.2025	9:30 - 9:30	61.2	40.9	19.9	7.0	17.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
17.12.2025	9:00 - 9:00	63.9	40.5	21.6	6.9	18.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
18.12.2025	9:30 - 9:30	62.4	39.6	22.1	6.2	17.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
28.12.2025	9:00 - 9:00	63.3	40.5	24.7	5.8	21.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
29.12.2025	9:30 - 9:30	64.0	40.2	23.5	5.9	24.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Note: BDL: Below Detection Limit ;DL: Detection Limit ; NH₃: BDL (DL:20); O₃: BDL (DL:20); CO: BDL (DL:1.0);
Pb: BDL (DL:0.1); Ni: BDL (DL:1.0); As: BDL (DL:1.0); C₆H₆: BDL (DL:1.0); BaP: BDL (DL:0.1)
Remarks: The values observed for the pollutants given above are within the CPCB standards.

End of Report

For Chennai Mettex Lab Private Limited



Reviewed & Authorized by
V. SELVAKUMAR
Technical Manager

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TEST REPORT

ISSUED TO: M/s. A.G. Granites (P) Ltd., (Thiu. M. Ramasamy – Managing Director)
Muthu Gounder Colony, Harur, Dharmapuri District – 636903.

Site Address: S.F. No. 65 (P-1) Kilpachar Village, Thandampattu Taluk,
Tiruvannamalai District, Tamil Nadu.

Test Certificate No : CML/25-26/T100158 Test Certificate Date : 03.01.2026
Location of Sampling : **AAQ – 5, Reddiarpalayam (School) - 12° 5'33.75"N 78°47'3.63"E**
Sampling Plan & Procedure : CML/LAB/ENV/SOP/AAQ (IS 5182 & USEPA Compendium)
Sampling Instrument ID & Calibration Due Date: CML/ENV/RDS/033 & 18.11.2026
Sampling Instrument ID & Calibration Due Date: CML/ENV/FDS/031 & 19.11.2026

Ambient Air Monitoring Details		Particulate Pollutant			Gaseous Pollutant					Metals Pollutant			Organic Pollutant	
Parameters		SPM	PM ₁₀	PM _{2.5}	SO ₂	NO ₂	NH ₃	O ₃	CO	Pb	Ni	As	C ₆ H ₆	BaP
NAAQ Norms		200	100	60	80	80	400	180	4	1	20	6	5	1
Unit		µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	mg/m ³	µg/m ³	ng/m ³	ng/m ³	µg/m ³	ng/m ³
Date	Period: hrs.	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
01.10.2025	9:00 - 9:00	64.1	32.9	19.0	5.1	16.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
02.10.2025	9:30 - 9:30	63.6	34.6	20.1	6.2	17.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
06.10.2025	9:00 - 9:00	65.5	35.9	22.2	6.8	17.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
07.10.2025	9:30 - 9:30	62.9	33.6	21.3	7.5	18.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
13.10.2025	9:00 - 9:00	64.7	39.1	22.9	6.0	18.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
14.10.2025	9:30 - 9:30	65.2	32.9	20.0	5.7	17.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
22.10.2025	9:00 - 9:00	64.9	37.4	21.1	6.8	17.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
23.10.2025	9:30 - 9:30	63.9	36.8	22.9	7.2	18.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
27.10.2025	9:00 - 9:00	66.0	32.2	23.0	5.9	18.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
28.10.2025	9:30 - 9:30	62.7	34.5	19.5	5.2	17.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
03.11.2025	9:00 - 9:00	64.0	37.9	19.7	6.8	17.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
04.11.2025	9:30 - 9:30	63.4	33.3	20.5	7.3	18.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
10.11.2025	9:00 - 9:00	62.8	35.9	22.2	7.4	18.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
11.11.2025	9:30 - 9:30	64.7	40.0	21.3	5.6	18.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
17.11.2025	9:00 - 9:00	65.8	38.8	19.9	5.6	17.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
18.11.2025	9:30 - 9:30	63.9	35.5	21.1	6.6	17.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
24.11.2025	9:00 - 9:00	62.7	36.9	22.2	5.3	17.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
25.11.2025	9:30 - 9:30	65.1	38.7	21.5	5.9	17.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
01.12.2025	9:00 - 9:00	62.0	39.1	20.0	6.9	17.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
02.12.2025	9:30 - 9:30	63.1	34.8	19.0	5.2	17.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
08.12.2025	9:00 - 9:00	64.5	32.3	21.1	5.9	17.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
09.12.2025	9:30 - 9:30	65.8	39.7	22.5	6.7	17.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
17.12.2025	9:00 - 9:00	63.3	33.5	22.9	64	17.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
18.12.2025	9:30 - 9:30	66.0	35.5	19.0	7.1	20.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
28.12.2025	9:00 - 9:00	62.5	34.8	21.4	5.7	22.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
29.12.2025	9:30 - 9:30	64.1	32.7	22.8	6.6	24.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Note: BDL: Below Detection Limit ;DL: Detection Limit ; NH₃: BDL (DL:20); O₃: BDL (DL:20); CO: BDL (DL:1.0);
Pb: BDL (DL:0.1); Ni: BDL (DL:1.0); As: BDL (DL:1.0); C₆H₆: BDL (DL:1.0); BaP: BDL (DL:0.1)
Remarks: The values observed for the pollutants given above are within the CPCB standards.

End of Report

For Chennai Mettex Lab Private Limited



Reviewed & Authorised by
V. SELVAKUMAR
Technical Manager

NOTE: Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and liable for legal action. Unless otherwise stated the submitted results in this test report refer only to the sample(s) tested and such sample(s) are retained for 15 days only from the completion date of testing, except in case of regulatory samples, which will be retained for a specific period as per statutory requirement; while perishable & environmental testing related remnant samples will be discarded consequent upon completion of testing. Samples are not drawn by us unless otherwise stated. This document cannot be reproduced except in full, without prior written approval of the laboratory. This report is for the exclusive use of Chennai Mettex Lab's customer, and is provided in accordance with the agreement between Chennai Mettex Lab and its Customer.



CHENNAI METTEX LAB PRIVATE LIMITED[®]

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TEST REPORT

ISSUED TO: M/s. A.G. Granites (P) Ltd., (Thiu. M. Ramasamy – Managing Director)
Muthu Gounder Colony, Harur, Dharmapuri District – 636903.

Site Address: S.F. No. 65 (P-1) Kilpachar Village, Thandampattu Taluk,
Tiruvannamalai District, Tamil Nadu.

Test Certificate No : CML/25-26/T100159 Test Certificate Date : 03.01.2026
Location of Sampling : **AAQ – 6, Beemarapatti (Residential)- 12° 2'28.05"N 78°44'32.24"E**
Sampling Plan & Procedure : CML/LAB/ENV/SOP/AAQ (IS 5182 & USEPA Compendium)
Sampling Instrument ID & Calibration Due Date: CML/ENV/RDS/034 & 18.11.2026
Sampling Instrument ID & Calibration Due Date: CML/ENV/FDS/032 & 19.11.2026

Ambient Air Monitoring Details		Particulate Pollutant			Gaseous Pollutant					Metals Pollutant			Organic Pollutant	
Parameters		SPM	PM ₁₀	PM _{2.5}	SO ₂	NO ₂	NH ₃	O ₃	CO	Pb	Ni	As	C ₆ H ₆	BaP
NAAQ Norms		200	100	60	80	80	400	180	4	1	20	6	5	1
Unit		µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	mg/m ³	µg/m ³	ng/m ³	ng/m ³	µg/m ³	ng/m ³
Date	Period: hrs	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
01.10.2025	9:00 - 9:00	64.5	32.1	19.0	5.0	18.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
02.10.2025	9:30 - 9:30	63.3	37.8	20.1	6.1	19.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
06.10.2025	9:00 - 9:00	65.1	36.6	22.2	6.2	18.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
07.10.2025	9:30 - 9:30	62.8	35.5	20.0	6.9	17.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
13.10.2025	9:00 - 9:00	66.0	38.8	22.1	5.7	16.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
14.10.2025	9:30 - 9:30	64.4	33.3	21.5	6.1	19.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
22.10.2025	9:00 - 9:00	63.9	34.8	23.0	6.3	17.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
23.10.2025	9:30 - 9:30	62.2	39.1	22.5	5.9	19.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
27.10.2025	9:00 - 9:00	65.5	35.4	21.5	5.2	20.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
28.10.2025	9:30 - 9:30	64.1	32.2	23.3	6.0	21.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
03.11.2025	9:00 - 9:00	65.2	39.1	21.7	6.1	22.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
04.11.2025	9:30 - 9:30	65.9	37.5	22.2	6.3	21.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
10.11.2025	9:00 - 9:00	62.0	38.3	22.5	5.7	20.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
11.11.2025	9:30 - 9:30	63.1	33.5	19.9	6.6	21.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
17.11.2025	9:00 - 9:00	64.9	39.2	19.1	5.8	20.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
18.11.2025	9:30 - 9:30	62.4	34.7	19.8	6.0	21.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
24.11.2025	9:00 - 9:00	63.3	37.3	20.2	6.9	20.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
25.11.2025	9:30 - 9:30	65.4	35.8	21.1	7.2	22.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
01.12.2025	9:00 - 9:00	64.4	38.9	22.2	6.3	20.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
02.12.2025	9:30 - 9:30	62.9	32.2	23.0	7.0	21.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
08.12.2025	9:00 - 9:00	62.1	33.4	20.1	5.5	20.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
09.12.2025	9:30 - 9:30	65.8	39.2	22.7	6.8	20.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
17.12.2025	9:00 - 9:00	63.3	33.5	21.1	6.4	21.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
18.12.2025	9:30 - 9:30	62.2	34.8	19.0	6.9	21.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
28.12.2025	9:00 - 9:00	64.1	33.5	22.4	5.3	22.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
29.12.2025	9:30 - 9:30	66.0	39.9	21.1	5.8	20.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Note: BDL: Below Detection Limit ;DL: Detection Limit ; NH₃: BDL (DL:20); O₃: BDL (DL:20); CO: BDL (DL:1.0);
Pb: BDL (DL:0.1); Ni: BDL (DL:1.0); As: BDL (DL:1.0); C₆H₆: BDL (DL:1.0); BaP: BDL (DL:0.1)
Remarks: The values observed for the pollutants given above are within the CPCB standards.

End of Report

For Chennai Mettex Lab Private Limited



V. Selvakumar
Reviewed & Authorised by
V. SELVAKUMAR
Technical Manager
Authorized Signatory

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TEST REPORT

ISSUED TO: M/s. A.G. Granites (P) Ltd., (Thiu. M. Ramasamy – Managing Director)
Muthu Gounder Colony, Harur, Dharmapuri District – 636903.

Site Address: S.F. No. 65 (P-1) Kilpachar Village, Thandarampattu Taluk,
Tiruvannamalai District, Tamil Nadu.

Test Certificate No : CML/25-26/T100160

Test Certificate Date : 03.01.2026

Location of Sampling : **AAQ – 7, Manthikulampatti(School)- 12° 5'31.48"N 78° 42'23.57"E**

Sampling Plan & Procedure : CML/LAB/ENV/SOP/AAQ (IS 5182 & USEPA Compendium)

Sampling Instrument ID & Calibration Due Date: CML/ENV/RDS/035 & 18.11.2026

Sampling Instrument ID & Calibration Due Date: CML/ENV/FDS/033 & 19.11.2026

Ambient Air Monitoring Details		Particulate Pollutant			Gaseous Pollutant					Metals Pollutant			Organic Pollutant	
Parameters		SPM	PM ₁₀	PM _{2.5}	SO ₂	NO ₂	NH ₃	O ₃	CO	Pb	Ni	As	C ₆ H ₆	BaP
NAAQ Norms		200	100	60	80	80	400	180	4	1	20	6	5	1
Unit		µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	mg/m ³	µg/m ³	ng/m ³	ng/m ³	µg/m ³	ng/m ³
Date	Period: hrs	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
07.03.2025	9:00 - 9:00	62.3	32.2	22.5	6.5	21.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
08.03.2025	9:30 - 9:30	63.1	33.6	21.5	5.2	19.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
14.03.2025	9:00 - 9:00	64.4	35.9	23.2	6.1	22.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
15.03.2025	9:30 - 9:30	65.5	38.8	21.0	5.9	23.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
21.03.2025	9:00 - 9:00	66.5	36.9	24.1	6.3	19.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
22.03.2025	9:30 - 9:30	63.6	32.7	23.5	6.8	19.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
28.03.2025	9:00 - 9:00	64.9	37.9	22.6	7.4	21.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
29.03.2025	9:30 - 9:30	62.8	38.5	23.4	5.5	22.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
04.04.2025	9:00 - 9:00	63.5	40.0	21.6	5.6	20.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
05.04.2025	9:30 - 9:30	62.4	32.2	25.0	5.1	19.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
11.04.2025	9:00 - 9:00	63.6	35.5	23.3	6.9	20.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
12.04.2025	9:30 - 9:30	65.2	39.1	24.9	7.0	22.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
18.04.2025	9:00 - 9:00	62.6	38.8	21.2	6.9	19.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
19.04.2025	9:30 - 9:30	64.6	33.3	22.9	6.5	20.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
25.04.2025	9:00 - 9:00	65.6	40.0	24.4	5.1	19.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
26.04.2025	9:30 - 9:30	65.2	36.5	25.0	6.0	22.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
02.05.2025	9:00 - 9:00	64.6	36.6	23.6	7.0	21.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
03.05.2025	9:30 - 9:30	63.5	39.2	22.1	6.8	19.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
09.05.2025	9:00 - 9:00	62.9	38.9	24.1	5.9	22.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
10.05.2025	9:30 - 9:30	64.5	34.4	21.1	7.3	19.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
16.05.2025	9:00 - 9:00	65.6	33.7	22.5	6.6	20.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
17.05.2025	9:30 - 9:30	63.4	35.1	23.3	5.9	19.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
23.05.2025	9:00 - 9:00	66.2	32.9	22.9	6.0	20.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
24.05.2025	9:30 - 9:30	64.5	34.9	21.2	7.5	22.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
30.05.2025	9:00 - 9:00	63.4	33.8	24.5	5.8	20.7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
31.05.2025	9:30 - 9:30	62.2	35.9	22.2	7.0	22.2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Note: BDL: Below Detection Limit ; DL: Detection Limit ; NH₃: BDL (DL:20); O₃: BDL (DL:20); CO: BDL (DL:1.0); Pb: BDL (DL:0.1); Ni: BDL (DL:1.0); As: BDL (DL:1.0); C₆H₆: BDL (DL:1.0); BaP: BDL (DL:0.1)

Remarks: The values observed for the pollutants given above are within the CPCB standards.

End of Report

For Chennai Mettex Lab Private Limited



Reviewed & Authorised by
V. SELVAKUMAR
Technical Manager

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TEST REPORT

ISSUED TO: M/s. A.G. Granites (P) Ltd., (Thi. M. Ramasamy – Managing Director)

Muthu Gounder Colony, Harur, Dharmapuri District – 636903.

Site Address: S.F. No. 65 (P-1) Kilpachar Village, Thandarampattu Taluk,
Tiruvannamalai District, Tamil Nadu.

Test Certificate No : CML/25-26/T100161

Test Certificate Date : 03.01.2026

Sample Description : Ambient Noise Monitoring

Location of Sampling : N1 - Core Zone - 12° 5'42.78"N 78°45'26.92"E

Location of Sampling : N2 - Near Existing Quarry - 12° 5'48.52"N 78°45'35.02"E

Sampling Plan & Procedure: CML/LAB/ENV/SOP/N&L & IS 9989:1981

Sampling Instrument : CML/ENV/SLM/001 & CML/ENV/SLM/003

Sampling Date : 11.10.2025						
Location	N1 – Core zone			N2 - Near Existing Quarry		
Parameter	Min	Max	Result	Min	Max	Result
Time	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
06:00-07:00	33.5	39.8	37.7	39.7	45.1	43.2
07:00-08:00	34.6	38.7	37.1	38.7	48.9	46.3
08:00-09:00	35.9	39.8	38.3	40.9	46.8	44.8
09:00-10:00	38.7	40.7	39.8	41.8	48.9	46.7
10:00-11:00	39.7	46.8	44.6	43.7	49.7	47.7
11:00-12:00	40.1	48.7	46.3	46.8	50.4	49.0
12:00-13:00	41.6	48.9	46.6	45.8	53.7	51.3
13:00-14:00	43.5	49.7	47.6	47.9	54.6	52.4
14:00-15:00	37.2	42.1	40.3	47.9	55.8	53.4
15:00-16:00	38.2	40.3	39.4	41.2	42.3	41.8
16:00-17:00	35.2	38.2	37.0	40.3	42.1	41.3
17:00-18:00	36.5	39.6	38.3	41.5	43.1	42.4
18:00-19:00	32.4	34.2	33.4	40.7	43.5	42.3
19:00-20:00	36.8	38.6	37.8	39.8	43.1	41.8
20:00-21:00	36.9	39.7	38.5	38.7	42.3	40.9
21:00-22:00	37.6	39.9	38.9	36.7	44.2	41.9
22:00-23:00	33.2	36.2	35.0	37.8	42.1	40.5
23:00-00:00	31.2	35.2	33.6	36.8	39.1	38.1
00:00-01:00	32.6	34.2	33.5	37.8	37.2	37.5
01:00-02:00	33.2	35.2	34.3	36.9	40.1	38.8
02:00-03:00	35.1	38.8	37.3	35.9	41.8	39.8
03:00-04:00	33.7	35.4	34.6	36.7	39.8	38.5
04:00-05:00	32.4	34.8	33.8	36.4	38.7	37.7
05:00-06:00	33.4	35.6	34.6	35.9	39.1	37.8
Result	Day Means		39.8	Day Means		45.1
	Night Means		34.5	Night Means		38.3
Note: CPCB Norms Industrial Area Day Time:75 dB(A); Night Time:70 dB(A) The Noise level in the above location exists within the permissible limits of CPCB.						

End of Report

For Chennai Mettex Lab Private Limited



Reviewed & Authorised by
V. SELVAKUMAR
Technical Manager

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Phone : +91 44 22323163, 22311034, 42179490, 42179491 | CIN : U74999TN2008PTC069459
Email : test@mettexlab.com | Web : www.mettexlab.com

TEST REPORT

ISSUED TO: M/s. A.G. Granites (P) Ltd., (Thiu. M. Ramasamy – Managing Director)

Muthu Gounder Colony, Harur, Dharmapuri District – 636903.

Site Address: S.F. No. 65 (P-1) Kilpachar Village, Thandarampattu Taluk,
Tiruvannamalai District, Tamil Nadu.

Test Certificate No : CML/25-26/T100162

Test Certificate Date : 03.01.2026

Sample Description : Ambient Noise Monitoring

Location of Sampling : N3 – Kilpasar (Residential) - 12° 5'27.84"N 78°45'27.20"E

Location of Sampling : N4 – Melpasar (Residential) - 12° 6'16.12"N 78°44'35.84"E

Sampling Plan & Procedure: CML/LAB/ENV/SOP/N&L & IS 9989:1981

Sampling Instrument : CML/ENV/SLM/003 & CML/ENV/SLM/009

Sampling Date : 19.11.2025						
Location	N3 Kilpasar(Residential)			N4 – Melpasar (Residential)		
Parameter	Min	Max	Result	Min	Max	Result
Time	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
06:00-07:00	39.6	44.9	43.0	32.6	39.8	37.5
07:00-08:00	38.7	41.7	40.5	33.8	38.7	36.9
08:00-09:00	39.4	43.2	41.7	34.8	40.8	38.8
09:00-10:00	38.7	44.2	42.3	38.9	41.9	40.7
10:00-11:00	38.2	42.3	40.7	41.5	48.9	46.6
11:00-12:00	37.8	43.7	41.7	43.5	49.7	47.6
12:00-13:00	37.2	42.6	40.7	42.7	50.7	48.3
13:00-14:00	39.7	43.6	42.1	46	51.4	49.5
14:00-15:00	37.2	42.1	40.3	45.7	52.7	50.5
15:00-16:00	38.2	40.3	39.4	48	53.4	51.5
16:00-17:00	39.5	42.7	41.4	47.2	54.8	52.5
17:00-18:00	36.5	40.8	39.2	46.7	55.8	53.3
18:00-19:00	40.6	44.8	43.2	45.7	50.7	48.9
19:00-20:00	36.8	41.5	39.8	42.7	49.8	47.6
20:00-21:00	36.9	40.8	39.3	41.8	47.8	45.8
21:00-22:00	37.6	40.6	39.4	40.8	46.7	44.7
22:00-23:00	39.5	44.3	42.5	39.8	45.8	43.8
23:00-00:00	32.8	36.4	35.0	37.8	46.7	44.2
00:00-01:00	35.3	39.8	38.1	36.7	47.8	45.1
01:00-02:00	32.1	41	38.5	35.7	43.8	41.4
02:00-03:00	34.1	39.4	37.5	34.9	44.7	42.1
03:00-04:00	30.2	33.7	32.3	33.8	42.8	40.3
04:00-05:00	32.4	34.8	33.8	32.8	41.7	39.2
05:00-06:00	30.6	34.4	32.9	34.6	40.2	38.2
Result	Day Means		41.0	Day Means		46.1
	Night Means		35.4	Night Means		41.5
Note: CPCB Norms Residential Area Day Time:55 dB(A); Night Time:45 dB(A) The Noise level in the above location exists within the permissible limits of CPCB.						

End of Report

For Chennai Mettex Lab Private Limited



V. Selvakumar

Reviewed & Authorised by
V. SELVAKUMAR
Technical Manager
Authorised Signatory

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Email : test@mettexlab.com | Web : www.mettexlab.com

TEST REPORT

ISSUED TO: M/s. A.G. Granites (P) Ltd., (Thiu. M. Ramasamy – Managing Director)

Muthu Gounder Colony, Harur, Dharmapuri District – 636903.

Site Address: S.F. No. 65 (P-1) Kilpachar Village, Thandarampattu Taluk,
Tiruvannamalai District, Tamil Nadu.

Test Certificate No : CML/25-26/T100163

Test Certificate Date : 03.01.2026

Sample Description : Ambient Noise Monitoring

Location of Sampling : N5 - Reddiyarpalayam (School) - 12°5'33.42"N 78°47'3.63"E

Location of Sampling : N6 - Beemarapatti (Residential) - 12° 2'27.99"N 78°44'31.77"E

Sampling Plan & Procedure: CML/LAB/ENV/SOP/N&L & IS 9989:1981

Sampling Instrument : CML/ENV/SLM/003 & CML/ENV/SLM/009

Sampling Date : 16.12.2025						
Location	N5 - Reddiyarpalayam (School)			N6 - Beemarapatti (Residential)		
Parameter	Min	Max	Result	Min	Max	Result
Time	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
06:00-07:00	39.2	42.1	40.9	38.6	42.1	40.7
07:00-08:00	38.7	43.3	41.6	38.2	43.2	41.4
08:00-09:00	39.1	45.3	43.2	39.7	45.1	43.2
09:00-10:00	38.6	42.3	40.8	39.4	42.1	41.0
10:00-11:00	41	43.6	42.5	40	44.3	42.7
11:00-12:00	41.3	42.5	41.9	40.3	42.1	41.3
12:00-13:00	42.3	44.9	43.8	41.5	43.1	42.4
13:00-14:00	43.3	45.1	44.3	42.8	44.8	43.9
14:00-15:00	42.1	44.5	43.5	40.6	41.2	40.9
15:00-16:00	40.1	42.3	41.3	41.2	42.3	41.8
16:00-17:00	41.1	43.5	42.5	40.3	42.1	41.3
17:00-18:00	42.1	44.2	43.3	41.5	43.1	42.4
18:00-19:00	40.3	42.1	41.3	42.3	43.5	42.9
19:00-20:00	41.5	43.2	42.4	41	43.1	42.2
20:00-21:00	40.5	42.5	41.6	40.5	42.3	41.5
21:00-22:00	41.2	43.6	42.6	41.3	44.2	43.0
22:00-23:00	38.9	40.1	39.5	40.2	42.1	41.3
23:00-00:00	33.5	35.2	34.4	37.2	39.1	38.3
00:00-01:00	35.2	38.6	37.2	35.1	37.2	36.3
01:00-02:00	33.4	35.6	34.6	34.2	36.4	35.4
02:00-03:00	32.2	36.4	34.8	33.2	35.2	34.3
03:00-04:00	30.2	32.6	31.6	31.2	33.5	32.5
04:00-05:00	32.1	34.5	33.5	30.4	34.6	33.0
05:00-06:00	34.2	36.1	35.3	31	36.4	34.5
Result	Day Means		42.2	Day Means		42.0
	Night Means		34.5	Night Means		34.9
Note: CPCB Norms Residential Area Day Time:55 dB(A); Night Time:45 dB(A) The Noise level in the above location exists within the permissible limits of CPCB.						

End of Report

For Chennai Mettex Lab Private Limited



Reviewed & Authorised by
V. SELVAKUMAR
Technical Manager
Authorised Signatory

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TEST REPORT

ISSUED TO: M/s. A.G. Granites (P) Ltd., (Thiu. M. Ramasamy – Managing Director)

Muthu Gounder Colony, Harur, Dharmapuri District – 636903.

Site Address: S.F. No. 65 (P-1) Kilpachar Village, Thandampattu Taluk,
Tiruvannamalai District, Tamil Nadu.

Test Certificate No : CML/25-26/T100164

Test Certificate Date : 03.01.2026

Sample Description : Ambient Noise Monitoring

Location of Sampling : N7 - Manthikulampatti (School) - 12°5'31.48"N 79°29'38.55"E

Sampling Plan & Procedure: CML/LAB/ENV/SOP/N&L & IS 9989:1981

Sampling Instrument : C/ENV/SLM/003

Location	N7 - Manthikulampatti (school)		
Parameter	Min	Max	Result
Time	dB(A)	dB(A)	dB(A)
06:00-07:00	34.6	40.1	38.2
07:00-08:00	35.8	39.8	38.2
08:00-09:00	37.8	40.5	39.4
09:00-10:00	39.8	41.5	40.7
10:00-11:00	40.8	45.8	44.0
11:00-12:00	42.7	46.8	45.2
12:00-13:00	43.7	48.7	46.9
13:00-14:00	45.8	49.8	48.2
14:00-15:00	46.7	50.8	49.2
15:00-16:00	48.7	51.7	50.5
16:00-17:00	47.8	52.4	50.7
17:00-18:00	43.8	43.5	43.7
18:00-19:00	41.7	44.7	43.5
19:00-20:00	40.9	45.1	43.5
20:00-21:00	39.8	42.8	41.6
21:00-22:00	37.8	41.8	40.2
22:00-23:00	36.7	40.8	39.2
23:00-00:00	35.6	39.8	38.2
00:00-01:00	34.6	38.7	37.1
01:00-02:00	32.8	36.1	34.8
02:00-03:00	33.4	37.8	36.1
03:00-04:00	34.6	38.9	37.3
04:00-05:00	35.6	39.8	38.2
05:00-06:00	33.6	36.7	35.4
Result	Day Means		43.7
	Night Means		36.7

End of Report

For Chennai Mettex Lab Private Limited



Reviewed & Authorised by
V. SELVAKUMAR
Technical Manager
Authorised Signatory

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TEST REPORT

Page No.1 of 2

ISSUED TO : M/s. A.G. Granites (P) Ltd., (Thiu. M. Ramasamy – Managing Director)

Muthu Gounder Colony, Harur,
Dharmapuri District – 636903.

