
**DRAFT ENVIRONMENTAL IMPACT ASSESSMENT
&
ENVIRONMENT MANAGEMENT PLAN**

” B1” CATEGORY – MINOR MINERAL – CLUSTER – NON-FOREST LAND-PATTA LAND

Tmt.K. SANGEETHA ROUGH STONE QUARRY

At

Vadapudur Village, Kinathukadavu Taluk, Coimbatore District

For Obtaining

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

IN CLUSTER OVER AN EXTENT OF 5.55.0 Ha

NAME OF PROPOSED PROJECT PROPONENT

| Code | Proponent Name | Project Location & Extent (Ha) |
|------|--|---|
| P1 | Tmt.K.Sangeetha W/o. Kumaresh, No.13, Nethaji Street, Bagavathipalayam, Kinathukadavu, Coimbatore District – 642109 | 423/2 (P), Vadapudur Village, Kinathukadavu Taluk 2.36.5Ha |

ToR obtained vide

Lr No. SEIAA-TN/F.No.8886/ToR-1116/2022 Dated: 23.03.2022-P1

Environmental Consultant

GEO EXPLORATION AND MINING SOLUTIONS



Old No. 260-B, New No. 17,

Advaitha Ashram Road, Alagapuram,

Salem – 636 004, Tamil Nadu, India



Accredited for sector 1 Category ‘A’, sector 31 Category ‘B’ & 38 Category ‘B’

Certificate No : NABET/EIA/2225/RA 0276 Dated: 20.02.2023

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ENVIRONMENTAL LAB

EHS 360 LABS PRIVATE LIMITED

(Approved by ISO/IEC 17025:2017)

10/2, Ground Floor, 50th Street, 7th Avenue, Ashok Nagar, Chennai – 600 083, Tamil Nadu, India.

Baseline Monitoring Season – Dec 2022 to Feb 2023

JULY 2023

For the easy representation the proposed, existing, abandoned and expired quarries are designated as below –

| PROPOSED QUARRIES | | | | |
|----------------------|-----------------------------------|---|--------------|--|
| CODE | Name of the Proponent and Address | S.F. Nos, Village & Taluk | Extent in Ha | Status |
| P1 | Tmt.K. Sangeetha | 423/2 (P), Vadapudur Village, Kinathukadavu Taluk | 2.36.5 | Obtained ToR vide, Lr No.SEIAA-TN/F.No.8886/ToR-1116/2022 Dated: 23.03.2022 |
| P2 | Thiru.S. Ramesh | 423/1(P) Vadapudur Village, Kinathukadavu Taluk | 1.52.0 | Obtained ToR vide, Lr No.SEIAA-TN/F.No.8463/SEAC/ToR-1008/2021 Dated: 28.07.2021 |
| P3 | Thiru. A.Kandasamy | 424/3, Vadapudur Village, Kinathukadavu Taluk | 1.66.5 | - |
| Total | | | 5.55.0 | |
| EXISTING QUARRIES | | | | |
| CODE | Name of the Proponent and Address | S.F.Nos , Village & Taluk | Extent in Ha | Lease Period |
| NIL | | | | |
| ABANDONED QURRIES | | | | |
| CODE | Name of the Proponent and Address | S.F. Nos, Village & Taluk | Extent in Ha | Lease Period |
| A-1 | Thiru.V.Marimuthu | 131/1C2A, Vadapudur Village, | 1.27.0 | 04.05.1999 to 03.05.2004 |
| Total | | | 1.27.0 | |
| EXPIRED QURRIES | | | | |
| CODE | Name of the Proponent and Address | S.F. Nos, Village & Taluk | Extent in Ha | Lease Period |
| Ex1 | Thiru.K.Ramalinga Gounder | 148/1 (P), Kinathukadavu Taluk | 1.45.0 | 03.03.2016 to 02.03.2021 |
| Total | | | 1.45.0 | |
| TOTAL CLUSTER EXTENT | | | 5.55.0 | |

Note:-

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

As per above notification S.O.2269(E) dated : 01.07.2016 in para (b) in Appendix XI,- (ii)(5): The lease not operative for three years or more and leases which have got environmental clearance as on 15th January, 2016 shall not be counted for calculating the area of cluster, but shall be included in the Environment Management Plan and the Regional Environmental Management Plan”

TERMS OF REFERENCE (ToR) COMPLIANCE

Tmt.K.Sangeetha-P1

“ToR issued vide Lr No.SEIAA-TN/F.No.8886/ToR-1116/2022 Dated: 23.03.2022”

| SPECIFIC CONDITIONS | | |
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| 1 | The Proponent shall carry out the cumulative & comprehensive impact study due to mining operations carried out in the quarry cluster specifically with reference to the 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. | Noted and agreed |
| 2 | The certified existing EC compliance report shall be included in the EIA Report. | Noted and agreed. |
| 3 | The entire Cluster of mine lease area along with green belt shall be video graphe through Drone and submit the same along with EIA report. | Noted and agreed. |
| 4 | If the proponent has already carried out the mining activity in the proposed mining lease area after 15.01.2016. then the proponent shall furnish the following details from AD/DD, mines. a) What was the period of the operation and stoppage of the earlier mines with last work permit issued by the AD/DD mines? b) Quality of minerals mined out. c) Highest production achieved in any one year d) Detail of approved depth of mining. e) Actual depth of the mining achieved earlier' f) Name of the person already mined in that lease area. g) If EC and CTO already obtained, the copy of the same shall be submitted. h) Whether the mining was carried out as per the approved mine plan (or EC if issued) with stipulated benches. | Patta Land (Patta No.116), jointly registered in the name of applicant (Tmt.Sangeetha) and Miss.Ananthavinothini 260m (L) x 82m (W) x 41m Bgl (D) (16m Agl +25m Bgl) Depth 41m bgl (1m topsoil+ 40m Roughstone) |
| 5 | All corner coordinates of the mine lease area, superimposed on a High-Resolution Imagery/Toposheet.Topographicsheet, 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). | Map showing – Project area is with adjacent quarries details is enclosed in Figure No1.1 Project area boundary coordinates superimposed on Toposheet – Figure No. 1.1A Toposheet of the project area covering 10km radius – Figure No. 1.2 Geology map of the project area covering 10km radius - Figure No. 2.11 |
| 6 | The proponent shall furnish photographs of adequate fencing, green belt along the periphery including replantation of existing trees & safety distance between the adjacent quarries & water bodies nearby provided as per the approved mining plan. | Noted and agreed |
| 7 | The Project Proponent shall provide the details of mineral reserves and mineable reserves. planned production capacity, proposed working methodology with justifications. The anticipated | Details of Geological Resources and Proposed reserves are discussed under Chapter No. 2. |

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| | impacts of the mining operations on the surrounding environment and the remedial measures for the same. | |
| 8 | The Project Proponent shall provide the Organization chart indicating the appointment of various statutory officials and other competent persons to be appointed as per the provisions of Mines Act'1952 and the MMR, 1961 for carrying out the quarrying operations scientifically and systematically in order to ensure safety and to protect the environment. | Discussed about Organization chart in Chapter 6 |
| 9 | The Project Proponent shall conduct the hydrogeological study considering the contour map of the water table detailing the number of ground water pumping & open wells. and surface water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) along with the collected water level data for both monsoon and non_monsoon seasons from the PWD /TWAD so as to assess the impacts on the wells due to mining activity. Based on actual monitored data. it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may. be provided. | The hydro-geological study was conducted to evaluate the possible impact on the ground water table. No significant impacts are anticipated on the water bodies around the project area. Details are discussed under Chapter No. 3. |
| 10 | The proponent shall furnish the baseline data for the environmental and ecological parameters with regard to surface water/ground water quality, air quality. soil quality & flora/fauna including traffic /vehicular movement study. | Baseline Data were collected for One Season (Winter Season) Dec2022-Feb2023 as per CPCB Notification and MoEF & CC Guidelines. Details in Chapter No. 3. |
| 11 | A tree survey study shall be carried out (nos., name of the species, age, diameter etc.,) both within the mining lease applied area & 300m buffer zone and its management during mining activity. | Details of the trees in the buffer zone given in Chapter No.3. |
| 12 | A detailed mine closure plan for the proposed project shall be included in EIAEMP report which should be site-specific. | Mine closure plan is detailed in Chapter:4. |
| 13 | The Public hearing advertisement shall be published in one major National daily and one most circulated vernacular daily. | Noted and agreed |
| 14 | The recommendation for the issue of "Terms of Reference" is subjected to the outcome of the Hon'ble NGT, Principal Bench, New Delhi in O.A No.186 of 2016 (M.A.No.35012016) and O.A. No.200/2016 and O.A.No.580/2016 (M.A.No.1182/2016) and O.A.No.10212017 and O.A.No.404/2016 (M.A.No.758/2016, M.A.No.92012016, M.A.No.112212016, M.A.No.1212017 & M.A. No. 843/2017) and O.A.No.40512016 and O.A.No.520 of 2016 (M.A.No.98 I /20 I 6. M.A.No.982 12016 & M.A.No.384/201 7). | Noted and agreed |
| 15 | 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 | It is detailed explained Chpter 4 |
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| | range of indigenous plant species should be planted as given in the appendix in consultation with the DFO, State Agriculture University and local school/college authorities. The plant species with dense/moderate canopy of native origin should be chosen. Species of small/medium/tall trees alternating with shrubs should be planted in a mixed manner. | |
| 16 | Taller/one year old Saplings raised in appropriate size of bags. preferably eco-friendly bags should be planted as per the advice of local forest authorities/botanist/Horticulturist with regard to site specific choices. The proponent shall earmark the greenbelt area with GPS coordinates all along the boundary of the project site with at least 3 meters wide and in between blocks in an organized manner | It is an existing Lease. Around 1180 trees are proposed to plant in lease area. |
| 17 | A Disaster management Plan shall be prepared and included in the EIA/EMP Report. | Disaster management Plan details in Chapter-7 |
| 18 | A Risk Assessment and management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period. | A Risk Assessment and management Plan Chapter-7 |
| 19 | The Socio-economic studies should be carried out within a 5 km buffer zone from the mining activity. Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible. quantitative dimensions may be given with time frames for implementation. | Details are listed in Chapter:3. |
| 20 | If any quarrying operations were carried out in the proposed quarrying site for which now the EC is sought. the Project Proponent shall furnish the detailed compliance to EC conditions given in the previous EC with the site photographs which shall duly be certified by MoEF&CC, Regional Office, Chennai (or) the concerned DEE/TNPCC. | It is an existing Lease |
| 21 | Concealing any factual information or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this Terms of Conditions besides attracting penal provisions in the Environment (protection) Act. 1986. | Noted and agreed |
| ADDITIONAL CONDITIONS | | |
| 1. | As per the MoEF& CP 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. | Noted, this is only Draft EIA report to submit PCB. Then after PH will be furnished this final EIA report. |
| 2 | 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 | It is detailed explained Chapter 4 |

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| | reduction including control of other emission and climate mitigation activities. | |
| 3 | The Environmental Impact Assessment should study the biodiversity, the natural ecosystem, the soil micro flora, fauna and soil seed banks and suggest measures to maintain the natural Ecosystem. | Details of the Biodiversity and Ecology in the Core and buffer zone given in Chapter No.3. |
| 4 | Action should specifically suggest for sustainable management of the area and restoration of ecosystem for flow of goods and services. | Details of the Biodiversity and Ecology in the Core and buffer zone given in Chapter No.3. |
| 5 | The project proponent shall study impact on fish habitats and the food WEB/ food chain in the water body and Reservoir. | Impact on Aquatic Biodiversity details in chapter 4 |
| 6 | The Terms of Reference should specifically study impact on soil health, soil erosion, the soil physical, chemical components and microbial components. | Details of the Soil environment is given core and buffer zone details in Chapter No.3. |
| 7 | The Environmental Impact Assessment should study impact on forest, vegetation, endemic, vulnerable and endangered iridigenous flora and farma. | Details of the Biodiversity and Ecology in the Core and buffer zone given in Chapter No.3. |
| 8 | The Environmental Impact Assessment should study impact on standing trees and the existing trees should be nuinbered and action suggested for protection. | Details of the Biodiversity and Ecology in the Core and buffer zone given in Chapter No.3. |
| 9 | The Environmental Impact Assessment should study on wetlands, water bodies, rivers streams, lakes and farmer sites | Details of the Water environment in the Core and buffer zone given in Chapter No.3. |
| 10 | The Environmental Impact Assessment should hold detailed study on EMP with budget for, Green belt development and mine closure plan including disaster management plan. | Disaster management Plan details in Chapter-7 and detailed study on EMP with budget in chapter 10 |
| 11 | The Environmental Impact Assessment should study impact on climate change, temperature rise, pollution and above soil & below soil carbon stock. | Details of the Soil environment is given core and buffer zone details in Chapter No.3. and Chapter – 6: Environmental Monitoring Programme |
| 12 | The Environmental Impact Assessment should study impact on protected areas, Reserve Forests. National Parks, Corridors and Wildlife pathways, near project site. | Details of the Land environment given Details of Environment Sensitivity Around the Project Area in Chapter No.3. |
| 13 | The project proponent shall study and furnish the impact of project on plantations in patta lands, Horticultwe, Agriculture and livestock. | Not Applicable. There is no Forest Land involved in the proposed project area. The proposed project area is a Patta land. Approved Mining Plan is enclosed as Annexure Volume 1. |
| 14 | The project proponent shall study and furnish the details on potential fragmentation impact of natural environment by the activities. | Datail explained in chapter- 4 |
| 15 | The project toponent 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 possibie land form changes visual and aesthetic impacts. | Details of the Land environment given Details of Environment Sensitivity Around the Project Area in Chapter No.3. |

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| 16 | The project proponent shall study and furnish the possible pollution due to plastic and microplastic on the environment. The ecological risks and impacts of plastic & microplastics on aquatic environment and fresh water systems due to activities. contemplated during mining may be investigated and reported. | Details of the Plastic and Microplastic on the environment given Details Project Area in details in Chapter No.7 |
| 17 | The project proponent shall detail study on impact of mining on Reserve forests free ranging wildlife. | Not Applicable. There is no Forest Land involved in the proposed project area. The proposed project area is a Patta land. Approved Mining Plan is enclosed as Annexure Volume 1. |
| STANDARD TERMS OF REFERENCE | | |
| 1 | Year-wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification 1994 came into force, w.r.t. the highest production achieved prior to 1994. | Not applicable. This is Not a violation category project. This proposal falls under B1 Category. |
| 2 | A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given. | The applied land for quarrying is a Patta Land. Document is enclosed along with Approved Mining Plan as Annexure Volume 1. |
| 3 | All documents including approved mine plan, EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee. | Noted & agreed. |
| 4 | All corner coordinates of the mine lease area, superimposed on a High-Resolution Imagery/toposheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone). | Map showing – Project area is with adjacent quarries details is enclosed in Figure No1.1 Project area boundary coordinates superimposed on Toposheet – Figure No. 1.1A Toposheet of the project area covering 10km radius – Figure No. 1.2 Geology map of the project area covering 10km radius - Figure No. 2.11 |
| 5 | Information should be provided in Survey of India Toposheet in 1:50,000 scale indicating geological map of the area, geomorphology of land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics. | Map showing – Geology map of the project area covering 10km radius - Figure No. 2.11 Geomorphological features are incorporated in the Toposheet map covering 10km radius around the project area Figure No. 2.12 |
| 6 | Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority. | The applied area was inspected by the officers of Department of Geology along with revenue officials and found that the land is fit for quarrying under the policy of State Government. |
| 7 | It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating process/procedures to bring into focus any | The proponent has framed their Environmental Policy and the same is discussed in the Chapter No 10.1. |

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| | infringement/deviation/ violation of the environmental or forest norms/conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large, may also be detailed in the EIA Report. | |
| 8 | Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided. | It is an opencast quarrying operation proposed to operate in Mechanized method. The rough stone formation is a hard, compact and homogeneous body. The height and width of the bench will be maintained as 5m with 90 ⁰ bench angles. Quarrying activities will be carried out under the supervision of Competent Persons like Mines Manager, Mines Foreman and Mining Mate. Necessary permissions will be obtained from DGMS after obtaining Environmental Clearance. |
| 9 | The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc., should be for the life of the mine / lease period. | Noted & agreed. The study area considered for this study is 10 km radius and all data contained in the EIA report such as waste generation etc., is for the Life of the Mine / lease period. |
| 10 | Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given. | Land use and land cover of the study area is discussed in Chapter No. 3. Land use plan of the project area showing pre-operational, operational and post-operational phases are discussed in Chapter No. 2, Table No 2.3 |
| 11 | Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given | Not Applicable. There is no waste anticipated during this quarry operation. The entire quarried out Rough stone will be transported to the needy customers. No Dumps is proposed outside the lease area. |
| 12 | A Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees. | Not Applicable. There is no Forest Land involved in the proposed project area. The proposed project area is a Patta land. Approved Mining Plan is enclosed as Annexure Volume 1. |
| 13 | Status of forestry clearance for the broken-up area and virgin forestland involved in the Project including deposition of net present value (NPV) | Not Applicable. The proposed project area does not involve any Forest Land. |

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| | 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. | Not Applicable. The project doesn't attract Recognition of Forest Rights Act, 2006. |
| 15 | The vegetation in the RF / PF areas in the study area, with necessary details, should be given. | No Reserve Forest within the Study Area. |
| 16 | A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly, detailed mitigative measures required, should be worked out with cost implications and submitted. | Not Applicable. There are No National Parks, Biosphere Reserves, Wildlife Corridors, and Tiger/Elephant Reserves within 10 km Radius from the periphery of the project area. |
| 17 | Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves (existing as well as proposed), if any, within 10 KM of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished | Not Applicable. There are No National Parks, Biosphere Reserves, Wildlife Corridors, and Tiger/Elephant Reserves within 10 km Radius from the periphery of the project area. |
| 18 | A detailed biological study of the study area core zone and buffer zone (10 KM radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled-I fauna found in the study area, the necessary plan along with budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost. | Detailed biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] was carried out and discussed under Chapter No. 3. There is no schedule I species of animals observed within study area as per Wildlife Protection Act 1972 as well as no species is in vulnerable, endangered or threatened category as per IUCN. There is no endangered red list species found in the study area. |
| 19 | Proximity to Areas declared as 'Critically Polluted' or the Project areas likely to come under the 'Aravalli Range', (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Department should be secured and furnished to the effect that the proposed mining activities could be considered. | Not Applicable. Project area / Study area is not declared in 'Critically Polluted' Area and does not come under 'Aravalli Range'. |
| 20 | Similarly, for coastal Projects, A CRZ map duly authenticated by one of the authorized agencies demarcating LTL, HTL, CRZ area, location of the mine lease w.r.t CRZ, coastal features such as mangroves, if any, should be furnished. (Note: | Not Applicable. The project doesn't attract The C. R. Z. Notification, 2018. |

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| | 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. | Not Applicable. There are no approved habitations within a radius of 300 meters. Therefore, R&R Plan / Compensation details for the Project Affected People (PAP) is not anticipated and Not Applicable for this project. |
| 22 | One season (non-monsoon) [i.e. March-May (Summer Season); October-December (post monsoon season); December-February (winter season)]primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM10, particularly for free silica, should be given. | Baseline Data were collected for Winter Season (Dec 2022-Feb 2023) as per CPCB Notification and MoEF & CC Guidelines. Details in Chapter No. 3. |
| 23 | Air quality modelling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of mineral. The details of the model used and input parameters used for modelling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map. | Air Quality Modelling for prediction of incremental GLC's of pollutant was carried out using AERMOD view 9.6.1 Model. Details in Chapter No. 4, |
| 24 | The water requirement for the Project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the Project should be indicated. | Total Water Requirement for this project is given in the chapter No 2, Table No 2.13. |

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| 25 | Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided. | Water for dust suppression, greenbelt development and domestic use will be obtained from accumulated rainwater/seepage water in mine pits. Drinking water will be sourced from the approved water vendors, No 2, Table No 2.13. |
| 26 | Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided. | The rain water collected in the pits after spell of rain will be used for greenbelt development and dust suppression. |
| 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 Quality discussed in Chapter No. 4. |
| 28 | Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. The Report inter-alia, shall include details of the aquifers present and impact of mining activities on these aquifers. Necessary permission from Central Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished. | The ground water table is at 65-60m below ground level. The ultimate depth of this projects is 41-47m from the general ground profile. Maximum depth is proposed in this cumulative EIA project is 47m. It is inferred the quarrying activities in the Cumulative EIA project (Quarries) will not intersect the Ground water table. |
| 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. | Highest elevation of the project area is 400m AMSL Ultimate depth of the mine is 37m AMSL Water level in the area is 70m BGL to 65m BGL |
| 30 | Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and BGL. A schematic diagram may also be provided for the same. | Progressive greenbelt development plan has been prepared and discussed along with Recommended Species details are given in the Chapter 4, Table No.4.9 . |
| 31 | A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution. | Traffic density survey was carried out to analyse the impact of Transportation in the study area as per IRC guidelines 1961 and it is inferred that there is no much significant impact due to the proposed transportation from the project area. Details in Chapter 2. |
| 32 | Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those outside the Project area) should be worked out, indicating whether it | 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. . |

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| | 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. | Discussed in chapter No 2. |
| 34 | Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report. | Details in Chapter 10. |
| 35 | Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed. | Details in Chapter 10. |
| 36 | Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations. | Details in Chapter 4,. |
| 37 | Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation. | Environment Management Plan Chapter 10. |
| 38 | Detailed environmental management plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project. | The outcome of public hearing will be updated in the final EIA/EMP report |
| 39 | Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project. | No litigation is pending in any court against this project. |
| 40 | Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given. | The proposed capital cost for Environmental Monitoring Programme is Rs 7,60,000/- Details in Chapter 6. |
| 41 | The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out. | Details in Chapter 10. |
| 42 | A Disaster management Plan shall be prepared and included in the EIA/EMP Report. | Details in Chapter 7. |
| 43 | Benefits of the Project if the Project is implemented should be spelt out. The benefits of | Details in Chapter.8. |

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| | 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 | Encloses as separate volume |
| B | All documents to be properly referenced with index and continuous page numbering. | All the documents are properly referenced with index and continuous page numbering. |
| C | Where data are presented in the Report especially in Tables, the period in which the data were collected and the sources should be indicated. | List of Tables and source of the data collected are given properly. |
| D | Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF & CC / NABL accredited laboratories. All the original analysis/testing reports should be available during appraisal of the Project | Baseline monitoring reports are enclosed |
| E | Where the documents provided are in a language other than English, an English translation should be provided. | Not Applicable. |
| F | The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted. | Will be enclosed along with Final EIA /EMP Report. |
| G | While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF & CC vide O.M. No. J-11013/41/2006-IA. II(I) Dated: 4th August, 2009, which are available on the website of this Ministry, should be followed. | Instructions issued by MoEF & CC O.M. No. J-11013/41/2006-IA. II (I) Dated: 4th August, 2009 are followed. |
| H | Changes, if any made in the basic scope and project parameters (as submitted in Form-I and the PFR for securing the TOR) should be brought to the attention of MoEF & CC with reasons for such changes and permission should be sought, as the TOR may also have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH again with the revised documentation | Noted & agreed. |
| I | As per the circular no. J-11011/618/2010-IA. II(I) Dated: 30.5.2012, certified report of the status of compliance of the conditions stipulated in the environment clearance for the existing operations of the project, should be obtained from the Regional Office of Ministry of Environment, Forest and Climate Change, as may be applicable. | Not applicable. |
| J | The EIA report should also include (i) surface plan of the area indicating contours of main topographic features, drainage and mining area, (ii) geological maps and sections and (iii) sections of the mine pit and external dumps, if any, clearly showing the land features of the adjoining area. | Surface Plan – Figure No. 2.2. Geological Plan – Figure No 2.9. Working Plan – Figure No 2.9. Closure Plan – Figure No.2.10. |

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CHAPTER – 1: INTRODUCTION

1.0 *Preamble*

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

Rough Stone are the major requirements for construction industry. This Draft EIA/EMP report is prepared by Proposed quarry of Tmt.K. Sangeetha Rough Stone Quarry (2.36.5Ha) in Vadapudur Village, Kinathukadavu Taluk Coimbatore District and Tamil Nadu State, cluster area calculated as per MoEF & CC Notification S.O. 2269(E) Dated 1st July 2016.

This EIA Report is prepared in compliance with ToR obtained for the below proposals in Table 1.1 and the Baseline Monitoring study has been carried out during the period of Dec2022-Feb 2023.

TABLE 1.1: ToR OBTAINED PROJECT

| Code | Name of the proponent | Extent (Ha) | Terms of Reference (ToR) |
|------|-----------------------|-------------|--|
| P1 | Tmt.K. Sangeetha | 2.36.5 | Lr No. SEIAA-TN/F.No.8886/ToR-1116 /2022 Dated: 23.03.2022 |

Source: ToR Letter's of the respective project proponents

1.1 *Purpose of the report*

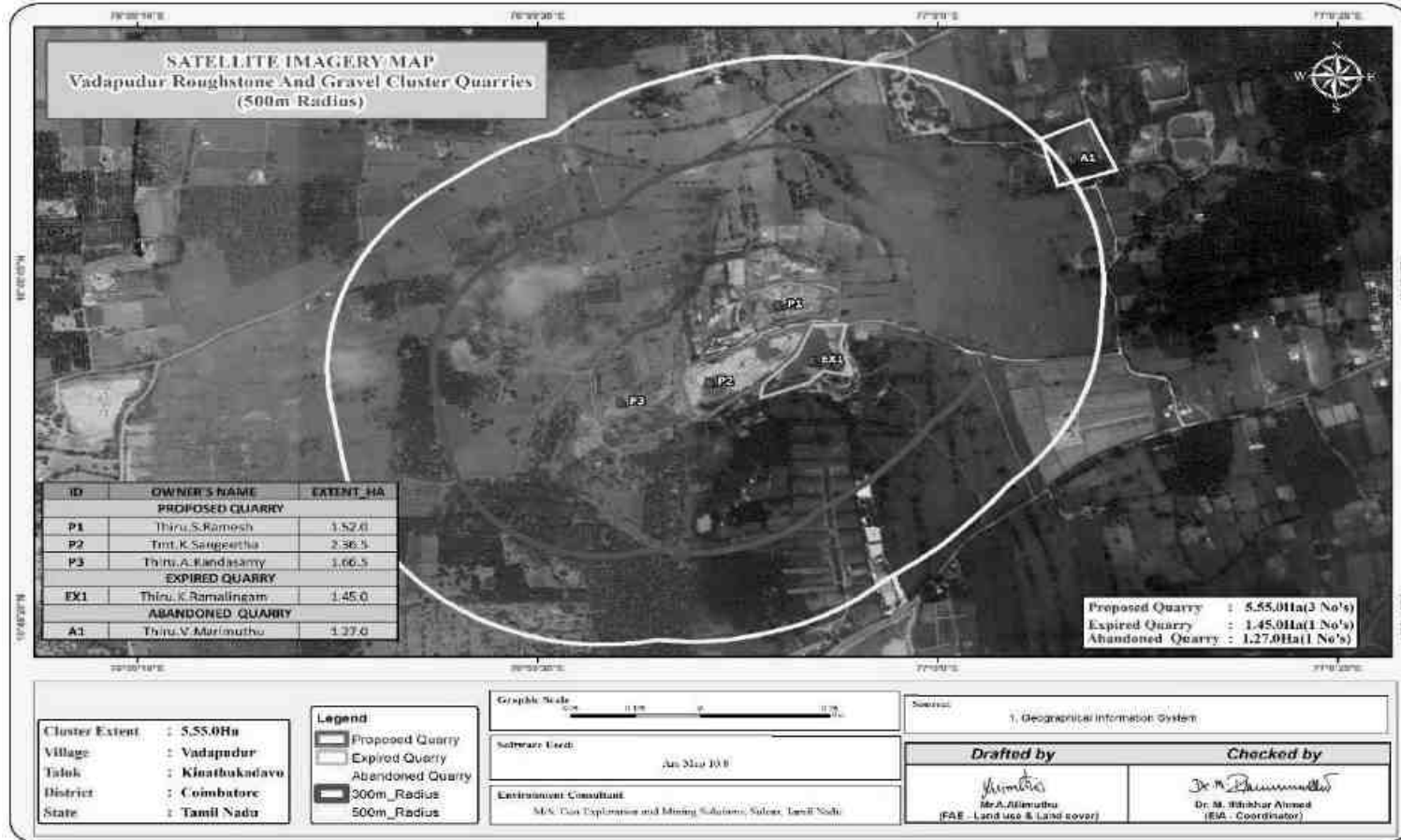
The Ministry of Environment and Forests, Govt. of India, through its EIA notification S.O. 1533(E) of 14th September 2006 and its subsequent amendments as per Gazette Notification S.O. 3977 (E) of 14th August 2018, Mining Projects are classified under two categories i.e. A (> 100 Ha) and B (\leq 100 Ha), and Schematic Presentation of Requirements on Environmental Clearance of Minor Minerals including cluster situation in Appendix – XI.

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

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

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

Figure 1.1. Satellite Imagery of Cluster quarries



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

Note: As per above notification S.O.2269(E) dated : 01.07.2016 in para (b) in Appendix XI, - (i)(6) A cluster shall be formed when the distance between the peripheries of one lease is less than 500 meters from the periphery of other lease in a homogeneous mineral area which shall be applicable to the mine lease or quarry licenses granted on and after 9th September, 2013

1.2 Identification of Project and Project Proponent

1.2.1 Identification of Project

The project areas in the cluster are Patta Land, no forest land is involved

TABLE 1.2: PROPOSED PROJECTS IN THE PROJECT AREA

| Description | P1 |
|---------------------|--|
| Name of the Project | Tmt.K. Sangeetha Rough stone quarry |
| S.F. No. | 423/2 (P), |
| Extent | 2.36.5 Ha |
| Village, Taluk | Vadapudur Village, Kinathukadavu Taluk |
| District | Coimbatore District |

Source: Approved Mining Plan

1.2.2 Identification of Project Proponent

TABLE 1.3: DETAILS OF PROJECT PROPONENT

| PROPOSAL -P1 | |
|---------------------|---|
| Name of the Company | Tmt.K. Sangeetha |
| Address | W/o. Kumaresh, No.13, Nethaji Street, Bagavathipalayam, Kinathukadavu, Coimbatore District – 642109 |
| Mobile | +91 98423 76783 |
| Status | Proprietor (Individual) |

Source: Approved Mining Plan of the respective projects

1.3 Brief description of the project

1.3.1 Nature and size of the Project

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

TABLE 1.4: SALIENT FEATURES OF THE PROPOSED PROJECT

| SALIENT FEATURES OF PROPOSAL "P1" | |
|-----------------------------------|---|
| Name of the Mine | Tmt.K. Sangeetha, Roughstone quarry |
| Land Type | Patta Land (Patta No.116), jointly registered in the name of applicant (Tmt.Sangeetha) and Miss.Ananthavinothini |
| S.F. No. | 423/2 (P), |
| Extent | 2.36.5 Ha |
| Previous quarry operation details | <p>Operated by</p> <ul style="list-style-type: none"> ☞ The quarry lease was previously granted in the favour of Tmt.K. Sangeetha, over an extent of 3.78.0hectares vide Rc.No.312/Mines/2015, Dated: 23.09.2016for the period of five years from 23.09.2016 to 22.09.2021 ☞ the applicant has obtained Environmental Clearance from the SEIAA, Tamil Nadu vide Lr. No. SEIAA-TN/F.No.3857/1(a)/ECNo.3397/2015, Dated: 25.07.2016for quarrying of Rough stone ☞ The applicant has once again applied a quarry lease on 19.10.2020, over an extent of 2.36.5hectares of Patta land in S.F.No.423/2 (P) of |

FIG1.1A KEY MAP SHOWING THE LOCATION OF THE PROJECT SITE

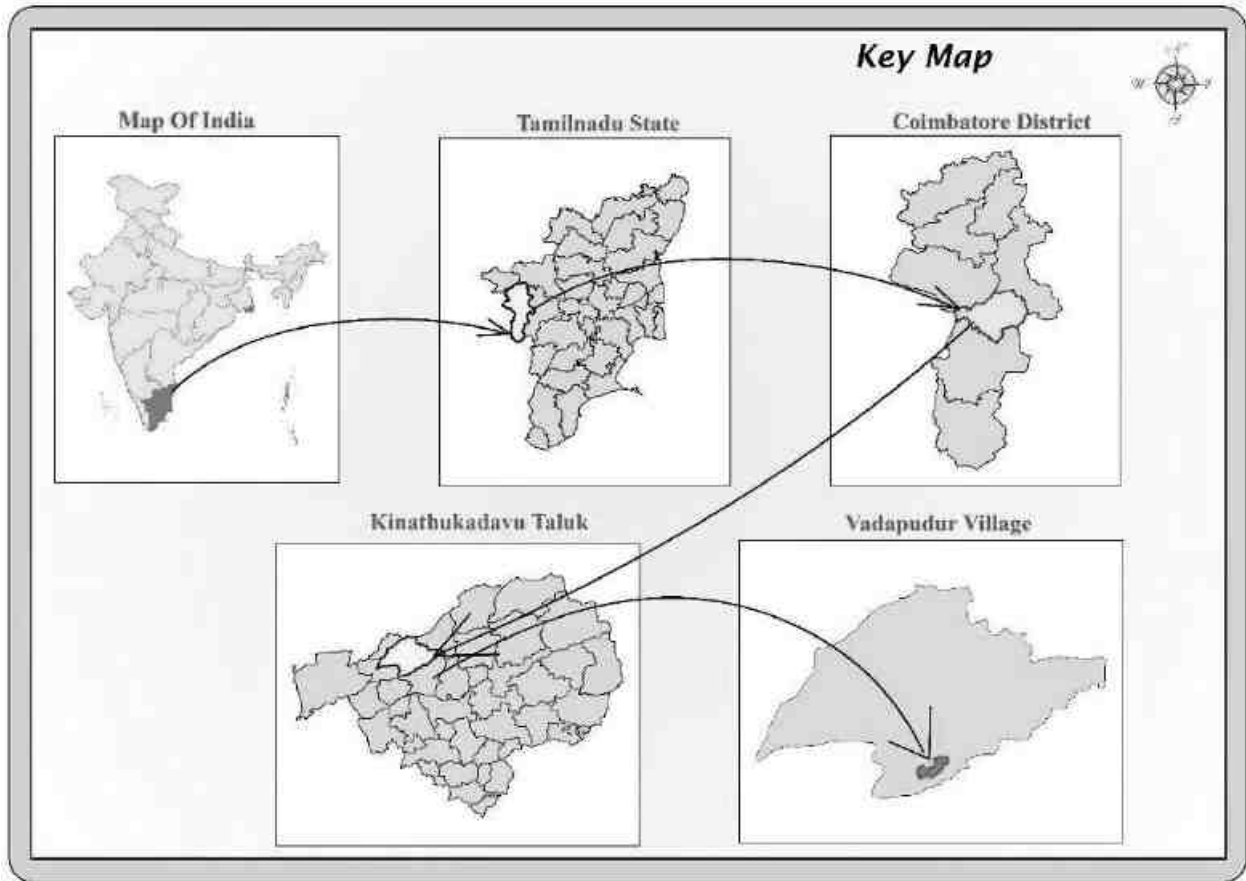
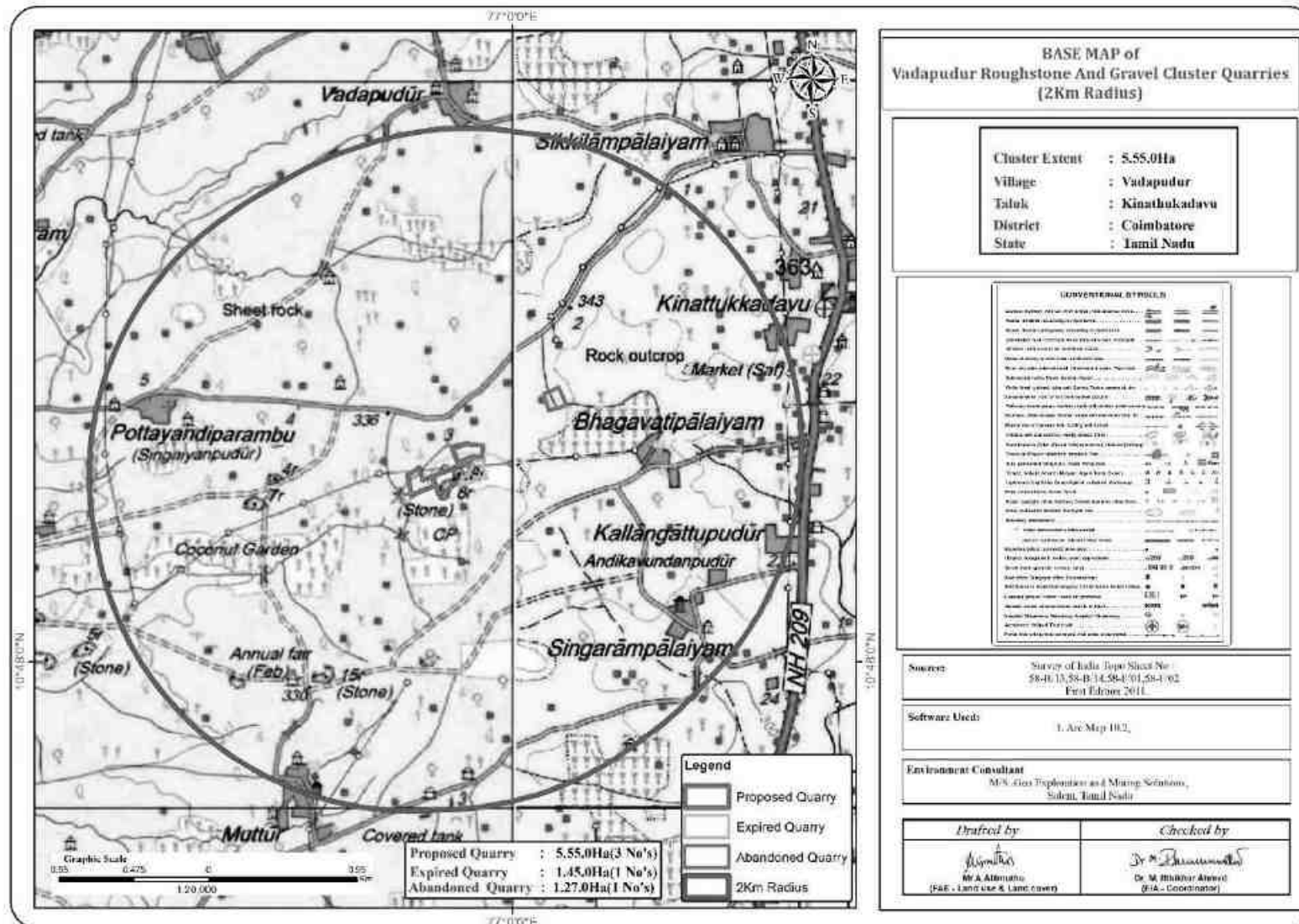


FIGURE 1.2: TOPOSHEET SHOWING LOCATION OF THE PROJECT SITE AROUND 2 KM RADIUS



1.4 Environmental Clearance

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

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

SCREENING –

Project -P1

- The proponent applied for Rough Stone Quarry Lease Date from 19.10.2020
- The precise area communication letter was received from the Assistant Director, Department of Geology and Mining, Coimbatore District vide Rc.No.764/Mines/2020, Dated: 03.08.2021.
- The Mining plan was approved by the Assistant Director, Department of Geology and Mining, Coimbatore vide Rc.No. 764/Mines/2020 Dated: 22.09.2021.
- Proponent applied for ToR for Environmental Clearance vides online Proposal No. SIA/TN/MIN/69057/2021, Dated:11.11.2021

SCOPING –

Project -P1

- The proposal was placed in 251st SEAC meeting held on 04.03.2022 and the committee recommended for issue of ToR.
- The proposal was considered in 495th SEIAA meeting held on 23.03.2022 and issued ToR vide Letter No Lr No. SEIAA-TN/F.No.8886/ToR-1116/2022 Dated: 23.03.2022

Public Consultation –

Application to the Member Secretary of the Tamil Nadu Pollution Control Board (TNPCB) to conduct Public Hearing in a systematic, time bound and transparent manner ensuring widest possible public participation at the project site or in its close proximity in the district is submitted along with this Draft EIA/ EMP Report and the outcome of public hearing proceedings will be detailed in the Final EIA/EMP Report.

Appraisal –

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

The report has been prepared using the following references:

- Guidance Manual of Environmental Impact Assessment for Mining of Minerals, Ministry of Environment and Forests, 2010
- EIA Notification, 14th September, 2006
 - **ToR vide Letter No Lr No. SEIAA-TN/F.No.8886/ToR-1116/2022 Dated: 23.03.2022-P1**
- Approved Mining of the Rough stone quarry projects

1.5 Post Environment Clearance Monitoring

The Project Proponents in the Cluster will submit a half-yearly compliance report in respect of stipulated Environmental Clearance terms and conditions to MoEF & CC Regional Office & SEIAA after grant of EC on 1st June and 1st December of every year.

1.6 Generic Structure of EIA Document

The overall contents of the EIA report follow the list of contents prescribed in the EIA Notification 2006 and the “Environmental Impact Assessment Guidance Manual for Mining of Minerals” published by MoEF & CC. A brief description of each Chapter is presented in Table No. 1.5.

TABLE 1.5 – STRUCTURE OF THE EIA REPORT

| S. No | Chapters | Title | Particulars |
|-------|------------|---|--|
| 1 | Chapter 1 | Introduction | Presents, an Introduction along with Scope and Objective of this EIA/EMP Studies |
| 2 | Chapter 2 | Project Description | Presents the Technical Details of the Project |
| 3 | Chapter 3 | Description of Environment | Presents the Baseline Status for various Environmental Parameters in the Study Area for One Season (3 Months) |
| 4 | Chapter 4 | Anticipated Environmental Impacts and Mitigation Measures | Presents the Identification, Prediction and Evaluation of overall Environmental Impacts due to the Proposed Projects Activities. Also presents Proposed Mitigation Measures. |
| 5 | Chapter 5 | Analysis of Alternatives (Technology & Site) | Presents Analysis of alternatives with respect to site |
| 6 | Chapter 6 | Environment Monitoring Programme | Present details of post project environment monitoring |
| 7 | Chapter 7 | Additional Studies | Presents Public Consultation, Risk Assessment and Disaster Management Plan |
| 8 | Chapter 8 | Project Benefits | Presents project benefits as: Improvements in the Physical Infrastructure, Social Infrastructure Employment Potential –Skilled; Semi-Skilled and Unskilled etc., |
| 9 | Chapter 9 | Cost Benefit Analysis | Environmental Cost Benefit Analysis has not been recommended at Scoping Stage – thus no analysis carried out separately in this EIA/EMP Report |
| 10 | Chapter 10 | Environmental Management Plan | Description of the administrative aspects to ensure the Mitigation Measures are implemented and their effectiveness monitored, after approval of the project. |
| 11 | Chapter 11 | Summary & Conclusion | Summary of the EIA Report |
| 12 | Chapter 12 | Disclosure of Consultants Engaged | Disclosure of the Consultants |

1.7 Scope of the Study

The main scope of the EIA study is to quantify the cumulative impact in the study area due to cluster quarries and formulate the effective mitigation measures for each individual leases. A detailed account of the emission sources, emissions control equipment, background Air quality levels, Meteorological measurements, Dispersion model and all other aspects of pollution like effluent discharge, Dust generation etc., have been discussed in this report. The baseline monitoring study has been carried out during the Winter season (Dec 2022 –Feb 2023) for various environmental components so as to assess the anticipated impacts of the cluster quarry projects on the environment and suggest suitable mitigation measures for likely adverse impacts due to the proposed project.

TABLE 1.6 – ENVIRONMENT ATTRIBUTES

| Sl.No. | Attributes | Parameters | Source and Frequency |
|--------|---------------------|--|--|
| 1 | Ambient Air Quality | PM ₁₀ , PM _{2.5} , SO ₂ , NO ₂ | 24 hourly samples twice a week for three months at 8 locations |
| 2 | Meteorology | Wind speed and direction, temperature, relative humidity and rainfall | Near project site continuous for three months with hourly recording and from |

| | | | |
|----|--|--|---|
| | | | secondary sources of IMD station, Coimbatore |
| 3 | Water quality | Physical, Chemical and Bacteriological parameters | Grab samples were collected at 5 ground water and 1 surface water locations once during study period. |
| 4 | Ecology | Existing terrestrial and aquatic flora and fauna within 10 km radius circle. | Limited primary survey and secondary data was collected from the Forest department. |
| 5 | Noise levels | Noise levels in dB(A) | At 8 locations data monitored once for 24 hours during EIA study. |
| 6 | Soil Characteristics | Physical and Chemical Parameters | Once at 6 locations during study period |
| 7 | Land use | Existing land use for different categories | Based on Survey of India topographical sheet and satellite imagery and primary survey. |
| 8 | Socio-Economic Aspects | Socio-economic and demographic characteristics, worker characteristics | Based on primary survey and secondary sources data like census of India 2011. |
| 9 | Hydrology | Drainage pattern of the area, nature of streams, aquifer characteristics, recharge and discharge areas | Based on data collected from secondary sources as well as hydro-geology study report prepared. |
| 10 | Risk assessment and Disaster Management Plan | Identify areas where disaster can occur by fires and explosions and release of toxic substances | Based on the findings of Risk assessment done for the mining associated activities |

Source: Field Monitoring Data

The data has been collected as per the requirement of the ToR issued by SEIAA – TN and Standard ToR Published by MoEF & CC.

1.7.1 Regulatory Compliance & Applicable Laws/Regulations

- Application for Quarrying Lease as per Tamil Nadu Minor Mineral Concession Rules, 1959
- Obtained Precise Area Communication Letter as per Tamil Nadu Minor Mineral Concession Rules, 1959 for Preparation of Mining Plan and obtaining Environmental Clearance
- The Mining Plan of Rough Stone quarry has been approved under Rule 41 & 42 as amended of Tamil Nadu Minor Mineral Concession Rules, 1959
- ToR from SEIAA –
- **ToR vide Letter No Lr No. SEIAA-TN/F.No.8886/ToR-1116/2022 Dated: 23.03.2022-P1**
- Approved Mining of P1 to P2 the Rough stone quarry project.

CHAPTER – 2: PROJECT DESCRIPTION

2.0 General

The Proposed Rough Stone Quarry require Environmental Clearance. There are three proposed quarries forming a cluster; calculated as per MoEF & CC Notification S.O. 2269(E) Dated 1st July 2016 and the total extent of cluster is 5.55.0ha.

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

2.1 Description of the Project

The proposed projects are site specific and there is no additional area required for this project. There is no effluent generation/discharge from the proposed quarries.

Method is mining is common for all the proposed quarries in the cluster. Rough stone are proposed to be excavated by opencast mechanized method involving splitting of rock mass of considerable volume from the parent rock mass by jackhammer drilling and blasting, hydraulic excavators are used for loading the Rough stone from pithead to the needy crushers and rock breakers to avoid secondary blasting.

2.2 Location of the Project

- Located in Vadapudur Village, Kinathukadavu Taluk, Coimbatore District, Tamil Nadu State.
- The project falls in Toposheet No: 58 B/13.
- The cluster areas fall in the Latitude between 10°48'41.11"N to 10°48'45.03"N and Longitude between 76°59'43.58"E to 76°59'52.08"E
- The projects under the cluster are classified as patta land (Non-Forest Land) & does not fall within 10 km radius of any Eco – sensitive zone, Wild life Sanctuary, National Park, Tiger Reserve, Elephant Corridor and Biosphere Reserves.

TABLE 2.1: SITE CONNECTIVITY TO THE PROJECT AREA

| | |
|-----------------|--|
| Nearest Roadway | NH 83 - Coimbatore -Pollachi Road -2.0km-E SH26 - Nattukal-Velamthavalam Road – 12.0km-NW MD165- Kinathukadavu-Kattampatti Road-4km-NE |
| Nearest Village | Bhagavathipalayam – 1.0Km- E |
| Nearest Town | Kinathukadavu – 2.2Km – NE |
| Nearest Railway | Kinathukadavu Railway station – 4Km - NE |
| Nearest Airport | Coimbatore Airport – 24Km - NE |
| Seaport | Kochi- 127Km-SW |

Source: Survey of India Toposheet

The cluster quarries corners co-ordinates are given below.

TABLE 2.2 – BOUNDARY CO-ORDINATES OF PROPOSED PROJECTS

| Proposed Quarries-P1 | | |
|-----------------------------|-----------------|------------------|
| S.No. | Latitude | Longitude |
| 1 | 10°48'34.52"N | 76°59'44.73"E |
| 2 | 10°48'38.25"N | 76°59'43.58"E |
| 3 | 10°48'41.61"N | 76°59'52.08"E |
| 4 | 10°48'39.33"N | 76°59'51.08"E |
| 5 | 10°48'37.59"N | 76°59'49.40"E |
| 6 | 10°48'35.38"N | 76°59'46.28"E |
| 7 | 10°48'34.71"N | 76°59'45.52"E |

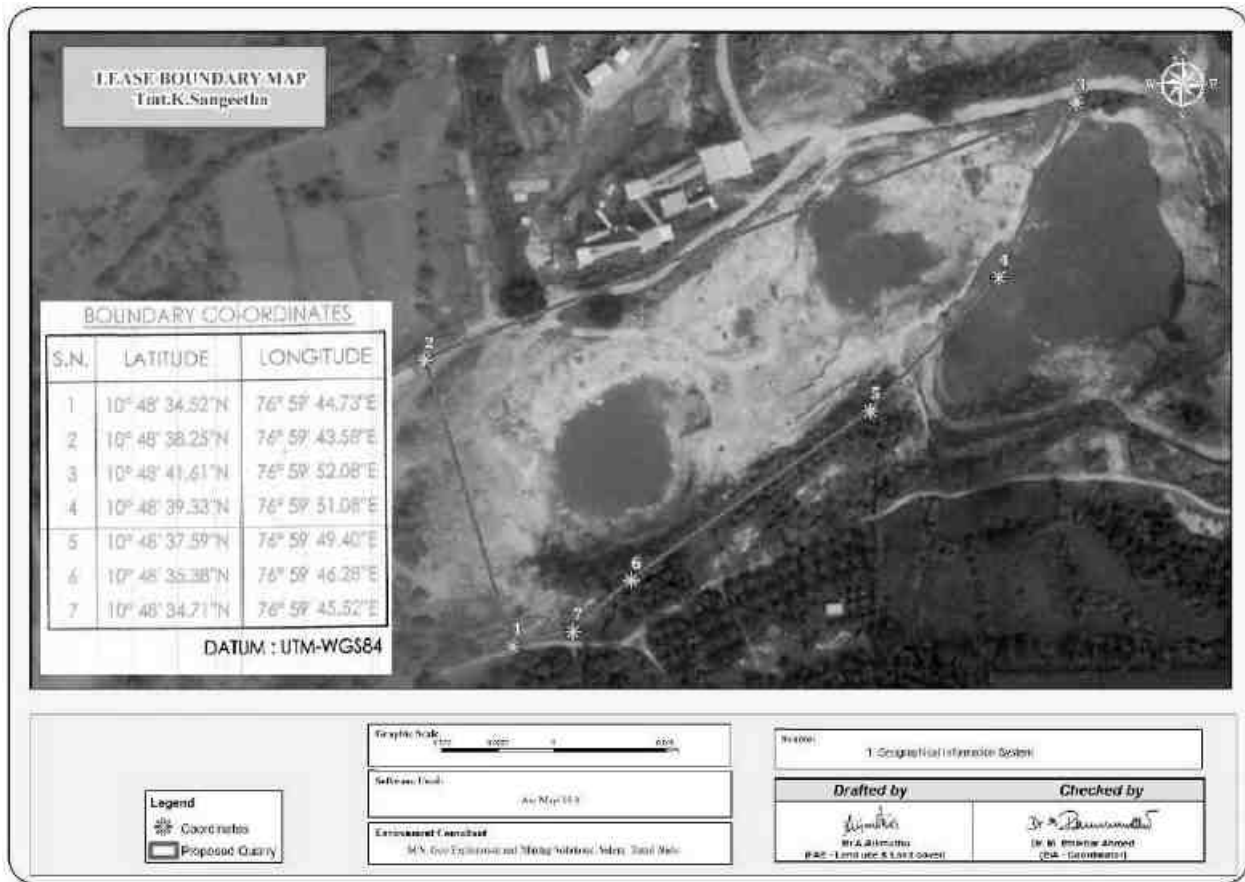
Source: Quarry Lease Plan of the respective proposals

FIGURE 2.1: TOPOGRAPHICAL VIEW OF THE PROJECT SITE



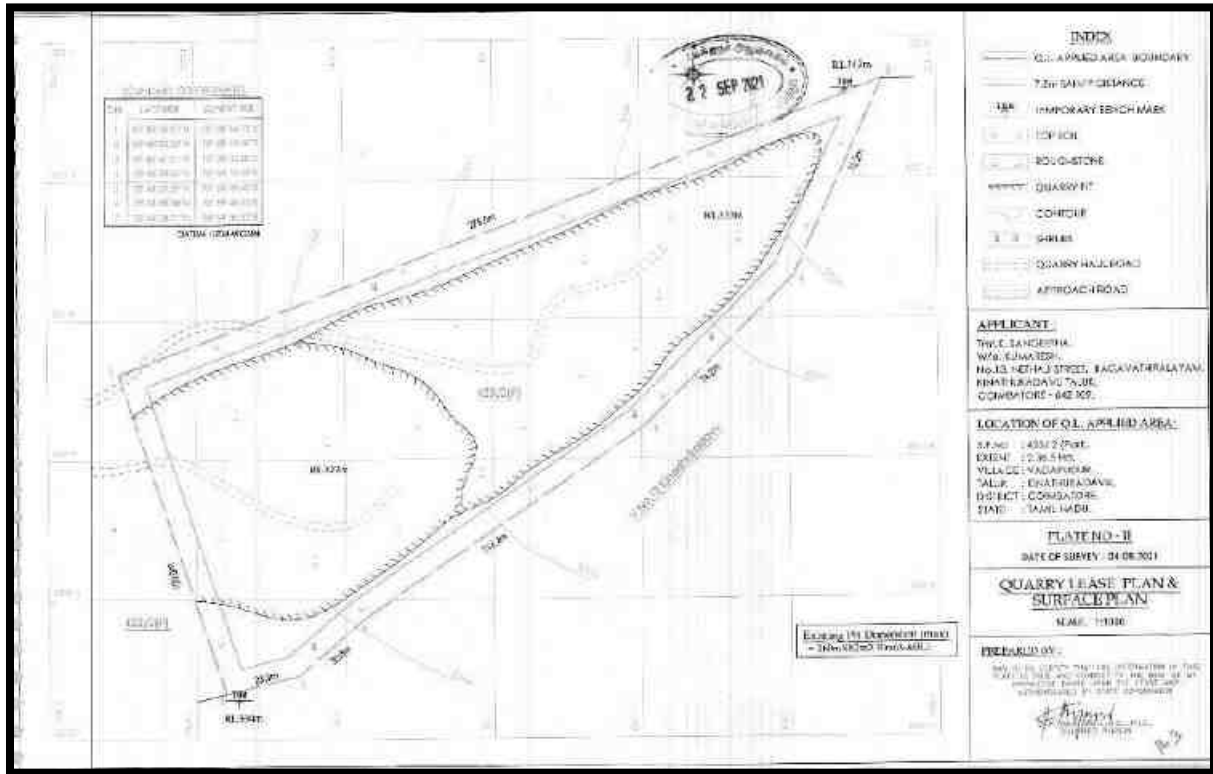
P1– Tmt.K.Sangeetha

FIGURE 2.2: SHOWING GOOGLE IMAGE ROUGH STONE QUARRY PROJECT AREA



SATELLITE IMAGERY OF P-1

FIGURE 2.3: QUARRY LEASE PLAN



P1- Thiru. Tmt.K.Sangeetha

FIGURE 2.4: DIGITIZED MAP OF THE STUDY AREA (10 KM RADIUS FROM PROJECT SITE)

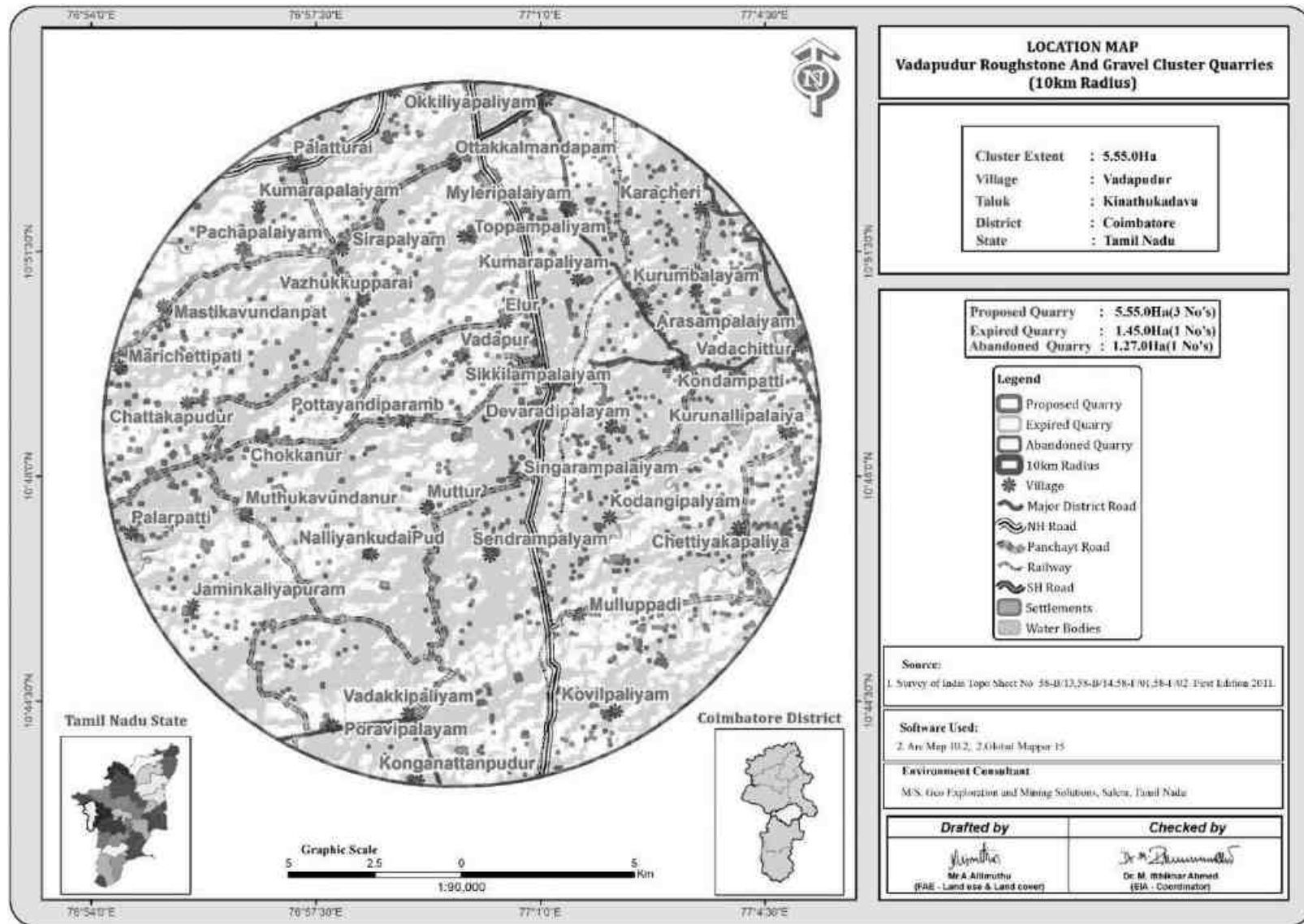


FIGURE 2.5: DIGITIZED MAP OF THE STUDY AREA (5 KM RADIUS FROM PROJECT SITE)

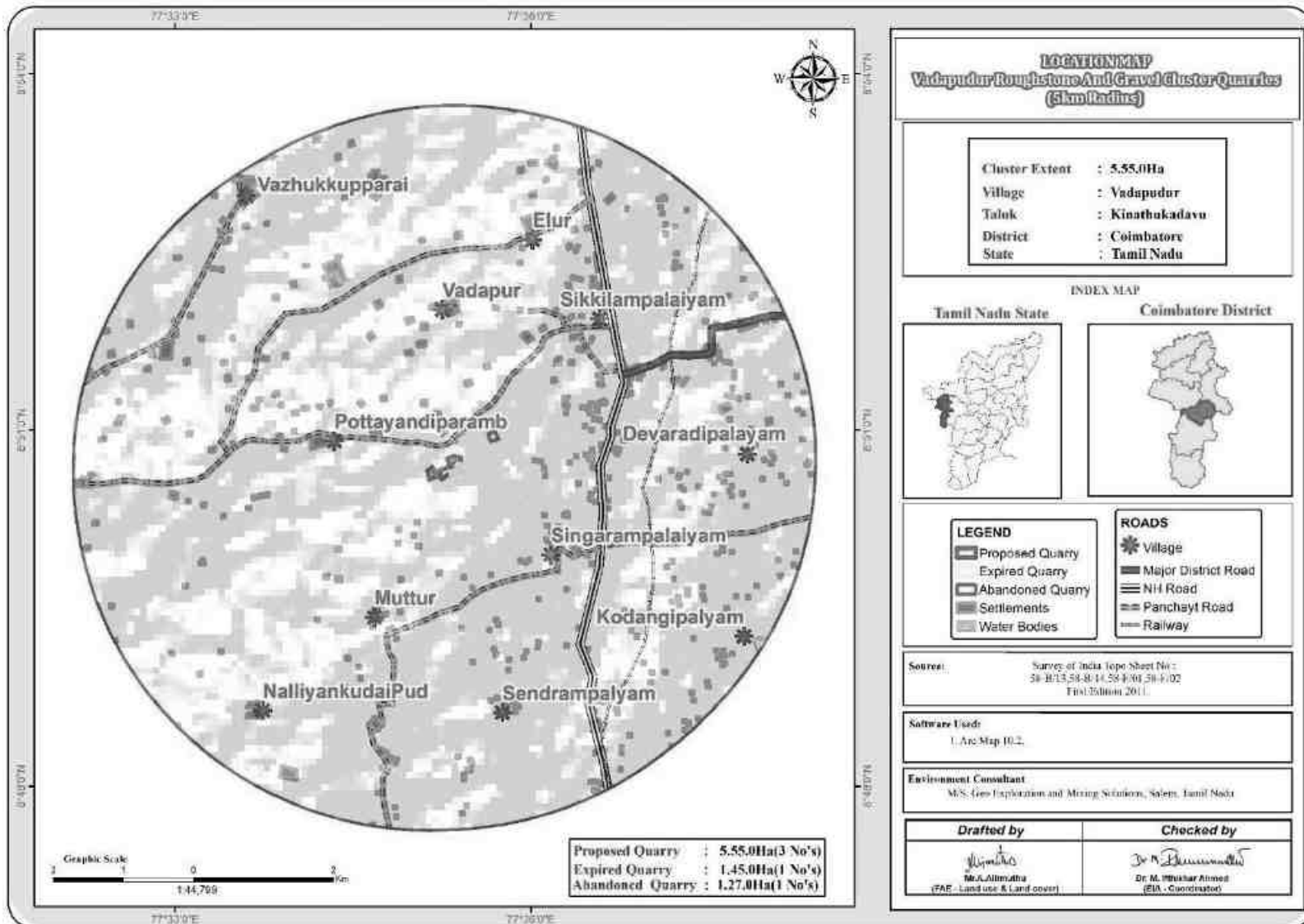
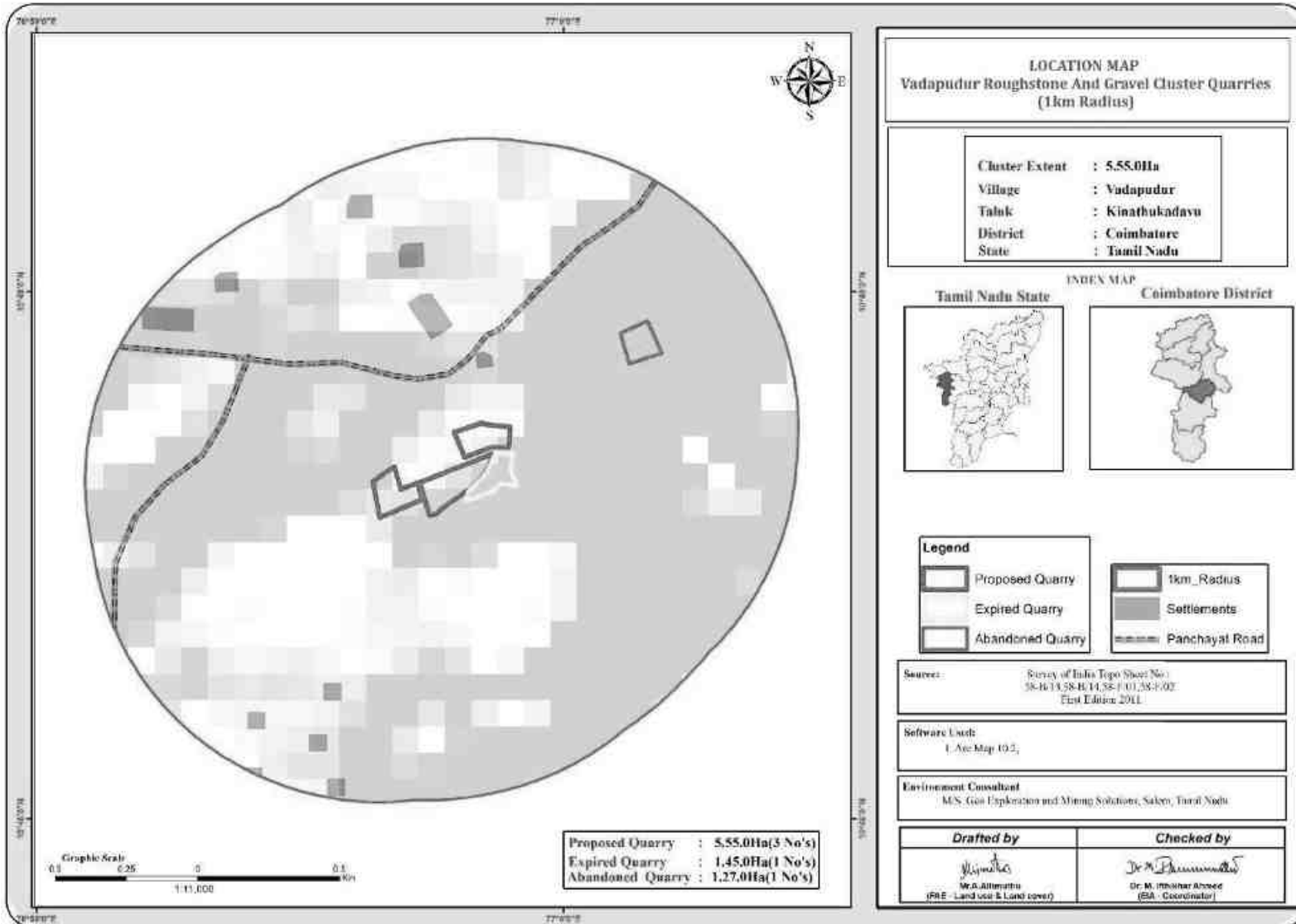


FIGURE 2.6: DIGITIZED MAP OF THE STUDY AREA (1 KM RADIUS FROM PROJECT SITE)



2.2.1 Project Area

- (i) All the projects under cluster are site specific, there is No beneficiation or processing proposed inside the project area.
- (ii) There is no forest land involved in the proposed project area and is devoid of major vegetation and trees.

TABLE 2.3 – LAND USE PATTERN OF THE PROPOSED PROJECT

| LAND USE PATTERN OF PROJECT – P1 | | |
|----------------------------------|----------------------|--|
| Description | Present area in (ha) | Area at the end of life of quarry (Ha) |
| Area under quarrying | 1.61.0 | 1.61.0 |
| Infrastructure | Nil | 0.01.0 |
| Road | 0.02.0 | 0.02.0 |
| Green Belt | Nil | 0.15.0 |
| Unutilized area | 0.73.5 | 0.57.5 |
| Grand Total | 2.36.5 | 2.36.5 |

Source: Approved Mining Plan

2.2.2 Size or Magnitude of Operation

TABLE 2.4: OPERATIONAL DETAILS FOR PROPOSED PROJECT

| OPERATIONAL DETAILS FOR PROJECT – P1 | | | |
|--|--|---------------------------|---|
| PARTICULARS | DETAILS | | |
| | Rough Stone (m ³) (5Year Plan period) | Topsoil (m ³) | |
| Geological Resources | 7,54,307m ³ | 2,340 m ³ | |
| Mineable Reserves | 2,28,084 m ³ | - | |
| Production for five years Plan | 2,28,084 m ³ | - | |
| Mining Plan Period / Lease Applied Period | 5Years | | |
| Number of Working Days | 300 Days | | |
| Production per day | 152 | -- | - |
| No of Lorry loads (6m ³ per load) | 25 | -- | - |
| Total Depth of mining | 41m bgl (1m topsoil+ 40m Roughstone) | | |

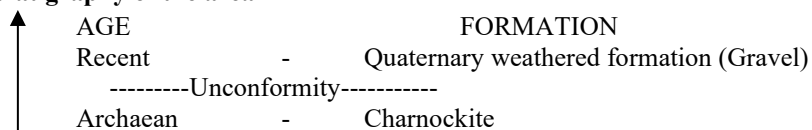
Source: approved mining plan

2.3 Geology

2.3.1 Regional Geology

Peninsular gneiss forms the oldest rock formations, in which the massive formation of Charnockite lies over with rich accumulation of recent quaternary formation. On regional scale the Charnockite body N30°E to S30°W with dipping SE60°.

