DRAFT EIA & EMP FOR
PROPOSED ROUGH STONE QUARRY
CATEGORY – B1

(Public Hearing Upgraded after Terms of Reference (ToR) as per the provisions of EIA Notification 2006 & amendments thereof)

ToR Identification No. TO24B0108TN5815892N dated 22.10.2024

PROPOSED QUARRY LEASE DETAILS	
SURVEY NO	91 (Part-2)
VILLAGE	ARIYANAYAGIPURAM
TALUK	KADAYANALLUR
DISTRICT	TENKASI
EXTENT	3.00.00 Ha
PROPOSED PRODUCTION FOR THREE YEARS	3,77,765 m^3 OF ROUGH STONE
LAND	GOVERNMENT LAND

(Sector No. 1(a) Sector No.1 as per NABET)
Category of the Project: B1 Cluster Mining, Total Cluster Area – 7.90.0 Ha
Baseline Monitoring Period – October to December 2024

APPLICANT

THIRU.V.M.SUNDARAIAH,
S/O.MUTHAIAH THEVAR,
NO.4/111D, SUNDARESAPURAM BLOCK-IV,
POGANALLUR VILLAGE, KADAYANALLUR TALUK,
TENKASI DISTRICT.

ORGANIZATION

M/s. GLOBAL MINING SOLUTIONS
(NABET ACCREDITED & ISO 9001 CERTIFIED CONSULTANT)
PLOT NO. 6, SF NO. 13/2, A2, VS CITY, RC CHETTYPATTY,
KOTTAMETTUPATTY, OMALUR, SALEM, TAMIL NADU – 636 455
NABET ACCREDITATION NO – NABET/EIA/2326/IA 0110
CONTACT: 97502 23535, 94446 54520
Email: infoglobalmining@gmail.com: globalminingsolutionssalem@gmail.com

Global Mining Solutions

MARCH - 2025

NABET

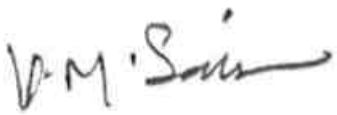
UNDERTAKING BY PROJECT PROPONENT

UNDERTAKING

I hereby, undertake that the Environmental Impact Assessment (EIA) Report for the Proposed Rough Stone Quarry at S.F.No.91 (Part-2) over an extent of 3.00.0 Ha in Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu and the report is line with compliance with Terms of Reference (ToR) issued by SEIAA, Tamil Nadu vide ToR Identification No. TO24B0108TN5815892N dated 22.10.2024. I, hereby assure that all the information and data provided in the EIA report is accurate, true and correct and owns the responsibility of the same.

Date:

Place: Tenkasi



Thiru. V. M. Sundaraiah

UNDERTAKING BY EIA CONSULTANT

UNDERTAKING

I, Mr. Manikandan Manickam, EIA Co-ordinator for sector 1 confirms that this EIA Report of proposed rough stone at S.F.No.91 (Part-2) over an extent of 3.00.0 Ha in Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu has been prepared by **M/s. Global Mining Solutions.**

I also confirm that I shall be fully accountable for any miss-leading information mentioned in this report.

Signature:

Name: Manikandan Manickam

Designation: EIA Co-Ordinator

Name of the EIA Consultant organization: M/s. Global Mining Solutions, Salem.

NABET Certificate No.: NABET/EIA/2326/IA 0110

Date: Place:

NABET ACCREDITATION CERTFICATE

QUALITY COUNCIL® OF INDIA
Creating an Ecosystem for Quality

NABET

National Accreditation Board for Education and Training

NABET

Certificate of Accreditation

Global Mining Solutions

Plot No - 6 SF No 13/2 A2, VS City, RC Chettypatty,
Kottamettupatty, Omalur, Salem, Tamil Nadu-636455

*The organization is accredited as **Category-B** under the QCI-NABET Scheme for Accreditation of EIA Consultant Organizations, Version 3: for preparing EIA-EMP reports in the following Sectors –*

S. No	Sector Description	Sector (as per)		Cat.
		NABET	MoEFCC	
1	Mining of minerals-opencast mining only	1	1 (a) (i)	A

Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in IAAC minutes dated February 10, 2023, posted on the QCI-NABET website.

The Accreditation shall remain in force subject to continued compliance with the terms and conditions mentioned in QCI-NABET's letter of accreditation bearing no. QCI/NABET/ENV/ACO/23/2724 dated March 31, 2023. The accreditation needs to be renewed before the expiry date by Global Mining Solutions, Salem following the due process of assessment.

Sr. Director, NABET
Date: March 31, 2023

Certificate No.
NABET/EIA/2326/IA 0110

Valid up to
January 4, 2026

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

DECLARATION OF EXPERTS

Declaration by Experts contributing to the EIA of Proposed Mining of Rough stone Quarry Over an Extent of 3.00.0 Ha by Thiru. V. M. Sundaraiah.

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

EIA Coordinator: Manikandan Manickam

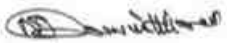
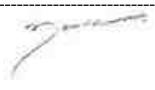
Signature and Date:

Period of involvement: October 24 - December 24

Contact information: M/s. Global Mining Solutions
Plot No. 6, SF NO. 13/2, A2, VS City,
RC Chettypatty, Kottamettupatty,
Omalur, Salem,
Tamil Nadu – 636 455

Functional area experts:

S. No.	Functional areas	Name of the expert/s	Involvement (Period and task)	Signature and date
1.	AP	Dhanalakshmi Ramanathan	1. Selection of Baseline Monitoring stations based on the wind direction 2. Interpretation of Baseline data by comparing it with standards prescribed by CPCB against the type of area 3. Identification of sources of air pollution and suggesting mitigation measures to minimize impact Period: Oct 24 to Dec 24	
2.	WP	Abirami Kaliaperumal	1. Selection of baseline Monitoring Locations for Ground water analysis and also identifying nearest surface water to be studied 2. Interpretation of baseline data collected 3. Identification of impacts based on the baseline study conducted and also to the ground water and nearby surface water due to the proposed project 4. Preparation of suitable and appropriate mitigation plan Period: Oct 24 to Dec 24	

5.	SHW	Ramadoss N	1. Identification of nature of solid waste generated 2. Categorization of the generated waste and estimating the quantity of waste to be generated based on the per capita basis. Identification of impacts of SHW on Environment 3. Suggesting suitable mitigation measures by recommending appropriate disposal method for each category of waste generated Period: Oct 24 to Dec 24	
4.	SE	Sarasvathy K	1. Primary data collection through the census questionnaire 2. Obtaining Secondary data from authenticated sources and incorporating the same in EIA report. 3. Impact assessment & proposing suitable mitigation plan 4. CSR budget allocation by discussing with the local body and allotting the same for need based activity. Period: Oct 24 to Dec 24	
5.	EB	Saravanan S	1. Primary data collection through field survey and sheet observation for ecology and biodiversity 2. Secondary Collection through various authenticated sources 3. Prediction of anticipated impacts and suggesting appropriate mitigation measures. Period: Oct 24 to Dec 24	
6.	HG	Ravinthiran N	1. Study of existing surface drainage arrangements in the core and buffer zone, impact due to mining on these drainage courses and suggestion of mitigative measures 2. Determination of groundwater use pattern, development of rainwater harvesting program. 3. Storm water management through garland drainage system. Period: Oct 24 to Dec 24	
7.	GEO	Valliappan Meyyappan	Field survey for assessing regional and local geology, aquifer distribution, Determination of groundwater use pattern, development of rainwater harvesting program. Period: Oct 24 to Dec 24	

8.	SC	Shisupal Sing	1. Interpretation of baseline report 2. Identification of possible impacts on soil, prediction of soil conservation and suggesting suitable mitigation measures. Period: Oct 24 to Dec 24	Shisupal Singh.
9.	AQ	Srilatha Thiruveedhula	1. Collection of Meteorological data for the baseline study period 2. Plotting wind rose plot and thereby selecting the monitoring locations based on the wind pattern 3. Estimation of sources of air emissions and air quality modelling is done 4. Interpretation of the results obtained 5. Identification of the impacts and suggesting suitable mitigation measures. Period: Oct 24 to Dec 24	T Srilatha
10.	NV	Dhanalakshmi Ramanathan	1. Selection of monitoring locations 2. Interpretation of baseline data 3. Prediction of impacts due to noise pollution and suggestion of appropriate mitigation measures Period: Oct 24 to Dec 24	R. Dhanal
11.	LU	Srilatha Thiruveedhula	1. Collection of Remote sensing satellite data to study the land use pattern. 2. Primary field survey and limited field verification for land categorization in the study area 3. Preparation of Land use map using Satellite data for 10km radius around the project site. Period: Oct 24 to Dec 24	T Srilatha
4.	RH	S.V. Prashant	1. Identification of the risk 2. Interpreting consequence contours 3. Suggesting risk mitigation measures Period: Oct 24 to Dec 24	Tprashant

Declaration by the Head of the accredited consultant organization/ authorized person

I, Prabhu, hereby, confirm that the above-mentioned experts prepared the EIA report of Proposed Mining of Rough stone Quarry Over an Extent of 3.00.0 Ha by Thiru. V. M. Sundaraiah. I also confirm that the consultant organization shall be fully accountable for any mis-leading information mentioned in this statement.

Signature:

Name:

Designation:

Name of the EIA consultant organization:

NABET Certificate No. & Issue Date:

TOR AND ITS COMPLIANCE

File No: 11031

Government of India

Ministry of Environment, Forest and Climate Change

(Issued by the State Environment Impact Assessment Authority(SEIAA), TAMIL NADU)

***

Dated **22/10/2024**

To,

Thiru.SUNDARAIAH
Thiru.SUNDARAIAH
Thiru.V.M.Sundaraiah, S/o.Muthaiah Thevar, No.4/111D, Sundaresapuram Block-IV, Poganallur village, Kadayanallur Taluk, Tenkasi District., Tenkasi , TENKASI, TAMIL NADU, Tenkasi , 627751
sundaraiahm7@gmail.com

Subject: Grant of Terms of Reference with Public Hearing (ToR) under the provision of the EIA Notification 2006-as amended regarding.

Sir/Madam,

SEIAA, Tamil Nadu – Terms of Reference with Public Hearing (ToR) for Proposed Rough stone Quarry lease over an extent of 3.00.0Ha at SF.No.91 (Part-2) of Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu by Thiru.V.M.Sundaraiah – 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/475931/2024, Dated:27.05.2024.
2. Your application submitted for Terms of Reference dated:28.06.2024.
3. Minutes of the 487th SEAC Meeting held on 01.08.2024
4. Minutes of the 503rd meeting of SEAC held on 04.10.2024.
5. Minutes of the 766th authority meeting held on 18.10.2024.

2. The particulars of the proposal are as below :

(i) TOR Identification No.	TO24B0108TN5815892N
(ii) File No.	11031
(iii) Clearance Type	TOR
(iv) Category	B1
(v) Project/Activity Included Schedule No.	1(a) Mining of minerals
(vii) Name of Project	Rough Stone Quarry of Thiru. V.M.Sundaraiah
(viii) Name of Company/Organization	SUNDARAIAH
(ix) Location of Project (District, State)	TENKASI, TAMIL NADU

(x) Issuing Authority	SEIAA
(xii) Applicability of General Conditions	no
(xiii) Applicability of Specific Conditions	no

1.In view of the particulars given in the Para 1 above, the project proposal interalia including Form-1(Part A and B) were submitted to the SEIAA for an appraisal by the SEAC under the provision of EIA notification 2006 and its subsequent amendments.

2.The above-mentioned proposal has been considered by (SEIAA) Appraisal Committee of SEIAA in the meeting held on 17/10/2024. The minutes of the meeting and all the Application and documents submitted [(viz. Form-1 Part A, Part B,] are available on PARIVESH portal which can be accessed by scanning the QR Code above.

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

4.The SEIAA has examined the proposal in accordance with the Environment Impact Assessment (EIA) Notification, 2006 & further amendments thereto and after accepting the recommendations of the SEAC hereby decided to issue the following Terms of Reference with Public Hearing for instant proposal of Thiru.SUNDARAIAH 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

1. The Principal Secretary to Government, Environment, Climate Change and Forests Department, Govt. of Tamil Nadu, Fort St. George, Chennai - 9.
2. The Chairman, Central Pollution Control Board, Parivesh Bhavan, CBD Cum-Office Complex, East Arjun Nagar, New Delhi - 110 032.
3. The Chairperson, Tamil Nadu Pollution Control Board, 76, Mount Salai, Guindy, Chennai - 600 032.
4. The APCCF (C), Regional Office, MoEF & CC (SZ), 34, HEPC Building, 1st & 2nd Floor, Cathedral Garden Road, Nungambakkam, Chennai - 34.
5. Monitoring Cell, IA Division, Ministry of Environment, Forests & CC, Paryavaran Bhavan, CGO Complex, New Delhi - 110 003.
6. The District Collector, Tenkasi District.
7. Stock File.

Annexure 1

Specific Terms of Reference for (Mining Of Minerals)

1. Seiaa Specific Conditions :

S. No	Terms of Reference
1.1	After detailed discussions, the Authority accepts the recommendation of SEAC and decided to grant Terms of Reference with Public Hearing subject to the conditions as recommended by SEAC & normal conditions and conditions in Annexure 'B' of this minutes in addition to the followings shall

S. No	Terms of Reference
	be incorporated in EIA study. 1. Traffic Study 2. Socio-Economic Study 3. Impact of Agriculture, Horticulture, Water Table, Climate change, Drainage Pattern. 4. Anticipated Green House Gas emissions and mitigation strategies. 5. Details of Plantation in EMP.

2. Seac Conditions - Site Specific

S. No	Terms of Reference
2.1	1. **A Cluster Management Committee (CMC) shall be constituted including all the mines in the cluster as Committee Members for the effective management of the mining operation in the cluster through systematic & scientific approach with appointment of statutory personnel, appropriate environmental monitoring, good maintenance of haul roads and village/panchayat roads, authorized blasting operation etc. The PP shall submit the following details in the form of an Affidavit during the EIA appraisal:** **(i) Copy of the agreement forming CMC.** **(ii) The Organisation chart of the Committee with defining the role of the members** **(iii) The 'Standard Operating Procedures' (SoP) executing the planned activities**. 2. As Sundaresapuram habitation is located within 300m, the public hearing to be conducted near the vicinity of the habitation. In addition to that, a wide publicity must be given regarding the date and venue of the public hearing in the said habitation and the proof of the above to be submitted along with EIA report. 3. Since waterbodies are situated nearby, the PP shall carry out the scientific studies to assess the hydrogeological condition of the quarry to determine impacts of the mining operation on the ground water conditions in the waterbodies. 4. The structures within the project site & within the radius of (i) 50 m, (ii) 100 m, (iii) 200 m and (iv) 300 m & upto 1km shall be enumerated with details such as dwelling houses with number of occupants, whether it belongs to the owner (or) not, places of worship, industries, factories, sheds, etc. and spell out the mitigation measures to be proposed for the protection of the above structures, if any during the quarrying operations. 5. The proponent shall furnish photographs of adequate fencing, garland drainage built with siltation tank & green belt along the periphery including replantation of existing trees; maintaining the safety distance between the adjacent quarries & water bodies nearby provided as per the approved mining plan. 6. **Since the structures are situated within a radial distance of 500 m,** the PP shall carry out only one blast per day with muffle technique, for not more than 30 to 40 holes in a round, with maximum charge of 375g/hole. 7. However, **since the structures are situated within a radial distance of *300* m,** the PP shall carry out the scientific studies **in the any one of the operating mine in the existing cluster** after obtaining the prior permission from the Director of Mines Safety/Chennai Region, **to design the controlled blast parameters** including **the type of explosive, maximum charge per delay & maximum total charge (kg) per round, maximum number of holes per round**, etc along with **indicating the statutory competent person responsible for the blasting operation in the cluster of quarries,** for reducing the blast-induced ground/air- vibrations and eliminating the fly rock from the blasting operations carried out in the quarry, by involving anyone of these reputed Research and Academic Institution such as CSIR-Central Institute of Mining & Fuel Research / Dhanbad, NIRM/Bangalore, IIT-Madras, NIT-Dept of Mining Engg, Surathkal, and Anna University Chennai-CEG Campus. A copy of such scientific study report shall be submitted to the SEIAA,

S. No	Terms of Reference
	MoEF, **at the time of EIA appraisal** as a part of the EIA Report. 8. The Proponent shall carry out Bio diversity study as a part of EIA study and the same shall be included in the Report. 9. The PP shall submit the action plan for the slope stability aspects at the time of EIA appraisal.

3. Seac Standard Conditions

S. No	Terms of Reference
3.1	1. In the case of existing/operating mines, a letter obtained from the concerned AD (Mines) shall be submitted and it shall include the following: (i) Original pit dimension (ii) Quantity achieved Vs EC Approved Quantity (iii) Balance Quantity as per Mineable Reserve calculated. (iv) Mined out Depth as on date Vs EC Permitted depth (v) Details of illegal/illicit mining (vi) Violation in the quarry during the past working. (vii) Quantity of material mined out outside the mine lease area (viii) Condition of Safety zone/benches (ix) Revised/Modified Mining Plan showing the benches of not exceeding 6 m height and ultimate depth of not exceeding 50m. 2. Details of habitations around the proposed mining area and latest VAO certificate regarding the location of habitations within 300m radius from the periphery of the site. 3. The proponent is requested to carry out a survey and enumerate on the structures located within the radius of (i) 50 m, (ii) 100 m, (iii) 200 m and (iv) 300 m (v) 500m shall be enumerated with details such as dwelling houses with number of occupants, whether it belongs to the owner (or) not, places of worship, industries, factories, sheds, etc with indicating the owner of the building, nature of construction, age of the building, number of residents, their profession and income, etc. 4. The PP shall submit a detailed hydrological report indicating the impact of proposed quarrying operations on the waterbodies like lake, water tanks, etc are located within 1 km of the proposed quarry. 5. The Proponent shall carry out Bio diversity study through reputed Institution and the same shall be included in EIA Report. 6. The DFO letter stating that the proximity distance of Reserve Forests, Protected Areas, Sanctuaries, Tiger reserve etc., up to a radius of 25 km from the proposed site. 7. In the case of proposed lease in an existing (or old) quarry where the benches are not formed (or) partially formed as per the approved Mining Plan, the Project Proponent (PP) shall the PP shall carry out the scientific studies to assess the slope stability of the working benches to be constructed and existing quarry wall, by involving any one of the reputed Research and Academic Institutions - CSIR-Central Institute of Mining & Fuel Research / Dhanbad, NIRM/Bangalore, Division of Geotechnical Engineering-IIT-Madras, NIT-Dept of Mining Engg, Surathkal, and Anna University Chennai-CEG Campus. The PP shall submit a copy of the aforesaid report indicating the stability status of the quarry wall and possible mitigation measures during the time of appraisal for obtaining the EC. 8. However, in case of the fresh/virgin quarries, the Proponent shall submit a conceptual 'Slope Stability Plan' for the proposed quarry during the appraisal while obtaining the EC, when the depth of the working is extended beyond 30 m below ground level. 9. The PP shall furnish the affidavit stating that the blasting operation in the proposed quarry is carried out by the statutory competent person as per the MMR 1961 such as blaster, mining mate, mine foreman, II/I Class mines manager appointed by the proponent. 10. The PP shall present a conceptual design for carrying out only controlled blasting operation

S. No	Terms of Reference
	involving line drilling and muffle blasting in the proposed quarry such that the blast-induced ground vibrations are controlled as well as no fly rock travel beyond 30 m from the blast site. 11. The EIA Coordinators shall obtain and furnish the details of quarry/quarries operated by the proponent in the past, either in the same location or elsewhere in the State with video and photographic evidences. 12. If the proponent has already carried out the mining activity in the proposed mining lease area after 15.01.2016, then the proponent shall furnish the following details from AD/DD, mines, 13. What was the period of the operation and stoppage of the earlier mines with last work permit issued by the AD/DD mines? 14. Quantity of minerals mined out. · Highest production achieved in any one year · Detail of approved depth of mining. · Actual depth of the mining achieved earlier. · Name of the person already mined in that leases area. · If EC and CTO already obtained, the copy of the same shall be submitted. · Whether the mining was carried out as per the approved mine plan (or EC if issued) with stipulated benches. 15. All corner coordinates of the mine lease area, superimposed on a High-Resolution Imagery/Topo sheet, topographic sheet, geomorphology, lithology and geology of the mining lease area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone). 16. The PP shall carry out Drone video survey covering the cluster, green belt, fencing, etc., 17. The proponent shall furnish photographs of adequate fencing, green belt along the periphery including replantation of existing trees & safety distance between the adjacent quarries & water bodies nearby provided as per the approved mining plan. 18. The Project Proponent shall provide the details of mineral reserves and mineable reserves, planned production capacity, proposed working methodology with justifications, the anticipated impacts of the mining operations on the surrounding environment, and the remedial measures for the same. 19. The Project Proponent shall provide the Organization chart indicating the appointment of various statutory officials and other competent persons to be appointed as per the provisions of the Mines Act'1952 and the MMR, 1961 for carrying out the quarrying operations scientifically and systematically in order to ensure safety and to protect the environment. 20. The Project Proponent shall conduct the hydro-geological study considering the contour map of the water table detailing the number of groundwater pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds, etc. within 1 km (radius) along with the collected water level data for both monsoon and non-monsoon seasons from the PWD / TWAD so as to assess the impacts on the wells due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. 21. The proponent shall furnish the baseline data for the environmental and ecological parameters with regard to surface water/ground water quality, air quality, soil quality & flora/fauna including traffic/vehicular movement study. 22. The Proponent shall carry out the Cumulative impact study due to mining operations carried out in the quarry specifically with reference to the specific environment in terms of soil health, biodiversity, air pollution, water pollution, climate change and flood control & health impacts. Accordingly, the Environment Management plan should be prepared keeping the concerned quarry and the surrounding habitations in the mind. 23. Rain water harvesting management with recharging details along with water balance (both monsoon & non-monsoon) be submitted. 24. Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other

S. No	Terms of Reference
	ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given. 25. Details of the land for storage of Overburden/Waste Dumps (or) Rejects outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be provided. 26. Proximity to Areas declared as 'Critically Polluted' (or) the Project areas which attracts the court restrictions for mining operations, should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the TNPCB (or) Dept. of Geology and Mining should be secured and furnished to the effect that the proposed mining activities could be considered. 27. Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided. 28. Impact on local transport infrastructure due to the Project should be indicated. 29. A tree survey study shall be carried out (nos., name of the species, age, diameter etc.,) both within the mining lease applied area & 300m buffer zone and its management during mining activity. 30. A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific. 31. As a part of the study of flora and fauna around the vicinity of the proposed site, the EIA coordinator shall strive to educate the local students on the importance of preserving local flora and fauna by involving them in the study, wherever possible. 32. The purpose of Green belt around the project is to capture the fugitive emissions, carbon sequestration and to attenuate the noise generated, in addition to improving the aesthetics. A wide range of indigenous plant species should be planted as given in the appendix-I in consultation with the DFO, State Agriculture University. The plant species with dense/moderate canopy of native origin should be chosen. Species of small/medium/tall trees alternating with shrubs should be planted in a mixed manner. 33. Taller/one year old Saplings raised in appropriate size of bags, preferably ecofriendly bags should be planted as per the advice of local forest authorities/botanist/Horticulturist with regard to site specific choices. The proponent shall earmark the greenbelt area with GPS coordinates all along the boundary of the project site with at least 3 meters wide and in between blocks in an organized manner 34. A Disaster management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period. 35. A Risk Assessment and management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period. 36. Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed. 37. Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations. 38. The Socio-economic studies should be carried out within a 5 km buffer zone from the mining activity. Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation. 39. Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given. 40. Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.

S. No	Terms of Reference
	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.

4. Seiaa Standard Conditions :

S. No	Terms of Reference
4.1	**Cluster Management Committee** 1. Cluster Management Committee shall be framed which must include all the proponents in the cluster as members including the existing as well as proposed quarry. 2. The members must coordinate among themselves for the effective implementation of EMP as committed including Green Belt Development, Water sprinkling, tree plantation, blasting etc., 3. The List of members of the committee formed shall be submitted to AD/Mines before the execution of mining lease and the same shall be updated every year to the AD/Mines. 4. Detailed Operational Plan must be submitted which must include the blasting frequency with respect to the nearby quarry situated in the cluster, the usage of haul roads by the individual quarry in the form of route map and network. 5. The committee shall deliberate on risk & emergency management plan, fire safety & evacuation plan and sustainable development goals pertaining to the cluster in a holistic manner especially during natural calamities like intense rain and the mitigation measures considering the inundation of the **cluster and evacuation plan.** 6. The Cluster Management Committee shall form Environmental Policy to practice sustainable mining in a scientific and systematic manner in accordance with the law. The role played by the committee in implementing the environmental policy devised shall be given in detail in the EIA Report. 7. The committee shall furnish action plan regarding the restoration strategy with respect to the individual quarry falling under the cluster in a holistic manner. 8. The committee shall deliberate on the health of the workers/staff involved in the mining as well as the health of the public in the vicinity. **Agriculture & Agro-Biodiversity** 9. Impact on surrounding agricultural fields around the proposed mining Area. 10. Impact on soil flora & vegetation around the project site. 11. Details of type of vegetation including no. of trees & shrubs within the proposed mining area and. If so, transplantation of such vegetation all along the boundary of the proposed mining area shall committed mentioned in EMP. 12. The Environmental Impact Assessment should study the agro-biodiversity, agro-forestry, horti-cultural plantations, the natural ecosystem, the soil micro flora, fauna and soil seed banks and suggest measures to maintain the natural Ecosystem. 13. Action should specifically suggest for sustainable management of the area and restoration of ecosystem for flow of goods and services. 14. The project proponent shall study and furnish the impact of project on plantations in adjoining patta lands, Horticulture, Agriculture and livestock. **Forests** 15. The project proponent shall detailed study on impact of mining on Reserve forests and free

S. No	Terms of Reference
	ranging wildlife. 16. The Environmental Impact Assessment should study impact on forest, vegetation, endemic, vulnerable and endangered indigenous flora and fauna. 17. The Environmental Impact Assessment should study impact on standing trees and the existing trees should be numbered and action suggested for protection. 18. The Environmental Impact Assessment should study impact on protected areas, Reserve Forests, National Parks, Corridors and Wildlife pathways, near project site. **Water Environment** 19. Hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) so as to assess the impacts on the nearby waterbodies due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided, covering the entire mine lease period. 20. Erosion Control measures. 21. Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area on the nearby Villages, Water-bodies/ Rivers, & any ecological fragile areas. 22. The project proponent shall study impact on fish habitats and the food WEB/ food chain in the water body and Reservoir. 23. The project proponent shall study and furnish the details on potential fragmentation impact on natural environment, by the activities. 24. The project proponent shall study and furnish the impact on aquatic plants and animals in water bodies and possible scars on the landscape, damages to nearby caves, heritage site, and archaeological sites possible land form changes visual and aesthetic impacts. 25. The Terms of Reference should specifically study impact on soil health, soil erosion, the soil physical, chemical components and microbial components. 26. The Environmental Impact Assessment should study on wetlands, water bodies, rivers streams, lakes and farmer sites. 27. The EIA shall include the impact of mining activity on the following: a) Hydrothermal/Geothermal effect due to destruction in the Environment. b) Bio-geochemical processes and its foot prints including environmental stress. c) Sediment geochemistry in the surface streams. **Energy** 28. The measures taken to control Noise, Air, Water, Dust Control and steps adopted to efficiently utilise the Energy shall be furnished. **Climate Change** 29. The Environmental Impact Assessment shall study in detail the carbon emission and also suggest the measures to mitigate carbon emission including development of carbon sinks and temperature reduction including control of other emission and climate mitigation activities. 30. The Environmental Impact Assessment should study impact on climate change, temperature rise, pollution and above soil & below soil carbon stock, soil health and physical, chemical & biological soil features. 31. Impact of mining on pollution leading to GHGs emissions and the impact of the same on the local livelihood. **Mine Closure Plan** 32. Detailed Mine Closure Plan covering the entire mine lease period as per precise area communication order issued. **EMP** 33. Detailed Environment Management Plan along with adaptation, mitigation & remedial strategies covering the entire mine lease period as per precise area communication order issued and the scope for achieving SDGs. 34. The Environmental Impact Assessment should hold detailed study on EMP with budget for

S. No	Terms of Reference
	Green belt development and mine closure plan including disaster management plan. **Risk Assessment** 35. To furnish risk assessment and management plan including anticipated vulnerabilities during operational and post operational phases of Mining. **Disaster Management Plan** 36. To furnish disaster management plan and disaster mitigation measures in regard to all aspects to avoid/reduce vulnerability to hazards & to cope with disaster/untoward accidents in & around the proposed mine lease area due to the proposed method of mining activity & its related activities covering the entire mine lease period as per precise area communication order issued. **Others** 37. The project proponent shall furnish VAO certificate with reference to 300m radius regard to approved habitations, schools, Archaeological sites, Structures, railway lines, roads, water bodies such as streams, odai, vaari, canal, channel, river, lake pond, tank etc. 38. As per the MoEF& CC office memorandum F.No.22-65/2017-IA.III dated: 30.09.2020 and 20.10.2020 the proponent shall address the concerns raised during the public consultation and all the activities proposed shall be part of the Environment Management Plan. 39. The project proponent shall study and furnish the possible pollution due to plastic and microplastic on the environment. The ecological risks and impacts of plastic & microplastics on aquatic environment and fresh water systems due to activities, contemplated during mining may be investigated and reported.

Standard Terms of Reference for (Mining of minerals)

1.

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

S. No	Terms of Reference
1.5	Map showing the core zone delineating the agricultural land (irrigated and un-irrigated, uncultivable land as defined in the revenue records, forest areas (as per records), along with other physical features such as water bodies, etc should be furnished.
1.6	A contour map showing the area drainage of the core zone and 25 km of the study area (where the water courses of the core zone ultimately join the major rivers/streams outside the lease/project area) should also be clearly indicated in the separate map.
1.7	Catchment area with its drainage map of 25 km area within and outside the mine shall be provided with names, details of rivers/ riverlet system and its respective order. The map should clearly indicate drainage pattern of the catchment area with basin of major rivers. Diversion of drains/ river need eloboration in form of lengthe, quantity and quality of water to be diverted
1.8	(Details of mineral reserves, geological status of the study area and the seams to be worked, ultimate working depth and progressive stage-wise working scheme until the end of mine life should be provided on the basis of the approved rated capacity and calendar plans of production from the approved Mining Plan. Geological maps and sections should be included. The Progressive mine development and Conceptual Final Mine Closure Plan should also be shown in figures. Details of mine plan and mine closure plan approval of Competent Authority should be furnished for green field and expansion projects.
1.9	Details of mining methods, technology, equipment to be used, etc., rationale for selection of specified technology and equipment proposed to be used vis-à-vis the potential impacts should be provided.
1.10	Impact of mining on hydrology, modification of natural drainage, diversion and channeling of the existing rivers/water courses flowing though the ML and adjoining the lease/project and the impact on the existing users and impacts of mining operations thereon.
1.11	A detailed Site plan of the mine showing the proposed break-up of the land for mining operations such as the quarry area, OB dumps, green belt, safety zone, buildings, infrastructure, Stockyard, township/colony (within and adjacent to the ML), undisturbed area -if any, and landscape features such as existing roads, drains/natural water bodies to be left undisturbed along with any natural drainage adjoining the lease /project areas, and modification of thereof in terms of construction of embankments/bunds, proposed diversion/re-channelling of the water courses, etc., approach roads, major haul roads, etc should be indicated.
1.12	Original land use (agricultural land/forestland/grazing land/wasteland/water bodies) of the area should be provided as per the tables given below. Impacts of project, if any on the land use, in particular, agricultural land/forestland/grazing land/water bodies falling within the lease/project and acquired for mining operations should be analyzed. Extent of area under surface rights and under mining rights should be specified. Area under Surface Rights S.N ML/Project Land use Area under Surface Rights(ha) Area Under Mining Rights(ha) (ha) Area under Both (ha) 1 Agricultural land 2 Forest Land 3 Grazing Land 4 Settlements

S. No	Terms of Reference
	5 Others (specify) S.N. Details Area (ha) 1 Buildings 2 Infrastructure 3 Roads 4 Others (specify) Total
1.13	Study on the existing flora and fauna in the study area (10km) should be carried out by an institution of relevant discipline. The list of flora and fauna duly authenticated separately for the core and study area and a statement clearly specifying whether the study area forms a part of the migratory corridor of any endangered fauna should be given. If the study area has endangered flora and fauna, or if the area is occasionally visited or used as a habitat by Schedule-I species, or if the project falls within 15 km of an ecologically sensitive area, or used as a migratory corridor then a Comprehensive Conservation Plan along with the appropriate budgetary provision should be prepared and submitted with EIA-EMP Report; and comments/observation from the CWLW of the State Govt. should also be obtained and furnished.
1.14	One-season (other than monsoon) primary baseline data on environmental quality - air (PM10, PM2.5, SOx, NOx and heavy metals such as Hg, Pb, Cr, As, etc), noise, water (surface and groundwater), soil - along with one-season met data coinciding with the same season for AAQ collection period should be provided. The detail of NABL/ MoEF&CC certification of the respective laborartory and NABET accreditation of the consultant to be provided.
1.15	Map (1: 50, 000 scale) of the study area (core and buffer zone) showing the location of various sampling stations superimposed with location of habitats, other industries/mines, polluting sources, should be provided. The number and location of the sampling stations in both core and buffer zones should be selected on the basis of size of lease/project area, the proposed impacts in the downwind (air)/downstream (surface water)/groundwater regime (based on flow). One station should be in the upwind/upstream/non-impact/non-polluting area as a control station. The monitoring should be as per CPCB guidelines and parameters for water testing for both ground water and surface water as per ISI standards and CPCB classification wherever applicable. Observed values should be provided along with the specified standards.
1.16	For proper baseline air quality assessment, Wind rose pattern in the area should be reviewed and accordingly location of AAMSQ shall be planned by the collection of air quality data by adequate monitoring stations in the downwind areas. Monitoring location for collecting baseline data should cover overall the 10 km buffer zone i.e. dispersed in 10 km buffer area. In case of expansion, the displayed data of CAAQMS and its comparison with the monitoring data to be provided
1.17	A detailed traffic study along with presence of habitation in 100 mts distance from both side of road, the impact on the air quality with its proper measures and plan of action with timeline for widening of road. The project will increase the no. of vehicle along the road which will indirectly contribute to carbon emission so what will be the compensatory action plan should be clearly spell out in EIA/ EMP report.

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

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

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

A. STANDARD TERMS OF REFERENCE

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

9) The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc. should be for the life of the mine / lease period.

10) Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.

11) Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given.

12) Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.

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

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

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

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

17) Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves/(existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife 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 shall be submitted along with EIA report.
9. Obtain a letter /certificate from the Assistant Director of Geology and Mining standing that there is no other Minerals/resources like sand in the quarrying area within the approved depth of mining and below depth of mining and the same shall be furnished in the EIA report.
10. EIA report should strictly follow the Environmental Impact Assessment Guidance Manual for Mining of Minerals published February 2010.
11. Detail plan on rehabilitation and reclamation carried out for the stabilization and

restoration of the mined areas.

12. The EIA study report shall include the surrounding mining activity, if any.
13. Modeling study for Air, Water and noise shall be carried out in this field and incremental increase in the above study shall be substantiated with mitigation measures.
14. A study on the geological resources available shall be carried out and reported.
15. A specific study on agriculture & livelihood shall be carried out and reported.
16. Impact of soil erosion, soil physical chemical and biological property changes may be assumed.
17. Site selected for the project - Nature of land - Agricultural (single/double crop), barren, Govt./ private land, status of is acquisition, nearby (in 2-3 km.) water body, population, with in 10km other industries, forest , eco-sensitive zones, accessibility, (note - in case of industrial estate this information may not be necessary)
18. Baseline environmental data - air quality, surface and ground water quality, soil characteristic, flora and fauna, socio-economic condition of the nearby population
19. Identification of hazards in handling, processing and storage of hazardous material and safety system provided to mitigate the risk.
20. Likely impact of the project on air, water, land, flora-fauna and nearby population
21. Emergency preparedness plan in case of natural or in plant emergencies
22. Issues raised during public hearing (if applicable) and response given
23. CER plan with proposed expenditure.
24. Occupational Health Measures
25. Post project monitoring plan
26. The project proponent shall carry out detailed hydro geological study through intuitions/NABET Accredited agencies.
27. A detailed report on the green belt development already undertaken is to be furnished and also submit the proposal for green belt activities.
28. The proponent shall propose the suitable control measure to control the fugitive emissions during the operations of the mines.
29. A specific study should include impact on flora & fauna, disturbance to migratory pattern of animals.
30. Reserve funds should be earmarked for proper closure plan.
31. A detailed plan on plastic waste management shall be furnished. Further, the proponent should strictly comply with, Tamil Nadu Government Order (Ms) No.84 Environment and forests (EC.2) Department dated 25.06.2018 regarding ban on one time use and throw

away plastics irrespective of thickness with effect from 01.01.2019 under Environment (Protection) Act, 1986. In this connection, the project proponent has to furnish the action plan.

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

a. A note confirming compliance of the TOR, with cross referencing of the relevant sections / pages of the EIA report should be provided.

b. All documents may be properly referenced with index, page numbers and continuous page numbering.

c. Where data are presented in the report especially in tables, the period in which the data were collected and the sources should be indicated.

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

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

- After preparing the EIA (as per the generic structure prescribed in Appendix-III of the EIA Notification, 2006) covering the above mentioned points, the proponent 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 as per OMNo.J-11013/41/2006-IA-II(I)(part) dated 29th August, 2017.

Signature Not Verified
Digitally Signed by : A R Rahul Nadh IAS
Member Secretary, SEIAA
Date: 23/10/2024

Table 1 ToR and its Compliance

S. No.	ToR Points	Compliance	Page No.
1.	SEIAA Specific Conditions		
1.1.	After detailed discussions, the Authority accepts the recommendation of SEAC and decided to grant Terms of Reference with Public Hearing subject to the conditions as recommended by SEAC & normal conditions and conditions in Annexure 'B' of this minutes in addition to the followings shall be incorporated in EIA study.		
	1. Traffic Study	The detailed traffic study is incorporated in Chapter 2 under section 2.8.2	39
	2. Socio-Economic Study	The Socio-Economic Study within 10 km radius is detailed in Chapter 3 under section 3.9	100
	3. Impact of Agriculture, Horticulture, Water Table, Climate change, Drainage Pattern.	**Agriculture & Horticulture:** The proposed mining project is located in the hilly terrain and as per Land Use Map (10 km Radius), the area surrounding the project is predominantly Land with scrub and no agricultural activity is carried out, hence there will be no impact on Agriculture & Horticulture **Water table:** The GW table is found to be 58 m BGL. In the proposed mining plan, only 40m AGL depth has been envisaged as workable depth for safe & economic quarrying for the entire lease period. Hence the quarrying operation may not affect the ground water. **Climate Change:** The proposed mining activity will not have any impact on climate change	

		Drainage Pattern: The drainage pattern within 5km radius is Dentric. Pappan channel is located at 2.1 km (SW) and Karuppu Nadi is located at 7.5 km (W). The proposed mining activity will not disturb the natural drainage flow pattern of the area. After closure of mine the excavated areawill be used as water reservoir.	
	4. Anticipated Green House Gas emissions and mitigation strategies.	The greenhouse gas emissions anticipated from the proposed quarrying activity is Nitrous Oxides. The details of anticipated impact and suitable mitigation measures to combat the same is highlighted in Chapter 4 under section 4.2 (Table 4-3)	108
	5. Details of Plantation in EMP.	The details of plantation are included in the EMP. The same is given in Table	
2.	SEAC Conditions – Site Specific		
2.1.	1. A Cluster Management Committee (CMC) shall be constituted including all the mines in the cluster as Committee Members for the effective management of the mining operation in the cluster through systematic & scientific approach with appointment of statutory personnel, appropriate environmental monitoring, good maintenance of haul roads and village/panchayat roads, authorized blasting operation etc. The PP shall submit the following details in the form of an Affidavit during the EIA appraisal	The affidavit showing the Copy of the agreement forming CMC, The Organisation chart of the Committee with defining the role of the members and the 'Standard Operating Procedures' (SOP) executing the planned activities will be enclosed in Final EIA Report	
	i. Copy of the agreement forming CMC		
	ii. The Organisation chart of the Committee with defining the role of the members		
	iii. The 'Standard Operating Procedures' (SoP) executing the planned activities.		

	2. As Sundaresapuram habitation is located within 300m, the public hearing to be conducted near the vicinity of the habitation. In addition to that, a wide publicity must be given regarding the date and venue of the public hearing in the said habitation and the proof of the above to be submitted along with EIA report.	There is no habitation in Sundaresapuram located within 300m. we assure that the public hearing will be conducted in the vicinity of the proposed quarrying area and the newspaper advertisement will be given for the date and venue of the public hearing in two widely spread magazines (both in English and vernacular language). The copy of the newspaper will be enclosed in the final EIA report.	
	3. Since waterbodies are situated nearby, the PP shall carry out the scientific studies to assess the hydrogeological condition of the quarry to determine impacts of the mining operation on the ground water conditions in the waterbodies.	The detailed hydrogeological study will be conducted and will be enclosed in the Final EIA report	
	4. The structures within the project site & within the radius of (i) 50 m, (ii) 100 m, (iii) 200 m and (iv) 300 m & upto 1km shall be enumerated with details such as dwelling houses with number of occupants, whether it belongs to the owner (or) not, places of worship, industries, factories, sheds, etc. and spell out the mitigation measures to be proposed for the protection of the above structures, if any during the quarrying operations.	The enumeration of structures is detailed in 3.5.1 of Chapter 3	45-49
	5. The proponent shall furnish photographs of adequate fencing, garland drainage built with siltation tank & green belt along the periphery including replantation of existing trees; maintaining the safety distance between the adjacent quarries & water bodies nearby provided as per the approved mining plan.	The photos of fencing and green belt is shown in Figure 2-16	39
	6. Since the structures are situated within a radial distance of 500 m, the PP shall carry out only one blast per day with muffle technique, for not more than 30 to 40 holes in a round, with maximum charge of 375g/hole.	Noted. Agree to comply.	
	7. However, since the structures are situated within a radial distance of 300 m, the PP shall carry out the scientific studies in the any one of the operating mine in the	The study will be carried out and the same will be furnished during the final EIA report	

	existing cluster after obtaining the prior permission from the Director of Mines Safety/Chennai Region, to design the controlled blast parameters including the type of explosive, maximum charge per delay & maximum total charge (kg) per round, maximum number of holes per round, etc along with indicating the statutory competent person responsible for the blasting operation in the cluster of quarries, for reducing the blast-induced ground/air- vibrations and eliminating the fly rock from the blasting operations carried out in the quarry, by involving anyone of these reputed Research and Academic Institution such as CSIR-Central Institute of Mining & Fuel Research / Dhanbad, NIRM/Bangalore, IIT-Madras, NIT-Dept of Mining Engg, Surathkal, and Anna University Chennai-CEG Campus. A copy of such scientific study report shall be submitted to the SEIAA, MoEF, at the time of EIA appraisal as a part of the EIA Report.		
	8. The Proponent shall carry out Bio diversity study as a part of EIA study and the same shall be included in the Report.	The detailed biodiversity study as a part of EIA is briefed in section 3.8.5 of Chapter 3	84
	9. The PP shall submit the action plan for the slope stability aspects at the time of EIA appraisal.	The same will be furnished during final appraisal.	
3. SEAC Standard Conditions			
3.1	1. In the case of existing/operation 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 lining lease area	Not applicable. This is a fresh quarry.	

	viii. Condition of Safety zone/benches ix. Revised/Modified Mining Plan showing the benches of not exceeding 6m 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.	The letter detailing habitations around the proposed mining is obtained from VAO is enclosed as Annexure – 5.	
	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	The enumeration of structures is detailed in 3.5.1 of Chapter 3	45-49
	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 detailed hydrogeology report will be furnished in the final EIA report	
	5. The Project Proponent shall carry out Bio-diversity study through reputed institution and the same shall be included in the EIA report.	The same will be complied in the final EIA report	
	6. The DFO letter stating that the proximity distance of Reserve Forests, Protected Areas, Sanctuaries. Tiger reserve etc. upto a radius of 25 km from the proposed site.	The DFO letter stating that the proximity distance of RF & PF will be incorporated in the final EIA report	
	7. In 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, Suratkal and Anna University Chennai-CEG Campus. The PP shall submit a copy of the aforesaid report indicating the stability status	Not applicable. This is a fresh quarry.	

	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 project shall submit a conceptual 'Slope Stability Plan' for the proposed quarry during the appraisal while obtaining the EC, when the depth of the working is extended beyond 30m below ground level.	Detailed slope stability study will be carried out after commencement of the mining operation while reach mine depth after 25 m. The details of slope stability is elaborated in section 7.7 of Chapter 7	137
	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	The same will be furnished during the final EIA report.	
	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.	The PP will use controlled blasting techniques with Nonel to ensure that dust generation, noise, and vibration levels remain within the prescribed limits.	
	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.	The PP has not carried out any quarrying operation before this project.	
	12. If the proponent has already carried out the mining activity in the proposed mining lease area after 15.01.2016, then the proponent shall furnish the following details from AD/DD, mines	Not applicable. This is a fresh quarry project.	
	13. What was the period of the operation and stoppage of the earlier mines with last work permit issued by the AD/DD mines?	Not applicable. This is a fresh quarry project.	
	14. Quantity of minerals mined out. • Highest production achieved in any one year. • Detail of approved depth of mining.	Not applicable. This is a fresh quarry project.	

• Actual depth of the mining achieved earlier. • Name of the person already mined in that leases area. • lf 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 comer coordinates of the mine lease area, superimposed on a High-Resolution Imagery/Topo sheet, topographic sheet, geomorphology, lithology and geology of the mining lease area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).	Project coordinates superimposed in satellite imagery and given as Figure No – 2-2 in Chapter – 2. The geology and geomorphology map are provided in Figure No.3.11 and 3.12 Chapter 3. The Soil map is provided under Figure No. 3-23, Chapter-3. The 10km Radius Index plan showing buffer zone is given in Figure No.3-6 in Chapter – 3.	20, 58, 59, 81, 50
16. The PP shall carry out Drone video survey covering the cluster, green belt, fencing etc.,	This is fresh quarry. The condition will be complied after commencement of the mining operation.	
17. The proponent shall furnish photographs of adequate fencing, greenbelt along the periphery including replantation of existing trees & safety distance between the adjacent quarries & water bodies nearby provided as per the approved mining plan	There are no trees within ML area. Fencing and plantations are under process (80 % of the work completed). Greenbelt / Plantation is being carried out in the safety zone to enhance the vegetative growth and aesthetic in the safety zone area. In the post mining stage, an area of 0.30.0 Ha will be under greenbelt and plantation.	
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 geological reserves - rough stone 8,28,065 m3. The mineable reserves: Rough stone 377765 m^3. The proposed production is rough stone 377765 m^3 of Rough Stone (Five year) by Opencast Mechanized mining method. The anticipated impact and its mitigation measures are detailed in Chapter 4.	104
19. The Project Proponent shall provide the Organization chart indicating the appointment of various statutory officials and other competent persons to be appointed as per the provisions of Mines Act'1952 and the MMR" 1961 for carrying out the quarrying	Complied. Please refer section 2.9.3 of Chapter 2	37

	operations scientifically and systematically in order to ensure safety and to protect the environment.		
	20. The Project Proponent shall conduct the Hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) along with the collected water level data for both monsoon and non-monsoon seasons from the PWD/TWAD so as to assess the impacts on the wells due to mining activity. Based on actual monitoring data, it may clearly be shown whether working all intersect ground water. Necessary data and documentation in this regard may be provided.	The hydrogeological study report will be furnished during the final EIA report	
	21. The proponent shall furnish the baseline data for the environmental and ecological parameters with regard to surface water/ground water quality, air quality, soil quality& flora/fauna including traffic/vehicular movement study.	The baseline data for all environments is collected for the Post Monsoon Season (Oct'24 – Dec'24).	
	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 air pollution, water pollution, & health impacts. Accordingly, the Environment Management plan should be prepared keeping the concerned quarry and the surrounding habitations in the mind.	Cumulative impact study has been carried covering existing and this proposed quarries in the cluster and the same is incorporated in the Chapter 7. Accordingly, a detailed Environment Management Plan is prepared considering air, water, noise and soil environment and the details are given in Chapter 10.	134 and 135 146
	23. Rain water harvesting management with recharging details along with water balance (both monsoon & non-monsoon) be submitted.	The runoff water during rainy season will be collected in the bottom quarry through proper drainage pattern and the collected water will be used for plantation and dust suppression during dry season. The Rain water harvesting plan is given chapter 4.	64,65,106,107
	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	The land use of the study area is described in Section 3.6.2 of Chapter 3. The anticipated impacts on the land environment and the mitigation measures are detailed in Chapter 4.	51,104

	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.	Not applicable. There is no generation of the OB & waste.	
	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.	No proximity to Critically polluted areas.	
	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.	The impact of the mining operations due to this quarry on water environment is studied and mitigation measures are proposed. Rain water harvesting plan is given Chapter 4.	106,107
	28. Impact on local transport infrastructure due to the Project should be indicated	Since the production is very less, only few trucks of 5/10T will be used for transport. The effect of transport on local transport will be negligible. 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 section 2.9.6 of Chapter 2.	39
	29. A tree survey shall be carried out (Nos. name of species, age, diameter, etc) both within the mining lease applied area & 300m buffer zone and its management during mining activity	There are no much trees within 300m buffer zone of the project area. The predominant flora noticed small tress of *Acacia nilotica* trees of very few numbers.	
	30. A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific.	Detailed mine closure plan is given in Chapter 7.6	136

	31. As 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, where ever possible	Accepted. It will be done.	
	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 and local school/college authorities. The plant species with dense/moderate canopy of native origin should be chosen. Species of small/medium/tall trees alternating with shrubs should be planted in a mixed manner.	Green belt is proposed in an area of 0.97.5 ha. Green belt development plan is provided in section 2.8.4 of chapter 2.	38
	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 green belt area with GPS coordinates all along the boundary of the project site with at least 3 m wide and in between blocks in an organized manner	The same will be furnished in the final EIA report	
	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.	A disaster management plan is prepared and the details are given in Chapter 7.	126
	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	Risk assessment and its management is given in Chapter 7.	123
	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 of the project and preventive measures are detailed under Chapter 4.	119
	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 major impact on public health will be there since the villages are located more than 1km from the lease area. Details of CER and CSR are discussed under Chapter No. 8	139

	38. The Socio-economic studies should be carried out within a 5km 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.	Socio economic study is conducted both by visits and secondary data collection. Details are given in Chapter 3	100
	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 is pending	
	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.	Benefits of the project is given in Chapter 8	138
	41. If any quarrying operations were carried out in the proposed quarrying site for which now EC is sought, the project proponent shall furnish the detailed compliance to EC conditions given in the previous EC with the site photographs which shall duly be certified by MoEF & CC, Regional Office, Chennai or the concerned DEE/TNPCB.	Not applicable. This is a fresh quarry project.	
	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 affidavit for EMP will be furnished during the final EIA report	
	43. Concealing any factual information or submission of false/fabricated data and failure to comply with any of the condition mentioned above may result in withdrawal of this Terms of Conditions besides attracting penal provisions in the Environment (Protection) Act, 1986	Agreed	
4.	SEIAA STANDARD CONDITIONS		
4.1	**Cluster Management Committee**		
	1. Cluster management committee shall be framed which must include all the proponents in the cluster as members including the existing as well as proposed quarry	There are two existing quarries and this proposed within a 500-metre radius. The proponent will take the initiative to form a cluster management committee once environmental clearance is obtained for this quarry.	

	2. The members must coordinate among themselves for the effective implementation of EMP as committed including Green Belt Development, Water sprinkling, tree plantation, blasting etc.,	Agreed. Will be complied.	
	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.	Agreed. The list of members of the committee formed will be submitted to AD/mines after obtaining Environmental Clearance.	
	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.	Agreed. Details of the Operation plan for cluster mining operations will be submitted once we get environmental clearance.	
	5. The committee shall deliberate on risk management plan pertaining to the cluster in a holistic manner especially during natural calamities like intense rain and the mitigation measures considering the inundation of the cluster and evacuation plan.	Risk management plan for the individual quarry is given in this report. As far as cluster working condition is concerned, once the committee is formed, risk management as a cluster including inundation of clusters and the evacuation plan will be elaborated.	
	6. The Cluster Management Committee shall form Environmental Policy to practice sustainable mining in a scientific and systematic manner in accordance with the law. The role played by the committee in implementing the environmental policy devised shall be given in detail.	Environmental policy for the cluster will be framed by the cluster management committee and the policy will be in accordance with EPA Act, 1986 and its amendments, guidelines by MoEF&CC/SEIAA and other regulatory bodies. This policy will be displayed in the quarry.	
	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.	Agreed. It will be complied as mentioned in the Point No.4	
	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.	Agreed. It will be complied as mentioned in the Point No.4.	
	Agriculture & Agro-Biodiversity		
	9. Impact on surrounding agricultural fields around the proposed mining Area.	Agreed.	
	10. Impact on soil flora & vegetation around the project site.	Complied. The details are given in Chapter 4.	118

	11. Details of type of vegetations including no. of trees & shrubs within the proposed mining area and. If so, transplantation of such vegetations all along the boundary of the proposed mining area shall committed mentioned in EMP.	There is no standing trees or vegetation within the mine lease area.	
	12. The Environmental Impact Assessment should study the biodiversity, the natural ecosystem, the soil micro flora, fauna and soil seed banks and suggest measures to maintain the natural Ecosystem.	The ecological details have been provided in Chapter 3 and measures have been provided in Chapter 4.	84, 118
	13. Action should specifically suggest for sustainable management of the area and restoration of ecosystem for flow of goods and services.	The detailed action plan has been described in the EMP (Chapter 10) for the sustainable management for the project area and its surroundings.	142
	14. The project proponent shall study and furnish the impact of project on plantations in adjoining patta lands, Horticulture, Agriculture and livestock.	The impact of project on the land environment has been discussed in Table 413 under Chapter 4.	105
	Forests		
	15. The project proponent shall detailed study on impact of mining on Reserve Forests free ranging wildlife.	Chokkampatti, Krishnapuram and Vairavankulam RF are located within 10 km radius and no other reserved forest located in the buffer zone. The fauna commonly found in the core and buffer zone is given in Chapter 3.	97
	16. The Environmental Impact Assessment should study impact on forest, vegetation, endemic, vulnerable and endangered indigenous flora and fauna.	There is no schedule I species of animals observed within study area as per Wildlife Protection Act, 1972 and no species falls in vulnerable, endangered or threatened category as per IUCN. There is no endangered red list species found in the study area. The anticipated impact and its mitigation measures for biological environment are detailed in Chapter 4.	97
	17. The Environmental Impact Assessment should study impact on standing trees and the existing trees should be numbered and action suggested for protection.	Not Applicable. This is a dry barren land.	

	18. The Environmental Impact Assessment should study impact on protected areas, Reserve Forests, National Parks, Corridors and Wildlife pathways, near project site.	Chokkampatti, Krishnapuram and Vairavankulam RF are located within 10 km radius and no other reserved forest located in the buffer zone. Nellai Wildlife Sanctuary is located at a distance of 5.8 km (NW). MoEF final notification has published and not applicable for NBWL.	
	Water Environment		
	19. Hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) so as to assess the impacts on the nearby waterbodies due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided, covering the entire mine lease period.	The hydrogeological study report will be incorporated in the final EIA report.	
	20. Erosion Control measures.	There is no waste generation (OB) in this quarry has been envisaged. However, there may be erosion due to rainy season and that is limited within quarry area. The control measures are explained in Chapter 4.	105
	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.	Complied. The study details are incorporated in Chapter 3. Anticipated impacts and its mitigation measures are detailed in Chapter 4.	106
	22. The project proponent shall study impact on fish habitats and the food WEB/ food chain in the water body and Reservoir.	There is no wastewater generation / discharge of wastewater from this Quarry, so this is not applicable.	
	23. The project proponent shall study and furnish the details on potential fragmentation impact on natural environment, by the activities.	Fragmentation impact on environment may be due to drilling and blasting. The anticipated impacts and mitigation measures are discussed in Chapter 4.	

	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.	An ecological and biodiversity study has been conducted and the same is incorporated in the Chapter 3 of the EIA/EMP report. However, there is no any features mentioned in this condition within the M.L area. However, the impacts anticipated with respect to the environment of the project area is very negligible and it will be minimized within the project area.	84
	25. The Terms of Reference should specifically study impact on soil health, soil erosion, the soil physical, chemical components and microbial components.	Agreed.	
	26. The Environmental Impact Assessment should study on wetlands, water bodies, rivers streams, lakes and farmer sites.	Complied. The details are described in Chapter 4.	106
	27. The EIA shall include the impact of mining activity on the following: a) Hydrothermal/Geothermal effect due to destruction in the Environment. b) Bio-geochemical processes and its foot prints including environmental stress. c) Sediment geochemistry in the surface streams.	The details will be incorporated in the final EIA report	
	Energy		
	28. The measures taken to control Noise, Air, Water, Dust Control and steps adopted to efficiently utilize the Energy shall be furnished.	Complied. The details are described in Chapter 4.	104
	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.	Only the best equipment will be used, and it will be properly and regularly maintained. Regular vehicular emission tests will be conducted on the transport vehicles to ensure minimal carbon emissions.	
	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.	To further reduce carbon emissions, a good greenbelt plan has been planned. The carbon emission and the measures to mitigate carbon emission have been discussed in Chapter 4.	

	31. Impact of mining on pollution leading to GHGs emissions and the impact of the same on the local livelihood.	The details are furnished in Chapter 4	
	Mine Closure Plan		
	32. Detailed Mine Closure Plan covering the entire mine lease period as per precise area communication order issued.	Complied. Mine Closure Plan has been incorporated in the approved Mining Plan .	
	EMP		
	33. Detailed Environment Management Plan along with adaptation, mitigation & remedial strategies covering the entire mine lease period as per precise area communication order issued.	Complied. The details are described in Chapter 10.	142
	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.	Total EMP Cost for 5 years is 270.3 lakhs i.e. Capital Cost Rs. 85.3 Lakhs + Recurring Cost Rs. 185 for five years, which is including greenbelt cost and cost for mine closure plan. The breakup of the EMP cost is mentioned in table 10-2.	146
	Risk Assessment		
	35. To furnish risk assessment and management plan including anticipated vulnerabilities during operational and post operational phases of Mining.	Complied. The details are described in Chapter 7.	123
	Disaster Management Plan		
	36. To furnish disaster management plan and disaster mitigation measures in regard to all aspects to avoid/reduce vulnerability to hazards & to cope with disaster/untoward accidents in & around the proposed mine lease area due to the proposed method of mining activity & its related activities covering the entire mine lease period as per precise area communication order issued.	Complied. The details are described in Chapter 7.	123
	Others		
	37. The project proponent shall furnish VAO certificate with reference to 300m radius regard to approved habitations, schools, Archaeological sites, Structures, railway	There are no historical places, schools, cemeteries, temples, bird sanctuaries, and wildlife sanctuaries within 500 metres of the proposed project area. In this regard, the project proponent has	

	lines, roads, water bodies such as streams, odai, vaari, canal, channel, river, lake pond, tank etc.	received an official letter from the Village Administrative Officer. The letter copy enclosed as Annexure – 5.	
	38. As per the MoEF& CC office memorandum F.N0.22-65/2017-1A.11I dated: 30.09.2020 and20.10.2020 the proponent shall address the concerns raised during the public consultation and all the activities proposed shall be part of the Environment Management Plan.	Complied. The action plan of the public hearing will be furnished in the final EIA report	
	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.	The same will be complied in the final EIA report	
STANDARD ToR			
1.1.	An EIA-EMP Report shall be prepared for peak capacity (…..MTPA) operation in an ML/project area of.....ha based on the generic structure specified in Appendix III of the EIA Notification, 2006.	Noted.	
1.2.	An EIA-EMP Report would be prepared for peak capacity operation to cover the impacts and environment management plan for the project specific activities on the environment of the region, and the environmental quality encompassing air, water, land, biotic community, etc. through collection of data and information, generation of data on impacts including prediction modelling for..... MTPA of mineral production based on approved project/Mining Plan for.....MTPA. Baseline data collection can be for any season (three months) except monsoon.	Noted and agree to comply	
1.3.	Proper KML file with pin drop and coordinate of mine at 500-1000 m interval be provided	Noted, Google earth image showing lease area with Coordinates of mine is given in Figure 2-2 of Chapter 2.	19
1.4.	A Study area map of the core zone (project area) and 10 km area of the buffer zone (1: 50,000 scale) clearly delineating the major topographical features such as the land use,	Study area map in 1: 50,000 scale covering 10 km radius showing all the features is given in Figure 2-7 of Chapter 3.	25

	surface drainage pattern including rivers/streams/nullahs/canals, locations of human habitations, major constructions including railways, roads, pipelines, major industries, mines and other polluting sources. In case of ecologically sensitive areas such as Biosphere Reserves/National Parks/WL Sanctuaries/ Elephant Reserves, forests (Reserved/Protected), migratory corridors of fauna, and areas where endangered fauna and plants of medicinal and economic importance found in the 15 km study area should be given. The above details to be furnished in tabular form also	Nellai Wildlife Sanctuary is located at 5.8 km (NW) within 10 km Radius from the periphery of the project area. MoEF final notification has published and not applicable for NBWL.	
1.5.	Map showing the core zone delineating the agricultural land (irrigated and un-irrigated, uncultivable land as defined in the revenue records, forest areas (as per records), along with other physical features such as water bodies, etc should be furnished.	The proposed quarry is Government Poramboke Land and the proponent has obtained through tender from Government. There is no forest land or other physical features such as water bodies within mine lease area.	
1.6.	A contour map showing the area drainage of the core zone and 25 km of the study area (where the water courses of the core zone ultimately join the major rivers/streams outside the lease/project area) should also be clearly indicated in the separate map.	The contour map for the study area of 10 km radius is attached as Annexure 12	
1.7.	Catchment area with its drainage map of 25 km area within and outside the mine shall be provided with names, details of rivers/ riverlet system and its respective order. The map should clearly indicate drainage pattern of the catchment area with basin of major rivers. Diversion of drains/ river need eloboration in form of length, quantity and quality of water to be diverted	Drainage map (Figure 3-10) is given in Chapter-3. This proposed project will not divert any water bodies.	57
1.8.	(Details of mineral reserves, geological status of the study area and the seams to be worked, ultimate working depth and progressive stage-wise working scheme until the end of mine life should be provided on the basis of the approved rated capacity and calendar plans of production from the approved Mining Plan. Geological maps and sections should be included. The Progressive mine development and Conceptual Final Mine Closure Plan should also be shown in figures. Details of mine plan and mine	The geological reserves, geology, production plan, pre and post land use pattern of the lease area, ultimate depth are provided in Chapter 2 and Chapter 3. Geological Map and its section (Figure 2-9), year wise Production plan (Figure 2-13), Conceptual plan and its section (Figure 2-14) are given in Chapter 2.	28, 33, 34

	closure plan approval of Competent Authority should be furnished for green field and expansion projects.	Mining plan approval letter and approved mining plan report is given in Annexure – 3.	
1.9.	Details of mining methods, technology, equipment to be used, etc., rationale for selection of specified technology and equipment proposed to be used vis-à-vis the potential impacts should be provided.	The method of mining and equipment to be used are detailed in Chapter 2.	35
1.10.	Impact of mining on hydrology, modification of natural drainage, diversion and channeling of the existing rivers/water courses flowing though the ML and adjoining the lease/project and the impact on the existing users and impacts of mining operations thereon.	Not Applicable. No stream passing through the mine lease area.	
1.11.	A detailed Site plan of the mine showing the proposed break-up of the land for mining operations such as the quarry area, OB dumps, green belt, safety zone, buildings, infrastructure, Stockyard, township/colony (within and adjacent to the ML), undisturbed area -if any, and landscape features such as existing roads, drains/natural water bodies to be left undisturbed along with any natural drainage adjoining the lease /project areas, and modification of thereof in terms of construction of embankments/bunds, proposed diversion/re-channelling of the water courses, etc., approach roads, major haul roads, etc should be indicated.	The pre and post land use pattern of the mine lease area is given in Table 3-4 of Chapter 3. This proposed quarry generates no waste, as the entire mined mineral will be directly dispatched to customers in need. Hence, no dumps are anticipated. There is an existing road from the area leads to Kadayanallur village road on Western side of the area.	56
1.12.	Original land use (agricultural land/forestland/grazing land/wasteland/water bodies) of the area should be provided as per the tables given below. Impacts of project, if any on the land use, in particular, agricultural land/forestland/grazing land/water bodies falling within the lease/project and acquired for mining operations should be analyzed. Extent of area under surface rights and under mining rights should be specified. Area under Surface Rights Area (ha) S.N ML/Project Land use Rights(ha) (ha) Area under Both (ha) 1 Agricultural land 2 Forest Land 3 Grazing Land 4 Settlements 5 Others (specify) S.N. Details Area (ha) 1 Buildings 2 Infrastructur 3. Roads 4 Others (specify) Total	The pre and post land use pattern of the mine lease area is given in Table 3-4 of Chapter 3.	56

1.13.	Study on the existing flora and fauna in the study area (10km) should be carried out by an institution of relevant discipline. The list of flora and fauna duly authenticated separately for the core and study area and a statement clearly specifying whether the study area forms a part of the migratory corridor of any endangered fauna should be given. If the study area has endangered flora and fauna, or if the area is occasionally visited or used as a habitat by Schedule-I species, or if the project falls within 15 km of an ecologically sensitive area, or used as a migratory corridor then a Comprehensive Conservation Plan along with the appropriate budgetary provision should be prepared and submitted with EIA-EMP Report; and comments/observation from the CWLW of the State Govt. should also be obtained and furnished.	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.	84
1.14.	One-season (other than monsoon) primary baseline data on environmental quality - air (PM10, PM2.5, SOx, NOx and heavy metals such as Hg, Pb, Cr, As, etc), noise, water (surface and groundwater), soil - along with one-season met data coinciding with the same season for AAQ collection period should be provided. The detail of NABL/ MoEF&CC certification of the respective laborartory and NABET accreditation of the consultant to be provided.	Baseline Data were collected for Post-Monsoon Season (October to December 2024) as per CPCB Notification and MoEF & CC Guidelines. Details are provided in Chapter No. 3. The NABL certificate of the lab, used for testing and analysis, is provided in Annexure -9	
1.15.	Map (1: 50, 000 scale) of the study area (core and buffer zone) showing the location of various sampling stations superimposed with location of habitats, other industries/mines, polluting sources, should be provided. The number and location of the sampling stations in both core and buffer zones should be selected on the basis of size of lease/project area, the proposed impacts in the downwind (air)/downstream (surface water)/groundwater regime (based on flow). One station should be in the upwind/upstream/non-impact/non-polluting area as a control station. The monitoring should be as per CPCB guidelines and parameters for water testing for both ground water and surface water as per ISI standards and CPCB classification wherever applicable. Observed values should be provided along with the specified standards.	Monitoring locations for Air, Water, Noise and Soil are given in Chapter 3. Criteria for Air Sampling Location Selection: Two Up Wind directions, one down wind direction and three cross wind directions were selected for air Monitoring. Details in Chapter 3. Criteria for Water Sampling Locations: Sundaresapuram Pond, Periyasamipuram Pond and six ground water sampling were collected and analysed and are given in Chapter 3.	

1.16.	For proper baseline air quality assessment, Wind rose pattern in the area should be reviewed and accordingly location of AAMSQ shall be planned by the collection of air quality data by adequate monitoring stations in the downwind areas. Monitoring location for collecting baseline data should cover overall the 10 km buffer zone i.e. dispersed in 10 km buffer area. In case of expansion, the displayed data of CAAQMS and its comparison with the monitoring data to be provided	Details given under description of the environment chapter-3.	
1.17.	A detailed traffic study along with presence of habitation in 100 mts distance from both side of road, the impact on the air quality with its proper measures and plan of action with timeline for widening of road. The project will increase the no. of vehicle along the road which will indirectly contribute to carbon emission so what will be the compensatory action plan should be clearly spell out in EIA/ EMP report.	Traffic density survey was carried out to analyses the impact of Transportation in the study area as per IRC guidelines 1961 and it is inferred that there is no significant impact due to the proposed transportation from the project area. Details in section 2.9.6 of Chapter-2.	39
1.18.	The socio-economic study to conducted with actual survey report and a comparative assessment to be provided from the census data should be provided in EIA/ EMP report also occupational status & economic status of the study area and what economically project will contribute should be clearly mention. The study should also include the status of infrastructural facilities and amenities present in the study area and a comparative assessment with census data to be provided and to link it with the initialization and quantification of need-based survey for CSR activities to be followed.	Detailed in chapter-3 socio-economic study with occupational status & economic status of the study area. The study should also include the status of infrastructural facilities and amenities present in the study area. CSR are discussed under Chapter 8.	139
1.19.	The Ecology and biodiversity study should also indicate the likely impact of change in forest area for surface infrastructural development or mining activity in relation to the climate change of that area and what will be the compensatory measure to be adopted by PP to minimize the impact of forest diversion.	Biodiversity study report is detailed in section 3.8.5 of Chapter 3	84
1.20.	Baseline data on the health of the population in the impact zone and measures for occupational health and safety of the personnel and manpower for the mine should be submitted.	Occupational health impacts and its mitigation measures are detailed in Table 4-8, chapter-4.	119

1.21.	Impact of proposed project/activity on hydrological regime of the area shall be assessed and report be submitted. Hydrological studies as per GEC 2015 guidelines to be prepared and submitted	The hydrogeological study report will be furnished in the final EIA report	
1.22.	Impact of mining and water abstraction from the mine on the hydrogeology and groundwater regime within the core zone and 10 km buffer zone including long-term monitoring measures should be provided. Details of rainwater harvesting and measures for recharge of groundwater should be reflected in case there is a declining trend of groundwater availability and/or if the area falls within dark/grey zone.	The total water requirement of 6.1 KLD will be sourced from outside agencies, so no water abstraction is anticipated. The rain water harvesting plan is detailed in Chapter 4 It is inferred the quarrying activities in the Cumulative EIA project (Quarry) will not intersect the Ground water table. Rainwater harvesting plan is given in Chapter 2.	107
1.23.	Study on land subsidence including modeling for prediction, mitigation/prevention of subsidence, continuous monitoring measures, and safety issues should be carried out.	Detailed in Chapter-4 Anticipated and mitigation measures of in the study area.	104
1.24.	Detailed water balance should be provided. The break up of water requirement as per different activities in the mining operations, including use of water for sand stowing should be given separately. Source of water for use in mine, sanction of the Competent Authority in the State Govt. and impacts vis-à-vis the competing users should be provided.	Total Water Requirement: 6.1 KLD Discussed under Chapter 2, the water balance chart is given in Figure 3-9 The required water will be met from rainwater accumulated in mine pit (when available) and from the approved water vendors.	37
1.25.	PP shall submit design details of all Air Pollution control equipment (APCEs) to be implemented as part of Environment Management Plan vis-à-vis reduction in concentration of emission for each APCEs	Air Pollution control equipment (APCEs) to be implemented as part of Environment Management Plan details given chapter-4	108
1.26.	PP shall propose to use LNG/CNG based mining machineries and trucks for mining operation and transportation of mineral. The measures adopted to conserve energy or use of renewable sources shall be explored	The machinery and equipment required for this project are given in Table 2.10 of Chapter 2. The proposal requires 3,02,208 Liters of HSD for the entire life of the mine.	35

1.27.	PP to evaluate the greenhouse emission gases from the mine operation and corresponding carbon absorption plan.	Carbon emission from quarrying activities is detailed in Chapter 4	102
1.28.	Site specific Impact assessment with its mitigation measures, Risk Assessment and Disaster Preparedness and Management Plan should be provided.	Impact assessment with its mitigation measures, Risk Assessment and Disaster Preparedness and Management Plan given chapter-7.	123
1.29.	Impact of choice of mining method, technology, selected use of machinery and impact on air quality, mineral transportation, handling & storage/stockyard, etc, Impact of blasting, noise and vibrations should be provided.	Mining method, technology details given chapter-2. The impact on mineral transportation, blasting, noise and vibration are detailed in Chapter 4.	25, 102
1.30.	Impacts of mineral transportation within the mining area and outside the lease/project along with flow-chart indicating the specific areas generating fugitive emissions should be provided. Impacts of transportation, handling, transfer of mineral and waste on air quality, generation of effluents from workshop etc, management plan for maintenance of HEMM and other machinery/equipment should be given. Details of various facilities such as rest areas and canteen for workers and effluents/pollution load emanating from these activities should also be provided.	Traffic density survey was carried out to analyze the impact of Transportation in the study area as per IRC guidelines 1961 and it is inferred that there is no much significant impact due to the proposed transportation from the project area. Details in Chapter 2. Infrastructure & other facilities will be provided to the Mine Workers after the grant of quarry lease and the same has been discussed in the Chapter No.2 There is no proposal for a rough stone processing or workshop within the project area, so no effluent is anticipated in the mine.	39
1.31.	Details of various facilities to be provided to the workers in terms of parking, rest areas and canteen, and effluents/pollution load resulting from these activities should also be given.	Infrastructure & other facilities will be provided to the Mine Workers after the grant of quarry lease and the same has been discussed in the Chapter No.2.	37
1.32.	The number and efficiency of mobile/static water jet, Fog cannon sprinkling system along the main mineral transportation road inside the mine, approach roads to the mine/stockyard/siding, and also the frequency of their use in impacting air quality should be provided.	PP will provide mobile water tankers with a cost of 1.0 lakhs under EMP.	
1.33.	Conceptual Final Mine Closure Plan and post mining land use and restoration of land/habitat to the pre- mining status should be provided. A Plan for the ecological restoration of the	Final Mine Closure Plan and post mining land use details given in chapter-7.	136

	mined out area and post mining land use should be prepared with detailed cost provisions. Impact and management of wastes and issues of re-handling (wherever applicable) and backfilling and progressive mine closure and reclamation should be furnished.	Mine Closure Plan is a part of Approved Mining Plan enclosed as Annexure – 3.	
1.34.	Adequate greenbelt nearby areas, mineral stock yard and transportation area of mineral shall be provided with details of species selected and survival rate Greenbelt development should be undertaken particularly around the transport route.	Inside the mine lease area 300 plants and out the mine lease area 1200 plants will be planted (Total 1500 nos of trees will be planted).	
1.35.	Cost of EMP (capital and recurring) should be included in the project cost and for progressive and final mine closure plan.	Total Project Cost including EMP cost is 270.3 lakhs. which is including the mine closure plan cost.	
1.36.	Details of R&R. Detailed project specific R&R Plan with data on the existing socio-economic status of the population (including tribals, SC/ST, BPL families) found in the study area and broad plan for resettlement of the displaced population, site for the resettlement colony, alternate livelihood concerns/employment for the displaced people, civic and housing amenities being offered, etc and costs along with the schedule of the implementation of the R&R Plan should be given.	Not Applicable. There are no approved habitations within a radius of 300 meters. Therefore, R&R Plan / Compensation details for the Project Affected People (PAP) is not anticipated and Not Applicable for this project.	
1.37.	CSR Plan along with details of villages and specific budgetary provisions (capital and recurring) for specific activities over the life of the project should be given.	CSR details given in chapter-8	139
1.38.	Corporate Environment Responsibility:		
1.39.	a) The Company must have a well laid down Environment Policy approved by the Board of Directors.	Environment policy details given in chapter- 10.	
1.40.	b) The Environment Policy must prescribe for standard operating process/procedures to bring into focus any infringements/deviation/violation of the environmental or forest norms/conditions.	Environment policy details given in chapter- 10.	
1.41.	c) The hierarchical system or Administrative Order of the company to deal with environmental issues and for ensuring compliance with the environmental clearance conditions must be furnished.	The administrative set up and environmental monitoring cell details are given in Chapter 10.	142

1.42.	d) To have proper checks and balances, the company should have a well laid down system of reporting of non-compliances/violations of environmental norms to the Board of Directors of the company and/or shareholders or stakeholders at large.	The administrative set up and environmental monitoring cell details are given in Chapter 10.	142
1.43.	e) Environment Management Cell and its responsibilities to be clearly spell out in EIA/ EMP report	The Environmental Monitoring cell detail is provided in Chapter 10	142
1.44.	f) In built mechanism of self-monitoring of compliance of environmental regulations should be indicated.	The Environmental Monitoring cell detail is provided in Chapter 10	142
1.45.	Status of any litigations/ court cases filed/pending on the project should be provided.	Nil	
1.46.	PP shall submit clarification from DFO that mine does not fall under corridors of any National Park and Wildlife Sanctuary with certified map showing distance of nearest sanctuary.	Nellai Wildlife Sanctuary is located at 5.8 km. MoEF final notification has published and not applicable for NBWL. DFO letter will be submitted in the Final EIA report.	
1.47.	Copy of clearances/approvals such as Forestry clearances, Mining Plan Approval, mine closer plan approval. NOC from Flood and Irrigation Dept. (if req.), etc. wherever applicable.	Nellai Wildlife Sanctuary is located at 5.8 km. MoEF final notification has published and not applicable for NBWL.	
1.48.	Details on the Forest Clearance should be given as per the format given: Total ML Total Project Area Forest (ha) land (ha) Date of FC Extent of Forest Land Balance area for which FC is yet to be obtained Status of appl for diversion of forest land If more than one provides details of each FC	Not Applicable	
1.49.	In case of expansion of the proposal, the status of the work done as per mining plan and approved mine closure plan shall be detailed in EIA/ EMP report	Not applicable. This is a fresh quarry project.	
1.50.	Details on Public Hearing should cover the information relating to notices issued in the newspaper, proceedings/minutes of Public Hearing, the points raised by the general public and commitments made by the proponent and the time bound action proposed with budgets in suitable time frame. These details should be presented in a tabular form.	The details of public hearing will be incorporated in the final EIA report	

	If the Public Hearing is in the regional language, an authenticated English Translation of the same should be provided.		
1.51.	PP shall carry out survey through drone highlighting the ground reality for atleast 10 minutes	Noted and agreed	
1.52.	Detailed Chronology of the project starting from the first lease deed alloted/Block allotment/ Land acquired to its No. of renewals, CTO /CTE with details of no. renewals, previous EC(s) granted details and its compliance details, NOC details from various Govt bodies like Forest NOC(s), CGWA permissions, Power permissions, etc as per the requisites respectively to be furnished in tabular form.	Noted and agreed	
1.53.	The first page of the EIA/ EMP report must mention the peak capacity production, area, detail of PP, Consultant (NABET acrreditation) and Laboratory (NABL / MoEF & CC certification)	Complied	
1.54.	The compliances of ToR must be properly cited with respective chapter section and page no in tabular form and also mention sequence of the respective ToR complied within the EIA-EMP report in all the chapter,s section.	As per Tor compliance each chapter wise page and table, figure no given in the EIA/EMP report.	
STANDARD TOR			
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	This is a fresh quarry	
2.	A copy of the document in support of the fact that the proponent is the rightful lessee of the mine should be given.	It is a Government Poramboke land and the applicant has obtained tender from the Government. The copy of the Precise area communication letter received from the District Collector enclosed as Annexure – 2 and Adangal & A-Register enclosed as Annexure - 6	

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. All documents including approved mine plan, EIA and Public Hearing are compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and is in the name of the lessee.	
4.	All comer coordinates of the mine lease area, superimposed on a High -Resolution Imagery/ topo sheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).	Project area is superimposed on Satellite imagery is enclosed in Figure No. 3-6. Project area boundary coordinates superimposed on Toposheet & Surface Features around the project area covering 10km radius – Figure No. 2-2. Geology map of the project area covering 10km radius - Figure No. 3-12. Geomorphology Map of the Study Area covering 10 km radius – Figure No. 3-11	50, 19, 58,59
5.	Information should be provided in Survey of India Topo sheet in l:50,000 scare indicating geological map of the area, geomorphology of land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics.	The following map in 1:50,000 Scale: Geology map of the project area covering 10km radius – Figure No. 3-12. Geomorphology Map of the Study Area covering 10 km radius – Figure No. 3-11. Important water bodies, streams and rivers are highlighted in Figure 3-2 and Soil Characteristics are shown in Figure 3-23	58,59,47,81
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.	**a. Precise Area Communication:** The Project Proponent has obtained Precise area communication letter received from the district collector, Tenkasi, vide Rc.No.M1/30292/2021 dated 24.08.2023. The letter copy is enclosed as Annexure – 2. **b. Mining Plan Approval:** The project proponent has prepared Mining Plan under rule 8, 41 & 42 of Tamil Nadu Minor Mineral Concession Rules, 1959 and the same has been approved by the Joint Director / Director (i/c), Dept. of Geology & Mining, Tenkasi vide Rc.No.	

		M1/30292/2021 dated 06.11.2023. The approval letter along with Mining Plan is enclosed as Annexure - 3	
7.	It should be clearly stated whether the proponent company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating process/procedures to bring into focus any infringement/deviation/ violation of the environmental or forest norms/ conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the company and/or shareholders or stakeholders at large, may also be detailed in the EIA Report.	The proponent will frame a well-planned environmental policy. Its details are provided under Chapter 10.	142
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.	The proposed quarrying operation is not underground mining and hence subsidence study is not applicable. Various risks likely to arise due to mining activities are detailed under section 7.3, Chapter-7. The impact due to ground vibrations due to blasting is given in para 2.8.6 of Chapter 2.	123, 36
9.	The study area will comprise of l0 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc. should be for the life of the mine / lease period.	Noted & Agreed The study area considered for this study is 10 km radius and all data contained in the EIA report such as waste generation etc., is for the Life of the Mine / lease period.	
10.	Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary. national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.	The land use of the study area was studied to demarcate various LULC categories and its details are provided under section 3.6.2 of Chapter-3. The land use pattern at present and at the end of the quarrying period has been provided in Table 3-4, Chapter-3. The Conceptual plan of mine lease area is shown in Figure No- 2-14.	51, 56, 34

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.	There is no overburden anticipated during the entire rough stone quarrying operation.	
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. ln 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.	There is no Forest Land involved in the proposed project area.	
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. The proposed project area does not involve any Forest Land.	
14.	Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act,2006 should be indicated.	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.	The list of RF in the study area are: a. Chokkampatti RF - 6 km (NW) b. Krishnapuram RF – 7.8 km (NW) c. Vairavankulam RF – 9 km (NW) The figure showing the same is illustrated in Figure 2-5.	
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.	Nellai Wildlife Sanctuary is located at 5.8km (NW). The impact study is detailed in Chapter 4. (Table 4-7)	118
17.	Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves/(existing as well as proposed), if any, within l0 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief	Nellai Wildlife Sanctuary is located at 5.8 km. MoEF final notification has published and not applicable for NBWL.	

	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 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.	The detailed biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] is carried out and the details are incorporated in section 3.8.5 of Chapter 3	84
19.	Proximity to Areas declared as 'critically Polluted' or the project areas likely to come under the 'Aravali Range', (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities. such as the SPCB or State Mining Department should be secured and furnished to the effect that the proposed mining activities could be considered.	Not Applicable	
20.	Similarly, for coastal projects, a CRZ map duly authenticated by one of the authorized agencies demarcating LTL. HTL, CRZ area, location of the mine lease with respect to CRZ, Coastal features such as mangroves, if any, should be furnished. (Note: The Mining projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority).	Not Applicable	
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	Not Applicable	

	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 of2009, water quality, noise revel, 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 is collected in post monsoon season (Oct – Dec 24) for AAQ, WQ, NL and EB. Site-specific meteorological study data is collected. 2 Locations are chosen for upwind, 2 Locations for downwind and 2 Locations for crosswind apart from project location.	
23.	Air quality modelling should be carried out for prediction of impact of the project on the air quality of the area. lt 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.	Air Quality Modelling for prediction of incremental GLC's of pollutant was carried out using AERMOD view and Detailed in Chapter 4. Air Quality Modelling for Cluster are detailed in Chapter 7.	112-113 134-135
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.	The total water requirement for the project is 6.8 KLD. The required water will be procured from outside agencies initially and later rainwater harvested in the mine pit shall be used other than drinking purpose. Water Balance diagram is presented in section 2.9.1 of chapter 2	37

25.	Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.	Water will be sourced from local vendors and ground water will not be extracted. Hence, not applicable.	
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.	Details of water conservation measures in detailed in Chapter 4. Rain water harvesting details are included in Chapter 3.	
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 Table 4-2	106
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-ali4 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.	The quarrying activity will not intersect ground water table as quarrying is proposed up to a depth of 40 m AGL and water table is found at a depth of 58 m BGL.	
29.	Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion proposed, if any, and the impact of the same on the hydrology should be brought out.	Not applicable	
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.	Site Elevation: ≃ 265 m from above MSL Working depth: 40m (AGL) GW Table: 58m BGL	
31.	A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected	Greenbelt Development are detailed in Chapter 4 and Chapter 8 0.97.5 hectares of land are allotted for greenbelt development.330 Nos. of tree species will be planted inside the Mine Lease Area and 1170 Nos. of tree species will be planted outside the Mine Lease Area.	

	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.	This is a small quarry and the production is very less. 4 Nos. of 5T/10T tippers will be used for transport. The trips will be minimum. Hence no major impact on transport is expected	
33.	Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.	Temporary Infrastructure & other facilities will be provided to the Mine Workers after the grant of quarry lease.	
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.	At the conceptual stage the quarried-out land will be fenced and lower benches will be allowed to collect rain water to act as a temporary reservoir and Greenbelt development will be carried out on the top bench, unutilized areas and haul roads.	
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.	Details of occupational health and safety aspects are given in Table 4-8 of Chapter 4	119
36.	Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.	No Public Health Implications anticipated due to this project. Details of CER and CSR are discussed under Chapter No. 8 under section 8.5.1	139
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.	This project provides employment to 30 people directly. Local people will be hired for unskilled labour. Through CSR, nearby schools, hospitals will be benefitted. For CSR, INR 8.0 Lakh is	

		allocated. Based on the demand of the people during public hearing, further funds will be allocated, if necessary.	
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.	Environmental Management plan details are given in Chapter 10.	141
39.	Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project.	The details of the public hearing will be included in Chapter 7 along with detailed action plan.	
40.	Details of litigation pending against the project, if any, with direction /order paced by any Court of Law against the Project should be given.	There is no litigation pending against the 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: 171.99 Lakhs CER Cost: Rs. 8 Lakhs EMP Cost: Rs. 270.3 Lakhs	146
42.	A Disaster management Plan shall be prepared and included in the EIA/EMP Report.	Included 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.	Outlined 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	Yes, Enclosed	
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.	Yes, Complied	
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 results are detailed in Chapter 3. Original Baseline monitoring reports will be made available during appraisal of the project.	

e.	Where the documents provided are in a language other than English, an English translation should be provided.	Yes, complied	
f.	The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted.	Yes, complied	
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- l 1013/41/2006-IA.11 0) dated 4th August, 2009, which are available on the website of this Ministry, should be followed.	Noted & agreed	
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-l l0l I161812010-1A.ll (l) dated 30.5.2012, certified report of the status of compliance of the conditions stipulated in the Environment Clearance 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.	Yes, Complied	
j.	The EIA report should also include (i) surface plan of the area indicating contours of main topographic features, drainage and mining area, (ii) geological maps and sections and (iii) sections of the mine pit and external dumps, if any, clearly showing the land features of the adjoining area.	Surface Plan and Geological Plan – Figure No. 2-8 and Figure No. 2-9	26,28

EIA REPORT

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1 INTRODUCTION

1.1 Preamble

Environment Impact Assessment (EIA) is a process used to identify the environmental, social & economic impacts of a project prior to decision making. It seeks to anticipate environmental effects early in the planning and design process, identify strategies to mitigate negative effects, adapt projects to the local environment, and provide the proponent with the predicted choices. Economic and environmental benefits can be obtained through the use of EIA. The project's overall time and cost can be reduced by taking into account environmental effects, including prediction and mitigation, early benefits in project design, environmental protection, and optimal resource utilization.

1.2 General Information on Mining of Minerals

Crystalline Limestone, Multi colour dimension stone, rough stone/gravel, garnet and ilmenite sand are notable economic importance minerals of found in Tirunelveli District. Minor occurrences of graphite, mica and gemstone are also reported in the district. Mining activities based on rough stone (mostly charnockite) are majorly concentrated in Alangulam, Radhapuram, Nanguneri, Manur and Sankarankovil Taluks in the district under operation for production of construction materials and earth fill as gravel. The multi color dimension stones occurring at Kaladaikurichi (Ambai White), Poongudiyarkulam, Mannarkovil, Adachani in Ambasamudram Taluk, Kasthurirangapuram, Kannanallur in Radhapuram Taluk and Singikulam, Melacheval in Cheranmahadevi Taluk are recorded in the district which once actively mined by M/s TAMIN Ltd (Govt of Taminadu) and other private miners. Crystalline Limestone occurring as bands in Talayuttu and Ramaayyanpatti extends over strike length of 2.5 km with average width of 120 m were extensively mined by M/s India Cements Ltd, M/s South India Mines and Minerals Industries Ltd, M/s Krishna Mines etc in recent years. Crystalline limestone intercalated with calc granulite occurring in Padmaneri, Pottasutti, Singikulam, Pandapulli, Terku Seliyanur and Marandai areas were also mined in 1980's by M/s TAMIN Ltd (Govt of Taminadu) and other private agencies. Rich deposits of garnet and ilmenite sand occurs along the coast part of Radhapuram Taluk, in Tirunelveli district. Red garnet sand occurs along Nambiar River. Vijayapatti, Kuttankuzhi and Idindakarai areas show notable garnet and ilmenite sands occuurrences which were exploited economically in recent times.

(Source: District Survey Report - Tirunelveli)

1.3 Purpose of the report

Thiru V. M. Sundaraiah proposes to establish a Rough Stone Quarry at S.F.No.91 (Part-2) over an extent of 3.00.0 Ha in Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu State. Though the area of the proposed mine is 3.00.0 Ha, the cluster area within 500 m radius calculated as per MoEF & CC Notification – S.O. 2269 (E) Dated: 01.07.2016 is 7.90.0 Ha> 5.00 Ha. In this regard, Form-I and Pre-Feasibility Report has been submitted on 27.05.24 and the ToR was granted by the SEIAA vide ToR Identification No. TO24B0108TN5815892N. The copy of the ToR is enclosed as Annexure - 1. The Geological Resources of Rough stone in the proposed Mine Lease area is 8,28,065 m^3. As per approved Mining Plan, the proposed production is 3,77,765 m^3 of Rough Stone for the period of

five years. The proposal for ToR was considered by the State Expert Appraisal Committee in its 503rd meeting held on 04.10.2024 for prescribing Terms of Reference (ToR) for preparation of the Environmental Impact Assessment (EIA) report.

The purpose of the EIA study is to assess the baseline environmental conditions and to anticipate the possible environmental impacts during operation of the project, thereby suggesting appropriate mitigation measures to control the same. The EIA report has been prepared in line with the Terms of Reference issued by MoEF&CC vide No. IA-J-11011/525/2022-IA-II(I) dated 18.01.2023.

1.4 Identification of the project and project proponent

1.4.1 About the Project:

The applicant V. M. Sundaraiah, proposed to quarry for the period of five years in Government Poramboke Land over an area of 3.00.0 Ha located in S.F.No.91 (Part-2) of Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu State. It is a Government Poramboke land and the applicant has obtained tender from the Government. The copy of the Precise area communication letter received from the District Collector enclosed as Annexure – 2 and Adangal, A-Register and land documents enclosed as Annexure - 6. The applied area is government land, previously quarried by the same party under District Collector, Tirunelveli's proceedings Rc.No. M2/32470/1999, dated 02.06.1999, for the lease period from 12.07.1999 to 11.07.2004. The existing pit dimensions were obtained from the Department of Geology and Mining, Tenkasi, via Rc.No. M1/30292/2021, dated 06.11.2023, and are provided in Chapter 2. The pit measurement letter is enclosed as Annexure -7. Since, there is no DSR and other secondary data such as mineral resources, natural resources etc available for Tenkasi District, secondary data is resorted to Tirunelveli District as Tenkasi falls under Tirunelveli District before bifurcation.

1.4.2 About the Project Proponent:

Table 1-1 Details of Project Proponent

Name of the Project Proponent	Thiru. V. M. Sundaraiah
Communication Address	S/o. Muthaiah Thevar, No.4/111D, Sundaresapuram Block-IV, Poganallur village, Kadayanallur Taluk, Tenkasi District. Pincode-627 751
Mobile No.	9788239125
Email - ID	Sundaraiahm7@gmail.com

1.5 Brief description of nature, size and location of the project

Table 1-2 Salient Features of the project

S. No.	Particulars	Description
1.	Nature	Mining of Rough Stone Quarry
2.	Location	S.F.No.91 (Part-2) over an extent of 3.00.0 Ha in Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
3.	Size (Extent)	3.00.0 Ha with cluster area of 7.90.0 Ha
4.	Project Cost	Rs. 442.29 lakhs

1.6 Details of Quarries within cluster area of 500m radius

The details of the quarries within 500 m radius are given below:

Table 1-3 Details of Quarry within 500m radius

S. No	Name and address of the lessee	Village & S. F. Nos	Extent in Hectare	Lease Period
i. Expired Quarries				
1.	S.Arunachalam, S/o.Subbiah Chettiar, 295, Main Road, Krishnapuram, Kadayanallur Taluk, Tenkasi District	Ariyanayagipuran Village, S.F.No.729 (Part-I),	2.00.0Ha	For a period of 5 years 08.02.2016 to 07.02.2021
2.	S.Arunachalam, S/o.Subbiah Chettiar, 295, Main Road, Krishnapuram, Kadayanallur Taluk, Tenkasi District	Ariyanayagipuran Village, S.F.No.729 (Part-II),	3.00.0Ha	For a period of 5 years 08.02.2016 to 07.02.2021
ii. Existing Quarries				
1.	M.Kalyanasundaram, S/o. Malaiyappan, 38, Kozhumbhu Street, Kadayanallur Taluk, Tenkasi District	Ariyanayagipuran Village, S.F.No.108/2 (Part), 108/3 (Part), 108/4 (Part), 108/5 (Part), 109/2, 109/3, 109/4, 109/5, 109/6	3.10.0Ha	For a period of 5 years 20.06.2023 to 19.06.2028
2.	V.M.Sundariah, S/o.Muthiah Thevar, 4/222, Main Road, Sundaresapuram, Kadayanallur Taluk, Tenkasi District	Ariyanayagipuran Village, S.F.No.94/1 (Part), 94/2 (Part), 94/3A (Part), 92 (Part), 93/3 (Part)	1.80.0Ha	For a period of 5 years 24.05.2023 to 23.05.2028
iii. Abandoned Quarries				

Nil					
iv.	**Proposed Quarries**				
	1	V.M.Sundaraiah, S/o.Muthiah Thevar, 4/222, Main Road, Sundaresapuram, Kadayanallur Taluk, Tenkasi District	Ariyanayagipuran Village, S.F.No.91 (Part-2)	3.00.0Ha	Proposed Quarry

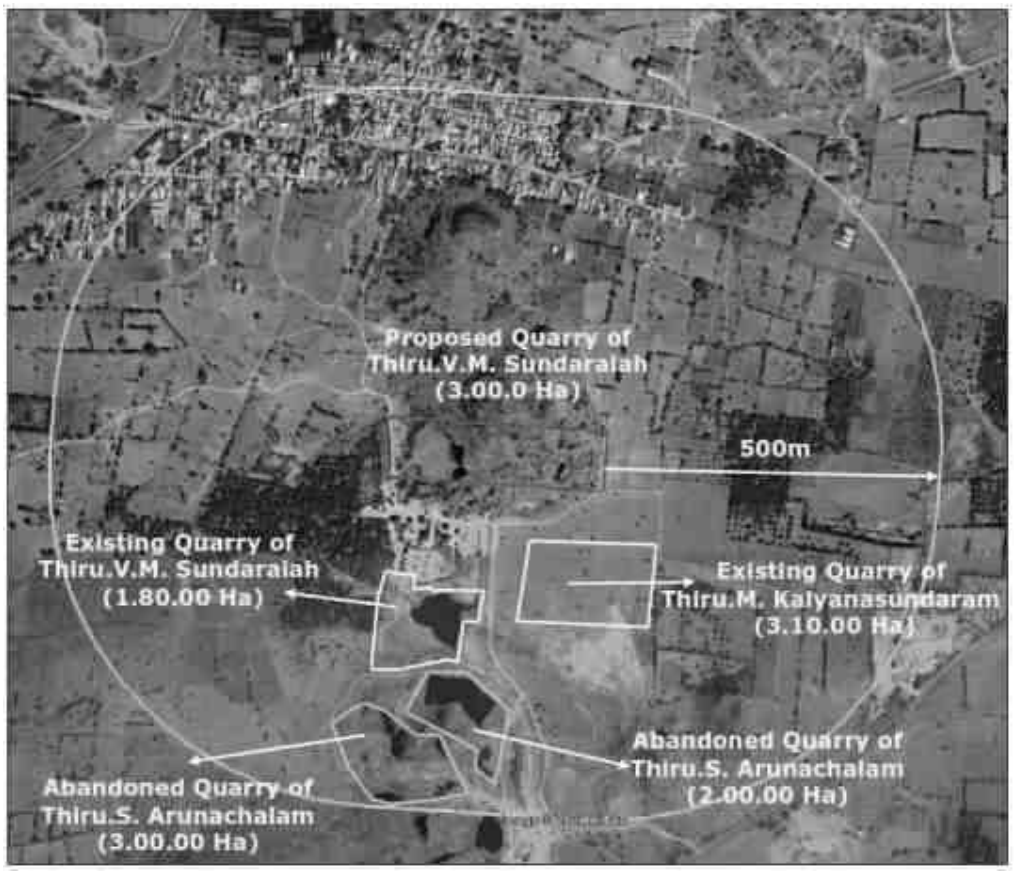


Figure 1-1 Details of Quarries within 500 m radius

1.7 Details of Statutory approvals

- Precise Area Communication:

  The project proponent has obtained Precise Area Communication by District Collector, Tenkasi vide Letter No. Rc. No. M1/30292/2021 dated 04.08.2023. the copy of the letter is enclosed as Annexure - 2

- Mining Plan Approval Letter

  The project proponent has prepared mining plan under rule 19(1)41 & 42 of Tamil Nadu Minor Mineral Concession Rules, 1959 and the same has been approved by the Joint / Assistant Director (i/c) Department of Geology and

Mining, Tenkasi vide Letter No. Rc. No. M1/30292/2021 dated 06.11.2023. The copy of the letter is enclosed as Annexure - 3

- 500 m radius quarry features

  The project proponent has obtained an official letter from the Joint Director / Assistant Director (i/c), Department of Geology and Mining, Tenkasi vide Letter No. Rc. No. M1/30292/2021 dated 06.11.2023. The copy of the letter is enclosed as Annexure - 4

- Land document of the proposed lease area

  The proposed project area is classified as a Government Poramboke land and the applicant has obtained tender from the Government. The copy of the Precise area communication Letter received from the District Collector enclosed as Annexure - 2 and Adangal & A-Register enclosed as Annexure - 6.

- VAO certification regarding 300m features of the project area

  There are no historical places, schools, cemeteries, HT and LT lines, temples, bird sanctuaries, and wildlife sanctuaries within 300 metres of the proposed project area. In this regard, the project proponent has received an official letter from the Village Administrative Officer, dated 20.05.2024. The copy of the letter is enclosed as Annexure - 5

1.8 EIA process

Screening: Screening is the first stage of the EIA process. In this stage, the State level Expert Appraisal Committee (SEAC) examined the application of EC made by the proponent in Form 1 through online (Proposal No. SIA/TN/MIN/475931/2024, dated 27.05.2024) and decided that the project requires detailed environmental studies for the preparation of EIA report.

Therefore, the proponent submitted application for Terms of Reference (ToR) on 28.06.2024.

Scoping: The proposal was placed in the 487th meeting of SEAC on 01.08.2024. Based on the presentation and documents furnished by the project proponent, SEAC decided to recommend the proposal for the grant of Terms of Reference (ToR) to SEIAA and SEIAA recommended ToR in its 766th meeting dated 18.10.2024.

Public Consultation: In this stage, an application along with the draft of EIA and EMP report will be made to the Member Secretary of the Tamil Nadu Pollution Control Board (TNPCB) to conduct Public Hearing ensuring public participation at the project site or in its close proximity in the district. During public hearing, an opportunity will be given to the people living nearby the project site to express their opinions about the impact of the proposed project on the environment. The outcome of the public hearing meeting will be updated in the final EIA report for appraisal.

Appraisal: In this stage, an application along with final EIA report including the outcome of the public consultations will be made to the SEIAA. The application thus made will be scrutinized by the SEAC. Then, the SEAC will make recommendations to grant EC or reject the application to the SEIAA.

1.9 Terms of Reference (ToR)

SEAC framed a comprehensive ToR based on the project information provided in Form I, PFR and issued ToR vide ToR Identification No. TO24B0108TN5815892N. The copy of the ToR is enclosed as Annexure - 1.

1.10 Scope of the EIA Study:

The main scope of the EIA study is to quantify the cumulative impact of the quarries in the cluster on the study area and formulate the effective mitigation measures for each individual lease. A detailed account of the emission sources, emissions control equipment, background air quality levels, meteorological measurements, dispersion model and all other aspects of pollution like sewage, and dust generation has been provided in this report. The baseline monitoring study has been carried out during the period of October 2024 – December 2024 for various environmental components such as land, soil, air, water, noise, ecology, etc. to assess the anticipated impacts of the cluster quarry projects on the environment and suggest suitable mitigation measures for likely adverse impacts due to the proposed project. The sampling methodologies for the various environmental parameters required for the study, frequency of sampling, method of sample analysis, etc., are given in Chapter 3.

1.11 Post Environmental Clearance Monitoring

1.11.1 Methodology adopted

Post project monitoring will be carried out as per conditions stipulated in environmental clearance letter issued by SEIAA, consent issued by SPCB as well as according to CPCB guidelines. The lease area is considered as core zone and the area lying within 10 km radius from the lease boundary is considered as buffer zone, where some impacts may be observed on physical and biological environment. In the buffer zone slight impact may be observed and that too is occasional.

Table 1-4 Post Environmental Clearance Monitoring

S. No.	Description	Frequency of monitoring
1.	Ambient Air Quality Monitoring	Quarterly /Half-yearly
2.	Water Level & Water Quality Monitoring (Both Surface and Ground Water)	Quarterly /Half-yearly
3.	Noise Level Monitoring	Quarterly /Half-yearly
4.	Soil Quality Monitoring	Quarterly /Half-yearly
5.	Medical check-up	Quarterly /Half-yearly

1.12 Structure of the EIA Report

The generic structure of the EIA Report is prepared as per the Technical EIA Guidance Manual for Mining of Minerals.

2 PROJECT DESCRIPTION

2.1 Type of the project

Thiru V.M. Sundaraiah proposes to set up a Rough Stone Quarry at S.F.No.91 (Part-2) over an extent of 3.00.0 Ha in Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu State. As per EIA Notification, 2006 and its subsequent amendments (O.M vide No.F.No.L- 11011/175/2018-IA-II(M) Govt of India MOEF&CC on December 12th 2018) project comes under category B1 cluster & schedule 1(a) under item 1 as the 500 m radius area is >5 Ha. As per approved Mining Plan, the proposed production is 3,77,765 m^3 of Rough Stone for the period of five years by opencast mechanized mining. The project will be appraised at state level by State Environment Impact Assessment Authority, Tamil Nadu. Environment Clearance study will involve preparation of draft EIA report on the basis of baseline & impact assessment study is carried out. Also, before appraisal, under 7(III) of EIA notification 2006, the project involves the Public Consultation and the same will be conducted under SPCB (TN) in Tenkasi District.

2.2 Need for the project

To achieve a huge infrastructure being envisaged by Government of India, particularly in road and housing sector, there is a need for basic building materials. The rough stone and gravel form the primary building material.

Rough stone is one of the most valuable natural building materials. Aggregates are mostly used for building roads and footpaths Aggregates – stone used for its strong physical properties – crushed and sorted into various sizes for use in concrete, coated with bitumen to make asphalt or used 'dry' as bulk fill in construction. Mostly used in roads, concrete and building products. Aggregates represent about 98% of quarry output, most of which is used in road construction, maintenance and repair. Much of this goes to the production of asphalt; the remainder is used 'dry' without the addition of other materials to provide a sturdy base for roads. Tirunelveli District is home to several minerals of significant economic importance, including crystalline limestone, multi-coloured dimension stone, rough stone or gravel, garnet, and ilmenite sand. Furthermore, the lease area has a wealth of geological reserves of gravel and rough stone, as demonstrated by the mining operations conducted nearby.

2.3 Project Location

2.3.1 Location of the project site

The proposed quarry is located at S.F.No.91 (Part-2) over an extent of 3.00.0 Ha in Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu State. The mining area is located in 09°05'49.31"N to 09°05'52.99"N & 77°23'24.02"E to 77°23'35.00"E. the location of the project is given below in Figure 2-1.