T.C Date : 03.01.2026

T.C No : CML/25-26/T100165

Site Address: S.F. No. 65 (P-1) Kilpachar Village,
Thandampattu Taluk, Tiruvannamalai District, Tamil Nadu.

Date Of Receipt : 20.12.2025

Analysis Commenced On: 20.12.2025

Cust. Ref : SRF Dated : 19.12.2025.

Analysis Completed On : 30.12.2026

Lab No : 2646195/001

Sample Description : Surface Water (SW-1) - Thenpennai River
(as stated by customer)

TEST	PROTOCOL	RESULTS
Discipline: Chemical		Group: Water
Colour	IS 3025 Part 4:2021	5 Hazen
Odour	IS 3025 Part 5:2018	Agreeable
pH at 25°C	IS 3025 Part 11:2022 (electrometric method)	8.02
Conductivity @ 25°C	IS 3025 Part 14:2013	1068 µmhos/cm
Turbidity	IS 3025 Part 10:2023	3 NTU
Total Dissolved Solids	IS 3025 Part 16:2023	630.0 mg/l
Total Hardness as CaCO ₃	IS 3025 Part 21:2009 (EDTA titrimetric method)	204.0 mg/l
Calcium as Ca	IS 3025 Part 40:1991 (EDTA titrimetric method)	48.1 mg/l
Magnesium as Mg	IS 3025 Part 46:2023	20.4 mg/l
Total Alkalinity as CaCO ₃	IS 3025 Part 23:2023	189.5 mg/l
Chloride as Cl	IS 3025 Part 32:1988 (Argentometric Method)	212.3 mg/l
Sulphate as SO ₄	IS 3025 Part 24/Sec 1-2022	42.6 mg/l
Iron as Fe	IS 3025 Part 53:2003 (1,10 phenanthroline method)	0.49 mg/l
Residual Free Chlorine	IS 3025 Part 26:2021	BDL (DL:0.1 mg/l)
Fluoride as F	APHA 24 th Edn. 2023:4500 F,D	0.39 mg/l
Nitrate as NO ₃	IS 3025 Part 34:1988 (Chromotropic acid method)	16.1 mg/l
Copper as Cu	IS 3025 Part 65:2022	BDL (DL:0.01 mg/l)
Manganese as Mn	IS 3025 Part 65:2022	BDL (DL:0.02 mg/l)
Mercury as Hg	IS 3025 Part 65:2022	BDL (DL:0.0005 mg/l)
Cadmium as Cd	IS 3025 Part 65:2022	BDL (DL:0.001 mg/l)
Selenium as Se	IS 3025 Part 65:2022	BDL (DL:0.005 mg/l)

...Contd....2

[Signature]

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Lab No: 2646195/001 T.C No: CML/25-26/T100165 Dated : 03.01.2026

Page No.2 of 2

TEST	PROTOCOL	RESULTS
Aluminium as Al	IS 3025 Part 65:2022	BDL (DL:0.005 mg/l)
Lead as Pb	IS 3025 Part 65:2022	BDL (DL:0.005 mg/l)
Zinc as Zn	IS 3025 Part 65:2022	BDL(DL : 0.05 mg/l)
Total Chromium as Cr	IS 3025 Part 65:2022	BDL(DL : 0.02 mg/l)
Boron as B	IS 3025 Part 65:2022	BDL(DL : 0.05 mg/l)
Mineral Oil	IS 3025 Part 39:2021	BDL(DL : 0.01 mg/l)
Phenolic compounds as C ₆ H ₅ OH	IS 3025 Part 43/Sec 1 - 2022	BDL (DL:0.0005 mg/l)
Anionic Detergents (as MBAS)	IS 3025 Part 68:2019	BDL (DL:0.01 mg/l)
Cyanide as CN	IS 3025 Part 27/Sec 1-2021 (Colorimetric method)	BDL (DL:0.01 mg/l)
BOD @ 27°C for 3 days	IS 3025 Part 44:2023	15.9 mg/l
Chemical Oxygen Demand	IS 3025 Part 58:2023	51.2 mg/l
Dissolved Oxygen	IS 3025 Part 38:1989 (Azide Modification)	7.5 mg/l
Barium as Ba	IS 3025 Part 65:2022	BDL(DL:0.05 mg/l)
Ammonia (as total ammonia-N)	IS 3025 Part 34-1988 (Nesslerization method)	BDL (DL:0.01 mg/l)
Sulphide as H ₂ S	IS 3025 Part 29:2022	BDL (DL:0.01 mg/l)
Molybdenum as Mo	IS 3025 Part 65:2022	BDL (DL:0.02 mg/l)
Total Arsenic as As	IS 3025 Part 65:2022	BDL (DL:0.005 mg/l)
Total Suspended Solids	IS 3025 Part 17 -2022	12.3 mg/l
Discipline: Biological Group: Water		
Total Coliform	APHA 24 th Edn. 2023-9221 B	1600 MPN/100ml
<i>Escherichia coli</i>	APHA 24 th Edn. 2023-9221 F	210 MPN/100ml
Note : APHA – American Public Health Association, BDL – Below Detection Limit, DL – Detection Limit, MPN – Most Probable Number.		

End of Report

For Chennai Mettex Lab Private Limited


Reviewed & Authorised by
G.S. RADHA
Technical Manager
Authorised Signatory




Reviewed & Authorised by
V. SELVAKUMAR
Technical Manager
Authorised Signatory



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TEST REPORT

Page No.1 of 2

ISSUED TO : M/s. A.G. Granites (P) Ltd., (Thiu. M. Ramasamy – Managing Director)

Muthu Gounder Colony, Harur,
Dharmapuri District – 636903.

T.C Date : 03.01.2026

T.C No : CML/25-26/T100166

Site Address: S.F. No. 65 (P-1) Kilpachar Village,
Thandampattu Taluk, Tiruvannamalai District, Tamil Nadu.

Date Of Receipt : 20.12.2025

Analysis Commenced On: 20.12.2025

Cust. Ref : SRF Dated : 19.12.2025.

Analysis Completed On : 30.12.2026

Lab No : 2646195/002

Sample Description : Surface Water (SW-2) – Tank Near Reddiarpalayam
(as stated by customer)

TEST	PROTOCOL	RESULTS
Discipline: Chemical		Group: Water
Colour	IS 3025 Part 4:1983 (Reaff:2017)	6 Hazen
Odour	IS 3025 Part 5:2018	Agreeable
pH at 25°C	IS 3025 Part 11:1983 (Reaff:2017)	7.99
Conductivity @ 25°C	IS 3025 Part 14:2013 (Reaff:2019)	1111.0 µmhos/cm
Turbidity	IS 3025 Part 10:1984 (Reaff:2017)	5 NTU
Total Dissolved Solids	IS 3025 Part 16:1984 (Reaff:2017)	644.0 mg/l
Total Hardness as CaCO ₃	IS 3025 Part 21:2009 (Reaff:2019)	192.0 mg/l
Calcium as Ca	IS 3025 Part 40:1991 (Reaff:2019)	57.7 mg/l
Magnesium as Mg	IS 3025 Part 46:1994 (Reaff:2019)	11.6 mg/l
Total Alkalinity as CaCO ₃	IS 3025 Part 23:1986 (Reaff:2019)	185.2 mg/l
Chloride as Cl	IS 3025 Part 32:1988 (Reaff:2019)	218.6 mg/l
Sulphate as SO ₄	IS 3025 Part 24:1986 (Reaff:2019)	42.1 mg/l
Iron as Fe	IS 3025 Part 53:2003 (Reaff:2019)	0.33 mg/l
Residual Free Chlorine	IS 3025 Part 26:1986 (Reaff:2019)	BDL (DL:0.1 mg/l)
Fluoride as F	APHA 23 rd Edn. 2017:4500 F,D	0.27 mg/l
Nitrate as NO ₃	IS 3025 Part 34:1988 (Reaff:2019)	14.3 mg/l
Copper as Cu	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.01 mg/l)
Manganese as Mn	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.02 mg/l)
Mercury as Hg	USEPA 200.8	BDL (DL:0.0005 mg/l)
Cadmium as Cd	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.001 mg/l)
Selenium as Se	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)

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Lab No: 2646195/002 T.C No: CML/25-26/T100166 Dated : 03.01.2026 Page No.2 of 2

TEST	PROTOCOL	RESULTS
Aluminium as Al	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
Lead as Pb	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
Zinc as Zn	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL : 0.05 mg/l)
Total Chromium as Cr	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL : 0.02 mg/l)
Boron as B	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL : 0.05 mg/l)
Mineral Oil	IS 3025 Part 39-1991 (Reaff. 2019)	BDL (DL : 0.01 mg/l)
Phenolic compounds as C ₆ H ₅ OH	IS 3025 Part 43-1992 (Reaff: 2019)	BDL (DL:0.0005 mg/l)
Anionic Detergents (as MBAS)	IS 13428 – 2005 (Reaff:2019) (Annex K)	BDL (DL:0.01 mg/l)
Cyanide as CN	IS 3025 Part 27-1986 (Reaff. 2019)	BDL (DL:0.01 mg/l)
BOD @ 27°C for 3 days	IS 3025 Part 44:1993 (Reaff:2019)	14.9 mg/l
Chemical Oxygen Demand	IS 3025 Part 58:2006 (Reaff:2017)	46.8 mg/l
Dissolved Oxygen	IS 3025 Part 38:1989 (Reaff:2019)	6.9 mg/l
Barium as Ba	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.05 mg/l)
Ammonia (as total ammonia-N)	IS 3025 Part 34-1988 (Reaff. 2019)	BDL (DL:0.01 mg/l)
Sulphide as H ₂ S	IS 3025 Part 29-1986 (Reaff: 2019)	BDL (DL:0.01 mg/l)
Sulphide as H ₂ S	IS 3025 Part 29-1986 (Reaff: 2019)	BDL (DL:0.01 mg/l)
Molybdenum as Mo	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.02 mg/l)
Total Arsenic as As	IS 3025 Part 65:2014 (Reaff:2019)	BDL (DL:0.005 mg/l)
Total Suspended Solids	IS 3025 Part 17 -1984 (Reaff:2017)	32.4 mg/l
Discipline: Biological Group: Water		
Total Coliform	APHA 23 rd Edn. 2017:9221B	1600 MPN/100ml
<i>Escherichia coli</i>	APHA 23 rd Edn. 2017:9221F	170 MPN/100ml
Note : APHA – American Public Health Association, BDL – Below Detection Limit, DL – Detection Limit, MPN – Most Probable Number.		

End of Report

For Chennai Mettex Lab Private Limited

Reviewed & Authorised by
G.S. RADHA
Technical Manager
Authorised Signatory



Reviewed & Authorised by
V. SELVAKUMAR
Technical Manager
Authorised Signatory

(Signature of V. Selvakumar)



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TEST REPORT

Page No.1 of 2

ISSUED TO : M/s. A.G. Granites (P) Ltd., (Thi. M. Ramasamy – Managing Director)

Muthu Gounder Colony, Harur,
Dharmapuri District – 636903.

T.C Date : 03.p01.2026

T.C No : CML/25-26/T100167

Date Of Receipt : 20.12.2025

Analysis Commenced On: 20.12.2025

Analysis Completed On : 30.12.2026

Site Address: S.F. No. 65 (P-1) Kilpachar Village,
Thandarampattu Taluk, Tiruvannamalai District, Tamil Nadu.

Cust. Ref : SRF Dated : 19.12.2025.

Lab No : 2646195/003

Sample Description : Open Well (OW-1)- Near Project Area
(as stated by customer)

TEST	PROTOCOL	RESULTS
Discipline: Chemical		Group: Water
Colour	IS 3025 Part 4:2021	5 Hazen
Odour	IS 3025 Part 5:2018	Agreeable
pH at 25°C	IS 3025 Part 11:2022 (electrometric method)	7.12
Conductivity @ 25°C	IS 3025 Part 14:2013	975.0 µmhos/cm
Turbidity	IS 3025 Part 10:2023	1 NTU
Total Dissolved Solids	IS 3025 Part 16:2023	565.0 mg/l
Total Hardness as CaCO ₃	IS 3025 Part 21:2009 (EDTA titrimetric method)	160.0 mg/l
Calcium as Ca	IS 3025 Part 40:1991 (EDTA titrimetric method)	36.8 mg/l
Magnesium as Mg	IS 3025 Part 46:2023	16.5 mg/l
Total Alkalinity as CaCO ₃	IS 3025 Part 23:2023	150.1 mg/l
Chloride as Cl	IS 3025 Part 32:1988 (Argentometric Method)	189.8 mg/l
Sulphate as SO ₄	IS 3025 Part 24/Sec 1-2022	41.8 mg/l
Iron as Fe	IS 3025 Part 53:2003 (1,10 phenanthroline method)	0.30 mg/l
Residual Free Chlorine	IS 3025 Part 26:2021	BDL (DL:0.1 mg/l)
Fluoride as F	APHA 24 th Edn. 2023:4500 F,D	0.46 mg/l
Nitrate as NO ₃	IS 3025 Part 34:1988 (Chromotropic acid method)	7.1 mg/l
Copper as Cu	IS 3025 Part 65:2022	BDL (DL:0.01 mg/l)
Manganese as Mn	IS 3025 Part 65:2022	BDL (DL:0.02 mg/l)
Mercury as Hg	IS 3025 Part 65:2022	BDL (DL:0.0005 mg/l)
Cadmium as Cd	IS 3025 Part 65:2022	BDL (DL:0.001 mg/l)
Selenium as Se	IS 3025 Part 65:2022	BDL (DL:0.005 mg/l)

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Lab No: 2646195/003 T.C No: CML/25-26/T100167 Dated : 03.01.2026 Page No.2 of 2

TEST	PROTOCOL	RESULTS
Aluminium as Al	IS 3025 Part 65:2022	BDL (DL:0.005 mg/l)
Lead as Pb	IS 3025 Part 65:2022	BDL (DL:0.005 mg/l)
Zinc as Zn	IS 3025 Part 65:2022	BDL(DL : 0.05 mg/l)
Total Chromium as Cr	IS 3025 Part 65:2022	BDL(DL : 0.02 mg/l)
Boron as B	IS 3025 Part 65:2022	BDL(DL : 0.05 mg/l)
Mineral Oil	IS 3025 Part 39:2021	BDL(DL : 0.01 mg/l)
Phenolic compounds as C ₆ H ₅ OH	IS 3025 Part 43/Sec 1 - 2022	BDL (DL:0.0005 mg/l)
Anionic Detergents (as MBAS)	IS 3025 Part 68:2019	BDL (DL : 0.01 mg/l)
Cyanide as CN	IS 3025 Part 27/Sec 1-2021 (Colorimetric method)	BDL (DL:0.01 mg/l)
Barium as Ba	IS 3025 Part 65:2022	BDL(DL:0.05 mg/l)
Ammonia (as total ammonia-N)	IS 3025 Part 34-1988 (Nesslerization method)	BDL (DL:0.01 mg/l)
Sulphide as H ₂ S	IS 3025 Part 29:2022	BDL (DL:0.01 mg/l)
Molybdenum as Mo	IS 3025 Part 65:2022	BDL (DL:0.02 mg/l)
Total Arsenic as As	IS 3025 Part 65:2022	BDL (DL:0.005 mg/l)
Total Suspended Solids	IS 3025 Part 17 -2022	BDL (DL:1.0 mg/l)
Discipline: Biological		Group: Water
Total Coliform	APHA 24 th Edn. 2023-9221 B	210 MPN/100ml
<i>Escherichia coli</i>	APHA 24 th Edn. 2023-9221 F	< 1.8 MPN/100ml
Note : APHA – American Public Health Association, BDL – Below Detection Limit, DL – Detection Limit, MPN – Most Probable Number, < 1.8 MPN/100ml can be taken as "No Microbial Growth".		

End of Report

For Chennai Mettex Lab Private Limited


Reviewed & Authorised by
G.S. RADHA
Technical Manager
Authorised Signatory




Reviewed & Authorised by
V. SELVAKUMAR
Technical Manager
Authorised Signatory



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TEST REPORT

Page No.1 of 2

ISSUED TO : M/s. A.G. Granites (P) Ltd., (Thiu. M. Ramasamy – Managing Director)

Muthu Gounder Colony, Harur,
Dharmapuri District – 636903.

T.C Date : 03.01.2026

T.C No : CML/25-26/T100168

Site Address: S.F. No. 65 (P-1) Kilpachar Village,
Thandarampattu Taluk, Tiruvannamalai District, Tamil Nadu.

Date Of Receipt : 20.12.2025

Analysis Commenced On: 20.12.2025

Cust. Ref : SRF Dated : 19.12.2025.

Analysis Completed On : 30.12.2026

Lab No : 2646195/004

Sample Description : Open Well (OW- 2)- Beemarapatti
(as stated by customer)

TEST	PROTOCOL	RESULTS
Discipline: Chemical		Group: Water
Colour	IS 3025 Part 4:2021	5 Hazen
Odour	IS 3025 Part 5:2018	Agreeable
pH at 25°C	IS 3025 Part 11:2022 (electrometric method)	7.56
Conductivity @ 25°C	IS 3025 Part 14:2013	961.0 µmhos/cm
Turbidity	IS 3025 Part 10:2023	1 NTU
Total Dissolved Solids	IS 3025 Part 16:2023	557.0 mg/l
Total Hardness as CaCO ₃	IS 3025 Part 21:2009 (EDTA titrimetric method)	168.0 mg/l
Calcium as Ca	IS 3025 Part 40:1991 (EDTA titrimetric method)	41.6 mg/l
Magnesium as Mg	IS 3025 Part 46:2023	15.5 mg/l
Total Alkalinity as CaCO ₃	IS 3025 Part 23:2023	142.8 mg/l
Chloride as Cl	IS 3025 Part 32:1988 (Argentometric Method)	189.8 mg/l
Sulphate as SO ₄	IS 3025 Part 24/Sec 1-2022	44.5 mg/l
Iron as Fe	IS 3025 Part 53:2003 (1,10 phenanthroline method)	0.31 mg/l
Residual Free Chlorine	IS 3025 Part 26:2021	BDL (DL:0.1 mg/l)
Fluoride as F	APHA 24 th Edn. 2023:4500 F,D	0.27 mg/l
Nitrate as NO ₃	IS 3025 Part 34:1988 (Chromotropic acid method)	6.8 mg/l
Copper as Cu	IS 3025 Part 65:2022	BDL (DL:0.01 mg/l)
Manganese as Mn	IS 3025 Part 65:2022	BDL (DL:0.02 mg/l)
Mercury as Hg	IS 3025 Part 65:2022	BDL (DL:0.0005 mg/l)
Cadmium as Cd	IS 3025 Part 65:2022	BDL (DL:0.001 mg/l)
Selenium as Se	IS 3025 Part 65:2022	BDL (DL:0.005 mg/l)

...Contd....,2

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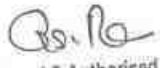
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Lab No: 2646195/004 T.C No: CML/25-26/T100168 Dated : 03.01.2026 Page No.2 of 2

TEST	PROTOCOL	RESULTS
Aluminium as Al	IS 3025 Part 65:2022	BDL (DL:0.005 mg/l)
Lead as Pb	IS 3025 Part 65:2022	BDL (DL:0.005 mg/l)
Zinc as Zn	IS 3025 Part 65:2022	BDL(DL : 0.05 mg/l)
Total Chromium as Cr	IS 3025 Part 65:2022	BDL(DL : 0.02 mg/l)
Boron as B	IS 3025 Part 65:2022	BDL(DL : 0.05 mg/l)
Mineral Oil	IS 3025 Part 39:2021	BDL(DL : 0.01 mg/l)
Phenolic compounds as C ₆ H ₅ OH	IS 3025 Part 43/Sec 1 - 2022	BDL (DL:0.0005 mg/l)
Anionic Detergents (as MBAS)	IS 3025 Part 68:2019	BDL (DL:0.01 mg/l)
Cyanide as CN	IS 3025 Part 27/Sec 1-2021 (Colorimetric method)	BDL (DL:0.01 mg/l)
Barium as Ba	IS 3025 Part 65:2022	BDL(DL:0.05 mg/l)
Ammonia (as total ammonia-N)	IS 3025 Part 34-1988 (Nesslerization method)	BDL (DL:0.01 mg/l)
Sulphide as H ₂ S	IS 3025 Part 29:2022	BDL (DL:0.01 mg/l)
Molybdenum as Mo	IS 3025 Part 65:2022	BDL (DL:0.02 mg/l)
Total Arsenic as As	IS 3025 Part 65:2022	BDL (DL:0.005 mg/l)
Total Suspended Solids	IS 3025 Part 17-2022	BDL (DL:1.0 mg/l)
Discipline: Biological		Group: Water
Total Coliform	APHA 24 th Edn. 2023-9221 B	130 MPN/100ml
<i>Escherichia coli</i>	APHA 24 th Edn. 2023-9221 F	< 1.8 MPN/100ml
Note : APHA – American Public Health Association, BDL – Below Detection Limit, DL – Detection Limit, MPN – Most Probable Number, < 1.8 MPN/100ml can be taken as "No Microbial Growth".		

End of Report

For Chennai Mettex Lab Private Limited


Reviewed & Authorised by
G.S. RADHA
Technical Manager
Authorised Signatory




Reviewed & Authorised by
V. SELVAKUMAR
Technical Manager
Authorised Signatory



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TEST REPORT

Page No.1 of 2

ISSUED TO : M/s. A.G. Granites (P) Ltd., (Thi. M. Ramasamy – Managing Director)

Muthu Gounder Colony, Harur,
Dharmapuri District – 636903.

T.C Date : 03.01.2026

T.C No : CML/25-26/T100169

Site Address: S.F. No. 65 (P-1) Kilpachar Village,
Thandarampattu Taluk, Tiruvannamalai District, Tamil Nadu.

Date Of Receipt : 20.12.2025

Analysis Commenced On: 20.12.2025

Cust. Ref : SRF Dated : 19.12.2025.

Analysis Completed On : 30.12.2026

Lab No : 2646195/005

Sample Description : Bore Well (BW-1) -Near Project Area
(as stated by customer)

TEST	PROTOCOL	RESULTS
Discipline: Chemical		Group: Water
Colour	IS 3025 Part 4:2021	5 Hazen
Odour	IS 3025 Part 5:2018	Agreeable
pH at 25°C	IS 3025 Part 11:2022 (electrometric method)	7.30
Conductivity @ 25°C	IS 3025 Part 14:2013	950.0 µmhos/cm
Turbidity	IS 3025 Part 10:2023	1 NTU
Total Dissolved Solids	IS 3025 Part 16:2023	551.0 mg/l
Total Hardness as CaCO ₃	IS 3025 Part 21:2009 (EDTA titrimetric method)	152.0 mg/l
Calcium as Ca	IS 3025 Part 40:1991 (EDTA titrimetric method)	38.4 mg/l
Magnesium as Mg	IS 3025 Part 46:2023	13.6 mg/l
Total Alkalinity as CaCO ₃	IS 3025 Part 23:2023	137.5 mg/l
Chloride as Cl	IS 3025 Part 32:1988 (Argentometric Method)	185.6 mg/l
Sulphate as SO ₄	IS 3025 Part 24:Sec 1-2022	39.7 mg/l
Iron as Fe	IS 3025 Part 53:2003 (1,10 phenanthroline method)	0.26 mg/l
Residual Free Chlorine	IS 3025 Part 26:2021	BDL (DL:0.1 mg/l)
Fluoride as F	APHA 24 th Edn. 2023:4500 F,D	0.22 mg/l
Nitrate as NO ₃	IS 3025 Part 34:1988 (Chromotropic acid method)	BDL (DL:1.0 mg/l)
Copper as Cu	IS 3025 Part 65:2022	BDL (DL:0.01 mg/l)
Manganese as Mn	IS 3025 Part 65:2022	BDL (DL:0.02 mg/l)
Mercury as Hg	IS 3025 Part 65:2022	BDL (DL:0.0005 mg/l)
Cadmium as Cd	IS 3025 Part 65:2022	BDL (DL:0.001 mg/l)
Selenium as Se	IS 3025 Part 65:2022	BDL (DL:0.005 mg/l)

...Contd....2

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Lab No: 2646195/005 T.C No: CML/25-26/T100169 Dated : 03.01.2026

Page No.2 of 2

TEST	PROTOCOL	RESULTS
Aluminium as Al	IS 3025 Part 65:2022	BDL (DL:0.005 mg/l)
Lead as Pb	IS 3025 Part 65:2022	BDL (DL:0.005 mg/l)
Zinc as Zn	IS 3025 Part 65:2022	BDL (DL : 0.05 mg/l)
Total Chromium as Cr	IS 3025 Part 65:2022	BDL (DL : 0.02 mg/l)
Boron as B	IS 3025 Part 65:2022	BDL (DL : 0.05 mg/l)
Mineral Oil	IS 3025 Part 39:2021	BDL (DL : 0.01 mg/l)
Phenolic compounds as C ₆ H ₅ OH	IS 3025 Part 43/Sec 1 - 2022	BDL (DL:0.0005 mg/l)
Anionic Detergents (as MBAS)	IS 3025 Part 68:2019	BDL (DL:0.01 mg/l)
Cyanide as CN	IS 3025 Part 27/Sec 1-2021 (Colorimetric method)	BDL (DL:0.01 mg/l)
Barium as Ba	IS 3025 Part 65:2022	BDL (DL:0.05 mg/l)
Ammonia (as total ammonia-N)	IS 3025 Part 34-1988 (Nesslerization method)	BDL (DL:0.01 mg/l)
Sulphide as H ₂ S	IS 3025 Part 29:2022	BDL (DL:0.01 mg/l)
Molybdenum as Mo	IS 3025 Part 65:2022	BDL (DL:0.02 mg/l)
Total Arsenic as As	IS 3025 Part 65:2022	BDL (DL:0.005 mg/l)
Total Suspended Solids	IS 3025 Part 17 -2022	BDL (DL:1.0 mg/l)
Discipline: Biological		Group: Water
Total Coliform	APHA 24 th Edn. 2023-9221 B	120 MPN/100ml
<i>Escherichia coli</i>	APHA 24 th Edn. 2023-9221 F	< 1.8 MPN/100ml
Note : APHA – American Public Health Association, BDL – Below Detection Limit, DL – Detection Limit, MPN – Most Probable Number, < 1.8 MPN/100ml can be taken as "No Microbial Growth".		

End of Report

For Chennai Mettex Lab Private Limited


Reviewed & Authorised by
G.S. RADHA
Technical Manager
Authorised Signatory




Reviewed & Authorised by
V. SELVAKUMAR
Technical Manager
Authorised Signatory



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TEST REPORT

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ISSUED TO : M/s. A.G. Granites (P) Ltd., (Thiu. M. Ramasamy – Managing Director)

Muthu Gounder Colony, Harur,
Dharmapuri District – 636903.

T.C Date : 03.01.2026

T.C No : CML/25-26/T100170

Site Address: S.F. No. 65 (P-1) Kilpachar Village,
Thandarampattu Taluk, Tiruvannamalai District, Tamil Nadu.

Date Of Receipt : 20.12.2025

Cust. Ref : SRF Dated : 19.12.2025.