Stratigraphy of the area –



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

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

The fissile homblende gneisses (Peninsular gneiss – younger phase) of Bhavani Group with enclaves of schistose, micaceous and amphibolitic rocks, fuchsite – kyanite quartzites, ferruginous quartzite (Satya Mangalam Group) intruded by a number of ultramafic and basic rocks and granites are seen in the Northern portions of the district especially around Mettupalayam and Northern areas of Coimbatore. The granites are Proterozoic age and occupy the

Western end and Eastern Part of the District as separate bodies and are recognized as Maruthamalai Granite and Punjapuliampatti Granites respectively. The quaternary alluvium is seen in the Western areas of Coimbatore town. The alluvium is more than 30m thick in the Chinnathadagam valley northwest of Coimbatore and in the Siruvani valley west of Coimbatore.

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

2.3.2 Local Geology: -

The study area follows the regional trend and mainly comprises of Hard Rock Formation as a homogeneous formation / Batholith formation of Charnockite. All the project areas are plain terrain, all the project areas is covered with gravel formation of 2m to 3m thickness; Massive Charnockite formation is found after 2 m to 3 m gravel formation which is clearly inferred from the nearby existing quarry pit.

2.3.3 Hydrogeology

Coimbatore District is underlain by crystalline metamorphic complex in the western parts of district and sedimentary tract in eastern side. An area of 4,551 Sq.km is covered by crystalline rocks (63%) and 2,671 Sq.km is covered by sediments (37%). The general geological sequence of formation is given below:

Quaternary - Laterites, Sands and Clays

Tertiary - Sandstone, Gravels and Clays

Cretaceous - Limestone, Calcareous Sandstone and Clay unconformity.

Archaean - Charnockites, Gneisses, Granites, Dolerites and Pegmatite

- The major part of the area is covered by metamorphic crystalline rocks of charnockite, granitic gneiss of Archaean age intruded by dolerite dykes and pegmatite veins. These rocks are highly metamorphosed and have been subjected to very severe folding, crushing and faulting.
- Ground Water occurs under the phreatic condition and wherever there are deep seated fractures, it occurs under semi-confined to confined conditions.
- Occurrence of Ground Water in hard rock depends upon the intensity and depth of weathering, fractures and fissures present in the rocks.
- Granites and gneisses yield moderately compared to the yield in Charnockites.
- Depth of well in hard rock generally ranges between 8 and 15m below ground level.
- Generally, yield in open wells ranges from 30 to 250m³ /day and in bore well between 260 and 430 m³ /day. The weathered thickness varies from 2.5 m to 42m in general there are 3 to 5 fracture zones within 100 m and 1 to 4 fracture zones between 100 and 200 m.

The Cretaceous formation is represented by Arenaceous Lime stone, Calcareous sand - stone and marl.

The Tertiary formation is argillaceous comprising of Silty clay stones, argillaceous Lime stone.

The Quaternary deposits represented by the river deposits of Ponnaiyar and Varahanadhi spread over as patches in Tiruppur District. The alluvium consists of unconsolidated sands, gravelly sands, clays and clayey sands. The thickness of the sands ranges between 15 and 25 m in the alluvial formation which also form potential aquifers. In some areas, sand stone of tertiary formation are the potential groundwater reservoirs.

Aquifer Systems:

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

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

Alluvial Formations

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

Tertiary Cuddalore sandstone

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

Cretaceous Formations

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

Hard Rock Formations

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

Granitic Gneiss

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

Charnockite

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

Aquifer Parameters

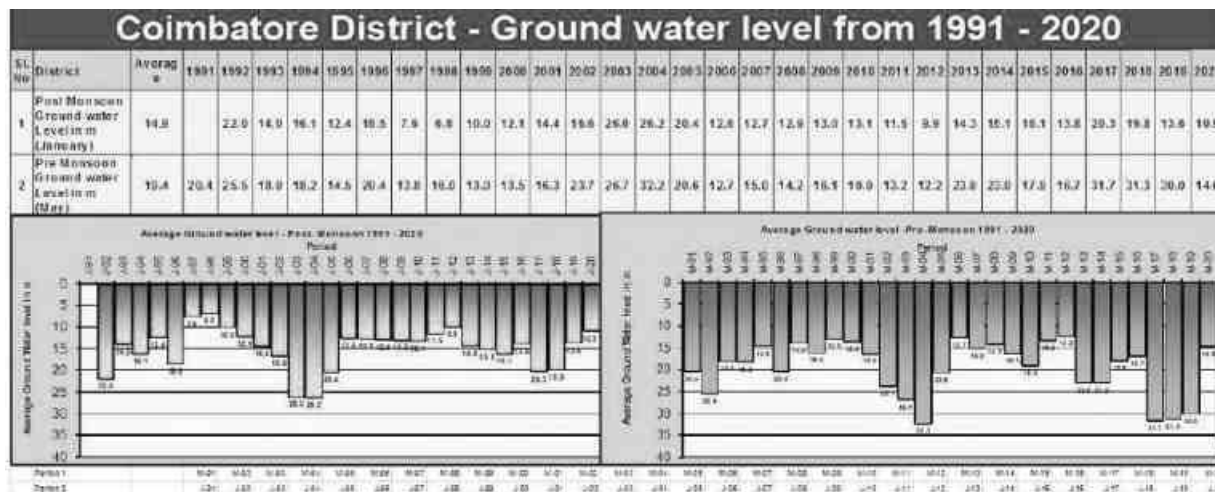
The thickness of aquifer in this district is highly erratic and varies between 15 m to 40 m below ground level. The inter granular Porosity is essentially dependent on the intensity and degree of weathering and fracture development in the bed rock. As discussed earlier deep weathering has developed in Gneissic formations and moderate weathering in charnockite formations. The range of aquifer parameters in hard rock and sedimentary formations are given below:

TABLE 2.5: RANGE OF AQUIFER PARAMETERS

| Parameters | Range |
|--|---------------------------------|
| Well yield in LPM | 50-300 lpm |
| Transmissivity (T) m ² /day | 1.49-164.18 m ² /day |
| Permeability (K) m/day | 0.25-26.75 m/day |

Source: <http://nwm.gov.in/sites/default/files/Notes%20on%20Coimbatore%20District.pdf>

FIGURE 2.7: GROUND WATER LEVEL VARIATIONS OF COIMBATORE DISTRICT



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

TABLE 2.6: GROUND WATER LEVEL VARIATIONS OF COIMBATORE DISTRICT

| Jan 2017 | May 2017 | Jan 2018 | May 2018 | Jan 2019 | May 2019 | Jan 2020 | May 2020 | Jan 2021 | May 2021 | 5 Years Pre-Monsoon Average | 5 Years Post Monsoon Average |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------------------------|------------------------------|
| 20.4 | 29.6 | 19.8 | 22.3 | 13.7 | 17.6 | 10.9 | 14.6 | 9.3 | 13.0 | 16.5 | 12.6 |

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

FIGURE 2.8: REGIONAL GEOLOGY MAP

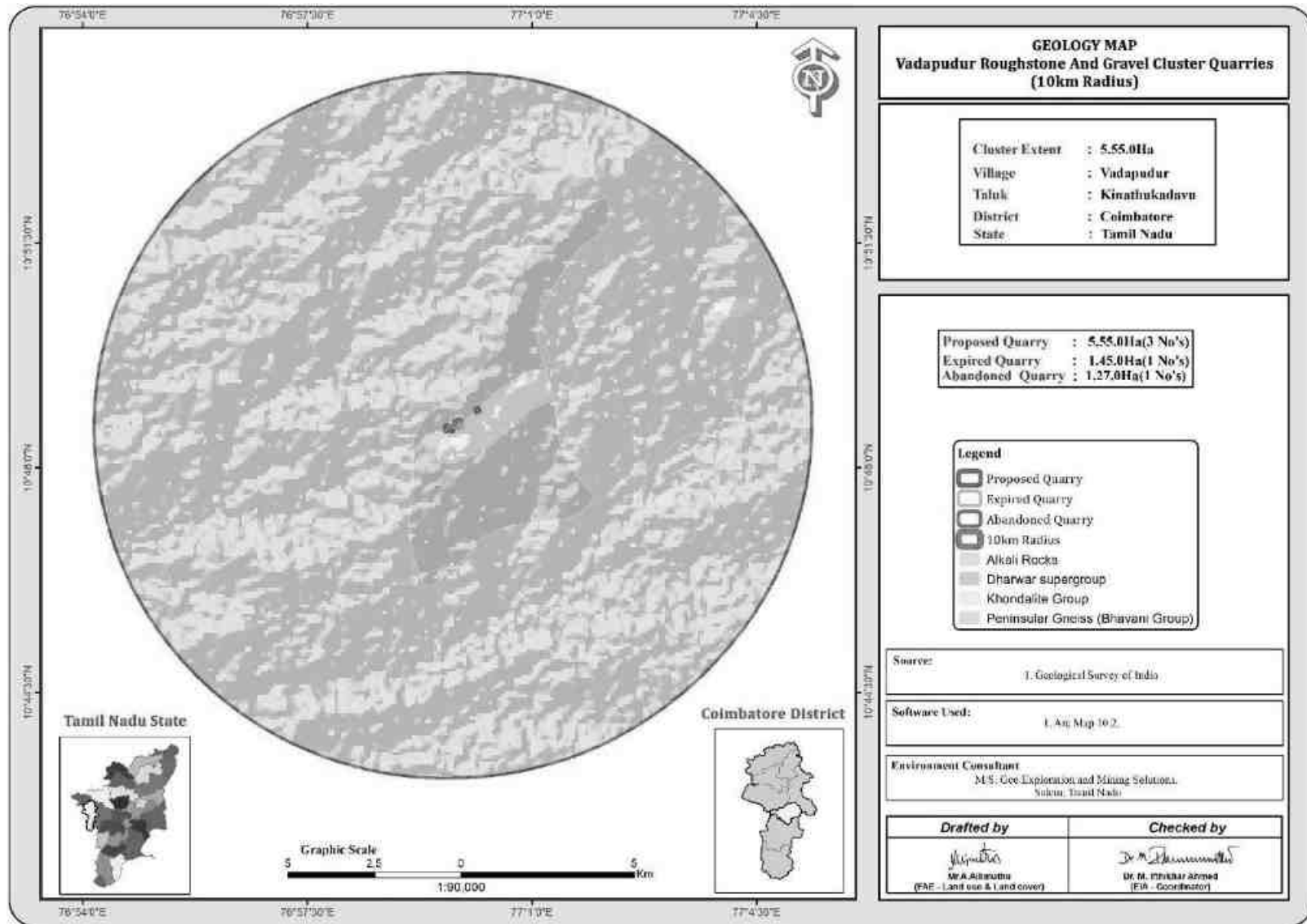


FIGURE 2.9: GEOMORPHOLOGY MAP

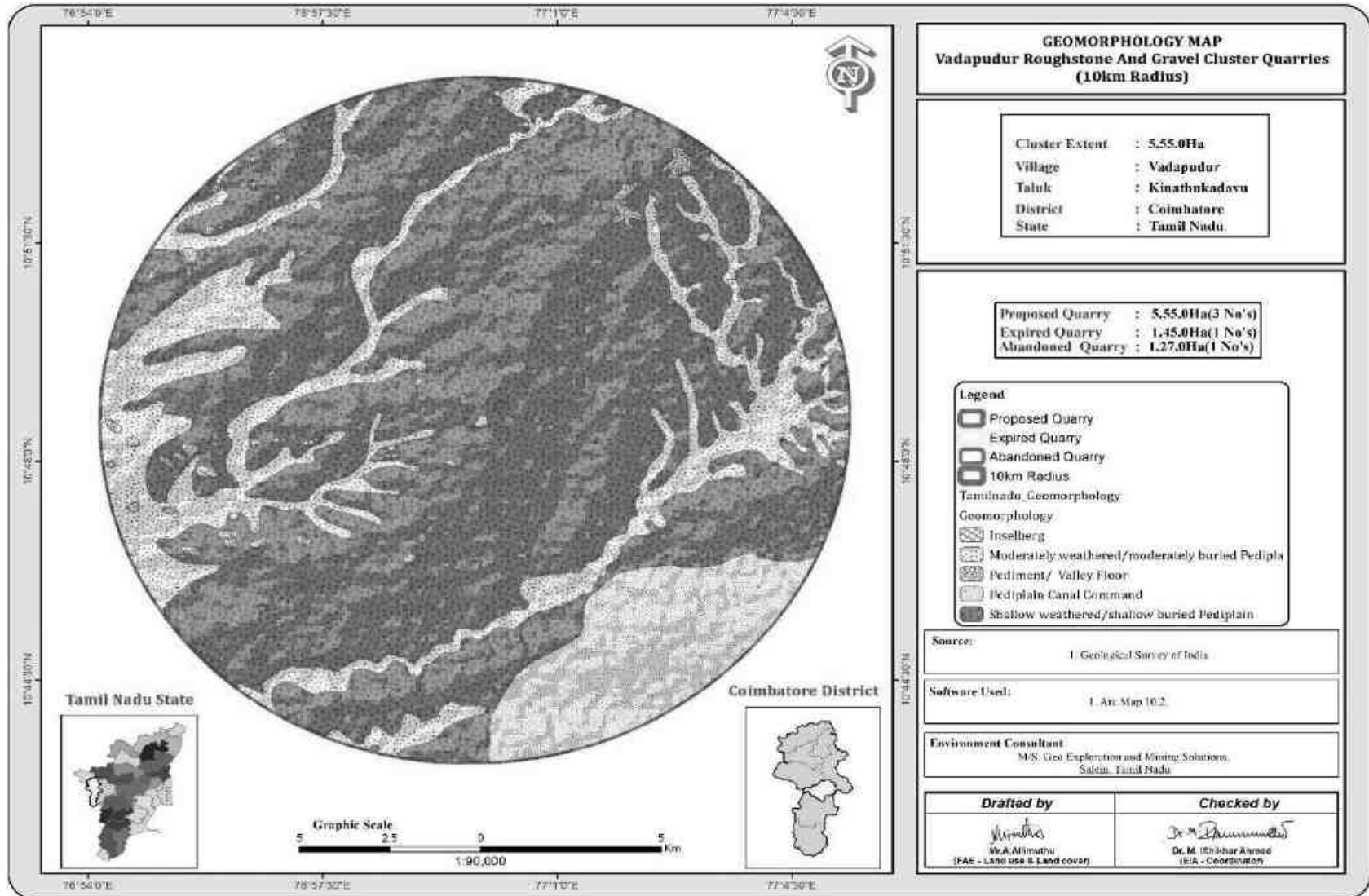
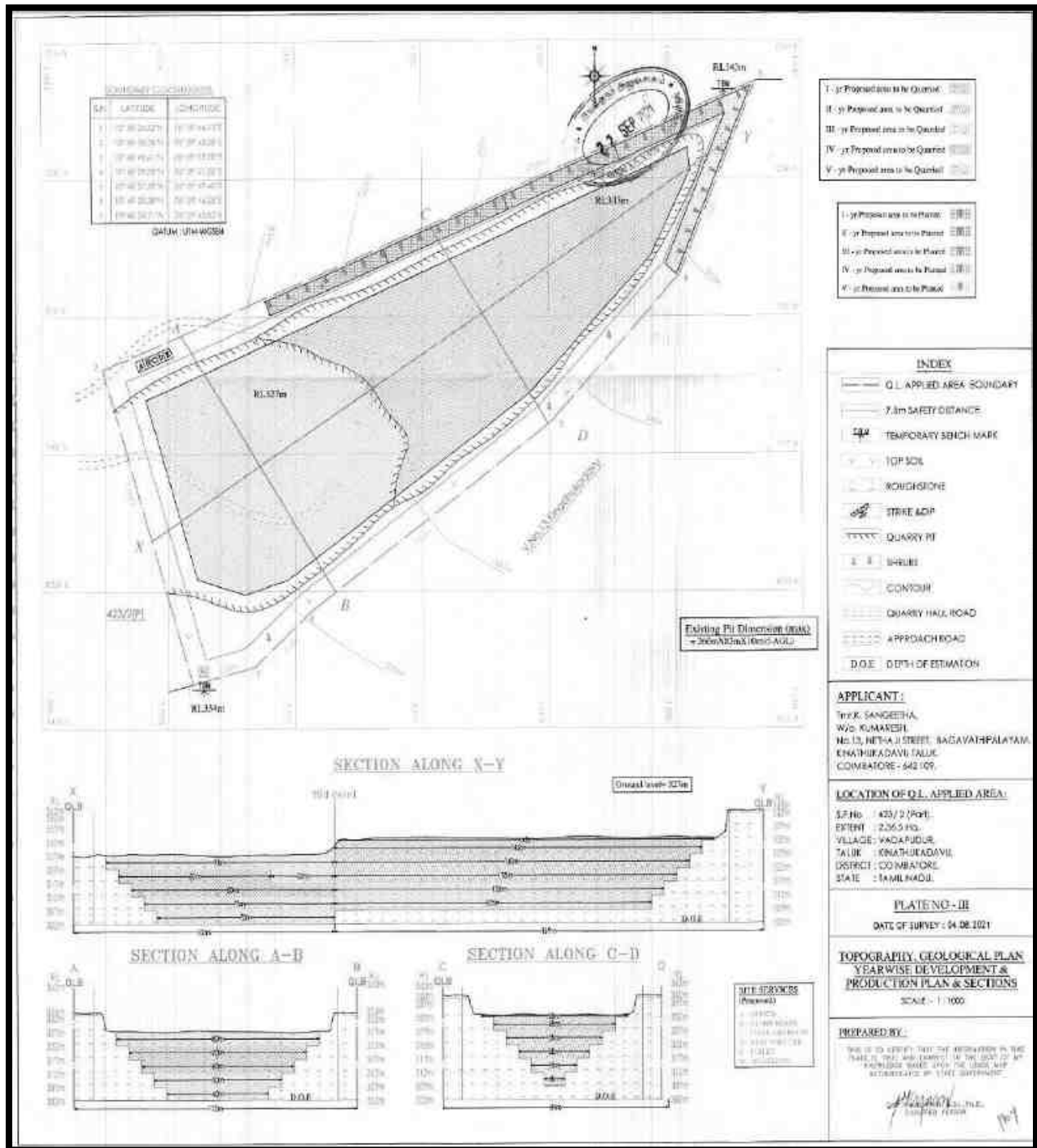


FIGURE 2.10: TOPOGRAPHY, GEOLOGICAL, YEARWISE DEVELOPMENT PRODUCTION PLAN AND SECTION-P1
Tmt.K.Sangeetha-P1



2.4 Resources and Reserves of the Project area

The available mineable reserves are calculated after leaving necessary safety distances prescribed in the Precise area communication letter.

TABLE 2.7: AVAILABLE GEOLOGICAL RESOURCES OF PROPOSED PROJECT- P1

| Description | P1 | |
|---|-------------------------------|----------------------|
| | Rough Stone quarry | Topsoil |
| Geological Resource | 7,54,307m ³ | 2,340 m ³ |
| Mineable Reserves | 2,28,084 m ³ | - |
| Proposed production for five years as per ToR | 2,28,084 m³ | - |

Source: Approved Mining Plan

TABLE 2.8: YEAR-WISE PROPOSAL FOR FIRST FIVE YEARS PRODUCTION PLAN-P1

| YEAR | ROUGH STONE QUARRY (m ³) |
|--------------|--------------------------------------|
| I | 43384 |
| II | 45500 |
| III | 44750 |
| IV | 45000 |
| V | 49450 |
| TOTAL | 2,28,084 |

Source: Approved Mining Plan

Disposal of Waste

In the entire cluster quarries no waste is anticipated, quarried out materials (Rough stone) will be utilized (100%).

Conceptual Mining Plan/ Final Mine Closure Plan

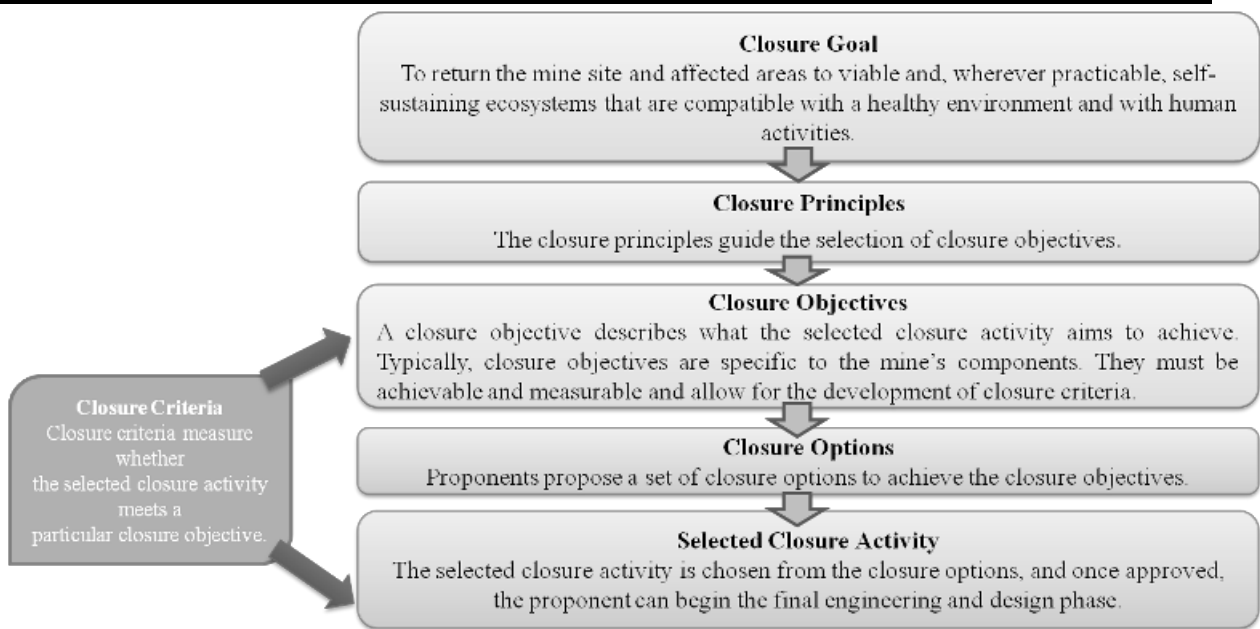
The ultimate pit size is designed based on certain practical parameters such as economical depth of mining, safety zones, permissible area, etc.

TABLE 2.9: ULTIMATE PIT DIMENSIONS

| Code | Length (Max) (m) | Width (Max) (m) | Depth (Max) (m) |
|------|------------------|-----------------|------------------------|
| P-1 | 260 | 82 | 41 m (16m Agl+25m Bgl) |

Source: Approved Mining Plan

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

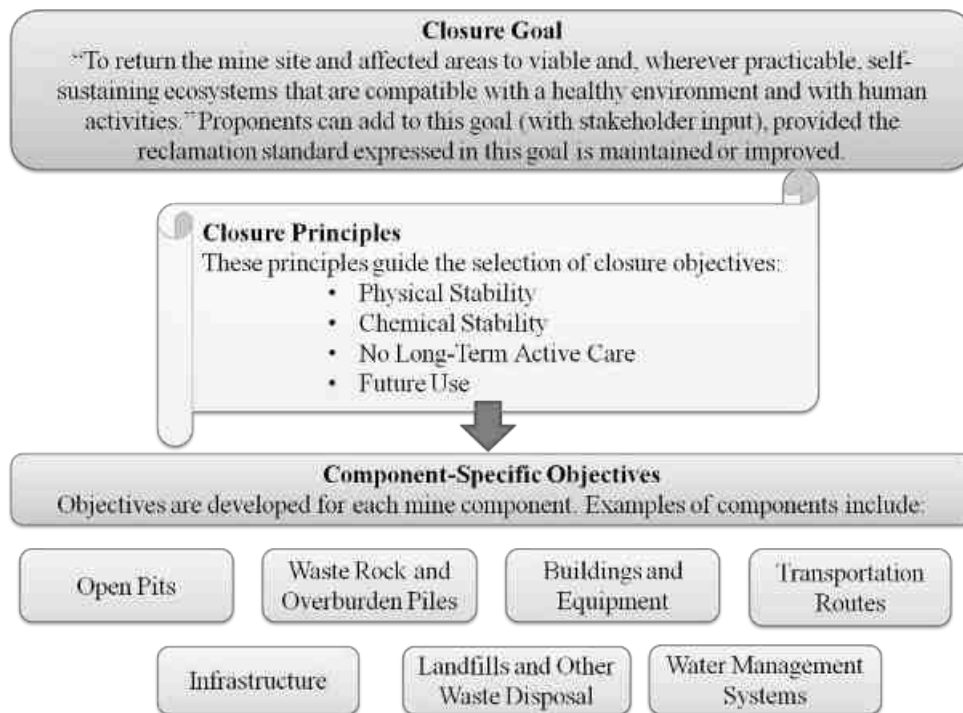


Closure Objectives

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

Closure Planning & Options Considerations in Mine Design –

- The closure of mine is well planned at the initial stage of planning & design consideration by the internal and external stake holders
- Construction of 2m height bund all along the mine pit boundary and ensure its stability all time & construction of garland drain along the natural slope to avoid sliding and collection of soil to the pit & surface runoff during rainfall
- After complete exploitation of mineral, the lowest bench foot wall side will be maintained as plain surface without any sump pits to avoid any accidents
- All the sharp edges will be dressed to smoother face before the closure of mine and ensure no loose debris on hanging wall side
- There is a river on southern side of the project area. The river will not be hindered by any of mine closure activities
- The project proponent as a part of social responsibilities assures to supply the stored mine pit water to the nearby villages after effective treatment process as per the standards of TNPCB & TWAD
- Native species will be planted in 3 row patterns on the boundary barriers and 1st bench, a full-time sentry will be appointed at the gate to prevent inherent entry of public & cattle.
- The access road to the quarry will be cut-off immediately after the closure
- The layout design shall be prepared and get approved from Department of Geology and Mining.
- The proponent is instructed to construct as per the layout approved
- Physical and chemical stability of structures left in place at the site, the natural rehabilitation of a biologically diverse, stable environment, the ultimate land use is optimized and is compatible with the surrounding area and the requirements of the local community, and taking the needs of the local community into account and minimizing the socio-economic impact of closure
- There will be a positive change in the environmental and ecology due to the mine closure



Post-Closure Monitoring –

The purpose of post-closure monitoring with respect to open pit mine workings is to ensure the attainment of closure objectives.

- Monitor physical and geotechnical stability of remnant pit walls.
- Monitor the ground regime in pit walls to confirm achievement of design objectives.
- Monitor water level in pit to confirm closure objectives regarding fish, fish habitat, and wildlife safety are being achieved.
- Sample water quality and quantity at controlled pit discharge points.
- Identify and test unanticipated areas where water management is an issue.
- Inspect integrity of barriers such as berms & fences.
- Monitor wildlife interactions with barriers to determine effectiveness.
- Inspect aquatic habitat in flooded pits where applicable.
- Monitor dust levels.

TABLE 2.11: MINE CLOSURE BUDGET-P1

| ACTIVITY | | YEAR | | | | | RATE | COST (Rs.) |
|--|------|--------|------|------|------|------|------------------------|-------------------|
| | | I | II | III | IV | V | | |
| Plantation under safety zone | Nos. | 30 | 30 | 30 | 30 | 30 | @100 Rs Per sapling | 15,000/- |
| | Cost | 3000 | 3000 | 3000 | 3000 | 3000 | | 10,000/- |
| Plantation in the approach road and nearby village roads | Nos. | 20 | 20 | 20 | 20 | 20 | | 10,000/- |
| | Cost | 2000 | 2000 | 2000 | 2000 | 2000 | | |
| Wire Fencing (In Mtrs) 570Mtrs | | 171000 | - | - | - | - | @300 Rs Per Meter | 1,71,000/- |
| Garland drain (In Mtrs) 510Mtrs | | 153000 | - | - | - | - | @300 Rs Per Meter | 1,53,000/- |
| TOTAL | | | | | | | | 3,49,000/- |

Source: Proposed by FAE's and EC

2.5 Method of Mining

The method of mining is common for all the proposed project – The method of mining is Opencast Mechanized Mining Method is being proposed by formation of 5.0-meter height bench with a bench width not less than the bench height. However, as far as the quarrying of Rough Stone is concerned, observance of the provisions of Regulation 106 (2) (b) as above is seldom possible due to various inherent petro genetic factors coupled with mining difficulties. Hence it is proposed to obtain relaxation to the provisions of the above regulation from the Director of Mines Safety for which necessary provision is available with the Regulation 106 (2) (b) of MMR-1961, under Mine Act – 1952.

The top layer of overburden (Gravel) will be Excavate directly by Hydraulic Excavators and loaded into tippers directly and sold to needy customers. The Rough Stone is a batholith formation and the splitting of rock mass of considerable volume from the parent rock mass will be carried out by deploying jackhammer drilling and Slurry Explosives will be used for blasting. Hydraulic Excavators attached with Rock Breakers unit will be deployed for breaking large boulders to required fragmented sizes to avoid secondary blasting and hydraulic excavators attached with bucket unit will be deployed for loading the Rough Stone into the tippers and then the stone is transported from pithead to the nearby crushers.

2.5.1 Drilling

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

Spacing – 1.2m, Burden – 1.0, Depth of hole - 1.5m

2.5.2 Blasting

Blasting will be done as per details below: -

- Controlled blasting parameter: -
 - Spacing – 1.2m
 - Burden – 1.0 m
 - Depth of hole – 1.5 m
 - Charge per hole – 0.5Kg
 - Powder factor – 6.0 tonnes/kg
 - Dia of hole – 32 mm
 - Details of blasting design and parameters are discussed in approved mining plan.

No of Holes to be drilled per day: -

Volume of Rough Stone will be excavated from one hole = 3 Tonnes
 Total Volume from one proposed quarries = 2,28,084 m³

| | | |
|------------------------------------|---|------------------------------------|
| | = | 2,28,084 /5 |
| | = | 45617 /300 |
| | = | 152* 2.6 |
| | = | 395 per day |
| Therefore, Number of Holes per day | = | 395/3 |
| | = | 132 Holes per day (for 1 Quarries) |

Type of Explosives to be used –

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

2.5.3 Extent of Mechanization**TABLE 2.13 PROPOSED MACHINERY DEPLOYMENT-P1**

| PROPOSAL – P1 | | | | |
|---------------|---|-----|---------------|----------------|
| S.NO. | TYPE | NOS | SIZE/CAPACITY | MOTIVE POWER |
| 1 | Jack hammers | 6 | 1.2m to 2.0m | Compressed air |
| 2 | Compressor | 2 | 400psi | Diesel Drive |
| 3 | Excavator with Bucket / Rock Breaker Unit 4 | 1 | 300 HP | Diesel Drive |
| 4 | Tipplers | 3 | 20 Tonnes | Diesel Drive |

Source: Approved Mining Plan of the respective projects.

2.6 General Features**2.6.1 Existing Infrastructures**

Infrastructures like Mine office, Temporary Rest shelters for workers, Latrine and Urinal Facilities are available in the Existing quarries and the same infrastructure as per the Mine Rule will be arranged after the grant of quarry lease in the proposed quarry.

2.6.1 Drainage Pattern

The general drainage pattern of the area is dendritic. There are no streams, canals or water bodies crossing within the project area, hence there is no requirement of stream or canals diversion in the near future.

2.6.2 Traffic Density

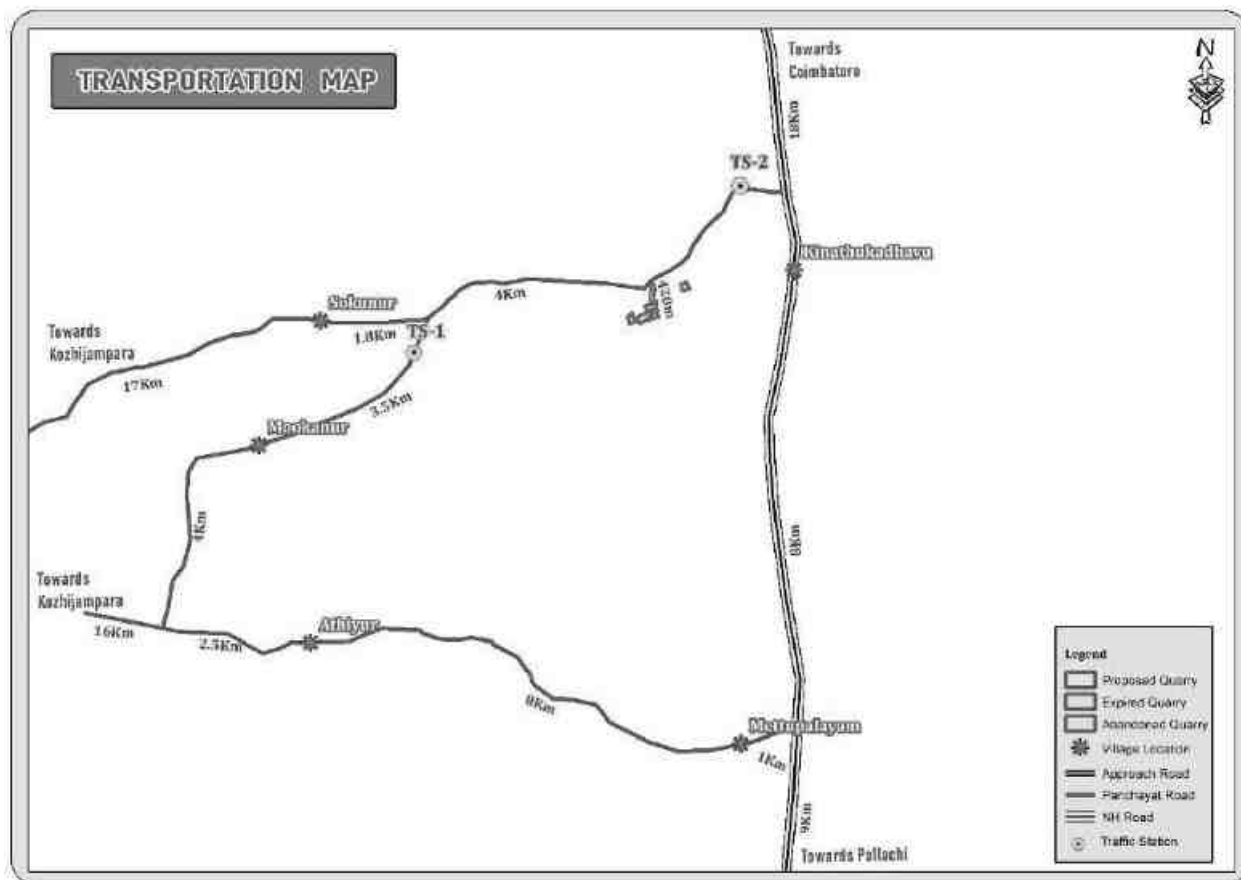
Traffic density measurements were performed as per IRC 1960 Guidelines at three locations based on the transportation route. Traffic density measurement were made continuously for 24 hours by visual observation and counting of vehicles under three categories, viz., heavy motor vehicles, light motor vehicles and two/three wheelers. As traffic densities on the roads are high, two skilled persons were deployed simultaneously at each station during each shift- one person on either direction for counting the traffic. At the end of each hour, fresh counting and recording was undertaken.

TABLE 2.14 – TRAFFIC SURVEY LOCATION'S

| Station code | Station location | Distance and Direction | Type of Road |
|--------------|----------------------------------|------------------------|----------------|
| TS1 | Sokkunur to Kinnathukadhavu Road | 3.5km- W | Panchayat Road |
| TS2 | Sukanur to Mookanur Road | 2.5Km-NE | Panchayat Road |

Source: On-site monitoring by GEMS FAE & TM

FIGURE 2.11: TRAFFIC SURVEY LOCATIONS & TRANSPORTATION ROUTE MAP



(Source: Survey of India Toposheet)

TABLE 2.15 – EXISTING TRAFFIC VOLUME

| Station code | HMV (Hourly Average) | | LMV hourly average | | 2/3 Hourly average | | Total PCU per hour |
|--------------|----------------------|-----|--------------------|-----|--------------------|-----|--------------------|
| | No | PCU | No | PCU | No | PCU | |
| TS1 | 55 | 165 | 50 | 50 | 100 | 50 | 265 |
| TS2 | 80 | 240 | 75 | 75 | 130 | 65 | 380 |

Source: On-site monitoring by GEMS FAE & TM

- PCU conversion factor for HMV (Trucks and Bus) = 3, LMV (Car, Jeep and Auto) = 1 and 0.5 for Motor Vehicles (2/3 Wheelers)

TABLE 2.16 – ANTICIPATED TRAFFIC DUE TO THIS PROPOSED PROJECT

| Transportation of Rough stone per day | | |
|---------------------------------------|------------------|---------------|
| Capacity of trucks | Cumulative Trips | Volume in PCU |
| 10/20 tonnes | 48 | 144 |

Source: Anticipated based on Approved Mining Plan Production

TABLE 2.17 – SUMMARY OF TRAFFIC VOLUME

| Route | Existing traffic value in PCU | Incremental traffic from the quarry in PCU | Total traffic volume | Hourly Capacity in PCU as per IRC guidelines |
|-------|-------------------------------|--|----------------------|--|
| TS1 | 265 | 144 | 409 | 1200 |
| TS2 | 380 | 144 | 524 | 1500 |

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

As per the IRC 1960 this existing road can handle 1,200 PCU in hour and Major district road can handle 1500 PCU in hour hence there will not be any conjunction due to this transportation.

2.6.3 Mineral Beneficiation and Processing

There is no proposal for the mineral processing or ore beneficiation in this project

2.6.4 Existing Infrastructure

It is a new quarry, no infrastructural facility available within the project area. The infrastructural facilities to be made after the start of the quarrying operations will be prepared outside limit as per the rules and safe distance to be adopted.

2.6.2 Drainage Pattern

The drainage pattern of the area is dendritic – sub dendritic.

2.7 Project Requirement

2.7.1 Water Source & Requirement

Detail of Total water requirements in KLD as given below:

TABLE 2.18 – WATER REQUIREMENT FOR THE CLUSTER PROJECT -P1

| PROPOSAL – P1 | | |
|-----------------------------|----------------|---|
| *Purpose | Quantity | Source |
| Domestic & Drinking purpose | 0.8KLD | From Existing, bore wells and drinking water will be sourced from Approved Water vendors. |
| Dust Suppression | 1.5KLD | From Existing bore wells from nearby area |
| Green Belt | 1.0KLD | From Existing bore wells from nearby area |
| Total | 3.3 KLD | |

Source: Prefeasibility Report

About 50% water will be required for the suspension of the dust, Water shall be obtained from accumulated rainwater/seepage water in quarry pits. Packaged Drinking Water is available from the nearby approved water vendors.

2.7.2 Power and Other Infrastructure Requirement

The project's does not require power supply for the quarry operation. The quarrying activity is proposed during day time only (General Shift 8 AM – 5 PM, Lunch Break 1 PM – 2 PM). Electricity for use in office and other internal infrastructure will be obtained from TNEB. For the quarrying operation like compressor for drilling Diesel will be utilized.

The temporary infrastructures such as Mine Office, First Aid Room, Rest Shelter etc., will be constructed within the project area before commencing the quarry operation. No workshops are proposed inside the project area hence there will not be any process effluent generation from the project area. Domestic effluent from the mine office will be discharged to septic tank and soak pit. There is no toxic effluent expected to generate in the form of solid, liquid or gaseous form hence there is no requirement of waste treatment.

2.7.3 Fuel Requirement

High speed Diesel (HSD) will be used for mining machineries. Diesel will be brought from nearby Fuel Stations.

Average diesel consumption is around = 500 Liters of HSD / day per project = proposed project

2.7.4 Employment Requirement:

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

TABLE 2.19: EMPLOYMENT POTENTIAL FOR PROPOSED QUARRY

| Identification code | Employment in Nos |
|---------------------|-------------------|
| P-1 | 28 |
| Total | 28 |

A total of 28 people will get employment due to these one proposed quarry

2.7.5 Project Cost

TABLE 2.20 – PROJECT COST OF PROPOSED PROJECT- P1

| Identification code | Project Cost |
|---------------------|-----------------|
| P-1 | Rs. 64,91,000/- |
| Total | Rs. 64,91,000/- |

Source: Approved Mining Plan & Prefeasibility Report of the respective projects

2.8 Project Implementation Schedule

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

TABLE 2.21 – EXPECTED TIME SCHEDULE FOR THE PROPOSED QUARRIES

| S. No | Particulars lease execution | Time schedule (in month) | | | | | Remarks if any |
|-------|-----------------------------|--------------------------|-----------------|-----------------|-----------------|-----------------|-------------------------|
| | | 1 st | 2 nd | 3 rd | 4 th | 5 th | |
| 1 | Environmental Clearance | | | | | | |
| 2 | Consent to operate | | | | | | Production start period |

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

CHAPTER – 3: DESCRIPTION OF ENVIRONMENT

3.0 General

This chapter presents a regional background to the baseline data at the very onset, which will help in better appreciation of micro-level field data, generated on several environmental and ecological attributes of the study area. The baseline status of the project environment is described section wise for better understanding of the broad-spectrum conditions. The baseline environment quality represents the background environmental scenario of various environmental components such as Land, Water, Air, Noise, Biological and Socio-economic status of the study area. Field monitoring studies to evaluate the base line status of the project site were carried out covering Dec 2022, Janu & Feb 2023 with CPCB guidelines. Environmental data has been collected with reference to cluster quarries by EHS 360 LABS PRIVATE LIMITED Approved by ISO/IEC 17025:2017 for the below attributes-

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

Study Area

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

Study Period

The baseline study was conducted during the Winter season i.e. Dec – Feb 2023.

Study Methodology

Baseline data was generated for various environmental parameters including Land, Soil, Water (surface and groundwater), Air, Noise, Ecology & Biodiversity and Socio-economic status to determine the quality of the prevailing environmental settings. A MoEF accredited Laboratory was used for generating the baseline data.

1. The project area (Core zone) was surveyed in detail with the help of Total Station survey instrument and the boundary pillars were picked up with the help of handheld GPS. The boundary coordinates were superimposed on the satellite imagery to understand the relief of the area, besides Land use pattern of the area was studied through the Bhuvan (ISRO).
2. Soil samples were collected and analysed for relevant physico-chemical characteristics, exchangeable cations, nutrients & micro nutrients etc., in order to assess the impact of mining activities and proposed greenbelt development.
3. Ground water samples were collected during the study period from the open wells and bore wells, while surface water was collected from river and lake in the buffer zone. The samples were analysed for parameters necessary to determine water quality (based on IS: 10500:2012 criteria) and those which are relevant from the point of view of environmental impact of the proposed quarries.
4. A meteorological station was setup in Vadapudur village. Wind speed, Wind direction, Dry and wet bulb temperature, Relative humidity, Rainfall with cloud cover and general weather conditions were recorded throughout the study period.
5. In order to assess the Ambient Air Quality (AAQ), samples of Ambient Air were collected by installation of Respiratory Dust Samplers (RDS) for Fugitive dust, PM₁₀ and SO₂, NO_x with gaseous attachments & Fine

Dust Samplers (FDS) for PM_{2.5} and other parameters as per NAAQ norms and analysed for primary air pollutants to work out the existing status of air quality

6. The noise level measurements were also made at various locations in different intervals of time with the help of sound level meter to establish the baseline noise levels in the impact zone
7. Baseline biological studies were carried out to assess the ecology of the study area to study the existing flora and fauna pattern of the area
8. Socio-Economic survey was conducted at village and household level in the study area to understand the present socio-economic conditions and assess the extent of impact due to the proposed mining project

The sampling methodologies for the various environmental parameters required for the study, frequency of sampling, method of samples analysis, etc., are given below Table 3.1.

TABLE 3.1 – ENVIRONMENTAL MONITORING ATTRIBUTES AND FREQUENCY OF MONITORING

| Attribute | Parameters | Frequency of Monitoring | No. of Locations | Protocol |
|------------------------------|---|---|---|--|
| Land-use Land cover | Land-use Pattern within 10 km radius of the study area | Data's from census handbook 2011 and from the satellite imagery | Study Area | Satellite Imagery Primary Survey |
| *Soil | Physio-Chemical Characteristics | Once during the study period | 6 (2 core & 4 buffer zone) | IS 2720 Agriculture Handbook - Indian Council of Agriculture Research, New Delhi |
| *Water Quality | Physical, Chemical and Bacteriological Parameters | Once during the study period | 6 (1 surface water & 5 ground water) | IS 10500& CPCB Standards |
| Meteorology | Wind Speed Wind Direction Temperature Cloud cover Dry bulb temperature Rainfall | 1 Hourly Continuous Mechanical/Automatic Weather Station | 1 | Site specific primary data& Secondary Data from IMD Station |
| *Ambient Air Quality | PM ₁₀ PM _{2.5} SO ₂ NO _x Fugitive Dust | 24 hourly twice a week (Oct – Dec 2022) | 8 (2 core & 6 buffer) | IS 5182 Part 1-23 National Ambient Air Quality Standards, CPCB |
| *Noise Levels | Ambient Noise | Hourly observation for 24 Hours per location | 8 (2 core & 6 buffer zone) | IS 9989 As per CPCB Guidelines |
| Ecology | Existing Flora and Fauna | Through field visit during the study period | Study Area | Primary Survey by Quadrate & Transect Study Secondary Data – Forest Working Plan |
| Socio Economic Aspects | Socio-Economic Characteristics, Population Statistics and Existing Infrastructure in the study area | Site Visit & Census Handbook, 2011 | Study Area | Primary Survey, census handbook & need based assessments. |

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

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

3.1 LAND ENVIRONMENT

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

3.1.1 LAND USE/LAND COVER

To study the land use pattern of the core as well as a buffer zone, land use/land cover details have been identified/ maps have been prepared in accordance with the **Standard ToR point no. 4 & 10 Stating:**

Point No. 4 All corner coordinates of the mine lease area, superimposed on a High-Resolution Imagery/ topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).

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

Current vintage data of Indian Remote Sensing Satellite Resourcesat1 L-III (False Color Composite) has been used for Land Use / Land Cover study. Satellite image has been procured from National Remote Sensing Centre, Hyderabad.

3.1.2 OBJECTIVE

The objectives of the LULC study are as follow:

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

Technical specification of Satellite imagery Data Used:

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

- ☞ Satellite Image - Resourcesat1-LISSIII, 23.5m Resolution
- ☞ Satellite Data Source - NRSC, Hyderabad
- ☞ Satellite Vintage - 14st July 2020, Swath 141km wide.
- ☞ SOI Toposheet No - 58 -B/13
- ☞ Software Used - ArcGIS 10.8

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

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

TABLE 3.2: Resourcesat1-LISSIII SENSOR characteristics

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

Source: NRSC, Hyderabad

3.1.3 METHODOLOGY

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

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

The land use/Land cover Map of the buffer zone is given in 3.3. Land Use Pattern of the Buffer Zone (Study area) Details of the same are given in Table - 3.3 and the map is shown in Figure - 3.3.

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

| S.No | Classification | Area_Ha | Area_% |
|--------------------------|-------------------------|-----------|--------|
| BUILTUP | | | |
| 1 | Builtup Urban | 71.00 | 0.22 |
| 2 | Builtup Rural | 890.80 | 2.73 |
| 3 | Builtup Mining | 228.78 | 0.70 |
| AGRICULTURAL LAND | | | |
| 4 | Crop Land | 11782.91 | 36.07 |
| 5 | Agricultural Plantation | 10683.94 | 32.70 |
| 6 | Fallow Land | 8618.85 | 26.38 |
| BARREN/WASTELAND | | | |
| 7 | Barren Rocky | 35.02 | 0.11 |
| 8 | Scrub Land | 308.70 | 0.94 |
| WATERBODIES | | | |
| 9 | Waterbodies | 50.523741 | 0.15 |

| | | |
|--|----------|--------|
| | 32670.52 | 100.00 |
|--|----------|--------|

Source: Bhuvan, NRSC.

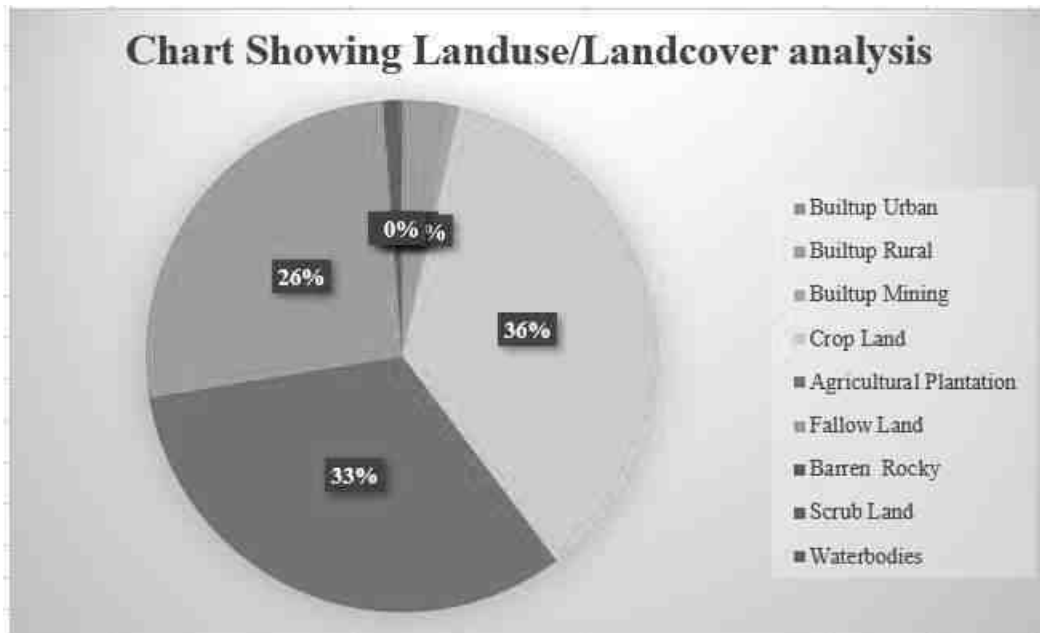


FIGURE 3.1: CHART SHOWING LANDUSE/LANDCOVER ANALYSIS USING LISS III Data

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

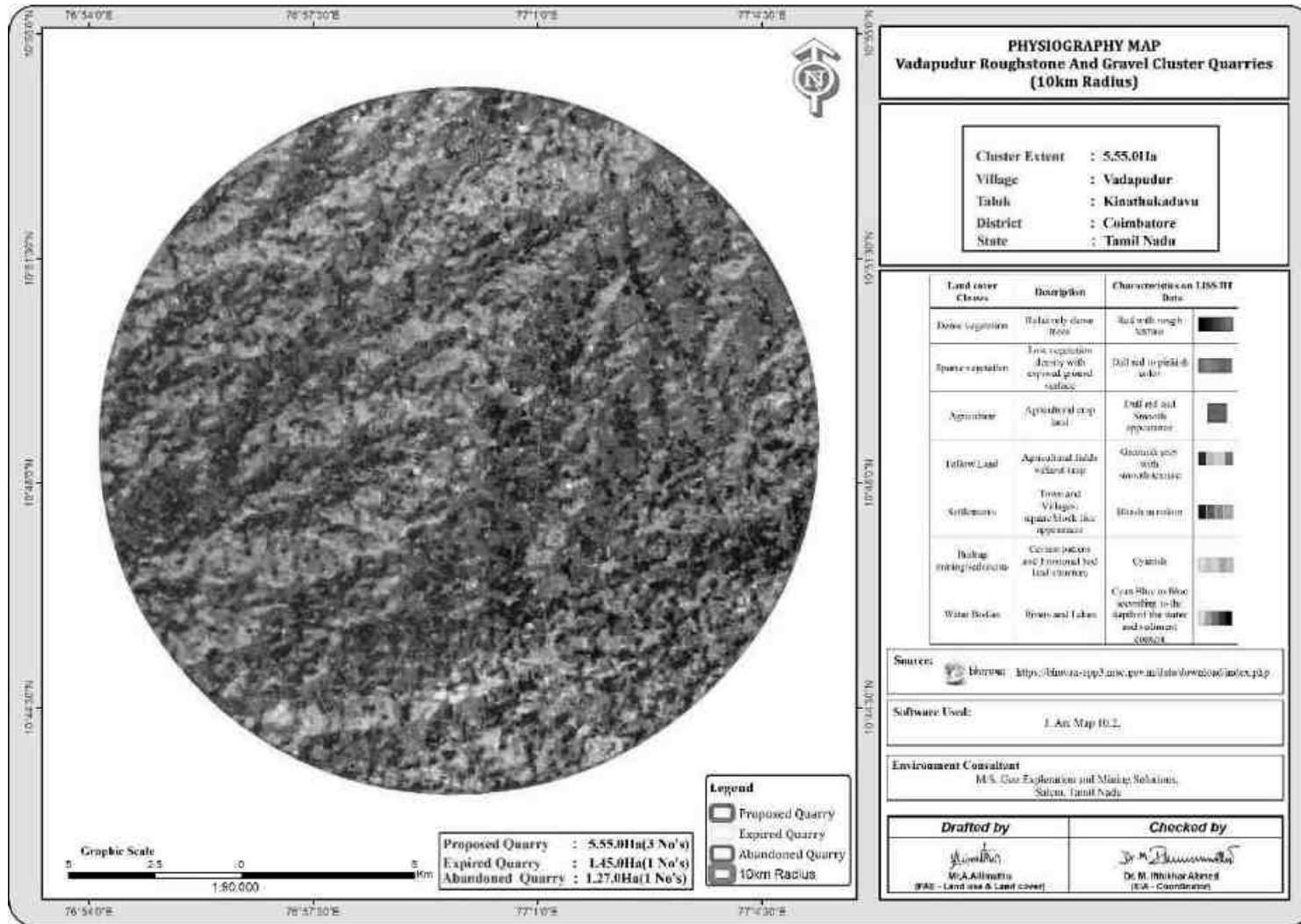
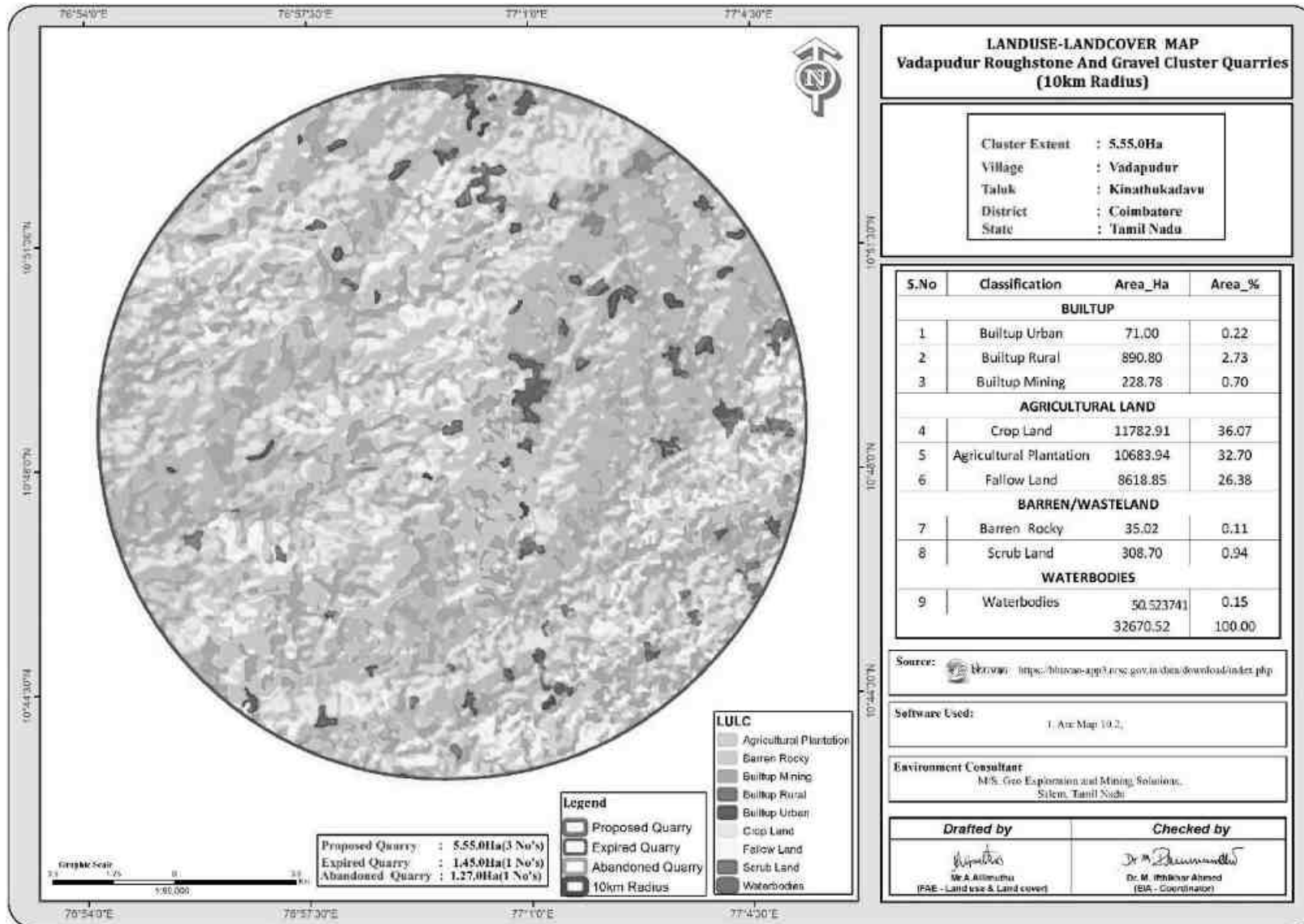


FIGURE 3.3: LAND USE LAND COVER MAP 10KM RADIUS



3.1.4 Interpretation

- ☞ The 10 km radius study area mainly comprises of Crop land & Agriculture Plantation land accounting of 36.07% & 32.70% of the total study area. The study area also consists of fallow land of 26.38%.
- ☞ The buffer zone studied has no ecological sensitive area (National Park, Wildlife Sanctuary, Biosphere Reserve/ etc.).
- ☞ Water Bodies such as Odai, ponds/ lakes comprise of 0.15% of the total buffer area. There are some lake found in the study area like Odai (60m-N), Kothavadi lake (7km-E), Koraiyur River (5km-SE) of the total study area.
- ☞ The Scrub land accounts of 0.94%. As per the primary survey, it was observed the scrub land is mainly occupied by the stony waste and left-over domestic waste generated by the nearby areas.
- ☞ The Barren rocky area covered is about 0.11% in buffer zone.
- ☞ 0.70% of the total study area is occupied by the mine industries. The area occupied by Mainly Rough stone
- ☞ of the total buffer area. As also observed within the primary survey, the 10 km buffer area is also occupied by the medium scaled roughstone and small Brick kiln industries also located in the study area.
- ☞ 0.22% of the area is covered under the Builtup Land including rural area. The nearest village within the 3km from the project site boundary is observed to be villages Muthur, Sankarayapuram, Kallapuram and Vadapudur villages etc.

The project site falls under the Roughstone region. Therefore, the area is appropriate for developing Road development and building etc., it shows that the region has good prospects in the future. Due to proposed Roughstone quarry in this region, economic condition of locals is expected to be improved directly & indirectly. Hence project will prove to be the best economic proposal for the coming times.

3.1.5 Cropping Pattern of the Buffer Zone

The district has a total Geographical area of 367097Ha with net cultivated area of about 165260 Ha. Coconut is the major plantation crop cultivated in an area of about 85831 Ha. The other Agricultural crops cultivated are Millets, Pulses, Oilseeds, Cotton and Sugarcane. Coimbatore is perhaps one of the very few districts in the State which is covered with thick forest (> 20 per cent of the total districts' area). The forests here are abundant in commercially significant trees such as Teak, Sandalwood, Rosewood, Bamboo etc. The cinchona department is raising a cinchona plantation in forests of Pollachi range to jungles of shrubs in Udumalpet. Apart from this, there are one or two tea plantations and coffee plantations.

Source: TNRTP-Coimbatore DDR, 2019

3.1.6 Topography

The project area is almost plain terrain with gentle gradient towards Southeast – Southwestern side, maximum elevation of the area is 400-450 m above Mean Sea level There are no hilly regions in and around the area.

3.1.7 Drainage Pattern of the Area

There are no developed surface drainage channels in the study area. Noyyal, a non-perennial pass 12.0km-North from the project site. The area is studded with few tanks that serve as the source of drinking water and also their surplus feeds adjoining tanks. The area is mostly dry in all seasons except rainy seasons.

The general drainage pattern of the area is of sub dendritic and dendritic pattern. No prominent water course or nallah is inferred. During rainy season the surface runoff flows in W to E direction. The drainage pattern of the study area is given in Fig. 3.5. The quarrying activity will not hinder the natural flow of rainwater.

3.1.8 Environmental Features in the Study Area

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

3.1.9 Seismic Sensitivity

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

TABLE 3.3 – DETAILS OF ENVIRONMENT SENSITIVITY AROUND THE PROJECT AREA

| Sl. No | Sensitive Ecological Features | Name | Arial Distance in km from Mine Lease Boundary |
|--------|--|------|--|
| 1 | National Park / Wild life Sanctuaries | None | Indiragandi (Anamalai) Wildlife sanctuary-33km-S |
| 2 | Reserve Forest | None | Boluvampatti R.F-12km-NW |
| 3 | Tiger Reserve/ Elephant Reserve/ Biosphere Reserve | None | Nil within 10Km Radius |
| 4 | Critically Polluted Areas | None | Nil within 10Km Radius |
| 5 | Mangroves | None | Nil within 10Km Radius |
| 6 | Mountains/Hills | None | Nil within 10Km Radius |
| 7 | Notified Archaeological Sites | None | Nil within 10Km Radius |
| 8 | Defence Installation | None | Nil within 10Km Radius |

Source: Survey of India Toposheet, Village Cadastral Map& Google Earth/Maps

TABLE 3.4 – WATER BODIES WITHIN THE CLUSTER FROM PROPOSED QUARRY

| Tmt.K.Sangeetha | | | |
|------------------------|--------------------|----------------------|------------|
| S.No | LABEL | DISTANCE & DIRECTION | Habitation |
| 1 | Odai | 130m NW | 1km- E |
| 2 | Kothavadi Lake | 7.3Km_E | |
| 3 | Koraiyur River | 5Km_S | |
| 4 | Kumittipatti River | 8Km_NW | |
| 5 | P.A.P Canal | 9.3Km_SE | |

Source: Village Cadastral Map and Field Survey, PFR Report

3.1.6 Soil Environment

Soil quality of the study area is one of the important components of the land environment. The composite soil samples were collected from the study area and analysed for different parameters. The locations of the monitoring sites are detailed in Table 3.4 and Figure 3.3.

TABLE 3.5 – SOIL SAMPLING LOCATIONS

| S. No | Location Code | Monitoring Locations | Distance & Direction | Coordinates |
|-------|---------------|----------------------|----------------------|-----------------------------|
| 1 | S-1 | Core Zone | Project Area | 10°48'38.51"N 76°59'44.53"E |
| 2 | S-2 | Muthur | 2.0km SW | 10°47'33.18"N 76°59'12.03"E |
| 3 | S-3 | Sankarayapuram | 4.2 km SW | 10°46'49.47"N 76°58'13.22"E |
| 4 | S-4 | Nallattipalayam | 4.5km SE | 10°47'17.55"N 77° 1'51.98"E |
| 5 | S-5 | Kinathukadavu | 2.5 km NE | 10°49'49.74"N 77° 0'23.93"E |
| 6 | S-6 | Kallapuram | 3.0 km NW | 10°50'7.28"N 76°58'58.95"E |

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

FIGURE 3.4: SITE PHOTOGRAPHS OF SOIL SAMPLING LOCATIONS



P1- Tmt.K.Sangeetha

The objective of the soil sampling is -

1. To determine the baseline soil characteristics of the study area;
2. To determine the impact of proposed activity on soil characteristics and;

To determine the impact on soil more importantly agriculture production point of view.

Methodology –

For studying soil quality, sampling locations were selected to assess the existing soil conditions in and around the proposed quarry site representing various land use conditions. The samples were collected by auger boring into the soil up to 90-cm depth. eight (6) locations were selected for soil sampling on the basis of soil types, vegetative cover, industrial & residential activities including infrastructure facilities, which would accord an overall idea of the soil characteristics. The samples were analysed for physical and chemical characteristics. The sealed samples were sent to laboratory for analysis. The samples were filled in Polythene bags, coded and sent to laboratory for analysis and the details of methodology in respect are given in below Table 3.5.

TABLE 3.6 – METHODOLOGY OF SAMPLING COLLECTION

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

Source: On-site monitoring/sampling by EHS 360 Labs Private Limited

Soil Testing Result –

The samples were analysed as per the standard methods prescribed in “Soil Chemical Analysis (M.L. Jackson, 1967) & Department of Agriculture, Cooperation & Farmers Welfare, Ministry of Agriculture & Farmers Welfare, Government of India”. The important properties analysed for soil are bulk density, porosity, infiltration rate, pH and Organic matter, kjeldahi Nitrogen, Phosphorous and Potassium. The standard classification of soil and physico-chemical characteristics of the soils are presented below in Table 3.6 & Test Results in Table 3.7.