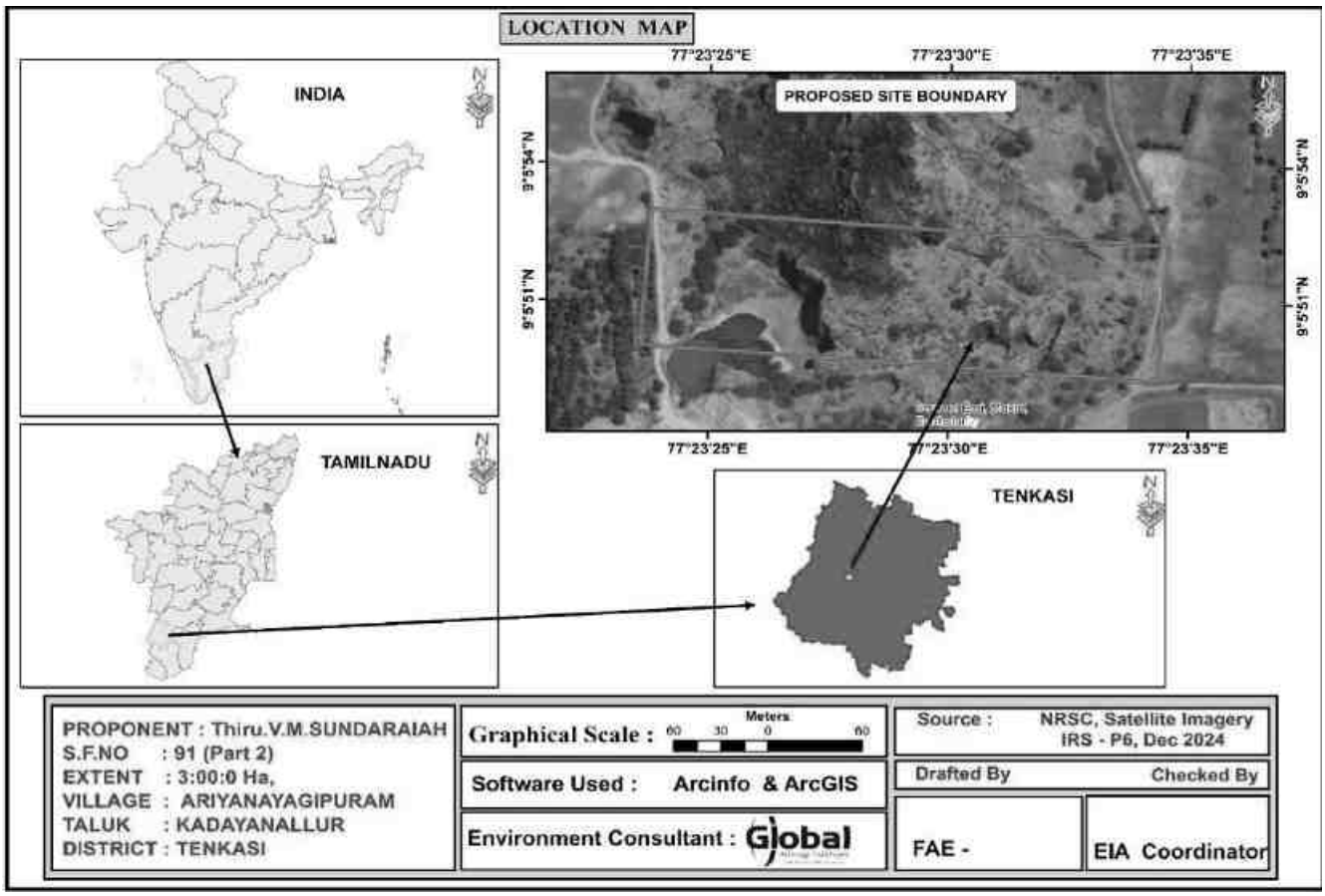
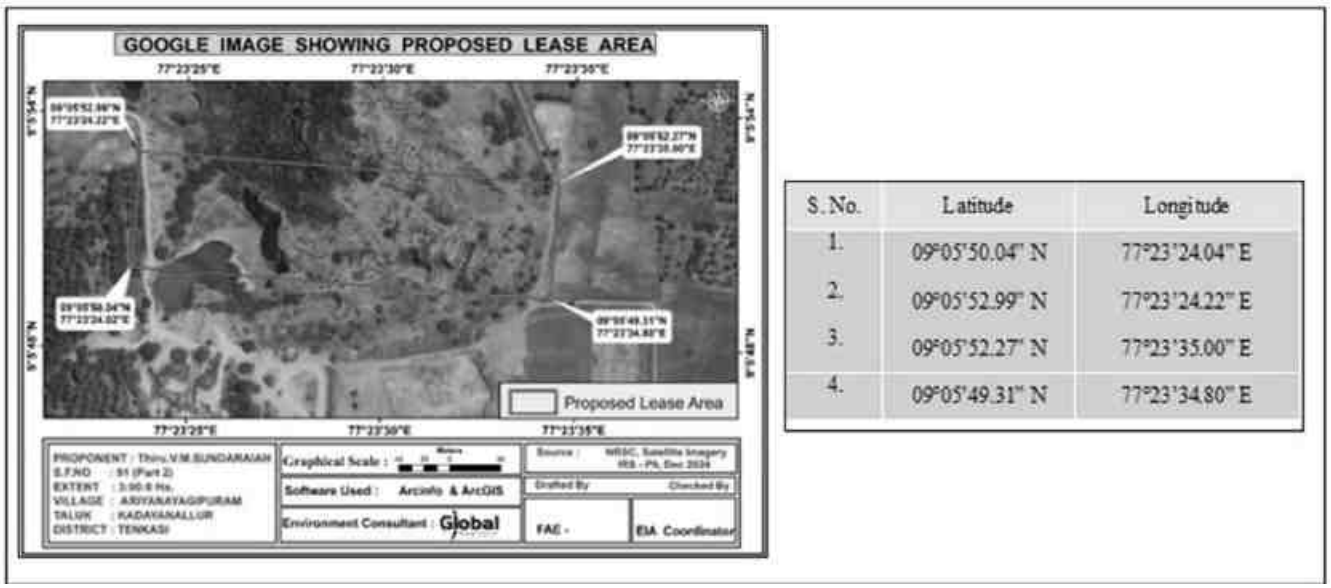


Figure 2-1 Project Location

The project boundary co-ordinates are shown below:



S.No.	Latitude	Longitude
1.	09°05'50.04" N	77°23'24.04" E
2.	09°05'52.99" N	77°23'24.22" E
3.	09°05'52.27" N	77°23'35.00" E
4.	09°05'49.31" N	77°23'34.80" E

Figure 2-2 Boundary Co-ordinates of the Project

The site photographs of the project site are shown below

Figure 2-3 Site Photographs

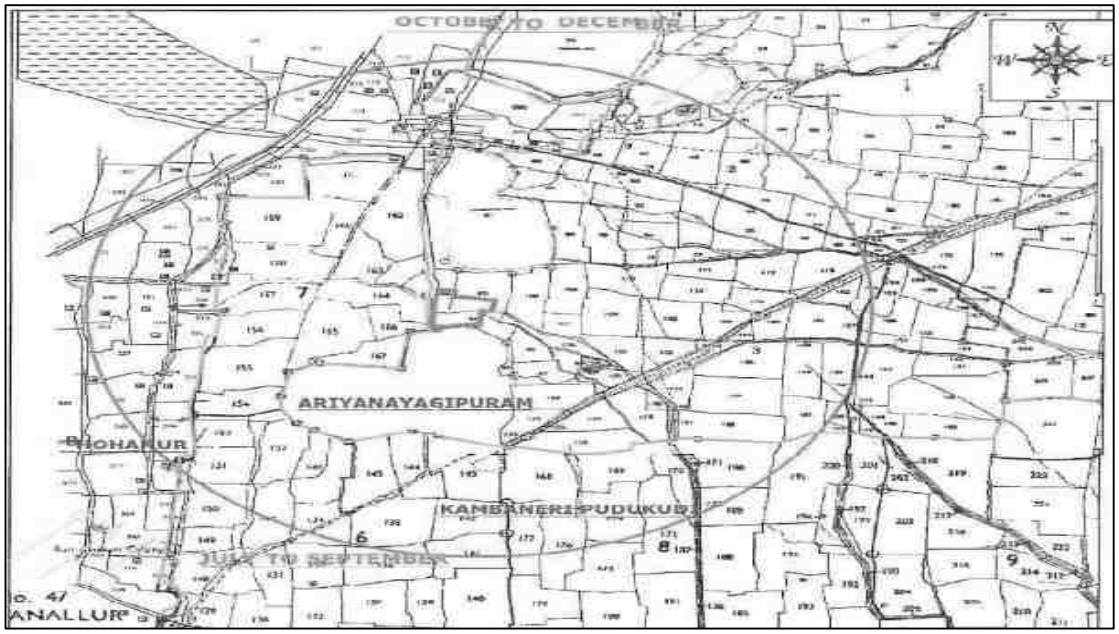


Figure 2-4 Village Map

2.3.2 Site Connectivity

The proposed site is located near Sundaresapuram Village (430m, N) and is accessible from NH 744 (Kollam - Thirumangalam Road) through collector roads. The site is located near Kadayanallur Station.

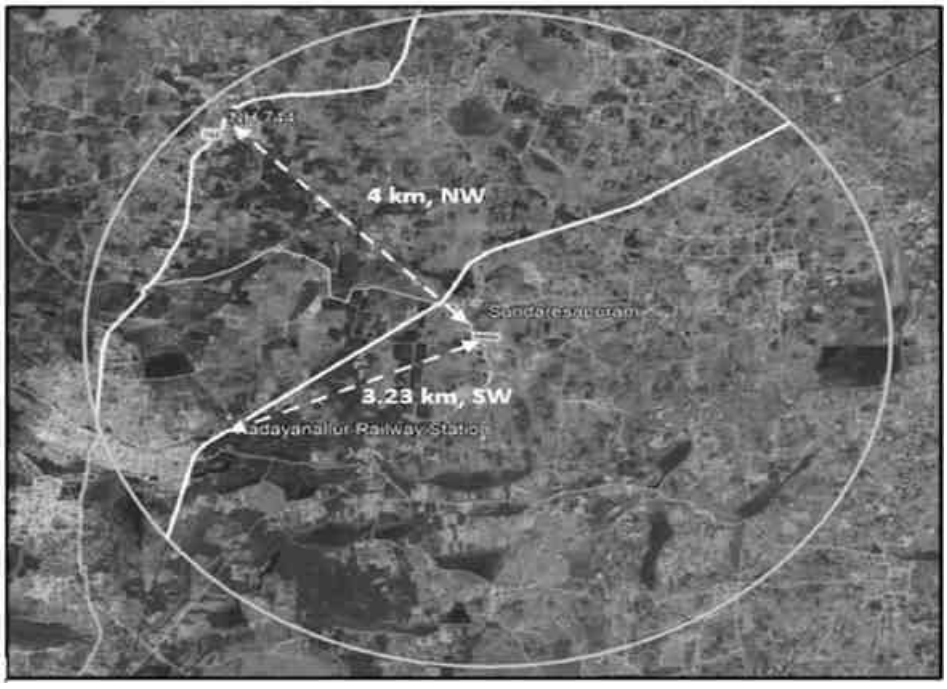


Figure 2-5 Site Connectivity

Table 2-1 Site Connectivity

S. No.	Particulars	Details
1.	Nearest Highway	NH 744 (Kollam – Thirumangalam Road) – 4 km, NW
2.	Interstate Boundary	Kerala – Tamilnadu - 15.9 km, W
3.	Nearest Railway Station	Kadayanalluir - 3.23km, W
4.	Nearest Airport	Tuticorin - 80 km, SE
5.	Nearest Port	Tuticorin - 94 km, SE
6.	Nearest Village	Sundaresapuram – 310m, N

The salient features of the project site are given below:

Table 2-2 Salient features of the project site

S. No.	Particulars	Details
1.	Proponent Name	Thiru. V. M. Sundaraiah
2.	Proposed project	Rough Stone Quarry of Thiru. V. M. Sundaraiah
3.	Extent	3.00.0 Ha and the cluster area within 500 m radius including the proposed mine is 7.90.0 Ha > 5 Ha
4.	Location	S.F.No.91 (Part-2) over an extent of 3.00.0 Ha in Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
5.	Co-ordinates of the project site	S. No. / Latitude / Longitude 1. / 09°05'50.04" N / 77°23'24.04" E 2. / 09°05'52.99" N / 77°23'24.22" E 3. / 09°05'52.27" N / 77°23'35.00" E 4. / 09°05'49.31" N / 77°23'34.80" E
6.	Topography	Hilly Terrain
7.	Site Elevation above MSL	≃ 276 m from above MSL
8.	Topo Sheet No.	58 G/08
9.	Minerals of Mine	Rough Stone
10.	Proposed production in m^3	3,77,765
11.	Ultimate Depth of mining	40m (AGL)
12.	Method of Mining	Opencast, Semi-Mechanized Mining with a bench height of 5m and bench width of 5m is proposed
13.	Drilling/Blasting	Drilling and controlled Blasting is proposed

14.	No. of Working days	300 Days
15.	Water requirement & Source	6.8 kLD and will be sourced from local vendors
16.	Manpower	30 Nos.
17.	Project Cost	Rs. 442.29 lakhs
18.	Mining Plan Approval	Mining Plan approved by Joint Director / Assistant Director (i/c), Dept. of Geology & Mining, Tenkasi vide Rc.No. ML/30292/2021 dated 06.11.2023
19.	Safety Zone	0.97.5 Ha will be maintained as safety zone and tree saplings will be planted in this area
20.	Ground water level	58 m BGL

The detailed Environmental Settings of the project is detailed below in Table 2-2

Table 2-3 Environmental Settings of the project

S. No.	Particulars	Details
1.	Nearest Highway	NH 744 (Kollam – Thirumangalam Road) – 4 km, NW
2.	Interstate Boundary	Kerala – Tamilnadu - 15.9 km, W
3.	Nearest Railway Station	Kadayanalluir - 3.23km, W
4.	Nearest Airport	Tuticorin - 80 km, SE
5.	Nearest Port	Tuticorin - 94 km, SE
6.	Nearest Village	Sundaresapuram – 310m, N
7.	Water bodies	Small Kuttai - 400m (SE) Seasonal Odai - 460 m (SE) Pappan Channel - 2.1km (SW) Karuppu Nadi - 7.5 km (W)
8.	Reserved Forest	Chokkampatti RF - 6 km (NW) Krishnapuram RF Varaivankulam RF
9.	Eco Sensitive Zone and Wildlife Sanctuary (Notified)	Nellai Wildlife Sanctuary - 5.8 km (NW)
10.	Archaeological important places	Nil within 10 km radius
11.	Defense Installations	Nil within 10 km radius
12.	Nearest Port	Nil within 10 km radius
13.	Seismic Zone	Nil within 10 km radius

The figure showing the environmental settings of the proposed mine is shown below:

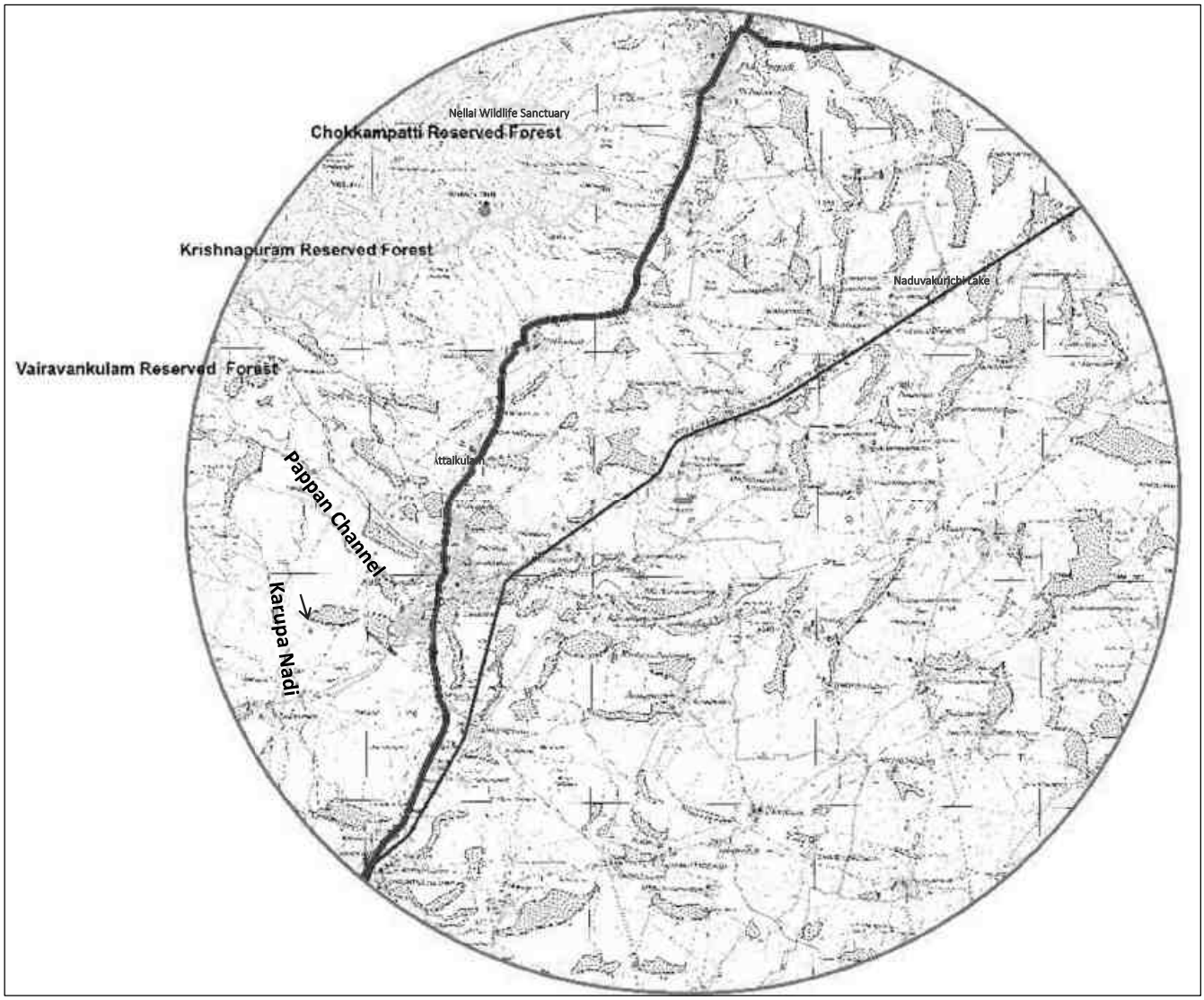


Figure 2-6 Environmental Settings of the Project

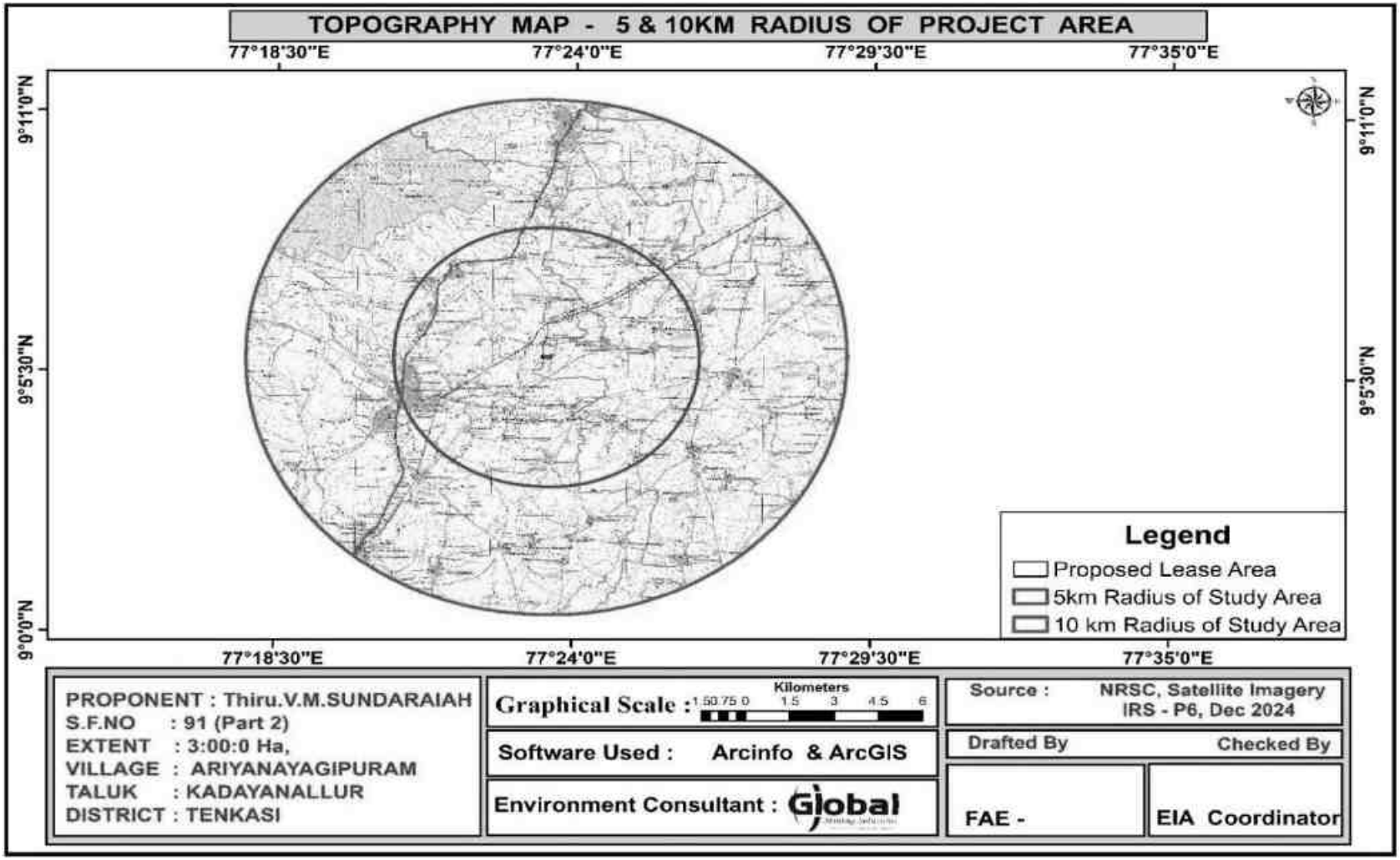


Figure 2-7 10 km Radius TOPO Map

2.4 Leasehold Area

The proposed project area is classified as a Government Poramboke land and the applicant has obtained tender from the Government. The copy of the Precise area communication Letter received from the District Collector enclosed as Annexure - 2 and Adangal & A-Register enclosed as Annexure - 3. There is no human settlement within 500m radius. The surface plan of the project is shown below:

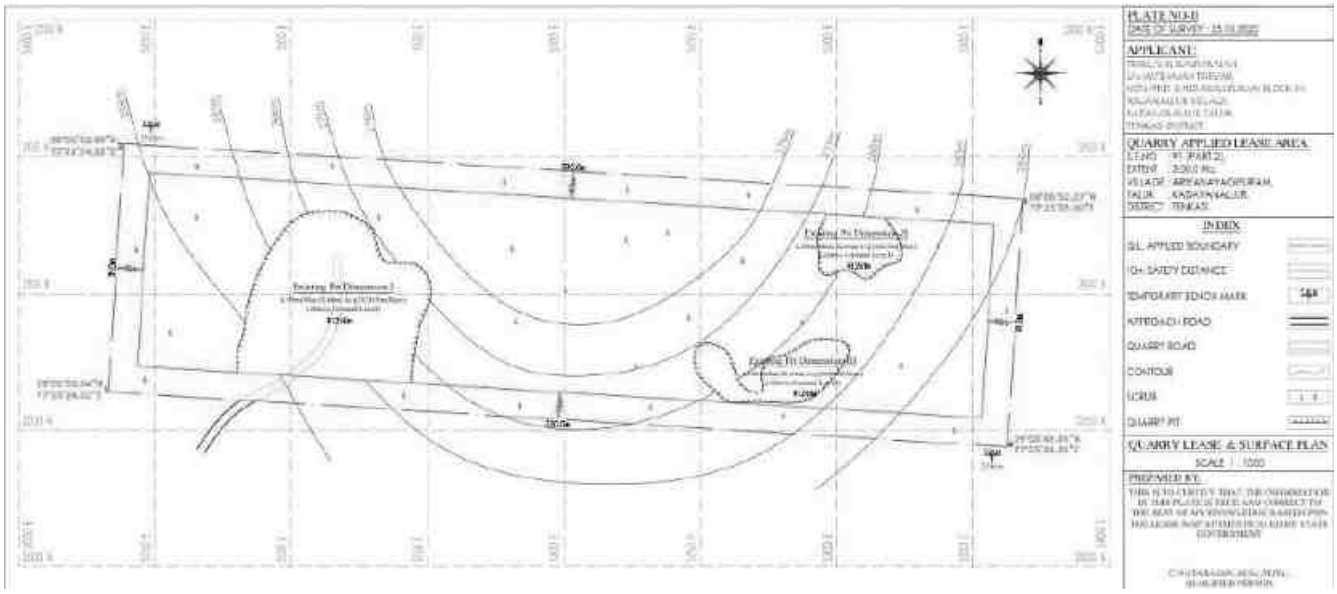


Figure 2-8 Surface plan of the project area

2.5 Land Use Pattern

The land use pattern of the project site is given below

Table 2-4 Land use pattern of the mine area

Sl. No.	Land Use	Present Area (Ha)	Area in use during the quarrying period (Ha)
1.	Quarrying Pit	0.38.0	2.00.5
2.	Infrastructure	Nil	0.01.0
3.	Roads	0.01.0	0.01.0
4.	Green Belt	Nil	0.97.5
5.	Unutilized	2.61.0	Nil
	Total =	**3.00.0**	**3.00.0**

2.6 Geology

2.6.1 Regional Geology

Southern Granulite Terrain (SGT) of Tamil Nadu lying south of Palaghat-Cauvery shear zone has been divided into two major tectonic blocks by the Madurai block and Nagercoil-Trivandrum Block in the south. It is separated by WNW-ESE trending Achankovil-Tambaraparani Lineament. Tirunelveli and Thothukudi are significantly the only districts in the state to witness the geology and structure of both the blocks. Tirunelveli district represents a well-developed lithopackage of meta-sedimentary sequence inter banded with charnockite Group of rocks. The rock types exposed are of quartzite, calc-granulite, garnet-biotite-sillimanite gneiss, garnet quartzo-feldspathic gneiss and garnetbiotite-cordierite gneiss belonging to Khondalite Group of rock. Charnockite and pyroxene granulite are the Charnockite Group. Hornblende-biotite gneiss belongs to Migmatitic Complex. Besides, basic intrusive (pyroxenite) and acid intrusive (granite) are noticed. The younger intrusive are represented by pegmatite and quartz veins. Evidence of development of incipient / patchy charnockite along the shear plane is noticed in the district along the Western Ghat high hills

	Recent-Sub recent	**Soil and alluvium, calcrete**
		Quartz and pegmatite vein
		Incipient charnockite
700-550 Ma	Younger intrusive	Acidic intrusive – Granite
		Basic intrusive (Pyroxenite, Ultramafic/mafic rocks)
2200-2550 Ma	Migmatite Group	Hornblende-biotite gneiss
2600 Ma	Charnockite Group	Meta gabbro (older Intrusive) Charnockite Pyroxene granulite
	Khondalite Group	Garnet-biotite-quartzofeldspathic gneiss Garnet-biotite gneiss Garnet –biotite –Sillimanite gneiss ± cordierite gneiss Crystalline limestone, Calc granulite Quartzite
		Basement Unknown

2.6.2 Regional Geology

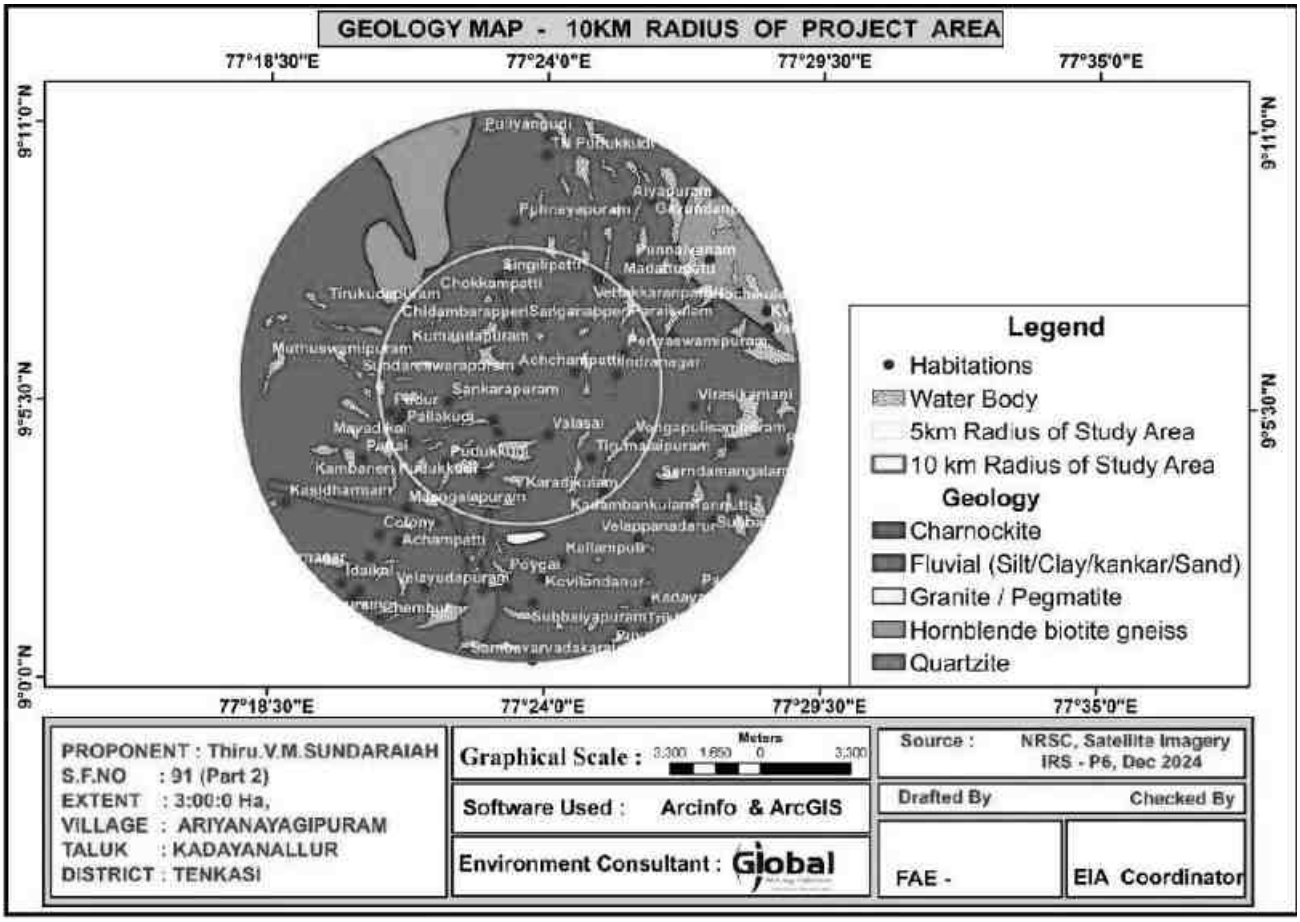


Figure 2-9 Geology map of the study area

The geology map of the study area reveals that the area is predominately covered with Charnockite, which falls under Charnockite group and the remaining area is covered with Fluvial (Silt/Clay/kankar/Sand), Quartzite (Khondalite group) and Hornblende biotite gnesis (Migmatite Group). No exploration was carried out. Massive Rough stone formation visible from the existing pits in thenearby quarry operations and dry open wells.

2.7 Details of Mining

The proposed activity is the extraction of Rough Stone by open cast semi mechanized mining method over an extent of 3.00.0 Ha. The details of mining are presented below

Table 2-5 Details of Mining

S. No.	Particulars	Details
1.	Method of mining	Open Cast Semi-mechanized
2.	Geological Reserves	8,28,065 Cu.m of Rough Stone
3.	Mineable Reserves	3,77,765 Cu.m of Rough Stone

4.	Proposed Production	3,77,765 Cu.m of Rough Stone
5.	Bench Details	Bench Height of 5m and Bench Width of 5m is proposed.

The details of geological and mineable reserves in the lease area have been provided below in the subsequent sub section.

2.7.1 Estimation of Reserves

The geological and recoverable reserves are estimated by cross-section method. Two sections have been drawn, one section drawn length wise as (X-Y) and another one section drawn width wise as (A-B), to cover maximum area considered for lease. The plans and sections have been drawn with a scale of 1:1000 and 1:500 respectively.

2.7.2 Geological Reserves

The quarrying is restricted up to a depth of 40m AGL. The details of the available geological reserve are given below.

Table 2-6 Geological Reserve

Section	Topography	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume in m^3	Geological Resources of Rough stone in m^3
XY-AB	Above ground level	I	121	62	5	37510	37510
		II	155	77	5	59675	59675
		III	179	81	5	72495	72495
		IV	214	91	5	97370	97370
		V	282	91	5	128310	128310
		VI	301	91	5	136955	136955
		VII	320	91	5	145600	145600
		VIII	330	91	5	150150	150150
Total							**828065**

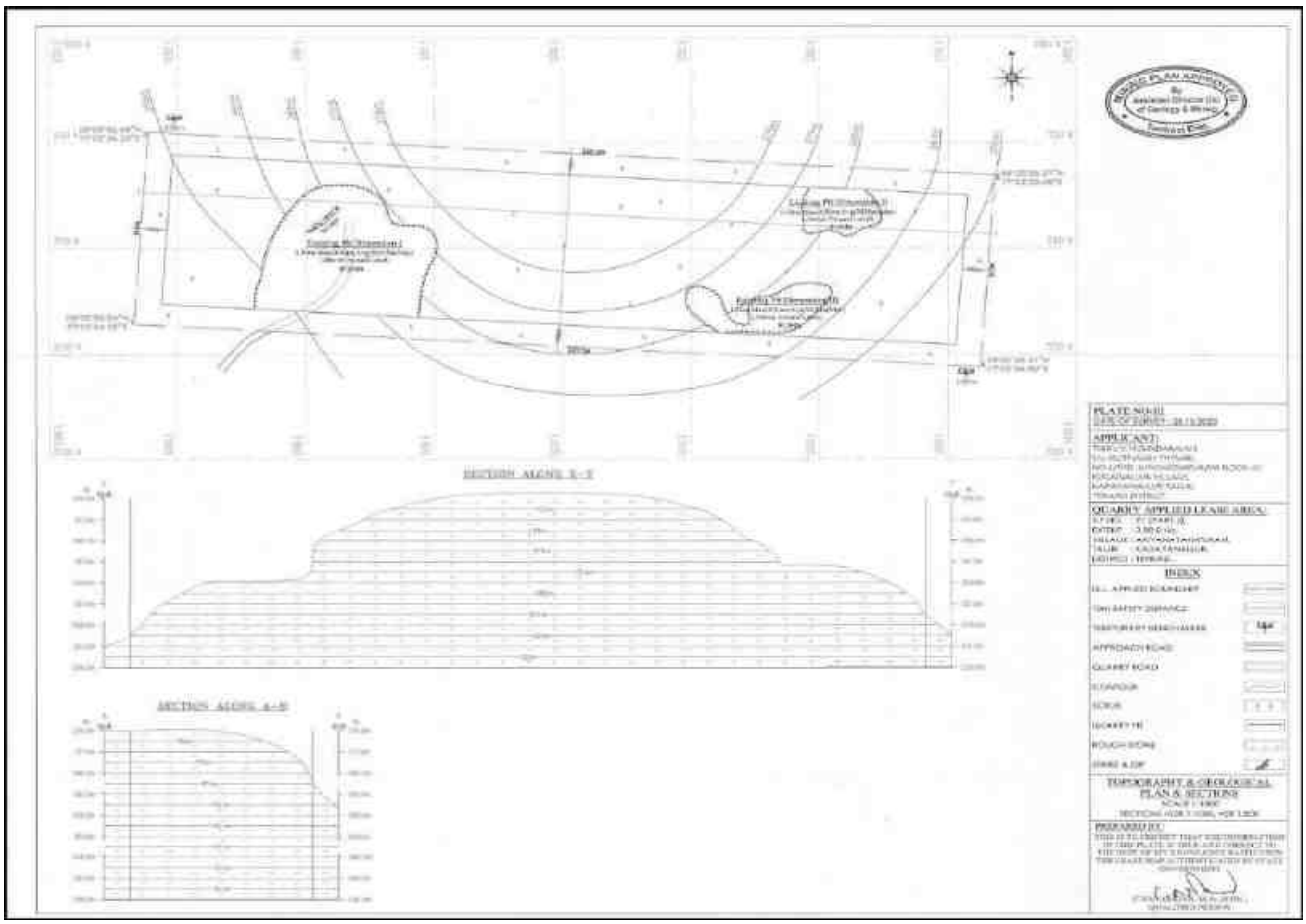


Figure 2-10 Available Geological Reserves

2.7.3 Already Excavated

The area has been quarried in earlier operation the existing pit dimension are given below.

Table 2-7 Existing Pit Dimension

Pit No	length (Max) in(m)	Width (Max) in (m)	Depth (Max) in (m)
I	59	40	15m Above ground level
II	30	20	5m Above ground level
III	52	16	5m Above ground level

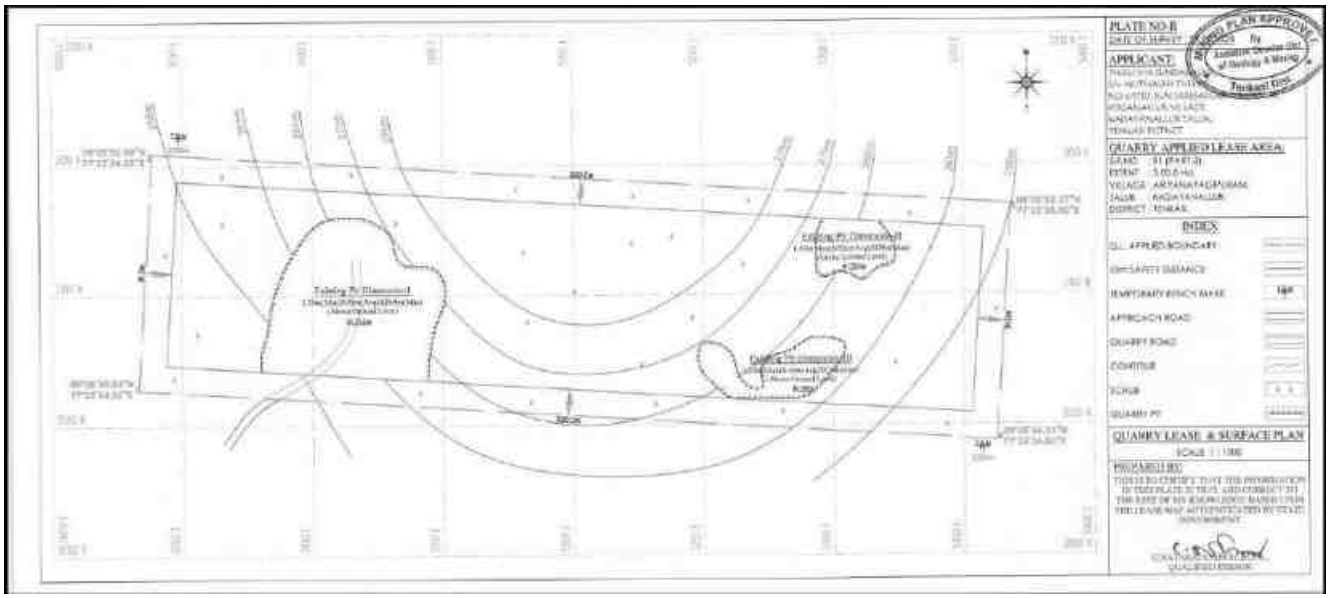


Figure 2-11 Quarry Lease and Surface Plan

2.7.4 Available Mineable Reserve

The available mineable reserve calculated by deducting 10m safety distance and bench loss.

Table 2-8 Available Mineable Reserve

Section	Topography	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume in m^3	Mineable Reserves of Rough stone in m^3
XY-AB	Above ground level	I	121	52	5	31460	31460
		II	155	62	5	48050	48050
		III	179	61	5	54595	54595
		IV	214	56	5	59920	59920
		V	282	46	5	64860	64860
		VI	301	36	5	54180	54180
		VII	310	26	5	40300	40300
		VIII	305	16	5	24400	24400
Total							**377765**

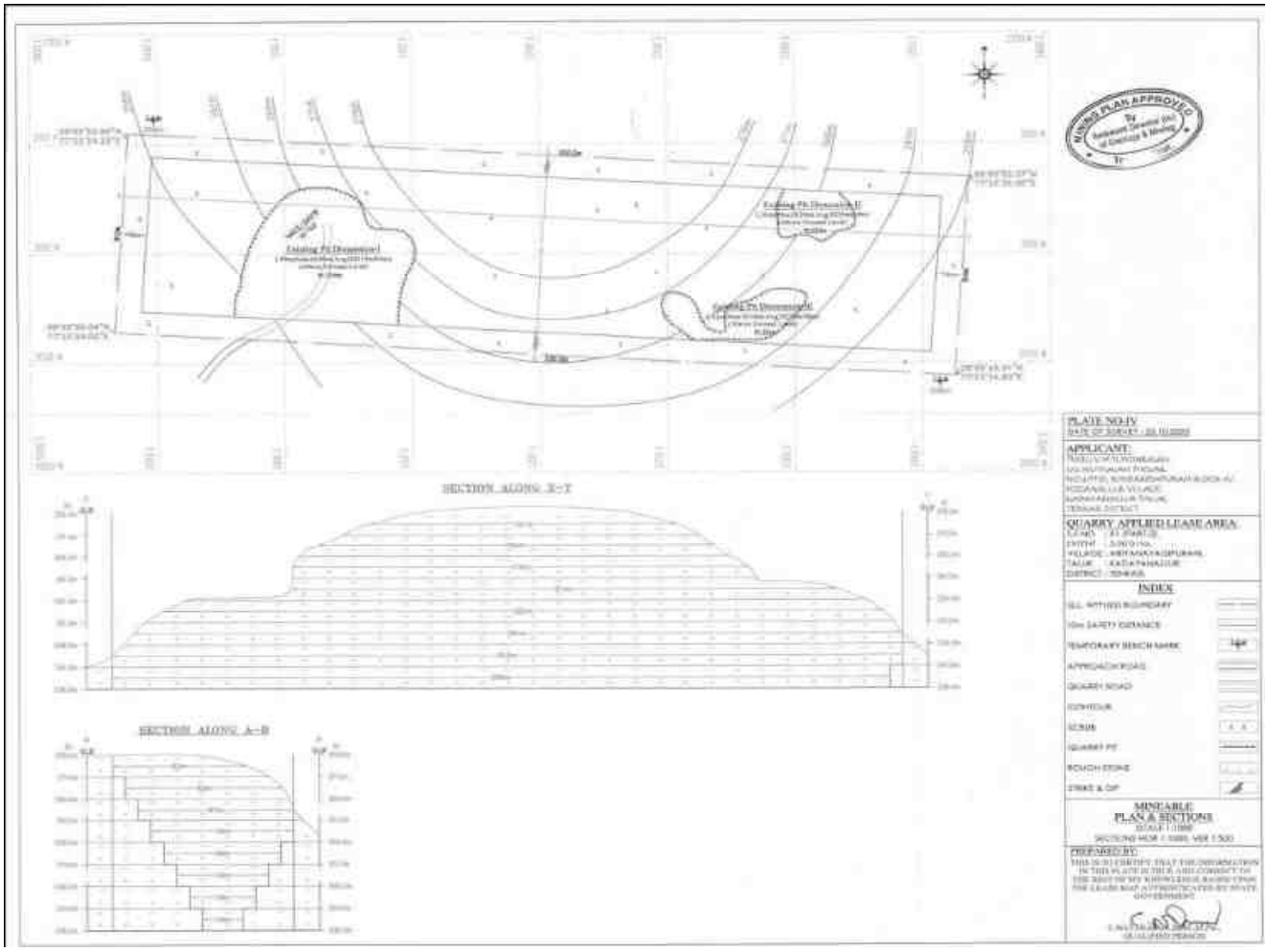


Figure 2-12 Mineable Reserves

2.7.5 Year-wise Production Plan

The production of minerals for the next five years as per the mining plan is given Table

Table 2-9 Year-wise Production Details

Year	Section	Topography	Bench	length in (m)	Width in (m)	Depth in (m)	Volume in m^3	Mineable Reserves of rough stone in m^3
I	XY-AB	Above ground level	I	121	52	5	31460	31460
			II	142	62	5	44020	44020
Total								**75480**
II	XY-AB	Above ground level	II	13	62	5	4030	4030
			III	179	61	5	54595	54595
			IV	61	56	5	17080	17080

Total								**75705**
III	XY-AB	Above ground level	IV	153	56	5	42840	42840
			V	142	46	5	32660	32660
Total								**75500**
IV	XY-AB	Above ground level	V	140	46	5	32200	32200
			VI	241	36	5	43380	43380
Total								**75580**
V	XY-AB	Above ground level	VI	60	36	5	10800	10800
			VII	310	26	5	40300	40300
			VIII	305	16	5	24400	24400
Total								**75500**
Grand Total								**377765**

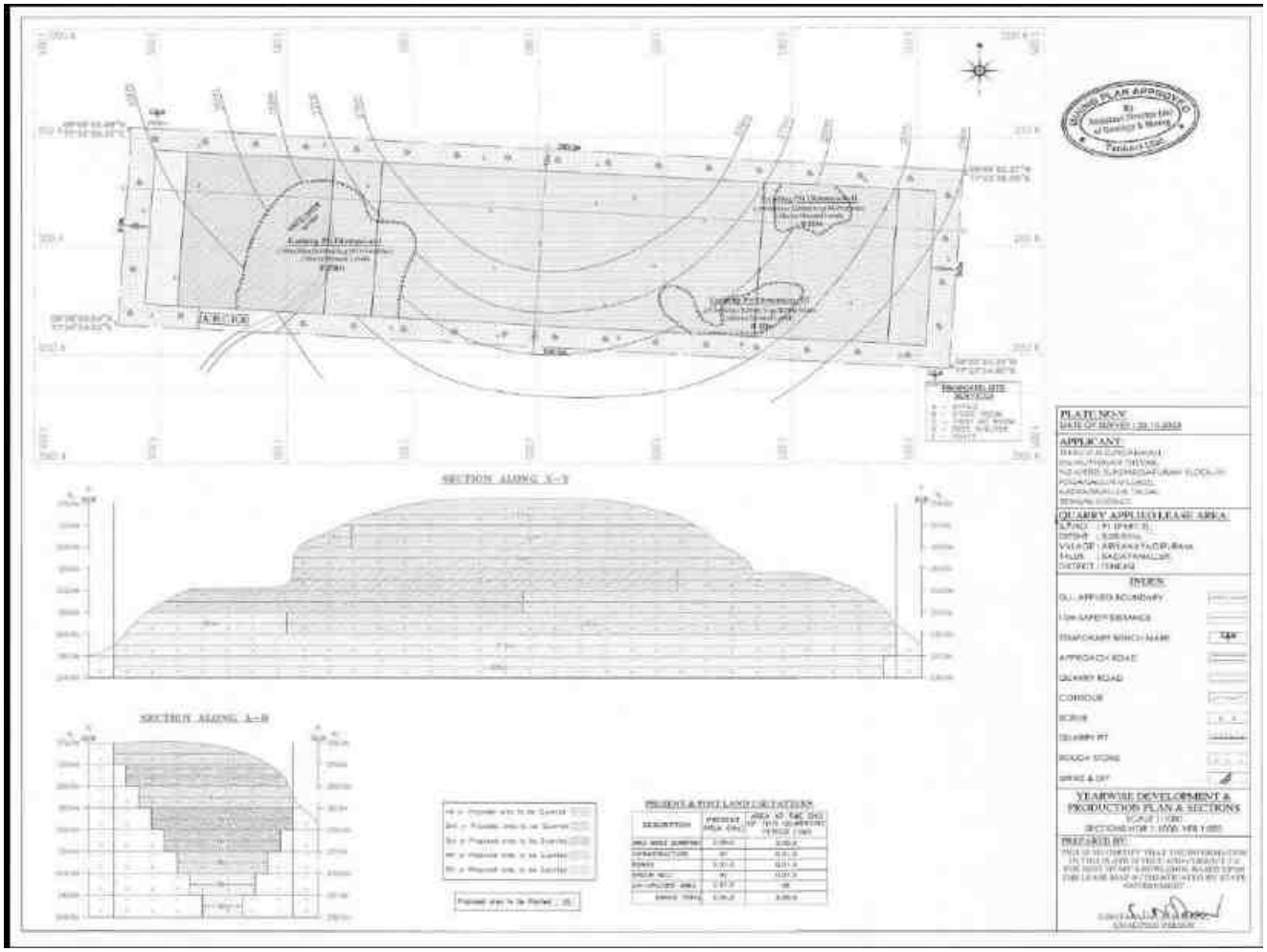


Figure 2-13 Year-Wise Production Plan

2.7.6 Conceptual Plan

Conceptual Mining Plan is prepared with an object of five years of systematic development of bench lay outs, selection of ultimate pit limit, depth of quarrying, ultimate pit slope, selection of sites for construction of infrastructures etc. Ultimate pit size is designed based on certain practical factors such as the economical depth of mining, safety zones, permissible areas etc. The ultimate pit dimension is given below:

Ultimate Pit dimension (M) end of Mining plan Period			
Pit No	Length (max) in (m)	Width (Avg) in (m)	Depth(max) in(m)
I	310	71	40m Above ground level

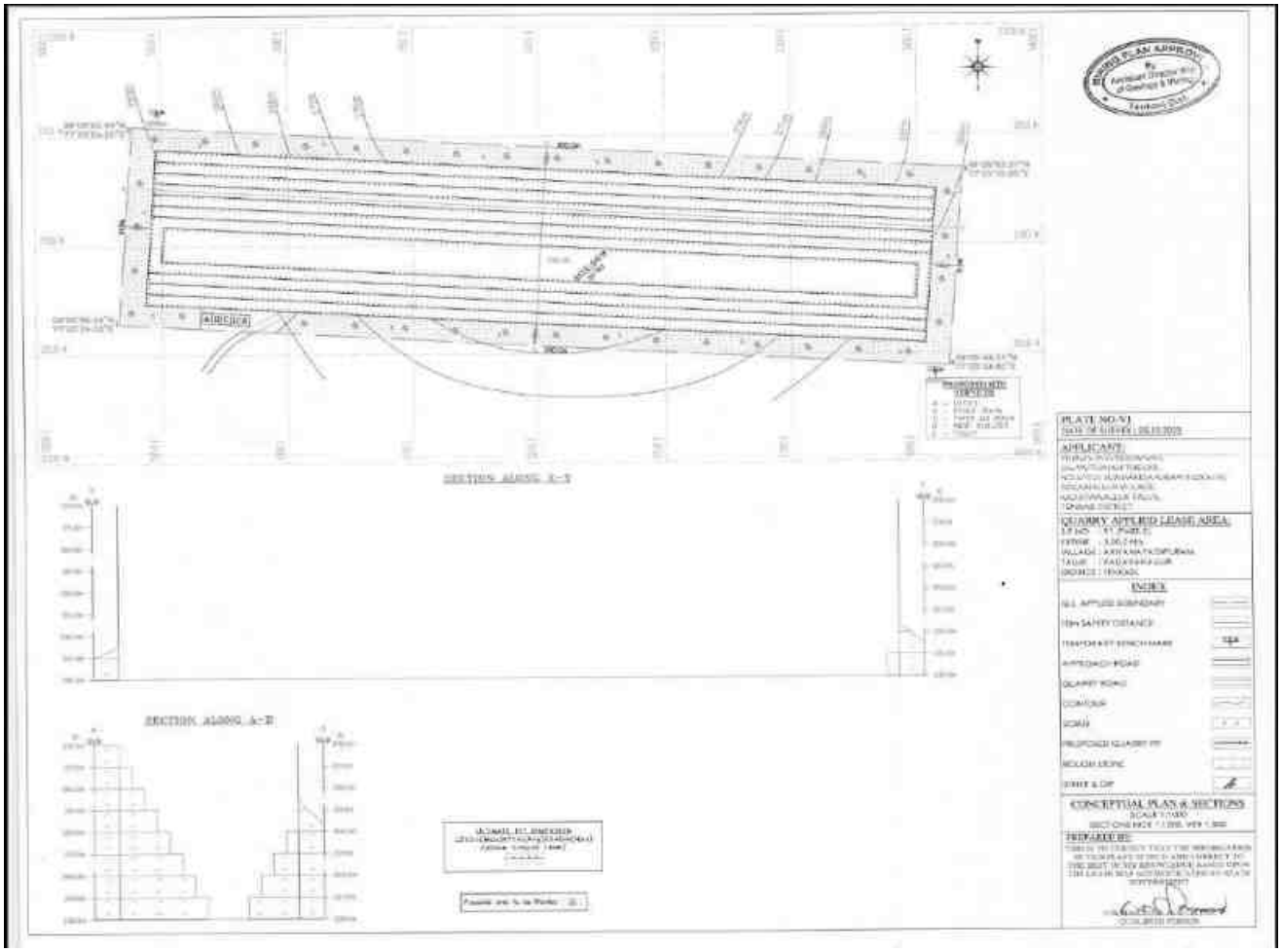


Figure 2-14 Conceptual Plan & Sections

2.8 Type of Mining

The proposed mining project is an opencast method of semi mechanized mining with 5.0m height 5m width of the bench. However, as far as the quarrying of rough stone is concerned, observance of the provisions of Regulation 106(2) (b) as above is seldom [possible due to various inherent petrogenetic factors coupled with mining difficulties. Hence it is proposed to obtain relaxation to the provisions of the above regulation from the Director of mines safety for which necessary provision is available with the regulation 106(2) (b) of MMR-1961, under Mine Act-1952.

2.8.1 Mode of working

The rough stone is proposed to quarry 5m bench height, 5m width with conventional opencast semi-Mechanized method. The quarry operation involves shallow jack hammer drilling, slurry blasting, excavation, Loading and transportation of rough stone to the needy crusher/other buyers. The production of rough stone in this quarry involves the following method which is typical for Rough Stone quarrying in contrast to other major mineral mining.

Splitting of rock mass of considerable volume from the parent rock mass by jackhammer drilling and blasting, hydraulic excavators are used for loading the Rough Stone from pithead to the needy crusher/other buyers.

Occasionally hydraulic excavators are attached with rock breakers for fragmentation to avoid secondary blasting.

The primary boulders thus splitted are removed from the pits by excavators and further made to smaller sizes by rock breakers attached in excavators. It is a conventional opencast semi mechanized method of mining.

2.8.2 Details of Overburden

There is no overburden anticipated during the entire Rough Stone quarrying operation. The excavated rough stone will be directly loaded into tipper to the needy crusher/other buyers.

2.8.3 Details of Machineries to be used in mining

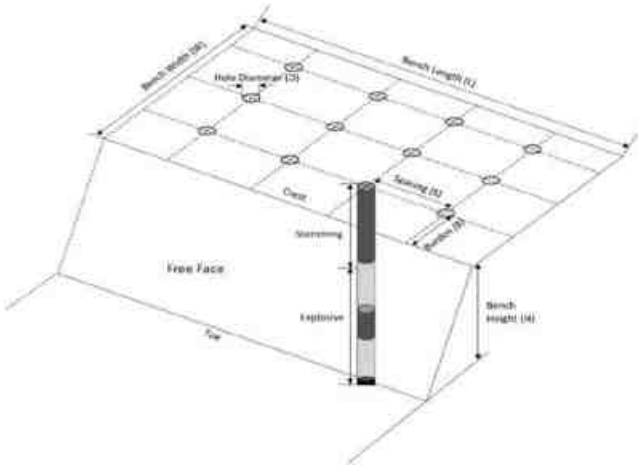
Table 2-10 List of Machineries

Drilling	S.No	Type	Nos	Dia Hole mm	Size Capacity	Make	Motive power
	1	Jack hammer	7	32	1.2m to 6m	Atlas Copco	Compressed air
	2	Compressor	2	-	-	Atlas Capco	Diesel Drive
Loading	Excavator of 0.90m3 bucket capacity (with Rock breaker attachment) (1No).						
Transportation	Tipper 4Nos (5/10Ts) capacity.						

2.8.4 Blasting

The massive formation shall be broken into pieces of portable size by drilling and blasting using jack hammers and shot hole blasting. Powder factor of explosives for breaking such hard rock shall be in the order of 6 to 7 Tonnes per K.g of explosives. Blasting parameters are as follows.

Diameter of the hole	Spacing	Depth	Burden for hole	Pattern of hole	Inclination of hole
32-36mm	0.6m	1 to 1.5m	0.6m	Zig Zag	70^0 from the horizontal



2.8.5 Type of Explosive to be used

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

2.8.6 Measures to minimize und vibration due to blasting

Controlled blasting measures will be adopted for minimizing ground vibration and fly rock. Shallow depths jackhammer drilling and blasting is proposed to be carried out with minimum use of explosive mainly to give shattering effect in rough stone for easy excavation and to control fly rock.

Number of holes	:	218
Powder factor	:	6Ts/Kg of explosives
Total explosive required	:	109Kg slurry explosives
Charge / hole	:	0.5Kg
Blasting time	:	12-2 Pm

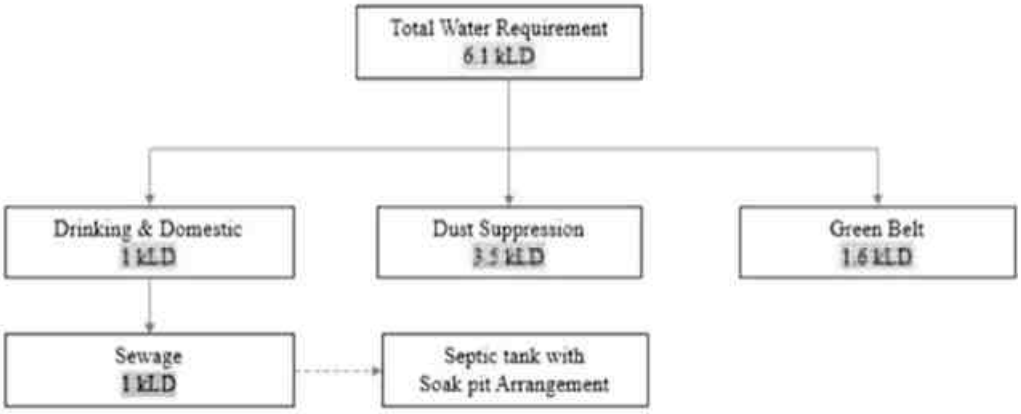
2.8.7 Storage & Safety measures taken during blasting

The applicant will engage an authorized explosive agency to carry out the small amount of blasting and it will be supervised by competent and statutory foreman/ mines manager. The applicant ensure that will appoint the Mate (Should have Valid Blaster Certificate) during Blasting Operation.

2.9 General Features

2.9.1 Water requirement

The total water requirement would be 6.1 kLD, which will be sourced from Local vendors. Out of 6.1 kLD, 1 kLD will be used for Drinking and Domestic purpose, 3.5 kLD will be used for Dust Suppression and remaining 1.6 kLD will be used for Green Belt. The water balance chart is shown below:



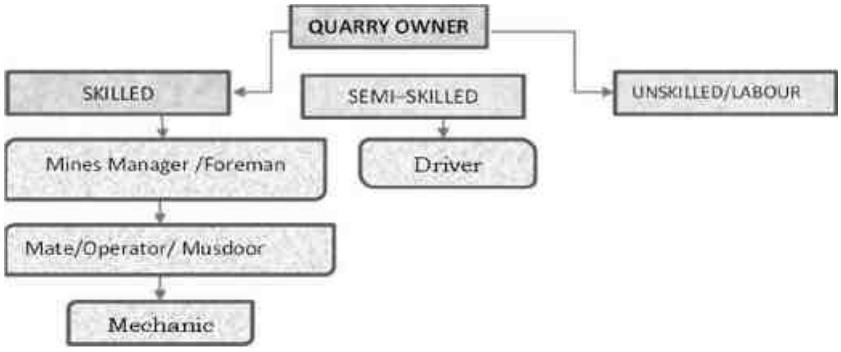
2.9.2 Surface drainage pattern

In an open cast mining project, the nearby streams may experience high siltation. The contours decide the runoff pattern of catchment area. It also indicates erosion potential. These may have significant impacts on water resources. However, in absence of any perennial drainage in the vicinity of mine and flat terrain having not higher than first order drain, the impact on water regime, with appropriate mitigation measures as mentioned, is likely to insignificant.

2.9.3 Manpower Requirement

The details of the manpower requirement are detailed below

1.	Skilled	Mines Manager	1 No.
		Foreman / Mate	2 No.
		Operator	12 No.
		Mechanic	1 No.
2.	Semi–skilled	Driver	4 No.
3.	Unskilled	Labours	10Nos
		Total =	**30Nos**



2.9.4 Green Belt

As per SEAC norms, PP have to plant 1,500 Saplings (500*3.00 Ha==1,500). The safety zone area of 0.97.50 Ha will be maintained as green belt area. This area will be planted with local Species of 1200 Nos. of saplings, remaining 300 saplings will be planted outside the lease such as at project surrounding schools, temples, road sides, etc. In the conceptual stage internal road and office area will be planted with local species.

Table 2-11 Green Belt development Plan

S.No.	Year	Species	No. of trees	Spacing	Survival
1	I	Pongamia pinnata, Syzigium cumini, Albizia lebbeck, Thespesia populnea, Bauhinia racemose, Cassia siamea, Azadirachta indiaca	240	3m x 3m	87%
2	II		240		
3	III		240		
4	IV		240		
5	V		240		
Total			**1200**		

The layout showing green belt plan is shown below

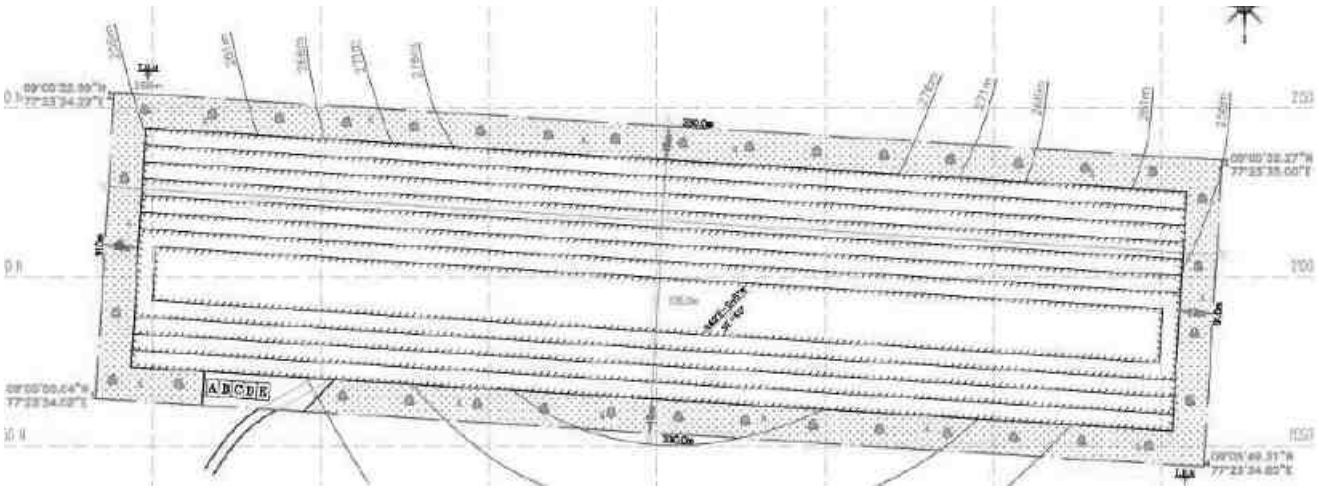


Figure 2-15 Green Belt Layout

Figure 2-16 Fencing & Plantation Photos

2.9.5 Energy Requirement

3,20,208 litres of HSD is required for the entire project life

2.9.6 Vehicular Traffic Density

The proposed quarry is located in Ariyanayagipuram village. The details oif transport route from the crusher plant is shown below:

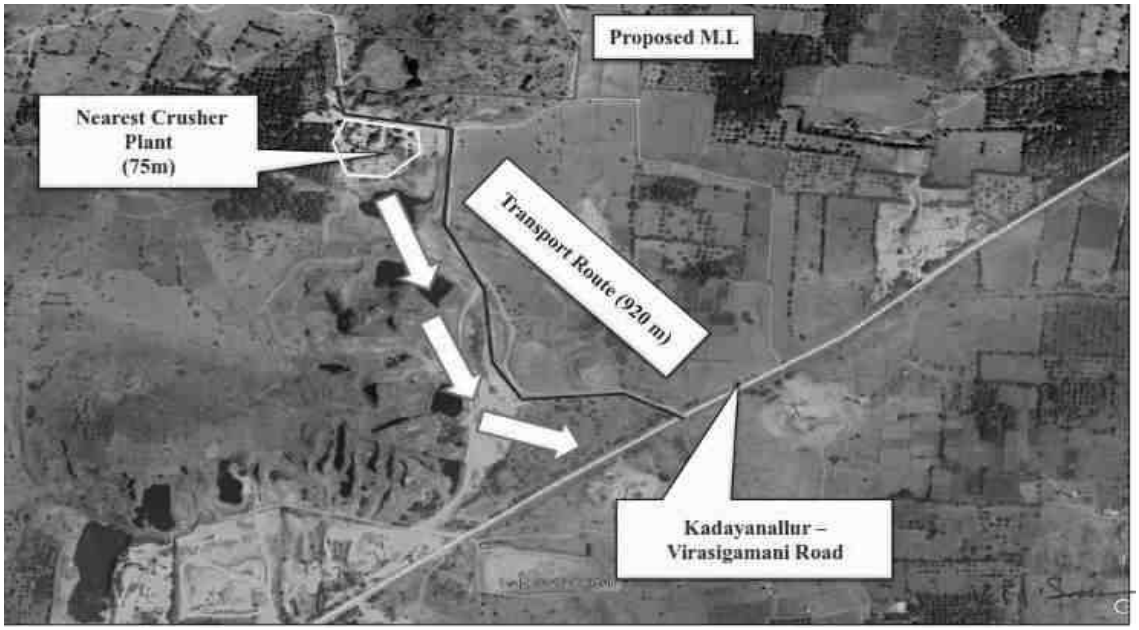


Figure 2-17Transport route from the crusher plant

The vehicular traffic survey will be carried out in the route through which mined out minerals are transported. Within 500 m radius, there are two existing quarries – Thiru. V. M. Sundaraiah and Thiru M. Kalyanasundaram. The No. of trips per day for carrying the mine out mineral for this project is 23 Nos. The No. of trips per day for carrying the mine out mineral for Thiru. V. M. Sundaraiah is 38 Nos. and for Thiru M. Kalyanasundaram is 26 Nos. Traffic Survey is conducted in Main Bazzar road

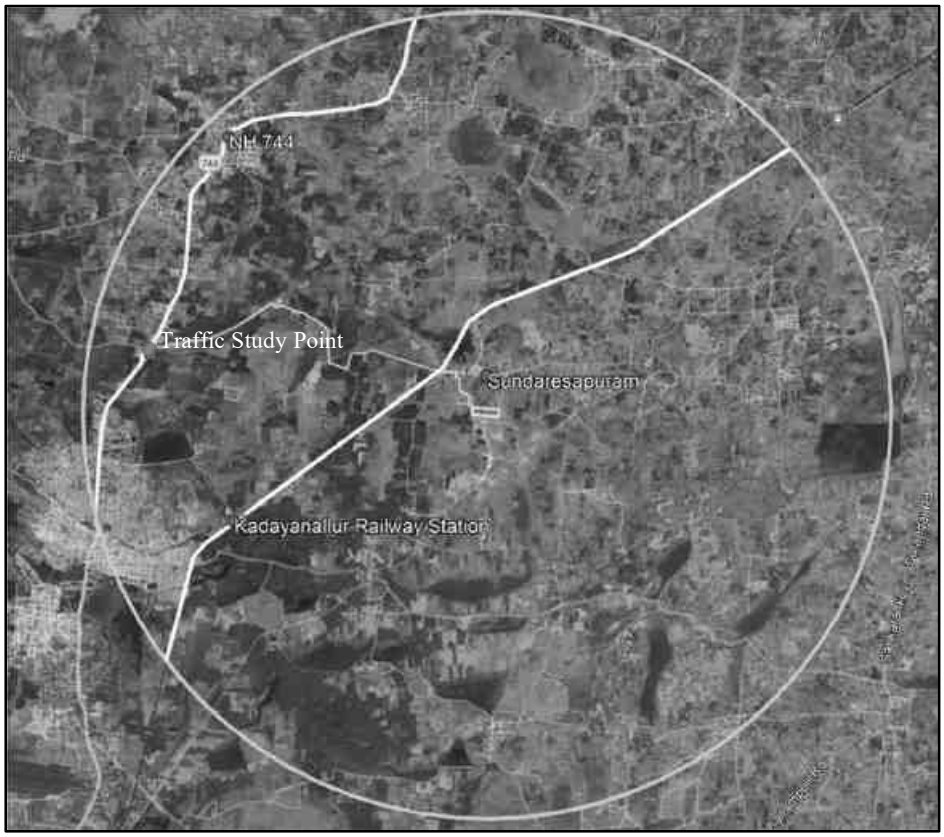


Figure 2-18 Traffic Study Point

Methodology

Vehicle Count

The vehicles passing through the road (in both ways) were counted separately for 24 hours at the one elected location from 0600 hrs to 0600 hrs next day continuously. Category wise vehicle counting has been done continuously and recorded in the traffic volume count on hourly basis under respective categories.

Categorization of Traffic

The engine driven vehicles were categorized into various heads viz. two wheelers, three wheelers, four wheelers and trucks/bus. The level of service is given below. (Source: Recommended Design Service Volumes (PCUs per hour), IRC)

Level of Service	General Operating conditions	Range of V/C
A	Free flow (traffic flows at or above speed limit and motorists have complete mobility between lanes)	<0.30
B	Reasonable flow (slightly more congested, with some maneuverability)	0.3 – 0.47
C	Stable flow (more congested than B, loads close to capacity)	0.48 – 0.68
D	Approaching unstable flow (speeds are somewhat reduced, example: busy corridor during middle of a weekday, or a functional urban highway during rush hour)	0.69 – 0.88
E	Unstable flow (flow becomes irregular, speed varies widely and rarely reaches speed limit)	0.88 - 1.00
F	Forced or breakdown flow (a constant traffic jam)	>1.00

Table 2-12 Summary on Traffic Volume

Route	Existing Traffic Survey in PCU	Incremental Traffic Survey due to project	Total traffic survey volume	Hourly capacity in PCU as per IRC -1960 guidelines
NH 744 (Kollam – Tirumangalam Road)	421	33	454	1500

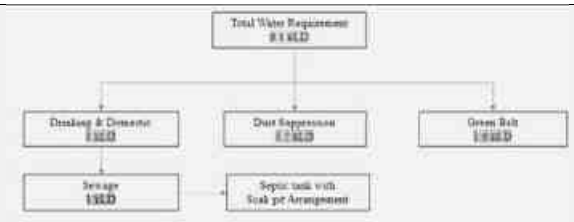
Table 2-13 Modified Level of service

Route	Existing Volume PCU/hr	Existing V/C Ratio	Additional Volume PCU/hr	Modified Volume PCU/hr	Modified V/C ratio	Modified LOS
NH 744 (Kollam – Tirumangalam Road)	421	0.28	33	0.02	0.3	A*

2.9.7 Project Requirements

Table 2-14 Project Requirements

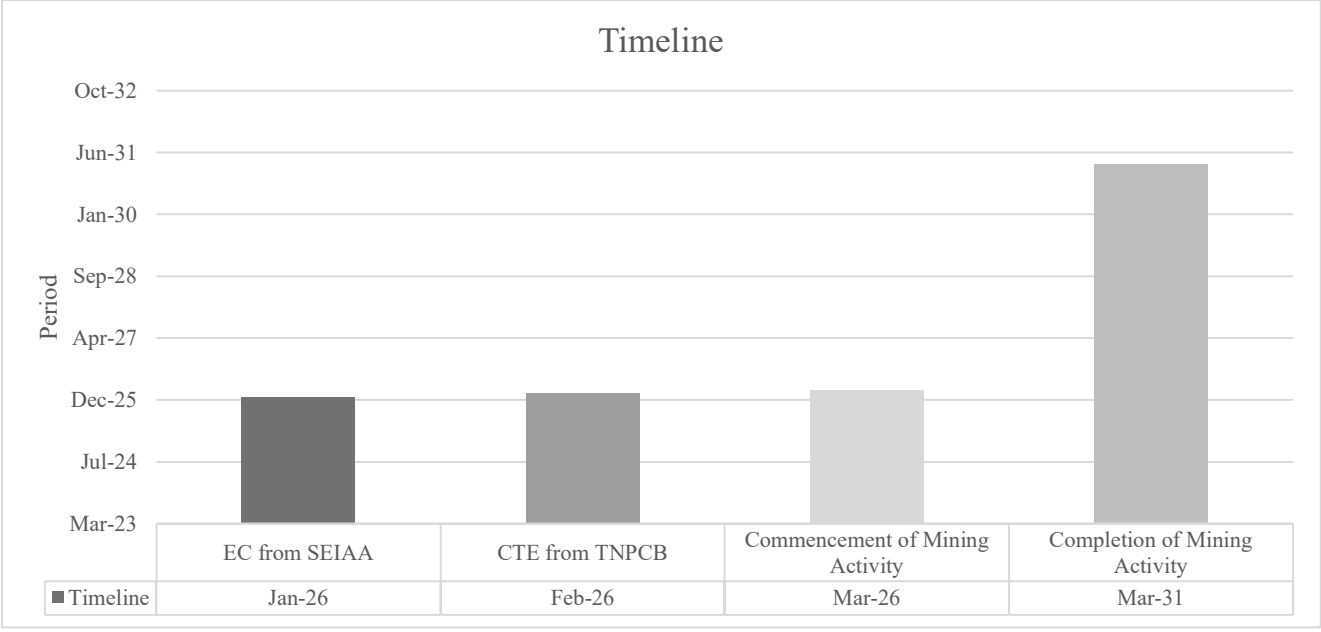
S. No.	Nature of requirement	Description
1.	Water requirement	The total water requirement would be 6.1 kLD, which will be sourced from Local vendors. Out of 6.1 kLD, 1 kLD will be used for Drinking and Domestic purpose, 3.5 kLD will be used for Dust Suppression and remaining 1.6 kLD will be used for Green Belt. The water balance chart is shown below:

		
2.	Power requirement	No electricity is needed for mining operations, for office demands, it will be met from the state grid.
3.	Manpower requirement	30 Nos.
4.	Project Cost	Rs. 442.29 lakhs
5.	CER Cost	Rs. 8,00, 000/-

2.10 Timeline for implementation of Project activities

Mining work will be started upon the grant of Environmental Clearance (E.C) from SEIAA and Consent to Establish (CTE) from TNPC Board. The mining activity will be completed in 5 years on receipt of all the statutory approvals.

Graph 2-1 Schedule for implementation of the proposed project



3 DESCRIPTION OF ENVIRONMENT

3.1 General

This chapter depicts the establishment of baseline for valued environmental components, as identified in and around the proposed project site with an area of 10 km radius. Primary baseline data monitoring covered one season (three (3) months) i.e., Oct'24 – Dec'24 (Post – Monsoon) and secondary information was taken from government and semi-government organization's published data.

Primary baseline data are collected through field study and it covers

- ♣ Physical - the area, the soil properties, the geological characteristics, the topography, etc
- ♣ Chemical - water, air, noise and soil pollution levels, etc.
- ♣ Biological - the biodiversity of the area, types of flora and fauna, species richness, species distribution, types of ecosystems, presence or absence of endangered species and/or sensitive ecosystems etc.
- ♣ Socioeconomic - demography, social structure, economic conditions, developmental capabilities, displacement of locals, etc.

Baseline study is carried out with an objective to assess the prevailing environmental quality and to compare the same after the establishment of the proposed project.

3.2 Study area extent

The study area for the proposed project is as follows:

- ♣ Mine Lease area as the "core zone"
- ♣ A study area of 10 km adius from the project boundary is designated as buffer Zone.

We have obtained Terms of Reference from SEIAA vide ToR Identification No. TO24B0108TN5815892N.

3.3 Monitoring Lab

The primary data for the proposed project was collected by M/s. Shrient Analytical and Research Labs Pvt Ltd, # 416/15, Dharga Road, Perungalathur, West Tambaram, Chennai – 600 045. (Accreditated by NABL as ISO/IEC/17025:2017)

3.4 Baseline Data Collection period

The baseline data is collected in accordance with the CPCB Guidelines. Primary baseline data monitoring covered one season (three (3) months) i.e., Oct'24 – Dec'24 (Post – Monsoon)

3.4.1 Frequency of Monitoring

Table 3-1 Frequency of Sampling and Analysis

S. No.	Attribute	Details of Baseline data	Frequency
1.	Air Environment		
i	Ambient air quality	Type of data: Primary data Sampling Locations: Project site and 6 surrounding locations within 10 km radius of the project site Period: Oct 24 – Dec 24	24 hourly twice a week 4 hourly. Twice a week, One non-monsoon season 8 hourly, twice a week

			24 hourly, twice a week
ii	Noise Level	Type of data: Primary data Sampling Locations: Project site and 6 surrounding locations within 10 km radius of the project site Period: One-time sampling	24 hourly Once in 5 locations
iii	Meteorological Data	Type of data: Project Site Note: Secondary for choosing the baseline monitoring locations Source: Indian Meteorological Department (IMD), Chennai 2020	1 hourly continuous
2	Water Environment		
i	Ground water	Type of data: Primary data Sampling Locations: Project site and 6 surrounding locations Within 5 km radius of the project site Period: Once during the study period	One time sampling
ii	Surface water	Type of data: Primary data Project site – Nil Within 10 km – 2 Nos. .	One time sampling
3	Land Environment		
vi	Land use & land cover	Type of data: Secondary Source: GIS Study for Land use/ Landcover details of 10 km radius	
vii	Soil analysis	Type of data: Primary data Sampling Locations: Project site and 6 surrounding locations within 5 km radius of the project site Period: Once during the study period	One time sampling
4	Socio – Economic Environment	1. Primary data: Project site (10 km around the project site) 2. Secondary data: Source: 'Census of India' 2011	One time sampling
5	Biological Environment	1. Primary data: Project site and selected locations in the 5 Km radius from the project site (Period: Nov 2024) 2. Secondary data: From 5 Km up to 10 km radius from the project site	

3.5 Study area details

Table 3-2 Study Area Details

S. No.	Description	Details	Source
1.	Project Location	S.F.No.91 (Part-2) over an extent of 3.00.0 Ha in Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu	Field Study
2.	Latitude & Longitude	S. No. / Latitude / Longitude 1. 09°05'50.04" N 77°23'24.04" E 2. 09°05'52.99" N 77°23'24.22" E 3. 09°05'52.27" N 77°23'35.00" E 4. 09°05'49.31" N 77°23'34.80" E	Land Documents
3.	Topo Sheet No.	58 G/08	Survey of India Toposheet
4.	Mine Lease Area	3.00.0 Ha	Land Documents
5.	Total population	14,40,795	Census Survey of India
6.	Maximum Temperature	36.4°C	IMD
7.	Minimum Temperature	23.8°C	
8.	Ecological Sensitive Areas - Wetlands, watercourses or other waterbodies, coastal zone, biospheres, mountains, forests	Nellai Wildlife Sanctuary is located at 5.8 km. MoEF final notification has published and not applicable for NBWL.	Survey of India Toposheet
9.	Densely Populated Area	Perunkottur	
10.	Areas occupied by sensitive manmade land uses (hospitals, schools, places of worship, community facilities)	Ooratchi Sevai Maiyam, Government Hospital - Sundaresapuram, Aulmigu Kaliamman Karuppasamy Thirukovil, Star industries, Kannithai temple, Sri maha mariamman, Sri Athadi Karuppasamy temple are the structures located within 1 km radius of the project site.	Field Study

3.5.1 Enumeration of the structures located within 500 m radius from the proposed quarry site

A site survey has been conducted to identify and list structures located within a 300 m radius from the proposed Quarry and are detailed below. There are no permanent structures or temples within a 300-meter radius from the project site. The PP has obtained a letter from Village Administrative Office (VAO), Tenkasi stating that there are no structures situated within 300 m radius.

Figure 3-1 Google map showing Environmental Features located within 500 m radius from the proposed quarry site

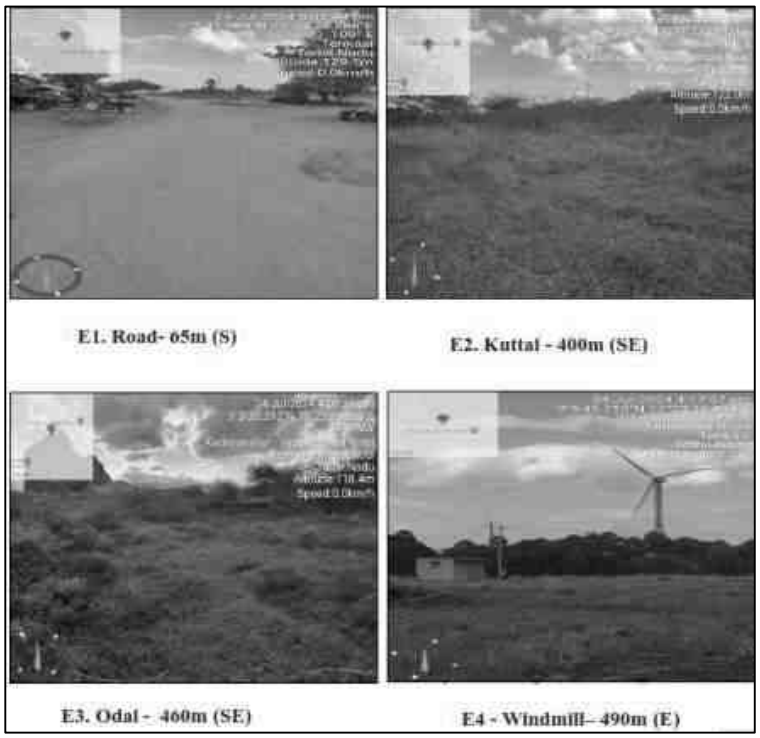
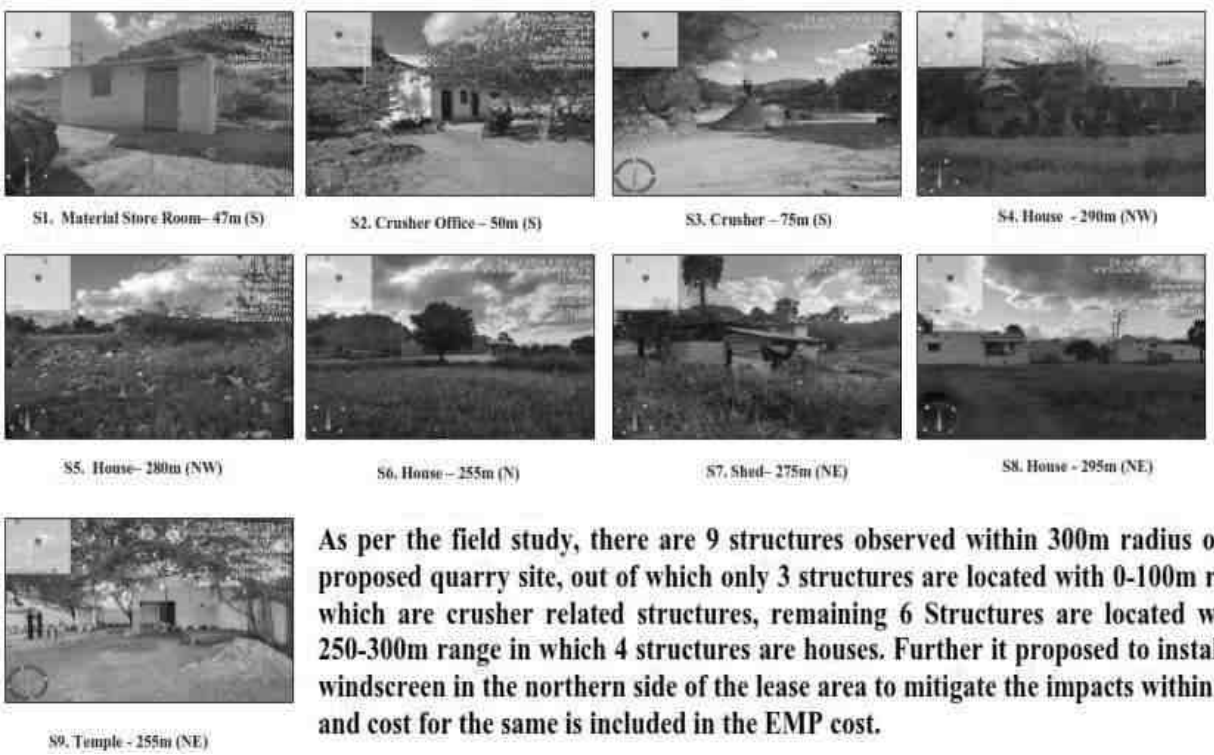


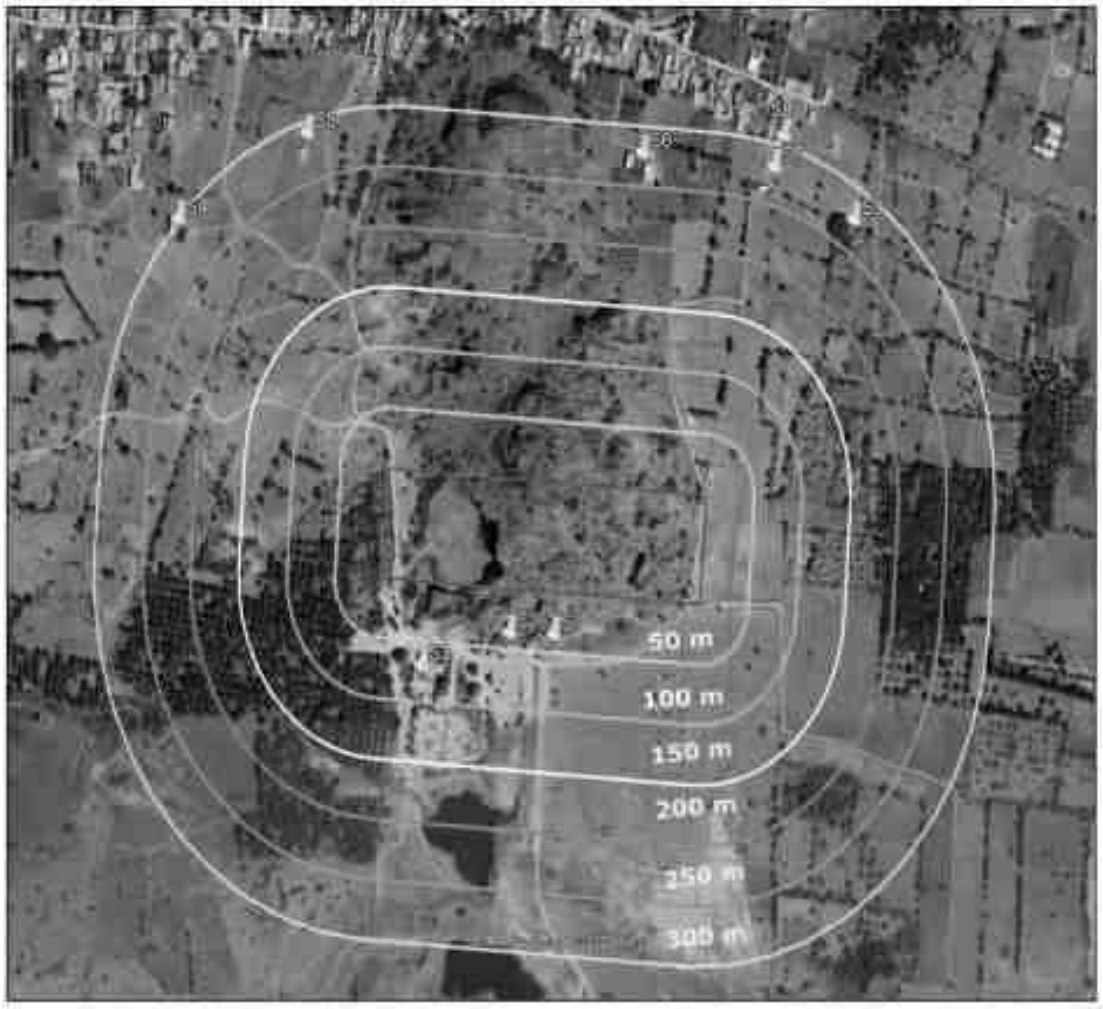
Figure 3-2 Photos of Environmental Features located within 500 m radius from the proposed quarry site

The details of the structures located within 500m radius is listed below



As per the field study, there are 9 structures observed within 300m radius of the proposed quarry site, out of which only 3 structures are located with 0-100m range which are crusher related structures, remaining 6 Structures are located within 250-300m range in which 4 structures are houses. Further it proposed to install the windscreen in the northern side of the lease area to mitigate the impacts within M.L and cost for the same is included in the EMP cost.

Figure 3-3 Photos of Structures located within 500 m radius from the proposed quarry site



S. No	Name of the Structure	Distance and direction	Ownership	Occupants	Type	Age
S1	Material Store Room	47m S	Not belongs to PP	Nil	Masonry building with G.I Sheathed Shed	Less than 5 Years
S2	Crusher Office	50m S		-	Concrete	
S3	Crusher	75m (S)		-	-	More than 5 Years
S4	House	290m (NW)		5	Concrete	
S5	House	280m NW		4	Concrete	More than 5 Years
S6	House	255m N		5	Concrete	Less than 5 Years
S7	Shed	275m NE		Nil	G.I Sheathed Shed	
S8	House	295m NE		4	Concrete	More than 5 Years
S9	Temple	255m NE		Nil	-	

Figure 3-4 Google map showing Structures located within 500 m radius from the proposed quarry site

Sl. No	Radius	School	Temple	Inhabited village	Ref. Code
1	0-100	Nil	Nil	Nil	Nil
2	100-200	Nil	Nil	Nil	Nil
3	200-300	Nil	1	Nil	I 1
4	300-400	Nil	Nil	1	I 2
5	400-500	Nil	1	Nil	I 3

I 1. Temple - 255m (NE)

I 2. Sundaresapuram Village –310m (N)

I 3. Sri maha mariamman, Sri Athadi Karuppasamy temple –455m (NE)

Figure 3-5 Google map & Photos showing Schools, Temples and inhabited village within 500m radius from the project site

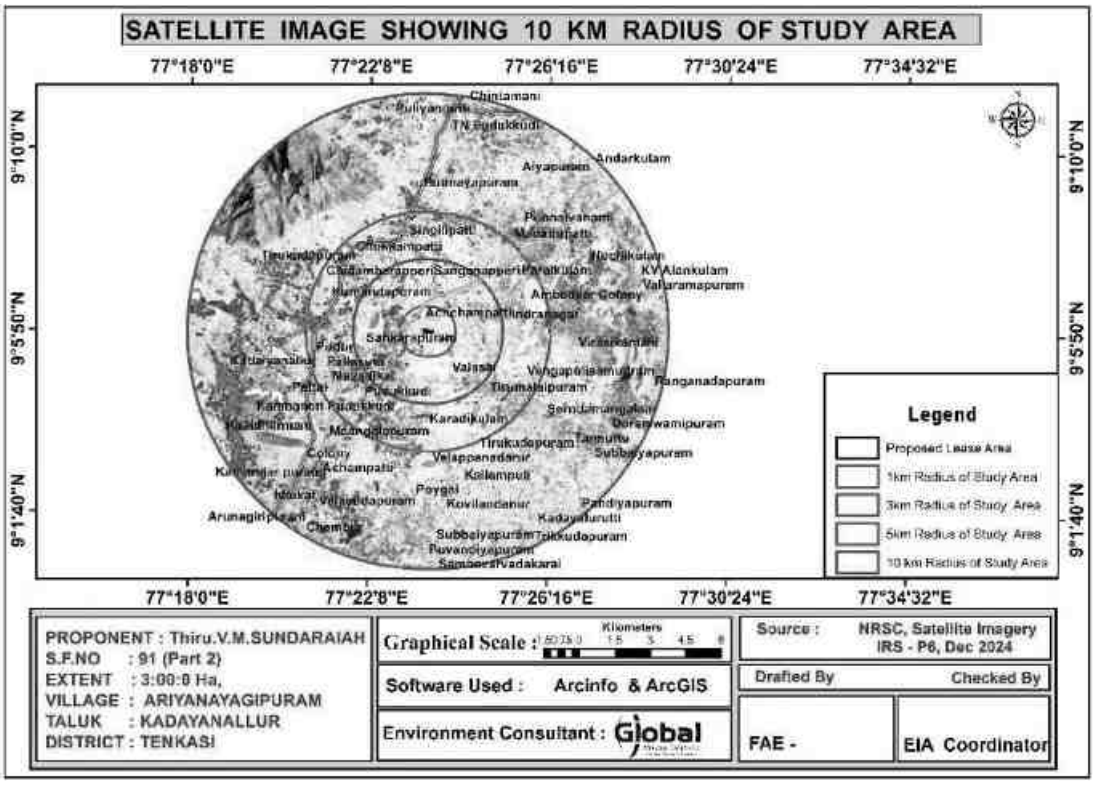


Figure 3-6 Satellite Image – 10km radius around the project site

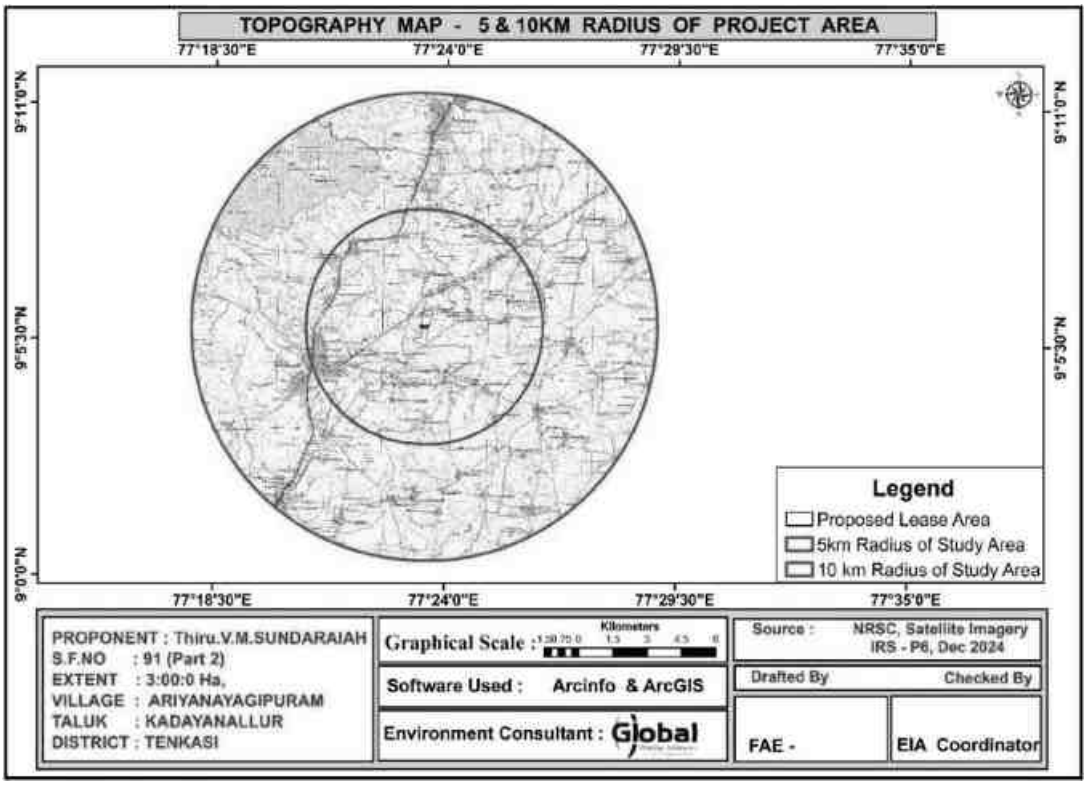


Figure 3-7 TOPO Map – 10km radius from the project site

3.6 Physical Conditions

The physical conditions of the study area are discussed:

- ♣ District Profile
- ♣ Land use, Drainage, Geology & Physiography
- ♣ Natural resources
- ♣ Seismic Zone Characteristics

3.6.1 District Profile

Tenkasi district was formed on 12.11.2019 vide. G.O.(MS) No.427, dated 12.11.2019 of Revenue and Disaster Management Department, Revenue Administration wing [RAI (1)] section, after bifurcating from Tirunelveli District. The Geographical area of the district is 2882.44 sq.kms which lies in the southwest part of Tamil Nadu. It lies in between 8º.57' and 8º.95' of the Northern latitude and 77º.18' and 77º.31' of Eastern longitude. The district has two revenue divisions viz., Tenkasi and Sankarankovil and 8 Taluks, 30 firkas, 246 revenue villages, 10 Development blocks, 6 Municipalities, 17 Town Panchayats and 221 Village Panchayats. The Population of the district was 14,40,795 as per 2011 census. The density of population per sq.km was 500 persons in the 2011 census. The sex ratiois1017females for every 1000 males. The literacy rate is 69% in the district as per2011census.Out of total population, males were 7,14,215 and females were 7,26,580 as per2011 census. The schedule caste population is 2,92,900 which represent 20% to the total population as per 2011 census. Schedule tribes are found to be very small in numbers of 3656 which is 0.3% to the total population.

Source: Directorate of Census Operations Tamil Nadu, "District Census Handbook 2011, Tenkasi District"

3.6.2 Land Use Analysis

Land Use classification:

Land Use / Land Cover - Land Use refers to man's activity and the various uses, which are carried on land. Land Cover refers to natural vegetation, water bodies, rock/soil, artificial cover and others, resulting due to land transformation. The present Land Use/Land Classification map is developed with following objectives. The main objective of the study is to classify the different land use within 10 km from the project boundary. The Land use map of Kadayanallur is enclosed as Annexure - 11

Methodology:

Information of land use and land cover is important for many planning and management activities concerning the surface of the earth (Agarwal and Garg, 2000). Land use refers to man's activities on land, which are directly related to land (Anderson et al., 1976). The land use and the land cover determine the infiltration capacity. Barren surfaces are poor retainers of water as compared to grasslands and forests, which not only hold water for longer periods on the surface, but at the same time allow it to percolate down.

The terms 'land use' and 'land cover' (LULC) are often used to describe maps that provide information about the types of features found on the earth's surface (land cover) and the human activity that is associated with them (land use).

Satellite remote sensing is being used for determining different types of land use classes as it provides a means of assessing a large area with limited time and resources. However, satellite images do not record land cover details directly and they are measured based on the solar energy reflected from each area on the land. The amount of multi spectral energy in multi wavelengths depends on the type of material at the earth's surface and the objective is to associate particular land cover with each of these reflected energies, which is achieved using either visual or digital interpretation. In the present study the task is to study in detail the land use and land cover in and around the project site. The study envisages different LULC around the proposed project area and the procedure adopted is as below

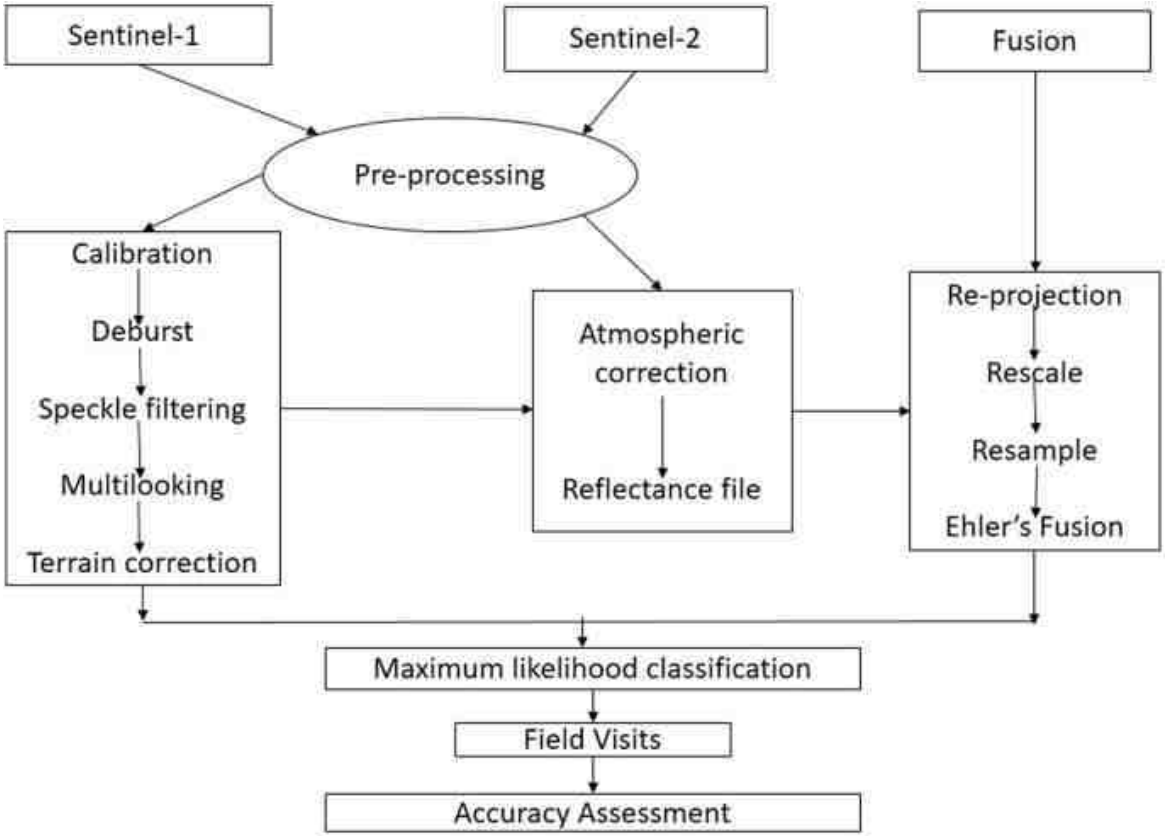


Figure 3-8 Flow-chart showing methodology of Land Use Mapping

Satellite Data:

Sentinal multispectral satellite data of 11th April 2022 was utilized for the present study. Details of satellite data is given below. The rectification of imagery was carried out on to bring the digital data on the earth coordinate system by means of ground control point (GCP) assignments/SOI topo sheets.

Scale of mapping:

Considering the user defined scale of mapping, 1:50000 Sential data on 1:50000 Scale was used for Land use / Land cover mapping of 10 km radius for proposed site. The description of the land use categories for 10 km radius and the statistics are given for 10 km radius.

Interpretation Technique:

Standard on screen visual interpretation procedure was followed. The various Land use / Land cover classes interpreted along with the SOI topographical maps during the initial rapid reconnaissance of the study area. The physiognomic expressions conceived by image elements of color, tone, texture, size, shape, pattern, shadow, location and associated features are used to interpret the FCC imagery. Image interpretation keys were developed for each of the LU/LC classes in terms of image elements.

February 2016 FCC imagery (Digital data) of the study area was interpreted for the relevant land use classes. On screen visual interpretation coupled with supervised image classification techniques are used to prepare the land use classification.

1. Digitization of the study area (10 km radius from the proposed site) from the topo maps
2. In the present study the IRS –P6 satellite image and SOI topo sheets of 47-F/01,02,03have been procured and interpreted using the ERDAS imaging and ARC-GIS software adopting the necessary interpretation techniques.
3. Satellite data interpretation and vectorisation of the resulting units
4. Adopting the available guidelines from manual of LULC mapping using Satellite imagery (NRSA, 1989)
5. Field checking and ground truth validation
6. Composition of final LULC map

The LULC Classification has been done at three levels where level -1 being the broad classification about the land covers that is Built-up land, agriculture land, waste land, wet lands, and water bodies. These are followed by level –II where built-up land is divided into towns/cities as well villages. The agriculture land is divided into different classes such as cropland, Fallow, Plantation, while wastelands are broadly divided into, Land with scrub and without Scrub and Mining and Industrial wasteland. The wetlands are classified into inland wetlands, coastal wetlands and islands. The water bodies are classified further into River/stream, Canal, Tanks and bay. In the present study level II classification has been undertaken.

Ground verification:

Field verification involved collection, verification and record of the different surface features that create specific spectral signatures / image expressions on FCC. In the study area, doubtful areas identified in course of interpretation of imagery is systematically listed and transferred on to the corresponding SOI topographical maps for ground verification. In addition to these, traverse routes were planned with reference to SOI topographical maps to verify interpreted LU/LC classes in such a manner that all the different classes are covered by at least 5 sampling areas, evenly distributed in the area. Ground truth details involving LU/LC classes and other ancillary information about crop growth stage, exposed soils, landform, nature and type of land degradation are recorded and the different land use classes are taken the Land use map.

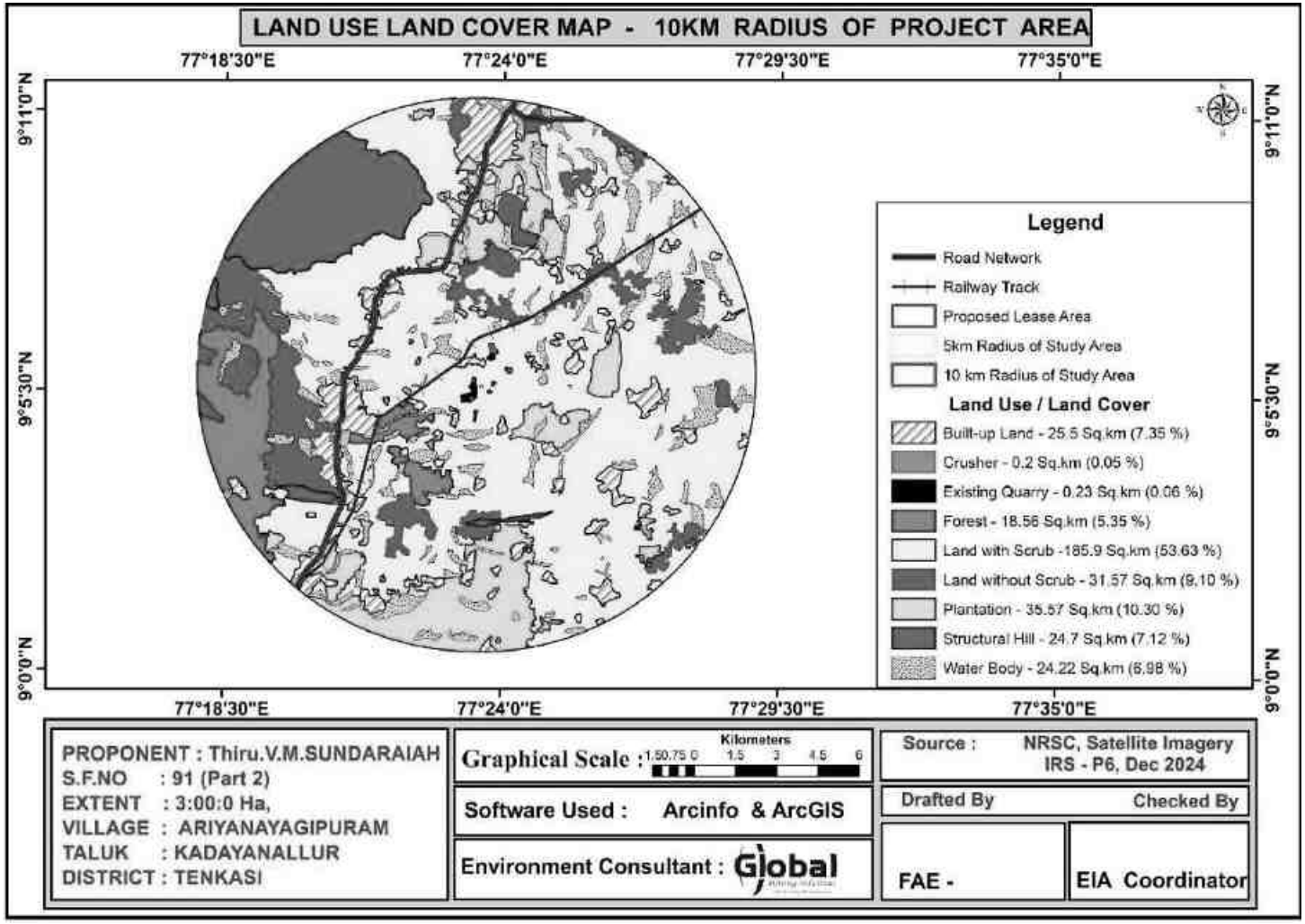


Figure 3-9 land Use Map – 10 km radius around the project site

Different Land use classes around 10 km radius from the project site are shown below

Table 3-3 land Use classification – 10km around the project site

Classification	Area in Sq.km	Percentage
Built – up Land	25.5	7.35
Crusher	0.2	0.05
Existing Quarry	0.23	0.06
Forest	18.56	3.5
Land with Scrub	185.9	53.63
Land without Scrub	31.57	9.10
Plantation	35.57	10.30
Structural hill	24.7	7.12
Water body	24.22	6.98

The land use pattern of the project site is shown below:

Table 3-4 Land use pattern of the project area

Sl. No.	Land Use	Present Area (Ha)	Area in use during the quarrying period (Ha)
1.	Quarrying Pit	0.38.0	2.00.5
2.	Infrastructure	Nil	0.01.0
3.	Roads	0.01.0	0.01.0
4.	Green Belt	Nil	0.97.5
5.	Unutilized	2.61.0	Nil
	Total =	**3.00.0**	**3.00.0**

3.6.3 Contour and Drainage:

The project site is 265m AMSL. The drainage pattern within 5km radius is dendritic.