Analysis Commenced On: 20.12.2025

Analysis Completed On : 30.12.2026

Lab No : 2646195/006

Sample Description : Bore Well (BW-2)- Manthikulampatti
(as stated by customer)

TEST	PROTOCOL	RESULTS
Discipline: Chemical		Group: Water
Colour	IS 3025 Part 4:2021	5 Hazen
Odour	IS 3025 Part 5:2018	Agreeable
pH at 25°C	IS 3025 Part 11:2022 (electrometric method)	7.13
Conductivity @ 25°C	IS 3025 Part 14:2013	860.0 µmhos/cm
Turbidity	IS 3025 Part 10:2023	1 NTU
Total Dissolved Solids	IS 3025 Part 16:2023	499.0 mg/l
Total Hardness as CaCO ₃	IS 3025 Part 21:2009 (EDTA titrimetric method)	140.0 mg/l
Calcium as Ca	IS 3025 Part 40:1991 (EDTA titrimetric method)	32.0 mg/l
Magnesium as Mg	IS 3025 Part 46:2023	13.6 mg/l
Total Alkalinity as CaCO ₃	IS 3025 Part 23:2023	123.5 mg/l
Chloride as Cl	IS 3025 Part 32:1988 (Argentometric Method)	156.8 mg/l
Sulphate as SO ₄	IS 3025 Part 24/Sec 1-2022	37.9 mg/l
Iron as Fe	IS 3025 Part 53:2003 (1,10 phenanthroline method)	0.32 mg/l
Residual Free Chlorine	IS 3025 Part 26:2021	BDL (DL:0.1 mg/l)
Fluoride as F	APHA 24 th Edn. 2023:4500 F,D	0.22 mg/l
Nitrate as NO ₃	IS 3025 Part 34:1988 (Chromotropic acid method)	BDL (DL:1.0 mg/l)
Copper as Cu	IS 3025 Part 65:2022	BDL (DL:0.01 mg/l)
Manganese as Mn	IS 3025 Part 65:2022	BDL (DL:0.02 mg/l)
Mercury as Hg	IS 3025 Part 65:2022	BDL (DL:0.0005 mg/l)
Cadmium as Cd	IS 3025 Part 65:2022	BDL (DL:0.001 mg/l)
Selenium as Se	IS 3025 Part 65:2022	BDL (DL:0.005 mg/l)

...Contd....2

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Lab No: 2646195/006 T.C No: CML/25-26/T100170 Dated : 03.01.2026

Page No.2 of 2

TEST	PROTOCOL	RESULTS
Aluminium as Al	IS 3025 Part 65:2022	BDL (DL:0.005 mg/l)
Lead as Pb	IS 3025 Part 65:2022	BDL (DL:0.005 mg/l)
Zinc as Zn	IS 3025 Part 65:2022	BDL(DL : 0.05 mg/l)
Total Chromium as Cr	IS 3025 Part 65:2022	BDL(DL : 0.02 mg/l)
Boron as B	IS 3025 Part 65:2022	BDL(DL : 0.05 mg/l)
Mineral Oil	IS 3025 Part 39:2021	BDL(DL : 0.01 mg/l)
Phenolic compounds as C ₆ H ₅ OH	IS 3025 Part 43/Sec 1 - 2022	BDL (DL:0.0005 mg/l)
Anionic Detergents (as MBAS)	IS 3025 Part 68:2019	BDL (DL:0.01 mg/l)
Cyanide as CN	IS 3025 Part 27/Sec 1-2021 (Colorimetric method)	BDL (DL:0.01 mg/l)
Barium as Ba	IS 3025 Part 65:2022	BDL(DL:0.05 mg/l)
Ammonia (as total ammonia-N)	IS 3025 Part 34-1988 (Nesslerization method)	BDL (DL:0.01 mg/l)
Sulphide as H ₂ S	IS 3025 Part 29-2022	BDL (DL:0.01 mg/l)
Molybdenum as Mo	IS 3025 Part 65:2022	BDL (DL:0.02 mg/l)
Total Arsenic as As	IS 3025 Part 65:2022	BDL (DL:0.005 mg/l)
Total Suspended Solids	IS 3025 Part 17 -2022	BDL (DL:1.0 mg/l)
Discipline: Biological		Group: Water
Total Coliform	APHA 24 th Edn. 2023-9221 B	170 MPN/100ml
Escherichia coli	APHA 24 th Edn. 2023-9221 F	< 1.8 MPN/100ml
Note : APHA – American Public Health Association, BDL – Below Detection Limit, DL – Detection Limit, MPN – Most Probable Number, < 1.8 MPN/100ml can be taken as "No Microbial Growth".		

End of Report

For Chennai Mettex Lab Private Limited


Reviewed & Authorised by
G.S. RADHA
Technical Manager
Authorised Signatory




Reviewed & Authorised by
V. SELVAKUMAR
Technical Manager
Authorised Signatory



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Muthu Gounder Colony, Harur,
Dharmapuri District – 636903.

T.C No : CML/25-26/T100171

Date Of Receipt : 20.12.2025

Cust. Ref : SRF Dated : 19.12.2025.

Analysis Commenced On: 20.12.2025

Lab No : 2646196/001

Analysis Completed On : 30.12.2026

Sample Description : Soil – 1 – Core Zone - Project Area
(as stated by customer)

S. No	Test Parameters	Protocols	Results
01	pH @ 25°C	IS 2720 Part 26 - 1987 (Reaff:2016)	7.10
02	Conductivity @ 25°C	IS 14767 - 2000 (Reaff : 2016)	261 µmhos/cm
03	Texture :		
	Clay	Gravimetric Method	27.7 %
	Sand		37.1 %
	Silt		35.2 %
04	Water Holding Capacity	By Gravimetric Method	42.3 %
05	Bulk Density	By Cylindrical Method	1.02 g/cm ³
06	Porosity	By Gravimetric Method	39.1 %
07	Calcium as Ca	USEPA 3050 B – 1996 & USEPA 6010 C - 2000	57.8 mg/kg
08	Magnesium as Mg		23.6 mg/kg
09	Manganese as Mn		28.3 mg/kg
10	Zinc as Zn		1.37 mg/kg
11	Boron as B		1.03 mg/kg
12	Chloride as Cl	APHA 23 rd Edn 2019 4500 Cl B	178 mg/kg
13	Total Soluble Sulphate as SO ₄	IS 2720 Part 27 : 1977 (Reaff:2015)	0.02 %
14	Potassium as K	USEPA 3050 B – 1996 & USEPA 6010 C - 2000	22.1 mg/kg
15	Total Phosphorus as P	IS 10158 : 1982 (Stannous chloride method)	1.29 mg/kg
16	Total Nitrogen as N	IS 14684 : 1999	218 mg/kg
17	Cadmium as Cd	USEPA 3050 B – 1996 & USEPA 6010 C - 2000	BDL (DL : 1.0 mg/kg)
18	Total Chromium as Cr		BDL (DL : 1.0 mg/kg)
19	Copper as Cu		BDL (DL : 1.0 mg/kg)
20	Lead as Pb		1.06 mg/kg
21	Iron as Fe		6.63 mg/kg
22	Organic Matter	IS : 2720 Part 22: 1972	2.03 %
23	Organic Carbon	Methods of analysis of soils, plants, waters and fertilizers by HLS Tandon	1.18 %
24	Cation Exchange Capacity	USEPA 9080 – 1986	26.9 meq/100g of soil

End of Report

For Chennai Mettlex Lab Private Limited

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ISSUED TO : M/s. A.G. Granites (P) Ltd., (Thiu. M. Ramasamy – Managing Director)

Muthu Gounder Colony, Harur,
Dharmapuri District – 636903.

T.C Date : 03.01.2026

T.C No : CML/25-26/T100172

Site Address: S.F. No. 65 (P-1) Kilpachar Village,
Thandarampattu Taluk, Tiruvannamalai District, Tamil Nadu.

Date Of Receipt : 20.12.2025

Analysis Commenced On: 20.12.2025

Cust. Ref : SRF Dated : 19.12.2025.

Analysis Completed On : 30.12.2026

Lab No : 2646196/002

Sample Description : Soil – 2 -Kilpasar (Agriculture Land)
(as stated by customer)

S. No	Test Parameters	Protocols	Results
01	pH @ 25°C	IS 2720 Part 26 - 1987 (Reaff:2016)	6.8
02	Conductivity @ 25°C	IS 14767 - 2000 (Reaff : 2016)	245 µmhos/cm
03	Texture :		
	Clay	Gravimetric Method	28.3 %
	Sand		37.8 %
	Silt		33.9 %
04	Water Holding Capacity	By Gravimetric Method	44.1%
05	Bulk Density	By Cylindrical Method	0.99 g/cm ³
06	Porosity	By Gravimetric Method	46.7 %
07	Calcium as Ca	USEPA 3050 B – 1996 & USEPA 6010 C - 2000	50.7 mg/kg
08	Magnesium as Mg		25.9 mg/kg
09	Manganese as Mn		21.3 mg/kg
10	Zinc as Zn		2.61 mg/kg
11	Boron as B		3.62 mg/kg
12	Chloride as Cl	APHA 23 rd Edn 2019 4500 Cl B	98.0 mg/kg
13	Total Soluble Sulphate as SO ₄	IS 2720 Part 27 : 1977 (Reaff:2015)	0.016 %
14	Potassium as K	USEPA 3050 B – 1996 & USEPA 6010 C - 2000	26.8 mg/kg
15	Total Phosphorus as P	IS 10158 : 1982 (Stannous chloride method)	2.72 mg/kg
16	Total Nitrogen as N	IS 14684 : 1999	399 mg/kg
17	Cadmium as Cd	USEPA 3050 B – 1996 & USEPA 6010 C - 2000	BDL (DL : 1.0 mg/kg)
18	Total Chromium as Cr		BDL (DL : 1.0 mg/kg)
19	Copper as Cu		BDL (DL : 1.0 mg/kg)
20	Lead as Pb		1.22 mg/kg
21	Iron as Fe		7.21 mg/kg
22	Organic Matter	IS : 2720 Part 22: 1972	2.60 %
23	Organic Carbon	Methods of analysis of soils, plants, waters and fertilizers by HLS Tandon	1.51 %
24	Cation Exchange Capacity	USEPA 9080 – 1986	27.8 meq/100g of soil

End of Report

For Chennai Mettex Lab Private Limited



Reviewed & Authorised by
V. SELVAKUMAR
Technical Manager

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ISSUED TO : M/s. A.G. Granites (P) Ltd., (Thiu. M. Ramasamy – Managing Director)

Muthu Gounder Colony, Harur,
Dharmapuri District – 636903.

T.C Date : 03.01.2026

T.C No : CML/25-26/T100173

Site Address: S.F. No. 65 (P-1) Kilpachar Village,
Thandarampattu Taluk, Tiruvannamalai District, Tamil Nadu.

Date Of Receipt : 20.12.2025

Cust. Ref : SRF Dated : 19.12.2025.

Analysis Commenced On: 20.12.2025

Lab No : 2646196/003

Analysis Completed On : 30.12.2026

Sample Description : Soil – 3 – Melpasar (Agriculture Land)
(as stated by customer)

S. No	Test Parameters	Protocols	Results
01	pH @ 25°C	IS 2720 Part 26 - 1987 (Reaff:2016)	6.89
02	Conductivity @ 25°C	IS 14767 - 2000 (Reaff : 2016)	229 µmhos/cm
03	Texture :		
	Clay	Gravimetric Method	29.8 %
	Sand		39.5 %
	Silt		30.7 %
04	Water Holding Capacity	By Gravimetric Method	46.5 %
05	Bulk Density	By Cylindrical Method	0.99 g/cm ³
06	Porosity	By Gravimetric Method	35.7 %
07	Calcium as Ca	USEPA 3050 B – 1996 & USEPA 6010 C - 2000	46.6 mg/kg
08	Magnesium as Mg		20.8 mg/kg
09	Manganese as Mn		19.6 mg/kg
10	Zinc as Zn		2.45 mg/kg
11	Boron as B		1.17 mg/kg
12	Chloride as Cl	APHA 23 rd Edn 2019 4500 Cl B	83.8 mg/kg
13	Total Soluble Sulphate as SO ₄	IS 2720 Part 27 : 1977 (Reaff:2015)	0.023 %
14	Potassium as K	USEPA 3050 B – 1996 & USEPA 6010 C - 2000	18.7 mg/kg
15	Total Phosphorus as P	IS 10158 : 1982 (Stannous chloride method)	5.13 mg/kg
16	Total Nitrogen as N	IS 14684 : 1999	325 mg/kg
17	Cadmium as Cd	USEPA 3050 B – 1996 & USEPA 6010 C - 2000	BDL (DL : 1.0 mg/kg)
18	Total Chromium as Cr		BDL (DL : 1.0 mg/kg)
19	Copper as Cu		BDL (DL : 1.0 mg/kg)
20	Lead as Pb		1.03 mg/kg
21	Iron as Fe		6.98 mg/kg
22	Organic Matter	IS : 2720 Part 22: 1972	2.37 %
23	Organic Carbon	Methods of analysis of soils, plants, waters and fertilizers by HLS Tandon	1.38 %
24	Cation Exchange Capacity	USEPA 9080 – 1986	26.9 meq/100g of soil

End of Report

For Chennai Mettex Lab Private Limited



V. Selvaraj

Reviewed & Authorised by

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ISSUED TO : M/s. A.G. Granites (P) Ltd., (Thiu. M. Ramasamy – Managing Director)

Muthu Gounder Colony, Harur,
Dharmapuri District – 636903.

T.C Date : 03.01.2026

T.C No : CML/25-26/T100174

Site Address: S.F. No. 65 (P-1) Kilpachar Village,
Thandarampattu Taluk, Tiruvannamalai District, Tamil Nadu.

Date Of Receipt : 20.12.2025

Analysis Commenced On: 20.12.2025

Cust. Ref : SRF Dated : 19.12.2025.

Analysis Completed On : 30.12.2026

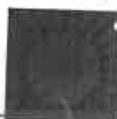
Lab No : 2646196/004

Sample Description : Soil – Reddiyarpalayam (Agriculture land)
(as stated by customer)

S. No	Test Parameters	Protocols	Results
01	pH @ 25°C	IS 2720 Part 26 - 1987 (Reaff:2016)	6.25
02	Conductivity @ 25°C	IS 14767 - 2000 (Reaff : 2016)	371.0 µmhos/cm
03	Texture :		
	Clay	Gravimetric Method	30.0 %
	Sand		36.2 %
	Silt		33.8 %
04	Water Holding Capacity	By Gravimetric Method	47.8 %
05	Bulk Density	By Cylindrical Method	0.98 g/cm ³
06	Porosity	By Gravimetric Method	41.3 %
07	Calcium as Ca	USEPA 3050 B – 1996 & USEPA 6010 C - 2000	47.6 mg/kg
08	Magnesium as Mg		26.6 mg/kg
09	Manganese as Mn		27.7 mg/kg
10	Zinc as Zn		6.78 mg/kg
11	Boron as B		2.32 mg/kg
12	Chloride as Cl	APHA 23 rd Edn 2019 4500 Cl B	161.8 mg/kg
13	Total Soluble Sulphate as SO ₄	IS 2720 Part 27 : 1977 (Reaff:2015)	0.024 %
14	Potassium as K	USEPA 3050 B – 1996 & USEPA 6010 C - 2000	29.3 mg/kg
15	Total Phosphorus as P	IS 10158 : 1982 (Stannous chloride method)	5.24 mg/kg
16	Total Nitrogen as N	IS 14684 : 1999	486.5 mg/kg
17	Cadmium as Cd	USEPA 3050 B – 1996 & USEPA 6010 C - 2000	BDL (DL : 1.0 mg/kg)
18	Total Chromium as Cr		BDL (DL : 1.0 mg/kg)
19	Copper as Cu		BDL (DL : 1.0 mg/kg)
20	Lead as Pb		1.57 mg/kg
21	Iron as Fe		7.21 mg/kg
22	Organic Matter	IS : 2720 Part 22: 1972	3.46 %
23	Organic Carbon	Methods of analysis of soils, plants, waters and fertilizers by HLS Tandon	2.01 %
24	Cation Exchange Capacity	USEPA 9080 – 1986	32.9 meq/100g of soil

End of Report

For Chennai Mettex Lab Private Limited



Reviewed & Authorised by

M. SELVAKUMAR

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ISSUED TO : M/s. A.G. Granites (P) Ltd., (Thiu. M. Ramasamy – Managing Director)

Muthu Gounder Colony, Harur,
 Dharmapuri District – 636903.

T.C Date : 03.01.2026

T.C No : CML/25-26/T100175

Date Of Receipt : 20.12.2025

Analysis Commenced On: 20.12.2025

Analysis Completed On : 30.12.2026

Site Address: S.F. No. 65 (P-1) Kilpachar Village,
 Thandampattu Taluk, Tiruvannamalai District, Tamil Nadu.

Cust. Ref : SRF Dated : 19.12.2025.

Lab No : 2646196/005

Sample Description : Soil – 5 Beemarapatti (Residential Land)
 (as stated by customer)

S. No	Test Parameters	Protocols	Results
01	pH @ 25°C	IS 2720 Part 26 - 1987 (Reaff:2016)	6.93
02	Conductivity @ 25°C	IS 14767 - 2000 (Reaff : 2016)	295 µmhos/cm
03	Texture :		
	Clay	Gravimetric Method	28.3 %
	Sand		37.9%
	Silt		33.8%
04	Water Holding Capacity	By Gravimetric Method	46.6 %
05	Bulk Density	By Cylindrical Method	1.32 g/cm ³
06	Porosity	By Gravimetric Method	42.2 %
07	Calcium as Ca	USEPA 3050 B – 1996 & USEPA 6010 C - 2000	44.2 mg/kg
08	Magnesium as Mg		22.5 mg/kg
09	Manganese as Mn		22.8 mg/kg
10	Zinc as Zn		2.36 mg/kg
11	Boron as B		1.14/kg
12	Chloride as Cl	APHA 23 rd Edn 2019 4500 Cl B	106 mg/kg
13	Total Soluble Sulphate as SO ₄	IS 2720 Part 27 : 1977 (Reaff:2015)	0.014 %
14	Potassium as K	USEPA 3050 B – 1996 & USEPA 6010 C - 2000	28.7 mg/kg
15	Total Phosphorus as P	IS 10158 : 1982 (Stannous chloride method)	2.61 mg/kg
16	Total Nitrogen as N	IS 14684 : 1999	262.8 mg/kg
17	Cadmium as Cd	USEPA 3050 B – 1996 & USEPA 6010 C - 2000	BDL (DL : 1.0 mg/kg)
18	Total Chromium as Cr		BDL (DL : 1.0 mg/kg)
19	Copper as Cu		BDL (DL : 1.0 mg/kg)
20	Lead as Pb		1.97 mg/kg
21	Iron as Fe		5.03 mg/kg
22	Organic Matter	IS : 2720 Part 22: 1972	2.51 %
23	Organic Carbon	Methods of analysis of soils, plants, waters and fertilizers by HLS Tandon	1.46 %
24	Cation Exchange Capacity	USEPA 9080 – 1986	26.1 meq/100g of soil

End of Report

For Chennai Mettex Lab Private Limited



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V. SELVAKUMAR

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ISSUED TO : M/s. A.G. Granites (P) Ltd., (Thi. M. Ramasamy – Managing Director)

Muthu Gounder Colony, Harur,
Dharmapuri District – 636903.

T.C Date : 03.01.2026

T.C No : CML/25-26/T100176

Site Address: S.F. No. 65 (P-1) Kilpachar Village,
Thandarampattu Taluk, Tiruvannamalai District, Tamil Nadu.

Date Of Receipt : 20.12.2025

Analysis Commenced On: 20.12.2025

Cust. Ref : SRF Dated : 19.12.2025.

Analysis Completed On : 30.12.2026

Lab No : 2646196/006

Sample Description : Soil – 6 Manthikulampatti (Barren Land)
(as stated by customer)

S. No	Test Parameters	Protocols	Results
01	pH @ 25°C	IS 2720 Part 26 - 1987 (Reaff:2016)	6.62
02	Conductivity @ 25°C	IS 14767 - 2000 (Reaff : 2016)	270 µmhos/cm
03	Texture :		
	Clay	Gravimetric Method	30.1 %
	Sand		36.9 %
	Silt		33.1 %
04	Water Holding Capacity	By Gravimetric Method	39.9 %
05	Bulk Density	By Cylindrical Method	1.04 g/cm³
06	Porosity	By Gravimetric Method	37.8 %
07	Calcium as Ca	USEPA 3050 B – 1996 & USEPA 6010 C - 2000	71.6 mg/kg
08	Magnesium as Mg		30.1 mg/kg
09	Manganese as Mn		25.9 mg/kg
10	Zinc as Zn		3.23 mg/kg
11	Boron as B		1.37 mg/kg
12	Chloride as Cl	APHA 23 rd Edn 2019 4500 Cl B	99. mg/kg
13	Total Soluble Sulphate as SO ₄	IS 2720 Part 27 : 1977 (Reaff:2015)	0.019 %
14	Potassium as K	USEPA 3050 B – 1996 & USEPA 6010 C - 2000	25.7 mg/kg
15	Total Phosphorus as P	IS 10158 : 1982 (Stannous chloride method)	2.21 mg/kg
16	Total Nitrogen as N	IS 14684 : 1999	312.7 mg/kg
17	Cadmium as Cd	USEPA 3050 B – 1996 & USEPA 6010 C - 2000	BDL (DL : 1.0 mg/kg)
18	Total Chromium as Cr		BDL (DL : 1.0 mg/kg)
19	Copper as Cu		BDL (DL : 1.0 mg/kg)
20	Lead as Pb		1.27 mg/kg
21	Iron as Fe		7.98 mg/kg
22	Organic Matter	IS : 2720 Part 22: 1972	2.27 %
23	Organic Carbon	Methods of analysis of soils, plants, waters and fertilizers by HLS Tandon	1.32 %
24	Cation Exchange Capacity	USEPA 9080 – 1986	26.7 meq/100g of soil

End of Report

For Chennai Mettex Lab Private Limited



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V. SELVAKUMAR

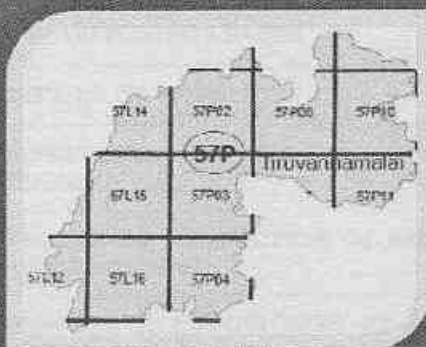
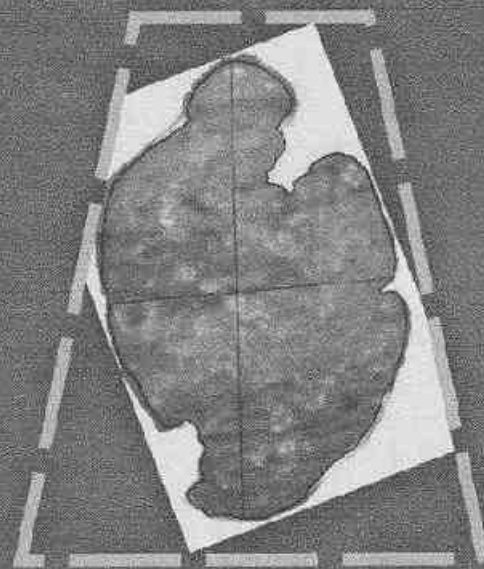
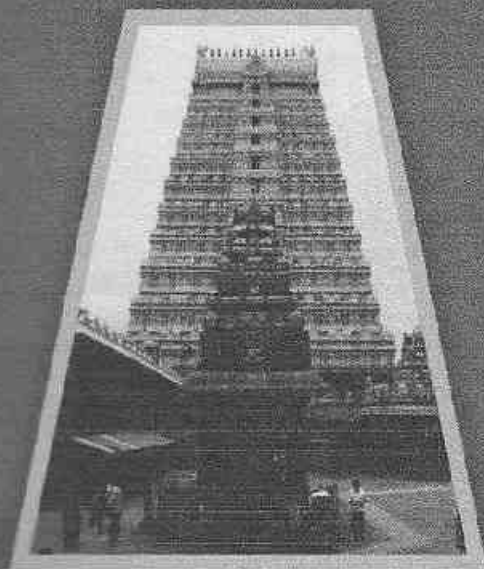
Technical Manager

Authorized Signatory

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DISTRICT MINERAL SURVEY REPORT

TIRUVANNAMALAI DISTRICT



GEOLOGICAL SURVEY OF INDIA
SU- TAMIL NADU & PUDUCHERRY
CHENNAI - 31

MARCH - 2019

GOVERNMENT OF TAMIL NADU
DEPARTMENT OF GEOLOGY &
MINING, TIRUVANNAMALAI

[Signature]
Assistant Director
Dept. of Geology & Mining
Tiruvannamalai District

[Signature]
COLLECTOR,
Tiruvannamalai District
Tiruvannamalai.

**DISTRICT MINERAL SURVEY REPORT
TIRUVANNAMALAI DISTRICT**

by

**Geological Survey of India
State Unit : Tamil Nadu & Puducherry
Chennai**

in collaboration with

**Government of Tamil Nadu
Department of Geology & Mining
Tiruvannamalai**

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1. INTRODUCTION

Geologically Tiruvannamalai District mainly comprises of rocks of Archaeon age. The type of rocks found in the district are Charnockite, Granitic gneiss, Epidote Hornblende Gneiss, Amphibolite, Pyroxenite, Dunite, Migmatites, Banded Magnetite Quartzite, Shale and Clay. Dolerite dykes (Black Granite) are also noticed cutting across the country rocks.

The need of the minor minerals particularly for infrastructural development of Individuals as well as for the Government is increasing day by day rapidly, accordingly the mining of minor minerals, is also developing vigorously. However, each entity looking for a good environment for their habitat.

To assure the same a committee named **DEIAA** (District Level Environment Impact Assessment Authority) is formed, principally for a safe and careful minor mineral mining without leaving any major impact to the environment. With the objective to generate the “District Survey Report” for Tiruvannamalai District a twenty one days collaborative field work was carried out by Geological Survey of India, State Unit: Tamil Nadu & Puducherry, and Dept. of Geology and Mining, Tiruvannamalai District to locate minor minerals, along with mining activities in the district.