FIGURE 3.5: SOIL SAMPLING LOCATIONS AROUND 10 KM RADIUS

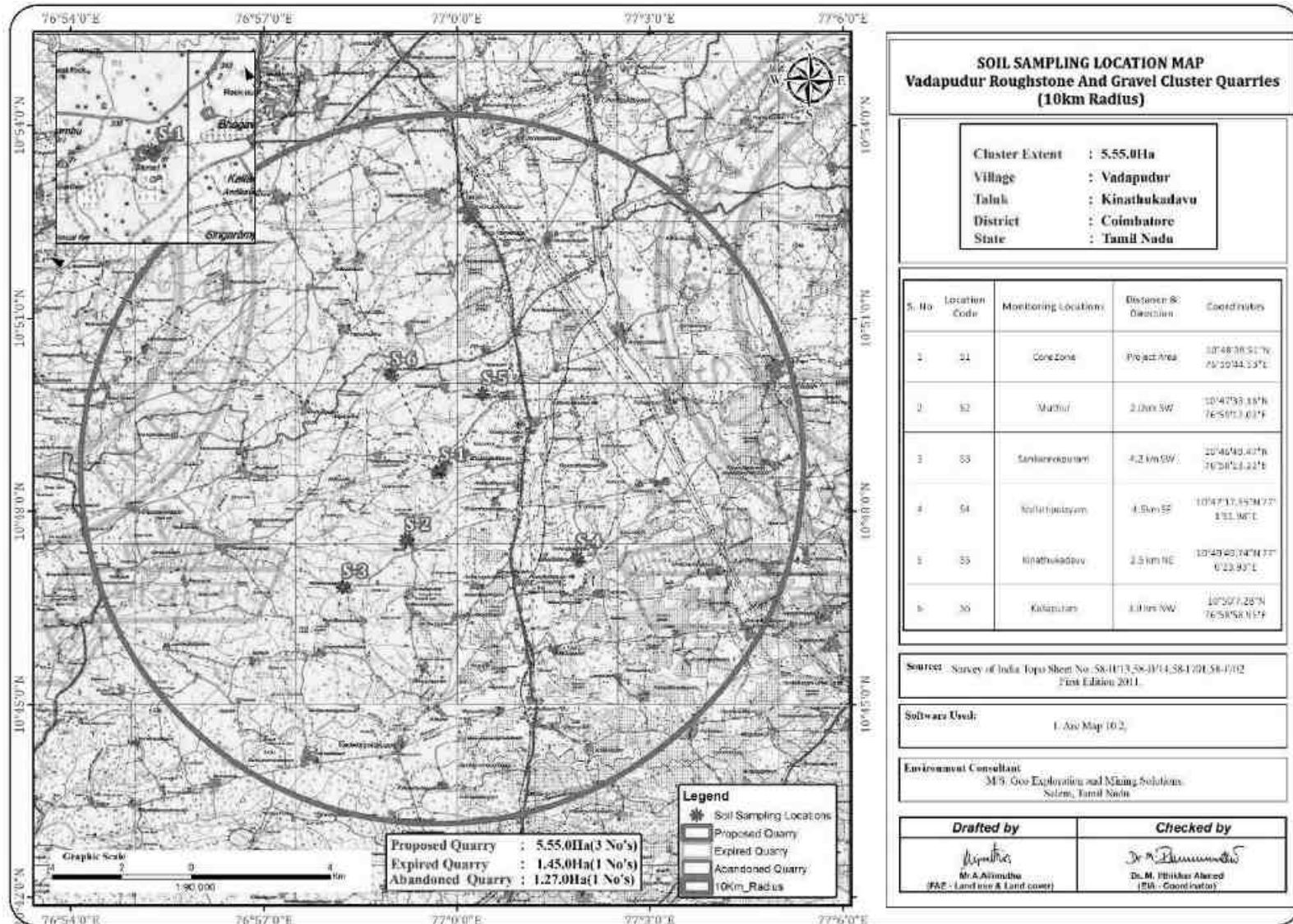


FIGURE 3.6: SOIL MAP

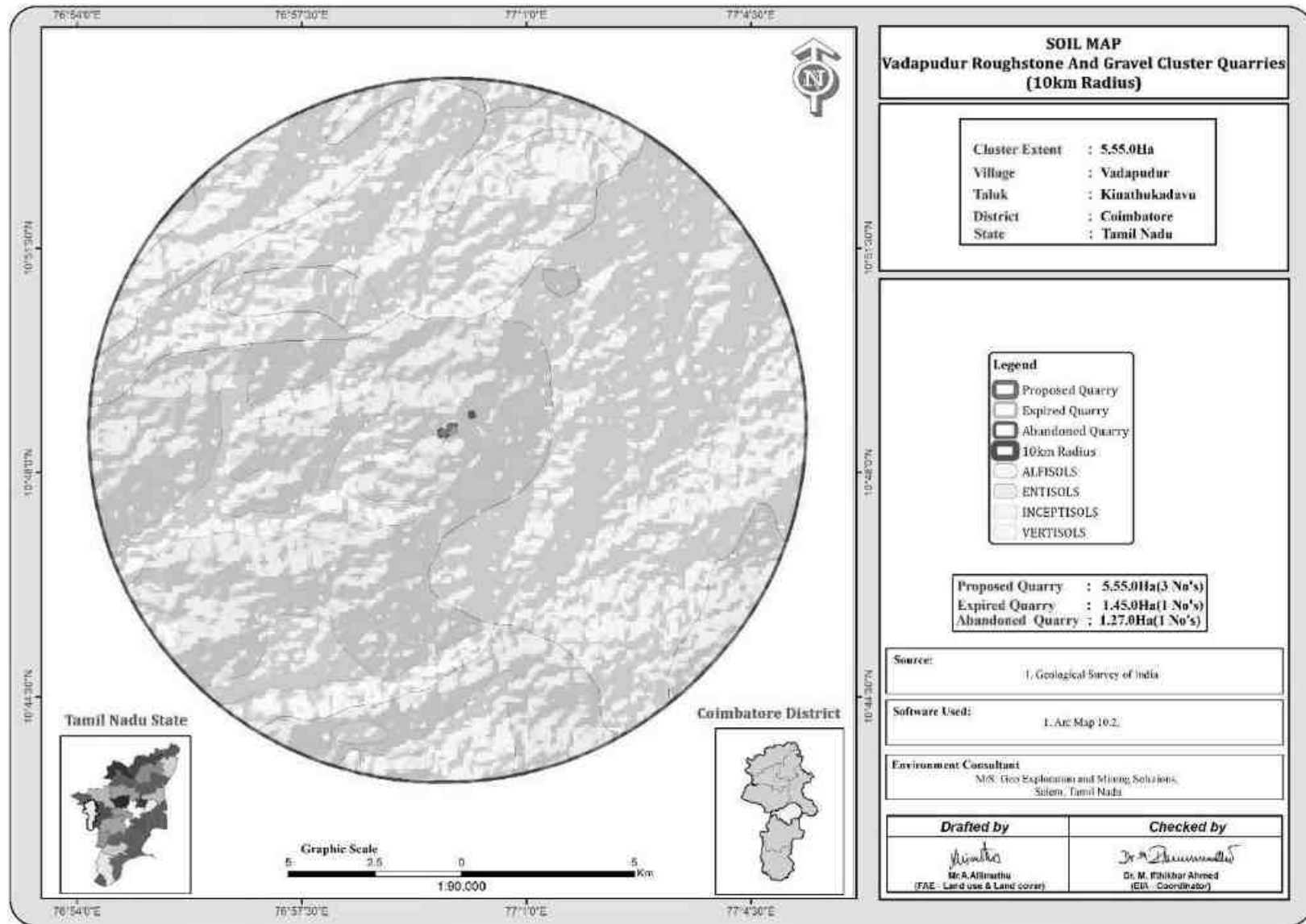


TABLE 3.7 – SOIL QUALITY MONITORING DATA

| Sno | Test Parameters | Protocols | S1-core Zone | S2- Muthur | S3- Sankarayapuram | S4- Nallattipalayam | S5- Kinathukadavu | S6- Kallapuram |
|-----|---|--|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| 1 | pH @ 25°C | IS 2720 Part 26 - 1987 (Reaff:2016) | 7.89 | 7.75 | 8.12 | 7.46 | 8.13 | 8.06 |
| 2 | Conductivity @ 25°C | IS 14767 - 2000 (Reaff : 2016) | 510 µmhos/cm | 494 µmhos/cm | 478 µmhos/cm | 356 µmhos/cm | 523 µmhos/cm | 493 µmhos/cm |
| 3 | Texture : | | | | | | | |
| | Clay | Gravimetric Method | 33.1 % | 33.8 % | 32.9 % | 33.6 % | 33.6 % | 33.3 % |
| | Sand | | 36.2 % | 36.7 % | 34.7 % | 34.5 % | 34.3 % | 34.7 % |
| | Silt | | 30.7 % | 29.5 % | 32.4 % | 31.9 % | 32.1 % | 32.0 % |
| 4 | Water Holding Capacity | By Gravimetric Method | 45.6 % | 41.5 % | 39.7 % | 40.1 % | 45.9 % | 45.1 % |
| 5 | Bulk Density | By Cylindrical Method | 1.14 g/cm ³ | 1.06 g/cm ³ | 1.14 g/cm ³ | 0.96 g/cm ³ | 1.13 g/cm ³ | 1.12 g/cm ³ |
| 6 | Porosity | By Gravimetric Method | 38.1 % | 42.13 % | 45.8 % | 43.9 % | 40.8 % | 43.5 % |
| 7 | Calcium as Ca | USEPA 3050 B – 1996 & | 147 mg/kg | 141 mg/kg | 149.2 mg/kg | 138 mg/kg | 133 mg/kg | 129 mg/kg |
| 8 | Magnesium as Mg | USEPA 6010 C - 2000 | 51.2 mg/kg | 53.4 mg/kg | 39.5 mg/kg | 50.9 mg/kg | 59.2 mg/kg | 38.9 mg/kg |
| 9 | Manganese as Mn | | 24.3 mg/kg | 27.5 mg/kg | 28.3 mg/kg | 27.4 mg/kg | 24.6 mg/kg | 25.4 mg/kg |
| 10 | Zinc as Zn | | 1.11 mg/kg | 2.21 mg/kg | 2.15 mg/kg | 1.14 mg/kg | 1.69mg/kg | 1.57 mg/kg |
| 11 | Boron as B | | 0.87 mg/kg | 1.12 mg/kg | 1.63 mg/kg | 1.57 mg/kg | 1.41 mg/kg | 1.41 mg/kg |
| 12 | Chloride as Cl | APHA 23 rd Edn 2019 4500 Cl B | 131 mg/kg | 132.5 mg/kg | 129.5 mg/kg | 133.5 mg/kg | 133 mg/kg | 136.5 mg/kg |
| 13 | Total Soluble Sulphate as SO ₄ | IS 2720 Part 27 : 1977 (Reaff:2015) | 0.021 % | 0.0032 % | 0.029 % | 0.0036 % | 0.0041 % | 0.0043 % |
| 14 | Potassium as K | USEPA 3050 B – 1996 & USEPA 6010 C - 2000 | 29.4 mg/kg | 1.12 mg/kg | 29.8 mg/kg | 39.1 mg/kg | 31.2 mg/kg | 25.8 mg/kg |
| 15 | Total Phosphorus as P | IS 10158 : 1982 (Reaff: 2019) | 1.41 mg/kg | 358 mg/kg | 2.41 mg/kg | 1.72 mg/kg | 2.37 mg/kg | 1.24 mg/kg |
| 16 | Total Nitrogen as N | IS 14684 : 1999 (Reaff:2019) | 351 mg/kg | 358 mg/kg | 387 mg/kg | 412 mg/kg | 412 mg/kg | 389 mg/kg |
| 17 | Cadmium as Cd | USEPA 3050 B – 1996 & | BDL (DL : 1.0 mg/kg) | BDL (DL : 1.0 mg/kg) | BDL (DL : 1.0 mg/kg) | BDL (DL : 1.0 mg/kg) | BDL (DL : 1.0 mg/kg) | BDL (DL : 1.0 mg/kg) |
| 18 | Total Chromium as Cr | USEPA 6010 C - 2000 | BDL (DL : 1.0 mg/kg) | BDL (DL : 1.0 mg/kg) | BDL (DL : 1.0 mg/kg) | BDL (DL : 1.0 mg/kg) | BDL (DL : 1.0 mg/kg) | BDL (DL : 1.0 mg/kg) |
| 19 | Copper as Cu | | BDL (DL : 1.0 mg/kg) | BDL (DL : 1.0 mg/kg) | BDL (DL : 1.0 mg/kg) | BDL (DL : 1.0 mg/kg) | BDL (DL : 1.0 mg/kg) | BDL (DL : 1.0 mg/kg) |
| 20 | Lead as Pb | | 0.95 mg/kg | 0.86 mg/kg | 1.23 mg/kg | 1.19 mg/kg | 1.54 mg/kg | 1.46 mg/kg |
| 21 | Iron as Fe | | 2.87 mg/kg | 2.94 mg/kg | 2.68 mg/kg | 2.73 mg/kg | 2.82 mg/kg | 2.87 mg/kg |
| 22 | Organic Matter | IS : 2720 Part 22: 1972 (Reaff: 2015) | 1.87 % | 2.08 % | 2.31 % | 2.43 % | 2.49 % | 2.22 % |
| 23 | Organic Carbon | IS : 2720 Part 22: 1972 (Reaff: 2015) | 1.09 % | 1.21 % | 1.34 % | 1.41 % | 1.45 % | 1.29 % |
| 24 | Cation Exchange Capacity | USEPA 9080 – 1986 | 31.2 meq/100g of soil | 36.8 meq/100g of soil | 30.8 meq/100g of soil | 38.2 meq/100g of soil | 42.5 meq/100g of soil | 39.8 meq/100g of soil |

Source: Sampling Results by EHS 360 Labs Private Limited

Interpretation & Conclusion**Physical Characteristics –**

The physical properties of the soil samples were examined for texture, bulk density, porosity and water holding capacity. The soil texture found in the study area is Clay to Sandy Soil and Bulk Density of Soils in the study area varied between 0.96– 1.14 g/cc. The Water Holding Capacity 39.7 to 45.9% and Porosity of the soil samples is found to be medium i.e. ranging from 38.1 – 45.8 %.

Chemical Characteristics –

- The nature of soil is slightly alkaline to strongly alkaline in nature with pH range 7.46 to 8.12
- The available Nitrogen content range between 351 to 412 mg/kg
- The available Phosphorus content range between 1.24 to 358 mg/kg
- The available Potassium range between 25.8 to 39.1 mg/kg

Whereas, the micronutrient as zinc (Zn), iron (Fe) and copper (Cu) were found in the range of 1.11 to 2.21mg/kg; 2.68 to 2.94 mg/kg and ND

Wilting co efficient in significant level would mean that the soil would support the vegetation. The soil properties in the buffer zone reveal that the soil can sustain vegetation. If amended suitability the core area can also withstand plantation.

3.2 Water Environment

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

3.2.1 Surface Water Resources:

Noyyal river lies at 12 Km North from the project cluster. The area is studded with few tanks that serve as the source for agriculture and also their surplus feeds adjoining tanks. The rainfall over the area is moderate, the rainwater storage in open wells, trenches is in practice over the area and the stored water acts as source of freshwater for couple of months after rainy season.

3.2.2 Ground Water Resources:

The terrain is underlain by hard rock formations, Fissured and fractured crystalline rocks constitute the important aquifer systems in the Coimbatore region. Ground water occurs under phreatic to semi-confined conditions in these formations and is being developed by means of dug wells and filter points. Proterozoic formation is the basement rocks which consist of quartzite, crystalline limestone, calc-granulite, hornblende – biotite gneiss, charnockite or pyroxene granulite, granite and pegmatite. Weathered, a fissured crack, shear zones and joints in the basement rock act as a good groundwater potential zone in the study area.

The study area falls in the Sulur block which is categorized as over-exploited zone as per G.O (MS) No 113 dated 09.06.2016.

3.2.3 Methodology

Reconnaissance survey was undertaken to collect the sampling and locations were finalized based on;

1. Drainage pattern;
2. Location of residential areas representing different activities/likely impact areas; and
3. Likely areas, which can represent baseline conditions

One (1) surface water and five (5) ground water samples were collected in the study area and physico-chemical, heavy metals and bacteriological parameters were analysed. The samples were analysed as per the procedures specified by CPCB, IS-10500:2012 and 'Standard methods for the Examination of Water and Waste water' published by American Public Health Association (APHA). The water sampling locations are given in Table 3.8 and shown as Figure 3.5.

TABLE 3.8 – WATER SAMPLING LOCATIONS

| S. No | Location code | Monitoring Locations | Distance & Direction | Coordinates |
|-------|---------------|----------------------|----------------------|-----------------------------|
| 1 | SW-1 | Kothavadi Lake | 7.5km East | 10°48'40.88"N 77° 4'1.08"E |
| 2 | WW-1 | Near Project Area | 420m SE | 10°48'34.91"N 77° 0'7.95"E |
| 3 | WW-2 | Kallapuram | 2.6 km NW | 10°50'1.49"N 76°59'8.86"E |
| 4 | WW-3 | Muthur | 2.2 km SW | 10°47'46.34"N 76°58'54.96"E |
| 5 | BW-1 | Near Project Area | 300m NW | 10°48'46.19"N 76°59'37.69"E |
| 6 | BW-2 | Vadakkipalayam | 1.6 km SE | 10°48'10.68"N 77° 0'36.48"E |

Source: On-site monitoring/sampling by EHS 360 Labs Private Limited

Note: SW- Surface water, WW – Well Water, BW – Bore well

FIGURE 3.7: SITE PHOTOGRAPHS OF WATER SAMPLING LOCATIONS



FIGURE 3.8: WATER SAMPLING LOCATIONS AROUND 10 KM RADIUS

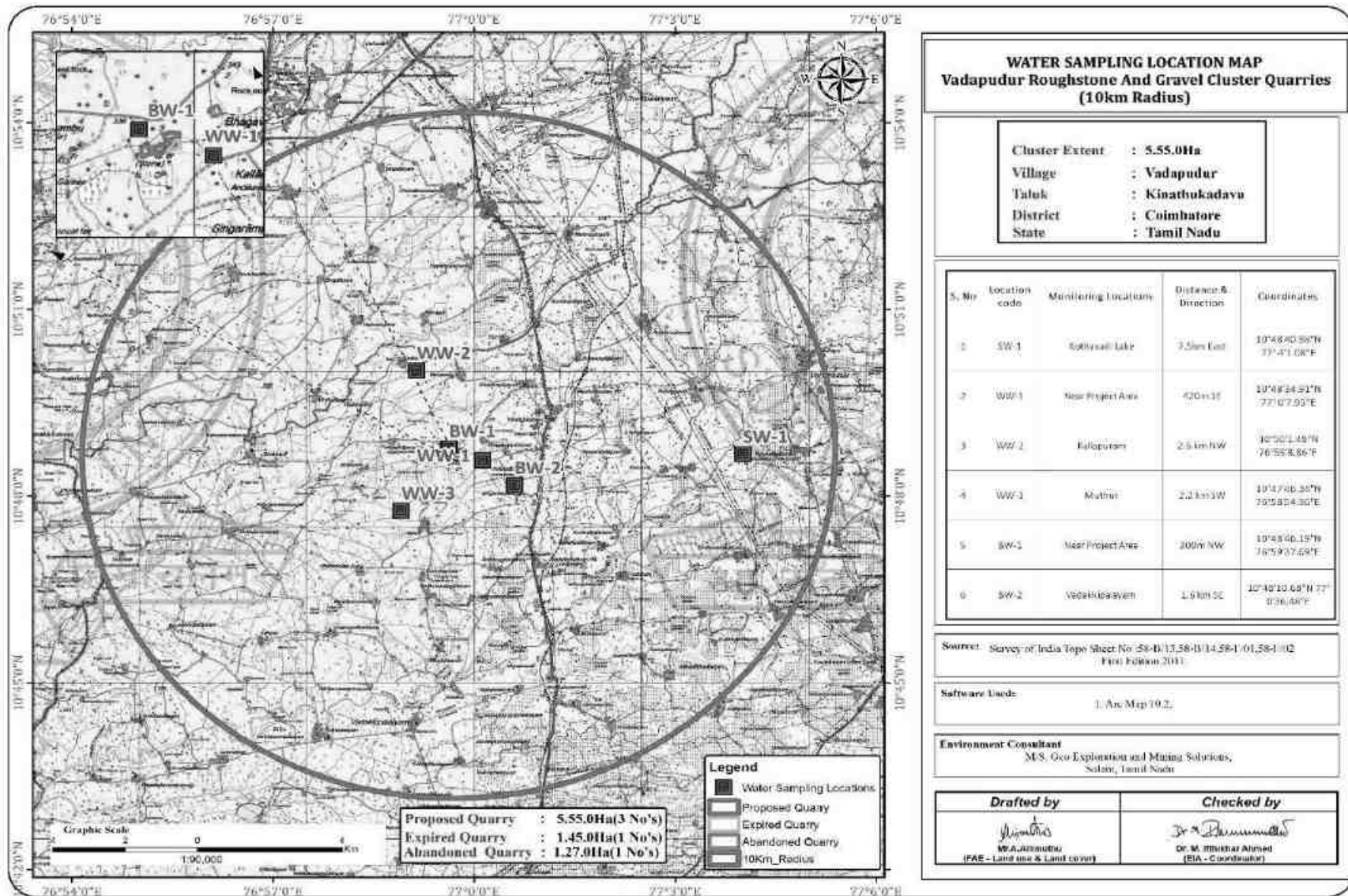


TABLE 3.9 – SURFACE WATER ANALYSIS RESULTS

| SNO | TEST | PROTOCOL | Surface Water (SW-1) - Kothavadi Lake | Ground Water (WW-1) – Near Project Area |
|-----|--|---|---------------------------------------|---|
| 1 | Colour | IS 3025 Part 4:1983 (Reaff:2017) | 9 Hazen | <5 |
| 2 | Odour | IS 3025 Part 5:2018 | Agreeable | Agreeable |
| 3 | pH at 25°C | IS 3025 Part 11:1983 (Reaff:2017) | 8.32 | 7.32 |
| 4 | Conductivity @ 25°C | IS 3025 Part 14:2013 (Reaff:2019) | 909 mhos/cm | 964 µmhos/cm |
| 5 | Turbidity | IS 3025 Part 10:1984 (Reaff:2017) | 5.2 NTU | 1.9 NTU |
| 6 | Total Dissolved Solids | IS 3025 Part 16:1984 (Reaff:2017) | 536 mg/l | 568 mg/l |
| 7 | Total Hardness as CaCO ₃ | IS 3025 Part 21:2009 (Reaff:2019) | 248 mg/l | 232 mg/l |
| 8 | Calcium as Ca | IS 3025 Part 40:1991 (Reaff:2019) | 67.3 mg/l | 54.5 mg/l |
| 9 | Magnesium as Mg | IS 3025 Part 46:1994 (Reaff:2019) | 19.5 mg/l | 23.3 mg/l |
| 10 | Total Alkalinity as CaCO ₃ | IS 3025 Part 23:1986 (Reaff:2019) | 198 mg/l | 199.5 mg/l |
| 11 | Chloride as Cl | IS 3025 Part 32:1988 (Reaff:2019) | 149.9 mg/l | 165 mg/l |
| 12 | Sulphate as SO ₄ | IS 3025 Part 24:1986 (Reaff:2019) | 58.6 mg/l | 49.8 mg/l |
| 13 | Iron as Fe | IS 3025 Part 53:2003 (Reaff:2019) | 0.21 mg/l | 0.27 mg/l |
| 14 | Residual Free Chlorine | IS 3025 Part 26:1986 (Reaff:2019) | BDL (DL:0.1 mg/l) | BDL (DL:0.1 mg/l) |
| 15 | Fluoride as F | APHA 23 rd Edn. 2017:4500 F,D | 0.22 mg/l | 0.16 mg/l |
| 16 | Nitrate as NO ₃ | IS 3025 Part 34:1988 (Reaff:2019) | 13.8 mg/l | 5.6 mg/l |
| 17 | Copper as Cu | IS 3025 Part 65:2014 (Reaff:2019) | BDL (DL:0.01 mg/l) | BDL (DL:0.01 mg/l) |
| 18 | Manganese as Mn | IS 3025 Part 65:2014 (Reaff:2019) | BDL (DL:0.02 mg/l) | BDL (DL:0.02 mg/l) |
| 19 | Mercury as Hg | USEPA 200.8 | BDL (DL:0.0005 mg/l) | BDL (DL:0.0005 mg/l) |
| 20 | Cadmium as Cd | IS 3025 Part 65:2014 (Reaff:2019) | BDL (DL:0.001 mg/l) | BDL (DL:0.001 mg/l) |
| 21 | Selenium as Se | IS 3025 Part 65:2014 (Reaff:2019) | BDL (DL:0.005 mg/l) | BDL (DL:0.005 mg/l) |
| 22 | Aluminium as Al | IS 3025 Part 65:2014 (Reaff:2019) | BDL (DL:0.005 mg/l) | BDL (DL:0.005 mg/l) |
| 23 | Lead as Pb | IS 3025 Part 65:2014 (Reaff:2019) | BDL (DL:0.005 mg/l) | BDL (DL:0.005 mg/l) |
| 24 | Zinc as Zn | IS 3025 Part 65:2014 (Reaff:2019) | BDL (DL : 0.05 mg/l) | BDL (DL : 0.05 mg/l) |
| 25 | Total Chromium as Cr | IS 3025 Part 65:2014 (Reaff:2019) | BDL (DL : 0.02 mg/l) | BDL (DL : 0.02 mg/l) |
| 26 | Boron as B | IS 3025 Part 65:2014 (Reaff:2019) | BDL (DL : 0.05 mg/l) | BDL (DL : 0.05 mg/l) |
| 27 | Mineral Oil | IS 3025 Part 39-1991 (Reaff. 2019) | BDL (DL : 0.01 mg/l) | BDL (DL : 0.01 mg/l) |
| 28 | Phenolic compounds as C ₆ H ₅ OH | IS 3025 Part 43-1992 (Reaff: 2019) | BDL (DL:0.0005 mg/l) | BDL (DL:0.0005 mg/l) |
| 29 | Anionic Detergents (as MBAS) | IS 13428 – 2005 (Reaff:2019) (Annex K) | BDL (DL:0.01 mg/l) | BDL (DL:0.01 mg/l) |
| 30 | Cyanide as CN | IS 3025 Part 27-1986 (Reaff. 2019) | BDL (DL:0.01 mg/l) | BDL (DL:0.01 mg/l) |
| 31 | BOD @ 27°C for 3 days | IS 3025 Part 44:1993 (Reaff:2019) | 14.3 mg/l | BDL (DL:0.01 mg/l) |
| 32 | Chemical Oxygen Demand | IS 3025 Part 58:2006 (Reaff:2017) | 46 mg/l | BDL (DL:0.01 mg/l) |
| 33 | Dissolved Oxygen | IS 3025 Part 38:1989 (Reaff:2019) | 6.2 mg/l | BDL (DL:0.01 mg/l) |
| 34 | Barium as Ba | IS 3025 Part 65:2014 (Reaff:2019) | BDL (DL:0.05 mg/l) | BDL (DL:0.05 mg/l) |
| 35 | Ammonia (as total ammonia-N) | IS 3025 Part 34-1988 (Reaff. 2019) | 3.6 mg/l | BDL (DL:0.01 mg/l) |
| 36 | Sulphide as H ₂ S | IS 3025 Part 29-1986 (Reaff: 2019) | BDL (DL:0.01 mg/l) | BDL (DL:0.01 mg/l) |
| 37 | Molybdenum as Mo | IS 3025 Part 65:2014 (Reaff:2019) | BDL (DL:0.02 mg/l) | BDL (DL:0.02 mg/l) |
| 38 | Total Arsenic as As | IS 3025 Part 65:2014 (Reaff:2019) | BDL (DL:0.005 mg/l) | BDL (DL:0.005 mg/l) |
| 39 | Total Suspended Solids | IS 3025 Part 17 -1984 (Reaff:2017) | 18.5 mg/l | BDL (DL:1.0 mg/l) |
| 40 | Total Coliform | APHA 23rd Edn. 2017:9221B | 982 MPN/100ml | 130 MPN/100ml |
| 41 | <i>Escherichia coli</i> | APHA 23rd Edn. 2017:9221F | 144 MPN/100ml | < 1.8 MPN/100ml |

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

TABLE 3.10 – GROUND WATER ANALYSIS RESULTS

| Sno | Test | Protocol | Ground Water (WW-2) Kallapuram | Ground Water (BW-1) – Near Project Area | Ground Water (BW-2) – Vadakkipalayam | Ground Water (WW-3) – Muthur |
|-----|---|--|-----------------------------------|--|---|---------------------------------|
| 1 | Colour | IS 3025 Part 4:1983 (Reaff:2017) | <5 | <5 | 5 | <5 |
| 2 | Odour | IS 3025 Part 5:2018 | Agreeable | Agreeable | Agreeable | Agreeable |
| 3 | pH at 25°C | IS 3025 Part 11:1983 (Reaff:2017) | 7.84 | 7.32 | 7.58 | 7.49 |
| 4 | Conductivity @ 25°C | IS 3025 Part 14:2013 (Reaff:2019) | 845 µmhos/cm | 717 µmhos/cm | 743 µmhos/cm | 845 µmhos/cm |
| 5 | Turbidity | IS 3025 Part 10:1984 (Reaff:2017) | 2.5 NTU | 1.7 NTU | 1.5 NTU | 2.8 NTU |
| 6 | Total Dissolved Solids | IS 3025 Part 16:1984 (Reaff:2017) | 498 mg/l | 423 mg/l | 438 mg/l | 498 mg/l |
| 7 | Total Hardness as CaCO ₃ | IS 3025 Part 21:2009 (Reaff:2019) | 168 mg/l | 152 mg/l | 164 mg/l | 180 mg/l |
| 8 | Calcium as Ca | IS 3025 Part 40:1991 (Reaff:2019) | 44.8 mg/l | 30.4 mg/l | 32.1 mg/l | 46.5 mg/l |
| 9 | Magnesium as Mg | IS 3025 Part 46:1994 (Reaff:2019) | 13.6 mg/l | 18.5 mg/l | 20.4 mg/l | 15.5 mg/l |
| 10 | Total Alkalinity as CaCO ₃ | IS 3025 Part 23:1986 (Reaff:2019) | 136 mg/l | 132.5 mg/l | 143 mg/l | 158 mg/l |
| 11 | Chloride as Cl | IS 3025 Part 32:1988 (Reaff:2019) | 148 mg/l | 117 mg/l | 122 mg/l | 121 mg/l |
| 12 | Sulphate as SO ₄ | IS 3025 Part 24:1986 (Reaff:2019) | 59.8 mg/l | 41.8 mg/l | 42.8 mg/l | 42.7 mg/l |
| 13 | Iron as Fe | IS 3025 Part 53:2003 (Reaff:2019) | 0.26 mg/l | 0.14 mg/l | 0.26 mg/l | 0.24 mg/l |
| 14 | Residual Free Chlorine | IS 3025 Part 26:1986 (Reaff:2019) | BDL (DL:0.1 mg/l) | BDL (DL:0.1 mg/l) | BDL (DL:0.1 mg/l) | BDL (DL:0.1 mg/l) |
| 15 | Fluoride as F | APHA 23 rd Edn. 2017:4500 F,D | 0.19 mg/l | 0.12 mg/l | 0.17 mg/l | 0.14 mg/l |
| 16 | Nitrate as NO ₃ | IS 3025 Part 34:1988 (Reaff:2019) | 8.9 mg/l | 7.9 mg/l | 4.9 mg/l | 7.3 mg/l |
| 17 | Copper as Cu | IS 3025 Part 65:2014 (Reaff:2019) | BDL (DL:0.01 mg/l) | BDL (DL:0.01 mg/l) | BDL (DL:0.01 mg/l) | BDL (DL:0.01 mg/l) |
| 18 | Manganese as Mn | IS 3025 Part 65:2014 (Reaff:2019) | BDL (DL:0.02 mg/l) | BDL (DL:0.02 mg/l) | BDL (DL:0.02 mg/l) | BDL (DL:0.02 mg/l) |
| 19 | Mercury as Hg | USEPA 200.8 | BDL (DL:0.0005 mg/l) | BDL (DL:0.0005 mg/l) | BDL (DL:0.0005 mg/l) | BDL (DL:0.0005 mg/l) |
| 20 | Cadmium as Cd | IS 3025 Part 65:2014 (Reaff:2019) | BDL (DL:0.001 mg/l) | BDL (DL:0.001 mg/l) | BDL (DL:0.001 mg/l) | BDL (DL:0.001 mg/l) |
| 21 | Selenium as Se | IS 3025 Part 65:2014 (Reaff:2019) | BDL (DL:0.005 mg/l) | BDL (DL:0.005 mg/l) | BDL (DL:0.005 mg/l) | BDL (DL:0.005 mg/l) |
| 22 | Aluminium as Al | IS 3025 Part 65:2014 (Reaff:2019) | BDL (DL:0.005 mg/l) | BDL (DL:0.005 mg/l) | BDL (DL:0.005 mg/l) | BDL (DL:0.005 mg/l) |
| 23 | Lead as Pb | IS 3025 Part 65:2014 (Reaff:2019) | BDL (DL:0.005 mg/l) | BDL (DL:0.005 mg/l) | BDL (DL:0.005 mg/l) | BDL (DL:0.005 mg/l) |
| 24 | Zinc as Zn | IS 3025 Part 65:2014 (Reaff:2019) | BDL(DL : 0.05 mg/l) | BDL(DL : 0.05 mg/l) | BDL(DL : 0.05 mg/l) | BDL(DL : 0.05 mg/l) |
| 25 | Total Chromium as Cr | IS 3025 Part 65:2014 (Reaff:2019) | BDL(DL : 0.02 mg/l) | BDL(DL : 0.02 mg/l) | BDL(DL : 0.02 mg/l) | BDL(DL : 0.02 mg/l) |
| 26 | Boron as B | IS 3025 Part 65:2014 (Reaff:2019) | BDL(DL : 0.05 mg/l) | BDL(DL : 0.05 mg/l) | BDL(DL : 0.05 mg/l) | BDL(DL : 0.05 mg/l) |
| 27 | Mineral Oil | IS 3025 Part 39-1991 (Reaff. 2019) | BDL(DL : 0.01 mg/l) | BDL(DL : 0.01 mg/l) | BDL(DL : 0.01 mg/l) | BDL(DL : 0.01 mg/l) |
| 28 | Phenolic compounds as C ₆ H ₅ OH | IS 3025 Part 43-1992(Reaff: 2019) | BDL (DL:0.0005 mg/l) | BDL (DL:0.0005 mg/l) | BDL (DL:0.0005 mg/l) | BDL (DL:0.0005 mg/l) |
| 29 | Anionic Detergents (as MBAS) | IS 13428 – 2005 (Reaff:2019) (Annex K) | BDL (DL:0.01 mg/l) | BDL (DL:0.01 mg/l) | BDL (DL:0.01 mg/l) | BDL (DL:0.01 mg/l) |
| 30 | Barium as Ba | IS 3025 Part 27-1986 (Reaff. 2019) | BDL(DL:0.05 mg/l) | BDL (DL:0.01 mg/l) | BDL (DL:0.01 mg/l) | BDL (DL:0.01 mg/l) |
| 31 | Ammonia (as total ammonia-N) | IS 3025 Part 44:1993 (Reaff:2019) | BDL (DL:0.01 mg/l) | BDL (DL:0.01 mg/l) | BDL (DL:0.01 mg/l) | BDL (DL:0.01 mg/l) |
| 32 | Sulphide as H ₂ S | IS 3025 Part 58:2006 (Reaff:2017) | BDL (DL:0.01 mg/l) | BDL (DL:0.01 mg/l) | BDL (DL:0.01 mg/l) | BDL (DL:0.01 mg/l) |
| 33 | Molybdenum as Mo | IS 3025 Part 38:1989 (Reaff:2019) | BDL (DL:0.02 mg/l) | BDL (DL:0.02 mg/l) | BDL (DL:0.02 mg/l) | BDL (DL:0.02 mg/l) |
| 34 | Total Arsenic as As | IS 3025 Part 65:2014 (Reaff:2019) | BDL (DL:0.005 mg/l) | BDL (DL:0.005 mg/l) | BDL (DL:0.005 mg/l) | BDL (DL:0.005 mg/l) |
| 35 | Total Suspended Solids | IS 3025 Part 17 -1984 (Reaff:2017) | BDL (DL:1.0 mg/l) | BDL (DL:1.0 mg/l) | BDL (DL:1.0 mg/l) | BDL (DL:1.0 mg/l) |
| 36 | Total Coliform | APHA 23 rd Edn. 2017:9221B | 159 MPN/100ml | 146 MPN/100ml | 176 MPN/100ml | 143 MPN/100ml |
| 37 | <i>Escherichia coli</i> | APHA 23 rd Edn. 2017:9221F | < 1.8 MPN/100ml | < 1.8 MPN/100ml | < 1.8 MPN/100ml | < 1.8 MPN/100ml |

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

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

Source: Sampling Results by EHS 360 Labs Private Limited

3.2.4 Interpretation & Conclusion

Surface Water

The pH of surface 8.32 while turbidity found within the standards. Total Dissolved Solids 536 mg/l and Chloride 149.9mg/l. Nitrates 13.8 mg/l, while sulphates 58.6 mg/l.

Ground Water

The pH of the water samples collected ranged from 7.32 to 7.84 and within the acceptable limit of 6.5 to 8.5. pH, Sulphates and Chlorides of water samples from all the sources are within the limits as per the Standard. on Turbidity, the water samples meet the requirement. Total Dissolved Solids were found in the range of 232- 498 mg/l in all samples. The Total hardness varied between 54.5 – 180 mg/l for all samples.

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

3.2.5 Hydrology and Hydrogeological studies

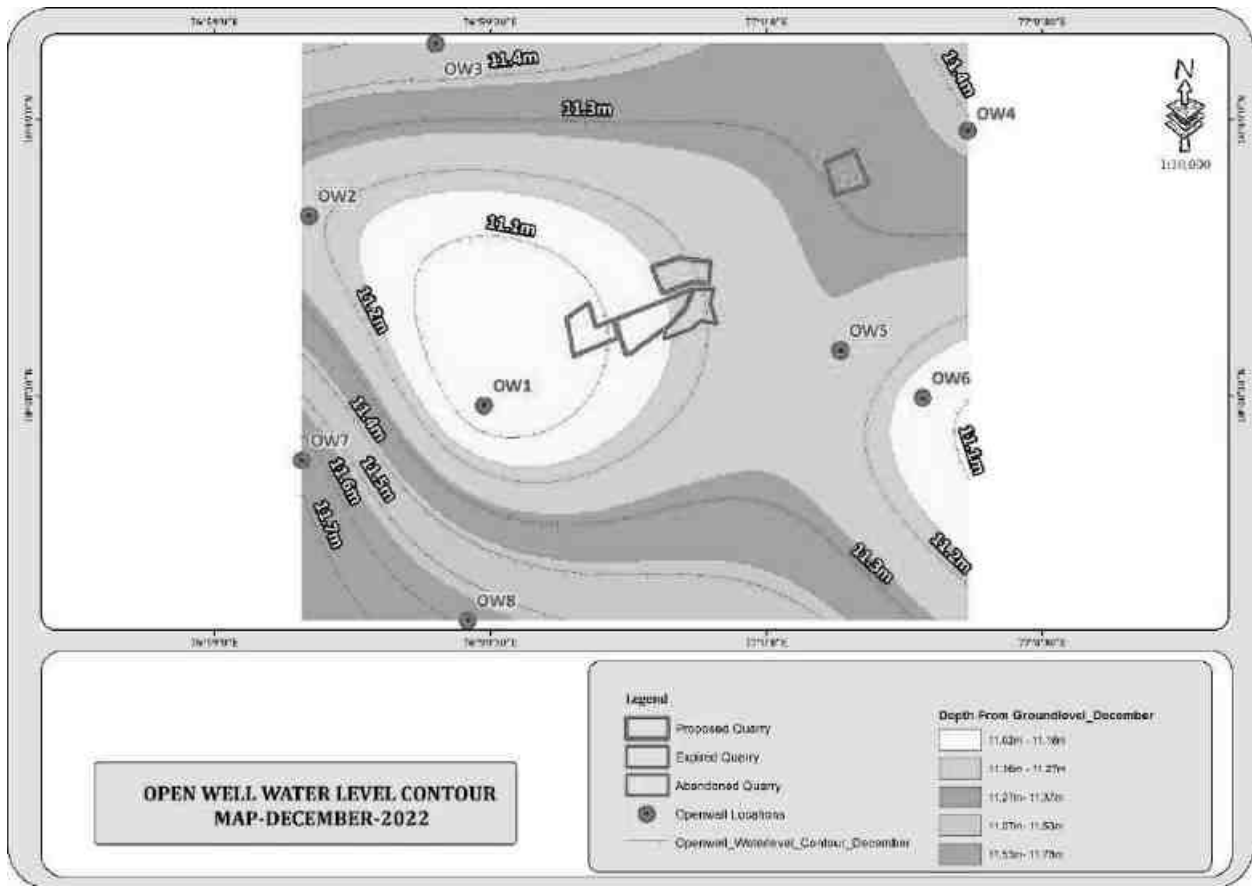
The district is underlain by hard rock formation Fissured and Fractured crystalline rocks constitute the important aquifer systems in the district. Geophysical prospecting was carried out in that area by SSRMP-80 Instrument by qualified Geo physicist with the help of GIS software and it was inferred that the low resistance encountered at the depth between 60-75m. the quarrying operations is restricted upto 25-47m hence there is no possibilities of water table intersection during the entire mine life period besides it is also inferred topographically that there are no major water bodies intersecting the project area. There is no necessity of stream, channel diversion due to this upcoming project.

During the rainy season there is a possibility of collection of seepage water from the subsurface levels this is due to the high intensity of fracture and weathered portion upto a depth of 10m thus the collected seepage water will be stored in the mine sump pits and will be used for dust suppression and greenbelt development and during the end of the life of the mine this collected water will be as a temporary reservoir in that area.

TABLE 3.11: POST MONSOON WATER LEVEL OF OPEN WELLS 1 KM RADIUS

| S.No | LABEL | LONGITUDE | LATITUDE | Dec 2022 | Jan 2023 | Feb 2023 |
|------|-------|-----------------|-----------------|----------|----------|----------|
| 1 | OW-1 | 10° 48' 28.94"N | 76° 59' 29.30"E | 11 | 11.6 | 12.2 |
| 2 | OW-2 | 10° 48' 49.55"N | 76° 59' 10.28"E | 11.2 | 11.8 | 12.4 |
| 3 | OW-3 | 10° 49' 08.26"N | 76° 59' 24.06"E | 11.5 | 12.1 | 12.7 |
| 4 | OW-4 | 10° 48' 58.80"N | 77° 00' 21.91"E | 11.4 | 12 | 12.6 |
| 5 | OW-5 | 10° 48' 34.93"N | 77° 00' 08.09"E | 11.3 | 11.9 | 12.5 |
| 6 | OW-6 | 10° 48' 29.75"N | 77° 00' 17.02"E | 11.1 | 11.7 | 12.3 |
| 7 | OW-7 | 10° 48' 22.99"N | 76° 59' 09.52"E | 11.7 | 12.3 | 12.9 |
| 8 | OW-8 | 10° 48' 05.59"N | 76° 59' 27.55"E | 11.6 | 12.2 | 12.8 |

FIGURE 3.9: CONTOUR MAP OF OPEN WELL WATER LEVEL



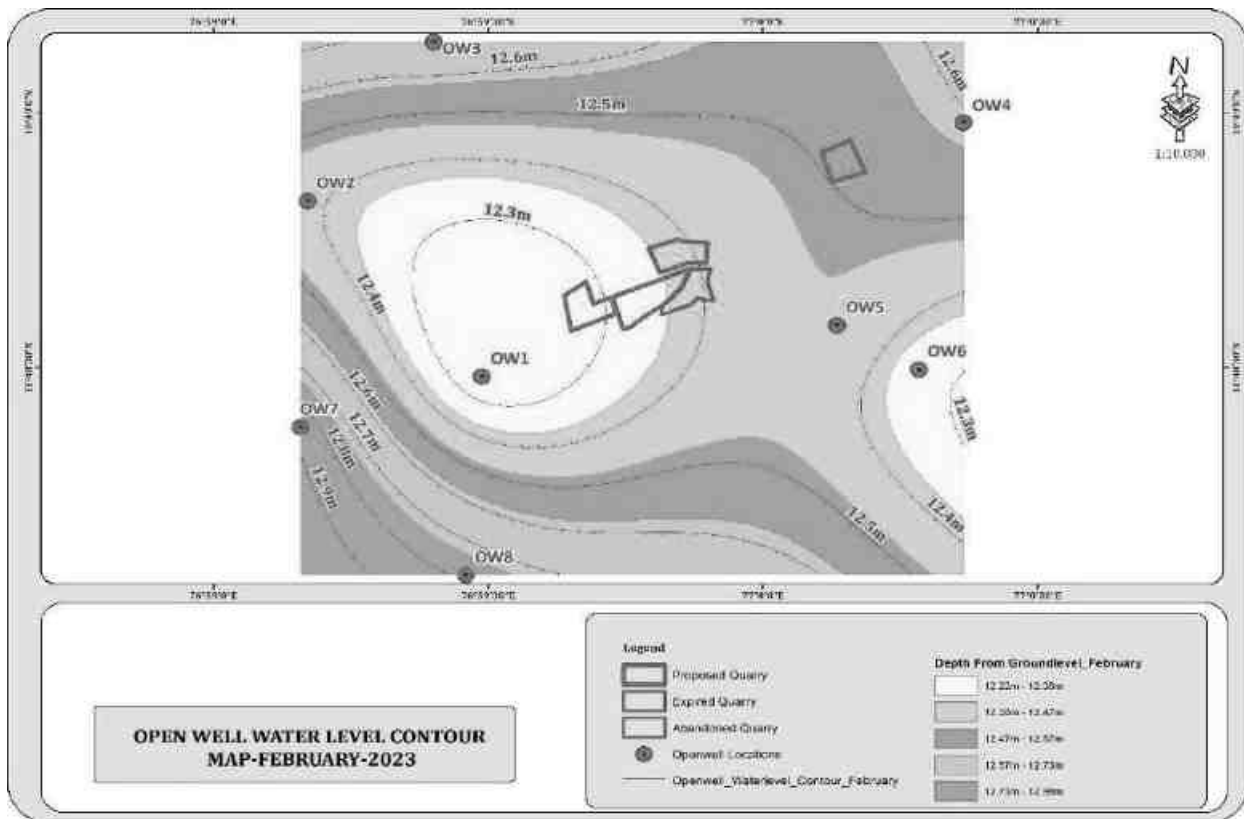
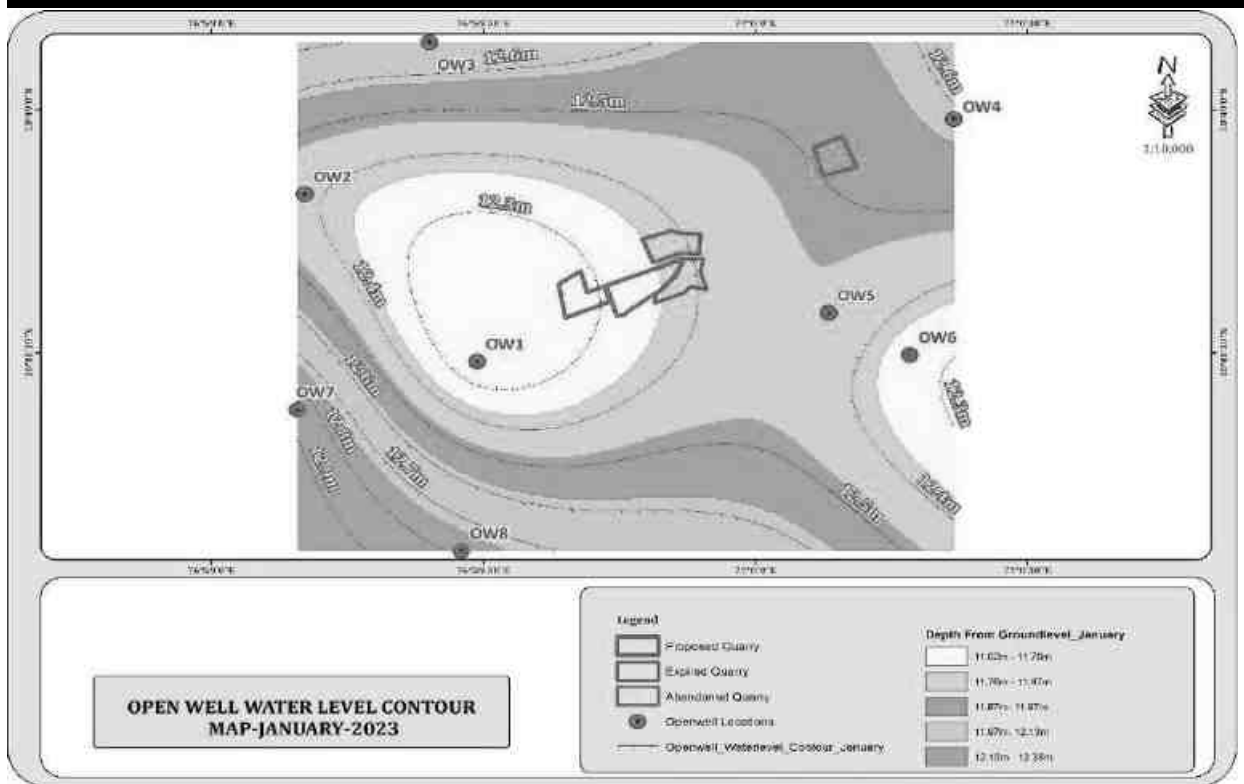
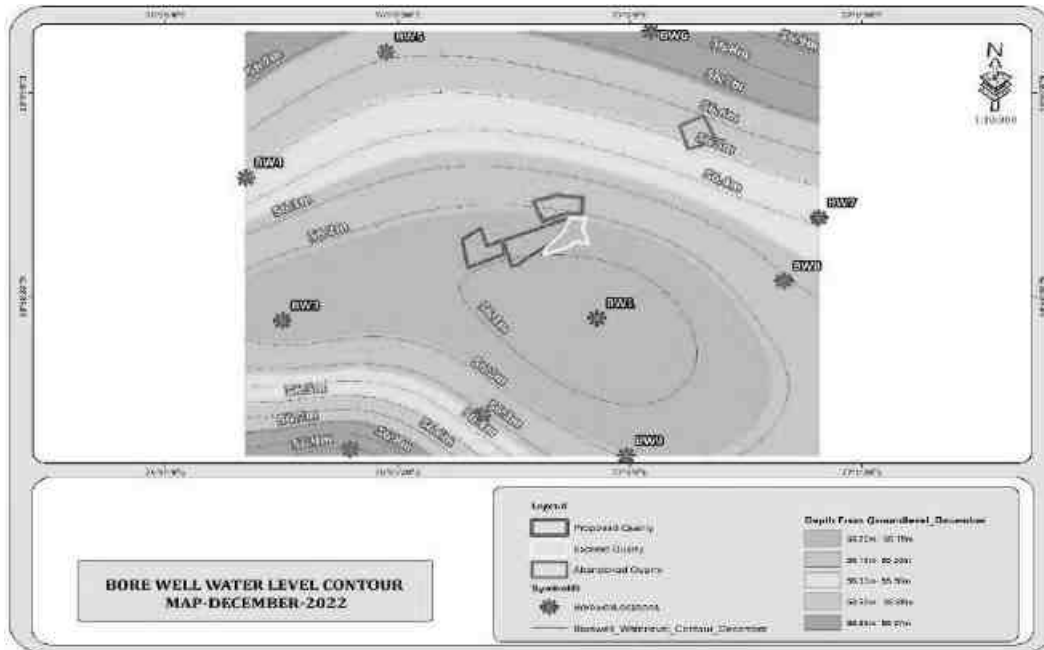


TABLE 3.12: POST MONSOON WATER LEVEL OF BOREWELLS 1 KM RADIUS

| S.No | LABEL | LONGITUDE | LATITUDE | Dec2022 | Jan 23 | Feb 23 |
|------|-------|-----------------|-----------------|---------|--------|--------|
| 1 | BW-1 | 10° 48' 26.83"N | 76° 59' 55.76"E | 56 | 56.6 | 57.2 |
| 2 | BW-2 | 10° 48' 12.51"N | 76° 59' 40.90"E | 56.3 | 56.9 | 57.5 |
| 3 | BW-3 | 10° 48' 26.47"N | 76° 59' 15.11"E | 56.1 | 56.7 | 57.3 |
| 4 | BW-4 | 10° 48' 47.55"N | 76° 59' 10.34"E | 56.5 | 57.1 | 57.7 |
| 5 | BW-5 | 10° 49' 06.10"N | 76° 59' 28.53"E | 56.6 | 57.2 | 57.8 |
| 6 | BW-6 | 10° 49' 09.16"N | 77° 00' 02.74"E | 56.8 | 57.4 | 58 |
| 7 | BW-7 | 10° 48' 41.66"N | 77° 00' 24.43"E | 56.4 | 57 | 57.6 |
| 8 | BW-8 | 10° 48' 32.37"N | 77° 00' 19.89"E | 56.3 | 56.9 | 57.5 |
| 9 | BW-9 | 10° 48' 06.54"N | 76° 59' 59.53"E | 56.2 | 56.8 | 57.4 |
| 10 | BW-10 | 10° 48' 07.45"N | 76° 59' 23.88"E | 57 | 57.6 | 58.2 |

FIGURE 3.10: CONTOUR MAP OF BORE WELL WATER LEVEL



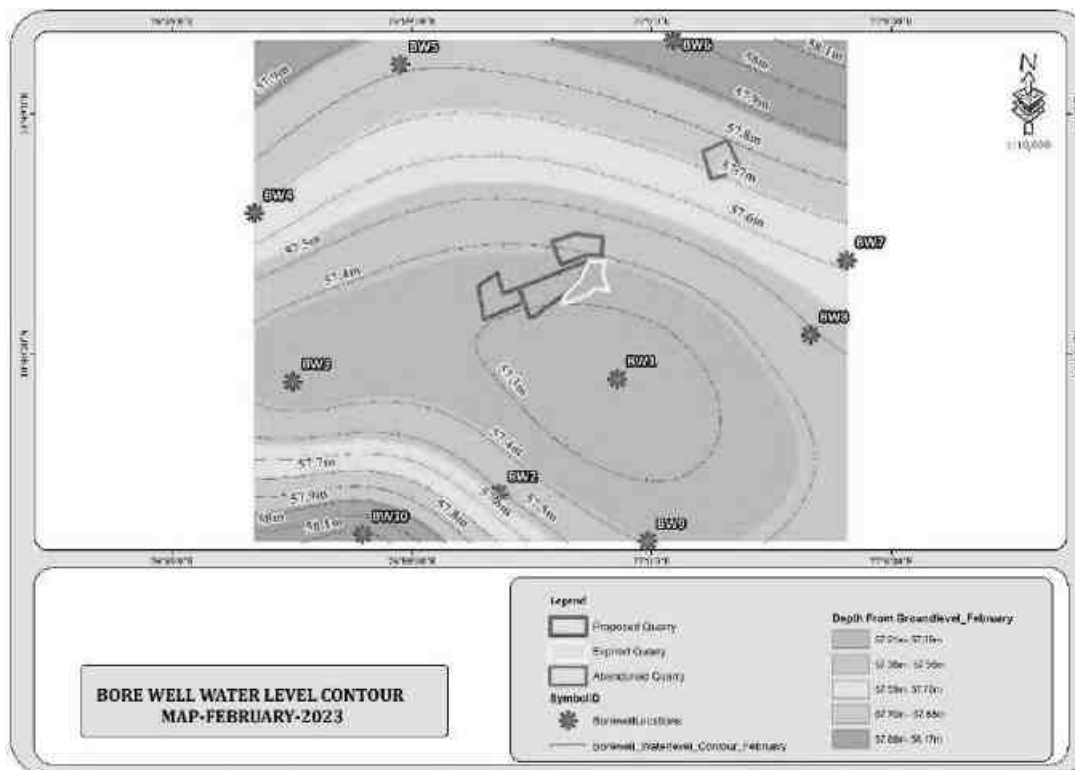
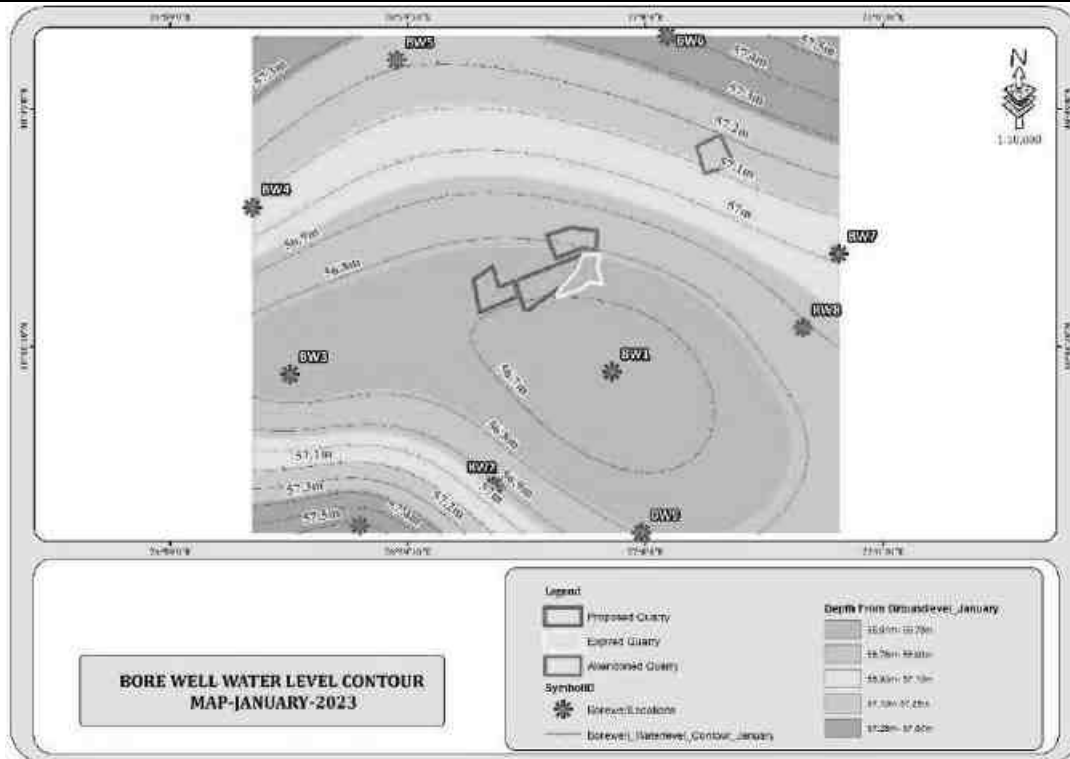


FIGURE 3.11: DRAINAGE MAP AROUND 10 KM RADIUS FROM PROJECT SITE

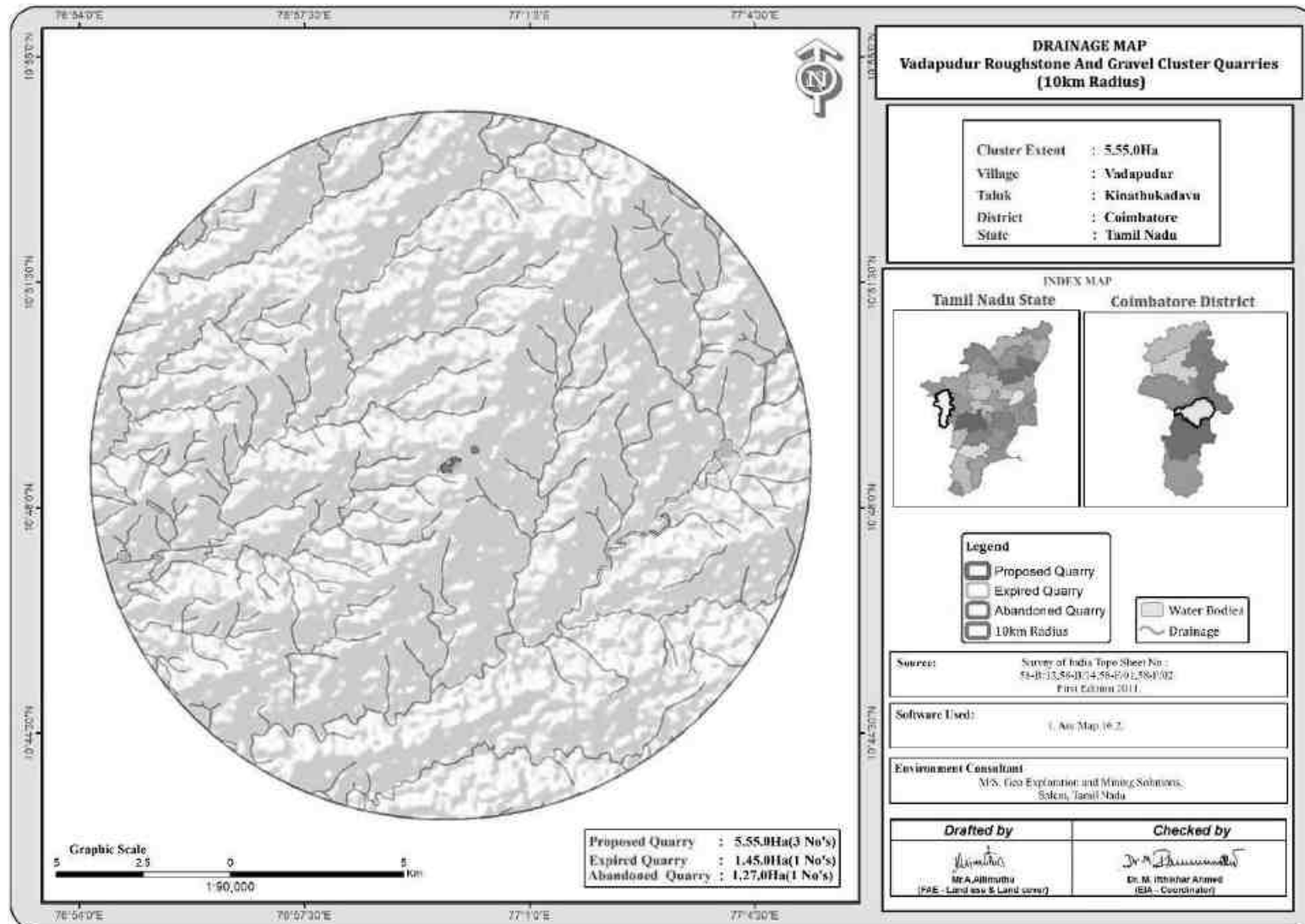
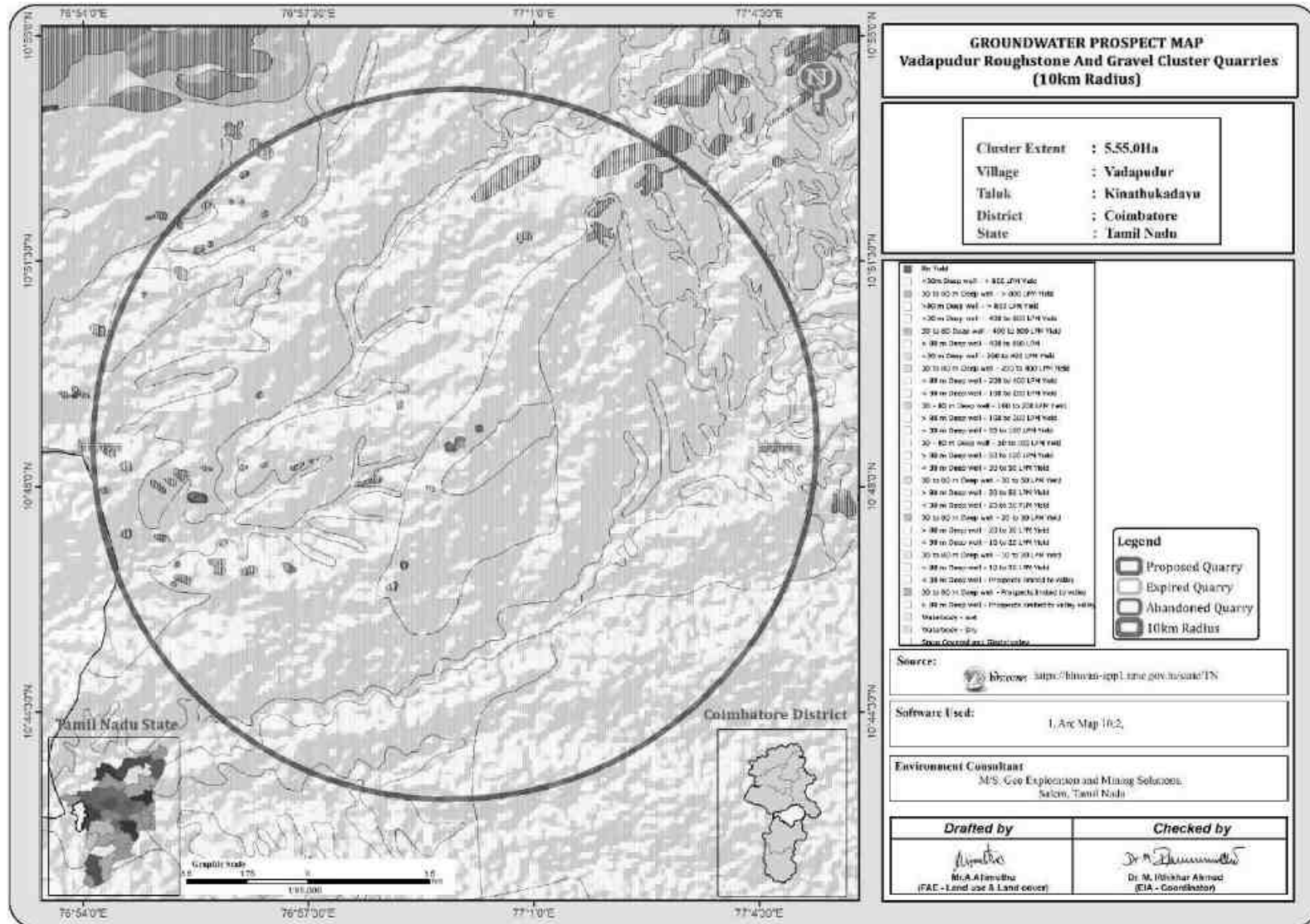


FIGURE 3.12: GROUND WATER LEVEL MAP



Source : Bhuvan

3.2.5.1 Methodology and Data Acquisition

Electric Resistivity Method is well established for delineating lateral as well vertical discontinuities in the resistive structure of the Earth's subsurface. The present study makes use of vertical electric sounding (VES) to delineate the Vertical Resistivity structure at depth. Schlumberger electrode set up was employed for making sounding measurements. Since it is least influenced by lateral inhomogeneities and is capable of providing higher depth of investigation. This is four electrodes collinear set up where in the outer electrodes send current into the ground and the inner electrodes measure the potential difference.

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

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

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

ΔV = potential difference between receiving electrodes

G = Geometric Factor.

Rocks show wide variation in resistivity ranging from 10-8 more than 10+14 ohmmeter. On a broad classification, one can group the rocks falling in the range of 10-8 to 1 ohmmeter as good conductors. 1 to 106 ohmmeter as intermediate conductors and 106 to 1012 ohmmeter as more as poor conductor. The resistivity of rocks and subsurface lithology, which is mostly dependent on its porosity and the pore fluid resistivity is defined by Archie's Law,

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

ρ_r = Resistivity of Rocks

ρ_w = Resistivity of water in pores of rock

F = Formation Factor

\emptyset = Fractional pore volume

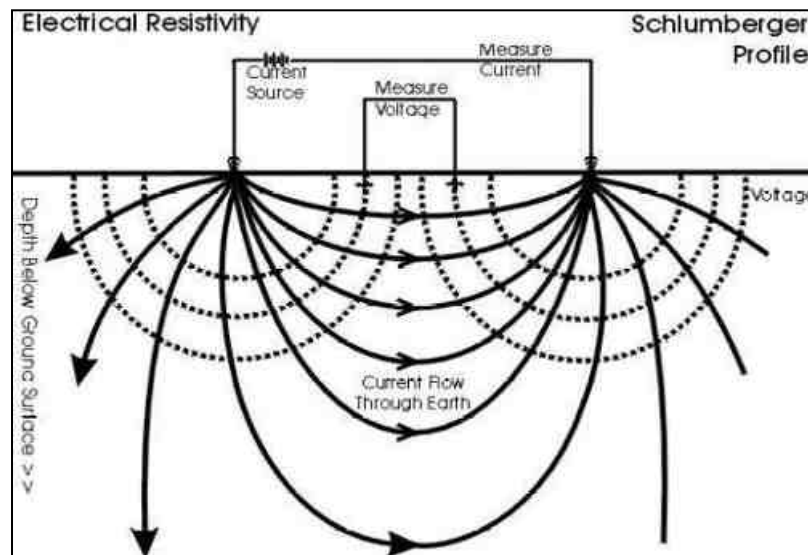
A = Constants with values ranging from 0.5 to 2.5

3.2.5.2 Survey Layout

The layout for a resistivity survey depends on the choice of the current and potential electrode arrangement, which is called electrode array. Here the present study is considered with Schlumberger array. In which the distance may be used for current electrode separation while potential electrode separation is kept on third to one fifth of the same. One interesting aspect in VES is the principle of reciprocity, which permits interchange of the potential and current electrode without any effect on the measured apparent resistivity.

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

RESISTIVITY SURVEY PROFILE



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

3.2.5.3 Data Presentation

It was inferred that the low resistance encountered at the depth between 73-68m. The maximum depth proposed out of proposed project is 41 m BGL. Hence there is no possibilities of water table intersection during the entire mine life period besides it is also inferred topographically that there are no major water bodies intersecting the project area.

3.2.5.4 Geophysical Data Interpretation

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

3.3 Air Environment

The ambient air quality with respect to the study area of 10 km radius including the cluster quarries forms the baseline information. The prime objective of baseline air quality monitoring is to assess existing air quality of the area. This will also be useful in assessing the conformity to standards of the ambient air quality during the operations

The existing ambient air quality of the area is important for evaluating the impact of mining activities on the ambient air quality. These will also be useful for assessing the conformity to standards of the ambient air quality during the operation of Existing and proposed quarries within the radius of 500m.

The sources of air pollution in the region are mostly due to vehicular traffic, dust arising from unpaved village road and domestic & agricultural activities. This section describes the identification of sampling locations, methodology adopted during the monitoring period and sampling frequency.

The baseline status of the ambient air quality has been assessed through scientifically designed ambient air quality network. The design of monitoring network in the air quality surveillance program has been based on the following considerations:

- Meteorological conditions.
- Topography of the study area.
- Likely impact area.

3.3.1 Meteorology & Climate

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

A temporary meteorological station was installed at project site. The station was installed at a height of 4 m above the ground level in such a way that there are no obstructions facilitating flow of wind, wind speed, wind direction, humidity and temperature are recorded on hourly basis.

Climate –

- Coimbatore's climate is classified as tropical. The summers here have a good deal of rainfall, while the winters have very little.
- The Köppen-Geiger climate classification is Aw. The average annual temperature in Coimbatore is 25.4 °C | 77.8 °F. The annual rainfall is 952 mm | 37.5 inch.
- This region, situated near the equator line, is characterized by difficult-to-define summer seasons. The best time to visit is March, April, May.
- Precipitation is the lowest in January, with an average of 13 mm | 0.5 inch. Most of the precipitation here falls in October, averaging 181 mm | 7.1 inch.
- At an average temperature of 28.9 °C | 84.1 °F, April is the hottest month of the year. December is the coldest month, with temperatures averaging 23.2 °C | 73.7 °F.