The Chittar has 5 tributaries, 3 sub tributaries and numerous small streams contributing the flow. The Chittar and its tributaries have their origin in Courtallam hills in Tenkasi and Shencottai Taluks (also spelt as Taluk) of Tenkasi District. The Chittar runs for about 80 kms before it confluences with Tambarabarani. The Chittar's first tributary is Ayindaruviar (River of Five Falls), which has an anaicut and irrigates about 293.40 hectares of land. Hariharanadhi confluences with Chittar has two sub tributaries called, the Gundar and Mottaiar. The Mottaiar has a reservoir and a pick up anaicut feeding 141.64 hectares. The Gundar, which is also called "Karungalar" has 7 anaicuts and a reservoir. They irrigate 465.39 hectares of land altogether. Mottaiar joins Gundar and Gundar joins Hariharanadhi. The Hariharanadhi itself has 7 anaicuts and irrigates 445.10 hectares of land. Aludakanniar, another tributary to Chittar has 8 anaicuts irrigating

827.47 hectares of land. Hanumanadhi is the next tributary to Chittar. It has a sub tributary called Karuppanadhi. There is a reservoir of 185 m.cft, capacity across Karuppanadhi besides 6 anaicuts. These irrigate 3,844.59 hectares, the Hanumanadhi has 14 anaicuts and irrigates 4,046.94 hectares and the last tributary to Chittar is Uppodai. Uppodai irrigates 445.16 hectares through two anaicuts. The Chittar River itself has 17 anaicuts irrigating 8,903.27 hectares of land.

The karuppanadhi is flowing in the study area of the project. There is one tank and seasonal odai running within 1 km radius of the project site.

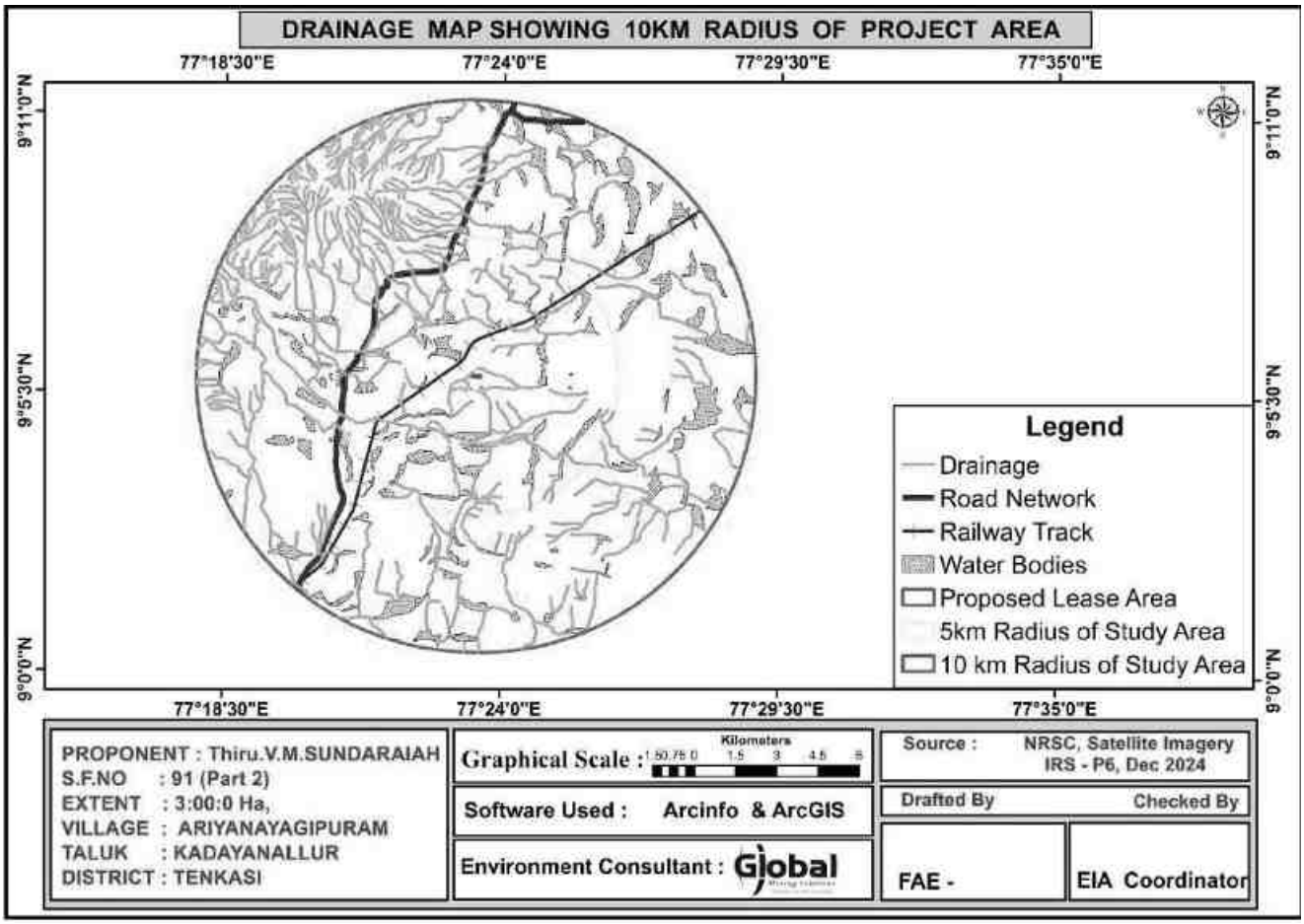


Figure 3-10 Drainage Map

3.6.4 Geomorphology

The prominent geomorphic units identified in the district through interpretation of Satellite imagery are 1) Bazada 2) Pediment 3) Pediplain Weathered buried 4) Residual Hill 5) Shallow Burried Pediment and 6) Structural Hills. The major part of the area is covered by weathered pediplain and it is formed by coalescence of pediments. A major part of the district constitutes a plain terrain with a gentle slope toward East and Southeast, except for the hilly terrain in the west. The general elevation of the area varies from less than 10 to 1408 m amsl (Tulukkaparai hill range)

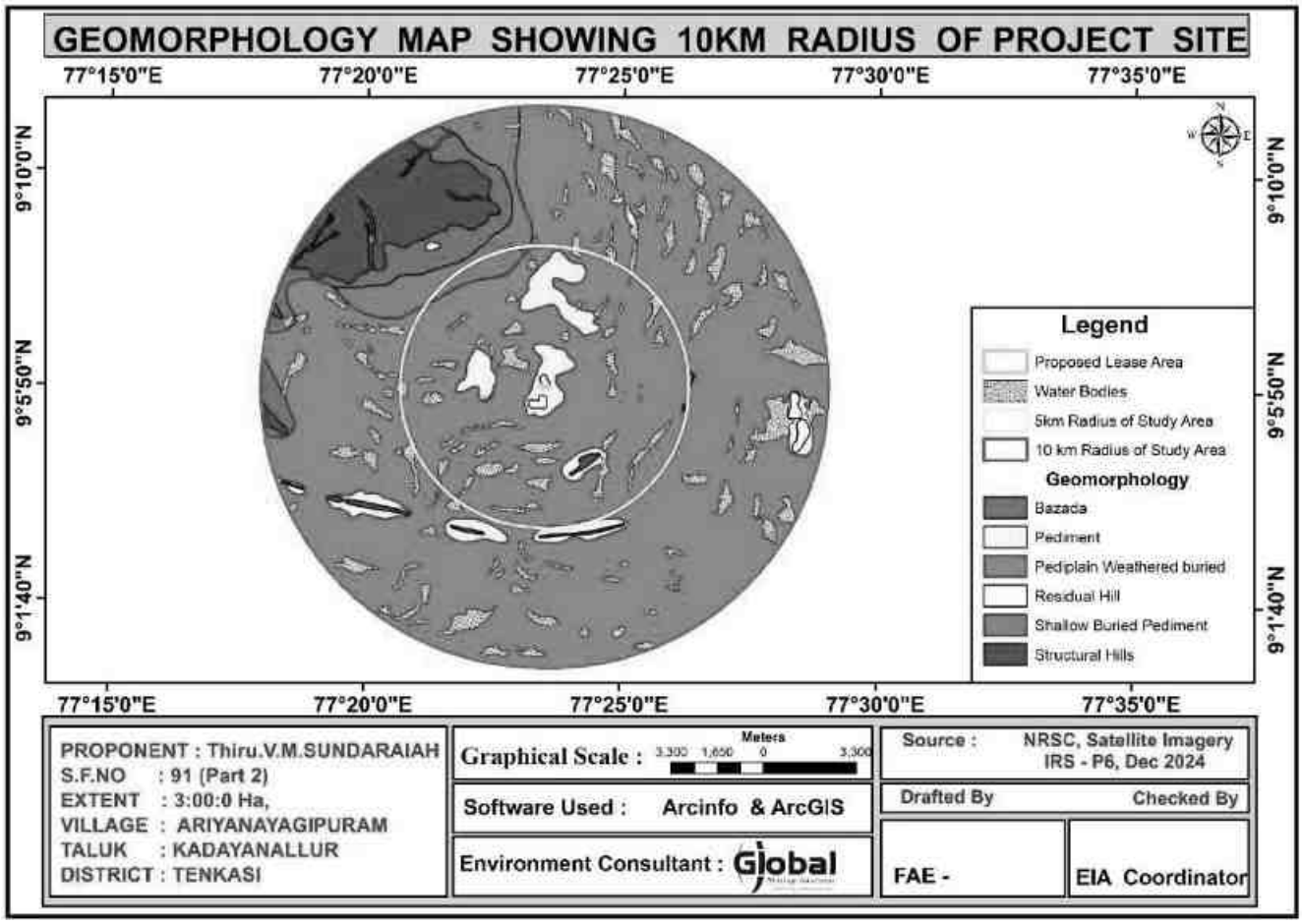


Figure 3-11 Geomorphology – 10 km radius around the project site

3.6.5 Geology

The geology map of the study area reveals that the area is predominately covered with Charnockite, which falls under Charnockite group and the remaining area is covered with Fluvial (Silt/Clay/kankar/Sand), Quartzite (Khondalite group) and Hornblende biotite gnesis (Migmatite Group). No exploration was carried out. Massive Rough stone formation visible from the existing pits in thenearby quarry operations and dry open wells.

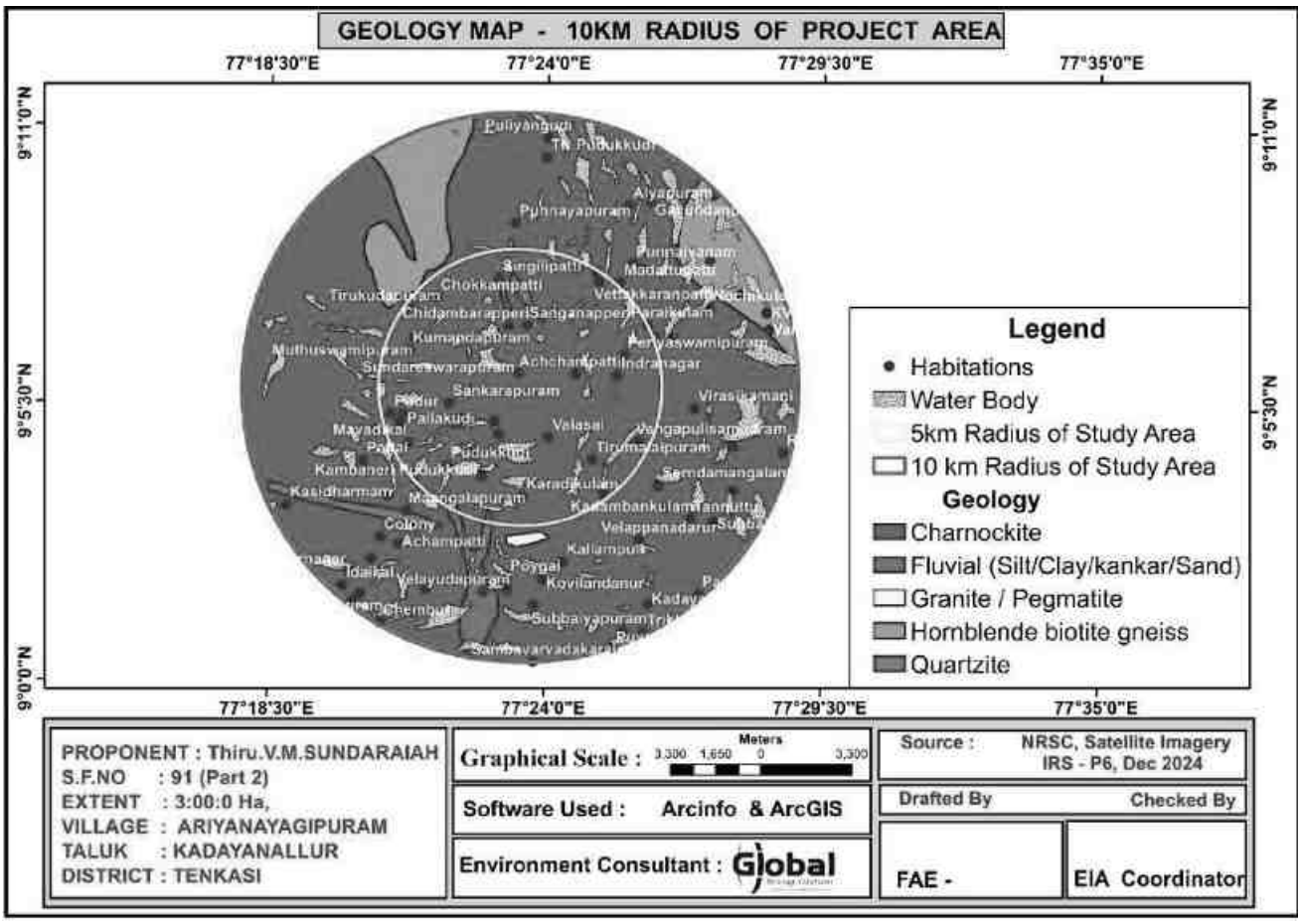


Figure 3-12 Geology – 10 km radius around the project site

3.6.6 Hydrogeology

The district is underlain by both porous and fissured formations. The important aquifer systems in the district are constituted by i) Weathered and fractured hard rock formations of Archaean age. ii) Porous sedimentary formations ranging in age from Tertiary and Recent. The porous formations are found as small patch in the southeastern part of the district and include sandstones, Limestones, Laterite and Clays from Tertiary to Quaternary. Isolated occurrence of calcareous sandstone and fossiliferous limestone are seen in coastal area on the southeastern side. The fossiliferous limestone is found south west of Kudankulam covering an area of 3 sq.km. Laterites are exposed as patches along Radhapuram-Edakkadu, Vijayanarayanam-Kumarapuram, Ittamoli, Nanguneri and Uramozi area.

Beach sand occurs as a patch along the coast with a width varying from 50-250m in Idindakarai-Ovari Belt. The river alluvium is found along the river courses and the thickness of alluvium is restricted to 5-6m. The exploration in sedimentary tract has revealed that the depth to basement occurs at a depth of 120m bgl and granular zones are encountered between the depths of 20 to 92 m bgl. The yield of bore wells varies from 1-4.5 lps. The aquifer at the shallow depth is under unconfined condition and aquifer at depth is under semi-confined to confined condition. The shallow aquifer is developed through dug wells and deeper aquifer through tube wells. The dug well can sustain a pumping of 4 to 6 hours while the tube wells can sustain a pumping of 6-8 hours.

The water-bearing properties of crystalline formations, which lack primary porosity, depend on the extent of development of secondary intergranular porosity. These aquifers are highly heterogeneous in nature due to variation in lithology, texture and structural features even within short distances. Ground water generally occurs under phreatic conditions in the weathered mantle and under semi-confined conditions in the fissured and fractured zones at deeper levels. The thickness of weathered zone in the district is in the ranges up to 30m bgl. The yield of large diameter wells in the district, tapping the weathered mantle of crystalline rocks ranges from 50 to 250 lpm and are able to sustain pumping for 3 to 5 hours per day. The Specific capacity of large diameter wells tested in crystalline rocks ranges from 25 to 300 lpm / m. of drawdown. The yield characteristics of wells vary considerably depending on the topographic set-up, lithology and nature of weathering. The groundwater exploration in the district down to a depth of 200m bgl has revealed that in the western part of the district potential fractures are encountered beyond 100m bgl while in the rest of the area, potential fractures are restricted to 100m bgl. The yield of the wells varies from 1 to 3.6 lps. In general, the wells drilled by various State agencies mainly for domestic purposes have yield in the range of 63 to 270 lpm. The depth to water level in the district varied between 1.19 to 13.35 m bgl during premonsoon depth to water level (May 2006) and varied between 0.18 to 7.97 m bgl during post monsoon depth to water level (Jan 2007). The seasonal fluctuation shows a fall in water level, which ranges from –0.12 to –2.14 m bgl, and rise in water level, which ranges from 0.33 to 11.24 m bgl. The piezometric head varied between 1.72 to 13.65 m bgl (May 2006) during pre monsoon and 0.47 to 13.25 m bgl during post monsoon.

Source: District Groundwater Brochure Tirunelveli District, Tamil Nadu

Aquifer Parameters:

To find out the aquifer thickness and parameters, more than 330 investigations bore wells have been drilled in the district. The aquifer parameters in porous formation, weathered rock, fractured rock, alluvium, bazada and hard rock formations are given below

Formation	Yield of wells (lps)	Transmissivity (m^2/day)	Hydraulic Conductivity (m/day)	Specific yield (%)	Storativity
Porous formation	1.0-4.5	50-250	20-65	3-6	$1.98x10^{-4}$
Weathered rock	<1-4.0	25-150	<1-15	1.5	-
Fractured rock	1.0-3.6	25-250	<1-25	-	$1.87x10^{-5}$ to $4.8x10^{-3}$
Alluvium	2.2-34	8-854	0.1-44	-	-
Bazada	3.8-17	8-225	1-16	-	-
Hard rock	0.15-6	3-212	0.1-27	-	-

Source: District Groundwater Brochure Tirunelveli District, Tamil Nadu & NWM report on GW resources, TVL.

3.6.7 Natural Resources

Forest Resources

The total area of the forest of the district is 1,22,055 ha of which 81700 ha is set apart for Tiger reserves of Mundanthurai and Kalakadu. The entire forest of the district stretches along the Western ghats. Various types of forests from luxuriant tropical wet evergreen forests to southern thorn scrub forests occur in the district. Owing to its diverse geographical factors, the forests in the district are technically classified as southern hill top tropical evergreen forests, west coast tropical evergreen forests, southern moist mixed deciduous forests, ochlandra reed forests, carnatic umbrella thorn forests, southern Euphorbia scrub and southern thorn scrub.

Source: http://tnenvis.nic.in/files/TIRUNELVELI%20.pdf

Agricultural Resources

Tirunelveli has fertile soils only in scattered regions. Less fertile red soils are found distributed over most of the region. The network of the irrigation system makes full use of the water resources, so the natural deficiency has been overcome to a greater extent. The cropping pattern of the district is essentially of the type characterising dry regions. It normally varies from taluk to taluk. Wet cultivation is essentially paddy cultivation and the major share of the gross cropped area is under one crop. In dry regions, diversified cropping patterns exist and no single crop claims a large share of the gross cropped area. Dry cultivation which characterises these regions is also basically millet and cash crop cultivation. Even in dry regions wherever water is available, it is the paddy crop that is sown by the farmers. Paddy occupies the largest area of cultivation, followed by cotton. Paddy is cultivated mainly in Tirunelveli, Palayamkottai, Tenkasi, Shencottai, Ambasamudram and Nanguneri taluks. Other crops grown in the district are cumbu, ragi, pulses, groundnut, gingelly, coconut, chillies and indigo. Portions of Sankarankoil taluk have the rich, fertile black soil which are highly suitable for cotton cultivation. Factors such as type of soil, climatic conditions, irrigation facilities, etc., determine the cropping pattern in a region. Most of the rain fed areas are cultivated in both the seasons. Most of the crops are on the ground for three or four months except chillies and cotton which take more than five months.

Source: http://tnenvis.nic.in/files/TIRUNELVELI%20.pdf

Mineral Resources

The district does not contain any precious mineral. However, it has a few varieties of major and minor minerals.

Source: District Survey report, Tirunelveli

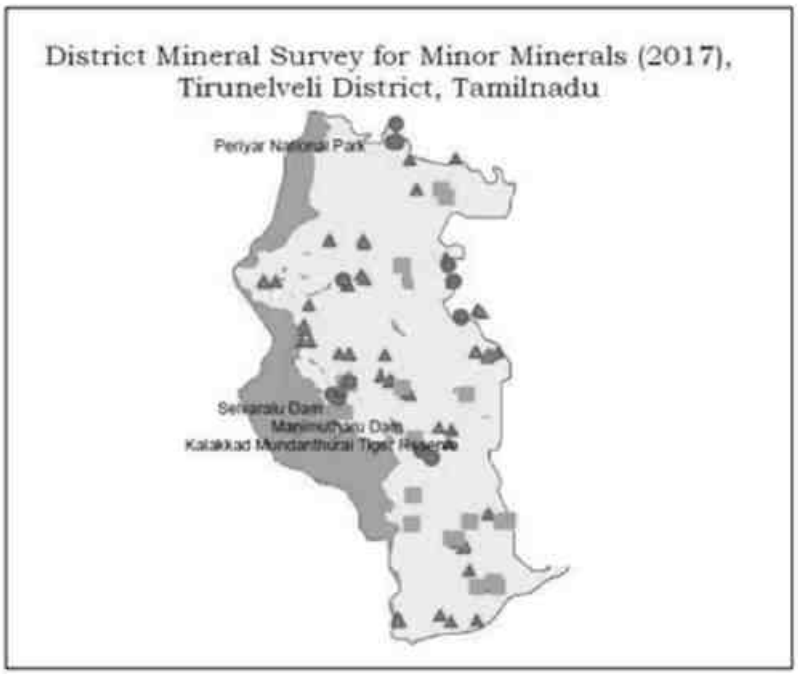


Figure 3-13 Tamilnadu Mineral Map

3.6.8 Seismicity

Tirunelveli falls under seismic zone III, which is categorised as moderate damage zone. Tirunelveli Local Planning Area falls under Seismic Zone – III, II. The whole of Tirunelveli Local Planning Area falls in this zone which is a moderate to low seismic risk. The seismic zone of Tamilnadu is shown below.

3.7 Water Environment

3.7.1 Ground water

Depth of GW Level and GW prospects

The ground water table in Kadayanallur area is in between from 4.47 m BGL to 6.91 m BGL. **(Source: CGWB)**

The project falls under Kadayanallur Block, which is categorized as Semi-Critical (> 70% and ≤90%) as per Annexure to G. O (Ms) No. 161, Public Works (R2) Department, dated: 23.10.2019, where the eligibility for the extraction of groundwater, extraction will be permitted only in Safe/Semi critical and non-metro area. **(Source: NWM)**

THIRUNELVELI DISTRICT							
Sl.No	Assessment Unit (Firka)	Net Annual Ground Water Availability	Existing Gross Ground Water Draft for Irrigation	Existing Gross Ground Water Draft for domestic and industrial water supply	Existing Gross Ground Water Draft for All uses (4+5)	Stage of Ground Water Development ((6/3)*100) %	Category of the Firka
8	GANGAIKONDAN	1,038.93	466.40	26.40	492.80	47	SAFE
9	GUDALUR	1,346.72	1,245.25	40.38	1,285.63	95	CRITICAL
10	KADAYAM	2,053.61	794.25	96.86	891.11	43	SAFE
11	KADAYANALLUR	3,376.95	2,499.80	33.29	2,533.09	75	SEMI CRITICAL

The figure showing GW prospects for study area of 5 km is shown below **(Source: Bhuvan)**

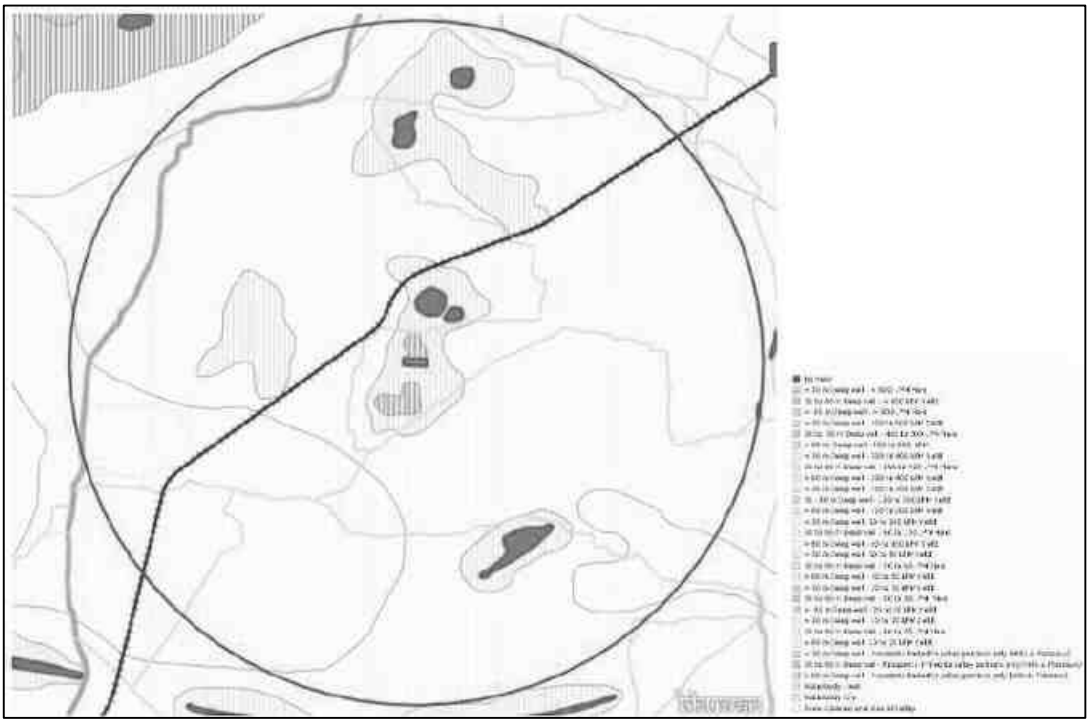


Figure 3-14 Ground water prospects – 5km radius around the project site

The average ground water level in the project is reported as 58 m BGL.

Ground water recharge estimation:

In view of the fact that the detailed data for recharge calculation is extremely difficult to come by some, very simple parameters have been enunciated by the CGWB in their '***Report of the Ground Water Resource Estimation Committee, Ground Water Resource Estimation Methodology - 1997, Central Ground Water Board'***. On an average infiltration can be taken as 44 to 60 cm per year over a total water spread based on the average area of water spread.

Ground water recharge: Total Mine Lease area x 0.6m x 60% x Mining period

= 30,000 Sq. m. x 0.6m x 0.6 x 5 years

= 54,000 Cu.m for 5 years

Rainfall Infiltration:

As per CGWB, the rainfall infiltration is computed by:

Rainfall Recharge = (Rainfall –minimum threshold) * RFIF *Area

= (0.0089 – 0.001) x 0.7 x 30,000

= 165.9 Cu.m

Ground Water Quality Monitoring

Ground water quality monitoring is done in the following locations and analysis will be done for physical, chemical & Biological parameters.

Table 3-5 Ground Water Quality Analysis

Environmental Parameters: ***Ground water Quality Analysis***

Monitoring Period	October 2024 – December 2024
Design Criteria	Based on the Environmental settings in the study area
Monitoring Locations	**Location** / **Distance from the project site** Project Site – - Sundaresapuram – 450 m, N Shenbaganallur – 2.5 km, W Thirumalapuram – 3.45 km, SE Chidambaraperi – 2.21 km, N Periyasamypuram – 3.22 km, E
Methodology	Water Samples were collected in 5 Litre fresh cans as per IS 3025 Part I and transported to the laboratory in Iceboxes
Frequency of Monitoring	Once in a season

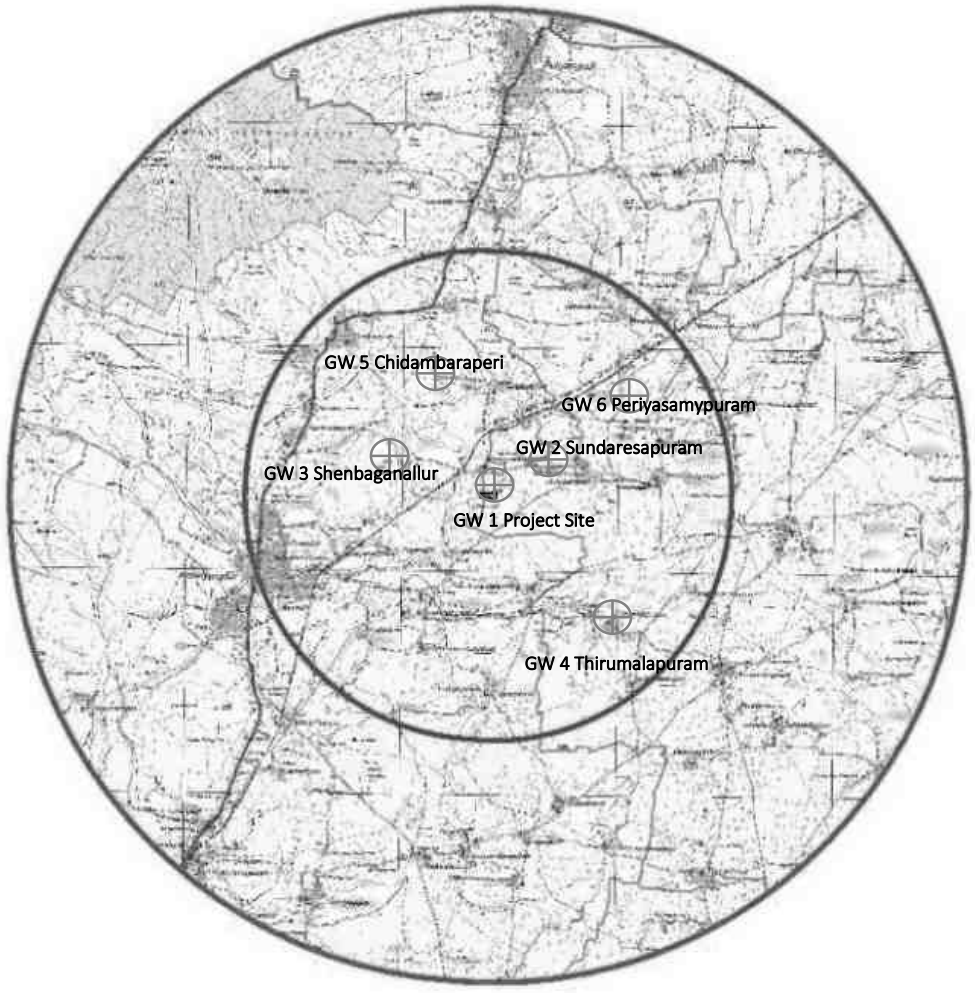


Figure 3-15 Ground Water Sampling Locations

Figure 3-16 Ground water sampling photos

Table 3-6 Ground water sampling results

S. No	Parameters	GW 1	GW 2	GW 3	GW 4	GW 5	GW 6
1	Odour	AGREEABLE	AGREEABLE	AGREEABLE	AGREEABLE	AGREEABLE	AGREEABLE
2	Turbidity	<1	<1	<1.0	<1	<1	<1
3	pH at 25 ˚C	7.60	7.87	7.01	7.44	7.69	8.12
4	Electrical Conductivity	1875	1659	1210	954.3	894.5	184.5
5	Total Dissolved Solids	1130	996	726	575	540	112
6	Total hardness as $CaCO_3$	246	582	226	277	181	83.0
7	Calcium as Ca	57.2	128	138	62.4	19.8	23.9
8	Magnesium as Mg	24.7	62.6	39.8	29.0	31.6	5.6
9	Calcium as $CaCO_3$	143	321	346	156	49.5	59.7
10	Magnesium as $CaCO_3$	103	261	166	121	132	23.3
11	Total alkalinity as $CaCO_3$	283	210	213	265	163	64.6
12	Chloride as Cl^-	499	319	250	157	257	26
13	Free Residual chlorine as Cl^-	BDL (D.L - 0.2)	BDL (D.L - 0.2)	BDL(D.L-0.2)	BDL(D.L-0.2)	BDL(D.L-0.2)	BDL(D.L-0.2)
14	Sulphates as SO_4^{2-}	194	265	136	124	124	16.7
15	Iron as Fe	0.08	0.09	0.06	0.09	0.09	BDL(D.L-0.01)
16	Nitrate as NO_3	5.24	3.48	3.31	2.65	3.65	BDL(D.L-1.0)

17	Fluoride as F	0.56	0.49	0.45	0.34	0.58	0.12
18	Manganese as Mn	BDL (D.L - 0.05)	BDL (D.L - 0.05)	BDL(D.L-0.05)	BDL(D.L-0.05)	BDL(D.L-0.05)	BDL(D.L-0.05)

Interpretation of results

Physical parameters of water

The basic physical parameters of the water include

Odour: The odour of the water is found to be agreeable in all the 6 monitoring locations.

pH:

Value observed in the project site: 7.60.

Acceptable and permissible limits: 6.5-8.5. The pH value is the measure of acid – base equilibrium. The value of pH in the project site clearly indicates that water is neutral in nature.

Turbidity:

Value observed in the project site: <1 NTU.

Acceptable and permissible limits:1 NTU & 5 NTU respectively. The value of turbidity generally indicates the presence of phytoplanktons and other sediments. The value in the project site indicates the water is not turbid and no any physical treatment is required to treat the turbidity of the water.

Total Dissolved Solids:

Value observed in project site: 1130 mg/L.

Acceptable and permissible limits: 500 mg/L and 2000 mg/L respectively. The TDS is the presence of the inorganic salts and small amounts of organic matter present in the water. This is mainly due to the result of surface runoff as the cations and anions in the top soil is carried away by the water. As per the Guidelines of WHO, if the value of TDS is greater than 1200 mg/L, it is designated as unacceptable. Since the value of the TDS is less than 1200 mg/L, it will not cause any adverse impact.

Chemical parameters of water:

The chemical parameters of the drinking water include

Calcium:

Value observed in the project site: 57.2 mg/L.

Acceptable and permissible limits:75mg/L and 200 mg/L respectively.

Calcium is the essential macronutrient. The value of the calcium is within the prescribed permissible standards. The higher level of calcium may cause hardening in domestic equipment and will also reduce the detergent efficiency. Higher levels of calcium will lead to constipation, gas, and bloating. Apart from that, extra calcium may also increase the risk of kidney stones. If the calcium deposit in blood is high, it may lead to hypercalcemia.

Magnesium:

Value observed in the project site: 24.7 mg/L.

Acceptable and permissible limits:30 mg/L and 100 mg/L respectively.

The value of Magnesium in the project site is less than the permissible limit. The increase in the level of magnesium will cause diarrhoea and vomiting in children.

Chloride

Value observed in the project site: 499 mg/L.

Acceptable and permissible limits: 250 mg/L and 1000 mg/L respectively.

The chloride level in the project site is less than the permissible limit. Hence it will not have any major impact.

Hardness:

Value observed in project site: 246 mg/L.

Acceptable and permissible limits:200 mg/L and 600 mg/L respectively.

The value of Hardness in the project site is within than permissible limit. The increase in the level of hardness may cause corrosion and scaling problems, increased soap consumption and it also contributes to the salty taste of water.

Secondary Data:

Following are the Analytical Results of samples collected from National Groundwater Monitoring Wells (May 2022)

S.No	District	Location	Latitude	Longitude	PH	EC *	TH**	Ca	Mg	Na	K	CO3	HCO3	Cl	SO4	NO3	F	U
							<-- mg/L -->											ppb
891	Tirunelveli	Idaikkal	8.5333	77.4653	7.10	1016	240	48	29	67	19	0	214	142	62	12	0.12	0.31
892	Tirunelveli	Ivan Singamputty OW	8.6709	77.4458	7.10	411	80	24	5	18	5	0	73	28	18	1	0.28	0.00
893	Tirunelveli	Kadayam	8.8333	77.4083	7.30	661	240	52	27	12	18	0	128	57	99	31	0.20	0.00
894	Tirunelveli	Kadayanallur	9.0667	77.3458	7.20	3060	550	144	41	255	47	0	268	624	102	55	0.45	3.92
895	Tirunelveli	Kadayanallur1	9.0833	77.3500	7.30	3370	550	204	10	288	47	0	390	631	103	54	1.44	5.56

Source: State Report on Groundwater Quality in Tamilnadu & U. T. of Puducherry by Government of India, Ministry of Jal Shakti Department of Water Resources, River Development & Ganga Rejuvenation Central Ground Water Board South Eastern Coastal Region, Chennai

3.7.2 Surface Water

Surface water was collected from Sundaresapuram Pond and Periyasamypuram Pond. The results are summarized below:

Parameters	Sundaresapuram Pond	Periyasamypuram Pond
Odour	AGREEABLE	AGREEABLE
Turbidity	17.6	25.0
pH at 25 ˚C	7.52	6.94
Electrical Conductivity	648.9	62.4
Total Dissolved Solids	390	38.0
Total hardness as $CaCO_3$	174	19.8
Calcium as Ca	54.0	5.6
Magnesium as Mg	9.4	1.4
Calcium as $CaCO_3$	135	13.9
Magnesium as $CaCO_3$	39.0	5.9
Total alkalinity as $CaCO_3$	101	12.1
Chloride as Cl^-	119	17.6
Free Residual chlorine as Cl^-	BDL(D.L-0.2)	BDL(D.L-0.2)
Sulphates as SO_4^{2-}	75.8	BDL (D.L - 5.0)

Iron as Fe	0.14	0.21
Nitrate as NO_3	3.64	BDL(D.L-1.0)
Fluoride as F	0.29	0.15
Manganese as Mn	BDL(D.L-0.05)	BDL(D.L-0.05)
COD	56.4	34.8
BOD	12.5	9.2
TSS	35	54

3.8 Climatology & Meteorology

Climate and meteorology of a place can play an important role in the implementation of any developmental project. Meteorology is also the key to understand local air quality as there is an essential relationship between meteorology and atmospheric dispersion involving wind in the broadest sense of the term.

The year may broadly be divided into four seasons:

Winter season: December to February

Pre-monsoon season: March to May

Monsoon season: June to September

Post-monsoon season: October to November

i) Climate

The district enjoys a Sub tropical climate. The period from May to June is generally hot and dry. The weather is pleasant during the period from December to January. The relative humidity is on an average between 79 and 84%.

ii) Temperature

The average daily temperature ranges from a maximum of 36.4 °C to a minimum of 23.8 °C

iii) Rainfall:

The maximum precipitation is contributed by the Northeast monsoon(821.4mm) followed by summer (155.3 mm), southwest monsoon (172.6 mm) and winter (61.1 mm).

3.8.1 Meteorological data collection

The meteorological data is collected based on daily observations for three-month period, is used in the current report.

Wind Speed:

Wind speed was in the range of 4 Km/hr to 12 Km/hr. The wind speed was almost close to each other during the whole study period. The wind speed varied from 4 Km/hr to 24 Km/hr. The site-specific meteorological data for the study period (October 2024 – December 2024) is presented below. The maximum and minimum values for all the parameters except wind speed and wind direction are presented below.

Wind Rose Diagram

The wind rose denotes a class of diagrams designed to display the distribution of wind direction at a given location over a period of time. Wind roses are also useful as they project a large quantity of data in a simple graphical plot. The wind speed & wind direction data are taken and wind rose is plotted for October 2024 – December 2024.

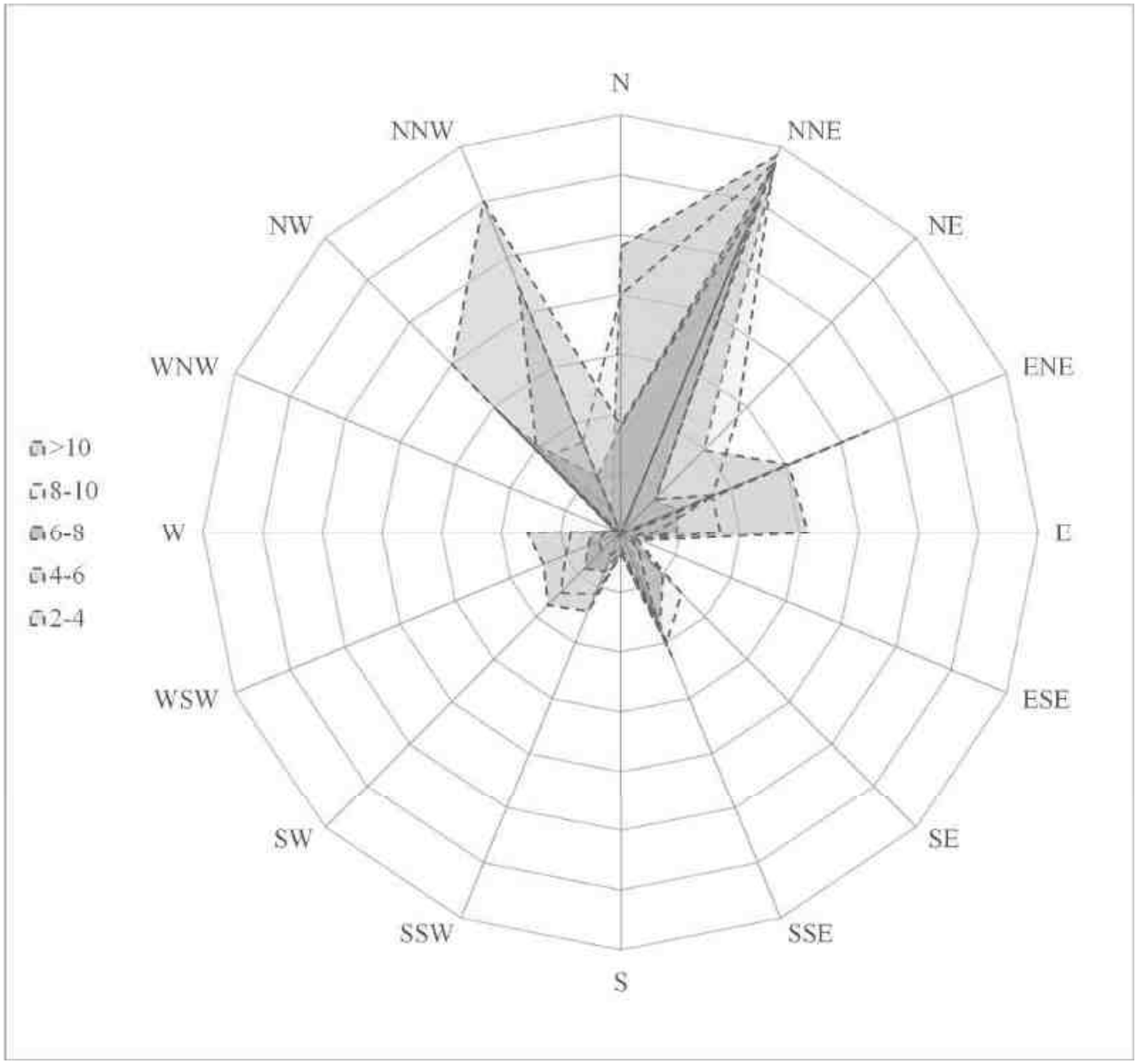


Figure 3-17 Wind Rose Diagram

3.8.2 Ambient Air Quality

Table 3-7 Environmental Parameters – Ambient Air

Environmental Parameters*: **Ambient Air***	
Monitoring Period	October 2024 – December 2024

Design Criteria	The monitoring stations are selected based on factors like topography/terrain, prevailing meteorological conditions like predominant wind direction (October 2024 – December 2024), etc, play a vital role in selection of air sampling stations. Based on these criteria, air sampling stations were selected in the area as shown below.
Monitoring Locations	**Location** / **Distance from the project site** Project Site - - Sundaresapuram 450 m, N Shenbaganallur 2.5 km, W Thirumalapuram 3.45 km, SE Chidambaraperi 2.21 km, N Periyasamypuram 3.22 km, E
Methodology	Respirable Particulate Matter (PM10) - Gravimetric (IS 5182: Part 23:2006) Particulate MatterPM2.5 - Gravimetric (Fine particulate matter) Sulphur Dioxide - Calorimetric (West & Gaeke Method) (IS 5182: Part 02: 2001) Nitrogen Dioxide - Calorimetric (Modified Jacob & Hocheiser Method) (IS 5182: Part 06:2006)
Frequency of Monitoring	2 days in a week, 4 weeks in a month for 3 months in a season.

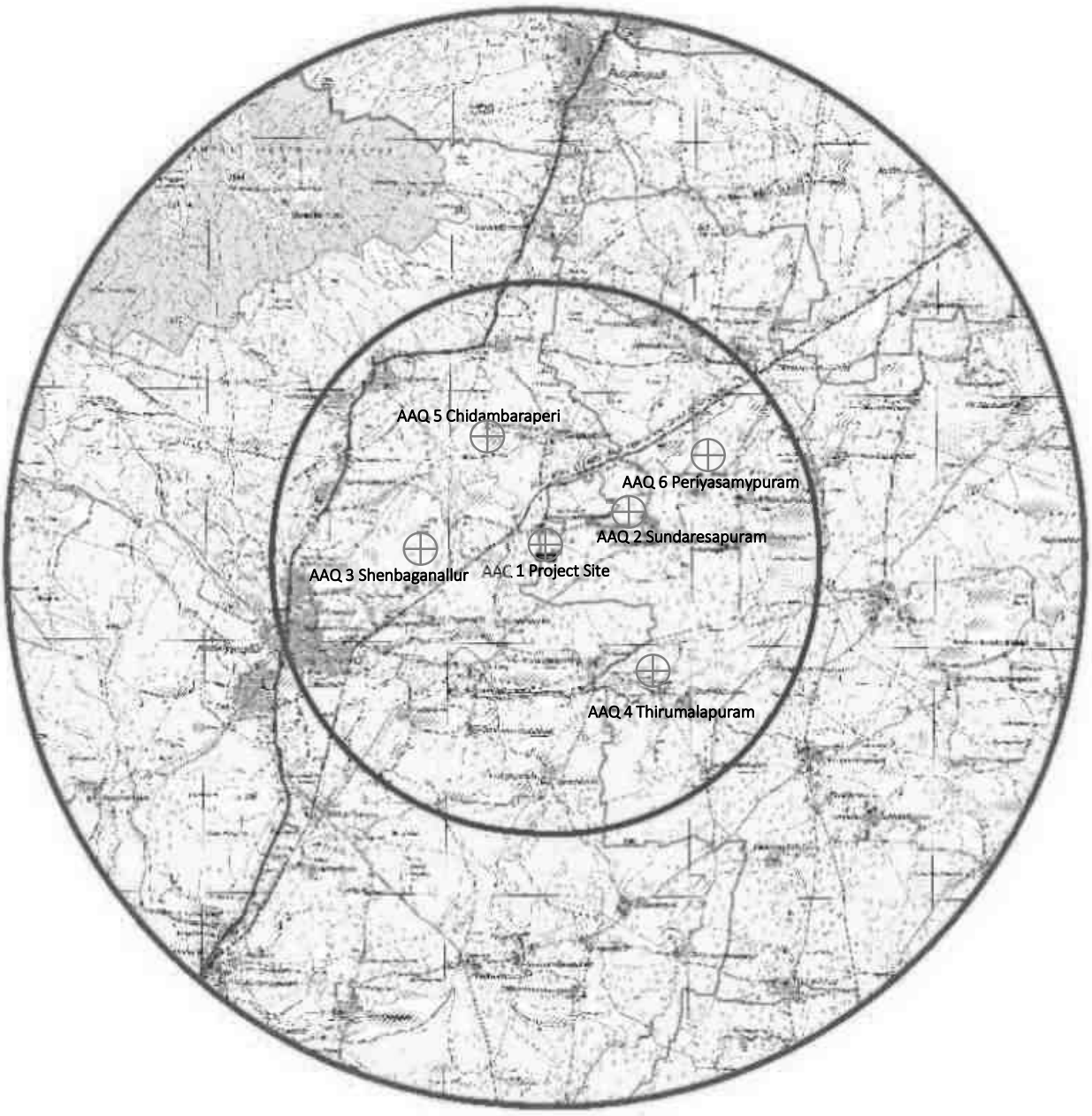


Figure 3-18 Ambient Air Quality Monitoring Stations

Monitoring Photos

Figure 3-19 AAQ Monitoring Photos

Ambient Air Quality: Results & Discussion

The test results of the ambient air quality monitored in project site and other locations were summarized below.

Table 3-8 Ambient Air Quality – Baseline Monitoring Values

Code	PM 10 (µg/m$^{3)}$				PM 2.5 (µg/m$^{3)}$				SO2 (µg/m$^{3)}$				NOx (µg/m$^{3)}$			
	Max	Min	Avg	98 percentile	Max	Min	Avg	98 percentile	Max	Min	Avg	98 percentile	Max	Min	Avg	98 percentile
AAQ 1	69.1	47.2	58.9	68.7	33.9	22.5	28.3	33.6	6.9	4.4	5.6	6.8	11.5	7.8	9.2	11.2
AAQ 2	60.0	39.9	50.0	59.8	28.4	19.3	23.6	28.1	6.4	4.2	5.3	6.4	10.4	7.2	8.5	10.2
AAQ 3	55.8	43.1	49.2	55.5	25.5	20.1	22.7	25.3	6.1	3.7	4.9	6	9.8	6.8	8.0	9.7
AAQ 4	50.9	38.1	44.5	50.3	23.5	18.8	20.8	23.1	6.6	4.1	5.3	6.5	11.0	7.3	8.9	10.9
AAQ 5	53.4	40.1	46.6	53.4	24.8	18.3	21.5	24.6	6.4	3.9	5.1	6.3	10.9	7.4	8.7	10.7
AAQ 6	58.7	41.9	50.6	57.9	26.8	20.2	23.5	26.7	5.3	3.9	4.6	5.3	10.1	8.0	9.1	10.1
NAAQ Standards - Residential Area	100 (µg/m^3)				60(µg/m^3)				80 (µg/m$^{3)}$				80 (µg/m$^{3)}$			

Ambient Air Quality: Results & Discussion

To assess the impact, AAQ were monitored in project site and five locations in the upwind, downwind & crosswind direction. The values of the AAQ in terms of NOx, SOx, PM 2.5, PM10 is maximum in the AAQ 1 than all other locations.

PM 2.5 and PM 10:

Table 3-9 Maximum and Minimum Values of PM 2.5 & PM 10

Description	PM 2.5	Location	PM 10	Location
Max	33.9	Within Mine Lease Area	69.1	Within Mine Lease Area
Min	18.3	Chidambaraperi	38.1	Thirumalapuram
Standard PM 2.5 - 60			**Standard PM 10 - 100**	

The main sources of PM include incomplete combustion, automobile emissions, Dust and also due to the chemical reactions in the atmosphere. From the monitoring locations, it is inferred that the maximum value of both PM 10 &PM 2.5 is observed in mine lease area. The main contributing factor is that there are two other existing quarries located near the project site within 500 m radius, where the vehicular traffic will be more. Approximately 86 trucks will be used for the transportation of mined out mineral from all the three quarries. Coupled to that, few crusher units are present near the project site and the route for carrying out the mined-out mineral will be through Kadayanallur – Virasigamani Road, which is one-way road, which may be an attributing factor.

The governing factors for the transport of PM are wind direction & wind speed. The baseline monitoring is done for the three months i.e., from October 2024 – December 2024. The predominant wind direction is blowing from North east to South West and the maximum wind speed is 4.2 mps. The greater values of Particulate matter will have its impacts on Human Health. Short term exposure may cause coughing, shortness of breath, tightness of the chest, irritation of the eyes. The Long-term exposure may lead to reduced lung function, development of respiratory diseases and also premature death of people with Lung diseases.

SO_2:

Table 3-10 Maximum and Minimum Values of SO_2

Description	SO2	Location
Max	6.9	Within Mine Lease Area
Min	3.7	Shenbaganallur
Standard SO2 - 80		

The main Source of SOx are Burning of fossil fuels such as coal, oil and natural gas. Sulfur dioxide emissions are released primarily as a result of generated electricity through fossil fuel burning power stations. Additional smaller

sources of sulfur dioxide are released from industrial processes. These include extracting metal from ore and the burning of fuels with high sulfur content by locomotives. The maximum value is observed in mine lease area & the minimum value is observed in Thirumalapuram.

The high value in mine lease area is attributed to crushers and existing mines present near the monitoring location – Thedi Vantha Selvam blue metals, Rasa blue metals, Janani Crusher and existing quarry of Thiru. V. M. Sundaraiah and Thiru. M. Kalyanasundaram.

The increased value of Sox can have detrimental effects on human health. Such effects include breathing problems, particularly in asthmatics, whereas short-term exposure can lead to chest tightness and coughing and wheezing. Continued exposure to sulfur dioxide has been linked with alterations of the lungs defenses and aggravation of existing cardiovascular disease.

Sulfur dioxide is a major precursor to particulate soot, which reduces air quality. Sulphur dioxide has an acidifying effect on the environment. Acidification harms plants and animals, both on land and in water. When the ground turns acidic, vital nutrients are leached from the soil, which eventually may result in reduced fertility of the soil.

NOx:

Table 3-11 Maximum and Minimum Values of NOx

Description	NOx	Location
Max	11.5	Within Mine Lease Area
Min	6.8	Shenbaganallur
Standard NOx - 80		

The sources of NOx pollution include emissions by automobiles, trucks and various non-road vehicles (e.g., construction equipment). NOx is released into the atmosphere by combustion of fuels, such as hydrocarbons, in air; especially at high temperatures, such as in car engines. In areas of high motor vehicle traffic, the nitrogen oxides emitted can be a significant source of air pollution.

The maximum value is observed in mine lease area. This is mainly due to more movement of vehicles and trucks in the area and all the mined-out mineral will be transported through Kadayanallur – Virasigamani Road, which is one-way road. Also, there are already 2 operating mines are present in the vicinity of the project site, where blasting operations will be carried out. The blasting of explosives may produce Nox, which will be dispersed in air by the wind, which may be an attributing factor.

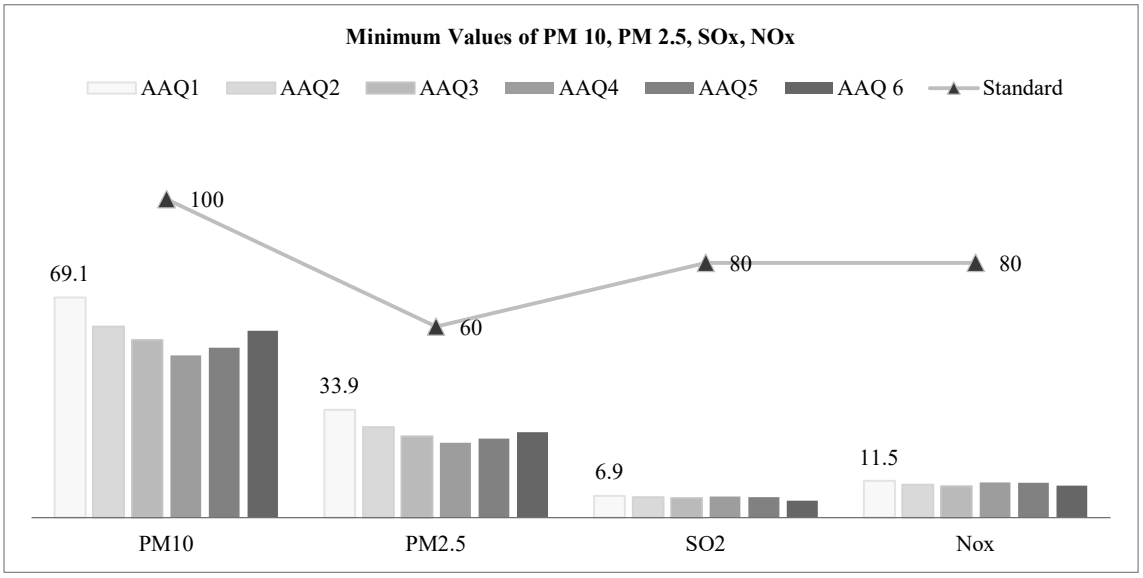


Figure 3-20 Maximum Values of PM10, PM2.5, SO_2, NOx

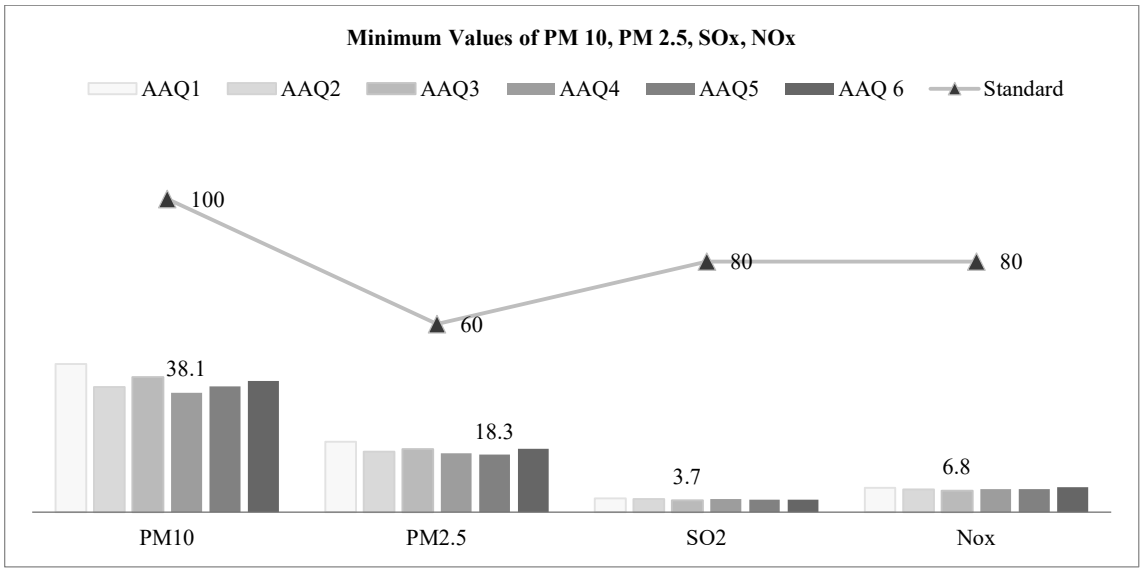


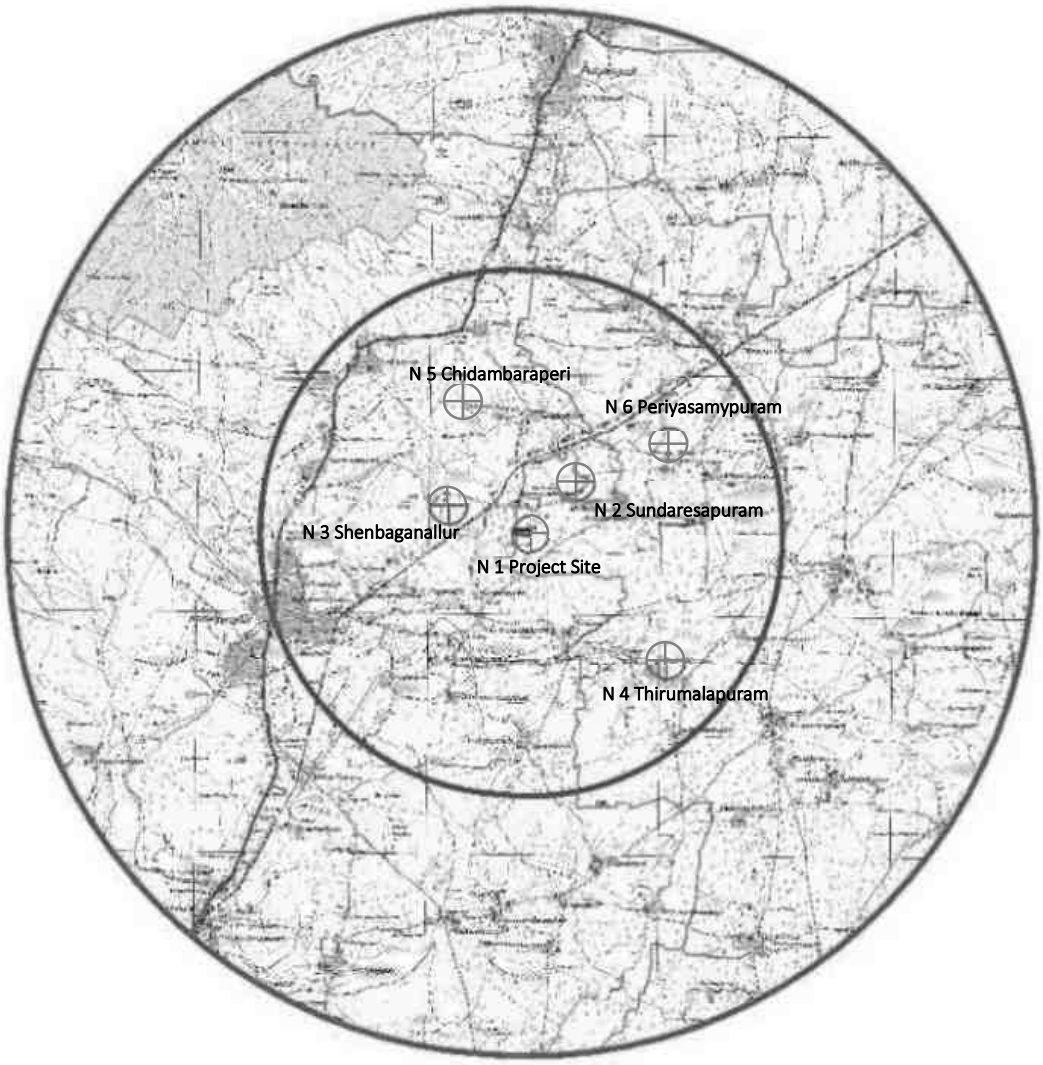
Figure 3-21 Minimum Values of PM10, PM2.5, SO_2, NOx

3.8.3 Noise Environment

Table 3-12 Noise Level Monitoring

Environmental Parameters*: Noise Analysis*		
Monitoring Period	October 2024 – December 2024	
Design Criteria	Based on the Sensitivity of the area	
Monitoring Locations	**Location**	**Distance from the project site**
	Project Site	-
	Sundaresapuram	450 m, N

	Shenbaganallur	2.5 km, W
	Thirumalapuram	3.45 km, SE
	Chidambaraperi	2.21 km, N
	Periyasamypuram	3.22 km, E
Methodology	Noise level measurements were taken at the selected locations using noise level meter both during day and night time. Noise level measurements were taken continuously for 24 hours at hourly intervals	
Frequency of Monitoring	Noise samples were collected from 8 locations - Once in a season	



Monitoring Photos

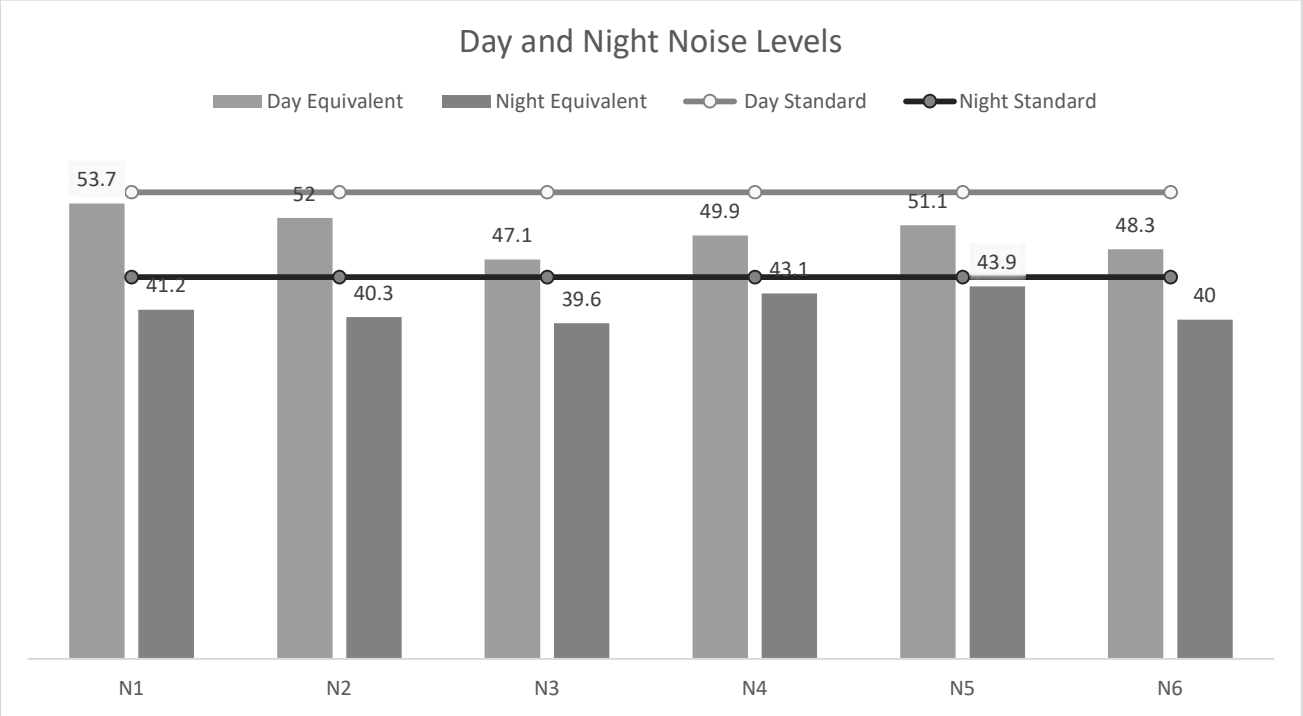
Figure 3-22 ANL Monitoring Photos

Ambient Noise Levels are monitored in the chosen 6 Locations including the project Site and the monitoring results are summarized below

Day and Night Noise Level (Leq day)

Table 3-13 Day Noise Level (Leq Day)

Noise Levels	N1	N2	N3	N4	N5	N6
Day Equivalent	53.7	52.0	47.1	49.9	51.1	48.3
Night Equivalent	41.2	40.3	39.6	43.1	43.9	40.0
Day Standard	55	55	55	55	55	55
Night Standard	45	45	45	45	45	45



Inference:

Day Noise Level: The maximum value is observed in Mine Lease Area. Since the monitoring location is near existing quarries and crushers, the noise levels will be more due to the quarrying and crushing activity. In addition to that, movement of trucks will be there to carry out the mined-out mineral, which is also a contributing factor.

The noise level in the project site is 53.7 dB (A) and the value is within the CPCB standards.

Night Noise Level:

The maximum night noise is observed in Chidambaraperi. This is due to the movement of trains, which adjoins the monitoring location and also since the monitoring location is in the vicinity of various commercial settlements viz Lodge, Temple, travel agencies, where the vehicular traffic will be more even during night time.

The noise level in the Chidambaraperi is 43.9 dB(A) and the value is within the CPCB standards.

3.8.4 Soil Environment

The project area is surrounded by Sundaresapuram, Shenbaganallur, Periyasamypuram etc which are not prone to erosion. Sheet erosion is the uniform removal of soil in thin layers by the forces of raindrops and overland flow. In few places, slight sheet erosion can be seen. It can be a very effective erosive process because it can cover large areas of sloping land and go unnoticed for quite some time. The saline nature of the soil within 5 km radius is studied. The soil in the area is not affected.

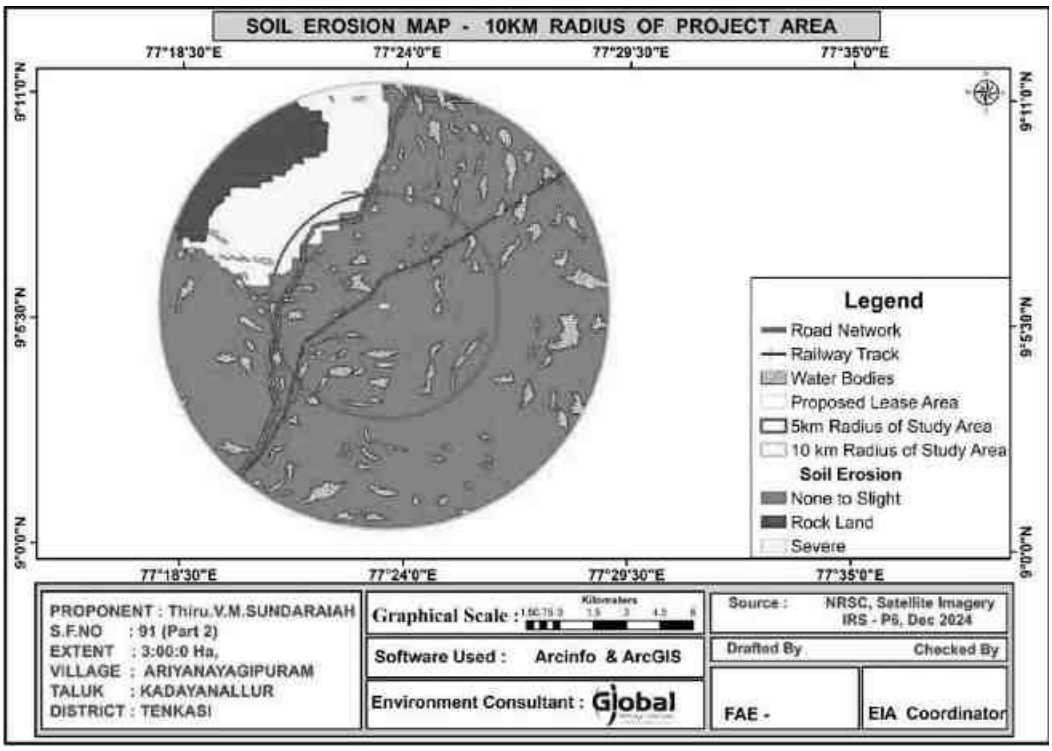


Figure 3-23 Soil Erosion pattern within 10km radius from the project site

Baseline Data

The present study of the soil quality establishes the baseline characteristics which will help in future in identifying the incremental concentrations if any, due to the operation Phase of the proposed project. The sampling locations have been identified with the following objectives:

- To determine the impact of proposed project on soil characteristics and
- To determine the impact on soils more importantly from agricultural productivity point of view.

Table 3-14 Soil Quality Analysis

Environmental Parameters*: Soil Analysis*		
Monitoring Period	October 2024 to December 2024	
Design Criteria	Based on the Environmental settings in the study area	
Monitoring Locations	**Location**	**Distance from the project site**
	Project Site	-
	Sundaresapuram	450 m, N
	Shenbaganallur	2.5 km, W
	Thirumalapuram	3.45 km, SE
	Chidambaraperi	2.21 km, N
	Periyasamypuram	3.22 km, E

Methodology	Composite soil samples using sampling augers and field capacity apparatus
Frequency of Monitoring	Soil samples were collected from 8 locations Once in a season

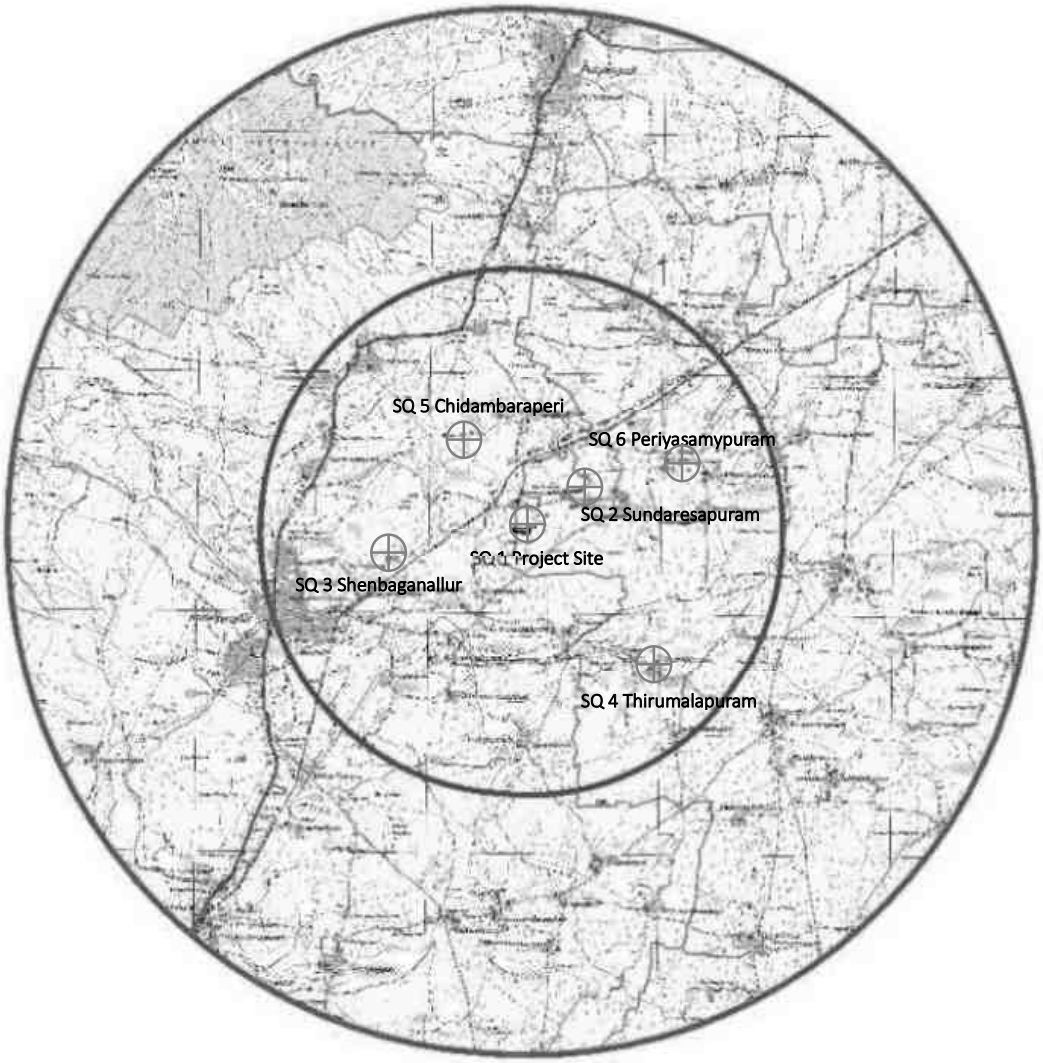


Figure 3-24 Soil Quality Monitoring Locations

Monitoring photos

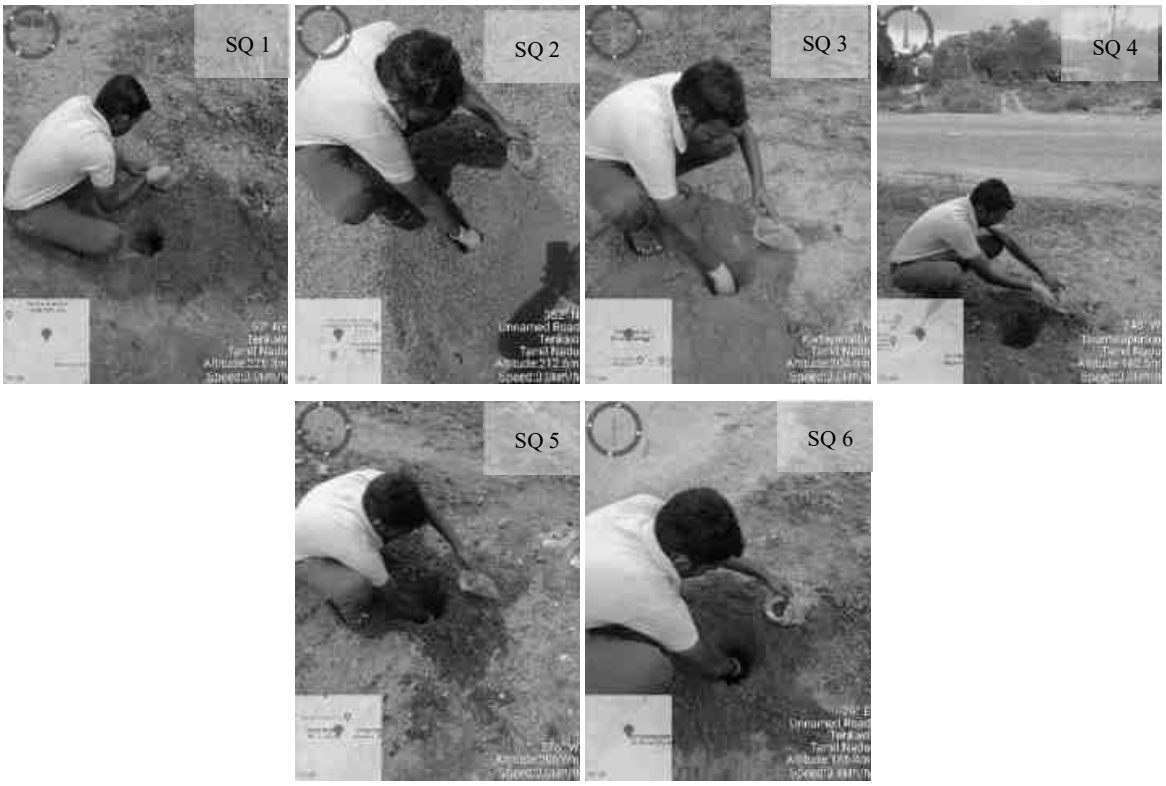


Figure 3-25 Soil Quality Sampling Photos

To assess the soil quality of the study area, 6 monitoring stations were selected and the results are summarized below

Table 3-15 Soil Quality Analysis

S.No	Parameter	Unit	SQ1	SQ2	SQ3	SQ4	SQ5	SQ6
1	pH at 25 °C	-	7.58	6.45	7.67	7.34	7.16	7.45
2	Electrical Conductivity	µmhos/ cm	68.97	56.22	78.95	112.3	101.2	120.6
3	Dry matter content	%	96.13	96.72	97.65	93.58	97.69	94.52
4	Water Content	%	3.87	3.28	2.35	6.42	2.31	5.48
5	Organic Matter	%	0.86	1.05	0.64	0.78	0.89	1.35
6	Soil texture	-	SILT LOAM	SILT LOAM	LOAM	LOAM	SILT LOAM	LOAM
7	Grain Size Distribution i. Sand	%	32.64	28.97	45.74	38.55	24.78	46.55
8	ii. Silt	%	52.38	60.19	43.16	47.89	55.22	43.69
9	iii.Clay	%	14.98	10.84	11.10	13.56	20.00	9.76
10	Phosphorous as P	mg/kg	0.94	1.75	1.64	2.99	1.66	2.01
11	Sodium as Na	mg/kg	720	694	832	644	897	546
12	Potassium as K	mg/kg	796	754	905	776	1035	703

13	Nitrogen and Nitregenous Compounds	mg/kg	240	314	198	245	256	489
14	Total Soluble Sulphate	%	BDL(D.L.0.02)	BDL(D.L.0.02)	BDL(D.L.0.02)	BDL(D.L.0.02)	BDL(D.L.0.02)	BDL(D.L.0.02)
15	Porosity	%	20.1	22.6	17.9	18.5	19.7	20.3
16	Water Holding Cabacity	Inches/foot	31	32	36	29	38	35

Physical Properties:

Regular cultivation practices increase the bulk density of soils thus inducing compaction. This results in reduction in water percolation rate and penetration of roots through soils. The soils with low bulk density have favourable physical conditions whereas those with high bulk density exhibit poor physical conditions for agriculture crops. The bulk density of the soil in the study area ranged between 0.99 to 1.36 g/cc. The water holding capacity was found in the range of 7.89 % to 12.4%.

Chemical Properties:

Chemical characteristics of soils include pH, exchangeable cations and fertility status in the form of NPK values and organic matter. The value of the pH is acidic and alkaline and it ranges from 5.01 to 7.63. The organic matter varies from 0.19% to 0.89%, which indicates the soil is slightly fertile.

3.8.5 Ecology and Biodiversity

Ecology and Biodiversity is studied for 10 km radius around the project site. Project site is considered as core zone and from radius of 5 km radius, it is considered as buffer zone.

- Primary field survey is carried out for the assessment of flora and fauna
- In addition to that, Secondary data from Journals/Literature were studied and compiled to understand the species present

Survey Purpose and Approach:

The basic purpose is to explore the biological environment under Environment Impact Assessment (EIA) and to assist in the decision-making process and to ensure that the project options under consideration are bio-environmentally friendly. EIA identifies ways of improving project environmentally by preventing, minimizing, mitigating or compensating for adverse impacts before construction and development phase. The present study on the floral & faunal assessment of the proposed project is based on field survey of the area supported by secondary data from various governmental and non-governmental sources.

Objectives of the Study:

The objectives of this study were as follows:

- To conduct detail study for floral/faunal/avifaunal elements in the Study area.

- To assess scheduled species in the Study area (Rare, endangered, critically endangered, endemic and vulnerable).
- Baseline data for the study area along with a description of the existing terrestrial, wetland and aquatic vegetation.
- To identify impact of project on the biological environment, this will be discussed under Chapter 4.

Field Study and Methodology adopted

To assess the suitability of the methodology, random field survey was done. Field survey was conducted around 5 km radius from the project site and five locations were chosen based on the species density. Quadrat method is chosen for the proposed study as compared to other sampling methods, because they are relatively simple to use. Quadrat plots are uniform in size and shape and distributed randomly throughout the sample area, which makes the study design straightforward. They are also one of the most affordable techniques because they require very few materials.

Monitoring Locations

Table 3-16 Ecology & Biodiversity – Monitoring Locations

S. No	Location	Latitude	Longitude	No. of Quadrates		
				Trees (10mx10m)	Shrubs (5mx5m)	Herbs and grasses (1mx1m)
1.	Project Site					
2.	Sundaresapuram	9° 6'6.06"N	77°23'27.16"E	1	4	5
3.	Kadayanallur	9° 4'50.06"N	77°21'29.60"E	1	4	5
4.	Boganallur	9° 5'18.40"N	77°22'7.14"E	1	4	5
5.	Meenatchipuram	9° 6'8.03"N	77°24'35.41"E	1	4	5

Study outcome:

Phytosociological parameters, such as Density, Frequency, Basal Area, Abundance and Importance Value Index of individual species (Trees) were determined in randomly placed quadrate of different sizes in the study area. Relative frequency, relative basal area and relative density were calculated and the sum of these three represented Importance Value Index (IVI) for various species. For shrubs, herbs and grasses, Density, Frequency, Relative Density & Relative Frequency were found.

Sample plots were selected in such a way to get maximum representation of different types of vegetation and plots were laid out in different part of the study area of 2 km radius. Analysis of the vegetation will help in determining the relative importance of each species in the study area and to reveal if any economically valuable species is threatened in the process.

Calculation of Density, Frequency (%), Dominance, Relative Density, Relative Frequency, Relative Dominance & Important Value Index:

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

The details of trees, herbs and shrubs along with the Phytosociological parameters for the study area is shown below:

Table 3-17 Tree Species in the core zone

S. No.	Scientific Name	Local Name	Total No. of species	Total of Quadrants with species	Total No. of Quadrants	Density	Frequency (%)	Abundance	Dominance	Relative Density	Relative Frequency	Relative Dominance	IVI
1	Ficus carica	Athi maram	2	2	6	0.33	33.33	1	0.28	1.74	2.20	4.45	8.39
2	Cassia siamea	Manjal Konrai	2	2	6	0.33	33.33	1	0.07	1.74	2.20	1.11	5.05
3	Acacia nilotica	Karuvelai	4	4	6	0.67	66.67	1	0.28	3.48	4.40	4.45	12.33
4	Bambusa vulgaris	Moongil	4	4	6	0.67	66.67	1	0.50	3.48	4.40	7.92	15.79
5	Anacardium occidentale	Cashew	2	2	6	0.33	33.33	1	0.44	1.74	2.20	6.96	10.89
6	Ailanthus excelsa	Pee-nari Maram	2	2	6	0.33	33.33	1	0.27	1.74	2.20	4.31	8.24
7	Butea monosperma	Parasa	3	3	6	0.50	50.00	1	0.23	2.61	3.30	3.61	9.51
8	Aegle marmelos	Vilvam	1	1	6	0.17	16.67	1	0.16	0.87	1.10	2.50	4.47
9	Causuarina equisetifolia	Savukku	2	1	6	0.33	16.67	2	0.21	1.74	1.10	3.34	6.18
10	Pterocarpus santalinus	Senjantanam	1	1	6	0.17	16.67	1	0.20	0.87	1.10	3.22	5.19
11	Cocos nucifera	Thennai	12	6	6	2.00	100.00	2.00	0.15	10.43	6.59	2.39	19.42
12	Artocarpus heterophyllus	Palaa	2	2	6	0.33	33.33	1	0.18	1.74	2.20	2.85	6.79
13	Bombax ceiba	Sittan	4	4	6	0.67	66.67	1	0.08	3.48	4.40	1.27	9.14
14	Azadirachta indica	Veppam	10	5	6	1.67	83.33	2	0.13	8.70	5.49	1.98	16.17
15	Delonix regia	Cemmayir-Konrai	1	1	6	0.17	16.67	1	0.21	0.87	1.10	3.34	5.31
16	Delonix elata	Perungondrai	5	1	6	0.83	16.67	5	0.17	4.35	1.10	2.62	8.06
17	Dalbergia sissoo	Shisham	1	1	6	0.17	16.67	1	0.15	0.87	1.10	2.29	4.26
18	Ficus benghalensis	Alai	2	2	6	0.33	33.33	1	0.08	1.74	2.20	1.19	5.13
19	Annona squamosa	Sitapalam	4	1	6	0.67	16.67	4	0.23	3.48	1.10	3.61	8.18
20	Citrullus colocynthis	Kumatti	1	1	6	0.17	16.67	1	0.14	0.87	1.10	2.18	4.15
21	Ficus religiosa	Arasa maram	3	3	6	0.50	50.00	1	0.09	2.61	3.30	1.35	7.25
22	Polyalthia longifolia	Nettilinkam	5	3	6	0.83	50.00	1.67	0.14	4.35	3.30	2.18	9.83

23	Musa paradise	Vaazhai	3	3	6	0.50	50.00	1	0.08	2.61	3.30	1.19	7.09
24	Prosopis juliflora	Vaelikaruvai	3	3	6	0.50	50.00	1	0.21	2.61	3.30	3.34	9.25
25	Mangifera indica	Mamaram	8	6	6	1.33	100.00	1.333333	0.07	6.96	6.59	1.11	14.66
26	Terminalia catappa	Nattuvadamai	2	2	6	0.33	33.33	1	0.18	1.74	2.20	2.85	6.79
27	Morinda pubescens	Nuna	6	6	6	1.00	100.00	1	0.24	5.22	6.59	3.74	15.55
28	Thespesia populnea	Poovarasam	3	3	6	0.50	50.00	1	0.15	2.61	3.30	2.39	8.30
29	Tectona grandis	Thekku	3	3	6	0.50	50.00	1	0.12	2.61	3.30	1.88	7.79
30	Tamarindus indica	Puli	8	6	6	1.33	100.00	1.333333	0.20	6.96	6.59	3.09	16.64
31	Syzygium cumini	naval	1	1	6	0.17	16.67	1	0.11	0.87	1.10	1.79	3.75
32	Psidium guajava	Segapu	2	3	6	0.33	50.00	0.666667	0.09	1.74	3.30	1.43	6.47
33	Ziziphus mauritiana	Elandai	1	1	6	0.17	16.67	1	0.28	0.87	1.10	4.45	6.42
34	Citrus medica	Elumichai	2	2	6	0.33	33.33	1	0.23	1.74	2.20	3.61	7.54
	Total		**115**	**91**					**6.35**				

Table 3-18 Shrubs in the study area

S. No.	Scientific Name	Local Name	Total No. of species	Total of Quadrants with species	Total No. of Quadrants	Density	Frequency (%)	Abundance	Relative Density	Relative Frequency	IUCN Conservation Status
1	Jatropagossypifolia	Kaatamanaku	28	17	24	1.17	0.71	1.65	14.43	17.17	Not Assessed
2	Lantana trifolia	Shrub verbana	10	3	24	0.42	0.13	3.33	5.15	3.03	Not Assessed
3	Robiniapseudoacacia	Black locust	17	5	24	0.71	0.21	3.4	8.76	5.05	Least Concern
4	Lantana camara	Unnichedi	9	6	24	0.38	0.25	1.5	4.64	6.06	Not Assessed
5	Calotropis gigantea	Erukam	14	12	24	0.58	0.50	1.17	7.22	12.12	Not Assessed
6	Stachytarpheaurticifolia	Rat tail	15	9	24	0.63	0.38	1.67	7.73	9.09	Not Assessed
7	Datura metal	Ummattangani	5	4	24	0.21	0.17	1.25	2.58	4.04	Not Assessed

8	Hibiscus rosa sinensis	Sembaruthi	3	2	24	0.13	0.08	1.5	1.55	2.02	Not Assessed
9	Tabernaemontanadivaricata	Crepe Jasmine	3	3	24	0.13	0.13	1	1.55	3.03	Not Assessed
10	Chloromolaena odorata	Venapacha	9	6	24	0.38	0.25	1.5	4.64	6.06	Least Concern
11	Euphorbia geniculata	Amman Pacharisi	3	3	24	0.13	0.13	1	1.55	3.03	Not Assessed
12	Catharanthus roseus	Nithyakalyani	3	3	24	0.13	0.13	1	1.55	3.03	Not Assessed
13	Woodfordiafruiticosa	Velakkai	3	3	24	0.13	0.13	1	1.55	3.03	Least Concern
14	Morindapubescens	Mannanunai	2	2	24	0.08	0.08	1	1.03	2.02	Not Assessed
15	Acalypha indica	Kuppaimeni	20	8	24	0.83	0.33	2.5	10.31	8.08	Not Assessed
16	Parthenium hysterophorous	Vishapoondu	50	13	24	2.08	0.54	3.85	25.77	13.13	Not Assessed

Table 3-19 Herbs & Grasses in the core zone

S. No.	Scientific Name	Local Name	Total No. of species	Total of Quadrants with species	Total No. of Quadrants	Density	Frequency (%)	Abundance	Relative Density	Relative Frequency	IUCN Conservation status
1	Plumbago zeylanica	Chittiramoolam	3	3	30	0.10	0.10	1	1.19	3.23	Not assessed
2	Mimosa pudica	Thottacherungi	6	5	30	0.20	0.17	1.2	2.38	5.38	Least concern
3	Sida acuta	Malaidangi	10	3	30	0.33	0.10	3.33	3.97	3.23	Not assessed
4	Scrophularia nodosa	Sarakkothini	15	7	30	0.50	0.23	2.14	5.95	7.53	Not assessed
5	Helicteresisora	Valampuri	2	2	30	0.07	0.07	1	0.79	2.15	Not assessed
6	Cynodondactylon	Arugu	12	6	30	0.40	0.20	2	4.76	6.45	Not assessed
7	Sporobolus fertilis	Giant Parramatta Grass	9	4	30	0.30	0.13	2.25	3.57	4.30	Not assessed

8	Viburnum dentatum	Viburnum	5	5	30	0.17	0.17	1	1.98	5.38	Least concern
9	Heraculem spondylium	Hog Weed	20	10	30	0.67	0.33	2	7.94	10.75	Not assessed
10	Laportea canadensis	Peruganchori	30	20	30	1.00	0.67	1.5	11.90	21.51	Not assessed
11	Euphorbia hirta	Amman Pacharisi	5	4	30	0.17	0.13	1.25	1.98	4.30	Not assessed
12	Tridax procumbens	Vettukaayathalai	5	4	30	0.17	0.13	1.25	1.98	4.30	
13	Tephrosia purpurea	Kavali	20	4	30	0.67	0.13	5	7.94	4.30	
14	Sida cordifolia	Maanikham	45	4	30	1.50	0.13	11.25	17.86	4.30	
15	Tridax procumbens	Cuminipachai	15	4	30	0.50	0.13	3.75	5.95	4.30	
16	Ruelliastrepens	Grandinayagam	25	4	30	0.83	0.13	6.25	9.92	4.30	
17	Senna occidentalis	Nattamsakarai	25	4	30	0.83	0.13	6.25	9.92	4.30	

Calculation of species diversity by Shannon – wiener Index, Evenness and richness by Margalef:

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

Table 3-20 Biodiversity Indices

Description	Formula
Species diversity – Shannon – Wiener Index	$H=\Sigma[(p_i)*\ln(p_i)]$ Where p_i : Proportion of total sample represented by species i:number of individuals of species i/ total number of samples

Evenness	H/H_{max} H_{max} = ln(s)= maximum diversity possible S=No. of species
Species Richness by Margalef	RI = S-1/ln N Where S = Total Number of species in the community N = Total Number of individuals of all species in the community

Calculation of species diversity by Shannon – wiener Index, Evenness and richness by Margalef for trees

Table 3-21 Species Diversity for trees

Scientific Name	Common Name	No. of Species	Pi	ln (Pi)	Pi x ln (Pi)
Ficus carica	Athi maram	2	0.017857	-4.02535	-0.07188
Cassia siamea	ManjalKonrai	2	0.017857	-4.02535	-0.07188
Acacia nilotica	Karuvelai	4	0.035714	-3.3322	-0.11901
Bambusa vulgaris	Moongil	4	0.035714	-3.3322	-0.11901
Anacardium occidentale	Cashew	2	0.017857	-4.02535	-0.07188
Alstoniascholaris	Elilaipalai	2	0.017857	-4.02535	-0.07188
Butea monosperma	Parasa	3	0.026786	-3.61989	-0.09696
Aegle marmelos	Vilvam	1	0.008929	-4.7185	-0.04213
Causuarinaequisetifolia	Savukku	2	0.017857	-4.02535	-0.07188
Albizia amara	Wunja	1	0.008929	-4.7185	-0.04213
Cocos nucifera	Thennai	15	0.133929	-2.01045	-0.26926
Artocarpus heterophyllus	Palaa	2	0.017857	-4.02535	-0.07188
Bombax ceiba	Sittan	4	0.035714	-3.3322	-0.11901
Azadirachta indica	Veppam	10	0.089286	-2.41591	-0.21571
Delonix regia	Cemmayir-Konrai	1	0.008929	-4.7185	-0.04213
Delonixelata	Perungondrai	1	0.008929	-4.7185	-0.04213
Dalbergia sissoo	Shisham	1	0.008929	-4.7185	-0.04213
Ficus benghalensis	Alai	2	0.017857	-4.02535	-0.07188
Annona squamosa	Sitapalam	1	0.008929	-4.7185	-0.04213
Citrullus colocynthis	Kumatti	1	0.008929	-4.7185	-0.04213
Ficus religiosa	Arasamaram	3	0.026786	-3.61989	-0.09696
Polyalthia longifolia	Nettilinkam	5	0.044643	-3.10906	-0.1388
Musa paradise	Vaazhai	3	0.026786	-3.61989	-0.09696
Prosopis juliflora	Vaelikaruvai	3	0.026786	-3.61989	-0.09696
Mangifera indica	Mamaram	8	0.071429	-2.63906	-0.1885
Terminalia catappa	Nattuvadamai	2	0.017857	-4.02535	-0.07188
Morindapubescens	Nuna	6	0.053571	-2.92674	-0.15679
Thespesia populnea	Poovarasam	3	0.026786	-3.61989	-0.09696
Tectona grandis	Thekku	3	0.026786	-3.61989	-0.09696
Tamarindus indica	Puli	8	0.071429	-2.63906	-0.1885
Syzygiumcumini	naval	1	0.008929	-4.7185	-0.04213
Psidium guajava	Segapu	3	0.026786	-3.61989	-0.09696

Ziziphus mauritiana	Elandai	1	0.008929	-4.7185	-0.04213
Citrus medica	Elumichai	2	0.017857	-4.02535	-0.07188
Total		112			-3.22

H (Shannon Diversity Index) =3.22

Table 3-22 Species Diversity for Shrubs

Scientific Name	Common Name	No. of Species	Pi	ln (Pi)	Pi x ln (Pi)
Jatropagossypifolia	Kaatamanaku	28	0.14433	-1.93565	-0.27937
Lantana trifolia	Shrub verbana	10	0.051546	-2.96527	-0.15285
Robiniapseudoacacia	Black locust	17	0.087629	-2.43464	-0.21335
Lantana camara	Unnichedi	9	0.046392	-3.07063	-0.14245
Calotropis gigantea	Erukam	14	0.072165	-2.6288	-0.18971
Stachytarpheaurticifolia	Rat tail	15	0.07732	-2.55981	-0.19792
Datura metal	Ummattangani	5	0.025773	-3.65842	-0.09429
Hibiscus rosa sinensis	Sembaruthi	3	0.015464	-4.16925	-0.06447
Tabernaemontanadivaricata	Crepe Jasmine	3	0.015464	-4.16925	-0.06447
Chloromolaena odorata	Venapacha	9	0.046392	-3.07063	-0.14245
Euphorbia geniculata	Amman Pacharisi	3	0.015464	-4.16925	-0.06447
Catharanthus roseus	Nithyakalyani	3	0.015464	-4.16925	-0.06447
Woodfordiafruiticosa	Velakkai	3	0.015464	-4.16925	-0.06447
Morindapubescens	Mannanunai	2	0.010309	-4.57471	-0.04716
Acalypha indica	Kuppaimeni	20	0.103093	-2.27213	-0.23424
Parthenium hysterophorous	Vishapoondu	50	0.257732	-1.35584	-0.34944
		194			-2.3656

H (Shannon Diversity Index) =2.36

Table 3-23 Species Diversity for Herbs

Scientific Name	Common Name	No. of Species	Pi	ln (Pi)	Pi x ln (Pi)
Plumbago zeylanica	Chittiramoolam	3	0.011905	-4.43082	-0.05275
Mimosa pudica	Thottacherungi	6	0.02381	-3.73767	-0.08899
Sida acuta	Malaidangi	10	0.039683	-3.22684	-0.12805
Scrophularia nodosa	Sarakkothini	15	0.059524	-2.82138	-0.16794
Helicteresisora	Valampuri	2	0.007937	-4.83628	-0.03838
Cynodondactylon	Arugu	12	0.047619	-3.04452	-0.14498
Sporobolus fertilis	Giant Parramatta Grass	9	0.035714	-3.3322	-0.11901
Viburnum dentatum	Viburnum	5	0.019841	-3.91999	-0.07778
Heraculem spondylium	Hog Weed	20	0.079365	-2.5337	-0.20109
Laportea canadensis	Peruganchori	30	0.119048	-2.12823	-0.25336

Euphorbia hirta	Amman Pacharisi	5	0.019841	-3.91999	-0.07778
Tridax procumbens	Vettukaayathalai	5	0.019841	-3.91999	-0.07778
Tephrosia purpurea	Kavali	20	0.079365	-2.5337	-0.20109
Sida cordifolia	Maanikham	45	0.178571	-1.72277	-0.30764
Tridax procumbens	Cuminipachai	15	0.059524	-2.82138	-0.16794
Ruelliastrepens	Grandinayagam	25	0.099206	-2.31055	-0.22922
Senna occidentalis	Nattamsakarai	25	0.099206	-2.31055	-0.22922
		252			-2.56298

H (Shannon Diversity Index) =2.56

Table 3-24 Evenness and Species Richness by Margalef

Details	H	Hmax	Evenness	Species Richness (Margalef)
Trees	3.22	3.5	0.9	7
Shrubs	2.36	2.77	0.85	2.84
Herbs	2.56	2.83	0.9	2.89

From the above, it can be interpreted that tree community has higher diversity. While the shrub community shows less diversity. It is also observed that most of the quadrates have controlled generation of plant species with older strands. Higher tree species diversity can be interpreted as a greater number of successful species and a more stable ecosystem where more ecological niches are available, environmental change is less likely to be damaging to the ecosystem as a whole. Species richness is high for tree community when compared with herbs and shrubs.

Frequency Pattern

To understand the frequency pattern, the observed frequency is compared with the Raunkiaer's frequency. Any deviation from Raunkiaer's frequency implies disturbed community.

Classes of species in a community and normal value of class according to Raunkiaer

Class	Frequency (%)	Normal Value in the class
A	1-20	53
B	21-40	14
C	41-60	9
D	61-80	8

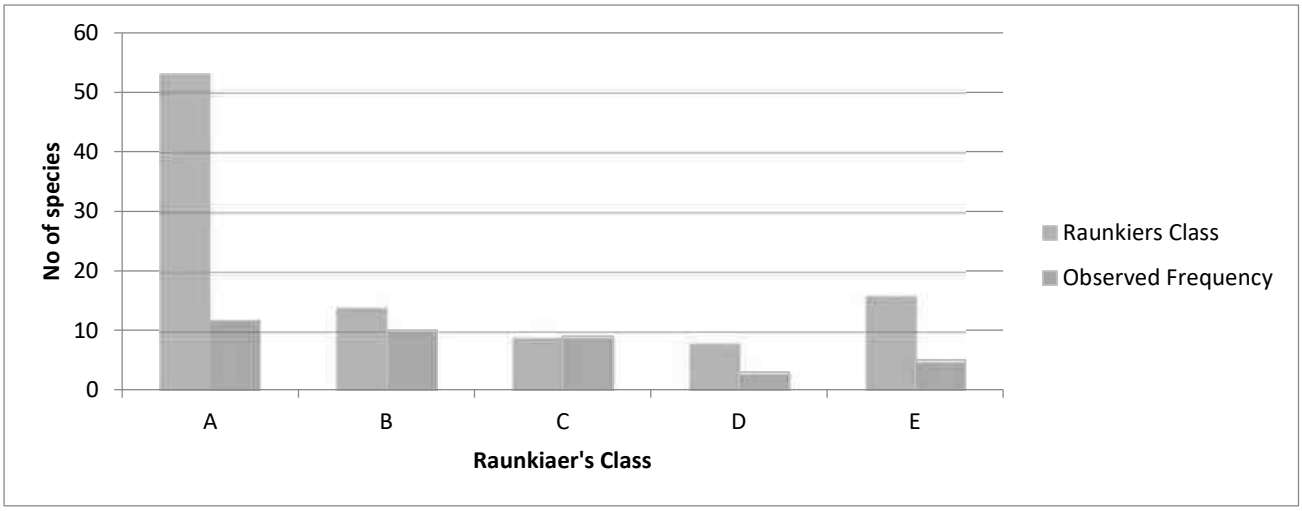
E	81-100	16

Where A>B>C>=<D<E

Raunkiaer's class for the observed species

S. No.	Scientific Name	Local Name	Frequency (%)	Class as per Raunkiaer's Law
1.	Ficus carica	Athi maram	33.33	B
2.	Cassia siamea	ManjalKonrai	33.33	B
3.	Acacia nilotica	Karuvelai	66.67	D
4.	Bambusa vulgaris	Moongil	66.67	D
5.	Anacardium occidentale	Cashew	33.33	B
6.	Alstoniascholaris	Elilaipalai	33.33	B
7.	Butea monosperma	Parasa	50.00	C
8.	Aegle marmelos	Vilvam	16.67	A
9.	Causuarinaequisetifolia	Savukku	33.33	B
10.	Albizia amara	Wunja	16.67	A
11.	Cocos nucifera	Thennai	100	E
12.	Artocarpus heterophyllus	Palaa	33.33	B
13.	Bombax ceiba	Sittan	66.67	D
14.	Azadirachta indica	Veppam	100	E
15.	Delonix regia	Cemmayir-Konrai	16.67	A
16.	Delonixelata	Perungondrai	16.67	A
17.	Dalbergia sissoo	Shisham	16.67	A
18.	Ficus benghalensis	Alai	33.33	B
19.	Annona squamosa	Sitapalam	16.67	A
20.	Citrullus colocynthis	Kumatti	16.67	A
21.	Ficus religiosa	Arasamaram	50.00	C
22.	Polyalthia longifolia	Nettilinkam	50.00	C
23.	Musa paradise	Vaazhai	50.00	C
24.	Prosopis juliflora	Vaelikaruvai	50.00	C
25.	Mangifera indica	Mamaram	100	E
26.	Terminalia catappa	Nattuvadamai	33.33	B
27.	Morindapubescens	Nuna	100	E
28.	Thespesia populnea	Poovarasam	50.00	C
29.	Tectona grandis	Thekku	50.00	C
30.	Tamarindus indica	Puli	100	E

31.	Syzygiumcumini	naval	16.67	A
32.	Psidium guajava	Segapu	50.00	C
33.	Ziziphus mauritiana	Elandai	16.67	A
34.	Citrus medica	Elumichai	33.33	B



Interpretation: The observed frequency is A>B>C<D>E, which follows Raunkiaer's Distribution Frequency and hence the ecology is undisturbed.

Floral study in the Buffer Zone:

Economically important Flora of the study area

Agricultural crops: Paddy, Maize are the main crop grown. Different fruits like Banana, papaya, mangoes, guava and vegetables like brinjal, drumsticks, onion, Coriander also grown by the local people.

Medicinal species: The nearby area is also endowed with the several medicinal species which are commonly available in the shrub forest and waste lands. The common medicinal species of the region are Asparagus racemosus (satamulli), Aegle marmelos (golden apple), Azadirachta indica (Neem) etc.

Rare and endangered floral species: There are no rare or endangered or threatened (RET) species of in the study area. During the vegetation survey, there are no any species which are endangered or threatened under IUCN (International Union for Conservation of Nature and Natural resources) guidelines.

Faunal Communities

Both direct and indirect observation methods were used to survey the fauna.

- Point Survey Method: Observations were made in each site for 15 minutes duration.
- Road Side Counts: The observer traveled by motor vehicles from site to site, all sightings were recorded (this was done both in the day and night time). An index of abundance of each species was also established.

- Pellet and Track Counts: All possible animal tracks and pellets were identified and recorded (South Wood, 1978).

Additionally, survey of relevant literature was also done to consolidate the list of fauna distributed in the buffer zone.

Methodology Adopted:

Point Survey method was adopted for this development project where observations were made in each site for 15 minutes duration.