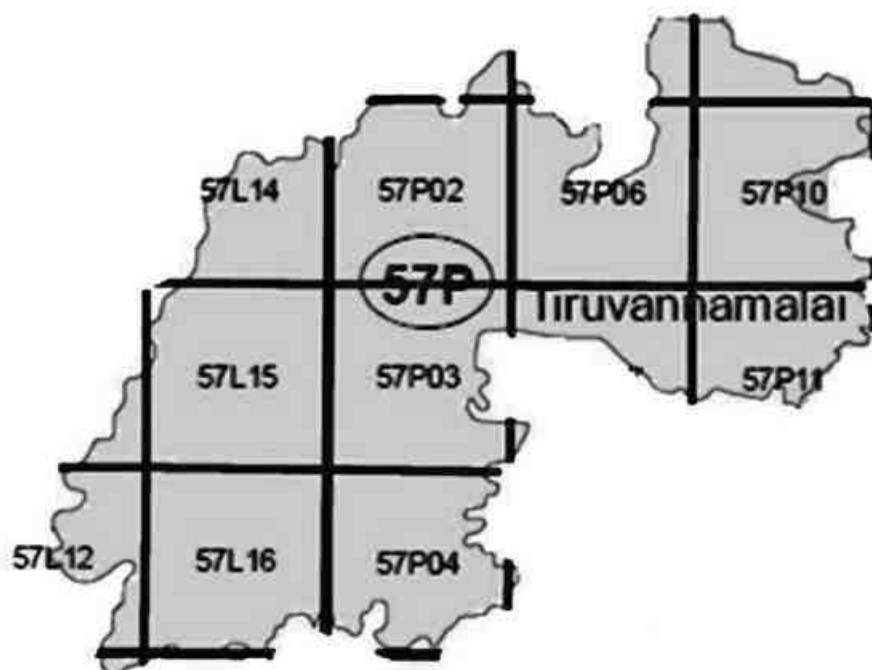


Fig.1.1 Toposheet in Tiruvannamalai District

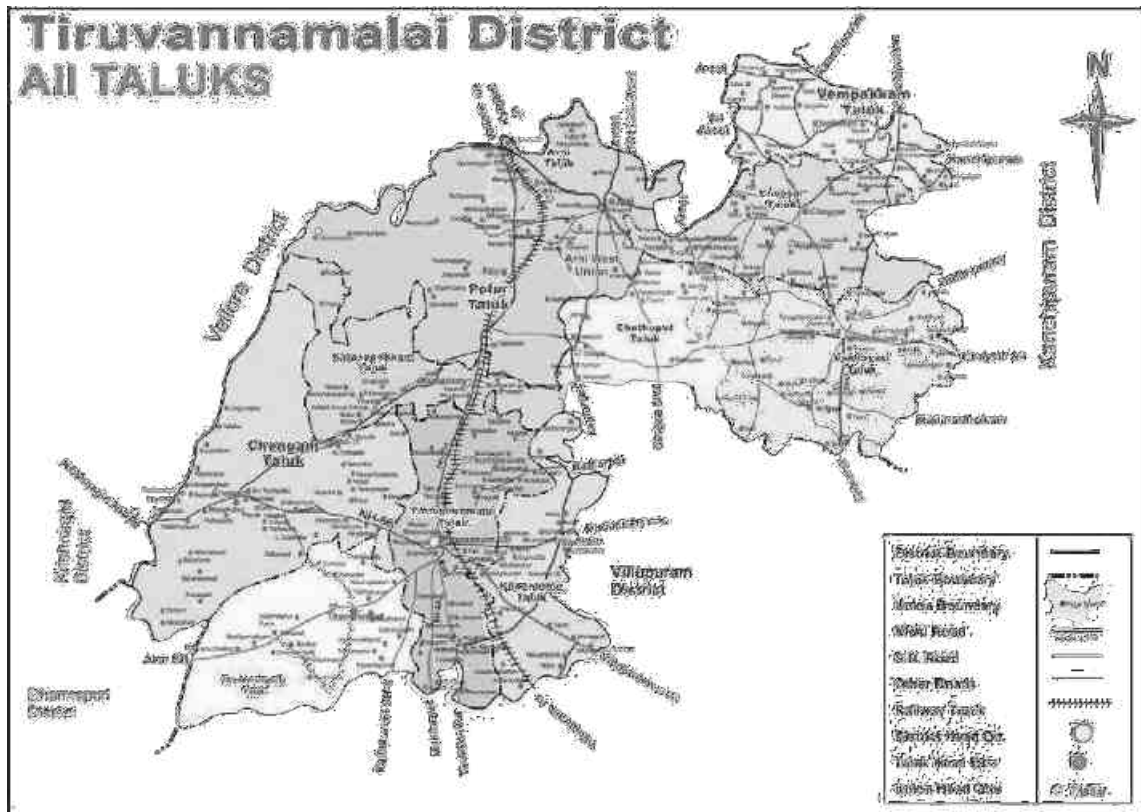


Fig.1.2 Tiruvannamalai District (Taluk wise)

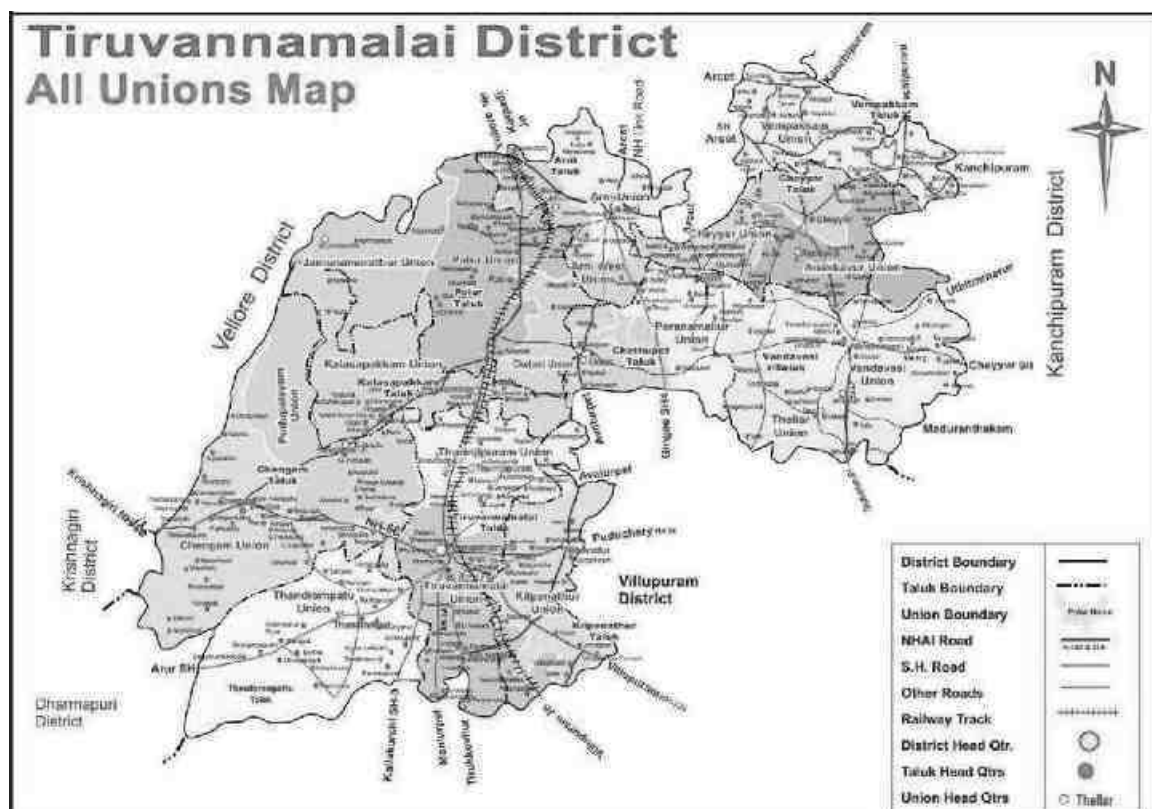


Fig.1.3 All Union Map, Tiruvannamalai District

2. OVERVIEW OF MINING ACTIVITY IN THE DISTRICT

The mineral base is found to be spread across for the district. It is one of the most important factors for the industrial development of the area. Tiruvannamalai district is enriched in with minerals deposit like Black Granite, Multi colored Granite, Blue metal, Earth and Brick Clay.

Private companies play a major role in mining activity, where as the Government agencies like TAMIN take part in mining dimension stones only. The major minerals like PGE, Gold and Iron Ore are reported in the district. This area has to be investigated by Geological Survey of India for mineral exploration purpose in detail. Steatite (Soapstone), Magnesite and Pink Granite are available in and around the reserve forest are to be considered for mining purpose.

3.LIST OF MINING LEASES
TIRUVANNAMALAI TALUK – GOVERNMENT LAND

Sl. No.	Name of the Mineral	Name & Address of the Lessee	Taluk & Village	SF. No & Extent	Lease Period	File No.	Classification
1	Rough Stone	P.Adimoolam, 57A, Tamizhnagar, Tiruavannamalai taluk	Tiruvannamalai Iynkunam	135 (Part 4), 1.00.0 hectares	01.7.2009 to 30.6.2019	130/K2/2009	Government Land – Rule 8
2	Rough Stone	D.Jaiganesh, Vettavalam village, Tiruvannnamalai taluk	Tiruvannamalai Vettavalam	230/4 (Part 2) 1.00.0 hectares	10.11.2009 to 09.11.2019	614/K2/2009	
3	Rough Stone	H.Rajaram, Polur Main Road, Tiruvannamalai.	Tiruvannamalai Veraiyur	21 (Part 2), 2.00.0 Hect.	08.03.2010 to 07.03.2020	39/K2/2010	
4	Rough Stone	A.Murugesan, Nachanandhal Tiruvannamalai.	Tiruvannamalai Pavupattu	6/1 (Part 5), 1.00.0 hectares	05.4.2010 to 04.4.2020	22/K2/2010	
5	Rough Stone	R.Singaram, Thenimalai, Tiruvannamalai	Tiruvannamalai Athipadi	45/2C (Part 5), 1.00.0 hectares	05.4.2010 to 04.4.2020	73/K2/2010	

Sl. No.	Name of the Mineral	Name & Address of the Lessee	Taluk & Village	SF. No & Extent	Lease Period	File No.	Classification
6	Rough Stone	A.Nakkeeran, 3, Kardukarar Street, Vettavalam	Tiruvannamalai Vettavalam	249/5 0.77.0 Hectare	10.5.2010 to 09.5.2020	636/K2/2009	Government Land - Rule 8
7	Rough Stone	R.Arul, Melanandahal Village, Tirukovilur Taluk.	Tiruvannamalai Athipadi	45/2C (Part 1), 1.00.0 hectares	13.5.2010 to 12.5.2020	40/K2/2010	
8	Rough Stone	N.Suresh, 25/73, Ayyankula Street, Tiruvannamalai	Tiruvannamalai Meyyur	194/2 (P), 2.00.0 hectares	16.12.2010 to 15.12.2020	43/K2/2010	
9	Rough Stone	M.Selvaraj, Chengam Road, Tiruvannamalai.	Adaiyur Tiruvannamalai	91/2A (Part), 1.00.0 Hect.	16.12.2010 to 15.12.2020	74/K2/2010	
10	Rough Stone	S.Prasanth, Chengam Road, Tiruvannamalai	Tiruvannamalai Adaiyur	91/2A (Part), 0.96.5 hect.	23.12.2010 to 22.12.2020	75/K2/2010	
11	Rough Stone	S.Senthilkumar, 10, Kardukarar Street, Vettavalam.	Tiruvannamalai Vettavalam	83, 1.23.5 hectares	24.12.2010 to 23.12.2020	168/K2/2010	
12	Rough Stone	K.Thirumal, Perayampattu post and Village, Tandarampet	Tiruvannamalai Athipadi	45/2C (Part 4), 1.30.0 hectare	01.3.2011 to 28.2.2021	72/K2/2010	

Sl. No.	Name of the Mineral	Name & Address of the Lessee	Taluk & Village	SF. No & Extent	Lease Period	File No.	Classification
13	Rough Stone	N. Harijayashree, 18/7, Vadamathathi St., Tiruvannamalai	Vallivagai Tiruvannamalai	111/2 4.00.0 hectares	28.04.2012 to 27.04.2022	57/K/2012	Government Land – Rule 8
14	Rough Stone	R.Karthikeyan 23/29, Lakshmipuram, Gandhi Nagar, Tiruvannamalai-2.	Tiruvannamalai Iynkunam	135 (part 3) 1.00.0 Hect.	20.04.2011 to 19.04.2021	483/K2/2009	
15	Rough Stone	R.Sekar, S/o. Ramasamy, Mel ChinnaGoundanpatti, Tharamangalam Village, Omalur Taluk, Salem Dt.	Tiruvannamalai Koothalavadi	94/1 (part) 1.00.0 Hect.	12.09.2017 to 11.09.2022	47/K2/2015	

TIRUVANNAMALAI TALUK – PATTA LAND

Sl. No.	Name of the Mineral	Name & Address of the Lessee	Taluk & Village	SF. No & Extent	Lease Period	File No.	Classification
1	Rough Stone	P.Vinayagamoorthi, Ramana Nagar, Tiruvannamalai	Tiruvannamalai Pavitharam	4/7 0.75.5 Hect	02.03.2016 to 01.03.2021	104/K2/2015	Patta Land

CHENGAM TALUK – GOVERNMENT LAND

Sl. No.	Name of the Mineral	Name & Address of Lessee	Taluk & Village	SF.Nos. & Extent (in Hects.)	Lease Period	File No	Classification
1	Rough Stone	R.Durai Tandrampet Village, Chengam	Chengam Porasapattu	134/B (Part) 2.00.0	31.03.2009 to 30.03.2019	Rc.No.287/K2/2008	Government Land – Rule 8
2	Rough Stone	S.Vasanthkumari Uchimalaikuppam Chengam	Chengam Uchimalaikuppam	39/9 (0.27.5), 39/11 (0.35.0) 1.35.5	12.04.2010 to 11.04.2020	Rc.No.621/K2/2009	
3	Rough Stone	K.Durai 1/2, Ramalinganar Street, Tiruvannamalai	Chengam Paliapattu	58 (Part1) 1.00.0	05.05.2010 to 04.05.2020	Rc.No.27/K2/2010	
4	Rough Stone	R.Jeevanantham, 50, Avarangaatu Street, Tiruvannamalai	Chengam Chinnakolapadi	39/1 (Part2) 2.00.0	13.05.2010 to 12.05.2020	Rc.No.24/K2/2010	
5	Rough Stone	R.M.Jayavelu Chengam Road, Tiruvannamalai	Chengam Paliapattu	58/3 (Part-1) 1.50.0	03.11.2010 to 02.11.2020	Rc.No.28/K2/2010	
6	Rough Stone	M.Palani 6, Peygopuram St., Tiruvannamalai	Chengam Periyakolapadi	105/1 (Part-1A) 0.50.0	12.01.2016 to 11.01.2026	Rc.No.15/K2/2011	

Sl. No.	Name of the Mineral	Name & Address of the Lessee	Taluk & Village	SF. No & Extent	Lease Period	File No.	Classification
7	Rough Stone	Sadhaknawas, No. 25, 3rd Street, Valace Garden, Chennai-6.	Chengam Periyakolapadi	105/1 (Part-1)0.50.0	12.01.2016 to 11.01.2021	Rc.No.14/K2/2011	Government Land - Rule 8
8	Rough Stone	Tmt.S.Kanimozhi /o.Shanmugam, No.152, Old St, Avoor Village, Tiruvannamalai	Chengam Periyakolapadi	105/1 (Part-4) 1.00.0	28.07.2016 to 27.07.2021	Rc.No.48/K2/2015	

CHENGAM TALUK - PATTA LAND

Sl. No.	Name of the Mineral	Name & Address of Lessee	Taluk & Village	SF.Nos. & Extent (in Hects.)	Lease Period	File No	Classification
1	Gravel	K.Bakthavachalam, S/o. Kuppusamy Gounder, Pudhupattu Village, Chengam Taluk.	Chengam Paramananthai	294/1 (Part) 1.21.5	24.05.2018 to 23.05.2019	Rc.No.121/K2/2016	Patta Land

POLUR TALUK – GOVERNMENT LAND

Sl.No.	Name of the Mineral	Name & Address of Lessee	Taluk & Village	SF.Nos. & Extent (in Hects.)	Lease Period	File No	Classification
1	Rough Stone	M.Julia W/o. Mariyaselvam, 180, Vambalur Road, Tirumalai village, Polur taluk	Polur taluk Tirumalai	507/1A (Part A), 2.00.0 hect.	22.6.2009 to 21.6.2019	231/K2/2009	Government Land – Rule 8
2	Rough Stone	K.C.Chinnakuzhandai, Kuppam village, Polur taluk.	Polur taluk Vadamadhimangalam Village	158/6, 2.89.0 hectares	16.12.2010 to 15.12.2020	628/K2/2009	
3	Rough Stone	M.Parthiban, 27/A, Vengadathan street, Polur taluk & village.	Polur taluk Pudhupalayam	224/1 (Part A), 1.00.0 Hect.	24.12.2010 to 23.12.2020	136/K2/2010	
4	Rough Stone	R.Kumar, Kil Arsampattu village, Vellore TK & DT.	Polur Taluk Kuppam Village	140/1, 1.02.5 hect.	17.3.2011 to 16.3.2021	135/K2/2010	
5	Rough Stone	R.Kumar Kil-Arasampattu Vge., Vellore Taluk.	Polur Taluk Kuppam Village	53 (Part-2) 2.00.0	25.5.2012 to 24.5.2022	21/K2/2011	
6	Rough Stone	S.Rajakumar S/o.Subaramani 2/57, Pillaiyar koil st, Kalasapakkam.	Vasur village, Polur Taluk.	97/1A1 2.00.0 hectares	21.07.2016 to 20.07.2021	50/K/2015	
7	Rough Stone	E.Sivakumar, S/o Elumalai, No.20.26.J.30, VRS Nagar,Govindasamy street,Polur.	Pudupalayam Village Polur Taluk.	224/1 (Part-2) 2.00.0 hectares	21.07.2016 to 20.07.2021	51/K/2015	

Polur Patta Land

Sl.No.	Name of the Mineral	Name & Address of Lessee	Taluk & Village	SF.Nos. & Extent (in Hects.)	Lease Period	File No	Classification
1	Gravel	M.Vasudevan, S/o. Masilamani, Naganadhi village, Kollaimedu, Vellore Taluk & District.	Kalpattu Village Polur Taluk.	28/4A,4B 1.21.5 hectares	24.05.2018 to 23.05.2019	83/K/2016	Patta Land
2	Rough Stone	Thiru.K.S.BABURAJ, No.12/14,3rd Cross Street, Karpagam Garden, Adayar, chennai -20	Kasthambadi Village, Polur Taluk	634/2, 635/10 1.66.0 hect	14.11.2018 to 13.11.2023	101/Kanimam/2018	

THANDARAMPATTU TALUK - GOVERNMENT LAND

Sl. No.	Name of the Mineral	Name & Address of Lessee	Taluk & Village	SF.Nos. & Extent (in Hects.)	Lease Period	File No	Classification
1	Rough Stone	P.Soundarajan Kolamanjanur Village, Tandarampet	Tandarampet Kolamanjanur	1 2.00.0	31.03.2009 To 30.03.2019	Rc.No.230/K2/2009	Government Land – Rule 8
2	Rough Stone	B.L.Arunachalam Beemanandhal Village, Chengam	Tandarampet taluk, Kannakandhal	77/3 (Part2) 0.50.0	17.03.2010 To 16.03.2020	Rc.No.26/K2/2010	
3	Rough Stone	P.Radhakrishnan Mettu Street, Tiruvannamalai	Tandarampet Sathanur	249/2B, 250/5 1.03.5	12.04.2010 To 11.04.2020	Rc.No.20/K2/2010	
4	Rough Stone	M.Govindarajan, S/o. Muthukrishnan, 3/337, Allabasha Mungilthuraipattu Shankarapuram Tk.	Tandarampet Thondamanur	59 (Part-1) 2.00.0	28.06.2010 To 27.06.2020	Rc.No.79/K2/2010	
5	Rough Stone	A.Thenarmozhi Manalurmel Siruvallur Village, Sankarapuram	Tandarampet Perukulathur	535 (Part1) 2.00.0	23.08.2010 TO 22.08.2020	Rc.No.134/K2/2010	
6	Rough Stone	Tmt.K.Sarasu 53, Nehru Street, Chengam	Tandarampet Sathanur	258/5 (PartA) 1.00.0	17.03.2011 To 16.03.2021	Rc.No.626/K2/2009	
7	Rough Stone	R.Dhanakotti Varagur Village, Tandarampet	Tandarampet Varagur	3 (Part2) 1.00.0	30.03.2011 To 29.03.2021	Rc.No.18/K2/2011	
8	Rough Stone	P.PalaniKolamanjanur Village,Tandarampet.	TandarampetKolamanjanur	1 (Part2) 2.00.0	18.04.2011 To 17.04.2021	Rc.No.20/K2/2011	

Sl. No.	Name of the Mineral	Name & Address of Lessee	Taluk & Village	SF.Nos. & Extent (in Hects.)	Lease Period	File No	Classification
9	Rough Stone	M.Veeramani Royandapuram Village Thandarampattu Tk.	Thandarampattu Royandapuram	294 (Part-1) 2.00.0	24.05.2012 to 23.05.2022	Rc.No.19/K2/2011	Government Land – Rule 8
10	Rough Stone	G.Harikrishnan, Meyyur village, Tiruvannamalai.	Thandarampattu Kampattu	S.F.7/1 (P) 1.00.0	04.11.2009 to 03.11.2019	R.C.No. 293/K-2/2008	
11	Rough Stone	M.Vinothkannan, Varagur Village, Tandrampet	Thandarampattu Varagur	21/1A (Part-1) 0.40.0	20.01.2016 to 19.01.2021	Rc.No.49/K/ 2015	
12	Rough Stone	Tmt.R.Amutha W/o.S.Ramachandran, No.712, Bajanai Koil st Thandarampattu Taluk	Thandarampattu Allappanur	51 (Part) 2.00.0	11.06.2018 to 10.06.2028	Rc.No.396/K/ 2017	

THANDARAMPATTU - PATTA LAND

Sl.No.	Name of the Mineral	Name & Address of Lessee	Taluk & Village	SF.Nos. & Extent (in Hects.)	Lease Period	File No	Classification
1	Rough Stone	T.Selvaraj, Harur Main Road, Mothakkal village, Thandarampattu Tk.	Thandarampattu Taluk Mothakkal Village	144/2(P) 0.40.5	16.06.2014 to 15.06.2019	31/K/2013	Patta Land
2	Rough Stone	R.Gopi, 4/75B, Veerapathran Kovil St., Vijayappanur, Thandarampattu Tk.	Thandarampattu Varagur Village	2/1, 2/2A, 2/3 - 1.71.0	02.06.2016 to 01.06.2021	101/K/2015	Patta Land

CHEYAR TALUK – GOVERNMENT LAND

Sl. No.	Name of Mineral	Name & Address of the Lease	Taluk & Village	SF.No. & Extent	Lease Period	File No.	Classification
1	Rough Stone	S.Nagaraj Manampathy Village, Uthiramerur Taluk.	Athi Village Cheyyar Taluk.	S.No.276/1 1.53.0 Hectare.	17.12.2011 to 16.12.2021	29/K2/2011	Government land – Rule 8

CHEYAR TALUK – PATTA LAND

Sl.No.	Name of the Mineral	Name & Address of the Lessee	Taluk & Village	SF. No & Extent	Lease Period	File No.	Classifi- cation
1	Rough Stone	Thiru.R.Venkatachalam, S/o. Ramasamy, No.30, New State Bank Colony, West Tambaram, Chennai.	Cheyar Taluk Palli Village	66/3A (1.03.0) & 66/3B (1.87.0) (2.90.0)	21.07.2016 to 20.07.2021	95/K/2015	Patta Land
2	Rough Stone	Tvl.SRC Projects (P) Ltd., 4-B, Lakshmipuram, Gandhi Road, Salem-636 007.	Cheyar Taluk Palli Village	40/1 (Part) (0.45.5), 40/3 (0.36.5) etc 4.75.5 hect .	21.07.2016 to 20.07.2021	99/K/2015	
3	Rough Stone	Thiru.I.Prakash S/o. Inbasekaran, Senthamangalam Village S.V.Chathiram (Via), Sriperumpthur Taluk, Kanchipuram District.	Cheyar Taluk Painkinar Village	6/5 (0.43.5) & 8/1A (0.34.5) 0.78.0 hect .	28.07.2016 to 27.07.2021	122/K/2015	Patta Land

4	Rough Stone	Thiru.S.Suresh Babu S/o. Shanmugam, No.5, Kulakkarai Street Anakkaputhur Village, Thambaram Taluk, Chennai District.	Cheyyar Taluk Kurumbur Village	110/2A (0.24.5), 110/2B (0.40.0) etc. 3.88.5 hect	28.07.2016 to 27.07.2021	147/K/2015	
5	Rough Stone	Thiru.R.Velmurugan,s/o Rajaram,304, Theradi Street,Asanamapettai Village,Vembakkam Taluk.	Cheyyar TalukPalli Village	80/2(0.02.5), 81/1 (0.31.0), 81/2A(0.17.5), 81/2B (0.48.0), 84/1 (0.21.0) 1.20.0 hect .	17.09.2018 to 16.09.2023	360/K/2017	
6	Rough Stone	Thiru.S.MURUGAN, S/o. Subramanian, No.62/2 , Vedanatham Village, Tiruvannamalai Taluk & District.	Cheyyar Taluk Agatheripattu Village	12/1 20/2C 20/3B etc., 2.06.5 hect.,	03.11.2018 to 02.11.2023	125/K/2015	
7	Rough Stone	Thiru.M.Marimuthu, S/o. Maharajan, Kilpudupakkam Village, Cheyyar Taluk, Tiruvannamalai District.	Cheyyar, Palli	74/3,74/4 0.98.5 Hect	16.11.2018 to 15.11.2023	413/K/2017	

VENBAKKAM TALUK – PATTA LAND

Sl.No.	Name of the Mineral	Name & Address of the Lessee	Taluk & Village	SF. No & Extent	Lease Period	File No.	Classifi-cation
1	Rough Stone	R.Seenuvasan, Road Street, Arasanipalai village, Vembakkam Taluk	Ezhacheri Village Vembakkam Taluk	65/4, 5, 7, 8A, 66/4 3.42.0 Hect.	27.06.2014 to 26.06.2019	176/K/2013	Patta Land
2	Rough Stone	Thiru. Ganesh Kaskar, Executive Director, RMC Ready mix (India) Sidco Industrial Estate, Thirumudivakkam, Chennai.	Sithalapakkam Village Vembakkam Taluk	16/2B, 16/8, 17/2, & etc., 4.23.5	14.07.2014 to 13.07.2019	105/K/2013	
3	Rough Stone	Thiru. D.Madhavan s/o Dhanapal, 19, Sarangapani street, Ambathur, Chennai-53.	Girijapuram Village Vembakkam Taluk	91/2B, 91/3A & etc., 0.90.0	03.03.2015 to 02.03.2020	116/K/2013	
4	Rough Stone	Thiru. R.Mohanraj s/o Rajagopal, No.33, Pillaiyar koil street, Puliyambedu village, Ambatthur Taluk.	Girijapuram Village Vembakkam Taluk	94/2B 0.81.0	13.05.2015 to 12.05.2020	242/K/2012	
5	Rough Stone	Thiru. N.Subramani s/o Nallathambi, No 210 , Mandapam Junction Arpakkam Village, Kanchipuram.	Menallur Village Vembakkam Taluk	123/18A, 123/18B, etc., 3.02.5	21.07.2016 to 20.07.2021	75/K/2014	
6	Rough Stone	Thiru. B.Sri Devi, W/o. P.Balaji, No.56, Balasundaram Street, Chandramohan Nagar, Velingapattarai, Kanchipuram .	Kundiyanthandalm Village Vembakkam Taluk	1181/2A (0.56.5), 181/2B (0.24.0), etc., 1.15.5 Hect.	28.07.2016 to 27.07.2021	12/K/2015	