<https://en.climate-data.org/asia/india/tamil-nadu/coimbatore-2788/>

Rainfall –

The average annual rainfall and the 5 years rainfall is as follows:

TABLE 3.13 – RAINFALL DATA

| Actual Rainfall in mm | | | | | Normal Rainfall in mm |
|-----------------------|------|--------|--------|--------|-----------------------|
| 2017 | 2018 | 2019 | 2020 | 2021 | 1213.2 |
| 873.4 | 1302 | 1272.4 | 1585.3 | 2119.1 | |

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

TABLE 3.14 – METEOROLOGICAL DATA RECORDED AT SITE

| S.No | Parameters | Dec-2022 | Jan-2023 | Feb-2023 | |
|------|-----------------------|----------|----------|----------|-------|
| 1 | Temperature (°C) | Max | 23.11 | 22.92 | 24.51 |
| | | Min | 20.68 | 18.76 | 22.04 |
| | | Avg | 21.89 | 20.84 | 23.27 |
| 2 | Relative Humidity (%) | Avg | 83.59 | 78.06 | 61.16 |
| 3 | Wind Speed (m/s) | Max | 4.38 | 3.47 | 3.7 |
| | | Min | 1.46 | 2.11 | 1.66 |
| | | Avg | 2.92 | 2.79 | 2.68 |
| 4 | Cloud Cover (OKTAS) | | 0-8 | 0-8 | 0-8 |
| 5 | Wind Direction | | ENE,NE | ENE,E | ENE,E |

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

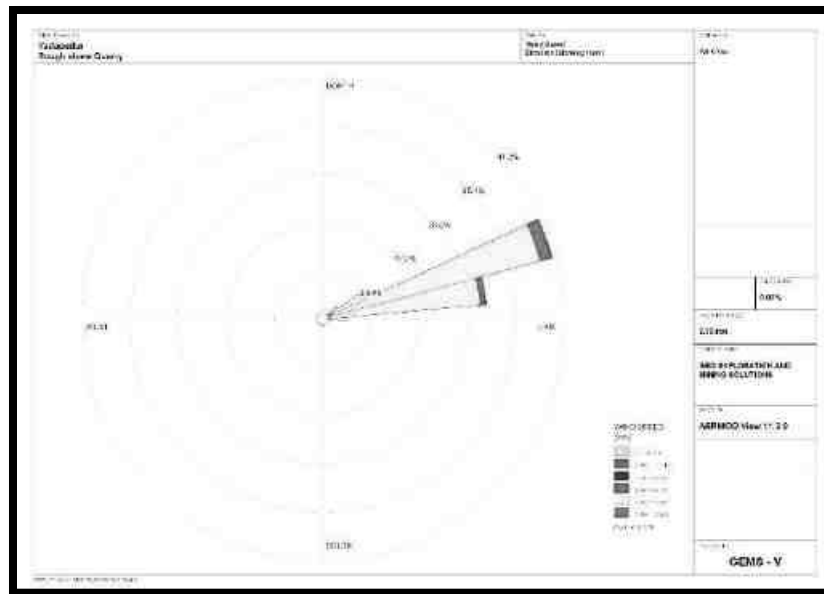
Correlation between Secondary and Primary Data

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

- The average maximum and minimum temperatures of IMD, Coimbatore agro showed a higher in respect of on-site data i.e. in Vadapudur village.
- The relative humidity levels were lesser at site as compared to IMD, Coimbatore agro.
- The wind speed and direction at site shows similar trend that of IMD, Coimbatore agro.

Windrose diagram of the study site is depicted in Figure. 3.8. Predominant downwind direction of the area during study season is North East to South West.

FIGURE 3.13: WINDROSE DIAGRAM



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

1. Predominant winds were from ENE NE, ENE,E,
2. Wind velocity readings were recorded between 0.50 to 3.60 km / hour
3. Calm conditions prevail of about 0.00% of the monitoring period
4. Temperature readings ranging from 18.76⁰ to 24.51⁰C
5. Relative humidity ranging from 61 to 83%
6. The monitoring was carried out continuously for three months

3.3.2 Methodology and Objective

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

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

3.3.3 Sampling and Analytical Techniques

TABLE 3.15 – METHODOLOGY AND INSTRUMENT USED FOR AIR QUALITY ANALYSIS

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

Source: Sampling Methodology followed by **EHS 360 Labs Private Limited** & CPCB Notification.

TABLE 3.16 – NATIONAL AMBIENT AIR QUALITY STANDARDS

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

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

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

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

3.3.4 Frequency & Parameters for Sampling

Ambient air quality monitoring has been carried out with a frequency of two samples per week at seven (7) locations, adopting a continuous 24 hourly (3 shift of 8-hour) schedule for the period Dec-Feb2023. The baseline data of ambient air has been generated for PM₁₀, PM_{2.5}, Sulphur Dioxide (SO₂) & Nitrogen Dioxide (NO₂).

3.3.5 Ambient Air Quality Monitoring Stations

Eight (8) monitoring stations were set up in the study area as depicted in Figure 3.6.1 for assessment of the existing ambient air quality. Details of the sampling locations are as per given below.

TABLE 3.17 – AMBIENT AIR QUALITY (AAQ) MONITORING LOCATIONS

| S. No | Location Code | Monitoring Locations | Distance & Direction | Coordinates |
|-------|---------------|----------------------|----------------------|-----------------------------|
| 1 | AAQ-1 | Core Zone | Project Area | 10°48'37.09"N 76°59'48.31"E |
| 2 | AAQ-2 | Core Zone | Project Area | 10°48'44.18"N 76°59'53.43"E |
| 3 | AAQ-3 | Muthur | 2.0 km SW | 10°47'35.49"N 76°59'14.93"E |
| 4 | AAQ-4 | Sankarayapuram | 4.2 km SW | 10°46'46.86"N 76°58'16.81"E |
| 5 | AAQ-5 | Vadakkipalayam | 1.7 km SE | 10°48'13.73"N 77° 0'42.20"E |
| 6 | AAQ-6 | Nallattipalayam | 4.5 km SE | 10°47'14.69"N 77° 1'52.50"E |
| 7 | AAQ-7 | Kinathukadavu | 2.5 km NE | 10°49'49.15"N 77° 0'44.08"E |
| 8 | AAQ-8 | Kallapuram | 3.0 km NW | 10°50'9.59"N 76°58'56.34"E |

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

FIGURE 3.14: SITE PHOTOGRAPHS OF AMBIENT AIR MONITORING



Tmt.K.Sangeetha

Source: Monitoring photographs from the FAE and Team Members

FIGURE 3.15 AMBIENT AIR QUALITY LOCATIONS AROUND 10 KM RADIUS

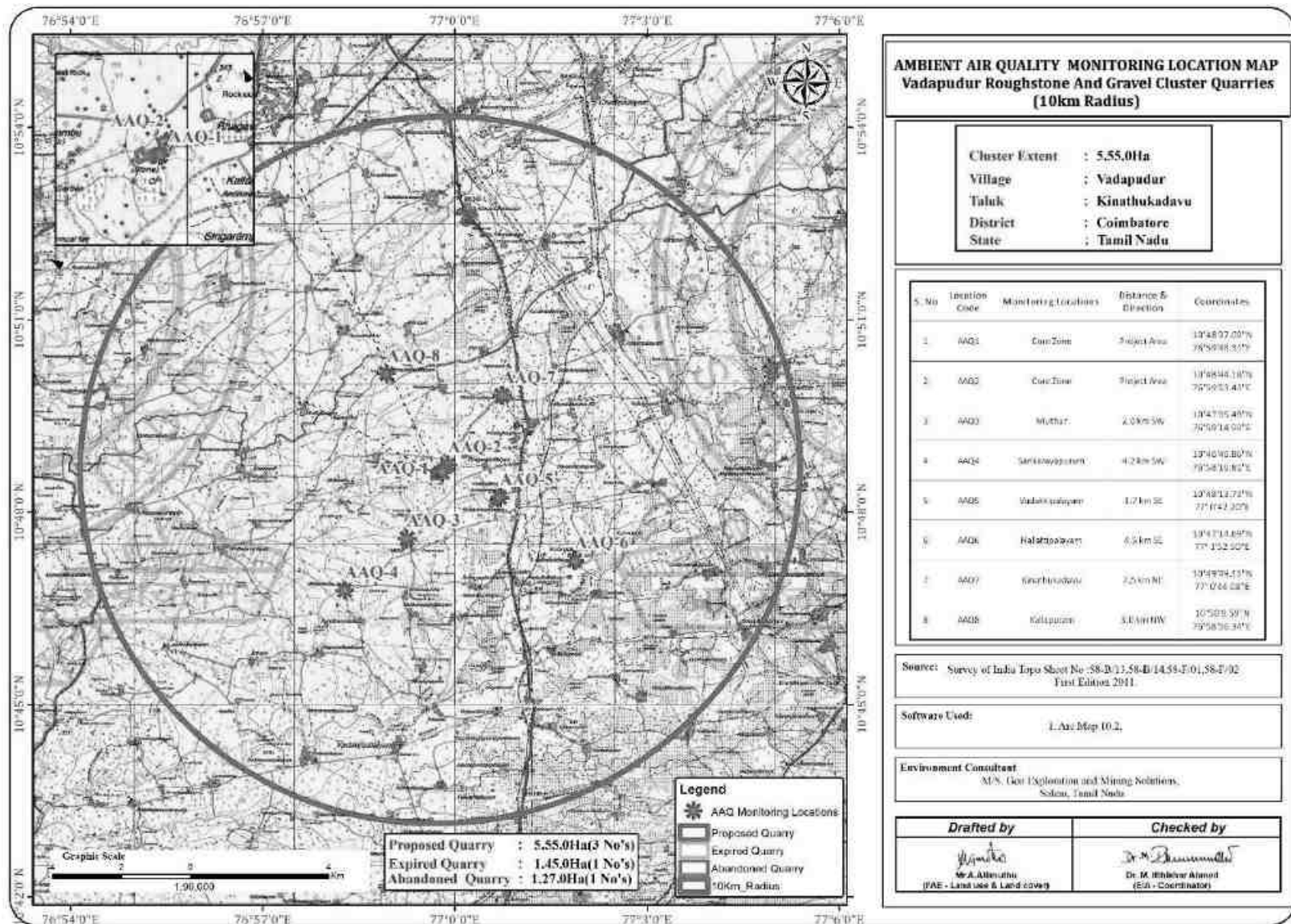


TABLE 3.18 – AAQ1- CORE ZONE

Period: Dec – Feb 2023

Location: AAQ1-

Sampling Time: 24-hourly

| Ambient Air Monitoring Details | | Particulate Pollutant | | | Gaseous Pollutant | | | | | Metals Pollutant | | | Organic Pollutant | |
|--------------------------------|------------|-----------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------------------|-------------------|
| Parameters | | SPM | PM ₁₀ | PM _{2.5} | SO ₂ | NO ₂ | NH ₃ | O ₃ | CO | Pb | Ni | As | C ₆ H ₆ | BaP |
| NAAQ Norms | | 200 | 100 | 60 | 80 | 80 | 400 | 180 | 4 | 1 | 20 | 6 | 5 | 1 |
| Unit | | µg/m ³ | µg/m ³ | µg/m ³ | µg/m ³ | µg/m ³ | µg/m ³ | µg/m ³ | mg/m ³ | µg/m ³ | ng/m ³ | ng/m ³ | µg/m ³ | ng/m ³ |
| Date | Period.hrs | Result | Result | Result | Result | Result | Result | Result | Result | Result | Result | Result | Result | Result |
| 05.12.2022 | 7:00-7:00 | 56.2 | 33.2 | 22.6 | 6.2 | 22.3 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 06.12.2022 | 7:15-7:15 | 55.2 | 34.1 | 24.3 | 5.3 | 21.2 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 12.12.2022 | 7:00-7:00 | 57.3 | 33.7 | 26.5 | 7.6 | 23.5 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 13.12.2022 | 7:15-7:15 | 60.2 | 33.5 | 22.3 | 8.2 | 22.0 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 19.12.2022 | 7:00-7:00 | 55.0 | 35.6 | 21.0 | 6.0 | 21.3 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 20.12.2022 | 7:15-7:15 | 57.3 | 34.2 | 22.6 | 5.6 | 23.6 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 26.12.2022 | 7:00-7:00 | 56.2 | 32.3 | 24.3 | 6.2 | 22.4 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 27.12.2022 | 7:15-7:15 | 57.0 | 35.0 | 25.1 | 7.8 | 20.5 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 02.01.2023 | 7:00-7:00 | 55.8 | 34.2 | 26.8 | 8.0 | 21.3 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 03.01.2023 | 7:15-7:15 | 56.2 | 32.0 | 22.0 | 6.3 | 22.6 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 09.01.2023 | 7:00-7:00 | 55.1 | 33.1 | 21.3 | 7.0 | 23.5 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 10.01.2023 | 7:15-7:15 | 57.6 | 34.6 | 22.6 | 5.2 | 22.5 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 16.01.2023 | 7:00-7:00 | 58.2 | 35.1 | 24.6 | 6.3 | 21.0 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 17.01.2023 | 7:15-7:15 | 59.1 | 32.3 | 26.5 | 8.0 | 22.3 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 23.01.2023 | 7:00-7:00 | 60.3 | 34.1 | 24.3 | 7.2 | 22.6 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 24.01.2023 | 7:15-7:15 | 58.2 | 35.3 | 23.9 | 6.3 | 22.0 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 30.01.2023 | 7:00-7:00 | 56.2 | 34.2 | 24.5 | 5.4 | 23.8 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 31.01.2023 | 7:15-7:15 | 55.3 | 31.2 | 22.6 | 8.8 | 21.4 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 06.02.2023 | 7:00-7:00 | 57.2 | 34.0 | 25.3 | 6.3 | 23.6 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 07.02.2023 | 7:15-7:15 | 55.0 | 32.3 | 26.0 | 7.2 | 22.5 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 13.02.2023 | 7:00-7:00 | 56.3 | 31.0 | 25.0 | 5.4 | 21.4 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 14.02.2023 | 7:15-7:15 | 57.8 | 33.0 | 21.0 | 6.8 | 22.5 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 20.02.2023 | 7:00-7:00 | 58.3 | 35.6 | 24.3 | 7.2 | 23.6 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 21.02.2023 | 7:15-7:15 | 59.4 | 33.2 | 22.3 | 8.3 | 22.5 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 27.02.2023 | 7:00-7:00 | 58.6 | 34.8 | 21.5 | 6.1 | 23.4 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 28.02.2023 | 7:15-7:15 | 60.5 | 32.0 | 22.4 | 7.5 | 22.5 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |

Note:BDL: Below Detection Limit ;DL: Detection Limit ; NH₃: BDL (DL:20); O₃: BDL (DL:20); CO: BDL (DL:1.0); Pb: BDL (DL:0.1); Ni: BDL (DL:1.0); As: BDL (DL:1.0); C₆H₆: BDL (DL:1.0); BaP: BDL (DL:0.1)

Remarks: The values observed for the pollutants given above are within the CPCB standards.

TABLE 3.19 – AAQ2 - CORE ZONE

Period: Dec – Feb 2023

Location: AAQ2- Core Zone

Time: 24-hourly

| Ambient Air Monitoring Details | | Particulate Pollutant | | | Gaseous Pollutant | | | | | Metals Pollutant | | | Organic Pollutant | |
|--------------------------------|------------|-----------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------------------|-------------------|
| Parameters | | SPM | PM ₁₀ | PM _{2.5} | SO ₂ | NO ₂ | NH ₃ | O ₃ | CO | Pb | Ni | As | C ₆ H ₆ | BaP |
| NAAQ Norms | | 200 | 100 | 60 | 80 | 80 | 400 | 180 | 4 | 1 | 20 | 6 | 5 | 1 |
| Unit | | µg/m ³ | µg/m ³ | µg/m ³ | µg/m ³ | µg/m ³ | µg/m ³ | µg/m ³ | mg/m ³ | µg/m ³ | ng/m ³ | ng/m ³ | µg/m ³ | ng/m ³ |
| Date | Period.hrs | Result | Result | Result | Result | Result | Result | Result | Result | Result | Result | Result | Result | Result |
| 05.12.2022 | 7:00-7:00 | 62.5 | 36.2 | 26.3 | 6.2 | 22.3 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 06.12.2022 | 7:15-7:15 | 63.0 | 37.3 | 25.1 | 5.0 | 23.4 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 12.12.2022 | 7:00-7:00 | 64.5 | 38.2 | 27.3 | 7.2 | 21.0 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 13.12.2022 | 7:15-7:15 | 65.0 | 39.3 | 25.0 | 8.0 | 22.5 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 19.12.2022 | 7:00-7:00 | 63.5 | 36.1 | 26.3 | 6.2 | 23.6 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 20.12.2022 | 7:15-7:15 | 62.5 | 35.3 | 27.1 | 7.2 | 21.5 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 26.12.2022 | 7:00-7:00 | 61.2 | 38.3 | 27.0 | 8.3 | 23.2 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 27.12.2022 | 7:15-7:15 | 60.8 | 36.2 | 26.3 | 5.2 | 22.4 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 02.01.2023 | 7:00-7:00 | 62.3 | 39.2 | 25.1 | 6.0 | 21.5 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 03.01.2023 | 7:15-7:15 | 63.0 | 36.1 | 26.3 | 5.8 | 22.6 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 09.01.2023 | 7:00-7:00 | 64.2 | 37.0 | 27.4 | 7.2 | 23.5 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 10.01.2023 | 7:15-7:15 | 65.0 | 38.2 | 26.3 | 6.2 | 24.3 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 16.01.2023 | 7:00-7:00 | 62.3 | 39.1 | 25.4 | 5.4 | 22.5 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 17.01.2023 | 7:15-7:15 | 63.1 | 37.5 | 27.3 | 6.8 | 23.6 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 23.01.2023 | 7:00-7:00 | 64.2 | 36.3 | 26.5 | 5.9 | 22.1 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 24.01.2023 | 7:15-7:15 | 65.8 | 36.0 | 27.0 | 5.0 | 23.8 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 30.01.2023 | 7:00-7:00 | 64.2 | 35.2 | 25.3 | 6.4 | 22.0 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 31.01.2023 | 7:15-7:15 | 63.5 | 37.1 | 26.2 | 7.0 | 23.6 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 06.02.2023 | 7:00-7:00 | 62.1 | 38.6 | 25.0 | 6.3 | 24.0 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 07.02.2023 | 7:15-7:15 | 64.5 | 39.2 | 27.3 | 5.0 | 22.8 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 13.02.2023 | 7:00-7:00 | 65.8 | 38.0 | 26.5 | 5.3 | 23.6 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 14.02.2023 | 7:15-7:15 | 60.2 | 36.3 | 25.4 | 6.8 | 21.0 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 20.02.2023 | 7:00-7:00 | 62.3 | 37.2 | 27.0 | 5.9 | 23.6 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 21.02.2023 | 7:15-7:15 | 63.5 | 39.2 | 26.8 | 6.2 | 24.5 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 27.02.2023 | 7:00-7:00 | 64.5 | 36.3 | 25.4 | 5.1 | 22.1 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 28.02.2023 | 7:15-7:15 | 65.0 | 37.2 | 27.1 | 8.2 | 23.6 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |

Note: BDL: Below Detection Limit ;DL: Detection Limit ; NH₃: BDL (DL:20); O₃: BDL (DL:20); CO: BDL (DL:1.0); Pb: BDL (DL:0.1); Ni: BDL (DL:1.0); As: BDL (DL:1.0); C₆H₆: BDL (DL:1.0); BaP: BDL (DL:0.1)

Remarks: The values observed for the pollutants given above are within the CPCB standards.

TABLE 3.20 – AAQ3 – Muthur

Period: Dec – Feb 2023

: AAQ3- Muthur

Sampling Time: 24-hourly

| Ambient Air Monitoring Details | | Particulate Pollutant | | | Gaseous Pollutant | | | | | Metals Pollutant | | | Organic Pollutant | |
|--------------------------------|------------|-----------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------------------|-------------------|
| Parameters | | SPM | PM ₁₀ | PM _{2.5} | SO ₂ | NO ₂ | NH ₃ | O ₃ | CO | Pb | Ni | As | C ₆ H ₆ | BaP |
| NAAQ Norms | | 200 | 100 | 60 | 80 | 80 | 400 | 180 | 4 | 1 | 20 | 6 | 5 | 1 |
| Unit | | µg/m ³ | µg/m ³ | µg/m ³ | µg/m ³ | µg/m ³ | µg/m ³ | µg/m ³ | mg/m ³ | µg/m ³ | ng/m ³ | ng/m ³ | µg/m ³ | ng/m ³ |
| Date | Period.hrs | Result | Result | Result | Result | Result | Result | Result | Result | Result | Result | Result | Result | Result |
| 05.12.2022 | 7:00-7:00 | 62.3 | 40.2 | 24.2 | 5.2 | 19.2 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 06.12.2022 | 7:15-7:15 | 63.5 | 43.2 | 23.2 | 6.3 | 20.0 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 12.12.2022 | 7:00-7:00 | 64.2 | 44.1 | 25.1 | 5.1 | 19.8 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 13.12.2022 | 7:15-7:15 | 62.0 | 40.3 | 24.3 | 6.0 | 21.3 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 19.12.2022 | 7:00-7:00 | 63.8 | 41.2 | 23.0 | 5.8 | 29.3 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 20.12.2022 | 7:15-7:15 | 64.2 | 42.2 | 25.7 | 6.3 | 20.1 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 26.12.2022 | 7:00-7:00 | 61.2 | 43.0 | 23.2 | 5.2 | 22.3 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 27.12.2022 | 7:15-7:15 | 62.3 | 42.3 | 24.1 | 6.4 | 21.4 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 02.01.2023 | 7:00-7:00 | 64.5 | 40.1 | 23.8 | 6.0 | 19.2 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 03.01.2023 | 7:15-7:15 | 62.3 | 44.2 | 24.0 | 5.8 | 20.3 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 09.01.2023 | 7:00-7:00 | 63.5 | 43.3 | 25.3 | 6.5 | 22.4 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 10.01.2023 | 7:15-7:15 | 62.5 | 40.2 | 23.0 | 5.3 | 21.6 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 16.01.2023 | 7:00-7:00 | 63.1 | 43.0 | 25.0 | 6.1 | 19.3 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 17.01.2023 | 7:15-7:15 | 64.3 | 42.2 | 24.2 | 5.3 | 20.0 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 23.01.2023 | 7:00-7:00 | 63.5 | 44.0 | 23.1 | 6.2 | 21.5 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 24.01.2023 | 7:15-7:15 | 62.1 | 43.2 | 25.4 | 5.1 | 23.6 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 30.01.2023 | 7:00-7:00 | 64.3 | 45.6 | 25.3 | 6.5 | 22.0 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 31.01.2023 | 7:15-7:15 | 63.0 | 43.0 | 25.0 | 7.3 | 23.8 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 06.02.2023 | 7:00-7:00 | 62.5 | 42.0 | 24.1 | 5.5 | 24.2 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 07.02.2023 | 7:15-7:15 | 61.5 | 45.3 | 23.6 | 6.3 | 23.6 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 13.02.2023 | 7:00-7:00 | 63.5 | 41.2 | 25.8 | 7.2 | 21.0 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 14.02.2023 | 7:15-7:15 | 64.5 | 44.2 | 24.6 | 6.8 | 22.8 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 20.02.2023 | 7:00-7:00 | 62.8 | 43.0 | 23.9 | 5.4 | 23.0 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 21.02.2023 | 7:15-7:15 | 63.5 | 42.3 | 24.8 | 7.2 | 22.8 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 27.02.2023 | 7:00-7:00 | 64.2 | 44.1 | 22.1 | 8.2 | 21.6 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 28.02.2023 | 7:15-7:15 | 62.8 | 43.6 | 25.3 | 6.3 | 22.9 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |

Note: BDL: Below Detection Limit ;DL: Detection Limit ; NH₃: BDL (DL:20); O₃: BDL (DL:20); CO: BDL (DL:1.0); Pb: BDL (DL:0.1); Ni: BDL (DL:1.0); As: BDL (DL:1.0); C₆H₆: BDL (DL:1.0); BaP: BDL (DL:0.1)

Remarks: The values observed for the pollutants given above are within the CPCB standards.

TABLE 3.21- AAQ4 – SANKARAYAPURAM

Period: Dec – Feb 2023

Location: AAQ4 - Sankarayapuram

Sampling Time: 24-hourly

| Ambient Air Monitoring Details | | Particulate Pollutant | | | Gaseous Pollutant | | | | | Metals Pollutant | | | Organic Pollutant | |
|--------------------------------|------------|-----------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------------------|-------------------|
| Parameters | | SPM | PM ₁₀ | PM _{2.5} | SO ₂ | NO ₂ | NH ₃ | O ₃ | CO | Pb | Ni | As | C ₆ H ₆ | BaP |
| NAAQ Norms | | 200 | 100 | 60 | 80 | 80 | 400 | 180 | 4 | 1 | 20 | 6 | 5 | 1 |
| Unit | | µg/m ³ | µg/m ³ | µg/m ³ | µg/m ³ | µg/m ³ | µg/m ³ | µg/m ³ | mg/m ³ | µg/m ³ | ng/m ³ | ng/m ³ | µg/m ³ | ng/m ³ |
| Date | Period.hrs | Result | Result | Result | Result | Result | Result | Result | Result | Result | Result | Result | Result | Result |
| 05.12.2022 | 7:00-7:00 | 64.5 | 43.2 | 23.5 | 5.5 | 23.2 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 06.12.2022 | 7:15-7:15 | 65.3 | 44.3 | 24.2 | 6.2 | 22.1 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 12.12.2022 | 7:00-7:00 | 66.2 | 42.0 | 25.6 | 7.2 | 20.3 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 13.12.2022 | 7:15-7:15 | 67.3 | 45.6 | 26.3 | 5.3 | 21.5 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 19.12.2022 | 7:00-7:00 | 65.0 | 46.3 | 27.1 | 6.2 | 20.0 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 20.12.2022 | 7:15-7:15 | 66.3 | 44.0 | 26.0 | 5.0 | 21.8 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 26.12.2022 | 7:00-7:00 | 67.2 | 43.1 | 24.3 | 7.4 | 22.3 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 27.12.2022 | 7:15-7:15 | 65.0 | 44.2 | 25.0 | 6.3 | 21.3 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 02.01.2023 | 7:00-7:00 | 66.3 | 45.6 | 26.5 | 7.2 | 23.6 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 03.01.2023 | 7:15-7:15 | 67.2 | 46.2 | 27.1 | 6.4 | 22.5 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 09.01.2023 | 7:00-7:00 | 66.2 | 42.1 | 25.3 | 7.0 | 21.4 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 10.01.2023 | 7:15-7:15 | 64.3 | 43.2 | 24.1 | 7.5 | 23.5 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 16.01.2023 | 7:00-7:00 | 65.2 | 44.5 | 26.3 | 6.3 | 22.8 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 17.01.2023 | 7:15-7:15 | 67.3 | 46.3 | 25.4 | 6.5 | 20.1 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 23.01.2023 | 7:00-7:00 | 65.2 | 47.8 | 27.0 | 7.1 | 23.9 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 24.01.2023 | 7:15-7:15 | 66.0 | 43.6 | 25.3 | 6.3 | 21.5 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 30.01.2023 | 7:00-7:00 | 67.3 | 44.5 | 26.0 | 7.3 | 22.5 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 31.01.2023 | 7:15-7:15 | 64.3 | 45.2 | 24.8 | 6.0 | 21.0 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 06.02.2023 | 7:00-7:00 | 65.4 | 46.8 | 25.0 | 6.8 | 23.6 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 07.02.2023 | 7:15-7:15 | 66.3 | 43.2 | 26.3 | 7.2 | 23.0 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 13.02.2023 | 7:00-7:00 | 67.2 | 42.1 | 24.3 | 5.3 | 21.8 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 14.02.2023 | 7:15-7:15 | 64.0 | 45.6 | 26.5 | 5.0 | 22.5 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 20.02.2023 | 7:00-7:00 | 65.8 | 46.2 | 25.0 | 6.8 | 22.0 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 21.02.2023 | 7:15-7:15 | 66.3 | 42.3 | 23.0 | 7.1 | 23.6 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 27.02.2023 | 7:00-7:00 | 67.2 | 44.1 | 24.1 | 6.0 | 22.1 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 28.02.2023 | 7:15-7:15 | 64.2 | 45.8 | 25.6 | 5.8 | 21.0 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |

Note: BDL: Below Detection Limit ;DL: Detection Limit ; NH₃: BDL (DL:20); O₃: BDL (DL:20); CO: BDL (DL:1.0); Pb: BDL (DL:0.1); Ni: BDL (DL:1.0); As: BDL (DL:1.0); C₆H₆: BDL (DL:1.0); BaP: BDL (DL:0.1)

Remarks: The values observed for the pollutants given above are within the CPCB standards.

TABLE 3.22 – AAQ5 – VADAKKIPALAYAM

Period: Dec – Feb 2023

: AAQ5- Vadakkipalayam

Sampling Time: 24-hourly

| Ambient Air Monitoring Details | | Particulate Pollutant | | | Gaseous Pollutant | | | | | Metals Pollutant | | | Organic Pollutant | |
|--------------------------------|------------|-----------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------------------|-------------------|
| Parameters | | SPM | PM ₁₀ | PM _{2.5} | SO ₂ | NO ₂ | NH ₃ | O ₃ | CO | Pb | Ni | As | C ₆ H ₆ | BaP |
| NAAQ Norms | | 200 | 100 | 60 | 80 | 80 | 400 | 180 | 4 | 1 | 20 | 6 | 5 | 1 |
| Unit | | µg/m ³ | µg/m ³ | µg/m ³ | µg/m ³ | µg/m ³ | µg/m ³ | µg/m ³ | mg/m ³ | µg/m ³ | ng/m ³ | ng/m ³ | µg/m ³ | ng/m ³ |
| Date | Period.hrs | Result | Result | Result | Result | Result | Result | Result | Result | Result | Result | Result | Result | Result |
| 05.12.2022 | 7:00-7:00 | 62.5 | 45.2 | 22.5 | 6.2 | 18.5 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 06.12.2022 | 7:15-7:15 | 63.4 | 44.0 | 24.3 | 7.1 | 17.2 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 12.12.2022 | 7:00-7:00 | 65.1 | 46.3 | 25.3 | 8.0 | 19.3 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 13.12.2022 | 7:15-7:15 | 62.0 | 45.0 | 26.0 | 6.3 | 20.0 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 19.12.2022 | 7:00-7:00 | 64.2 | 44.2 | 24.1 | 7.0 | 18.3 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 20.12.2022 | 7:15-7:15 | 65.3 | 46.0 | 25.0 | 8.2 | 19.2 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 26.12.2022 | 7:00-7:00 | 66.0 | 44.1 | 26.3 | 6.0 | 17.2 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 27.12.2022 | 7:15-7:15 | 64.2 | 45.2 | 23.0 | 7.2 | 19.3 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 02.01.2023 | 7:00-7:00 | 63.5 | 46.3 | 24.5 | 6.3 | 18.0 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 03.01.2023 | 7:15-7:15 | 60.2 | 44.8 | 26.5 | 8.1 | 20.3 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 09.01.2023 | 7:00-7:00 | 62.5 | 45.2 | 24.0 | 7.4 | 17.0 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 10.01.2023 | 7:15-7:15 | 63.0 | 44.3 | 25.1 | 6.5 | 18.5 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 16.01.2023 | 7:00-7:00 | 64.1 | 46.0 | 21.0 | 8.2 | 19.3 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 17.01.2023 | 7:15-7:15 | 65.2 | 44.8 | 22.3 | 6.8 | 18.5 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 23.01.2023 | 7:00-7:00 | 66.5 | 45.3 | 24.6 | 7.5 | 17.3 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 24.01.2023 | 7:15-7:15 | 64.0 | 44.2 | 22.0 | 6.8 | 19.2 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 30.01.2023 | 7:00-7:00 | 63.2 | 45.8 | 23.5 | 7.3 | 19.0 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 31.01.2023 | 7:15-7:15 | 62.1 | 44.3 | 24.1 | 6.9 | 20.5 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 06.02.2023 | 7:00-7:00 | 63.0 | 46.2 | 23.0 | 7.1 | 17.2 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 07.02.2023 | 7:15-7:15 | 62.1 | 44.0 | 24.8 | 8.2 | 18.4 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 13.02.2023 | 7:00-7:00 | 63.8 | 46.0 | 25.0 | 7.2 | 19.2 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 14.02.2023 | 7:15-7:15 | 64.5 | 45.2 | 26.1 | 6.8 | 20.5 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 20.02.2023 | 7:00-7:00 | 65.0 | 46.3 | 25.6 | 8.3 | 18.2 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 21.02.2023 | 7:15-7:15 | 62.3 | 44.9 | 25.0 | 6.5 | 19.3 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 27.02.2023 | 7:00-7:00 | 66.0 | 45.0 | 24.1 | 7.2 | 20.0 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 28.02.2023 | 7:15-7:15 | 65.8 | 43.6 | 23.1 | 6.3 | 19.5 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |

Note: BDL: Below Detection Limit ;DL: Detection Limit ; NH₃: BDL (DL:20); O₃: BDL (DL:20); CO: BDL (DL:1.0); Pb: BDL (DL:0.1); Ni: BDL (DL:1.0); As: BDL (DL:1.0); C₆H₆: BDL (DL:1.0); BaP: BDL (DL:0.1)

Remarks: The values observed for the pollutants given above are within the CPCB standards.

TABLE 3.23 – AAQ6 - NALLATTIPALAYAM

Period: Dec – Feb 2023

Location: AAQ6 – Nallattipalayam

Sampling Time: 24-hourly

| Ambient Air Monitoring Details | | Particulate Pollutant | | | Gaseous Pollutant | | | | | Metals Pollutant | | | Organic Pollutant | |
|--------------------------------|------------|-----------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------------------|-------------------|
| Parameters | | SPM | PM ₁₀ | PM _{2.5} | SO ₂ | NO ₂ | NH ₃ | O ₃ | CO | Pb | Ni | As | C ₆ H ₆ | BaP |
| NAAQ Norms | | 200 | 100 | 60 | 80 | 80 | 400 | 180 | 4 | 1 | 20 | 6 | 5 | 1 |
| Unit | | µg/m ³ | µg/m ³ | µg/m ³ | µg/m ³ | µg/m ³ | µg/m ³ | µg/m ³ | mg/m ³ | µg/m ³ | ng/m ³ | ng/m ³ | µg/m ³ | ng/m ³ |
| Date | Period.hrs | Result | Result | Result | Result | Result | Result | Result | Result | Result | Result | Result | Result | Result |
| 05.12.2022 | 7:00-7:00 | 65.5 | 45.5 | 23.1 | 6.5 | 18.5 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 06.12.2022 | 7:15-7:15 | 62.0 | 44.3 | 22.3 | 6.8 | 17.2 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 12.12.2022 | 7:00-7:00 | 60.3 | 46.3 | 23.1 | 7.0 | 20.3 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 13.12.2022 | 7:15-7:15 | 62.5 | 45.3 | 22.4 | 6.2 | 22.2 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 19.12.2022 | 7:00-7:00 | 63.2 | 46.1 | 24.3 | 7.6 | 18.3 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 20.12.2022 | 7:15-7:15 | 64.1 | 45.1 | 22.1 | 6.3 | 17.2 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 26.12.2022 | 7:00-7:00 | 65.3 | 44.3 | 22.6 | 7.4 | 20.3 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 27.12.2022 | 7:15-7:15 | 60.1 | 45.2 | 23.6 | 6.2 | 22.1 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 02.01.2023 | 7:00-7:00 | 62.3 | 46.3 | 24.3 | 7.1 | 19.2 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 03.01.2023 | 7:15-7:15 | 64.5 | 44.1 | 22.1 | 6.5 | 20.3 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 09.01.2023 | 7:00-7:00 | 65.1 | 45.3 | 24.3 | 7.8 | 18.5 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 10.01.2023 | 7:15-7:15 | 60.3 | 46.3 | 26.5 | 6.8 | 19.2 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 16.01.2023 | 7:00-7:00 | 62.4 | 44.2 | 23.1 | 7.2 | 20.2 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 17.01.2023 | 7:15-7:15 | 64.3 | 46.3 | 24.3 | 6.5 | 17.3 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 23.01.2023 | 7:00-7:00 | 65.2 | 45.0 | 25.6 | 7.2 | 17.5 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 24.01.2023 | 7:15-7:15 | 62.5 | 46.2 | 22.1 | 6.3 | 18.2 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 30.01.2023 | 7:00-7:00 | 63.2 | 44.1 | 23.5 | 7.1 | 19.5 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 31.01.2023 | 7:15-7:15 | 64.1 | 46.2 | 24.5 | 6.5 | 20.3 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 06.02.2023 | 7:00-7:00 | 65.2 | 45.2 | 25.6 | 7.2 | 17.5 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 07.02.2023 | 7:15-7:15 | 63.5 | 46.3 | 26.2 | 6.8 | 18.2 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 13.02.2023 | 7:00-7:00 | 62.1 | 44.2 | 24.1 | 7.3 | 19.3 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 14.02.2023 | 7:15-7:15 | 64.3 | 43.2 | 23.5 | 6.9 | 20.3 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 20.02.2023 | 7:00-7:00 | 65.2 | 41.3 | 22.1 | 7.2 | 18.5 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 21.02.2023 | 7:15-7:15 | 62.1 | 45.3 | 26.3 | 7.0 | 19.3 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 27.02.2023 | 7:00-7:00 | 63.1 | 46.2 | 22.4 | 7.2 | 20.2 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 28.02.2023 | 7:15-7:15 | 62.3 | 44.1 | 21.3 | 6.5 | 19.6 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |

Note: BDL: Below Detection Limit ;DL: Detection Limit ; NH₃: BDL (DL:20); O₃: BDL (DL:20); CO: BDL (DL:1.0); Pb: BDL (DL:0.1); Ni: BDL (DL:1.0); As: BDL (DL:1.0); C₆H₆: BDL (DL:1.0); BaP: BDL (DL:0.1)

Remarks: The values observed for the pollutants given above are within the CPCB standards.

TABLE 3.24 – AAQ7 - KINATHUKADAVU

Period: Dec – Feb 2023

Location: AAQ7– Kinathukadavu

Sampling Time: 24-hourly

| Ambient Air Monitoring Details | | Particulate Pollutant | | | Gaseous Pollutant | | | | | Metals Pollutant | | | Organic Pollutant | |
|--------------------------------|------------|-----------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------------------|-------------------|
| Parameters | | SPM | PM ₁₀ | PM _{2.5} | SO ₂ | NO ₂ | NH ₃ | O ₃ | CO | Pb | Ni | As | C ₆ H ₆ | BaP |
| NAAQ Norms | | 200 | 100 | 60 | 80 | 80 | 400 | 180 | 4 | 1 | 20 | 6 | 5 | 1 |
| Unit | | µg/m ³ | µg/m ³ | µg/m ³ | µg/m ³ | µg/m ³ | µg/m ³ | µg/m ³ | mg/m ³ | µg/m ³ | ng/m ³ | ng/m ³ | µg/m ³ | ng/m ³ |
| Date | Period.hrs | Result | Result | Result | Result | Result | Result | Result | Result | Result | Result | Result | Result | Result |
| 05.12.2022 | 7:00-7:00 | 63.5 | 45.5 | 22.3 | 6.2 | 18.5 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 06.12.2022 | 7:15-7:15 | 62.0 | 43.2 | 24.3 | 7.3 | 19.2 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 12.12.2022 | 7:00-7:00 | 66.3 | 46.1 | 23.0 | 6.3 | 17.2 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 13.12.2022 | 7:15-7:15 | 65.4 | 40.2 | 25.1 | 7.1 | 18.0 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 19.12.2022 | 7:00-7:00 | 66.2 | 45.0 | 26.0 | 6.3 | 17.3 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 20.12.2022 | 7:15-7:15 | 67.2 | 41.2 | 22.1 | 7.0 | 20.2 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 26.12.2022 | 7:00-7:00 | 63.1 | 44.3 | 23.5 | 6.2 | 17.5 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 27.12.2022 | 7:15-7:15 | 64.0 | 45.3 | 24.0 | 7.3 | 19.2 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 02.01.2023 | 7:00-7:00 | 65.2 | 43.2 | 25.3 | 6.4 | 18.0 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 03.01.2023 | 7:15-7:15 | 66.0 | 40.5 | 22.3 | 6.0 | 19.2 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 09.01.2023 | 7:00-7:00 | 63.1 | 41.2 | 23.4 | 7.8 | 18.8 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 10.01.2023 | 7:15-7:15 | 64.0 | 43.2 | 24.5 | 6.3 | 17.2 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 16.01.2023 | 7:00-7:00 | 65.2 | 43.0 | 25.6 | 7.1 | 19.2 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 17.01.2023 | 7:15-7:15 | 66.8 | 44.2 | 26.1 | 6.8 | 20.3 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 23.01.2023 | 7:00-7:00 | 67.2 | 40.2 | 22.4 | 7.2 | 19.0 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 24.01.2023 | 7:15-7:15 | 64.3 | 41.0 | 25.3 | 7.0 | 17.2 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 30.01.2023 | 7:00-7:00 | 63.2 | 45.6 | 26.1 | 6.5 | 19.2 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 31.01.2023 | 7:15-7:15 | 62.0 | 40.9 | 24.3 | 7.2 | 20.5 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 06.02.2023 | 7:00-7:00 | 64.5 | 45.0 | 25.0 | 6.1 | 19.0 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 07.02.2023 | 7:15-7:15 | 62.3 | 44.8 | 26.1 | 7.8 | 18.8 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 13.02.2023 | 7:00-7:00 | 65.4 | 42.3 | 25.0 | 6.1 | 20.8 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 14.02.2023 | 7:15-7:15 | 66.3 | 43.5 | 26.0 | 7.4 | 17.2 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 20.02.2023 | 7:00-7:00 | 67.2 | 44.2 | 24.8 | 6.5 | 18.2 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 21.02.2023 | 7:15-7:15 | 65.4 | 45.3 | 23.5 | 7.2 | 19.2 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 27.02.2023 | 7:00-7:00 | 66.3 | 39.8 | 22.1 | 6.3 | 20.2 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 28.02.2023 | 7:15-7:15 | 67.0 | 40.7 | 23.8 | 7.8 | 19.5 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |

Note: BDL: Below Detection Limit ;DL: Detection Limit ; NH₃: BDL (DL:20); O₃: BDL (DL:20); CO: BDL (DL:1.0); Pb: BDL (DL:0.1); Ni: BDL (DL:1.0); As: BDL (DL:1.0); C₆H₆: BDL (DL:1.0); BaP: BDL (DL:0.1)

Remarks: The values observed for the pollutants given above are within the CPCB standards.

TABLE 3.25 – AAQ8 - KALLAPURAM

Period: Dec – Feb 2023

Location: AAQ98– Kallapuram

Sampling Time: 24-hourly

| Ambient Air Monitoring Details | | Particulate Pollutant | | | Gaseous Pollutant | | | | | Metals Pollutant | | | Organic Pollutant | |
|--------------------------------|------------|-----------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------------------|-------------------|
| Parameters | | SPM | PM ₁₀ | PM _{2.5} | SO ₂ | NO ₂ | NH ₃ | O ₃ | CO | Pb | Ni | As | C ₆ H ₆ | BaP |
| NAAQ Norms | | 200 | 100 | 60 | 80 | 80 | 400 | 180 | 4 | 1 | 20 | 6 | 5 | 1 |
| Unit | | µg/m ³ | µg/m ³ | µg/m ³ | µg/m ³ | µg/m ³ | µg/m ³ | µg/m ³ | mg/m ³ | µg/m ³ | ng/m ³ | ng/m ³ | µg/m ³ | ng/m ³ |
| Date | Period.hrs | Result | Result | Result | Result | Result | Result | Result | Result | Result | Result | Result | Result | Result |
| 05.12.2022 | 7:00-7:00 | 64.2 | 43.5 | 24.2 | 5.5 | 22.3 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 06.12.2022 | 7:15-7:15 | 66.3 | 44.2 | 23.2 | 6.2 | 23.4 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 12.12.2022 | 7:00-7:00 | 65.2 | 45.6 | 25.1 | 8.2 | 24.5 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 13.12.2022 | 7:15-7:15 | 66.1 | 46.2 | 26.2 | 7.2 | 20.2 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 19.12.2022 | 7:00-7:00 | 67.0 | 42.1 | 27.1 | 5.0 | 22.3 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 20.12.2022 | 7:15-7:15 | 68.2 | 43.2 | 28.3 | 6.2 | 23.0 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 26.12.2022 | 7:00-7:00 | 64.3 | 44.5 | 25.5 | 7.2 | 24.5 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 27.12.2022 | 7:15-7:15 | 66.2 | 44.0 | 26.5 | 5.0 | 21.2 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 02.01.2023 | 7:00-7:00 | 65.1 | 45.0 | 27.3 | 6.3 | 22.6 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 03.01.2023 | 7:15-7:15 | 68.0 | 46.3 | 28.1 | 7.4 | 21.0 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 09.01.2023 | 7:00-7:00 | 67.4 | 44.0 | 23.0 | 6.1 | 23.5 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 10.01.2023 | 7:15-7:15 | 65.2 | 42.3 | 26.1 | 5.4 | 24.6 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 16.01.2023 | 7:00-7:00 | 66.0 | 45.0 | 25.1 | 5.0 | 22.1 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 17.01.2023 | 7:15-7:15 | 64.1 | 43.2 | 24.0 | 6.2 | 23.2 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 23.01.2023 | 7:00-7:00 | 67.2 | 42.1 | 23.5 | 5.4 | 20.2 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 24.01.2023 | 7:15-7:15 | 66.0 | 46.2 | 25.0 | 7.0 | 21.5 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 30.01.2023 | 7:00-7:00 | 65.2 | 45.2 | 24.8 | 8.2 | 22.6 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 31.01.2023 | 7:15-7:15 | 66.8 | 43.0 | 26.2 | 6.0 | 23.4 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 06.02.2023 | 7:00-7:00 | 67.0 | 44.2 | 25.0 | 7.4 | 24.1 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 07.02.2023 | 7:15-7:15 | 66.4 | 42.0 | 23.1 | 5.0 | 21.0 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 13.02.2023 | 7:00-7:00 | 65.0 | 43.1 | 24.5 | 6.3 | 22.5 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 14.02.2023 | 7:15-7:15 | 64.2 | 45.1 | 23.0 | 5.4 | 23.0 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 20.02.2023 | 7:00-7:00 | 66.0 | 46.5 | 26.8 | 6.2 | 22.4 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 21.02.2023 | 7:15-7:15 | 64.3 | 43.5 | 227.3 | 7.2 | 23.6 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 27.02.2023 | 7:00-7:00 | 68.2 | 44.2 | 28.2 | 5.8 | 23.0 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 28.02.2023 | 7:15-7:15 | 67.0 | 42.1 | 26.2 | 6.2 | 21.5 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |

Note: BDL: Below Detection Limit ;DL: Detection Limit ; NH₃: BDL (DL:20); O₃: BDL (DL:20); CO: BDL (DL:1.0); Pb: BDL (DL:0.1); Ni: BDL (DL:1.0); As: BDL (DL:1.0); C₆H₆: BDL (DL:1.0); BaP: BDL (DL:0.1)

Remarks: The values observed for the pollutants given above are within the CPCB standards.

TABLE 3.26 – ABSTRACT OF AMBIENT AIR QUALITY DATA

| 1 | Parameter | PM10 | PM2.5 | SO ₂ | NO ₂ |
|----|-----------------------------------|--------------|-------------|-----------------|-----------------|
| 2 | No. of Observations | 260 | 260 | 260 | 260 |
| 3 | 10 th Percentile Value | 34.8 | 22.3 | 5.3 | 18.2 |
| 4 | 20 th Percentile Value | 37.5 | 23.1 | 6.0 | 19.2 |
| 5 | 30 th Percentile Value | 41.1 | 24.0 | 6.2 | 19.6 |
| 6 | 40 th Percentile Value | 43.0 | 24.3 | 6.3 | 20.3 |
| 7 | 50 th Percentile Value | 43.5 | 25.0 | 6.5 | 21.3 |
| 8 | 60 th Percentile Value | 44.2 | 25.1 | 6.8 | 22.1 |
| 9 | 70 th Percentile Value | 45.0 | 25.6 | 7.2 | 22.5 |
| 10 | 80 th Percentile Value | 45.3 | 26.2 | 7.2 | 23.0 |
| 11 | 90 th Percentile Value | 46.2 | 26.8 | 7.8 | 23.6 |
| 12 | 95 th Percentile Value | 46.3 | 27.3 | 8.2 | 24.0 |
| 13 | 98 th Percentile Value | 46.5 | 28.2 | 8.3 | 24.5 |
| 14 | Arithmetic Mean | 43.0 | 25.3 | 6.9 | 21.7 |
| 15 | Geometric Mean | 42.9 | 25.2 | 6.8 | 21.6 |
| 16 | Standard Deviation | 3.8 | 1.8 | 1.0 | 2.1 |
| 17 | Minimum | 34.8 | 22.3 | 5.3 | 18.2 |
| 18 | Maximum | 46.5 | 28.1 | 8.3 | 24.5 |
| 19 | NAAQ Norms* | 100.0 | 60.0 | 80.0 | 80.0 |
| | % Values exceeding Norms* | 0.0 | 0.0 | 0.0 | 0.0 |

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

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

TABLE 3.27 –SUMMARY OF AMBIENT AIR QUALITY DATA

| PM10 | AAQ1 | AAQ2 | AAQ3 | AAQ4 | AAQ5 | AAQ6 | AAQ7 | AAQ8 |
|-------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| Arithmetic Mean | 33.6 | 37.3 | 42.7 | 44.5 | 45.1 | 45.1 | 43.1 | 44.1 |
| Minimum | 31.0 | 35.2 | 40.1 | 42.0 | 43.6 | 41.3 | 39.8 | 42.0 |
| Maximum | 35.6 | 39.3 | 45.6 | 47.8 | 46.3 | 46.3 | 46.1 | 46.5 |
| NAAQ Norms | 60.0 | 60.0 | 60.0 | 60.0 | 60.0 | 60.0 | 60.0 | 60.0 |
| PM2.5 | AAQ1 | AAQ2 | AAQ3 | AAQ4 | AAQ5 | AAQ6 | AAQ7 | AAQ8 |
| Arithmetic Mean | 23.7 | 26.3 | 24.3 | 25.4 | 45.1 | 45.1 | 24.3 | 33.2 |
| Minimum | 21.0 | 25.0 | 22.1 | 23.0 | 21.0 | 21.3 | 22.1 | 23.0 |
| Maximum | 26.8 | 27.4 | 25.8 | 27.1 | 26.5 | 26.5 | 26.1 | 28.3 |
| NAAQ Norms | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| SO2 | AAQ1 | AAQ2 | AAQ3 | AAQ4 | AAQ5 | AAQ6 | AAQ7 | AAQ8 |
| Arithmetic Mean | 6.8 | 6.3 | 6.1 | 6.4 | 7.1 | 6.9 | 6.8 | 6.3 |
| Minimum | 5.2 | 5.0 | 5.1 | 5.0 | 6.0 | 6.2 | 6.0 | 5.0 |
| Maximum | 8.8 | 8.3 | 8.2 | 7.5 | 8.3 | 7.8 | 7.8 | 8.2 |
| NAAQ Norms | 80.0 | 80.0 | 80.0 | 80.0 | 80.0 | 80.0 | 80.0 | 80.0 |
| NO2 | AAQ1 | AAQ2 | AAQ3 | AAQ4 | AAQ5 | AAQ6 | AAQ7 | AAQ8 |
| Arithmetic Mean | 22.4 | 22.9 | 21.9 | 22.1 | 18.8 | 19.2 | 18.8 | 22.6 |
| Minimum | 20.5 | 21.0 | 19.2 | 20.0 | 17.0 | 17.2 | 17.2 | 20.2 |
| Maximum | 23.8 | 24.5 | 29.3 | 23.9 | 20.5 | 22.2 | 20.8 | 24.6 |
| NAAQ Norms | 80.0 | 80.0 | 80.0 | 80.0 | 80.0 | 80.0 | 80.0 | 80.0 |

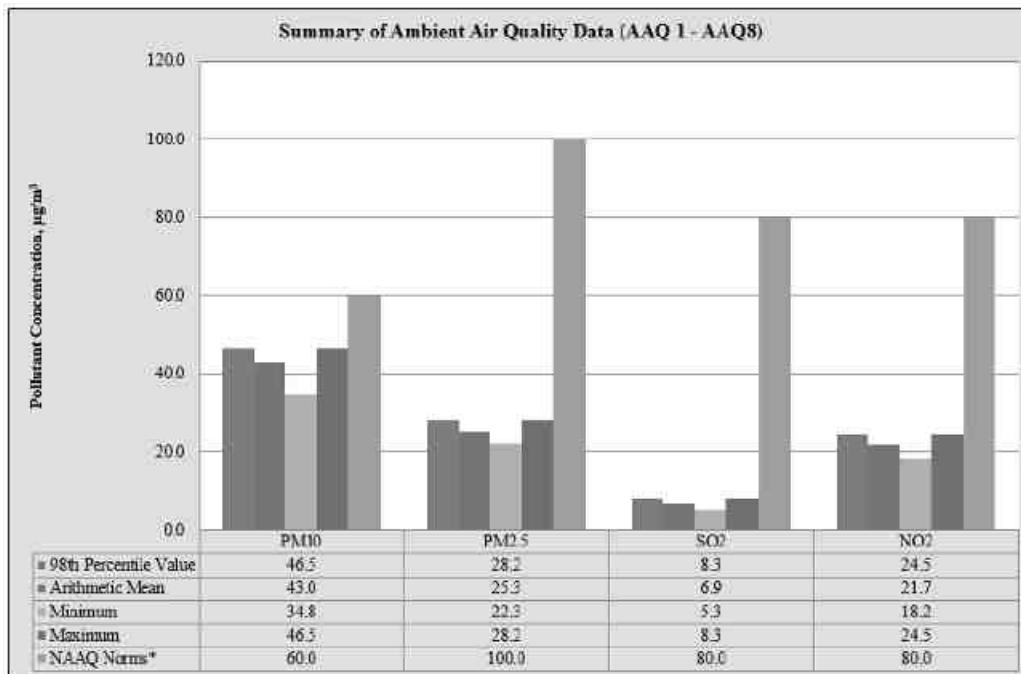


FIGURE 3.16 : BAR DIAGRAM OF SUMMARY OF AAQ

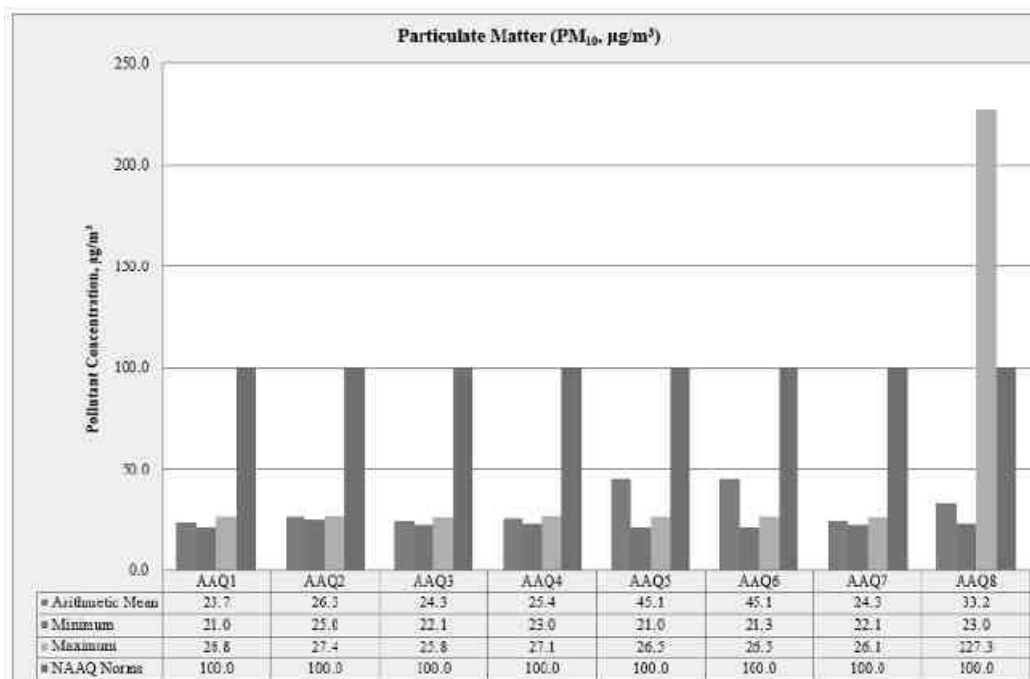


FIGURE 3.17 : BAR DIAGRAM OF PARTICULATE MATTER (PM10)

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

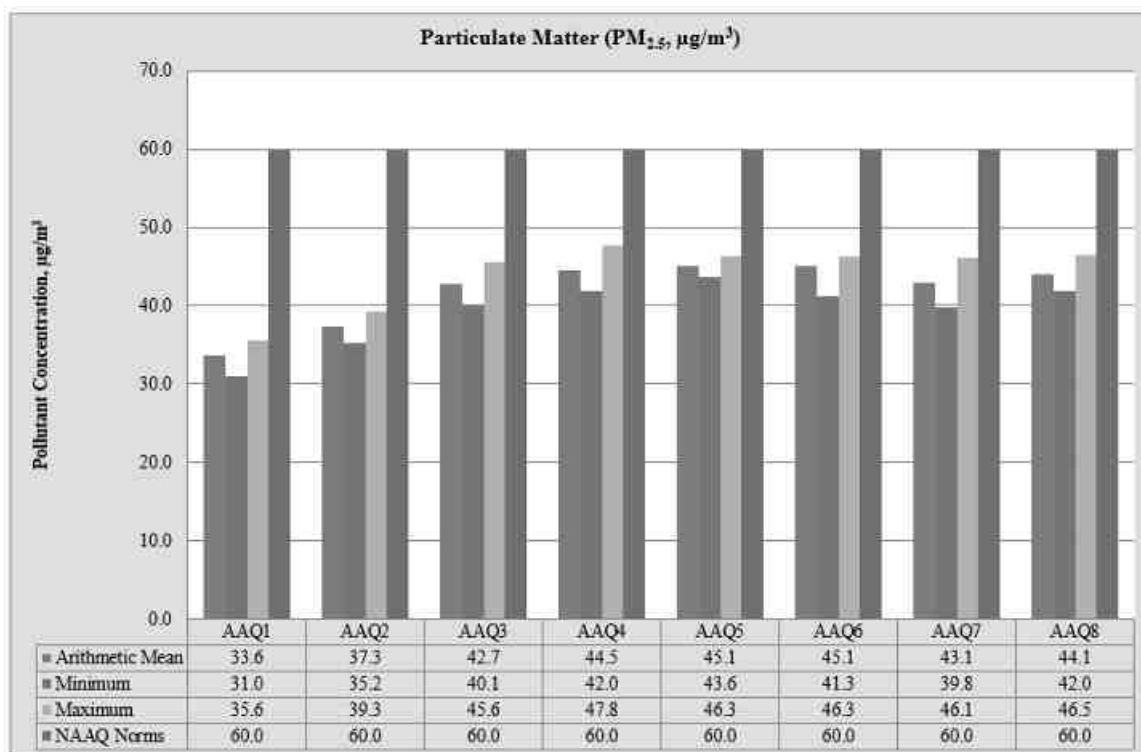


FIGURE 3.18: BAR DIAGRAM OF PARTICULATE MATTER (SO₂)

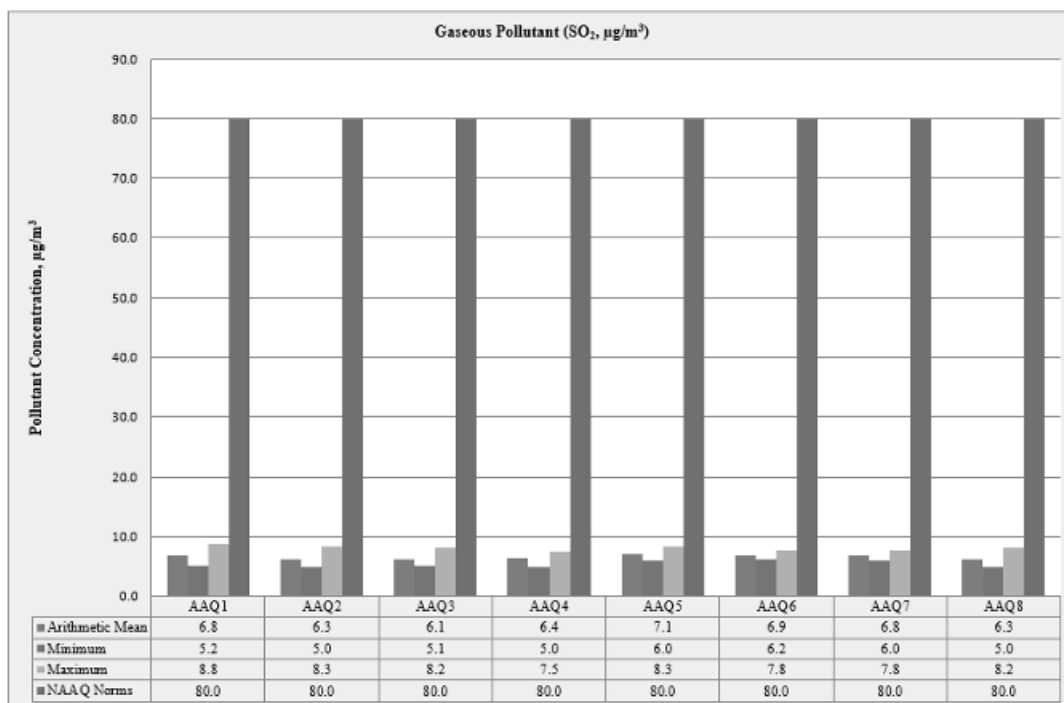
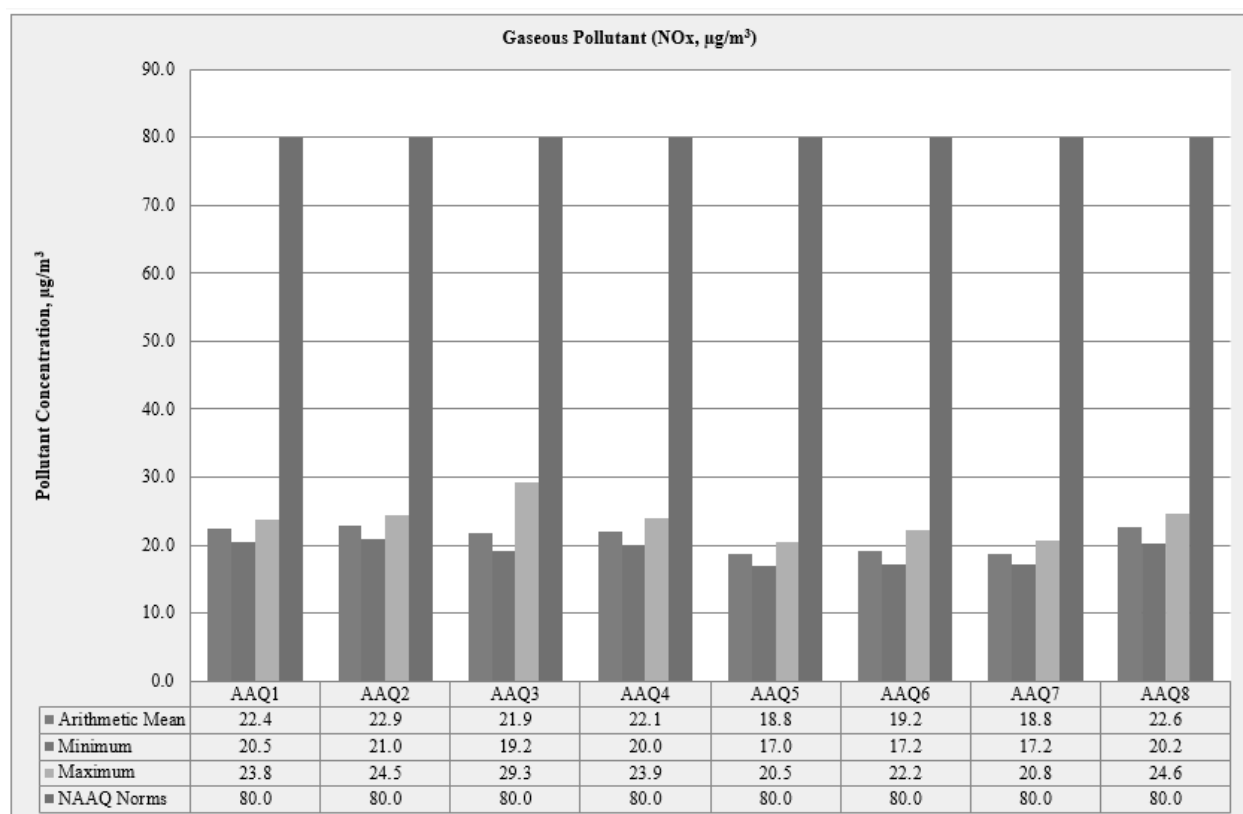


FIGURE 3.18 A: BAR DIAGRAM OF PARTICULATE MATTER (NO2)

3.3.6 Interpretations & Conclusion

As per monitoring data, PM₁₀ ranges from 31 µg/m³ to 47.8µg/m³, PM_{2.5} data ranges from 21 µg/m³ to 28.3 µg/m³, SO₂ ranges from 5.0 µg/m³ to 8.8 µg/m³ and NO₂ data ranges from 17 µg/m³ to 29.3 µg/m³. The concentration levels of the above criteria pollutants were observed to be well within the limits of NAAQS prescribed by CPCB. The minimum & maximum concentrations of PM₁₀ were found to be 31.0 µg/m³ in Core area & 43.6 µg/m³ in Vadakkipalayam Village respectively. The minimum & maximum concentrations of PM_{2.5} were found to be 21.0 µg/m³ in core zone and Vadakkipalayam Village respectively & 28.3 µg/m³ in Kallapuram Village area respectively. The maximum concentration in the core zone is due to the cluster of quarries situated within 500m radius.

3.3.7 FUGITIVE DUST EMISSION –

Fugitive dust was recorded at 8 AAQ monitoring stations for 30 days average during the study period.

TABLE 3.29– AVERAGE FUGITIVE DUST SAMPLE VALUES IN µg/m³

| AAQ Locations | Avg SPM (µg/m ³) |
|---------------|------------------------------|
| AAQ 1 | 57.29 |
| AAQ 2 | 63.40 |
| AAQ 3 | 63.15 |
| AAQ 4 | 65.87 |
| AAQ 5 | 63.83 |
| AAQ 6 | 63.26 |
| AAQ 7 | 64.97 |
| AAQ 8 | 66.02 |

Source: EHS 360 Labs Private Limited

Source: Line Diagram of Table 3.29

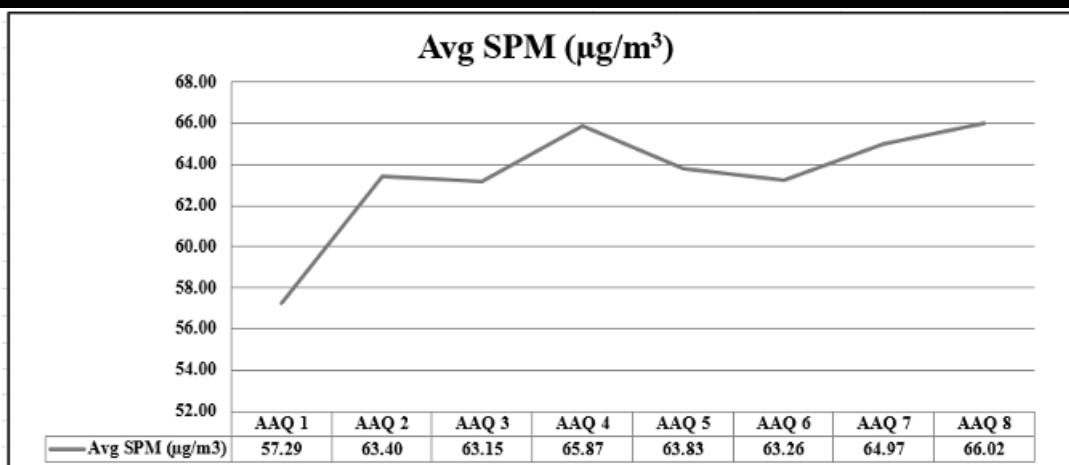
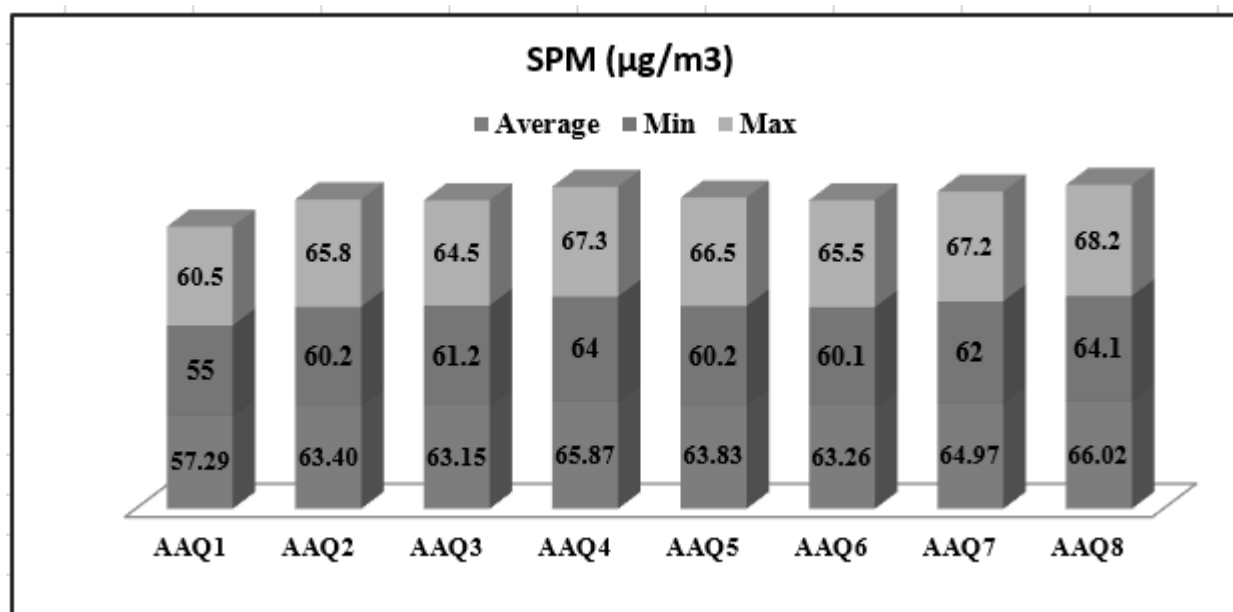


TABLE 3.30– FUGITIVE DUST SAMPLE VALUES IN $\mu\text{g}/\text{m}^3$ –

| SPM ($\mu\text{g}/\text{m}^3$) | AAQ1 | AAQ2 | AAQ3 | AAQ4 | AAQ5 | AAQ6 | AAQ7 | AAQ8 |
|----------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| Average | 57.29 | 63.40 | 63.15 | 65.87 | 63.83 | 63.26 | 64.97 | 66.02 |
| Max | 55 | 60.2 | 61.2 | 64 | 60.2 | 60.1 | 62 | 64.1 |
| Min | 60.5 | 65.8 | 64.5 | 67.3 | 66.5 | 65.5 | 67.2 | 68.2 |

Source: Calculations from Lab Analysis Reports



Source: Bar Diagram of table 3.30

3.4 Noise Environment

The vehicular movement on road and mining activities is the major sources of noise in study area, the environmental assessment of noise from the mining activity and vehicular traffic can be undertaken by taking into consideration various factors like potential damage to hearing, physiological responses, and annoyance and general community responses.