Study in the core zone:

Point Survey method was adopted for the study within 2 km radius and the following species were observed

Study in the core Zone

Mammals: No wild mammalian species was directly sighted during the field survey. Discussion with local villagers located around the study area also could not confirm presence of any wild animal in that area. Three stripped Palm Squirrel, Common Indian Hare, Common mongoose, Common Mouse etc were observed during primary survey.

Avifauna: Since birds are considered to be the indicators for monitoring and understanding human impacts on ecological systems (Lawton, 1996) attempt was made to gather quantitative data on the avifauna by walk through survey within the entire study area and surrounding areas. From the primary survey, a total of 26 species of avifauna were identified and recorded in the study area. The diversity of avifauna from this region was found to be quite high and encouraging.
The list of fauna species found in the study area is mentioned below

Table 3-25 List of faunal Species

Scientific Name	Common Name	Schedule of wild life protection act	IUCN conservation status
Mammals			
Funambulus pennanti	Palm Squirrel	IV	Least Concern
Mus rattus	Indian rat	IV	Not listed
Bandicota bengalensis	Indian mole rat	IV	Least Concern
Funambulus palmarum	Three stripped palm squirrel	IV	Least Concern
Herestes edwardsii	Common Mangoose	IV	Not listed
Mus musculus	Common Mouse	IV	Least Concern
Bandicota indica	Rat	IV	Least Concern
Lepus nigricollis	Indian Hare	IV	Least Concern
Felis catus	Cat	Not listed	Not listed
Canis lupus familiaris	Indian dog	Not listed	Not listed
Bos Indicus	Indian Cow	Not listed	Not listed

Bubalus bubalis	Buffalo	I	Not listed
Sus scrofa domesticus	Domestic pig	Not listed	Not listed
Birds			
Milvus migrans	Black kite	IV	Least concern
Vanellus indicus	Red wattled lapwing	IV	Least concern
Saxicoloides fulicatus	Indian Robin	IV	Least concern
Pycnonotus cafer	Red vented Bulbul	IV	Least concern
Phragamaticola aedon	Thick billed warbler	IV	Least concern
Pericrocotus cinnamomeus	Small Minivet	IV	Least concern
pseudibis papillosa	Black lbis	IV	Least concern
Eudynamys scolopaceus	Koel	IV	Least concern
Ergetta garzetta	Little Erget	IV	Least concern
Psittacula krameni	Rose ringed parakeet	IV	Least concern
Bubulcus ibis	Cattle Erget	IV	Least concern
Dicrurus marcocercus	Black drongo	IV	Least concern
Streptopelia chinensis	Spotted dove	IV	Least concern
Columba livia	Rock pigeon	IV	Least concern
Corvus splendens	House crow	IV	Least concern
Cypsirurus balasiensis	Asian palm swift	IV	Least concern
Ardeola grayii	Pond heron	IV	Least concern
Elanus caeruleus	Black-winged kite	IV	Least concern
Alcedo atthis	Small blue kingfisher	IV	Least concern
Cuculus canorus	Common Cukoo	IV	Least concern
Centropus sinensis	Greater coucal	IV	Least concern
Phalacrocrax niger	Little comorant	IV	Least concern
Perdicula asiatica	Bush Quail	IV	Least concern
Alauda gulgula	Oriental skylark	IV	Least concern
Passer domesticus	House sparrow	IV	Least concern
Merops orientalis	Green bee eater	IV	Least concern
Reptiles & Amphibians			
Chameleon zeylanicum	Chameleon	IV	Not listed
Calotes versicolor	Common garden lizard	II	Not listed
Bungarus caeruleus	Common krait	IV	Not listed
Ophisops leschenaultia	Snake eyed lizard	--	Not listed
Bufo melanostictus	Toad	IV	Least concern
Ptyas mucosa	Rat snakes	IV	Least concern
Hemidactylus sp.	House lizard	--	Not listed

Butterflies			
Danaus chrysippus	Plain Tiger	--	Not listed
Papilio demoleus	Common lime	--	Not listed
Euploea core	Common crow	--	Least concern
Danaus genutia	Common tiger	--	Not listed
Eurema brigitta	Small grass yellow	--	Least concern

Secondary Data:

Nellai Wildlife Sanctuary:

The project site is located at 5.8 km from the Nellai Wildlife sanctuary. Nellai Wildlife Sanctuary is a protected area, spread across an area of 35,673.33 hectares and is a part of the Tirunelveli Forest Division. It is mostly covered with amazing hills and densely forested areas. The sanctuary also shares borders with tiger and grizzled squirrel reserves.

Flora:

Nellai Wildlife Sanctuary is known for its diverse flora, which includes a wide range of plant species found in the Western Ghats biographic zone. Here are some of the notable flora species that can be found in the sanctuary:

Hopea utilis: This is a hardwood tree species native to the Western Ghats region. It is valued for its timber.

Bentinckia condappana: Bentinckia condappana is a palm species native to the Western Ghats. It is known for its distinctive fan-shaped leaves.

Gluta travancorica: This is a tree species found in the Western Ghats. It is known for its medicinal properties and is used in traditional medicine.

Humboldtia unijuga: Humboldtia unijuga is a tree species commonly found in the Western Ghats. It belongs to the legume family (Fabaceae).

Eugenia singampattiana: Eugenia singampattiana is a plant species belonging to the Myrtaceae family. It is native to the Western Ghats and is known for its aromatic leaves and fruits.

Symplocos macrocarpa: Symplocos macrocarpa is a tree species found in the Western Ghats. It is known for its large fruits and is a part of the Symplocaceae family.

Fauna:

Nellai Wildlife Sanctuary in Tamil Nadu, India, is home to a diverse range of fauna, including mammals, birds, reptiles, and more. Here are some of the notable species of fauna that can be found in the sanctuary:

Mammals: Leopard, Nilgiri Langur, Nilgiri Marten, Mouse Deer, Sambar Deer

Birds: Malabar Whistling Thrush, Grey Junglefowl, Malabar Pied Hornbill, Great Pied Hornbill, Sri Lankan Frogmouth, Nilgiri Wood Pigeon

Reptiles: Indian Rock Python, Rat Snake, Spectacled Cobra, Common Indian Monitor Lizard

Avifauna:

Migratory birds start coming by December end and fly away to their northern homes by June or July after they lay eggs, hatch them and the young ones grow old enough to fly with the older ones. About 35 species of birds visit this calm but congenial village for breeding.

3.9 Demography and Socio-Economics

The demography survey study is done within 10km from the project site. The population, Household, Sex ratio, Literacy rate, SC, ST details for all the villages in the study area is listed below,

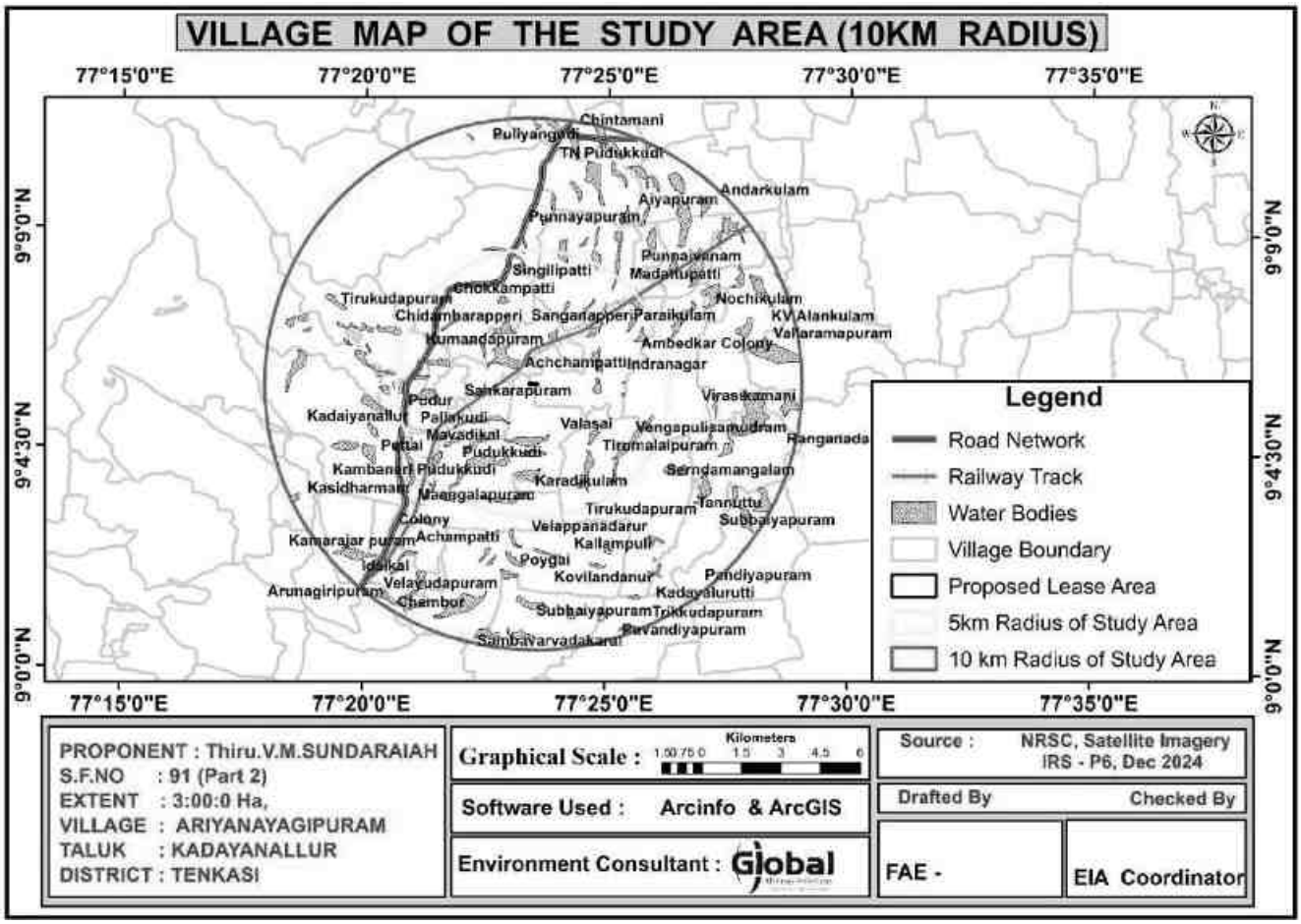


Figure 3-26 Villages around 10 km of the project site

Table 3-26 Demographic Profile – Study area

S.No.	Name of the Block	Rural			Urban			Total Population		
		Persons	Male	Female	Persons	Male	Female	Persons	Male	Female
1	Tenkasi	51206	25609	25597	143451	71573	71878	194657	97182	97475
2	Shenkottai	26710	13344	13366	84684	42209	42475	111394	55553	55841
3	Kadayanallur	77482	38611	38871	90364	45449	44915	167846	84060	83786
4	Keelapavoor	129281	64317	64964	57503	28650	28853	186784	92967	93817
5	Kadayam	89661	44153	45508	21708	10703	11005	111369	54856	56513
6	Alangulam	128216	62927	65289	28776	14135	14641	156992	77062	79930
7	Vasudevanallur	72498	35269	37229	121658	60268	61390	194156	95537	98619
8	Sankarankoil	102406	50780	51626	57277	28470	28807	159683	79250	80433
9	Melaneelithanallur	69784	34577	35207	0	0	0	69784	34577	35207
10	Kuruvikulam	79793	39027	40766	8337	4144	4193	88130	43171	44959
Total		**827037**	**408614**	**418423**	**613758**	**305601**	**308157**	**1440795**	**714215**	**726580**

Source: Census of India, 2011

The Population of the district was 14,40,795 as per 2011 census. Thedensityofpopulation per sq.km was 500 persons in the 2011 census. The sex ratiois1017females for every 1000 males. The literacy rate is 69% in the district as per2011census.Out of total population, males were 7,14,215 and females were 7,26,580asper2011 census. The schedule caste population is 2,92,900 which represent 20%tothetotal population as per 2011 census. Schedule tribes are found to be very small in numbers of 3656 which is 0.3% to the total population.

I	Area (Sq.Km.)		:	**2882.44**
II	Population			
	a	Male	:	714215
	b	Female	:	726580
	c	Total	:	1440795
	d	Rural	:	827037
	e	Urban	:	613758
III	Density / Sq. Km		:	500
IV	Literates			
	a	Male	:	551165
	b	Female	:	453890
V	Main Workers 2011 Census - After Bifurcation			
	a	Total Workers	:	729007
	b	Male Workers	:	419862
	c	Female Workers	:	309145
	d	Rural Workers	:	452280
	e	Urban Workers	:	276727
	f	Cultivators	:	61979
	g	Agricultural Labours	:	200229
	h	Household Industry	:	134575
	i	Other Workers	:	258783
VI	Non-Workers		:	711414
VII	Language Spoken in the District		:	Tamil, English, Telugu &Urdu
3.VITAL STATISTICS				
I	Birth		:	17296
II	Death		:	8657
III	Infant Deaths		:	164
IV	Birth Rate (per 1000 Population)		:	11.37
V	Death Rate (per 1000 Population)		:	5.7
VI	Infant Mortality Rate (Per 1000 Live Births)		:	9.2
VII	Expectation of life at Birth		:	-
	a	Male	:	-
	b	Female	:	-
VIII	No. of Deaths of Women due to			
	a	At the time of delivery	:	-
	b	During Pregnancy	:	-

Source: District Statistical Handbook 2023-2024

Socio-economic survey methodology

Purposive sampling methods were used for selecting respondents (male and female) for household survey. For official information of village, Gram Panchyat member has been chosen. Structured questionnaire was used for survey. For group discussion, Panchyat bhavan, Aanganwadi bhavan, community halls were used. Out of total 55 villages, 5 villages (9%) were surveyed for which selection criteria is based on proximity to the project site and area with dense and scarce populations were chosen. The chosen villages for the study include: ***Sundaresapuram, Meenatchipuram, Boganallur, Kadayanallur, Periyasamipuram***

Table 3-27 Consolidated Report – Key Socio-Economic Indicator in the study area

S. No	Indicator	Percentage/Nos.
1	People below age 18	38
2	People age limit above 18	62
3	Literates	75
4	Illiterates	25
5	% of people employed in company	50
6	% of people self employed	43
7	% of people seasonally employed	3
8	% of people unemployed	4
9	% of houses covered with LPG Cooking gas	80
10	% of houses covered with toilet facility	70
11	% of houses covered with piped water supply	60

Salient Features in the study area

House pattern: It is notable that nearly 98% of the houses were pakka at survey area.

Employment: Main occupation of the people in the study area was agriculture

Fuel: All the households use LPG for cooking purpose

Main Crops: The cash crops include cotton, sugarcane, oilseeds, coffee, tea, rubber, coconut, gingelly and chillies. The important horticultural products are bananas and mangoes.

Migration: During survey, it was found that local population were migrating for employment purpose. Since due to the presence of various industrial units, migration from other places were also noted.

Sanitation: All the households were having toilet facilities in their houses. Drainage system was maintained in the study area.

Drinking Water Facilities: Ground water is the major source of drinking water in the villages wherein hand pumps, tap water and dug wells are installed.

Transportation Facility: For transportation purpose Auto, Public and Private Bus services

were available. Transportation facilities were frequently available in the study area and connecting major cities. Private vehicles like Bicycles & Motor Cycles were mostly used by villagers for transportation purpose

4 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

4.1 Introduction

An environmental impact is defined as any change to the environment, whether adverse or beneficial, resulting from a facility's activities, products, or services. The anticipation of the possible & potential Environmental impact due to the proposed project is a key step in EIA. Based on the impacts assessed, appropriate mitigation measures should be adopted to maintain the environment with less or no damage.

4.2 Environmental Impacts

Environmental Impacts can be group into Primary impacts & Secondary Impacts

Primary Impacts: These impacts are directly attributed by the project

Secondary Impacts: These are those which are induced by primary impacts and include the associated investments and changed patterns of the social and economic activities by the action.

Assessment of impacts is done for the following Environmental Parameters:

- ♣ Land Environment
- ♣ Water Environment
- ♣ Air Environment
- ♣ Noise Environment
- ♣ Biological Environment
- ♣ Socio Economic Environment

Table 4-1 Impact & Mitigation measures on Land Environment

<table>
<tr><th>Aspect</th><th>Impact</th><th>Mitigation Measures</th></tr>
<tr><td>Quarrying operation</td><td>The proposed 3.00.0 Ha mine is quarrying of 3,77,765m^3 of Rough Stone. The quarry operation is proposed to carry out with Opencast, Semi-mechanized Mining with a bench height of 5m and bench width of 5m is proposed. At the end of 5 years, mining lease area will be converted into ultimate pit of
<table>
<tr><th>Pit No.</th><th>Length (m)</th><th>Width (m)</th><th>Depth (m)</th></tr>
<tr><td>I</td><td>310</td><td>71</td><td>40</td></tr>
</table>
This may lead to soil erosion, degradation & resource loss

The main impact of open cast mining on land-use is land degradation. The land is bound to be excavated for mining of Rough Stone Quarry.

Impact on soil of the study area will be minimal as there are no wastewater generated, heavy metal infusion, stack emissions.</td><td>The proposed project site is not prone to any kind of soil erosion. In addition, garland drainage of 1m x 1m will be provided to avoid storm water run- off.

It is proposed to plant 330 Nos. of local tree species (Neem, Magizham, Tamarind, Elandhai and Vilvam) along the roads, outer periphery of the mining area which enhances the binding property of the soil. It is proposed to improve the affected land wherever possible for better land use, so as to support vegetation and creation of water reservoir in the ultimate pit after quarrying

There is no overburden anticipated during the entire Rough Stone quarrying operation. The excavated rough stone will be directly loaded into tipper to the needy crusher/other buyers.

The source of dust generation is majorly due to drilling, blasting, loading & unloading of the mined-out mineral, the impact will be mitigated by water sprinkling regularly once in 3hrs.</td></tr>
</table>

	Impact due to transformation of terrain characteristics over the large area results in soil degradation.	The proposed mining activity is carried out in almost hilly terrain where the contour level difference is 35m.
	Solid waste will be generated from the mining activity as there will be refuse also generation of domestic waste. If it not properly managed, may cause odor and health problem to the workers.	The 100% recovery is achieved by extracting the entire mineable reserve. Hence there will be no refuse generation due to the mining activity. Apart from that, a very meagre quantity of domestic waste will be generated in the project, which will be handed over to the local body on daily basis.

Table 4-2 Impact & Mitigation measures on water environment

Aspect	Impact	Mitigation Measures
Drilling, Blasting, Loading and unloading, Transportation of the excavated mineral.	The mining in the area may cause ground water contamination due to intersection of the water table and mine runoff.	The water table will not be intersected during mining, as the ultimate depth is limited up to 40-meter AGL, whereas the ground water table is at 55m - 58m below the ground level. The municipal wastewater will be disposed into septic tanks followed by soak pit. No chemicals consisting of toxic elements will be used for carrying out mining activity. For the management of surface run-off, rain water harvesting plan will be proposed. The total harvested rainfall is 11,319 Cum [(3.00.0 Ha x 0.98 x 0.35) + (0.3 Ha x 0.98 x 0.35)]. 10% will be evaporated and the

		remaining 10,188 Cum. will be harvested in two sumps each of capacity 5100 Cu.m
	The ground water depletion may occur due to mining activity	The ground water table is at a depth of 55m - 58m the mining operation will not affect the aquifer. The ultimate pit at the end of the mining operation will be used for rain water storage, the stored water will be used for greenbelt development and further the stored water will be used for domestic purposes (other than drinking) after proper treatment.
	Chemicals consisting of nitrate used for blasting may pollute the surface run off	Further, the run-off water will be stored in sumps and after proper treatment; water will be used in the mining operation for dust suppression.
	Improper management of Domestic wastewater in the Mine lease may create unhygienic conditions in the site thereby causing health impacts to the labours	Provision of urinals/Latrines along with septic tank followed by soak pit arrangement will be provided in the Mine Lease area for the proper management of wastewater
Drainage	Mine drainage is surface water or groundwater that drains from an active or abandoned mine. One of the adverse impacts of mine drainage is it will contaminate the ground water.	As per the approved mining plan the ultimate pit limit is 40 m (AGL) for first five years. The ground water table is reported as 58m BGL. The depth is safe and economic for the quarrying operation. Hence the quarrying operation may not affect the ground water.

Table 4-3 Impact and mitigation measures on air environment

Aspect	Impact	Mitigation Measures
Drilling, Blasting, Loading and unloading, Transportation of the excavated mineral.	During mining operation, fugitive dust and other air pollutants like particulate matter (PM10 & PM 2.5) will be generated. The main source of pollutants arises due to drilling and blasting. 1 No of Tipper will be used for loading nd unloading, 1 No of Excavator (0.90 m bucket capacity (with rock breaker attachment) will be used for excavation of the mineral which contributes to the generation of fugitive dust. In addition, blasting will be done using explosives leading to the generation of dust. <u>Effect on Human</u> Adverse effect on human health of working labourers and neighboring villagers like effect on breathing and respiratory system, damage to lung tissue, influenza or asthma.	It is proposed to plant 1200 Nos of local species (with 240 Nos each year) along the haul roads, outer periphery within the lease area to prevent the impact of dust in consultation with Forest department for the plantation of trees (Neem, Magizham, Tamarind, Elandhai and Vilvam) in two tier to combat air pollution and with herbs (Nerium) in between the tree species. 300 Nos. of tree species will be planted outside the mine lease area Planning transportation routes of the mined-out mineral, so as to reach the nearest paved roads (an approach road) by shortest route connecting NH 744 Alternatively, graveled road may be constructed between mine lease area and nearest paved road connectivity. The speed of trucks plying on the haul road will be limited to 20km/hr to avoid generation of dust. The trucks will be covered by tarpaulin. Overloading will be avoided. Personal Protective Equipments (PPEs) like eye goggles, dust mask, leather gloves, safety shoes &boots will be provided to the workers engaged at dust generation points like excavation and loading points.

	Dust generation due to loading and unloading of mineral and due to transportation can also affect the workers as well as nearby villagers Effect on Plants Stomatal index may be minimized due to dust deposit on leaf.	1 kLD of water will be proposed for sprinkling on unpaved roads to avoid dust generation during transportation.

AERMOD Modelling:

Impact Prediction: Impact prediction is a very important phenomenon in evaluating the environmentally potential adverse impacts for any proposed mine project. The impact prediction is always carried out under worst possible conditions so as to mitigate or to eliminate the environmental hazards. These predictions thus calculated are superimposed over the baseline data to calculate the net impact on the environment after the proposed mine Project comes into production.

Air Emissions: The impacts on air environment from a mining activity depend on various factors like production capacity, machinery involved, operations and maintenance of various equipment and vehicle. Apart from these, there will be other activities associated viz transportation of mineral and waste, stocking facilities and dump management within the mine lease area that may contribute to pollution.

The air-borne particulate matter generated by quarrying operations and transportation is mainly PM10 and PM2.5, and emissions of sulfur dioxide (SO2) and oxides of nitrogen (NO2) due to excavation/loading equipment and vehicles plying on haul roads are the cause of air pollution in the project area.

Furthermore, the loading, unloading, and transportation of rough stone, as well as wind erosion of the exposed area and movement of light vehicles, will cause pollution within a 500-meter radius of the project area due to quarrying activities. This has a cumulative impact on the ambient air environment around the project area.

Quantitative Estimation of Impacts on Air Environment: An attempt has been made to predict the incremental rise of various ground level concentrations above the baseline status in respect of air pollution due to proposed production of 3,77,765m^3 of Rough Stone by the open-cast mechanized mining method.

The pollutants released into the atmosphere will disperse in the down wind direction and finally reach the ground at farther distance from the source. The concentration of ground level concentrations mainly depends upon the strength of the emission source and micrometeorology of the study area.

In order to estimate the ground level concentrations due to the emission from the proposed project, EPA approved Industrial Source Complex ISC AERMOD View Model has been employed.

The mathematical model used for predictions on air quality impact in the present study is ISC-AERMOD View-6.8.6. It is the next generation air dispersion model, which incorporates planetary boundary layer concepts.

The AERMOD is actually a modelling system with three separate components:

AERMOD (AERMIC Dispersion Model), AERMAP (AERMOD Terrain Preprocessor) and AERMET (AERMOD Meteorological Preprocessor).

Special features of AERMOD include its ability to treat the vertical in homogeneity of the planetary boundary layer special treatment of surface releases, irregularly shaped area sources, a plume model for the convective boundary layer, limitation of vertical mixing in the stable boundary layer, and fixing the reflecting surface at the stack base.

The AERMET is the meteorological preprocessor for the AERMOD. Input data can come from hourly cloud cover observations, surface meteorological observations and twice-a-day upper air soundings. Output includes surface meteorological observations and parameters and vertical profiles of several atmospheric parameters.

The AERMAP is a terrain preprocessor designed to simplify and standardize the input of terrain data for the AERMOD. Input data include receptor terrain elevation data. Output includes, for each receptor, location and height scale, which are elevations used for the computation of airflow around hills.

Salient features of the AERMOD model are given hereunder:

- ♣ Excavation operations are considered as area sources.
- ♣ Transportation of material on haulage roads has been considered as line source

The predicted ground level concentrations for study period computed using AERMOD model are plotted as isopleths.

Sources of Dust Emission:

The proposed mining is carried out by semi mechanized opencast method. The air borne particulate matter generated by ore handling operations, transportation and screening of ore is the main air pollutant. The emissions of sulphur dioxide (SO2), Oxides of Nitrogen (NOx) contributed by diesel operated excavation/loading equipment and vehicles plying on haul roads are marginal. Prediction of impacts on air environment has been carried out taking into consideration proposed production and net increase in emissions. Based on the various operations involved in the production of minerals, the various emission sources have been identified as given below.

a. Area sources.
b. Line sources.

Extraction of mineral from mine, are considered as area sources. Transportation of material from mining benches to various end points are considered as line sources. The impact of above sources on air environment is discussed below:

The other sources of air pollution are the dust generated during the movement of tippers on the haul road. Water tankers with spraying arrangement will be used for regular water sprinkling on the haul roads to ensure effective dust suppression. The tippers are well maintained so that exhaust smoke does not contribute abnormal values of noxious gases and un-burnt hydrocarbons.

Emission Details:

All the emissions discussed above are quantified for proposed maximum production of is 3,77,765m^3 of Rough Stone by the open-cast mechanized mining method by the open-cast semi-mechanised mining method. The existing air quality levels are covered in the baseline scenario. Excavation, loading and transportation through tippers are the major sources, which are of significance. Therefore, the emissions considered for modeling are from drilling blasting, excavation & transportation rough stone.

The emissions are computed based on AP-42 emission factors. Operational hours, activity rate, wind speed and moisture content have been considered for estimation of emissions from point and area sources. For line source, apart from operational hours, activity rate, moisture, silt content and vehicle weight have been considered.

Predictions are carried out for the worst-case scenario of simultaneous operation of excavators (area sources) and tippers for transportation from mine pit to loading pit (line sources) over a distance of 500 m.

The number of working days has been taken at 300 days per year with 8 hours of operation/day, hence the concentrations predicted are considered to be the worst case. With control measures, the emissions have been taken at 30% of uncontrolled emissions for handling and 10% of uncontrolled emissions for transportation.

Meteorological Data: The meteorological data recorded continuously during the month of October 2024 – December 2024 on hourly basis on wind speed, wind direction and temperature has been processed to extract the 24- hourly mean meteorological data as per the guidelines of IMD and MoEF for application of AERMOD model. Stability classes computed for the mean hours is based on guidelines issued by CPCB on modelling. Mixing heights representative of the region have been taken from the available published literature.

Summary of Predicted Ground Level Concentrations: Ground level concentrations due to the mining activities have been estimated to know the incremental raise and extent of impact in the study area.

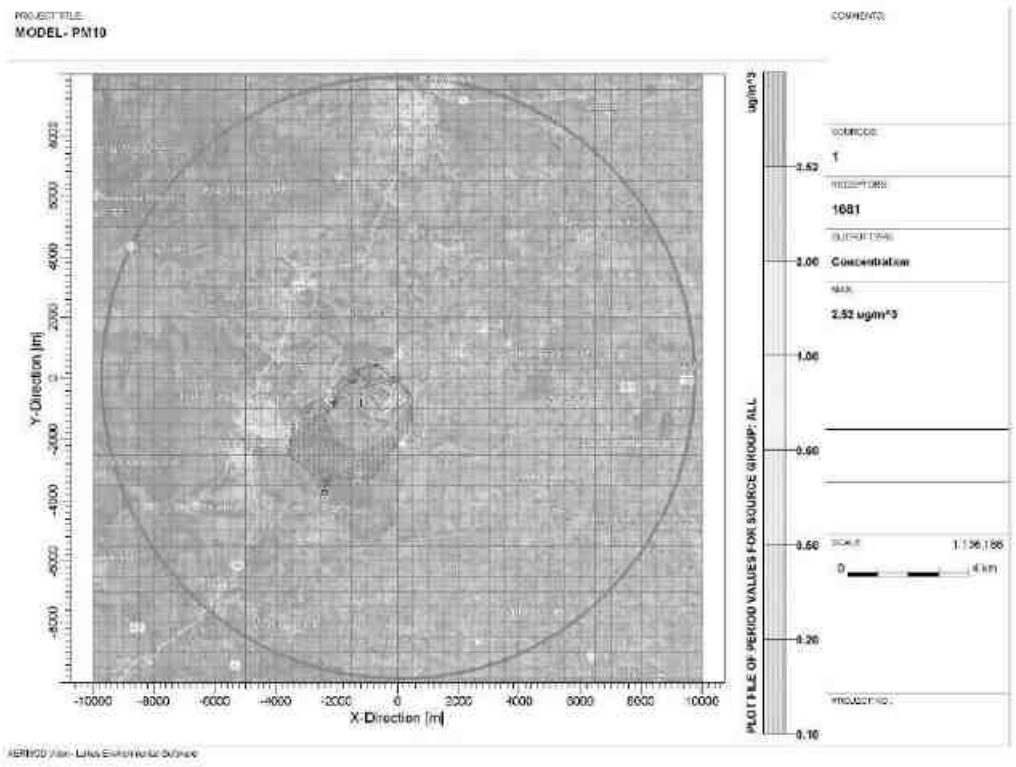


Figure 4-1Isopleth of GLC Prediction for PM10

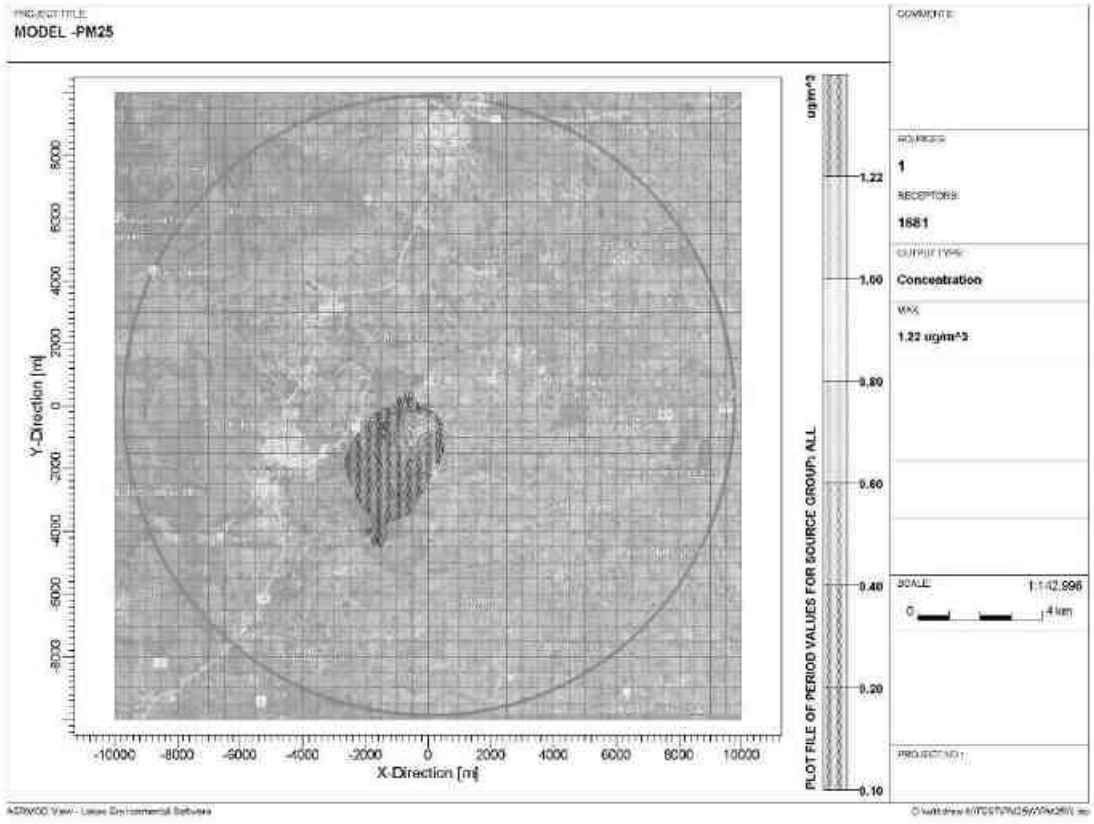


Figure 4-2Isopleth of GLC Prediction for PM2.5

Predicted Ambient Air Quality:

The post project Concentrations of PM10, PM2.5, (GLC) (base line + incremental) after adopting necessary control measures is given in Table No. 4-4 & 4-5

Table 4-4 Concentrations of PM10 after Project Implementation

S. No.	Location	Background Concentration	Predicted incremental Concentration	Post Project Concentration	Statutory Limits in µg/m^3
1.	Project Site	69.1	<1	70.1	100
2.	Sundaresapuram	60.0	<1	61.0	
3.	Shenbaganallur	55.8	<1	56.8	
4.	Thirumalapuram	50.9	<1	51.9	
5.	Chidambaraperi	53.4	<1	54.4	
6.	Periyasamypuram	58.7	<1	59.7	

Table 4-5 Concentrations of PM2.5 after Project Implementation

S. No.	Location	Background Concentration	Predicted incremental Concentration	Post Project Concentration	Statutory Limits in µg/m^3
1.	Project Site	33.9	<1	34.9	60
2.	Sundaresapuram	28.4	<1	29.4	
3.	Shenbaganallur	25.5	<1	26.5	
4.	Thirumalapuram	23.5	<1	24.5	
5.	Chidambaraperi	24.8	<1	25.8	
6.	Periyasamypuram	26.8	<1	27.8	

The above result seems that, even in the worst-case scenario, the resultant added concentrations with baseline figures show that the values of ambient air quality for PM10 are within the statutory limits in each case.

Table 4-6 Impact & Mitigation measures on Noise Environment and vibration

Aspect	Impact	Mitigation Measures
Loading and unloading, Transportation of the excavated mineral.	Usage of Equipments (Excavator – 82 dBA, Tipper - , Jack Hammer), Machinery and trucks used for transportation will generate noise. Noise from the machinery can cause hypertension, high stress level, hearing loss, sleep disturbance etc due to prolonged exposure. Number of vehicles will be increased due to the proposed mining activity hence vehicle may collate which may result in unwanted sound and can also cause impact on human health like breathing and respiratory system, damage to lung tissue, influenza or asthma.	• The machinery will be maintained in good running condition so that noise will be reduced to minimum possible level. • Awareness will be imparted to the workers once in six months about the permissible noise level and effect of maximum exposure to those levels. Adequate silencers will be provided in all the diesel engines of vehicles. • It will be ensured that all transportation vehicles carry a valid PUC Certificates. • Speed of trucks entering or leaving the mine will be limited to moderate speed (20km/hr) to prevent undue noise from empty vehicles. The noise generated by the machinery will be reduced by proper lubrication of the machinery and other equipment. • It is proposed to plant 1200 Nos. of local species (Neem, Mandharai, Athi, Ashoka and Villam) to reduce the impact of noise in the study area. The development of green belts

		around the periphery of the mine will be implemented to attenuate noise. • The trucks will be diverted on two roads and a District Road to avoid traffic congestion. • Health checkup camps will be organized once in six months. • Use of personal protective devices i.e., earmuffs and earplugs by workers, who are working in high noise generating areas. • Provision of quiet areas, where employees can get relief from workplace noise.
Mining activities such as blasting, drilling and movement of machinery	Though vibration will be only felt by the people working inside the lease area it is usually undesired. Vibration may also cause flyrocks. It may frighten the birds and small insects in the lease area. However, it will be felt only for a short period.	• The DG set will be kept within the acoustic enclosure made by the stone blocks. • Drills will be equipped with sharp bits and wet drilling will be adopted. • A well-planned green belt is proposed for the mining to reduce noise level. • Proper warning system before blasting will be adopted and clearance of the area before blasting will be ensured. • Regular maintenance of the machineries and vehicles to reduce the noise level. • Use of ear muffs by the workers with occupational exposure to noise.

		• Carrying out blasting on limited scale, only from 12:00 PM to 2:00 PM • Control of fly rock and vibration by maintaining peak particle velocity within the standard as prescribed by the DGMS and MOEF & CC. • Shallow depth jackhammer drilling and blasting is proposed to be carried out with minimum use of explosive. • Supervising blasting by competent and statutory Foreman/ Mines Manager.

4.2.1 Impact on Socio-economic Environment

Aspect	Impact	Mitigation Measures
Proposed implementation of Mining activity	Land acquisition for the implementation of the project may result in loss of assets, which in return will make the PAP to shift, losing their normal routine and livelihood	The proposed project is a Government Poramboke land and the applicant has obtained tender from the Government and the land is vacant where there is no human settlement within 300m radius. Hence the project does not involve Rehabilitation and resettlement
Loading and Transportation of the mined-out mineral	The mining activities may cause dust emission, noise pollution thereby causing disturbance to the local habitat	No human activity is envisaged near the project site. The nearest human settlement is observed in Sundaresapuram, which is 350m away from the project site.

Grazing and Rearing activities in the nearby villages	The Grazing and rearing of local animals like Sheep, Goat and cows is observed in the nearby villages, which may be affected due to the project as the movement of the vehicles may affect/injure the animals	It is proposed to use graveled road and nearest paved road and preferred not to use unpaved roads. In addition to that, the speed of trucks will be limited to 20km/hr to avoid any accidents
Employment opportunity	The project will improve the livelihood of the local people	After the development of the proposed mine, it will improve the livelihood of local people and also provide the direct and indirect employment opportunities. The rough stone for the infrastructural development in the area will be made available from the local markets at reasonably lower price.
Corporate Environmental Responsibility	The proposed project will help in natural resource augmentation & Community resource development	As a part of CER, Rs. 8,00,000 will be allocated. The detailed agenda, which is to be executed, has been framed. The salient features of the programme are as follows: Provision of Library, Plantation of trees and other developmental facilities to the Panchayat Union Middle School, Sundaresapuram

Table 4-7 Impact & mitigation measures on Biological Environment

Aspect	Impacts	Mitigation Measures

Site Clearance	Loss of habitat due to site clearance which may lead to ecological disturbance.	The proposed mining lease is already a barren land hence no site clearance is required. Only few shrubs and herbs like parthenium sp., prosopis juliflora were present.
Planting of trees	Development of afforestation in the mine lease area will have a positive impact as the land was initially a barren.	7.5m safety distance will be provided all along the boundary of the mine lease area. This will attract avifauna thus enhancing the existing ecological environment.
Mining activities such as drilling, blasting etc.	The mining activity such as drilling, blasting etc. may affect the fauna due to noise and vibration	Sirens will be blown before blasting in the mines. To reduce noise levels, plantation will be done. Blasting will be carried out only in the allotted time.
	Accidental falling of animals	To prevent entry of animals, the mine lease surrounding area will be properly fenced with barbed wire.
Conservation of Wildlife Sanctuary	The proposed mining project is located at a distance of 5.8 km (NW) of Nellai wildlife Sanctuary, which may impact the species present in the sanctuary.	The maximum impact of the propose mining activity in all the aspects will not exceed more than 2 km radius and hence there will not be any significant impact to the Nellai wildlife sanctuary due to the proposed project. In addition to that, Rs. 6,00,000/- (Rs. 2 Lakhs/Hectare) will be provided for the conservation of Nellai Wildlife Sanctuary.

Table 4-8 Impact & mitigation measures on occupational Health and safety

S. No	Aspect	Impact	Mitigation measure

1.	Risk due to the proposed mining	Accidents may occur in the mine area	Proper PPE kit (Safety jacket, Helmet, Safety Shoes, Gloves) etc will be provided to each and every employee in the mine lease concerning the safety of each labor
2.	Screening of Labors	Labors will be checked for health condition before employing them in mining activity	All the labors will be checked and screened for health before employing them After employing them, periodical medical checkups will be held once in every six months
3.	Blasting	Injury to the labours due to the blasting activity	Alarm system in the form of Siren will be engaged in the project site to caution the blasting activity. In addition to that, the blasting activity will be scheduled at particular time – 4.30 P.M to 5.30 P.M (or whenever required) so that the employees will be aware of the activity. Smoking will be banned in the site and sign boards will be displayed in various places at site

5 ANALYSIS OF ALTERNATIVES

5.1 Introduction

Analysis of alternative is a significant aspect in planning and designing any project. Cost benefit analysis should be work out along with other parameters while choosing an alternative in such a way that the production is maximum and the mining operation is environment friendly and cost effective. The mine plan and mine closure plan has been approved prior to submission of the Form-1 and PFR.

ToR issued by the SEIAA-TN vide ToR Identification No. TO24B0108TN5815892N Dated: 22/10/2024. The study for alternative analysis involves in-depth examination of site and technology.

5.2 Analysis for Site Alternative

The proposed project is the mining of Rough Stone Quarry and is proposed after prospecting the area. In other words, these can be implemented in the mineral available zone. Since the mining block has been allotted in principal by the State Government, there is no case for studying and exploring any other site as an alternative.

5.3 Alternatives for Mining Technologies

The open cast mining could be manual/semi-mechanized/mechanized depending upon the geological and topographical setup of the mineral (ROM) to be won and the daily/annual targeted production.

Sr. No.	Particular	Alternative Option 1	Alternative Option 2	Remarks
1.	Technology	Opencast semi mechanized mining	Opencast mechanized mining	Opencast mechanized mining is preferred
2.	Employment	Local employment.	Outsource employment	Local employment is preferred Benefits: Provides employment to local people along with financial benefits No residential building/ housing is required.
3.	Labour transportation	Public transport	Private transport	Local labors will be deployed from Sundaresapuram, Valasai, Meenatchipuram so they will either reach mine site by bicycle or by foot. Benefits: Cost of transportation of labors will be negligible

4.	Material transportation	Public transport	Private transport	Material will be transported through trucks/trolleys on the contract basis Benefits: It will give indirect employment.
5.	Water	Private Tankers	Ground water	Water will be supplied from private tankers

6 ENVIRONMENTAL MONITORING PROGRAM

6.1 Introduction

This chapter covers the planned environmental monitoring program. It also includes the technical aspects of monitoring the effectiveness of mitigation measures. Monitoring is important to measure the efficiency of control measures. Post project monitoring of environmental parameters is of key importance to assess the status of environment. The monitoring program will serve as an indicator for identifying environmental degradation due to operation of the project and help in selection of appropriate mitigation measures to safeguard the environment.

Regular monitoring is as important as control of pollution since the efficacy of control measures can only be determined by monitoring. The project proponent will carry out the post project environmental monitoring (PPM) and timely compliance report submission to various regulatory authorities.

Therefore, regular monitoring programme of the environmental parameters is essential to take into account the changes in the environmental quality. The objectives of monitoring are to: -

- Verify effectiveness of planning decisions;
- Measure effectiveness of operational procedures;
- Confirm statutory and corporate compliance; and
- Identify unexpected changes.

Table 6-1 Monitoring Schedule during mining

S. No.	Attributes	Parameters	Frequency	Location
1.	Ambient Air Quality at Mine Site & Fugitive Dust Sampling	PM 10, PM 2.5, SO_2, NO_X	Once in a Month	Project Site & Sundaresapuram
2.	Ground water Quality	Drinking Water Parameters, as per IS - 10500: 2012	Half yearly	Project Site & Sundaresapuram
3.	Surface Water Quality	Class will be assessed as per the CPCB Guidelines	Half yearly	Project Site & Sundaresapuram
4.	Soil Quality	(Organic matter, Texture, pH, Electrical Conductivity, Permeability, Water holding capacity, Porosity)	Half yearly	Project Site & Sundaresapuram
5.	Noise Level Monitoring	Noise level in dB(A) Quarterly/half yearly	Half yearly	Project Site & Sundaresapuram

6.2 MEASUREMENT METHODOLOGY

Table 6-2 measurement Methodology

Ambient Air Quality	Ambient air quality will be monitored for SO_2, NO_x, PM_{10} and $PM_{2.5}$. The instruments like high volume air samplers and Respirable dust samplers would be used for this purpose. These parameters will be monitored as mentioned in the monitoring schedule previously.
Water Quality	Water quality analysis will be done quarterly and the monitored parameters include pH, Temperature, TDS, etc. as specified by SPCB from time to time.
Noise Monitoring	Noise level will be monitored in working environment mainly noise producing sources over the boundary and around the mining area.
Green Belt and Afforested area	Continuous vigilance and monitoring of green belt will be done for performance and survival rate of the saplings. Watch and ward personnel will properly guard the plantation. Provision will be made for fertilizers application and watering on schedule.
Socio-Economics	Socio-economic of the core and buffer zone details elaborated in Chapter-3.

Reports to be generated

The Project Proponent will maintain records of each test and its interpretation so as to formulate an adequate Environmental Management Plan. The set of records planned to be maintained by Project Proponent are given in below table 6.2.

Table 6-3 Important records to be maintained by PP

S. No.	Particulars
1	Monitoring results for Air, Water & Soil.
2	Records of slope failure, land erosion & drainage.
3	Plantation Records
4	Environmental and related standards/ norms
5	Records pertaining to statutory consents, approvals.
6	Periodic Medical examination (PME) records.
7	Complain register (Environmental pollution)
8	Records on water and electricity consumption
9	Periodic progress records.
10	Environmental Expenses Records

7 ADDITIONAL STUDIES

7.1 General

This chapter covers the details of the additional studies viz. Risk assessment, Disaster Management, Public Hearing, Rehabilitation and resettlement

7.2 Public Consultation

As the proposed mining project falls under 1(a), Category B1 – Cluster Mining, the project involves the Public Consultation and the same will be conducted under SPCB (TN) in Thenkasi District. The proceedings of the same will be incorporated in the Final EIA Report

7.3 Risk Assessment and Management

Mining and allied activities are associated with several potential hazards both to the employees and the public at large. A worker in a mine should be able to work under conditions that are adequately safe and healthy. At the same time the environmental conditions should be such as not to impair his working efficiency. The various safeguards to be taken to ensure the safety of the mine and that of employees are provided in the Mines Act, 1952. Risk involves the occurrence or potential occurrence of some accidents consisting of an event or sequence of events. The risk assessment study covers the following:

- Identification of potential hazard areas
- Identification of representative failure cases
- Assess the overall damage potential of the identified hazardous events and the impact zones from the accidental scenarios
- Assess the overall suitability of the site from hazard minimization and disaster mitigation point of view
- Furnish specific recommendations on the minimization of the worst accident possibilities
- Preparation of broad DMP, On-site and Off-site Emergency Plan, which includes Occupational Health and Safety Plan

The complete mining will be carried out under the management control and direction of a qualified mine manager holding a manager's certificate of competency.

Moreover, mining staff will be sent to refresher courses from time to time to keep them alert. However, following natural/industrial hazards may occur during normal operation:

- Accident due to explosives
- Accident due to heavy mining equipment; and
- In order to take care of above hazard/disasters, the following control measures will be adopted.
- All safety precautions and provisions of the Mine Act, 1952, the MMR, 1961 and the 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's 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
- Training and refresher courses for all the employees working in hazardous premises; under mines rules all employees of mines will have to undergo the training at a regular interval working of mine, as per approved plans and regularly updating the mine plans.
- Cleaning of mine faces will be regularly done.
- Handling of explosives, charging and blasting will be carried out by competent persons only.
- Regular maintenance and testing of all mining equipment as per manufacturer's guidelines.
- Suppression of dust on the haulage roads. Adequate safety equipment will be provided at explosive magazine
- Increasing the awareness of safety and disaster through competitions, posters and other similar drives. For any type of above disaster, a rescue team will be formed by training the mining staff with specialized training.

7.3.1 Identification of hazards in open cast mining

There are various factors, which can cause disaster in the mines. These hazards are as follows: Identification of Hazards in Opencast Mine is given in below,

- Drilling
- Blasting
- Overburden handling
- Heavy Machinery

Drilling:

The drilling is carried out using jack hammers with a diameter of hole is 32-36 mm up to 1.5m long drilling will be utilized. The breakages of drill rods may blast injuring the nearby personnel. These can be easily remedied as follows:

- Maintain and operating the equipment's as per the manufacturer's manual.
- Compressor is kept at a safe distance from the main operation area and operated, so that in the event of any disruption the personnel in the operating area are safe.

Blasting:

Most of the accidents from blasting occur due to the projectiles, as they may sometimes go even beyond the danger zone, mainly due to overcharging of the shot-holes as a result of certain special features of the local ground. Flying rocks are encountered during initial and final blasting operations. Vibrations also lead to displacement of adjoining areas. Dust and noise are also problems commonly encountered during blasting operations.

The blasting is the predominating method of breaking rocks in various surface and underground mines. At the same time some damaging impacts on environment are evident: noise, gas, dust, fly rock and ground vibration.

The considering factor is most important for safety of natural objects in the vicinity of mining area.

The ground vibration parameters, crucial for safety of endangered objects have a significant correlation with charge weight and distance of blasting.

This study tried to associate the main vibration parameter, particle velocity with blasting parameters and properties of vibration medium.

- Precautionary Measures to Avoid Accidents due to Blasting
- The lessee is advised to store the explosives as per the Indian Explosive act, 1958
- The explosives to be used in mines being a small quantity, the district collector may be approached to keep the stocks not exceeding 5kgs at time or any other quantity permined by the concerned authorities in a portable magazine of S & B types.
- The lessee is advised to engage an authorized explosive agency to carry out proposed control blasting.
- The Proposed Control Blasting time at a day is proposed to 5PM to 6 PM.
- First Aid Box will be keeping ready at all the time.
- Necessary precautionary announcement will be carried out before the proposed Control Blasting operation.

Overburden handling

No overburden will be generated in the proposed project and side burden dump may cause and slides. High side burden dump created at the quarry edge may cause sliding of the side burden dump or may cause failure of the pit slope due to excessive loading, thereby causing loss of life and property.

Heavy machinery

Most of the accidents during transport of tippers and other heavy vehicles are often attributable to mechanical failures and human errors.

7.3.2 Precautionary Measures to Prevent Accidents due to Trucks and Dumpers

All transportation within the main working shall be carried out directly under the supervision and control of the management.

The vehicles must be maintained in good condition and checked thoroughly at least once a week by the competent person authorized for the purpose by the Management.

Road signs shall be provided at each and every turning point especially for the guidance of the drivers at the night.

To avoid danger while reversing vehicles especially at the embankment and tipping points, all areas for reversing of lorries should as far as possible be made man free.

A statutory provision of the fences, constant education, training etc. will go a long Way in reducing the incidents of such accidents.

A Load consisting of large rocks must not be over the edge. This is unsafe and may damage equipment.

The movement of the dumpers will be governed under the Code of Traffic rule.

Storage of explosives

There will not be any storage of explosives during the operation of the quarry. The blasting will be done by contractors authorized by the Government.

Safety measures at site

- Adequate care has been taken in deciding the size of the bench for the working as well as ultimate pit.
- Adequate drainage system at the top of the pit and also on the benches shall be made to prevent erosion of the benches.
- The quarries will be protected by garland drains around the periphery for storm water drainage.

7.4 Disaster Management Plan:

7.4.1 Objective

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. For effective implementation of the disaster management plan, it should be widely circulated and personnel training through rehearsals/drills. 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;
- Identify any dead;
- Provide for the needs of relatives;
- Provide authoritative information to the news media;
- Secure the safe rehabilitation of affected area and
- Preserve relevant records and equipment for the subsequent inquiry into the cause and circumstances of the emergency.

In effect, it is to optimize operational efficiency to rescue rehabilitation and render medical help and to restore normalcy.

EMERGENCY ORGANIZATION (EO):

It is recommended to setup an emergency organization. A senior executive (mine manager) who has control over the affairs of the mine would be heading the emergency organization. He would be designated as site controller. As per the general organization chart, in the mines, the mines manager would be designated as the Incident Controller (IC). The

incident controller would be reporting to the site controller. Each incident controller, for him-self, organizes a team responsible for controlling the incidence with the personnel under his control. Shift In-charge would be the reporting officer, who would bring the incidence to the notice of the incidence controller and site controller. Emergency coordinators would be appointed who would undertake the responsibilities like firefighting, rescue, rehabilitation, transport and provide essential and support services. For this purposes, Security in-charge, personnel department, essential services personnel would be engaged. All these personnel would be designated as key personnel.

In each shift, electrical supervisor, electrical fitters, pump house in-charge and other maintenance staff would be drafted for emergency operations. In the event of power or communication system failure, some of staff members in the mine offices would be drafted and their services would be utilized as messengers for quick passing of communications. All these personnel would be declared as essential personnel.

EMERGENCY COMMUNICATION (EC):

Whoever notices an emergency situation such as fire, growth of fire etc. would inform his immediate superior and Emergency Control Center (ECC). The person on duty in the emergency control center would appraise the site controller. Site Controller verifies the situation from the incident controller of that area or the Shift In-charge and takes a decision about an impending on site emergency. This would be communicated to the entire incident controllers, emergency coordinators. Simultaneously, the emergency warning system would be activated on the instructions of the site controller.

EMERGENCY RESPONSIBILITIES:

The responsibilities of the key personnel are appended below:

Site Controller:

On receiving information about emergency, he would rush to emergency control center and take charge of ECC and the situations which all are given below:

Assesses the magnitude of the situation on the advice of incident controller and decides;

- Whether the affected area needs to be evacuated;
- Whether personnel who are at assembly points need to be evacuated;
- Declares Emergency and orders for operation of emergency siren;
- Organizes announcement by public address system about location of emergency;
- Assesses which areas are likely to be affected, or need to be evacuated or are to be alerted;
- Maintains a continuous review of possible development and assesses the situation in consultation with Incident Controller and other Key Personnel as to whether shutting the mine operation required and if evacuation of persons is required;
- Directs personnel for Rescue, rehabilitation, transport, fire, brigade, medical and other designated mutual support systems locally available, for meeting emergencies;

- Controls evacuation of affected areas, if the situation is likely to go out of control or effects are likely to go beyond the mine boundary, informs to District Emergency Authority, Police, Hospital and seeks their intervention and help;
- Informs the statutory authorities;
- Gives a public statement if necessary;
- Keeps record of chronological events and prepares an investigation report and preserves evidence; and
- On completion of On-Site Emergency and restoration of normalcy, declares all clear and orders for all clear warning.

Incident Controller:

- Assembles the incident control team;
- Directs operations within the affected areas with the priorities for safety to personnel; minimize damage to property and environment and minimize the loss of materials;
- Directs the shutting down the operations and areas likely to be adversely affected by the emergency;
- Ensures that all key personnel help is sought;
- Provides advice and information to the Fire and Security Officer and the Local Fire Services as and when they arrive;
- Ensures that all non-essential workers/staff of the affected areas evacuated to the appropriate assembly points, and the areas are searched for causalities;
- Has regard to the need for preservation of evidence so as to facilitate any inquiry into the cause and circumstances which caused or escalated the emergency;
- Co-ordinates with emergency services at the site;
- Provides tools and safety equipment to the team members;
- Keeps in touch with the team and advise them regarding the method of control to be used; and
- Keeps the Site Controller of Emergency informed of the progress being made.

Emergency Coordinator – Rescue, Fire Fighting

- On knowing about emergency, rushes to ECC;
- Helps the incident Controller in containment of the emergency;
- Ensure fire pumps in operating conditions and instructs pump house operator to ready for any emergency with standby arrangement;
- Guides the firefighting crew i.e. firemen, trained mine personnel and security staff;
- Organizes shifting the firefighting facilities to the emergency site, if required;
- Takes guidance of the Incident Controller for firefighting as well as assesses the requirements of outside help;
- Arranges to control the traffic at the incident area;

- Directs the security staff to the incident site to take part in the emergency operations under his guidance and supervision;
- Evacuates the people in the mine or in the nearby areas as advised by Site Controller;
- Searches for casualties and arranges proper aid for them;
- Assembles search and evacuation team;
- Arranges for safety equipment for the members of this team;
- Decides which paths the evacuated workers should follow; and
- Maintains law and order in the area, and if necessary, seeks the help of police.

Emergency Coordinator – Medical, Mutual Aid, Transport and Communication. In the event of failure of electric supply and thereby internal telephone, sets up communication point and establishes contact with the Emergency Control Center (ECC).

- Organizes medical treatment to the injured and if necessary, will shift the injured to nearby hospitals;
- Mobilizes extra medical help from outside, if necessary;
- Keeps a list of qualified first aiders of the mines and seek their assistance;
- Maintains first aid and medical emergency requirements;
- Makes sure that all safety equipment is made available to the emergency team;
- Assists Site Controller with necessary data and to coordinate the emergency activities;
- Assists Site Controller in updating emergency plan, organizing mock drills verification of inventory of emergency facilities and furnishing report to Site Controller;
- Maintains liaison with Civil Administration;
- Ensure availability of canteen facilities and maintenance of rehabilitation center;
- He will be in liaison with Site Controller/Incident Controller;
- Ensure transportation facility;
- Ensures availability of necessary cash for rescue/rehabilitation and emergency expenditure;
- Controls rehabilitation of affected areas on discontinuation of emergency; and
- Makes available diesel/petrol for transport vehicles engaged in emergency operation.

Emergency Coordinator – Essential Services:

He would assist Site Controller and Incident Controller;
Maintains essential services like Diesel Generator, Water, Fire Water, power supply for lighting;
Gives necessary instructions regarding emergency electrical supply, isolation of certain sections etc. to shift in-charge and electricians; and
Ensures availability of adequate quantities of protective equipment and other emergency materials, spares etc.

GENERAL RESPONSIBILITIES OF EMPLOYEES DURING AN EMERGENCY:

During an emergency, it becomes more enhanced and pronounced when an emergency warning is raised, the workers in-charge, should adopt safe and emergency shut down and attend any prescribed duty as essential employee. If no such responsibility is assigned, he should adopt a safe course to assembly point and await instructions. He should not resort to spread panic. On the other hand, he must assist emergency personnel towards objectives of Disaster Management Plan.

EMERGENCY FACILITIES:

Emergency Control Center (ECC): The Mine Office Block is identified as Emergency Control Center. It would have external Telephone, Fax, and Telex facility. All the Site Controller/ Incident Controller Officers, Senior Personnel would be located here. Also, it would be an elevated place.

The following information and equipment are to be provided at the Emergency:

Control Center (ECC):

- Intercom, telephone;
- Safe contained breathing apparatus;
- Fire suit/gas tight goggles/gloves/helmets;
- Hand tools, wind direction/velocities indications;
- Public address megaphone, hand bell, telephone directories;
- Mine layout, site plan;
- Emergency lamp/torch light/batteries;
- Plan indicating locations of hazard inventories, sources of safety equipment, work road plan, assembly points, rescue location vulnerable zones, escape routes;
- Hazard chart;
- Emergency shut-down procedures;
- Nominal roll of employees;
- List of key personnel, list of essential employees, list of Emergency Coordinators;
- Duties of key personnel;
- Address with telephone numbers and key personnel, emergency coordinator, essential employees; and
- Important address and telephone numbers including Government agencies, neighbouring industries and sources of help, outside experts, population details around the Mine.

Assembly Point:

Number of assemblies depending upon the mine location would be identified wherein employees who are not directly connected with the disaster management would be assembled for safety and rescue. Emergency breathing apparatus, minimum facilities like water etc. would be organized. In view of the size of mine, different locations should be ear marked as assembly points. Depending upon the location of hazard, the assembly points are to be used.

Emergency Power Supply:

Mine facilities are connected to power supply from the SEB. In the event of any grid supply failure, Diesel Generator will be provided at the mine, which is operated as soon as any power failure occurs. Thus water pumps, mine lighting and emergency control center, administrative building and other auxiliary services are connected to emergency power supply. In all the blocks flame proof type emergency lamps would be provided.

Fire Fighting Facilities:

First aid firefighting equipment suitable for emergency should be maintained in each operation areas of the mine as per statutory requirements.

Location of Wind Sock:

On the top of the administration block, windsocks would be installed to indicate direction of wind for emergency escape.

Emergency Medical Facilities:

Stretchers, gas masks and general first aid materials for dealing with chemical burns, fire burns etc. would be maintained in the medical center as well as in the emergency control room. Private medical practitioners help would be sought. Government hospital would be approached for emergency help.

First aid facilities would be augmented. Names of medical personnel, medical facilities in the area would be prepared and updated. Necessary specific medicines for emergency treatment of burns patients and for those affected by toxicity would be maintained.

Breathing apparatus and other emergency medical equipment would be provided and maintained. The help of nearby industrial managements in this regard would take on mutual support basis.

Ambulance:

An ambulance with driver availability in all the shifts, emergency shift vehicle would be ensured and maintained to transport injured or affected persons. Number of persons would be trained in first aid so that, in every shift first aid personnel would be available.

EMERGENCY ACTIONS:

Emergency Warning:

Communication of emergency would be made familiar to the personnel inside the mine and people outside. An emergency warning system would be established.

Evacuation of Personnel:

In the event of an emergency, unconnected personnel have to escape to assembly point. Operators have to take emergency shutdown procedure and escape. Time Office maintains a copy of deployment of employees in each shift. If necessary, persons can be evacuated by rescue teams.

All Clear Signal:

Also, at the end of an emergency, after discussing with Incident Controllers and Emergency coordinators, the Site Controller orders an all-clear signal. When it becomes essential, the site controller communicates to the district emergency authority, police and fire service personnel regarding help required or development of the situation into an Off-Site Emergency

GENERAL:

Employee Information:

During an emergency, employees would be warned by raising siren in specific pattern. Employees would be provided with information related to fire hazards, antidotes and first aid measures. Those who would designate as key personnel and essential employees should be given training to emergency response.

Co-ordination with Local Authorities:

Keeping in view of the nature of emergency, two levels of coordination are proposed. In the case of an On Site Emergency, resources within the organization would be mobilized and in the event extreme emergency local authorities help should be sought.

In the event of an emergency developing into an offsite emergency, local authority and District emergency Authority (normally the Collector) would be appraised and under his supervision, the Off Site Disaster Management Plan would be exercised. For this purpose, the facilities that are available locally, i.e. medical, transport, personnel, rescue accommodation, voluntary organizations etc. would be mustered. Necessary rehearsals and training in the form of mock drills should be organized.

Mutual Aid:

Mutual aid in the form of technical personnel, runners, helpers, special protective equipment, transport vehicles, communication facility etc. should be sought from the neighbouring industrial management's.

Mock Drills:

Emergency preparedness is an important aspect of planning in Industrial Disaster Management. Personnel would be trained suitably and prepared mentally and physically in emergency response through carefully planned, simulated procedures. Similarly, the key personnel and essential personnel should be trained in the operations.

Important Information

Important information such names and addresses of key personnel, essential employees, medical personnel, transporters address, address of those connected with Off Site Emergency such as Police, Local Authorities, Fire Services, District Emergency Authority should be prepared and maintained.

The Unit Head is in charge for disaster management and monitors all activities related to disaster management/risk assessment in case of any such situations.

Care and maintenance during temporary discontinuance:

In case, of any temporary closure or discontinuous of mining operations, the following steps are proposed.

a. Notice to be served to all concerned authority.

b. The mining pit area shall be covered by temporary fencing.

c. Watchman will be posted round the clock to prevent any unauthorized or inadvertent entry of public.

d. Works on stabilization of dumps to provided vegetal cover would be taken up.

e. Construction of garland or retaining walls around the dumps will be attempted.

f. Watering of plants in the afforested area will be considered.

g. All safety precautions shall be taken care off as per rule.

7.5 Cumulative Environmental Impact Assessment Study

The cumulative production load of existing and proposed rough stone quarries within cluster is shown in below table.

Description		P1	P2	P3
Name of the Quarry		V. M. Sundaraiah	M. Kalyanasundaram	V. M. Sundaraiah
Geological Resources in m3	Rough stone	7,45,079	11,78,000	8,28,065
	Gravel	81,745	62,000	-
Mineable Reserves in m3	Rough stone	2,15,679	4,30,403	3,77,765
	Gravel	59,205	47,044	-
Five years plan period as in the approved mining plan	Rough stone	2,15,679	4,30,403	3,77,765
	Gravel	59,205	47,044	-
Production per day in m^3	Peak Production	223.75	368.32	252.35
Lorry Loads per day in Nos	-	23	37	26
Employment in Nos		15	38	25
Proposed Depth in meters		45 m	40 m (2m Gravel + 38m Rough Stone)	40 m (AGL) Existing Depth - 15m (Max) AGL
Status of the quarry		Existing	Existing	Proposed

Based on the above production quantities the emissions due to various activities in all the 3 mines (2 Existing + 1 Proposed) includes various activities like ground preparation, excavation, handling and transport.

Emission Estimation from Cluster

The AERMOD atmospheric dispersion modeling (AERMOD Cloud remote version) is used for assessment of incremental Ground level concentration (GLC) for the cluster area. Area source model taken into consideration taking into consideration of wet drilling and loading of the cluster mines. Further line source model was taken into consideration for transportation through haul road. Baseline meteorological studies were conducted for the period of October - December 2024. The following sources are considered.

Emission sources & Quantification of the cluster area:

Various point and non-point sources of emissions from Proposed Rough Stone Quarry of Thiru. V. M. Sundaraiah is quantified and presented below:

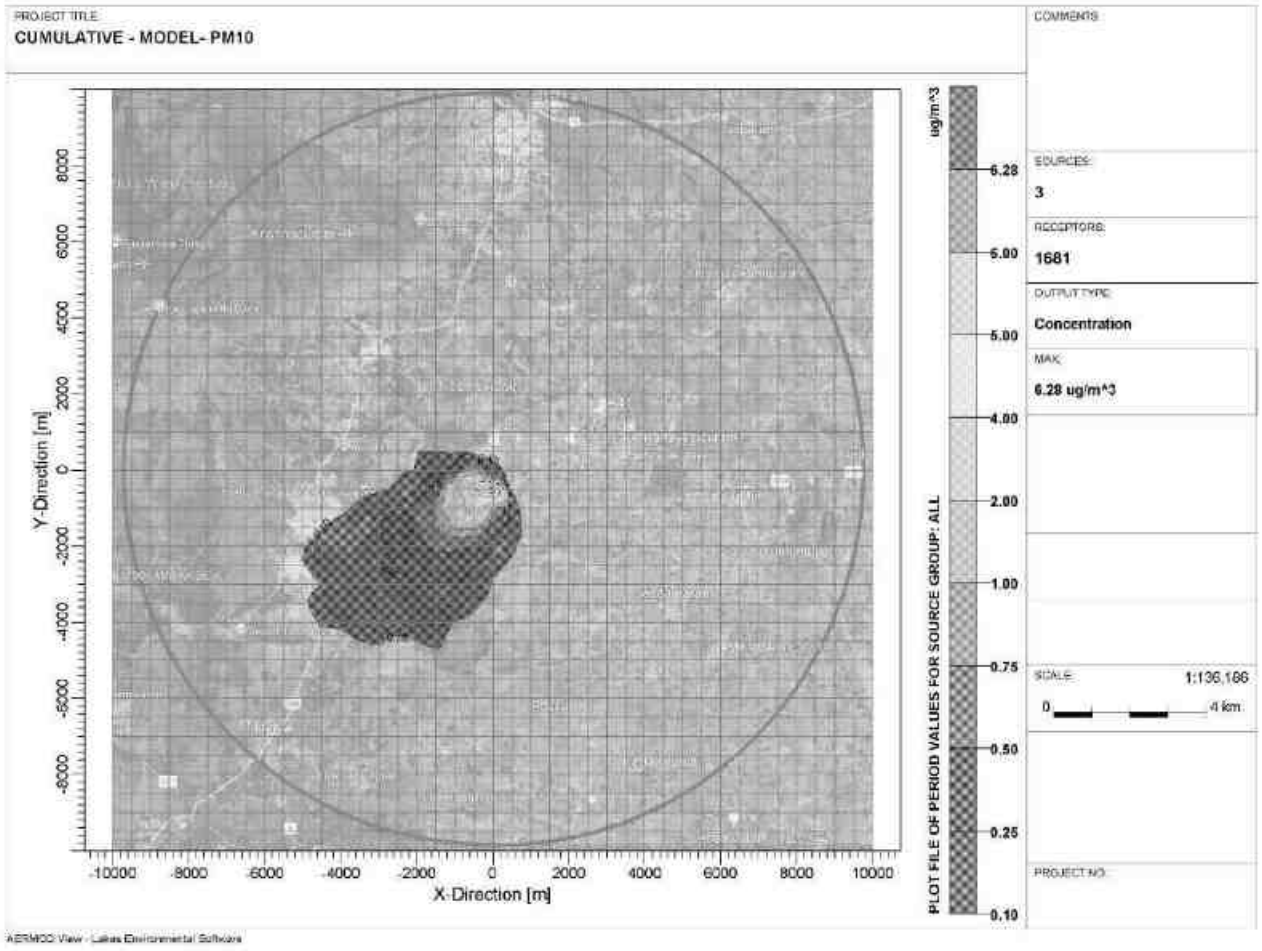


Figure 7-1 Isopleth of GLC Prediction – Cumulative for PM 10

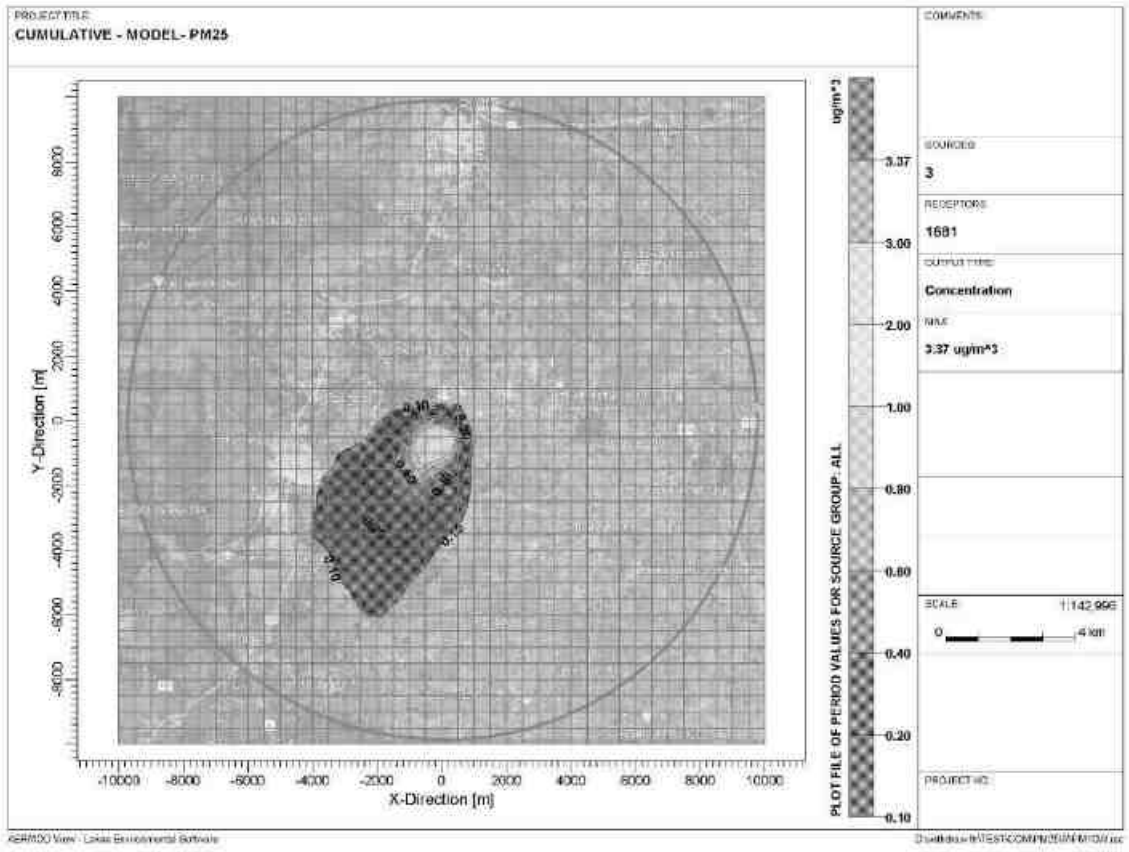


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Figure 7-2 Isopleth of GLC Prediction – Cumulative for PM 2.5

Predicted Ambient Air Quality:

The post project Concentrations of PM10, PM2.5, (GLC) (base line + incremental) after adopting necessary control measures is given in Table No. 7-1 & 7-2

Table 7-1 Concentrations of PM 10 after Project Implementation

S. No.	Location	Background Concentration	Predicted incremental Concentration	Post Project Concentration	Statutory Limits in µg/m^3
1.	Project Site	69.1	3.7	72.8	100
2.	Sundaresapuram	60.0	1.5	61.5	
3.	Shenbaganallur	55.8	3.7	59.5	
4.	Thirumalapuram	50.9	4.1	55	

5.	Chidambaraperi	53.4	1.3	54.7	
6.	Periyasamypuram	58.7	2	60.7	

Table 7-2 Concentrations of PM 2.5 after Project Implementation

S. No.	Location	Background Concentration	Predicted incremental Concentration	Post Project Concentration	Statutory Limits in µg/m^3
1.	Project Site	33.9	1	34.9	60
2.	Sundaresapuram	28.4	<1	29.4	
3.	Shenbaganallur	25.5	1.2	26.7	
4.	Thirumalapuram	23.5	1.3	24.8	
5.	Chidambaraperi	24.8	<1	25.8	
6.	Periyasamypuram	26.8	<1	27.8	

The above results seem that, even in the worst-case scenario, the resultant added concentrations with baseline figures show that the values of ambient air quality for PM10 are within the statutory limits. The mitigation measures undertaken in the mine for control of air pollution are given below.

- Wet drilling will be practiced in drilling operation.
- Water sprinkling will be done in haul roads & loading etc.
- The mines workers are provided with the dust masks.
- DG sets shall be periodically maintained as per manufacturer's specifications.

7.6 Progressive Mine Closure Plan

There is no proposal for back filling, reclamation and rehabilitation. The quarried pits after the end of the life of lease will be fenced to prevent inherent entry of public and cattles. Measures will be taken as per the Acts and Rules. The quarried pit will be fenced by using Barbed wire fencing to prevent inherent entry of public and cattle. Drilling will be carried out by wet drilling mode to control the dust propagation into the air.Blasting will be carried out on limited scale. Mist Water spraying on haul road is proposed to prevent the dust propagation into the air.

7.7 Slope Stability Study

The proposed quarry is a very small quarry and the production is also less. Opencast Semi-mechanized mining with a bench height of 5m and bench width of 5m and 45° Slope is proposed. The depth of mining is proposed as 40m (AGL), which is the ultimate pit limit. Also, there is no overburden since the entire mined out material will be utilized.

As far as technical factors are concerned, the following precautionary measures will be adopted:

- Strict adherence to DGMS norms
- Frequent inspection by Mines-in-charge/Mines Manager

7.8 Natural Resource Conservation

There are no natural resources within the premises. The conservation strategies for energy will be followed in the proposed mine lease area. The pollutants of the mine will be minimized by adopting appropriate mitigation measures as mentioned Chapter 4 to prevent the effects on nearest water bodies. No surface runoff from the project site will be let into the nearby waterbody. Nellai Wildlife Sanctuary is located at a distance of 5.8 km, NW and EMP cost of Rs. 6 Lakhs will be provided for the conservation of the same.

7.9 Reclamation and Rehabilitation:

It is a fresh mining lease applied area. Reclamation and rehabilitation will be carried out at the end of the life of the mine. The mined-out pit is proposed to be used as small reservoir for storing much needed rainwater at the end of the life of the mine when the mine reaches its ultimate pit limit. Since the surrounding areas are dry and experiences low rainfall, any amount of storage of water will be beneficial for recharging the groundwater in the adjacent areas. Along the permanent roads and vacant places, afforestation is being carried out at present. Before closure of the mine, barbed fencing wire will be constructed to prevent inadvertent entry of cattle and human beings. A watchman (Security guard) will be posted around the clock to prevent inherent entry of public and cattle which are growing in and around the area

8 PROJECT BENEFITS

8.1 General

This chapter covers the benefits accruing to the locality, neighbourhood, region and nation as a whole. It brings out the details of benefits by way of improvements in the physical infrastructure, social infrastructure, employment potential and other tangible benefits.

8.2 Improvements in the physical infrastructure

The opening of the proposed project will enhance the following physical infrastructure facilities in the adjoining areas:

a. Market: Generating useful economical resource for construction. Due to demand supply chain, excavated mineral (Rough stone & Gravel) will be sold in the market in the affordable price.

b. Infrastructure: The excavated rough stone and gravel will be used for Laying Roads, Building & Construction Projects, Bridges.

c. Enhancement of Green Cover & Green Belt Development: As a part of reclamation plan, native tree species will be planted along the safety boundary (0.97.5 Ha) of the mine lease area. A suitable combination of trees that can grow fast and also have good leaf cover will be adopted to develop the green belt. It is proposed to plant 330 numbers of native species along with some fruit bearing and medicinal trees during the mining plan period.

8.3 Improvements in the Social Infrastructure

The mining in the area will create rural employment. During site visit, it has been observed that the economic conditions of the villages in the study area is quite normal. After the development of the proposed mine, it will improve the livelihood of local people and also provide the indirect employment opportunities. The rough stone and gravel for the infrastructural development in the area will be made available from the local markets at reasonably lower price.

As a part of CER, Rs. 8 Lakhs will be allocated. The detailed agenda, which is to be executed has been framed. The salient features of the programme are as follows:

Provision of Library, Plantation of trees and other developmental facilities to the Panchayat Union Middle School, Sundaresapuram

8.4 Employment potential – Skilled; Semi-skilled and unskilled

The proposed project will create direct and indirect employment within nearby areas, depending upon the availability of skilled and unskilled manpower. During mining, about 30 people will be employed.

8.5 Other tangible benefits

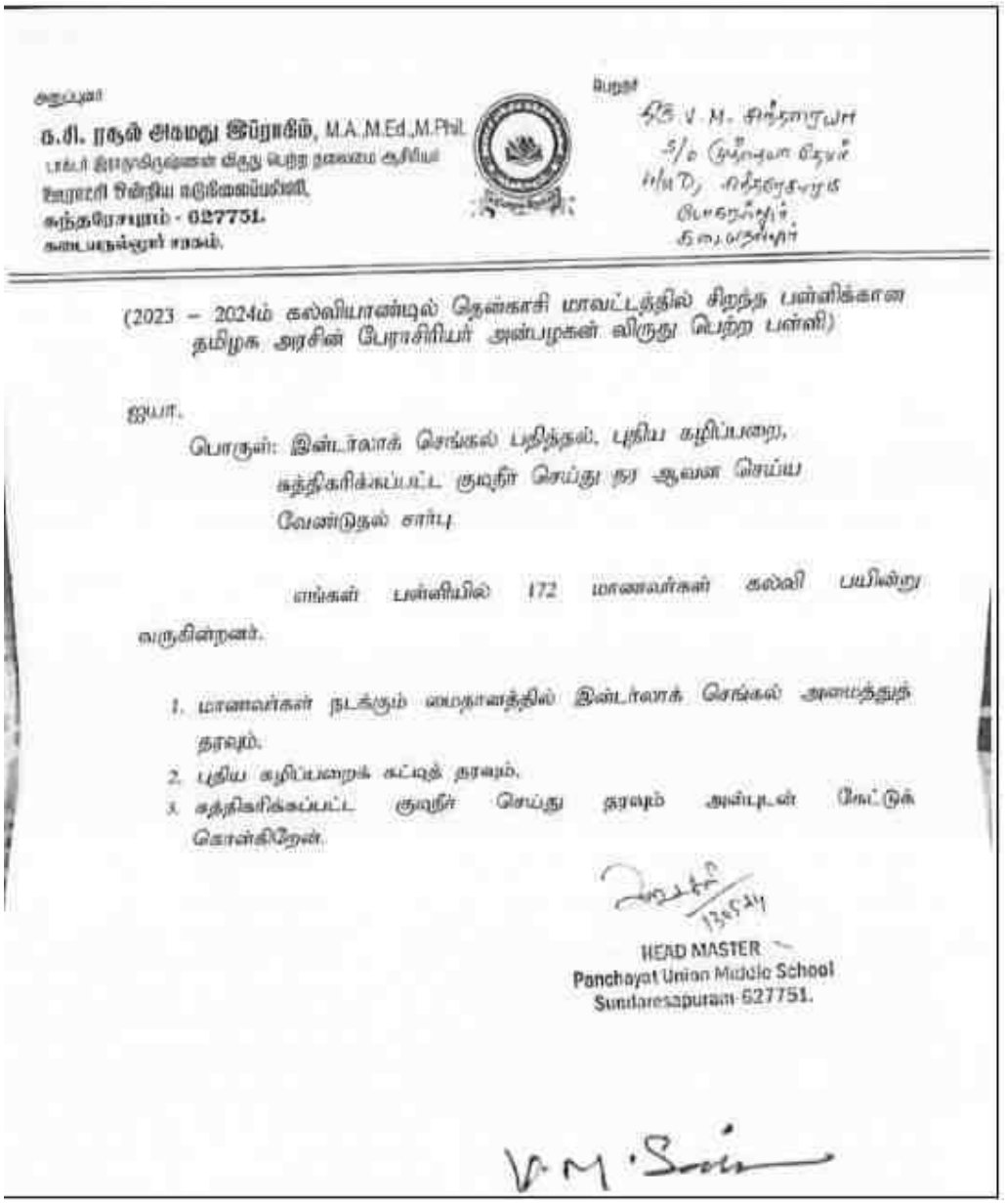
As mentioned above, the project will have employment & trade opportunities with the inception of the quarrying activities. Thus, these considerable employment & trade opportunities will eventually result in appreciable economic benefits to the local people & businesses/contractors.

8.5.1 Corporate Social Responsibility

The CER funds will be utilised for the following activities to Panchayat Union Middle School, Sundaresapuram

S. No.	Proposed CER Activities	Cost in Lakhs
1	♣ Establishment of Library ♣ Plantations inside the school premises (50 Nos.) ♣ Flooring the school campus with interlocking bricks ♣ Establishment of RO treated drinking water facilities ♣ inside the school campus ♣ Construction of toilet and maintenance of the same for the entire lease period	8.00
	Total CER Cost	8.00

Figure 8-1 Photos of Panchayat Union Middle School, Sundaresapuram



அனுப்புனர்

ந.மி. ரசூல் அகமது இப்ராகிம், M.A.,M.Ed.,M.Phil.,
பட்டம் இரண்டிற்கான விருது பெற்ற தலைமை ஆசிரியர்
ஊராட்சி ஒன்றிய நடுநிலைப்பள்ளி,
சுந்தரேசபுரம் - 627751.
கடையநல்லூர் வட்டம்.

பெறுநர்

திரு V. M. சுந்தரராஜா
S/o முத்தையா பிள்ளை
M/s D. சுந்தரேசபுரம்
பொதுநபர்
கடையநல்லூர்

(2023 – 2024ம் கல்வியாண்டில் தென்காசி மாவட்டத்தில் சிறந்த பள்ளிக்கான தமிழக அரசின் பேராசிரியர் அன்பழகன் விருது பெற்ற பள்ளி)

ஐயா,

பொருள்: இண்டர்லாக் செங்கல் பதித்தல், புதிய கழிப்பறை, கத்திகரிக்கப்பட்ட குடிநீர் செய்து தர ஆவன செய்ய வேண்டுதல் சார்பு

எங்கள் பள்ளியில் 172 மாணவர்கள் கல்வி பயின்று வருகின்றனர்.

1. மாணவர்கள் நடக்கும் மைதானத்தில் இண்டர்லாக் செங்கல் அமைத்துத் தரவும்.
2. புதிய கழிப்பறைக் கட்டித் தரவும்.
3. கத்திகரிக்கப்பட்ட குடிநீர் செய்து தரவும் அன்புடன் கேட்டுக் கொள்கிறேன்.

13/5/24

HEAD MASTER
Panchayat Union Middle School
Sundaresapuram-627751.

V. M. Sun

Figure 8-2 Copy of letter from Panchayat Union Middle School, Sundaresapuram

9 ENVIRONMENTAL COST BENEFIT ANALYSIS

As per EIA Notification 2006 (amended from time to time), this chapter of the 'Environmental Cost Benefit Analysis' is applicable only if it is recommended at the Scoping stage. However, as per the standard TORs awarded by the (EAC), the Environmental Cost Benefit Analysis is not asked for and hence has not been prepared

10 ENVIRONMENTAL MANAGEMENT PLAN

10.1 Introduction

This chapter will provide information about Environmental Management Plan (EMP), which includes the administrative and technical setup, summary matrix of EMP, the cost involved to implement the EMP, both during the construction and operational phase. This chapter will also describe the proposed post-monitoring scheme for effective implementation of the mitigation measures.

10.2 Administrative and Technical Setup

The project proponent has taken extensive measures to delineate the environmental monitoring plan for compliance of various environmental regulations. The Environment Management Plan (EMP) will consist of all mitigation measures for each component of the environment due to the activities increased during the entire life cycle to minimize adverse environmental impacts resulting from the activities of the project.

Since this is a very small quarry, the mines in-charge will take care of all environment related aspects. He will ensure effective implementation of environment management plan and to ensure compliance of environmental statutory guidelines through Mine Management Level. The action plan for monitoring consists of monitoring of following environmental components.

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

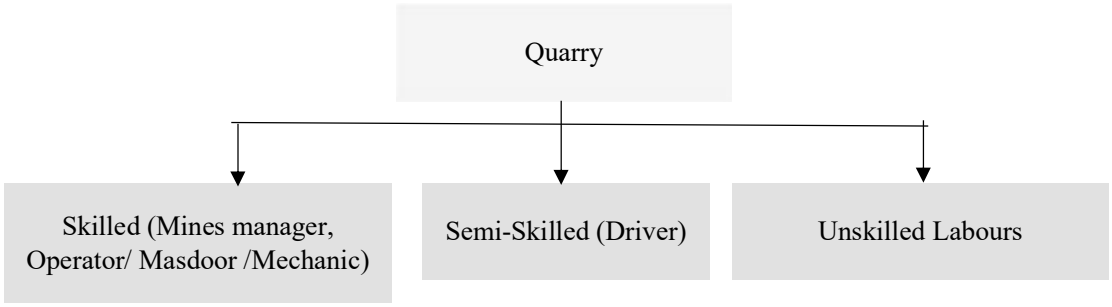


Figure 10-1 Organization Chart

Table 10-1Detailed Environmental Management Plan

S. No	Impacts on Environment	Activity /Aspect	Anticipated impacts	Mitigation measures
1.	Air	Fugitive emissions during operation activity	Due to quarrying activity, fugitive dust and other air pollutants like particulate matter (PM10 & PM 2.5) will be generated.	Trees will be planted along the safety distance of the Mine Lease area. Water will be sprinkled in the site as dust suppression measure. Sharp drill bits will be used for drilling and regrinding will be done periodically to minimize the generation of dust. Wet drilling to suppress the dust emission from drill machine
			Blasting of explosive may result in increase of nitrogen oxides, which may get diluted by the wind	Controlled blasting and optimization of use of explosive energy will help in reducing the above emissions
		During Loading	Dust emission during loading operation	Latest loading equipment like hydraulic excavators of large capacity will be used with dumpers. This reduces the number of buckets to fill from height and thus comparatively less dust generation
		During transportation	Dust emission during transportation	All the haulage roads including the main ramp from crusher to mines pit will be kept wide, leveled, compacted and properly maintained and watered regularly during the shift operation to prevent generation of dust due to movement of dumpers, and other vehicles.
				Periodic air quality survey will be carried out to monitor the changes consequent upon mining activities as per the norms of TNPC Board.
2.	Water	Wastewater generation	Improper management of Domestic wastewater in the Mine lease may create unhygienic conditions in the site thereby causing health impacts to the labors	Provision of urinals/Latrines along with septic tank followed by soak pit arrangement will be provided in the Mine Lease area for the proper management of wastewater

		Surface water runoff due to rain	Improper management of surface runoff may pollute the nearest waterbody	Storm water drains will be provided. Rainwater harvesting pits will be proposed to capture the surface run-off
3.	Noise	Mining activities like drilling, blasting, loading and transportation	Noise from the machinery can cause hypertension, high stress level, hearing loss, sleep disturbance etc due to prolonged exposure. Apart from Mining activities like drilling, blasting may generate noise	Use of personal protective devices i.e., earmuffs and earplugs by workers, who are working in high noise generating areas
4	Vibration	Ground Vibration and Fly Rock Control	The quarrying activity such as drilling and blasting may cause ground vibration, which in turn can disturbance to the local public	Controlled blasting using delay detonators will be carried out to maintain the PPV value well within the prescribed standards of DGMS. Drilling and blasting will be carried under the supervision of qualified persons.
4.	Land	Improper management of Storm water Runoff	Storm water Runoff may result in Soil Erosion	Garland drainage of 1m x 1m will be provided to avoid storm water run- off.
4.	Social Responsibility	Mining workers	Unhygienic site sanitation facilities may cause health damage to workers.	The objective is to ensure health and safety of the workers with effective provisions for the basic facilities of sanitation, drinking water, safety of equipments or machinery etc. The following will be done in the site ✓ By complying with the safety procedures, norms and guidelines (as applicable) as outlined in the National Building Code of India, Bureau of Indian Standards. ✓ Provide adequate number of decentralized latrines and urinals ✓ Providing Septic tank along with Soak pit arrangement ✓ Providing First Aid room, conducting frequent health checkups to labor and conducting free medical camps ✓ Providing safety helmet, Gloves, Jacket & Boots

				✓ Providing measures to prevent fires. Firefighting extinguishers and buckets of sand will be provided in the construction site
6.	Building materials resource conservation	Building Material consumption	Use of farfetched construction materials than the locally available construction materials may lead to over exploitation of natural resources & increase in carbon footprint.	• Use of locally available construction materials.

10.3 Environmental Policy

- The Project Proponent has stipulated a well-defined Environmental policy by which the lessee is committed to conducting business with a strong environmental conscience towards the community, customers, and employees. The Environment policy is given as below.
- The Environment policy of "Rough Stone Quarry of Thiru. V. M. Sundaraiah is that the rules and commitment are driven towards conservation of the environment.
- The lessee is committed to efficient use of natural resources based on the reduce, recycle and reuse method.
- The project is committed to the identification of possible impacts and will take the necessary management steps to mitigate the impacts.
- Environment performance will be regularly monitored and reported for continual improvement of our environment and health performance.

Table 10-2 Budgetary allocation

EMP Cost			
Sl. No.	**Mitigation Measure**	**Capital cost**	**Recurring Cost /Annum**
Air Environment			
1	Haul Road Maintenance	0.30	0.30
2	Water Sprinkler Arrangement	8.00	0.50
3	AAQ Monitoring	0.00	0.50
4	Control Blasting (Muffle blasting)	0.00	0.18
5	Wet Drilling	1.75	0.05
6	No overloading of trucks/tippers/tractors	0.00	0.18
7	Stone carrying trucks will be covered by tarpaulin	0.00	0.05
8	Enforcing speed limits of 20 km/hr within ML area	0.20	0.00
9	Regular monitoring of exhaust fumes as per RTO norms	0.00	0.06
10	Regular sweeping and maintenance of approach roads for at least about 200 m from ML Area	0.00	7.20
11	Installing wheel wash system near gate of quarry	0.50	0.20
	Sub-Total (A)	**10.75**	**9.22**
Noise Environment			
12	Provision for Portable blaster shed	0.50	0.04

13	NONEL Blasting will be practiced to control Ground vibration and fly rocks	0.00	9.46
	Sub-Total (B)	**0.5**	**9.50**
Water Environment			
14	Water management (Garland Drain)	0.30	0.05
15	Installation of Bio toilet (Portable)	2.00	0.20
16	Sump Maintenance	0.00	0.20
17	Dewatering Cost	0.00	1.00
	Sub-Total (C)	**2.30**	**1.45**
Implementation of EC, Mining Plan & DGMS Condition			
18	Environmental Parameters Display Board	0.20	0.02
19	Environmental Monitoring	0.35	0.23
20	Issue of PPE's	1.20	0.30
21	IME & PME Checkup	0.00	0.30
22	First Aid facility Provision	0.00	0.12
23	Signage & boards for safety precautions	0.10	0.02
24	Barbed wire fencing to quarry area	6.00	0.10
25	Parking yard Management	1.50	0.10
26	Installation of CCTV cameras in the mines and mine entrance	0.30	0.05
27	Implementation as per Mining Plan and ensure safe quarry working	0.00	10.80
28	Slope Stability Analysis	5.00	0.50
	Sub-Total (D)	**14.65**	**12.54**
Waste management			
28	Provision for waste collection	0.25	0.20
29	Installation of Dustbins	0.05	0.02
	Sub-Total (D)	**0.30**	**0.22**
Green Belt Development			
29	Plantation inside ML area (300 Nos)	0.90	0.09
30	Plantation outside ML area (1200 Nos)	2.40	0.36
	Sub-Total (E)	**3.30**	**0.45**
Additional Key EMP Expenses			
31	Establishing Rainwater Structure	5.00	0.10

32	Environmental Awareness Programme	0.50	0.00
33	Mine Closure Plan	5.00	0.00
34	District Green Fund	34.00	0.00
35	Wildlife Conservation (Nellai Wildlife Sanctuary)	6.00	0.00
36	Construction of windscreen in the northern side of the lease area	3.00	0.00
	Sub-Total (F)	**53.5**	**0.10**
	Grand Total in Lakhs (A+B+C+D+E+F)	**85.3**	**33.48**
EMP Cost for 5 years			
32	1st Year	0.0	33.48
33	2nd Year	0.0	35.15
34	3rd Year	0.0	36.91
35	4th year	0.0	38.76
36	5th year	0.0	40.70
	Sub Total (G)	**0.0**	**185.00**
Total EMP Cost for 5 years is 270.3 lakhs			
i.e., Rs.85.3 Lakhs of Capital + Recurring cost Rs. 185 lakhs for Five years			

11 SUMMARY AND CONCLUSION

11.1 Prelude

This chapter gives the overall summary of the proposed Rough Stone at S.F.No.91 (Part-2) over an extent of 3.00.0 Ha in Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu (Cluster Area: 7.90.0 Ha).

11.2 Project Overview

Table 11-1 Project Overview

S. No.	Particulars	Details
7.	Proponent Name	Thiru. V. M. Sundaraiah
8.	Proposed project	Rough Stone Quarry of Thiru. V. M. Sundaraiah
9.	Extent	3.00.0 Ha and the cluster area within 500 m radius including the proposed mine is 7.90.0 Ha > 5 Ha
10.	Location	S.F.No.91 (Part-2) over an extent of 3.00.0 Ha in Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
11.	Co-ordinates of the project site	S. No. / Latitude / Longitude 5. / 09°05'50.04" N / 77°23'24.04" E 6. / 09°05'52.99" N / 77°23'24.22" E 7. / 09°05'52.27" N / 77°23'35.00" E 8. / 09°05'49.31" N / 77°23'34.80" E
12.	Topography	Hilly Terrain
13.	Site Elevation above MSL	≃ 265 m from above MSL
14.	Topo Sheet No.	58 G/08
15.	Minerals of Mine	Rough Stone
16.	Proposed production in m^3	3,77,765
17.	Ultimate Depth of mining	40m (AGL)
18.	Method of Mining	Opencast, Semi-Mechanized Mining with a bench height of 5m and bench width of 5m is proposed
19.	Water requirement & Source	6.8 kLD and will be sourced from local vendors
20.	Manpower	30 Nos.
21.	Mining Plan Approval	Mining Plan approved by Joint Director / Assistant Director (i/c), Dept. of Geology & Mining, Tenkasi vide Rc.No. ML/30292/2021 dated 06.11.2023
22.	Safety Zone	0.97.5 Ha will be maintained as safety zone and tree saplings will be planted in this area

23.	Ground water level	58 m BGL

Table 11-2 Environmental Settings of the Project

S. No.	Particulars	Details
1.	Nearest Highway	NH 744 (Kollam – Thirumangalam Road) – 4 km, NW
2.	Interstate Boundary	Kerala – Tamilnadu - 15.9 km, W
3.	Nearest Railway Station	Kadayanalluir - 3.23km, W
4.	Nearest Airport	Tuticorin - 80 km, SE
5.	Nearest Port	Tuticorin - 94 km, SE
6.	Nearest Village	Sundaresapuram – 310m, N
7.	Water bodies	Small Kuttai - 400m (SE) Seasonal Odai - 460 m (SE) Pappan Channel - 2.1km (SW) Karuppu Nadi - 7.5 km (W)
8.	Reserved Forest	Chokkampatti RF - 6 km (NW) Krishnapuram RF Varaivankulam RF
9.	Eco Sensitive Zone and Wildlife Sanctuary (Notified)	Nellai Wildlife Sanctuary - 5.8 km (NW)
10.	Archaeological important places	Nil within 10 km radius
11.	Defense Installations	Nil within 10 km radius
12.	Nearest Port	Nil within 10 km radius
13.	Seismic Zone	Nil within 10 km radius

11.3 Baseline Status

Ground water analysis in the project site reveals that the value of pH is 7.60, Turbidity is <1 NTU, TDS is 1130 mg/L, calcium is 57.2 mg/L, Magnesium is 24.7 mg/L, Chloride is 499 mg/L and hardness is 246 mg/L.The baseline value of air environment reveals that the maximum value of PM10, PM2.5, Sox and NOx is observed in Mine Lease Area with values 69.1µg/m^3, 33.9 1µg/m^3, 6.9 1µg/m^{3}and 11.5 1µg/m^3 respectively. The day noise value lies in the range of 47.1 dB(A) to 53.7 dB(A) and night noise value lies in the range of 39.6 dB(A) to 43.9 dB(A). The bulk density of the soil in the study area ranged between 0.99 to 1.36 g/cc which indicates favourable physical condition for plant growth. The water holding capacity was found in the range of 7.89 % to 12.4%. The value of the pH is acidic and alkaline

and it ranges from 5.01 to 7.63. The organic matter varies from 0.19% to 0.89%, which indicates the soil is slightly fertile.

11.4 Anticipated Impacts and mitigation measures

The potential impacts and appropriate mitigation measures are listed below:

Table 11-3Anticipated impacts & suggestive mitigation measures

S. No.	Potential Impact	Mitigation Measures
1.	The main impact in the air environment is dust emission during various mining activities such drilling, blasting, excavation, loading and transportation. The dust emission may affect the quality of ambient air in the and around the mine area. The increased emission may cause respiratory & Cardiovascular problems in human health	Proper mitigation measures like water sprinkling on haul roads will be adopted to control dust emissions. To control the emissions regular preventive maintenance of equipment will be carried out on contractual basis. Plantation will be carried out along approach roads & mine premises.
2.	Waste water will be generated due to mining activity and from other domestic activities. These may contaminate the ground water leading to ground water. The mining activity may affect the ground water table	No waste water will be generated from the mining activity of minor minerals as the project only involves lifting of over burden from mine site. The wastewater generated from the domestic activity will be disposed off safely through the proposed septic tank. Mining will not intersect ground water table. Hence the water table will not be impacted due to the proposed project
3.	Noise will be generated in the mine area during various mining activities such as blasting, drilling, excavation. During transportation of the mined-out mineral, there may be noise generation due to the movement of vehicles. This may impact the health condition of the workers by creating headache	Periodical monitoring of noise will be done. No other equipment except the transportation vehicles and Excavator (as & when required) for loading will be allowed at site. Noise generated by these equipment shall be intermittent and does not cause much adverse impact. Plantation will be carried out along approach roads. The plantation minimizes propagation of noise and also arrest dust.
4.	Solid waste will be generated from the mining activity as there will be refuse after 95% recovery and also generation of domestic waste	he 100% recovery is achieved by extracting the entire mineable reserve. Hence there will be no refuse generation due to the mining activity. Apart from that, a very meagre quantity of domestic waste will be generated in the project,

		which will be handed over to the local body on daily basis.
5.	During mining activities, there are chances of workers getting health issues or may be prone to accidents	Dust masks will be provided as additional personal protection equipment to the workers working in the dust prone area. Periodical trainings will be conducted to create awareness about the occupational health hazards due to activities like blasting, drilling, excavation. Workers health related problem if any, will be properly addressed.

11.5 Environmental Monitoring program

A monitoring programme for all the physical environment, which includes Ambient Air Quality, Surface & Ground Water & Wastewater Quality and Noise as per CPCB/MoEF&CC/Tamil Nadu Pollution Control Board (TNPCB) shall be maintained.

11.6 Disaster Management Plan

No high-risk accidents are anticipated as it is small scale mechanized Quarry with essential light machinery. The area is not prone for landslides, seismic activities, subsidence, floods, inundation etc. As there are no rivers and habitation in the vicinity of probable disaster from the mine lease area. Elaborate description in respect of Risk Assessment and disaster Management plan are detailed in Chapter – 7.

11.7 Project benefits

The proposed project benefits the local community by providing them employment opportunity. Total 30 Nos. will be employed in the proposed quarrying activity. It also provides indirect job opportunity to many people, thereby improving the standard of living. Quarrying activity produces materials gravel, rough stone, sand which are used in construction and other industries, thereby contributing to the economic development of the local region. CER fund of Rs. 8 Lakhs will be used for the development of school in the study area.

11.8 Conclusion

To carry out the EIA study, 10km buffer zone was considered around the proposed site. Studies were conducted within the buffer zone, to obtain the information regarding the existing status of environment, for predicting the impacts if any due to proposed expansion activity and EMP regarding the project.

The studies done on different environmental parameters mandated by CPCB/ IS10500:2012/NAAQMS for noise, water, soil and air.

Appropriate models and techniques were used to predict the impact of the proposed project and to minimize impacts at every level of development, mitigation measures were suggested.

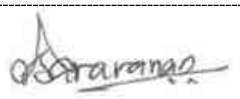
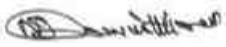
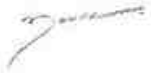
It can be concluded on a positive note that after the implementation of the mitigation measures and environmental management plans, the proposed project would result in minimal and controlled impacts during the operational phase.

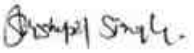
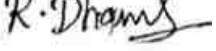
12 DISCLOSURE OF CONSULTANT

In order to assess the potential environmental impacts due to the proposed *Rough Stone at S.F.No.91 (Part-2) over an extent of 3.00.0 Ha in Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu (Cluster Area: 7.90.0 Ha)*, the project proponent has engaged M/s. Global Mining Solutions, Salem to undertake EIA study. The nature of consultancy service rendered covers terrestrial environmental assessment.

Table 12-1 Declaration of Experts

S. No.	Functional areas	Name of the expert/s	Involvement (Period and task)	Signature and date
1.	AP	Dhanalakshmi Ramanathan	1. Selection of Baseline Monitoring stations based on the wind direction 2. Interpretation of Baseline data by comparing it with standards prescribed by CPCB against the type of area 3. Identification of sources of air pollution and suggesting mitigation measures to minimize impact Period: Oct 24 to Dec 24	
2.	WP	Abirami Kaliaperumal	1. Selection of baseline Monitoring Locations for Ground water analysis and also identifying nearest surface water to be studied 2. Interpretation of baseline data collected 3. Identification of impacts based on the baseline study conducted and also to the ground water and nearby surface water due to the proposed project 4. Preparation of suitable and appropriate mitigation plan Period: Oct 24 to Dec 24	
5.	SHW	Ramadoss N	1. Identification of nature of solid waste generated 2. Categorization of the generated waste and estimating the quantity of waste to be generated based on the	

			per capita basis. Identification of impacts of SHW on Environment 3. Suggesting suitable mitigation measures by recommending appropriate disposal method for each category of waste generated Period: Oct 24 to Dec 24	
4.	SE	Sarasvathy K	1. Primary data collection through the census questionnaire 2. Obtaining Secondary data from authenticated sources and incorporating the same in EIA report. 3. Impact assessment & proposing suitable mitigation plan 4. CSR budget allocation by discussing with the local body and allotting the same for need based activity. Period: Oct 24 to Dec 24	
5.	EB	Saravanan S	1. Primary data collection through field survey and sheet observation for ecology and biodiversity 2. Secondary Collection through various authenticated sources 3. Prediction of anticipated impacts and suggesting appropriate mitigation measures. Period: Oct 24 to Dec 24	
6.	HG	Ravinthiran N	1. Study of existing surface drainage arrangements in the core and buffer zone, impact due to mining on these drainage courses and suggestion of mitigative measures 2. Determination of groundwater use pattern, development of rainwater harvesting program. 3. Storm water management through garland drainage system. Period: Oct 24 to Dec 24	
7.	GEO	Valliappan Meyyappan	Field survey for assessing regional and local geology, aquifer distribution, Determination of groundwater use	

			pattern, development of rainwater harvesting program. Period: Oct 24 to Dec 24	
8.	SC	Shisupal Sing	1. Interpretation of baseline report 2. Identification of possible impacts on soil, prediction of soil conservation and suggesting suitable mitigation measures. Period: Oct 24 to Dec 24	
9.	AQ	Srilatha Thiruveedhula	1. Collection of Meteorological data for the baseline study period 2. Plotting wind rose plot and thereby selecting the monitoring locations based on the wind pattern 3. Estimation of sources of air emissions and air quality modelling is done 4. Interpretation of the results obtained 5. Identification of the impacts and suggesting suitable mitigation measures. Period: Oct 24 to Dec 24	
10.	NV	Dhanalakshmi Ramanathan	1. Selection of monitoring locations 2. Interpretation of baseline data 3. Prediction of impacts due to noise pollution and suggestion of appropriate mitigation measures Period: Oct 24 to Dec 24	
11.	LU	Srilatha Thiruveedhula	1. Collection of Remote sensing satellite data to study the land use pattern. 2. Primary field survey and limited field verification for land categorization in the study area 3. Preparation of Land use map using Satellite data for 10km radius around the project site. Period: Oct 24 to Dec 24	
4.	RH	S.V. Prashant	1. Identification of the risk 2. Interpreting consequence contours 3. Suggesting risk mitigation measures	

			Period: Oct 24 to Dec 24	

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

EIA Coordinator: Manikandan Manickam

Signature and Date:

Period of involvement: October 2024 to December 2024

Contact information: M/s. Global Mining Solutions
Plot No. 6, SF NO. 13/2, A2, VS City,
RC Chettypatty, Kottamettupatty,
Omalur, Salem,
Tamil Nadu – 636 455

Declaration by the Head of the accredited consultant organization/ authorized person

I, Prabhu, hereby, confirm that the above-mentioned experts prepared the EIA report of Proposed Mining of Rough stone Quarry Over an Extent of 3.00.0 Ha by Thiru. V. M. Sundaraiah. I also confirm that the consultant organization shall be fully accountable for any mis-leading information mentioned in this statement.