Sl.No.	Name of the Mineral	Name & Address of the Lessee	Taluk & Village	SF. No & Extent	Lease Period	File No.	Classifi-cation
7	Rough Stone	Thiru.K.Kumar, S/o. Kannaiyan, No.2/32, Mandapam Junction, Arpakkam Village & Post, Kanchipuram.	Kundiyanthandalm Village Vembakkam Taluk	14B (0.12.0), 163/14C (0.12.0), etc., 2.29.5 Hect.	28.07.2016 to 27.07.2021	14/K/2015	Patta Land
8	Rough Stone	Thiru.K.Thirumalai, S/o. Kannaiyan, No.52, Pillaiyar Koil Street, M.G.R. Nagar,Kundrathur, Chennai 600 069.	Suruttal Village Vembakkam Taluk	174/1A1 (0.74.5) & 175/2 (0.75.5) 1.50.0 Hect.	28.07.2016 to 27.07.2021	29/K/2015	
9	Rough Stone	Thiru.M.Palanisamy 81, Santhi Nagar First Street, Chengalpattu, Kanchipuram District	Cheyyar Taluk Thiruppanamoor	455/6, 624/1A, 624/1C (0.90.5)	06.06.2016 to 05.06.2021	11/K/2014	
10	Rough Stone	J. Venkatesan 153-A/1, Pillaiyar Koil Street, Melapattu Vge., Cheyyar Taluk.	Vembakkam Taluk Chithathur	217/1, 217/2, 217/4(Part), 217/5 (Part) Totally 1.00.0 Hect.	14.09.2017 to 13.09.2022	06/K/2017	
11	Rough Stone	Thiru.E.Panneerselvam S/o. Elumalai, 89, Vanniya Mettu St., Arpakkam Village, Kanchipuram Tk & Dt.	Vembakkam Taluk Kundiyan-thandalam	187/3(1.43.0)	14.09.2017 to 13.09.2022	131/K/2015	
12	Rough Stone	Thiru.L.Sudhakar S/o.Loganathan, 89, Palla Street, Agaram Village, Kanchipuram Taluk.	Vembakkam Taluk Girijapuram Village	94/4, 95/2, 96/1, 103/11, 103/12 (3.51.5)	14.09.2017 to 13.09.2022	105/K/2016	

Sl.No.	Name of the Mineral	Name & Address of the Lessee	Taluk & Village	SF. No & Extent	Lease Period	File No.	Classification
13	Rough Stone	Thiru.A.ARON SAMUVEL, S/o. Arockiyathan, No.15, Sessa Nagar, Poovirnthavalli, Chennai – 600 056.	Vembakkam Taluk Kundiyanthandalam	176/6A,6B,7A,7B,7 C,9A,9B 1.83.5 Hect	17.09.2018 to 16.09.2023	80/K/2017	Patta Land
14	Rough Stone	Thiru.M.SUDHARSAN, Pl.No.37, Parvathi Nagar, 3rd Street, Madampakkam, Chennai- 600 126.	Vembakkam Taluk Kundiyanthandalam	178/,1B2,1C1,1C2, 1D1,1D2, 1D4,181/1C1, 1C2 & 1G1 3.25.0 Hect.	17.09.2018 to 16.09.2023	377/K/2017	
15	Rough Stone	Thiru.S.SRIDHAR, S/o.T.Sivaprakasam, Managing Director,' SKT MINES,No.19C, Villakkadi Koil Thoppu Street,Kancheepuram.	Vembakkam Taluk Kaganam	44/11,58/7,5A,60/ 2,58/5B,59/1A,1B, 2B,60/3,5,6,7 3.96.5 Hect.	17.09.2018 to 16.09.2023	26/K/2018	
16	Rough Stone	B.Dheenana , Vembakkam Taluk	Ezhacheri Village Vembakkam Taluk	65/6 0.95.5	20.07.2018 to 01.03.2021	78/K/2014	
17	Rough Stone	THIRU.K.DEVARAJ, S/o. T.Kanniyappan, No.105, Gandhisilai Street, Lakshmipuram Village, Vembakkam Taluk, Tiruvannamalai District.	Vembakkam Taluk Girijapuram	83/11F83/11G, 83/11H,92/1B, 92/3A,92/3B 92/3C,98/13A 98/14A,91/4B 2.10.0 Hect.	17.10.2018 to 14.10.2023	248/K/2017	
18	Rough Stone	ThiruJ.K.SRINIVASANS/o. Kannan,No.782, Mariyamman Koil Street,Jambodai Village, Azhividaithangal Post,Vembakkam Taluk.	Vembakkam TalukChithathoor	260/1A2305/81.21 .54 Hect.	15.10.2018 to 14.10.2023	249/K/2017	

Sl.No.	Name of the Mineral	Name & Address of the Lessee	Taluk & Village	SF. No & Extent	Lease Period	File No.	Classifi-cation
19	Rough Stone	Thiru.M.R.AZHAGIRI, S/o. M.P.Rajalingam, No.120, Shanmuganandhar Kovil St, Sriperumbuthur Tk, Kancheepuram District.	Vembakkam Taluk Chithalapakkam	8/1A,8/1B 8/1C,8/1D & etc., 3.87.5 Hect.	17.10.2018 to 16.10.2023	85/K/2018	Patta Land
20	Rough Stone	Tvl.Golden Sands, No.15, 4th Street, VGP Lay Out, East coast Road, Chennai-115.	Vembakkam, Ezchari	1/2B2B,1/2D 1/7,1/8,1/9 1/2C, 20/3A 3.74.5 Hect	07.11.2018 to 06.11.2023	23/K/2018	
21	Rough Stone	Thiru.C.Sugumar,S/o. Chandrababu,No.18-A, V.V.Kovil Street, Walajabad Taluk,Kancheepuram District.	Vembakkam, Ezchari	20/1H, 20/1I, 20/3B,20/3C and 20/3D 1.82.5 Hect	16.11.2018 to 15.11.2023	375/K/2017	
22	Rough Stone	THIRU.E.MUTHUKRISHNAN, S/o. G.Elumalai, No.221,Chenjiamman Koil st, Chithalappakkam Village, Arasanipalayam Post, Vempakkam Taluk.	Vembakkam, Chithalapakkam	16/6 16/7 17/1 1.26.0 Hect	22.11.2018 to 23.11.2023	337/K/2017	
23	Rough Stone	Thiru.R.Venkatasubramaniyan S/o. G. Ramachandiran, No.83/1 Pillaiyar Kovil Street, Sirumayilur Village, Kancheepuram- 635 501.	Vembakkam Taluk Kundiyan-thandalam	168/2A 168/2B2 168/2C 2.43.0 Hect	04.12.2018 to 05.12.2023	05/K/2018	
24	Rough Stone	Tvl.SRC Projects (P) Ltd.,4-B, Lakshmipuram,Gandhi Road,Salem- 636 007.	Chithathur Village Vembakkam Taluk	213/1, 213/2214/1, & etc., 4.71.5 Hect	14.12.2018 to 13.12.2023	371/K/2017	

CHETHUPATTU TALUK – GOVERNMENT LAND

Sl.No	Name of the Mineral	Name & Address of the Lessee	Taluk & Village	SF. No & Extent	Lease Period	File No.	Classification
1	Rough Stone	J.M.Constructions, 88, 7th Cross Street, Anna Nagar, Pelamedu, Coimbatore – 4.	Chethupattu Taluk Thellarampattu	214/1 (Part 1), 1.00.0	25.05.2009 to 24.05.2019	136/K2/2009	Government Land – Rule 8
2	Rough Stone	J.M.Constructions, 88, 7th Cross Street, Anna Nagar, Pelamedu, Coimbatore – 4.	Chethupattu Taluk Thellarampattu	214/1 (Part 2), 1.00.0	25.05.2009 to 24.05.2019	137/K2/2009	
3	Rough Stone	K.Gopinath, Kandigai melkottaiyur post, Chengelpet taluk.	Chethupattu Taluk Avaniapuram village,	111(Part 2), 2.00.0 hectares	03.06.2011 to 02.06.2021	26/K2/2011	
4	Rough Stone	V.Rajagopal, Oorapakkam, Chengalpattu.	Chethupattu Taluk Jeganathapuram village,	63/2 (Part) 1.00.0 hectares	17.12.2011 to 16.12.2021	169/K2/2010	

VANDAVASI TALUK – GOVERNMENT LAND

Sl.No	Name of the Mineral	Name & Address of the Lessee	Taluk & Village	SF. No & Extent	Lease Period	File No.	Classification
1	Rough Stone	IVRCL building products Ltd., 30-A, 6th Cross Road, Thiru.vi.Ka Industrial Estate, Guindy, Chennai – 32.	Vandavasi taluk. Gangampoondi	172/1 (Part A), 2.00.0	12.05.2010 to 11.05.2020	604/K2/2009	Government Land – Rule 8
2	Rough Stone	IVRCL building products Ltd., 30-A, 6th Cross Road, Thiru.vi.Ka Industrial Estate, Guindy, Chennai – 32.	Vandavasi taluk. Gangampoondi	172/1 (Part B), 2.00.0	12.05.2010 to 11.05.2020	605/K2/2009	
3	Rough Stone	D.saravanan, Venkatapuram, Saidapet, Chennai – 15.	Seeyalam village, Vandavasi taluk	176 (Part A), 2.00.0	18.10.2010 to 17.10.2020	140/K2/2010	
4	Rough Stone	K.Pasupathy, Pancharai Post, Vandavasi taluk.	Seeyalam village, Vandavasi taluk	176(Part C), 2.00.0	25.10.2010 to 24.10.2020	142/K2/2010	
5	Rough Stone	R.Tamilvanan, Saidapet, Chennai – 15.	Seeyalam village, Vandavasi Tk.	176 (Part D), 2.00.0	18.10.2010 to 17.10.2020	143/K2/2010	
6	Rough Stone	R.Ramadoss, 7, Thirumanjanar Street, Sirkazhi – 609 110.	Mazhaiyur village, Vandavasi taluk	93/1, 1.77.0	08.12.2010 to 07.12.2020	29/K2/2010	
7	Rough Stone	P.Srinivasan, Pallavaram, Chennai - 43	Mazhaiyur village, Vandavasi taluk	93/6, 1.41.0	08.12.2010 to 07.12.2020	30/K2/2010	
8	Rough Stone	Mohammed Muzammil 4-th Street, Thousand Lights, Chennai-6.	Vandavasi Arungunam	70/1 (Part) 2.00.0	26.03.2012 to 25.03.2022	24/K2/2011	

VANDAVASI TALUK – PATTA LAND

Sl.No.	Name of the Mineral	Name & Address of the Lessee	Taluk & Village	SF. No & Extent	Lease Period	File No.	Classifi-cation
1	Rough Stone	VIJAY RAMAKRISHNAN Door No.52, MGR Road, Kalachitra Colony, Besent Nagar, Chennai-90	Vandavasi Taluk Kizhnamandi Village	290, 291 (1.50.5)	23.09.2014 to 22.09.2019	193/K/2013	Patta Land
2	Rough Stone	Thiru. G.VASUDEVAN, S/O.Gengappan, Door No.842-D, Vengidamangalam Road, Melakkottaiyur, Chengalpattu Taluk, Kancheepuram.	Vandavasi Taluk Septangulam	393/1 1.04.0 Hectare	08.12.2016 to 07.12.2021	115/K/2015	
3	Rough Stone	Thiru. G.RAJENDRAN, S/O.Gopal, No.18, First Street, Rajiv Gandhi Nagar, Urapakkam Village, Chengalpattu .	Vandavasi Taluk Mavalavadi	22/1B (0.87.0), 22/1C (0.44.0), 33/3B (0.37.0) 1.68.0 Hectare	22.12.2016 to 21.12.2021	37/K/2014	

ARNI TALUK – GOVERNMENT LAND

Sl.No.	Name of the Mineral	Name & Address of the Lessee	Taluk & Village	SF. No & Extent	Lease Period	File No.	Classification
1	Rough Stone	V.Vijayakumar, S/o. Vellai, 3 Manikkapuram, Kollacheri, Chennai – 600 069.	Mullandiram village, Arni taluk	5.(Part 4A), 1.00.0 hectares	04.11.2009 to 03.11.2019	233/K2/2009	Government Land – Rule 8
2	Rough Stone	D.Ilanchezian, S/o. Theyvasikamani, 54, Appavu Nagar, Maangadu, Chennai – 602 101.	Mullandiram village, Arni taluk	53(Part 4), 1.00.0 hectares	04.11.2009 to 03.11.2019	756/K2/2009	
3	Rough Stone	D.Rushendrakumar, S/o. Theyvasikamani, 54, Appavu Nagar, Maangadu, Chennai – 602 101.	Sirumoor village, Arni taluk	25/1(Part A) 1.00.0 Hectare	04.11.2009 to 03.11.2019	758/K2/2008	
4	Rough Stone	J.Yamuna, T.H.Salai, Aandarasanpettai, Chennai – 602 107.	Sirumoor village, Arni taluk	25/1(Part B), 1.00.0 hectares	04.11.2009 to 03.11.2019	759/K2/2008	
5	Rough Stone	Siddique basha, Kunnathur village, Arni taluk	Melnagar ramasani kuppam ,Arni	188(Part), 2.00.0 hectares	19.11.2009 to 18.11.2019	602/K2/2009	
6	Rough Stone	S.Suresh, S/o. Sundarrajan, 3, Saradha Nagar, Agraharam Koratur, Chennai – 76.	Mullandiram village, Arni taluk	53(Part 3), 1.00.0 hectares	23.11.2009 to 22.11.2019	135/K2/2009	

Sl.No.	Name of the Mineral	Name & Address of the Lessee	Taluk & Village	SF. No & Extent	Lease Period	File No.	Classification
7	Rough Stone	M.Shajakhan 855, Bazar Street Santhavasal, Polur Tk.	Arni Taluk Melnagar	29/1 (Part-3) 1.00.0	24.05.2012 to 23.05.2022	68/K/2012	Government Land
8	Rough Stone	A.Nazeer basha, S/o. Allabasha, 520/1, C.C.Road, Vannangulam, Arni.	Ayyampalayam village, Arni taluk	149 (part), 2.00.0	14.9.2010 to 13.9.2020	51/K2/2010	

ARNI TALUK – PATTA LAND

Sl.No.	Name of the Mineral	Name & Address of the Lessee	Taluk & Village	SF. No & Extent	Lease Period	File No.	Classification
1	Rough Stone	A.C.Mani, Vetrilaikara street, Arni.	Arni Taluk Ariyapadi Village	515/2 515/3A, 3B, 3C 0.67.0	25.09.2014 to 24.09.2019	36/K/2013	Patta land
2	Rough Stone	A.G.Mohan, 43, V.A.K.Nagar, Arni Taluk	Arni Taluk Ariyapadi Village	516/3 Part 1 0.40.0	13.11.2017 to 12.11.2022	52/K/2015	

MINOR MINERAL

Sl.No.	Name of the Mineral	Name & Address of the Lessee	Taluk & Village	SF. No & Extent	Lease Period	File No.	Classification
1	Fire Clay	Tvl.Arcot Pipes No.118/259, Bazaar, Street, Virudhachalam, Cuddalore	Cheyar Cholavaram	131/2, 132/1 etc.,	4.87.5 Hect.,	R.c.No.7031/MME/04, dated.12.04.2005. Distirct.Rc.No.44/K-2/2004 dated.24.06.2005.	Patta Land

LIST OF EXISTING GRANITE QUARRY LEASES IN TIRUVANNAMALAI DISTRICT
TIRUVANNAMALAI TALUK

Sl. No.	Name of the Mineral	Name and Address of the Lessee (Tvl.)	Classification	Village	S.No.	Extent in Hect.,	Period of lease	G.O.No. & District Collector Proceedings No./dt.
1	Black Granite	Tvl.R.Radhakrishnan Karasanur Vilalge, Villupuram	Patta Land	Vazhuthangulam	78/3C	1.41.0	9.12.2010 to 8.12.2020	G.O. (3D) No. 61 /Ind (MMB-1) Dept. Dated: 03.12.2010.
2	Black Granite	Tvl.R.K.Ramesh Virukampakkam Chennai	Patta Land	Karnampoondi	6/2E, 6/3C2, & 7/4A	1.27.0	17.3.2008 to 16.3.2028	G.O. M.S. (3D) No. 12/Ind (MME-1) Dept. Dated: 06.03.2008.
3	Black Granite	M/S. Aruna Granites, 109-A Big Street, Tiruvannamalai.	Govt. Land	Nadazhaga-nandal	61/2	2.21.0	21.01.2000 to 20.01.2020	G.O.M.S. (4D) No.2/ Ind (MMB1) Dept. dated,27.8.1999
4	Black Granite	Tvl.Enterprising Exporters Chennai.	Govt. Land	Vettavalam	433/6	4.95.0	05.12.1990 to 04.12.2000 Renewal applied.	G.O.No.1375/Ind/MME-1/ dept. dated,28.11.1990. W.P.No.11954/06 dated 26.04.2006.
5	Black Granite	TAMIN 39, Kamarajar Salai Chennai.	Govt. Land	Velanandal	63/1, 71, 78	3.81.0	28.02.2000 to 27.02.2020	G.O.Ms.No.248/Ind(MME2)Dept,Dt:14.09.94 & Govt.Lr.No.31852/MME2/1993 Dt: 4.02.2000
6	Black Granite	TAMIN 39, Kamarajar Salai Chennai.	Govt. Land	Velanandal	67	1.88.0	08.01.2007 to 07.01.2027	G.O.(3D) No.38/Ind/ MME1/ Dept dated 17.6.2008
7	Colour Granite	TAMIN 39, Kamarajar Salai Chennai.	Govt. Land	Rantham	56/6 (Part)	9.30.5	12.9.2008 to 11.9.2038	G.O.Ms.No.49/Ind (MME1)Dept, Dt:22.7.2008

CHENGAM TALUK

Sl. No	Name of the Mineral	Name and Address of the Lessee (Tvl.)	Clasiffi-cation	Village	S.No.	Extent in Hect.,	Period of lease	G.O.No. & District Collector Proceedings No./dt.
1	Black Granite	Tvl.Regal Granites and Stone Works, No.34/66, Oomer Road, Ambur, Vellore District.	Patta Land	Palamarathur	115/1B, 115/2B, 119/2B	2.47.5	06.06.2005 to 05.06.2025	G.O.No.27/Ind, dt: 02.05.2005.
2	Black Granite	Tvl.Zohra Imbex, B2, T5, Rohini Garden Enclave, Pattabiraman Street, Thennur, Trichy-17	Patta Land	Eraiyr	132/2 (Part)	1.00.0	01.8.2005 to 31.7.2025	G.O.50/Ind/MME-1/Dept. dated,11.7.2005
3	Black Granite	TAMIN 39, Kamarajar Salai Chennai.	Govt. Land	Eraiyr	202/2, 203/2	2.78.5	19.10.2004 to 18.10.2034	G.O.3D.42/Ind(MME1) Dept., Dt: 21.07.2004

THANDARAMPATTU TALUK

Sl. No	Name of the Mineral	Name and Address of the Lessee (Tvl.)	Clasiffi-cation	Village	S.No.	Extent in Hect.,	Period of lease	G.O.No. & District Collector Proceedings No./dt.
1	Black Granite	Tvl. Sun Shine Enterprises Pvt. Ltd., Coimbatore	Patta Land	Thiruvadatha-nur	162/3, 162/14	1.17.5	10.12.2004 to 09.12.2024	G.O.No.104/Ind (MMB.1) Dept, Dt: 08.11.2004.
2	Black Granite	Tvl. Balaji Granites, Naripalli Village, Harur Taluk, Dharmapuri District.	Patta Land	Mothakkal	139/4, 144/1 144/5	1.07.5	24.12.2004 to 23.12.2024	G.O.No.107/Ind Dept, Dt: 24.11.2004.
3	Black Granite	Tvl.Madhucon GranitesLtd, Khammam A.P	Patta Land	Appunaicken-palayam	70/5, 72/1, 73/3	2.73.0	9.11.2006 to 8.11.2026	G.O.3DNo.72/ Ind/ (MME-1) dept. dated,1.11.2006
4	Black Granite	Tvl.Madhucon Granites Ltd Khammam AP	Patta Land	Edakkal	21/3C1 (Part), C3(part) etc	2.39.5	17.3.2008 to 16.3.2028	G.O. M.S. (3D) No. 10/ Ind (MME-1)Dept. Dated: 4.3.2008.
5	Black Granite	Tvl Mir .Nazim Ali, Jagadevi, Krishnagiri	Patta Land	Thenkarum-palur & Vanapuram	51/3A 2, 17/1(P)/17/2(P),17/3(P)	2.26.0	1.9.2008 to 31.8.2028	G.O.3(D) No.50/Ind/MME-1/dept. dated,22.7.2008
6	Black Granite	Tvl.Oriental Minerals stone, Sri Ram Nagar, Trichy road,Nammakkal	Patta Land	Malamnjanur	No 245/1	Ext 1.10.0	04.07.1994 to 03.07.2004 (Renewal applied)	G.O.3(D) No211/Ind/MMB-2/dept. dated,31.5.1994

7	Black Granite	Thiru.M.RamasamyS/o. Muthu Gounder,MuthuGounder Colony,Harur-636903.	Patta Land	Thondamanur	52/1 (1.52.5) & 52/2A1 (0.26.5)	1.79.0	15.05.2015 to 14.05.2035	G.O.(3D) No.7 / Industries (MMB.2) Department, Dated:10.03.2015.
8	Black Granite	Thiru.N.Viswanathan S/o. Narayanasamy, Eraiyur Village, Vanur Taluk, Villupuram District.	Patta Land	Rayandapuram	277/3A1B, 277/3A2 etc.,	1.07.5	08.12.2015 to 07.12.2035	G.O.(3D) No.30 / Industries (MMB.2) Department, Dated:29.10.2015.
9	Black Granite	Tvl.Lakshmi Sai Granites, No.4/491-C, Adhiyaman Nagar, Krishnagiri.	Patta Land	Agarampalli-pattu	98/4A, 98/4B etc.,	3.10.0	08.02.2016 to 07.02.2036	G.O.(3D) No.14/ Industries (MMB.2) Department, Dated:25.01.2016.
10	Black Granite	TAMIN 39, Kamarajar Salai Chennai.	Govt. Land	Veeranam	74(part) 126/1A, 127,132 etc	20.50.0	15.06.2004 to 14.06.2024	G.O.28/Ind/MME1 dept, dt:24.05.2004 Renewal granted
11	Black Granite	TAMIN 39, Kamarajar Salai Chennai.	Govt. Land	Appunaickan-palayam	67	4.79.5	29.11.2004 to 28.11.2034	G.O.57/Ind/MME/Dept dt:31.08.2004
12	Black Granite	TAMIN 39, Kamarajar Salai Chennai.	Govt. Land	Olagalapadi	83	29.62.0	28.11.2005 to 27.11.2035	G.O.Ms.No.112/Ind/MME-1/dept, dated.30.8.2005
13	Black Granite	TAMIN 39, Kamarajar Salai Chennai.	Govt. Land	Keelpachar	65(Part)	11.11.5	26.12.2005 to 25.12.2035	G.O.Ms.No.127/Ind/MME-1/dept, dated.18.10.2005
14	Black Granite	TAMIN39, Kamarajar SalaiChennai.	Govt. Land	Sathanur	286/1 (Part), 304/1	2.41.0	22.5.2006 to21.05.2036	G.O.Ms.No.21/Ind(MME1)Dept, Dt:27.02.2006
15	Black Granite	TAMIN 39, Kamarajar Salai Chennai.	Govt. Land	Thandaram-pattu	92	8.61.5	08.01.2007 to 07.01.2027	G.O.Ms.No.164/Ind (MME1)Dept, Dt:29.12.2006

16	Black Granite	TAMIN 39, Kamarajar Salai Chennai.	Govt. Land	T.Velur	176(Part)	10.50.0	09.02.2007 to 08.02.2027	G.O.Ms.No.23/Ind (MME1)Dept, Dt:29.01.2007
17	Black Granite	TAMIN 39, Kamarajar Salai Chennai.	Govt. Land	Thandram-pattu	4/2, 4/37,	5.57.0 1.21.5	01.09.2009 to 31.08.2029	G.O.No.21/Ind/H2/Dept, Dt:03.08.2009.
18	Black Granite	TAMIN 39, Kamarajar Salai Chennai.	Govt. Land	Kolamanjanur	125	7.27.5	20.04.2012 to 19.04.2042	G.O.Ms.(3D)No.1/Ind (MME1) Dept., Dt:25.01.2012
19	Colour Granite	TAMIN 39, Kamarajar Salai Chennai.	Govt. Land	Rayandapuram	294(Part)	10.50.0	21.02.2012 to 20.02.2042	G.O.Ms.(3D)No.61/Ind (MME1)Dept., Dt:05.12.2011
20	Black Granite	Tvl.Magam Inc, Chennai.	Govt. Land	Agarampalli-pattu	99/2	0.86.0	05.12.1990 to 04.12.2000. Renewal applied.	G.O.No.1376/Ind/ MME-1/ dept. dated,28.11.1990 W.P.No.20391/2000 dated 20.12.2002.

Vandavasi Taluk

Sl.No.	Name of the Mineral	Name and Address of the Lessee	Clasiffication	Village	S.No.	Extent in Hect.,	Period of lease	G.O.No. & District Collector Proceedings No./dt.
1	Black Granite	Tvl.K.Vijaykumar, S/o.V.K.Sundaram No.3, Palace Nagar, Pudukotai & District.	Patta Land	Seiyalam	6/2C(Part), 7/2C1 (Part) etc,	1.07.5	18.12.2006 to 17.12.2026	G.O. (3D). No.94/ Ind Dept. Dated: 4.12.2006
2	Black Granite	Tvl.A.Gunasekaran. Balajinagar Chennai	Patta Land	Athipakkam	222/1B, (Part), 225/B(part) 225/2 (Part)	1.22.0	31.3.2008 to 30.3.2028	G.O.(M.S.) 3D No. 11 /Ind (MME-1) Dept. date:,05.3.2008.