The main objective of noise monitoring in the study area is to establish the baseline noise level and assess the impact of the total noise expected to be generated during the project operations around the project site.

3.4.1 Identification of Sampling Locations

In order to assess the ambient noise levels within the study area, noise monitoring was carried out at eight (8) locations. The noise level monitoring locations were carried out by covering commercial, residential, rural areas within the radius of 10km. A noise monitoring methodology was chosen such that it best suited the purpose and objectives of the study.

TABLE 3.31 – DETAILS OF SURFACE NOISE MONITORING LOCATIONS

| S. No | Location code | Monitoring Locations | Distance & Direction | Coordinates |
|-------|---------------|----------------------|----------------------|-----------------------------|
| 1 | N-1 | Core Zone | Project Area | 10°48'35.96"N 76°59'46.86"E |
| 2 | N-2 | Core Zone | Project Area | 10°48'43.71"N 76°59'53.67"E |
| 3 | N-3 | Muthur | 2.0 km SW | 10°47'36.13"N 76°59'16.04"E |
| 4 | N-4 | Sankarayapuram | 4.2 km SW | 10°46'49.85"N 76°58'19.13"E |
| 5 | N-5 | Vadakkipalayam | 1.7 km SE | 10°48'15.06"N 77° 0'42.12"E |
| 6 | N-6 | Nallattipalayam | 4.5 km SE | 10°47'14.33"N 77° 1'53.00"E |
| 7 | N-7 | Kinathukadavu | 2.5 km NE | 10°49'46.29"N 77° 0'45.13"E |
| 8 | N-8 | Kallapuram | 3.0 km NW | 10°50'9.62"N 76°58'54.13"E |

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

FIGURE 3.19: SITE PHOTOGRAPHS OF NOISE MONITORING IN PROJECT AREA



P1- Tmt.K.Sangeetha

3.4.2 Method of Monitoring

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

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

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

T = Time interval of observation

3.4.3 Analysis of Ambient Noise Level in the Study Area

An analysis of the different Leq data obtained during the study period has been made. Variation was noted during the day-time as well as night-time. The results are presented in below Table 3.6

Day time : 6:00 hours to 22.00 hours.

Night time : 22:00 hours to 6.00 hours

TABLE 3.32 – NOISE MONITORING RESULTS IN CORE AND BUFFER ZONE

| S. No | Locations | Noise level (dB (A) Leq) | | Ambient Noise Standards |
|-------|-----------------|--------------------------|------------|--|
| | | Day Time | Night Time | |
| N-1 | Core Zone | 42.6 | 38.0 | Industrial Day Time- 75 dB (A) Night Time- 70 dB (A) |
| N-2 | Core Zone | 41.8 | 37.0 | |
| N-3 | Muthur | 38.2 | 35.9 | |
| N-4 | Sankarayapuram | 39.1 | 34.2 | |
| N-5 | Vadakkipalayam | 37.0 | 35.7 | Residential Day Time– 55 dB (A) Night Time- 45 dB (A) |
| N-6 | Nallattipalayam | 36.1 | 35.0 | |
| N-7 | Kinathukadavu | 36.2 | 35.8 | |
| N-8 | Kallapuram | 36.7 | 34.8 | |

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

FIGURE 3.20: NOISE MONITORING STATIONS AROUND 10 KM RADIUS

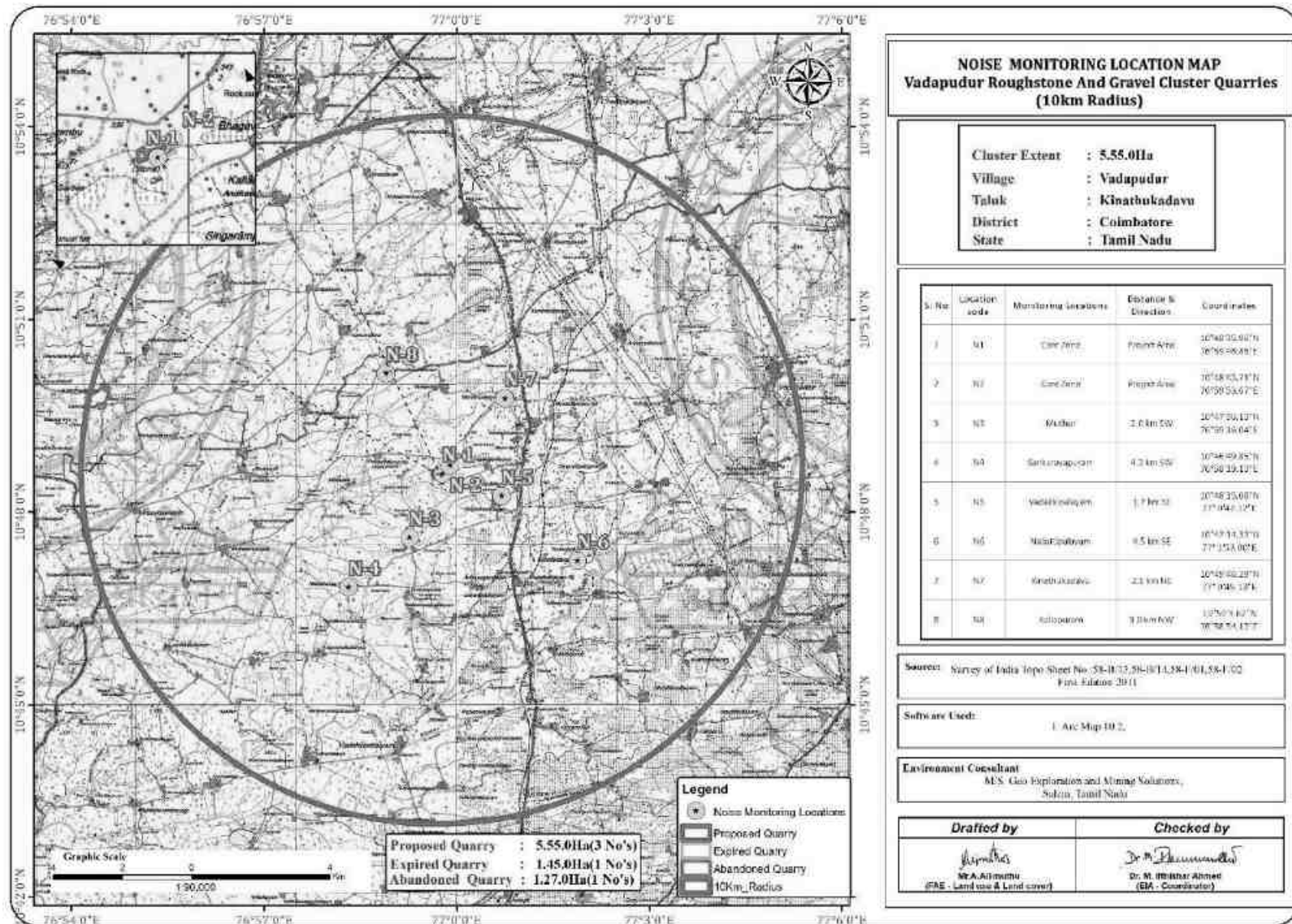
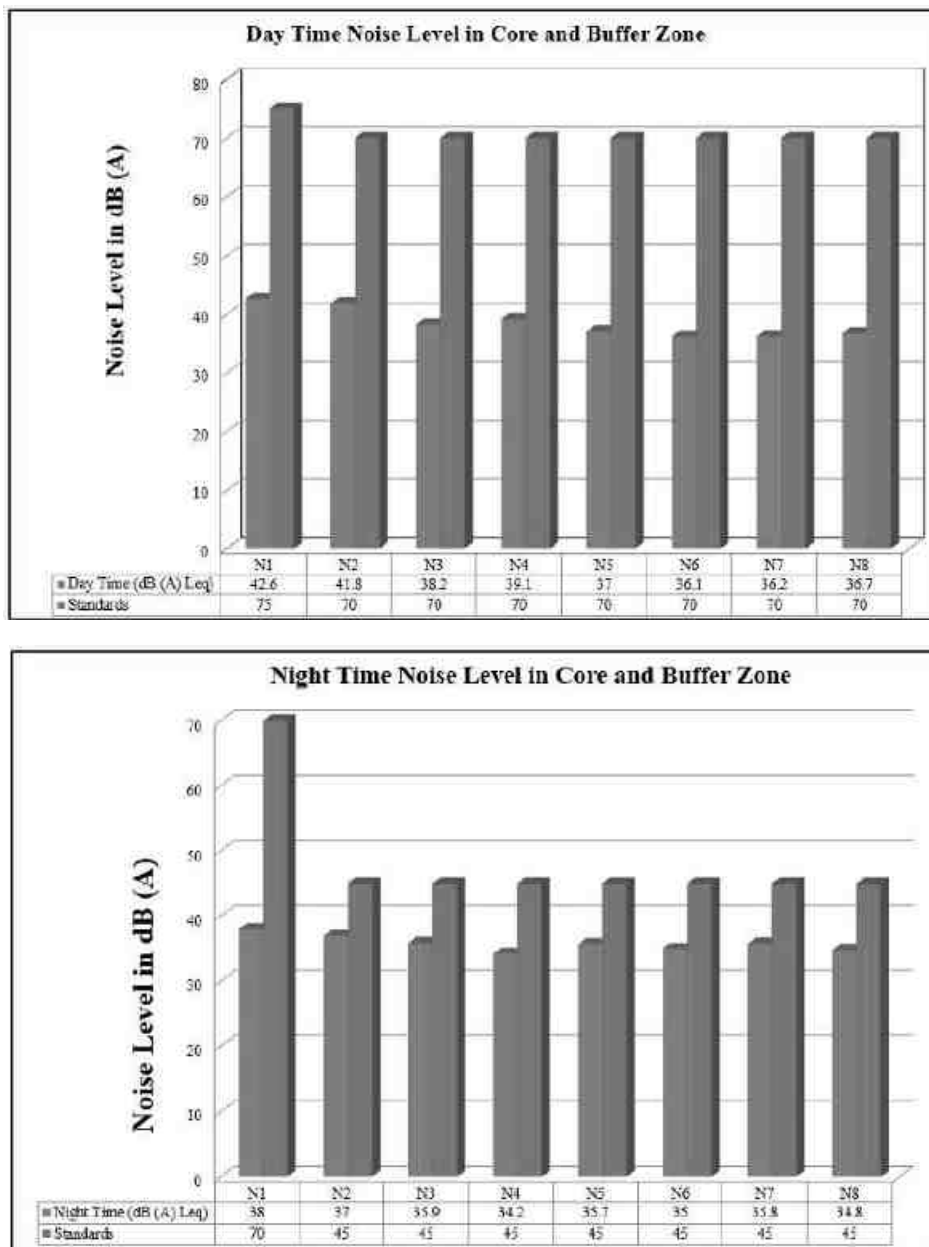


FIGURE 3.21: DAY & NIGHT TIME NOISE LEVELS IN CORE AND BUFFER ZONE



3.4.4 Interpretation & Conclusion:

Ambient noise levels were measured at 8 (eight) locations around the project area considering cluster quarries. Noise levels recorded in core zone during day time were from 41.8 – 42.6 dB (A) Leq and during night time were from 37.0-38.0 dB (A) Leq. Noise levels recorded in buffer zone during day time were from 36.1 – 39.1dB (A) Leq and during night time were from 34.0 – 35.9 dB (A) Leq.

The values of noise observed in some of the areas are primarily owing to quarrying activities due to cluster of quarries within 500m radius, movement of vehicles and other anthropogenic activities. Noise monitoring results reveal that the minimum & maximum noise levels at day time were recorded in the range of 30.2 dB(A) in Nallattipalayam Village and 46.5 dB(A) in Core area respectively. 31.2 db (A) Muthur, Sankarayapuram, Nallattipalayam, Kinathukadavu and Kallapuram Village respectively minimum noise levels in night time. 40.2dB(A) maximum noise levels in night time for Thus, the noise level for Industrial and Residential area meets the requirements of CPCB.

3.5 Biological Environment

3.5.1. Study area Ecology

The core area extent of 2.36.5 Ha of Rough stone quarry has an impact on the diversity of flora and fauna of the surrounding area. But present work was carried out on the detailed study of the impacts of the Rough stone quarry on the ecology and biodiversity of the core lease area with the proper mitigation and sustainable management plan. The proposed area applied area exhibits plain topography. The following methods were applied during the baseline study of flora, fauna, and diversity assessment.

3.5.2. Objectives of Biological Studies

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

3.5.3 Methodology of Sampling

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

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

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

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

a) Sampling

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

b). Sampling Size

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

c) Timing of Study

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

d) Observations from Sampling

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

e) Equipment/ References

- Canon Mark III Camera with 50-500mm lens– Snap shots taken
- Leica Binoculars (8x 20) to spot/identify species
- IUCN Red Data Book – <https://www.iucnredlist.org/species>

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

3.5.4 Part I Field Sampling Techniques

3.5.4.1 Transect walk – Birds

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

3.5.4.2. Modified Pollard Walk – for Butterflies

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

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

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

3.5.4.4. Observational methods- Mammals

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

3.5.4.5. Multiple Stage Quadrat – Vegetation

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

3.5.5 Flora

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

Table No: 3.33 Flora in the Core zone of Rough Stone quarry

| Sl.No | English Name | Vernacular Name | Scientific Name | Family Name |
|----------------|----------------------|-----------------|------------------------------|---------------|
| Trees | | | | |
| 1. | Velvet mesquite | Mullu Maram | <i>Prosopis juliflora</i> | Fabaceae |
| 2. | White Bark Acacia | Vela maram | <i>Vachellia leucophloea</i> | Fabaceae |
| 3. | Neem or Indian lilac | Vembu maram | <i>Azadirachta indica</i> | Meliaceae |
| 4. | Millettia Pinnata | Pongam oiltree | <i>Pongamia pinnata</i> | Fabaceae |
| Shrubs | | | | |
| 1. | Avaram | Avarai | <i>Senna auriculata</i> | Fabaceae |
| 2. | Devil's trumpet | Umathai | <i>Datura metel</i> | Solanaceae |
| 3. | Milk Weed | Erukku | <i>Calotropis gigantea</i> | Apocynaceae |
| Herbs | | | | |
| 1. | Common leucas | Thumbai | <i>Leucas aspera</i> | Lamiaceae |
| 2. | Fish poison | Kolinchi | <i>Tephrosia purpurea</i> | Fabaceae |
| 3. | Coat buttons | Thatha poo | <i>Tridax procumbens</i> | Asteraceae |
| 4. | Devil's thorn | Nerunji | <i>Tribulus terrestris</i> | Zygophyllales |
| 5. | Asthma-plant | Amman pacharisi | <i>Euphorbia hirta</i> | Euphorbiaceae |
| 6. | Indian doab | Arugampul | <i>Cynodon dactylon</i> | Poaceae |
| 7. | Malabar catmint | Pic Viratti | <i>Anisomeles malabarica</i> | Lamiaceae |
| Grasses | | | | |
| 1. | Eragrostis | Pullu | <i>Eragrostis ferruginea</i> | Poaceae |
| 2. | Great brome | Thodappam | <i>Bromus diandrus</i> | Poaceae |

3.5.5.1 Flora Composition in the Core Zone

Taxonomically a total of 16 species belonging to 10 families have been recorded from the core mining lease area. The proposed area applied area exhibits plain topography. This land is fit for vegetation and cultivation. Based on the habitat classification of the enumerated plants the majority of species were Herbs 7 followed by Shrubs 3, Trees 4, and Grasses 2. Details of flora with the scientific name were mentioned in Table No. 3.33 The result of the core zone of flora studies shows that Fabaceae and Poaceae, Lamiaceae are the main dominating species in the study area mentioned in Table No.3.33 No species found as threatened category.

a. *Calotropis gigantea*b. *Prosopis juliflora*c. *Vachellia leucophloea*



d. *Azadirachta indica*



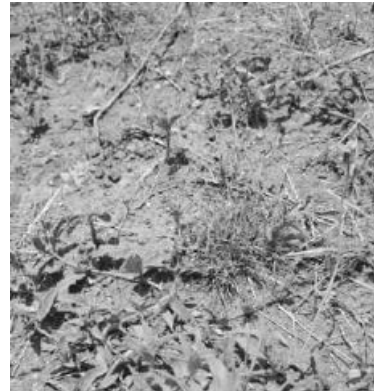
e. *Euphorbia hirta*



f. *Bromus diandrus*



g. *Tephrosia purpurea*



h. *Tridax procumbens*

Fig No: 3.22 Flora species observation in the core zone area

Table No: 3.34 Flora in Buffer Zone of Rough Stone quarry.

| Sl.No | English Name | Vernacular Name | Scientific Name | Family Name |
|--------------|----------------------|-----------------|--------------------------------|-----------------|
| Trees | | | | |
| 1. | Velvet mesquite | Mullu maram | <i>Prosopis juliflora</i> | Fabaceae |
| 2. | Neem or Indian lilac | Vembu | <i>Azadirachta indica</i> | Meliaceae |
| 3. | Mango | Manga | <i>Mangifera indica</i> | Anacardiaceae |
| 4. | Wild Tamarind | Savundal | <i>Leucaena latisiliqua</i> | Mimosaceae |
| 5. | Tree of heaven | Perumaram | <i>Ailanthus excelsa</i> | Simaroubaceae |
| 6. | Coconut | Thennai maram | <i>Cocos nucifera</i> | Arecaceae |
| 7. | Madras thorn | Kudukapuli | <i>Pithecellobium dulce</i> | Fabaceae |
| 8. | River tamarind | Soundal maram | <i>Leucaena leucocephala</i> | Fabaceae |
| 9. | Indian siris | Eayal vaagai | <i>Albizia lebbek</i> | Mimosaceae |
| 10. | Monkey pod tree | Thungumoonchi | <i>Samanea saman</i> | Fabaceae |
| 11. | Cutch tree | Karangali | <i>Acacia chundra</i> | Mimosaceae |
| 12. | Portia tree | Poovarasam | <i>Thespesia Populnea</i> | Malvaceae |
| 13. | Sage-leaved alangium | Alangi | <i>Alangium salviifolium</i> | Alangiaceae |
| 14. | Jack fruit | Bala maram | <i>Artocarpusintegrifolia</i> | Moraceae |
| 15. | Indian siris | Vagai | <i>Albizia lebbek</i> | Mimosaceae |
| 16. | Bitter Albizia | Unja, Usilai | <i>Albizia amara</i> | Mimosaceae |
| 17. | Tree of heaven | Perumaram | <i>Ailanthus excelsa</i> | Simaroubaceae |
| 18. | Velvet mesquite | Mullu maram | <i>Prosopis juliflora</i> | Fabaceae |
| 19. | Yellow Flame | Vagai | <i>Peltophorum pterocarpum</i> | Caesalpiniaceae |
| 20. | Lemon | Ezhumuchaipalam | <i>Citrus lemon</i> | Rutaceae |
| 21. | Jamun Fruit Plant | Naval maram | <i>Syzygium cumini</i> | Myrtaceae |
| 22. | Gum arabic tree | Karuvelam | <i>Vachellia nilotica</i> | Fabaceae |
| 23. | Yellow oleander | Ponarali | <i>Cascabela thevetia</i> | Apocynaceae |
| 24. | Rain Tree | Mazlhimaram | <i>Samanea saman</i> | Mimosaceae |
| 25. | Chinese chaste tree | Nochi | <i>Vitex negundo</i> | Verbenaceae |
| 26. | Umbrella thorn | Umbrella thorn | <i>Acacia planifrons</i> | Mimosaceae |
| 27. | Golden shower tree | Sarakonnai | <i>Cassia fistula</i> | Caesalpiniaceae |
| 28. | Asian Palmyra palm | Panai maram | <i>Borassus flabellifer</i> | Arecaceae |
| 29. | Curry tree Plant | Karuveppilai | <i>Murraya koenigii</i> | Rutaceae |

| | | | | |
|---------------|-------------------|--------------------------|---------------------------------|----------------|
| 30. | Teak | Thekku | <i>Tectona grandis</i> | Verbenaceae |
| 31. | Indian mulberry | Nuna maram | <i>Morinda tinctoria</i> | Rubiaceae |
| 32. | Drumstick tree | Murunga maram | <i>Moringa oleifera</i> | Moringaceae |
| 33. | Guava | Koyya | <i>Psidium guajava</i> | Myrtaceae |
| 34. | Indian-almond | Inguti | <i>Terminalia catappa</i> | Combretaceae |
| 35. | Cat Spider Flower | Cleome | <i>Cleome felina</i> | Capparaceae |
| 36. | Eucalyptus | Thailam maram | <i>Eucalyptus tereticornis</i> | Myrtaceae |
| 37. | Pongamia pinnata | Pongam | <i>Millettia pinnata</i> | Fabaceae |
| 38. | Horsetail She-oak | Savukku maram | <i>Casuarina equisetifolia</i> | Casuarinaceae |
| 39. | Henna | Marudaani | <i>Lawsonia inermis</i> | Lythraceae |
| 40. | Indian gooseberry | Nelli | <i>Phyllanthus emblica</i> | Phyllanthaceae |
| 41. | Peepal | Asoka maram | <i>Ficus religiosa</i> | legume |
| 42. | Tamarind | Puliyamaram | <i>Tamarindus indica</i> | Legumes |
| 43. | Rosewood | Eeti, Thodagathi, Tawadi | <i>Dalbergia latifolia</i> | Fabaceae |
| 44. | Butter Tree | Kattu illupai | <i>Madhuca indica</i> | Sapotaceae |
| 45. | Conkerberry | Sirukilaa | <i>Carissa spinarum</i> | Apocynaceae |
| 46. | Malayan Cherry | Ten Pazham | <i>Muntingia calabura</i> | Muntingiaceae |
| 47. | Sacred fig | Arasa maram | <i>Ficus religiosa</i> | Moraceae |
| 48. | Jujube Trees | Elantha Pazham | <i>Ziziphus Mauritiana</i> | Rhamnaceae |
| 49. | Papaya | Pappali maram | <i>Carica papaya L</i> | Caricaceae |
| 50. | Mountain date | Malai eecham, | <i>Phoenix loureirii</i> | Arecaceae |
| 51. | Java olive tree | Kutiraippitukku | <i>Sterculia foetida</i> | Malvaceae |
| 52. | Ceylon satinwood | Purush, Porasu | <i>Chloroxylon swietenia</i> | Rutaceae |
| 53. | Banana tree | Vazhaimaram | <i>Musa acuminata</i> | Musaceae |
| 54. | Amati | Agathi keerai | <i>Sesbania grandiflora</i> | Fabaceae |
| 55. | Custard apple | Seethapazham | <i>Annona reticulata</i> | Annonaceae |
| 56. | Manilkara zapota | Sapota | <i>Manilkara zapota</i> | Sapotaceae |
| 57. | Indian-almond | Badam | <i>Terminalia catappa</i> | Combretaceae |
| 58. | Banyan tree | Alamaram | <i>Ficus benghalensis</i> | Moraceae |
| 59. | Jack fruit | Palamaram | <i>Artocarpus heterophyllus</i> | Moraceae |
| Shrubs | | | | |
| 1. | Giant reed | Mudaampul | <i>Arundo donax</i> | Poaceae |
| 2. | Devil's trumpet | Umathai | <i>Datura metel</i> | Solanaceae |

| | | | | |
|--------------|-------------------------|------------------|---------------------------------|-----------------|
| 3. | Senna Coffee | Payaveri | <i>Cassia occidentalis</i> | Caesalpiniaceae |
| 4. | Avaram | Avarai | <i>Senna auriculata</i> | Fabaceae |
| 5. | Water-hyacinth | Agayathamara | <i>Eichhornia crassipes</i> | Pontederiaceae |
| 6. | Kangkong | Sarkaraivalli | <i>Ipomeae aquatica</i> | Convolvulaceae |
| 7. | Castor bean | Amanakku | <i>Ricinus communis</i> | Euphorbiaceae |
| 8. | - | Vellai indu | <i>Acacia pennata</i> | Mimosaceae |
| 9. | Green amaranth | Kuppaikerai | <i>Amaranthus vividis</i> | Amaranthaceae |
| 10. | Jungle geranium | Idly Poo | <i>Ixora coccinea</i> | Rubiaceae |
| 11. | Birch-Leaved Cat Tail | Aathaathazhai | <i>Acalypha fruticosa</i> | Euphorbiaceae |
| 12. | Horn of Plenty | Karu Umathai | <i>Datura metel</i> | Solanaceae |
| 13. | Devil's claw | Thael kodukkukai | <i>Martynia annua</i> | Pedaliaceae |
| 14. | Shoe flower | Chemparuthi | <i>Hibiscu rosa-sinensis</i> | Malvaceae |
| 15. | Asian Bushbeech | Sirukumalaan | <i>Gmelina asiatica</i> | Verbenaceae |
| 16. | Wild jasmine | Kattumalli | <i>Jasminum trichotomum</i> | Oleaceae |
| 17. | Milk Weed | Erukku | <i>Calotropis gigantea</i> | Apocynaceae |
| 18. | Rough cocklebur | Marlumuttu | <i>Xanthium indicum</i> | Asteraceae |
| 19. | Mexican prickly poppy | Bramathndu | <i>Argemone mexicana</i> | Papaveraceae |
| 20. | Orange Jasmine | Mock Orange | <i>Murraya paniculata</i> | Rutaceae |
| 21. | Puriging nut | Kattamanakku | <i>Jatropha curcas</i> | Euphorbiaceae |
| 22. | Cypress vine | Mayil maanikam | <i>Ipomoea quamoclit</i> | Convolvulaceae |
| 23. | Indian Balm of Gilead | Mulkilluvai | <i>Commiphora berryi</i> | Burseraceae |
| 24. | Malabar catmint | Pei veratti | <i>Anisomeles malabarica</i> | Lamiaceae |
| 25. | Dwarf Heliotrope | Theelkoduku | <i>Heliotropium supinum</i> | Boraginaceae |
| 26. | Clustered Morning Glory | Onan kodi | <i>Ipomoea staphylina</i> | Convolvulaceae |
| 27. | Touch-me-not | Thottalchinungi | <i>Mimosa pudica</i> | Mimosaceae |
| 28. | Indian mallow | Thuthi | <i>Abutilon indicum</i> | Meliaceae |
| 29. | Night shade plan | Sundaika | <i>Solanum torvum</i> | Solanaceae |
| 30. | Rosary pea | Kundumani | <i>Abrus precatorius</i> | Fabaceae |
| 31. | Indian Oleander | Arali | <i>Nerium indicum</i> | Apocynaceae |
| 32. | West Indian Lantana | Unni chedi | <i>Lantana camara</i> | Verbenaceae |
| 33. | Rough cocklebur | Marlumutt | <i>Xanthium indicum</i> | Asteraceae |
| Herbs | | | | |
| 1. | Carrot grass | Parttiniyam | <i>Parthenium hysterophorus</i> | Asteraceae |

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|-----|-----------------------|-----------------------------|-------------------------------|------------------|
| 2. | Sessile Joyweed | Ponnankanni | <i>Alternanthera sessilis</i> | Amaranthaceae |
| 3. | Billygoat weed | Pumpillu | <i>Ageratum conyzoides</i> | Asteraceae |
| 4. | Aloe barbadensis | Katrazhai | <i>Aloe vera</i> | Asphodelaceae |
| 5. | Madagascar Periwinkle | Nithyakalyani | <i>Catharanthus roseus</i> | Apocynaceae |
| 6. | Indian Mercury | Kuppamani | <i>Acalypha indica</i> | Euphorbiaceae |
| 7. | Indian nettle | Nayuruvi | <i>Achyranthes aspera</i> | Amaranthaceae |
| 8. | Chloris barbata | Kodai pul | <i>Chloris barbata</i> | Poaceae |
| 9. | Spreading hogweed | Mookkaratti | <i>Boerhavia diffusa</i> | Nyctaginaceae |
| 10. | Bui | Ciru-pulai | <i>Aervalanata</i> | Amaranthaceae |
| 11. | Indian doab | Arugampul | <i>Cynodon dactylon</i> | Poaceae |
| 12. | Spiny amaranth | Mullu keerai | <i>Amaranthus spinosus</i> | Amaranthaceae |
| 13. | Prickly chaff flower | Uthrani | <i>Achyranthes aspera</i> | Amaranthaceae |
| 14. | Malabar spinach | Pasalaikeerai, Paasaangalli | <i>Basella alba</i> | Basellaceae |
| 15. | Tropical milkweed | Blood Flower | <i>Asclepias curassavica</i> | Asclepiadaceae |
| 16. | Mexican prickly poppy | Mullu umathai | <i>Argemone mexicana</i> | Papaveraceae |
| 17. | Dwarf morning-glory | Vishnu kiranthi | <i>Evolvulus alsinoides</i> | Convolvulaceae |
| 18. | Datura metel | Oomathai | <i>Datura metel</i> | Solanaceae |
| 19. | Carry me seed | Kizhar nelli | <i>Phyllanthus amarus</i> | Phyllanthaceae |
| 20. | Malabar catmint | Peymarutti | <i>Anisomeles malabarica</i> | Lamiaceae |
| 21. | Black-jack | Mukkuthi Asteraceae | <i>Bidens pilosa</i> | Aizoaceae |
| 22. | Yellow elder | Manjarali | <i>Tecoma stans</i> | Apocynaceae |
| 23. | Green amaranth | Kuppai keerai | <i>Amaranthus viridis</i> | Amaranthaceae |
| 24. | Obscure Morning Glory | Siruthaali | <i>Ipomoea obscura</i> | Convolvulaceae |
| 25. | Cleome viscosa | Nai kadugu | <i>Celome viscosa</i> | Capparidaceae |
| 26. | Common leucas | Thumbai | <i>Leucas aspera</i> | Lamiaceae |
| 27. | Waterhyssop | Nilappachai | <i>Bacopa monnieri</i> | Scrophulariaceae |
| 28. | Century plant | Agave | <i>Agave america</i> | Agavaceae |
| 29. | Sand Herbage | Manal keerai | <i>Gisekia pharnaceoides</i> | |
| 30. | Fish poison | Kollukaivelai | <i>Tephrosia purpureae</i> | Papilionaceae |
| 31. | Elephant Climber | Vettai chedi, Kanvali poo | <i>Argyreia cuneata</i> | Convolvulaceae |
| 32. | Asthma-plant | Amman pacharisi | <i>Euphorbia hirta</i> | Euphorbiaceae |
| 33. | Porcupine flower | Shemmuli | <i>Barleria prionitis</i> | Acanthaceae |
| 34. | Holy basil | Thulasi | <i>Ocimum tenuiflorum</i> | Lamiaceae |

| | | | | |
|-------------------------|---------------------------|------------------|------------------------------|----------------|
| 35. | Peanut | Kadalai | <i>Arachis hypogaea</i> | Fabaceae |
| 36. | Red Hogweed | Mukurattai | <i>Boerhavia diffusa</i> | Nyctaginaceae |
| 37. | Tridax daisy | Thatha poo | <i>Tridax procumbens</i> | Asteraceae |
| 38. | Gale of the wind | Keelaneeli | <i>Phyllanthus niruri</i> | Phyllanthaceae |
| 39. | Eggplant | Kathirikai | <i>Solanum melongena</i> | Solanaceae |
| 40. | European black nightshade | Manathakkali | <i>Solanumnigrum</i> | Solanaceae |
| Climber/ Creeper | | | | |
| 1. | Ivy gourd | Kovai | <i>Coccinia grandis</i> | Cucurbitaceae |
| 2. | Cucumis maderaspatanus | Musumusukkai | <i>Mukia maderaspatana</i> | Cucurbitaceae |
| 3. | Indian atalantia | Kattu naarangam, | <i>Atalantia monophylla</i> | Rutaceae |
| 4. | Butterfly pea | Sangu poo | <i>Clitoria ternatea</i> | Fabaceae |
| 5. | Wild water lemon | Sirupoonakaali | <i>Passiflora foetida</i> | Passifloraceae |
| 6. | Stemmed vine | Perandai | <i>Cissus quadrangularis</i> | Vitaceae |
| 7. | Bottle Guard | Sorakkai | <i>Lagenaria siceraria</i> | Cucurbitaceae |
| 8. | Rosary Pea | Gundumani | <i>Abrus precatorius</i> | Fabaceae |
| 9. | Shatavari | Thaneervittaan | <i>Asparagus racemosus</i> | Liliaceae |
| 10. | Pointed gourd | Kovakkai | <i>Trichosanthes dioica</i> | Cucurbitaceae |
| 11. | Wild bitter | Pavarkai | <i>Momordica charantia</i> | Cucurbitaceae |
| Grass | | | | |
| 1. | Eragrostis | Pullu | <i>Eragrostis ferruginea</i> | Poaceae |
| 2. | Giant reed | Elephant grass | <i>Arundo donax</i> | Poaceae |
| 3. | Windmill grass | Chevvarakupul | <i>Chloris barbata</i> | Amaranthaceae |
| 4. | Nut grass | Korai | <i>Cyperus rotandus</i> | Poaceae |
| 5. | Great brome | Thodappam | <i>Bromus diandrus</i> | Poaceae |
| Cactus | | | | |
| 1. | Prickly pear | Nagathali | <i>Opuntia dillenii</i> | Cactaceae |
| 2. | Triangular spruge | Chaturakalli | <i>Euphorbia antiquorum</i> | Euphorbiaceae |

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

3.5.5.2 Flora Composition in the Buffer Zone

Similar habitats may be found in the buffer area as well, although there is a wider variety of plants there than in the core zone area. The buffer zone study area contains a total of 150 species that have been recorded from the buffer zone. The floral (150) varieties of them Trees 59, herbs 40, shrubs 33, Climbers 11, Grasses 5, and Cactus 2 were identified. The result of the buffer zone of flora studies shows that Fabaceae and Poaceae, Mimosaceae is the main dominating species in the study area mentioned in Table No.3.35. There are no impacts due to this mining activity. There are no Rare, Endangered, and Threatened Flora species in the mining area and their surrounding study area. Apart from the proposed project area, there is agricultural land. Horticulture and agricultural land are untouched. There are no Rare, Endangered, and Threatened Flora species in the mining area and their surrounding study area. A list of floral species has been prepared based on a primary survey (site observations) and discussion with local people (Secondary data). The total number of different plant life forms under trees, shrubs, herbs, and climbers is shown in Table 3.35 and their % distribution is shown in Figure 3.22.

Table 3.35 Number of floral life forms in the Study Area

| S. No | Plant Life Form | Number of Species |
|-----------------------------|-----------------|-------------------|
| 1 | Trees | 59 |
| 2 | Shrubs | 33 |
| 3 | Herbs | 40 |
| 4 | Climber | 11 |
| 6 | Grass | 5 |
| 7 | Cactus | 2 |
| Total No. of Species | | 150 |

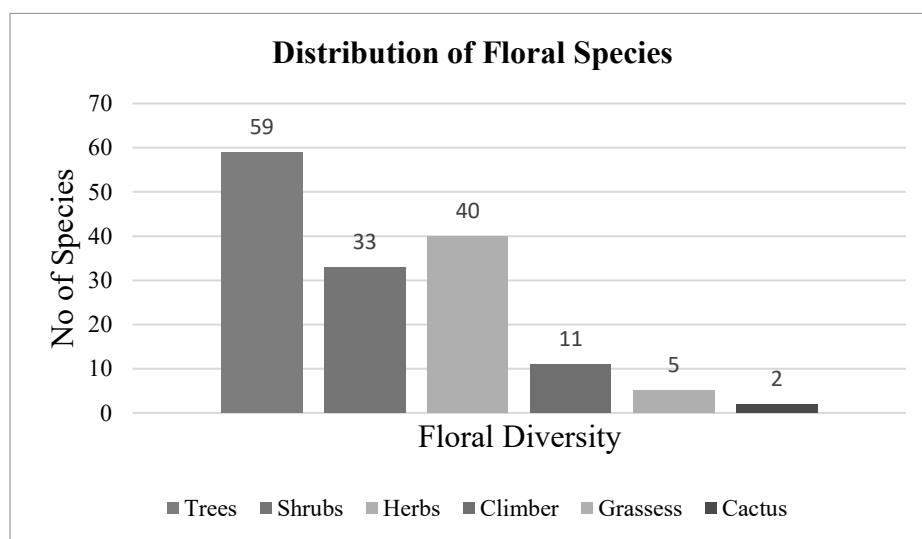


Fig No. 3.23: Graph showing % distribution of floral life forms



a. *Ziziphus Mauritiana*



b. *Azadirachta indica*



c. *Euphorbia hirta*



d. *Leucas aspera*



e. *Argemone Mexicana*



f. *Cissus quadrangularis*



g. *Senna auriculata*



h. *Euphorbia antiquorum*



i. *Parthenium hysterophorus*



J. *Cocos nucifera*



k. *Musa acuminata*



l. *Prosopis juliflora*



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

3.5.5.3 The vegetation in the RF / PF areas, ecologically sensitive areas

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

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

3.5.6 Fauna

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

3.5.6.1. Fauna Composition in the Core Zone

Core Zone: During the study, it was found that the faunal diversity in the core site was limited to Butterflies, insects, and some species of mammals & reptiles among them numbers Insects 8, Reptiles 3, Mammals 3, and Avian 9. The core site has avifauna species like crow, Black drongo, Koel, etc. None of these species are threatened or endemic in the study area and surroundings. There is no Schedule I species and 12 species are under Schedule IV according to the Indian Wildlife Act 1972. There are no critically endangered, endangered, vulnerable, and endemic species were observed.

Table No: 3.36. Fauna in the Core zone of Rough Stone quarry

| Sl. No | Common Name | Scientific Name | Schedule list WLPC 1972 |
|-----------------|------------------------|----------------------------------|-------------------------|
| Insects | | | |
| 1. | Common Tiger | <i>Danaus genutia</i> | NL |
| 2. | Red-veined darter | <i>Sympetrum fonscolombii</i> | NL |
| 3. | Tawny coster | <i>Danaus chrysippus</i> | Schedule IV |
| 4. | House fly | <i>Musca domestica</i> | - |
| 5. | Dragonfly | <i>Agriansp</i> | - |
| 6. | Striped tiger | <i>Danaus plexippus</i> | Schedule IV |
| 7. | Grey pansy | <i>Junonia atlites</i> | LC |
| 8. | Common Tiger | <i>Danaus genutia</i> | LC |
| Reptiles | | | |
| 1. | Oriental garden lizard | <i>Calotes versicolor</i> | NL |
| 2. | Indian forest skink | <i>Sphenomorphus indicus</i> | NL |
| 3. | House lizards | <i>Hemidactylus flaviviridis</i> | Schedule IV |
| Mammals | | | |
| 1. | Indian Field Mouse | <i>Mus booduga</i> | Schedule IV |
| 2. | Asian Small Mongoose | <i>Herpestes javanicus</i> | Schedule (Part II) |
| 3. | Squirrel | <i>Funambulus palmarum</i> | Schedule IV |
| Aves | | | |
| 1. | Rose-ringed parakeet | <i>Psittacula krameri</i> | Schedule IV |
| 2. | Common myna | <i>Acridotheres tristis</i> | NL |
| 3. | Blue-rock pigeon | <i>Colombalivia</i> | Schedule IV |
| 4. | Yellow wagtail | <i>Motacilla flava</i> | Schedule IV |
| 5. | Pond heron | <i>Ardeolagravii</i> | Schedule IV |
| 6. | Asian koel | <i>Eudynamysscolopacea</i> | Schedule IV |
| 7. | Koel | <i>Eudynamys</i> | Schedule IV |
| 8. | Black drongo | <i>Dicrurus macrocercus</i> | Schedule IV |
| 9. | House crow | <i>Corvus splendens</i> | NL |

*NL- Not listed, LC- Least Concern (**Sources:** Species observation in the field study)

3.5.6.2. Fauna Composition in the Buffer Zone

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

There are no Sanctuaries, National Parks, Tiger Reserve or Biosphere reserves or Elephant Corridor or other protected areas within 10 km radius of from the core area. It is evident from the available records, reports, and circumstantial evidence that the entire study area including the core and buffer areas were free from any endangered animals. There were no resident birds other than common bird species such as Cattle egret, Asian Koel, House crow, Black drangos, Crows, Rose-ringed Parakeet etc.

The list of bird species recorded during the field survey and literature from the study area are given in Table 3.38 The list of reptilian species recorded during the field survey and literature from the study area is given in Table 3.41 The list of insect species recorded during the field survey and literature from the study area are given in Table 3.40. The list of Butterflies species recorded during the field survey and literature from the study area are given in Table 3.8. It is apparent from the list that none of the species either spotted or reported is included in Schedule I of the Wildlife Protection Act. Similarly, none of them comes under the REET category.

Taxonomically a total of 84 species recorded were from the buffer zone area. Based on habitat classification the majority of species were Insects 5, followed by birds 46, Reptiles 10, Mammals 5, Amphibians 7, and Butterflies 11. There are five Schedule II species, and 61 species are under Schedule IV according to the Indian Wildlife Act 1972. A total of 46 species of bird were sighted in the study area. There are no critically endangered, endangered, vulnerable, and endemic species were observed. There are no impacts on nearby fauna species.

Dominant species are mostly birds, butterflies, and insects, and seven amphibian was observed during the extensive field visit *Sphaerotheca breviceps*, *Euphlyctis hexadactylus*, *Bufo melanostictus*, etc. There is no Schedule I Species in the study area. There are no critically endangered, endangered, vulnerable, and endemic species were observed.

Table 3.37. List of Fauna & Their Conservation Status, Mammals: (*directly sighted animals & Secondary data)

| SI. No | Common Name | Scientific Name | Schedule list WLPA 1972 |
|--------|----------------------|----------------------------|-------------------------|
| 1. | Brown rat | <i>Rattus norvegicus</i> | Schedule IV |
| 2. | Indian palm squirrel | <i>Funambulus palmarum</i> | Schedule IV |
| 3. | Asian Small Mongoose | <i>Herpestes javanicus</i> | Schedule (Part II) |
| 4. | Indian hare | <i>Lepus nigricollis</i> | Schedule (Part II) |
| 5. | Indian Field Mouse | <i>Mus booduga</i> | Schedule IV |

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

Table 3.38 Listed birds

| SI. No | Common Name | Scientific Name | Schedule list WLP 1972 |
|--------|---------------------------|------------------------------|------------------------|
| 1. | Rose-ringed Parakeet | <i>Psittaculakrameria</i> | Schedule IV |
| 2. | Little grebe | <i>Tachybaptusruficollis</i> | Schedule IV |
| 3. | Large cormorant | <i>Phalacrocorax carbo</i> | Schedule IV |
| 4. | Jungle Myna | <i>Acridotheres fuscus</i> | Schedule IV |
| 5. | <i>Anthus campestris</i> | <i>Anthus campestris</i> | Schedule IV |
| 6. | Grey heron | <i>Ardeacineria</i> | Schedule IV |
| 7. | Cattle egret | <i>Bubulcus ibis</i> | Schedule IV |
| 8. | Indian roller | <i>Coracias benghalensis</i> | Schedule IV |
| 9. | Night heron | <i>Nicticoraxncticorax</i> | Schedule IV |
| 10. | Greater Coucal | <i>Centropus sinensis</i> | Schedule IV |
| 11. | <i>Cinnyris asiaticus</i> | <i>Cinnyris asiaticus</i> | Schedule IV |

| | | | |
|-----|---------------------------|-------------------------------|-------------|
| 12. | Yellowbrowed Bulbul | <i>Acritillas indica</i> | Schedule IV |
| 13. | Large egret | <i>Casmerodius albus</i> | Schedule IV |
| 14. | Coot | <i>Fulica atra</i> | Schedule IV |
| 15. | Red-necked halarope | <i>Phalaropus lobatus</i> | Schedule IV |
| 16. | Greater Flameback | <i>Chrysocolaptes lucidus</i> | Schedule IV |
| 17. | Tree Pipit | <i>Anthus trivialis</i> | Schedule IV |
| 18. | Common Iora | <i>Aegithina tiphia</i> | Schedule IV |
| 19. | Forest Wagtail | <i>Dendronanthus indicus</i> | Schedule IV |
| 20. | Yellow wagtail | <i>Motacilla flava</i> | Schedule IV |
| 21. | Spotted owlet | <i>Athene brama</i> | Schedule IV |
| 22. | House Sparrow | <i>Passer domesticus</i> | Schedule IV |
| 23. | Common HawkCuckoo | <i>Hieroccyx varius</i> | Schedule IV |
| 24. | White-eyed Buzzard | <i>Butastur teesa</i> | Schedule IV |
| 25. | Whitebellied Drongo | <i>Dicrurus caeruleus</i> | Schedule IV |
| 26. | Brown Shrike | <i>Lanius cristatus</i> | Schedule IV |
| 27. | Plain Prinia | <i>Prinia inornata</i> | Schedule IV |
| 28. | Thickbilled Warbler | <i>Iduna aedon</i> | Schedule IV |
| 29. | Spotted dove | <i>Streptopelia chinensis</i> | Schedule IV |
| 30. | Shikra | <i>Accipiter badius</i> | Schedule IV |
| 31. | Indian Swiftlet | <i>Aerodramus unicolor</i> | Schedule IV |
| 32. | Squaretailed Black Bulbul | <i>Hypsipetes ganeesa</i> | Schedule IV |
| 33. | Longtailed Shrike | <i>Lanius schach</i> | Schedule IV |
| 34. | Asian koel | <i>Eudynamis scolopacea</i> | Schedule IV |
| 35. | Small-blue kingfisher | <i>Alcedo atthis</i> | Schedule IV |
| 36. | White-breasted kingfisher | <i>Halcyon smyrnensis</i> | Schedule IV |
| 37. | Ashy Drongo | <i>Dicrurus leucophaeus</i> | Schedule IV |
| 38. | Common Flamback | <i>Dinopium javanensis</i> | Schedule IV |
| 39. | Blue-rock pigeon | <i>Colombalivia</i> | Schedule IV |
| 40. | Dicrurus aeneus | <i>Dicrurus aeneus</i> | Schedule IV |
| 41. | Golden-backed wood Pecker | <i>Dinopium benghalensis</i> | Schedule IV |
| 42. | House crow | <i>Corvus splendens</i> | Schedule IV |
| 43. | Jungle crow | <i>Corvus macrorhynchos</i> | Schedule IV |
| 44. | Robin | <i>Copsychus saularis</i> | Schedule IV |
| 45. | Pond heron | <i>Ardeola grayii</i> | Schedule IV |
| 46. | Orange-headed thrush | <i>Zoothera citrine</i> | Schedule IV |

Table 3.39 List of Reptiles either spotted or reported from the study area

| SI. No | Common Name | Scientific Name | Schedule list WLP 1972 |
|--------|-----------------------------|----------------------------------|---------------------------|
| 1. | Oriental garden lizard | <i>Calotes versicolor</i> | NL |
| 2. | Common krait | <i>Bungarus caeruleus</i> | Schedule IV |
| 3. | House lizards | <i>Hemidactylus flaviviridis</i> | Schedule IV |
| 4. | Indian cobra | <i>Naja naja</i> | Sch II (Part II) |
| 5. | Green vine snake | <i>Ahaetulla nasuta</i> | Schedule IV |
| 6. | Russell's viper | <i>Vipera russelli</i> | Sch II (Part II) |
| 7. | Rat snake | <i>Ptyas mucosa</i> | Sch IV (Part II) |
| 8. | Common skink | <i>Mabuya carinatus</i> | NL |
| 9. | Bornze Grass Skink | <i>Eutropis macularia</i> | Schedule IV |
| 10. | Keeled / Common Grass Skink | <i>Eutropis carinata</i> | Schedule IV |

Table.3.40. List of Butterflies reported from the study area

| SI. No | Common Name | Scientific Name | Schedule |
|--------|-----------------------|---------------------------------|----------|
| 1. | Crimson tip | <i>Colotisdanae</i> | - |
| 2. | Common Tiger | <i>Danaus genutia</i> | - |
| 3. | Milkweed butterfly | <i>Danainae</i> | - |
| 4. | Striped tiger | <i>Danaus plexippus</i> | - |
| 5. | Common emigrant | <i>Catopsiliapomona</i> | - |
| 6. | Common Indian crow | <i>Euploea core</i> | - |
| 7. | Indian palm bob | <i>Suastusgremius</i> | - |
| 8. | Common rose | <i>Pachlioptaaristolochiaee</i> | - |
| 9. | Great orange tip | <i>Hebomoiaaglaucippe</i> | - |
| 10. | Common jay | <i>Graphiumdoson</i> | - |
| 11. | Spotless grass yellow | <i>Euremalaeta</i> | - |

Table 3.41 List of insects either spotted or reported from the study area

| SI. No | Common Name | Scientific Name | Schedule list WLP 1972 |
|--------|------------------|-----------------------------|------------------------|
| 1. | Indian honey bee | <i>Apis cerana</i> | - |
| 2. | Termite | <i>Hamitermes silvestri</i> | NE |
| 3. | Grasshopper | <i>Hieroglyphus sp</i> | NL |
| 4. | Ant | <i>Camponotus Vicinus</i> | NL |
| 5. | Dragonfly | <i>Ceratogomphus pictus</i> | - |

3.5.7. Aquatic Ecology

The study area has few seasonal odai and canal away from the proposed project site. But no major drainage system can be found within the study area. No Aquatic diversity is noticed in the core zone area. Aquatic weeds are found to be growing everywhere in 10 km radius area, in every water bog, pond, etc. *Typha angustata* can be found growing all along the drains of villages, small water-logged depressions, and agricultural fields lacking water but containing enough moisture to support its growth. And where water is present, *Eichhornia crassipes* has taken its roots and covers the entire water surface by its sprawl and invasion.

3.5.7.1 Objectives of Aquatic Studies

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

3.9.2. Macrophytes

The macrophytes observed within the study area are tabulated in Table 3.10.

Table No.3.41 Description of Macrophytes

| S.No | Scientific Name | Common Name | Type |
|------|------------------------------|-----------------------|-------------------------------|
| 1. | <i>Eichhornia crassipes</i> | Common water hyacinth | Free floating hydrophytes |
| 2. | <i>Typha angustifolia</i> | Lesser Bulrush | Emergent hydrophytes |
| 3. | <i>Hydrilla verticillata</i> | Hydrilla | Submerged hydrophytes |
| 4. | <i>Pistia stratiotes</i> | Water lettuce | Free floating hydrophytes |
| 5. | <i>Cyperus articulates</i> | Jointed flatsedge | Emergent Hydrophytes |
| 6. | <i>Ipomea aquatica</i> | Water Morning Glory | Marshy amphibious hydrophytes |

3.5.8 Aquatic Faunal Diversity

Amphibian species like the common Pond frog, Skipper frog, Indian Pond Frog etc., were sighted near the water bodies located in the study area.

Table no. 3.42. Amphibians Observed/Recorded from the Study Area

| SI. No | Common Name | Scientific Name | Schedule list WLPC 1972 |
|--------|----------------------------|--------------------------------|-------------------------|
| 1. | Indian Burrowing frog | <i>Sphaerotheca breviceps</i> | Schedule IV |
| 2. | Green pond frog | <i>Euphlyctis hexadactylus</i> | Schedule IV |
| 3. | Common Indian Toad | <i>Bufo melanostictus</i> | Schedule IV |
| 4. | Indian bull Frog | <i>Hoplobatrachus tigerinu</i> | Schedule IV |
| 5. | Paddyfield / Cricket Frog | <i>Limnonectes limnocharis</i> | Schedule IV |
| 6. | Ornate Narrow-mouthed Frog | <i>Microhyla ornata</i> | Schedule IV |
| 7. | Southern Burrowing Frog | <i>Sphaerotheca rolandea</i> | Schedule IV |

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

3.5.9 Findings/Results

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

Records of threatened species in the area

No threatened species were observed

Endangered Species as per Wildlife (Protection) Act

No Endangered fauna was recorded in the project area.

Endemic Species of the Project areas

No endemic species were observed in the project area.

Migratory species of the Project areas

No migratory fauna observed in project area.

Migratory corridors and Flight paths

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

Breeding and spawning grounds

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

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

There are no National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar sites, Tiger/Elephant Reserves (existing as well as proposed) within 10 km of the mine lease area. There are no protected forests within the project area. Hence submission of clearance from the National Board of Wildlife does not arise.

There is no endangered, endemic and RET Species. There is no Schedule I species in study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] The proposed project is not going to have any direct or indirect adverse impact on the species mentioned above.

3.5.10 Conclusion

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

3.6 Socio Economic Environment

The major developmental activities in mining /Industrial sector are required for economic development as well as creation of employment opportunities (direct and indirect) and to meet the basic/modern needs of the society, which ultimately results in overall improvement of the quality of life through upliftment of social, economic, health, education and nutritional status in the project region, state as well as the country. In this manner all developmental projects have direct as well as indirect relationships with socioeconomic aspects, which also include public acceptability for new developmental projects. Thus, the study of socioeconomic component incorporating various facets related to prevailing social and cultural conditions and economic status of the Roughstone quarry project region is an important part of EIA study. The study of these parameters helps in identification, prediction and evaluation of the likely impacts on the socio economics and parameters of human interest due to the project.

3.6.1 Objectives of the Study

The objectives of the socio-economic impact assessment are as follows:

- a) To study the socio-economic status of the people living in the study area of the project.
- b) To identify the basic needs of the nearby villages within the study area.
- c) To assess the impact on socio-economic environment due to the project.
- d) To provide the employment and improved living standards.
- e) To study the socio-economic status of the people living in the study area Roughstone quarry project region
- f) To assess the impact on socio-economic environment due to Roughstone quarry project region
- g) To analysis of impact of socio economic and Environmental Infrastructure facilities and road accessibility.

3.6.2 Scope of Work

- To study the Socio-economic Environment of area from the secondary sources
- Developing a questionnaire for Survey
- Data Collection and Analysis
- Identification of impacts due to the mining projects
- Mitigation Measures

3.6.3 Methodology

The methodology adopted for the socio-economic impact assessment is as follows:

- a) The details of the activities and population structure have been obtained from Census 2001 and 2011 and analyzed.
- b) Based on the above data, impacts due to plant operation on the community have been assessed and recommendations for further improvement have been made.

3.6.4 Sources of Information and Data Base

To achieve the above objectives, the information has been collected from both primary and secondary sources. Both primary data and secondary data have been analyzed by means of suitable statistical techniques for the purpose of verifying the above selected hypotheses concerned with the surrounding area.

3.6.5 Primary Survey

The primary data collection includes the collection of data through a structured interview schedule by direct observation method. The questionnaire survey includes both open and closed methods. The sample size is limited respondents, who were selected on the basis of simple random sampling from Vadapudur Village, Kinathukadavu Taluk, Coimbatore District, Tamilnadu State. in the field survey has been divided into three major segments namely Primary Zone (0 - 3 km), Secondary Zone (3 - 7 km) and tertiary Zone (7 - 10 km).

The questionnaires were designed to suit the subjects considering their rural background enabling to furnish correct information and data as far as possible. Data were collected at village level and household level by questionnaires and focused group discussions.

The study area for the field survey has been divided into three major segments namely Primary Zone (0 - 3 km), Secondary Zone (3 - 7 km) and Outer Zone (7 - 10 km).

3.6.6 Collection of Data from Secondary Sources

Data from secondary sources were collected on following aspects:

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

Table 3.6.1 Type of Information and Sources

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

b) Data Presentation and Analysis

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

3.7 Background Information of the Area

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

The State can be divided broadly into two natural divisions (a) the Coastal plains of South India and (b) the hilly western area. Parallel to the coast and gradually rising from it is the broad strip of plain country. It can further be subdivided into coromandal plains comprising the districts of Viluppuram, Cuddalore and Vellore. The alluvial plains of the Cauvery delta extending over Thanjavur and part of Tiruchirapalli districts and dry southern plains in Madurai, Dindigul, Ramanathapuram, Sivaganga, Virudhunagar, Tirunelveli and Tuticorin districts. It extends a little beyond Western Ghats in Kanyakumari District. The Cauvery delta presents some extremely distinctive physical and human features, its power being a main factor in the remarkable growth, the towns of Tamilnadu have witnessed.

3.8 Geography of the Area

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

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

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

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

3.9 Population Growth Rate

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

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

3.10 Coimbatore District

Coimbatore is the third largest city of the state, one of the most industrialized cities in Tamil Nadu, known as the textile capital of South India or the Manchester of the South India, the city is situated on the banks of the river Noyyal, Coimbatore existed even prior to the 2nd or 3rd century AD by Karikalan, the first of the early Cholas. Among its other great rulers were Rashtrakutas, Chalukyas, Pandyas, Hoysalas and the Vijayanagara kings. When Kongunadu fell to the British along with the rest of the state, its name was changed to Coimbatore and it is by this name that it is known today, in local Tamil language it is also called as Kovai.

Coimbatore serves as an entry and exit point to neighboring Kerala State and the very popular hill station of Udhamandalam (Ooty) is 70 kms from Coimbatore. It is the disembarking point for those who want to take the

Mountain train that runs from Mettupalayam just 35 kms away from Coimbatore, regular bus services also available daily from Coimbatore to Ooty and other districts, towns and major cities.

Coimbatore lies at 11°1'6"N 76°58'21"E in south India at 427 metres above sea level on the banks of the Noyyal River, in northwestern Tamil Nadu.

3.11 Study Area

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

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

Table 3.12.1 Shows the socio-economic profile of the study area as compared to district, state and national level socio-economic profile

| Particular | India | Tamil Nadu | Coimbatore District | Study Area (10km Radius) |
|------------------------------------|--------------|------------|---------------------|--------------------------|
| Area (in sq. km.) | 3,287,263 | 130058 | 7649 | 326 |
| Population Density/ sq. Km. | 368 | 554 | 452 | 318 |
| No. of Households | 249454252 | 13357027 | 958035 | 29947 |
| Population | 1210569573 | 72147030 | 3458045 | 103581 |
| Male | 623121843 | 36137975 | 1729297 | 51291 |
| Female | 587447730 | 36009055 | 1728748 | 52290 |
| Scheduled Tribes | 104281034 | 794697 | 28342 | 1873 |
| Scheduled Castes | 201378086 | 14438445 | 535911 | 22934 |
| Literacy Rate (%) | 72.99 | 80 | 76 | 71 |
| Sex Ratio (Females per 1000 Males) | 943 | 996 | 1000 | 1019 |

Source: Census of India, 2011

Table no 3.12.1 show demographic pattern of India, Tamil Nadu, Coimbatore District & Study area (10km Radius). In India had total area of 3.2 sqkm, State of Tamil Nadu area was 130058 sqkm, District of Coimbatore area was 7649 sqkm and study area is about 326 sqkm. Population density is total population per sqkm. So, India population density was 368 sqkm, state of Tamil Nadu density was 554 sqkm, District had density about 452 sqkm and study area density is about 318 sqkm. As per Census 2011, about 5.96percent of population in the state lives in areas. Coimbatore had comparing state wise 4.79 percent of population lives in the district. In study area has 3 % around 10km radius. State, District and study area. In Tamil Nadu state SC categories people had about 19 %, district of Coimbatore about 15.49

% it has increasing to Study area about 22% increasing in the total population Similarly ST population is about 1.10%, 0.82% and 1.81% of the total population in the study area. State level Literacy rate is 80%, district level is 76% but study area has increased about 71%. There is literacy rate is study area Increase comparing district level decrease in the study area. Sex ratio female per thousand males about state level is 996, District level is 1000 and study area is 1019.

The study area has population density 318persons per sq.km of total population about 103581 as per census 2011. There were about 49.52 percent male and 50.48% female population. Study area has literate rate is about 71%. District had about 76% of literate rate as per census 2011.

3.13 Population Projection of the Study Area

A population projection is an estimation of the number of people expected to be alive at a future date that is made based on assumptions of population structure, fertility, mortality and migration. It is an essential to assess the need for new jobs, schools, doctors and nurses, planning urban housing, foods, clothing and requirements of energy and resources. It is also needed for policy discourse i.e., helps to the policy-makers to understand the existing problems and finally supports to develop the suitable solutions.

Table 3.13.1 Total Population of Study Area

| Sl No. | Population in 2001 | Population in 2011 |
|--------|--------------------|--------------------|
| 1 | 98404 | 103581 |

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

Table 3.13.2 Population Projection of Study Area

| S. No | Year | Projected Population (Approximately) |
|-------|------|--------------------------------------|
| 1. | 2021 | 108758 |
| 2. | 2031 | 113935 |
| 3. | 2041 | 119112 |
| 4. | 2051 | 124289 |

Source: Calculated by SPSS v23, 2022.

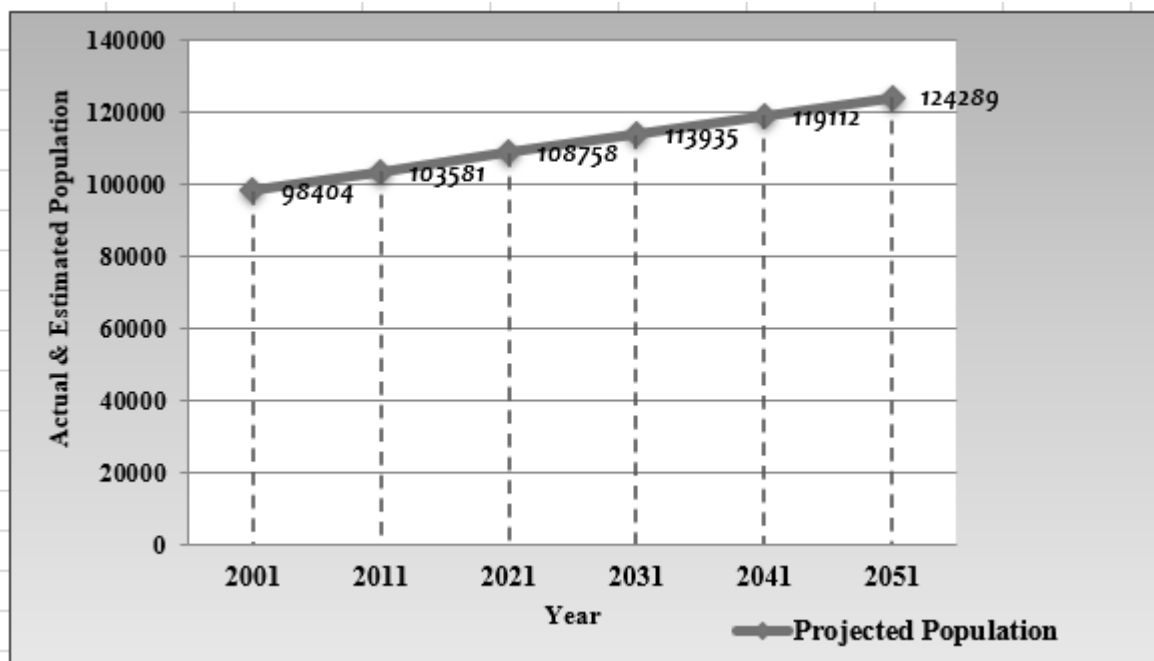


Fig 3.13.3 Graph Showing Population Projection

Following formula has been used for the projection of population.

$$Y=a+bt$$

Where: Y= Dependent variable (Population)

a=Intercept

b=Slope

t=Interdependent variables (Time)

Above formula is applied to project population for the years (2021, 2031, 2041, 2051). Due to avoid the errors in manual calculation the statistical software SPSS (demo version 23) is used to calculate the intercept and the slope.

Due to the shortage of data on population the results show same value of growth for the years (2021, 2031, 2041, 2051). If the researcher gets enough the data on population for earlier years the data projection will be accurate.

- Ref: Indian Economic survey, the SLR (Simple Linear Regression) techniques are used by statistical department, Government of India to project population.
- Source: <https://www.ibm.com/in-en/analytics/spss-statistics-software>

3.14 Population Growth of the Study Area

Table 3.14.1 Population Growth rate in Study area

| Year | Actual Population | Growth Rate % |
|------|-------------------|---------------|
| 2001 | 98404 | - |
| 2011 | 103581 | 10.53 |
| 2021 | 108758 | 10.50 |
| 2031 | 113935 | 10.48 |

| | | |
|------|--------|-------|
| 2041 | 119112 | 10.45 |
| 2051 | 124289 | 10.43 |

Source: Compiled by Author-2022

Above table no 3.14.1 is showing the growth rate of population since 2001, as per census in 2001 the population of study area was 98404 and 2011 it was 103581 if the population growth rate is 10.53%, it will approximately 108758 in year 2021 and 124289 in the year of 2051. It has approximately population growth rate decline will be 10.43%.

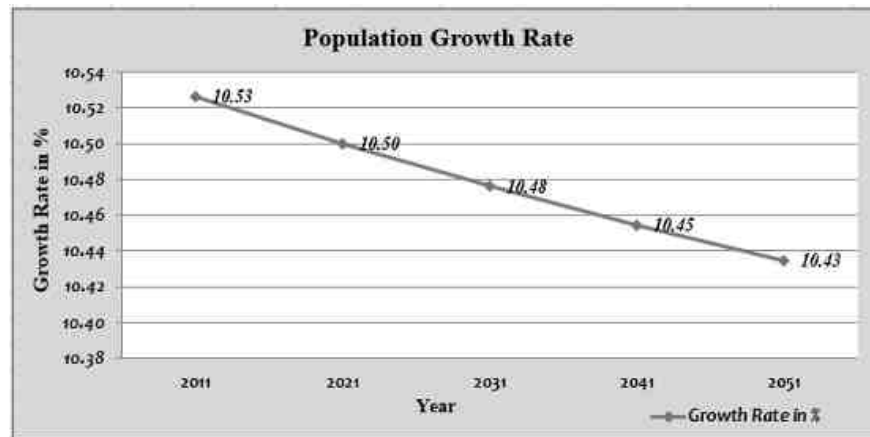


Fig.3.14.2 Graph Showing Population Growth Rate

Planning Analysis:

Calculating Growth Rates

The percent change from one period to another is calculated from the formula:

Where:

$$PR = \frac{(V_{Present} - V_{Past})}{V_{Past}} \times 100$$

PR=PercentRate

$V_{Present}$ =PresentorFutureValue

V_{Past} = Past or Present Value

The *annual* percentage growth rate is simply the percent growth divided by N, the number of years.