Signature:

Name:

Designation:

Name of the EIA consultant organization:

NABET Certificate No. & Issue Date:

TM-EC:

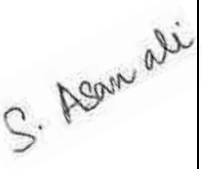
S.No	Name of TM (EC)	Sector(s) proposed	Name of EC with whom to be attached	Period of involvement	Type of work	Signature
1	R. Dhanalakshmi	1	Manikandan Manickam	*Period: Oct 2024 to Dec 2024.*	Associated with EIA Coordinator in overall preparation of Draft EIA/EMP report.	

TM-FAE:

S.No	Name of TM (FAE)	Functional Area	Approved FAE (to work under)	Period of involvement	Type of work	Signature
1	M.Prabu	LU	Srilatha Thiruveedhula	*Oct 2024 to Dec 2024.*	Associated with FAE in preparing Land use map based on satellite imagery, Land use classification and analysis, Impact prediction on surrounding land environment	
		HG	Ashok Kumar Rajagopal		Associated with FAE in studying hydrogeological pattern of study area, Studying ground water and the impact of the project on ground water	
2	M. Manikandan	EB	Saravanan S	*Oct 2024 to Dec 2024.*	Associated with the expert in baseline data collection related to ecology of the study area	
		SC	Shishu Pal Singh		Associated with the expert in Soil monitoring, secondary data collection on soil type, soil management practices, utilization of top soil	

TM-FAA:

S. No	Name of TM (FAA)	Functional Area	Approved FAE (to work under)	Period of involvement	Type of work	Signature

1	S. Kamaraj	HG	Ashok Kumar Rajagopal	*Oct 2024 to Dec 2024.*	Associated with Experts in studying hydrogeological pattern of study area, Studying ground water and the impact of the project on ground water	
2	Asan Ali S	GEO	Valliappan Meyyappan	*Oct 2024 to Dec 2024.*	Associated with the expert in preparing Geological map, assessing stability of quarry slope faces and dump, management plan for mine stability, after use of mining quarry and geological features of the area	
		NV	Srilatha Thiruveedhula		Associated with the expert in monitoring and analysis of blast induced ground vibration in order to develop the site-specific equation for its prediction, monitoring of fly rocks & air blast (noise), preparation of SOP's for the safety blasting practice in the mines.	
3	Mownica. B	AP	Dhanalakshmi Ramanathan	*Oct 2024 to Dec 2024*	Associated with expert team in assessing existing air quality, impact of the project on ambient air and suggesting mitigation measures for air pollution	
		NV	Dhanalakshmi Ramanathan		Associated with the expert team in suggesting control measures for noise and Ground Vibration.	
4	G.Balasubramani	GEO	Valliappan Meyyappan	*Oct 2024 to Dec 2024*	with the expert in preparing Geological map, assessing stability of quarry slope faces and dump, management plan for mine stability, after use of mining quarry and geological features of the area	
		NV	Srilatha Thiruveedhula		Associated with the expert in monitoring and analysis of blast induced ground vibration in order to develop the site-specific	

					equation for its prediction, monitoring of fly rocks & air blast (noise), preparation of SOP's for the safety blasting practice in the mines.	

ANNEXURE-1

File No: 11031
Government of India
Ministry of Environment, Forest and Climate Change
(Issued by the State Environment Impact Assessment Authority(SEIAA), TAMIL NADU)
***

Dated **22/10/2024**

To,

Thiru.SUNDARAIAH
Thiru.SUNDARAIAH
Thiru.V.M.Sundaraiah, S/o.Muthaiah Thevar, No.4/111D, Sundaresapuram Block-IV, Poganallur village, Kadayanallur Taluk, Tenkasi District., Tenkasi , TENKASI, TAMIL NADU, Tenkasi , 627751
sundaraiahm7@gmail.com

Subject: Grant of Terms of Reference with Public Hearing (ToR) under the provision of the EIA Notification 2006-as amended regarding.

Sir/Madam,

SEIAA, Tamil Nadu – Terms of Reference with Public Hearing (ToR) for Proposed Rough stone Quarry lease over an extent of 3.00.0Ha at SF.No.91 (Part-2) of Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu by Thiru.V.M.Sundaraiah – 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/475931/2024, Dated:27.05.2024.
2. Your application submitted for Terms of Reference dated:28.06.2024.
3. Minutes of the 487th SEAC Meeting held on 01.08.2024
4. Minutes of the 503rd meeting of SEAC held on 04.10.2024.
5. Minutes of the 766th authority meeting held on 18.10.2024.

2. The particulars of the proposal are as below :

(i) TOR Identification No.	TO24B0108TN5815892N
(ii) File No.	11031
(iii) Clearance Type	TOR
(iv) Category	B1
(v) Project/Activity Included Schedule No.	1(a) Mining of minerals
(vii) Name of Project	Rough Stone Quarry of Thiru. V.M.Sundaraiah
(viii) Name of Company/Organization	SUNDARAIAH
(ix) Location of Project (District, State)	TENKASI, TAMIL NADU

(x) Issuing Authority	SEIAA
(xii) Applicability of General Conditions	no
(xiii) Applicability of Specific Conditions	no

1.In view of the particulars given in the Para 1 above, the project proposal interalia including Form-1(Part A and B) were submitted to the SEIAA for an appraisal by the SEAC under the provision of EIA notification 2006 and its subsequent amendments.

2.The above-mentioned proposal has been considered by (SEIAA) Appraisal Committee of SEIAA in the meeting held on 17/10/2024. The minutes of the meeting and all the Application and documents submitted [(viz. Form-1 Part A, Part B,] are available on PARIVESH portal which can be accessed by scanning the QR Code above.

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

4.The SEIAA has examined the proposal in accordance with the Environment Impact Assessment (EIA) Notification, 2006 & further amendments thereto and after accepting the recommendations of the SEAC hereby decided to issue the following Terms of Reference with Public Hearing for instant proposal of Thiru.SUNDARAIAH 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

1. The Principal Secretary to Government, Environment, Climate Change and Forests Department, Govt. of Tamil Nadu, Fort St. George, Chennai - 9.
2. The Chairman, Central Pollution Control Board, Parivesh Bhavan, CBD Cum-Office Complex, East Arjun Nagar, New Delhi - 110 032.
3. The Chairperson, Tamil Nadu Pollution Control Board, 76, Mount Salai, Guindy, Chennai - 600 032.
4. The APCCF (C), Regional Office, MoEF & CC (SZ), 34, HEPC Building, 1st & 2nd Floor, Cathedral Garden Road, Nungambakkam, Chennai - 34.
5. Monitoring Cell, IA Division, Ministry of Environment, Forests & CC, Paryavaran Bhavan, CGO Complex, New Delhi - 110 003.
6. The District Collector, Tenkasi District.
7. Stock File.

Annexure 1

Specific Terms of Reference for (Mining Of Minerals)

1. Seiaa Specific Conditions :

S. No	Terms of Reference
1.1	After detailed discussions, the Authority accepts the recommendation of SEAC and decided to grant Terms of Reference with Public Hearing subject to the conditions as recommended by SEAC & normal conditions and conditions in Annexure 'B' of this minutes in addition to the followings shall

S. No	Terms of Reference
	be incorporated in EIA study. 1. Traffic Study 2. Socio-Economic Study 3. Impact of Agriculture, Horticulture, Water Table, Climate change, Drainage Pattern. 4. Anticipated Green House Gas emissions and mitigation strategies. 5. Details of Plantation in EMP.

2. Seac Conditions - Site Specific

S. No	Terms of Reference
2.1	1. **A Cluster Management Committee (CMC) shall be constituted including all the mines in the cluster as Committee Members for the effective management of the mining operation in the cluster through systematic & scientific approach with appointment of statutory personnel, appropriate environmental monitoring, good maintenance of haul roads and village/panchayat roads, authorized blasting operation etc. The PP shall submit the following details in the form of an Affidavit during the EIA appraisal:** **(i) Copy of the agreement forming CMC.** **(ii) The Organisation chart of the Committee with defining the role of the members** **(iii) The 'Standard Operating Procedures' (SoP) executing the planned activities**. 2. As Sundaresapuram habitation is located within 300m, the public hearing to be conducted near the vicinity of the habitation. In addition to that, a wide publicity must be given regarding the date and venue of the public hearing in the said habitation and the proof of the above to be submitted along with EIA report. 3. Since waterbodies are situated nearby, the PP shall carry out the scientific studies to assess the hydrogeological condition of the quarry to determine impacts of the mining operation on the ground water conditions in the waterbodies. 4. The structures within the project site & within the radius of (i) 50 m, (ii) 100 m, (iii) 200 m and (iv) 300 m & upto 1km shall be enumerated with details such as dwelling houses with number of occupants, whether it belongs to the owner (or) not, places of worship, industries, factories, sheds, etc. and spell out the mitigation measures to be proposed for the protection of the above structures, if any during the quarrying operations. 5. The proponent shall furnish photographs of adequate fencing, garland drainage built with siltation tank & green belt along the periphery including replantation of existing trees; maintaining the safety distance between the adjacent quarries & water bodies nearby provided as per the approved mining plan. 6. **Since the structures are situated within a radial distance of 500 m,** the PP shall carry out only one blast per day with muffle technique, for not more than 30 to 40 holes in a round, with maximum charge of 375g/hole. 7. However, s**ince the structures are situated within a radial distance of 300 m,** the PP shall carry out the scientific studies **in the any one of the operating mine in the existing cluster** after obtaining the prior permission from the Director of Mines Safety/Chennai Region, **to design the controlled blast parameters** including **the type of explosive, maximum charge per delay & maximum total charge (kg) per round, maximum number of holes per round**, etc along with **indicating the statutory competent person responsible for the blasting operation in the cluster of quarries,** for reducing the blast-induced ground/air- vibrations and eliminating the fly rock from the blasting operations carried out in the quarry, by involving anyone of these reputed Research and Academic Institution such as CSIR-Central Institute of Mining & Fuel Research / Dhanbad, NIRM/Bangalore, IIT-Madras, NIT-Dept of Mining Engg, Surathkal, and Anna University Chennai-CEG Campus. A copy of such scientific study report shall be submitted to the SEIAA,

S. No	Terms of Reference
	MoEF, **at the time of EIA appraisal** as a part of the EIA Report. 8. The Proponent shall carry out Bio diversity study as a part of EIA study and the same shall be included in the Report. 9. The PP shall submit the action plan for the slope stability aspects at the time of EIA appraisal.

3. Seac Standard Conditions

S. No	Terms of Reference
3.1	1. In the case of existing/operating mines, a letter obtained from the concerned AD (Mines) shall be submitted and it shall include the following: (i) Original pit dimension (ii) Quantity achieved Vs EC Approved Quantity (iii) Balance Quantity as per Mineable Reserve calculated. (iv) Mined out Depth as on date Vs EC Permitted depth (v) Details of illegal/illicit mining (vi) Violation in the quarry during the past working. (vii) Quantity of material mined out outside the mine lease area (viii) Condition of Safety zone/benches (ix) Revised/Modified Mining Plan showing the benches of not exceeding 6 m height and ultimate depth of not exceeding 50m. 2. Details of habitations around the proposed mining area and latest VAO certificate regarding the location of habitations within 300m radius from the periphery of the site. 3. The proponent is requested to carry out a survey and enumerate on the structures located within the radius of (i) 50 m, (ii) 100 m, (iii) 200 m and (iv) 300 m (v) 500m shall be enumerated with details such as dwelling houses with number of occupants, whether it belongs to the owner (or) not, places of worship, industries, factories, sheds, etc with indicating the owner of the building, nature of construction, age of the building, number of residents, their profession and income, etc. 4. The PP shall submit a detailed hydrological report indicating the impact of proposed quarrying operations on the waterbodies like lake, water tanks, etc are located within 1 km of the proposed quarry. 5. The Proponent shall carry out Bio diversity study through reputed Institution and the same shall be included in EIA Report. 6. The DFO letter stating that the proximity distance of Reserve Forests, Protected Areas, Sanctuaries, Tiger reserve etc., up to a radius of 25 km from the proposed site. 7. In the case of proposed lease in an existing (or old) quarry where the benches are not formed (or) partially formed as per the approved Mining Plan, the Project Proponent (PP) shall the PP shall carry out the scientific studies to assess the slope stability of the working benches to be constructed and existing quarry wall, by involving any one of the reputed Research and Academic Institutions - CSIR-Central Institute of Mining & Fuel Research / Dhanbad, NIRM/Bangalore, Division of Geotechnical Engineering-IIT-Madras, NIT-Dept of Mining Engg, Surathkal, and Anna University Chennai-CEG Campus. The PP shall submit a copy of the aforesaid report indicating the stability status of the quarry wall and possible mitigation measures during the time of appraisal for obtaining the EC. 8. However, in case of the fresh/virgin quarries, the Proponent shall submit a conceptual 'Slope Stability Plan' for the proposed quarry during the appraisal while obtaining the EC, when the depth of the working is extended beyond 30 m below ground level. 9. The PP shall furnish the affidavit stating that the blasting operation in the proposed quarry is carried out by the statutory competent person as per the MMR 1961 such as blaster, mining mate, mine foreman, II/I Class mines manager appointed by the proponent. 10. The PP shall present a conceptual design for carrying out only controlled blasting operation

S. No	Terms of Reference
	involving line drilling and muffle blasting in the proposed quarry such that the blast-induced ground vibrations are controlled as well as no fly rock travel beyond 30 m from the blast site. 11. The EIA Coordinators shall obtain and furnish the details of quarry/quarries operated by the proponent in the past, either in the same location or elsewhere in the State with video and photographic evidences. 12. If the proponent has already carried out the mining activity in the proposed mining lease area after 15.01.2016, then the proponent shall furnish the following details from AD/DD, mines, 13. What was the period of the operation and stoppage of the earlier mines with last work permit issued by the AD/DD mines? 14. Quantity of minerals mined out. · Highest production achieved in any one year · Detail of approved depth of mining. · Actual depth of the mining achieved earlier. · Name of the person already mined in that leases area. · If EC and CTO already obtained, the copy of the same shall be submitted. · Whether the mining was carried out as per the approved mine plan (or EC if issued) with stipulated benches. 15. All corner coordinates of the mine lease area, superimposed on a High-Resolution Imagery/Topo sheet, topographic sheet, geomorphology, lithology and geology of the mining lease area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone). 16. The PP shall carry out Drone video survey covering the cluster, green belt, fencing, etc., 17. The proponent shall furnish photographs of adequate fencing, green belt along the periphery including replantation of existing trees & safety distance between the adjacent quarries & water bodies nearby provided as per the approved mining plan. 18. The Project Proponent shall provide the details of mineral reserves and mineable reserves, planned production capacity, proposed working methodology with justifications, the anticipated impacts of the mining operations on the surrounding environment, and the remedial measures for the same. 19. The Project Proponent shall provide the Organization chart indicating the appointment of various statutory officials and other competent persons to be appointed as per the provisions of the Mines Act'1952 and the MMR, 1961 for carrying out the quarrying operations scientifically and systematically in order to ensure safety and to protect the environment. 20. The Project Proponent shall conduct the hydro-geological study considering the contour map of the water table detailing the number of groundwater pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds, etc. within 1 km (radius) along with the collected water level data for both monsoon and non-monsoon seasons from the PWD / TWAD so as to assess the impacts on the wells due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. 21. The proponent shall furnish the baseline data for the environmental and ecological parameters with regard to surface water/ground water quality, air quality, soil quality & flora/fauna including traffic/vehicular movement study. 22. The Proponent shall carry out the Cumulative impact study due to mining operations carried out in the quarry specifically with reference to the specific environment in terms of soil health, biodiversity, air pollution, water pollution, climate change and flood control & health impacts. Accordingly, the Environment Management plan should be prepared keeping the concerned quarry and the surrounding habitations in the mind. 23. Rain water harvesting management with recharging details along with water balance (both monsoon & non-monsoon) be submitted. 24. Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other

S. No	Terms of Reference
	ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given. 25. Details of the land for storage of Overburden/Waste Dumps (or) Rejects outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be provided. 26. Proximity to Areas declared as 'Critically Polluted' (or) the Project areas which attracts the court restrictions for mining operations, should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the TNPCB (or) Dept. of Geology and Mining should be secured and furnished to the effect that the proposed mining activities could be considered. 27. Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided. 28. Impact on local transport infrastructure due to the Project should be indicated. 29. A tree survey study shall be carried out (nos., name of the species, age, diameter etc.,) both within the mining lease applied area & 300m buffer zone and its management during mining activity. 30. A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific. 31. As a part of the study of flora and fauna around the vicinity of the proposed site, the EIA coordinator shall strive to educate the local students on the importance of preserving local flora and fauna by involving them in the study, wherever possible. 32. The purpose of Green belt around the project is to capture the fugitive emissions, carbon sequestration and to attenuate the noise generated, in addition to improving the aesthetics. A wide range of indigenous plant species should be planted as given in the appendix-I in consultation with the DFO, State Agriculture University. The plant species with dense/moderate canopy of native origin should be chosen. Species of small/medium/tall trees alternating with shrubs should be planted in a mixed manner. 33. Taller/one year old Saplings raised in appropriate size of bags, preferably ecofriendly bags should be planted as per the advice of local forest authorities/botanist/Horticulturist with regard to site specific choices. The proponent shall earmark the greenbelt area with GPS coordinates all along the boundary of the project site with at least 3 meters wide and in between blocks in an organized manner 34. A Disaster management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period. 35. A Risk Assessment and management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period. 36. Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed. 37. Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations. 38. The Socio-economic studies should be carried out within a 5 km buffer zone from the mining activity. Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation. 39. Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given. 40. Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.

S. No	Terms of Reference
	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.

4. Seiaa Standard Conditions :

S. No	Terms of Reference
4.1	**Cluster Management Committee** 1. Cluster Management Committee shall be framed which must include all the proponents in the cluster as members including the existing as well as proposed quarry. 2. The members must coordinate among themselves for the effective implementation of EMP as committed including Green Belt Development, Water sprinkling, tree plantation, blasting etc., 3. The List of members of the committee formed shall be submitted to AD/Mines before the execution of mining lease and the same shall be updated every year to the AD/Mines. 4. Detailed Operational Plan must be submitted which must include the blasting frequency with respect to the nearby quarry situated in the cluster, the usage of haul roads by the individual quarry in the form of route map and network. 5. The committee shall deliberate on risk & emergency management plan, fire safety & evacuation plan and sustainable development goals pertaining to the cluster in a holistic manner especially during natural calamities like intense rain and the mitigation measures considering the inundation of the **cluster and evacuation plan.** 6. The Cluster Management Committee shall form Environmental Policy to practice sustainable mining in a scientific and systematic manner in accordance with the law. The role played by the committee in implementing the environmental policy devised shall be given in detail in the EIA Report. 7. The committee shall furnish action plan regarding the restoration strategy with respect to the individual quarry falling under the cluster in a holistic manner. 8. The committee shall deliberate on the health of the workers/staff involved in the mining as well as the health of the public in the vicinity. **Agriculture & Agro-Biodiversity** 9. Impact on surrounding agricultural fields around the proposed mining Area. 10. Impact on soil flora & vegetation around the project site. 11. Details of type of vegetation including no. of trees & shrubs within the proposed mining area and. If so, transplantation of such vegetation all along the boundary of the proposed mining area shall committed mentioned in EMP. 12. The Environmental Impact Assessment should study the agro-biodiversity, agro-forestry, horti-cultural plantations, the natural ecosystem, the soil micro flora, fauna and soil seed banks and suggest measures to maintain the natural Ecosystem. 13. Action should specifically suggest for sustainable management of the area and restoration of ecosystem for flow of goods and services. 14. The project proponent shall study and furnish the impact of project on plantations in adjoining patta lands, Horticulture, Agriculture and livestock. **Forests** 15. The project proponent shall detailed study on impact of mining on Reserve forests and free

S. No	Terms of Reference
	ranging wildlife. 16. The Environmental Impact Assessment should study impact on forest, vegetation, endemic, vulnerable and endangered indigenous flora and fauna. 17. The Environmental Impact Assessment should study impact on standing trees and the existing trees should be numbered and action suggested for protection. 18. The Environmental Impact Assessment should study impact on protected areas, Reserve Forests, National Parks, Corridors and Wildlife pathways, near project site. **Water Environment** 19. Hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) so as to assess the impacts on the nearby waterbodies due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided, covering the entire mine lease period. 20. Erosion Control measures. 21. Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area on the nearby Villages, Water-bodies/ Rivers, & any ecological fragile areas. 22. The project proponent shall study impact on fish habitats and the food WEB/ food chain in the water body and Reservoir. 23. The project proponent shall study and furnish the details on potential fragmentation impact on natural environment, by the activities. 24. The project proponent shall study and furnish the impact on aquatic plants and animals in water bodies and possible scars on the landscape, damages to nearby caves, heritage site, and archaeological sites possible land form changes visual and aesthetic impacts. 25. The Terms of Reference should specifically study impact on soil health, soil erosion, the soil physical, chemical components and microbial components. 26. The Environmental Impact Assessment should study on wetlands, water bodies, rivers streams, lakes and farmer sites. 27. The EIA shall include the impact of mining activity on the following: a) Hydrothermal/Geothermal effect due to destruction in the Environment. b) Bio-geochemical processes and its foot prints including environmental stress. c) Sediment geochemistry in the surface streams. **Energy** 28. The measures taken to control Noise, Air, Water, Dust Control and steps adopted to efficiently utilise the Energy shall be furnished. **Climate Change** 29. The Environmental Impact Assessment shall study in detail the carbon emission and also suggest the measures to mitigate carbon emission including development of carbon sinks and temperature reduction including control of other emission and climate mitigation activities. 30. The Environmental Impact Assessment should study impact on climate change, temperature rise, pollution and above soil & below soil carbon stock, soil health and physical, chemical & biological soil features. 31. Impact of mining on pollution leading to GHGs emissions and the impact of the same on the local livelihood. **Mine Closure Plan** 32. Detailed Mine Closure Plan covering the entire mine lease period as per precise area communication order issued. **EMP** 33. Detailed Environment Management Plan along with adaptation, mitigation & remedial strategies covering the entire mine lease period as per precise area communication order issued and the scope for achieving SDGs. 34. The Environmental Impact Assessment should hold detailed study on EMP with budget for

S. No	Terms of Reference
	Green belt development and mine closure plan including disaster management plan. **Risk Assessment** 35. To furnish risk assessment and management plan including anticipated vulnerabilities during operational and post operational phases of Mining. **Disaster Management Plan** 36. To furnish disaster management plan and disaster mitigation measures in regard to all aspects to avoid/reduce vulnerability to hazards & to cope with disaster/untoward accidents in & around the proposed mine lease area due to the proposed method of mining activity & its related activities covering the entire mine lease period as per precise area communication order issued. **Others** 37. The project proponent shall furnish VAO certificate with reference to 300m radius regard to approved habitations, schools, Archaeological sites, Structures, railway lines, roads, water bodies such as streams, odai, vaari, canal, channel, river, lake pond, tank etc. 38. As per the MoEF& CC office memorandum F.No.22-65/2017-IA.III dated: 30.09.2020 and 20.10.2020 the proponent shall address the concerns raised during the public consultation and all the activities proposed shall be part of the Environment Management Plan. 39. The project proponent shall study and furnish the possible pollution due to plastic and microplastic on the environment. The ecological risks and impacts of plastic & microplastics on aquatic environment and fresh water systems due to activities, contemplated during mining may be investigated and reported.

Standard Terms of Reference for (Mining of minerals)

1.

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

S. No	Terms of Reference
1.5	Map showing the core zone delineating the agricultural land (irrigated and un-irrigated, uncultivable land as defined in the revenue records, forest areas (as per records), along with other physical features such as water bodies, etc should be furnished.
1.6	A contour map showing the area drainage of the core zone and 25 km of the study area (where the water courses of the core zone ultimately join the major rivers/streams outside the lease/project area) should also be clearly indicated in the separate map.
1.7	Catchment area with its drainage map of 25 km area within and outside the mine shall be provided with names, details of rivers/ riverlet system and its respective order. The map should clearly indicate drainage pattern of the catchment area with basin of major rivers. Diversion of drains/ river need eloboration in form of lengthe, quantity and quality of water to be diverted
1.8	(Details of mineral reserves, geological status of the study area and the seams to be worked, ultimate working depth and progressive stage-wise working scheme until the end of mine life should be provided on the basis of the approved rated capacity and calendar plans of production from the approved Mining Plan. Geological maps and sections should be included. The Progressive mine development and Conceptual Final Mine Closure Plan should also be shown in figures. Details of mine plan and mine closure plan approval of Competent Authority should be furnished for green field and expansion projects.
1.9	Details of mining methods, technology, equipment to be used, etc., rationale for selection of specified technology and equipment proposed to be used vis-à-vis the potential impacts should be provided.
1.10	Impact of mining on hydrology, modification of natural drainage, diversion and channeling of the existing rivers/water courses flowing though the ML and adjoining the lease/project and the impact on the existing users and impacts of mining operations thereon.
1.11	A detailed Site plan of the mine showing the proposed break-up of the land for mining operations such as the quarry area, OB dumps, green belt, safety zone, buildings, infrastructure, Stockyard, township/colony (within and adjacent to the ML), undisturbed area -if any, and landscape features such as existing roads, drains/natural water bodies to be left undisturbed along with any natural drainage adjoining the lease /project areas, and modification of thereof in terms of construction of embankments/bunds, proposed diversion/re-channelling of the water courses, etc., approach roads, major haul roads, etc should be indicated.
1.12	Original land use (agricultural land/forestland/grazing land/wasteland/water bodies) of the area should be provided as per the tables given below. Impacts of project, if any on the land use, in particular, agricultural land/forestland/grazing land/water bodies falling within the lease/project and acquired for mining operations should be analyzed. Extent of area under surface rights and under mining rights should be specified. Area under Surface Rights S.N ML/Project Land use Area under Surface Rights(ha) Area Under Mining Rights(ha) Area under Both (ha) 1 Agricultural land 2 Forest Land 3 Grazing Land 4 Settlements

S. No	Terms of Reference
	5 Others (specify) S.N. Details Area (ha) 1 Buildings 2 Infrastructure 3 Roads 4 Others (specify) Total
1.13	Study on the existing flora and fauna in the study area (10km) should be carried out by an institution of relevant discipline. The list of flora and fauna duly authenticated separately for the core and study area and a statement clearly specifying whether the study area forms a part of the migratory corridor of any endangered fauna should be given. If the study area has endangered flora and fauna, or if the area is occasionally visited or used as a habitat by Schedule-I species, or if the project falls within 15 km of an ecologically sensitive area, or used as a migratory corridor then a Comprehensive Conservation Plan along with the appropriate budgetary provision should be prepared and submitted with EIA-EMP Report; and comments/observation from the CWLW of the State Govt. should also be obtained and furnished.
1.14	One-season (other than monsoon) primary baseline data on environmental quality - air (PM10, PM2.5, SOx, NOx and heavy metals such as Hg, Pb, Cr, As, etc), noise, water (surface and groundwater), soil - along with one-season met data coinciding with the same season for AAQ collection period should be provided. The detail of NABL/ MoEF&CC certification of the respective laborartory and NABET accreditation of the consultant to be provided.
1.15	Map (1: 50, 000 scale) of the study area (core and buffer zone) showing the location of various sampling stations superimposed with location of habitats, other industries/mines, polluting sources, should be provided. The number and location of the sampling stations in both core and buffer zones should be selected on the basis of size of lease/project area, the proposed impacts in the downwind (air)/downstream (surface water)/groundwater regime (based on flow). One station should be in the upwind/upstream/non-impact/non-polluting area as a control station. The monitoring should be as per CPCB guidelines and parameters for water testing for both ground water and surface water as per ISI standards and CPCB classification wherever applicable. Observed values should be provided along with the specified standards.
1.16	For proper baseline air quality assessment, Wind rose pattern in the area should be reviewed and accordingly location of AAMSQ shall be planned by the collection of air quality data by adequate monitoring stations in the downwind areas. Monitoring location for collecting baseline data should cover overall the 10 km buffer zone i.e. dispersed in 10 km buffer area. In case of expansion, the displayed data of CAAQMS and its comparison with the monitoring data to be provided
1.17	A detailed traffic study along with presence of habitation in 100 mts distance from both side of road, the impact on the air quality with its proper measures and plan of action with timeline for widening of road. The project will increase the no. of vehicle along the road which will indirectly contribute to carbon emission so what will be the compensatory action plan should be clearly spell out in EIA/ EMP report.

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

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

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

A. STANDARD TERMS OF REFERENCE

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

9) The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc. should be for the life of the mine / lease period.

10) Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.

11) Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given.

12) Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.

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

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

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

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

17) Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves/(existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife 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 shall be submitted along with EIA report.
9. Obtain a letter /certificate from the Assistant Director of Geology and Mining standing that there is no other Minerals/resources like sand in the quarrying area within the approved depth of mining and below depth of mining and the same shall be furnished in the EIA report.
10. EIA report should strictly follow the Environmental Impact Assessment Guidance Manual for Mining of Minerals published February 2010.
11. Detail plan on rehabilitation and reclamation carried out for the stabilization and

restoration of the mined areas.

12. The EIA study report shall include the surrounding mining activity, if any.
13. Modeling study for Air, Water and noise shall be carried out in this field and incremental increase in the above study shall be substantiated with mitigation measures.
14. A study on the geological resources available shall be carried out and reported.
15. A specific study on agriculture & livelihood shall be carried out and reported.
16. Impact of soil erosion, soil physical chemical and biological property changes may be assumed.
17. Site selected for the project - Nature of land - Agricultural (single/double crop), barren, Govt./ private land, status of is acquisition, nearby (in 2-3 km.) water body, population, with in 10km other industries, forest , eco-sensitive zones, accessibility, (note - in case of industrial estate this information may not be necessary)
18. Baseline environmental data - air quality, surface and ground water quality, soil characteristic, flora and fauna, socio-economic condition of the nearby population
19. Identification of hazards in handling, processing and storage of hazardous material and safety system provided to mitigate the risk.
20. Likely impact of the project on air, water, land, flora-fauna and nearby population
21. Emergency preparedness plan in case of natural or in plant emergencies
22. Issues raised during public hearing (if applicable) and response given
23. CER plan with proposed expenditure.
24. Occupational Health Measures
25. Post project monitoring plan
26. The project proponent shall carry out detailed hydro geological study through intuitions/NABET Accredited agencies.
27. A detailed report on the green belt development already undertaken is to be furnished and also submit the proposal for green belt activities.
28. The proponent shall propose the suitable control measure to control the fugitive emissions during the operations of the mines.
29. A specific study should include impact on flora & fauna, disturbance to migratory pattern of animals.
30. Reserve funds should be earmarked for proper closure plan.
31. A detailed plan on plastic waste management shall be furnished. Further, the proponent should strictly comply with, Tamil Nadu Government Order (Ms) No.84 Environment and forests (EC.2) Department dated 25.06.2018 regarding ban on one time use and throw

away plastics irrespective of thickness with effect from 01.01.2019 under Environment (Protection) Act, 1986. In this connection, the project proponent has to furnish the action plan.

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

a. A note confirming compliance of the TOR, with cross referencing of the relevant sections / pages of the EIA report should be provided.
b. All documents may be properly referenced with index, page numbers and continuous page numbering.
c. Where data are presented in the report especially in tables, the period in which the data were collected and the sources should be indicated.
d. While preparing the EIA report, the instructions for the proponents and instructions for the consultants issued by MoEF & CC vide O.M. No. J-11013/41/2006-IA.II (I) dated 4th August, 2009, which are available on the website of this Ministry should also be followed.
e. The consultants involved in the preparation of EIA/EMP report after accreditation with Quality Council of India (QCI)/National Accreditation Board of Education and Training (NABET) would need to include a certificate in this regard in the EIA/EMP reports prepared by them and data provided by other organization/Laboratories including their status of approvals etc. In this regard circular no F. No.J -l1013/77/2004-IA-II(I) dated 2nd December, 2009, 18th March 2010, 28th May 2010, 28th June 2010, 31st December 2010 & 30th September 2011 posted on the Ministry's website http://www.moef.nic.in/ may be referred.
    - After preparing the EIA (as per the generic structure prescribed in Appendix-III of the EIA Notification, 2006) covering the above mentioned points, the proponent 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.

ANNEXURE-2

ANNEXURE 1

MINING PLAN APPROVED By Assistant Director (I/c) of Geology & Mining Tenkasi Dist.

From

Thiru.D.Ravichandran, I.A.S.,
District Collector,
Tenkasi.

To

Thiru.V.M.Sundaraiah,
S/o.Muthaiah Thevar,
4/111D, Sundaresampuram,
Poganallur Village,
Kadayanallur Taluk,
Tenkasi District.

Rc.No.M1/30292/2021 Dated.24.08.2023

Sir,

Sub: **Mines and Minerals** - Minor Mineral - Rough stone quarry lease - Tenkasi District - formerly Sankarankovil Taluk now Kadayanallur Taluk - lease granted to Thiru.V.M.Sundaraiah - over an extent of 3.00.0 hetares in Government Poromboke SF.o. 91 (part-2) - extension of lease for a period of 5 years as per the orders of the Hon'ble Madurai Bench of Madras High Court in WP (MD) No. 8883 of 2021 and the Commissioner of Geology and Mining, Chennai - Precise area communicated - regarding.

Ref:
1. Proceedings of the District Collector, Tirunelveli in Rc. No. M2/32470/1999, dated. 02.06.1999.

2. The Hon'ble Madurai Bench of Madras High Court order in W.P. (MD) No. 8883 of 2021, dated. 18.06.2021.

3. Proceedings of the Commissioner of Geology and Mining, Chennai in Rc. No. 786/MM6/2023, dated. 12.05.2023.

4. District Collector, Tenkasi Letter No M1/30292/2021, dated: 05.06.2023.

5. Representation of Thiru.V.M.Sundaraiah dated 03.08.2023.

******

A roughstone quarry lease had been granted to Thiru.V.M.Sundaraiah over an extent of 3.00.0 hectares in government poromboke SF. No. 91(part-2) in Ariyanayagipuram village, Kadayanallur Taluk of Tenkasi District for a period of 5 years from 12.07.1999 to 11.07.2004 through Tender Cum Action and the lease was expired on 11.07.2004.

2. The Government of Tamil Nadu in G.O (Ms) No. 391, Industries, dated. 17.11.2000 amended the Rule 8(8) of the Tamil Nadu Minor Mineral Concession Rules, 1959 to the effect that the period of lease for quarrying stones in respect of the virgin area which have not been subjected to quarrying so far, shall be 10 years. Since the area is notified for grant of lease for the first time by the Tirunelveli District Gazette Extra - ordinary issue No.14, dated. 23.04.1999 and the area is virgin area then, he is entitled for the grant of lease for a period of 10 years in view of Rule 8(8) of the Tamil Nadu Minor Mineral Concession Rules, 1959.

3. Thiru.V.M.Sundaraiah has filed writ petition in W.P (MD).No. 8883/2021 before the Hon'ble Madurai Bench of Madras High Court with a prayer to issue a writ of mandamus to call for the records of the respondent i.e., the District Collector in Na.Ka.No.M3/30292/2021, dated. 23.10.2021, quash the same, directing the respondent to consider and grant lease for quarrying roughstone and jelly from the land bearing SF. No.91 (part-2) admeasuring 3.00.0 hectares in Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District for the balance period of 5 years for completing ten years lease period as virgin quarry within time frame fixed by the Court.

4. The Hon'ble Madural Bench of Madras High Court in its order dated. 18.06.2023 in W.P (MD) No. 8883 of 2021 has set aside the orders passed by the District Collector, Tenkasi dated. 18.06.2023 and directed the respondent to issue appropriate orders.

MINING PLAN APPROVED
By
Assistant Director (i/c)
of Geology & Mining
Tenkasi Dist.

5. At this juncture, Thiru.V.M.Sundaraiah has preferred an appeal before the Commissioner of Geology and Mining, Chennai and requested to grant extension of lease period for another five years since the said quarry is a virgin quarry based on the orders passed by the Hon'ble Madurai Bench of Madras High Court order dated. 18.06.2023 in W.P (MD) No. 8883 of 2021

6. The Commissioner of Geology and Mining, Chennai vide reference 3th cited, has passed an order as follows:

> *"In view of the above, without going to the merits of the appeal, the appellant Thiru.V.M.Sundaraiah is directed to prefer an appeal before the District Collector, Tenkasi for getting remedy in respect of grant of extension of lease period for further period of five years in S.F.No.91 (Part-2) of Ariyanayagipuram village, Kadayanallur Taluk, Tenkasi District".*

7. Based on the orders of Hon'ble Madurai Bench of Madras High Court in WP (MD) No. 8883 of 2021 dated. 18.06.2021, orders of Commissioner of Geology and Mining, Chennai and appeal preferred by the applicant, Thiru.V.M.Sundaraiah was directed to pay the lease amount,security amount and area assessment in the Government account.

8. The applicant has remitted the lease amount Rs.1,06,49,333/-, security deposit Rs.21,29,867/- and Area Assessment Rs.3,000/- vide challan nos. 20230721008937, 20230814003446 & 20230721009130 respectively and submitted the original challans in this office.

9. The quarry lease area comes under Hill Village as per G.O (Ms) No.49, Housing and Urban Development (UD2.2) Department, dated. 24.03.2003, clearance of HACA Committee is mandatory to process the application.

MINING PLAN APPROVED
By
Assistant Director (i/c)
of Geology & Mining
Tenkasi Dist.

10. In view of the above, based on the above circumstances, the area granted under quarry lease in favour of Thiru.V.M.Sundaraiah for quarrying roughstone over an extent of 3.00.0 hectares of Government pormaboke land in SF No.91 (Part-2) of Ariyanayagipuram village, Kadayanallur Taluk, Tenkasi District is hereby considered and communicated as precise area under Rule 8(8) Tamil Nadu Minor Mineral Concession Rules, 1959 for a period of further 5 years and the applicant is directed to produce approved mining plan ,Environmental Clearance obtained from the State Level Environmental Impact Assessment Authority, Chennai and the clearance obtained from the Hill Area Conservation Authority so as to proceed further in this regard.

District Collector,
Tenkasi.

Copy to:

The Chairman,
State Level Environment Impact Assessment Authority,
Chennai.

ANNEXURE-3

From

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

To

Thiru.V.M.Sundaraiah,
S/o. Muthiah Thevar,
4/222, Main Road,
Sundaresapuram,
Kadayanallur Taluk,
Tenkasi District.

Rc.No.M1/30292/2021 dated.06.11.2023

Sir,

Sub: **Mines and Minerals** - Minor Minerals - Tenkasi District - Quarry lease application preferred by Thiru.V.M.Sundaraiah for quarrying and transportation of Roughstone - over an extent of 3.00.0 hectares of Government poramboke land in SF. No. 91(part-2) of Ariyanayagipuram Village, Kadayanallur Taluk - precise area communicated - Mining plan submitted - Approval accorded - Reg.

Ref :

1. Proceedings of the District Collector, Tirunelveli in Rc. No.M2/32470/1999, dated. 02.06.1999.
2. The Hon'ble Madurai Bench of Madras High Court order in WP (MD) No. 8883 of 2021, dated. 18.06.2021.
3. Proceedings of the Commissioner of Geology and Mining, Chennai in Rc. No. 786/MM6/2023, dated. 12.05.2023.
4. District Collector, Tenkasi letter No. M1/30292/2021, dated. 05.06.2023.
5. Precise area communication letter in Rc. No.M1/30292/2021, dated. 24.08.2023.
6. Letter dated.30.10.2023 received from the applicant.

*****

A roughstone quarry lease had been granted to Thiru.V.M.Sundaraiah over an extent of 3.00.0 hectares in Government poramboke land in SF. No. 91(Part-II) in Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District for a period of 5 years from 12.07.1999 to 11.07.2004 through Tender Cum Auction and the lease was expired on 11.07.2004.

2. Based facts on the case, the area granted under quarry lease in favour of Thiru.V.M.Sundaraiah for quarrying roughstone over an extent of 3.00.0 hectares of Government pormaboke land in SF. No. 91(Part-II) of Ariyanayagipuram village, Kadayanallur Taluk, Tenkasi District was hereby considered and communicated as precise area under Rule 8(8) Tamil Nadu Minor Mineral Concession Rules, 1959 for a period of further 5 years vide reference 5th cited.

3. In response to the precise area communicated, the applicant has submitted three copies of draft Mining Plan duly prepared by a Qualified Person and requested for approval of the same vide reference 6th cited.

4. The draft Mining Plan submitted in respect of the precise area communicated have been verified with reference to field conditions. All the conditions stipulated in the precise area communicated have been incorporated in the Mining Plan. The required safety distance of

7.5 meters to the adjacent patta lands have been clearly demarcated.

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

i. The mining plan is approved without prejudice to any other order or direction from any court of contempt jurisdiction.

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

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

iv. Quarrying operations should be carried out in accordance with the Approved Mining Plan.

v. The applicant is entitled for production of 3,77,765 cbm of Roughstone upto a depth of 40 meters for a period of 5 years as per the Mining Plan.

vi. A safety distance of 7.5 meters should be provided to the adjoining patta land.

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

viii. Environmental Clearance should be obtained from the State Level Environment Impact Assessment Authority, Chennai.

6. As directed by the District Collector, Tenkasi in the reference 5th cited, you are hereby requested to produce Environmental Clearance obtained from the State Level Environment Impact Assessment Authority (SEIAA), Chennai as applicable under Rule 42 of Tamil Nadu Minor Mineral Concession Rules, 1959 for grant of quarry lease, in respect of the precise area communicated.

Encl: Approved Mining plan.

Joint Director/
Assistant Director(i/c),
Geology and Mining,
Tenkasi.

APPROVAL MINING PLAN

MINING PLAN APPROVED
By
Assistant Director (i/c)
of Geology & Mining
Tenkasi Dist.

MINING PLAN FOR ARIYANAYAGIPURAM ROUGH STONE QUARRY

(Prepared Under Rule 8, 41 & 42 of Tamil Nadu Minor Mineral Concession Rules, 1959)

LOCATION OF THE QUARRY LEASE APPLIED AREA

STATE	:	TAMIL NADU
DISTRICT	:	TENKASI
TALUK	:	KADAYANALLUR
VILLAGE	:	ARIYANAYAGIPURAM
S.F.NO	:	91 (PART-2)
EXTENT	:	3.00.0Ha

ECO-FRIENDLY

SUSTAINABILITY

SAFETY

FOR
APPLICANT

Thiru.V.M.Sundaraiah,
S/o.Muthaiah Thevar,
No.4/111D, Sundaresapuram Block-IV,
Poganallur village, Kadayanallur Taluk,
Tenkasi District.

PREPARED BY

C.Natarajan, M.Sc.,M.Phil.,
Qualified Person
No.93/36E2, Subramaniyar Kovil Street,
Omalur Taluk, Salem District,
Tamil Nadu, Pin-636 455.
Mobile: 97502 23535 & 94446 54520.

(PPE)

V.M.Sundaraiah,
S/o.Muthaiah Thevar,
No.4/111D, Sundaresapuram Block-IV,
Poganallur village,
Kadayanallur Taluk, Tenkasi District.

CONSENT LETTER FROM THE APPLICANT

The Mining Plan in respect of **Rough Stone** quarry over an extent of 3.00.0hectares of Government land in S.F.No.91(Part-2) of Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu State has been prepared by

C.Natarajan, M.Sc.,M.Phil.,
Qualified Person

I request the Joint Director/Assistant Director(i/c), Department of Geology and Mining, Tenkasi District to make further correspondence regarding modifications of the Mining Plan with the said Qualified Person on this following address.

C.Natarajan, M.Sc.,M.Phil.,
Qualified Person
No.93/36E2, Subramaniyar Kovil Street,
Omalur Taluk, Salem District,
Tamil Nadu, Pin code-636 455.
Mobile:97502 23535 & 94446 54520.

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

Signature of the Applicant

V.M.Sundaraiah

Place: Tenkasi
Date: 25.10.2023

V.M.Sundaraiah,
S/o.Muthaiah Thevar,
No.4/111D, Sundaresapuram Block-IV,
Poganallur village,
Kadayanallur Taluk, Tenkasi District.

MINING PLAN APPROVED By Assistant Director (i/c) of Geology & Mining Tenkasi Dist.

DECLARATION

The Mining Plan in respect of **Rough Stone** quarry over an extent of 3.00.0hectares of Government land in S.F.No.91(Part-2) of Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu State has been prepared with my consultation and I have understood the contents and agree to implement the same in accordance with the Mining Laws.

Signature of the Applicant

V.M.Sundaraiah

Place: Tenkasi
Date: 25.10.2023

C.Natarajan, M.Sc.,M.Phil.,
Qualified Person
No.93/36E2, Subramaniyar Kovil Street,
Omalur Taluk, Salem District,
Tamil Nadu, Pin code-636 455.
Mobile:97502 23535 & 94446 54520.

MINING PLAN APPROVED By Assistant Director (i/c) of Geology & Mining Tenkasi Dist.

CERTIFICATE

This is to certify that, the provisions of Minor Minerals Conservation and Development Rules, 2010 (MMCDR) have been observed in the Mining Plan for the grant of **Rough Stone** quarry lease over an extent of 3.00.0hectares of Government land in S.F.No.91(Part-2) of Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu State applied by Thiru.V.M.Sundaraiah, for fresh quarry lease.

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

Certified
Signature of Qualified Person.

C.Natarajan, M.Sc.,M.Phil.,
Qualified Person
C.NATARAJAN M.Sc.,M.Phil.,
Qualified Person

Place: Salem
Date: 26.10.2023

C.Natarajan, M.Sc.,M.Phil.,
Qualified Person
No.93/36E2,Subramaniyar Kovil Street,
Omalur Taluk, Salem District,
Tamil Nadu, Pin code-636 455.
Mobile:97502 23535 & 94446 54520.

MINING PLAN APPROVED
By
Assistant Director (I/c)
of Geology & Mining
Tenkasi Dist

CERTIFICATE

Certified that, in preparation of Mining Plan for **Rough Stone** quarry over an extent of 3.00.0hectares of Government land in S.F.No.91(Part-2) of Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu State for Thiru.V.M.Sundaraiah covers all the provisions of Mines Act, Rules, and Regulations etc made there under and whenever specific permission are required, the applicant will approach the Director General of Mines Safety, Chennai. The standards prescribed by DGMS in respect of Mines Health will be strictly implemented.

Certified
Signature of Qualified Person.

C.Natarajan, M.Sc.,M.Phil.,
Qualified Person
C.NATARAJAN M.Sc.,M.Phil.,
Qualified Person

Place: Salem
Date: 26.10.2023

MINING PLAN APPROVED
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Assistant Director (i/c)
of Geology & Mining
Tenkasi Dist.

CERTIFICATE

Certified that I, C.Natarajan, residing at No.93/36 E2, Subramaniyar Kovil Street, Omalur Taluk, Salem District, Tamil Nadu, Pin Code-636 455. I am a Post graduate in Geology (M.Sc., Geology) from Annamalai university and more than five years of experience in mining Field.

Rule 15(1)(a) and (b) of Minerals (Other than Atomic, Hydro Carbons Energy Minerals) concession Rules 2016 stipulates the eligibility for preparing Mining Plans as *"(1)(a) a post graduate degree in Geology granted by a university established" and (1)(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 (1)(a) and (1)(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 in respect of Rough Stone quarry lease applied for an extent of 3.00.0Ha of (Government land) in S.F.No.91 (Part-2) of Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, by Thiru.V.M.Sundaraiah, for a period of Five years. Since the Mining Plan is prepared as per the provisions contained in Rule 15(1) (a) and (b) of Minerals (Other than Atomic, Hydro Carbons Energy Minerals) concession Rules 2016, the same may be approved by the Competent Authority.

C.Natarajan, M.Sc.,M.Phil.,

Qualified Person

C.NATARAJAN M.Sc.,M.Phil.,
Qualified Person

Place: Salem

Date: 26.10.2023

MINING PLAN APPROVED By Assistant Director (i/c) of Geology & Mining Tenkasi Dist.

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of Geology & Mining
Tenkasi District

Annexure

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3.0	Satellite imagery map	I-B
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MINING PLAN FOR MINOR MINERALS

ROUGH STONE

Over an extent of 3.00.0hectares of Government land in S.F.No.91 (Part-2) of Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu State.

(PREPARED UNDER RULE 8, 41 and 42 OF TNMMCR 1959)

1.0 Introduction and Executive Summary;

1. The present Mining Plan is prepared for Thiru.V.M.Sundaraiah, S/o.Muthaiah Thevar, No.4/111D, Sundaresapuram Block-IV, Poganallur village, Kadayanallur Taluk, Tenkasi District.
2. The application was processed by the District Collector, Tenkasi, and passed an order vide Rc.No. M1/30292/2021 dated 24.08.2023 directing the applicant to produce approved Mining Plan under Rule 41(5) of the Tamil Nadu Minor Mineral Concession Rules, 1959 and Environmental Clearance Certificate under Rule 42 from the State Level Environmental Impact Assessment Authority (SEIAA) for the grant of quarry lease to quarry **Rough Stone** over an extent of 3.00.0hectares of Government lands in S.F.No. 91 (Part-2) of Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District of Tamil Nadu State for a period of five years.
3. Accordingly, Mining Plan is prepared under the provisions of rule 8, 41 and 42 as per the amendments under Tamil Nadu Minor Mineral Concession Rules, 1959 by incorporating all the conditions imposed in the precise area communication letter.
4. Geological Resources is estimated at 8,28,065m^3 of Rough stone and Mineable Reserves is estimated at 3,77,765m^3 of Rough Stone, after leaving necessary safety distance from the lease boundary as indicated in the precise area letter and relevant mining laws in force.
5. Production Schedule is proposed production of 3,77,765m^3 of Rough Stone for the period of five years.
6. The applicant ensured that, child labours under 18 years of age will not be engaged for quarrying operation.

7. The applicant ensure that will engage should have valid certified persons (Mines Manager, Foreman, Mate) during quarrying operation.

8. Environmental parameters,

   i) The area for quarry lease area comes under Hill Village, The applicant applied for Clearance from HACA before the execution of lease.

   ii) There is no interstate boundary around 10kms radius.

   iii) There is no wild life animal sanctuary within 6km radius from the project site area under the Wildlife (Protection) Act, 1972.

   Therefore the project seeks clearance only from State Level Environmental Impact Assessment Authority (SEIAA).

9. Environmental measures to be adopted shall be,

   i) Dust Control at source while drilling and blasting,

   ii) Dust suppression at loading point and transport haul roads,

   iii) Noise Control in blasting, control of fly rock missiles and vibration by doing peak particle velocity with in standard as prescribed by the DGMS and MOEF.

   iv) Unnecessary land degradation should be avoided or damaged land should be reclaimed or rehabilitated.

   v) Avoid uneven rat hole mining and follow scientific and systematic mining by safe bench system of open cast mining.

   vi) Mining near major fracture zones if any should be avoided to control ground water fluctuation in the adjacent agricultural lands.

   vii) Emission test of vehicles should be in tack to maintain minimum emission level of flue gases.

   viii) Noise level should not exceed 80db and the vehicles should use only permitted Air Horn while on road near residential areas.

   ix) Safety zones as prescribed by the Department of Geology and Mining from adjacent infrastructures should be strictly adhere to.

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

EXECUTIVE SUMMARY:

a.	Name of the Village Panchayat	:	Ariyanayagipuram
b.	Name of the Panchayat Union	:	Kadayanallur
c.	The proposed total Minable Reserves	:	3,77,765m³ of Rough Stone,
d.	The proposed quantity of reserves (level of production) for Five years to be mined is (Recoverable reserves)	:	3,77,765m³ of Rough Stone,
e.	Total extent of the area	:	3.00.0Ha
f.	Proposed Period of mining	:	Five Years
g.	Existing depth	:	15m (Maximum) Above ground level
h.	Proposed Depth of mining	:	40m Above ground level for the proposed mining plan.
i.	Method of mining/level of mechanization	:	Opencast, Semi-mechanized Mining with a bench height of 5m and bench width of 5m is proposed.
j.	Types of Machineries used in the quarry	:	Machineries like Tractor mounted compressor attached with Jack hammers, Excavators are proposed to deploy for quarrying operation.
k.	Cost of the Project A. Fixed Assets Cost B. Operational Cost C. EMP Cost		Rs. 1,09,49,333/- Rs. 62,50,000/- Rs. 5,80,000/- Total Project cost(A+B+C)=**Rs.1,77,79,333/-**
l.	The area applied for lease is bounded by Four corners and the coordinates are clearly marked in plate no II.		

Corners	Co- ordinates		Distance between the corners		
	Latitude	Longitude			
1	09°05'50.04"N	77°23'24.02"E	1-2	=	91.0m
2	09°05'52.99"N	77°23'24.22"E	2-3	=	330.0m
3	09°05'52.27"N	77°23'35.00"E	3-4	=	91.0m
4	09°05'49.31"N	77°23'34.80"E	4-1	=	330.0m

2.0 General Information:

	a.	Name of the Applicant	:	Thiru.V.M.Sundaraiah,
	b.	Address of the Applicant with phone No and e-mail id if any	:	S/o.Muthaiah Thevar, No.4/111D, Sundaresapuram Block-IV, Poganallur village, Kadayanallur Taluk, Tenkasi District. Pincode-627 751 Cell No.: 97882 39125
	c.	Status of the Applicant	:	Individual
2.2	a.	Mineral Which the applicant intends to mine	:	Rough Stone.
	b.	Precise area communication letter No.	:	Precise area communication letter received from the District Collector, Tenkasi vide Rc.No.M1/30292/2021 dated 24.08.2023
	c.	Period of permission / lease granted	:	The District Collector, Tenkasi, has grant of lease Period for **Five years.**
	d.	Name and Address of the QP preparing Mining Plan	:	**C.Natarajan, M.Sc.,M.Phil.,** **Qualified Person** No.93/36E2, Subramaniyar Kovil Street, Omalur Taluk, Salem District, Tamil Nadu, Pin-636 455. Mobile: 97502 23535 & 94446 54520.

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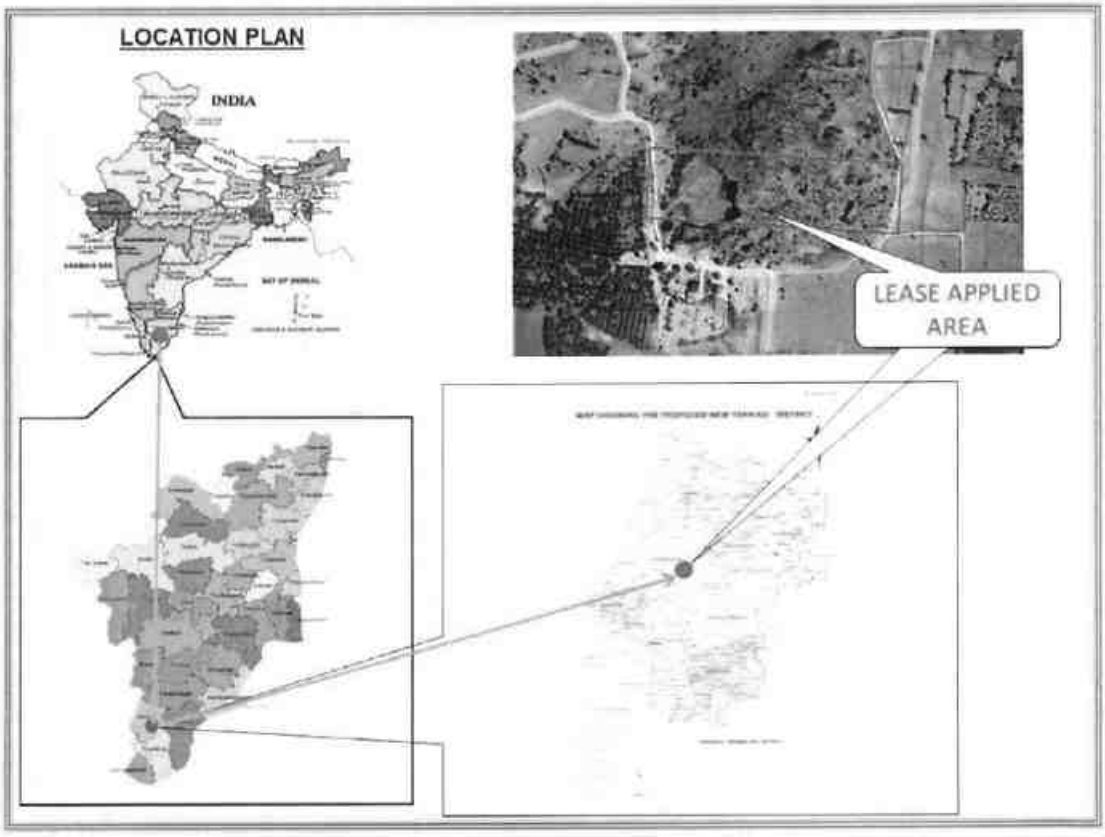
3.0 Location:

S.No	Details of the Area:	
1	Corner Coordinates	Latitude : 09°05'49.31"N to 09°05'52.99"N Longitude : 77°23'24.02"E to 77°23'35.00"E
2	Toposheet Number	58 G / 08
3	The altitude of the area	276m (MSL)
4	Extent	3.00.0Ha
5	Survey No	91 (Part-2)
6	Village	Ariyanayagipuram
7	Taluk	Kadayanallur
8	District	Tenkasi
9	State	Tamil Nadu



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a.	Classification of the Area (Ryotwari / poramboke / others)	:	Government poramboke land
b.	Ownership / Occupancy of the Applied area (Surface rights)	:	It is Government land the applicant has obtained tender from the Government Please refer annexure no –I.
c.	Toposheet No. with Latitude and Longitude	: : :	Topo Sheet No: 58 G / 08 Latitude: 09°05'49.31"N to 09°05'52.99"N Longitude: 77°23'24.02"E to 77°23'35.00"E
d.	Existence of Public Road / Railway line if any nearby the area and approximate distance	:	There is an existing road from the area leads to Sundaresapuram – Bala Arunachalapuram village road on western side of the area. The Nearest Railway line is Tenkasi – Virudhunagar line which is about 650m on western side of the area.

SATELLITE IMAGERY OF THE LEASE APPLIED AREA

TOPOGRAPHICAL VIEW OF THE LEASE APPLIED AREA

PART - A

4.0 Geology and Mineral Reserves:

4.1	a.	Topography	:	➢ The area applied for quarry lease is exhibits hilly terrain covered by rough stone formation. The massive Charnockite formation is noticed right from the surface and sloping towards southern side of the area, the altitude of the area is above 276m (maximum) from MSL. ➢ No major river is found nearby the lease applied area. ➢ Water table is found at a depth of 58m in summer and 55m in rainy seasons. ➢ Temperature of the area is reported to be 18°C to a maximum of 42°C during summer. ➢ Rainfall of this area is about 800mm to 900 mm during the both NE & SW monsoons.
	b.	General Geology of the Area	:	The area is underlain by the wide range of metamorphic rocks of peninsular gneissic complex. These rocks are extensively weathered and overlain by the recent valley fills and alluvium at places. The geological formations found in the district are Archaean rocks like Gneisses, Granites, Charnockites basic granulites and calc-gneisses. The younger formations are Quartz veins and pegmatite. The rock type noticed in the area for lease is Charnockite which contains mostly Quartz and Feldspar with some ferromagnesian minerals. The Charnockite is part of peninsular Gneisses, a high grade metamorphic rock. The strike of the Charnockite formation is N45°E-S45°W with dipping towards SE60°. The general geological succession of the area is given as under.

				AGE — **ROCK TYPE** Recent - Topsoil Unconformity Archaean - Dolerite dyke Charnockite. Peninsular Gneissic complex and Calc Gneiss
4.2		Details of Exploration already carried out if any	:	No exploration was carried out, as the Rough stone formations are clearly visible from existing quarry pit.
4.3	a.	Estimation of Reserves	:	The Geological and Recoverable reserves are estimated by cross sectional method. Two sections have been drawn, one section drawn length wise as (X-Y) and another one section drawn width wise as (A-B), to cover maximum area considered for lease. The Plans and Sections have been drawn with a scale of 1:1000 and 1:500 respectively. Please refer plate No.III.

a. Geological Resources

The quarrying is restricted up to a depth of 40m Above ground level only. Availability of Resources is given below.

Table No-1

Section	Topography	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume in m^3	Geological Resources of Rough stone in m^3
XY-AB	Above ground level	I	121	62	5	37510	37510
		II	155	77	5	59675	59675
		III	179	81	5	72495	72495
		IV	214	91	5	97370	97370
		V	282	91	5	128310	128310
		VI	301	91	5	136955	136955
		VII	320	91	5	145600	145600
		VIII	330	91	5	150150	150150
Total							**828065**

The Geological Resources of Rough stone : 8,28,065m^3

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b. Already excavated

The area has been quarried in earlier operation the existing pit dimension are given below.

Table No-2

Pit No	length (Max) in(m)	Width (Max) in (m)	Depth (Max) in (m)
I	59	40	15m Above ground level
II	30	20	5m Above ground level
III	52	16	5m Above ground level

c. Available Mineable Reserve

The available mineable reserve calculated by deducting 10m safety distance and bench loss.

Table No-3

Section	Topography	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume in m^3	Mineable Reserves of Rough stone in m^3
XY-AB	Above ground level	I	121	52	5	31460	31460
		II	155	62	5	48050	48050
		III	179	61	5	54595	54595
		IV	214	56	5	59920	59920
		V	282	46	5	64860	64860
		VI	301	36	5	54180	54180
		VII	310	26	5	40300	40300
		VIII	305	16	5	24400	24400
Total							**377765**

The available mineable reserve is computed as 3,77,765m^3 of Rough stone upto a depth of 40m Above ground level only.

5.0 Mining:

5.1	Method of Mining	:	1. Opencast method of semi mechanized mining with 5.0m height 5m width of the bench. 2. However, as far as the quarrying of Rough stone is concerned, observance of the provisions of Regulation 106(2) (b) as above is seldom[possible due to various inherent petrogenetic factors coupled with mining difficulties. Hence it is proposed to obtain relaxation to the provisions of the above regulation from the Director of mines safety for which necessary provision is available with the regulation 106(2) (b) of MMR-1961, under Mine Act-1952.

5.2	Mode of Working	:	The rough stone is proposed to quarry 5m bench height 5m width with conventional opencast semi-Mechanized method. The quarry operation involves shallow jack hammer drilling, slurry blasting, excavation, Loading and transportation of Rough stone to the needy crusher/other buyers. The production of Rough stone in this quarry involves the following method which is typical for Rough Stone quarrying in contrast to other major mineral mining. Splitting of rock mass of considerable volume from the parent rock mass by jackhammer drilling and blasting, hydraulic excavators are used for loading the Rough Stone from pithead to the needy crusher/other buyers. Occasionally hydraulic excavators are attached with rock breakers for fragmentation to avoid secondary blasting. The primary boulders thus splitted are removed from the pits by excavators and further made to smaller sizes by rock breakers attached in excavators. It is a conventional opencast semi mechanized method of mining.
5.3	Proposed bench height & Width	:	Quarrying of Rough Stone is proposed bench height of 5m and bench width of 5m.
5.4	Details of Overburden / Mineral Production proposed for the first 5 years.	:	There is no overburden anticipated during the entire Rough Stone quarrying operation. The excavated rough stone will be directly loaded into tipper to the needy crusher/other buyers.

The Yearwise Production and Development Table

Table No –4

Year	Section	Topography	Bench	length in (m)	Width in (m)	Depth in (m)	Volume in m^3	Mineable Reserves of Rough stone in m^3
I	XY-AB	Above ground level	I	121	52	5	31460	31460
			II	142	62	5	44020	44020
Total								**75480**
II	XY-AB	Above ground level	II	13	62	5	4030	4030
			III	179	61	5	54595	54595
			IV	61	56	5	17080	17080
Total								**75705**
III	XY-AB	Above ground level	IV	153	56	5	42840	42840
			V	142	46	5	32660	32660
Total								**75500**
IV	XY-AB	Above ground level	V	140	46	5	32200	32200
			VI	241	36	5	43380	43380
Total								**75580**
V	XY-AB	Above ground level	VI	60	36	5	10800	10800
			VII	310	26	5	40300	40300
			VIII	305	16	5	24400	24400
Total								**75500**
Grand Total								**377765**

The applicant has proposed to carry out 3,77,765m^3 of Rough stone upto a depth of 40m Above ground level for the period of five years.

5.5 Machineries to be used

a. Drilling : It is proposed to use following machineries for quarrying rough stone

S.No	Type	Nos	Dia Hole mm	Size Capacity	Make	Motive power
1	Jack hammer	7	32	1.2m to 6m	Atlas Copco	Compressed air
2	Compressor	2	-	-	Atlas Capco	Diesel Drive

b. Loading : Excavator of 0.90m^3 bucket capacity (with Rock breaker attachment) (1No).

	c.	Transportation	:	Tipper 4Nos (5/10Ts) capacity.
5.6		Disposal of Overburden	:	There is no overburden anticipated during the entire rough stone quarrying operation.
5.7		Brief Note on Conceptual Mining Plan for the entire lease period	:	Conceptual Mining Plan is prepared with an object of five years of systematic development of bench lay outs, selection of ultimate pit limit, depth of quarrying, ultimate pit slope, selection of sites for construction of infrastructures etc. Ultimate pit size is designed based on certain practical factors such as the economical depth of mining, safety zones, permissible areas etc. Ultimate Pit dimension is given as under,

Ultimate Pit dimension (M) end of Mining plan Period			
Pit No	Length (max) in (m)	Width (Avg) in (m)	Depth(max) in(m)
I	310	71	40m Above ground level

Afforestation has been proposed on all along the boundary barrier by planting trees.

All the baseline information studies like Air Quality monitoring, Noise and Vibration monitoring, Water Analysis studies will be carried out every year as per the MOEF norms.

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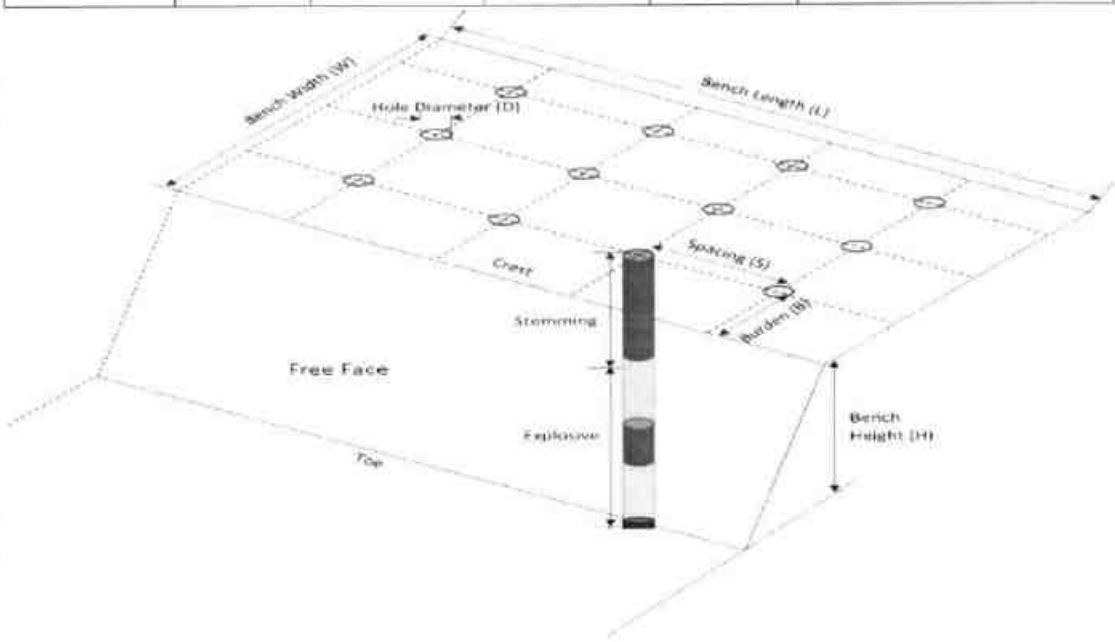
6.0 Blasting:

6.1	Blasting Pattern	:	The massive formation shall be broken into pieces of portable size by drilling and blasting using jack hammers and shot hole blasting. Powder factor of explosives for breaking such hard rock shall be in the order of 6 to 7 Tonnes per K.g of explosives. Blasting parameters are as follows.

Diameter of the hole	Spacing	Depth	Burden for hole	Pattern of hole	Inclination of hole
32-36mm	0.6m	1 to 1.5m	0.6m	Zig Zag	70^0 from the horizontal



6.2	Types of Explosives	:	Small dia, 25mm slurry explosive are proposed to be used for shattering and heaving effect for removal and winning of Rough stone. No deep hole drilling or primary blasting is proposed.

6.3	Measures proposed to minimize ground vibration due to blasting	:	➢ Controlled blasting measures will be adopted for minimizing ground vibration and fly rock. ➢ Shallow depths jackhammer drilling and blasting is proposed to be carried out with minimum use of explosive mainly to give shattering effect in rough stone for easy excavation and to control fly rock.

Number of holes	:	218
Powder factor	:	6Ts/Kg of explosives
Total explosive required	:	109Kg slurry explosives
Charge / hole	:	0.5Kg
Blasting time	:	12-2 Pm

6.4	Storage of Explosives and safety measures to be taken while blasting.	:	➢ The applicant will engage an authorized explosive agency to carry out the small amount of blasting and it will be supervised by competent and statutory foreman/ mines manager. ➢ ***The applicant ensure that will appoint the Mate (Should have Valid Blaster Certificate) during Blasting Operation.***

7.0 Mine Drainage:

7.1	Depth of Water table	:	The ground water table is reported as 58m below ground level. In the proposed mining plan only 40m Above ground level depth has been envisaged as workable depth for safe & economic quarrying for the entire lease period. Hence the quarrying operation may not affect the ground water.
7.2	Arrangement and Places where the mine water is finally proposed to be discharged	:	The ground water may not rise immediately in this type of mining. However, the rain water percolation and collection of water from the seepage shall be less than 300lpm and it shall be pumped about periodically by a stand by diesel powered Centrifugal pump motivated with 7.5H.P.Motor. The quality of water is potable and it is not contaminated with any hazardous things. Hence, water stored in the quarry pit will be pumped into the adjacent agricultural fields. Further the water stored in the old pit will also be used for plantation purposes

8.0	**Other Permanent Structures:**		
8.1	Habitations / Village	:	There are no habitations within a radius of 300m.
8.2	Power lines (HT/LT)	:	There is no Power lines (HT/LT) within a radius of 50m.
8.3	Water bodies (River, Pond, Lake, Odai, Channel etc)	:	There is a tank situated on southeastern side and is 400m away from the lease applied area. There is a seasonal odai passing on southeastern side and is 460m away from the lease applied area.
8.4	Archeological / Historical Monuments	:	There are no Archeological / Historical Monuments within a radius of 500m.
8.5	Road (NH, SH, Village Road etc)	:	The National Highway (NH-744) Tenkasi – Tirumangalam is about 4.0km on Northwestern side of the area. The State Highway (SH-76) Sankarankovil - Nalatinpudur is about 9.5Km on Northern side of the area.
8.6	Places of Worship	:	There are no Places of Worship within a radius of 500m.
8.7	Reserved Forest / Forest / Social Forest / Wild Life Sanctuary etc.,	:	There is no Reserved Forest /Wild Life Sanctuary etc within a radius of 1Km.
8.8	Any Interstate Border, Protected areas under the Wild Life (Protection) Act, 1972, Critically Polluted Areas as Identified by Central Pollution Control Board and Notified Eco sensitive areas	:	There are No inter State border within a radius of 10kms.
8.9	Any Other Structures	:	Nil

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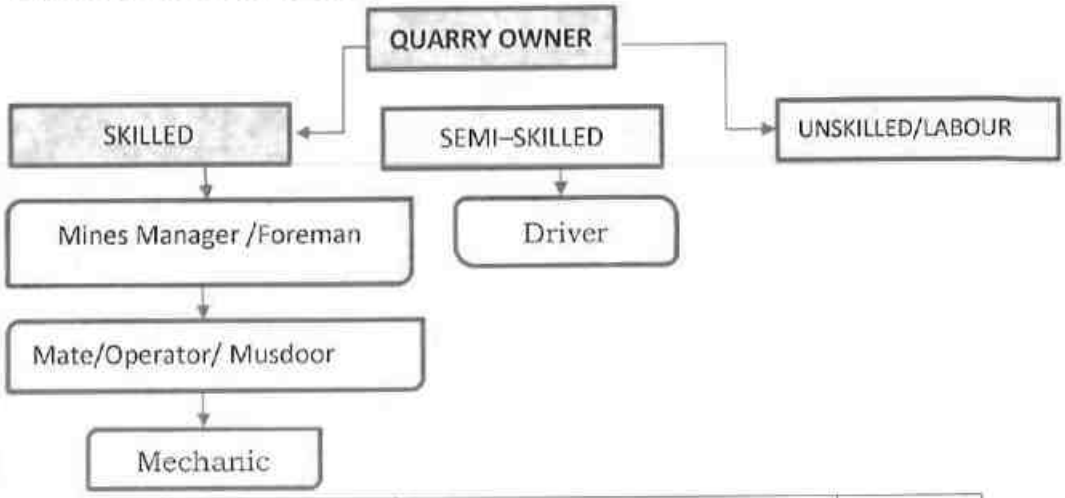
9.0 Employment Potential & Welfare Measures:

9.1 Employment Potential (Management & Supervisory personal)

The proposed organization chart



1.	Skilled	Mines Manager	1 No.
		Foreman / Mate	2 No.
		Operator	12 No.
		Mechanic	1 No.
2.	Semi–skilled	Driver	4 No.
3.	Unskilled	Labours	10Nos
		Total =	30Nos

Allowing 10% absentee, the no. of men of roll will be around 27.

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

- **It is been ensured that, child labours under 18 years of age will not be engaged for quarrying operation.**
- **Necessary life insurance policies will be taken by the applicant to all the employees up to the end of the lease period.**

9.2 Welfare Measures

a.	Drinking Water	:	Packaged drinking water is available from the nearby approved water vendors in Sundaresapuram Village which is about 310m on northern side of the area.
b.	Sanitary facilities	:	Semi-permanent latrines & urinals shall be maintained at convenient places for use of labours as per the provisions of Rule (33) of the Mines Rules, 1960 separately for males and females. Washing facilities shall also be arranged as per rule (36) of the Mines Rules, 1960.

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	c.	First Aid Facility	:	First aid kits are kept in Mines office room, in casest of such eventualities the victim will be given first aid immediately at the site and injured person will be taken to the hospital. Hospital is available at distance of 4.2Km (SW) in Kadayanallur the competent and Statutory foreman/ permit manager will be in charge of first aid.
	d.	Labour Health	:	As per Mines Rule, Periodic medical examination related to occupational health safety will be conducted to all the workers in applicant's own cost.
	e.	Precautionary safety measures to the Labourers:		

Safety provisions like helmet, goggles, safety shoes, Dust mask, Ear muffs etc., have to be provided as per the circulars and amendments made for Mine labours under the guidance of DGMS being a mechanized operation.

Necessary training will be conducted once in a year to all the employees with the help of qualified and experienced officers to train about the safe and systematic quarrying operation.

PART – B

10.0 Environmental Management Plan:

10.1	Existing Land Use Pattern	:	1. The area is exhibits hilly terrain covered by Charnockite formation. 2. Quarrying operation is proposed up to a depth of 40m Above ground level for the proposed mining plan period. 3. Fluctuation of Water table in this area is in between 58m and 55m during a year. 4. This region receives the average annual rainfall of 800mm to 900mm. The surrounding area is practiced by the seasonal cultivation. The existing land use pattern is given as under. Table No-5

Sl. No.	Land Use	Present Area (Ha)	Area in use during the quarrying period (Ha)
1.	Quarrying Pit	0.38.0	2.00.5
2.	Infrastructure	Nil	0.01.0
3.	Roads	0.01.0	0.01.0
4.	Green Belt	Nil	0.97.5
5.	Unutilized	2.61.0	Nil
	Total =	**3.00.0**	**3.00.0**

10.2	Water Regime	:	Water table in this area is noticed at a depth of 58m and presently, in the proposed mining plan only 40m Above ground level depth has been envisaged as workable depth for safe & economic quarrying for the entire lease period. hence, it will not affect the ground water depletion of this area.
10.3	Flora and Fauna	:	Except acacia bushes, no other valuable trees are noticed in the applied area. Further, neither flora of botanical interest nor fauna of zoological interest is noticed in this area.
10.4	Climatic conditions	:	Generally subtropical climatic condition prevails throughout the year and there is no sharp variation in climate. This District receives rain both in south west and north east monsoon. The average rainfall is about 800mm to 900mm and the temperature ranges from 18°C during winter and to a maximum of 42°C during the summer.

MINING PLAN APPROVED
By
Assistant Director (i/c)
of Geology & Mining
Tenkasi Dist.

<table>
<tr><td>10.5</td><td>Human Settlement</td><td>:</td><td>The nearest habitations with the population is given as under.
Table No-6<table><tr><th>S. No</th><th>Name of the Village</th><th>Approximate distance & Direction from lease applied area</th><th>Approximate population</th></tr><tr><td>1.</td><td>Alagapuri</td><td>1.8Km - NE</td><td>600</td></tr><tr><td>2.</td><td>Ariyanayagipuram</td><td>0.8km - NW</td><td>500</td></tr><tr><td>3.</td><td>Madurapuri</td><td>2.8Km - SE</td><td>400</td></tr><tr><td>4.</td><td>Perunkottur</td><td>1.9km - SW</td><td>1000</td></tr></table></td></tr>
<tr><td>10.6</td><td>Plan for Air, Dust Suppression</td><td>:</td><td>Air or dust expected to be generated from drilling process, hauling roads, places of excavation etc., will be suppressed by periodical wetting of land by water spraying. Wet drilling and dust extractor arrangements will be provided to drilling units so as to control raise of dust from the site of drilling. Operators, those exposed directly to such conditions will be provide such protective equipment like mask, ear plug, helmet, gloze etc., as per the Mines Act.</td></tr>
<tr><td>10.7</td><td>Plan for Noise Control</td><td>:</td><td>Quarrying of Rough Stone will be carried out by drilling and blasting by using low power explosives, and hence, noise will be very minimum. However, periodical noise level monitoring will be carried out to check the noise level in and around the quarry site. Nowhere the noise level should exceed the permissible limit of 80db during the quarry working hours.</td></tr>
<tr><td>10.8</td><td>Environmental Impact Assessment Statement Describing Impact on mining on the next Five years</td><td>:</td><td>The mining plan proposed is for a small production of Rough stone without involving deep hole drilling and heavy blasting. Such limited mining activity is not likely to cause any impact adversely on environment as far as pollution of air, water and noise is concerned, anyhow environmental impact studies will be conducted as per EIA notification issued by MOEF.</td></tr>
</table>

10.9	Proposal for Waste Management	:	There is no waste anticipated in this rough stone quarry operation.
10.10	Proposal of Reclamation of Land affected during mining activities and at the end of mining.	:	In the proposed mining plan 40m Above ground level depth has been envisaged as workable depth for safe & economic mining during the lease period. Hence, after quarry reaches ultimate pit limit (for this lease period) of 40m depth, fencing will be constructed around the quarried pits to prevent inherent entry of the public and cattle.
10.11	Program for Afforestation	:	The 10m safety distance along the lease boundary has been identified to be utilized for afforestation Appropriate native species of Neem/Pungan trees will be planted in the first year. Nearly 9750Sqm area is proposed to use under afforestation by planting 1170nos of Neem/Pungan trees during first year with an anticipated survival rate of 80%. The Quarry landuse, layout and afforestation plan is shown in Plate No.III.
10.12	Proposed Financial Estimate / Budget for (EMP) Environment Management		
	A. Fixed Asset Cost:		
	1. Land Cost (Lease amount)	:	Rs. 1,06,49,333
	2. First aid room and accessories	:	Rs.1,00,000
	3.Labour Shed	:	Rs.1,00,000
	4.Sanitary Facility	:	Rs.1,00,000
	Total =	:	**Rs. 1,09,49,333/-**
	B. Operational Cost:		
	1. Machineries	:	Rs.60,00,000-
	2. Fencing cost	:	Rs. 2,50,000
	Total	:	**Rs.62,50,000/-**

	C.EMP Cost:		Budget Provision for the entire quarrying period. Air Quality Sampling = Rs. 40,000/- Water Quality Sampling = Rs. 40,000/- Noise Monitoring = Rs. 20,000/- Ground vibration test = Rs. 20,000/-
	Expenditure 1. Drinking water facility 2. Sanitary Arrangements 3. Safety kids 4. Water sprinkling 5. Afforestation **Total=**	: : : : :	Rs.1,00,000/- Rs. 50,000/- Rs. 50,000/- Rs. 1,00,000/- Rs. 1,60,000/- **Rs. 5,80,000/-**
	Total Project Cost (A+B+C)	:	**Rs. 1,77,79,333/-**
	CSR Cost (2% of Total Project Cost)	:	**Rs. 3,55,587/-**

11.0 Mine Closure Plan:

11.1	Steps proposed for phased restoration, reclamation of already mined out area.	:	There is no proposal for back filling, reclamation and rehabilitation. The quarried pits after the end of the life of lease will be fenced to prevent inherent entry of public and cattles.
11.2	Measures to be under taken on mine closure as per Act & Rules	:	Measures will be taken as per the Acts and Rules. The quarried pit will be fenced by using Barbed wire fencing to prevent inherent entry of public and cattle.
11.3	Mitigation measures to be undertaken for safety and restoration/ reclamation of the already mined out area	:	Mitigation measures: Drilling will be carried out by wet drilling mode to control the dust propagation into the air. Blasting will be carried out on limited scale. Mist Water spraying on haul road is proposed to prevent the dust propagation into the air.

MINING PLAN APPROVED
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of Geology & Mining
Tenkasi Dist.

11.0 Any Other Details Intend to Furnish by the Applicant:

(i) Permission will be obtained from the District Mines Office to extract the Rough Stone from the Boundary barriers and for slopes.

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

(iii) The applicant will endeavor every attempt to quarry the Rough Stone economically without any wastage and to improve the environment and ecology.

(iv) The Mining Plan is prepared by incorporating the conditions stipulated in the precise area communication issued and relevant mining laws in force.

(v) Any violation pointed out by the inspecting authorities shall be rectified as per the guidelines of the Department.

Prepared by

C.Natarajan, M.Sc.,M.Phil.,
Qualified Person
C.NATARAJAN M.Sc.,M.Phil.,
Qualified Person

Place : Salem
Date : 26.10.2023

This Mining Plan is approved Subject to the Conditions / Stipulation Indicated in the Mining Plan Approval
Letter Roc.No. MI / 30292/2021
Dated 06.11.2023

Regional Joint Director
Assistant Director (I/C)
Geology and Mining
Tenkasi

6/11/23 6/11/23

ANNEXURE 1

MINING PLAN APPROVED By Assistant Director (I/c) of Geology & Mining Tenkasi Dist.

From

Thiru.D.Ravichandran, I.A.S.,
District Collector,
Tenkasi.

To

Thiru.V.M.Sundaraiah,
S/o.Muthaiah Thevar,
4/111D, Sundaresampuram,
Poganallur Village,
Kadayanallur Taluk,
Tenkasi District.

Rc.No.M1/30292/2021 Dated.24.08.2023

Sir,

Sub: **Mines and Minerals** - Minor Mineral - Rough stone quarry lease - Tenkasi District - formerly Sankarankovil Taluk now Kadayanallur Taluk - lease granted to Thiru.V.M.Sundaraiah - over an extent of 3.00.0 hetares in Government Poromboke SF.o. 91 (part-2) - extension of lease for a period of 5 years as per the orders of the Hon'ble Madurai Bench of Madras High Court in WP (MD) No. 8883 of 2021 and the Commissioner of Geology and Mining, Chennai - Precise area communicated - regarding.

Ref:
1. Proceedings of the District Collector, Tirunelveli in Rc. No. M2/32470/1999, dated. 02.06.1999.
2. The Hon'ble Madurai Bench of Madras High Court order in W.P. (MD) No. 8883 of 2021, dated. 18.06.2021.
3. Proceedings of the Commissioner of Geology and Mining, Chennai in Rc. No. 786/MM6/2023, dated. 12.05.2023.
4. District Collector, Tenkasi Letter No M1/30292/2021, dated: 05.06.2023.
5. Representation of Thiru.V.M.Sundaraiah dated 03.08.2023.

******

A roughstone quarry lease had been granted in favour of Thiru.V.M.Sundaraiah over an extent of 3.00.0 hectares in government poromboke SF. No. 91(part-2) in Ariyanayagipuram village, Kadayanallur Taluk of Tenkasi District for a period of 5 years from 12.07.1999 to 11.07.2004 through Tender Cum Action and the lease was expired on 11.07.2004.

2. The Government of Tamil Nadu in G.O (Ms) No. 391, Industries, dated. 17.11.2000 amended the Rule 8(8) of the Tamil Nadu Minor Mineral Concession Rules, 1959 to the effect that the period of lease for quarrying stones in respect of the virgin area which have not been subjected to quarrying so far, shall be 10 years. Since the area is notified for grant of lease for the first time by the Tirunelveli District Gazette Extra - ordinary issue No.14, dated. 23.04.1999 and the area is virgin area then, he is entitled for the grant of lease for a period of 10 years in view of Rule 8(8) of the Tamil Nadu Minor Mineral Concession Rules, 1959.

3. Thiru.V.M.Sundaraiah has filed writ petition in W.P (MD).No. 8883/2021 before the Hon'ble Madurai Bench of Madras High Court with a prayer to issue a writ of mandamus to call for the records of the respondent i.e., the District Collector in Na.Ka.No.M3/30292/2021, dated. 23.10.2021, quash the same, directing the respondent to consider and grant lease for quarrying roughstone and jelly from the land bearing SF. No.91 (part-2) admeasuring 3.00.0 hectares in Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District for the balance period of 5 years for completing ten years lease period as virgin quarry within time frame fixed by the Court.

4. The Hon'ble Madural Bench of Madras High Court in its order dated. 18.06.2023 in W.P (MD) No. 8883 of 2021 has set aside the orders passed by the District Collector, Tenkasi dated. 18.06.2023 and directed the respondent to issue appropriate orders.

MINING PLAN APPROVED
By
Assistant Director (i/c)
of Geology & Mining
Tenkasi Dist.

5. At this juncture, Thiru.V.M.Sundaraiah has preferred an appeal before the Commissioner of Geology and Mining, Chennai and requested to grant extension of lease period for another five years since the said quarry is a virgin quarry based on the orders passed by the Hon'ble Madurai Bench of Madras High Court order dated. 18.06.2023 in W.P (MD) No. 8883 of 2021

6. The Commissioner of Geology and Mining, Chennai vide reference 3th cited, has passed an order as follows:

> *"In view of the above, without going to the merits of the appeal, the appellant Thiru.V.M.Sundaraiah is directed to prefer an appeal before the District Collector, Tenkasi for getting remedy in respect of grant of extension of lease period for further period of five years in S.F.No.91 (Part-2) of Ariyanayagipuram village, Kadayanallur Taluk, Tenkasi District".*

7. Based on the orders of Hon'ble Madurai Bench of Madras High Court in WP (MD) No. 8883 of 2021 dated. 18.06.2021, orders of Commissioner of Geology and Mining, Chennai and appeal preferred by the applicant, Thiru.V.M.Sundaraiah was directed to pay the lease amount,security amount and area assessment in the Government account.

8. The applicant has remitted the lease amount Rs.1,06,49,333/-, security deposit Rs.21,29,867/- and Area Assessment Rs.3,000/- vide challan nos. 20230721008937, 20230814003446 & 20230721009130 respectively and submitted the original challans in this office.

9. The quarry lease area comes under Hill Village as per G.O (Ms) No.49, Housing and Urban Development (UD2.2) Department, dated. 24.03.2003, clearance of HACA Committee is mandatory to process the application.

MINING PLAN APPROVED
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of Geology & Mining
Tenkasi Dist.

10. In view of the above, based on the above circumstances, the area granted under quarry lease in favour of Thiru.V.M.Sundaraiah for quarrying roughstone over an extent of 3.00.0 hectares of Government pormaboke land in SF No.91 (Part-2) of Ariyanayagipuram village, Kadayanallur Taluk, Tenkasi District is hereby considered and communicated as precise area under Rule 8(8) Tamil Nadu Minor Mineral Concession Rules, 1959 for a period of further 5 years and the applicant is directed to produce approved mining plan ,Environmental Clearance obtained from the State Level Environmental Impact Assessment Authority, Chennai and the clearance obtained from the Hill Area Conservation Authority so as to proceed further in this regard.

District Collector,
Tenkasi.

Copy to:

The Chairman,
State Level Environment Impact Assessment Authority,
Chennai.

ANNEXURE II

MINING PLAN APPROVED
By
Assistant Director (I/c)
of Geology & Mining
Tenkasi Dist.

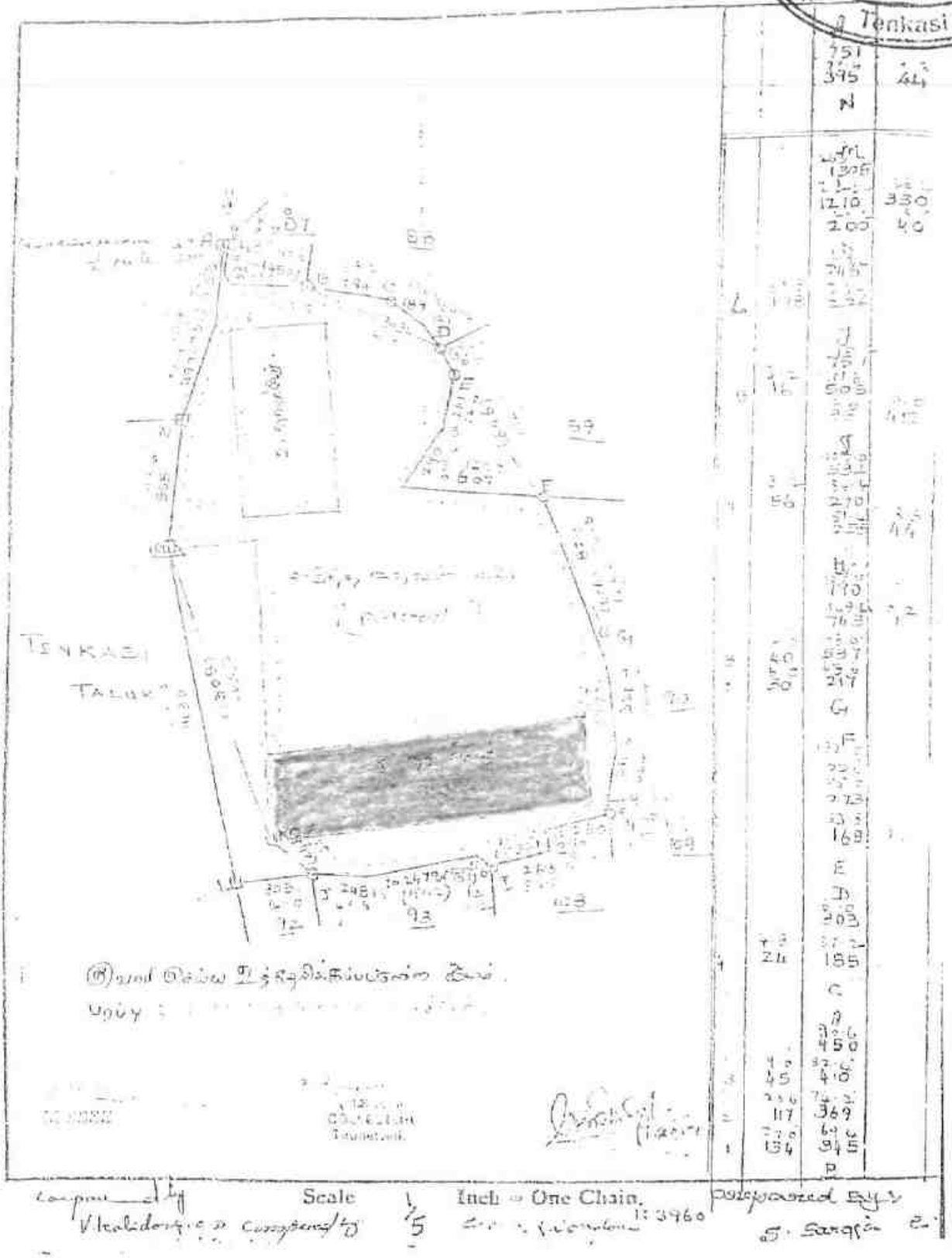
District TIRUNELVELI

Taluk SANKARANKOVIL

Village

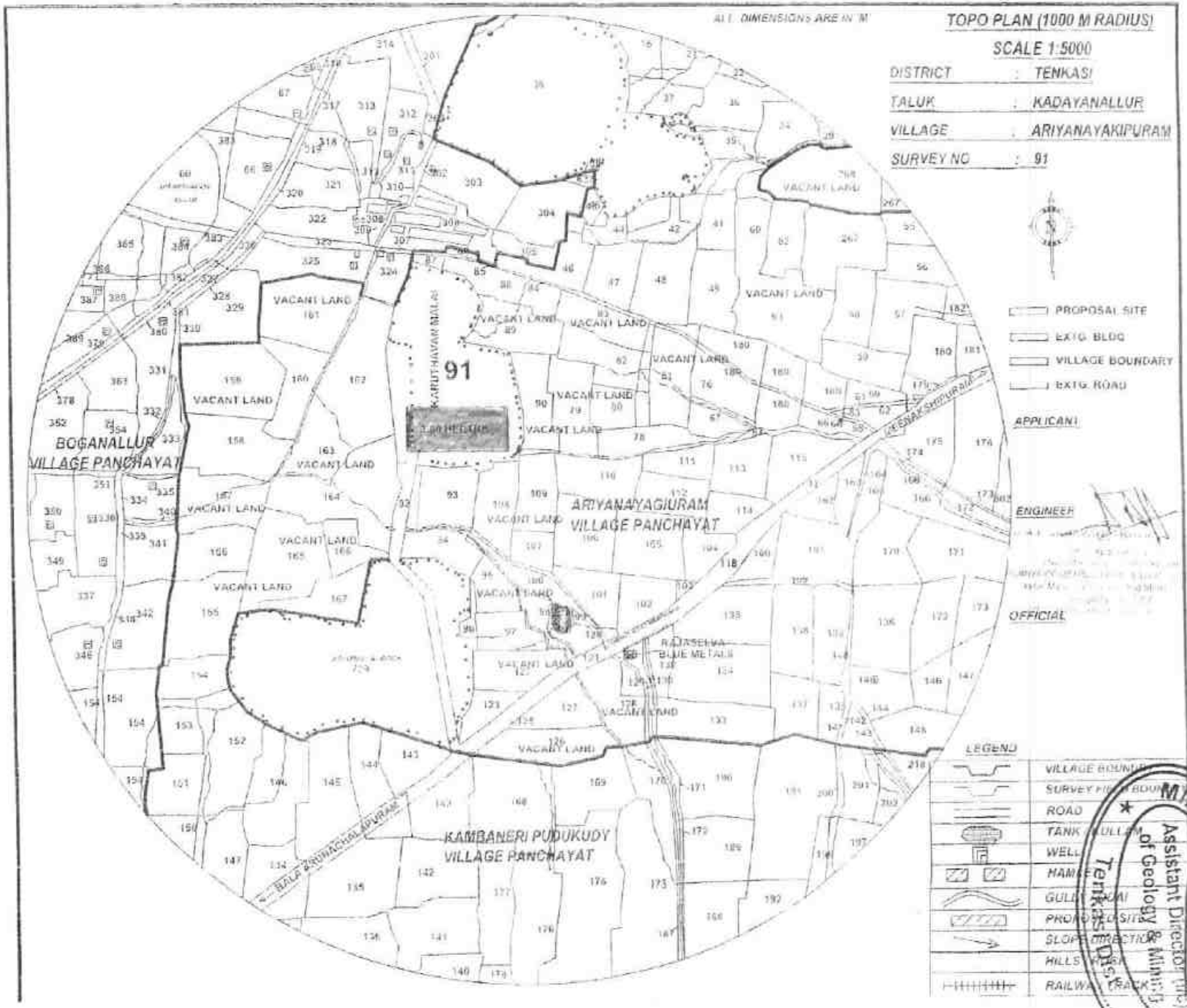
Field No. 91

Area



Scale 1 Inch = One Chain. 1 : 3960

LEASE APPLIED AREA



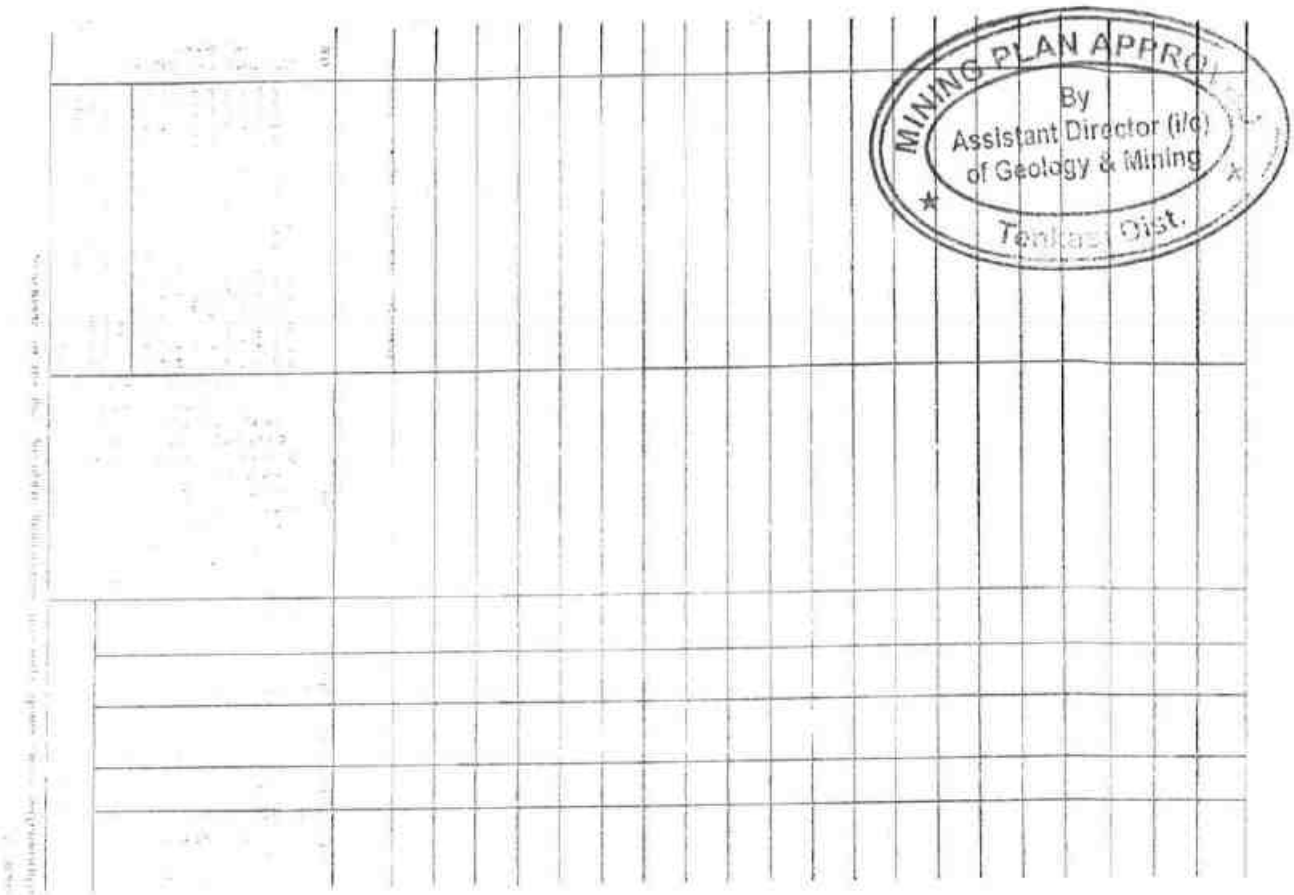
LEASE APPLIED AREA

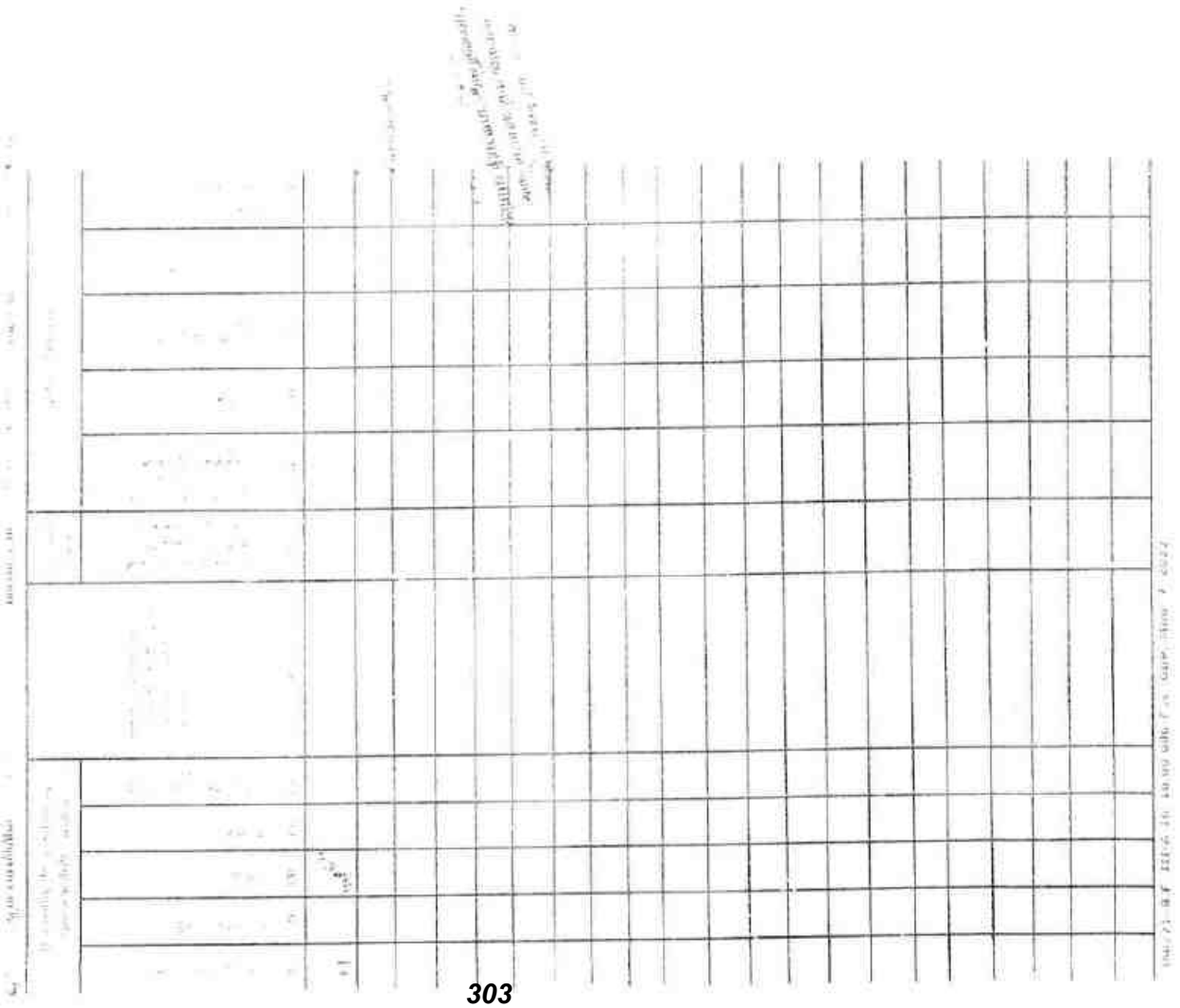
ANNEXURE III

MINING PLAN APPROVED By Assistant Director (i/c) of Geology & Mining Tenkasi Dist.

302

ANNEXURE IV


MINING PLAN APPRO
By
Assistant Director (i/c)
of Geology & Mining
Tenkasi Dist.



ANNEXURE V

MINING PLAN APPROVED
By
Assistant Director (I/c)
of Geology & Mining
Tenkasi Dist.

MINING
By
Assistant Director
of Geology & Mining
Tenkasi Dist.
ANNEXURE VI

ANNEXURE - VII

CHETTINAD CEMENT CORPORATION LTD.,

(Regd. Office: RANI SEETHAI HALL BUILDING IV & V FLOORS, 603, ANNA SALAI, MADRAS-600006)
WORKS OFFICE: PULIYUR.

TELEX: 21144
PHONE 22744 | KARUR
21745
GRAM "CEMENT" Puliyur C.F.
Telex: 0456-215.
STD Code: 04324

MINING PLAN APPROVED
By
Assistant Director (I/c)
Asst. Controller of Mines & Mining
Kumararajan Muthiah Nagar
PULIYUR CEMENT FACTORY POST 639114
(Karur Taluk Tamil Nadu)

22nd September, 1987.

T.RAJU.,B.E.,
MINES MANAGER & DY.GENERAL MANAGER.

CERTIFICATE.

This is to certify that Mr.C.Natarajan has been working as a Geologist from 14-12-1979 to till date. He has been incharge of supervision of day to day functions in respect of Exploration, Preparation of Geological Plans & Sections, Preparation of Mines Plans, QC Quality control and other allied mining activities in the following Pits of our Seethainager Limestone Mines in Anna District.

Name of the Pit.		Average Quarrying/day.
1. Alambadi Pit.	-	1,700 T.
2. Mallapuram Pit.	-	900 T.
3. Karikkali Pit.	-	150 T.
Total.	-	2,750 T.

He has got nearly eight years of total experience in our Mines in the above supervisory capacity.

for CHETTINAD CEMENT CORPORATION LTD.,

(T.RAJU).
Mines Manager & Dy. General Manager.

MINING PLAN APPROVED
By
Assistant Director (I/c)
of Geology & Mining
Tenkasi Dist.