Arani Taluk

Sl.No.	Name of the Mineral	Name and Address of the Lessee	Clasiffication	Village	S.No.	Extent in Hect.,	Period of lease	G.O.No. & District Collector Proceedings No./dt.
1	Colour Granite	TAMIN 39, Kamarajar Salai Chennai.	Govt. Land	Nachapuram	85	22.26.0	27.04.2012 to 26.04.2042	G.O.Ms.(3D)No.02/ Ind (MME1)Dept., Dt:25.01.2012

Polur Taluk

Sl.No.	Name of the Mineral	Name and Address of the Lessee	Clasiffication	Village	S.No.	Extent in Hect.,	Period of lease	G.O.No. & District Collector Proceedings No./dt.
1	Colour Granite	TAMIN 39, Kamarajar Salai Chennai.	Govt. Land	Sengunam	55A/1B1	22.88.5	17.10.2005 to 16.10.2034	G.O.Ms.No.111/Ind (MME1) Dept., Dt:30.08.2005

MINOR MINERAL
Leases Granted Under Rule 8C

Sl.No.	Name of the Mineral	Name and Address of the Lessee	Taluk	Village	S.No.	Extent in Hect.,	Period of lease	G.O.No. & District Collector Proceedings No./dt.
Tiruvannamalai Taluk								
1	Black Granite	TAMIN 39, Kamarajar Salai Chennai.	Tiruvannamalai	Velanandal	63/1, 71, 78	3.81.0	28.02.2000 to 27.02.2020	G.O.Ms.No.248/Ind(MME2)Dept,D t:14.09.94 & Govt.Lr.No.31852/MME2/1993 Dt: 4.02.2000
2	Black Granite	TAMIN 39, Kamarajar Salai Chennai.	Tiruvannamalai	Velanandal	67	1.88.0	08.01.2007 to 07.01.2027	G.O.(3D) No.38/Ind/ MME1/ Dept dated 17.6.2008
3	Colour Granite	TAMIN 39, Kamarajar Salai Chennai.	Tiruvannamalai	Rantham	56/6 (Part)	9.30.5	12.9.2008 to 11.9.2038	G.O.Ms.No.49/Ind (MME1)Dept, Dt:22.7.2008
Chengam Taluk								
4	Black Granite	TAMIN 39, Kamarajar Salai Chennai.	Chengam	Eraiur	202/2, 203/2	2.78.5	19.10.2004 to 18.10.2034	G.O.3D.42/Ind(MME1) Dept., Dt: 21.07.2004
Thandampattu Taluk								
5	Black Granite	TAMIN 39, Kamarajar Salai Chennai.	Thandampattu	Veeranam	74 (part) 126/1A, 127,132 etc	20.50.0	15.06.2004 to 14.06.2024	G.O.28/Ind/MME1 dept, dt:24.05.2004 Renewal granted

Sl.No.	Name of the Mineral	Name and Address of the Lessee	Taluk	Village	S.No.	Extent in Hect.,	Period of lease	G.O.No. & District Collector Proceedings No./dt.
6	Black Granite	TAMIN 39, Kamarajar Salai Chennai.	Thandarampattu	Appunaickan- palayam	67	4.79.5	29.11.2004 to 28.11.2034	G.O.57/Ind/MME/Dept dt:31.08.2004
7	Black Granite	TAMIN 39, Kamarajar Salai Chennai.	Thandarampattu	Olagalapadi	83	29.62.0	28.11.2005 to 27.11.2035	G.O.Ms.No.112/Ind/MME-1/dept, dated.30.8.2005
8	Black Granite	TAMIN 39, Kamarajar Salai Chennai.	Thandarampattu	Keelpachar	65 (Part)	11.11.5	26.12.2005 to 25.12.2035	G.O.Ms.No.127/Ind/MME-1/dept, dated.18.10.2005
9	Black Granite	TAMIN 39, Kamarajar Salai Chennai.	Thandarampattu	Sathanur	286/1 (Part), 304/1	2.41.0	22.5.2006 to 21.05.2036	G.O.Ms.No.21/Ind (MME1)Dept, Dt:27.02.2006
10	Black Granite	TAMIN 39, Kamarajar Salai Chennai.	Thandarampattu	Thandarampattu	92	8.61.5	08.01.2007 to 07.01.2027	G.O.Ms.No.164/Ind(MME1)Dept, Dt:29.12.2006
11	Black Granite	TAMIN39, Kamarajar SalaiChennai.	Thandarampattu	T.Velur	176 (Part)	10.50.0	09.02.2007to08. 02.2027	G.O.Ms.No.23/Ind (MME1)Dept, Dt:29.01.2007
12	Black Granite	TAMIN 39, Kamarajar Salai Chennai.	Thandarampattu	Thandrampattu	4/2, 4/37,	5.57.0 1.21.5	01.09.2009 to 31.08.2029	G.O.No.21/Ind/H2/Dept, Dt:03.08.2009

Sl.No.	Name of the Mineral	Name and Address of the Lessee	Taluk	Village	S.No.	Extent in Hect.,	Period of lease	G.O.No. & District Collector Proceedings No./dt.
13	Black Granite	TAMIN 39, Kamarajar Salai Chennai.	Thandarampattu	Kolamanj-anur	125	7.27.5	20.04.2012 to 19.04.2042	G.O.Ms.(3D)No.1/Ind (MME1) Dept., Dt:25.01.2012
14	Colour Granite	TAMIN 39, Kamarajar Salai Chennai.	Thandarampattu	Royanda-puram	294(Part)	10.50.0	21.02.2012 to 20.02.2042	G.O.Ms.(3D)No.61/Ind (MME1)Dept., Dt:05.12.2011
Polur Taluk								
15	Colour Granite	TAMIN 39, Kamarajar Salai Chennai.	Polur	Sengunam	55A/1B1	22.88.5	17.10.2005 to 16.10.2034	G.O.Ms.No.111/Ind (MME1) Dept., Dt:30.08.2005
Arani Taluk								
16	Colour Granite	TAMIN 39, Kamarajar Salai Chennai.	Arni	Nacha-puram	85	22.26.0	27.04.2012 to 26.04.2042	G.O.Ms.(3D)No.02/Ind (MME1)Dept., Dt:25.01.2012

BLACK GRANITE

Sl.No.	Name of the Mineral	Name and Address of the Lessee	Clasiffication	Village	S.No.	Flag Day Demand	Collection	Balance
1	Black Granite	Tvl. Sun Shine Enterprises Pvt. Ltd., Coimbatore	Patta Land	Thiruvadatha-nur	162/3, 162/14			
2	Black Granite	Tvl.Madhucon GranitesLtd, Khammam A.P	Patta Land	Appunaicken-palayam	70/5, 72/1, 73/3			
3	Black Granite	Tvl.Madhucon Granites Ltd Khammam AP	Patta Land	Edakkal	21/3C1 (Part), C3(part) etc			
4	Black Granite	Tvl.Oriental Minerals stone, Sri Ram Nagar, Trichy road, Nammakkal.	Patta Land	Malamnjanur	No 245/1	Tvl.Oriental Minerals Stone, No.5/1050, B-3, Natachathra Appartment, Rockey Nagar, Namakkal.		
5	Black Granite	Thiru.N.Viswanathan S/o. Narayanasamy, Eraiyur Village, Vanur Taluk, Villupuram District.	Patta Land	Rayandapuram	277/3A1B, 277/3A2 etc.,			
6	Black Granite	Tvl.R.K.Ramesh Virukampakkam Chennai	Patta Land	Karnampoondi	6/2E,6/3C2,& 7/4A			
7	Black Granite	Tvl.Lakshmi Sai Granites, Adhiyaman Nagar, Krishnagiri.	Patta Land	Agarampalli-pattu	98/4A, 98/4B etc.,			
8	Black Granite	Tvl.Magam Inc, Chennai.	Govt. Land	Agarampalli-pattu	99/2			
9	Black Granite	TAMIN 39, Kamarajar Salai Chennai.	Govt. Land	Thandaram-pattu	92			

**4. DETAILS OF REVENUE COLLECTED IN THE LAST FOUR YEARS IN
TIRUVANNAMALAI DISTRICT**

Sl.No.	Year	Revenue Collected
1.	2014-2015	79427432
2.	2015-2016	57100027
3.	2016-2017	64516405
4.	2017-2018	113328355
Total		314372219

**5. MINERAL WISE PRODUCTION DETAILS IN THE LAST FOUR
YEARS IN TIRUVANNAMALAI DISTRICT**

Sl.No.	Year	Name of the Mineral			
		Black Granite (in Cu.m)	Colour Granite (in Cu.m)	Rough Stone (in Cu.m)	Gravel (in Cu.m)
1.	2014-2015	4585.714	460.000	803002	194876
2.	2015-2016	4051.573	-	610182	122645
3.	2016-2017	4014.495	-	744882	122446
4.	2017-2018	4315.219	--	825787	100296

**6. DETAILS OF PRODUCTION OF SAND OR BAJARI OR MINOR MINERAL
IN (FOUR YEARS)IN TIRUVANNAMALAI DISTRICT**

Sl.No	Year	Name of the Mineral			
		Black Granite (in Cu.m)	Colour Granite (in Cu.m)	Rough Stone (in Cu.m)	Gravel (in Cu.m)
1.	2014-2015	4314	--	803002	194876
2.	2015-2016	3789.567	103.359	579633	89709
3.	2016-2017	4014.092	--	688198	94434
4.	2017-2018	4315.219	--	825787	100296

7. PROCESS OF DEPOSITION OF SEDIMENTS IN THE RIVERS

There are three main types of processes that occur in a river. These are ***Erosion, Transportation and Deposition.*** All three depend on the amount of energy there is in a river.

7.1 Types of erosion

The energy in a river causes erosion. The bed and banks can be eroded making it wider, deeper and longer. Head ward erosion makes a river longer. This erosion happens near its source. Surface run-off and through flow causes erosion at the point where the water enters the valley head. Vertical erosion makes a river channel deeper. This happens more in the upper stages of a river (the V of vertical erosion should help you remember the v-shaped valleys that are created in the upper stages). Lateral erosion makes a river wider. This occurs mostly in the middle and lower stages of a river.

There are four main processes of erosion that occur in rivers. These are:

1. Hydraulic action;
2. Abrasion / corrasion;
3. Attrition; and
4. Corrosion.

7.1.1 Hydraulic action

The pressure of water breaks away rock particles from the river bed and banks. The force of the water hits river banks, and then pushes water into cracks. Air becomes compressed, pressure increases and the riverbank may, in time collapse. Where velocity is high e.g. the outer bend of meander, hydraulic action can remove material from the banks which may lead to undercutting and river bank collapse. Near waterfalls and rapids, the force may be strong enough to work on lines of weakness in joints and bedding planes until they are eroded.

7.1.2 Abrasion / Corrosion

The sediment carried by a river scours the bed and banks. Where depressions exist in the channel floor the river can cause pebbles to spin around and turn hollows into potholes.

7.1.3 Attrition

Eroded rocks collide and break into smaller fragments. The edges of these rocks become smoother and more rounded. Attrition makes the particles of rock smaller. It does not erode the bed and bank. Pieces of river sediment become smaller and more rounded as they move downstream.

7.1.4 Corrosion / Solution

Carbon dioxide dissolves in the river to form a weak acid. This dissolves rock by chemical processes. This process is common where carbonate rocks such as limestone and chalk are evident in a channel.

7.2 Transportation

Transportation of material in a river begins when friction is overcome. Material that has been loosened by erosion may be then transported along the river. There are four main processes of transportation. These are:

1. Suspension / suspended load;
2. Solution / solution load;
3. Saltation; and
4. Traction.

7.2.1. Suspension

Suspension is when material made up of very fine particles such as clay and silt is lifted as the result of turbulence and transported by the river. Faster-flowing, turbulent rivers carry more suspended material. This is why river appear muddy as they are approaching bankfull discharge and towards the mouth of the river (where velocity is greater as is the occurrence of finer sediment).

7.2.2. Solution

Solution is when dissolved material is carried by a river. This often happens in areas where the geology is limestone and is dissolved by slightly acidic water.

7.2.3. Saltation

Saltation is when material such as pebbles and gravel that is too heavy to be carried in suspension is bounced along the river by the force of the water.

7.2.4. Traction

Traction is when large materials such as boulders are rolled and pushed along the river bed by the force of the river.

The ***capacity of a river*** is the total load a river can transport at a given point.

7.3. Deposition

Deposition is the process of eroded material being dropped. This happens when a river loses energy. A river can lose its energy when rainfall reduces, evaporation increases, friction close to river banks and shallow areas which leads to the speed of the river reducing and therefore the energy reduces, when a river has to slow down it reduces its speed (and ability to transport material) and when a river meets the sea.

Sediment in rivers gets deposited as the river slows down. Larger, heavier particles like pebbles and sand are deposited first, whilst the lighter silt and clay only settle if the water is almost still. The flow of water is strongest on the outside of river bends, eroding the bank, but is slowest on the inside of the bends, allowing deposition of sand and gravel. When a river “bursts its banks” after heavy rain, flood water spreads out across the floodplain and, because this water hardly moves, finer silt and clay are deposited – often making good farmland.

When a river reaches a lake or the sea, it quickly deposits much of its sediment. This may choke up the river channel, which then divides up into distributaries, between which swamps are formed.

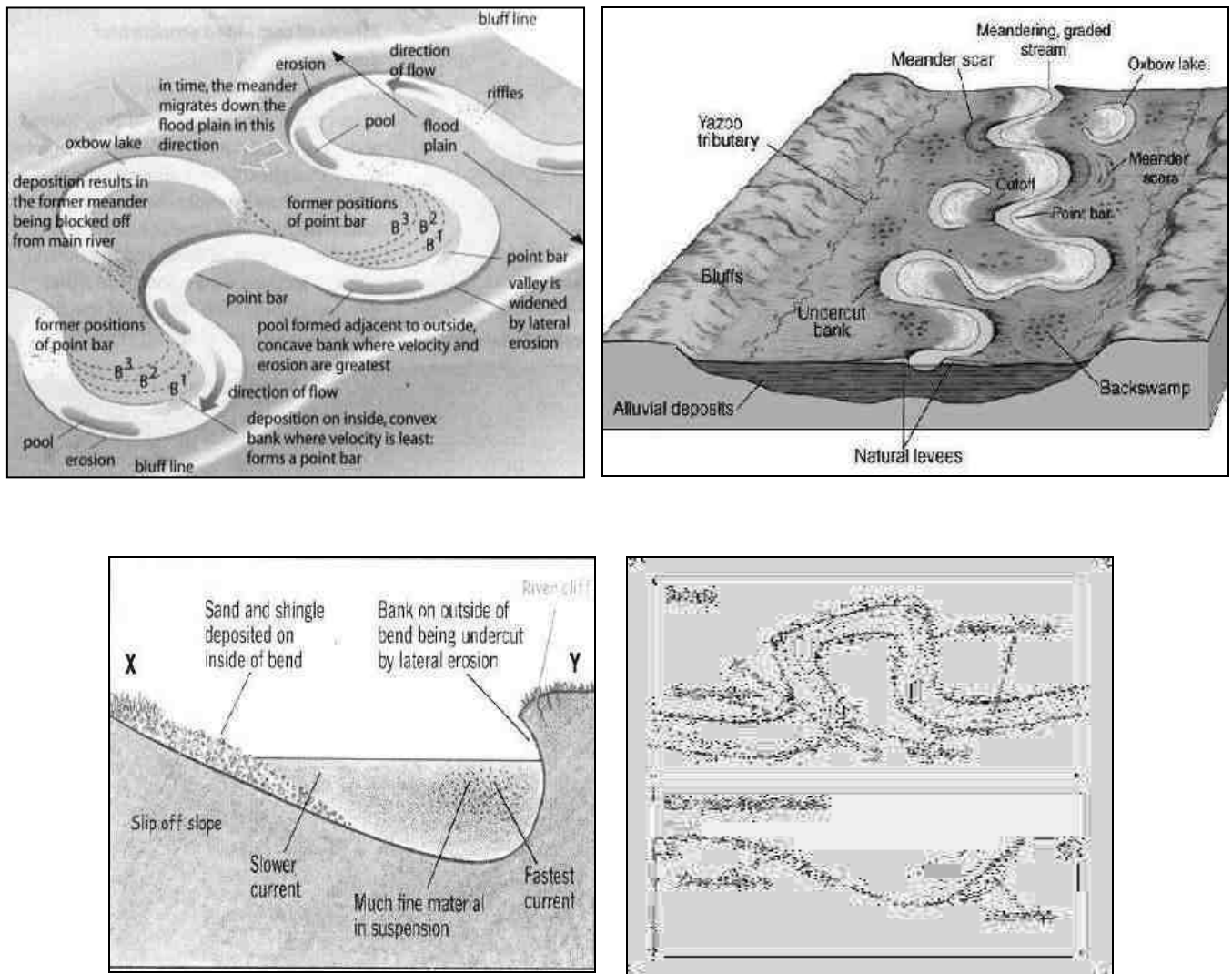


Fig.7.3.1. Schematic picture of meandering and deposition of sediments



Fig. 7.3.2 River Map of Tiruvannamalai District

7.4. Impact of sand removal from the river

Mining within or near riverbed has a direct impact on the stream's physical characteristics, such as stream roughness of the bed, flow velocity, discharge capacity, sediment transport capacity, turbidity, temperature etc. Alteration or modification of the above attributes may cause hazardous impact on ecological equilibrium of riverine regime. This may also cause adverse impact on in-stream biota and riparian habitats. This disturbance may also cause changes in channel configuration and flow-paths. The effects of sand and gravel mining are as follows: channel geometry, bed elevation, substratum composition and stability, in-

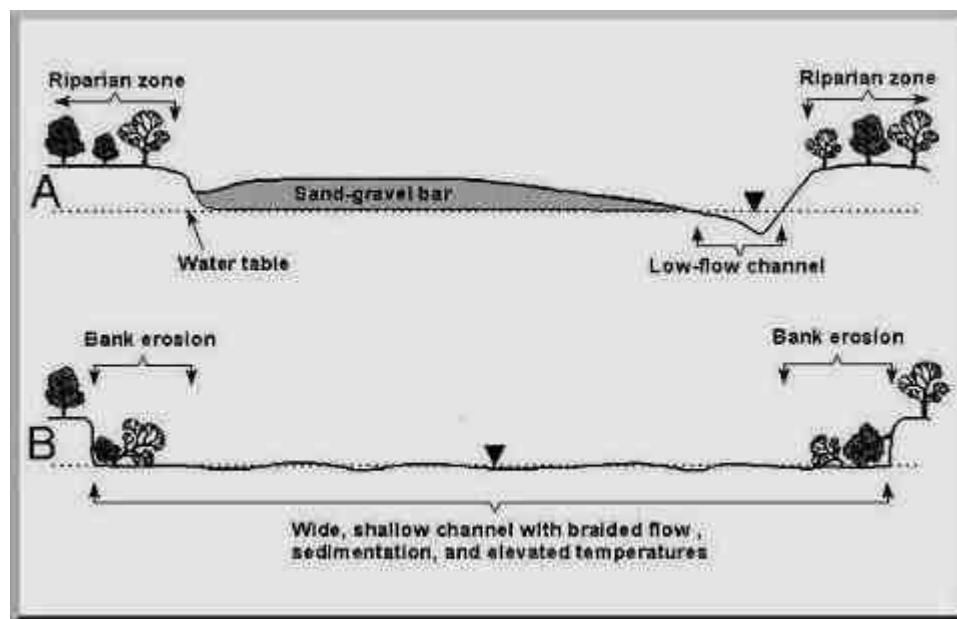


Fig.7.4.1 Impact of Sand Extraction from River

- a) Extraction of bed material in excess of replenishment by transport from upstream causes the bed to lower (degrade) upstream and downstream of the site of removal.
- b) In-stream habitat is impacted by increase in river gradient, suspended load, sediment transport and sediment deposition. Excessive sediment deposition for replenishment increases turbidity which prevents penetration of light required for photosynthesis and reduces food availability of aquatic fauna.
- c) Riparian habitat including vegetative cover on and adjacent to the river banks it controls erosion, provide nutrient inputs into the stream and prevents intrusion of pollutants in the stream through

runoff. Bank erosion and change of morphology of the river can destroy the riparian vegetative cover.

- d) Bed degradation are responsible for channel shifting, causing loss of properties and degradation of landscape, it can also undermine bridge supports, pipe lines or other structures.
- e) Degradation may change the morphology of the river bed, which constitutes one aspect of the aquatic habitat.
- f) Degradation can deplete the entire depth of gravelly bed material, exposing other substrates that may underlie the gravel, which could in turn affect the quality of aquatic habitat.

Lowering of ground water table in the flood plain because of lowering of riverbed level as well as river water level takes place because of extraction and draining out of excessive ground water from the adjacent areas. So, if a floodplain aquifer drains to the stream, groundwater levels can be lowered as a result of bed degradation.

- g) Lowering of the water table can destroy riparian vegetation.
- h) Excessive pumping of ground water in the process of mining in abandoned channels depletes ground water causing scarcity of irrigation and drinking water. In extreme cases it may create ground fissures and subsidence in adjacent areas.
- i) Flooding is reduced as bed elevations and flood heights decrease, reducing hazard for human occupancy of floodplains and the possibility of damage to engineering works.
- j) The supply of overbank sediments to floodplains is reduced as flood heights decrease.
- k) An un-scientific and unregulated sand and gravel mining tends to increase channel bank

7.5. Impacts on description

Biodiversity	: Impacts on related ecosystems (for example, fisheries)
Land losses	: Both inland and coastal through erosion
Hydrological functions	: Change in water flows, flood regulation and marine currents
Water supply	: Through lowering of the water table and pollution

Infrastructures	:	Damage to bridges, river embankments and coastal infrastructures
Climate	:	Directly through transport emissions
Landscape	:	Coastal erosion, changes in deltaic structures, quarries, pollution of rivers
Extreme events	:	Decline of protection

8. GENERAL PROFILE OF THE DISTRICT

Tiruvannamalai lies in the northern part of Tamil Nadu, and 200 Km from the state capital Chennai. The district lies between 78° 20' and 79° 50' of the eastern longitudes and 11°55' and 13° 15' of the northern Latitudes. It is bounded on the north by Vellore District, on the east by Kanchipuram District, on the south by Villupuram District, and on the west by Dharmapuri and Krishnagiri districts. The area of the district is 6312 sq.km. It consists of Two Revenue Divisions and Eleven Taluks- Tiruvannamalai, Chengam, Arani, Polur, Cheyyar, Chetpet, Vandavasi, Kilpennathur, Kalasapakkam, Thandarampattu and Vembakkam. After independence Tiruvannamalai was under North Arcot District. The revenue district of North Arcot was divided into Vellore District and Tiruvannamalai District in October 1989. Population of the district is 2469 thousand numbers as per Census 2011. The district is 20% urbanized and constitutes literacy rate of 74.21%.

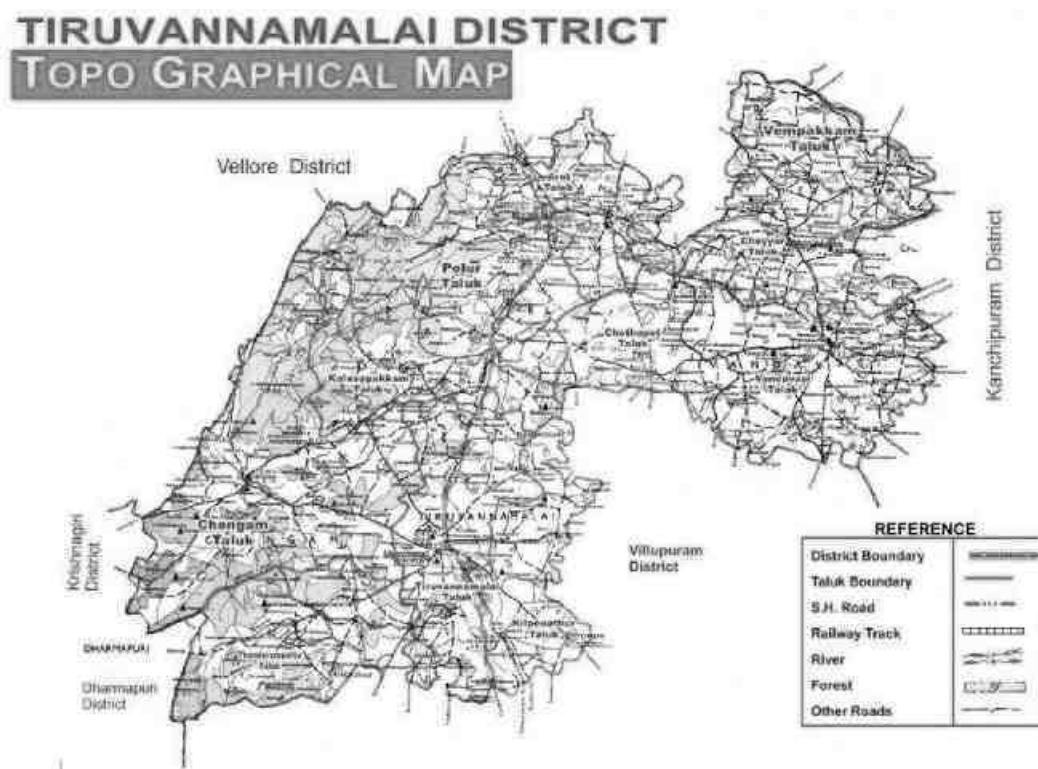


Fig.8.1.1Topographical Map of Tiruvannamalai District

8.1 Total Area

The total geographical area of the district is 6188 Sq K.M comprising the Revenue Divisions of Thiruvannamalai and Cheyyar. The district has 11 taluks viz. Thiruvannamalai, Kilpennathur, Chengam, Thandrapat, Polur, Kalasapakkam, Chetpet, Arni, Cheyyar, Vembakkam and Vandavasi. There are 18 Blocks including one tribal Block Javvadhu Hills constituting the district under Rural sector and four Municipalities viz. Thiruvannamalai, Arni, Cheyyar(Thiruvathipuram) and Vandavasi representing urban sectors along with ten Town Panchayats viz. Kilpennathur, Vettavalam, Chengam, Pudupalayam, Polur, Kalambur, Chetpat, Kannamangalam, Peranamallur, and Desur.

8.2. Physiography

The Jawadhu Hills are the highest mountains of this region. The general elevation of the Jawadhu Hills is 2500 ft with peaks rising up to 4200 ft. The district is extended upto Tirupathur taluk on the eastern part, the north-western portion of Chengam taluk and the western part of Polur taluk with spurs running in to Vellore taluk up to 9 kms. Kalrayan Hills range is on the southern part of Chengam taluk. The North-Western part of the region covers portions of Eastern Ghats and their spurs. The Hills in Tiruvannamalai and Pavala Malai at Polur taluk are famous for their spiritual sanctity. There are also a large number of small hills in Polur and Chengam taluks.

8.3. Drainage

Cheyyar river which originates from Jawadhu Hills, flows in a southern direction at first, and turns south-east near Chengam after flowing through Polur, Vandavasi and Cheyyar taluks. Palar raising near Nandidurg in Mysore enters Vellore district passing through Gudiyatham, Walajah and Arakonam taluks before entering into Cheyyar taluk of Tiruvannamalai district and there after enters into Kancheepuram district. Pennaiyar and South Pennaiyar originate from Nandidurg of Karnataka. They pass through Dharmapuri district and enter southern part of Chengam taluk before entering in to Viluppuram district. Finally, the river enters into the Bay of Bengal at Cuddalore. The river is dry for the most part of the year. Water flows during the monsoon season when it is fed by the southwest monsoon in catchment area and the northeast monsoon

in Tamil Nadu. A dam has been constructed across this river at Sathanur which is a picnic spot in this district. Sathanur Reservoir provides drinking water to Tiruvannamalai town and the water is used for irrigation when the reservoir is filled with surplus water.

8.4. Climate

This district has moderate climate. In Tiruvannamalai and Chengam taluks, the climate is cool in winter and hot during summer. The district gets rainfall during both north-east monsoon and southwest monsoon. The physiographic nature prevailing in the district forces variation in the climatic conditions. The radiation of the heat from the rocky hills and the dry weather due to sandy bed of the Palar minimises the rainfall in the region. The rainfall of the region depends on the south-west and the north-east monsoons. Except southern taluks of Cheyyar and Vandavas, the district experience moderate rainfall during north-east monsoon. In summer, from March to June, the wind is hot and uncomfortable. In the monsoon seasons, from July to November, the wind is mild and from December to February, the wind is cold. The hottest month in this district was April (36.3o C) and coldest month in this district was January (21.2° C).

8.5. Boundaries

The district is bounded on the North and West by Vellore district and on the South West by Dharmapuri district on the South Villupuram district and on the east by Kancheepuram district.

8.6. Soil

The red loamy soil is predominantly found here. However Polur taluk has concentration of red series loam. The district has also different types of soils such as ferruginous loamy and sandy loamy however black series loam is found in tanks and river beds of Cheyyar and Vandavasi Taluks.

8.7. Climate and rainfall

The general climate is tropical. The district receives rainfall from North East and South West monsoons. The total rainfall during 2016-17 districts is 635.8 mm.

8.8. Population

The total population of this district 2464875 comprising 1235889 Men and 1228986 women as per 2011 census. The urban population is 494945 constituting 20 % of the total Population, the remaining 80% ie.1969930 is rural population. The density of the population is 398 per sq.km. The total literate among male are 909803 and that of female are 717010

8.9. River

There is no perennial river in the district. Cheyyar, Thenpennai, Kamandala, Naganathi are only in seasonal. Sathanur Dam is constructed across Thenpennai River in Thandrapet taluk among Chennakesava Hills.

8.10. Water Resource

The rivers flowing in the district are Pennaiyar and Kamandala River. Sathanur dam is the major dam constructed across middle Pennaiyar River Basin among Chennakesava Hills in the district. Canals, wells, tanks and reservoirs are the sources of irrigation in the district. Several plans and schemes have been introduced for uninterrupted water supply for domestic and economic activities.