Source: <https://pages.uoregon.edu/rgp/PPPM613/class8a.htm>

3.15 Population Distribution and Composition of Study Area

The population as per 2011 Census records is 103581 (for 10 km radius buffer zone). Total no. of household is 5094, 10855 and 13998 respectively, in primary, secondary and tertiary zone. Sex ratio is 1022, 1012 and 1024 (females per 1000 males) observed in primary, secondary and tertiary zone respectively. SC population distribution is 2994,8678 and 11262 respectively in primary, secondary and tertiary zone. ST population distribution is 169,933,771 for primary, secondary and tertiary zone respectively. Average household size is 3. Zone wise Demographic profile of study area is given in the table 3.15.1 below:

Table 3.15.1 Zone wise Demographic Profile of Study Area

| Zone | No. of Villages | Total Household | Total Population | Male Population | % | Female Population | % |
|-----------------------------|-----------------|-----------------|------------------|-----------------|--------------|-------------------|--------------|
| Primary Zone (0 - 3 Km) | 5 | 5094 | 17993 | 8898 | 49.45 | 9095 | 50.55 |
| Secondary Zone (3 - 7 Km) | 13 | 10855 | 37266 | 18524 | 49.71 | 18742 | 50.29 |
| Tertiary Zone (7 - 10 km) | 13 | 13998 | 48322 | 23869 | 49.40 | 24453 | 50.60 |
| Study Area (0-10 km) | 31 | 29947 | 103581 | 51291 | 49.52 | 52290 | 50.48 |

Source: Census of India, 2011

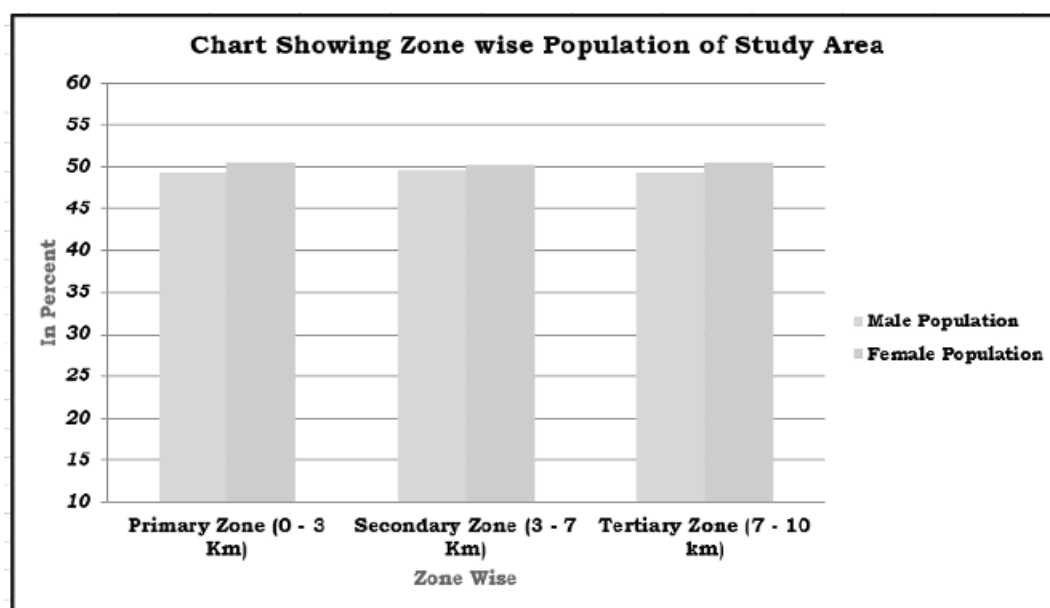


Figure 3.15.2 Population of study area

- ✓ Above table identifies the presence of villages and their subsequent population divided under three zones from plant boundary (i.e., Primary, secondary and tertiary zone)
- ✓ Primary zone has 5 villages where as much as 5094 households with 17993 population are located. Mostly lying on Built-up land for their livelihood and substance.
- ✓ Secondary and tertiary zone both comprise of 13 and 13 villages having a total population of 37266 and 48322 respectively.

3.16 Gender and Sex Ratio

Sex ratio is used to describe the number of females per 1000 of males. Sex ratio is a valuable source for finding the population of women in India and what is the ratio of women to that of men in India. In the Population Census of 2011, it was revealed that the population ratio in India 2011 is 940 females per 1000 of males. The study area has 1019 females per 1000 males. Gender and sex ratio determine the Human Development Index (HDI) of an area thereby understanding the status of women in that region. Census data suggests that the study area is composed of 49.52% of male and 50.48 % of female population. Following table entails information about sex ratio of 31 villages lying in study area (buffer zone) as primary, secondary and tertiary zone.

Table 3.16.1 Sex ratio of the study area

| S. No. | Buffer Zone | Sex Ratio of Study area Female/ 1000 Male |
|--------|-------------------------|--|
| 1 | Primary Zone (0-3 km) | 1022 |
| 2 | Secondary zone (3-7 km) | 1012 |
| 3 | Tertiary Zone (7-10 km) | 1024 |

Source: Census of India, 2011

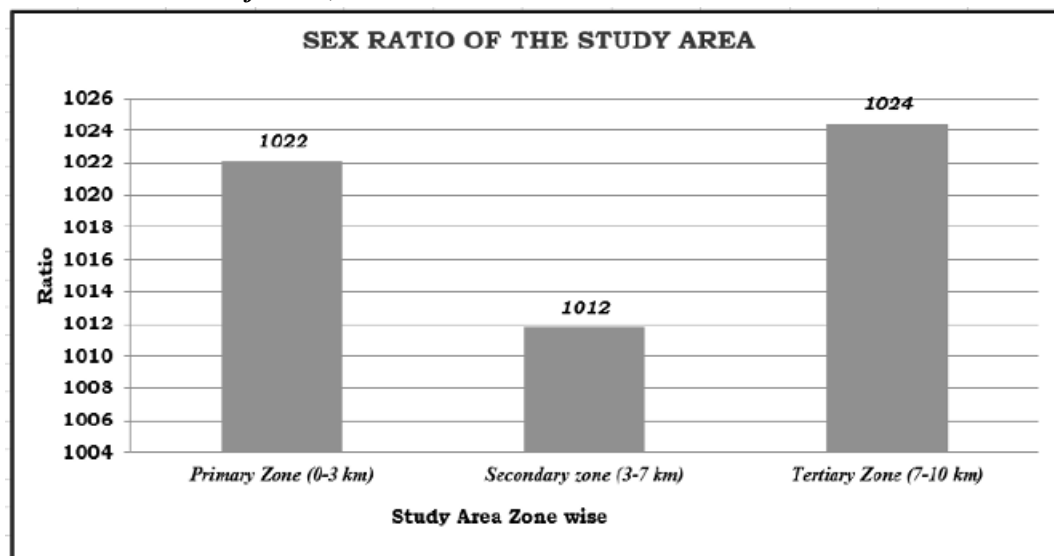


Figure 3.16.2 Sex Ratio within 10 Km study area

3.17 Literacy Rate in Study Area

Literacy Rate is the number of people in a place with the ability to read and write. The analysis of the literacy levels has been done in the study area. As per the 2011 Census of India, the male literacy rate, i.e., the percentage of literate males in the study area works out to be 78.35 %. Whereas the female literacy rate which is an important indicator for social change, is observed to be 60.42%. Female literacy rate in the region is coming out low as compared

to male. This indicates that there is a need to focus in sociological aspect in the region and enhance further development. The distribution of literates and literacy rates in the surveyed villages is given below: (Table no 3.17.1).

Table 3.17.1 Literacy Rate of the Study Area

| Zone | No. of Villages | Male Lite Population | Male literacy Rate | Female Literacy Population | Female literacy Rate | Total Literacy | Total Literacy Rate |
|----------------------------|-----------------|----------------------|--------------------|----------------------------|----------------------|----------------|---------------------|
| Primary Zone (0 - 3 Km) | 5 | 6842 | 84.49 | 5868 | 70.60 | 12710 | 77.45 |
| Secondary Zone (3 - 7 Km) | 13 | 13316 | 78.40 | 10837 | 62.80 | 24153 | 70.54 |
| Tertiary Zone (7 - 10 Km) | 13 | 17172 | 78.16 | 13877 | 61.51 | 31049 | 69.73 |
| Study Area (0-10km) | 31 | 37330 | 79.34 | 30582 | 63.54 | 67912 | 71.35 |

Source: Census of India, 2011

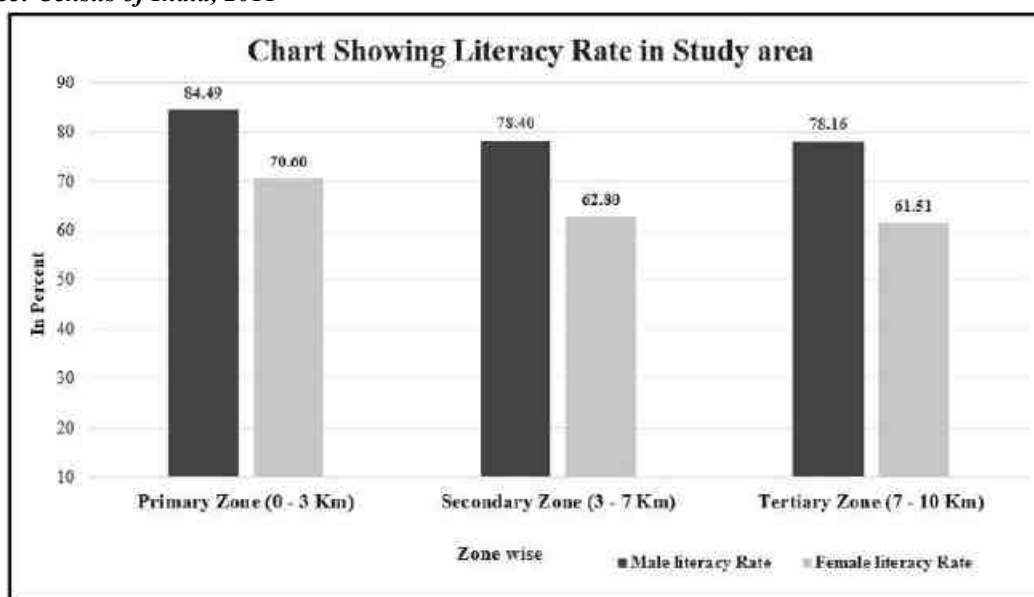


Figure 3.17.2 Gender wise Literacy Rate in the study area

3.18 Family Size

Size of family also describes about family functioning, resource consumption, total income generated and their expenditure pattern. Census 2011 data suggests that most of these households have a family size of up to 3 members, knowing the size of family also give fair understanding of relating how much resource consumption is being incurred, and annual income being generated and spent.

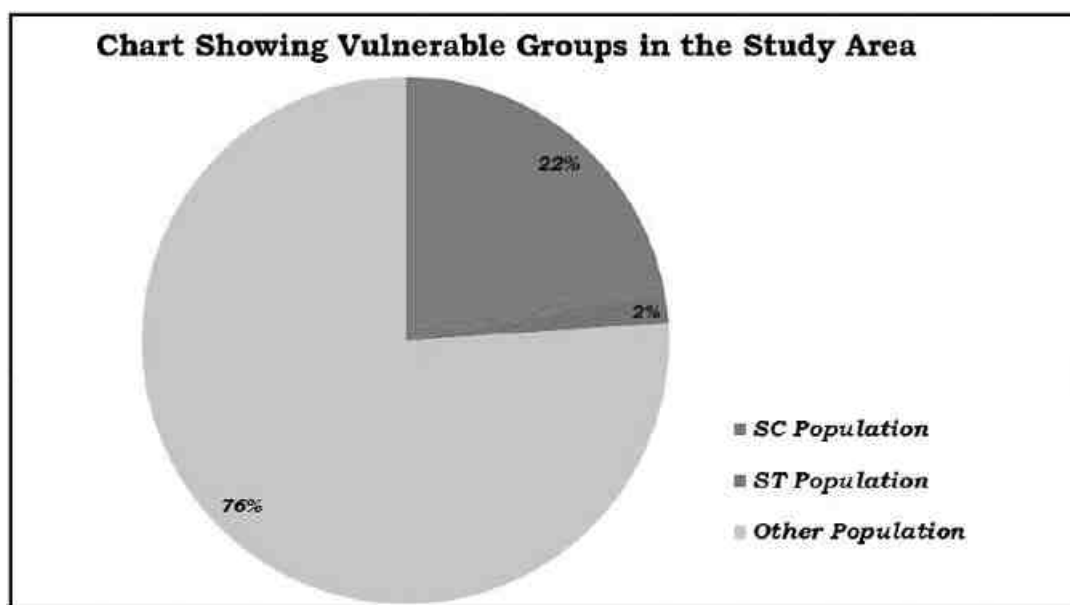
3.19 Vulnerable Group

While developing an action plan, it is very important to identify the population who fall under the marginalized and vulnerable groups and special attention has to be given towards these groups while making action plans. On the bases of data, it has been observed that the study area comprises of 41.82% Schedule Caste population and 1.60% of Schedule Tribe population. It is clearly show in below table that ST population is dominant than SC Population in the study area.

Table 3.19.1 vulnerable groups of the study area

| Zone | No. of Villages | Vulnerable Groups | | | | | |
|---------------------------|-----------------|-------------------|-------|---------------|------|------------------|-------|
| | | SC Population | % | ST Population | % | Other Population | % |
| Primary Zone (0 - 3 Km) | 5 | 2994 | 16.64 | 169 | 0.94 | 14830 | 82.42 |
| Secondary Zone (3 - 7 Km) | 13 | 8678 | 23.29 | 933 | 2.50 | 27655 | 74.21 |
| Tertiary Zone (7 - 10 Km) | 13 | 11262 | 23.31 | 771 | 1.60 | 36289 | 75.10 |
| Study Area (0-10km) | 31 | 22934 | 22.14 | 1873 | 1.81 | 78774 | 76.05 |

Source: Census of India, 2011

**Figure 3.19.2 vulnerable groups**

3.20 Economic Activities

The economy of an area is defined by the occupational pattern and income level of the people in the area. The occupational structure of residents in the study area is studied with reference to work category. The population is divided occupation wise into three categories, viz., main workers, marginal workers and non-workers. The workers include cultivators, agricultural laborers, those engaged in household industry and other services.

The marginal workers are those workers engaged in some work for a period of less than 180 days during the reference year. The non-workers include those engaged in unpaid household duties, students, retired persons, dependents, beggars, vagrants etc. besides institutional inmates or all other non-workers who do not fall under the above categories.

Table 3.20.1 shows the work force of the study area

| Zone | No. of Villages | Total Workers | % | Main Workers | % | Marginal Workers | % | Non-Workers | % |
|---------------------------|-----------------|---------------|-------|--------------|-------|------------------|------|-------------|-------|
| Primary Zone (0 - 3 Km) | 5 | 9185 | 51.05 | 8423 | 46.81 | 762 | 4.23 | 8808 | 48.95 |
| Secondary Zone (3 - 7 Km) | 13 | 20886 | 56.05 | 18786 | 50.41 | 2100 | 5.64 | 16380 | 43.95 |

| | | | | | | | | | |
|----------------------------|-----------|--------------|--------------|--------------|--------------|-------------|-------------|--------------|--------------|
| Tertiary Zone (7 - 10 Km) | 13 | 28086 | 58.12 | 25387 | 52.54 | 2699 | 5.59 | 20236 | 41.88 |
| Study Area (10 Km) | 31 | 58157 | 56.15 | 52596 | 50.78 | 5561 | 5.37 | 45424 | 43.85 |

Source: Census of India, 2011

The above table shows that out of the total working population, the percentage of main workers is 56.15 % while 5.37% are marginal workers. Number of working populations is 56.15% and non-working population is 43.85% in the study area. As per the data obtained from the survey (as mentioned previously in occupational structure) most of these people are employed for major period of the year. Also, to mention the natural environment also restricts the people in finding stable business is performed for only certain months. Thus, proposed project will act as possible exposure for them to get enroll and earn sustain livelihood.

As per the villages analysis most of them are non-working population. A major portion of working age people is not ideal worker because of limited sectors in which they are engaged with less training and not awareness of latest sectors in which maybe they can better other than traditional work.

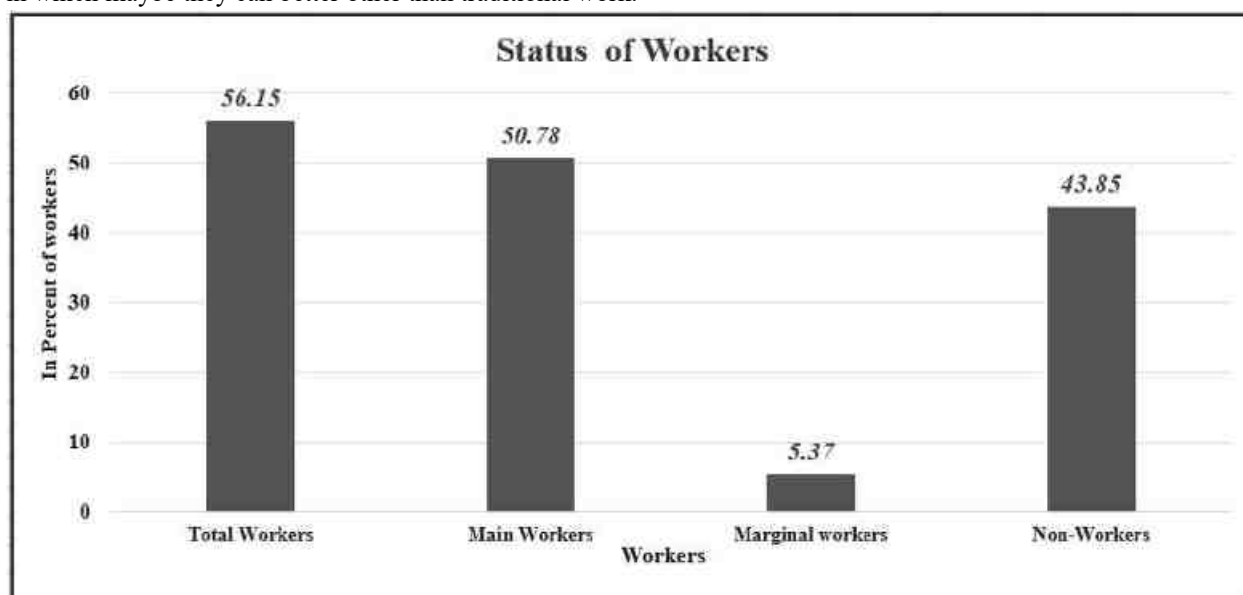


Figure 3.20.2. Working population in the study area

3.21 Basic Amenities

A better network of physical infrastructure facilities (well-built roads, rail links, irrigation, power and telecommunication, information technology, market-network and social infrastructure support, viz. health and education, water and sanitation, veterinary services and co-operatives) is essential for the development of the rural economy. A review of infrastructure facilities available in the area has been done based on the information from baseline survey of the study area. In this review, the villages which fall within 10Km radius round the site has been considered. Infrastructure facilities available in the area have been described in the subsequent sections as below:

1. Educational Facilities

Education is considered to be one of the most dominant indicators towards the development of a region. According to baseline survey, education facilities are available in the villages within the study area. All the villages have schools only up to primary and middle level, higher level education facilities very less only one-degree college available in Kinathukadavu Taluk. Improved educational facilities will be provided by CCIL, which will contribute Improvement in awareness level of the villagers.

2. Health Facilities

Medical facilities are available. There are majorly non-Government medical facilities/medicine shop available in the area. There is only one dispensary / health center available and no Primary Health Sub-Centers available in the study area. There is no such case of epidemic or some special diseases in the region. Normal cases of diseases i.e. Cough, cold, fever, headache etc. are reported in the region.

3. Other Infrastructure Facilities

Basic facilities are available in study area as educational facilities, health, transportation, electricity, drinking water, market, bank, post office, petrol pump; Aanganbadi Centers, Community Hall, Cooperative bank and Commercial Bank etc. are available.

➤ Transport Facilities

The study area is served by road transport. Most of the villages connected by bus/other transport services. The area has a moderate road network, which includes state highway, major District Roads and other roads within 10 km radius of the lease boundary. Major District Road is passing through the adjacent of Quarry area.

➤ Electrification in the Area

100% villages in the study area are electrified. Electricity is available for domestic, commercial, industrial agricultural and public lighting purposes.

➤ Drinking Water Facility

Village people are availing Drinking water facilities generally from Tap water, Pond, Well, Tube well, Hand Pump, River etc. In few villages like Muthur, Vadakkipalayam, Sigadpudur Villages, etc. there is problem of drinking water facility.

3.22 Interpretation

Based on the data, following inferences could be drawn:

- Total literacy rate in the study area is 71%.
- The study area had average educational facilities. The overall status depicts that the education is limited to primary and middle level.
- The schedule tribe community forms 1.81% and Scheduled Caste forms 22% of the total population of study area.
- The Other Population forms 76% of the total population of study area.
- The study area is well connected by District/Village Road.
- The study area not well health facilities of primary level.
- Considering the above facts, the proposed project will boost the socio-economic development activities in the area and hence will leave positive impact.
- The study area has mobile connectivity

3.23 Recommendations and Suggestion

- ❖ Education Awareness program is being/will be conducted to make the population aware and better treatment for livelihood.
- ❖ Vocational training session is being/will be organized to provide self-employment to the women and unemployment youth.
- ❖ Healthcare Centre and Ambulance facility is being/will be provided to make the population get easy medical facilities.
- ❖ Natural Resource Management and Environmental Conservation.
- ❖ On the basis of qualification and skills local youths is being/will be employed. Long term and short-term employments is being/will be generated.
- ❖ Health care center and ambulance facility is being/will be provided to make the population get easy medical facilities.

- ❖ Basic amenities and facilities are being/will be made available to the people and there will be proper maintenance of the facilities already provided by the government in the study area through various CSR activities conducted by Proposal proponent.

3.24 CONCLUSION

To evaluate the impacts of proposed rough stone quarry project on the surrounding area, it is vital to assess the baseline status of the environmental quality in the locality of the site. Socio-Economic Survey was also conducted during the study period which revealed that area further require improvement in the Economy and Infrastructure Development of the area. Hence it can be concluded that the present baseline environment status of the study area will not be affected by the proposed project as **Tmt.K.Sangeetha Rough stone quarry** will adopt adequate control measures to protect the surrounding environment and will contribute in development of the study areas.

The proposed project will aim to provide preferential employment to the local people there by improving the employment opportunity in the area and in turn the social standards will improve.

CHAPTER – 4: ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

4.0 General

The environmental impact can be categorized as either primary or secondary, primary impacts which are attributed directly by the project; secondary impacts are those which are indirectly induced. The open cast mining operations involve development of benches, Approach Road, Haul Road, Excavation and handling of material. If adequate control measures are not taken to prevent/mitigate the adverse environmental impacts/lead to damage of the eco-system.

In order to maintain the environmental commensuration with the mining operation, it is essential to undertake studies on the existing environmental scenario and assess the impact on different environmental components. This would help in formulating suitable management plans for sustainable resource extraction. Based on the baseline environmental status at the existing mine site, the environmental factors that are likely to be affected (Impacts) are identified, quantified and assessed. The various anticipated impacts will be on

- Land environment
- Water Environment
- Air Environment
- Noise Environment
- Socio economic environment
- Solid waste
- Soil environment

4.1 Land Environment

4.1.2 Anticipated Impact from all Proposed Projects

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

4.1.2.1 Common Mitigation Measures for Respective Individual Proposed Projects

- The mining activity will be gradual confined in blocks and excavation will be undertaken progressively along with other mitigative measures like phase wise development of greenbelt etc.,
- Construction of garland drains all around the quarry pits and construction of check dam at strategic location in lower elevations to prevent erosion due to surface runoff during rainfall and also to collect the storm water for various uses within the proposed area.
- Green belt development along the boundary within safety zone. The small quantity of water stored in the mined-out pit will be used for greenbelt.
- Thick plantation will be carried out on unutilized area, top benches of mined out pits, on safety barrier, etc.,
- At conceptual stage, the land use pattern of the quarry will be changed into Greenbelt area and temporary reservoir
- In terms of aesthetics, natural vegetation surrounding the quarry will be retained (such as in a buffer area i.e., 7.5 m safety barrier and other safety provided) so as to help minimise dust emissions.
- Proper fencing will be carried out at the conceptual stage, Security will be posted round the clock, to prevent inherent entry of the public and cattle

4.1.3 Soil Environment

4.1.4 Impact on Soil Environment

The top layer of the project site in the form of Gravel formation, the Gravel will be directly loaded into tippers for the filling and levelling of low-lying areas. There is no disposal of Gravel. The excavated rough stone will be directly loaded into dumpers to the needy customers.

There will be no disposal of waste water from the quarry operation, No discharge of toxic effluent from the proposed projects. The dust emission at working face and haul roads will be controlled by water sprinkling and plantation.

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

4.1.5 Common Mitigation Measures for Respective Individual Proposed Projects

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

4.1.6 Waste Dump Management

There are no wastages anticipated in this rough stone quarrying operation. The entire quarried out materials will be utilized (100%).

The overburden in the form of gravel formation will be also sold to needy customers for the filling and levelling of low-lying areas.

4.2 *Water Environment*

4.2.1 Anticipated Impact on Surface and ground water

The impact due to quarrying on the water quality is expected to be insignificant because of no use of chemicals or hazardous substances during quarrying process. The quarrying activity will not intersect ground water table as the maximum depth of the quarry is 41m and water table is found at a depth of 73-68m BGL.

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

TABLE 4.1: WATER REQUIREMENT

| PROPOSAL – P1 | | |
|-----------------------------|-----------------|---|
| *Purpose | Quantity | Source |
| Domestic & Drinking purpose | 0.8KLD | From Existing, bore wells and drinking water will be sourced from Approved Water vendors. |
| Dust Suppression | 1.5KLD | From Existing bore wells from nearby area |
| Green Belt | 1.0KLD | From Existing bore wells from nearby area |
| Total | 3.3 KLD | |

* Water for drinking purpose will be brought from approved water vendors

Source: Approved Mining Plan Pre-Feasibility Report

Total water requirement is about 3.3 KLD, the water for dust suppression and greenbelt development will be sourced from the mine pit water collected during rainy seasons, the water for domestic purpose and drinking will be sourced from the approved water vendors.

4.2.2 Common Mitigation measures:

- Garland drain, settling tank will be constructed along the proposed mining lease area. The Garland drain will be connected to settling tank and sediments will be trapped in the settling traps and only clear water will be discharged out to the natural drainage
- Rainwater will be collected in sump in the mining pits and will be allowed to store and pumped out to surface setting tank of 15 m x 10m x 3m to remove suspended solids if any. This collected water will be judiciously used for dust suppression and such sites where dust likely to be generated and for developing green belt. The proponent will collect and judiciously utilize the rainwater as part of rainwater harvesting system.
- Providing benches with inner slopes and through a system of drains and channels, allowing rain water to descent into surrounding drains, so as to minimize the effects of erosion & water logging arising out of uncontrolled descent of water.
- Reuse the water collected during storm for dust suppression and greenbelt development within the mines
- Installing interceptor traps/oil separators to remove oils and greases. Water from the tipper wash-down facility and machinery maintenance yard will pass through interceptor traps/oil separators prior to its reuse;
- Using flocculating or coagulating agents to assist in the settling of suspended solids during monsoon seasons;
- Periodic (every 6 month once) analysis of quarry pit water and ground water quality in nearby villages.
- Domestic sewage from site office & urinals/latrines provided in ML is discharged in septic tank followed by soak pits.
- Waste water discharge from mine will be treated in settling tanks before using for dust suppression and tree plantation purposes.
- De-silting will be carried out before and immediately after the monsoon season.
- Regular monitoring (every 6 month once) and analysing the quality of water in open well, bore wells and surface water

4.3 Air Environment

The air borne particulate matter is the main air pollutant in this opencast mining. The mining operation will be carried out by jackhammer drilling (35mm dia) and Hydraulic Excavators will be utilized for excavation of Rough Stone waste.

4.3.1. Anticipated

Impact

- During mining, at various stages activities such as excavation, drilling, blasting, and transportation of materials, particular matter (PM), gases such as Sulphur dioxide, oxides of Nitrogen from vehicular exhaust are the main air pollutants.
- Emissions of noxious gases due to incomplete detonation of explosive may sometimes pollute the air.

- The fugitive dust released from the mining operations may cause effect on the mine workers who are directly exposed to the fugitive dust.
- Simultaneously, the air-borne dust may travel to longer distances and settle in the villages located near the mine lease area.

4.3.1.1. Modelling of Incremental Concentration from all Proposed Projects

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

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

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

The impact on Air Environment is due to the mining and allied activities during Land Development phase, Mining process and Transportation. The emissions of Sulphur dioxide (SO₂), Oxides of Nitrogen (NOx) due to excavation/loading equipment and vehicles plying on haul roads are marginal. Loading - unloading and transportation of Rough Stone, wind erosion of the exposed area and movement of light vehicles will be the main polluting source in the mining activities releasing Particulate Matter (PM₁₀) affecting Ambient Air of the area. Prediction of impacts on air environment has been carried out taking into consideration cumulative production three proposed quarries. Air environment and net increase in emissions by Open pit source modelling in AERMOD Software.

4.3.1.2 Emission Estimation

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

The general equation for emissions estimation is:

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

Where:

E = emissions;

A = activity rate;

EF = emission factor, and

ER = overall emission reduction efficiency, %

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

TABLE 4.2: ESTIMATED EMISSION RATE OF LEASE AREA

| EMISSION ESTIMATION FOR QUARRY "P1"- Tmt.K.Sangeetha, | | | | |
|---|-----------------|--------------|-------------|-------|
| | Activity | Source type | Value | Unit |
| Estimated Emission Rate for PM ₁₀ | Drilling | Point Source | 0.083649640 | g/s |
| | Blasting | Point Source | 0.000990683 | g/s |
| | Mineral Loading | Point Source | 0.041366904 | g/s |
| | Haul Road | Line Source | 0.002489834 | g/s/m |
| | | | | |

| | | | | |
|---|--------------|-------------|-------------|-----|
| | Overall Mine | Area Source | 0.055330281 | g/s |
| Estimated Emission Rate for SO ₂ | Overall Mine | Area Source | 0.000546691 | g/s |
| Estimated Emission Rate for NO _x | Overall Mine | Area Source | 0.000028788 | g/s |

4.3.2 Frame work of Computation & Model details

The prediction included the impact of Excavation, Drilling, Blasting, loading and movement of vehicles during transportation and meteorological parameters such as wind speed, wind direction, temperature, rainfall, humidity and Cloud cover.

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

Air Pollution Dispersion Modelling

Baseline Air Quality –

Baseline air quality has been measured at 1 locations Core and 6 locations within the buffer zone of the study area. The 24 - hourly average samples of particulate matters (PM₁₀ and PM_{2.5}), SO₂ and NO_x were measured following the National Ambient Air Quality Standards (NAAQS), 2009. Monitoring data of 8 sampling stations are given below –

Meteorological Data –

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

A temporary meteorological station was installed at project site and monitored continually for study period without break. The station was installed at a height of 4 m above the ground level in such a way that there are no obstructions facilitating flow of wind, wind speed, wind direction, humidity and temperature are recorded on hourly basis. A weather data was collected from IMD, Coimbatore agro for the month of Dec2022 – Feb 2023 to correlate with site data and found not much of change in the parameters.

FIGURE 4.1: AERMOD TERRAIN MAP

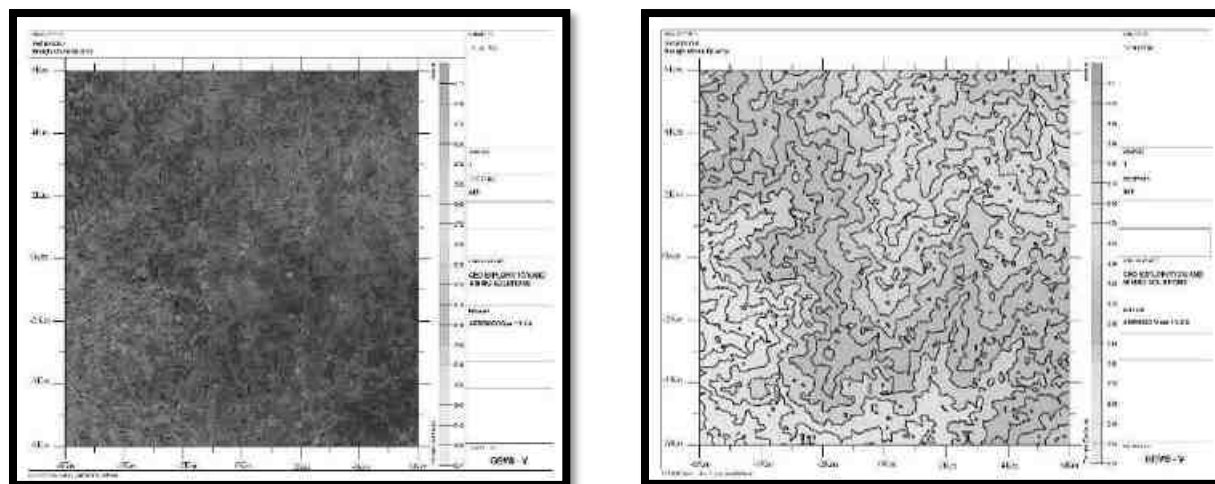


FIGURE 4.2: PREDICTED INCREMENTAL CONCENTRATION OF PM₁₀

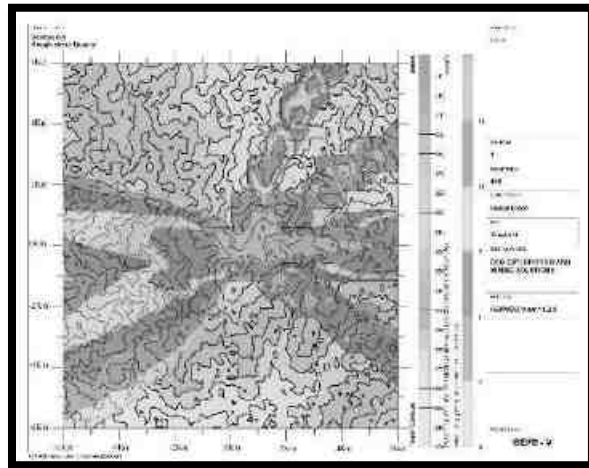
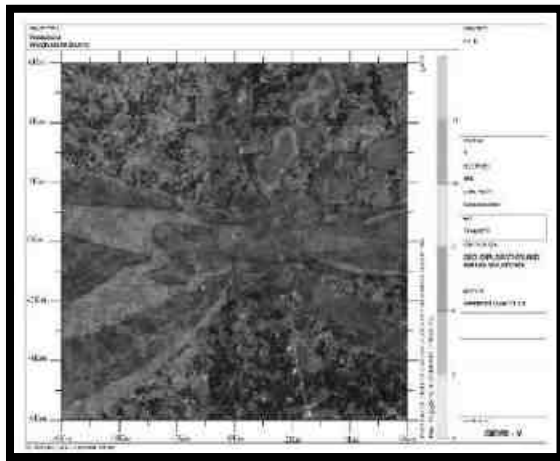


FIGURE 4.3: PREDICTED INCREMENTAL CONCENTRATION OF PM₂₅

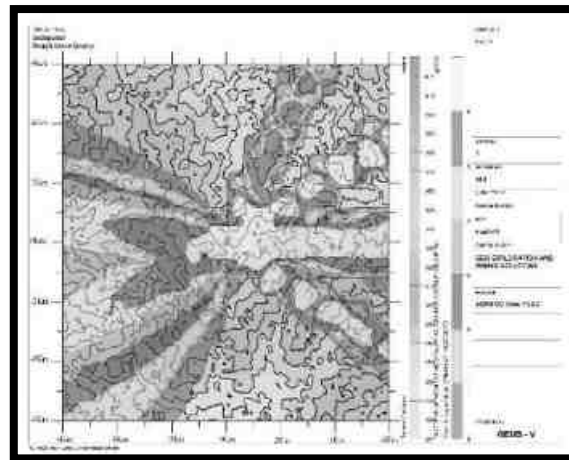
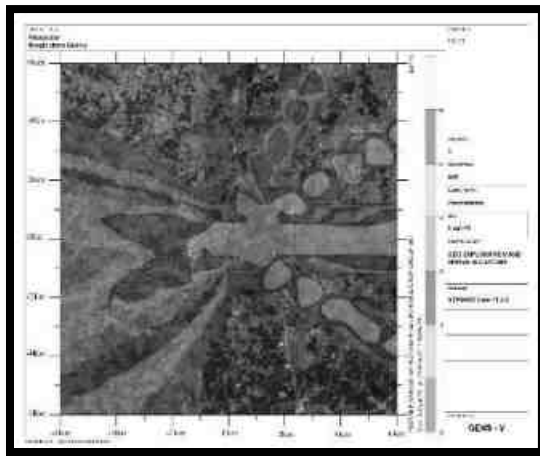


FIGURE 4.4: PREDICTED INCREMENTAL CONCENTRATION OF SO₂

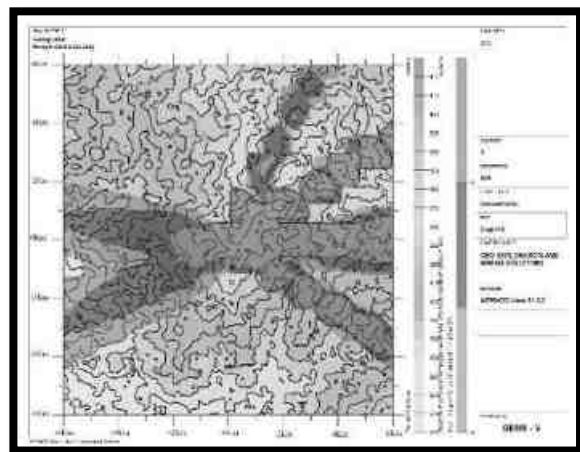
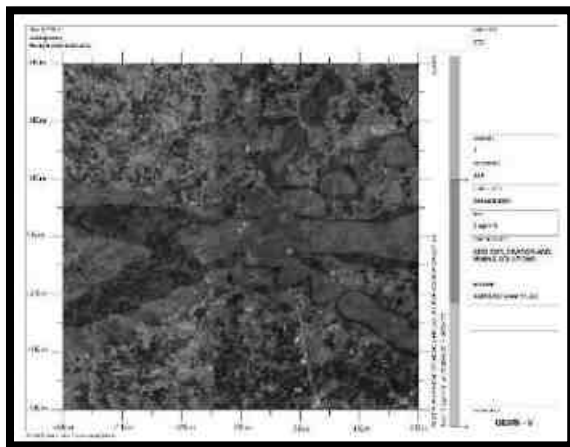
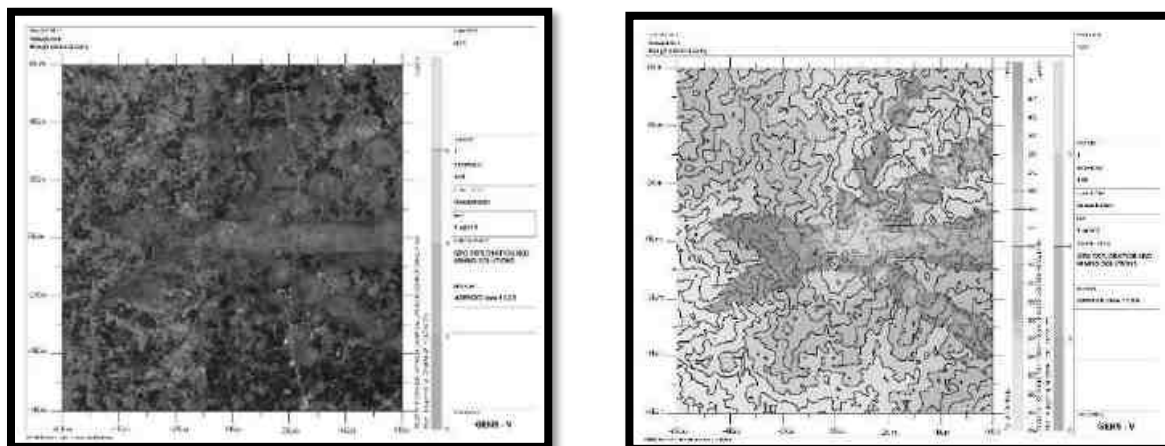
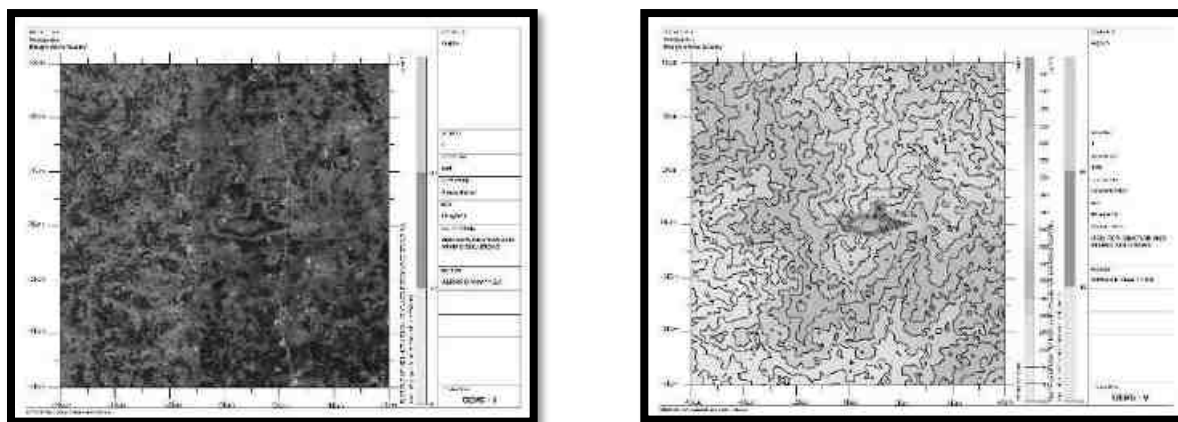


FIGURE 4.5: PREDICTED INCREMENTAL CONCENTRATION OF NO_x**FIGURE 4.6: PREDICTED INCREMENTAL CONCENTRATION OF FUGITIVE DUST**

4.3.2.1 Model Results

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

TABLE 4.3: INCREMENTAL & RESULTANT GLC OF PM₁₀

| Station Code | Location | X Coordinate (m) | Y Coordinate (m) | Average Baseline PM ₁₀ (µg/m ³) | Incremental value of PM ₁₀ due to mining (µg/m ³) | Total PM ₁₀ (µg/m ³) (5+6) |
|--------------|-----------------------------|------------------|------------------|--|--|---|
| AAQ1 | 10°48'37.09"N 76°59'48.31"E | -6 | -58 | 33.6 | 13.89 | 47.5 |
| AAQ2 | 10°48'44.18"N 76°59'53.43"E | 153 | 163 | 37.3 | 13.20 | 50.5 |
| AAQ3 | 10°47'40.98"N 76°59'13.20"E | -1076 | -1795 | 42.7 | 5.80 | 48.5 |
| AAQ4 | 10°46'46.86"N 76°58'16.81"E | -2804 | -3464 | 44.5 | 3.31 | 47.8 |
| AAQ5 | 10°48'13.73"N 77° 0'42.20"E | 1641 | -780 | 45.1 | 12.10 | 57.2 |
| AAQ6 | 10°47'41.29"N 77° 1'40.88"E | 3439 | -1778 | 45.1 | 9.00 | 54.1 |
| AAQ7 | 10°49'48.96"N 77° 0'43.74"E | 1692 | 2159 | 43.1 | 0.34 | 43.4 |
| AAQ8 | 10°50'9.59"N 76°58'56.34"E | -1597 | 2797 | 44.1 | 0 | 44.1 |

TABLE 4.4: INCREMENTAL & RESULTANT GLC OF PM_{2.5}

| Station Code | Location | X Coordinate (m) | Y Coordinate (m) | Average Baseline PM _{2.5} (µg/m ³) | Incremental value of PM _{2.5} due to mining (µg/m ³) | Total PM _{2.5} (µg/m ³) (5+6) |
|--------------|-----------------------------|------------------|------------------|---|---|--|
| AAQ1 | 10°48'37.09"N 76°59'48.31"E | -6 | -58 | 23.7 | 6.87 | 30.5 |
| AAQ2 | 10°48'44.18"N 76°59'53.43"E | 153 | 163 | 26.3 | 6.41 | 32.7 |
| AAQ3 | 10°47'40.98"N 76°59'13.20"E | -1076 | -1795 | 24.3 | 3.65 | 27.9 |
| AAQ4 | 10°46'46.86"N 76°58'16.81"E | -2804 | -3464 | 25.4 | 2.49 | 27.9 |
| AAQ5 | 10°48'13.73"N 77° 0'42.20"E | 1641 | -780 | 45.1 | 5.53 | 50.6 |
| AAQ6 | 10°47'41.29"N 77° 1'40.88"E | 3439 | -1778 | 45.1 | 4.66 | 49.7 |
| AAQ7 | 10°49'48.96"N 77° 0'43.74"E | 1692 | 2159 | 24.3 | 1.70 | 26.0 |
| AAQ8 | 10°50'9.59"N 76°58'56.34"E | -1597 | 2797 | 25.5 | 0 | 25.5 |

TABLE 4.5: INCREMENTAL & RESULTANT GLC OF SO₂

| Station Code | Location | X Coordinate (m) | Y Coordinate (m) | Average Baseline SO ₂ (µg/m ³) | Incremental value of SO ₂ due to mining (µg/m ³) | Total SO ₂ (µg/m ³) (5+6) |
|--------------|-----------------------------|------------------|------------------|---|---|--|
| AAQ1 | 10°48'37.09"N 76°59'48.31"E | -6 | -58 | 6.8 | 2.49 | 9.3 |
| AAQ2 | 10°48'44.18"N 76°59'53.43"E | 153 | 163 | 6.3 | 2.25 | 8.6 |
| AAQ3 | 10°47'40.98"N 76°59'13.20"E | -1076 | -1795 | 6.1 | 0.30 | 6.4 |
| AAQ4 | 10°46'46.86"N 76°58'16.81"E | -2804 | -3464 | 6.4 | 0 | 6.4 |
| AAQ5 | 10°48'13.73"N 77° 0'42.20"E | 1641 | -780 | 7.1 | 2.00 | 9.1 |
| AAQ6 | 10°47'41.29"N 77° 1'40.88"E | 3439 | -1778 | 6.9 | 1.62 | 8.5 |
| AAQ7 | 10°49'48.96"N 77° 0'43.74"E | 1692 | 2159 | 6.8 | 0 | 6.8 |
| AAQ8 | 10°50'9.59"N 76°58'56.34"E | -1597 | 2797 | 6.3 | 0 | 6.3 |

TABLE 4.6: INCREMENTAL & RESULTANT GLC OF NO_x

| Station Code | Location | X Coordinate (m) | Y Coordinate (m) | Average Baseline NO _x (µg/m ³) | Incremental value of NO _x due to mining (µg/m ³) | Total NO _x (µg/m ³) (5+6) |
|--------------|-----------------------------|------------------|------------------|---|---|--|
| AAQ1 | 10°48'37.09"N 76°59'48.31"E | -6 | -58 | 22.4 | 9.76 | 32.1 |
| AAQ2 | 10°48'44.18"N 76°59'53.43"E | 153 | 163 | 22.9 | 9.14 | 32.0 |
| AAQ3 | 10°47'40.98"N 76°59'13.20"E | -1076 | -1795 | 21.9 | 0 | 21.9 |
| AAQ4 | 10°46'46.86"N 76°58'16.81"E | -2804 | -3464 | 22.1 | 0 | 22.1 |
| AAQ5 | 10°48'13.73"N 77° 0'42.20"E | 1641 | -780 | 18.8 | 5.23 | 24.0 |
| AAQ6 | 10°47'41.29"N 77° 1'40.88"E | 3439 | -1778 | 19.2 | 0.46 | 19.7 |
| AAQ7 | 10°49'48.96"N 77° 0'43.74"E | 1692 | 2159 | 18.8 | 0 | 18.8 |
| AAQ8 | 10°50'9.59"N 76°58'56.34"E | -1597 | 2797 | 22.6 | 0 | 22.6 |

TABLE 4.7: INCREMENTAL & RESULTANT GLC OF FUGITIVE DUST

| Station Code | Location | X Coordinate (m) | Y Coordinate (m) | Average Baseline Fugitive ($\mu\text{g}/\text{m}^3$) | Incremental value of Fugitive due to mining ($\mu\text{g}/\text{m}^3$) | Total Fugitive ($\mu\text{g}/\text{m}^3$) (5+6) |
|--------------|-----------------------------|------------------|------------------|--|--|---|
| AAQ1 | 10°48'37.09"N 76°59'48.31"E | -6 | -58 | 57.29 | 85 | 142.3 |
| AAQ2 | 10°48'44.18"N 76°59'53.43"E | 153 | 163 | 63.40 | 60 | 123.4 |
| AAQ3 | 10°47'40.98"N 76°59'13.20"E | -1076 | -1795 | 63.15 | 0 | 63.2 |
| AAQ4 | 10°46'46.86"N 76°58'16.81"E | -2804 | -3464 | 65.87 | 0 | 65.9 |
| AAQ5 | 10°48'13.73"N 77° 0'42.20"E | 1641 | -70 | 63.83 | 0 | 63.8 |
| AAQ6 | 10°47'41.29"N 77° 1'40.88"E | 3439 | -1778 | 63.26 | 0 | 63.3 |
| AAQ7 | 10°49'48.96"N 77° 0'43.74"E | 1692 | 2159 | 64.97 | 0 | 65.0 |
| AAQ8 | 10°50'9.59"N 76°58'56.34"E | -1597 | 2797 | 66.02 | 0 | 66.0 |

From the resultant of cumulative concentration i.e., Background + Incremental Concentration of pollutant in all the receptor locations without effective mitigation measures are still within the prescribed NAAQ limits of 100, 80 & 80 $\mu\text{g}/\text{m}^3$ for PM10, SO₂ & NO_x respectively. By adopting suitable mitigation measures, the pollutant levels in the atmosphere can be further being controlled.

4.3.4. Common Mitigation Measures for Respective Individual Proposed Projects

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

Advantages of Wet Drilling: -

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

Blasting –

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

Haul Road & Transportation –

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

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

Green Belt –

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

Occupational Health

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

4.4 Noise Environment (Impact & Mitigation Measures)

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

Predictions have been carried out to compute the noise level at various distances around the working pit due to these major noise-generating sources. Noise modelling has been carried out to assess the impact on surrounding ambient noise levels. Basic phenomenon of the model is the geometric attenuation of sound. Noise at a point generates spherical waves, which are propagated outwards from the source through the air at a speed of 1,100 ft/sec, with the first wave making an ever-increasing sphere with time. As the wave spreads the intensity of noise diminishes as the fixed amount of energy is spread over an increasing surface area of the sphere. The assumption of the model is based on point source relationship i.e., for every doubling of the distance the noise levels are decreased by 6 dB (A).

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

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

Where:

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

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

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

4.4.1 Anticipated Impact

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

- Source data
- Receptor data
- Attenuation factor

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

TABLE 4.8: ACTIVITY AND NOISE LEVEL PRODUCED BY MACHINERY

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

*50 feet from source = 15.24 meters

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

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

TABLE 4.9: PREDICTED NOISE INCREMENTAL VALUES

| Location ID | N1 | N2 | N3 | N4 | N5 | N6 | N7 | N8 |
|-------------------------------------|--------------------|-------|----------------------------|-------|-------|------------------------------|-------|-------|
| Maximum Monitored Value (Day) dB(A) | 46.5 | 45.6 | 43.2 | 45.9 | 40.2 | 42.3 | 44.2 | 39.2 |
| Incremental Value dB(A) | 47.30 | 52.14 | 34.08 | 27.64 | 35.49 | 27.04 | 32.14 | 30.56 |
| Total Predicted Noise level dB(A) | 46.30 | 53.01 | 43.70 | 45.96 | 41.47 | 42.43 | 44.46 | 39.76 |
| NAAQ Standards | Industrial | | Day Time- 75 dB (A) | | | Night Time- 70 dB (A) | | |
| | Residential | | Day Time- 55 dB (A) | | | Night Time- 45 dB (A) | | |

4.4.2 Common Mitigation Measures for Respective Individual Proposed Projects

The following noise mitigation measures are proposed for control of Noise.

- Time intervals for each quarries during blasting.
- Use of personal protective devices i.e., earmuffs and earplugs by workers, who are working in high noise generating areas.
- Limiting time exposure of workers to excessive noise.
- Proper and regular maintenance of vehicles, machinery and other equipment's.
- The noise generated by the machinery will be reduced by proper lubrication of the machinery and other equipment's.
- Speed of trucks entering or leaving the quarry will be limited to moderate speed to prevent undue noise from empty vehicles...
- Noise levels will be controlled by using optimum explosive charge, proper delay detonators and proper stemming to prevent blow out of holes (occasionally).
- Providing proper noise proof enclosure for the workers separated from the noise source and noise prone equipment.
- Provision of Quiet areas, where employees can get relief from workplace noise.
- The development of green belts around the periphery of the quarry site to attenuate noise.
- Regular medical check-up and proper training to personnel to create awareness about adverse noise level effects.

4.4.3 Ground Vibrations

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

Another impact due to blasting activities is fly rocks. These may fall on the houses or agricultural fields nearby the mining lease area and may cause injury to persons or damage to the structures. Nearest habitation from the project area is located 1km Southeast in Karacheri village. The ground vibrations due to the blasting in proposed mine are calculated using the empirical equation.

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

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

Where –

V = peak particle velocity (mm/s)

K = site and rock factor constant

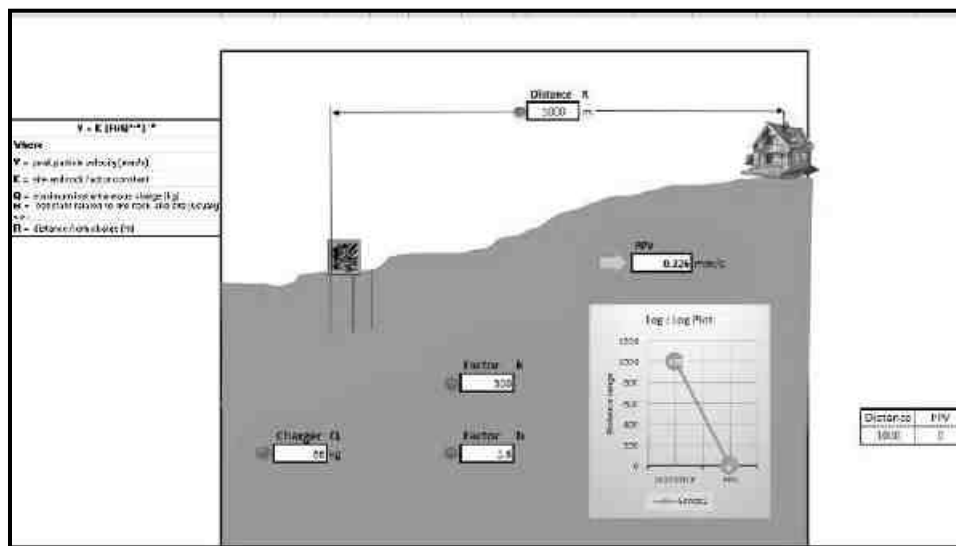
Q = maximum instantaneous charge (kg)

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

R = distance from charge (m)

TABLE 4.10: PREDICTED PPV VALUES DUE TO BLASTING

| Location ID | Maximum Charge in kgs | Nearest Habitation in m | PPV in m/ms |
|-------------|-----------------------|-------------------------|-------------|
| P-1 | 66 | 1000 | 0.226 |



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From the above, the charge per blast of Maximum 66Kg is well below the Peak Particle Velocity of 8 mm/s as per Directorate General of Mines Safety for safe level criteria through Circular No. 7 dated 29/8/1997. It should be ensured that the explosives used for blasting at one blast should not exceed more than 28 Kg at any point of time. However, as per statutory requirement control measures will be adopted to avoid the impacts due to ground vibrations and fly rocks due to blasting.

4.4.3.1 Common Mitigation Measures for Respective Individual Proposed Projects

- The blasting operations in the cluster quarries are carried out without deep hole drilling and blasting using delay detonators, which reduces the ground vibrations;
- Proper quantity of explosive, suitable stemming materials and appropriate delay system will be adopted to avoid overcharging and for safe blasting;
- Adequate safe distance from blasting will be maintained as per DGMS guidelines;
- Blasting shelter will be provided as per DGMS guidelines;
- Blasting operations will be carried out only during day time;
- The charge per delay will be minimized and preferably a greater number of delays will be used per blasts;
- During blasting, other activities in the immediate vicinity will be temporarily stopped;
- Drilling parameters like depth, diameter and spacing will be properly designed to give proper blast;
- A fully trained explosives blast man (Mining Mate, Mines Foreman, 2nd Class Mines Manager/ 1st Class Mines Manager) will be appointed.
- A set of shot firing rules will be drawn up and blasting shall commence outlining the detailed operating procedures that will be followed to ensure that shot firing operations on site take place without endangering the workforce or public.

- Sufficient angular stemming material will be used to confine the explosive force and minimise environmental disturbance caused by venting / misfire.
- The detonators will be connected in a predetermined sequence to ensure that only one charge is detonated at any one time and a NONEL or similar type initiation system will be used.
- The detonation delay sequence shall be designed so as to ensure that firing of the holes is in the direction of free faces so as to minimise vibration effects.
- Appropriate blasting techniques shall be adopted such that the predicted peak particle velocity shall not exceed 8 Hz.
- Vibration monitoring will be carried out every 6 months to check the efficacy of blasting practices

4.5 Ecology and Biodiversity

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

4.5.1. Anticipated Impact on Flora

- None of the plants will be cut during the operational phase of the mine.
- There shall be negligible air emissions or effluents from the project site. During the loading of the truck, dust generation will be likely. This shall be a temporary effect and not anticipated to affect the surrounding vegetation significantly.
- Most of the land in the buffer area is undulating terrain with croplands, grass patches, and small shrubs. Hence, there will be no effect on the flora of the region.

4.5.1.1. Mitigation Measures

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

- Plants that grow fast will be preferred.
- Preference for high canopy covers plants with local varieties.
- Perennial and evergreen plants will be preferred.
- The development of the Green Belt is an important aspect for any plant because:
 - a. It improves the ambient air quality by controlling Suspended Particulate Matter (SPM) in the air.
 - b. It helps in noise abatement for the surrounding area.
 - c. It helps in the settlement of new birds and insects within itself.
 - d. It maintains the ecological balance.
 - e. It increases the aesthetic value of the site.

Table No 4.11 List of plant species proposed for Greenbelt development

| S. No | Scientific name | Tamil Name |
|-------|------------------------|--------------|
| 1 | <i>Aegle marmelos</i> | Vilva Maram |
| 2 | <i>Albizia lebbeck</i> | Vaagai Maram |
| 3 | <i>Cassia fistula</i> | Konrai tree |

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

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

4.5.2. Anticipated Impact on Fauna

- No rare, endemic & endangered species are reported in the buffer zone. However, during the course of mining, the management will practice the scientific method of mining with a proper Environmental Management Plan including pollution control measures especially for air and noise, to avoid any adverse impact on the surrounding wildlife.
- Fencing around the mine lease area to restrict the entry of stray animals.
- Green belt development will be carried out which will help in minimizing adverse impact on the flora found in the area.

4.5.2.1. Mitigation Measures

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

TABLE 4.12: GREENBELT DEVELOPMENT PLAN

| PROPOSAL – P1- Tmt.K. Sangeetha | | | | | |
|--|-------------------------------------|-----------|--|---|-----------------------------------|
| Year | No. of trees proposed to be planted | Survial % | Area to be covered sq.m | Name of the species | No. of trees expected to be grown |
| I | 1180 | 80% | Near 7.5m safety distance, panchayat road and village road | Neem, Pongamia Pinnata, Casuarina etc., | 940 |

TABLE 4.13: BUDGET FOR GREEBELT DEVELOPMENT PLAN-P1

| ACTIVITY | | YEAR | | | | | RATE | COST (Rs.) |
|--|------|--------|------|------|------|------|---------------------|-------------------|
| | | I | II | III | IV | V | | |
| Plantation under safety zone | Nos. | 30 | 30 | 30 | 30 | 30 | @100 Rs Per sapling | 15,000/- |
| | Cost | 3000 | 3000 | 3000 | 3000 | 3000 | | 10,000/- |
| Plantation in the approach road and nearby village roads | Nos. | 20 | 20 | 20 | 20 | 20 | | 10,000/- |
| | Cost | 2000 | 2000 | 2000 | 2000 | 2000 | | |
| Wire Fencing (In Mtrs) 570Mtrs | | 171000 | - | - | - | - | @300 Rs Per Meter | 1,71,000/- |
| Garland drain (In Mtrs) 510Mtrs | | 153000 | - | - | - | - | @300 Rs Per Meter | 1,53,000/- |
| TOTAL | | | | | | | | 3,49,000/- |

After complete extraction of mineral, the excavated pits will be allowed to collect rainwater and seepage water to serve as a reservoir to charge the nearby wells. Fish culture will also be attempted. A bund will be constructed around the pits. In order to minimize the impact of mining on the vegetation outside the mine lease area, it is recommended that adequate protection measures must be implemented. As mining involves movement of vehicles and increased anthropogenic activities, some of the areas can be fenced by involving local people and educating them about increased benefits of such activities.

4.5.3. Anticipated Impact on Fauna

- Since the terrestrial fauna in the study area are distributed away from the mine site, the impacts of project are likely to be much low on terrestrial fauna of the region. The proposed mining lease area is devoid of any significant vegetation, it is not suitable for permanent habitat for any specific wildlife.
- Habitat degradation and disturbance to faunal group due to ground vibration and increase in noise level will be minimize or resolved by modern technologies. So, from above facts it is revealed that there will be no impact on fauna. No threatened fauna species reported in the core and buffer study area.

4.5.3.1. Measures for protection and conservation of wildlife species

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

4.5.3.2. Mitigation Measures

- All the preventive measures will be taken for growth & development of fauna.
- Creating and development awareness for nature and wildlife in the adjoin villages.
- The workers shall be trained to not harm any wildlife, should it come near the project site. No work shall be carried out after 6.00 pm.

4.5.4. Impact on Aquatic Biodiversity

Mining activities will not disturb the aquatic ecology as there is no effluent discharge proposed from the Rough stone quarry. There is no natural perennial surface water body within the mine lease area, like wetlands, rivers streams, Odai, Vaari, Canal, Channel, lakes, Pond, Tank, and farmer sites. There is no impact on fish habitats and the food WEB/ food chain in the water body and Reservoir. There is no nearby any water bodies. Aquatic biodiversity is not observed in the study area.

4.5.5. Impact Assessment on Biological Environment

A detail of impact and assessments was mentioned in Table No 4.15.

TABLE 4.14: ECOLOGICAL IMPACT ASSESSMENTS

| S.No | Attributes | Assessment |
|------|--|---|
| 1 | Impact of mining activity on agricultural land nearby the proposed project site. | Agricultural land is located away from the proposed project site. There are no impacts on the agricultural land & Horticulture. Kindly refer to the conclusion. |
| | Activities of the project affect the breeding/nesting sites of birds and animals | No breeding and nesting site was identified in the mining lease site. The fauna sighted mostly migrated from the buffer area. |
| 2 | Located near an area populated by rare or endangered species | No Endangered, Critically Endangered, or vulnerable species were sighted in the core mining lease area. |
| 3 | Proximity to national park/wildlife sanctuary/reserve forest /mangroves/ coastline/estuary/sea | There is no National Park/ Wildlife Sanctuary/ Reserve Forest/ Mangroves and Eco-Sensitive zone/ Critically polluted area/ HACA/CRZ located within 10 km radius of the area. Indira Gandhi (Anamalai) Wildlife Sanctuary-44.2km-S. |
| 4 | The proposed project restricts access to waterholes for wildlife | 'No ' |
| 5 | Proposed mining project impact surface water quality that also provides water to wildlife | 'No 'scheduled or threatened wildlife animals are sighted regularly core in the core area. |
| 6 | Proposed mining project increase siltation that would affect nearby biodiversity areas. | Surface runoff management such as drains is constructed properly so there will be no siltation effect in the nearby mining area. |
| 7 | Risk of fall/slip or cause death to wild animals due to project activities. | 'No' |
| 8 | The project release effluents into a water body that also supplies water to a wildlife. | No water body near to core zone so the chances of water becoming polluted is low. |

| | | |
|----|---|--|
| 9 | Mining projects affect the forest-based livelihood/ any specific forest product on which local livelihood depended. | 'No' |
| 10 | The project likely to affect migration routes. | 'No 'migration route was observed during the monitoring period. |
| 11 | The project is likely to affect the flora of an area, which have medicinal value | 'No' |
| 12 | Forestland is to be diverted, has carbon high sequestration. | 'No 'There was no forest land diverted. |
| 13 | The project is likely to affect wetlands, Fish breeding grounds, and marine ecology. | 'No'. Wetland was not present in the near core Mining lease area. No breeding and nesting ground is present in the core mining area. |

4.6 Socio Economic

4.6.1 Anticipated Impact from all Proposed Projects

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

4.6.2 Common Mitigation Measures for Respective Individual Proposed Projects

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

4.7 Occupational Health and Safety

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

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

4.7.1 Respiratory Hazards

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

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

4.7.2 Noise

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

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

4.7.3 Physical Hazards

The following measures are proposed for control of physical hazards

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

4.7.4 Occupational Health Survey

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

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

Essential medicines will be provided at the site. The medicines and other test facilities will be provided at free of cost. The first aid box will be made available at the mine for immediate treatment.

First aid training will be imparted to the selected employees regularly. The lists of first aid trained members shall be displayed at strategic places.

4.8 *Mine Waste Management*

No waste is anticipated from any of the proposed quarries.

4.9 *Mine Closure*

Mine closure plan is the most important environmental requirement in mining projects. The mine closure plan should cover technical, environmental, social, legal and financial aspects dealing with progressive and post closure activities. The closure operation is a continuous series of activities starting from the decommissioning of the project. Therefore, progressive mine closure plan should be specifically dealt with in the mining plan and is to be reviewed along with mining plan. As progressive mine closure is a continuous series of activities, it is obvious that the proposals of scientific mining have included most of the activities to be included in the closure plan. While formulating the closure objectives for the site, it is important to consider the existing or the pre-mining land use of the site; and how the operation will affect this activity.

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

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

4.9.1 Mine Closure Criteria

The criteria involved in mine closure are discussed below:

4.9.1.1 Physical Stability

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

4.9.1.2 Chemical Stability

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

4.9.1.3 Biological Stability

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

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

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

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

CHAPTER – 5: ANALYSIS OF ALTERNATIVES (TECHNOLOGY AND SITE)

5.0 Introduction:

Consideration of alternatives to a project proposal is a requirement of EIA process. This quarry is site specific. The site has been selected based on geological investigation and exploration and from the Existing quarry pits around the project site. Drilling, Blasting, Excavation, Loading & Transportation will be carried out in this quarrying operation.

- This area denotes the indicative of flow pattern of the rock mass in N30⁰E to S30⁰W with dipping SE60⁰.
- Transportation facility for materials & manpower.
- Overall impact on environment and mitigation feasibility.
- Socio – economic background.

Enough infrastructure exists and lesser resources are required to be deployed. Since, any major construction for infrastructure is not required and hence does not affect the environment considerably.

5.1 Factors Behind the Selection of Project Site

Rough Stone Quarry Project at Vadapudur Village are a site specific. The proposed mining lease area has following advantages: -

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

5.2 Analysis of Alternative Site

The mineral deposits are site specific in nature; hence, question of seeking alternate site does not arise for this project.

5.3 Factors Behind Selection of Proposed Technology

Mechanized open cast mining operation with drilling and blasting method will be used to extract Rough Stone in the area. The quarry areas fall in the clusters has following advantages –

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

Semi skilled labours fit for quarrying operations are easily available around the nearby villages.

5.4 *Analysis of Alternative Technology*

Open cast mechanized method has been selected for this project. This technology is having least gestation period, economically viable, safest and less labour intensive. The method has inbuilt flexibility for increasing or decreasing the production as per market condition.

CHAPTER – 6: ENVIRONMENTAL MONITORING PROGRAMME

6.0 General

Environmental Monitoring will be taken up for various environmental components as per conditions stipulated in Environmental Clearance Letter issued by MoEF & Consent to Operate issued by the State Pollution Control Board. Monitoring reports will be submitted to regulator as per statutory requirements. The entire monitoring work will be carried out by MoEF & CC / NABL recognized laboratories.