3249

Annamalai University

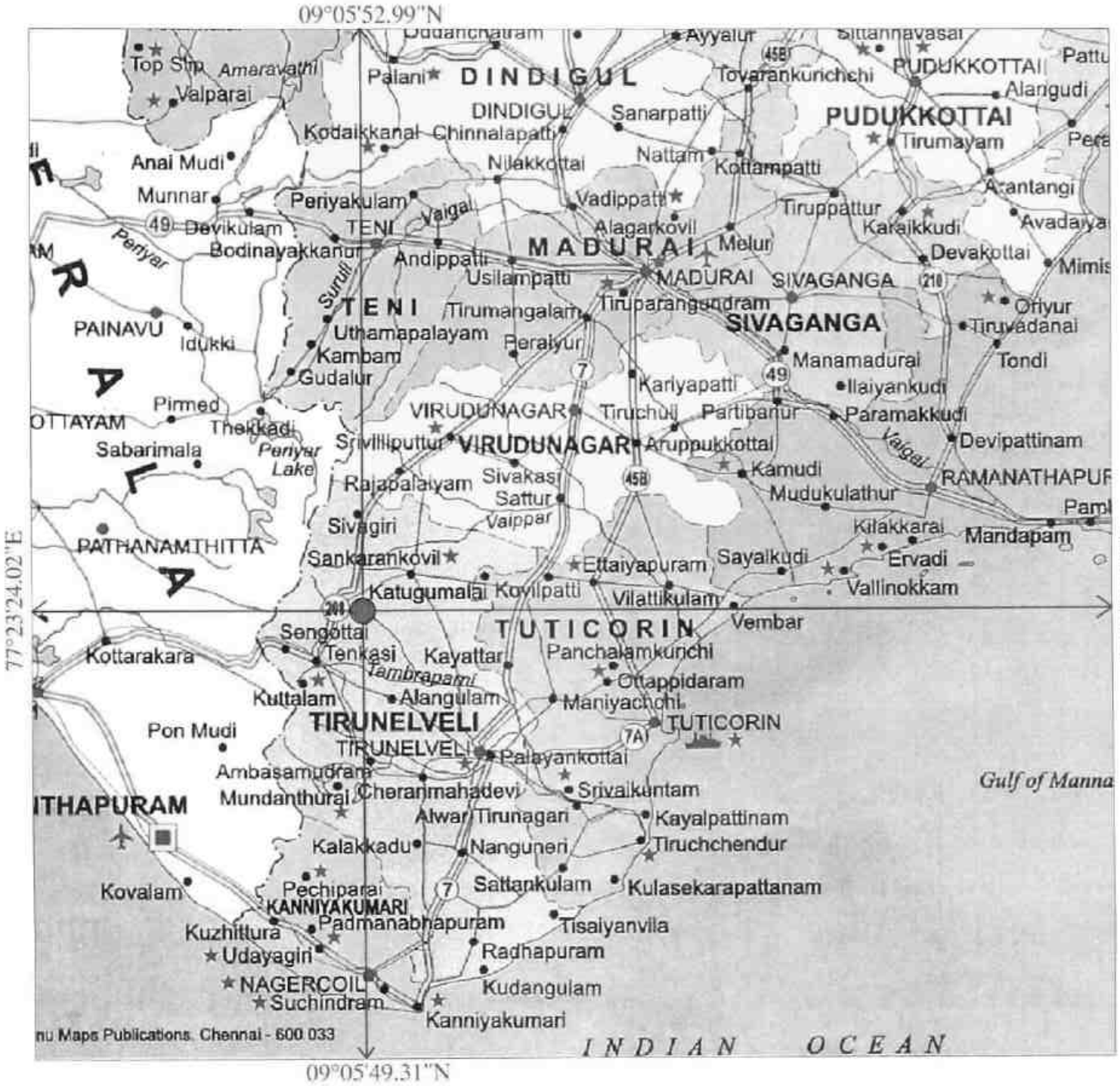
Faculty of Science

The Senate of the Annamalai University hereby makes known that _____ has been admitted to the Degree of Master of Science (By Examination) in _____ having been adjudged by duly appointed Examiners of the examination held in April, 1976 to be entitled to receive the same and that he was placed in the _____ Class.

Given under the seal of the University

Annamalainagar
8th December, 1976.

N. Chandrasekhara
Vice-Chancellor.



308

PLATE NO. 1

DATE OF SURVEY : 25.10.2023

APPLICANT:

THIRU.V.M.SUNDARAIAH,
S/o.MUTHAIAH THEVAR,
NO.4/111D, SUNDARESAPURAM BLOCK-IV,
POGANALLUR VILLAGE,
KADAYANALLUR TALUK,
TENKASI DISTRICT.

QUARRY APPLIED LEASE AREA:

S.F.NO : 91 (PART-2),
EXTENT : 3.00.0 Ha.
VILLAGE : ARIYANAYAGIPURAM,
TALUK : KADAYANALLUR,
DISTRICT : TENKASI.

INDEX

Q. L. APPLIED AREA :

TOPO SHEET NO : 58 G / 08

LATITUDE :09°05'49.31"N to 09°05'52.99"N

LONGITUDE :77°23'24.02"E to 77°23'35.00"E

LOCATION PLAN

NOT TO SCALE

PREPARED BY :

THIS IS TO CERTIFY THAT THE INFORMATION IN THIS PLATE IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE BASED UPON THE LEASE MAP AUTHENTICATED BY STATE GOVERNMENT

C.NATARAJAN M.Sc.,M.Phil.,
QUALIFIED PERSON

KEY PLAN

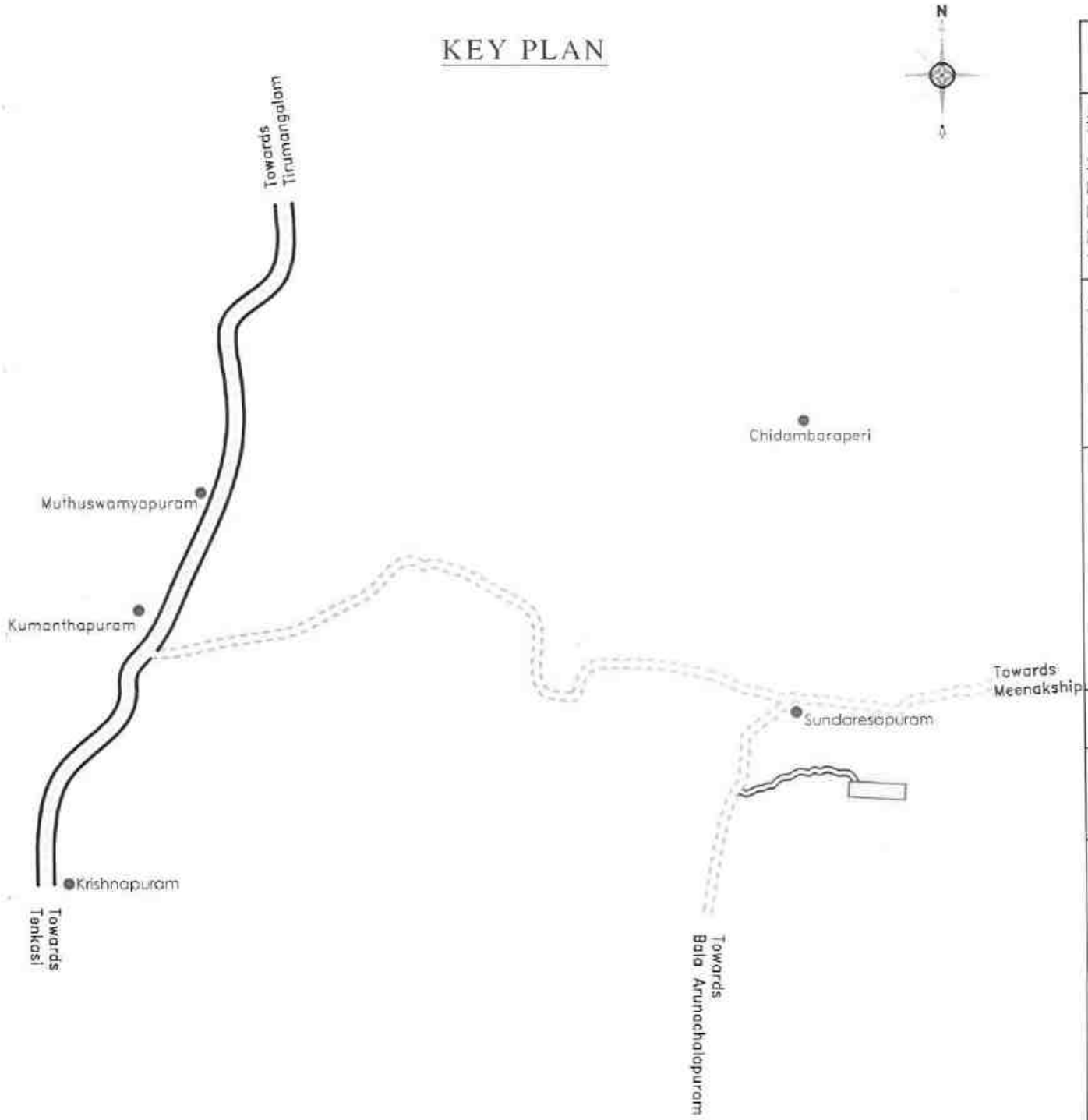


PLATE NO.ID
DATE OF SURVEY : 25.10.2023

APPLICANT:

THIRU.V.M.SUNDARAIAH,
S/o.MUTHAIAH THEVAR,
NO.4/111D, SUNDARESAPURAM BLOCK-IV,
POGANALLUR VILLAGE,
KADAYANALLUR TALUK,
TENKASI DISTRICT.

QUARRY APPLIED LEASE AREA:

S.F.NO : 91 (PART-2),
EXTENT : 3.00.0 Ha.
VILLAGE : ARIYANAYAGIPURAM,
TALUK : KADAYANALLUR,
DISTRICT : TENKASI.

INDEX

Q.L.APLLIED AREA	
APPROACH ROAD	
PANCHAYAT ROAD	
NATIONAL HIGHWAY	
HABITATIONS	

KEY PLAN

Not To Scale

PREPARED BY:

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C.NATARAJAN.,M.Sc.,M.Phil.,
QUALIFIED PERSON

MINING PLAN APPROVED
By
Assistant Director (I/c)
of Geology & Mining
Tenkasi

309

PLATE NO: IA

DATE OF SURVEY : 25.10.2023

APPLICANT:

THIRU.V.M.SUNDARAIAH,
S/o.MUTHAIAH THEVAR,
NO.4/111D, SUNDARESAPURAM BLOCK-IV
POGANALLUR VILLAGE,
KADAYANALLUR TALUK,
TENKASI DISTRICT.

QUARRY APPLIED LEASE AREA:

S.F.NO : 91 (PART-2),
EXTENT : 3.00.0 Ha,
VILLAGE : ARIYANAYAGIPURAM,
TALUK : KADAYANALLUR,
DISTRICT : TENKASI.

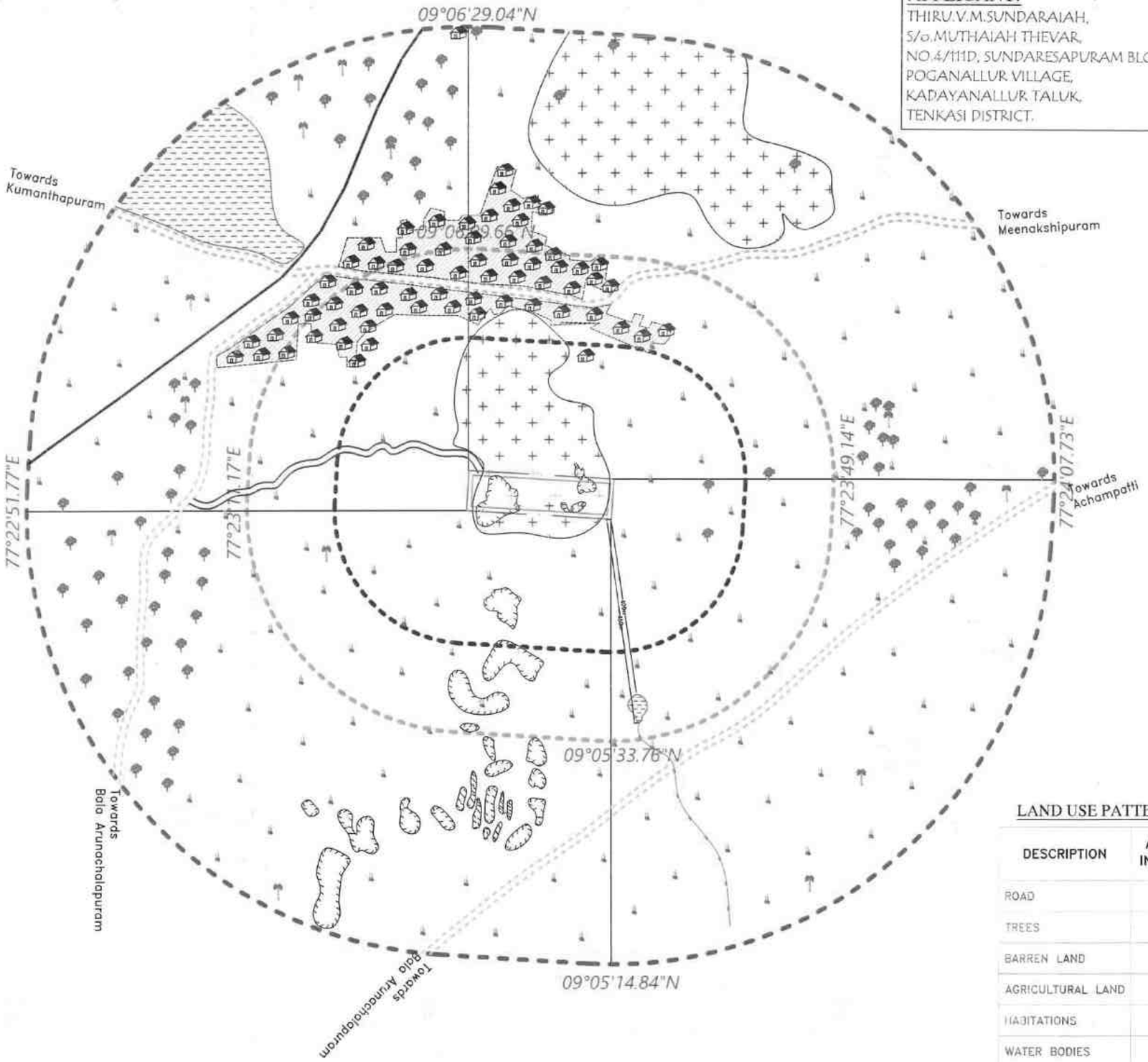
MINING PLAN APPR
By
Assistant Director (i/c)
of Geology & Mining
Tenkasi Dist

INDEX

TOPO SHEET NO : 58 G / 08

LATITUDE :09°05'49.31"N to 09°05'52.99"N

LONGITUDE :77°23'24.02"E to 77°23'35.00"E



Q.L.APPLIED AREA	
10m SAFETY	
300M RADIUS	
500M RADIUS	
1KM RADIUS	
APPROACH ROAD	
PANCHAYAT ROAD	
BARREN LAND	
TREES	
AGRICULTURAL LAND	
QUARRY PIT	
HABITATIONS	
ODAI	
TANK	
RAILWAY TRACK	
HILLOCK	

LAND USE PATTERN

DESCRIPTION	AREA IN (%)
ROAD	04
TREES	15
BARREN LAND	27
AGRICULTURAL LAND	07
HABITATIONS	15
WATER BODIES	10
RAILWAY TRACK	02
HILLOCK	20

ENVIRONMENTAL PLAN

SCALE 1:10,000

PREPARED BY :

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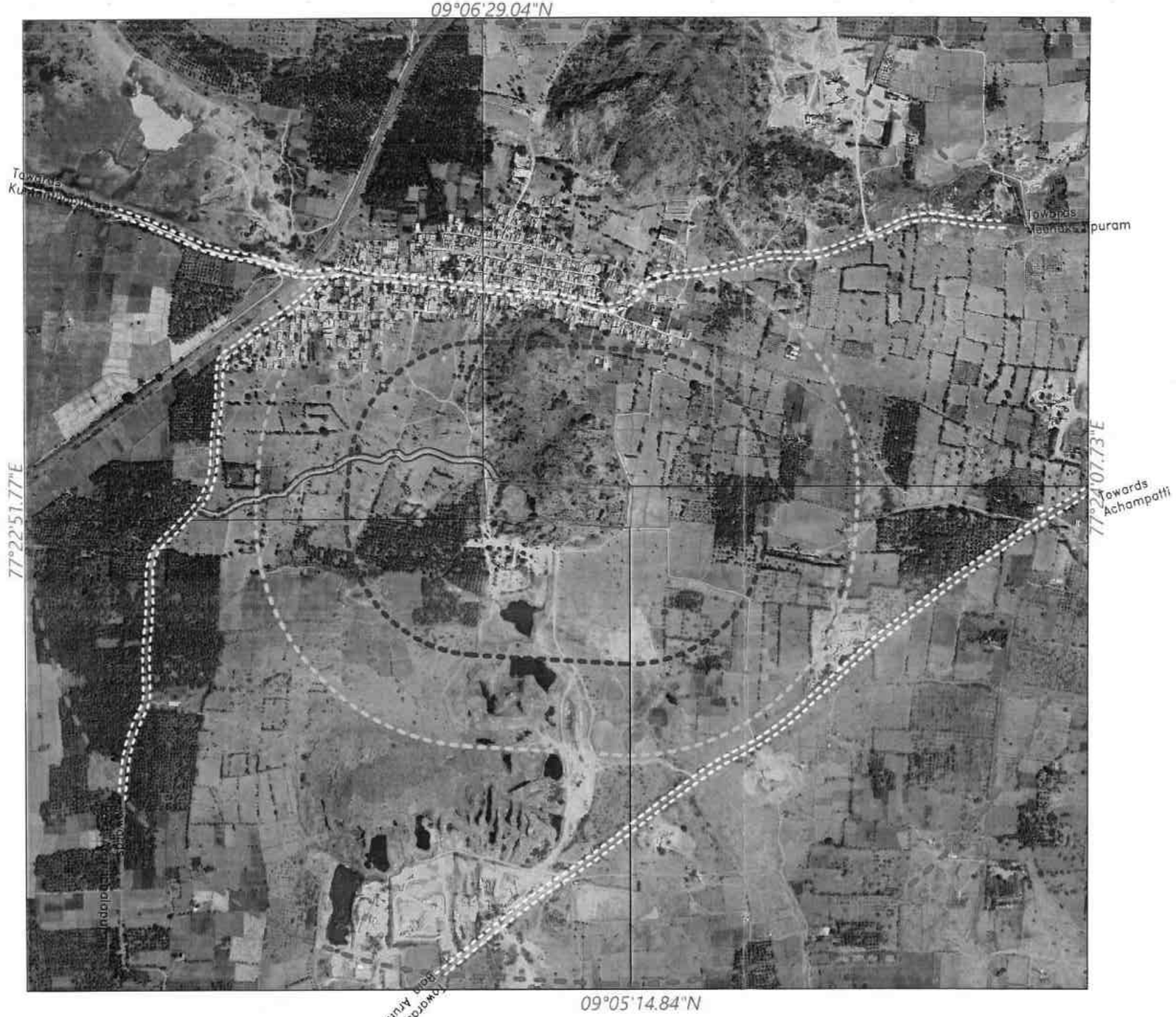
C.NATARAJAN,M.Sc.,M.Phil.,
QUALIFIED PERSON



MINING PLAN APPROVED
By
Assistant Director (I/c)
of Geology & Mining
Tenkasi Dist.

PLATE NO: IB

DATE OF SURVEY : 25.10.2023

APPLICANT:

THIRU.V.M.SUNDARAIAH,
S/o.MUTHAIAH THEVAR,
NO.4/111D, SUNDARESAPURAM BLOCK-IV,
POGANALLUR VILLAGE,
KADAYANALLUR TALUK,
TENKASI DISTRICT.

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LONGITUDE :77°23'24.02"E to 77°23'35.00"E

Q.L.APPLIED AREA	
10m SAFETY	
300M RADIUS	
500M RADIUS	
1KM RADIUS	
APPROACH ROAD	
PANCHAYAT ROAD	

SATELLITE IMAGERY MAP

SCALE 1:10,000

PREPARED BY :

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C.NATARASAN.,M.Sc.,M.Phil.,
QUALIFIED PERSON

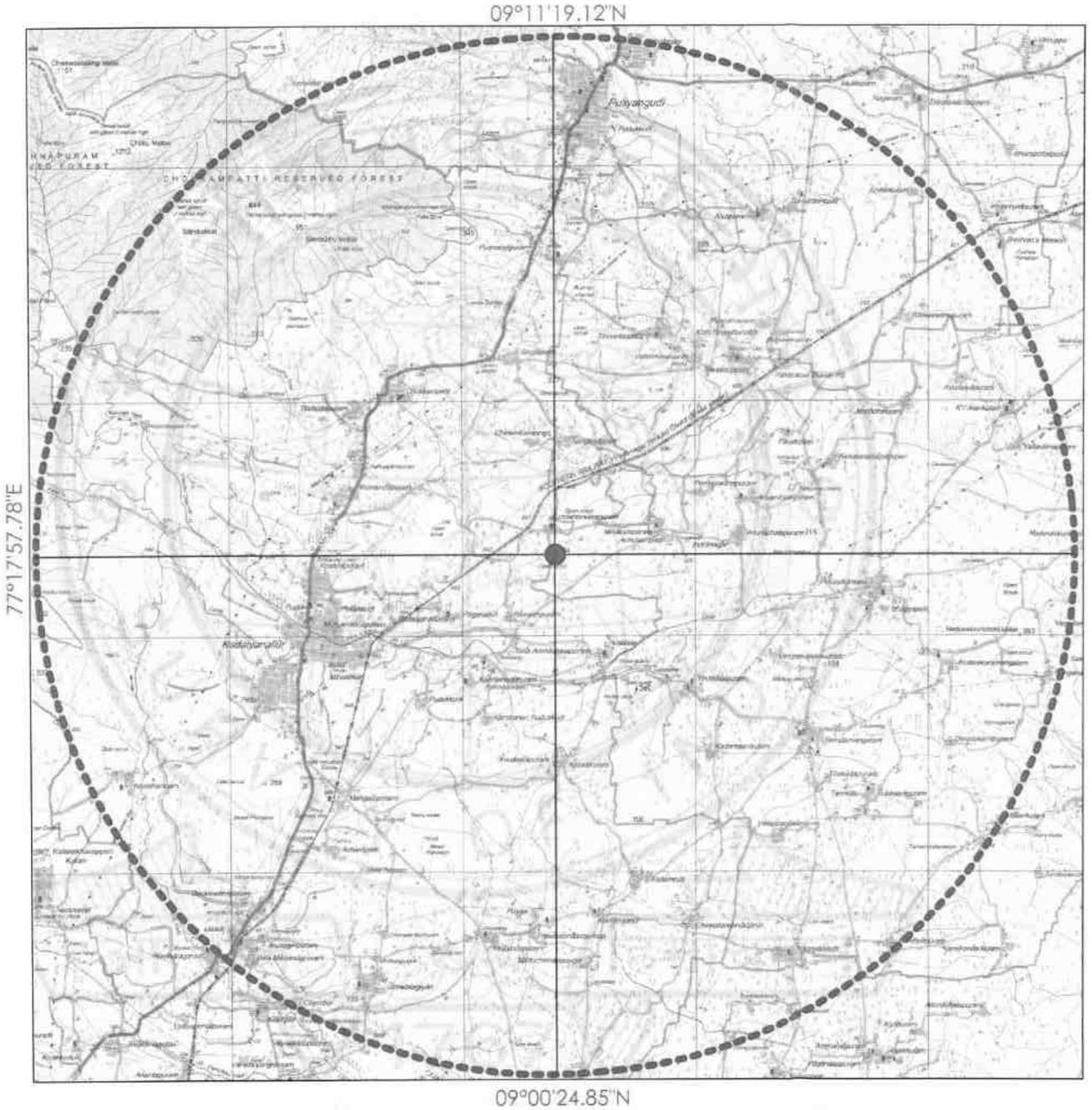

PLATE NO-I C

DATE OF SURVEY : 25.10.2023

MINING PLAN PROJ
By
Assistant Director (i/c)
of Geology & Mining
Tenkasi Dist.

APPLICANT:

THIRU.V.M.SUNDARAIAH,
S/o.MUTHAIAH THEVAR,
NO.4/111D, SUNDARESAPURAM BLOCK-IV,
POGANALLUR VILLAGE,
KADAYANALLUR TALUK,
TENKASI DISTRICT.

QUARRY APPLIED LEASE AREA:

S.F.NO : 91 (PART-2),
EXTENT : 3.00.0 Ha,
VILLAGE : ARIYANAYAGIPURAM,
TALUK : KADAYANALLUR,
DISTRICT : TENKASI.

INDEX

TOPO SHEET NO : 58 G / 08

LATITUDE :09°05'49.31"N to 09°05'52.99"N

LONGITUDE :77°23'24.02"E to 77°23'35.00"E

Q.L.APPLIED AREA

10KM RADIUS

TOPO SKETCH OF QUARRY LEASE APPLIED AREA FOR 10Km RADIUS

SCALE– 1:100000

PREPARED BY :

THIS IS TO CERTIFY THAT THE INFORMATION IN THIS PLATE IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE BASED UPON THE LEASE MAP AUTHENTICATED BY STATE GOVERNMENT

C.NATARAJAN.,M.Sc.,M.Phi.,
QUALIFIED PERSON

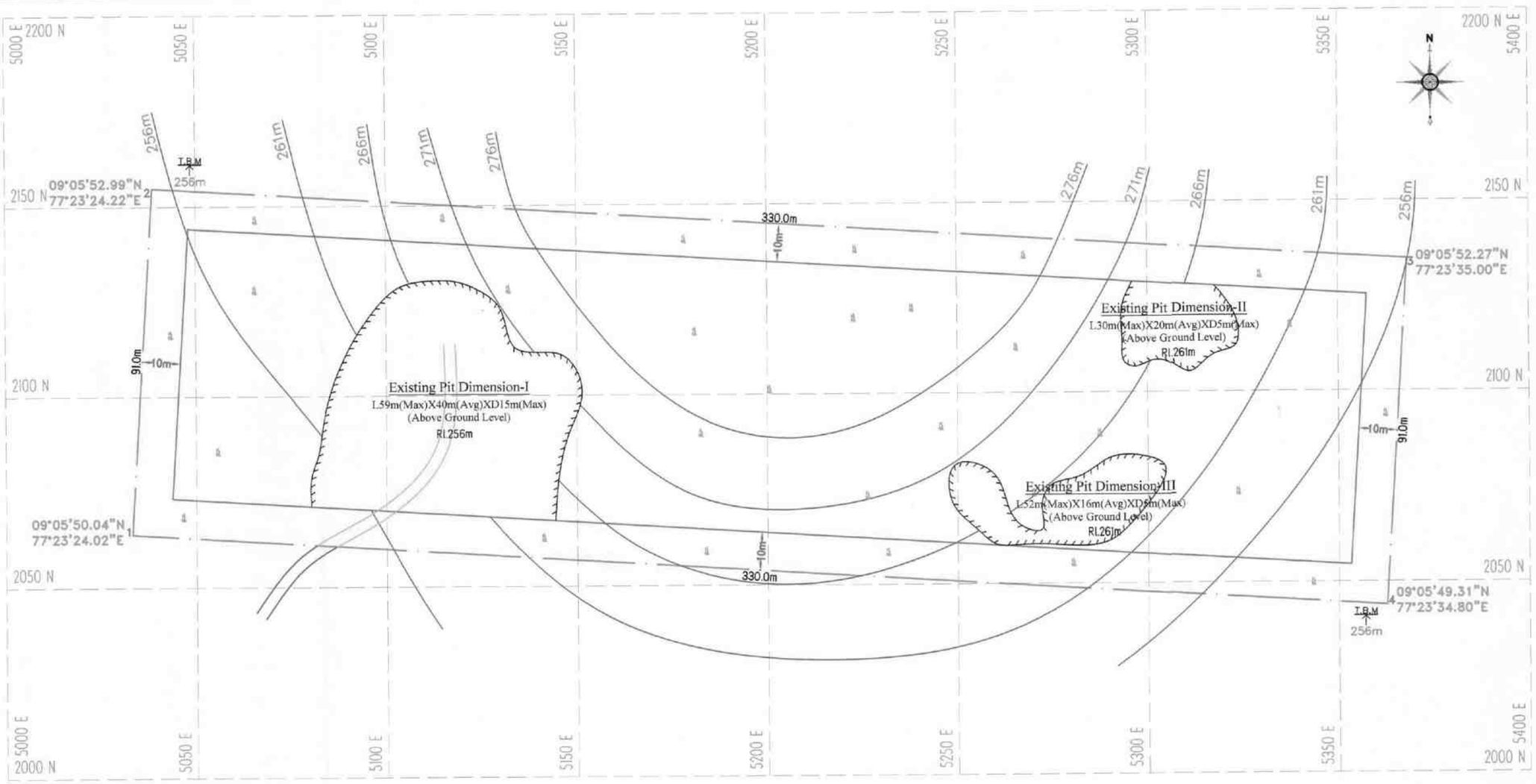

PLATE NO-II

DATE OF SURVEY : 25.10.2023

MINING PLAN APPROVED
By
Assistant Director (i/c)
of Geology & Mining
Tenkasi Dist.

APPLICANT:

THIRU.V.M.SUNDARALAH,
S/o.MUTHAIAH THEVAR,
NO.4/111D, SUNDARESAPURAM BLOCK IV,
POGANALLUR VILLAGE,
KADAYANALLUR TALUK,
TENKASI DISTRICT.

QUARRY APPLIED LEASE AREA:

S.F.NO : 91 (PART-2),
EXTENT : 3.00.0 Ha,
VILLAGE : ARIYANAYAGIPURAM,
TALUK : KADAYANALLUR,
DISTRICT : TENKASI.

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- TEMPORARY BENCH MARK (T.B.M)
- APPROACH ROAD
- QUARRY ROAD
- CONTOUR
- SCRUB
- QUARRY PIT

QUARRY LEASE & SURFACE PLAN

SCALE 1 : 1000

PREPARED BY:

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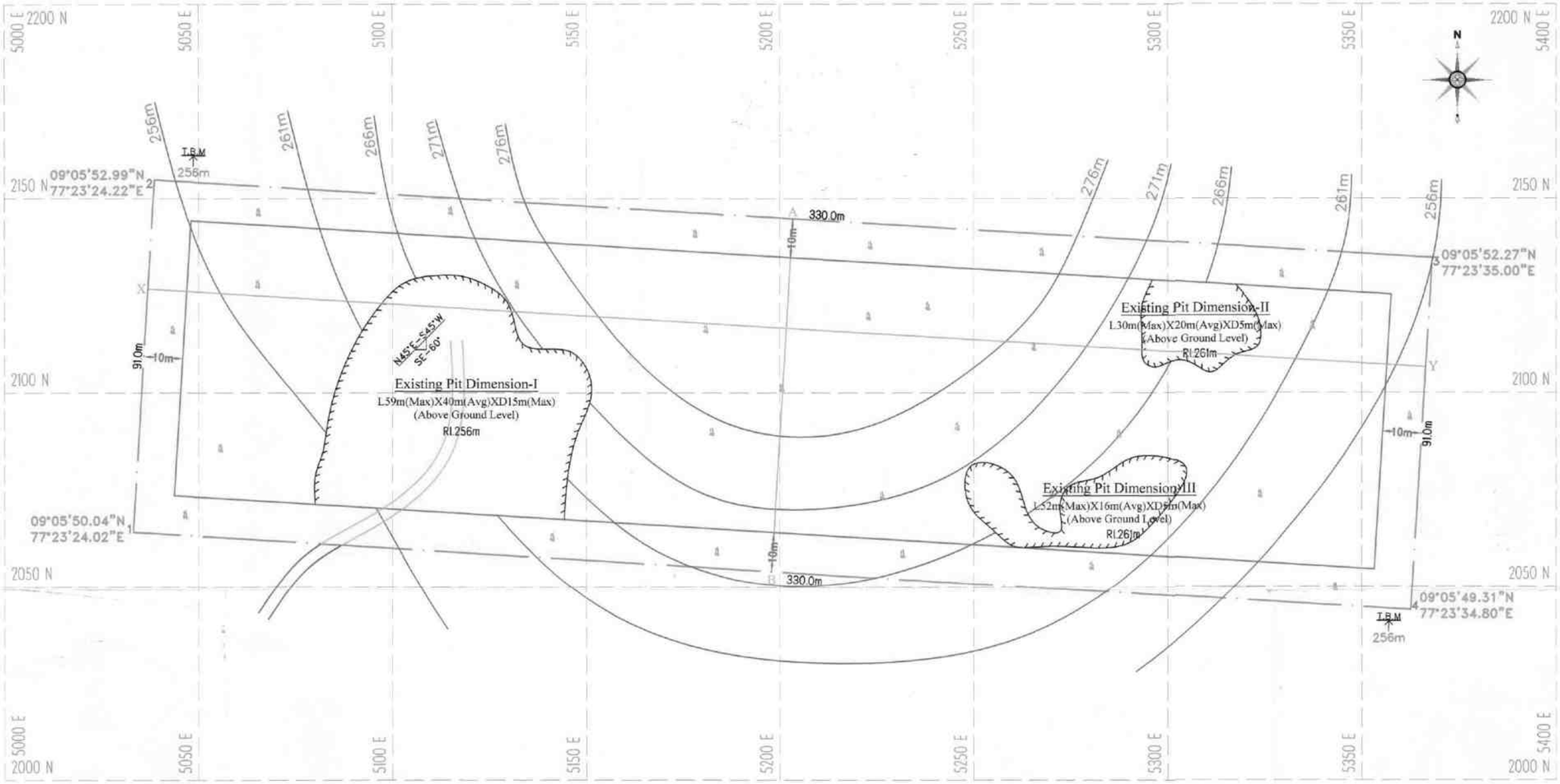
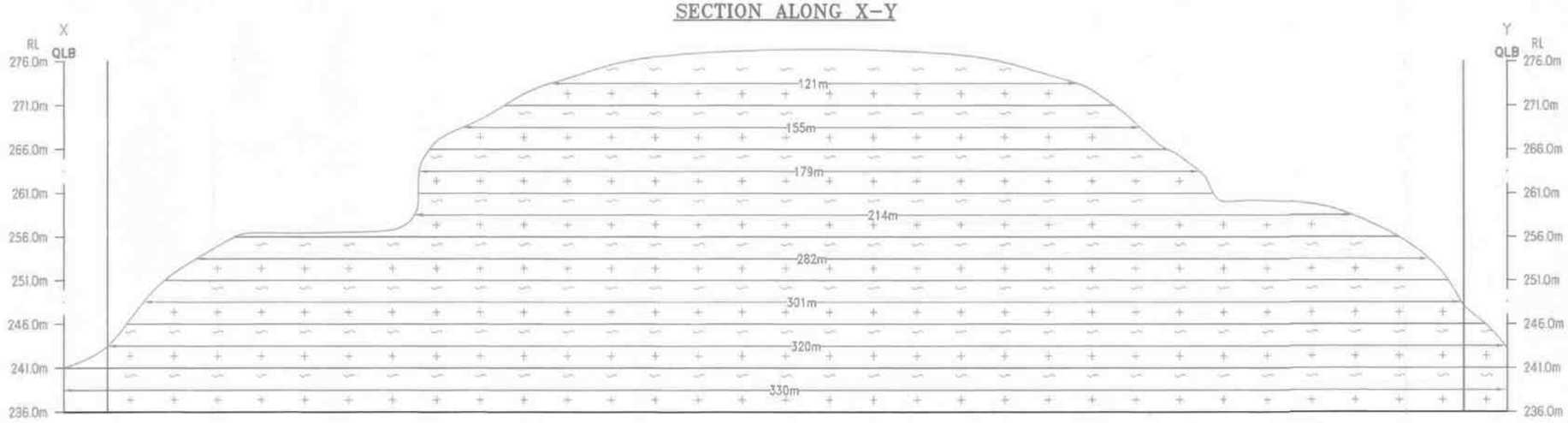
C.NATARAJAN,M.Sc.,M.Phil.,
QUALIFIED PERSON



MINING PLAN APPROVED
By
Assistant Director (i/c)
of Geology & Mining
Tenkasi Dist.

SECTION ALONG X–Y



SECTION ALONG A–B

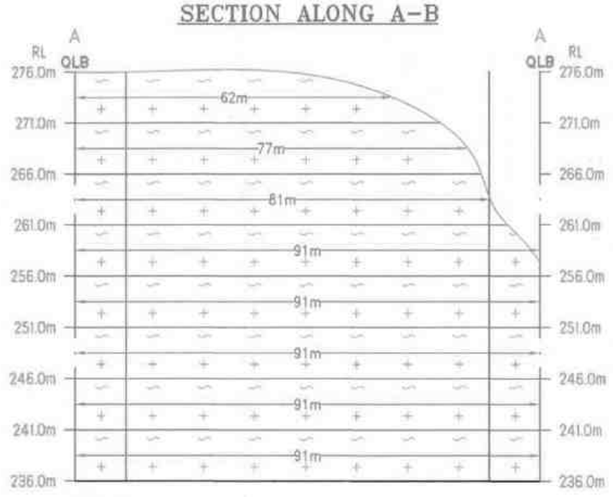


PLATE NO-III
DATE OF SURVEY : 25.10.2023

APPLICANT:
THIRU.V.M.SUNDARAIAH,
S/o.MUTHAIAH THEVAR,
NO.4/111D, SUNDARESAPURAM BLOCK-IV,
POGANALLUR VILLAGE,
KADAYANALLUR TALUK,
TENKASI DISTRICT.

QUARRY APPLIED LEASE AREA:
S.F.NO : 91 (PART-2),
EXTENT : 3.00.0 Ha,
VILLAGE : ARIYANAYAGIPURAM,
TALUK : KADAYANALLUR,
DISTRICT : TENKASI.

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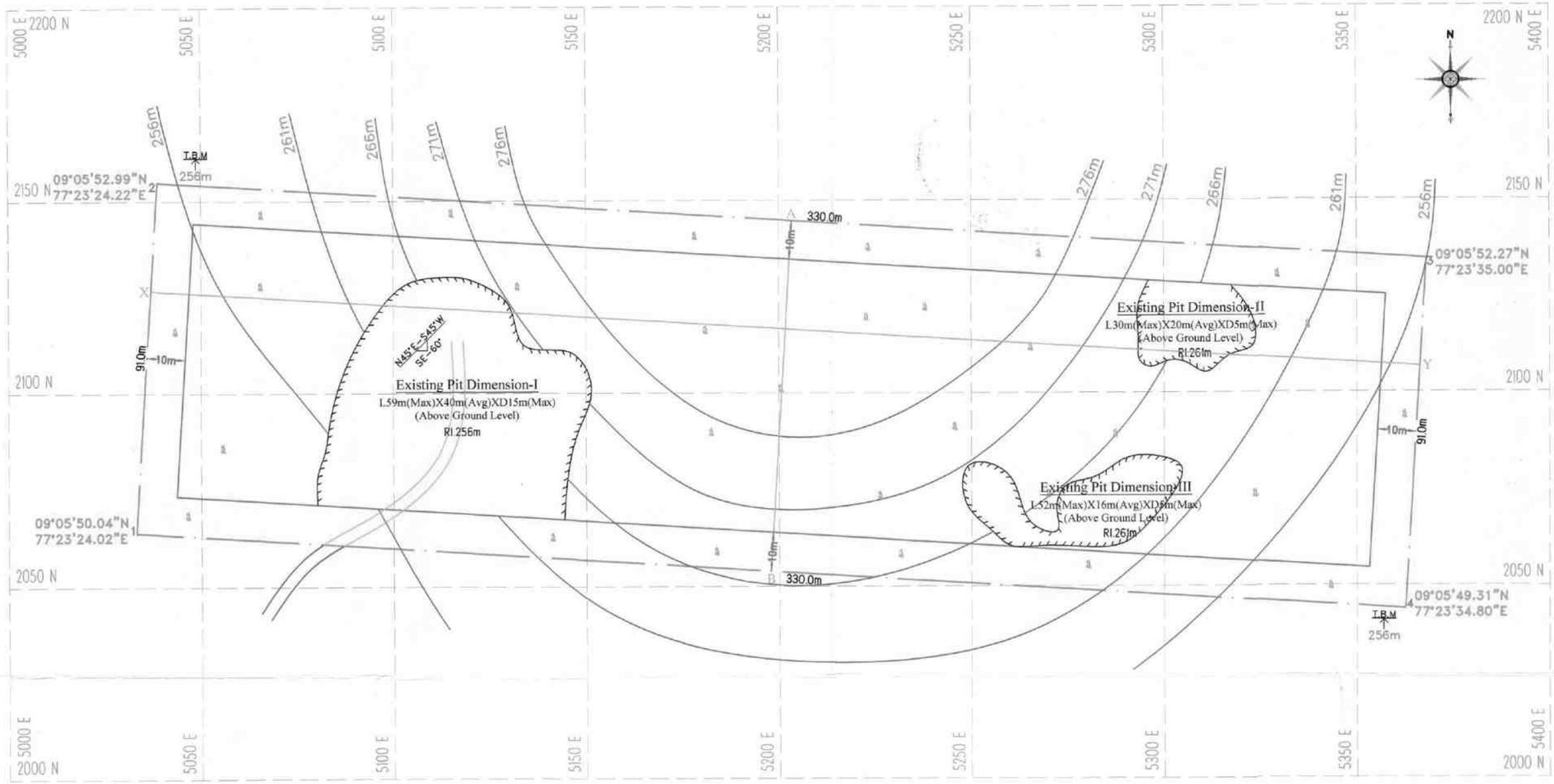
- TEMPORARY BENCH MARK (T.B.M)
- APPROACH ROAD
- QUARRY ROAD
- CONTOUR
- SCRUB
- QUARRY PIT
- ROUGH STONE
- STRIKE & DIP

TOPOGRAPHY & GEOLOGICAL PLAN & SECTIONS
SCALE 1:1000
SECTIONS HOR 1:1000, VER 1:500

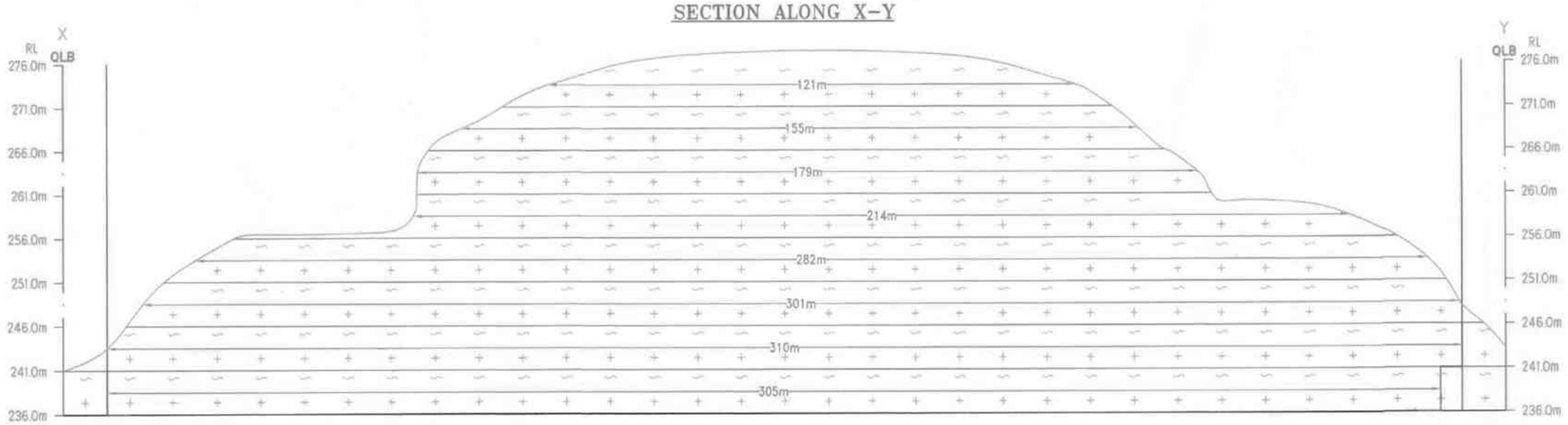
PREPARED BY:
THIS IS TO CERTIFY THAT THE INFORMATION IN THIS PLATE IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE BASED UPON THE LEASE MAP AUTHENTICATED BY STATE GOVERNMENT

C.NATARAJAN.,M.Sc.,M.Phi.,
QUALIFIED PERSON



MINING PLAN APPROVED
By
Assistant Director (i/c)
of Geology & Mining
Tenkasi District.

SECTION ALONG X-Y



SECTION ALONG A-B

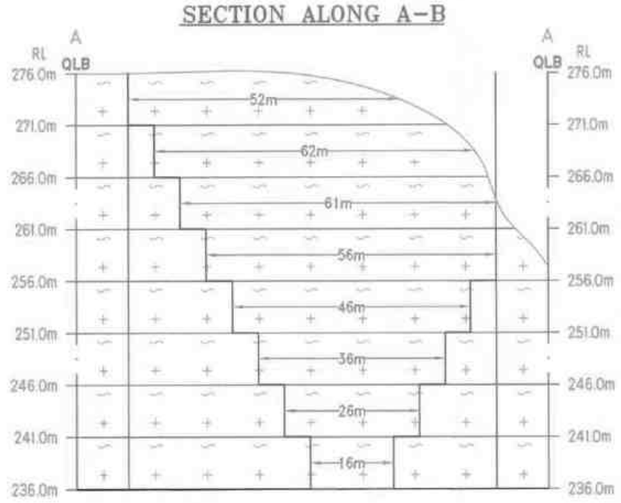


PLATE NO-IV
DATE OF SURVEY : 25.10.2023

APPLICANT:
THIRU.V.M.SUNDARAIAH,
S/o.MUTHAIAH THEVAR,
NO.4/111D, SUNDARESAPURAM BLOCK-IV,
POGANALLUR VILLAGE,
KADAYANALLUR TALUK,
TENKASI DISTRICT.

QUARRY APPLIED LEASE AREA:
S.F.NO : 91 (PART-2),
EXTENT : 3.00.0 Ha,
VILLAGE : ARIYANAYAGIPURAM,
TALUK : KADAYANALLUR,
DISTRICT : TENKASI.

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- CONTOUR
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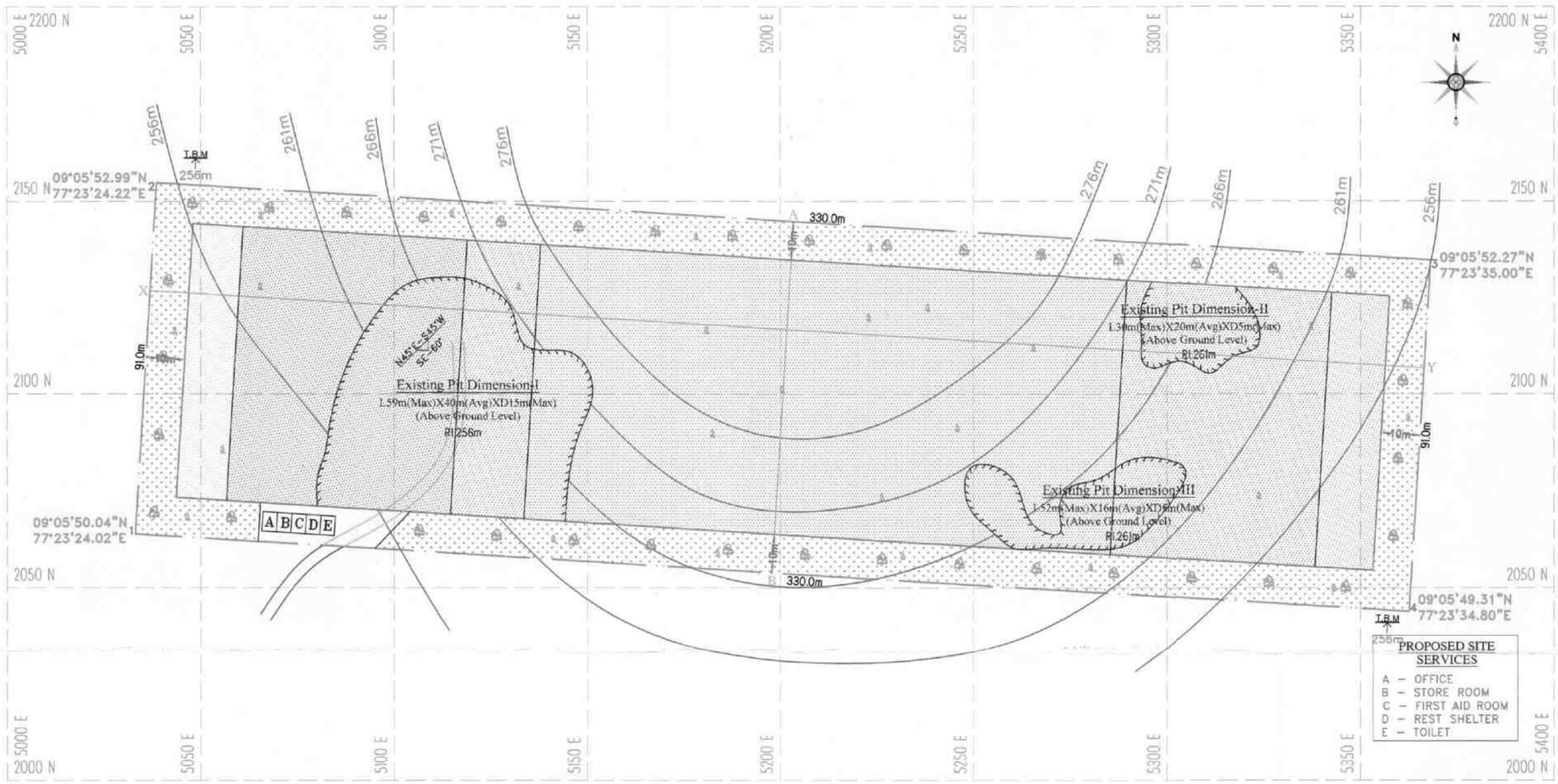
- QUARRY PIT
- ROUGH STONE
- STRIKE & DIP

MINEABLE PLAN & SECTIONS
SCALE 1:1000
SECTIONS HOR 1:1000, VER 1:500

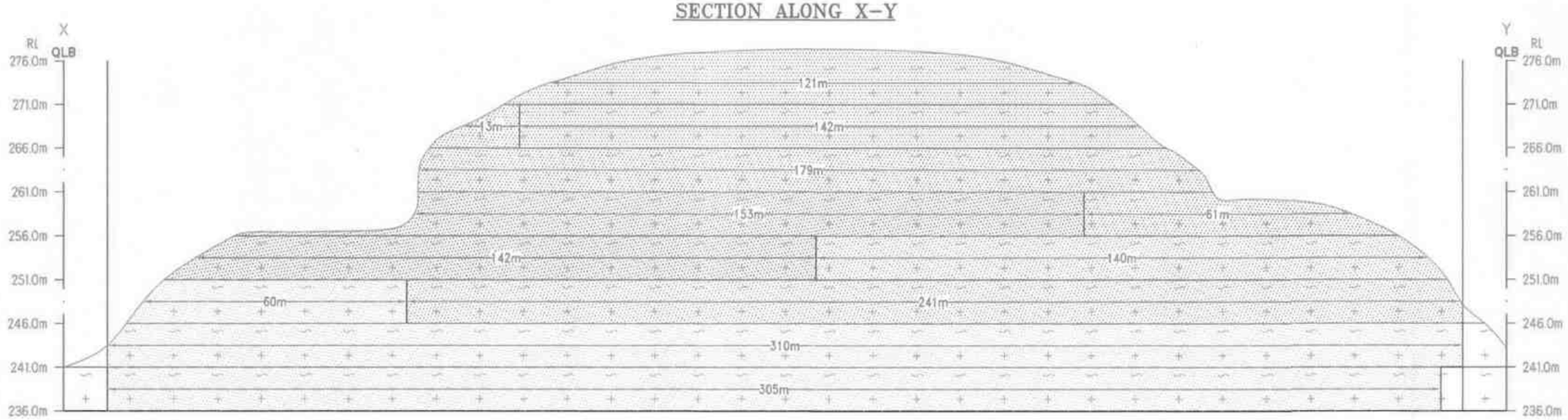
PREPARED BY:
THIS IS TO CERTIFY THAT THE INFORMATION IN THIS PLATE IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE BASED UPON THE LEASE MAP AUTHENTICATED BY STATE GOVERNMENT

C.NATARAJAN, M.Sc.,M.Phil.,
QUALIFIED PERSON

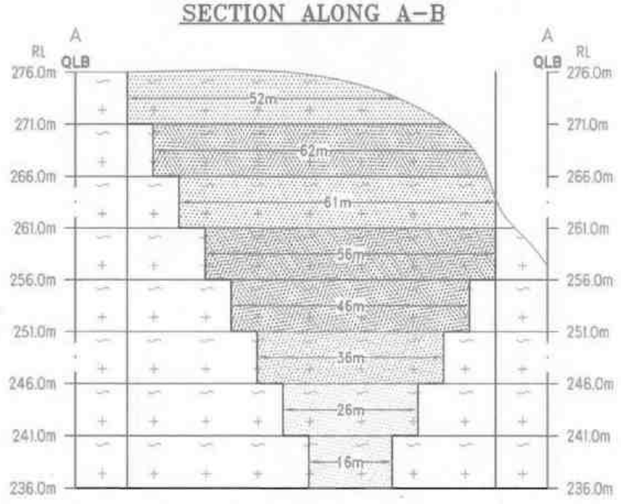


MINING PLAN APPROVED
By
Assistant Director (i/c)
of Geology & Mining
Tenkasi Dist.

SECTION ALONG X–Y



SECTION ALONG A–B



1st yr Proposed area to be Quarried
2nd yr Proposed area to be Quarried
3rd yr Proposed area to be Quarried
4th yr Proposed area to be Quarried
5th yr Proposed area to be Quarried

Proposed area to be Planted

PRESENT & POST LAND USE PATTERN

DESCRIPTION	PRESENT AREA (Ha)	AREA AT THE END OF THIS QUARRYING PERIOD (Ha)
AREA UNDER QUARRYING	0.38.0	2.00.5
INFRASTRUCTURE	NIl	0.01.0
ROADS	0.01.0	0.01.0
GREEN BELT	NIl	0.97.5
UN-UTILIZED AREA	2.61.0	NIl
GRAND TOTAL	3.00.0	3.00.0

PLATE NO-V
DATE OF SURVEY : 25.10.2023

APPLICANT:
THIRU.V.M.SUNDARAIAH,
S/o.MUTHAIAH THEVAR,
NO.4/111D, SUNDARESAPURAM BLOCK-IV,
POGANALLUR VILLAGE,
KADAYANALLUR TALUK,
TENKASI DISTRICT.

QUARRY APPLIED LEASE AREA:
S.F.NO : 91 (PART-2),
EXTENT : 3.00.0 Ha,
VILLAGE : ARIYANAYAGIPURAM,
TALUK : KADAYANALLUR,
DISTRICT : TENKASI.

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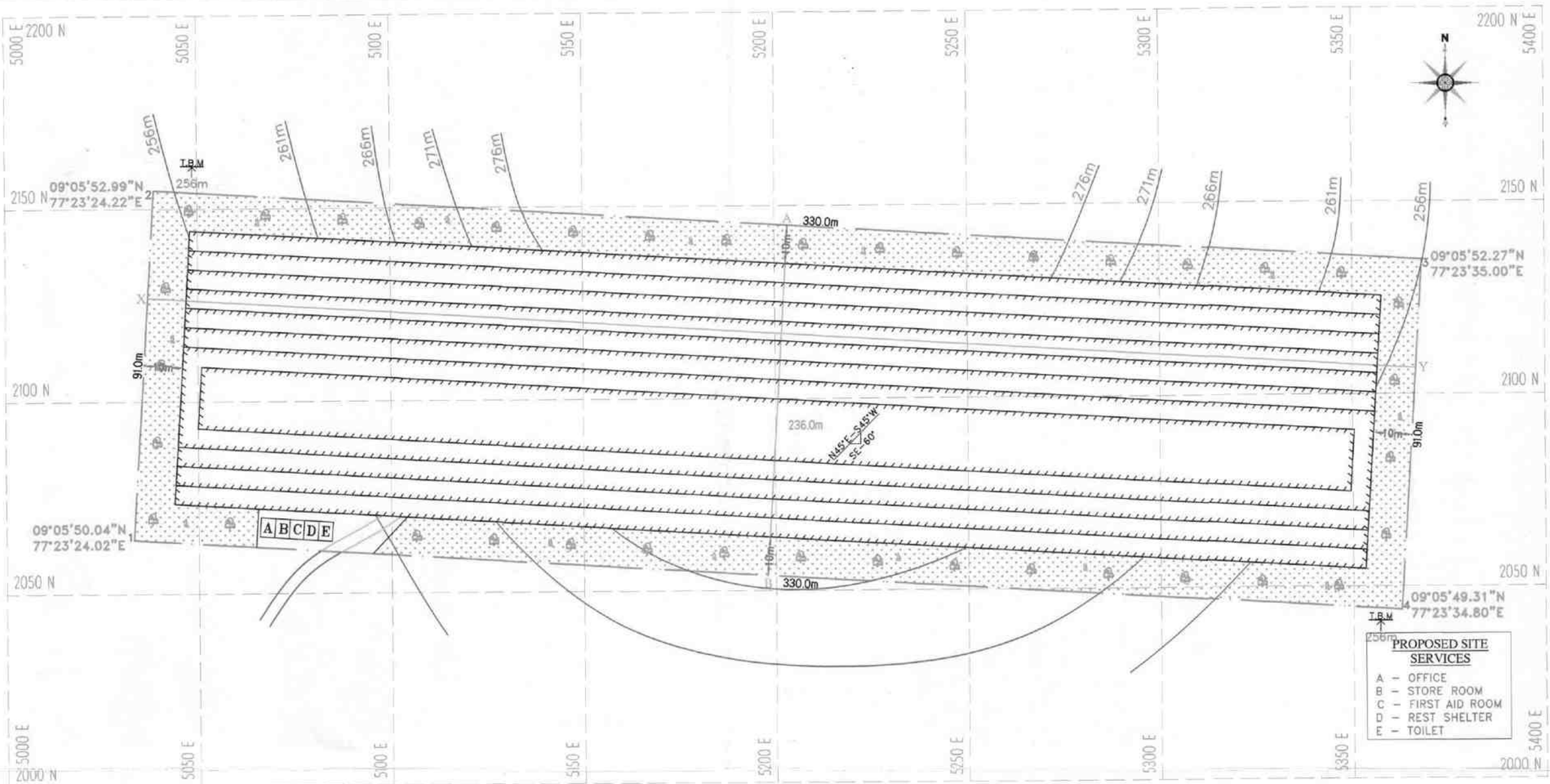
- CONTOUR
- SCRUB
- QUARRY PIT
- ROUGH STONE
- STRIKE & DIP

YEARWISE DEVELOPMENT & PRODUCTION PLAN & SECTIONS
SCALE 1:1000
SECTIONS HOR 1:1000, VER 1:500

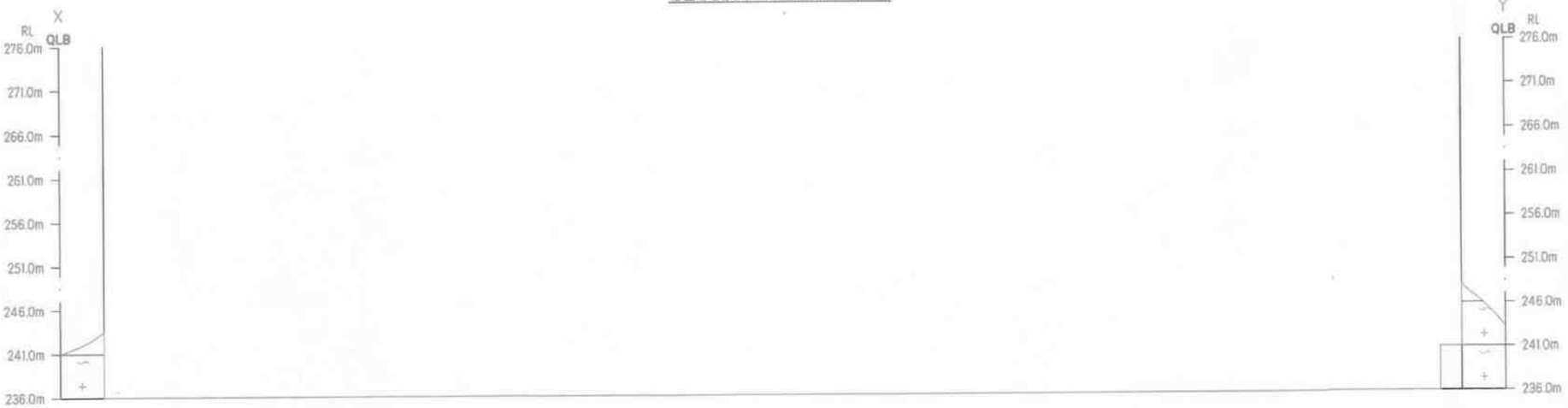
PREPARED BY:
THIS IS TO CERTIFY THAT THE INFORMATION IN THIS PLATE IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE BASED UPON THE LEASE MAP AUTHENTICATED BY STATE GOVERNMENT

C.NATARAJAN, M.Sc.,M.Phil.,
QUALIFIED PERSON

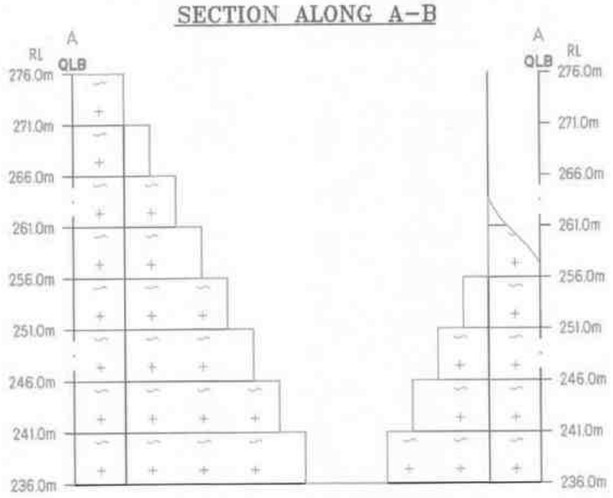


MINING PLAN APPROVED
By
Assistant Director (i/c)
of Geology & Mining
Tenkasi Dist.

SECTION ALONG X–Y



SECTION ALONG A–B



ULTIMATE PIT DIMENSION
L310m(Max)X71m(Avg)XD40m(Max)
(Above Ground Level)

Proposed area to be Planted

PLATE NO-VI
DATE OF SURVEY : 25.10.2023

APPLICANT:
THIRU.V.M.SUNDARAIAH,
S/o.MUTHAIAH THEVAR,
NO.4/111D, SUNDARESAPURAM BLOCK-IV,
POGANALLUR VILLAGE,
KADAYANALLUR TALUK,
TENKASI DISTRICT.

QUARRY APPLIED LEASE AREA:
S.F.NO : 91 (PART-2),
EXTENT : 3.00.0 Ha,
VILLAGE : ARIYANAYAGIPURAM,
TALUK : KADAYANALLUR,
DISTRICT : TENKASI.

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- APPROACH ROAD
- QUARRY ROAD
- CONTOUR
- SCRUB
- PROPOSED QUARRY PIT
- ROUGH STONE
- STRIKE & DIP

CONCEPTUAL PLAN & SECTIONS
SCALE 1:1000
SECTIONS HOR 1:1000, VER 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 LEASE MAP AUTHENTICATED BY STATE GOVERNMENT

C.NATARAJAN.,M.Sc.,M.Phil.,
QUALIFIED PERSON

ANNEXURE-4

From

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

To

Thiru.V.M.Sundaraiah,
S/o. Muthiah Thevar,
4/222, Main Road,
Sundaresapuram,
Kadayanallur Taluk,
Tenkasi District.

Rc.No.M1/30292/2021, dated.06.11.2023

Sir,

Sub: **Mines and Minerals** - Minor Minerals - Tenkasi District - Quarry lease application preferred by Thiru.V.M.Sundaraiah for quarrying and transportation of Roughstone - over an extent of 3.00.0 hectares of Government poramboke land in SF. No. 91(part-2) of Ariyanayagipuram Village, Kadayanallur Taluk - Certain Particulars requested - for obtaining Environmental Clearance - furnished - reg.

Ref:

1. Proceedings of the District Collector, Tirunelveli in Rc. No.M2/32470/1999, dated. 02.06.1999.

2. The Hon'ble Madurai Bench of Madras High Court order in WP (MD) No. 8883 of 2021, dated. 18.06.2021.

3. Proceedings of the Commissioner of Geology and Mining, Chennai in Rc. No. 786/MM6/2023, dated. 12.05.2023.

4. District Collector, Tenkasi letter No. M1/30292/2021, dated. 05.06.2023.

5. Precise area communication letter in Rc. No.M1/30292/2021, dated. 24.08.2023.

6. Letter dated.30.10.2023 received from the applicant.

7. Mining plan approved letter in Rc. No.M1/30292/2021, dated. 06.11.2023.

*****

A roughstone quarry lease had been granted to Thiru.V.M.Sundaraiah over an extent of 3.00.0 hectares in Government poramboke land in SF. No. 91(Part-II) in Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District for a period of 5 years from 12.07.1999 to 11.07.2004 through Tender Cum Auction and the lease was expired on 11.07.2004.

2. Based facts on the case, the area granted under quarry lease in favour of Thiru.V.M.Sundaraiah for quarrying roughstone over an extent of 3.00.0 hectares of Government pormaboke land in SF. No. 91(Part-II) of Ariyanayagipuram village, Kadayanallur Taluk, Tenkasi District was hereby considered and communicated as precise area under Rule 8(8) Tamil Nadu Minor Mineral Concession Rules, 1959 for a period of further 5 years vide reference 5th cited.

3. The Mining Plan submitted by the lessee, Thiru.V.M.Sundaraiah for quarrying roughstone has been approved vide this office letter No.M1/30292/2021, dated.06.11.2023 for obtaining Environmental Clearance as per Rule 41 and 42 of Tamil Nadu Minor Mineral Concession Rules, 1959.

4. In the reference 4th cited, Thiru.V.M.Sundaraiah has requested to furnish certain particulars such as existing / proposed / abandoned

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

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

Sl. No	Name of the Lessee	Village & SF. No.	Extent - Hects	Lease status
a. Details of Abandoned Quarries				
Nil				
b. Details of Existing Quarries				
1.	M.Kalyanasundaram, S/o.Malaiyappan, 38, Kozhumbhu Street, Kadayanallur Taluk, Tenkasi District.	Ariyanayagipuram (V) & SF. Nos. 108/2(P), 108/3(P), 108/4(P), 108/5(P), 109/2, 109/3, 109/4, 109/5 & 109/6	3.10.0	Proceeding No. M1/37557/2020, dt: 20.06.2023 for a period 5 years from 20.06.2023 to 19.06.2028
2.	Thiru.V.M.Sundariah, S/o.Muthiah Thevar, 4/222, Main Road, Sundaresapuram, Kadayanallur Taluk, Tenkasi Taluk.	Ariyanayagipuram (V) & SF. Nos. 94/1(P), 94/2(P), 94/3A(P), 92(P), 93/1(P), 93/2(P) & 93/3(P)	1.80.0	Proceeding No. M1/25664/2014, dt: 24.05.2023 for a period 5 years from 24.05.2023 to 23.05.2028
c. Details of Expired Quarries				
1.	S.Arunachalam, S/o.Subbiah Chettiar, 295, Main Road, Krishnapuram, Kadayanallur Taluk, Tenkasi District.	Ariyanayagipuram (V) & SF. No. 729(Part-I)	2.00.0	Lease granted vide Proceedings No. M3/67787/2004, dt. 19.01.2016 for a period of 5 years from 08.02.2016 to 07.02.2021

2.	S.Arunachalam, S/o.Subbiah Chettiar, 295, Main Road, Krishnapuram, Kadayanallur Taluk, Tenkasi District.	Ariyanayagipuram (V) & SF. No. 729(Part-II)	3.00.0	Lease granted vide Proceedings No. M3/67787/2004, dt. 19.01.2016 for a period of 5 years from 08.02.2016 to 07.02.2021
d. Present Proposed Quarries				
1.	Thiru.V.M.Sundaraiah S/o. Muthiah Thevar, 4/222, Main Road, Sundaresapuram, Kadayanallur Taluk, Tenkasi District.	Ariyanayagipuram (V) & SF. No. 91(Part-II)	3.00.0	Instant proposal

Joint Director/
Assistant Director(i/c),
Geology and Mining,
Tenkasi.

6/4/23

ANNEXURE-5

சான்று

தென்காசி மாவட்டம், கடையநல்லூர் வட்டம், அரியநாயகிபுரம் கிராமம், அரசு புறம்போக்கு புல எண் 91ல் 3.00.00 ஹெக்டேரில் V.M.சுந்தரையா த/பெ.முத்தையா தேவர், எண் 4/111D, சுந்தரேசபுரம், போகநல்லூர் கிராமம் கடையநல்லூர் வட்டம் தென்காசி மாவட்டம் முகவரியில் வசித்து வருகிறார். இவர் உடைகல் குவாரி அமைக்க மாவட்ட ஆட்சித்தலைவர் அனுமதி வழங்கியுள்ளார். உடைகல் குவாரி அமைக்க உள்ள இடத்தை சுற்றி 300 (முன்னூறு) மீட்டர் சுற்றளவில் பொதுமக்கள் வசிக்கும் குடியிருப்புகளோ, அங்கீகரிக்கப்பட்ட மனையிடங்களோ ஏதுமில்லை. மேலும் புராதன சின்னங்கள், விலையுர்ந்த மரங்கள், பள்ளி கல்லூரிகள், பறவைகள், விலங்குகள் சரணாலயங்கள் ஏதும் இல்லை மற்றும் அரசு சிறப்பு ஒதுக்கீடு நிலம் எதுமில்லை என் தெரியவிக்கப்படுகிறது.

கிராதம நிர்வாக அலுவலர்.
அரியநாயகிபுரம்

ANNEXURE-6

ANNEXURE II

MINING PLAN APPROVED
By
Assistant Director (I/c)
of Geology & Mining
Tenkasi Dist.

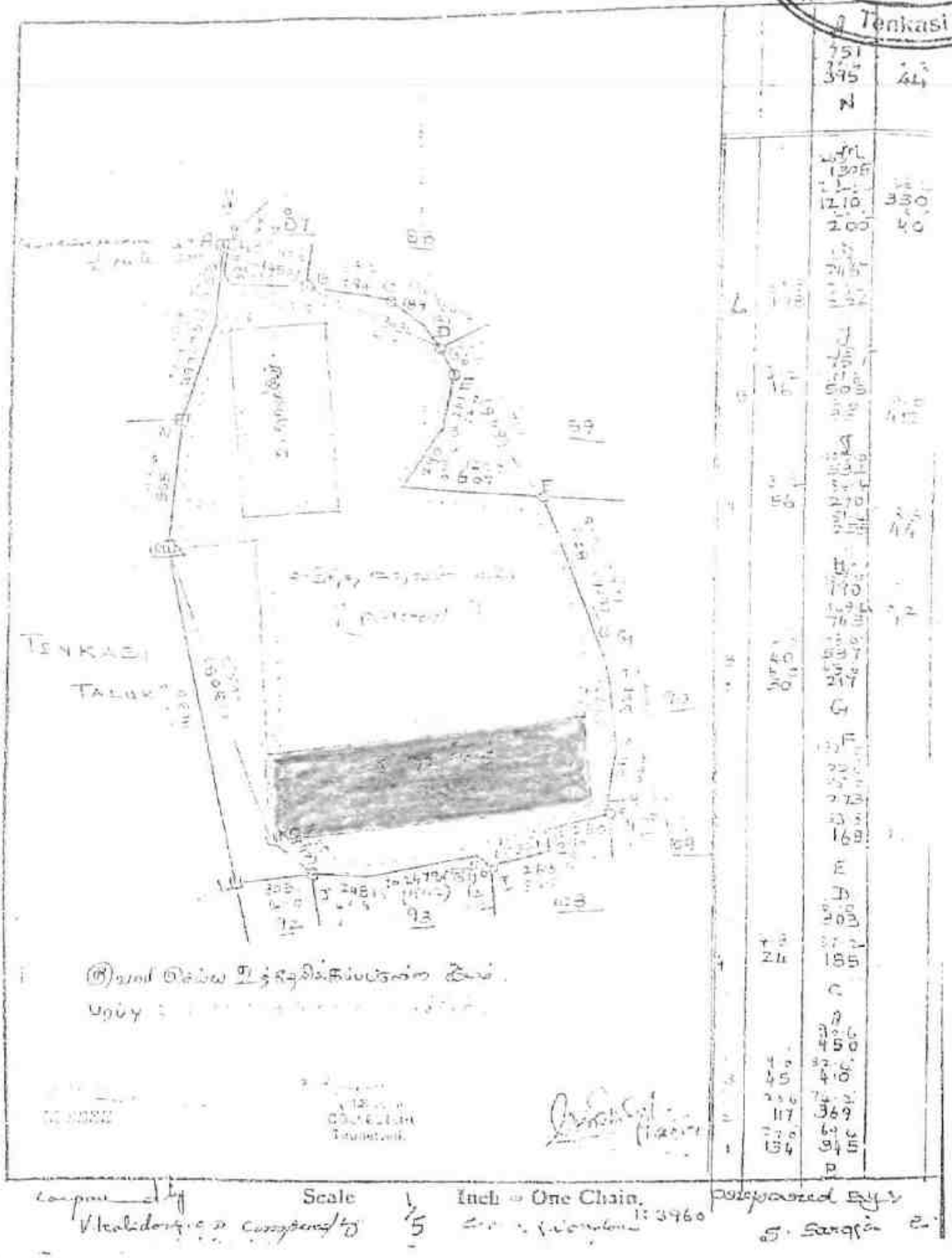
District TIRUNELVELI

Taluk SANKARANKOVIL

Village

Field No. 91

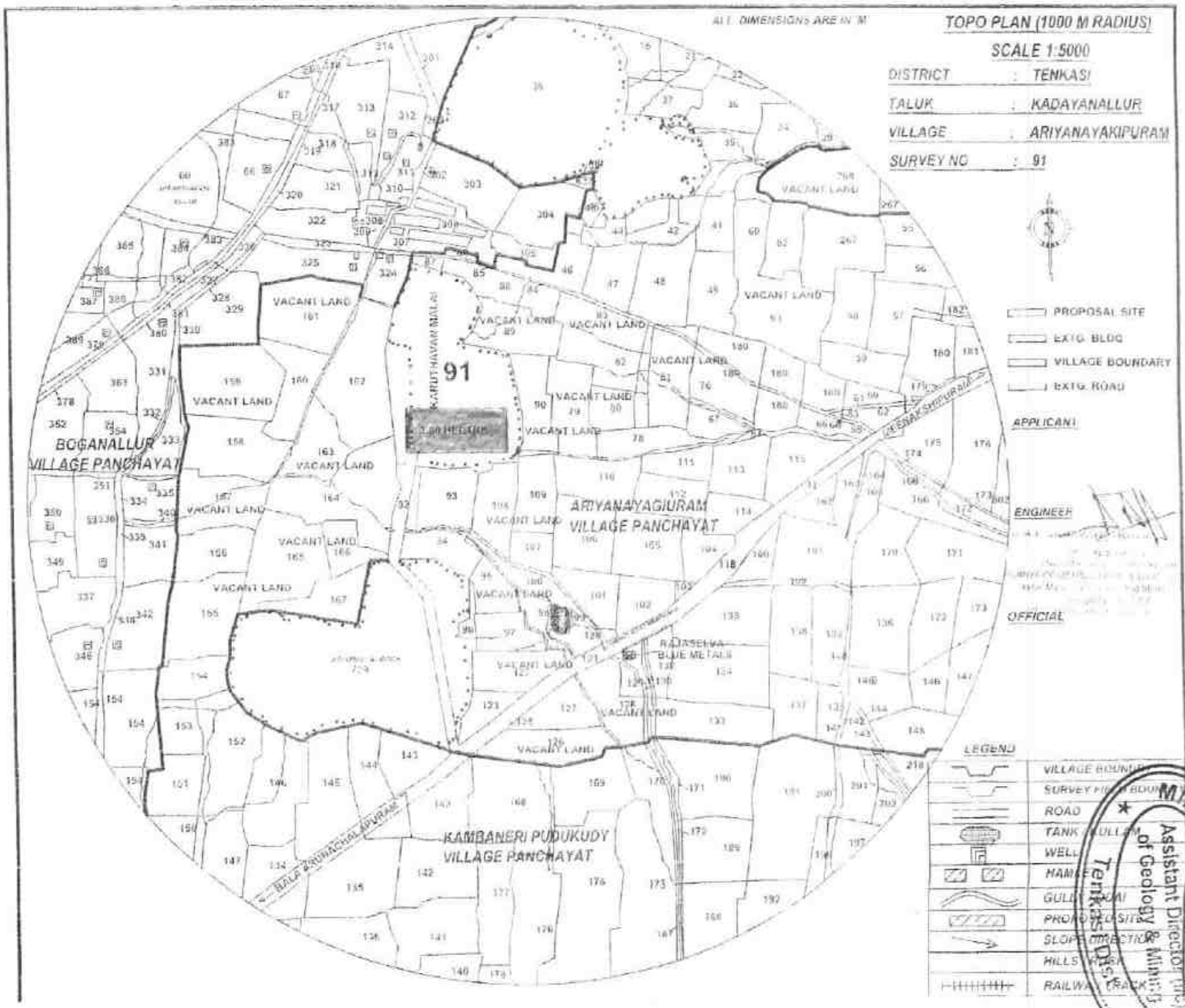
Area



Scale 1 Inch = One Chain.

1 : 3960

LEASE APPLIED AREA



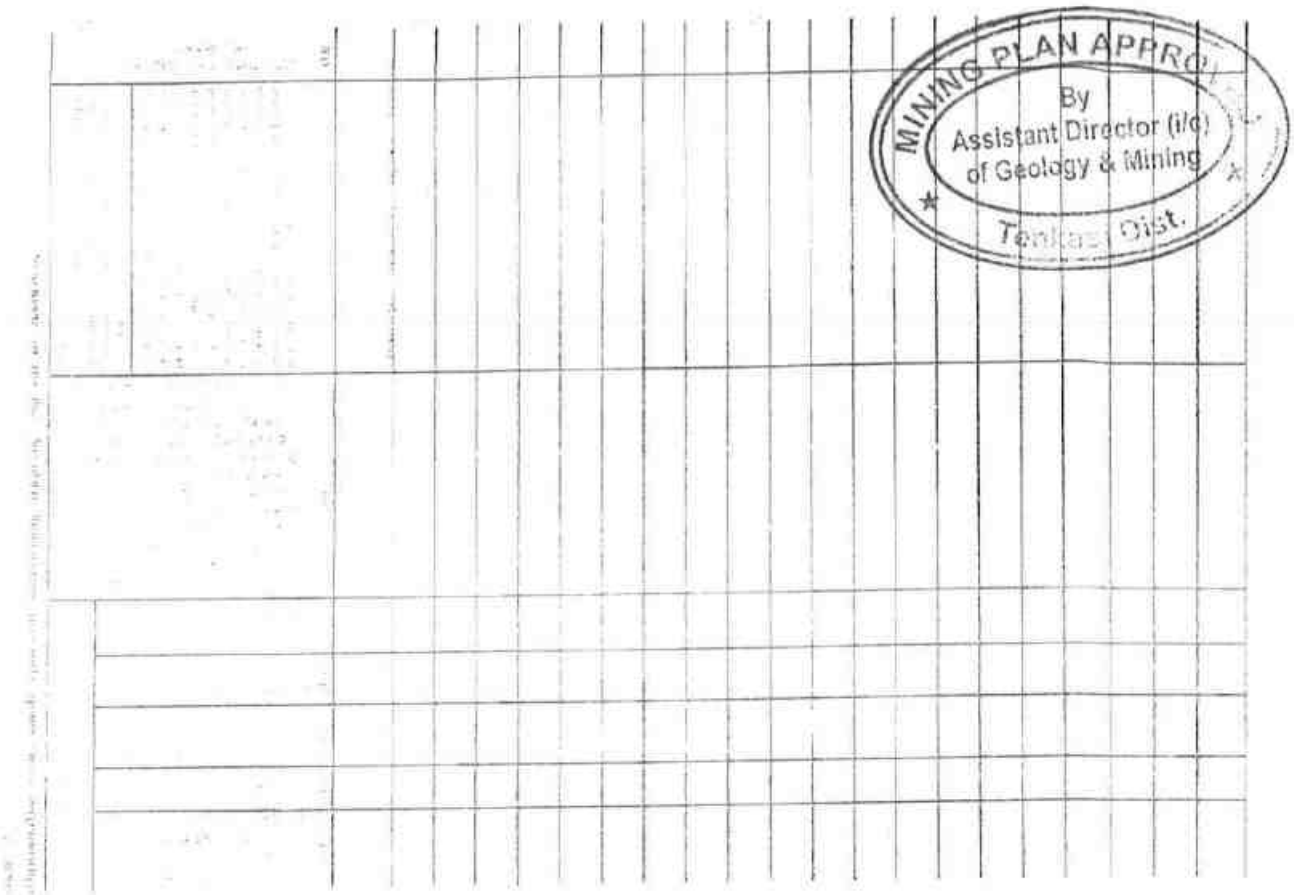
LEASE APPLIED AREA

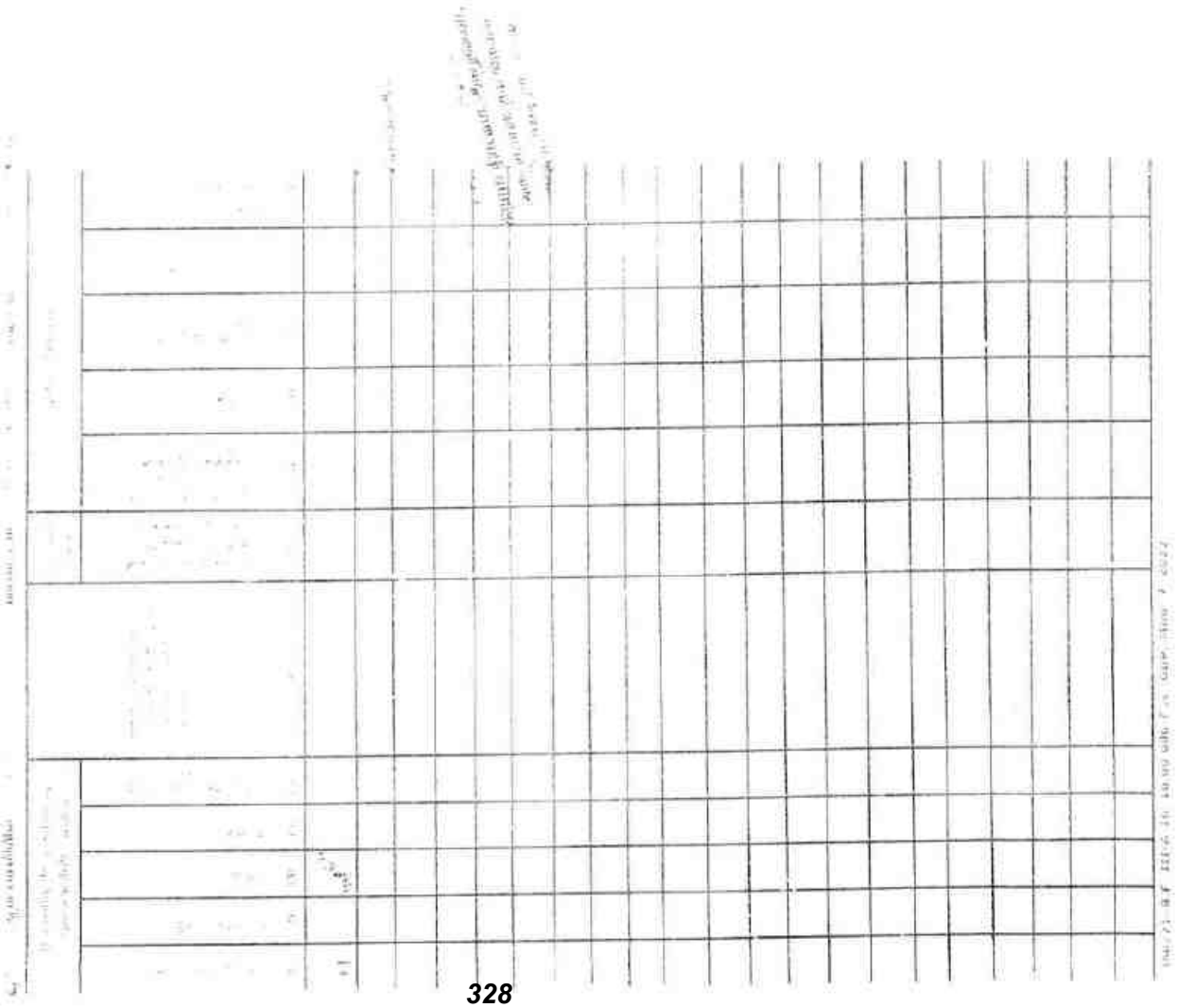
ANNEXURE III

MINING PLAN APPROVED By Assistant Director (i/c) of Geology & Mining Tenkasi Dist.

327

ANNEXURE IV


MINING PLAN APPROVED
By
Assistant Director (i/c)
of Geology & Mining
Tenkasi Dist.



ANNEXURE V

MINING PLAN APPROVED
By
Assistant Director (I/c)
of Geology & Mining
Tenkasi Dist.

ANNEXURE-7

From

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

To

Thiru.V.M.Sundaraiah,
S/o. Muthiah Thevar,
4/222, Main Road,
Sundaresapuram,
Kadayanallur Taluk,
Tenkasi District.

Rc.No.M1/30292/2021, dated.06.11.2023

Sir,

Sub: **Mines and Minerals** - Minor Minerals - Tenkasi District - Quarry lease application preferred by Thiru.V.M.Sundaraiah for quarrying and transportation of Roughstone - over an extent of 3.00.0 hectares of Government poramboke land in SF. No. 91(part-2) of Ariyanayagipuram Village, Kadayanallur Taluk - Certain Particulars requested - for obtaining Environmental Clearance - furnished - reg.

Ref:

1. Proceedings of the District Collector, Tirunelveli in Rc. No.M2/32470/1999, dated. 02.06.1999.

2. The Hon'ble Madurai Bench of Madras High Court order in WP (MD) No. 8883 of 2021, dated. 18.06.2021.

3. Proceedings of the Commissioner of Geology and Mining, Chennai in Rc. No. 786/MM6/2023, dated. 12.05.2023.

4. District Collector, Tenkasi letter No. M1/30292/2021, dated. 05.06.2023.

5. Precise area communication letter in Rc. No.M1/30292/2021, dated. 24.08.2023.

6. Letter dated.30.10.2023 received from the applicant.

7. Mining plan approved letter in Rc. No.M1/30292/2021, dated. 06.11.2023.

*****

A roughstone quarry lease had been granted to Thiru.V.M.Sundaraiah over an extent of 3.00.0 hectares in Government poramboke land in SF. No. 91(Part-II) in Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District for a period of 5 years from 12.07.1999 to 11.07.2004 through Tender Cum Auction and the lease was expired on 11.07.2004.

2. Based facts on the case, the area granted under quarry lease in favour of Thiru.V.M.Sundaraiah for quarrying roughstone over an extent of 3.00.0 hectares of Government pormaboke land in SF. No. 91(Part-II) of Ariyanayagipuram village, Kadayanallur Taluk, Tenkasi District was hereby considered and communicated as precise area under Rule 8(8) Tamil Nadu Minor Mineral Concession Rules, 1959 for a period of further 5 years vide reference 5th cited.

3. The Mining Plan submitted by the lessee, Thiru.V.M.Sundaraiah for quarrying roughstone has been approved vide this office letter No.M1/30292/2021, dated.06.11.2023 for obtaining Environmental Clearance as per Rule 41 and 42 of Tamil Nadu Minor Mineral Concession Rules, 1959.

4. In the reference 4th cited, Thiru.V.M.Sundaraiah has requested to furnish existing pit dimension in the applied area.

The existing pit in the area applied for lease as follows;

Pit No	Length (in m)	Width (in m)	Depth (in m)	Volume (in cbm)
Pit – I	59	40	15m Above ground level	35,400
Pit – II	30	20	5m Above ground level	3,000
Pit- III	52	16	5m Above ground level	4,160
Total				**42,560**

Joint Director/
Assistant Director(i/c),
Geology and Mining,
Tenkasi.

ANNEXURE-8

DISTRICT SURVEY REPORT FOR

ROUGH STONE

TIRUNELVELI DISTRICT

தமிழ்நாடு அரசு
புவியியல் மற்றும் சுரங்கத்துறை

GOVERNMENT OF TAMIL NADU
DEPARTMENT OF GEOLOGY AND MINING

TIRUNELVELI DISTRICT

2019

1. INTRODUCTION

In conjunction to the Ministry of Environment, Forest and Climate Change, the Government of India Notification No.SO 3611 (E) dated 25.07.2018 and SO 190 (E) dated 20.01.2016 the District Level Environment Impact Assessment Authority (DEIAA) and District Environment Appraisal Committee (DEAC) were constituted in Tirunelveli District for the grant of Environmental Clearance for category "B2" projects for quarrying of Minor Minerals.

The main purpose of preparation of District Survey Report is to identify the mineral resources and develop the mining activities along with relevant current geological data of the District. The DEAC will scrutinize and screen scope of the category "B2" projects and the DEIAA will grant Environmental Clearance based on the recommendations of the DEAC for the Minor Minerals on the basis of District Survey Report. This District Mineral Survey Report is prepared on the basis of field work carried out in Tirunelveli district by the official from Geological Survey of India and Directorate of Geology and Mining, (Tirunelveli District), Govt. of Tamilnadu.

Tirunelveli district was formed in the year 1790 and is one of the oldest districts in the state, with effect from 20.10.1986 the district was bifurcated and new district Thothukudi was formed carving it. Tirunelveli district has geographical area of 6759 sq.km and lies in the south eastern part of Tamilnadu state. The district is bounded by the coordinates 08°05 to 09°30' N and 77°05' to 78°25 E and shares boundary with Virudunagar district in north, Thothukudi district in east, Kanniyakumari district in south and with Kerala state in the West.

District Abstract			
1.	Area	:	6823 Sq.Kms
2.	No.of Revenue Divisions	:	3 - Tirunelveli, Cheranmadevi and Tenkasi
3.	No.of Taluks	:	16
4.	No.of Revenue Villages	:	559
5.	No.of Panchayat Unions	:	19
6.	No.of Village Panchayats	:	425
7.	No.of Town Panchayats	:	36
8.	No.of Municipalities	:	7
9.	No.of Corporation	:	1 - Tirunelveli

The perennial river Tamiraparani flows almost in the central part of the district and feeds the entire district population. Tirunelveli district has fifteen taluks (Alangulam, Ambasamudram, Nanguneri, Palayamkottai, Radhapuram, Sankarankoil, Shenkottai,

Sivagiri, Tenkasi, Tirunelveli, Thisaiyanvilai, Veerakeralamputhur, Cheranmahadevi, Kadayanallur, Manur and Thiruvenkatam) with total population of 33, 22, 644 (as per 2011

census).

Fig. 1. Tirunelveli district map showing important towns and road connectivity.

2. OVERVIEW OF MINING ACTIVITY IN TIRUNELVELI DISTRICT.

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

The multi color dimension stones occurring at Kaladaikurichi (Ambai White), Poongudiyarkulam, Mannarkovil, Adachani in Ambasamudram Taluk, Kasthurirangapuram, Kannanallur in Radhapuram Taluk and Singikulam, Melacheval in Cheranmahadevi Taluk are recorded in the district which once actively mined by M/s TAMIN Ltd (Govt of Taminadu) and other private miners.

Crystalline Limestone occurring as bands in Talayuttu and Ramaayyanpatti extends over strike length of 2.5 km with average width of 120 m were extensively mined by M/s India Cements Ltd, M/s South India Mines and Minerals Industries Ltd, M/s Krishna Mines etc in recent years. Crystalline limestone intercalated with calc granulite occurring in Padmaneri, Pottasutti, Singikulam, Pandapulli, Terku Seliyanur and Marandai areas were also mined in 1980's by M/s TAMIN Ltd (Govt of Taminadu) and other private agencies.

Rich deposits of garnet and ilmenite sand occurs along the coast part of Radhapuram Taluk, in Tirunelveli district. Red garnet sand occurs along Nambiar River. Vijayapatti, Kuttankuzhi and Idindakarai areas show notable garnet and ilmenite sands occuurrences which were exploited economically in recent times.

The Deputy Director, Geology and Mining, Tirunelveli district functioning under the control of District Collector, Tirunelveli manages and administrates the minerals and mining activity in the district.

3. GENERAL PROFILE OF TIRUNELVELI DISTRICT.

Tirunelveli district has its climate, physiography and culture almost similar to Tamil Nadu State, and as a whole it described as the microcosm of the State. The erstwhile single district which is ancient in history and culture, was divided into two districts, namely Tirunelveli - the western half of the former district, and Thoothukudi district - the eastern half of the former district - through the State Government's Notification G.O.Ms.No.l314, dt.27.09.1986. The erstwhile district, which covered an area of 11,433 sqkms, has been limited to 6,283sqkms, after bifiircation. Tirunelveli is derived from three Tamil words *tiru* (holy), *nel* (paddy), and *veil* (fence), which meant for *Sacred Paddy Hedge* referring to a legend that the God Shiva protected a devotee's rice crop there. Later the city was one amongst the commercial centre under the Pandya Dynasty who ruled Tamil Nadu during medieval period.

The population of this District was 2723988 as per 2001 Census and 30, 72,880 as per 2011 census. The Density of Population per sq.km. was 399 as per 2001 census and 455 persons as per 2011 census . Tirunelveli, Tenkasi and Ambasamudram are the most densely populated Taluks in the District as per 2001 census. The Sex ratio is 1024 females for every 1000 males in the District as per 2011 census. The Literacy rate is 76.09% in the District as per 2001 census. Out of the total population, males are 1333939and females1390049 as per 2001 census. Out of the total population, males are 1518595 and females 1554285 as per 2011 census.The district having Schedule caste population of 481052 which represents 17.66% to total population as per 2001 census. Schedule Tribes are found to be very small in numbers 358 which is 0.31% of the Total population. 4.36% of State population lives in Tirunelveli district, 1415742 live in Rural area and 1308246 live in urban area forming 52% and 48% respectively as per 2001.

There are 25 medium and major industries such as cement, cotton yarn, calcium carbide, sugar, cotton seed oil, printing papers and flour mill etc. Among the other industries in the district pin, clip, matches, beedi, vessels making and engineering industries are important. The important Village industries functioning in the district are handloom, poultry farming, brick making, jaggary (Palm) production. The Handloom products Lungi, Sarees etc are marketed in north India. So also the fine Korai mats one from Pathamadi has world fame. Kallidaikurichi pappads, Karukurichi mud pots, also Tirunelveli “Halva” are specialities which earned many laurels to the District.

Courtallam is situated at the Western Ghats in Tenkasi Taluk. The famous waterfalls on rocks and tiny droplets are sprinkled in the air. The water falls of Courtalam have medicinal value as they run through forest and herbs before their decent. Pappanasam Agasthiar falls also attracts tourist and pilgrims.There is a Wild life sanctuary at Mundanthurai and Kalakadu. Spotted deers, Liontailed monkeys, Elephants and Tigers are plenty.

The Nellaiappar temple at Tirunelveli, Sankaranainar temple at Sankarankoil, Kasiviswanathar temple at Tenkasi and Vanamamalai Temple at Nanguneri are the land marks of the District signifying the Hindu Culture. Palayamkottai has many Christian missions and Athankaraipallivasal & Pottalpudur Darga have considered being important sacred places for Islam.

4. GEOLOGY OF THE DISTRICT

4.1 An Over view of Geology of Tamilnadu

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. 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 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.

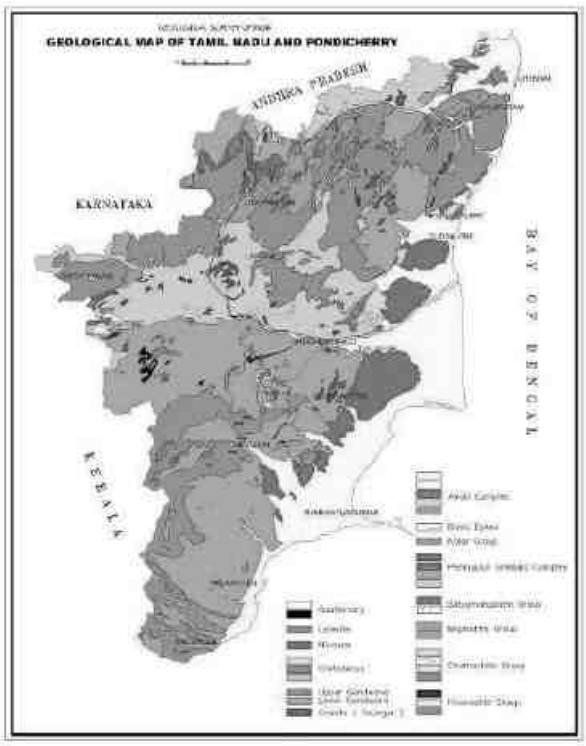


Fig 2. Geological Map of Tamilnadu *(Source: Miscellaneous Publication, GSI, SU: TN&P, Chennai)*

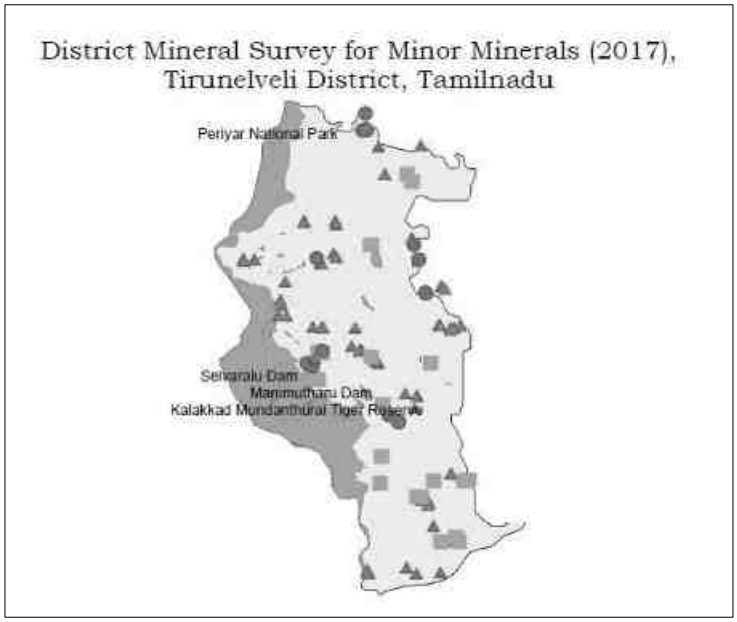
4.2 General Geology of Tirunelveli district:

Southern Granulite Terrain (SGT) of Tamil Nadu lying south of Palaghat-Cauvery shear zone has been divided into two major tectonic blocks by the Madurai block and Nagercoil-Trivandrum Block in the south. It is separated by WNW-ESE trending Achankovil-Tambaraparani Lineament. Tirunelveli and Thothukudi are significantly the only districts in the state to witness the geology and structure of both the blocks.

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

	Recent-Sub recent	**Soil and alluvium, calcrete**
		Quartz and pegmatite vein
		Incipient charnockite
700-550 Ma	Younger intrusive	Acidic intrusive – Granite
		Basic intrusive (Pyroxenite, Ultramafic/mafic rocks)
2200-2550 Ma	Migmatite Group	Hornblende-biotite gneiss
2600 Ma	Charnockite Group	Meta gabbro (older Intrusive) Charnockite Pyroxene granulite
	Khondalite Group	Garnet-biotite-quartzofeldspathic gneiss Garnet-biotite gneiss Garnet –biotite –Sillimanite gneiss ± cordierite gneiss Crystalline limestone, Calc granulite Quartzite
		Basement Unknown

Table 7.1 General tectono-stratigraphy of Tirunelveli District



Index
Dimension Stone
Limestone
Rough Stone

After independence mineral survey and exploration work in the country took momentum by Geological Survey of India and other govt agencies. Kanishkan (1981-82) carried out mineral investigation for tungsten and associated ores in Tirunelveli and Madurai district and reported the major band of crystalline limestone with lenses of calc-gneiss and calc-ganulite associated with gneisses and quartzite bands to the north of Talaiyuttu around Seliyanur-Nellaitiruttu in Tirunelveli district. Tungsten upto 600 ppm have been recorded in crystalline limestone from the area. Jayaprakash (1986-87) from GSI carried out investigation for calc tufa occurrences in the areas of Uttumalai and Reddiyarpatti shows 35% of CaO and is restricted to a few patches with total areal extent of 2.85 sq.km.

In Tirunelveli district, bulk of crystalline limestone for cement industry comes from Ramayyanpatti, Talaiyuttu and Pandapalli areas. The total reserves are about 20-30 million tonnes with average CaO 45%, MgO 6% and SiO_2 8%. Tuffaceous limestone and kankar of about 23-24 million tonnes occurs near Vijayapatti in the district. Gypsum associated with kankar is reported from a few localities in the saltpans, located along the east coast between Veppalodai and Ayyanapuram in the district. Minor graphite occurrences are located in Kurinjankulam in Tirunelveli District with a reserve of about 19,000 tonnes on Palakottai Hill. Rough stone (mostly charnockite and Hbl-bt gneiss) are majorly concentrated in Alangulam, Radhapuram, Nanguneri, Manur and Sankarankovil Taluks in the district.

Multi color dimension stones occurrences significantly visited during the field work at Kaladaikurichi (Ambai White), Poongudiyarkulam, Mannarkovil, Adachani in Ambasamudram Taluk, Kasthurirangapuram, Kannanallur in Radhapuram Taluk and Singikulam, Melacheval in Cheranmahadevi Taluk of Tiurnelveli District. Rich deposits of garnet and ilmenite sand occurs along the coast part of Radhapuram Taluk, in Tirunelveli district. Vijayapatti, Kuttankuzhi and Idindakarai areas show notable garnet and ilmenite sands occurrences. Red garnet sand occurs significantly along Nambiar river. The main sources of the heavy minerals are found to garnetiferrous quartzo-feldspathic gneiss and garnet biotite sillimanite gneiss of Khondalite Group of rocks.

Occurrences of Limekankar are identified in Kasthurirengapuram village of Radhapuram Taluk. Where the lime kankar deposit is about 2 to 3 meters thickness with minimum soil cover. Limekankar having CaO from 35% to 40%, it may be used for cement manufacturing.

Occurrences of Clay is identified in Pallikottai village of Manur Taluk. In this area clay deposit thickness varies from 1 to 2 meters and contains Al_2O_3 13% to 18%.

5. DRAINAGE OF IRRIGATION PATTERN

Irrigation is the artificial application of water to soil for the purpose of crop cultivation. As the timing and amount of rainfall are not adequate to meet the moisture requirement of cultivation, irrigation is essential to raise crops and meet the need for food and fiber. In areas where the rainfall is plentiful and well distributed over the year there will be year round production. Indeed, rainfall in certain areas will be very scanty as well as uncertain. This is so in Tirunelveli district. The irrigation system in Tirunelveli district consists of rivers like Tamirabarani, Manimuttaru, Pachaiyaru, Nambiyaru, and Chittaru which originating from Western Ghats and running across the gentle slopes of the mid lands and confluence in Bay of Bengal. The River Tamirabarani is the main source of irrigation which also provides drinking water facilities to a number of places in the district, as well. Pabanasam, Manimuttar and Chervalar are the major reservoirs in the district. Gadana Nathi, Ramanathi, Karuppanathi, Gundaru, Adavi Nainar Koil, Vadakku Pachaiyaru, Kodumudiyaru, and Nambiyaru are the minor reservoirs in the district. Besides these rivers and reservoirs the other different sources of irrigation prevailing in the district are canal, tank and well.

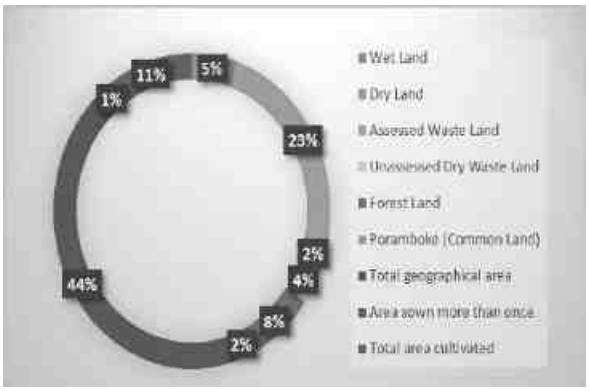
6. LAND UTILISATION PROFILE OF THE DISTRICT

Of the total of 6,82,300 hectares area in Tirunelveli district, about 79,668 (11.7%) hectares are wet lands well suited for the cultivation of paddy and other crops which need adequate water supply, while others are not useful for agricultural purposes. Nearly 3,58,151 (52.5%) hectares is dry land with no irrigation facilities for agriculture, although soil condition is moderate for growing crops, so that it mat be used to grow drought resistant plants which offer firewood.

A block of waste lands which about 39,274 (5.7%) hectares is proclaimed to be not useful for growing crops, because of lack of enough water, poor soil, and undesired topographic conditions. Approximately 57,676 (8.5%) hectares is unassessed wasteland where soil condition is fair while water supply scarcity prevails for several months, so that it is used for agriculture only when rainfall is high. Yet, another 1, 22,055 (17.8%) hectares is occupied by forests which are declared to be reserves as forest resources for liontailed monkeys, rich in deciduous and evergreen plants. Poromboke - common lands, covers about 25,456 (3.8%) hectares, which may be used to create social forests although water is scarce. Fig 4.1 Land use land cover map of Tirunelveli District (after National Natural Resource Management system, ISRO, 2014).

In 2002 as per NRSA data (Bhuvan, Govt. of India), shows that 29% of the total area of urban centers used for residential purposes while in rural centers only 14% of areas used for this purposes. The area of agricultural lands and open spaces gets reduced every year in the district owing to the rapid conversion in these areas for residential purposes. The land use pattern in the district is shown in the Table No.5.1.