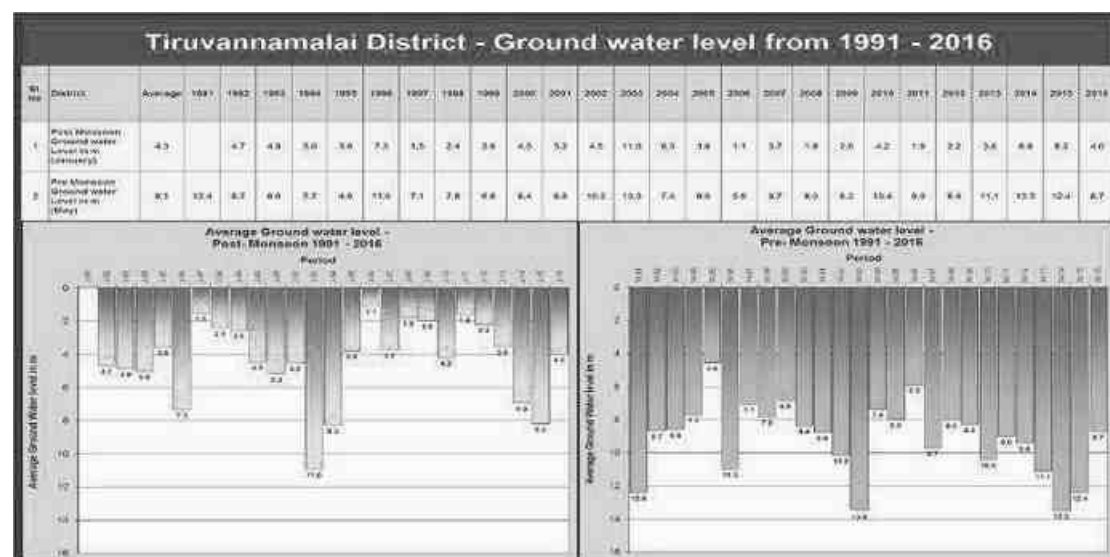


Fig: 8.10.1. Ground Water Level From 1991 – 2016

Few Schemes to enhance the water supply in the district are as follows:

Combined Water Supply Scheme (CWSS)

More than one local body are involved which consists of assistance from Minimum Needs Program, National Rural Drinking Water program and financial assistance from institutions like TUFIDCO, TNUIFSL, NABARD and ADB.

HDPE linings of major canals

High Density Polyethylene (HDPE) linings are being implemented by the state government to limit the transmission loss.

8.11. Cropping Pattern

Paddy, Groundnut, Sugarcane, Millets and pulses are the major crops, during the current fasli-1426(2016-17) 78149 /Hects of paddy, 25399 /Hects of sugarcane/ 50730 /Hects of groundnut, 34225 /Hects of pulses are cultivated.

8.12. Transport and communication

93 Km of Broad gauge rail transport in the Katpadi and Villupuram segment utilized for both passenger and goods transportation as far as road transports nearly, 1600 km of various kinds of roads are used. The district has two head post offices, 72 sub offices, 455 branch post offices, 4 Telephone divisions and nearly 18430 phone connections in use.

8.13 Industries

This district is industrially backward, the (Sevoor) Arni T.K SLS cotton spinning mill is the only major industry and Cheyyar Co-operative Sugar mill in Annakkavoor. Dharani Sugars, Polur and Bannari Amman Sugars, Gozhthuthampattu Sugar mills are functioning. However medium and small scale industries as well as cottage industries, such as modern rice mills, weaving factories, cotton, silk and mat weaving, coir manufacturing and beedi manufacturing are flourishing here. The district is enriched in mineral deposits such as black granites, multi-colored granites, soap and magnetite deposits.

8.14 Places of worship and tourist

Tiruvannamalai is one of the most venerated places in Tamil Nadu. The main Deepam festival, Maha shivarathri and Pournami girivalam attracts Tiruvannamalai and Parvathamalai devotees from far and wide throughout India and abroad. Further main features of the District attract historic places besides Tiruvannamalai, Arni, Vandavasi and Devigapuram connected to East India and French companies. It is also noticed that well-maintained tourist places such as Sathanur dam, Jawathumalai and Amirthy Game Park.

In the late Chola period the Cholan of Sambuvarayar having Padavedu near Arni as HQ ruled this district. We can now find the fort and note along with a Shiva temple namely Kailasanathar in Arni town. On the whole Tiruvannamalai is traditionally rich in Historic and Spiritual values but lacks in industrial growth.

9. LAND UTILIZATION PATTERN IN THE DISTRICT

Land and Agriculture 32% of land in Thiruvannamalai is used for agricultural activities to produce rice, ground nut and sugarcane. Another major economic activity of the district is Silk Saree weaving, a bulk of India's Silk apparels is produced by the people of Thiruvannamalai district largest concentration of Silk producers and weavers in Arni Taluk.

9.1. Cropping Pattern

Paddy, Groundnut, Sugarcane, Millets and pulses are the major crops, during the current fasli-1426(2016-17) 78149 /Hects of paddy, 25399 /Hects of sugarcane/ 50730 /Hects of groundnut, 34225 /Hects of pulses are cultivated.

9.2. Soil

The red loamy soil is predominantly found here. However Polur taluk has concentration of red series loam. The district has also different types of soils such as ferruginous loamy and sandy loamy however black series loam is found in tanks and river beds of Cheyyar and Vandavasi Taluks.

9.3. Forest and Hills

One sixth of the area of this district is covered by reserve forest and hills which is part and parcel of Eastern Ghats under Jawadhu Hills. The important hills in this district are Thiruvannamalai (2668 ft MSL), Jawadhu hills (3600-3800 ft MSL) and Kailasagiri (2743 ft MSL)

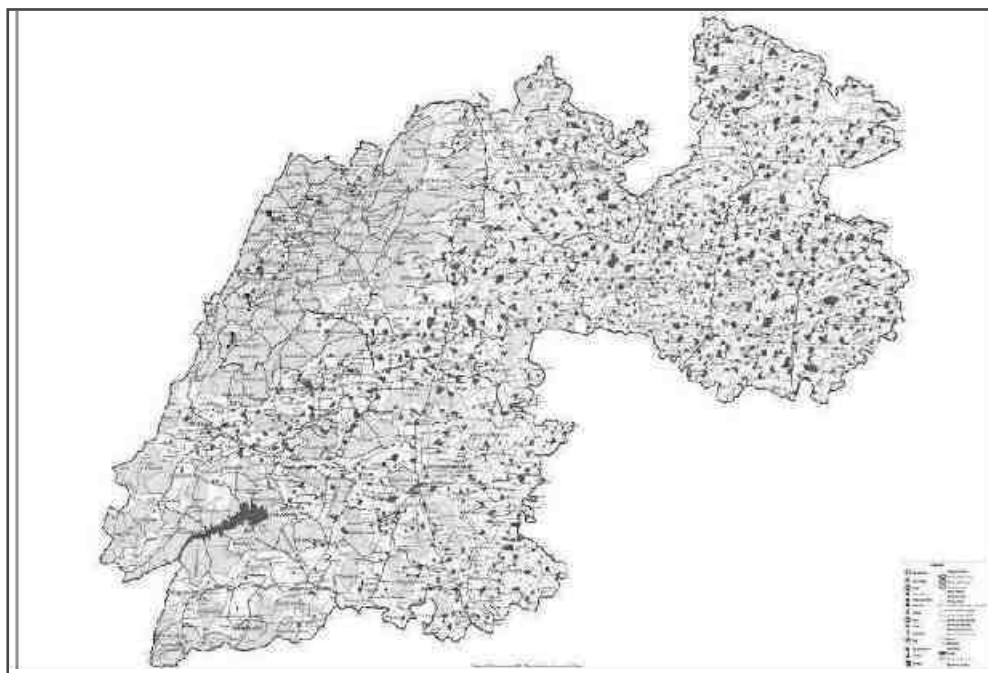


Fig.9.3.1.Forest Map of Tiruvannamalai District

9.4. Industries

This district is industrially backward, the (Sevoor) Arni T.K SLS cotton spinning mill is the only major industry and Cheyyar Co-operative Sugar mill in Annakkavoor. Dharani Sugars, Polur and Bannari Amman Sugars, Gozhhuthampattu Sugar mills are functioning. However medium and small scale industries as well as cottage industries, such as modern rice mills, weaving factories, cotton, silk and mat weaving, coir manufacturing and beedi manufacturing are flourishing here. The district is enriched in mineral deposits such as black granites, multi-colored granites soap stone and magnetite deposits.

10. PHYSIOGRAPHY

The Jawadhu Hills are the highest mountains of this region. The general elevation of the Jawadhu Hills is 2500 ft with peaks rising up to 4200 ft. The district is extended upto Tirupathur taluk on the eastern part, the north-western portion of Chengam taluk and the western part of Polur taluk with spurs running in to Vellore taluk up to 9 kms. Kalrayan Hills range is on the southern part of Chengam taluk. The North-Western part of the region covers portions of Eastern Ghats and their spurs. The Hills in Tiruvannamalai and Pavala Malai at Polur taluk are famous for their spiritual sanctity. There are also a large number of small hills in Polur and Chengam taluks.

11. RAINFALL DATA

Rain fall details of Tiruvannamalai District for the year 2015

Month	TV Malai	Chengam	Polur	Sathanur Dam	Arni	Cheygar	Vandavasi	Total	Average
Jan 2015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Feb 2015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
March 2015	0.00	2.00	0.00	0.00	10.80	0.00	0.00	12.80	1.83
April 2015	174.80	162.70	135.40	126.40	204.00	48.60	43.80	895.70	127.95
May 2015	80.00	45.90	128.40	42.40	148.60	114.00	69.80	629.10	89.87
June 2015	71.80	90.80	76.00	41.20	70.20	39.00	7.00	396.00	56.57
July 2015	55.60	56.00	106.40	141.80	88.70	101.50	135.30	685.30	97.90
Aug 2015	246.70	111.80	182.50	232.60	171.80	172.60	149.80	1267.80	181.11
Sept 2015	142.20	173.60	114.20	158.40	80.40	136.00	82.00	886.80	126.68
Oct 2015	87.20	110.60	197.80	80.80	148.20	243.90	132.30	1000.80	142.97
Nov 2015	472.20	324.00	406.60	506.40	375.60	933.42	700.47	3718.69	531.24
Dec 2015	69.10	36.70	137.80	98.00	142.40	262.00	231.00	977.00	139.57
Total	1399.60	1114.10	1485.10	1428.00	1440.70	2051.02	1551.47	10469.99	1495.71

Rain fall details of Tiruvannamalai District for the year 2016

Date	TV Malai	Chengam	Polur	Sathanur Dam	Arni	Cheygar	Vandavasi	Total	Average
Jan 2016	0.00	0.00	4.80	30.20	27.8	0.00	0.00	62.80	8.97
Feb 2016	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
March 2016	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
April 2016	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
May 2016	88.40	102.60	54.60	95.20	70.00	120.80	57.30	588.90	84.13
June 2016	85.60	104.40	98.60	96.00	167.60	74.00	98.20	724.40	103.49
July 2016	104.30	79.90	173.20	78.20	142.80	114.80	120.60	813.80	116.26
Aug 2016	50.80	107.20	60.80	24.80	102.40	178.50	147.00	671.50	95.93
Sept 2016	49.20	27.60	107.20	4.20	197.00	115.00	223.00	723.20	103.31
Oct 2016	61.10	73.60	58.80	168.60	37.60	14.00	40.00	453.70	64.81
Nov 2016	28.70	1.40	3.80	6.00	0.00	3.00	0.00	42.90	6.13
Dec 2016	60.80	41.20	90.00	64.60	126.70	189.00	139.00	711.30	101.61
Total	528.90	537.90	651.80	567.8	871.9	809.10	825.10	4792.50	684.64

Rain fall details of Tiruvannamalai District for the year 2017

Date	TV Malai	Chengam	Polur	Sathanur Dam	Arni	Cheygar	Vandavasi	Total	Average
Jan 2017	22.50	20.00	50.00	69.00	94.00	37.00	36.00	329.30	47.04
Feb 2017	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
March 2017	0.00	29.40	4.60	0.00	0.00	0.00	0.00	34.00	4.86
April 2017	0.00	11.50	2.40	0.00	9.20	1.00	0.00	24.10	3.44
May 2017	13.10	118.20	70.00	114.80	24.60	7.00	0.00	347.70	49.67
June 2017	7.40	108.10	64.60	25.80	66.20	23.00	94.40	389.50	55.64
July 2017	24.80	42.60	54..8	61.80	52.60	124.50	122.40	483.50	69.07
Aug 2017	314.40	657.30	530.00	313.60	215.90	253.50	255.00	2539.70	362.81
Sept 2017	49.40	68.90	139.60	81.80	74.80	118.00	101.60	634.10	90.59
Total	431.60	1056.80	916.00	585.00	537.30	564.00	609.40	4700.10	671.44

12. GEOLOGY AND MINERAL WEALTH

11.1 An outline on Geology of Tamil Nadu:

Crystalline rocks of Archaean to late Proterozoic age occupy over 80% of the area of the state of Tamilnadu, while the rest is covered by Phanerozoic sedimentary rocks mainly along the coastal belt and in a few inland River valleys.

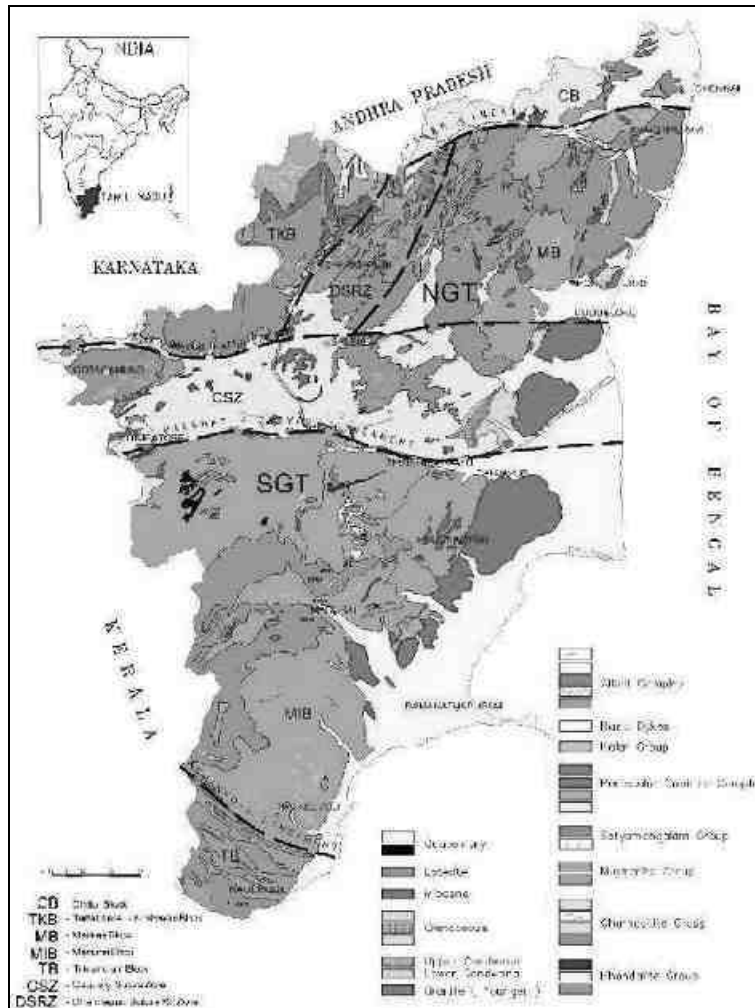


Fig 11.1.1 Geological Map Of Tamil Nadu And Puducherry

(Source: Miscellaneous Publication, GSI, SU:TN&P, Chennai)

The hard rock terrain comprises predominantly of Charnockite and Khondalite groups and their migmatitic derivatives, supracrustal sequences of Sathyamangalam and Kolar groups and Peninsular Gneissic Complex (Bhavani Group), intruded by ultramafic-mafic complexes, basic dykes, granites and syenites. The sedimentary rocks of the coastal belt include fluvial, fluvio-marine and marine sequences, such as Gondwana

Supergroup (Carboniferous to Permian and Upper Jurassic to Lower Cretaceous), marine sediments of Cauvery basin (Lower Cretaceous to Paleogene), Cuddalore /Pannambarai Formation (Mio-Pliocene) and sediments of Quaternary and Recent age.

12.2 Mineral Wealth of District

Geologically Tiruvannamalai District mainly comprises of rocks of Archaeon age. The type of rocks found in the district are Charnockite, Granitic gneiss, Amphibolite, Pyroxenite, Dunite, Migmatites, Banded Magnetite Quartzite, Shale and Clay. Dolerite dykes (Black Granite) are also noticed cutting across the country rocks.

12.2.1 Major Minerals

12.2.1.1 Iron Ore

The Magnetite quartzite deposit of Kavuthimalai, Vediappanmalai hills near Tiruvannamalai is one of the potential deposits. This Magnetite quartzite deposit is a low grade one and has to be beneficiated and also pelletised. At present there is no mining lease for mining Iron Ore in Tiruvannamalai District.

Magnetite-quartzite bands occur near Manikkavalli (12°31': 79°17') and Arumbalur (12°32': 79°13'). The probable reserves are of the order of 2.03 million tonnes. An iron-ore containing 23-39% Fe occurs near Kelur (12°36': 79°09')-The probable reserves are of the order of 34 million tonnes within a depth of 10 m. This ore is free from sulphur and the phosphorous content is within limits for use in blast furnace.

A 4.4 km. long and 10 to 25 m. wide magnetite-quartzite band occurs about 2.0 km. to the north of Puliappattu (12°16': 79°00'). The inferred reserves upto a depth of 100 m. are of the order of 28.50 million tonnes with 30.54% Fe content. Of the five bands of magnetite-quartzite in parts of Chengam and Tiruppattur taluks, the largest measures 4 km. long and 6 m. wide and passes through the crests of hills .1451 (12°16': 78°41') and .1375 (12°17':78°42'). The inferred reserve is of the order of 2.52 million tonnes upto a depth of 30 m. with a Fe content ranging between 38.50—38.78%.

Two magnetite-quartzite bands measuring 1.6 km. x 12 m. and 1.4 km. x 7 m. are located 0.2 km. to the east and 0.4 km. to the

south-east of Durgamalai .3349 (12°28': 78°45'), respectively. The samples analysed 41.88 and 44.67% Fe and are free of phosphorous, sulphur and titanium.

Out of the eleven magnetite-quartzite bands, the biggest measures 3.6 km. x 9 m. and occurs 1.2 km. west of Pudur (12°24': 78°41') analysing 36% Fe. The total inferred reserves are of the order of 3.4 million tonnes upto an assumed depth of 30 m.

Banded magnetite-quartzite with hematite has been recorded 12 km. north-west of Tiruvannamalai (12°14' : 79°05') in Kavuthi Malai (12°18' : 79°01') and Vediappan Malai (12°18' : 79°02') and to the south of Ponakkadu. The iron-ore band is being investigated by the State Geology Department with the aid of the **U. N. D. P. (Madras Mineral Project)**. The band occurs in three detached synclinal basins on either side of Tiruvannamalai-Kanchi road (12°23' : 78°58') with converging dips of 65° to 80°. Its strike length varies from 2.5 to 4.5 km. According to the State Geology Department of Tamil Nadu, the inferred reserves are :

Vediappanmalai	...	60 million tonnes
Kavuthi Malai	...	56 million tonnes
Uchchimalai	...	20 million tonnes

Five drill holes have also been completed by them in the Kavuthi Malai iron-ore band.

12.2.1.2 Magnesite

An occurrence of ultra basic-Alkali syenite comprises with rocks like Dunite and Corundum Syenite is found near Thenmudiyanur Village in Thandarampattu Taluk. Another small occurrence of Magnesite has been reported near Thorapadi in the Eraiyurmalai R.F. amidst the ultra basic complex. At present there is no mining lease for mining Magnesite in Tiruvannamalai District.



Photo:1 Eraiyur R.F



Photo:2 Magnesite, Narasinganallur



Photo:3 Serpentinite / Dunite / Pyroxenite



Photo:4 Magnesite

Foliation : N50°E / 80°SE

Joint : S35°E / 63°NE

Location : Narsinganallur Eraiyur R.F., Chengam Taluk

Coordinates : 12° 18' 33.61" N,
78° 54' 42.96" E



Photo:5 Magnesite

Foliation : N-S / 65°E

78° 54' 42.96" E

Location : Thenmudaiyanur , Thandrapattu Taluk



Photo:6 Magnesite

Coordinates : 12° 06' 41.53" N,

12.2.1.3 Steatite / Soapstone:

A small occurrence of steatite is located in Poomalai R.F. Royandapuram R.F., in Thandarampattu Taluk and also near Thenkarimallur and Radhapuram Villages in Thandarampattu Taluk. At present there is no mining lease for mining Steatite in Tiruvannamalai District.



Photo: 7 - 10 Steatite / Soapstone

Foliation : N85°E / 85°SW **Coordinates** : 12° 07' 42.58" N,
Joint : N10°E / 85°SW 78° 57' 58.83" E
Location : Poomalai R.F. Royandapuram R.F near Radhapuram,
Thandarampattu Taluk



Photo 11 -12. Steatite / Soapstone

Location : Near Radhapuram, Thandrapattu Taluk

12.2.1.4 Fire Clay

Clay mineral suitable for making stoneware pipes, tiles, ceramic utensils etc. is available in Painkinar and Cholavaram Village of Cheyyar Taluk. At present there is one mining lease for mining Fire Clay exists in Cholavaram Village of Cheyyar Taluk.



Photo:13 – 15. Tvl. Arcot Pipes, Factory (FIRE CLAY) Cholawaram, Cheyyar Taluk



Photo:16 – 17. Fire Clay, Painkinar Village, Cheyyar Taluk. Coordinates :12°42'44.30" N; 79°32'45.55" E



Photo:18 – 19 Fire Clay, PeriyaKoil -Village, Cheyyar Taluk, Tiruvannamalai

12.2.2 Minor Minerals

12.2.2.1 Black Granite

Dolerite dyke commercially called as Black Granite play a vital role in the mineral resources of this District. Black Granite is found in Tiruvannamalai, Chengam, Thandarampattu and Vandavasi Taluks.



Photo:20. Black Granite, **Location:** Seiyalam, Vandavasi Taluk
Foliation: N65°E / 80°SE **Coordinates :** 12° 26' 40.29" N,
79° 43' 23.56" E



Photo:21. Black Granite **Location:** Atthipakkam, Vandavasi Taluk
Foliation : N-S / 60°SE **Coordinates :** 12° 27' 38.56" N, 79° 35' 53.39" E

12.2.2.2 Multi colour Granite

The granite gneisses commercially called as Multi Coloured Granite are noticed in parts of Tiruvannamalai, Arni, Thandarappattu, Polur and Chetpet Taluks.



Foliation : S80°E / 80°SW **Coordinates** : 12° 30' 28.21" N,
Joint : S50°W / 80°SW 79° 18' 03.11" E
: E-W / 60°N

Photo. 22& 23: Multi Colour Granite

Location : Nachiyapuram, Chetpet Taluk

12.2.2.3 Roughstone and Jellies

Ordinary stones suitable for making Roughstones, Jelly, Ballast etc., used for road formation, construction and other purpose are available in all Taluks.



Photo.23: Charnockite (Rough Stone) Quarry

Foliation : N55°W / 70°SW **Coordinates** : 12° 38' 40.04" N,

Joint : S50°W / 80°SW 79° 36' 12.21" E

Location : Athi - Village, Cheyyar Taluk



Photo .24: Rough stone crushed into Jellies, Ezhacherri, Cheyyar – Taluk

12.2.2.4 Brick Clay

Brick Clay suitable for manufacturing bricks is available in all Taluks.

12.2.2.5 Sand

Sand for construction purpose is available in Palar River and Cheyyar and other small streams in the Districts. At present there are no leases for quarrying Sand by P.W.D. in Tiruvannamalai District.

12.2.2.6 M – Sand

Manufactured Sand is defined as a purpose-made crushed fine aggregate produced from a suitable source material. Production generally involves crushing, screening and possibility washing. It is a substitute of river sand is produced from hard granite stone. The crushed sand is of cubical shape with grounded edges, washed and graded to as a construction material. The size of manufactured sand (M-Sand) is less than 4.75mm.

The precious river bed acts as not only mechanical filter but also as a biological filter with its microorganisms, formed through natural evolution over centuries which cannot be artificially replicated. Due to the depletion of good quality river sand for the use of construction, the use of manufactured sand has been increased.



Photo .25: Mining for M – Sand, Palli- Village, Cheyyar – Taluk



Photo .26: Wastage (Dust Particle) Of M- Sand



Photo .27: Powdered Rough stone for preparation of M - Sand



**Photo: 28. Crushing Unit for preparation of M - Sand
Manufactured Sand (M – Sand)**



“Our Children’s Future is in Our Hand or Decision”

Our contribution to environment is by producing M-Sand as an alternative to river sand, for reducing the extraction of sand from river bed

12. NEW FIND OF GOLD IN EDATHANUR, TIRUVANNAMALAI DISTRICT

In connection with the DEIAA work of DGM, Tiruvannamalai District, Tamilnadu, field work was carried out by Shri.Paranjothi,S., Assistant Geologist, GSI, SU:TN&P, Chennai along with Smt.Mythili, Asst.Director, DGM, Tiruvannamalai District. During the field work,active panning by the locales for gold along the river Ponnaiyar was observed in Edathanur village, 22kms SW of Tiruvannamalai. It is noticed that the occurrence of **gold in bluish quartz vein associated with Epidote Hornblende Biotite Gneiss** occur along the course of Ponnaiyar river, near Edathanur village, Thandrapattu Taluk, Tiruvannamalai District. Heavies were collected by panning and treated with mercury followed by smelting under controlled heating using brass troche burner gold weighing **0.58mg** was extracted.