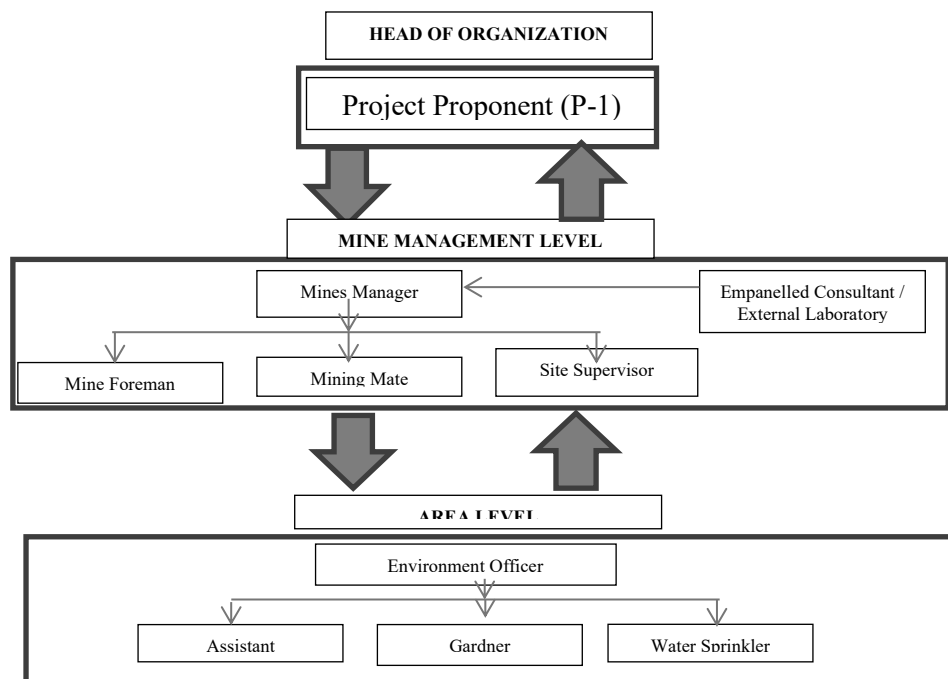
The monitoring and evaluation of environmental parameters indicates potential changes occurring in the environment, which paves way for implementation of rectifying measures wherever required to maintain the status of the natural environment. Evaluation is also a very effective tool to judge the effectiveness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

6.1 Methodology of Monitoring Mechanism

Implementation of EMP and periodic monitoring will be carried out by the proponents and respective quarry owners in the cluster quarries. A comprehensive monitoring mechanism has been devised for monitoring of impacts due to proposed project; Mine Management Level environmental protection measures like dust suppression, treatment and recycling of waste water, control of noise due to blasting and Ground vibration, maintenance of machinery and vehicles, housekeeping in the mine premises, plantation, implementation of other hand, implementation of area level protection measures like plantation and green Environmental Management Plan and environmental clearance conditions will be monitored by the proponent. On the belt development, environmental quality monitoring etc.,

An environment monitoring cell (EMC) will be constituted at the quarry consisting of following members to monitor the implementation of EMP and other environmental protection measures.

FIGURE 6.1 ENVIRONMENTAL MONITORING CELL



The responsibilities of this cell will be:

- Implementation of pollution control measures
- Monitoring programme implementation
- Post-plantation care
- To check the efficiency of pollution control measures taken
- Any other activity as may be related to environment
- Seeking expert's advice when needed

The environmental monitoring cell will co-ordinate all monitoring programs at site and data thus generated will be regularly furnished to the State regulatory agencies. The sampling and analysis report of the monitored environmental attributes will be submitted to the Tamil Nadu Pollution Control Board (TNPCB) at a frequency of monthly, half-yearly and yearly. The half-yearly reports will be submitted to Ministry of Environment and Forest, Regional Office and SEIAA as well.

The sampling and analysis of the environmental attributes will be as per the guidelines of Central Pollution Control Board (CPCB)/Ministry of Environment, Forest and Climate Change (MoEF & CC).

6.2 Implementation Schedule of Mitigation Measures

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

TABLE 6.1 IMPLEMENTATION SCHEDULE

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

6.3 Monitoring Schedule and Frequency

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

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

The details of monitoring are detailed in Table 6.2

TABLE 6.2: PROPOSED MONITORING SCHEDULE POST EC FOR- P1

| S. No. | Environment Attributes | Location | Monitoring | | Parameters |
|--------|--------------------------|--|----------------|------------------------------|---|
| | | | Duration | Frequency | |
| 1 | Air Quality | 2 Locations (1 Core & 1 Buffer) | 24 hours | Once in 6 months | Fugitive Dust, PM _{2.5} , PM ₁₀ , SO ₂ and NO _x . |
| 2 | Meteorology | At mine site before start of Air Quality Monitoring & IMD Secondary Data | Hourly / Daily | Continuous online monitoring | Wind speed, Wind direction, Temperature, Relative humidity and Rainfall |
| 3 | Water Quality Monitoring | 2 Locations (1SW & 1 GW) | - | Once in 6 months | Parameters specified under IS:10500, 1993 & CPCB Norms |
| 4 | Hydrology | Water level in open wells in buffer zone around 1 km at specific wells | - | Once in 6 months | Depth in bgl |
| 5 | Noise | 2 Locations (1 Core & 1 Buffer) | Hourly – 1 Day | Once in 6 months | Leq, Lmax, Lmin, Leq Day & Leq Night |
| 6 | Vibration | At the nearest habitation (in case of reporting) | - | During blasting Operation | Peak Particle Velocity |
| 7 | Soil | 2 Locations (1 Core & 1 Buffer) | - | Once in six months | Physical and Chemical Characteristics |
| 8 | Greenbelt | Within the Project Area | Daily | Monthly | Maintenance |

Source: Guidance of manual for mining of minerals, February 2010

6.4 Environmental Policy of the Proponents

The project proponents in the proposed quarries are committed to ensure that:

- Protect the environment by control and prevention of pollution and promote green environment.
- To operate the quarry with an objective of no injuries and accidents at the work place and provide a safe work place for our employees, contractors and others who perform their duties.
- Adequate health care will be taken to all the employees and create process to reduce the adverse effect of the operations on Health of the employees.
- Provide safety appliance and continuous training in safety to employees to ensure safe production and achieve the target of zero accidents.
- Develop safe working methods and practices, remove unsafe work conditions and consider all the aspects at the early stages of process development to provide safe working atmosphere.
- Communicate Safety, Health and Environmental Policy to all employees for better understanding and practice.

6.5 Budgetary Provision for Environmental Monitoring Programme

The cost in respect of monitoring of environmental attributes, parameter to be monitored, sampling/monitoring locations with frequency and cost provision against each proposal is shown in Table 6.3. Monitoring work will be outsourced to external laboratory approved by NABL / MoEF.

The proposed total cost for Environmental Monitoring Programme for one proposed quarry for the mining plan period is Rs 3,80,000/-

TABLE 6.3 ENVIRONMENT MONITORING BUDGET- P1

| Parameter | Sl. Nos | Capital Cost |
|---|----------------|-----------------------|
| Air Quality, Meteorology, Water Quality, Hydrology, Soil Quality Noise Quality, Vibration Study Greenbelt | P1 | Rs.3,80,000/- |
| | Total | Rs. 3,80,000/- |

Source: Approved Mining Plan

6.6 Reporting Schedules of Monitored Data

The monitored data on Air quality, Water quality, Noise levels and other environmental attributes will be periodically examined by the proponent with Environmental Monitoring cell and necessary corrective measures will be carried out. The monitoring data will be submitted to Tamil Nadu State Pollution Control Board in the Compliance to CTO Conditions & environmental audit statements every year to MoEF & CC and Half-Yearly Compliance Monitoring Reports to MoEF & CC Regional Office and SEIAA.

Periodical reports to be submitted to: -

- MoEF & CC – Half yearly status report
- TNPCB - Half yearly status report
- Department of Geology and Mining: quarterly, half yearly annual reports
- SEIAA, Chennai, Tamil Nadu

Besides the Mines Manager/Agent will submit the periodical reports to –

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

CHAPTER – 7: ADDITIONAL STUDIES

7.0 General

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

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

7.1. Public Consultation:

Application to The Member Secretary of the Tamil Nadu Pollution Control Board (TNPCB) to conduct Public Hearing in a systematic, time bound and transparent manner ensuring widest possible public participation at the project site or in its close proximity in the district is submitted along with this Draft EIA / EMP Report and the outcome of public hearing proceedings will be detailed in the Final EIA/EMP Report.

7.2 Risk Assessment

The methodology for the risk assessment has been based on the specific risk assessment guidance issued by the Directorate General of Mine Safety (DGMS), Dhanbad, vide Circular No.13 of 2002, dated 31st December, 2002. The DGMS risk assessment process is intended to identify existing and probable hazards in the work environment and all operations and assess the risk levels of those hazards in order to prioritize those that need immediate attention. Further, mechanisms responsible for these hazards are identified and their control measures, set to timetable are recorded along with pinpointed responsibilities.

The cluster quarry operation will be carried out under the direction of a Qualified Competent Mine manager holding certificate of competency to manage a metalliferous mine granted by the DGMS, Dhanbad. Risk Assessment is all about prevention of accidents and to take necessary steps to prevent it from happening. Factors of risks involved due to human induced activities in connection with mining & allied activities with detailed analysis of causes and control measures for the mine is given in below Table 7.1.

TABLE 7.1 RISK ASSESSMENT & CONTROL MEASURES

| S. No | Risk factors | Causes of risk | Control measures |
|-------|--|---|--|
| 1 | Accidents due to explosives and heavy mining machineries | Improper handling and unsafe working practice | <ul style="list-style-type: none"> ▪ All safety precautions and provisions of Mine Act, 1952, Metalliferous Mines Regulation, 1961 and Mines Rules, 1955 will be strictly followed during all mining operations; ▪ Entry of unauthorized persons will be prohibited; ▪ Fire fighting and first-aid provisions in the mine office complex and mining area; ▪ Provisions of all the safety appliances such as safety boot, helmets, goggles etc. will be made available to the employees and regular check for their use. ▪ Working of quarry, as per approved plans and regularly updating the mine plans; ▪ Cleaning of mine faces shall be daily done in order to avoid any overhang or undercut; |

| | | | |
|---|--------------------|---|---|
| | | | <ul style="list-style-type: none"> ▪ Handling of explosives, charging and firing shall be carried out by competent persons only under the supervision of a Mine Manager; ▪ Maintenance and testing of all mining equipment as per manufacturer 's guidelines. |
| 2 | Drilling& Blasting | <p>Due to improper and unsafe practices</p> <p>Due to high pressure of compressed air, hoses may burst</p> <p>Drill Rod may break</p> | <ul style="list-style-type: none"> ▪ Safe operating procedure established for drilling (SOP) will be strictly followed. ▪ Only trained operators will be deployed. ▪ No drilling shall be commenced in an area where shots have been fired until the blaster/blasting foreman has made a thorough Examination of all places. ▪ Drilling shall not be carried on simultaneously on the benches at places directly one above the other. ▪ Periodical preventive maintenance and replacement of worn-out accessories in the compressor and drill equipment as per operator manual. ▪ All drills unit shall be provided with wet drilling shall be maintained in efficient working in condition. ▪ Operator shall regularly use all the personal protective equipment. |
| 3 | Blasting | <p>Fly rock, ground vibration, Noise and dust.</p> <p>Improper charging, stemming & Blasting/fining of blast holes</p> <p>Vibration due to movement of vehicles</p> | <ul style="list-style-type: none"> ▪ The maximum charge per delay and by optimum blast hole pattern, vibrations will be controlled within the permissible limit and blast can be conducted safely. ▪ SOP for Charging, Stemming & Blasting/Firing of Blast Holes will be followed by blasting crew during initial stage of operation ▪ Shots are fired during daytime only. ▪ All holes charged on any one day shall be fired on the same day. ▪ The danger zone is and will be distinctly demarcated (by means of red flags) |
| 4 | Transportation | <p>Potential hazards and unsafe workings contributing to accident and injuries</p> <p>Overloading of material</p> <p>While reversal & overtaking of vehicle</p> | <ul style="list-style-type: none"> ▪ Before commencing work, drivers personally check the dumper/truck/tipper for oil(s), fuel and water levels, tyre inflation, general cleanliness and inspect the brakes, steering system, warning devices including automatically operated audio-visual reversing alarm, rear view mirrors, side indicator lights etc., are in good condition. ▪ Not allow any unauthorized person to ride on the vehicle nor allow any unauthorized person to operate the vehicle. |

| | | | |
|---|---------------------------------------|--|--|
| | | Operator of truck leaving his cabin when it is loaded. | <ul style="list-style-type: none"> ▪ Concave mirrors should be kept at all corners ▪ All vehicles should be fitted with reverse horn with one spotter at every tipping point ▪ Loading according to the vehicle capacity ▪ Periodical maintenance of vehicles as per operator manual |
| 5 | Natural calamities | Unexpected happenings | <ul style="list-style-type: none"> ▪ Escape Routes will be provided to prevent inundation of storm water ▪ Fire Extinguishers & Sand Buckets |
| 6 | Failure of Mine Benches and Pit Slope | Slope geometry, Geological structure | <ul style="list-style-type: none"> ▪ Ultimate or over all pit slope shall be below 60° and each bench height shall be 5m height. |

7.3 Disaster Management Plan

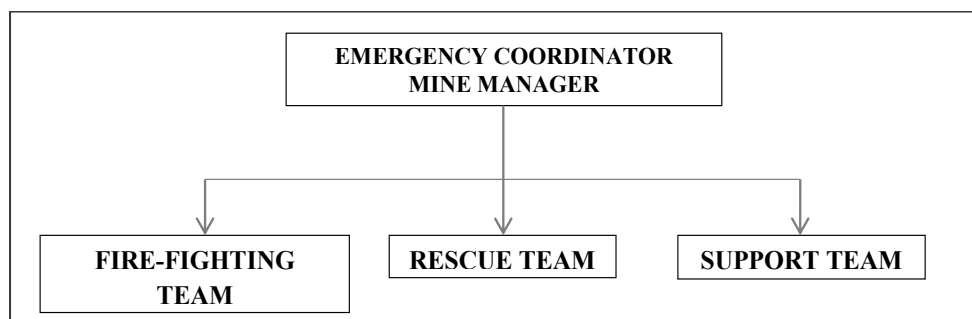
Natural disasters like Earthquake, Land slides has not been recorded in the past history as the terrain is categorized under seismic zone III. The area is far away from the sea hence the disaster due to heavy floods and tsunamis are not anticipated. The Disaster Management Plan is aimed to ensure safety of life, protection of environment, protection of installation, restoration of production and salvage operations in this same order of priorities.

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

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

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

FIGURE 7.1: DISASTER MANAGEMENT TEAM LAYOUT FOR P1



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

TABLE 7.2: PROPOSED TEAMS TO DEAL WITH EMERGENCY SITUATION

| DESIGNATION | QUALIFICATION |
|---|----------------------|
| FIRE-FIGHTING TEAM | |
| Team Leader/ Emergency Coordinator (EC) | Mines Manager |
| Team Member | Mines Foreman |
| Team Member | Mining Mate |
| RESCUE TEAM | |
| Team Leader/ Emergency Coordinator (EC) | Mines Manager |
| Team Member/ Incident Controller (IC) | Environment Officer |
| Team Member | Mining Foreman |
| SUPPORT TEAM | |
| Team Leader/ Emergency Coordinator (EC) | Mines Manager |
| Assistant Team Leader | Environment Officer |
| Team Member | Mining Mate |
| Security Team Leader/ Emergency Security Controller | Mines Foreman |

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

Roles and responsibilities of emergency team –

(a) Emergency coordinator (EC)

The emergency coordinator shall assume absolute control of site

(b) Incident controller (IC)

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

(c) Communication and advisory team

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

(d) Roll call coordinator

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

(e) Search and rescue team

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

(f) Emergency security controller

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

Emergency control procedure –

The onset of emergency, will in all probability, commence with a major fire or explosion or collapse of wall along excavation and shall be detected by various safety devices and also by members of operational staff on duty. If located by a staff member on duty, he (as per site emergency procedure of which he is adequately briefed) will go to nearest alarm call point, break glass and trigger off the alarms. He will also try his best to inform about

location and nature of accident to the emergency control room. In accordance with work emergency procedure the following key activities will immediately take place to interpret and take control of emergency.

- On site fire crew led by a fireman will arrive at the site of incident with fire foam tenders and necessary equipment.
- Emergency security controller will commence his role from main gate office
- Incident controller shall rush to the site of emergency and with the help of rescue team and will start handling the emergency.
- Site main controller will arrive at MECR with members of his advisory and communication team and will assume absolute control of the site.
 - He will receive information continuously from incident controller and give decisions and directions to:
 - Incident controller
 - Mine control rooms
 - Emergency security controller

Proposed fire extinguishers at different locations

The following type of fire extinguishers is proposed at strategic locations within the quarry.

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

Alarm system to be followed during disaster –

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

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

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

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

- All safety precautions and provisions of Metalliferous Mines Regulations (MMR), 1961 is strictly followed during all mining operations
- Fire fighting and first-aid provisions in the mines office complex and mining area will be provided.
- Provisions of all the safety appliances such as safety boot, helmets, goggles, dust masks, ear plugs and ear muffs etc. are made available to the employees and the use of same is strictly adhered to through regular monitoring
- Training and refresher courses for all the employees working in the quarry in phase manner
- Cleaning of mine faces will be carried out regularly
- Provision of high-capacity standby pumps with generator sets with enough quantity of diesel for emergency pumping especially during monsoon.
- A blasting SIREN will be used at the time of blasting for audio signal.
- Checking of blasting area for any un-blasted hole or material.
- Warning notice boards indicating the time of blasting and NOT TO TRESPASS will be displayed at prominent places

7.4 CUMULATIVE IMPACT STUDY

There are 3 proposed and none existing quarries, 1 abandoned quarry 1 Expired quarry falls in the cluster. The list of quarries is as below –

TABLE 7.3: LIST OF QUARRIES WITHIN 500 METER RADIUS FROM THIS PROPOSAL

| PROPOSED QUARRIES | | | | |
|----------------------|-----------------------------------|---|--------------|--|
| CODE | Name of the Proponent and Address | S.F. Nos, Village & Taluk | Extent in Ha | Status |
| P-1 | Tmt.K.Sangeetha | 423/2 (P), Vadapudur Village, Kinathukadavu Taluk | 2.36.5 | Obtained ToR vide, Lr No.SEIAA-TN/F.No.8886/ToR-1116/2022 Dated: 23.03.2022 |
| P-2 | Thiru.S.Ramesh | 423/1(P) Vadapudur Village, Kinathukadavu Taluk | 1.52.0 | Obtained ToR vide, Lr No.SEIAA-TN/F.No.8463/SEAC/ToR-1008/2021 Dated: 28.07.2021 |
| P3 | Thiru. A.Kandasamy | 424/3, Vadapudur Village, Kinathukadavu Taluk | 1.66.5 | - |
| Total | | | 5.55.0 | |
| EXISTING QUARRIES | | | | |
| CODE | Name of the Proponent and Address | S.F.Nos , Village & Taluk | Extent in Ha | Lease Period |
| NIL | | | | |
| ABANDONED QURRIES | | | | |
| CODE | Name of the Proponent and Address | S.F. Nos, Village & Taluk | Extent in Ha | Lease Period |
| A-1 | Thiru.V.Marimuthu | 131/1C2A, Vadapudur Village, | 1.27.0 | 04.05.1999 to 03.05.2004 |
| Total | | | 1.27.0 | |
| EXPIRED QURRIES | | | | |
| CODE | Name of the Proponent and Address | S.F. Nos, Village & Taluk | Extent in Ha | Lease Period |
| Ex1 | Thiru.K.Ramalinga Gounder | 148/1 (P), Kinathukadavu Taluk | 1.45.0 | 03.03.2016 to 02.03.2021 |
| Total | | | 1.45.0 | |
| TOTAL CLUSTER EXTENT | | | 5.55.0 | |

Note:-

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

As per above notification S.O.2269(E) dated : 01.07.2016 in para (b) in Appendix XI, - (ii)(5): The lease not operative for three years or more and leases which have got environmental clearance as on 15th January, 2016 shall not be counted for calculating the area of cluster, but shall be included in the Environment Management Plan and the Regional Environmental Management Plan”

TABLE 7.4: SALIENT FEATURES OF THE PROPOSED PROJECTS IN CLUSTER

| SALIENT FEATURES OF PROPOSAL “P1” | |
|-----------------------------------|--|
| Name of the Mine | Tmt.K.Sangeetha, Roughstone quarry |
| Land Type | Patta Land (Patta No.116), jointly registered in the name of applicant (Tmt.Sangeetha) and Miss.Ananthavinithini |
| S.F. No. | 423/2 (P), |
| Extent | 2.36.5 Ha |
| Previous quarry operation details | Operated by It is a existing lease area. ☞ The quarry lease was previously granted in the favour of Tmt.K.Sangeetha, over an extent of 3.78.0hectares vide |

| | | |
|--|---|----------------------|
| | <p>Rc.No.312/Mines/2015, Dated: 23.09.2016 for the period of five years from 23.09.2016 to 22.09.2021</p> <p>☞ the applicant has obtained Environmental Clearance from the SEIAA, Tamil Nadu vide Lr. No. SEIAA-TN/F.No.3857/1(a)/ECNo.3397/2015, Dated: 25.07.2016 for quarrying of Rough stone.</p> <p>☞ The applicant has once again applied a quarry lease on 19.10.2020, over an extent of 2.36.5hectares of Patta land in S.F.No.423/2 (P) of Vadapudur Village, Kinathukadavu Taluk, Coimbatore District for the period of five years.</p> | |
| Maximum dimension of the existing quarry pit (as per AD letter Rc.764mines/2020, 22.09.2021) | 260m (L) x 82m (W) x 10m Agl (D) | |
| Depth | 41m bgl (1m topsoil+ 40m Roughstone) | |
| Geological Resources | Rough Stone | Topsoil |
| | 7,54,307m ³ | 2,340 m ³ |
| Mineable Reserves | Rough Stone | Topsoil |
| | 2,28,084 m ³ | - |
| Proposed production for five years | 2,28,084 m ³ | - |
| Mining Plan Period / Lease Period | 5 Years | |
| Ultimate Pit Dimension | 260m (L) x 82m (W) x 41m Bgl (D) (16m Agl +25m Bgl) | |
| Toposheet No | 58 - B/13 | |
| Latitude | 10°48'34.52"N to 10°48'41.61"N | |
| Longitude | 76°59'43.58"E to 76°59'52.08"E | |
| Highest Elevation | 344m AMSL | |
| Water table depth | The Ground water occurrence in this area is 73-68m depth below the ground level. | |
| Machinery | Jack Hammer | 6 |
| | Compressor | 2 |
| | Excavator with Bucket and Rock Breaker | 1 |
| | Tippers | 3 |
| Blasting | Usage of Slurry Explosive with MSD detonators | |
| Manpower Deployment | 28Nos | |
| Total Cost | Project Cost | Rs. 61,11,000/- |
| | EMP Cost | Rs. 3,80,000/- |
| | Total | Rs. 64,91,000/- |
| CER cost | Rs.5,00,000/- | |
| Water Requirements | Total water requirement for 3.3KLD from water vendors & nearby Bore well. | |
| Nearest Habitation | 1000m-E | |
| SALIENT FEATURES OF PROPOSAL "P2" | | |
| Name of the Mine | Thiru.S. Ramesh Rough Stone & Gravel Quarry Project | |
| Land Type | <p>It is an Existing Lease application, but the quarry lease was previously granted in the favour of Thiru.Ramasamy Gounder, over an extent of 1.22.0hectares of Patta land in S.F.No.423/1 of Vadapudur Village, Kinathukadavu Taluk, Coimbatore District vide Rc.No.1431/2004/MM1, Dated:07.09.2004</p> <p>The quarry lease was again granted in the favour of the applicant (Thiru.S.Ramesh), over an extent of 2.63.0hectares of Patta land in S.F.No.423/1 of Vadapudur Village, Kinathukadavu Taluk, Coimbatore District vide Rc.No.525/2010/MM-2, Dated: 01.10.2010.</p> <p>The applicant has once again applied a quarry lease on 03.08.2020, over an extent of 1.52.0hectares of Patta land in S.F.No.423/1 (P) of</p> | |

| | | |
|--|--|----------------------|
| | Vadapudur Village, Kinathukadavu Taluk, Coimbatore District for the period of five years (vide patta no 770) | |
| S.F. Nos | 423/1(P) | |
| Extent | 1.52.0 Ha | |
| Maximum dimension of the existing quarry pit (as per AD letter Rc.408mines/2020, 19.02.2021) | 135m (L) x 75m (W) x 7m Agl (D) | |
| Geological Reserves | Rough Stone | Gravel |
| | 5,91,286 m ³ | 6,958 m ³ |
| Mineable Reserves | Rough Stone | Gravel |
| | 1,93,521 m ³ | 3,294 m ³ |
| Proposed Quantity of Reserves/Production as per ToR | 1,79,931 m ³ | 3,294 m ³ |
| Mining Plan Period / Lease Period | 5 Years | |
| Ultimate Pit Dimension | 164m (L) x 78m (W) x 47m Bgl (D) (7m Agl +40m Bgl) | |
| Depth (As per ToR) | 37m (2m Gravel + 35m Rough stone) | |
| Toposheet No | 58 B/13 | |
| Latitude | 10°48'41.11"N to 10°48'45.03"N | |
| Longitude | 76°59'47.54"E to 76°59'53.91"E | |
| Elevation | 344m Amsl. | |
| Water table depth | The Ground water occurrence in this area is 65-60m depth below the ground level. | |
| Machinery proposed | Jack Hammer | 5 |
| | Compressor | 1 |
| | Excavator with Bucket and Rock Breaker | 1 |
| | Tippers | 3 |
| Blasting | Usage of Slurry Explosive with MSD detonators | |
| Water requirement & source | Total water requirement for 2.0KLD from water vendors & nearby tank. | |
| Manpower Deployment | 26 Nos | |
| Total Project Cost | Operational Cost | Rs. 48,90,000/- |
| | EMP Cost | Rs. 3,80,000/- |
| | Total | Rs. 52,70,000/- |
| CER cost | Rs.5,00,000/- | |
| Nearest Habitation | 990m-E | |

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

Impact on Air Environment –

Calculating the Cumulative Load of Mining within the cluster is as shown in table 7.5 & 7.6

TABLE 7.5 CUMULATIVE PRODUCTION LOAD OF ROUGH STONE IN CLUSTER

| Quarry | Production for five-year plan period | Per Year Production in m ³ | Per Day Production in m ³ | Number of Lorry Load Per Day @ 6m ³ per load |
|--------------|--------------------------------------|---------------------------------------|--------------------------------------|---|
| P1 | 2,28,084 | 45617 | 152 | 25Trips /Day |
| P2 | 1,79,931 | 35986 | 120 | 20Trips /Day |
| Total | 4,08,015 | 81603 | 272 | 45Trips /Day |

TABLE 7.6: CUMULATIVE PRODUCTION OF GRAVEL IN CLUSTER

| Quarry | Mineable Reserves in m ³ | Per Year Production in m ³ | Per Day in m ³ | Number of Lorry Load @ 6m ³ per load |
|--------------|-------------------------------------|---------------------------------------|---------------------------|---|
| P1 | - | - | - | - |
| P2 | 3294 | 1098 | 4 | 1Trips /Day |
| Total | 3294 | 1098 | 4 | 1 Trips\ day |

Source: Approved Mining plans of the respective projects

Based on the above production quantities the emissions due to various activities in all the 2 proposal quarry various activities like ground preparation, excavation, handling and transport of mineral. These activities have been analysed systematically basing on USEPA-Emission Estimation Technique Manual, for Mining AP-42, to arrive at possible emissions to the atmosphere and estimated emissions are given in Table 7.7.

TABLE 7.7: EMISSION ESTIMATION FROM CLUSTER

| EMISSION ESTIMATION FOR QUARRY "P1"- Tmt.K.Sangeetha, | | | | |
|--|---|--------------------|--------------|-------------|
| | Activity | Source type | Value | Unit |
| Estimated Emission Rate for PM ₁₀ | Drilling | Point Source | 0.083649640 | g/s |
| | Blasting | Point Source | 0.000990683 | g/s |
| | Mineral Loading | Point Source | 0.041366904 | g/s |
| | Haul Road | Line Source | 0.002489834 | g/s/m |
| | Overall Mine | Area Source | 0.055330281 | g/s |
| | Estimated Emission Rate for SO ₂ | Overall Mine | Area Source | 0.000546691 |
| Estimated Emission Rate for NO _x | Overall Mine | Area Source | 0.000028788 | g/s |
| EMISSION ESTIMATION FOR QUARRY "P2"- Thiru.S.Ramesh | | | | |
| | Activity | Source type | Value | Unit |
| Estimated Emission Rate for PM ₁₀ | Drilling | Point Source | 0.078833537 | g/s |
| | Blasting | Point Source | 0.000736495 | g/s |
| | Mineral Loading | Point Source | 0.040713052 | g/s |
| | Haul Road | Line Source | 0.002488703 | g/s/m |
| | Overall Mine | Area Source | 0.046148981 | g/s |
| | Estimated Emission Rate for SO ₂ | Overall Mine | Area Source | 0.000443997 |
| Estimated Emission Rate for NO _x | Overall Mine | Area Source | 0.000015659 | g/s |

Source: Emission Formula

TABLE 7.8: INCREMENTAL & RESULTANT GLC WITHIN CLUSTER

| PM₁₀ in µg/m³ | |
|---|-----------------------|
| Location | AAQ1 – CORE |
| Background (average) | 33.6 |
| Highest Incremental | 13.89 |
| Resultant | 47.5 |
| NAAQ Norms | 100 µg/m ³ |
| PM_{2.5} in µg/m³ | |
| Background (average) | 23.7 |
| Highest Incremental | 6.87 |
| Resultant | 30.5 |
| NAAQ Norms | 80 µg/m ³ |
| SO₂ in µg/m³ | |
| Location | AAQ1 – CORE |
| Background (average) | 6.8 |
| Highest Incremental | 2.49 |
| Resultant | 9.3 |
| NAAQ Norms | 80 µg/m ³ |
| NO_x in µg/m³ | |
| Location | AAQ1 – CORE |
| Background (average) | 22.4 |
| Incremental | 9.76 |
| Resultant | 32.1 |
| NAAQ Norms | 80 µg/m ³ |

Noise Environment –

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

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

$$L_{p2} = L_{p1} - 20 \log (r_2/r_1) - Ae_{1,2}$$

Where:

L_{p1} & L_{p2} are sound levels at points located at distances r_1 & r_2 from the source.

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

$$L_{p_{total}} = 10 \log \{10^{(L_{p1}/10)} + 10^{(L_{p2}/10)} + 10^{(L_{p3}/10)} + \dots\}$$

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

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

TABLE 7.9: PREDICTED NOISE INCREMENTAL VALUES FROM CLUSTER

| Location ID | N1 | N2 | N3 | N4 | N5 | N6 | N7 | N8 |
|-------------------------------------|--------------------|-------|----------------------------|-------|-------|------------------------------|-------|-------|
| Maximum Monitored Value (Day) dB(A) | 46.5 | 45.6 | 43.2 | 45.9 | 40.2 | 42.3 | 44.2 | 39.2 |
| Incremental Value dB(A) | 47.30 | 52.14 | 34.08 | 27.64 | 35.49 | 27.04 | 32.14 | 30.56 |
| Total Predicted Noise level dB(A) | 46.30 | 53.01 | 43.70 | 45.96 | 41.47 | 42.43 | 44.46 | 39.76 |
| NAAQ Standards | Industrial | | Day Time- 75 dB (A) | | | Night Time- 70 dB (A) | | |
| | Residential | | Day Time- 55 dB (A) | | | Night Time- 45 dB (A) | | |

Source: Lab Monitoring Data

The incremental noise level is found within the range of 27.04 – 35.49dB (A) in Buffer zone. The noise level at different receptors in buffer zone is lower due to the distance involved and other topographical features adding to the noise attenuation. The resultant Noise level due to monitored values and calculated values at the receptors are based on the mathematical formula considering attenuation due to Green Belt as 4.9 dB (A) the barrier effect. From the above table, it can be seen that the ambient noise levels at all the locations near habitations are within permissible limits of Residential Area (buffer zone) as per THE NOISE POLLUTION (REGULATION AND CONTROL) RULES, 2000 (The Principal Rules were published in the Gazette of India, vide S.O. 123(E), dated 14.2.2000 and subsequently amended vide S.O. 1046(E), dated 22.11.2000, S.O. 1088(E), dated 11.10.2002, S.O. 1569 (E), dated 19.09.2006 and S.O. 50 (E) dated 11.01.2010 under the Environment (Protection) Act, 1986.).

Ground Vibrations

Ground vibrations due to mining activities in the all the proposal quarry within cluster are anticipated due to operation of Mining Machines like Excavators, drilling and blasting, transportation vehicles, etc. However, the major source of ground vibration from the all the 2 proposal quarries is blasting. The major impact of the ground vibrations is observed on the domestic houses located in the villages nearby the mine lease area. The kuchha houses are more prone to cracks and damage due to the vibrations induced by blasting whereas RCC framed structures can withstand more ground vibrations. Apart from this, the ground vibrations may develop a fear factor in the nearby settlements.

Another impact due to blasting activities is fly rocks. These may fall on the houses or agricultural fields nearby the mining areas and may cause injury to persons or damage to the structures. Nearest Habitations from 8mines respectively are as in below Table 7.9

TABLE 7.10: NEAREST HABITATION FROM EACH MINE

| Location ID | Distance in Meters |
|--------------------|--------------------|
| Habitation Near P1 | 1000 |
| Habitation Near P2 | 990 |

Source: Satellite Imagery and Field Data

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

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

Where –

V = peak particle velocity (mm/s)

K = site and rock factor constant

Q = maximum instantaneous charge (kg)

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

R = distance from charge (m)

TABLE 7.11: GROUND VIBRATIONS AT 2MINES

| Location ID | Maximum Charge in kgs | Nearest Habitation in m | PPV in m/ms |
|-------------|-----------------------|-------------------------|-------------|
| P1 | 66 | 1000 | 0.226 |
| P2 | 56 | 990 | 0.202 |

Source: PPV Calculation

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

Socio Economic Environment –

The 7 mines shall provide employment and revenue will be created to government

TABLE 7.12: SOCIO ECONOMIC BENEFITS FROM 2MINES

| Location Code | Employment | Project Cost | CER |
|---------------|------------|-------------------------|-----------------------|
| P1 | 28 | Rs. 64,91,000/- | Rs.5,00,000/- |
| P2 | 26 | Rs. 52,70,000/- | Rs.5,00,000/- |
| Total | 54 | Rs 1,17,61,000/- | Rs.10,00,000/- |

A total of 54 people will get employment due to 2 mines Proposal in cluster. Allocation for Corporate Environment Responsibility (CER) shall be made as per Government of India, MoEF & CC Office Memorandum F.No.22-65/2017-IA.III, Dated: 01.05.2018 by all the mines.

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

- 2 mines Proposed projects shall fund towards CER – **Rs 10,00,000/-**

TABLE 7.13: GREENBELT DEVELOPMENT BENEFITS FROM 2 MINES

| CODE | No of Trees proposed to be planted | Survival % | Area Covered Sq.m | Name of the Species | No. of Trees expected to be grown |
|--------------|------------------------------------|------------|--|--|-----------------------------------|
| P1 | 1180 | 80% | Near 7.5m safety distance, panchayat road and village road | Neem, Pongania, Pinnata, Causarina etc.. | 940 |
| P2 | 760 | 80% | | | 600 |
| Total | 1,940 | 80% | | | 1,540 |

Based on the Proposed Mining Plans it's anticipated that there shall growth of native species of Neem, Casuarina, etc in the Cluster at a rate of 1,940 Trees Planted over a period of 5 Years with Survival Rate of 80% and expected growth is around 1,540 Trees over an area.

7.5 PLASTIC WASTE MANAGEMENT PLAN FOR P1

All the Project Proponent shall comply with Tamil Nadu Government Order (Ms) No. 84 Environment and Forest (EC.2) Department Dated: 25.06.2018 regarding ban on one time use and throw away plastics irrespective of thickness with effect from 01.01.2019 under Environment (Protection) Act, 1986.

Objective –

- To investigate the actual supply chain network of plastic waste.
- To identify and propose a sustainable plastic waste management by installing bins for collection of recyclables with all the plastic waste

- Preparation of a system design layout, and necessary modalities for implementation and monitoring.

TABLE 7.14: ACTION PLAN TO MANAGE PLASTIC WASTE

| Sl.No. | Activity | Responsibility |
|---------------|---|-----------------------|
| 1 | Framing of Layout Design by incorporating provision of the Rules, user fee to be charged from waste generators for plastic waste management, penalties/fines for littering, burning plastic waste or committing any other acts of public nuisance | Mines Manager |
| 2 | Enforcing waste generators to practice segregation of bio-degradable, recyclable and domestic hazardous waste | Mines Manager |
| 3 | Collection of plastic waste | Mines Foreman |
| 4 | Setting up of Material Recovery Facilities | Mines Manager |
| 5 | Segregation of Recyclable and Non-Recyclable plastic waste at Material Recovery Facilities | Mines Foreman |
| 6 | Channelization of Recyclable Plastic Waste to registered recyclers | Mines Foreman |
| 7 | Channelization of Non-Recyclable Plastic Waste for use either in Cement kilns, in Road Construction | Mines Foreman |
| 8 | Creating awareness among all the stakeholders about their responsibility | Mines Manager |
| 9 | Surprise checking's of littering, open burning of plastic waste or committing any other acts of public nuisance | Mine Owner |

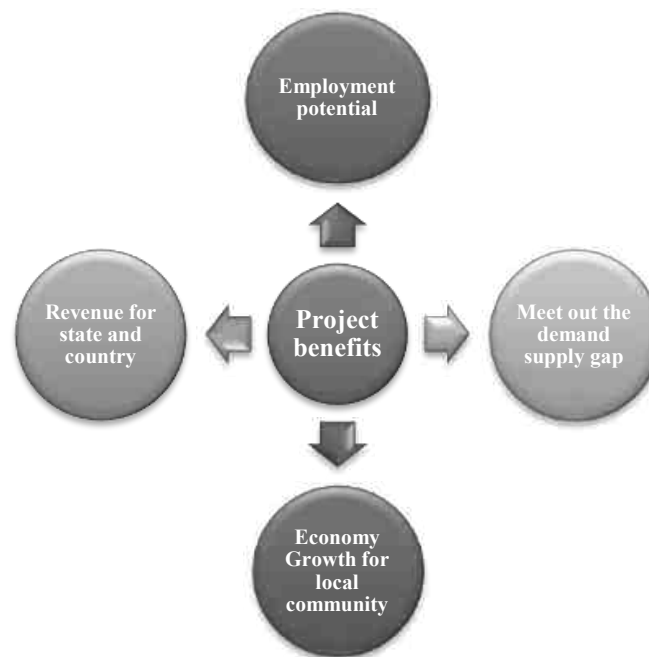
Source: Proposed by FAE's and EC

CHAPTER – 8: PROJECT BENEFITS

8.0 General

Tmt.K. Sangeetha Roughstone quarry Project at Vadapudur Village aims to produce 2,28,084m³ Rough Stone over a period of 5 Years & Topsoil nil. This will enhance the socio-economic activities in the adjoining areas and will result in the following benefits

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



8.1 Employment Potential

It is proposed to provide employment to about 28persons for carrying out mining operations and give preference to the local people in providing employment. In addition, there will be opportunity for indirect employment to many people in the form of contractual jobs, business opportunities, service facilities etc. the economic status of the local people will be enhanced due to mining project.

8.2 Socio-Economic Welfare Measures Proposed

The impact of mining activity in the area will be more positive than negative on the socio-economic environment in the immediate project impact area. The employment opportunities both direct and indirect will contribute to enhanced money incomes to job seekers with minimal skill sets especially among the local communities.

8.3 Improvement in Physical Infrastructure

The proposed project site is located in Vadapudur Village, Kinathukadavu Taluk, Coimbatore District of Tamil Nadu and the area have communications, roads and other facilities already well established. The following physical infrastructure facilities will further improve due to the cluster quarry projects.

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

8.4 Improvement in Social Infrastructure

The quarry projects in the region will have positive impact on the social economic condition of the area by way of providing employment to the local peoples; thereby increasing the per capita income, housing, education, medical and transportation facilities, economic status, health and agriculture.

- Social welfare program like medical camps, educational facilities to the poverty level students, providing water supply from the quarries during drought seasons will be taken from the project proponent's
- Supplementing Govt. efforts in health monitoring camps, social welfare and various Awareness programs among the rural population.

8.5 Other Tangible Benefits

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

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

CORPORATE SOCIAL RESPONSIBILITY

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

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

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

CSR Cost Estimation

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

CORPORATE ENVIRONMENT RESPONSIBILITY–

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

As per para 6 (II) of the office memorandum, all the mines being a green field project & Capital Investment is ≤ 100 crores, they shall contribute 2% of Capital Investment towards CER as per directions of EAC/SEAC and the total CER amount from the 2 proposed mines is Rs. 10,00,000/-.

TABLE 8.1 CER – ACTION PLAN

| Code | CER |
|--------------|-----------------------|
| P1 | Rs 5,00,000/- |
| P2 | Rs 5,00,000/- |
| Total | Rs.10,00,000/- |

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

CHAPTER – 9: ENVIRONMENTAL COST BENEFIT ANALYSIS

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

CHAPTER - 10: ENVIRONMENTAL MANAGEMENT PLAN – P1 (Tmt.K. Sangeetha)

10.1 General

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

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

10.2 Environmental Policy

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

The Proponent **Tmt.K.Sangeetha** will –

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

Description of the Administration and Technical Setup –

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

The said team will be responsible for:

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

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

10.3 Land Environment Management –

Land degradation is one of the major adverse impacts of opencast mining in the form of excavated voids and contamination of soil affects the viability of the soil resource.

Soil contamination then has a number of flow-on effects like, Inhabitation of plant growth, and death of existing plants in contaminated areas and contamination of soil also has potential to impact on a surface water quality and groundwater resources.

TABLE 10.1: PROPOSED CONTROLS FOR LAND ENVIRONMENT

| CONTROL | RESPONSIBILITY |
|---|----------------------------|
| Designing vehicle wash-down system so that all washed water is captured and passed through grease and oil separators. | Mines Manager |
| Re fueling will be carried out in a safe location, away from vehicle movement pathways | Mine Foreman & Mining Mate |
| Greenbelt development and its maintenance | Environment Officer |
| Garland drains with catch pits to be provided all around the project area to prevent run off affecting the surrounding lands. | Environment Officer |
| The periphery of Project area will be planted with thick plantation to arrest the fugitive dust, which will also act as acoustic barrier. | Mines Manager |
| Thick plantation using native flora species will be carried out on the top benches. | Mines Manager |
| There will be formation of a small surface water body in the mined-out area, which can be used for watering the greenbelt at the conceptual stages. | Environment Officer |

Source: Proposed by FAE's & EIA Coordinator

10.4 Soil Management

Top Soil Management –

- There is nil topsoil for this project site.

Overburden / Waste and Side Burden Management –

- The overburden in the form of topsoil formation, the topsoil will be directly loaded into tippers for the filling and levelling of low-lying areas, this will be done only after obtaining permission and paying necessary seigniorage fees to the Government.

TABLE 10.2: PROPOSED CONTROLS FOR SOIL MANAGEMENT

| CONTROL | RESPONSIBILITY |
|---|----------------------------|
| Garland drains are to be paved around the quarry pit area to arrest possible wash off in the rainy seasons | Mines Manager |
| Surface run-off from the surface water via garland drains will be diverted to the mine pits | Mine Foreman & Mining Mate |
| Design haul roads and other access roads with drainage systems to minimize concentration of flow and erosion risk | Environment Officer |
| keeping records of mitigation of erosion events, to improve on management techniques | Environment Officer |
| A monitoring map with information including their GPS coordinates, erosion type, intensity, and the extent of the affected area, as well as existing control measures and assessment of their performance | Environment Officer |
| Empty sediment from sediment traps Maintain, repair or upgrade garland drain system | Environment Officer |

| | |
|---|---------------|
| Test soils for pH, EC, chloride, exchangeable cations, particle size and water holding capacity | Mines Manager |
|---|---------------|

Source: Proposed by FAE's & EIA Coordinator

10.5 Water Management

In the proposed quarrying project, no process is involved for the effluent generation, only oil & grease from the machinery wash is anticipated and domestic sewage from mine office.

The quarrying operation is restricted upto a depth of 41BGL as per the ToR, the water table in the area is 73m – 68m below ground level, hence the proposed projects will not intersect the Ground water table during entire quarry period.

TABLE 10.3: PROPOSED CONTROLS FOR WATER ENVIRONMENT

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

Source: Proposed by FAE's & EIA Coordinator

10.6 Air Quality Management

The existing and proposed mining activities would result in the increase of particulate matter concentrations due to fugitive dust. Water sprinkling twice per day on the haul roads, approach roads in the vicinity would be undertaken and will be continued as there is possibility for dust generation due to truck mobility. It will be ensured that vehicles are properly maintained to comply with exhaust emission requirements.

TABLE 10.4: PROPOSED CONTROLS FOR AIR ENVIRONMENT

| CONTROL | RESPONSIBILITY |
|---|----------------|
| Generation of dust during excavation is minimized by daily (twice) water sprinkling on working face and daily (twice) water sprinkling on haul road | Mines Manager |
| Wet drilling procedure /drills with dust extractor system to control dust generation during drilling at source itself is implemented | Mines Manager |
| Maintenance as per operator manual of the equipment and machinery in the mines to minimizing air pollution | Mines Manager |
| Ambient Air Quality Monitoring carried out in the project area and in surrounding villages to assess the impact due to the mining activities and the efficacy of the adopted air pollution control measures | Mines Manager |

| | |
|---|---------------|
| Provision of Dust Mask to all workers | Mines Manager |
| Greenbelt development all along the periphery of the project area | Mines Manager |

Source: Proposed by FAE's & EIA Coordinator

10.7 Noise Management

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

TABLE 10.5: PROPOSED CONTROLS FOR NOISE ENVIRONMENT

| CONTROL | RESPONSIBILITY |
|--|----------------|
| Development of thick greenbelt all along the Buffer Zone (7.5 Meters) of the project area to attenuate the noise and the same will be maintained | Mines Manager |
| Preventive maintenance of mining machinery and replacement of worn-out accessories to control noise generation | Mines Foreman |
| Deployment of mining equipment with an inbuilt mechanism to reduce noise | Mines Manager |
| Provision of earmuff / ear plugs to workers working in noise prone zones in the mines | Mining Mate |
| Provision of effective silencers for mining machinery and transport vehicles | Mines Manager |
| Provision of sound proof AC operator cabins to HEMM | Mines Manager |
| Sharp drill bits are used to minimize noise from drilling | Mines Foreman |
| Controlled blasting technologies are adopted by using delay detonators to minimize noise from blasting | Mines Manager |
| Annual ambient noise level monitoring shall be carried out in the project area and in surrounding villages to assess the impact due to the mining activities and the efficacy of the adopted noise control measures. Additional noise control measures will be adopted if required as per the observations during monitoring | Mines Manager |
| Reduce maximum instantaneous charge using delays while blasting | Mining Mate |
| Change the burden and spacing by altering the drilling pattern and/or delay layout, or altering the hole inclination | Mines Manager |
| Undertake noise or vibration monitoring | Mines Manager |

Source: Proposed by FAE's & EIA Coordinator

10.8 Ground Vibration and Fly Rock Control

TABLE 10.6: PROPOSED CONTROLS FOR GROUND VIBRATIONS & FLY ROCK

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

| | |
|--|---------------|
| ensure blast holes are adequately stemmed for the depth of the hole and stemmed with suitable angular material | Mines Foreman |
|--|---------------|

Source: Proposed by FAE's & EIA Coordinator

10.8 Biological Environment Management

The proponent will take all necessary steps to avoid the impact on the ecology of the area by adopting suitable management measures in the planning and implementation stage. During mining, thick plantation will be carried out around the project periphery, on safety barrier zone, on top benches of quarried out area etc.,

Following control measures are proposed for its management and will be the responsibility of the Mines Manager.

- Greenbelt development all along the safety barrier of the project area
- It is also proposed to implement the greenbelt development programme and post plantation status will be regularly checked for every season.
- The main attributes that retard the survival of sapling is fugitive dust, this fugitive dust can be controlled by water sprinkling on the haul roads and installing a sprinkler unit near the newly planted area.
- Year wise greenbelt development will be recorded and monitored
 - Based on the area of plantation.
 - Period of plantation
 - Type of plantation
 - Spacing between the plants
 - Type of manuring and fertilizers and its periods
 - Lopping period, interval of watering
 - Survival rate
 - Density of plantation
- The ultimate reclamation planned leaves a congenial environment for development of flora & immigration of small fauna through green belt and water reservoir. The green belt and water reservoir developed within the Project at the end of mine life will attract the birds and animals towards the project area in the post mining period.

10.8.1 Green Belt Development Plan

About 1180 nos. of saplings is proposed to be planted for the Mining plan period in safety barrier of applied mine lease area with survival rate 80%. The greenbelt development plan has been prepared keeping in view the land use changes that will occur due to mining operation in the area.

TABLE 10.7 PROPOSED GREENBELT ACTIVITIES FOR 5 YEAR PLAN PERIOD – P1

| PROPOSAL – P2- Tmt.K. Sangeetha | | | | | |
|---------------------------------|-------------------------------------|------------|--|---|-----------------------------------|
| Year | No. of trees proposed to be planted | Survival % | Area to be covered sq.m | Name of the species | No. of trees expected to be grown |
| I | 1180 | 80% | Near 7.5m safety distance, panchayat road and village road | Neem, Pongamia Pinnata, Casuarina etc., | 940 |

Source: Conceptual Plan of Approved Mining plan& proposed by FAE's & EIA Coordinator

The objectives of the greenbelt development plan are –

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

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

10.8.2 Species Recommended for Plantation

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

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

TABLE 10.8: RECOMMENDED SPECIES TO PLANT IN THE GREENBELT – P1

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

Source: Proposed by FAE's & EIA Coordinator

10.9 Occupational Safety & Health Management

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

10.9.1 Medical Surveillance and Examinations –

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

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

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

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

TABLE 10.9: MEDICAL EXAMINATION SCHEDULE – P1

| Sl.No | Activities | 1 st Year | 2 nd Year | 3 rd Year | 4 th Year | 5 th Year |
|-------|--|----------------------|----------------------|----------------------|----------------------|----------------------|
| 1 | Initial Medical Examination (Mine Workers) | | | | | |
| A | Physical Check-up | | | | | |
| B | Psychological Test | | | | | |
| C | Audiometric Test | | | | | |
| D | Respiratory Test | | | | | |
| 2 | Periodical Medical Examination (Mine Workers) | | | | | |
| A | Physical Check - up | | | | | |
| B | Audiometric Test | | | | | |
| C | Eye Check - up | | | | | |
| D | Respiratory Test | | | | | |
| 3 | Medical Camp (Mine Workers & Nearby Villagers) | | | | | |
| 4 | Training (Mine Workers) | | | | | |

| Medical Follow ups:- Work force will be divided into three targeted groups age wise as follows:- | | |
|--|-----------------------------|------------------------|
| Age Group | PME as per Mines Rules 1955 | Special Examination |
| Less than 25 years | Once in a Three Years | In case of emergencies |
| Between 25 to 40 Years | Once in a Three Years | In case of emergencies |
| Above 40 Years | Once in a Three Years | In case of emergencies |

Medical help on top priority immediately after diagnosis/ accident is the essence of preventive aspects.

10.9.2 Proposed Occupational Health and Safety Measures –

- The mine site will have adequate drinking water supply so that workers do not get dehydrated.
- Lightweight and loose-fitting clothes having light colours will be preferred to wear.
- Noise exposure measurements will be taken to determine the need for noise control strategies.
- The personal protective equipment will be provided for mine workers.
- Supervisor will be instructed for reporting any problems with hearing protectors or noise control equipment.
- At noisy working activity, exposure time will be minimized.
- Dust generating sources will be identified and proper control measure will be adopted.
- Periodic medical examinations will be provided for all workers.
- Strict observance of the provisions of DGMS Acts, Rules and Regulations in respect of safety both by management and the workers.
- The width of road will be maintained more than thrice the width of the vehicle. A code of traffic rules will be implemented.
- In respect of contract work, safety code for contractors and workers will be implemented. They will be allowed to work under strict supervision of statutory person/officials only after they will impart training at vocational training centres. All personal protective equipment's will be provided to them.
- A safety committee meeting every month will be organized to discuss the safety of the mines and the persons employed.
- Celebration of annual mines safety week and environmental week in order to develop safety awareness and harmony amongst employees and co quarry owners.

FIGURE 10.1: PERSONAL PROTECTIVE EQUIPMENT TO THE MINE WORKERS – P1



10.9.3 Health and Safety Training Programme

The Proponents will provide special induction program along with machinery manufacturers for the operators and co-operators to run and maintain the machinery effectively and efficiently. The training program for the supervisors and office staffs will be arranged in the Group Vocational Training Centres in the State and engage Environmental Consultants to provide periodical training to all the employees to carry out the mining operation in and eco-friendly manner.

TABLE 10.10: LIST OF PERIODICAL TRAININGS PROPOSED FOR EMPLOYEES – P1

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

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

10.9.4 Budgetary Provision for Environmental Management –

Adequate budgetary provision has been made by the Company for execution of Environmental Management Plan. The Table 10.11 gives overall investment on the environmental safeguards and recurring expenditure for successful monitoring and implementation of control measures.

TABLE 10.11: EMP BUDGET FOR PROPOSED PROJECT – P1

| | Mitigation Measure | Provision for Implementation | Capital | Recurring |
|--------------------------|--|---|---------|-----------|
| Air Environment | Compaction, gradation and drainage on both sides for Haulage Road | Rental Dozer & drainage construction on haul road @ Rs. 10,000/- per hectare; and yearly maintenance @ Rs. 10,000/- per hectare | 23650 | 23650 |
| | Fixed Water Sprinkling Arrangements + Water sprinkling by own water tankers | Fixed Sprinkler Installation and New Water Tanker Cost for Capital; and Water Sprinkling (thrice a day) Cost for recurring | 800000 | 50000 |
| | Muffle blasting – To control fly rocks during blasting | Blasting face will be covered with sand bags / steel mesh / old tyres / used conveyor belts | 0 | 5000 |
| | Wet drilling procedure / latest eco-friendly drill machine with separate dust extractor unit | Dust extractor @ Rs. 25,000/- per unit deployed as capital & @ Rs. 2500 per unit recurring cost for maintenance - 6Units | 150000 | 15000 |
| | No overloading of trucks/tippers/tractors | Manual Monitoring through Security guard | 0 | 5000 |
| | Stone carrying trucks will be covered by tarpaulin | Monitoring if trucks will be covered by tarpaulin | 0 | 10000 |
| | Enforcing speed limits of 20 km/hr within ML area | Installation of Speed Governors @ Rs. 5000/- per Tipper/Dumper deployed - 3 Units | 15000 | 750 |
| | Regular monitoring of exhaust fumes as per RTO norms | Monitoring of Exhaust Fumes by Manual Labour | 0 | 5000 |
| | Regular sweeping and maintenance of approach roads for at least about 200 m from ML Area | Provision for 2 labours @ Rs.10,000/labour (Contractual) per Hectare | 0 | 47300 |
| | Installing wheel wash system near gate of quarry | Installation + Maintenance + Supervision | 50000 | 20000 |
| Noise Environment | Source of noise will be during operation of transportation vehicles, HEMM for this proper maintenance will be done at regular intervals. | Provision made in Operating Cost | 0 | 0 |

| | | | | |
|-------------------------|--|--|--------|--------|
| | Oiling & greasing of Transport vehicles and HEMM at regular interval will be done | Provision made in Operating Cost | 0 | 0 |
| | Adequate silencers will be provided in all the diesel engines of vehicles. | Provision made in Operating Cost | 0 | 0 |
| | It will be ensured that all transportation vehicles carry a fitness certificate. | Provision made in Operating Cost | 0 | 0 |
| | Safety tools and implements that are required will be kept adequately near blasting site at the time of charging. | Provision made in OHS part | 0 | 0 |
| | Line Drilling all along the boundary to reduce the PPV from blasting activity and implementing controlled blasting. | Provision made in Operating Cost | 0 | 0 |
| | Proper warning system before blasting will be adopted and clearance of the area before blasting will be ensured. | Blowing Whistle by Mining Mate / Blaster / Competent Person | 0 | 0 |
| | Provision for Portable blaster shed | Installation of Portable blasting shelter | 50000 | 2000 |
| | NONEL Blasting will be practiced to control Ground vibration and fly rocks | Rs. 30/- per 6 Tonnes of Blasted Material | 0 | 593018 |
| Waste Management | Waste management (Spent Oil, Grease etc.,) | Provision for domestic waste collection and disposal through authorized agency | 5000 | 20000 |
| | | Installation of dust bins | 5000 | 2000 |
| | Bio toilets will be made available outside mine lease on the land of owner itself | Provision made in Operating Cost | 0 | 0 |
| Mine Closure | 1. Progressive Closure Activity - Surface Runoff managment | Provision for garland drain @ Rs. 10,000/- per Hectare with maintenance of Rs. 5,000/- per annum | 23650 | 5000 |
| | 2. Progressive Closure Activity Barbed Wire Fencing to quarry area will be provisioned. | Per Hectare fencing Cost @ Rs. 2,00,000/- with Maintenance of Rs 10,000/- per annum | 473000 | 10000 |
| | 3. Progressive Closure Activity Green belt development - 500 trees per one hectare - Proposal for 1180Trees - (510 Inside Lease Area & 570 Outside Lease Area) | Site clearance, preparation of land, digging of pits / trenches, soil amendmets, transplantation of saplings @ 200 per plant (capital) for | 102000 | 15300 |

| | | | | |
|---|--|--|---------|-------|
| | | plantation inside the lease area and @ 30 per plant maintenance (recurring) | | |
| | | Avenue Plantation @ 300 per plant (capital) for plantation outside the lease area and @ 30 per plant maintenance (recurring) | 171000 | 17100 |
| | 4. Implementation of Final Mine Closure Activity as per Approved Mining Plan on Last Year | Few activities already covered as progressive closure activities as greenbelt development, wire fencing, garland drain. *For Final Closure Activities 15% of the proposed closure cost will be spent during the final mine closure stage - Last Year | 52350 | 0 |
| | 5. Contribution towards Green Fund. As per TNMMCR 1959, Rule 35 A | The Contribution towards Green Funds @ 10% of Seigniorage fee are indicated as part of EMP Budge and not necessarily implemented in the Project Site | 1345696 | 0 |
| Implementation of EC, Mining Plan & DGMS Condition | Size 6' X 5' with blue background and white letters as mentioned in MoM Appendix II by the SEAC TN | Fixed Display Board at the Quarry Entrance as permanent structure mentioning Environmental Conditions | 10000 | 1000 |
| | Air, Water, Noise and Soil Quality Sampling every 6 Months for Compliance Report of EC Conditions | Submission of 2 Half Yearly Compliance - Lab Monitoring Report as per CPCB norms | 0 | 50000 |
| | Workers will be provided with Personal Protective Equipment's | Provision of PPE @ Rs. 4000/- per employee with recurring based on wear and tear (say, @ Rs. 1000/- per employee) - 28Employees | 112000 | 28000 |
| | Health check up for workers will be provisioned | IME & PME Health check up @ Rs. 1000/- per employee | 0 | 28000 |

| | | | | |
|--------------|--|--|----------------|------------------|
| | First aid facility will be provided | Provision of 2 Kits per Hectare @ Rs. 2000/- | 0 | 4730 |
| | Mine will have safety precaution signages, boards. | Provision for signages and boards made | 10000 | 2000 |
| | No parking will be provided on the transport routes. Separate provision on the south side of the hill will be made for vehicles /HEMMs. Flaggers will be deployed for traffic management | Parking area with shelter and flags @ Rs. 50,000/- per hectare project and Rs. 10,000/- as maintenance cost | 118250 | 10000 |
| | Installation of CCTV cameras in the mines and mine entrance | Camera 4 Nos, DVR, Monitor with internet facility | 30000 | 5000 |
| | Implementation as per Mining Plan and ensure safe quarry working | Mines Manager (1 st Class / 2 nd Class / Mine Foreman) under regulation 34 / 34 (6) of MMR, 1961 and Mining Mate under regulation 116 of MMR,1961 @ 40,000/- for Manager & @ 25,000/- for Foreman / Mate | 0 | 780000 |
| CER | As per MoEF &CC OM 22-65/2017-IA.III Dated 25.02.2021 | Detailed Description in following slides and Budget allocation is included as per MoeEF & CC OM | 500000 | 0 |
| TOTAL | | | 2648550 | 1754848.4 |

In order to implement the environmental protection measures, an amount of Rs.26.48 lakhs as capital cost and recurring cost as Rs. 17.54 lakhs as recurring cost is proposed considering present market price considering present market scenario for the proposed project.

| Year Wise Break Up | |
|--------------------|-------------|
| 1st Year | ₹ 4403398.4 |
| 2nd Year | ₹ 1842590.8 |
| 3rd Year | ₹ 1934720.4 |
| 4th Year | ₹ 2031456.4 |

| | |
|----------|-------------|
| 5th Year | ₹ 2185379.2 |
| Total | ₹ 124 lakhs |

10.10 CONCLUSION –

Various aspects of mining activities were considered and related impacts were evaluated. Considering all the possible ways to mitigate the environmental concerns Environmental Management Plan was prepared and fund has been allocated for the same. The EMP is dynamic, flexible and subjected to periodic review. For project where the major environmental impacts are associated, EMP will be under regular review. Senior Management responsible for the project will conduct a review of EMP and its implementation to ensure that the EMP remains effective and appropriate. Thus, the proper steps will be taken to accomplish all the goals mentioned in the EMP and the project will bring the positive impact in the study area.

CHAPTER – 11: SUMMARY AND CONCLUSIONS

Tmt.K. Sangeetha Rough Stone Quarry (2.36.5Ha) falls under “B” category as per MoEF & CC Notification (S.O. 3977 (E)).

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

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

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

The main scope of the EIA study is to quantify the cumulative impact in the study area due to cluster quarries and formulate the effective mitigation measures for each individual leases. A detailed account of the emission sources, emissions control equipment, background Air quality levels, Meteorological measurements, Dispersion model and all other aspects of pollution like effluent discharge, Dust generation etc., have been discussed in this report. The baseline monitoring study has been carried out during the months December 2022 to Feb 2023 for various environmental components so as to assess the anticipated impacts of the quarry project on the environment and suitable mitigation measures for likely adverse impacts due to the proposed project is suggested individually for the respective proposed project under Chapter 10.

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

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

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

Sustainable and modern mining leads us to see positive impact of mining operation and providing consistent employment for nearly 28 people directly in the cluster and indirectly around 100 people.

As discussed, it is safe to say that the proposed quarries are not likely to cause any significant impact to the ecology of the area, as adequate preventive measures will be adopted to keep the various pollutants within the permissible limits. Green belt development around the area will also be taken up as an effective pollution mitigate technique, as well as to serve as biological indicators for the pollutants released from the Tmt.K. Sangeetha Rough Stone Quarry (2.36.5Ha).

CHAPTER 12.0: DISCLOSURE OF CONSULTANTS

The Project Proponent's –

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

Name and address of the consultancy:

GEO EXPLORATION AND MINING SOLUTIONS

No 17, Advaita Ashram Road,

Alagapuram, Salem – 636 004

Tamil Nadu, India

Email: infogeoexploration@gmail.com

Web: **www.gemssalem.com**

Phone: 0427 2431989.

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

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

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

DECLARATION BY EXPERTS CONTRIBUTING TO THE EIA/EMP

Declaration by experts contributing to the Draft EIA/EMP for Tmt.K. Sangeetha Rough Stone Quarry (2.36.5Ha) in Vadapudur Village, Kinathukadavu Taluk, Coimbatore District of Tamil Nadu. It is also certified that information furnished in the above EIA study are true and correct to the best of our knowledge.

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

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

Designation: **EIA Coordinator**

Date & Signature:




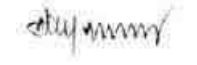

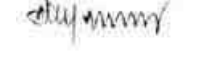



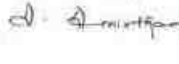









Period of Involvement: **January 2022 to till date**

Associated Team Member with EIA Coordinator:



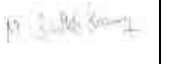
1. **Mr. S. Nagamani**
2. **Mr. Viswanathan**
3. **Mr. Santhoshkumar**
4. **Mr. S. Ilavarasan**

FUNCTIONAL AREA EXPERTS ENGAGED IN THE PROJECT

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

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

LIST OF TEAM MEMBERS ENGAGED IN THIS PROJECT

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

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

DECLARATION BY THE HEAD OF THE ACCREDITED CONSULTANT ORGANIZATION

I, Dr. M. Ifthikhar Ahmed, Managing Partner, Geo Exploration and Mining Solutions, hereby, confirm that the above-mentioned Functional Area Experts and Team Members prepared the Draft EIA/EMP for Tmt.K. Sangeetha Rough Stone Quarry (2.36.5Ha) in Vadapudur Village, Kinathukadavu Taluk, Coimbatore District of Tamil Nadu. It is also certified that information furnished in the EIA study are true and correct to the best of our knowledge.

Signature& Date:



Name:

Dr. M. Ifthikhar Ahmed

Designation:

Managing Partner

Name of the EIA Consultant Organization:

M/s. Geo Exploration and Mining Solutions

NABET Certificate No & Issue Date:

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

Validity:

Valid till 06.08.2025

ANNEXURE
Tmt.K. SANGEETHA ROUGH
STONE QUARRY

Vadapudur Village,
Kinathukadavu Taluk,
Coimbatore District

EXTENT = 2.36.5Ha

ToR obtained

Lr No. SEIAA-TN/F.No.8886/ToR-1116/2022 Dated: 23.03.2022-P1

Project Proponent
Tmt.K.Sangeetha
W/o. Kumaresh, No.13,
Nethaji Street,
Bagavathipalayam,
Kinathukadavu,
Coimbatore District – 642109

LIST OF ANNEXURES

| Annexure No | DESCRIPTION | PAGE NO |
|--------------------------------------|---|----------------|
| P1 Tmt.K. Sangeetha | COPY OF TERMS OF REFERENCE | 1A - 18A |
| | COPY OF 500M RADIUS QUARRIES DETAILS AND EXISTING PIT LETTER | 19A - 22A |
| | COPY OF MINING PLAN APPROVED LETTER | 23A - 24A |
| | COPY OF APPROVED MINING PLAN WITH PLATES | 25A - 90A |
| | COPY OF ADDITIONAL DOCUMENT | 91A - 121A |
| P2 Thiru.S. Ramesh | COPY OF 500M RADIUS QUARRIES DETAILS | 122A - 123A |
| | COPY OF BASE LINE MONITORING DATA | 124A - 167A |
| | COPY OF NABET CERTIFICATE | 168A |



TMT.P.RAJESWARI, I.F.S.,
MEMBER SECRETARY

STATE LEVEL ENVIRONMENT IMPACT
ASSESSMENT AUTHORITY – TAMIL NADU

3rd Floor, Panagal Maaligai,
No.1, Jeenis Road, Saidapet,
Chennai-15.
Phone No. 044-24359973
Fax No. 044-24359975

TERMS OF REFERENCE (ToR)

Lr No.SEIAA-TN/F.No.8886/ToR-1116/2022 Dated: 23.03.2022.

To

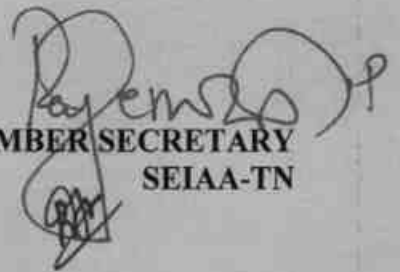
Tmt.K.Sangeetha
W/o.Kumaresh
No.13, Nethaji Street
Bagavathipalayam
Kinathukadavu Taluk
Coimbatore District-642109.

Sir / Madam,

Sub: SEIAA, Tamil Nadu – Terms of Reference with public Hearing (ToR) for the proposed Rough stone quarry lease over an extent of 2.36.5Ha in S.F.No.423/2 (P) Vadapudur Village, Kinathukadavu Taluk, Coimbatore District, Tamil Nadu by Tmt.K.Sangeetha - 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/69057/2021 Dt.11.11.2021.
 2. Your application submitted for Terms of Reference dated: 21.01.2022.
 3. Minutes of the 251st SEAC meeting held on 04.3.2022.
 4. Minutes of the 495th Authority meeting held on 23.03.2022.

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


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The proponent, Tmt.K.Sangeetha has submitted application for Terms of Reference (ToR) with public Hearing on 21.01.2022, in Form-I, Pre- Feasibility report for the proposed Rough stone quarry lease over an extent of 2.36.5Ha in S.F.No.423/2 (P) Vadapudur Village, Kinathukadavu Taluk, Coimbatore District, Tamil Nadu.

Discussion by SEAC and the Remarks:-

Proposed Rough stone quarry lease over an extent of 2.36.5 Ha in S.F.No.423/2 (P) Vadapudur Village, Kinathukadavu Taluk, Coimbatore District, Tamil Nadu by Tmt.K.Sangeetha - For Terms of Reference.

(SIA/TN/MIN/69057/2021 Dt.11.11.2021)

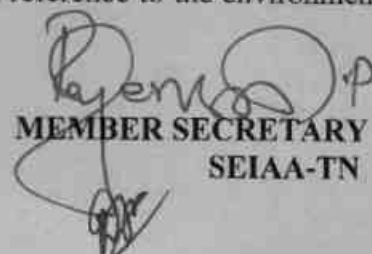
The proposal was placed in 251st SEAC meeting held on 4.3.2022. The project proponent has given a detailed presentation. The details of the project furnished by the proponent are given in the website (parivesh.nic.in).