Land Use Pattern in Tirunelveli District		
Land Category	**Area (in Hectares)**	**Percentage**
Wet Land	79,668	11.7
Dry Land	3,58.151	52.5
Assessed Waste Land	39,274	5.7
Unassessed Dry Waste Land	57,696	8.5
Forest Land	1,22,055	17.8
Poramboke (Common Land)	25,456	3.8
Total geographical area	6,82,300	100
Area sown more than once	30,163	1.50
Total area cultivated	1,61,976	23.74



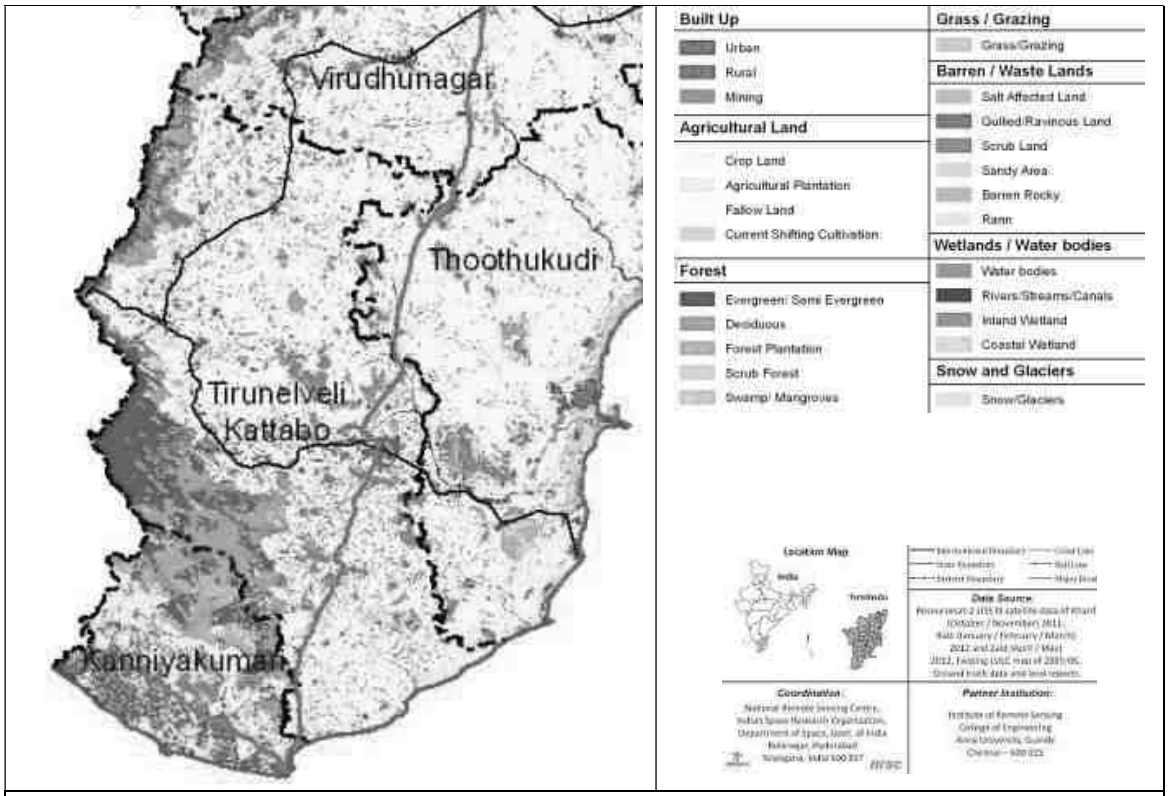
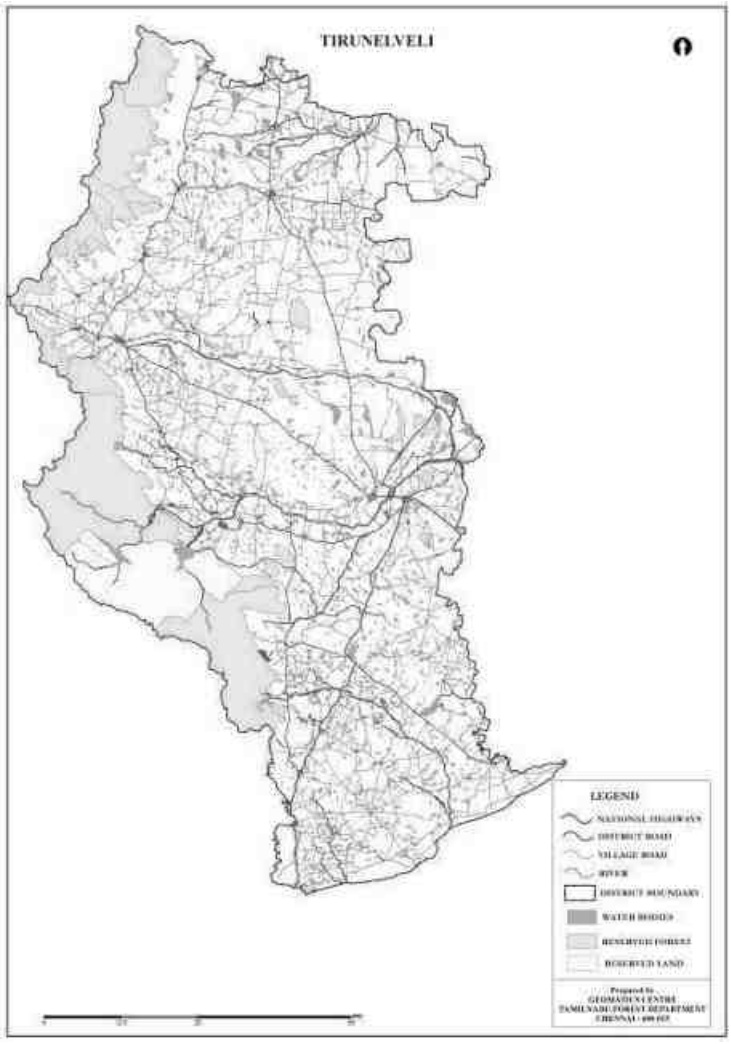


Fig 4. Land use land cover map of Tirunelveli District (after National Natural Resource Management system, ISRO, 2014).

FOREST:

The total area of the forest of the district is 1,22,055 ha of which 81700 ha is set apart for Tiger reserves of Mundanthurai and Kalakadu. The entire forest of the district stretches along the Western ghats. Various types of forests from luxuriant tropical wet evergreen forests to southern thorn scrub forests occur in the district. Owing to its diverse geographical factors,the forests in the district are technically classified as southern hill top tropical evergreen forests, west coast tropical evergreen forests, southern moist mixed deciduous forests, ochlandra reed forests,carnatic umbrella thorn forests, southern Euphorbia scrub and southern thorn scrub.



The forest areas in the district are mostly in the ghat region on the western part of the district.The ghat regions are under the influence of the southwest monsoon and have thick forest. The forest is of light dry deciduous forest growth in the lower slopes and dense masses of short trees from an elevation of 1000 to 4000 feet height. At high peak region of the ghats, evergreen forest with very tall trees are found.Teakwood, blackwood, rosewood etc are the most important among them. Honey, wax, mango, cashew,palmyrah, cane, pepper, tamarind, bamboo etc are the important forest products in the district.

Tiger Reserve Forest with an extent of 817 sq.kms in Ambasamudram Taluk is established which is known as 'Kalakad-Mudanthurai Tiger Reserve'. This Tiger Reserve Forest is extremely rich and diverse in nature, ranging from wet evergreen forest, mixed deciduous forest, dry teak forests to forests and thorny bushes in many places. The animals found in this Reserve forests are Tiger, Leopard, Jungle, Cat, Civet, Hyena, Jackal, Elephant, Guar, Sambar, Mouse, Deer, Nilgris Talir the lion-tailed monkeys etc.

AGRICULTURE

The major crop cultivated in the district is paddy. Other crops like cumbu, cholam, kuthiraivali and ragi are cultivated as dry land crops in the district. Cotton is cultivated in Sankarankoil. Sugarcane is being raised in Sivagiri and Tenkasi taluks. Banana and vegetables are grown in the river belt areas of Ambasamudram, Tenkasi and Tirunelveli taluks. Manimuthar main canal and Papanasam reservoir are the irrigation source for the cultivation of different crops. There is a Farmers Training centre at Palayankottai run with the aid of Danish International Development Agency. Rice Research Station in Urkad near Ambasamudram and a parasite breeding centre for coconut at Tenkasi play a crucial role for the development of the farmers in the district.

SOIL:

The soil condition of the district may be grouped into two main varieties namely red loam soil and black soil. The black soil is of a higher value compared to the red loam soil and the black soil of the Tamirabarani River Valley overlies a stiff yellow colour. The red loam found in Tenkasi, Shenkottai, Sivagiri, and Radhapuram Taluks. The black soil is found in Sankarankoil, Palayamkottai, and Tirunelveli Taluks. The other soils like lateritic, sandy coastal alluvial soil and red-sand soil are not found much in the district. In the south-east coast, the soil is deep, loose and red loam surfaced by sand with its depth varying from a few inches to 20 feet.

Soil Types found in Tirunelveli District	
Soil Type	**Places in Tirunelveli District**
Red Loam	Alangulam, Tenkasi, Shenkottai, Sivagiri, Veerakeralam Puthur and Radhapuram Taluks
Lateritic	Nil.
Black Soil	Sankarankoil, Thiruvengadam, Kuruvikulam, Palayamkottai, Manur, and Tirunelveli.
Sandy Coastal Alluvium and Red Sandy Soil	In coastal areas of Tirunelveli district

HORTICULTURE:

Major horticulture crops cultivated in this district are fruits crops like mango, banana, lime and aonla, vegetables like bhendi, tomato, brinjal, onion, spices and condiments like chillies and tamarind and flower crops like jasmine and rose.

MINERALS AND MINING

Khondolites and the Charnockites with Pyroxene granulites and the associated migmatitic/ rocks are the two major groups of rocks found in the district. Limestones occur within the genesis and are found around Tirunelveli and Ambasamudram. Pink coloured granites, pegmatites and quartz veins are

also found to occur within the above mentioned rocks. Tertiary formations consisting of calcareous sand stones and limestones are also exposed all along the coastal area overlying the Charnockites and genissic rocks particularly around Koondankulam Rocks probably connected with the Deccan trap activity occur as thin veins and dykes within the genissic rocks around Koondankulam. The crystalline limestone deposit located around Tirunelveli is the main mineral supplied to M/s. India Cements at Thalaiyuthu with a capacity of 3000 tonnes per day. Large reserves of limestones of the crystalline, sedimentary and tafaccous types amounting to 59 million tonnes are found in Nanguneri, Ambasamudram, Sankarankoil and Tenkasi taluks. Limenite and associated minerals occur in Nanguneri taluk and garnet sands occur widely in Radhapuram taluk.

7. SURFACE WATER AND GROUND WATER SCENARIO OF THE DISTRICT

SURFACE WATER

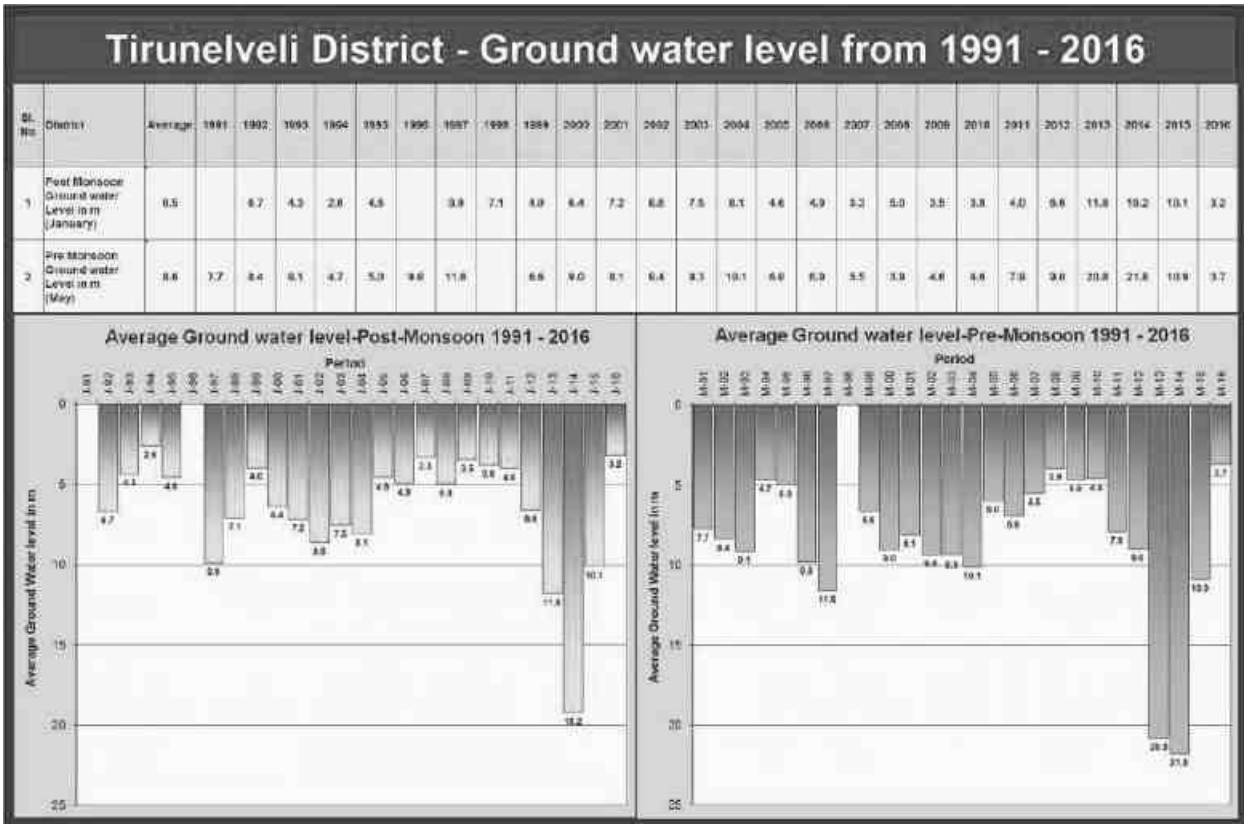
Tirunelveli district enjoys the benefit of the early showers of south west monsoon and of the later rains of the north-east monsoon. The district is chiefly irrigated by rivers rising in Western ghats. The dams and anaicuts constructed on Tamiraparani and Manimuthar rivers serve both agriculture and power generation. The total rain fall, though is light, averaging about 814.8 mm per annum, is generally well distributed. The Tamiraparani river affords perennial irrigation to a fairly large area on which two crops are normally raised. Several tanks and wells form part of the other sources of irrigation.

The Tamiraparani is a symbol of Tamil culture and civilization and an identity of the far south of India. In Tamil and Sanskrit literature of earlier times, the Pandyas were referred to as the rulers of the land where the Tamiraparani flowed. Tamiraparani is the chief river of the district which has a large network of tributaries which include the Peyar, Ullar, Karaiyar, Servalar, Pampar, Manimuthar, Varahanathi, Ramanathi, Jambunathi, Gadananathi, Kallar, Karunaiyar, Pachaiyar, Chittar, Gundar, Aintharuviar, Hanumanathi, Karuppanathi and Aluthakanniar. The two rivers of the district which are not linked with Tamiraparani are the Nambiar and the Hanumanathi of Nanguneri taluk.

GROUND WATER SCENRIO

The district is underlain by both porous and fissured formations. The important aquifer systems in the district are constituted by i) Weathered and fractured hard rock formations of Archaean age. ii) Porous sedimentary formations ranging in age from Tertiary and Recent. The porous formations are found as small patch in the southeastern part of the district and include sandstones, Limestones, Laterite and Clays from Tertiary to Quaternary. Isolated occurrence of calcareous sandstone and fossiliferous limestone are seen in coastal area on the southeastern side. The fossiliferous limestone is

found south west of Kudankulam covering an area of 3 sq.km. Laterites are exposed as patches along Radhapuram-Edakkadu, Vijayanarayanam-Kumarapuram, Ittamoli, Nanguneri and Uramozi area. Beach sand occurs as a patch along the coast with a width varying from 50-250m in Idindakarai-Ovari Belt. The river alluvium is found along the river courses and the thickness of alluvium is restricted to 5-6m The exploration in sedimentary tract has revealed that the depth to basement occurs at a depth of 120m bgl and granular zones are encountered between the depths of 20 to 92 m bgl. The aquifer at the shallow depth is under unconfined condition and aquifer at depth is under semi-confined to confined condition. The shallow aquifer is developed through dug wells and deeper aquifer through tube wells. The groundwater exploration in the district down to a depth of 200m bgl has revealed that in the western part of the district potential fractures are encountered beyond 100m bgl while in the rest of the area, potential fractures are restricted to 100m bgl. The yield of the wells varies from 1 to 3.6 lps. In general, the wells drilled by various State agencies mainly for domestic purposes have yield in the range of 63 to 270 lpm. (Source :CGWB).



Souce: https://www.twadboard.tn.gov.in/content/tirunelvelli

Fig.No. District level ground water level

8. RAINFALL OF THE DISTRICT AND CLIMATIC CONDITIONS

Rainfall: Main rainy season is from October to the middle of January. During this southwest monsoon season the rainfall is more in the western parts of the district. November is generally the rainiest month. The heaviest rainfall in 24 hours recorded in the district was 371.5 mm at Sivagiri on 29/10/1929. The average rain fall in the district is 814.8 mm per annum.

Month	Normal	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
January	50.2	80.16	6.40	0.58	36.57	4.92	54.49	24.80	9.28	8.89	37.16
February	30.2	26.54	75.83	104.25	16.62	27.50	1.80	3.52	83.3	NIL	0.08
March	41.3	9.53	29.30	100.72	5.82	68.17	124.23	7.44	377.19	31.63	40.48
April	59.8	118.79	91.00	0.78	91.15	180.49	25.51	131.64	103.4	72.01	36.91
May	38.0	26.73	82.91	29.55	135.02	25.46	35.95	10.97	4.94	24.07	39.4
June	29.6	24.43	4.12	20.18	59.16	20.28	28.60	87.78	10.32	21.38	29.67
July	26.4	29.58	5.14	19.19	9.53	80.50	26.80	46.49	35.22	59.94	60.56
August	23.3	10.80	35.68	15.48	26.12	19.91	25.38	33.11	72.00	25.97	18.43
September	30.2	22.03	13.66	10.34	101.48	32.77	63.04	79.70	20.63	30.56	77.53
October	166.0	141.32	213.12	185.84	220.09	84.68	361.28	187.03	345.6	126.59	107.56
November	208.2	195.97	241.82	256.57	260.55	248.45	287.23	181.90	183.1	431.59	293.38
December	111.6	79.52	17.85	56.89	32.37	178.36	19.31	126.16	94.78	153.29	168.53
Total Rainfall	**814.8**	**765.40**	**816.83**	**900.37**	**994.48**	**971.49**	**1179.66**	**920.54**	**1339.76**	**985.93**	**873.6**

6.1. Table Comparative Statement of monthly Rainfall data in Tirunelveli district in mm (Source: http://www.nellai.tn.nic.in)

Month	Normal	2011	2012	2013	2014	2015	2016	2017
January	50.2	25.26	40.54	2.19	57.20	4.75	4.85	38.56
February	30.2	46.37	29.03	98.50	9.24	13.48	6.31	3.44
March	41.3	40	35.95	142.14	60.30	71.80	10.62	40.29
April	59.8	65	65.12	24.94	36.28	133.36	14.26	19.63
May	38.0	4.25	9.82	25.72	206.55	93.09	80.23	61.75
June	29.6	63.31	2.31	103.92	7.88	56.32	71.72	50.1
July	26.4	22.08	15.68	46.58	12.98	13.15	24.23	5.3
August	23.3	23.43	12.66	28.35	52.52	10.55	1.15	40.9

September	30.2	14.93	8.35	41.05	38.45	71.62	0.38	116.3
October	166.0	311.84	304.41	57.01	391.66	234.59	47.22	83.6
November	208.2	275.7	144.8	256.66	316.91	448.89	103.26	344
December	111.6	79.52	100.2	86.80	150.89	269.47	33.22	273.9
Total Rainfall	**814.8**	**971.69**	**768.87**	**913.86**	**1340.86**	**1421.07**	**396.95**	**1077.77**

6.1. (contd) Table Comparative Statement of monthly Rainfall data in Tirunelveli district in mm (Source: http://www.nellai.tn.nic.in)

CLIMATE:

The district, in general experiences tropical climate with minor changes. The normal temperature varies between 24.4°C and 27.1°C at mean minimum, whereas the hottest climate experiences from March to May with mercury reaching 38.5°C at the highest. The climate is comparatively cool during the months from November to February. The average rainfall during 2005-06 is 917.86 mm and the number of rainy days varies from 98 to 110 in a year. The relative humidity, in general around the year is between 55 and 65% in most parts of the district, except during the north-east monsoon season when it is over 65%. However, the coastal areas will be comparatively more humid.

9. DETAILS OF MINING LEASES IN THE DISTRICT IN THE DISTRICT

Table No. **Mineral:Roiugh Stone**

Sl. No	Name of the mineral	Name of the lessee	Address & Contact No. of lessee	Mining lease grant order No. and date	Area of mining lease (Ha)	Period of mining lease (Initial)		Period of mining lease (1st & 2nd renewal)		Date of commencement of Mining Opera-tion	Status (Wor-king / Non-Wor-king / Temp. Wor-king for dispatch etc.)	Captive / Non-Captive	Obtain-ed Enviro-nmen- tal Clear-ance (Yes / No)	Location of the Mining Lease (Latitude & Longitude)	Method of Mining (Open cast / Under ground)
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
1	**Rough Stone**	Tmt.LakshmiRajam,	W/o. Babu Aravinth, Ramana Bhavan, 36, South, Melagaram,Tenkasi	M1/33629/2015, 14.06.2016	2.59.0	**14.06.2016**	**13.06.2021**	-	-	**14.06.2016**	working	Non-captive	Yes	08°49'04" N to 08°49'10" N & 77°26'06" E to 77°26'15" E	Open-cast
2.	**Rough Stone**	Thiru.B.Thangammal,	W/o. R.Balamuruga n, 8/105, Mariammanko vil Street, Lakshmiyoor, Koviloothu post, Alangulam	M1/13785/2016, dated: 24.12.2016	2.47.0	**20.03.2017**	**19.03.2022**			**20.03.2017**	working	Non-captive	Yes	08°49'12.14"N to 08°49'06.26"N & 77°26'26.08"E to 77°26'17.85"E	Open-cast
3.	**Rough Stone**	G.Karuppasamy,	S/o. Gurusamy, 271A,	M1/6395/2014 Dt: 04.01.2016	3.76.0	**08.01.2016**	**07.01.2021**			**08.01.2016**	working	Non-captive	Yes	08°49'7" N to	Open-cast

			Kannimaran Amman Kovil St, Tenkasi											08°49'14.8"N & 77°31'21.5"E to 77°31'29.6"E	
4	**Rough Stone**	Tmt. R.Minnalkodi,	W/o. S.S.Ramasubbu, No.72/V, Ambasamudram Road, Alangulam	M1/40481/2013 Dt: 16.12.2016	2.76.5	**08.03.2017**	**07.03.2022**			**08.03.2017**	working	Non-captive	Yes	08°48'56" N to 08°49'05" N & 77°31'16" E to 77°31'26" E	Open-cast
5	**Rough Stone**	Thiru.S.Ajimon	307, Parampilvila Veedu, Kampaladi Porvali Post, Quilon	M1/36063/13, Dt: 24.03.2015	4.81.0	**24.03.2015**	**23.03.2020**			**24.03.2015**	working	Non-captive	Yes	08°49'16" N to 08°49'21" N & 77°24'48" N to 77°24'51" N	Open-cast
6	**Rough Stone**	Thiru K.Selvakumar,	136/46, LRS, Palayam, Tenkasi	M1/11147/2013, dt: 10.06.2014	2.00.0	**10.06.2014**	**09.06.2019**			**10.06.2014**	working	Non-captive	Yes	08°51'07"N to 77°19'35"E	Open-cast
7	**Rough Stone**	Thiru.Sadacharavel,	S/o. Muthusamy, 8-23-J-7, Sivabhavan, Melamathapuram, Mathapuram Post, Ambasamudram Taluk	M1/23938/2014, Dt: 24.04.2015	0.24.0	**03.05.2015**	**02.05.2020**			**03.05.2015**	working	Non-captive	Yes		Open-cast

8	**Rough Stone**	P.Arun Gopinath,	4/136, Sidar Street, Mettur, Ambai	M1/16644/12, dt: 19.5.12	1.85.0	**11.06.2012**	**10.06.2022**			**11.06.2012**	working	Non-captive	Yes	08°50'59" N to 08°51'03" N & 77°21'22" E to 77°21'30" E	Open-cast
9	**Rough Stone**	M.K.Kuperasundar,	6/67B, Kottai st, Athalanallur, Ambai	M1/16635/12, dt: 20.05.2012	2.06.5	**30.06.2012**	**29.06.2022**			**30.06.2012**	working	Non-captive	Yes	08°45'32" N to 08°45'40" N & 77°31'58" E to 77°32'04" E	Open-cast
10	**Rough Stone**	Tmt.Hedwig Raj,	W/o. Joseph Antony, 9/250, Ilanthaikulam Road, Singamparai	M1/2827/2012 dt: 08.09.2014	1.00.0	**08.09.2014**	**07.09.2019**			**08.09.2014**	working	Non-captive	Yes	08°45'44" N to 08°45'39" N & 77°32'04" E to 77°32'09" E	Open-cast
11	**Rough Stone**	Thiru. S.Arunachalam	S/o. A.Subbiah Chettiar,295, Main Road,Krishnapuram,Kadayanallur Taluk, Tirunelveli District	M3/67787/2004DATED. 19.01.2016	2.00.0	**08.02.2016**	**07.02.2021**			**08.02.2016**	working	Non-captive	Yes	9°5'39" & 77°23'30"	Open-cast
12	**Rough Stone**	Thiru.S.Arunachalam,	S/o. A.Subbiah Chettiar,295, Main	M3/67787/2004DATED. 19.01.2016	3.00.0	**08.02.2016**	**07.02.2021**			**08.02.2016**	working	Non-captive	Yes	9°5'39.52" &	Open-cast

			Road,Krishnapuram,Kadayanallur Taluk, Tirunelveli District										77°26'31.14"	
13	**Rough Stone**	Thiru M. Murugaiah,	S/O. Muthiayah Thevar, 32-B1 Kattabomman Street, Kayathar	M1/5539/2013 dt:14.06.2014	2.26.0	**14.06.2014**	**13.06.2019**			**14.06.2014**	working	Non-captive	Yes	08°55'35.01"N to 08°55'30.36"N & 77°44'34.85"E to 77°44'31.02"E	Open-cast
14	**Rough Stone**	Thiru.S.Vellapandi,	Mainroad, Kayathar,	M1/25662/2016, Dt. 05.03.2016	1.92.0	**14.06.2016**	**13.06.2021**			**14.06.2016**	working	Non-captive	Yes	08°55'04"N to 08°55'10"N & 77°45'06"E to 77°45'12"E	Open-cast
15	**Rough Stone**	Thiru.V.Karuppasamy,	S/o. Velayutha Thevar, 3/4A, Sannathi Pudhukudi, Blcok No. 1, Rajaputukudi Post, Kovilpatti,	M1/36935/202, dated. 10.12.2016	1.16.0	**07.03.2017**	**06.03.2022**			**07.03.2017**	working	Non-captive	Yes	08°53'27"N to 08°53'32"N & 77°45'37"E to 77°45'40"E	Open-cast
16	**Rough Stone**	Thiru. M.Maridurai,	S/o. Maruthappapandian, 3/189, A.Maruthappapuram, Nettur Post,	M1/43605/2014, dt. 24.08.2016	1..29.0	**24.08.2016**	**23.08.2021**			**24.08.2016**	working	Non-captive	Yes	08°53'30"N to 08°53'35"N & 77°38'21"	Open-cast

			Alankulam,											E to 77°38'25" E	
17	**Rough Stone**	Thiru. B. Pramsivam,	S/o Esakkiappan, 749A/2, Main Road, NellaiThiruthu	M1/25864/2013 dt: 22.06.2014	1.58.5	**22.06.2014**	**21.06.2019**			**22.06.2014**	working	Non-captive	Yes	08°53'18" & 77°38'27"	Open-cast
18	**Rough Stone**	Thiru. Y.Arulraj,	S/O.Yesaiah, Kanarpatti Village, Therku Theru, Manur	M1/27276/2013 dt: 29.09.2014	2.68.0	**29.09.2014**	**28.09.2019**			**29.09.2014**	working	Non-captive	Yes	08°53'24" N to 08°53'30" N & 77°38'27" E to 77°38'35" E	Open-cast
19	**Rough Stone**	Thiru.A.Kanagaraj,	Palayamkottai	M1/20703/2016, 16.02.2016	1.42.0	**10.06.2016**	**09.06.2021**			**10.06.2016**	working	Non-captive	Yes	08°53'31" N to 08°53'35" N & 77°38'27" E to 77°38'37" E	Open-cast
20	**Rough Stone**	Thiru N.Ganesa Raja,	Tirunelveli	M2/76818/2008, dt:12.06.2002	4.08.5	**12.06.2012**	**11.06.2022**			**12.06.2012**	working	Non-captive	Yes		Open-cast
21	**Rough Stone**	Thiru.S.Backiyaraj,	S/o. Santhos Nadar, 298/2, Church Street, Parappadi - 627110	M1/48829/2013, dt. 10.10.2015	1.22.0	**16.10.2015**	**15.10.2020**			**16.10.2015**	working	Non-captive	Yes		Open-cast
22	**Rough Stone**	Thiru.S.Backiyaraj,	S/o. Santhos Nadar, 298/2, Church Street, Parappadi -	M1/48829/2013-1, dt. 24.11.2015	0.47.0	**28.11.2015**	**27.11.2020**			**28.11.2015**	working	Non-captive	Yes	08°26'41" N to 08°26'37"	Open-cast

			627110											N & 77°46'12" E to 77°46'09" E	
23	**Rough Stone**	Thiru.A.Kirupanithi,	S/o. Arumuga Nadar, 8-180, Tiruchendur Main Road, K.Uvari Village, Radhapuram Taluk	M1/7014/2014, Dated: 01.04.2015	1.92.0	**15.04.2015**	**14.04.2020**			**15.04.2015**	working	Non-captive	Yes	08°11'15" N to 08°11'20" N & 77°40'44" E to 77°40'49" E	Open-cast
24	**Rough Stone**	Thiru.A.K.A.Rajan,	S/o. Kirupanithi, 8-180, Tiruchendur Main Road, K.Uvari Village, Radhapuram Taluk	M1/7012/2014, dated: 01.04.2015	0.96.0	**15.04.2015**	**14.04.2020**			**15.04.2015**	working	Non-captive	Yes	08°11'11" N to 08°11'15" N & 77°40'44" E to 77°40'48" E	Open-cast
25	**Rough Stone**	Thiru.M.Selvaraj,	S/o.Mariya Nadar, 25/33A, Muthunagar, Thovalai	M1/27274/2013, dated:22.01.2016	0.61.0	**08.02.2016**	**07.02.2021**			**08.02.2016**	working	Non-captive	Yes	08°12'11" N to 08°12'13" N & 77°39'11" E to 77°39'15" E	Open-cast
26	**Rough Stone**	Thiru. D. Esakiappan,	12/51, Odaitheru, Vadakkankulam	M1/62128/2010, dated : 22.09.2010	2.50.0	**01.11.2010**	**31.10.2020**			**01.11.2010**	working	Non-captive	Yes	08°11'08" N to 08°11'16" N &	Open-cast

														77°33'11" E to 77°33'16" E	
27	**Rough Stone**	Thiru. K. Dinesh,	Avaraikulam, Radhapuram Taluk	M1/74015/2010, Dt: 22.11.2010	2.50.0	**15.11.2010**	**14.11.2020**			**15.11.2010**	working	Non-captive	Yes	08°11'08" N to 08°11'17" N & 77°33'16" E to 77°33'21" E	Open-cast
28	**Rough Stone**	Thiru.Sakthipeeriyakumaran,	Koodankulam, Radhapuram	M1/5944/2012, Dt. 21.06.2016	4.16.5	**21.06.2016**	**20.06.2021**			**21.06.2016**	working	Non-captive	Yes	08°11'14" N to 08°11'23" N & 77°44'23" E to 77°44'31" E	Open-cast
29	**Rough Stone**	Tmt. Sakunthala, ,	W/o. S.T.Dhanapal, Sankarankovil	M1/18548/2013, Dt: 24.08.2016,	1.41.0	**20.09.2016**	**19.09.2021**			**20.09.2016**	working	Non-captive	Yes	09°12'59" N to 09°13'2.4 "N & 77°30'22" E to 77°30'27" N	Open-cast
30	**Rough Stone**	Thiru S. Kasipandiyan,	S/o. Sundariyah Thevar, Pillaiyarkovil Street, Naduvakurichi	M1/33384/2013 dt: 23.06.2014	1.79.5	**23.06.2014**	**22.06.2019**			**23.06.2019**	working	Non-captive	Yes	09°05'10" N & 77°28'20" E	Open-cast

			Major, Sankarankovil												
31	**Rough Stone**	Thiru S. Kasipandiyan,	S/o. Sundariyah Thevar, 1-7-160, Pillaiyarkovil Street, Naduvakurichi Major, Sankarankovil	M1/33382/2013 Dated: 17.07.2015	2.03.5	**26.07.2015**	**25.07.2020**			**26.07.2015**	working	Non-captive	Yes		Open-cast
32	**Rough Stone**	Thiru P.Paulraj,	S/o. Pilliyar, 2/174 Malayadipatti, Karichathan.	M1/59706/2010 dt: 04.07.2014	0.79.5	**04.07.2014**	**03.07.2019**			**04.07.2014**	working	Non-captive	Yes	09°17'15" E to 09°17'11" E & 77°34'55" E to 77°34'59" E	Open-cast
33	**Rough Stone**	Thiru.T.Kombaiah,	S/o. Thangapandian, 10-33A, Main Road, Panavadalichathiram Village, Sankarankovil	M1/1114/2014, dated: 04.04.2015.	4.57.5	**07.04.2015**	**06.04.2020**			**07.04.2015**	working	Non-captive	Yes	09°02'56" N to 09°03'03" N & 77°40'02" E to 77°40'12" E	Open-cast
34	**Rough Stone**	K.Karuppasamy, Street, Visvanathapuram, Senkottai.	48/445, E.K. Thevar	M1/6637/12, dt: 20.05.12	0.86.0	**30.06.2012**	**29.03.2022**			**30.06.2012**	working	Non-captive	Yes	08°59'44" N to 08°59'48" N & 77°14'08" E to 77°14'14" E	Open-cast

35	**Rough Stone**	K.J.Ajaidulasidaran	S/o. K.A.Jeyadevaraja, State bank colony, melagaram, tenkasi	M1/64857/2015, Dt: 24.08.2016	3.98.5	**23.09.2016**	**22.09.2021**			**23.09.2016**	working	Non-captive	Yes	08°56'14" N to 08°56'23" N & 77°20'33" N to 77°20'41 N	Open-cast
36	**Rough Stone**	Thiru.C.Azhayakoothan,	66, North Street, Rajavallipuram, Tirunelveli	M1/18823/2013, dt. 16.12.2015	3.37.0 hects.	**19.12.2015**	**18.12.2020**			**19.12.2015**	working	Non-captive	Yes	08°49'27" N & 77°45'56" E	Open-cast
37	**Rough Stone**	Thiru.David,	S/o. M.Gnanasundaram, 11-E, Blessing Cottage, (Behind) Shanmuga Theatre, Ettayapuram Road, Kovilpatti	M1/37378/2013, dated. 10.12.2016	1.61.0	**14.03.2017**	**13.03.2022**			**14.03.2017**	working	Non-captive	Yes	08°49'30" N to 08°49'34" N & 77°44'10" E to 77°44'17" E	Open-cast
38	**Rough Stone**	M.Abdul Ali,	Vadakari	M1/19230/2015, dt:20.02.2016	4.00.0	**10.06.2016**	**09.06.2021**			**10.06.2016**	working	Non-captive	Yes	08°59'58" N to 09°00'05" N & 77°28'26" E to 77°28'36" E	Open-cast
39	**Rough Stone**	Thiru V.Chandhran,	Sambavar Vadakarai	M1/15990/2016, dt:05.03.2016	0.98.0	**10.06.2016**	**09.06.2021**			**10.06.2016**	working	Non-captive	Yes	09°00'02" N to 08°59'57" N &	Open-cast

														77°25'28" E to 77°25'33" E	
40	**Rough Stone**	Thiru S.Palani Nadar,	S/o. Subbiah, 1-7-65, Nadar Therkku Street, Surandai.	M1/30208/2014, dt:04.08.2014	0.98.5	**12.07.2016**	**11.07.2021**			**12.07.2016**	working	Non-captive	Yes	08°59'58" N to 09°00'02" N & 77°25'35" E to 77°25'39" E	Open-cast
41	**Rough Stone**	Thiru P.Rajendran,	S/o. Ponnusamy Nadar, 18-7-23, Kamaraj Nagar, Surandai.	M1/30206/2014, dt:20.06.2016	0.85.0	**12.07.2016**	**11.07.2021**			**12.07.2016**	working	Non-captive	Yes	08°59'58" N to 09°00'01" N & 77°25'39" E to 77°25'42" E	Open-cast
42	**Rough Stone**	Thiru.A.Ayyalusamy,	S/o. Ayyasamy, 1/5, Chithirampatti, Kovilpatti Taluk, Tirunelveli District.	M1/18824/2013, dated. 08.08.2017	1.37.0	**22.08.2017**	**21.08.2022**			**22.08.2017**	working	Non-captive	Yes	08°51'05" N to 08°51'08" N & 77°45'05" E to 77°45'10" E	Open-cast
43	**Rough Stone**	Thiru.K.Ganesan,	S/o. Kathappathevar, 2/3, Pathu Veetu Street, Rastha, Mathavakuric	M1/70340/2010, dated. 08.08.2018	1.74.0	**22.08.2017**	**21.08.2022**			**22.08.2017**	working	Non-captive	Yes	08°48'28" N & 77°38'56" E	Open-cast

			hi Post, Tirunelveli District.												
44	**Rough Stone**	Tmt. D.Mercy Mary,	W/o. G.Jebarajan, 54, Sivan Mela Ratha Veethi, Palayamkottai Taluk, Tirunelveli District	M1/54558/2014, dated. 16.10.2017	2.51.5	**25.10.2017**	**24.10.2022**			**25.10.2017**	working	Non-captive	Yes	08°38'16" N to 08°38'22" N & 77°41'15 E to 77°41'23 E"	Open-cast
45	**Rough Stone**	Tvl. Success Granites Pvt Ltd, Prop: Pasil Joseph,	Padanilath House, Thuthiyur Kara, Valakkala Village, Ernakulam Taluk, Kerala State	M1/22451/2014, dated. 11.09.2017	1.92.5	**25.10.2017**	**24.10.2022**			**25.10.2017**	working	Non-captive	Yes	09°07'30" N to 09°07'36" N & 77°28'56" E to 77°29'02" E	Open-cast
46	**Rough Stone**	Thiru.N.Esakkiappan,	S/o. Narayanan, Vattarakathan Kovil Street, Ambalavanapuram, Palavoor Village, Radhapuram Taluk, Tirunelveli District	M1/48377/2015, dated. 19.02.2018	2.41.0	**28.02.2018**	**27.02.2023**			**28.02.2018**	working	Non-captive	Yes	08°12'05" N to 08°12'11" N & 77°39'52" E to 77°39'59" E	Open-cast
47	**Rough Stone**	Thiru.M.sundaravel,	S/o. Muthusekarapandian, 19/2, Seethapal, Poothapandi Post, Thovalai	M1/48376/2015, dated. 19.02.2018	2.70.0	**28.02.2018**	**27.02.2023**			**28.02.2018**	working	Non-captive	Yes	08°18'15" N to 08°18'21" N & 77°42'02"	Open-cast

			Taluk, Kanniyakumari District											E to 77°42’10” E	
48	**Rough Stone**	Thiru.S.Syed Ibrahim,	S/o. Sahool Hameethu, 95, Malampatti Road Street, Krishnapuram Village, Kadayanallur Taluk	M1/22269/2016, dated. 27.02.2018	4.95.5	**13.03.2018**	**12.03.2023**			**13.03.2018**	working	Non-captive	Yes	08°51'40" N to 08°51'50" E & 77°27'01" E to 77°27'12" E	Open-cast
49	**Rough Stone**	Thiru.H.Mohamed Kadar Meeran Mohideen,	S/o. Hanifa, 31, Pavalar Street, Kayathar, Thothukudi District	M1/30791/2016, dated. 02.03.2018	1.90.0	**13.03.2018**	**12.03.2023**			**13.03.2018**	working	Non-captive	Yes	08°55'08" N to 08°55'13" N & 77°44'03" E to 77°44'08" E	Open-cast
50	**Rough Stone**	Tvl. Hi-Tech Rock Products Agreegates ltd,	Mount Poonamalle Road, Manapakkam Post Box 979, Chennai - 600 089	M1/36278/2017, dated. 21.03.2018	4.96.5	**04.04.2018**	**03.04.2023**			**04.04.2018**	working	Non-captive	Yes	08°11’44” N to 08°11’56” N & 77°38’12” E to 77°38’20” E	Open-cast
51	**Rough Stone**	Thiru.S.Somasundaram,	s/o. K.Subbiah, Akka Salai, Pillaiyar Kovil Street, Valliyur, Radhapuram	M1/41046/2017, dated. 20.03.2018	4.90.5	**04.04.2018**	**03.04.2023**			**04.04.2018**	working	Non-captive	Yes	08°15'57" N to 08°16'09" N & 77°37'18" E to	Open-cast

			Taluk, Tirunelveli District											77°37'25" E	
52	**Rough Stone**	G.Inbarajan,	S/o. Grurusamy, 4/21-C, Sri Ram Nagar, Ponnagaram, Rajapalayam - 626 108, Virudhunagar District	M1/5931/2013, dated. 21.03.2018	2.03.05	**16.04.2018**	**15.04.2023**			**16.04.2018**	working	Non-captive	Yes	09°11'35.47"N to 09°11'43.60"N & 77°30'41.63"E to 77°30'45.86"E	Open-cast
53	**Rough Stone**	Thiru.V.Chandrasekaran	S/o. Velu, 4/119-C, Achampatti Road, Vadakkupudur Village, Sankarankovil Taluk, Tirunelveli district	M1/4509/2014, dated. 18.03.2018	2.00.0	**16.04.2018**	**15.04.2023**			**16.04.2018**	working	Non-captive	Yes	09°13'02.01"N to 09°13'07" N & 77°30'42.66"E to 77°30'46.82"E	Open-cast
54	**Rough Stone**	Thiru.M.Vairavan,	S/o. Muthu, Old No. 2/22, New No. 1/410, Vaithiyar Street, Thirisoolam, Chennai - 43	M1/31993/2012, dated. 21.03.2018	2.98.5	**16.04.2018**	**15.04.2023**			**16.04.2018**	working	Non-captive	Yes	09°12'57.90"N to 09°13'06.38"N & 77°30'31.97"E to 77°30'39.72"E	Open-cast
55	**Rough Stone**	Thiru.N.Abdul Gani,	S/o.S.M.Nagoor Meeran, No.2, Kulathur Ayyanar Kovil Street, Tenkasi Taluk, Tirunelveli District	M1/25661/2014, DATED: 22.03.2018.	1.05.65	**16.04.2018**	**15.04.2023**			**16.04.2018**	working	Non-captive	Yes	08°58'12.11"N to 08°58'16.02"N & 77°21'5.00"E to	Open-cast

														77°21'9.17"E	
56	**Rough Stone**	Thiru.N.Mohamed Mahaboob,	S/o. Nagoor Pitchai, No. 8/143, Main Road, Pottalpudur Village kaspa, Ambasamudram Taluk, Tirunelveli District	M1/44736/2016, DATED: 20.03.2018.	3.74.5	**16.04.2018**	**15.04.2023**			**16.04.2018**	working	Non-captive	Yes	08°48'01" N to 08°48'09" N & 77°26'16" E to 77°26'29" E	Open-cast
57	**Rough Stone**	Tmt.C.Maheswari,	W/o. M.Jesurajan, No:14/1/23, Anna Nagar, Surandai, Veerakeralampudur Taluk, Tirunelveli District	M1/22319/2016, DATED: 21.03.2018.	1.81.5	**17.04.2018**	**16.04.2023**			**17.04.2018**	working	Non-captive	Yes	09°00'35" N to 09°00'40" N & 77°27'54" E to 77°28'02" E	Open-cast
58	**Rough Stone**	Thiru.R.P.Arunachala Pandian,	S/o. R.Ponnusamy Nadar, No.4/37, Madianoor, Avudaiyanoor, Tenkasi Taluk, Tirunelveli District	M1/40906/2016, DATED: 22.03.2018.	1.89.0	**17.04.2018**	**16.04.2023**			**17.04.2018**	working	Non-captive	Yes	08°51'27" N to 08°51'32" N & 77°24'49" E to 77°24'55" E	Open-cast
59	**Rough Stone**	Thiru.K.Sasikumar,	S/o. Kalangiam, Door No.	M1/34173/2016, DATED: 20.03.2018.	1.99.0	**17.04.2018**	**16.04.2023**			**17.04.2018**	working	Non-captive	Yes	08°47'59" N to 08°48'05"	Open-cast

			203/1, New No. 321/9, Nainar Kovil Street, Ariyappapuram Vellappanaiyaneripatti, Thippanampatti Village, Tenkasi Taluk, Tirunelveli District											N & 77°26'29" E to 77°26'35" E	
60	**Rough Stone**	Thiru.S.Shankar,	S/o. R.Subramaniam, residing at 131/1, A.P.T.Road, Erode – 638 003	M1/43375/2015, DATED: 31.03.2018.	1.60.0	**17.04.2018**	**16.04.2023**			**17.04.2018**	working	Non-captive	Yes	08°38'43" N to 08°38'48" N & 77°40'44" E to 77°40'49" E	Open-cast
61	**Rough Stone**	Thiru.P.Marimuthu,	S/o. Petchi Thevar, residing at 1/3-A, Kasba Melbagam, Ponnakudi Village, Palayamkottai Taluk Tirunelveli District	M1/36802/2014, DATED: 22.03.2018.	4.73.5	**19.04.2018**	**18.04.2023**			**19.04.2018**	working	Non-captive	Yes	08°38'43" N to 08°38'52" N & 77°40'49" E to 77°40'58" E	Open-cast
62	**Rough Stone**	Thiru.N.Maria Robin,	S/o. Nasaren Martin, No:48, Xavier Colony, Melapalayam Post, Palayamcottai Taluk,	M1/47664/2016, DATED: 20.03.2018.	2.00.0	**19.04.2018**	**18.04.2023**			**19.04.2018**	working	Non-captive	Yes	08°11'01" N to 08°11'05" N & 77°40'16"	Open-cast

			Tirunelveli District											E to 77°40'22" E	
63	**Rough Stone**	Thiru.S.Rajendran,	S/o. Sreedharan, residing at D.No. 13-43A, Preetha Bavan, Pathittavilai, Chitharal Post, Kanniyakumari District,	M1/12755/2016, DATED: 04.04.2018.	2.45.48	**17.04.2018**	**16.04.2023**			**17.04.2018**	working	Non-captive	Yes	08°16'18" N to 08°16'24" N & 77°46' 59"E to 77°47'04" E	Open-cast
64	**Rough Stone**	Thiru.C.Sugu,	S/o. Chellappan, residing at No. 12-1B, Vellancode, Chitharal Post, Kanniyakumari District	M1/12757/2016, DATED: 04.04.2018.	1.26.25	**17.04.2018**	**16.04.2023**			**17.04.2018**	working	Non-captive	Yes	08°16' 09"N to 08°16'17" N & 77°46'46" E to 77°46'49" E	Open-cast
65	**Rough Stone**	Tvl. Hi-Tech Rock Products & Aggregates Limited,	Registered Office: Mount Poonamalle Road, Manapakkam P.B. No. 979, Chennai – 600 089.	M1/36279/2017, dated. 05.06.2018	3.18.0	**22.06.2018**	**21.06.2020**			**22.06.2018**	working	Non-captive	Yes		Open-cast
66	**Rough Stone**	Thiru.J.Shaboor Bathusha,	S/o. Jabhar Sha, 1, Geethanjali House, Courtallam, Tenkasi	M1/11473/2014, dated. 09.07.2018	1.40.50	**06.07.2018**	**05.07.2023**			**06.07.2018**	working	Non-captive	Yes	08°57'57 .95"N to 08°58'01. 60"N & 77°20'32. 25"E to 77°20'36.	Open-cast

														90”E	
67	**Rough Stone**	Thiru.A.Sankaranarayanan @ Sankaran,	S/o. Arunachalam, 24-B, Pillamar Street,Tisaiyanvilai, Radhapuram, Tirunelveli District- 627 657	M1/27262/2016, dated. 13.07.2018	2.36.5	**17.07.2018**	**16.07.2023**			**17.07.2018**	working	Non-captive	Yes	08°38’15”N to 08°38’21”N & 77°41’22”E to 77°41’28”E	Open-cast
68	**Rough Stone**	Tmt. D.Mercy Mary,	W/o. G.Jebarajan, No. 54-Sivan West Car Street, Palayamkottai, Tirunelveli District	M1/3939/2017, dated. 13.07.2018	1.62.5	**17.07.2018**	**16.07.2023**			**17.07.2018**	working	Non-captive	Yes	08°38’10”N to 08°38’15”N & 77°41’20”E to 77°41’25”E	Open-cast
69	**Rough Stone**	Thiru.S.Subbiah,	S/o. Sornathevar, 760, Pazhar Street,Seevalaperi, Palayamkottai Taluk, Tirunelveli District.	M1/3390/2017, dated. 18.07.2018	1.38.5	**24.07.2018**	**23.07.2023**			**24.07.2018**	working	Non-captive	Yes	08°49'04" N to 08°49'10" N & 77°26'06" E to 77°26'15" E	Open-cast
70	**Rough Stone**	Thiru.K.S.R.J.Rajkumar,	S/o. K.S.R.Jeyakumar, residing at K.S.R.Illam, Peruratchi Theru, Kambam Puthupatti Village,	M1/18028/2016, DATED: 07.09.2018	2.02.5	**15.11.2018**	**14.11.2023**			**15.11.2018**	working	Non-captive	Yes	08°49'12.14"N to 08°49'06.26"N & 77°26'26.08"E to 77°26'17.85"E	Open-cast

			Uthamapalayam Taluk, Theni District												
71	**Rough Stone**	Thiru.N.K.S.Anbazhagan,	S/o. (late) Subramania Nadar, residing at No. 96, North Car Street, Aladipatti, Nallur Post, Sivalarkulam Village, Alangulam Taluk, Tirunelveli District	M1/2464/2016, dated. 31.03.2018	1.42.5	**17.04.2018**	**16.04.2023**			**17.04.2018**	working	Non-captive	Yes	08°49'7" N to 08°49'14.8"N & 77°31'21.5"E to 77°31'29.6"E	Open-cast
72	**Rough Stone**	Tvl.V.V.Mineral,	Keeraikaranthattu, Tisaiyanvilai	M1/54004/2010, Dated: 11.07.2011	3.72.5	**09.08.2018**	**08.08.2023**			**09.08.2018**	working	Non-captive	Yes	08°48'56" N to 08°49'05" N & 77°31'16" E to 77°31'26" E	Open-cast

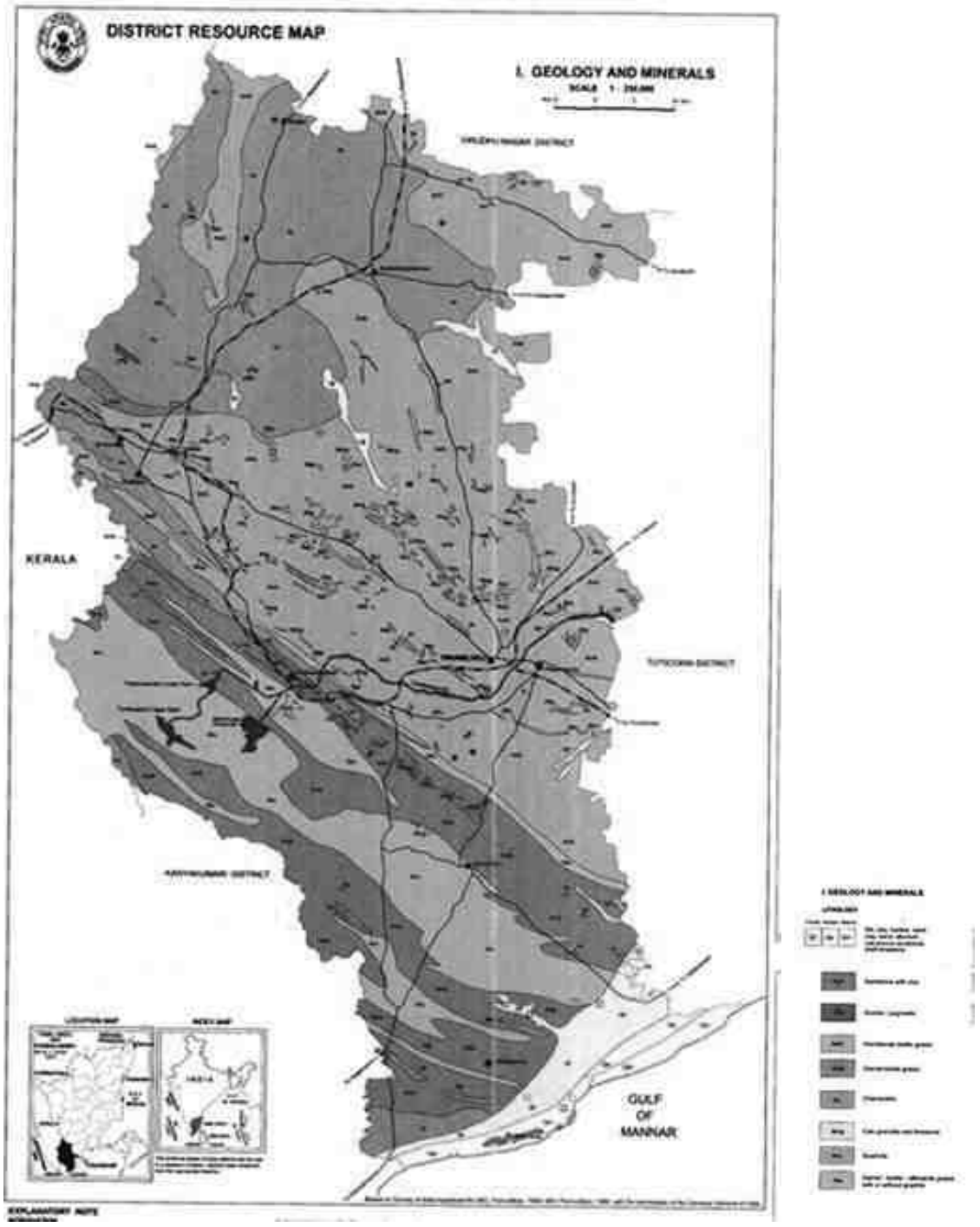
10. DETAILS OF ROYALTY/SEINIORAGE FEE RELEASED IN THE LAST THREE YEARS.

Sl. No.	Name of the mineral	Royalty/Seiniorage fee collected (In Rupees)		
		2015-16	2016-17	2017-18
1.	Rough Stone	99688026	127126612	171150277

11. DETAILS OF PRODUCTION OF MINOR MINERALS IN LAST THREE YEARS.

Sl. No.	Name of the mineral	Quantity produced (Cubic meter)		
		2015-16	2016-17	2017-18
3	Rough Stone	2125138	2825205	3470931

12. MINERAL MAP OF DISTRICT:



13.0 LIST OF LETTER OF INTENT (LOI) HOLDER IN THE DISTRICT ALONG WITH ITS VALIDITY

Sl. No	Name of the Mineral	Name of the Lessee	Address & Contact No. of Letter of Intent Holder	Letter of Intent Grant Order No. & date	Area of Mining lease to be allotted	Extent	Validity of LoI	Use (Captive/Non-Captive)	Location of the Mining lease (Latitude & Longitude)
1	Rough Stone	S.Sundaramahalingam	S.Sundaramahalingam, S/o.Subbiah, 465A, Bazar Road, Mavadikkal, Kadayanallur Taluk, Tirunelveli.	M1/25687/2017, dt.22.05.2018	Kambaneri Pudukudi Part - II Village, Kadayanallur Taluk in SF.No. 1061/1(P), 1061/2(P), 1061/3(P) & 1062/1(P)	5.00.0	-	Non - Captive	09°02'53"N to 09°03'03"N & 77°22'00"E to 77°22'07"E
2	Rough Stone	S.Sundaramahalingam	S.Sundaramahalingam, S/o.Subbiah, 465A, Bazar Road, Mavadikkal, Kadayanallur Taluk, Tirunelveli.	M1/28404/2017, dt.22.05.2018	Idaigal Part - I village, Ambasamudram Taluk in SF.No. 361/1	4.99.0	-	Non - Captive	08°47'52"N to 08°48'01"N & 77°27'45"E to 77°27'56"E
3	Rough Stone	C.Ramesh	C.Ramesh, S/o.Chokkalinga Thevar, Perumal Kovil Street, Palamadai Village, Tirunelveli Taluk, Tirunelveli District.	M1/41429/2016, dt.09.07.2017	Palamadai Village, Tirunelveli Taluk in SF.No. 375	4.89.5	-	Non - Captive	08°48'17"N to 08°48'26"N & 77°45'41"E to 77°45'48"E

4	Rough Stone	A.Kothar Mydeen	A.Kothar Mydeen, S/o.Ahamed Ravoothar, 18, Nallammalpuram, Thenkulam Village, Tirunelveli Taluk & District.	M1/31268/2016 , dt.09.07.2017	Gangaikondan Part - II village, Tirunelveli Taluk in SF.No. 1660/4	1.62.0	-	Non - Captive	08°48'38"N to 08°48'48"N & 77°45'17"E to 77°45'20"E
5	Rough Stone	M.Marutharaj	M.Marutharaj, S/o.Murugaiah, 32, B1, Kattapomman Street, kayathar, Kovilpatti Taluk, Tuticorin District.	M1/18647/2017 , dt.27.02.2018	Pranjeri Village, Manur Taluk in SF.No. 720	1.99.5	-	Non - Captive	08°55'35"N to 08°55'38"N & 77°44'27"E to 77°44'31"E
6	Multi Colour Granite	Tvl.Winner Minerals Exim India Private Limited	Tvl.Winner Minerals Exim India Private Limited, 2/4, Second Floor, 1st Cross Street, Indira Nagar, Adayar, Chennai.		Urumankulam Village, Radhapuram Taluk in SF.No. 712/3	4.00.0	-	Captive	08°19'09.79"N to 08°19'19.95"N & 77°49'06.65"E to 77°49'14.76"E
7	Rough Stone	D.Arunachalasamy	D.Arunachalasamy, S/o.Dharmaraja, 777, NGO Colony, Kalappakulam, Sankarankovil Taluk, Tirunelveli Distirct.	M1/5315/2015, dt.15.12.2016	Vadikottai Village, Sankarankovil Taluk in SF.Nos. 44/10, 11, 12 & 13	0.72.0	-	Non - Captive	09°12'59"N to 09°13'02"N & 77°30'50"E to 77°30'54"E
8	Rough Stone	A.Mumthaj	A.Mumthaj, W/o.Azad, 10B, Periya Kothithupu, Pallivasal Vadakku Keela Puthu Theru, Malapalayam Village, Palayamkottai Taluk, Tirunelveli District.	M1/27624/2014 , dt.11.01.2018	Melaseval Part - I village, Ambasamudram Taluk in SF.Nos. 419/1B & 419/2	1.78.5	-	Non - Captive	08°39'08"N to 08°39'17"N & 77°37'21"E to 77°37'26"E

9	Rough Stone	T.Balasubramanian	T.Balasubramanian, S/o.Thangamuthu Pandian, 214/1, Poonathotta Street, Chathiramkudiyiruppu, Sankar Nagar, Tirunelveli District.	M1/39664/2016, dt.09.07.2017	Alangaraperi Village, Tirunelveli Taluk in SF.Nos. 37/1 & 37/2	1.59.0	-	Non - Captive	08°48'45"N to 08°48'50"N & 77°46'24"E to 77°46'27"E
10	Rough Stone	I.Ananth	I.Ananth, S/o.Iyappan, 3/853, East Street, Sounthiralingapuram, Avaraikulam Post, Radhapuram Taluk, Tirunelveli District.	M1/28487/2017, dt.21.12.2017	Panagudi Part - I Village, Radhapuram Taluk in SF.Nos. 281 & 282	1.54.0	-	Non - Captive	08°19'54"N to 08°19'58"N & 77°32'26"E to 77°32'32"E
11	Rough Stone	M.Murugaiah	M.Murugaiah, S/o.Muthiah, 1/36A, Mela Theru, Thirumalaikolunthupuram Village, Palayamkottai Taluk, Tirunelveli District.	M1/50561/2017, dt.19.02.2018	Melathidiyur Village, Palayamkottai Taluk in SF.No. 27/7B1A	1.27.5	-	Non - Captive	08°38'10"N to 08°38'18"N & 77°39'06"E to 77°39'10"E
12	Rough Stone	T.Lakshmi	T.Lakshmi, W/o.Thirumalaisamy, 83-B, North Street, Dharmathoorani Village, Pattadaikatti Panchayat, Sankarankovil Taluk, Tirunelveli District.	M1/10042/2015, dt.21.06.2018	South Sankarankovil Village, Sankarankovil Taluk in SF.No. 163/1	1.64.0	-	Non - Captive	09°06'38"N to 09°06'41"N & 77°30'49"E to 77°30'59"E

13	Rough Stone	HI TECH ROCK PRODUCTS & AGGREGATES LIMITED	Tvl.Hi Tech Rock Products & Aggregates Limited, Mount Poonamalee Road, Manapakkam, P.B.No.979, Chennai - 600 089.	M1/39681/2017, dt.14.11.2018	Irukkandurai Part - II Village, Radhapuram Taluk in SF.No.		-	Non - Captive	8 10'40.40" to 8 10'50.20" & 77 39'23.90" to 77 39'34.50"
17	Rough Stone	G.Karuppasamy	G.Karuppasamy, S/o.Gurusamy, 249, Sivanthinagar, Kuthukkal Valasai, Tenkasi Taluk, Tirunelveli District.	M1/24418/2017, dt.06.09.2018	Maruthamputhur Part - I village, Alangulam Taluk in SF.Nos. 35/4A, 4B, 4C, 4D, 4E, 4F, 4G, 4H & 4I	3.99.0	-	Non - Captive	08°49'11"N to 08°49'19"N & 77°31'22"E to 77°31'31"E
21	Rough Stone	A.Kirubanidhi	A.Kirubanidhi, S/o.Arumuga Nadar, 8/180, Tiruchendur Main Road, K.uvari village, Radhapuram Taluk, Tirunelveli District.	M1/7014/2014, dt.25.06.2014	Irukkandurai Part - II Village, Radhapuram Taluk in SF.No. 181/2A2	1.92.0	-	Non - Captive	08°11'14"N to 08°11'19"N & 77°40'44"E to 77°40'49"E
23	Rough Stone	A.K.A.Rajan	A.K.A.Rajan, S/o.Kirubanidhi, 8/180, Tiruchendur Main Road, K.Uvari Village, Radhapuram Taluk, Tirunelveli District.	M1/7012/2014, dt.25.06.2014	Irukkandurai Part - II Village, Radhapuram Taluk in SF.No. 181/2B	0.96.0	-	Non - Captive	08°11'11"N to 08°11'14"N & 77°40'43"E to 77°40'48"E
24	Rough Stone	M.Chinnathambi	M.Chinnathambi, S/o.Muthusamy, 67-A, Samba Street, Tenkasi Taluk, Tirunelveli District.	M1/1570/2015, dt.23.06.2018	Thippanampatti Village, Tenkasi Taluk in SF.Nos. 1377/1C, 1F, 1G, 2I, 2B, 2F, 2H & 1137/2E,	1.81.0	-	Non - Captive	08°53'03"N to 08°53'10"N & 77°20'09"E to 77°20'17"E

25	Rough Stone	C.Sugu	C.Sugu, S/o.Chellappan, 12-1B, Vellancode, Chitharal Post, Kanniyakumari District.	M1/12757/2016 , dt.29.12.2017	Kasthurirengapuram Part - II village, Radhapuram Taluk in SF.No. 193(P)	1.42.0	-	Non - Captive	08°16'09"N to 08°16'17"N & 77°46'46"E to 77°46'49"E
26	Rough Stone	S.Rajendran	S.Rajendran, S/o.Sridharan, 13-43-A, Preetha Bavan, Vellancode, Chitharal Post, Kanniyakumari District.	M1/12755/2016 , dt.29.12.2017	Kasthurirengapuram Part - II village, Radhapuram Taluk in SF.No. 181/1A(P)	2.45.48	-	Non - Captive	08°16'18"N to 08°16'24"N & 77°46'59"E to 77°47'04"E
28	Rough Stone	Tvl. Triveni Real Estate & Developers (P) Ltd	Tvl.Triveni Real Estate & Developers Pvt Ltd, Prop.Sajan K.Thomas, 11/312, Kulangaramuriy, Valakagam, Chirakadavu Post, Cheruwally village, Kanjirapalli Taluk, Kottayam District, Kerala	M1/6165/2012, dt.31.08.2017	Therkku Madathur Village, Ambasamudram Taluk in SF.No. 102(P)	2.16.0	-	Non - Captive	08°49'48"N to 08°49'55"N & 77°23'44"E to 77°23'46"E
29	Rough Stone	V.Maripandi	V.Maripandi, S/o.Velusamy Thevar, 4/66, Pillaiyar Kovil Main Road, Sundaresapuram Post, Kadayanallur Taluk, Tirunelveli District.	M1/61043/2009 , dt.11.05.2017	Kambaneri Pudukudi Part - I Village, Kadayanallur Taluk in SF.Nos. 155/3, 8B, 11, 13, 14, 15 & 16	2.23.0	-	Non - Captive	09°05'32"N to 09°05'38"N & 77°23'03"E to 77°23'11"E
32	Rough Stone	P.K.S.Ahamad Meeran	P.K.S.Ahamed Meeran, 18, Puthu Amman Kovil Street, Sindhupundhurai, Tirunelveli Taluk & District.	M1/30717/2016 , dt.09.07.2017	Gangaikondan Part - II village, Tirunelveli Taluk in SF.Nos. 1665/1B	2.10.5	-	Non - Captive	08°48'24"N to 08°48'39"N & 77°45'11"E to 77°45'13"E

33	Rough Stone	K.Sasikumar	K.Sasikumar, S/o.Kalaigiam, 9/303, Nainar Kovil Street, Vellapanaiyaneripatti, Thippanampatti village, Tenkasi Taluk, Tirunelveli District.	M1/34173/2016 , dt.09.07.2017	A.P.Nadanoor village, Alangulam Taluk in SF.Nos. 433/1 and 433/2	1.99.0	-	Non - Capti ve	08°47'59"N to 08°48'05"N & 77°26'29"E to 77°26'35"E

14. TOTAL MINERAL RESERVE AVAILABLE IN THE DISTRICT

The District Collector has vested with powers for the grant of licence for minor minerals like, Rough Stone, as per Rule 19 of TNMMCR 1959. The minor minerals noticed in poromboke lands are leased out through tender cum auction system. With regard to major minerals, in patta lands powers vested with Commissioner of Geology and Mining for the grant of mining leases. In poromboke lands power is vested with Government. Apart from major minerals, the minor minerals like Rough stone are noticed.

Sl.No.	Name of the Mineral	Classification of Land	No.of Existing leases
1	Rough Stone	Patta Land	75
		Government Land	09

15. QUALITY /GRADE OF MINERAL AVAILABLE IN THE DISTRICT.

The Charnockite includes felsic and rich in quartz and microcline, others mafic and full of pyroxene and olinine, a special feature, recurring in many members of the group, is the presence of a strongly pleochroic, reddish or green orthopyroxene (formerly known as hypersthene).

Rocks of the Charnockite series may be named by adding orthopyroxene to the normal igneous nomenclature. Chemical composition of the charnockite available in the district is given below.

Chemical composition	Ranges in %
SiO_2	46-49
Al_2O_3	1-3
Fe_2O_3	1.16
FeO	21-33
MgO	12-20
MnO	0.3-0.8
CaO	0.04-2.0
Na_2O	0.02-0.50
K_2O	0.02-0.30

Gneiss is a high grade metamorphic rock. This means that gneiss has been subjected to more heat and pressure than schist. This banding has alternating layers that are composed of different minerals.

Chemical composition	Ranges in %
SiO_2	55
Al_2O_3	15-18
Fe_2O_3	2-3
MgO	2.5-3.5
CaO	1.5-2
Na_2O	0.50-1
K_2O	3.5-4.0
Specific Gravity	1.5 gm/cc
Bulk Density	2.7 gm/cc

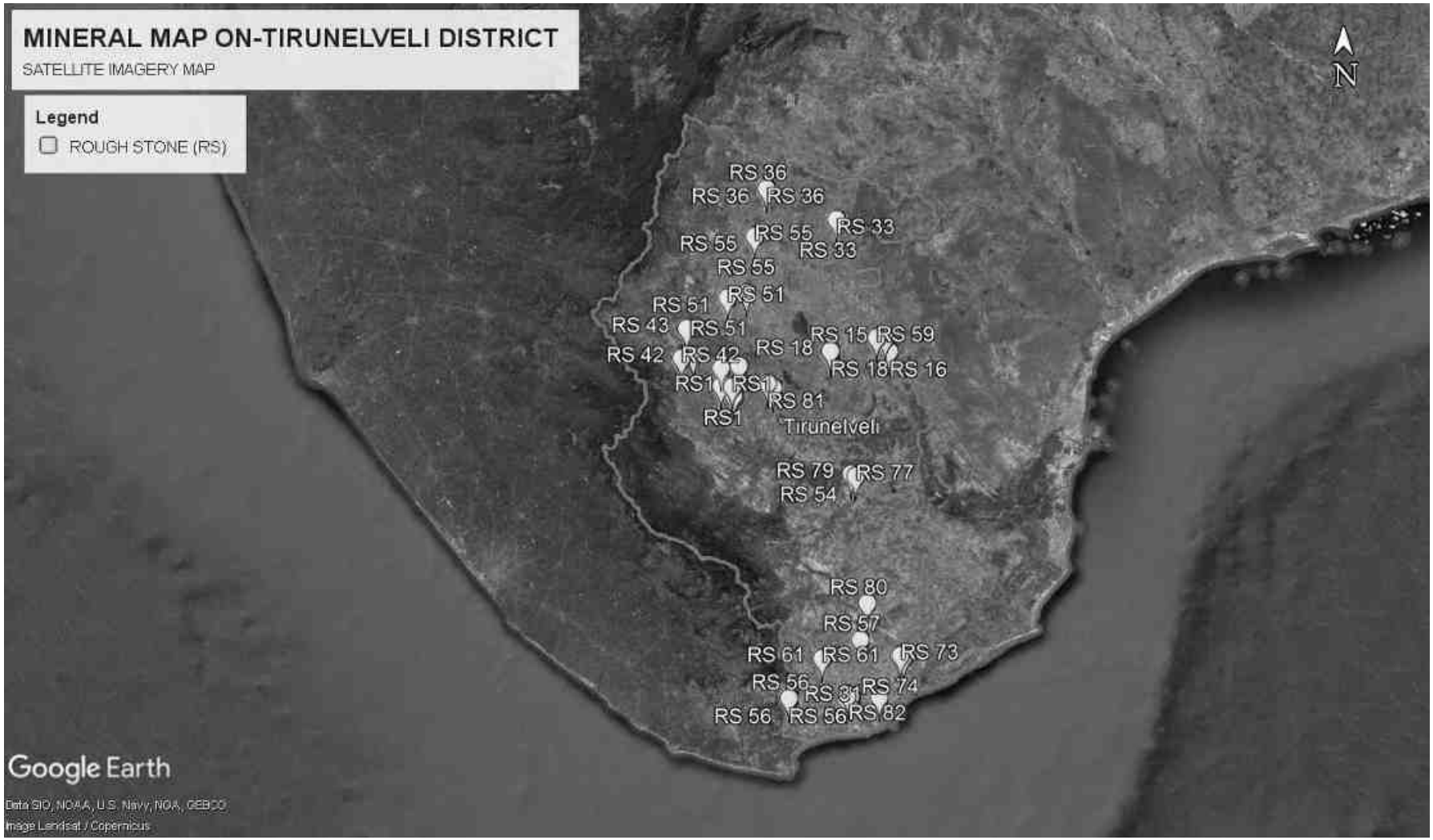
16. USE OF MINERAL

Charnockite and granitic gneisses are extensively quarried as rough stone which is used as aggregates for construction of building, laying of roads and for preparation of value added products like hollow blocks, pillar stones, M-sand etc.

17. DEMAND AND SUPPLY OF THE MINERALS IN THE LAST THREE YEARS.

Sl. No.	Name of the mineral	Demand 2015-16	Supply 2015-16	Demand 2016-17	Supply 2016-17	Demand 2017-18	Supply 2017-18
1	Rough Stone	2125138	2125138	2825205	2825205	3470931	3470931

18.0 MINING LEASE MARKED ON THE MAP OF THE DISTRICT


MINERAL MAP ON-TIRUNELVELI DISTRICT
SATELLITE IMAGERY MAP
Legend
ROUGH STONE (RS)
N
RS 36
RS 36
RS 36
RS 33
RS 55
RS 55
RS 33
RS 55
RS 51
RS 51
RS 43
RS 51
RS 15
RS 59
RS 42
RS 42
RS 18
RS 18
RS 16
RS1
RS1
RS 81
RS1
Tirunelveli
RS 79
RS 77
RS 54
RS 80
RS 57
RS 61
RS 61
RS 73
RS 56
RS 74
RS 56
RS 56
RS 82
Google Earth
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image Landsat / Copernicus

19.0 Details of the area where there is a cluster of mining leases viz., number of mining leases, location (latitude & longitude)

As per the Ministry of Environment, Forest and Climate Change Notification No. S.O. 3933(E) dated 18.12.2017, the quarries situated in the following villages are in cluster situation and to follow the conditions stipulated in the Government of India Notification.

S. No	Taluk	Village
1.	Alangulam	Vengatampatti - II
		Maruthampudur - I
		A.P. Nadanoor
2.	Kadayanallur	Ariyanayagipuram
3.	Manur	Pirancheri
		Vagaikulam
		Kanarpatti
4.	Palayamkottai	Tharuvai
5.	Radhapuram	Irukkandurai
		Therkku Karunkulam
		Kasthurirengapuram Part - II
6.	Tirunelveli	Kodaganallur
		Gangaikondan Part - I & II
7.	V.K.Pudur	Surandai - I

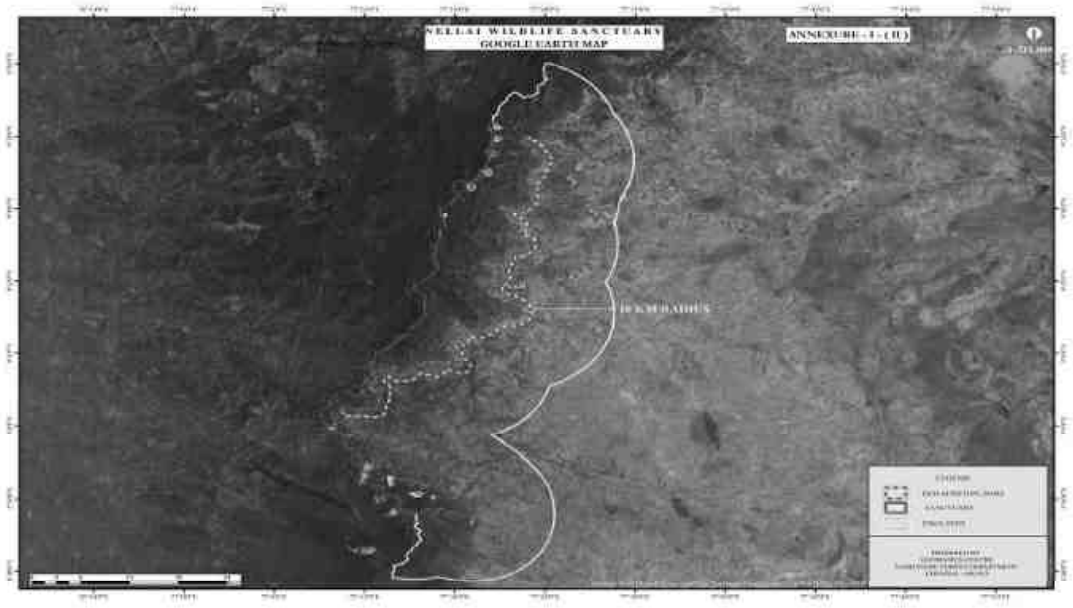
20. DETAILS OF ECO-SENSITIVE AREA.

The Indian board for Wildlife in its 'Wildlife Conservation Strategy-2002' envisaged 'lands falling within 10 km of the boundaries of National parks and sanctuaries should be notified as eco-fragile zones under section 3 (v) of the Environment (Protection) Act and Rule 5 Sub rule (vii) & (x) of the Environment (Protection) Rules'. With concerns over applicability of the 10 km range, the National Board for Wildlife decided that 'delineation of eco-sensitive zones would have to be site specific and relate to regulation, rather than prohibition, of specific activities'.

The purpose of declaring Eco-sensitive zones around National Parks and sanctuaries is to create some kind of **'Shock Absorber'** for the protected areas and they would also act as a transition zone from areas of high protection to areas involving lesser protection.

20.1 Nellai Wildlife Sanctuary

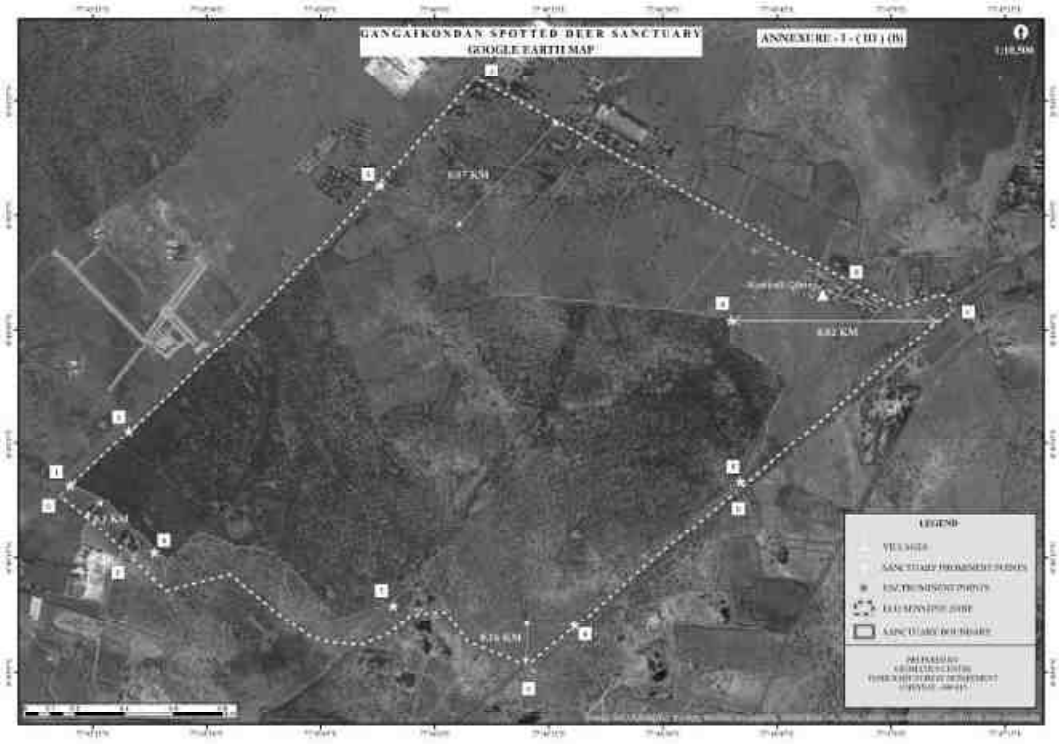
Nellai Wildlife Sanctuary spread over an area of 35,673.33 ha comes under Tenkasi, Shenkottai, Kadayanallur, and sivagiri taluk of Tirunelveli District in Tamilnadu.



(Eco Sensitive Zones are showed in Red and Yellow dotted lines in this figure)

20.2 Gangaikondan spotted Deer Sanctuary

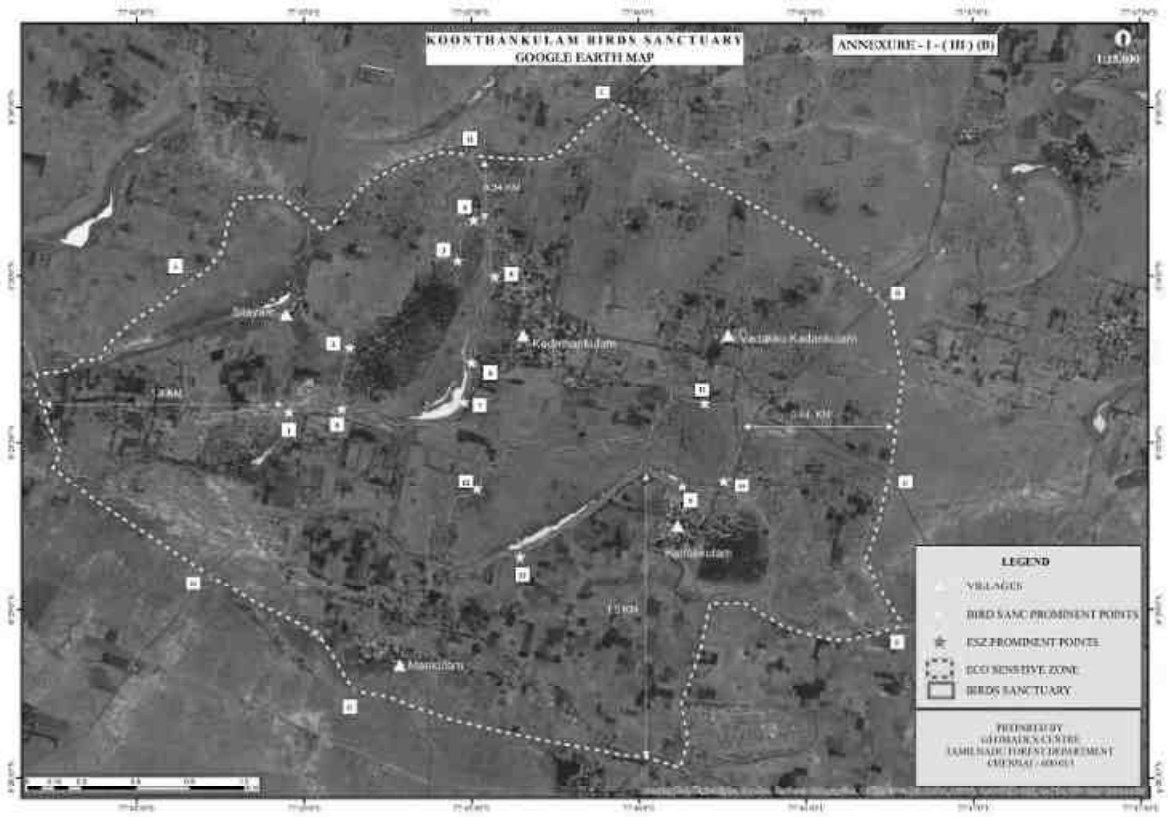
Gangaikondan spotted Deer Sanctuary spread over an area of 288.40 ha comes under Tirunelveli taluk of Tirunelveli District in Tamilnadu. It is located at on the N.H.7 towards Kanyakumari to Madurai.



(Eco Sensitive Zones are showed in Red and Yellow dotted lines in this figure)

20.3 Koonthankulam Bird Sanctuary

Koonthankulam Bird Sanctuary spread over an area of 129.33 ha comes under Nanguneri taluk of Tirunelveli District in Tamil Nadu and comprises of two fresh water wetlands, namely Koonthankulam and Kadankulam. It is located at Koonthankulam village, about 15 km west of Nanguneri and 35 km from Tirunelveli city. The approach road from Tirunelveli is through Moolakaraipatti, which is 6kms away from the sanctuary.



(Eco Sensitive Zones are showed in Red and Yellow dotted lines in this figure)

21. IMPACT ON THE ENVIRONMENT (AIR, WATER, NOISE, SOIL, FLORA & FAUNA, LAND USE, AGRICULTURE, FOREST ETC.) DUE TO MINING ACTIVITY

Mining and allied operations may affect the existing environmental setup in the area unless proper mitigation measures are not taken. Hence it is essential to assess the impacts of mining on various environmental parameters so that abatement measures could be planned in advance for systematic, sustainable and eco-friendly mining in the area.

21.1 Air Environment

The mining and allied operations may cause deterioration of air quality due to pollution if prompt care is not taken. The principal sources of air pollution in general due to mining and allied activities will be the dust generation in the mine due to:

- Excavation of Minerals and overburden.
- Movement of HEMM such as Excavators, tippers etc.
- Loading and unloading operation
- Overburden & Mineral transportation

Besides the above mentioned fugitive dust emissions, atmospheric pollution can occur as a result of emission of SO2, NOx, CO etc., from diesel driven mining equipment, compressors, generator sets, etc. Larger suspended particles are generally filtered in the nose and throat and do not cause problems.

Particulate matter smaller than 10 microns, referred to as PM10, can settle in the bronchi and lungs and cause health problems like Bronchitis, Emphysema, Bronchial Asthma, Irritation of mucus membranes of eyes, etc. Particles smaller than 2.5 micrometers (PM2.5), tend to penetrate into the lungs and very small particles (<100 nanometers) may pass through the lungs to affect other organs.

21.2 Water Environment

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

- Generation of industrial effluent water from workshop, service building.
- Disturbance to drainage course or water bodies in the project area, if any.
- Washouts from waste dumps / embankment, if any.
- Domestic effluent
- Mine discharge water pumped out from opencast mines, if any and effect on ground water table.

Direct impact on human beings due to poor water quality consequent to mining operation can lead to various water borne diseases like diarrhea, jaundice, dysentery, typhoid, etc. Besides, the polluted water may not be useful for animal or human consumption, vegetation and may affect aquatic life, if effluents are not properly treated to remove the harmful pollutants.

21.3 Noise & Vibration

The impact prediction and control measure for noise environment due to mining and allied activities are described below:

Noise is one of the inevitable causes of pollution in mining operations, largely due to the extensive mechanization adopted. Since the Limekankar/Clay (others) in the District is in friable form, no drilling and blasting is required for the excavation. Hence the major source of noise will be from the equipment‟s, such as, Excavation, loading & unloading & movement of vehicles, etc. will produce noise of considerable magnitude in mining operations. Prolonged exposure to a high noise level is harmful to the human auditory system and can create mental fatigue, rebellious attitude, annoyance and carelessness, which may lead to neglect of work and also result in accidents.

The Limekankar/Clay (others) in this region is in friable form and can be excavated directly by using hydraulic excavator and there will not be any drilling and blasting involved in the mining operation. Hence, vibration due to blasting is not envisaged.

21.4 Impact on Land Environment

Due to mining and its allied activities there will some changes to the pre mining land status due to the following activities:

- Excavation of Ore and Waste / Overburden.
- Temporary side casting / Backfilling of Waste / Overburden.
- Construction of infrastructure facilities such as, office, road. Site services, etc.

21.5 Impact on Biological Environment

The major possible impact on biological environment due to mining are given below

- Clearance of vegetation due to mining and allied activities

- Retardation of tree growth, tip burning, etc., due to deposition of dust and the Particulate matter generated from the mining operation.
- Presence of Schedule-I fauna in the mining area
- Proposed impact on surface water quality that also provides water to wildlife
- Risk of fall/slip or cause death to wild animals due to project activities
- The project releases effluents into water bodies that also supplies water to wildlife
- Diversion of Agricultural lands for mining
- Diversion of Forest Lands for mining

22. REMEDIAL MEASURES TO MITIGATE THE IMPACT OF MINING ON THE ENVIRONMENT

The following remedial measures to be taken during mining

22.1. Remedial Measures to mitigate Air Pollution

- Water sprinkling on mineral transport road from the mines to the main road
- Black topping of the main transportation roads to the possible extent
- Avoiding crowding of trucks by properly spacing them to avoid the concentration of dust emission at any time
- Covering the trucks by tarpaulin sheets during ore transportation
- Proper maintenance of HEMM to minimize gaseous emission
- Imparting sufficient training to operators on safety and environmental parameters
- Proper maintenance of haul road and other roads
- Development of green belt/ plantation around mine, along the roads, backfilled area, in various undisturbed areas within the mine lease areas etc.

22.2. Remedial Measures to mitigate Water Pollution

- Industrial effluent treatment systems wherever necessary to be introduced and maintained properly.
- Saftey barriers to be provided for all water bodies and no mining activities should be carried out in the safety barrier area
- Mitigative measures like construction of garland drains formation of earth bunds to be followed in the waste dumping areas to avoid wash off.
- Domestic effluents to be treated in scientific manner.
- Required statutory clearances to be obtained and all precautionary measures to be adopted wherever punping of ground water is involved.

22.3 Remedial Measures to reduce Noise & Vibration

- Planting rows of native trees around mine, along the roads, other noise generating centres to act as acoustic barriers.
- Sound proof operator's cabin for equipment like Excavators, tippers etc.
- Proper and regular maintenance of equipment may lead to less noise generation.
- Air silencers of suitable type that can modulate the noise of the engines of machinery to be utilized and will be maintained effectively.

- Providing in-built mechanism for reducing sound emissions.
- Providing earmuffs to workers exposed to higher noise level and to those persons operating or working close to any machine.
- Conducting regular health check-up of workers including Audiometric test for the workers engaged in noise prone area.

22.4 Remedial Measures to reduce Impact on Land Environment

Scientific reclamation measures to be adopted to reduce the impact of land environment due to mining. Limekankar/Clay(Others) being shallow deposit backfilling of mined out voids may be practiced to avoid land degradation.

22.5 Remedial Measures to reduce Impact on Biological Environment

- The mineral bearing areas in the District is mostly of dry areas, afforestation to be carried out in the mining areas.
- Necessary mitigative measures like dust suppression, proper maintenance of equipments, black topping of roads etc., to be carried out to prevent dust generation & any further impact on the vegetation
- Conservation plan for schedule-I species if any to be prepared in consultation with Forest Department and the proposals given in the conservation plan to be strictly implemented.
- Effluents generated in the mining areas to be treated properly.

23. RECLAMATION OF MINED OUT AREA (BEST PRACTICE ALREADY IMPLEMENTED IN THE DISTRICT, REQUIREMENT AS PER RULES AND REGULATION, PROPOSED RECLAMATION PLAN)

In the post mining period, the mined out pit it will be used for Rain Water Harvesting. Waste dumps will be reclaimed with suitable type of plantation with necessory garland drain system.

24. RISK ASSESSMENT & DISASTER MANAGEMENT PLAN

Risk Assessment and Disaster Management Plan in connection with mining and allied operations should be spelt out in detail to cover possible dangers /risks/explosions/accidents, etc. likely to arise from the project operations, including onsite and off-site emergency plans to meet the disastrous situations if any.

The mine management should be able to deal with the situation efficiently to reduce confusion keeping in view of the likely sources of danger in the project.

1) Outline of Disaster Management Plan :-

The purpose of disaster management plan is to restore the normalcy for early resumption of mining operation due to an unexpected, sudden occurrence resulting to an abnormality in the course of mining activity leading to a serious danger to workers or any machinery or the environment.

2) System of Communication:-

An internal communication system should be provided. Telephone nos and addresses of adjoining mines, rescue station, police station, fire service station, local hospital, electricity supply agency and standing consultative committee members should be propely updated and displayed.

3) Consultative Committee:-

A standing consultative committee should be formed under the Head of Mines. The members consists of Mines Manager / Safety Officer / Medical Officer / Public Relation Officer/ Foreman/ and Environmental Engineer.

4) Facilities & Accommodation:-

Accommodation and facilities for medical centre, rescue room and for various working groups should be provided. Regular checking of these facilities shall be undertaken.

5) First Aid & Medical Facilities:-

The mine management should be having first aid / medical centre for use in emergency situation. All casualties should be registered and should be given first aid. The centre should have facilities for first aid & minor treatment, resuscitation, ambulance and transport. Proper telephone / wireless set should be provided for quick communication with hospitals where the complicated cases are to be referred. Regular checking of these facilities shall be under taken by the doctor and the in-charge of the first aid room.

6) Stores and Equipment :-

A detailed list of equipment available, its type and capacity and items reserved for emergency should be maintained.

7) Transport Services:-

A well-defined transport control system should be provided to deal with the situation.

8) Functions of Public Relations Group:-

Liaison with representatives of the mine workers is required to ameliorate the situation of panic, tension, sentiments, grievances and misgivings created by any disaster. Management is required to ameliorate the injured, survivors and family members of affected persons by providing material, finance, moral support and establishing contact with relatives of victims.

The consultative committee formed, especially the nominated public relation officer shall look into these aspects.

9) Security:-

Manning of security posts is very essential during the disaster management.

10) Catering & Refreshment: -

Arrangement will be made for the victims, rescue teams and others.

25.Details of occupational health issue in the district (last five –year data of number of patients of silicosis & tuberculosis is also needs to be submitted)

Sl.No.	Year	Number of patients treated for silicosis	Number of patients treated for Tuberculosis
1	2015	Nil	Nil
2	2016	Nil	Nil
3	2017	Nil	Nil
4	2018	Nil	Nil
5	2019	Nil	Nil

26.Plantation and green belt development in respect of leases already granted in the district

It is necessary to develop Green belt in and around the polluted site with suitable species to reduce the air pollution effectively. Implementation of afforestation program is of paramount importance. In addition to augmenting existing vegetation, it also checks soil erosion, make the ecosystem more complex and functionally more stable and make the climate more conductive.

Simultaneous backfilling method will be followed in most of the mining areas. During the operations, the plantation will be proposed and will be carried out on the safety barrier areas and also on the mined out and backfilling areas.

27. Any other Information

Kudankulam Nuclear Power Project situated in Kudankulam village, Radhapuram Taluk, Tirunelveli District as per AERB guidelines No Quarries can be started within 5 kilo meters radius and will be scrutinised by Kudankulam Local Committee.

SITE PHOTOS

ROUGH STONE Village ; Kovankulam Latitude ; 08° 22' 44"N Longitude ; 77° 42' 53"E 	**ROUGH STONE** Village ; Thippanampatti Latitude ; 08° 53' 08"N Longitude ; 77° 20' 09"E

ROUGH STONE

Village ; Tharuvai

Latitude ; 08°38'28"N

Longitude ; 77°40'53"E

ROUGH STONE

Village ; Therkkumadathur

Latitude ; 08°49'48"N

Longitude ; 77°23'44"E

ROUGH STONE

Village ; Irukkandurai Part-2

Latitude ; 08° 11' 14"N

Longitude ; 77° 40' 44"E

ROUGH STONE

Village ; Idaigal Part-I

Latitude ; 08° 47' 58"N

Longitude ; 77° 27' 46"E

ROUGH STONE

Village ; Poigai

Latitude ; 09°07'30"N

Longitude ; 77°28'57"E

ROUGH STONE

Village ; Venkadampatti Part-1

Latitude ; 08° 51' 27"N

Longitude ; 77° 24' 49"E

Conclusion and Recommendations

This District Survey Report has been prepared by doing field work in a short span of ten working days. The details related to the occurrence of mineral resources and other data of the district are subject to updation of district mineral inventory from time to time. It may be periodically done every five (05) years with the help of GSI and other govt/non-govt geoscience exploration organisations.

Considerable amount of crystalline limestone deposit is the Tirunelveli District is occurs in Talaiyuttu-Nanjakulam-Terkuseiyanur areas are known from previous histories. Around Usilangulam, Ottavidu and Tadiyampatti areas, linear band of crystalline limestone is exposed with quartzite and Charnockite. This area may be taken up for geological survey in view of future mining prospects. Crystalline limestone occurrences south of Tirunelveli around Padmaneri-Devanallur-Pottaisutti areas may be reapparaised and to be developed for cement grade deposits.

Charnockite rock the raw material for the production of building/construction aggregates, road metal and M-sand is more concentrated spatially. With respect to the need for public utility is it locally quarried/mined in the entire district proportionately and to be continued in the same manner.

The entire Tirunelveli district has high hills of quartzite exposed in Talaiyuttu, Marandai Malai, Reddiyarpatti hill, Krishnapuram-Nochikulam and Uttumalai hills but due to its high metamorphic nature and its impurities it attracts very less importance. The River Sand in the Chittar and Tamarabarani River is very small in quantity which cannot be exploited for public purpose. The gemstone reported in Kalakadu and Manimuthar Dam area may be explored in collaboration with GSI or any govt organisations.

The introduction of e-permit system and serious implementation of Mineral Dealers Rule and the despatch slips / transit permits with tampered proof security features will enhance sustainable mining activity in the district.

GPS/Auto Tags installed tracking of mined out mineral vehicles will fetch more revenue to the state exchequer and over exploitation.

An appreciable work carried out by Deputy Director (Mines)/ Tirunelveli District and his office in considering all parameters related to ground geology and environmental issues before granting of any quarrying lease is highly commendable and to be continued.

ANNEXURE-9

भारतीय गैर न्यायिक

बीस रुपये

Rs.20

रु.20

TWENTY RUPEES

INDIA

INDIA NON JUDICIAL

तमिलनाडु TAMIL NADU M. Prabu 92AB 023464

30 SEP 2023

Global Mining Solutions
Chennai

THIS **MEMORANDUM OF UNDERSTANDING (MOU)** IS ENTERED INTO
ON THIS THE 30.09.2023
BETWEEN

M/s. GLOBAL MINING SOLUTIONS , duly represented by its Managing Director Mr.M.Prabhu, having its registered office at Plot No. 6 V.S. City,Kottamettupatti, Omalur, Salem – 636455, hereinafter referred to as **"GMS"** (which expression shall unless repugnant to the context or meaning thereof be deemed to include its successors, assigns, nominees, affiliated companies, etc.) of the One Part;

AND

SHRIENT ANALYTICAL AND RESERCH LABS PRIVATE LIMITED., represented by its General Manager- Technical Mr. V.Vimal Nath its registeredat 416 /15 Dhargas Road ,Perunkolathur, West Tambara, Chennai -600045,Tamil NAdu **"SARL"** (which expression shall unless repugnant to the context or meaning thereof be deemed to include its successors and assigns) of the Other Part.

(Hereinafter **GMS** and **SARL** will be individually referred to as **"Party"** and collectively referred to as **"Parties"**)

WHEREAS,

a) **GMS** is engaged in the Business of offering consultancy, EIA works, and Testing Services.
b) **SARL** is engaged in manufacture and supply of wide range of chemicals for various water, process and waste water treatment applications. Besides having NABL accredited laboratory also.

NOW, THEREFORE IN CONSIDERATION OF THE MUTUAL PROMISES AND COVENANTS CONTAINED IN THIS MOU, IT IS HEREBY AGREED BETWEEN THE PARTIES AS FOLLOWS:

1) GMS will subcontract testing services of the NABL Accredited SARL scope for following

- Ambient Air Quality Monitoring and analysis
- Water and waste water Quality analysis
- Soil Quality Analysis
- Noise Monitoring

2) Prices will be as mutually agreed.

3) DURATION AND RENEWAL

This MoU is entered into initially for a period of 24 (Twenty-four) from the date of entering into this MoU, and the same is extendable for a further periods on mutually agreed terms and conditions between the parties herein.

Provided, if either party is unwilling to extend the term of the MoU for a second term. Notice in writing, of such intention not to extend the term of this MoU, should be given to the other party not later than three months before the expiry of the first term of six months.

4) TERMINATION

a) Without prejudice to any other remedies both the parties may have, the right at any time by giving notice in writing to the other party to terminate the MoU.
b) Termination of this MOU can be done by either party, with a 1 month notice period by the terminating party. It is expected that the parties will discuss any issues that arise that would lead to the need to terminate this agreement prior to the written formal termination of the agreement.
c) Both the Parties shall on the termination of this MoU return to the other party forthwith any books, records, papers or other property in its possessions belonging to the other party.

5) CONFIDENTIALITY

Both during the term of this MoU as well as after the termination of this MoU, the Parties are obliged to keep confidential all proprietary informal on such as technical data, know-how, business and operating conditions, technical experience, working methods and the like received from the other Party and not to disclose this information to anyone other than employees, directors and officers. The Parties are obliged to make sure that their employees, directors and officers who have a need to know, at the same time as they receive the said information, are informed.

IN WITNESS WHEREOF THE PARTIES HAVE SIGNED THESE PRESENTS, THE DAY AND YEAR FIRST HEREINABOVE WRITTEN IN THE PRESENCE OF THE FOLLOWING WITNESSES:

M/S GLOBAL MINING SOLUTIONS

M/S SHRIENT ANALYTICAL AND RESERCH LABS PRIVATE LIMITED

WITNESSES:

M. Vasanthakumar

Name: Vasantha Kumar
Address: 315, Ramaninagar,
East Thiruvagavundanur, Salem-636005

Name: J.Gnanaprakasam
Address:Plot No 11 Saraswathi Nagar
Old perunkolathur,Chennai-600059

National Accreditation Board for Testing and Calibration Laboratories

CERTIFICATE OF ACCREDITATION

SHRIENT ANALYTICAL & RESEARCH LABS PRIVATE LIMITED

has been assessed and accredited in accordance with the standard

ISO/IEC 17025:2017

"General Requirements for the Competence of Testing & Calibration Laboratories"

for its facilities at

416/15, DHARGAS ROAD, PERUNGALATHUR, WEST TAMBARAM, CHENNAI, KANCHIPURAM, TAMIL NADU, INDIA

in the field of

TESTING

Certificate Number: TC-12339

Issue Date: 30/09/2023 **Valid Until:** 29/09/2025

This certificate remains valid for the Scope of Accreditation as specified in the annexure subject to continued satisfactory compliance to the above standard & the relevant requirements of NABL.
(To see the scope of accreditation of this laboratory, you may also visit NABL website www.nabl-india.org)

Name of Legal Entity: SHRIENT ANALYTICAL AND RESEARCH LABS PRIVATE LIMITED

Signed for and on behalf of NABL

N. Venkateswaran
Chief Executive Officer

ANNEXURE-10

Shrient Analytical and Research Labs Pvt. Ltd

416/15, Dhargas Road, West Tambaram, Chennai- 600045
Phone Number +91 82208 36377 Email: - **info@shrientanalytical.com**
www.shrientanalytical.com

TEST REPORT

Report No.	SARL/24/3041

Report Date.	16.03.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A1-WITHIN MINE LEASE AREA
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3041	Sample Received on	11.03.2024
Sample Collected by	LABORATORY	Test Commenced on	11.03.2024
Sample Collected on	05.03.2024	Test Completed on	16.03.2024
Temperature	35°C	Relative Humidity	23%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	49.4	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	23.5	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.6	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.0	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified

Shrient Analytical & Research Labs Pvt. Ltd. Chennai - 45.

Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

END OF THE REPORT

Please Contact:
For any Technical Issues & Complaints: vimalnath@shrientanalytical.com

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TEST REPORT

Report No.	SARL/24/3042	Report Date.	16.03.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A2-SUNDERASAPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3042	Sample Received on	11.03.2024
Sample Collected by	LABORATORY	Test Commenced on	11.03.2024
Sample Collected on	05.03.2024	Test Completed on	16.03.2024
Temperature	35°C	Relative Humidity	23%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	50.6	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	23.3	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.2	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.4	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified

Shrient Analytical & Research Labs Pvt. Ltd. Chennai - 45

Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

*****END OF THE REPORT*****

Please Contact:
For any Technical Issues & Complaints: vimalnath@shrientanalytical.com

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TEST REPORT

Report No.	SARL/24/3043

Report Date.	16.03.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A1-WITHIN MINE LEASE AREA
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3043	Sample Received on	11.03.2024
Sample Collected by	LABORATORY	Test Commenced on	11.03.2024
Sample Collected on	06.03.2024	Test Completed on	16.03.2024
Temperature	35°C	Relative Humidity	23%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	54.2	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	25.7	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.1	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.5	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified

Shrient Analytical & Research Labs Pvt. Ltd. Chennai - 45.

Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

END OF THE REPORT

Please Contact:
For any Technical Issues & Complaints: vimalnath@shrientanalytical.com

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TEST REPORT

Report No.	SARL/24/3044	Report Date.	16.03.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A2-SUNDERASAPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3044	Sample Received on	11.03.2024
Sample Collected by	LABORATORY	Test Commenced on	11.03.2024
Sample Collected on	06.03.2024	Test Completed on	16.03.2024
Temperature	35°C	Relative Humidity	23%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	µg/m^3	54.0	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	µg/m^3	24.8	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	µg/m^3	5.6	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	µg/m^3	8.8	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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For Shrient Analytical and Research Labs Pvt. Ltd

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Shrient Analytical & Research Labs Pvt. Ltd Chennai - 45

Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/24/3045

Report Date.	16.03.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A3-SHENBAGANALLUR VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3045	Sample Received on	11.03.2024
Sample Collected by	LABORATORY	Test Commenced on	11.03.2024
Sample Collected on	07.03.2024	Test Completed on	16.03.2024
Temperature	36°C	Relative Humidity	22%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	53.5	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	24.4	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.7	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.2	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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For Shrient Analytical and Research Labs Pvt. Ltd

Verified

Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

*****END OF THE REPORT*****

Please Contact:
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TEST REPORT

Report No.	SARL/24/3046

Report Date.	16.03.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A4-THIRUMALAPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3046	Sample Received on	11.03.2024
Sample Collected by	LABORATORY	Test Commenced on	11.03.2024
Sample Collected on	07.03.2024	Test Completed on	16.03.2024
Temperature	36°C	Relative Humidity	22%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	40.7	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	18.8	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.3	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.4	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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For Shrient Analytical and Research Labs Pvt. Ltd

Verified

Shrient Analytical & Research Labs Pvt. Ltd. Chennai - 45.

Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/24/3047

Report Date.	16.03.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A3-SHENBAGANALLUR VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3047	Sample Received on	11.03.2024
Sample Collected by	LABORATORY	Test Commenced on	11.03.2024
Sample Collected on	08.03.2024	Test Completed on	16.03.2024
Temperature	36°C	Relative Humidity	21%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	50.3	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	22.9	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.0	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.0	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified

Shrient Analytical & Research Labs Pvt. Ltd. Chennai - 45.

Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

END OF THE REPORT

Please Contact:
For any Technical Issues & Complaints: vimalnath@shrientanalytical.com

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TEST REPORT

Report No.	SARL/24/3048	Report Date.	16.03.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A4-THIRUMALAPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3048	Sample Received on	11.03.2024
Sample Collected by	LABORATORY	Test Commenced on	11.03.2024
Sample Collected on	08.03.2024	Test Completed on	16.03.2024
Temperature	36°C	Relative Humidity	21%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	43.2	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	19.9	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.9	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.0	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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For Shrient Analytical and Research Labs Pvt. Ltd

Verified

Shrient Analytical & Research Labs Pvt. Ltd. Chennai - 45

Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/24/3049

Report Date.	16.03.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A5- CHIDAMBARAPERI VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3049	Sample Received on	11.03.2024
Sample Collected by	LABORATORY	Test Commenced on	11.03.2024
Sample Collected on	09.03.2024	Test Completed on	16.03.2024
Temperature	36°C	Relative Humidity	24%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	44.6	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	20.3	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.7	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.2	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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For Shrient Analytical and Research Labs Pvt. Ltd

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Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/24/3050

Report Date.	16.02.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A6-PERIYASAMYPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3050	Sample Received on	11.03.2024
Sample Collected by	LABORATORY	Test Commenced on	11.03.2024
Sample Collected on	09.03.2024	Test Completed on	16.03.2024
Temperature	36°C	Relative Humidity	24%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	46.9	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	21.4	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.3	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.5	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/24/3051	Report Date.	16.03.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A5- CHIDAMBARAPERI VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3051	Sample Received on	11.03.2024
Sample Collected by	LABORATORY	Test Commenced on	11.03.2024
Sample Collected on	10.03.2024	Test Completed on	16.03.2024
Temperature	35°C	Relative Humidity	28%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	47.1	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	21.4	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.1	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.6	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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Technical Manager

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TEST REPORT

Report No.	SARL/24/3052

Report Date.	16.03.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A6-PERIYASAMYPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3052	Sample Received on	11.03.2024
Sample Collected by	LABORATORY	Test Commenced on	11.03.2024
Sample Collected on	10.03.2024	Test Completed on	16.03.2024
Temperature	35°C	Relative Humidity	28%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	50.6	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	23.1	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.5	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.0	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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Technical Manager

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TEST REPORT

Report No.	SARL/24/3077

Report Date.	23.03.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A5- CHIDAMBARAPERI VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3077	Sample Received on	18.03.2024
Sample Collected by	LABORATORY	Test Commenced on	18.03.2024
Sample Collected on	12.03.2024	Test Completed on	23.03.2024
Temperature	36°C	Relative Humidity	25%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	40.1	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	18.3	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	3.9	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.4	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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Authorized Signatory
J. GNANAPRAKASAM
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TEST REPORT

Report No.	SARL/24/3078	Report Date.	23.03.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A6-PERIYASAMYPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3078	Sample Received on	18.03.2024
Sample Collected by	LABORATORY	Test Commenced on	18.03.2024
Sample Collected on	12.03.2024	Test Completed on	23.03.2024
Temperature	36°C	Relative Humidity	25%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	52.5	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	24.3	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.8	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.5	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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TEST REPORT

Report No.	SARL/24/3079

Report Date.	23.03.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A5- CHIDAMBARAPERI VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3079	Sample Received on	18.03.2024
Sample Collected by	LABORATORY	Test Commenced on	18.03.2024
Sample Collected on	13.03.2024	Test Completed on	23.03.2024
Temperature	36°C	Relative Humidity	27%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	42.5	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	19.3	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.3	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.9	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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TEST REPORT

Report No.	SARL/24/3080

Report Date.	23.03.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A6-PERIYASAMYPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3080	Sample Received on	18.03.2024
Sample Collected by	LABORATORY	Test Commenced on	18.03.2024
Sample Collected on	13.03.2024	Test Completed on	23.03.2024
Temperature	36°C	Relative Humidity	27%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	56.2	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	25.8	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.1	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	10.1	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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TEST REPORT

Report No.	SARL/24/3081	Report Date.	23.03.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A3-SHENBAGANALLUR VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3081	Sample Received on	18.03.2024
Sample Collected by	LABORATORY	Test Commenced on	18.03.2024
Sample Collected on	14.03.2024	Test Completed on	23.03.2024
Temperature	37°C	Relative Humidity	20%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	52.8	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	24.1	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.5	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.8	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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Authorized Signatory
J. GNANAPRAKASAM
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TEST REPORT

Report No.	SARL/24/3082

Report Date.	23.03.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A4-THIRUMALAPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3082	Sample Received on	18.03.2024
Sample Collected by	LABORATORY	Test Commenced on	18.03.2024
Sample Collected on	14.03.2024	Test Completed on	23.03.2024
Temperature	37°C	Relative Humidity	20%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	48.5	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	22.4	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	6.2	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	10.6	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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For Shrient Analytical and Research Labs Pvt. Ltd

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Shrient Analytical & Research Labs Pvt. Ltd. Chennai - 45.

Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/24/3083	Report Date.	23.03.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A3-SHENBAGANALLUR VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3083	Sample Received on	18.03.2024
Sample Collected by	LABORATORY	Test Commenced on	18.03.2024
Sample Collected on	15.03.2024	Test Completed on	23.03.2024
Temperature	37°C	Relative Humidity	19%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	49.6	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	22.6	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.8	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.9	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/24/3084	Report Date.	23.03.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A4-THIRUMALAPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3084	Sample Received on	18.03.2024
Sample Collected by	LABORATORY	Test Commenced on	18.03.2024
Sample Collected on	15.03.2024	Test Completed on	23.03.2024
Temperature	37°C	Relative Humidity	19%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	44.2	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	20.4	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.1	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.5	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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TEST REPORT

Report No.	SARL/24/3085

Report Date.	23.03.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A1-WITHIN MINE LEASE AREA
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3085	Sample Received on	18.03.2024
Sample Collected by	LABORATORY	Test Commenced on	18.03.2024
Sample Collected on	16.03.2024	Test Completed on	23.03.2024
Temperature	36°C	Relative Humidity	28%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	64.4	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	30.6	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	6.0	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.6	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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TEST REPORT

Report No.	SARL/24/3086	Report Date.	23.03.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A2-SUNDERASAPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3086	Sample Received on	18.03.2024
Sample Collected by	LABORATORY	Test Commenced on	18.03.2024
Sample Collected on	16.03.2024	Test Completed on	23.03.2024
Temperature	36°C	Relative Humidity	28%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	45.2	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	20.8	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.6	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.7	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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TEST REPORT

Report No.	SARL/24/3087

Report Date.	23.03.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A1-WITHIN MINE LEASE AREA
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3087	Sample Received on	18.03.2024
Sample Collected by	LABORATORY	Test Commenced on	18.03.2024
Sample Collected on	17.03.2024	Test Completed on	23.03.2024
Temperature	36°C	Relative Humidity	28%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	61.0	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	29.0	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.7	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.2	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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TEST REPORT

Report No.	SARL/24/3088	Report Date.	23.03.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A2-SUNDERASAPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3088	Sample Received on	18.03.2024
Sample Collected by	LABORATORY	Test Commenced on	18.03.2024
Sample Collected on	17.03.2024	Test Completed on	23.03.2024
Temperature	36°C	Relative Humidity	28%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	48.5	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	28.4	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.9	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.2	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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TEST REPORT

Report No.	SARL/24/3113

Report Date.	30.03.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A1-WITHIN MINE LEASE AREA
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3113	Sample Received on	25.03.2024
Sample Collected by	LABORATORY	Test Commenced on	25.03.2024
Sample Collected on	19.03.2024	Test Completed on	30.03.2024
Temperature	35°C	Relative Humidity	28%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	67.5	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	33.2	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	6.6	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	10.6	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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TEST REPORT

Report No.	SARL/24/3114	Report Date.	30.03.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A2-SUNDERASAPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3114	Sample Received on	25.03.2024
Sample Collected by	LABORATORY	Test Commenced on	25.03.2024
Sample Collected on	19.03.2024	Test Completed on	30.03.2024
Temperature	35°C	Relative Humidity	28%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	49.4	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	24.0	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.3	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.5	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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TEST REPORT

Report No.	SARL/24/3115

Report Date.	30.03.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A1-WITHIN MINE LEASE AREA
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3115	Sample Received on	25.03.2024
Sample Collected by	LABORATORY	Test Commenced on	25.03.2024
Sample Collected on	20.03.2024	Test Completed on	30.03.2024
Temperature	35°C	Relative Humidity	22%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	63.1	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	31.1	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	6.1	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.8	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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For Shrient Analytical and Research Labs Pvt. Ltd

Verified

Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/24/3116

Report Date.	30.03.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A2-SUNDERASAPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3116	Sample Received on	25.03.2024
Sample Collected by	LABORATORY	Test Commenced on	25.03.2024
Sample Collected on	20.03.2024	Test Completed on	30.03.2024
Temperature	35°C	Relative Humidity	22%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	51.0	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	24.7	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.6	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.7	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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J. GNANAPRAKASAM
Technical Manager

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Report No.	SARL/24/3117	Report Date.	30.03.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A3-SHENBAGANALLUR VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3117	Sample Received on	25.03.2024
Sample Collected by	LABORATORY	Test Commenced on	25.03.2024
Sample Collected on	21.03.2024	Test Completed on	30.03.2024
Temperature	32°C	Relative Humidity	44%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	51.0	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	24.4	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.6	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.0	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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Technical Manager

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TEST REPORT

Report No.	SARL/24/3118

Report Date.	30.03.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A4-THIRUMALAPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3118	Sample Received on	25.03.2024
Sample Collected by	LABORATORY	Test Commenced on	25.03.2024
Sample Collected on	21.03.2024	Test Completed on	30.03.2024
Temperature	32°C	Relative Humidity	44%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	39.9	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	19.4	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.6	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.6	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/24/3119

Report Date.	30.03.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A3-SHENBAGANALLUR VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3119	Sample Received on	25.03.2024
Sample Collected by	LABORATORY	Test Commenced on	25.03.2024
Sample Collected on	22.03.2024	Test Completed on	30.03.2024
Temperature	35°C	Relative Humidity	30%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	44.4	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	21.3	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.3	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.3	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/24/3120

Report Date.	30.03.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A4-THIRUMALAPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3120	Sample Received on	25.03.2024
Sample Collected by	LABORATORY	Test Commenced on	25.03.2024
Sample Collected on	22.03.2024	Test Completed on	30.03.2024
Temperature	35°C	Relative Humidity	30%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	42.8	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	20.3	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.0	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.2	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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TEST REPORT

Report No.	SARL/24/3121

Report Date.	30.03.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A5- CHIDAMBARAPERI VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3121	Sample Received on	25.03.2024
Sample Collected by	LABORATORY	Test Commenced on	25.03.2024
Sample Collected on	23.03.2024	Test Completed on	30.03.2024
Temperature	36°C	Relative Humidity	29%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	49.2	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	23.5	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.8	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.5	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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J. GNANAPRAKASAM
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TEST REPORT

Report No.	SARL/24/3122

Report Date.	30.03.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A6-PERIYASAMYPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3122	Sample Received on	25.03.2024
Sample Collected by	LABORATORY	Test Commenced on	25.03.2024
Sample Collected on	23.03.2024	Test Completed on	30.03.2024
Temperature	36°C	Relative Humidity	29%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	47.9	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	23.3	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.5	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.9	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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J. GNANAPRAKASAM
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TEST REPORT

Report No.	SARL/24/3123	Report Date.	30.03.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A5- CHIDAMBARAPERI VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3123	Sample Received on	25.03.2024
Sample Collected by	LABORATORY	Test Commenced on	25.03.2024
Sample Collected on	24.03.2024	Test Completed on	30.03.2024
Temperature	37°C	Relative Humidity	24%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	44.4	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	21.3	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.0	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.5	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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TEST REPORT

Report No.	SARL/24/3124

Report Date.	30.03.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A6-PERIYASAMYPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3124	Sample Received on	25.03.2024
Sample Collected by	LABORATORY	Test Commenced on	25.03.2024
Sample Collected on	24.03.2024	Test Completed on	30.03.2024
Temperature	37°C	Relative Humidity	24%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	41.9	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	20.2	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.0	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.0	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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For Shrient Analytical and Research Labs Pvt. Ltd

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Shrient Analytical & Research Labs Pvt. Ltd. Chennai - 45.

Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/24/3149

Report Date.	06.04.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A5- CHIDAMBARAPERI VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3149	Sample Received on	01.04.2024
Sample Collected by	LABORATORY	Test Commenced on	01.04.2024
Sample Collected on	26.03.2024	Test Completed on	06.04.2024
Temperature	37°C	Relative Humidity	22%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	44.0	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	20.1	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.6	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.1	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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Technical Manager

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TEST REPORT

Report No.	SARL/24/3150

Report Date.	06.04.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A6-PERIYASAMYPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3150	Sample Received on	01.04.2024
Sample Collected by	LABORATORY	Test Commenced on	01.04.2024
Sample Collected on	26.03.2024	Test Completed on	06.04.2024
Temperature	37°C	Relative Humidity	22%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	52.3	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	24.1	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.6	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.4	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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J. GNANAPRAKASAM
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TEST REPORT

Report No.	SARL/24/3151

Report Date.	06.04.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A5- CHIDAMBARAPERI VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3151	Sample Received on	01.04.2024
Sample Collected by	LABORATORY	Test Commenced on	01.04.2024
Sample Collected on	27.03.2024	Test Completed on	06.04.2024
Temperature	37°C	Relative Humidity	22%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	46.8	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	21.3	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.9	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.4	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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TEST REPORT

Report No.	SARL/24/3152

Report Date.	06.04.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A6-PERIYASAMYPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3152	Sample Received on	01.04.2024
Sample Collected by	LABORATORY	Test Commenced on	01.04.2024
Sample Collected on	27.03.2024	Test Completed on	06.04.2024
Temperature	37°C	Relative Humidity	22%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	56.0	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	25.9	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.0	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.7	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/24/3153

Report Date.	06.04.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A3-SHENBAGANALLUR VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3153	Sample Received on	01.04.2024
Sample Collected by	LABORATORY	Test Commenced on	01.04.2024
Sample Collected on	28.03.2024	Test Completed on	06.04.2024
Temperature	38°C	Relative Humidity	22%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	44.1	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	20.1	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	3.7	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	6.8	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/24/3154

Report Date.	06.04.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A4-THIRUMALAPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3154	Sample Received on	01.04.2024
Sample Collected by	LABORATORY	Test Commenced on	01.04.2024
Sample Collected on	28.03.2024	Test Completed on	06.04.2024
Temperature	38°C	Relative Humidity	22%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	40.6	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	18.8	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.1	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.3	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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TEST REPORT

Report No.	SARL/24/3155

Report Date.	06.04.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A3-SHENBAGANALLUR VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3155	Sample Received on	01.04.2024
Sample Collected by	LABORATORY	Test Commenced on	01.04.2024
Sample Collected on	29.03.2024	Test Completed on	06.04.2024
Temperature	37°C	Relative Humidity	24%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	48.0	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	21.9	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.4	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.4	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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J. GNANAPRAKASAM
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TEST REPORT

Report No.	SARL/24/3156

Report Date.	06.04.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A4-THIRUMALAPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3156	Sample Received on	01.04.2024
Sample Collected by	LABORATORY	Test Commenced on	01.04.2024
Sample Collected on	29.03.2024	Test Completed on	06.04.2024
Temperature	37°C	Relative Humidity	24%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	43.2	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	19.9	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.7	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.8	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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TEST REPORT

Report No.	SARL/24/3157

Report Date.	06.04.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A1-WITHIN MINE LEASE AREA
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3157	Sample Received on	01.04.2024
Sample Collected by	LABORATORY	Test Commenced on	01.04.2024
Sample Collected on	30.03.2024	Test Completed on	06.04.2024
Temperature	37°C	Relative Humidity	24%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	60.2	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	28.6	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.6	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.1	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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For Shrient Analytical and Research Labs Pvt. Ltd

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Shrient Analytical & Research Labs Pvt. Ltd. Chennai - 45.

Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/24/3158

Report Date.	06.04.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A2-SUNDERASAPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3158	Sample Received on	01.04.2024
Sample Collected by	LABORATORY	Test Commenced on	01.04.2024
Sample Collected on	30.03.2024	Test Completed on	06.04.2024
Temperature	37°C	Relative Humidity	24%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	46.8	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	21.6	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.6	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.9	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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For Shrient Analytical and Research Labs Pvt. Ltd

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TEST REPORT

Report No.	SARL/24/3159

Report Date.	06.04.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A1-WITHIN MINE LEASE AREA
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3159	Sample Received on	01.04.2024
Sample Collected by	LABORATORY	Test Commenced on	01.04.2024
Sample Collected on	31.03.2024	Test Completed on	06.04.2024
Temperature	37°C	Relative Humidity	17%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	69.1	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	32.8	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	6.4	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	10.4	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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TEST REPORT

Report No.	SARL/24/3160

Report Date.	06.04.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A2-SUNDERASAPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3160	Sample Received on	01.04.2024
Sample Collected by	LABORATORY	Test Commenced on	01.04.2024
Sample Collected on	31.03.2024	Test Completed on	06.04.2024
Temperature	37°C	Relative Humidity	17%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	57.7	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	26.5	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	6.2	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.6	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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For Shrient Analytical and Research Labs Pvt. Ltd

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TEST REPORT

Report No.	SARL/24/3185

Report Date.	13.04.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A1-WITHIN MINE LEASE AREA
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3185	Sample Received on	08.04.2024
Sample Collected by	LABORATORY	Test Commenced on	08.04.2024
Sample Collected on	02.04.2024	Test Completed on	13.04.2024
Temperature	39°C	Relative Humidity	19%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	47.2	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	22.5	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.4	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.8	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/24/3186

Report Date.	13.04.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A2-SUNDERASAPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3186	Sample Received on	08.04.2024
Sample Collected by	LABORATORY	Test Commenced on	08.04.2024
Sample Collected on	02.04.2024	Test Completed on	13.04.2024
Temperature	39°C	Relative Humidity	19%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	41.8	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	19.3	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.8	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.2	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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For Shrient Analytical and Research Labs Pvt. Ltd

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Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/24/3187

Report Date.	13.04.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A1-WITHIN MINE LEASE AREA
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3187	Sample Received on	08.04.2024
Sample Collected by	LABORATORY	Test Commenced on	08.04.2024
Sample Collected on	03.04.2024	Test Completed on	13.04.2024
Temperature	39°C	Relative Humidity	23%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	52.8	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	25.1	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.1	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.5	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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For Shrient Analytical and Research Labs Pvt. Ltd

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J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/24/3188

Report Date.	13.04.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A2-SUNDERASAPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3188	Sample Received on	08.04.2024
Sample Collected by	LABORATORY	Test Commenced on	08.04.2024
Sample Collected on	03.04.2024	Test Completed on	13.04.2024
Temperature	39°C	Relative Humidity	23%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	45.1	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	20.9	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.6	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.6	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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For Shrient Analytical and Research Labs Pvt. Ltd

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Authorized Signatory
J. GNANAPRAKASAM
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TEST REPORT

Report No.	SARL/24/3189

Report Date.	13.04.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A3-SHENBAGANALLUR VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3189	Sample Received on	08.04.2024
Sample Collected by	LABORATORY	Test Commenced on	08.04.2024
Sample Collected on	04.04.2024	Test Completed on	13.04.2024
Temperature	39°C	Relative Humidity	24%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	55.2	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	25.2	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.8	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.4	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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For Shrient Analytical and Research Labs Pvt. Ltd

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J. GNANAPRAKASAM
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TEST REPORT

Report No.	SARL/24/3190

Report Date.	13.04.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A4-THIRUMALAPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3190	Sample Received on	08.04.2024
Sample Collected by	LABORATORY	Test Commenced on	08.04.2024
Sample Collected on	04.04.2024	Test Completed on	13.04.2024
Temperature	39°C	Relative Humidity	24%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	41.9	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	19.4	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.4	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.5	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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For Shrient Analytical and Research Labs Pvt. Ltd

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Shrient Analytical & Research Labs Pvt. Ltd. Chennai - 45.

Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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Please Contact:
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TEST REPORT

Report No.	SARL/24/3191

Report Date.	13.04.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A3-SHENBAGANALLUR VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3191	Sample Received on	08.04.2024
Sample Collected by	LABORATORY	Test Commenced on	08.04.2024
Sample Collected on	05.04.2024	Test Completed on	13.04.2024
Temperature	40°C	Relative Humidity	17%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	51.8	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	23.6	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.3	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.1	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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For Shrient Analytical and Research Labs Pvt. Ltd

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Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/24/3192

Report Date.	13.04.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A4-THIRUMALAPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3192	Sample Received on	08.04.2024
Sample Collected by	LABORATORY	Test Commenced on	08.04.2024
Sample Collected on	05.04.2024	Test Completed on	13.04.2024
Temperature	40°C	Relative Humidity	17%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	43.6	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	20.2	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.0	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.9	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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TEST REPORT

Report No.	SARL/24/3193

Report Date.	13.04.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A5- CHIDAMBARAPERI VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3193	Sample Received on	08.04.2024
Sample Collected by	LABORATORY	Test Commenced on	08.04.2024
Sample Collected on	06.04.2024	Test Completed on	13.04.2024
Temperature	40°C	Relative Humidity	17%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	46.0	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	21.0	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.8	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.4	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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TEST REPORT

Report No.	SARL/24/3194

Report Date.	13.04.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A6-PERIYASAMYPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3194	Sample Received on	08.04.2024
Sample Collected by	LABORATORY	Test Commenced on	08.04.2024
Sample Collected on	06.04.2024	Test Completed on	13.04.2024
Temperature	40°C	Relative Humidity	17%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	50.1	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	23.0	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.4	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.7	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/24/3195

Report Date.	13.04.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A5- CHIDAMBARAPERI VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3195	Sample Received on	08.04.2024
Sample Collected by	LABORATORY	Test Commenced on	08.04.2024
Sample Collected on	07.04.2024	Test Completed on	13.04.2024
Temperature	39°C	Relative Humidity	21%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	50.3	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	22.9	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.8	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.0	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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For Shrient Analytical and Research Labs Pvt. Ltd

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J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/24/3196

Report Date.	13.04.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A6-PERIYASAMYPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3196	Sample Received on	11.03.2024
Sample Collected by	LABORATORY	Test Commenced on	11.03.2024
Sample Collected on	07.04.2024	Test Completed on	16.03.2024
Temperature	39°C	Relative Humidity	21%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	45.4	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	20.5	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	3.9	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.1	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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For Shrient Analytical and Research Labs Pvt. Ltd

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Shrient Analytical & Research Labs Pvt. Ltd. Chennai - 45.

Authorized Signatory
J. GNANAPRAKASAM
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TEST REPORT

Report No.	SARL/24/3221

Report Date.	20.04.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A5- CHIDAMBARAPERI VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3221	Sample Received on	15.04.2024
Sample Collected by	LABORATORY	Test Commenced on	15.04.2024
Sample Collected on	09.04.2024	Test Completed on	20.04.2024
Temperature	37°C	Relative Humidity	28%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	41.1	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	18.8	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.2	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.5	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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TEST REPORT

Report No.	SARL/24/3222

Report Date.	20.04.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A6-PERIYASAMYPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3222	Sample Received on	15.04.2024
Sample Collected by	LABORATORY	Test Commenced on	15.04.2024
Sample Collected on	09.04.2024	Test Completed on	20.04.2024
Temperature	37°C	Relative Humidity	28%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	58.7	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	26.8	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.2	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	10.1	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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For Shrient Analytical and Research Labs Pvt. Ltd

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TEST REPORT

Report No.	SARL/24/3223

Report Date.	20.04.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A5- CHIDAMBARAPERI VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3223	Sample Received on	15.04.2024
Sample Collected by	LABORATORY	Test Commenced on	15.04.2024
Sample Collected on	10.04.2024	Test Completed on	20.04.2024
Temperature	37°C	Relative Humidity	26%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	41.3	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	20.5	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.8	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.1	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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For Shrient Analytical and Research Labs Pvt. Ltd

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Shrient Analytical & Research Labs Pvt. Ltd. Chennai - 45.

Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/24/3224

Report Date.	20.04.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A6-PERIYASAMYPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3224	Sample Received on	15.04.2024
Sample Collected by	LABORATORY	Test Commenced on	15.04.2024
Sample Collected on	10.04.2024	Test Completed on	20.04.2024
Temperature	37°C	Relative Humidity	36%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	51.4	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	25.4	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.6	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.5	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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Authorized Signatory
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TEST REPORT

Report No.	SARL/24/3225

Report Date.	20.04.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A3-SHENBAGANALLUR VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3225	Sample Received on	15.04.2024
Sample Collected by	LABORATORY	Test Commenced on	15.04.2024
Sample Collected on	11.04.2024	Test Completed on	20.04.2024
Temperature	37°C	Relative Humidity	26%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	45.7	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	20.8	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.1	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	6.9	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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Authorized Signatory
J. GNANAPRAKASAM
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TEST REPORT

Report No.	SARL/24/3226

Report Date.	20.04.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A4-THIRUMALAPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3226	Sample Received on	15.04.2024
Sample Collected by	LABORATORY	Test Commenced on	15.04.2024
Sample Collected on	11.04.2024	Test Completed on	20.04.2024
Temperature	37°C	Relative Humidity	26%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	50.9	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	23.5	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	6.6	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	11.0	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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Technical Manager

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TEST REPORT

Report No.	SARL/24/3227

Report Date.	20.04.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A3-SHENBAGANALLUR VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3227	Sample Received on	15.04.2024
Sample Collected by	LABORATORY	Test Commenced on	15.04.2024
Sample Collected on	12.04.2024	Test Completed on	20.04.2024
Temperature	38°C	Relative Humidity	30%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	43.5	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	21.5	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.4	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.2	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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Technical Manager

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TEST REPORT

Report No.	SARL/24/3228

Report Date.	20.04.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A4-THIRUMALAPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3228	Sample Received on	15.04.2024
Sample Collected by	LABORATORY	Test Commenced on	15.04.2024
Sample Collected on	12.04.2024	Test Completed on	20.04.2024
Temperature	38°C	Relative Humidity	30%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	42.8	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	21.5	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.8	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.2	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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For Shrient Analytical and Research Labs Pvt. Ltd

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Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/24/3229

Report Date.	20.04.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A1-WITHIN MINE LEASE AREA
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3229	Sample Received on	15.04.2024
Sample Collected by	LABORATORY	Test Commenced on	15.04.2024
Sample Collected on	13.04.2024	Test Completed on	20.04.2024
Temperature	37°C	Relative Humidity	28%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	58.4	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	27.7	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.6	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.8	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/24/3230

Report Date.	20.04.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A2-SUNDERASAPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3230	Sample Received on	15.04.2024
Sample Collected by	LABORATORY	Test Commenced on	15.04.2024
Sample Collected on	13.04.2024	Test Completed on	20.04.2024
Temperature	37°C	Relative Humidity	28%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	59.6	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	27.4	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	6.4	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	10.0	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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J. GNANAPRAKASAM
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TEST REPORT

Report No.	SARL/24/3231

Report Date.	20.04.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A1-WITHIN MINE LEASE AREA
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3231	Sample Received on	15.04.2024
Sample Collected by	LABORATORY	Test Commenced on	15.04.2024
Sample Collected on	14.04.2024	Test Completed on	20.04.2024
Temperature	37°C	Relative Humidity	29%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	59.3	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	29.9	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	6.0	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.2	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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For Shrient Analytical and Research Labs Pvt. Ltd

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Authorized Signatory
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Technical Manager

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TEST REPORT

Report No.	SARL/24/3232

Report Date.	20.04.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A2-SUNDERASAPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3232	Sample Received on	15.04.2024
Sample Collected by	LABORATORY	Test Commenced on	15.04.2024
Sample Collected on	14.04.2024	Test Completed on	20.04.2024
Temperature	37°C	Relative Humidity	29%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	51.9	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	25.5	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.9	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.0	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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For Shrient Analytical and Research Labs Pvt. Ltd

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Shrient Analytical & Research Labs Pvt. Ltd. Chennai - 45.

Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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Please Contact:
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TEST REPORT

Report No.	SARL/24/3257

Report Date.	27.04.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A1-WITHIN MINE LEASE AREA
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3257	Sample Received on	22.04.2024
Sample Collected by	LABORATORY	Test Commenced on	22.04.2024
Sample Collected on	16.04.2024	Test Completed on	27.04.2024
Temperature	38°C	Relative Humidity	22%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	48.5	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	23.0	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.7	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.9	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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Authorized Signatory
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Technical Manager

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TEST REPORT

Report No.	SARL/24/3258

Report Date.	27.04.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A2-SUNDERASAPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3258	Sample Received on	22.04.2024
Sample Collected by	LABORATORY	Test Commenced on	22.04.2024
Sample Collected on	16.04.2024	Test Completed on	27.04.2024
Temperature	38°C	Relative Humidity	22%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	44.4	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	20.4	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.5	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.5	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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For Shrient Analytical and Research Labs Pvt. Ltd

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Shrient Analytical & Research Labs Pvt. Ltd. Chennai - 45.

Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/24/3259

Report Date.	27.04.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A1-WITHIN MINE LEASE AREA
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3259	Sample Received on	22.04.2024
Sample Collected by	LABORATORY	Test Commenced on	22.04.2024
Sample Collected on	17.04.2024	Test Completed on	27.04.2024
Temperature	39°C	Relative Humidity	23%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	53.9	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	25.6	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.2	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.4	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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TEST REPORT

Report No.	SARL/24/3260

Report Date.	27.04.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A2-SUNDERASAPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3260	Sample Received on	22.04.2024
Sample Collected by	LABORATORY	Test Commenced on	22.04.2024
Sample Collected on	17.04.2024	Test Completed on	27.04.2024
Temperature	39°C	Relative Humidity	23%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	51.0	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	23.5	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.3	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.4	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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Technical Manager

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TEST REPORT

Report No.	SARL/24/3261

Report Date.	27.04.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A3-SHENBAGANALLUR VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3261	Sample Received on	22.04.2024
Sample Collected by	LABORATORY	Test Commenced on	22.04.2024
Sample Collected on	18.04.2024	Test Completed on	27.04.2024
Temperature	40°C	Relative Humidity	28%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	48.7	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	22.1	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.7	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.5	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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TEST REPORT

Report No.	SARL/24/3262

Report Date.	27.04.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A4-THIRUMALAPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3262	Sample Received on	22.04.2024
Sample Collected by	LABORATORY	Test Commenced on	22.04.2024
Sample Collected on	18.04.2024	Test Completed on	27.04.2024
Temperature	40°C	Relative Humidity	28%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	45.3	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	20.9	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.4	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.6	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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For Shrient Analytical and Research Labs Pvt. Ltd

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TEST REPORT

Report No.	SARL/24/3263

Report Date.	27.04.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A3-SHENBAGANALLUR VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3263	Sample Received on	22.04.2024
Sample Collected by	LABORATORY	Test Commenced on	22.04.2024
Sample Collected on	19.04.2024	Test Completed on	27.04.2024
Temperature	40°C	Relative Humidity	26%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	45.3	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	20.6	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.5	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	6.8	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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TEST REPORT

Report No.	SARL/24/3264

Report Date.	27.04.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A4-THIRUMALAPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3264	Sample Received on	22.04.2024
Sample Collected by	LABORATORY	Test Commenced on	22.04.2024
Sample Collected on	19.04.2024	Test Completed on	27.04.2024
Temperature	40°C	Relative Humidity	26%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	47.6	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	22.0	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	6.1	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.8	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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TEST REPORT

Report No.	SARL/24/3265

Report Date.	27.04.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A5- CHIDAMBARAPERI VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3265	Sample Received on	22.04.2024
Sample Collected by	LABORATORY	Test Commenced on	22.04.2024
Sample Collected on	20.04.2024	Test Completed on	27.04.2024
Temperature	40°C	Relative Humidity	24%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	53.4	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	24.3	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	6.2	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.9	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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For Shrient Analytical and Research Labs Pvt. Ltd

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Shrient Analytical & Research Labs Pvt. Ltd. Chennai - 45.

Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/24/3266

Report Date.	27.04.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A6-PERIYASAMYPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3266	Sample Received on	22.04.2024
Sample Collected by	LABORATORY	Test Commenced on	22.04.2024
Sample Collected on	20.04.2024	Test Completed on	27.04.2024
Temperature	40°C	Relative Humidity	24%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	46.1	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	20.7	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.1	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.1	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/24/3267

Report Date.	27.04.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A5- CHIDAMBARAPERI VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3267	Sample Received on	22.04.2024
Sample Collected by	LABORATORY	Test Commenced on	22.04.2024
Sample Collected on	21.04.2024	Test Completed on	27.04.2024
Temperature	40°C	Relative Humidity	21%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	42.5	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	19.4	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.4	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.7	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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TEST REPORT

Report No.	SARL/24/3268

Report Date.	27.04.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A6-PERIYASAMYPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3268	Sample Received on	22.04.2024
Sample Collected by	LABORATORY	Test Commenced on	22.04.2024
Sample Collected on	21.04.2024	Test Completed on	27.04.2024
Temperature	40°C	Relative Humidity	21%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	48.4	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	22.1	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.2	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.6	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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J. GNANAPRAKASAM
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TEST REPORT

Report No.	SARL/24/3293

Report Date.	04.05.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A5- CHIDAMBARAPERI VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3293	Sample Received on	29.04.2024
Sample Collected by	LABORATORY	Test Commenced on	29.04.2024
Sample Collected on	23.04.2024	Test Completed on	04.05.2024
Temperature	39°C	Relative Humidity	19%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	51.4	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	24.8	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	6.4	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	10.9	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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Authorized Signatory
J. GNANAPRAKASAM
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TEST REPORT

Report No.	SARL/24/3294

Report Date.	04.05.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A6-PERIYASAMYPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3294	Sample Received on	29.04.2024
Sample Collected by	LABORATORY	Test Commenced on	29.04.2024
Sample Collected on	23.04.2024	Test Completed on	04.05.2024
Temperature	39°C	Relative Humidity	19%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	51.3	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	25.3	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.6	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.6	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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J. GNANAPRAKASAM
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TEST REPORT

Report No.	SARL/24/3295

Report Date.	04.05.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A5- CHIDAMBARAPERI VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3295	Sample Received on	29.04.2024
Sample Collected by	LABORATORY	Test Commenced on	29.04.2024
Sample Collected on	24.04.2024	Test Completed on	04.05.2024
Temperature	39°C	Relative Humidity	20%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	46.5	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	22.6	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.4	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.9	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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TEST REPORT

Report No.	SARL/24/3296

Report Date.	04.05.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A6-PERIYASAMYPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3296	Sample Received on	29.04.2024
Sample Collected by	LABORATORY	Test Commenced on	29.04.2024
Sample Collected on	24.04.2024	Test Completed on	04.05.2024
Temperature	39°C	Relative Humidity	20%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	54.7	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	26.6	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.3	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.9	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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TEST REPORT

Report No.	SARL/24/3297

Report Date.	04.05.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A3-SHENBAGANALLUR VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3297	Sample Received on	29.04.2024
Sample Collected by	LABORATORY	Test Commenced on	29.04.2024
Sample Collected on	25.04.2024	Test Completed on	04.05.2024
Temperature	39°C	Relative Humidity	29%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	43.1	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	21.0	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.2	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.0	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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TEST REPORT

Report No.	SARL/24/3298

Report Date.	04.05.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A4-THIRUMALAPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3298	Sample Received on	29.04.2024
Sample Collected by	LABORATORY	Test Commenced on	29.04.2024
Sample Collected on	25.04.2024	Test Completed on	04.05.2024
Temperature	39°C	Relative Humidity	23%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	38.1	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	19.0	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.4	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.4	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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For Shrient Analytical and Research Labs Pvt. Ltd

Verified

Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/24/3299

Report Date.	04.05.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A3-SHENBAGANALLUR VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3299	Sample Received on	29.04.2024
Sample Collected by	LABORATORY	Test Commenced on	29.04.2024
Sample Collected on	26.04.2024	Test Completed on	04.05.2024
Temperature	39°C	Relative Humidity	20%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	46.3	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	22.5	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.7	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.7	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/24/3300

Report Date.	04.05.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A4-THIRUMALAPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3300	Sample Received on	29.04.2024
Sample Collected by	LABORATORY	Test Commenced on	29.04.2024
Sample Collected on	26.04.2024	Test Completed on	04.05.2024
Temperature	39°C	Relative Humidity	20%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	42.3	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	21.0	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.3	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.8	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/24/3301

Report Date.	04.05.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A1-WITHIN MINE LEASE AREA
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3301	Sample Received on	29.04.2024
Sample Collected by	LABORATORY	Test Commenced on	29.04.2024
Sample Collected on	27.04.2024	Test Completed on	04.05.2024
Temperature	40°C	Relative Humidity	19%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	68.2	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	33.9	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	6.9	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	11.5	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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TEST REPORT

Report No.	SARL/24/3302

Report Date.	04.05.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A2-SUNDERASAPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3302	Sample Received on	29.04.2024
Sample Collected by	LABORATORY	Test Commenced on	29.04.2024
Sample Collected on	27.04.2024	Test Completed on	04.05.2024
Temperature	40°C	Relative Humidity	19%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	39.9	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	20.0	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.3	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.4	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/24/3303

Report Date.	04.05.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A1-WITHIN MINE LEASE AREA
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3303	Sample Received on	29.04.2024
Sample Collected by	LABORATORY	Test Commenced on	29.04.2024
Sample Collected on	28.04.2024	Test Completed on	04.05.2024
Temperature	40°C	Relative Humidity	21%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	64.9	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	32.3	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	6.3	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	10.2	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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For Shrient Analytical and Research Labs Pvt. Ltd

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Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/24/3304

Report Date.	04.05.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A2-SUNDERASAPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3304	Sample Received on	29.04.2024
Sample Collected by	LABORATORY	Test Commenced on	29.04.2024
Sample Collected on	28.04.2024	Test Completed on	04.05.2024
Temperature	40°C	Relative Humidity	21%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	45.0	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	22.1	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.8	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.0	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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For Shrient Analytical and Research Labs Pvt. Ltd

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Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/24/3329

Report Date.	11.05.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A1-WITHIN MINE LEASE AREA
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3329	Sample Received on	06.05.2024
Sample Collected by	LABORATORY	Test Commenced on	06.05.2024
Sample Collected on	30.04.2024	Test Completed on	11.05.2024
Temperature	40°C	Relative Humidity	21%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	59.1	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	28.1	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.6	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.9	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/24/3330

Report Date.	11.05.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A2-SUNDERASAPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3330	Sample Received on	06.05.2024
Sample Collected by	LABORATORY	Test Commenced on	06.05.2024
Sample Collected on	30.04.2024	Test Completed on	11.05.2024
Temperature	40°C	Relative Humidity	21%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	60.0	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	27.8	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	6.3	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	10.4	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/24/3331

Report Date.	11.05.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A1-WITHIN MINE LEASE AREA
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3331	Sample Received on	06.05.2024
Sample Collected by	LABORATORY	Test Commenced on	06.05.2024
Sample Collected on	01.05.2024	Test Completed on	11.05.2024
Temperature	42°C	Relative Humidity	21%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	66.7	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	31.7	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	6.2	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.9	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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For Shrient Analytical and Research Labs Pvt. Ltd

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Shrient Analytical & Research Labs Pvt. Ltd. Chennai - 45.

Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/24/3332

Report Date.	11.05.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A2-SUNDERASAPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3332	Sample Received on	06.05.2024
Sample Collected by	LABORATORY	Test Commenced on	06.05.2024
Sample Collected on	01.05.2024	Test Completed on	11.05.2024
Temperature	42°C	Relative Humidity	21%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	56.7	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	26.1	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.9	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.3	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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Technical Manager

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TEST REPORT

Report No.	SARL/24/3333

Report Date.	11.05.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A3-SHENBAGANALLUR VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3333	Sample Received on	06.05.2024
Sample Collected by	LABORATORY	Test Commenced on	06.05.2024
Sample Collected on	02.05.2024	Test Completed on	11.05.2024
Temperature	42°C	Relative Humidity	22%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	55.8	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	25.5	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	6.1	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.8	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/24/3334	Report Date.	11.05.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A4-THIRUMALAPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3334	Sample Received on	06.05.2024
Sample Collected by	LABORATORY	Test Commenced on	06.05.2024
Sample Collected on	02.05.2024	Test Completed on	11.05.2024
Temperature	42°C	Relative Humidity	22%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	48.5	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	22.5	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	6.1	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	10.4	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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TEST REPORT

Report No.	SARL/24/3335

Report Date.	11.05.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A3-SHENBAGANALLUR VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3335	Sample Received on	06.05.2024
Sample Collected by	LABORATORY	Test Commenced on	06.05.2024
Sample Collected on	03.05.2024	Test Completed on	11.05.2024
Temperature	42°C	Relative Humidity	21%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	52.1	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	23.7	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.3	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.3	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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Technical Manager

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TEST REPORT

Report No.	SARL/24/3336

Report Date.	11.05.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A4-THIRUMALAPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3336	Sample Received on	06.05.2024
Sample Collected by	LABORATORY	Test Commenced on	06.05.2024
Sample Collected on	03.05.2024	Test Completed on	11.05.2024
Temperature	42°C	Relative Humidity	21%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	46.8	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	21.6	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.7	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.5	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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TEST REPORT

Report No.	SARL/24/3337

Report Date.	11.05.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A5- CHIDAMBARAPERI VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3337	Sample Received on	06.05.2024
Sample Collected by	LABORATORY	Test Commenced on	06.05.2024
Sample Collected on	04.05.2024	Test Completed on	11.05.2024
Temperature	40°C	Relative Humidity	28%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	41.6	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	19.0	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.1	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.6	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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TEST REPORT

Report No.	SARL/24/3338

Report Date.	11.05.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A6-PERIYASAMYPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3338	Sample Received on	06.05.2024
Sample Collected by	LABORATORY	Test Commenced on	06.05.2024
Sample Collected on	04.05.2024	Test Completed on	11.05.2024
Temperature	40°C	Relative Humidity	28%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	48.7	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	22.2	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.4	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.7	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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TEST REPORT

Report No.	SARL/24/3339

Report Date.	11.05.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A5- CHIDAMBARAPERI VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3339	Sample Received on	06.05.2024
Sample Collected by	LABORATORY	Test Commenced on	06.05.2024
Sample Collected on	05.05.2024	Test Completed on	11.05.2024
Temperature	42°C	Relative Humidity	23%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	48.1	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	21.9	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.2	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.6	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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TEST REPORT

Report No.	SARL/24/3340

Report Date.	11.05.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A6-PERIYASAMYPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3340	Sample Received on	06.05.2024
Sample Collected by	LABORATORY	Test Commenced on	06.05.2024
Sample Collected on	05.05.2024	Test Completed on	11.05.2024
Temperature	42°C	Relative Humidity	23%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	46.2	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	21.2	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.1	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.3	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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For Shrient Analytical and Research Labs Pvt. Ltd

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Shrient Analytical & Research Labs Pvt. Ltd. Chennai - 45

Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/24/3365

Report Date.	18.05.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A5- CHIDAMBARAPERI VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3365	Sample Received on	13.05.2024
Sample Collected by	LABORATORY	Test Commenced on	13.05.2024
Sample Collected on	07.05.2024	Test Completed on	18.05.2024
Temperature	40°C	Relative Humidity	26%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	51.0	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	23.3	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.7	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.4	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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Technical Manager

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TEST REPORT

Report No.	SARL/24/3366

Report Date.	18.05.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A6-PERIYASAMYPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3366	Sample Received on	13.05.2024
Sample Collected by	LABORATORY	Test Commenced on	13.05.2024
Sample Collected on	07.05.2024	Test Completed on	18.05.2024
Temperature	40°C	Relative Humidity	26%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	55.1	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	25.5	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.9	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.8	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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J. GNANAPRAKASAM
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TEST REPORT

Report No.	SARL/24/3367

Report Date.	18.05.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A5- CHIDAMBARAPERI VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3367	Sample Received on	13.05.2024
Sample Collected by	LABORATORY	Test Commenced on	13.05.2024
Sample Collected on	08.05.2024	Test Completed on	18.05.2024
Temperature	24°C	Relative Humidity	87%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	53.4	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	24.3	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	6.1	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	10.5	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/24/3368

Report Date.	18.05.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A6-PERIYASAMYPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3368	Sample Received on	13.05.2024
Sample Collected by	LABORATORY	Test Commenced on	13.05.2024
Sample Collected on	08.05.2024	Test Completed on	18.05.2024
Temperature	24°C	Relative Humidity	87%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	51.4	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	23.7	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.6	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.9	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/24/3369

Report Date.	18.05.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A3-SHENBAGANALLUR VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3369	Sample Received on	13.05.2024
Sample Collected by	LABORATORY	Test Commenced on	13.05.2024
Sample Collected on	09.05.2024	Test Completed on	18.05.2024
Temperature	39°C	Relative Humidity	33%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	50.1	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	22.8	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.9	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.9	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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For Shrient Analytical and Research Labs Pvt. Ltd

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Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/24/3370

Report Date.	18.05.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A4-THIRUMALAPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3370	Sample Received on	13.05.2024
Sample Collected by	LABORATORY	Test Commenced on	13.05.2024
Sample Collected on	09.05.2024	Test Completed on	18.05.2024
Temperature	39°C	Relative Humidity	33%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	45.5	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	21.1	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.4	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.0	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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For Shrient Analytical and Research Labs Pvt. Ltd

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Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/24/3371

Report Date.	18.05.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A3-SHENBAGANALLUR VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3371	Sample Received on	13.05.2024
Sample Collected by	LABORATORY	Test Commenced on	13.05.2024
Sample Collected on	10.05.2024	Test Completed on	18.05.2024
Temperature	38°C	Relative Humidity	31%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	52.5	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	23.9	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.4	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.6	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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For Shrient Analytical and Research Labs Pvt. Ltd

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Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/24/3372

Report Date.	18.05.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A4-THIRUMALAPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3372	Sample Received on	13.05.2024
Sample Collected by	LABORATORY	Test Commenced on	13.05.2024
Sample Collected on	10.05.2024	Test Completed on	18.05.2024
Temperature	38°C	Relative Humidity	31%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	47.8	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	22.1	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	6.0	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	10.2	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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For Shrient Analytical and Research Labs Pvt. Ltd

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Authorized Signatory
J. GNANAPRAKASAM
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TEST REPORT

Report No.	SARL/24/3373

Report Date.	18.05.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A1-WITHIN MINE LEASE AREA
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3373	Sample Received on	13.05.2024
Sample Collected by	LABORATORY	Test Commenced on	13.05.2024
Sample Collected on	11.05.2024	Test Completed on	18.05.2024
Temperature	37°C	Relative Humidity	35%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	50.1	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	23.8	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.7	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.1	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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For Shrient Analytical and Research Labs Pvt. Ltd

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Shrient Analytical & Research Labs Pvt. Ltd. Chennai - 45.

Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/24/3374

Report Date.	18.05.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A2-SUNDERASAPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3374	Sample Received on	13.05.2024
Sample Collected by	LABORATORY	Test Commenced on	13.05.2024
Sample Collected on	11.05.2024	Test Completed on	18.05.2024
Temperature	37°C	Relative Humidity	35%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	43.0	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	19.8	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.2	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.4	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/24/3375

Report Date.	18.05.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A1-WITHIN MINE LEASE AREA
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3375	Sample Received on	13.05.2024
Sample Collected by	LABORATORY	Test Commenced on	13.05.2024
Sample Collected on	12.05.2024	Test Completed on	18.05.2024
Temperature	38°C	Relative Humidity	32%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	55.5	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	26.3	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.2	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.6	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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Technical Manager

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TEST REPORT

Report No.	SARL/24/3376

Report Date.	18.05.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A2-SUNDERASAPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3376	Sample Received on	13.05.2024
Sample Collected by	LABORATORY	Test Commenced on	13.05.2024
Sample Collected on	12.05.2024	Test Completed on	18.05.2024
Temperature	38°C	Relative Humidity	32%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	46.9	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	21.6	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.7	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.9	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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J. GNANAPRAKASAM
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TEST REPORT

Report No.	SARL/24/3401

Report Date.	25.05.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A1-WITHIN MINE LEASE AREA
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3401	Sample Received on	20.05.2024
Sample Collected by	LABORATORY	Test Commenced on	20.05.2024
Sample Collected on	14.05.2024	Test Completed on	25.05.2024
Temperature	37°C	Relative Humidity	32%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	68.1	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	33.3	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	6.6	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	10.8	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/24/3402

Report Date.	25.05.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A2-SUNDERASAPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3402	Sample Received on	20.05.2024
Sample Collected by	LABORATORY	Test Commenced on	20.05.2024
Sample Collected on	14.05.2024	Test Completed on	25.05.2024
Temperature	37°C	Relative Humidity	32%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	53.1	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	25.4	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	6.1	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.8	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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For Shrient Analytical and Research Labs Pvt. Ltd

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Authorized Signatory
J. GNANAPRAKASAM
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TEST REPORT

Report No.	SARL/24/3403

Report Date.	25.05.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A1-WITHIN MINE LEASE AREA
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3403	Sample Received on	20.05.2024
Sample Collected by	LABORATORY	Test Commenced on	20.05.2024
Sample Collected on	15.05.2024	Test Completed on	25.05.2024
Temperature	36°C	Relative Humidity	34%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	63.1	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	29.9	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.9	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.4	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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J. GNANAPRAKASAM
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TEST REPORT

Report No.	SARL/24/3404

Report Date.	25.05.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A2-SUNDERASAPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3404	Sample Received on	20.05.2024
Sample Collected by	LABORATORY	Test Commenced on	20.05.2024
Sample Collected on	15.05.2024	Test Completed on	25.05.2024
Temperature	36°C	Relative Humidity	34%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	55.6	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	25.5	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.8	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.2	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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TEST REPORT

Report No.	SARL/24/3405

Report Date.	25.05.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A3-SHENBAGANALLUR VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3405	Sample Received on	20.05.2024
Sample Collected by	LABORATORY	Test Commenced on	20.05.2024
Sample Collected on	16.05.2024	Test Completed on	25.05.2024
Temperature	31°C	Relative Humidity	51%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	43.7	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	20.8	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.1	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.1	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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TEST REPORT

Report No.	SARL/24/3406

Report Date.	25.05.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A4-THIRUMALAPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3406	Sample Received on	20.05.2024
Sample Collected by	LABORATORY	Test Commenced on	20.05.2024
Sample Collected on	16.05.2024	Test Completed on	25.05.2024
Temperature	31°C	Relative Humidity	51%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	45.3	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	21.9	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.9	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	10.0	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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For Shrient Analytical and Research Labs Pvt. Ltd

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Shrient Analytical & Research Labs Pvt. Ltd. Chennai - 45.

Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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Please Contact:
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TEST REPORT

Report No.	SARL/24/3407

Report Date.	25.05.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A3-SHENBAGANALLUR VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3407	Sample Received on	20.05.2024
Sample Collected by	LABORATORY	Test Commenced on	20.05.2024
Sample Collected on	17.05.2024	Test Completed on	25.05.2024
Temperature	33°C	Relative Humidity	48%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	48.3	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	21.9	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.6	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.6	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/24/3408

Report Date.	25.05.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A4-THIRUMALAPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3408	Sample Received on	20.05.2024
Sample Collected by	LABORATORY	Test Commenced on	20.05.2024
Sample Collected on	17.05.2024	Test Completed on	25.05.2024
Temperature	33°C	Relative Humidity	48%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	42.1	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	19.4	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.6	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.7	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/24/3409

Report Date.	25.05.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A5- CHIDAMBARAPERI VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3409	Sample Received on	20.05.2024
Sample Collected by	LABORATORY	Test Commenced on	20.05.2024
Sample Collected on	18.05.2024	Test Completed on	25.05.2024
Temperature	35°C	Relative Humidity	41%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	41.4	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	19.8	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.4	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	7.9	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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TEST REPORT

Report No.	SARL/24/3410

Report Date.	25.05.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A6-PERIYASAMYPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3410	Sample Received on	20.05.2024
Sample Collected by	LABORATORY	Test Commenced on	20.05.2024
Sample Collected on	18.05.2024	Test Completed on	25.05.2024
Temperature	35°C	Relative Humidity	41%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	44.5	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	21.2	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.2	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.3	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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For Shrient Analytical and Research Labs Pvt. Ltd

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Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/24/3411

Report Date.	25.05.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A5- CHIDAMBARAPERI VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3411	Sample Received on	20.05.2024
Sample Collected by	LABORATORY	Test Commenced on	20.05.2024
Sample Collected on	19.05.2024	Test Completed on	25.05.2024
Temperature	36°C	Relative Humidity	41%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	52.2	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	23.7	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.9	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.7	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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For Shrient Analytical and Research Labs Pvt. Ltd

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TEST REPORT

Report No.	SARL/24/3412

Report Date.	25.05.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A6-PERIYASAMYPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3412	Sample Received on	20.05.2024
Sample Collected by	LABORATORY	Test Commenced on	20.05.2024
Sample Collected on	19.05.2024	Test Completed on	25.05.2024
Temperature	36°C	Relative Humidity	41%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	48.9	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	22.2	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.5	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.6	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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TEST REPORT

Report No.	SARL/24/3453

Report Date.	01.06.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A5- CHIDAMBARAPERI VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3453	Sample Received on	27.05.2024
Sample Collected by	LABORATORY	Test Commenced on	27.05.2024
Sample Collected on	21.05.2024	Test Completed on	01.06.2024
Temperature	36°C	Relative Humidity	40%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	48.7	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	22.0	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.3	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.8	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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TEST REPORT

Report No.	SARL/24/3454

Report Date.	01.06.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A6-PERIYASAMYPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3454	Sample Received on	27.05.2024
Sample Collected by	LABORATORY	Test Commenced on	27.05.2024
Sample Collected on	21.05.2024	Test Completed on	01.06.2024
Temperature	36°C	Relative Humidity	40%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	57.0	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	26.0	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.1	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	10.1	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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TEST REPORT

Report No.	SARL/24/3455

Report Date.	01.06.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A5- CHIDAMBARAPERI VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3455	Sample Received on	27.05.2024
Sample Collected by	LABORATORY	Test Commenced on	27.05.2024
Sample Collected on	22.05.2024	Test Completed on	01.06.2024
Temperature	35°C	Relative Humidity	43%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	49.9	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	22.7	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.6	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.1	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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For Shrient Analytical and Research Labs Pvt. Ltd

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Shrient Analytical & Research Labs Pvt. Ltd. Chennai - 45.

Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/24/3456

Report Date.	01.06.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A6-PERIYASAMYPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3456	Sample Received on	27.05.2024
Sample Collected by	LABORATORY	Test Commenced on	27.05.2024
Sample Collected on	22.05.2024	Test Completed on	01.06.2024
Temperature	35°C	Relative Humidity	43%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	52.8	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	24.3	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.7	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.4	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/24/3457

Report Date.	01.06.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A3-SHENBAGANALLUR VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3457	Sample Received on	27.05.2024
Sample Collected by	LABORATORY	Test Commenced on	27.05.2024
Sample Collected on	23.05.2024	Test Completed on	01.06.2024
Temperature	34°C	Relative Humidity	50%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	54.9	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	24.8	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.9	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.6	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/24/3458

Report Date.	01.06.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A4-THIRUMALAPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3458	Sample Received on	27.05.2024
Sample Collected by	LABORATORY	Test Commenced on	27.05.2024
Sample Collected on	23.05.2024	Test Completed on	01.06.2024
Temperature	34°C	Relative Humidity	50%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	49.6	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	22.7	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	6.3	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	10.8	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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Technical Manager

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TEST REPORT

Report No.	SARL/24/3459

Report Date.	01.06.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A3-SHENBAGANALLUR VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3459	Sample Received on	27.05.2024
Sample Collected by	LABORATORY	Test Commenced on	27.05.2024
Sample Collected on	24.05.2024	Test Completed on	01.06.2024
Temperature	31°C	Relative Humidity	61%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	51.1	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	23.2	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.2	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.2	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/24/3460

Report Date.	01.06.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A4-THIRUMALAPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3460	Sample Received on	27.05.2024
Sample Collected by	LABORATORY	Test Commenced on	27.05.2024
Sample Collected on	24.05.2024	Test Completed on	01.06.2024
Temperature	31°C	Relative Humidity	61%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	45.8	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	21.1	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.6	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	9.4	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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For Shrient Analytical and Research Labs Pvt. Ltd

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J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/24/3461

Report Date.	01.06.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A1-WITHIN MINE LEASE AREA
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3461	Sample Received on	27.05.2024
Sample Collected by	LABORATORY	Test Commenced on	27.05.2024
Sample Collected on	25.05.2024	Test Completed on	01.06.2024
Temperature	36°C	Relative Humidity	38%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	51.5	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	24.2	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	4.8	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.2	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/24/3462

Report Date.	01.06.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A2-SUNDERASAPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3462	Sample Received on	27.05.2024
Sample Collected by	LABORATORY	Test Commenced on	27.05.2024
Sample Collected on	25.05.2024	Test Completed on	01.06.2024
Temperature	36°C	Relative Humidity	38%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	49.5	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	22.6	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.0	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.2	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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J. GNANAPRAKASAM
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TEST REPORT

Report No.	SARL/24/3463

Report Date.	01.06.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A1-WITHIN MINE LEASE AREA
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3463	Sample Received on	27.05.2024
Sample Collected by	LABORATORY	Test Commenced on	27.05.2024
Sample Collected on	26.05.2024	Test Completed on	01.06.2024
Temperature	35°C	Relative Humidity	39%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	56.2	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	26.7	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.3	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.7	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

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For Shrient Analytical and Research Labs Pvt. Ltd

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TEST REPORT

Report No.	SARL/24/3464

Report Date.	01.06.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	AMBIENT AIR QUALITY
Sampling Procedure	IS – 5182 (Part – 14: 2000 & Part – V: Reaffirmed - 2003), CPCB Guide lines

Sample Location	A2-SUNDERASAPURAM VILLAGE
Positioned height of Sampler	1.5 M above Ground Level

Customer Reference	By Mail	Sampling Duration	24 hrs
Sample Reference No	SARL/A/CHE-3464	Sample Received on	27.05.2024
Sample Collected by	LABORATORY	Test Commenced on	27.05.2024
Sample Collected on	26.05.2024	Test Completed on	01.06.2024
Temperature	35°C	Relative Humidity	39%
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results	*Limits
1	Particulate Matter less than 10micron size (PM_{10})	IS:5182: Part 23:2006	$\mu g/m^3$	52.1	100
2	Particulate Matter less than 2.5micron size ($PM_{2.5}$)	IS 5182 (Part 24):2019	$\mu g/m^3$	23.9	60
3	Sulphur dioxide (SO_2)	IS:5182: Part 02:2001	$\mu g/m^3$	5.4	80
4	Nitrogen Dioxide (NO_2)	IS:5182: Part 06:2006	$\mu g/m^3$	8.6	80
5	Carbon monoxide (CO)	SARL/IOP/013 (Issue No:01, Issue Date – 01.03.2023)	mg/m^3	BDL (D.L – 1.1)	-

Remarks: Limits: *National Ambient air quality standards from CPCB. BDL- Below detectable limit. DL –Detectable limit

.

For Shrient Analytical and Research Labs Pvt. Ltd

Verified

Shrient Analytical & Research Labs Pvt. Ltd. Chennai - 45.

Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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Please Contact:
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TEST REPORT

Report No.	SARL/24/3479	Report Date.	01.06.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	NOISE LEVEL DATA

Customer Reference	As per work order	Sampling Method	SARL/IOP/023
Sample Reference No	SARL/N/CHE-3479	Date of Monitoring	25.05.2024/ 26.05.2024
Sample Collected by	LABORATORY		

Time in hrs	N1	N2	N3	N4	N5	N6
06.00	42.4	40.5	41.9	44.3	43.4	39.4
07.00	43.9	41.9	45.3	46.9	41.1	46.7
08.00	45.7	45.0	44.4	45.3	44.4	50.8
09.00	49.1	47.0	48.8	48.9	45.8	52.1
10.00	51.0	49.4	47.2	51.0	52.8	49.4
11.00	52.7	51.3	46.0	53.8	51.9	52.4
12.00	53.6	55.6	44.8	55.0	48.6	46.6
13.00	55.4	57.1	49.3	51.3	49.5	47.4
14.00	56.7	54.8	46.5	48.9	55.1	50.4
15.00	54.1	56.0	49.9	46.8	54.9	49.5
16.00	59.6	52.9	47.8	50.9	53.5	48.9
17.00	57.7	52.1	46.8	49.9	54.9	44.4
18.00	52.5	52.9	50.0	48.0	51.6	42.5
19.00	51.4	46.8	49.1	48.6	48.0	41.6
20.00	50.5	42.9	42.0	46.0	47.4	40.9
21.00	47.4	41.9	40.9	44.3	45.5	43.9
22.00	44.5	41.3	39.8	44.9	47.0	39.5
23.00	41.0	41.0	38.1	43.3	45.1	38.1
24.00	39.9	40.6	39.6	42.4	42.9	40.6
01.00	39.1	39.6	38.3	43.8	44.6	38.7
02.00	40.5	39.3	37.1	43.0	43.4	39.5
03.00	38.2	39.8	39.5	43.1	42.3	40.8
04.00	41.1	39.5	40.3	41.6	40.9	38.7
05.00	42.1	40.9	41.9	41.3	41.0	42.4

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TEST REPORT

Report No.	SARL/24/3479

Report Date.	01.06.2024

	N1	N2	N3	N4	N5	N6
DAY EQUIVALENT	**53.7**	**52.0**	**47.1**	**49.9**	**51.1**	**48.3**
NIGHT EQUIVALENT	**41.2**	**40.3**	**39.6**	**43.1**	**43.9**	**40.0**
DAY & NIGHT EQUIVALENT	**52.1**	**50.4**	**45.7**	**48.5**	**49.7**	**46.8**

Remarks:

LOCATIONS:

N1-WITHIN MINE LEASE AREA
N2-SUNDERASAPURAM VILLAGE
N3-SHENBAGANALLUR VILLAGE
N4-THIRUMALAPURAM VILLAGE
N5- CHIDAMBARAPERI VILLAGE
N6-PERIYASAMYPURAM VILLAGE

For Shrient Analytical and Research Labs Pvt. Ltd

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Shrient Analytical & Research Labs Pvt. Ltd. Chennai - 45

Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/24/3473	Report Date.	01.06.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	SOIL
Sample Mark	S1-WITHIN MINE LEASE AREA

Customer Reference	By Mail	Sampling Procedure	-
Sample Reference No	SARL/SO/CHE-3473	Sample Received on	27.05.2024
Sample Collected by	LABORATORY	Test Commenced on	27.05.2024
Sample Collected on	26.05.2024	Test Completed on	01.06.2024
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results
1	pH at 25 °C	IS 2720: Part 26: 1987	-	7.58
2	Electrical Conductivity	IS 14767: 2000	µmhos/cm	68.97
3	Dry matter content	IS 15106: 2002	%	96.13
4	Water Content	IS 15106: 2002	%	3.87
5	Organic Matter	IS 2720: Part 22: 1972	%	0.86
6	Nitrogen and Nitrogenous compounds	IS 14684: 1999	mg/kg	240
7	Soil Texture	Methods Manual - Soil testing in India - P. No-67: 2011	%	LOAM
8	Grain Size Distribution i. Sand	Methods Manual - Soil testing in India - P. No-67: 2011	%	32.64
	ii. Silt	Methods Manual - Soil testing in India - P. No-67: 2011	%	52.38
	iii. Clay	Methods Manual - Soil testing in India - P. No-67: 2011	%	14.98
9	Phosphorus as P	IS 10158: 1982	mg/kg	0.94
10	Sodium as Na	USEPA 3050 B: 1996	mg/kg	720
11	Potassium as K	USEPA 3050 B: 1996	mg/kg	796
12	Total soluble sulphates	IS 2720: Part 27: 1977	%	BDL (D.L.0.02)
13	Porosity	SARL/SOP/SO/001 (Issue No:01, Issue Date – 01.03.2023): 2023	%	20.1
14	Water holding capacity	Methods Manual - Soil testing in India - P. No-76: 2011	Inches/foot	31

BDL – Below Detectable limit (DL - Detectable limit).

For Shrient Analytical and Research Labs Pvt. Ltd

Verified

Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/24/3474	Report Date.	01.06.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	SOIL
Sample Mark	S2-SUNDERASAPURAM VILLAGE

Customer Reference	By Mail	Sampling Procedure	-
Sample Reference No	SARL/SO/CHE-3474	Sample Received on	27.05.2024
Sample Collected by	LABORATORY	Test Commenced on	27.05.2024
Sample Collected on	26.05.2024	Test Completed on	01.06.2024
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results
1	pH at 25 °C	IS 2720: Part 26: 1987	-	6.45
2	Electrical Conductivity	IS 14767: 2000	µmhos/cm	56.22
3	Dry matter content	IS 15106: 2002	%	96.72
4	Water Content	IS 15106: 2002	%	3.28
5	Organic Matter	IS 2720: Part 22: 1972	%	1.05
6	Nitrogen and Nitrogenous compounds	IS 14684: 1999	mg/kg	314
7	Soil Texture	Methods Manual - Soil testing in India - P. No-67: 2011	%	LOAM
8	Grain Size Distribution i. Sand	Methods Manual - Soil testing in India - P. No-67: 2011	%	28.97
	ii. Silt	Methods Manual - Soil testing in India - P. No-67: 2011	%	60.19
	iii. Clay	Methods Manual - Soil testing in India - P. No-67: 2011	%	10.84
9	Phosphorus as P	IS 10158: 1982	mg/kg	1.75
10	Sodium as Na	USEPA 3050 B: 1996	mg/kg	694
11	Potassium as K	USEPA 3050 B: 1996	mg/kg	754
12	Total soluble sulphates	IS 2720: Part 27: 1977	%	BDL (D.L.0.02)
13	Porosity	SARL/SOP/SO/001 (Issue No:01, Issue Date – 01.03.2023): 2023	%	22.6
14	Water holding capacity	Methods Manual - Soil testing in India - P. No-76: 2011	Inches/foot	32

BDL – Below Detectable limit (DL - Detectable limit).

For Shrient Analytical and Research Labs Pvt. Ltd

Verified

Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/24/3475	Report Date.	01.06.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	SOIL
Sample Mark	S3-SHENBAGANALLUR VILLAGE

Customer Reference	By Mail	Sampling Procedure	-
Sample Reference No	SARL/SO/CHE-3475	Sample Received on	27.05.2024
Sample Collected by	LABORATORY	Test Commenced on	27.05.2024
Sample Collected on	26.05.2024	Test Completed on	01.06.2024
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results
1	pH at 25 °C	IS 2720: Part 26: 1987	-	7.67
2	Electrical Conductivity	IS 14767: 2000	µmhos/cm	78.95
3	Dry matter content	IS 15106: 2002	%	97.65
4	Water Content	IS 15106: 2002	%	2.35
5	Organic Matter	IS 2720: Part 22: 1972	%	0.64
6	Nitrogen and Nitrogenous compounds	IS 14684: 1999	mg/kg	198
7	Soil Texture	Methods Manual - Soil testing in India - P. No-67: 2011	%	CLAY LOAM
8	Grain Size Distribution i. Sand	Methods Manual - Soil testing in India - P. No-67: 2011	%	45.74
	ii. Silt	Methods Manual - Soil testing in India - P. No-67: 2011	%	43.16
	iii. Clay	Methods Manual - Soil testing in India - P. No-67: 2011	%	11.10
9	Phosphorus as P	IS 10158: 1982	mg/kg	1.64
10	Sodium as Na	USEPA 3050 B: 1996	mg/kg	832
11	Potassium as K	USEPA 3050 B: 1996	mg/kg	905
12	Total soluble sulphates	IS 2720: Part 27: 1977	%	BDL (D.L.0.02)
13	Porosity	SARL/SOP/SO/001 (Issue No:01, Issue Date – 01.03.2023): 2023	%	17.9
14	Water holding capacity	Methods Manual - Soil testing in India - P. No-76: 2011	Inches/foot	36

BDL – Below Detectable limit (DL - Detectable limit).

For Shrient Analytical and Research Labs Pvt. Ltd

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Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/24/3476	Report Date.	01.06.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	SOIL
Sample Mark	S4-THIRUMALAPURAM VILLAGE

Customer Reference	By Mail	Sampling Procedure	-
Sample Reference No	SARL/SO/CHE-3476	Sample Received on	27.05.2024
Sample Collected by	LABORATORY	Test Commenced on	27.05.2024
Sample Collected on	26.05.2024	Test Completed on	01.06.2024
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results
1	pH at 25 °C	IS 2720: Part 26: 1987	-	7.34
2	Electrical Conductivity	IS 14767: 2000	µmhos/cm	112.3
3	Dry matter content	IS 15106: 2002	%	93.58
4	Water Content	IS 15106: 2002	%	6.42
5	Organic Matter	IS 2720: Part 22: 1972	%	0.78
6	Nitrogen and Nitrogenous compounds	IS 14684: 1999	mg/kg	245
7	Soil Texture	Methods Manual - Soil testing in India - P. No-67: 2011	%	SILT LOAM
8	Grain Size Distribution i. Sand	Methods Manual - Soil testing in India - P. No-67: 2011	%	38.55
	ii. Silt	Methods Manual - Soil testing in India - P. No-67: 2011	%	47.89
	iii. Clay	Methods Manual - Soil testing in India - P. No-67: 2011	%	13.56
9	Phosphorus as P	IS 10158: 1982	mg/kg	2.99
10	Sodium as Na	USEPA 3050 B: 1996	mg/kg	644
11	Potassium as K	USEPA 3050 B: 1996	mg/kg	776
12	Total soluble sulphates	IS 2720: Part 27: 1977	%	BDL (D.L.0.02)
13	Porosity	SARL/SOP/SO/001 (Issue No:01, Issue Date – 01.03.2023): 2023	%	18.5
14	Water holding capacity	Methods Manual - Soil testing in India - P. No-76: 2011	Inches/foot	29

BDL – Below Detectable limit (DL - Detectable limit).

For Shrient Analytical and Research Labs Pvt. Ltd

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Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/24/3477	Report Date.	01.06.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	SOIL
Sample Mark	S5- CHIDAMBARAPERI VILLAGE

Customer Reference	By Mail	Sampling Procedure	-
Sample Reference No	SARL/SO/CHE-3477	Sample Received on	27.05.2024
Sample Collected by	LABORATORY	Test Commenced on	27.05.2024
Sample Collected on	26.05.2024	Test Completed on	01.06.2024
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results
1	pH at 25 °C	IS 2720: Part 26: 1987	-	7.16
2	Electrical Conductivity	IS 14767: 2000	µmhos/cm	101.2
3	Dry matter content	IS 15106: 2002	%	97.69
4	Water Content	IS 15106: 2002	%	2.31
5	Organic Matter	IS 2720: Part 22: 1972	%	0.89
6	Nitrogen and Nitrogenous compounds	IS 14684: 1999	mg/kg	256
7	Soil Texture	Methods Manual - Soil testing in India - P. No-67: 2011	%	SANDY CLAY LOAM
8	Grain Size Distribution i. Sand	Methods Manual - Soil testing in India - P. No-67: 2011	%	24.78
	ii. Silt	Methods Manual - Soil testing in India - P. No-67: 2011	%	55.22
	iii. Clay	Methods Manual - Soil testing in India - P. No-67: 2011	%	20.00
9	Phosphorus as P	IS 10158: 1982	mg/kg	1.66
10	Sodium as Na	USEPA 3050 B: 1996	mg/kg	897
11	Potassium as K	USEPA 3050 B: 1996	mg/kg	1035
12	Total soluble sulphates	IS 2720: Part 27: 1977	%	BDL (D.L.0.02)
13	Porosity	SARL/SOP/SO/001 (Issue No:01, Issue Date – 01.03.2023): 2023	%	19.7
14	Water holding capacity	Methods Manual - Soil testing in India - P. No-76: 2011	Inches/foot	38

BDL – Below Detectable limit (DL - Detectable limit).

For Shrient Analytical and Research Labs Pvt. Ltd

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Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/24/3478	Report Date.	01.06.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	SOIL
Sample Mark	S6-PERIYASAMYPURAM VILLAGE

Customer Reference	By Mail	Sampling Procedure	-
Sample Reference No	SARL/SO/CHE-3478	Sample Received on	27.05.2024
Sample Collected by	LABORATORY	Test Commenced on	27.05.2024
Sample Collected on	26.05.2024	Test Completed on	01.06.2024
Sample Condition	Fit for Analysis		

S. No.	Parameters	Protocol	Unit	Results
1	pH at 25 °C	IS 2720: Part 26: 1987	-	7.45
2	Electrical Conductivity	IS 14767: 2000	µmhos/cm	120.6
3	Dry matter content	IS 15106: 2002	%	94.52
4	Water Content	IS 15106: 2002	%	5.48
5	Organic Matter	IS 2720: Part 22: 1972	%	1.35
6	Nitrogen and Nitrogenous compounds	IS 14684: 1999	mg/kg	489
7	Soil Texture	Methods Manual - Soil testing in India - P. No-67: 2011	%	CLAY LOAM
8	Grain Size Distribution i. Sand	Methods Manual - Soil testing in India - P. No-67: 2011	%	46.55
	ii. Silt	Methods Manual - Soil testing in India - P. No-67: 2011	%	43.69
	iii. Clay	Methods Manual - Soil testing in India - P. No-67: 2011	%	9.76
9	Phosphorus as P	IS 10158: 1982	mg/kg	2.01
10	Sodium as Na	USEPA 3050 B: 1996	mg/kg	546
11	Potassium as K	USEPA 3050 B: 1996	mg/kg	703
12	Total soluble sulphates	IS 2720: Part 27: 1977	%	BDL (D.L.0.02)
13	Porosity	SARL/SOP/SO/001 (Issue No:01, Issue Date – 01.03.2023): 2023	%	20.3
14	Water holding capacity	Methods Manual - Soil testing in India - P. No-76: 2011	Inches/foot	35

BDL – Below Detectable limit (DL - Detectable limit).

For Shrient Analytical and Research Labs Pvt. Ltd

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Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/2024/3465	Report Date.	01.06.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	WATER
Sample Mark	W1-WITHIN MINE LEASE AREA

Customer Reference	By Mail	Sampling Procedure	IS 17614: Part 14: 2021
Sample Reference No	SARL/W/CHE-3465	Sample Received on	27.05.2024
Sample Collected by	LABORATORY	Test Commenced on	27.05.2024
Sample Collected on	26.05.2024	Test Completed on	01.06.2024
Sample Condition	Fit for Analysis		

Sl. No.	Parameters	Protocol	Unit	Result	*Limits Permissible
A.	**Physical parameters**				
1	Odour	IS 3025 (Part 5): 2018	-	Agreeable	Agreeable
2	Turbidity	APHA 24th Edition 2130 B: 2023	NTU	<1.0	5.0
3	pH at 25 ˚C	APHA 24th Edition 4500 – H+ B: 2023	-	7.60	6.50-8.50
4	Electrical Conductivity	APHA 24th Edition 2510 B: 2023	(µS/cm)	1875	-
B.	**Chemical parameters**				
5	Total Dissolved Solids	APHA 24th Edition 2540-C: 2023	mg/L	1130	2000
6	Total hardness (as CaCO3)	APHA 24th Edition 2340 C: 2023	mg/L	246	600
7	Calcium (as Ca)	IS 3025 (Part 40): 1991	mg/L	57.2	200
8	Magnesium (as Mg)	IS 3025 (Part 46): 1994	mg/L	24.7	100
9	Calcium Hardness (as CaCO3)	APHA 24th Edition 3500 Ca B: 2023	mg/L	143	-
10	Magnesium Hardness (as CaCO3)	APHA 24th Edition 3500 Mg B: 2023	mg/L	103	-
11	Total alkalinity (as CaCO3)	APHA 24th Edition 2320 B: 2023	mg/L	283	600
12	Chloride (as Cl)	APHA 24th Edition 4500 Cl- B: 2023	mg/L	499	1000

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TEST REPORT

Report No.	SARL/2024/3465	Report Date.	01.06.2024

Sl. No.	Parameters	Protocol	Unit	Result	*Limits Permissible
13	Free Residual chlorine	APHA 24th Edition 4500 Cl- B: 2023	mg/L	BDL (D.L - 0.2)	1.0
14	Sulphate as (SO42-)	APHA 24th Edition 4500 SO42- E: 2023	mg/L	194	400
15	Iron (as Fe)	APHA 24th Edition 3500 Fe B: 2023	mg/L	0.08	0.3
16	Nitrate (as NO3)	IS 3025 (Part 34): 1988	mg/L	5.24	45
17	Fluoride (as F)	APHA 24th Edition 4500 F- D: 2023	mg/L	0.56	1.5
18	Manganese (as Mn)	APHA 24th Edition 3500 Mn B: 2023	mg/L	BDL (D.L - 0.05)	0.3

Remarks: *Drinking Water Specifications as per IS – 10500:2012. BDL – Below Detectable limit (DL - Detectable limit).

For Shrient Analytical and Research Labs Pvt. Ltd

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Shrient Analytical & Research Labs Pvt. Ltd. Chennai - 45

Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/2024/3466	Report Date.	01.06.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	WATER
Sample Mark	W2-SUNDERASAPURAM VILLAGE

Customer Reference	By Mail	Sampling Procedure	IS 17614: Part 14: 2021
Sample Reference No	SARL/W/CHE-3466	Sample Received on	27.05.2024
Sample Collected by	LABORATORY	Test Commenced on	27.05.2024
Sample Collected on	26.05.2024	Test Completed on	01.06.2024
Sample Condition	Fit for Analysis		

Sl. No.	Parameters	Protocol	Unit	Result	*Limits Permissible
A.	**Physical parameters**				
1	Odour	IS 3025 (Part 5): 2018	-	Agreeable	Agreeable
2	Turbidity	APHA 24th Edition 2130 B: 2023	NTU	<1.0	5.0
3	pH at 25 ˚C	APHA 24th Edition 4500 – H+ B: 2023	-	7.87	6.50-8.50
4	Electrical Conductivity	APHA 24th Edition 2510 B: 2023	(µS/cm)	1659	-
B.	**Chemical parameters**				
5	Total Dissolved Solids	APHA 24th Edition 2540-C: 2023	mg/L	996	2000
6	Total hardness (as CaCO3)	APHA 24th Edition 2340 C: 2023	mg/L	582	600
7	Calcium (as Ca)	IS 3025 (Part 40): 1991	mg/L	128	200
8	Magnesium (as Mg)	IS 3025 (Part 46): 1994	mg/L	62.6	100
9	Calcium Hardness (as CaCO3)	APHA 24th Edition 3500 Ca B: 2023	mg/L	321	-
10	Magnesium Hardness (as CaCO3)	APHA 24th Edition 3500 Mg B: 2023	mg/L	261	-
11	Total alkalinity (as CaCO3)	APHA 24th Edition 2320 B: 2023	mg/L	210	600
12	Chloride (as Cl)	APHA 24th Edition 4500 Cl- B: 2023	mg/L	319	1000

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TEST REPORT

Report No.	SARL/2024/3466

Report Date.	01.06.2024

Sl. No.	Parameters	Protocol	Unit	Result	*Limits Permissible
13	Free Residual chlorine	APHA 24th Edition 4500 Cl- B: 2023	mg/L	BDL (D.L - 0.2)	1.0
14	Sulphate as (SO42-)	APHA 24th Edition 4500 SO42- E: 2023	mg/L	265	400
15	Iron (as Fe)	APHA 24th Edition 3500 Fe B: 2023	mg/L	0.09	0.3
16	Nitrate (as NO3)	IS 3025 (Part 34): 1988	mg/L	3.48	45
17	Fluoride (as F)	APHA 24th Edition 4500 F- D: 2023	mg/L	0.49	1.5
18	Manganese (as Mn)	APHA 24th Edition 3500 Mn B: 2023	mg/L	BDL (D.L - 0.05)	0.3

Remarks: *Drinking Water Specifications as per IS – 10500:2012. BDL – Below Detectable limit (DL - Detectable limit).

For Shrient Analytical and Research Labs Pvt. Ltd

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Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/2024/3467	Report Date.	01.06.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	WATER
Sample Mark	W3-SHENBAGANALLUR VILLAGE

Customer Reference	By Mail	Sampling Procedure	IS 17614: Part 14: 2021
Sample Reference No	SARL/W/CHE-3467	Sample Received on	27.05.2024
Sample Collected by	LABORATORY	Test Commenced on	27.05.2024
Sample Collected on	26.05.2024	Test Completed on	01.06.2024
Sample Condition	Fit for Analysis		

Sl. No.	Parameters	Protocol	Unit	Result	*Limits Permissible
A.	**Physical parameters**				
1	Odour	IS 3025 (Part 5): 2018	-	Agreeable	Agreeable
2	Turbidity	APHA 24th Edition 2130 B: 2023	NTU	<1.0	5.0
3	pH at 25 ˚C	APHA 24th Edition 4500 – H+ B: 2023	-	7.01	6.50-8.50
4	Electrical Conductivity	APHA 24th Edition 2510 B: 2023	(µS/cm)	1210	-
B.	**Chemical parameters**				
5	Total Dissolved Solids	APHA 24th Edition 2540-C: 2023	mg/L	726	2000
6	Total hardness (as CaCO3)	APHA 24th Edition 2340 C: 2023	mg/L	226	600
7	Calcium (as Ca)	IS 3025 (Part 40): 1991	mg/L	138	200
8	Magnesium (as Mg)	IS 3025 (Part 46): 1994	mg/L	39.8	100
9	Calcium Hardness (as CaCO3)	APHA 24th Edition 3500 Ca B: 2023	mg/L	346	-
10	Magnesium Hardness (as CaCO3)	APHA 24th Edition 3500 Mg B: 2023	mg/L	166	-
11	Total alkalinity (as CaCO3)	APHA 24th Edition 2320 B: 2023	mg/L	213	600
12	Chloride (as Cl)	APHA 24th Edition 4500 Cl- B: 2023	mg/L	250	1000

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TEST REPORT

Report No.	SARL/2024/3467

Report Date.	01.06.2024

Sl. No.	Parameters	Protocol	Unit	Result	*Limits Permissible
13	Free Residual chlorine	APHA 24th Edition 4500 Cl- B: 2023	mg/L	BDL (D.L - 0.2)	1.0
14	Sulphate as (SO42-)	APHA 24th Edition 4500 SO42- E: 2023	mg/L	136	400
15	Iron (as Fe)	APHA 24th Edition 3500 Fe B: 2023	mg/L	0.06	0.3
16	Nitrate (as NO3)	IS 3025 (Part 34): 1988	mg/L	3.31	45
17	Fluoride (as F)	APHA 24th Edition 4500 F- D: 2023	mg/L	0.45	1.5
18	Manganese (as Mn)	APHA 24th Edition 3500 Mn B: 2023	mg/L	BDL (D.L - 0.05)	0.3

Remarks: *Drinking Water Specifications as per IS – 10500:2012. BDL – Below Detectable limit (DL - Detectable limit).

For Shrient Analytical and Research Labs Pvt. Ltd

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J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/2024/3468	Report Date.	01.06.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	WATER
Sample Mark	W4-THIRUMALAPURAM VILLAGE

Customer Reference	By Mail	Sampling Procedure	IS 17614: Part 14: 2021
Sample Reference No	SARL/W/CHE-3468	Sample Received on	27.05.2024
Sample Collected by	LABORATORY	Test Commenced on	27.05.2024
Sample Collected on	26.05.2024	Test Completed on	01.06.2024
Sample Condition	Fit for Analysis		

Sl. No.	Parameters	Protocol	Unit	Result	*Limits Permissible
A.	**Physical parameters**				
1	Odour	IS 3025 (Part 5): 2018	-	Agreeable	Agreeable
2	Turbidity	APHA 24th Edition 2130 B: 2023	NTU	<1.0	5.0
3	pH at 25 ˚C	APHA 24th Edition 4500 – H+ B: 2023	-	7.44	6.50-8.50
4	Electrical Conductivity	APHA 24th Edition 2510 B: 2023	(µS/cm)	954.3	-
B.	**Chemical parameters**				
5	Total Dissolved Solids	APHA 24th Edition 2540-C: 2023	mg/L	575	2000
6	Total hardness (as CaCO3)	APHA 24th Edition 2340 C: 2023	mg/L	277	600
7	Calcium (as Ca)	IS 3025 (Part 40): 1991	mg/L	62.4	200
8	Magnesium (as Mg)	IS 3025 (Part 46): 1994	mg/L	29.0	100
9	Calcium Hardness (as CaCO3)	APHA 24th Edition 3500 Ca B: 2023	mg/L	156	-
10	Magnesium Hardness (as CaCO3)	APHA 24th Edition 3500 Mg B: 2023	mg/L	121	-
11	Total alkalinity (as CaCO3)	APHA 24th Edition 2320 B: 2023	mg/L	265	600
12	Chloride (as Cl)	APHA 24th Edition 4500 Cl- B: 2023	mg/L	157	1000

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TEST REPORT

Report No.	SARL/2024/3468

Report Date.	01.06.2024

Sl. No.	Parameters	Protocol	Unit	Result	*Limits Permissible
13	Free Residual chlorine	APHA 24th Edition 4500 Cl- B: 2023	mg/L	BDL (D.L - 0.2)	1.0
14	Sulphate as (SO42-)	APHA 24th Edition 4500 SO42- E: 2023	mg/L	124	400
15	Iron (as Fe)	APHA 24th Edition 3500 Fe B: 2023	mg/L	0.09	0.3
16	Nitrate (as NO3)	IS 3025 (Part 34): 1988	mg/L	2.65	45
17	Fluoride (as F)	APHA 24th Edition 4500 F- D: 2023	mg/L	0.34	1.5
18	Manganese (as Mn)	APHA 24th Edition 3500 Mn B: 2023	mg/L	BDL (D.L - 0.05)	0.3

Remarks: *Drinking Water Specifications as per IS – 10500:2012. BDL – Below Detectable limit (DL - Detectable limit).

For Shrient Analytical and Research Labs Pvt. Ltd

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Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/2024/3469	Report Date.	01.06.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	WATER
Sample Mark	W5- CHIDAMBARAPERI VILLAGE

Customer Reference	By Mail	Sampling Procedure	IS 17614: Part 14: 2021
Sample Reference No	SARL/W/CHE-3469	Sample Received on	27.05.2024
Sample Collected by	LABORATORY	Test Commenced on	27.05.2024
Sample Collected on	26.05.2024	Test Completed on	01.06.2024
Sample Condition	Fit for Analysis		

Sl. No.	Parameters	Protocol	Unit	Result	*Limits Permissible
A.	**Physical parameters**				
1	Odour	IS 3025 (Part 5): 2018	-	Agreeable	Agreeable
2	Turbidity	APHA 24th Edition 2130 B: 2023	NTU	<1.0	5.0
3	pH at 25 ˚C	APHA 24th Edition 4500 – H+ B: 2023	-	7.69	6.50-8.50
4	Electrical Conductivity	APHA 24th Edition 2510 B: 2023	(µS/cm)	894.5	-
B.	**Chemical parameters**				
5	Total Dissolved Solids	APHA 24th Edition 2540-C: 2023	mg/L	540	2000
6	Total hardness (as CaCO3)	APHA 24th Edition 2340 C: 2023	mg/L	181	600
7	Calcium (as Ca)	IS 3025 (Part 40): 1991	mg/L	19.8	200
8	Magnesium (as Mg)	IS 3025 (Part 46): 1994	mg/L	31.6	100
9	Calcium Hardness (as CaCO3)	APHA 24th Edition 3500 Ca B: 2023	mg/L	49.5	-
10	Magnesium Hardness (as CaCO3)	APHA 24th Edition 3500 Mg B: 2023	mg/L	132	-
11	Total alkalinity (as CaCO3)	APHA 24th Edition 2320 B: 2023	mg/L	163	600
12	Chloride (as Cl)	APHA 24th Edition 4500 Cl- B: 2023	mg/L	257	1000

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TEST REPORT

Report No.	SARL/2024/3469	Report Date.	01.06.2024

Sl. No.	Parameters	Protocol	Unit	Result	*Limits Permissible
13	Free Residual chlorine	APHA 24th Edition 4500 Cl- B: 2023	mg/L	BDL (D.L - 0.2)	1.0
14	Sulphate as (SO42-)	APHA 24th Edition 4500 SO42- E: 2023	mg/L	124	400
15	Iron (as Fe)	APHA 24th Edition 3500 Fe B: 2023	mg/L	0.09	0.3
16	Nitrate (as NO3)	IS 3025 (Part 34): 1988	mg/L	3.65	45
17	Fluoride (as F)	APHA 24th Edition 4500 F- D: 2023	mg/L	0.58	1.5
18	Manganese (as Mn)	APHA 24th Edition 3500 Mn B: 2023	mg/L	BDL (D.L - 0.05)	0.3

Remarks: *Drinking Water Specifications as per IS – 10500:2012. BDL – Below Detectable limit (DL - Detectable limit).

For Shrient Analytical and Research Labs Pvt. Ltd

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Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/2024/3470	Report Date.	01.06.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	WATER
Sample Mark	W6-PERIYASAMYPURAM VILLAGE

Customer Reference	By Mail	Sampling Procedure	IS 17614: Part 14: 2021
Sample Reference No	SARL/W/CHE-3470	Sample Received on	27.05.2024
Sample Collected by	LABORATORY	Test Commenced on	27.05.2024
Sample Collected on	26.05.2024	Test Completed on	01.06.2024
Sample Condition	Fit for Analysis		

Sl. No.	Parameters	Protocol	Unit	Result	*Limits Permissible
A.	**Physical parameters**				
1	Odour	IS 3025 (Part 5): 2018	-	Agreeable	Agreeable
2	Turbidity	APHA 24th Edition 2130 B: 2023	NTU	<1.0	5.0
3	pH at 25 ˚C	APHA 24th Edition 4500 – H+ B: 2023	-	8.12	6.50-8.50
4	Electrical Conductivity	APHA 24th Edition 2510 B: 2023	(µS/cm)	184.5	-
B.	**Chemical parameters**				
5	Total Dissolved Solids	APHA 24th Edition 2540-C: 2023	mg/L	112	2000
6	Total hardness (as CaCO3)	APHA 24th Edition 2340 C: 2023	mg/L	83.0	600
7	Calcium (as Ca)	IS 3025 (Part 40): 1991	mg/L	23.9	200
8	Magnesium (as Mg)	IS 3025 (Part 46): 1994	mg/L	5.6	100
9	Calcium Hardness (as CaCO3)	APHA 24th Edition 3500 Ca B: 2023	mg/L	59.7	-
10	Magnesium Hardness (as CaCO3)	APHA 24th Edition 3500 Mg B: 2023	mg/L	23.3	-
11	Total alkalinity (as CaCO3)	APHA 24th Edition 2320 B: 2023	mg/L	64.6	600
12	Chloride (as Cl)	APHA 24th Edition 4500 Cl- B: 2023	mg/L	26	1000

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TEST REPORT

Report No.	SARL/2024/3470	Report Date.	01.06.2024

Sl. No.	Parameters	Protocol	Unit	Result	*Limits Permissible
13	Free Residual chlorine	APHA 24th Edition 4500 Cl- B: 2023	mg/L	BDL (D.L - 0.2)	1.0
14	Sulphate as (SO42-)	APHA 24th Edition 4500 SO42- E: 2023	mg/L	16.7	400
15	Iron (as Fe)	APHA 24th Edition 3500 Fe B: 2023	mg/L	BDL(D.L-0.01)	0.3
16	Nitrate (as NO3)	IS 3025 (Part 34): 1988	mg/L	BDL(D.L-1.0)	45
17	Fluoride (as F)	APHA 24th Edition 4500 F- D: 2023	mg/L	0.12	1.5
18	Manganese (as Mn)	APHA 24th Edition 3500 Mn B: 2023	mg/L	BDL (D.L - 0.05)	0.3

Remarks: *Drinking Water Specifications as per IS – 10500:2012. BDL – Below Detectable limit (DL - Detectable limit).

For Shrient Analytical and Research Labs Pvt. Ltd

Verified

Shrient Analytical & Research Labs Pvt. Ltd * Chennai - 45

Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

*****END OF THE REPORT*****

Please Contact:
For any Technical Issues & Complaints: vimalnath@shrientanalytical.com

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Shrient Analytical and Research Labs Pvt. Ltd

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Phone Number +91 82208 36377 Email: - **info@shrientanalytical.com**
www.shrientanalytical.com

TEST REPORT

Report No.	SARL/2024/3471	Report Date.	01.06.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	WATER
Sample Mark	SW1-SUNDERESAPURAM POND

Customer Reference	By Mail	Sampling Procedure	IS 17614: Part 14: 2021
Sample Reference No	SARL/W/CHE-3471	Sample Received on	27.05.2024
Sample Collected by	LABORATORY	Test Commenced on	27.05.2024
Sample Collected on	26.05.2024	Test Completed on	01.06.2024
Sample Condition	Fit for Analysis		

Sl. No.	Parameters	Protocol	Unit	Result
A.				
1	Odour	IS 3025 (Part 5): 2018	-	Agreeable
2	Turbidity	APHA 24th Edition 2130 B: 2023	NTU	17.6
3	pH at 25 ˚C	APHA 24th Edition 4500 – H+ B: 2023	-	7.52
4	Electrical Conductivity	APHA 24th Edition 2510 B: 2023	(µS/cm)	648.9
B.	**Chemical parameters**			
5	Total Dissolved Solids	APHA 24th Edition 2540-C: 2023	mg/L	390
6	Total hardness (as CaCO3)	APHA 24th Edition 2340 C: 2023	mg/L	174
7	Calcium (as Ca)	IS 3025 (Part 40): 1991	mg/L	54.0
8	Magnesium (as Mg)	IS 3025 (Part 46): 1994	mg/L	9.4
9	Calcium Hardness (as CaCO3)	APHA 24th Edition 3500 Ca B: 2023	mg/L	135
10	Magnesium Hardness (as CaCO3)	APHA 24th Edition 3500 Mg B: 2023	mg/L	39.0
11	Total alkalinity (as CaCO3)	APHA 24th Edition 2320 B: 2023	mg/L	101
12	Chloride (as Cl)	APHA 24th Edition 4500 Cl- B: 2023	mg/L	119

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TEST REPORT

Report No.	SARL/2024/3471	Report Date.	01.06.2024

Sl. No.	Parameters	Protocol	Unit	Result
13	Free Residual chlorine	APHA 24th Edition 4500 Cl- B: 2023	mg/L	BDL(D.L-0.2)
14	Sulphate as (SO42-)	APHA 24th Edition 4500 SO42- E: 2023	mg/L	75.8
15	Iron (as Fe)	APHA 24th Edition 3500 Fe B: 2023	mg/L	0.14
16	Nitrate (as NO3)	IS 3025 (Part 34): 1988	mg/L	3.64
17	Fluoride (as F)	APHA 24th Edition 4500 F- D: 2023	mg/L	0.29
18	Manganese (as Mn)	APHA 24th Edition 3500 Mn B: 2023	mg/L	BDL(D.L-0.05)
19	Chemical Oxygen Demand	APHA 24th Edition 5220 B: 2023	mg/L	56.4
20	Bio Chemical Oxygen Demand 3 Days at 27°c	IS 3025 (Part 44): 1993	mg/L	12.5
21	Total Suspended Solids	APHA 24th Edition 2540 D: 2023	mg/L	35
22	Dissolved Oxygen	IS 3025 (Part 38): 1989	mg/L	5.9

Remarks: *Drinking Water Specifications as per IS – 10500:2012. BDL – Below Detectable limit (DL - Detectable limit).

For Shrient Analytical and Research Labs Pvt. Ltd

Verified

Authorized Signatory
J. GNANAPRAKASAM
Technical Manager

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TEST REPORT

Report No.	SARL/2024/3472	Report Date.	01.06.2024

Customer Name & Address	Rough stone Quarry of Thiru.V.M.Sundaraiah, extent of 3.00.0Ha,Ariyanayagipuram Village, Kadayanallur Taluk, Tenkasi District, Tamil Nadu
Sample Description	WATER
Sample Mark	SW2-PERIYASAMYPURAM POND

Customer Reference	By Mail	Sampling Procedure	IS 17614: Part 14: 2021
Sample Reference No	SARL/W/CHE-3472	Sample Received on	27.05.2024
Sample Collected by	LABORATORY	Test Commenced on	27.05.2024
Sample Collected on	26.05.2024	Test Completed on	01.06.2024
Sample Condition	Fit for Analysis		

Sl. No.	Parameters	Protocol	Unit	Result
A.				
1	Odour	IS 3025 (Part 5): 2018	-	Agreeable
2	Turbidity	APHA 24th Edition 2130 B: 2023	NTU	<1.0
3	pH at 25 ˚C	APHA 24th Edition 4500 – H+ B: 2023	-	25.0
4	Electrical Conductivity	APHA 24th Edition 2510 B: 2023	(µS/cm)	6.94
B.	**Chemical parameters**			
5	Total Dissolved Solids	APHA 24th Edition 2540-C: 2023	mg/L	62.4
6	Total hardness (as CaCO3)	APHA 24th Edition 2340 C: 2023	mg/L	38.0
7	Calcium (as Ca)	IS 3025 (Part 40): 1991	mg/L	19.8
8	Magnesium (as Mg)	IS 3025 (Part 46): 1994	mg/L	5.6
9	Calcium Hardness (as CaCO3)	APHA 24th Edition 3500 Ca B: 2023	mg/L	1.4
10	Magnesium Hardness (as CaCO3)	APHA 24th Edition 3500 Mg B: 2023	mg/L	13.9
11	Total alkalinity (as CaCO3)	APHA 24th Edition 2320 B: 2023	mg/L	5.9
12	Chloride (as Cl)	APHA 24th Edition 4500 Cl- B: 2023	mg/L	12.1

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TEST REPORT

Report No.	SARL/2024/3472	Report Date.	01.06.2024

Sl. No.	Parameters	Protocol	Unit	Result
13	Free Residual chlorine	APHA 24th Edition 4500 Cl- B: 2023	mg/L	BDL(D.L-0.2)
14	Sulphate as (SO42-)	APHA 24th Edition 4500 SO42- E: 2023	mg/L	BDL (D.L - 5.0)
15	Iron (as Fe)	APHA 24th Edition 3500 Fe B: 2023	mg/L	0.21
16	Nitrate (as NO3)	IS 3025 (Part 34): 1988	mg/L	BDL(D.L-1.0)
17	Fluoride (as F)	APHA 24th Edition 4500 F- D: 2023	mg/L	0.15
18	Manganese (as Mn)	APHA 24th Edition 3500 Mn B: 2023	mg/L	BDL(D.L-0.05)
19	Chemical Oxygen Demand	APHA 24th Edition 5220 B: 2023	mg/L	34.8
20	Bio Chemical Oxygen Demand 3 Days at 27°c	IS 3025 (Part 44): 1993	mg/L	9.2
21	Total Suspended Solids	APHA 24th Edition 2540 D: 2023	mg/L	54
22	Dissolved Oxygen	IS 3025 (Part 38): 1989	mg/L	6.6

Remarks: *Drinking Water Specifications as per IS – 10500:2012. BDL – Below Detectable limit (DL - Detectable limit).

For Shrient Analytical and Research Labs Pvt. Ltd

Verified

Shrient Analytical & Research Labs Pvt. Ltd. Chennai - 45

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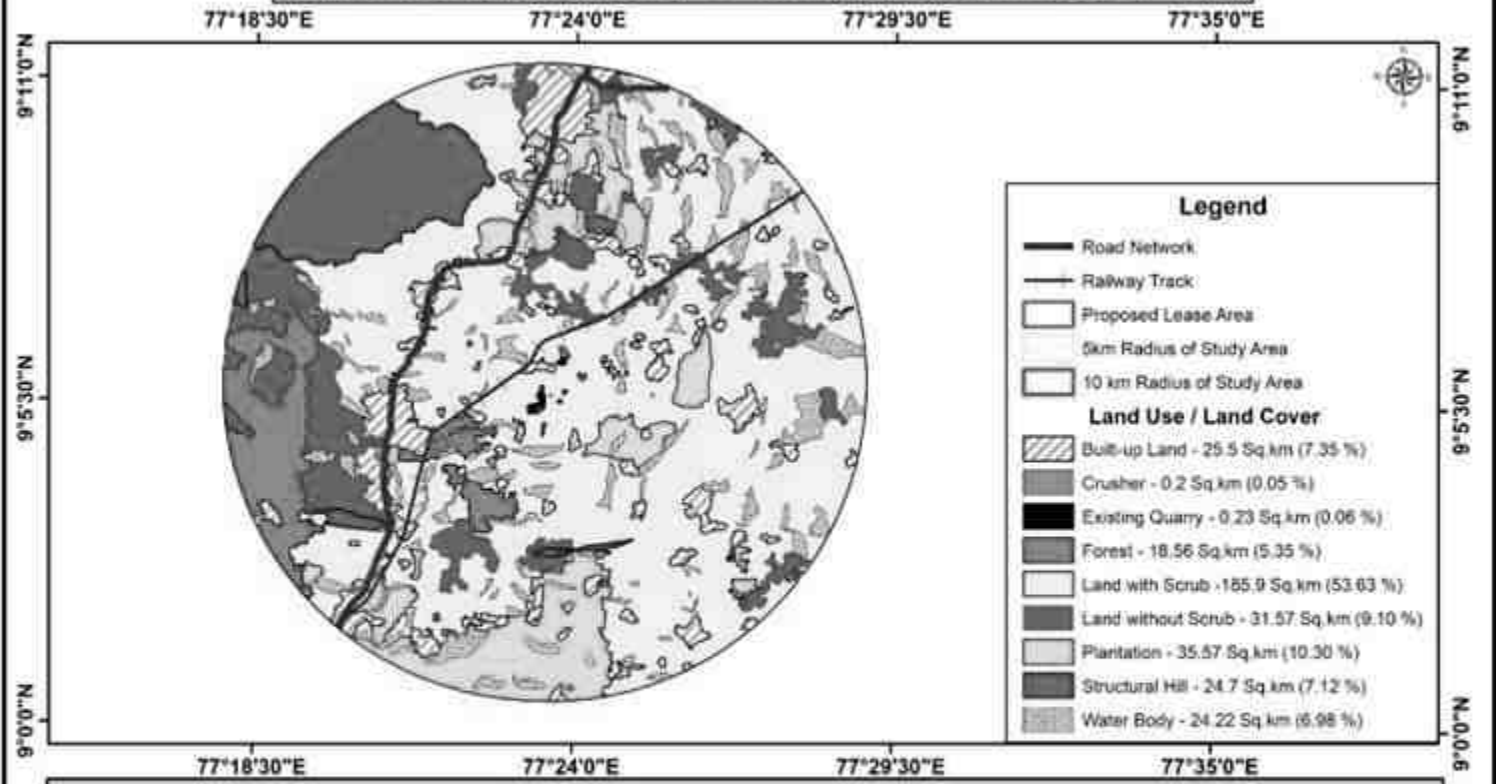
ANNEXURE-11

LAND USE LAND COVER MAP - 10KM RADIUS OF PROJECT AREA



PROPONENT : Thiru.V.M.SUNDARAIAH
S.F.NO : 91 (Part 2)
EXTENT : 3:00:0 Ha,
VILLAGE : ARIYANAYAGIPURAM
TALUK : KADAYANALLUR
DISTRICT : TENKASI

Graphical Scale : 1.50 0.75 0 1.5 3 4.5 6 Kilometers

Software Used : Arcinfo & ArcGIS

Environment Consultant : Global

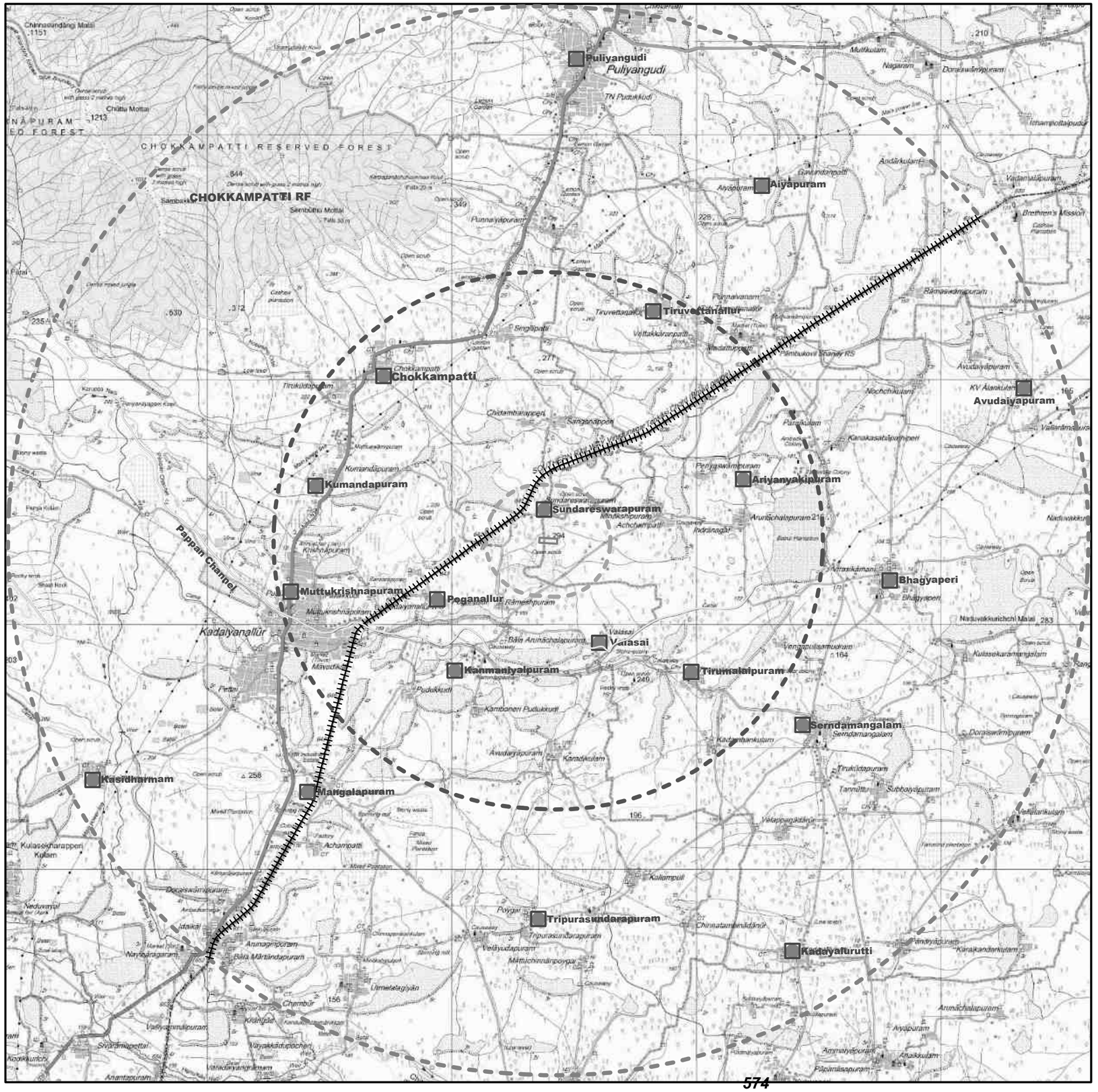
Source : NRSC, Satellite Imagery IRS - P6, Dec 2024

Drafted By | Checked By

FAE - | EIA Coordinator

ANNEXURE-12

PROPOSED ROUGH STONE QUARRY OF THIRU.V.M.SUNDARAIAH OVER AN EXTENT 3.00.0HA LOCATED AT S.F.NO. 91 (PART-2) OF ARIYANAYAGIPURAM VILLAGE, KADAYANALLUR TALUK, TENKASI DISTRICT, TAMIL NADU STATE



INDEX

TOPO SHEET NO:

58 G /08 & 58 H /05

CONVENTIONAL SYMBOLS

Q.L.APPLIED AREA	
10km RADIUS	
5.0km RADIUS	
1.0km RADIUS	
NATIONAL HIGHWAY	
STATE HIGHWAY	
HABITATION	
RAILWAY LINE	
FOREST	
CHANNEL	

Global Mining Solutions

ANNEXURE-13

QUALITY COUNCIL® OF INDIA
Creating an Ecosystem for Quality

National Accreditation Board for Education and Training

Certificate of Accreditation

Global Mining Solutions

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Kottamettupatty, Omalur, Salem, Tamil Nadu-636455

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S. No	Sector Description	Sector (as per)		Cat.
		NABET	MoEFCC	
1	Mining of minerals-opencast mining only	1	1 (a) (i)	A

Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in IAAC minutes dated February 10, 2023, posted on the QCI-NABET website.

The Accreditation shall remain in force subject to continued compliance with the terms and conditions mentioned in QCI-NABET's letter of accreditation bearing no. QCI/NABET/ENV/ACO/23/2724 dated March 31, 2023. The accreditation needs to be renewed before the expiry date by Global Mining Solutions, Salem following the due process of assessment.

Sr. Director, NABET
Date: March 31, 2023

Certificate No.
NABET/EIA/2326/IA 0110

Valid up to
January 4, 2026

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