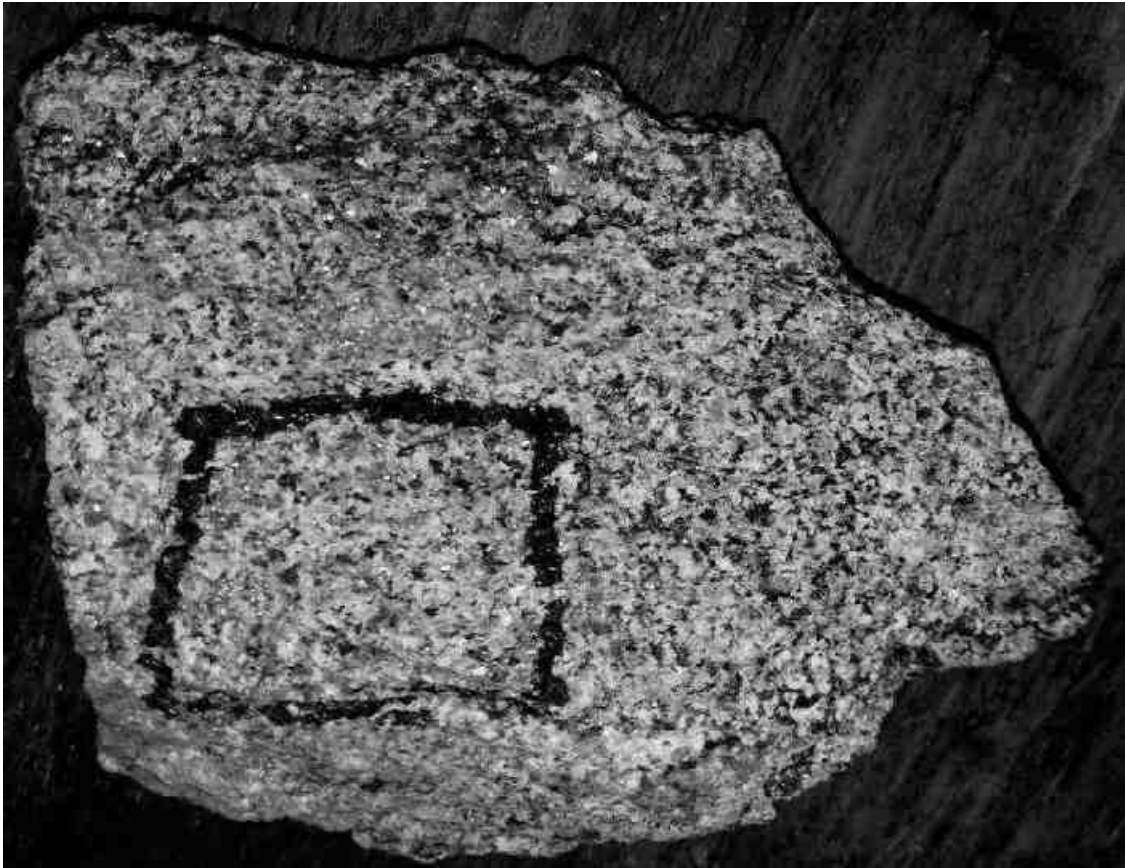


**Photo: 29. Gold mineralisation with Sulphide
in Epidote Hornblende Biotite Gneiss,**



Photo: 30. Pits excavated in the river course (R. Then Pennar) for removing the top gravel containing gold grains, Edathanur area, **Loc.** Edathaur and collecting weathered material for panning., **Loc.** Edathaur



Photo:31. Weathered surface of Bed rock (hornblende gneiss) showing visible gold grains, Edathanur area, **Loc.** Edathaur



Photo: 31. Close view of the bedrock hosting minute grains of visible gold, **Loc:** Edathaur



Photo:31. Visible gold grains on the weathered surface of hornblende gneiss, **Loc:** Edathaur



Photo: 32. Residue containing gold grains after panning, **Loc.** Edathaur



Photo: 33. Residue containing gold grains after panning, **Loc.** Edathaur,

13.1. Confirmation of gold by goldsmith

Field experiment was carried out by Shri. Paranjothi S, Asst. Geologist for the confirmation of gold grains. The officer has collected bed rock samples of 7 – 8 kg from weathered Epidote-Hornblende Gneiss was collected at Edathanur village to confirm the gold grain. The sample was panned and the residue consisting of heavies and gold grains, collectively weighing of about 50 gms were separated. The residue was treated with conc. nitric acid to remove elements like iron, silver and copper. After acid treatment the residue was amalgamated with mercury, followed by smelting under controlled heating using brass troche burner. After smelting gold speck weighing of **0.58mg** was extracted.

13.2. Inspection Visit of Deputy Director General, GSI, SU:TN&P

In connection with the DEIAA work of DGM, Tiruvannamalai District, Tamil Nadu, Shri Paranjothi S, Assistant Geologist of Geological Survey of India, SU:TN & P, and Smt. Mythili, Asst. Director, Directorate of Geology and Mining, Tiruvannamalai District, has carried out field work in Tiruvannamalai District during the month of July 2017. During the course of field work, the officer has witnessed Gold occurrence above the country rock ie., Epidote Hornblende Biotite Gneiss along with bluish quartz vein along the river Ponnaiyar, at Edathanur village, Thandrapattu – Taluk, Tiruvannamalai District South of Sattanur Water reservoir.

Based on the report of Shri. Paranjothi S, Assistant Geologist, Dr. S. Raju, Dy. Director General, Shri. S. B. Vijay Kumar, Senior Geologist, GSI, SU: TNP and Smt. Mythili, Asst. Director, Directorate of Geology and Mining, Tiruvannamalai District has carried out field work during 13.07.17 and 14.07.17, in the areas reported for gold panning with an objective to identify the source and mode of occurrence of mineralisation, and the scope of carrying out G4 stage exploratory work in the area for Gold.

The lithounits encountered in the area includes charnockite, charnockitic gneiss and hornblende gneiss +/- epidote. Thin quartz veins (ribbon like) is found to occur along the gneissic planes of hornblende biotite gneiss, where fine grains of gold and other sulphides were present along the contact. Stream sediment and bed rock chip samples were collected for chemical analysis and petrological studies (Annexure-1 & 2).

The team has taken field traverse in Sathanaur reservoir and Neepathurai area, reported gold panning, in the upstream side of the river,

The Sattanaur reservoir lies 11 kms north of Edathanur village. It is reported that local panning for gold is being carried out in the natural course and surplus water course of the reservoir in the downstream side.

The team has visited the Neepathurai site around 25 km east of Sattanaur along the upstream side where active panning was going on. The lithounits encountered in the area includes Charnockite, Charnockitic Gneiss, Mylonite with Pseudotachylites, Fault breccia and younger pegmatitic intrusives. The general trend observed in the area N45°E / S45°W with 50° westerly dip. Highly weathered (limonitic) sulphidic zones of 3.5 to 15m width cutting across the river channel, with disseminations of Pyrite, Chalcopyrite and Sphalerite? were noticed. These sulphidic zones are oxidised, yellow to brown colour, fragile with black streak and pungent smell. It is observed that the local people carry out panning mainly in the limonitised sulphidic zones. However, visible gold grains were not noted in the rock chip samples collected from various lithounits present in the area. Also, it is observed that the locales could not yield gold grains by panning compared to Edathanur. Bed rocks were collected for chemical analysis and optical studies.

The presence of fault breccia with pseudotachylite, garnet and well developed mylonitic fabric reveals that the area has undergone severe, multiple brittle-ductile deformation. It is suspected that the deformation event could have facilitated in the movement/remobilisation of gold grains within the rock units.

13.3. Study Area

The area falls in Toposheet No. 57 L/16 and bound by the latitude of 12°14'02"N - 12° 01'41"N and longitude of 78°35'57"E - 78°59'15.83"E. It is situated in 22kms SW of Tiruvannamalai town. Geomorphologically, the area is an undulating terrain with residual hills and intermittent plain lands. The area falls a part of Ponnaiyar (South Pennar) river, that originates at Nandidurga in Chikkaballapura District of Karnataka State and flows towards south-east for 400 km through Karnataka and Tamil Nadu, emptying into the Bay of Bengal at Cuddalore. The South Pennar River is known as Dakshina Pinakini in Kannada and Thenpennai in Tamil. It is also referred as Ponnaiyar. It has a catchment area of 3,690 km² located in Karnataka, Tamil Nadu and Andhra Pradesh States. Water flows during the

monsoon season when it is fed by the south-west monsoon in catchment area and the northeast monsoon in Tamil Nadu. However this water flow raises the water table throughout the river basin and feeds numerous reservoirs/tanks.

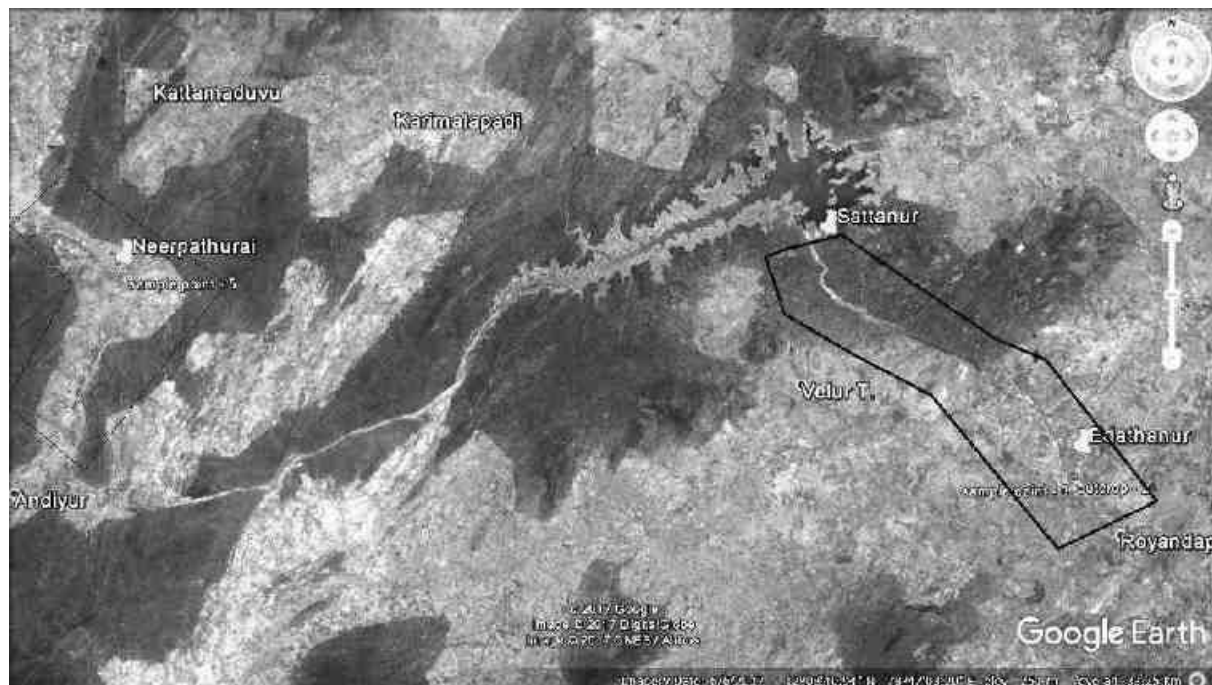


FIG: 12.3.1: IMAGE SHOWING THE AREA OF STUDY

13.4 Background Information

The area forms a part of the Archaean Granulite Terrain of Tamil Nadu, which consists of gabbro, pyroxenite, banded magnetite quartzite, pyroxene granulite, charnockite, hornblende biotite gneiss, pink granite gneiss/pink granitoid gneiss, quartzo-feldspathic gneiss, pink migmatite, epidote – hornblende gneiss, basic dykes (dolerite), granite, quartz and pegmatite veins. The general trend of the foliation is N45°E – S45°W with moderate to steep dip on either side.

During 1990-91, P. Shanmugam, et al carried out regional exploration for Au in banded iron formation in Chengam and Sankarapuram areas of Tiruvannamalai and South Arcot districts, Tamil Nadu, falling in Toposheets No. 57L/11, 15, 16 and 58I/13. Striking map of Banded Iron Formation (BIF) bands and the enclosing/neighbouring meta basic rocks on 1:50,000 scale, plotting of shear zones, silicified zones and few stream sediment heavies collected from 1st order nalas draining BIF bands. Out of the total 350 samples analysed for Au, 85 samples show Au values ranging from 0.1 to 0.4

g/t, 32 samples showing 0.5 to 0.7 g/t and one sample shows value of 0.8 g/t. Samples from magnetite quartzite with quartz veinlets show Cu values from 115 to 515 ppm. These values fall in the adjoining Toposheet of the present study area.

Geochemical Mapping (GCM) was taken up in toposheet no.57L/16 in parts of Tiruvannamalai and Villupuram District of Tamil Nadu by Dilip Kumar Yadav and Lakshmy C.S during Field Season 2012-13. The analytical results of one composite stream sediment sample show high value of Au (650 ppb), which falls in the north of Pudurnattam village, (unit cell No.119). Further the composite cell no. 174 and 178, the gold value were 34 ppb and 52 ppb respectively and the authors recommended to analyze the existing 4 unit cell samples representing the high value of Gold (Au).



Photo:34. Fault breccia with angular clasts within pseudotachylites and development of mylonitic fabric,
Loc. Neepathurai



Photo:35. Finegrained garnetiferous gneiss with pseudotachylites,
Loc. Neepathurai



Photo: 36. Oxidised sulphidic zone, **Loc.** Neepathurai



Photo: 37. Oxidised sulphidic zone with malachite stains,
Loc. Neepathurai



Photo: 38. Mylonitic fabric with development of boudins,
Loc: Neepathurai



Photo: 39. Panning for gold by the locales,
Loc: Neepathurai

13.5. Laboratory studies

Subsequent to the field visit carried out, the stream sediment samples and the rock chip samples of the bed rock were subjected to the laboratory tests including hand picking of suspected gold grains from the stream sediments and mounting for petrological studies, pulverising of stream sediments and rock chip samples for chemical analysis etc.

13.6. Heavy mineral separation

About 50gm of residue after panning obtained from the local villagers engaged in panning was subjected to bromoform gravity separation process, thereby separating the lighter minerals from the heavies including the gold grains. The heavies obtained from the gravity separation was air dried and the suspected gold grains were handpicked using forceps and mounted on the thin section for petrological studies. Detailed petrographic studies were carried out including the ore microscopic techniques and grain morphometric analysis.

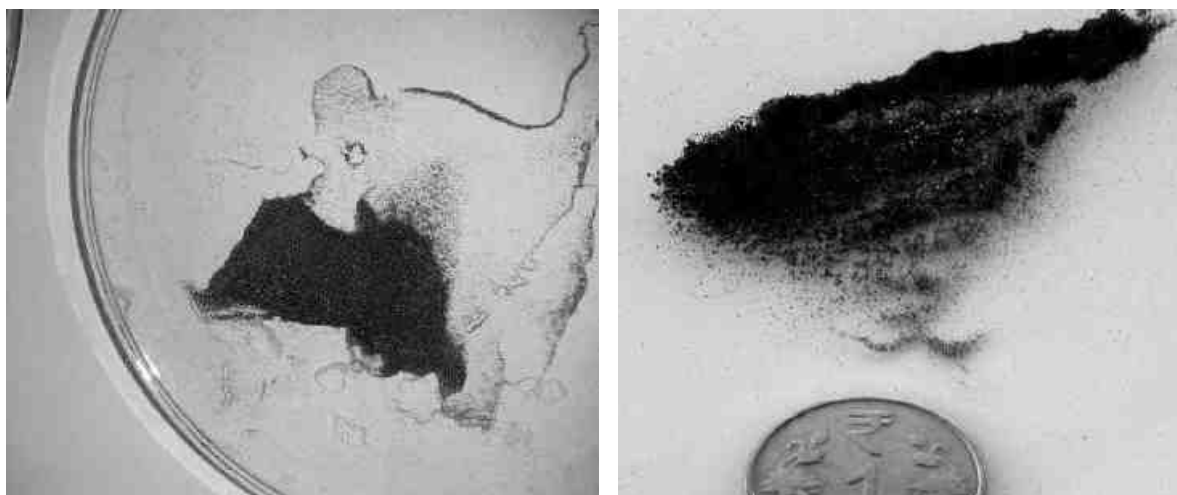


Photo: 40. Heavies containing gold grains



Photo: 41. Gold grains mounted on thin section

13.7. Petrological studies

The gold grains were identified by high reflectivity, brilliant yellow colour, absence of cleavage, isotropic, absence of internal reflection and less tarnishing effect. The gold grains are rounded and elongated, flaky in nature and shows brilliant yellow colour in low illumination. The grain size varies between 300 μ m and 1500 μ m. Further detailed studies including EPMA studies with corroborating chemical analysis may throw light on the identification of gold grains.

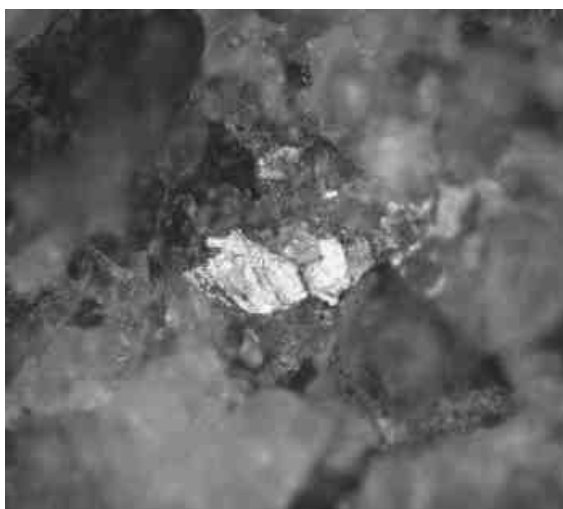
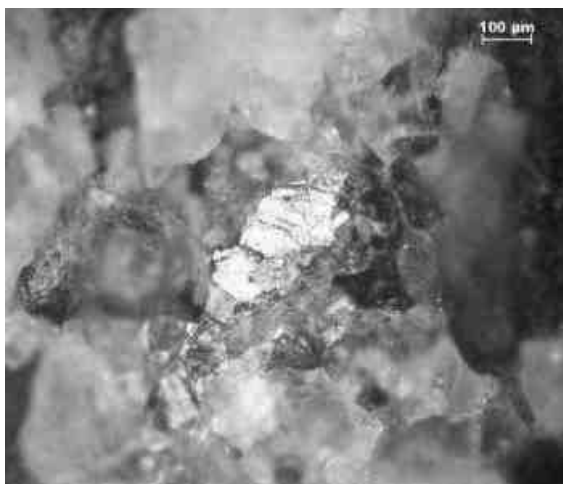
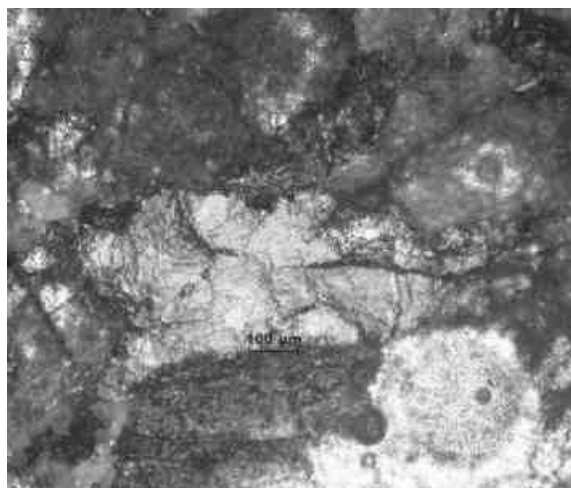


Photo: 44-47 Photomicrograph of gold grains associated with quartz grains in hornblende gneiss, **Loc:** Edathanur

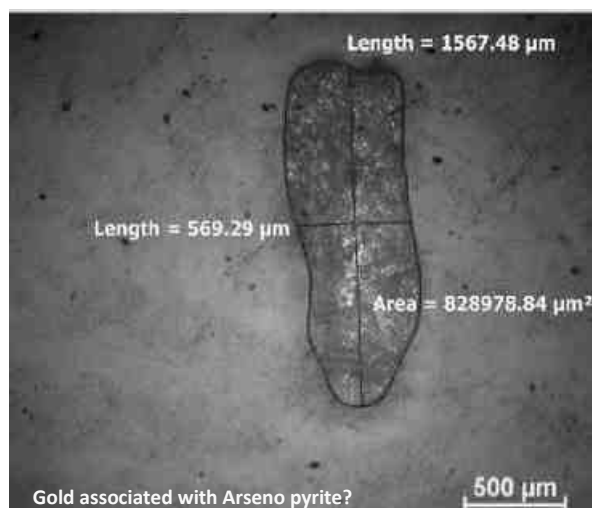
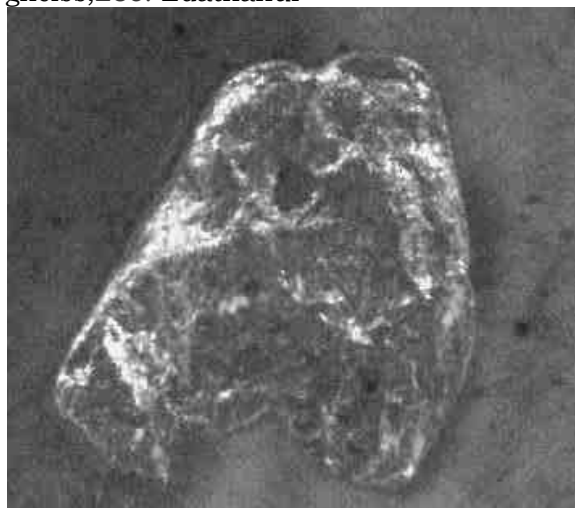


Photo: 48-49 Photomicrograph of gold grains after heavy mineral separation method, **Loc:** Edathanur

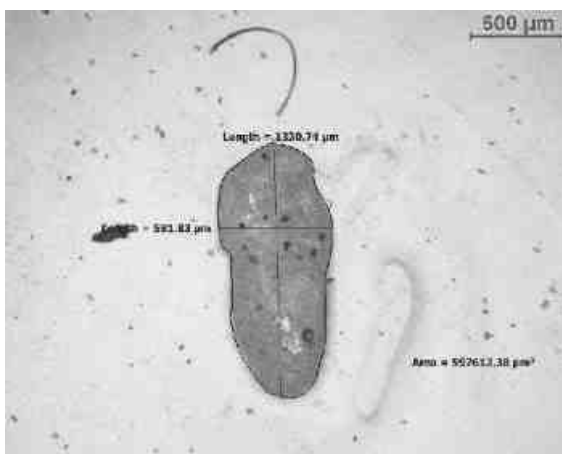
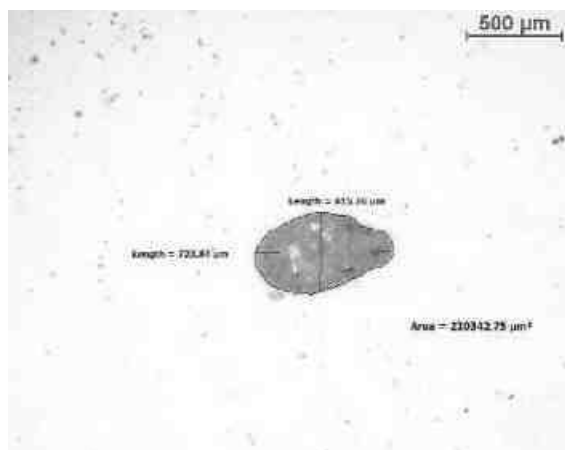


Photo: 50-51. Photomicrograph of gold grains displaying the shape and geometry

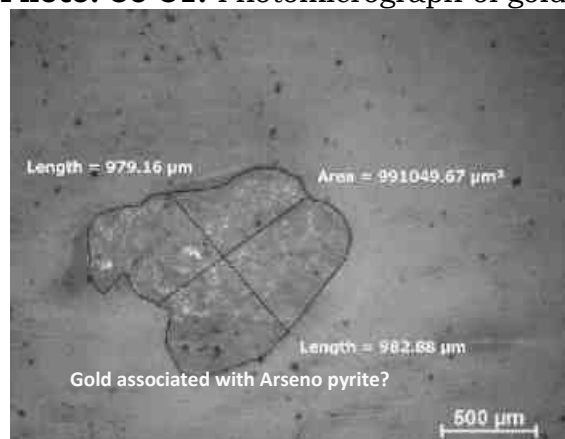


Photo: 52 - 53. Photomicrograph of gold grains displaying the shape and geometry

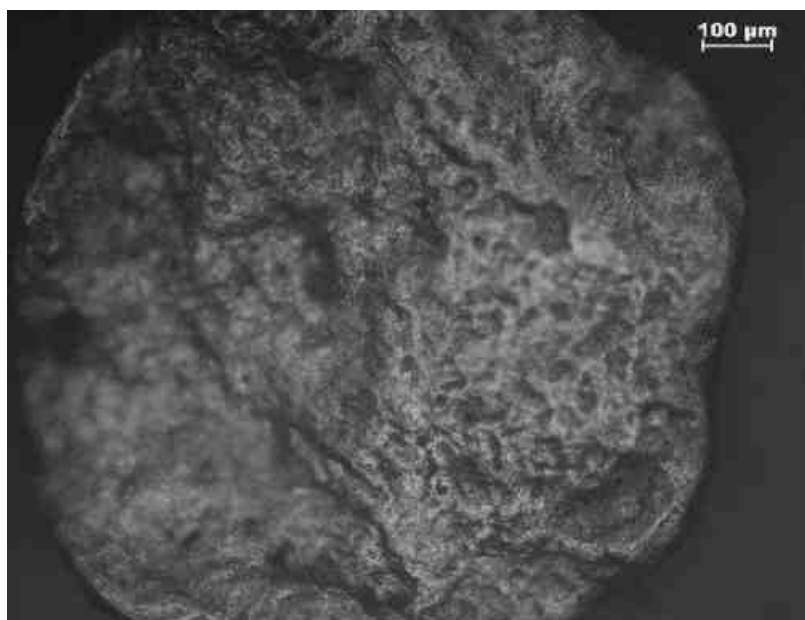


Photo: 54. Photomicrograph of gold grains displaying the shape and geometry

13.8. Chemical Analytical Result:

The analytical results of two samples analyzed in **HGML**, Karnataka indicated Gold (Au) assay value of **0.2 g/t**. The petrological studies of the same, reveals the presence of few gold grains. Which are rounded, elongated, flaky in nature and shows brilliant yellow colour in low illumination. The grain size varies between 300µm and 1500 µm.

Note: The samples are submitted for chemical analyses in GSI, SR-Hyderabad, results are awaited.

13.9. EPMA Result:

EPMA studies resulted with **Au: 74.82 wt% and Ag: 25.87wt%**, Ni: 0.03wt%, Fe: 0.05wt%

Sample details for chemical analysis:

Annexure – 1

S.No.	Sample No.	Type of Sample	Rock type	Coordinates
1	ED – 1	-200 size fraction & powdered by pulveriser	Epidote hornblende biotite gneiss	12° 06' 23.42" 78° 55' 08.10"
3	NE – 1	-200 size fraction & powdered by pulveriser	Hornblende Gneiss	12° 09' 39.20" 78° 38' 34.39"

Sample details for petrological studies

Annexure – 2

S.No.	Sample No.	Type of Section	Rock type	Coordinates
1	ED – 1	Thin/ Polished section	Epidote hornblende biotite gneiss	12°06'23.42" 78°55'08.10"
2	ED – 2 (3 nos)	Thin/ Polished section	Charnockite gneiss?	12°06'30.99" 78°55'03.75"
3	NE – 2	Thin/ Polished section	Gneissic Charnockite?	12°09'39.20" 78°38'34.39"
4	N E – 3	Thin/ Polished section	Hornblende gneiss	12°09'52.7" 78°38'38"

General characteristic of gold**Annexure – 3**

Chemical symbol	: Au	Atomic number	: 79
Group,Period,Block	: 11,6,d (Transition Element)	Atomic weight	: 197
Crystal form	: Cubic	Colour	: Golden yellow to silver white rarely orange red
Luster	: Metallic	Hardness :	: 2.5 to 3.0
Reflectivity	: 99 % of infrared rays	Troy ounce (Oz)	: 31.10428 gm
Tola	: 11.66 gm	1 carat	: 4.167 % of gold
24 carat	: 100 % of gold or 1000 fine	Alloys	: Electrum, Amalgam, Tellurides
Melting point	: 1064.43 °C (1948 °F)	Conductivity	: Electrical: 0.452*10 ⁶ /cm ohm Thermal: 300K

National Accreditation Board for Education and Training

Certificate of Accreditation

Geo Exploration and Mining Solutions, Salem

No. 17, Advaita Ashram Road, Fairlands, Salem, Tamil Nadu – 636 004

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S. No	Sector Description	Sector (as per)		Cat.
		NABET	MoEFCC	
1.	Mining of minerals including opencast / underground mining	1	1 (a) (i)	A
2.	Mineral beneficiation	7	2 (b)	A
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4.	Building and construction projects	38	8 (a)	B

Note: Names of approved experts and sectors are mentioned in RAAC minutes dated August 21, 2025, posted on QCI-NABET website.

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Valid up to
August 06, 2028

Issue Date
August 25, 2025



Certificate No.
NABET/EIA/25-28/RA 0424


 Prof (Dr) Varinder S Kanwar
 (CEO – NABET)

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