The project proponent gave detailed presentation. SEAC noted the following:

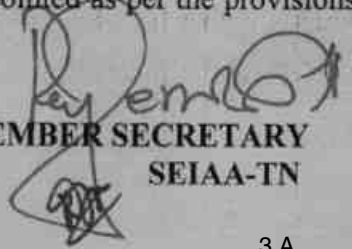
1. The Project Proponent Tmt.K.Sangeetha has applied for Terms for Reference for the proposed Rough stone quarry lease over an extent of 2.36.5 Ha in S.F.No.423/2 (P) Vadapudur Village, Kinathukadavu Taluk, Coimbatore District, Tamil Nadu.
2. The project/activity is covered under Category "B1" of Item 1(a) "Mining Projects" of the Schedule to the EIA Notification, 2006.
3. The Production for the five years states that total quantity should not exceed 2,28,084m³ of Rough stone with an ultimate depth of mining is 41m (16m above ground level + 25m below ground level).

Based on the presentation made by the proponent and the documents furnished, SEAC decided to **recommend the proposal for the grant of Terms of Reference (TOR) with Public Hearing** for the production for the five years states that total quantity should not exceed 2,28,084m³ of Rough stone with an ultimate depth of mining is 41m (16m above ground level & 25m below ground level, Subject to the following TORs, in addition to the standard terms of reference for EIA study for non-coal mining projects and details issued by the MOEF & CC to be included in EIA/EMP Report:

1. The Proponent shall carry out the cumulative & comprehensive impact study due to mining operations carried out in the quarry cluster specifically with reference to the environment in


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- 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.
2. The certified existing EC compliance report shall be included in the EIA Report.
 3. The entire Cluster of mine lease area along with green belt shall be video graphed through Drone and submit the same along with EIA report.
 4. If the proponent has already carried out the mining activity in the proposed mining lease area after 15.01.2016, then the proponent shall furnish the following details from AD/DD, mines,
 - a) What was the period of the operation and stoppage of the earlier mines with last work permit issued by the AD/DD mines?
 - b) Quantity of minerals mined out.
 - c) Highest production achieved in any one year
 - d) Detail of approved depth of mining.
 - e) Actual depth of the mining achieved earlier.
 - f) Name of the person already mined in that leases area.
 - g) If EC and CTO already obtained, the copy of the same shall be submitted.
 - h) Whether the mining was carried out as per the approved mine plan (or EC if issued) with stipulated benches.
 5. 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).
 6. 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.
 7. 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.
 8. 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


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- of Mines Act 1952 and the MMR, 1961 for carrying out the quarrying operations scientifically and systematically in order to ensure safety and to protect the environment.
9. The Project Proponent shall conduct the hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) along with the collected water level data for both monsoon and non-monsoon seasons from the PWD / TWAD so as to assess the impacts on the wells due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided.
 10. 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.
 11. 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.
 12. A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific.
 13. The Public hearing advertisement shall be published in one major National daily and one most circulated vernacular daily.
 14. The recommendation for the issue of "Terms of Reference" is subjected to the outcome of the Hon'ble NGT, Principal Bench, New Delhi in O.A No.186 of 2016 (M.A.No.350/2016) and O.A. No.200/2016 and O.A.No.580/2016 (M.A.No.1182/2016) and O.A.No.102/2017 and O.A.No.404/2016 (M.A.No.758/2016, M.A.No.920/2016, M.A.No.1122/2016, M.A.No.12/2017 & M.A. No. 843/2017) and O.A.No.405/2016 and O.A.No.520 of 2016 (M.A.No.981/2016, M.A.No.982/2016 & M.A.No.384/2017).
 15. The purpose of Green belt around the project is to capture the fugitive emissions, carbon sequestration and to attenuate the noise generated, in addition to improving the aesthetics. A wide range of indigenous plant species should be planted as given in the **appendix** in consultation with the DFO, State Agriculture University and local school/college authorities. The plant species with dense/moderate canopy of native origin should be

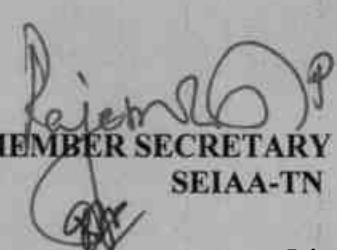

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- chosen. Species of small/medium/tall trees alternating with shrubs should be planted in a mixed manner.
16. Taller/one year old Saplings raised in appropriate size of bags, preferably eco-friendly bags should be planted in proper espacement as per 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.
 17. A Disaster management Plan shall be prepared and included in the EIA/EMP Report.
 18. A Risk Assessment and management Plan shall be prepared and included in the EIA/EMP Report.
 19. 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.
 20. If any quarrying operations were carried out in the proposed quarrying site for which now the EC is sought, the Project Proponent shall furnish the detailed compliance to EC conditions given in the previous EC with the site photographs which shall duly be certified by MoEF&CC, Regional Office, Chennai (or) the concerned DEE/TNPCB.
 21. Concealing any factual information or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this Terms of Reference besides attracting penal provisions in the Environment (Protection) Act, 1986.

Appendix

List of Native Trees Suggested for Planting

1. *Aegle marmelos* - Vilvam
2. *Adenaanthera pavonina* - Manjadi
3. *Albizia lebbeck* - Vaagai
4. *Albizia amara* - Usil
5. *Bauhinia purpurea* - Mantharai
6. *Bauhinia racemosa* - Aathi
7. *Bauhinia tomentosa* - Iruvathi
8. *Buchanania aillaris* - Kattuma
9. *Borassus flabellifer* - Panai


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


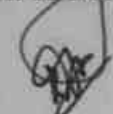

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46. *Pterospermum xylocarpum* - Polavu
47. *Puthranjiva roxburghii* - Puthranjivi
48. *Salvadora persica* - Uгаа Maram
49. *Sapindus emarginatus* - Manipungan, Soapu kai
50. *Saraca asoca* - Asoca
51. *Streblus asper* - Piraya maram
52. *Strychnos nuxvomica* - Yetti
53. *Strychnos potatorum* - Therthang Kottai
54. *Syzygium cumini* - Naval
55. *Terminalia bellerica* - Thandri
56. *Terminalia arjuna* - Ven marudhu
57. *Toona ciliate* - Sandhana vembu
58. *Thespesia populnea* - Puvarasu
59. *Walsura trifoliata* - valsura
60. *Wrightia tinctoria* - Vep


Discussion by SEIAA and the Remarks:-

The subject was placed in the 495th Authority meeting held on 23.03.2022. After detailed discussions, the Authority accepts the recommendation of SEAC and decided to grant Terms of Reference (ToR) along with Public Hearing under cluster for undertaking the combined Environment Impact Assessment Study and preparation of separate Environment Management Plan subject to the conditions as recommended by SEAC & normal condition in addition to the following conditions:

1. 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.
2. 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.
3. 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.

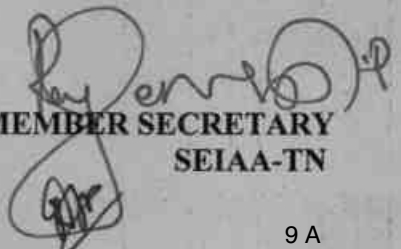

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4. Action should specifically suggest for sustainable management of the area and restoration of ecosystem for flow of goods and services.
5. The project proponent shall study impact on fish habitats and the food WEB/ food chain in the water body and Reservoir.
6. The Terms of Reference should specifically study impact on soil health, soil erosion, the soil physical, chemical components and microbial components.
7. The Environmental Impact Assessment should study impact on forest, vegetation, endemic, vulnerable and endangered indigenous flora and fauna.
8. The Environmental Impact Assessment should study impact on standing trees and the existing trees should be numbered and action suggested for protection.
9. The Environmental Impact Assessment should study on wetlands, water bodies, rivers streams, lakes and farmer sites.
10. The Environmental Impact Assessment should hold detailed study on EMP with budget for Green belt development and mine closure plan including disaster management plan.
11. The Environmental Impact Assessment should study impact on climate change, temperature rise, pollution and above soil & below soil carbon stock.
12. The Environmental Impact Assessment should study impact on protected areas, Reserve Forests, National Parks, Corridors and Wildlife pathways, near project site.
13. The project proponent shall study and furnish the impact of project on plantations in adjoining patta lands, Horticulture, Agriculture and livestock.
14. The project proponent shall study and furnish the details on potential fragmentation impact of natural environment, by the activities.
15. 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.
16. 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.
17. The project proponent shall detailed study on impact of mining on Reserve forests free ranging wildlife.


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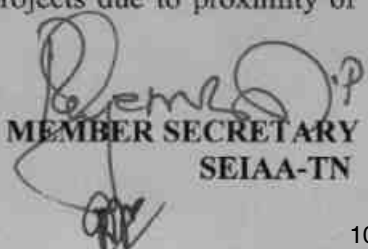
A. STANDARD TERMS OF REFERENCE

- 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


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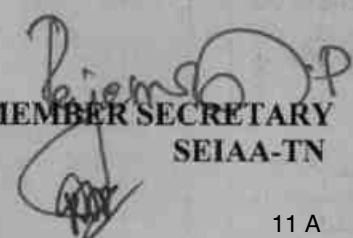
safeguard measures in each case should also be provided.

- 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


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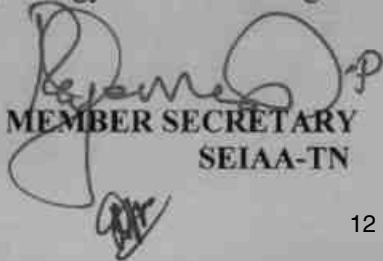
ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished.

- 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

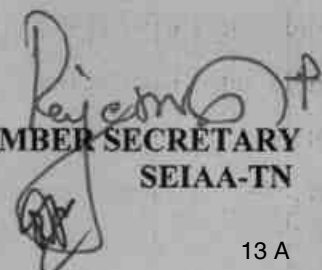

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shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the 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.

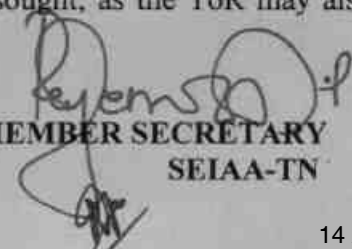
- 23) Air quality modeling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of Vehicles for transportation of mineral. The details of the model used and input parameters used for modeling should be provided. 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.


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- 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.


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- 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


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have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH again with the revised documentation.

- i) As per the circular no. J-11011/618/2010-IA.II(I) dated 30.5.2012, certified report of the status of compliance of the conditions stipulated in the Environment Clearance for the existing operations of the project, should be obtained from the Regional Office of Ministry of Environment, Forest and Climate Change, as may be applicable.
- j) The EIA report should also include (i) surface plan of the area indicating contours of main topographic features, drainage and mining area, (ii) geological maps and sections and (iii) sections of the mine pit and external dumps, if any, clearly showing the land features of the adjoining area.

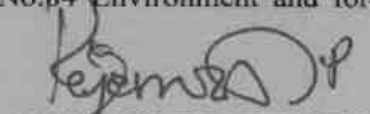
In addition to the above, the following shall be furnished:-

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

1. Project name and location (Village, District, State, Industrial Estate (if applicable).
2. Process description in brief, specifically indicating the gaseous emission, liquid effluent and solid and hazardous wastes.
3. Measures for mitigating the impact on the environment and mode of discharge or disposal.
4. Capital cost of the project, estimated time of completion.
5. The proponent shall furnish the contour map of the water table detailing the number of wells located around the site and impacts on the wells due to mining activity.
6. A detailed study of the lithology of the mining lease area shall be furnished.
7. Details of village map, "A" register and FMB sketch shall be furnished.
8. Detailed mining closure plan for the proposed project approved by the Geology of Mining department shall be submitted along with EIA report.
9. Obtain a letter /certificate from the Assistant Director of Geology and Mining standing that there is no other Minerals/resources like sand in the quarrying area within the approved depth of mining and below depth of mining and the same shall be furnished in the EIA report.
10. EIA report should strictly follow the Environmental Impact Assessment Guidance Manual for Mining of Minerals published February 2010.
11. Detail plan on rehabilitation and reclamation carried out for the stabilization and restoration of the mined areas.


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


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(EC.2) Department dated 25.06.2018 regarding ban on one time use and throw away plastics irrespective of thickness with effect from 01.01.2019 under Environment (Protection) Act, 1986. In this connection, the project proponent has to furnish the action plan.

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

- a. A note confirming compliance of the TOR, with cross referencing of the relevant sections / pages of the EIA report should be provided.
- b. All documents may be properly referenced with index, page numbers and continuous page numbering.
- c. Where data are presented in the report especially in tables, the period in which the data were collected and the sources should be indicated.
- d. While preparing the EIA report, the instructions for the proponents and instructions for the consultants issued by MoEF & CC vide O.M. No. J-11013/41/2006-IA.II (I) dated 4th August, 2009, which are available on the website of this Ministry should also be followed.
- e. The consultants involved in the preparation of EIA/EMP report after accreditation with Quality Council of India (QCI)/National Accreditation Board of Education and Training (NABET) would need to include a certificate in this regard in the EIA/EMP reports prepared by them and data provided by other organization/Laboratories including their status of approvals etc. In this regard circular no F. No.J -11013/77/2004-IA-II(I) dated 2nd December, 2009, 18th March 2010, 28th May 2010, 28th June 2010, 31st December 2010 & 30th September 2011 posted on the Ministry's website <http://www.moef.nic.in/> may be referred.
 - After preparing the EIA (as per the generic structure prescribed in Appendix-III of the EIA Notification, 2006) covering the above mentioned points, the proponent will take further necessary action for obtaining environmental clearance in accordance with the procedure prescribed under the EIA Notification, 2006.
 - The final EIA report shall be submitted to the SEIAA, Tamil Nadu for obtaining Environmental Clearance.
 - The TORs with public hearing prescribed shall be **valid for a period of three years** from the date of issue, for submission of the EIA/EMP report as per OMNo.J-11013/41/2006-IA-II(I)(part) dated 29th August, 2017.


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Copy to:

1. The Additional Chief Secretary to Government, Environment & Forests Department, Govt. of Tamil Nadu, Fort St. George, Chennai - 9
2. The Chairman, Central Pollution Control Board, Parivesh Bhavan, CBD Cum-Office Complex, East Arjun Nagar, New Delhi 110032.
3. The Member Secretary, Tamil Nadu Pollution Control Board, 76, Mount Salai, Guindy, Chennai-600 032.
4. 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 110003
6. The District Collector, Coimbatore District.
7. The EO/BDO, Vadapudur Village, Kinathukadavu Taluk, Coimbatore District
8. Stock File.



From

Thiru.S.Rameshkumar, M.Sc.,
Assistant Director,
Dept. of Geology and Mining,
Coimbatore.

To

Tmt.K.Sangeetha,
W/o.Kumaresh,
No.13, Nethaji Street,
Bagavathipalayam,
Kinathukadavu,
Coimbatore.

Rc.No.764/Mines/2020 Dated: 22.09.2021

Sir,

Sub: Mines & Minerals - Minor Mineral - Coimbatore District - Kinathukadavu Taluk - Vadapudur Village - Survey No. 423/2 (Part) - over an extent of 2.36.5 hectares of patta land - Application preferred by Tmt.K.Sangeetha for quarrying Roughstone - Precise area communicated - Details of quarries situated within 500 meter radial distance - Requested - furnished - reg.

- Ref. 1. Assistant Director, Dept. of Geology and Mining, Coimbatore Letter Rc.No.764/Mines/2020, Dated: 03.08.2021.
2. Tmt.K.Sangeetha letter dated: 20.09.2021

I invite kind attention to the reference cited wherein Tmt.K.Sangeetha has been issued precise area for the grant of quarry lease for Rough Stone over an extent of 2.36.5 hectares of patta land in Survey No. 423/2 (Part) of Vadapudur Village, Kinathukadavu Taluk, Coimbatore District.

In the reference 2nd cited of Tmt.K.Sangeetha has requested to furnish the details of quarries situated within 500 meter radial distance from the proposed area.

In this connection the details of abandoned, expired, existing and proposed quarries situated within 500 meter radial distance from the proposed area is furnished below.

i) **Existing Quarries**

| Sl. No. | Name of the Owner | Village & S.F.Nos. | Extent in Hect. | Lease period | Remarks |
|-----------|-------------------|--------------------|-----------------|--------------|---------|
| ---Nil--- | | | | | |

ii) Expired Quarries

| Sl. No. | Name of the Owner | Village & S.F.Nos. | Extent in Hect. | Lease period | Remarks |
|---------|---------------------------|----------------------------|-----------------|--------------------------|---------|
| 1 | Thiru.K.Ramalinga Gounder | Kinathukadavu 148/1 (Part) | 1.45.0 | 03.03.2016 to 02.03.2021 | |

iii) Abandoned quarries


| Sl. No. | Name of the Owner | Village & S.F.Nos. | Extent in Hect. | Lease period | Remarks |
|-----------|-------------------|--------------------|-----------------|--------------|---------|
| ---NIL--- | | | | | |

iv) Proposed quarries

| Sl. No. | Name of the Owner | Village & S.F.Nos. | Extent in Hect. | Remarks |
|---------|-------------------|-----------------------|-----------------|--|
| 1 | Tmt.K.Sangeetha | Vadapudur 423/2(P) | 2.36.5 | Subject area Precise area communicated |
| 2 | Thiru.S.Ramesh | Vadapudur 423/1(Part) | 1.52.0 | Pending with SEIAA |

v) Future Proposed quarries

| Sl. No. | Name of the Owner | Village & S.F.Nos. | Extent in Hect. | Remarks |
|-----------|-------------------|--------------------|-----------------|---------|
| ---NIL--- | | | | |


 Assistant Director,
 Dept. of Geology and Mining,
 Coimbatore.

22/9/21

From
Thiru.S.Rameshkumar, M.Sc.,
Assistant Director,
Dept. of Geology and Mining,
Coimbatore.

To
Tmt.K.Sangeetha,
W/o.Kumaresh,
No.13, Nethaji Street,
Bagavathipalayam,
Kinathukadavu,
Coimbatore.

Rc.No.764/Mines/2020 Dated: 22.09.2021

Sir,

Sub : Mines & Minerals – Minor Mineral – Coimbatore District
– Kinathukadavu Taluk – Vadapudur Village - Survey
No. 423/2 (Part) - over an extent of 2.36.5 hectares of
patta land - Application preferred by Tmt.K.Sangeetha for
quarrying Roughstone – Precise area communicated –
Mining Plan – approved – further particulars called for –
furnished - regarding.


- Ref: 1. Assistant Director, Dept. of Geology and Mining,
Coimbatore Letter Rc.No.764/Mines/2020, Dated:
03.08.2021.
2. Tmt.K.Sangeetha letter dated: 20.09.2021.

In the reference 2nd cited Tmt.K.Sangeetha has requested to
furnish certain particulars regarding the precise area granted in Survey
No. 423/2(Part) over an extent of 2.36.5 hectares of patta land in
Vadapudur Village, Kinathukadavu Taluk, Coimbatore District. In this
connection the following details are furnished.

The area was previously held under quarry lease and the details
are as follows,

| Sl. No. | Name of the Exlessee | SF.No/ Extent | District Collector's proceedings No. & Date | Validi ty | Lease Period |
|---------|----------------------|------------------|---|------------|--------------------------------|
| 1 | Tmt.Sadayammal | 423/2 3.78.0 | MM-4/209/99 Dt: 06.05.1999 | 5 Years | 01.07.1999 to 30.06.2004 |
| 2 | Tmt.Sadayammal | 423/2 3.78.0 | 746/2004/MM- 1 Dt: 15.07.2004 | 5 Years | 25.07.2004 to 24.07.2009 |
| 3 | Thru.N.Ramkumar | 423/2 3.78.0 | 125/2010/MM- 2 Dt: 21.05.2010 | 5 Years | 21.05.2010 to 20.05.2015 |
| 4 | Tmt.K.Sangeetha | 423/2 3.78.0 | 312/2015/Mine s Dt: 23.09.2016 | 5 Years | 23.09.2016 to 22.09.2021 |

At the time of inspection, the quarry pit with a dimension of 260 Meter (length) X 82 Meter (width) X 10 Meter (Max depth) is noticed in the applied area.


Assistant Director,
Dept. of Geology and Mining,
Coimbatore.



From
Thiru.S.Rameshkumar, M.Sc.,
Assistant Director,
Dept. of Geology and Mining,
Coimbatore.

To
Tmt.K.Sangeetha,
W/o.Kumaresh,
No.13, Nethaji Street,
Bagavathipalayam,
Kinathukadavu,
Coimbatore.

Rc.No.764/Mines/2020 Dated: 22.09.2021

Sir,

Sub: Mines & Minerals - Minor Mineral - Coimbatore District - Kinathukadavu Taluk - Vadapudur Village - Survey No. 423/2 (Part) - over an extent of 2.36.5 hectares of patta land - Application preferred by Tmt. K.Sangeetha for quarrying Roughstone - Submission of mining plan for approval - approved - regarding.

- Ref: 1. Quarry lease application dated 19.10.2020 preferred by Tmt.K.Sangeetha, Kinathukadavu Taluk, Coimbatore District.
2. Assistant Director, Dept. of Geology and Mining, Coimbatore Letter Rc.No.764/Mines/2020, Dated: 03.08.2021
3. Mining Plan submitted by Tmt.K.Sangeetha dated: 20.09.2021.


In response to the precise area communicated by the Assistant Director of Geology and Mining, Coimbatore, the applicant Tmt.K.Sangeetha vide reference 3rd cited has submitted three copies of mining plan for the area applied for the grant of quarry lease for Roughstone over an extent of 2.36.5 hectares of patta land in Survey No. 423/2(Part) of Vadapudur Village, Kinathukadavu Taluk, Coimbatore District.

2. The mining plan submitted for the grant of quarry lease for Roughstone over an extent of 2.36.5 hectares of patta land in Survey No. 423/2 (Part) of Vadapudur Village, Kinathukadavu Taluk, Coimbatore District has been verified in detail.

3. As per the guidelines/instructions issued by the Commissioner of Geology and Mining, Chennai vide letter Rc.No.3868/LC/2012, dated 19.11.2012, the mining plan is hereby approved, subject to the following conditions:

- (i) The mining plan is approved without prejudice to any other Law applicable to the quarry lease from time to time whether such laws are made by the Central Government, State Government or any other authority.
- (ii) This approval of the mining plan does not in any way imply the approval of the Government in terms or any other provisions of the Mines and Minerals (Development and Regulation) Amended Act, 2015, or any other connected laws including Forest (Conservation) Act, 1980, Forest Conservation Rules, 1981, Environment Protection Act, 1980, Explosives Act, 1884 (Central Act IV of 1884) and the Rules made there under and the Tamil Nadu Minor Mineral Concession Rules, 1959.
- (iii) The mining plan is approved without prejudice to any other order or direction from any court of competent jurisdiction.
- (iv) As per the Assistant Director, Dept. of Geology and Mining, Coimbatore letter Rc.No.764/Mines/2020, Dated: 03.03.2021 the following conditions have been incorporated in the Mining Plan .
- a) No hindrance should be caused to the adjacent pattadars and public.
- b) A safety distance of 7.5 meters should be provided for the adjacent patta lands from the lease applied area.
- v) Quarrying shall be done as per the approved Mining Plan and that the mining plan is approved without prejudice to any other law applicable to the quarry lease from time to time whether such laws are made by the Central Government, State Government or any other authority.

Encl: Two copies of Approved Mining Plan.


Assistant Director,
Dept. of Geology and Mining,
Coimbatore.

Copy submitted to:
The Director of Geology and Mining, Chennai-32.



**MINING PLAN AND PROGRESSIVE QUARRY
CLOSURE PLAN FOR VADAPUDUR
ROUGH STONE QUARRY**



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

Patta Land / Lease Period = Five Years

IN

LOCATION OF THE QUARRY LEASE APPLIED AREA

EXTENT : 2.36.5ha
S.F.NO : 423/2 (P)
VILLAGE : VADAPUDUR
TALUK : KINATHUKADAVU
DISTRICT : COIMBATORE
STATE : TAMIL NADU

FOR

APPLICANT

Tmt.K.Sangeetha,

W/o. Kumaresh,

No.13, Nethaji Street, Bagavathipalayam,

Kinathukadavu,

Coimbatore District – 642 109,

Tamil Nadu State.

PREPARED BY

Dr. P. Thangaraju, M.Sc., Ph.D.,

Qualified Person

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

Alagapuram, Salem District – 636 004.

Cell: +91 94422 78601 & 94433 56539.

E-mail: infogeoexploration@gmail.com

K.Sangeetha,
W/o. Kumaresh,
No.13, Nethaji Street, Bagavathipalayam,
Kinathukadavu,
Coimbatore District – 642 109,
Tamil Nadu State.



CONSENT LETTER FROM APPLICANT

The Mining Plan and Progressive Quarry Closure Plan in Respect of Vadapudur Rough stone Quarry in S.F.No.423/2 (P) over an extent of 2.36.5ha of Patta land in Vadapudur Village, Kinathukadavu Taluk, Coimbatore District, Tamil Nadu State has been prepared by

Dr. P. Thangaraju, M.Sc., Ph.D.,
Qualified Person

I request to the Assistant Director, Department of Geology and Mining, Coimbatore District to make further correspondence regarding the modification of the Mining Plan with the said Qualified Person at his following address.

Dr. P. Thangaraju, M.Sc., Ph.D.,
Regd. Off. No. 17,
Advaitha Ashram Road,
Alagapuram, Salem District – 636 004.
Cell: +91 94422 78601 & 94433 56539.

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

Signature of the Applicant

K. Sangeetha

K.Sangeetha

Place: Coimbatore

Date: 04.08.2021



K.Sangeetha,
W/o. Kumaresh,
No.13, Nethaji Street, Bagavathipalayam,
Kinathukadavu,
Coimbatore District – 642 109,
Tamil Nadu State.

DECLARATION OF THE APPLICANT

The Mining Plan and Progressive Quarry Closure Plan in Respect of Vadapudur Rough stone Quarry in S.F.No.423/2 (P) over an extent of 2.36.5ha of Patta land in Vadapudur Village, Kinathukadavu Taluk, Coimbatore District, Tamil Nadu State has been prepared in full consultation with me.

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

Signature of the Applicant

K. Sangeetha

K.Sangeetha

Place: Coimbatore

Date: 04.08.2021



CERTIFICATE

Certified that I am, **Dr. P. THANGARAJU**, M.Sc., Ph.D., having an office at Regd. Off. No. 17, Advaita Ashram Road, Alagapuram, Salem – 636 004, holding a Post Graduate Degree in Geology (M.Sc. Geology) from Madras University, Chennai and I worked in the field of Geology in a role of Geologist.

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

Accordingly, I am prepare this Mining Plan and Progressive Quarry Closure Plan in Respect of Vadapudur Rough stone Quarry in S.F.No.423/2 (P) over an extent of 2.36.5ha of Patta land in Vadapudur Village, Kinathukadavu Taluk, Coimbatore District, Tamil Nadu State for **Tmt.K.Sangeetha**, W/o. Kumaresh, No.13, Nethaji Street, Bagavathipalayam, Kinathukadavu, Coimbatore District – 642 109, Tamil Nadu State. Since the Mining Plan is prepared as per the provisions contained in Rule 15(I)(a) and (I)(b) of Minerals (Other than Atomic and Hydro Carbons Energy Minerals) Concession Rules, 2016.

Signature of the Qualified Person


Dr. P. Thangaraju, M.Sc., Ph.D.,

Place: Salem

Date: 06.08.2021

Dr. P. Thangaraju, M.Sc., Ph.D.,

Regd. Off. No. 17,

Advaita Ashram Road,

Alagapuram, Salem District – 636 004.

Cell: +91 94422 78601 & 94433 56539.



CERTIFICATE FROM THE QUALIFIED PERSON

This is to certify that the Provisions of under Rules 41 & 42 as per the Amended under Tamil Nadu Minor Mineral Concession Rules, 1959 have been observed in the preparation of Mining Plan and Progressive Quarry Closure Plan for Vadapudur Rough stone Quarry in S.F.No.423/2 (P) over an extent of 2.36.5ha of Patta land in Vadapudur Village, Kinathukadavu Taluk, Coimbatore District, Tamil Nadu State has been prepared for

Tmt.K.Sangeetha,

W/o. Kumaresh,

No.13, Nethaji Street, Bagavathipalayam,

Kinathukadavu,

Coimbatore District – 642 109,

Tamil Nadu State.

Whenever specific permissions/ exemptions/ relaxations and approvals are required, the Applicant will approach the concerned authorities of the Assistant Director, Department of Geology and Mining, Coimbatore District, Tamil Nadu for such permissions/ exemptions/ relaxations and approvals.

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

Signature of the Qualified Person


Dr. P. Thangaraju, M.Sc., Ph.D.,

Place: Salem

Date: 06.08.2021

Dr. P. Thangaraju, M.Sc., Ph.D.,

Regd. Off. No. 17,

Advaitha Ashram Road,

Alagapuram, Salem District – 636 004.

Cell: +91 94422 78601 & 94433 56539.



CERTIFICATE FROM THE QUALIFIED PERSON

Certified that the Provisions of Mines Act, Rules and Regulations and Orders made there under have been observed in the preparation of Mining Plan and Progressive Quarry Closure Plan for Vadapudur Rough stone Quarry in S.F.No.423/2 (P) over an extent of 2.36.5ha of Patta land in Vadapudur Village, Kinathukadavu Taluk, Coimbatore District, Tamil Nadu State has been prepared for

Tmt.K.Sangeetha,

W/o. Kumaresh,

No.13, Nethaji Street, Bagavathipalayam,

Kinathukadavu,

Coimbatore District – 642 109,

Tamil Nadu State.

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

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

Signature of the Qualified Person


Dr. P. Thangaraju, M.Sc., Ph.D.,

Place: Salem

Date: 06.08.2021

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**MINING PLAN AND PROGRESSIVE QUARRY CLOSURE PLAN FOR
VADAPUDUR ROUGH STONE QUARRY OVER AN EXTENT OF 2.36.5ha IN
VADAPUDUR VILLAGE, KINATHUKADAVU TALUK, COIMBATORE
DISTRICT, TAMIL NADU STATE.**

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

1.0 INTRODUCTION AND EXECUTIVE SUMMARY

This Mining Plan and Environment Management Plan are prepared for **Tmt.K.Sangeetha**,
W/o.Kumaresh, residing at No.13, Nethaji Street, Bagavathipalayam, Kinathukadavu, Coimbatore
District – 642 109, Tamil Nadu State.

The applicant applied for Rough stone quarry over an extent of 2.36.5ha of Patta land in
S.F.No.423/2 (P) of Vadapudur Village, Kinathukadavu Taluk, Coimbatore District, Tamil Nadu State
under Rules 19 (1) & 20 of Tamil Nadu Minor Mineral Concession Rules, 1959.

The application was processed by the Assistant Director, Department of Geology and Mining,
Coimbatore District and passed a Precise Area Communication letter vide **Rc.No.764/Mines/2020**,
Dated: 03.08.2021 to submit Mining Plan for the approval in Department of Geology and Mining,
Coimbatore District and obtain Environmental Clearance from the SEIAA, Chennai, Tamil Nadu State,
with the conditions to provide:

1. No hindrance shall be caused to the adjoining Patta lands and Public habitation while carrying out quarrying operations.
2. Quarrying should be leave a safety distance of 7.5m to the patta land.
3. Quarrying should not be cut upgraded granite stones.
4. Quarrying should not be employed Child labor.

(Please refer Annexure No – I).

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

In the above circumstances the applicant through his consultant is hereby preparing the Mining Plan, Environmental Management Plan and Progressive Quarry Closure Plan for approval and subsequent submission of Form-I, Form-IM and Pre feasibility report to obtain environmental clearance from the SEIAA, Chennai, Tamil Nadu State, Rough stone quarry. This mining plan is prepared by considering the Rules 41 & 42 as Amended in Tamil Nadu Minor Mineral Concession Rules, 1959 and as per the EIA Notification 2006 and its subsequent Amendment and judgments till 24.01.2019.

Short Notes of Mining Plan:

- a. Village Panchayat - Vadapudur
- b. Panchayat Union - Kinathukadavu
- c. The Geological Resources are 7,54,307m³ of Rough stone and 2,340m³ of Topsoil in the entire area.
- d. The Total Mineable Reserves are 2,28,084m³ of Rough stone in the entire area and Topsoil was removed in previous lease period.
- e. The proposed quantity of reserves/ (level of production) to be mined are 2,28,084m³ of Rough stone for five years in the entire area.
- f. Total extent of the lease applied area = 2.36.5ha
- g. Topography of the area = The area exhibits undulated terrain
- h. Proposed Depth of mining = 41m (1m Topsoil + 40m Rough stone)
[16m above ground level + 25m below ground level]
- i. Mining Plan Period = Five years

- j. It is a fresh lease application but, the applied area has been considered quarrying operation earlier. The quarry lease was previously granted in the favour of **Tmt.K.Sangeetha**, over an extent of 3.78.0hectares of Patta land in S.F.No.423/2 of Vadapudur Village, Kinathukadavu Taluk, Coimbatore District vide **Rc.No.312/Mines/2015, Dated: 23.09.2016** for the period of five years from 23.09.2016 to 22.09.2021 and the applicant has obtained Environmental Clearance from the SEIAA, Tamil Nadu vide **Lr. No. SEIAA-TN/F.No.3857/1(a)/ECNo.3397/2015, Dated: 25.07.2016** for quarrying of Rough stone and Gravel. The applicant has once again applied a quarry lease on 19.10.2020, over an extent of 2.36.5hectares of Patta land in S.F.No.423/2 (P) of Vadapudur Village, Kinathukadavu Taluk, Coimbatore District for the period of five years. The application was meritoriously processed by the Assistant Director, Department of Geology and Mining, Coimbatore District and recommended the quarry lease for the period of five years. The maximum dimension of the **existing quarry pit** is given table below (Refer Plate No. II).

| Length (m) (max) | Width (m) (max) | Depth (m) (max) |
|---------------------|--------------------|------------------------|
| 260 | 82 | 10m above ground level |

- k. Method of mining / level of mechanization.
Opencast mechanized method, the quarry operation involves shallow Jack hammer drilling, slurry blasting.
- l. Type of machineries proposed in the quarrying operation is given below:
Excavators attached with rock breaker (Rental Basis).
Jack hammer, Compressor (Diesel drive) (4 Jack hammer capacity) (Rental Basis).
- m. No trees will be uprooted due to this quarrying operation.
- n. The existing road from the main road to quarry is in good condition. The same will be maintained and utilized for Transportation of quarry materials and machineries.
- o. There is No Export of this Rough stone.
- p. Topo sketch covering 10km and 1km radius around the proposed area with markings of habitations, water bodies including streams, rivers, roads, major structure like bridges, wells, archaeological importance, places of worships is marked and enclosed as Plate Nos. IA & IB.
- q. The lease applied area is about 2.36.5ha bounded by seven corners; the corners are designated as 1-7 Clockwise from the Southern corner the Co – ordinates for the all the corners are clearly marked in the Quarry Lease and Surface Plan enclosed as Plate No. II.

Mining Plan and PQCP

- r. The plans of proposed quarrying area showing the dimensions of the pit, their proposed depth and maximum area of proposed quarrying are enclosed as Plate Nos. III and IV.
- s. General conditions will not be applicable for the proposed area. The area applied for lease is 10Km away from the,
- i) *Interstate Boundary,*
 - ii) *Protected area under wild life protection ACT, 1972,*
 - iii) *Critically polluted areas as identified by CPCB,*
 - iv) *Notified Eco sensitive areas.*
- t. There is no waste anticipated during this quarry operation, hence waste dump is not proposed in the lease applied area.
- u. Around 28 employees are deploying in the quarrying operation.
- v. Total Cost of the project is about **Rs.61,21,000/-**.
- w. Infrastructures around the lease applied area given below in the table:

TABLE-1

| Particulars | Location | Approximate aerial distance and direction from lease applied area |
|-------------------------|---------------|---|
| Nearest Post Office | Kinathukadavu | 3km – Northeast |
| Nearest School | Kinathukadavu | 3km – Northeast |
| Nearest Dispensary | Kinathukadavu | 3km – Northeast |
| Nearest Town | Kinathukadavu | 3km – Northeast |
| Nearest Police Station | Kinathukadavu | 3km – Northeast |
| Nearest Hospital | Kinathukadavu | 3km – Northeast |
| Nearest D.S.P. Office | Pollachi | 17km – Southeast |
| Nearest Railway Station | Kinathukadavu | 3km – Northeast |
| Nearest Airport | Coimbatore | 23km – Northwest |
| Nearest Seaport | Kochi | 126km – Southwest |
| District Head quarters | Coimbatore | 23km – Northwest |

2.0 GENERAL INFORMATION

2.1 a) Name of the Applicant : Tmt.K.Sangeetha,
W/o. Kumaresh,

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

Address : No.13, Nethaji Street, Bagavathipalayam,
Kinathukadavu,
Coimbatore District.

Pin Code : 642 109

Mobile No : +91 98423 76783

Aadhaar No : 4614 3846 6353

Email ID : jeevasangee1992@gmail.com

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

The applicant is an Individual.

2.2 a) Mineral which the Applicant intends to mine:

The Applicant intends to quarry Rough stone only.

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

The precise area communication letter was received from the Assistant Director, Department of Geology and Mining, Coimbatore District vide **Rc.No.764/Mines/2020, Dated: 03.08.2021** to submit approved mining plan and to obtain Environmental Clearance from the SEIAA, Chennai, Tamil Nadu State.

c) Period of permission / lease to be granted:

Five Years.

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

Name : **Dr. P. Thangaraju, M.Sc., Ph.D.,**
Qualified Person

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

Telephone : 0427- 2431989 (Office)

Cell No : +91 94422 78601 & 94433 56539

Email : infogeoexploration@gmail.com

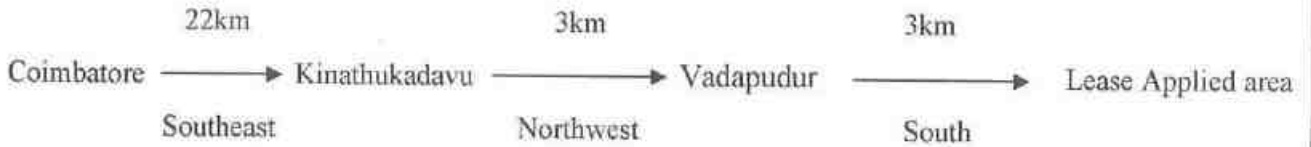
(Refer Annexure Nos. IX and X).



3.0 LOCATION

a) Details of the area with location map:

The lease applied area is about 23km Southeastern side of Coimbatore town and 3km Southwestern side of Kinathukadavu town, the lease applied area located along Vadapudur Village at a distance of 3km Southern side.



Location Map of the Lease Applied Area

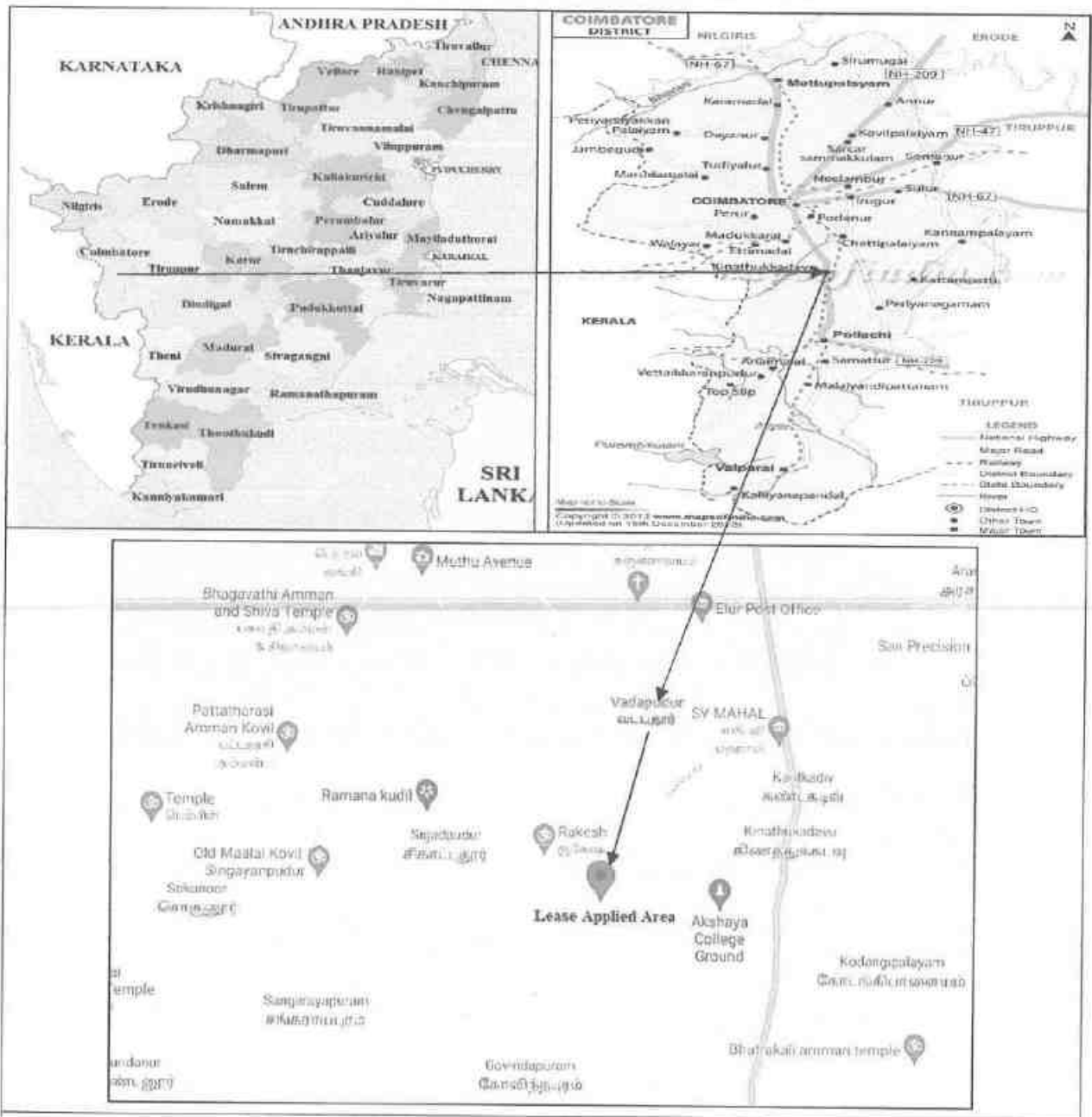


TABLE-2

| District | Taluk | Village | S.F. No. | Lease Applied Area in ha. |
|---------------------|---------------|-----------|-----------|---------------------------|
| Coimbatore | Kinathukadavu | Vadapudur | 423/2 (P) | 2.36.5 |
| Total Extent | | | | 2.36.5ha |

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

It is a Patta land (Barren land) which is not fit for vegetation/ Cultivation.

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

It is a Patta land. Jointly Registered in the name of the applicant (Tmt.K.Sangeetha) and Miss.Ananthavinothini, vide Patta No.116. The applicant has obtained consent from the other joint Pattadar. Refer Annexure Nos. IV & VII.

d) Topo sheet No. with latitude and longitude:

The lease applied area falls in the Topo sheet No: 58 - B/13 Latitude between: 10°48'34.52"N to 10°48'41.61"N and Longitude between: 76°59'43.58"E to 76°59'52.08"E on WGS datum-1984. Please refer the Plate Nos. I to II.

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

The approach (metal) road is situated on the Western side which connects the Village Road at a distance of 530m from the Northwestern side of the applied area.

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

The approach road from the quarry is already existed and the same will be utilized for haulage and maintained during the entire lease period, tree sapling will be planted on the either side of the road to prevent dust and noise propagation to the nearby areas.

The Nearest Railway line is Coimbatore – Pollachi which is about 3km on the Eastern side of the lease applied area.



PART – A

4.0 GEOLOGY AND MINERAL RESERVES

4.1 Brief description of the Topography and general Geology of the area (with plans):

The lease applied area exhibits undulated terrain. The area has gentle sloping towards Southern side. The altitude of the area is 344m (max) above Mean Sea level. The area is covered by 1m thickness of Topsoil. Massive Charnockite is found after 1m (Topsoil) which is clearly inferred from the existing quarry pit.

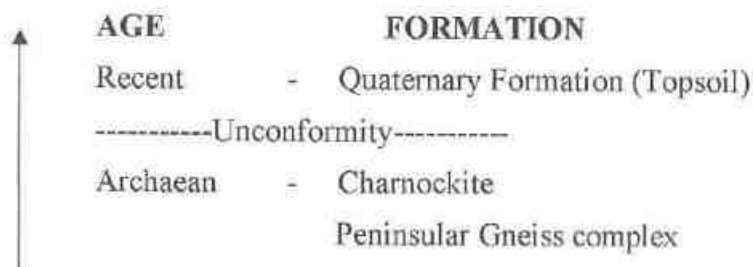
The Water table is found at a depth of 73m in summer and at 68m in rainy seasons. Average annual rainfall is about 689mm.

Topographical View of lease applied area



Peninsular gneiss forms the oldest rock formations, in which the massive formation of Charnockite lies over with rich accumulation of recent quaternary formation. On regional scale of the Charnockite body is N45°E – S45°W with dipping towards SE60°.

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



4.2 Details of exploration already carried out if any:

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

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

4.3 Estimation of Reserves:

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

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

Totally three sections have been drawn, one section is drawn as Length wise as (X-Y) and other two sections are drawn as Width wise as (A-B) & (C-D) to cover the maximum area considered for lease.

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

Geological Resources (Plate No. III):

The Geological Resources of Rough stone are calculated up to a maximum depth of 41m (1m Topsoil + 40m Rough stone) [16m above ground level + 25m below ground level]. **The total Geological resources are calculated by sectional method and the resources are estimated after depletion of existing quarry pits.** The total geological resources are given below:

TABLE-3

| GEOLOGICAL RESOURCES | | | | | | |
|-----------------------------|--------------|---------------|--------------|--------------|---|---------------------------|
| Section | Bench | Length in (m) | Width in (m) | Depth in (m) | Geological Resources in Rough stone (m ³) | Topsoil (m ³) |
| XY-AB | I | 103 | 20 | 1 | - | 2060 |
| | III | 103 | 21 | 1 | 2163 | - |
| | IV | 103 | 22 | 5 | 11330 | - |
| | V | 103 | 112 | 5 | 57680 | - |
| | VI | 103 | 112 | 5 | 57680 | - |
| | VII | 103 | 112 | 5 | 57680 | - |
| | VIII | 103 | 112 | 5 | 57680 | - |
| | IX | 103 | 112 | 5 | 57680 | - |
| | Total | | | | | 301893 |
| XY-CD | I | 14 | 20 | 1 | - | 280 |
| | II | 14 | 20 | 2 | 560 | - |
| | III | 16 | 23 | 4 | 1472 | - |
| | III | 167 | 86 | 1 | 14362 | - |
| | IV | 169 | 86 | 5 | 72670 | - |
| | V | 169 | 86 | 5 | 72670 | - |
| | VI | 169 | 86 | 5 | 72670 | - |
| | VII | 169 | 86 | 5 | 72670 | - |
| | VIII | 169 | 86 | 5 | 72670 | - |
| | IX | 169 | 86 | 5 | 72670 | - |
| | Total | | | | | 452414 |
| Grand Total | | | | | 754307 | 2340 |

Total Geological Resources of Topsoil : 2,340m³

Total Geological Resources of Rough stone : 7,54,307m³

Existing Pit Dimension:

The lease applied area has been quarried in earlier the existing pit dimensions are follows:

TABLE-4

| Length (m) (max) | Width (m) (max) | Depth (m) (max) |
|---------------------|--------------------|------------------------|
| 260 | 82 | 10m above ground level |

Available Mineable Reserves:

The available Mineable reserves are calculated after leaving the safety distance and bench loss to a maximum depth of 41m [16m above ground level + 25m below ground level].

TABLE-5

| MINEABLE RESERVES | | | | | |
|--------------------------|--------------|----------------------|---------------------|---------------------|---|
| Section | Bench | Length in (m) | Width in (m) | Depth in (m) | Mineable Reserves in Rough stone (m³) |
| XY-AB | V | 90 | 80 | 5 | 36000 |
| | VI | 85 | 70 | 5 | 29750 |
| | VII | 80 | 60 | 5 | 24000 |
| | VIII | 75 | 50 | 5 | 18750 |
| | IX | 70 | 40 | 5 | 14000 |
| | Total | | | | |
| XY-CD | III | 148 | 58 | 1 | 8584 |
| | IV | 145 | 48 | 5 | 34800 |
| | V | 140 | 38 | 5 | 26600 |
| | VI | 135 | 28 | 5 | 18900 |
| | VII | 130 | 18 | 5 | 11700 |
| | VIII | 125 | 8 | 5 | 5000 |
| | Total | | | | |
| Grand Total | | | | | 228084 |

The mineable reserves have been computed as **2,28,084m³** of Rough stone at the rate of 100% recovery upto a maximum depth of 41m [16m above ground level + 25m below ground level] for a period of five years and Topsoil was removed in previous quarry operation.

5.0 MINING

5.1 Method of mining (opencast / underground):

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

However, as far as the quarrying of Rough stone is concerned, observance of the provisions of Regulation 106 (2) (b) as above is seldom possible due to various inherent petro genetic factors coupled with mining difficulties. Hence it is proposed to obtain relaxation to the provisions of the above regulation from the Director of Mines Safety for which necessary provision is available with the Regulation 106 (2) (b) of MMR-1961, under Mine Act - 1952.

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

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

The quarry operation involves shallow Jack hammer drilling, slurry explosives in blasting, excavation, loading and transportation of Rough stone to the needy crusher.

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

Splitting of rock mass of considerable volume from the parent rock mass by jackhammer drilling and slurry explosives blasting, hydraulic excavators are used for loading the Rough stone from pithead to the needy crushers.

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

5.3 Proposed Bench Height and Width:

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

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

The overburden in the form of Topsoil, the Topsoil already removed during previous quarry lease period. The excavated Rough stone will be directly loaded into tippers to the needy customers. The Composite year wise Development and production plan and sections indicating the Pit lay out, Green belt development are shown in Plate No. III.

Yearwise development and Production

TABLE-6

| YEARWISE PRODUCTION DETAILS | | | | | | |
|------------------------------------|----------------|--------------|----------------------|---------------------|---------------------|--|
| Years | Section | Bench | Length in (m) | Width in (m) | Depth in (m) | Recoverable Reserves in Rough stone (m³) |
| I | XY-CD | III | 148 | 58 | 1 | 8584 |
| | | IV | 145 | 48 | 5 | 34800 |
| | | Total | | | | 43384 |
| II | XY-CD | V | 140 | 38 | 5 | 26600 |
| | | VI | 135 | 28 | 5 | 18900 |
| | | Total | | | | 45500 |
| III | XY-AB | V | 90 | 80 | 5 | 36000 |
| | | VI | 25 | 70 | 5 | 8750 |
| | | Total | | | | 44750 |
| IV | XY-AB | VI | 60 | 70 | 5 | 21000 |
| | | VII | 80 | 60 | 5 | 24000 |
| | | Total | | | | 45000 |
| V | XY-AB | VIII | 75 | 50 | 5 | 18750 |
| | | IX | 70 | 40 | 5 | 14000 |
| | | Total | | | | 32750 |
| | XY-CD | VII | 130 | 18 | 5 | 11700 |
| | | VIII | 125 | 8 | 5 | 5000 |
| Total | | | | 49450 | | |
| Grand Total | | | | | | 228084 |

The Recoverable reserves have been computed as **2,28,084m³** of Rough stone for five years at 100% recovery upto depth of 41m [16m above ground level + 25m below ground level].

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

| | | |
|---|---|---|
| One lorry load | = | 6m ³ (approx.) |
| Total No of Working days | = | 300 Days per year |
| Total quantity to be removed in these five years plan period | = | 2,28,084m ³ |
| Hence total lorry loads per day | = | 2,28,084m ³ /6m ³ |
| | = | 38014 lorry loads |
| | = | 38014/5 years |
| | = | 7603/300 Days |
| Rough stone | = | 25 lorry loads per day |
| Working hours = 8.30 am to 5.30 pm (with 12.30-1.30 pm lunch break) | | |

5.5 Machineries to be used:

For Mining:

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

TABLE-7

I. DRILLING MACHINE:

| S. No. | Type | Nos | Dia Hole mm | Size Capacity | Motive power |
|--------|-------------|-----|-------------|---------------|----------------|
| 1 | Jack hammer | 6 | 30-35 | 1.2m to 2.0m | Compressed air |
| 2 | Compressor | 2 | - | 400 psi | Diesel Drive |

II. EXCAVATION & LOADING EQUIPMENT:

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

III. HAULAGE WITHIN THE MINE & TRANSPORT EQUIPMENT:

| S. No. | Type | Nos | Capacity | Motive Power |
|--------|---------|-----|-----------|--------------|
| 1 | Tippers | 3 | 20 tonnes | Diesel Drive |

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5.6 Disposal of Overburden/Waste:

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

5.7 Brief note on conceptual mining plan for the entire lease period base on the geological, mining and Environment considerations:

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

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

As the applicant has applied quarry lease for five years, the ultimate pit limit (dimension) at the end of this mining plan period is given below:

TABLE-8

| <i>Length in m (Max)</i> | <i>Width in m (Max)</i> | <i>Depth in m (Max)</i> |
|------------------------------|-----------------------------|--|
| 260 | 82 | 41m [16m above ground level + 25m below ground level] |

Greenbelt has proposed on the Panchayat roads by planting native species of Neem, Casuarina and Pongamia pinnata, etc., tree sapling. All the base line information studies like Air quality monitoring, Noise and vibration monitoring, Water analysis studies will be carried out every year as per the MoEF&CC Norms. It is propose to engage any local institution to monitor the EIA and EMP during the course of quarrying operation after the grant of quarry lease.

Except topsoil, there is no wastage anticipated during the entire life of quarry. The quarried out topsoil will be preserved within the applied area and utilized for construction of bund and backfilled in the part of the quarry pit also spread out the quarried out top bench to facilitate the greenbelt development. The quarry area will be fenced with barbed wire fencing also safety bund constructed around the area to prevent inadvertent entry of public and cattle (Refer Plate No. IV).



6.0 BLASTING

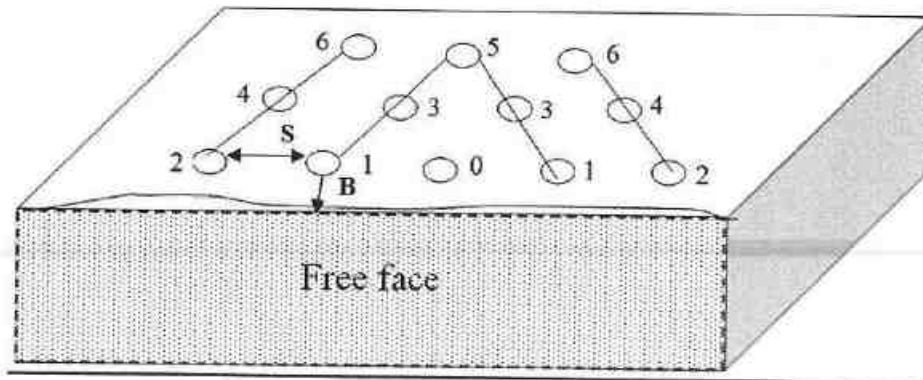
6.1 Blasting pattern:

The quarrying operation is proposed to be carried out by Mechanized Opencast Method in conjunction with conventional method of mining using Jack hammer drilling and slurry blasting of shattering effect for loosening the Rough stone.

Drilling and blasting parameters are as follows:

| | | |
|-------------------------|---|----------------------|
| Depth of Each hole | : | 1.5m |
| Diameter of hole | : | 30-32mm |
| Spacing between holes | : | 1.2m |
| Burden for hole | : | 1.0m |
| Pattern of hole | : | Zigzag – Multi-rows |
| Inclination of holes | : | 80° from horizontal |
| Use of delay detonators | : | 25millisecond relays |
| Detonating fuse | : | “Detonating” Cord |

BLASTING PATTERN DRAWING



Staggered “V” Pattern of Blasting Design

| | | |
|-------------------------------|---|-----------|
| Spacing | = | 1.2m |
| Burden | = | 1.0m |
| Depth of the hole | = | 1.5m |
| No of holes proposed per day= | | 132 Holes |

6.2 Type of explosives to be used:

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

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6.3 Measures proposed to minimize ground vibration due to blasting:

The quarry is situated more than 300m from the nearby villages, Controlled blasting measures is being adopt for minimizing ground vibration and fly rock.

Shallow depths jackhammer drilling & blasting is proposed to be carried out with minimum use of explosive mainly to give hearing effect in Rough stone for easy excavation and to control fly rock.

Delay detonators:

Delay blasting (millisecond delays) permits to divide the shot in to smaller charges, which are detonated in a predetermined millisecond sequence at specific time intervals.

The major advantages of delay blasting are:

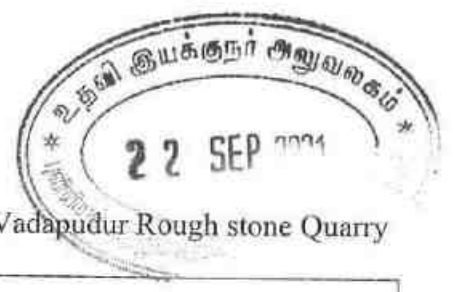
- Reduction of ground vibration.
- Reduction in air blast.
- Reduction in over break.
- Improved fragmentation.
- Better control of fly-rock.

Blasting program for the production per day:

| | |
|---------------------------|--|
| No of Holes | = 132 Holes |
| Yield | = 396 Tons |
| Powder factor | = 6 Tons/Kg of explosives |
| Total explosive required | = 66 Kg-Slurry explosives |
| Charge/ hole | = 0.5 Kg |
| Blasting at day time only | = 12.00 – 12.30p.m (whenever required) |

6.4 Storage and safety measures to be taken while blasting:

The applicant will engage authorized explosive agency to carry out the small amount of blasting and it will be supervised by competent and statutory foreman/Permit Mines Manager. The explosives agencies should be have the valid Blaster certificate. He will blast holes in the quarry site. After the completion of Blasting the Explosives Agencies will take it out back the remaining quantity of Explosives. The magazine is available at the quarry site to temporarily store the explosives.



7.0 MINE DRAINAGE

7.1 Depth of water table (based on nearby wells and water bodies):

The Water Table in the area is 73m in summer season and 68m in rainy season which is observed from the nearby bore wells and the data obtained from existing private boreholes. The lease area is fully covered by Massive Charnockite formation. Hence the Ground Water problem will not arise. If water seepage may occur due to the fracture, the same will be used for Greenbelt.

TABLE-9

| Type | Distance & Direction | Location |
|-----------|------------------------|--------------------------------|
| Bore Well | 790m Northwestern side | 10°48'54.87"N 76°59'24.69"E |

7.2 Arrangements and places where the mine water is finally proposed to be discharged:

Quarry operations are confined well above the water table during the entire lease period. If water is encountered at due to rain water and seepage, the same will be pumped out by 5HP water pumps to the Greenbelt development areas. Besides, the water will also be used for dust suppression on haul roads during Haulage of machineries.

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8.0 OTHER PERMANENT STRUCTURES (also shown in the map)

8.1 Habitations/ Villages natham:

There is no approved habitation within 300m radius from the lease applied area.

8.2 Power Lines (HT/LT):

There is no Housing area, EB line (HT & LT Line) within the radius of 50m from the lease applied area.

8.3 Water bodies (river, ponds, lake, odai, canal, etc.):

There is no River, Pond, Lake, Odai, Canal located within 50m radius of the lease applied area.

8.4 Archaeological / historical monuments:

There is no Archaeological / historical monuments within 300m radius from the lease applied area.

8.5 Road (NH, SH, others):

The Nearest National Highway (NH-209) Coimbatore – Dindigul is situated about 2km on the Eastern side of the lease applied area.

The State Highway (SH-163) Palladam – Cochin Frontier Road is situated about 9km on the Northeastern side of the lease applied area.

The Major District (MD-165) Kinathukadavu – Kattampatti Road is situated about 4km on the Northeastern side of the lease applied area.

8.6 Places of worships:

There is no place of worships within the radius of 300m from the lease applied area.

8.7 Reserved forest / forest / social forest / wild life sanctuary etc.,:

There is no reserved forest / forest / social forest / wild life sanctuary etc., within radius of 500m of the lease applied area.

SALIENT FEATURES

| S. No. | Salient Features Present around site | Prescribed safety distance | If any present within Prescribed distance it's actual distance and direction from the area | | | | | | | | | | | | | | | |
|-----------|--|----------------------------|---|-----------|----------------|-----------------|-------|------------|------|------|---------|------|-------|---------------|------|------|------------|------|
| 1. | Railways, Highways, Reservoirs or Canal | 50m | None of the above situated within 50m radius. | | | | | | | | | | | | | | | |
| 2. | Village Road | 10m | No Village Road is situated within 10m radius on the lease applied area. | | | | | | | | | | | | | | | |
| 3. | Habitation / Village | 300m | There is no approved habitation within 300m radius from the lease applied area (Refer Plate No I-B). | | | | | | | | | | | | | | | |
| 4. | Adjacent Patta lands / Govt. Land | 7.5m/10m | <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <thead> <tr> <th style="width: 20%;">Direction</th> <th style="width: 40%;">Classification</th> <th style="width: 40%;">Safety Distance</th> </tr> </thead> <tbody> <tr> <td>North</td> <td>Patta land</td> <td>7.5m</td> </tr> <tr> <td>East</td> <td>V.No.13</td> <td>7.5m</td> </tr> <tr> <td>South</td> <td>Kinathukadavu</td> <td>7.5m</td> </tr> <tr> <td>West</td> <td>Patta land</td> <td>7.5m</td> </tr> </tbody> </table> <p>(Refer Plate No. II).</p> | Direction | Classification | Safety Distance | North | Patta land | 7.5m | East | V.No.13 | 7.5m | South | Kinathukadavu | 7.5m | West | Patta land | 7.5m |
| Direction | Classification | Safety Distance | | | | | | | | | | | | | | | | |
| North | Patta land | 7.5m | | | | | | | | | | | | | | | | |
| East | V.No.13 | 7.5m | | | | | | | | | | | | | | | | |
| South | Kinathukadavu | 7.5m | | | | | | | | | | | | | | | | |
| West | Patta land | 7.5m | | | | | | | | | | | | | | | | |
| 5. | Housing area, EB line (HT & LT Line) | 50m | There is no other Housing area, EB line (HT & LT Line) within the radius of 50m from the lease applied area. | | | | | | | | | | | | | | | |
| 6. | Boundaries of the permitted area | 7.5m/10m | <p>The boundaries of the permitted areas are as follows:</p> <p>North - S.F.No.423/2 (P)</p> <p>East - V.No.13 Kinathukadavu</p> <p>South - V.No.13 Kinathukadavu</p> <p>West - S.F.No.423/2 (P)</p> <p>(Refer Plate No. II).</p> | | | | | | | | | | | | | | | |
| 7. | Reserve forest | 60m | There is no reserved forest located within the radius of 60m from the lease applied area. (Refer Plate No. IA and IB). | | | | | | | | | | | | | | | |
| 8. | Protected area / ECO sensitive area/ Wild Life Sanctuary | 10km | There is no ECO sensitive Zone/ Wild Life Sanctuary/ Critically Polluted Area/ HACA/ CRZ located within 10km radius of the area. (Refer Plate No. IA). | | | | | | | | | | | | | | | |



9.0 EMPLOYMENT POTENTIAL & WELFARE MEASURES

9.1 Employment potential (skilled, semi skilled, un skilled):

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

a. Skilled labour:

| | | |
|-------------------------------|---|----|
| Mine Foreman | : | 1 |
| Blaster/mate | : | 1 |
| Excavator – Operator & Driver | : | 4 |
| Jack hammer operator | : | 12 |

b. Semi-skilled:

| | | |
|----------|---|---|
| Security | : | 1 |
|----------|---|---|

c. Unskilled:

| | | |
|-------------------------|---|-----------|
| Labour & Helper | : | 4 |
| Co-operator and Cleaner | : | 5 |
| Total | : | 28 |

The above manpower is adequate to meet out the production schedule and the machinery strength envisaged in the mining plan and to comply with the statutory provisions of the Mines Safety Regulations. It is been ensured that the labour will not be employed less than 18 years, **No child labour** will engaged or entertained for any kind of quarrying operations. All the labours engaged for quarrying operations will be insured during the quarry lease period.

9.2 Welfare Measures:

a. Drinking Water:

Packaged drinking water is available from the nearby approved water vendors in Kinathukadavu which is about 3km on the Northeastern side of the lease applied area.

b. Sanitary Facilities:

Hygienic modern Sanitary Facilities will be constructed as semi permanent structure and it will be maintained periodically as hygienic.

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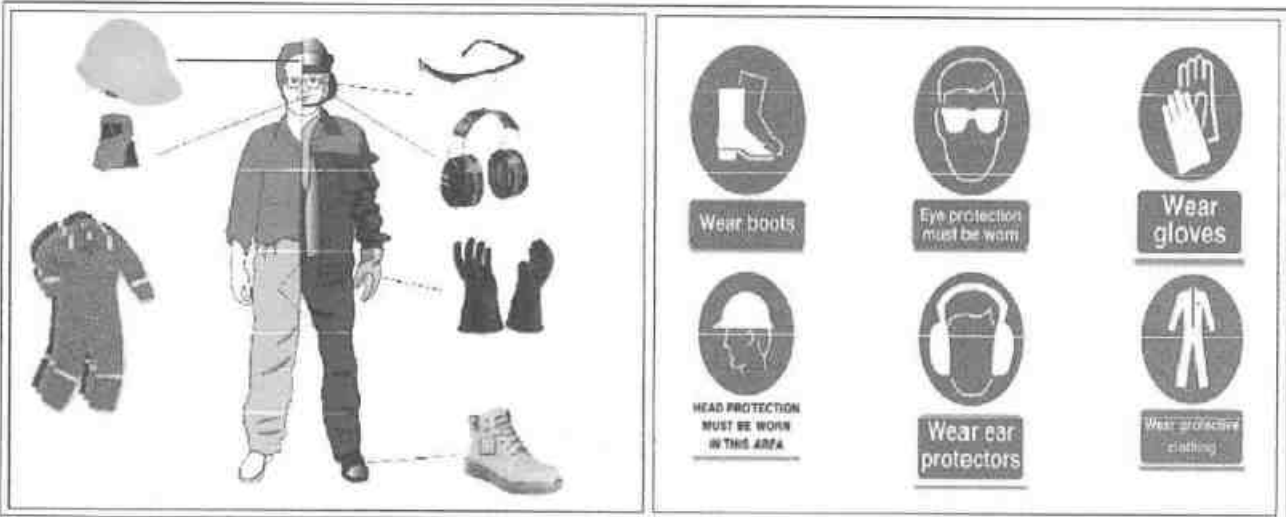
c. First aid facility:

First aid kits are kept in Mines office room, in case of such eventuality is the victim will be given first aid immediately at the site by the competent and statutory foreman/permit manager/mate will be in charge of first aid and injured person will be taken to the hospital by the applicant vehicle. Hospital is available in Kinathukadavu located at a distance of 3km on the Northeastern side.

d. Labour Health:

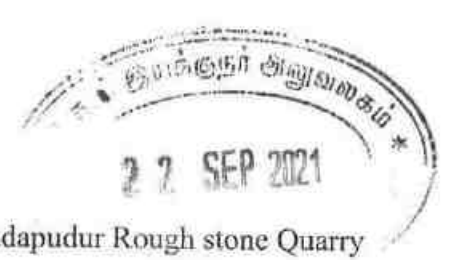
Periodically medical check-up related to occupational health safety will be conducted to all the workers in applicant own cost.

e. Precautionary safety measures to the labourers:



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

All personnel protective devices will be provided as per the specification approved by Director of mines safety. Periodically medical check-up will be conducted for all workers for any mine health related problems. Proper training and vocational education will be given by qualified and experienced safety officer to all the employees about the safety and systematic Rough stone quarrying operations. The drillers and workers will be sent for vocational training periodically, to carry out the quarrying operations scientifically and to safe guard the men and machinery and to create awareness about conventional opencast quarrying operations.

**PART - B****10.0 ENVIRONMENT MANAGEMENT PLAN****10.1 Existing Land use pattern:**

The quarry lease applied area exhibits plain terrain. The area is a dry barren land devoid of Agriculture and Habitations. The lease applied area has utilized only for quarry operation in earlier.

LAND USE TABLE-10

| Description | Present area in (ha) | Area at the end of this quarrying period (ha) |
|--------------------|----------------------|---|
| Quarrying Pit | 1.61.0 | 1.61.0 |
| Infrastructure | Nil | 0.01.0 |
| Roads | 0.02.0 | 0.02.0 |
| Green Belt | Nil | 0.15.0 |
| Unutilized Area | 0.73.5 | 0.57.5 |
| Grand Total | 2.36.5 | 2.36.5 |






10.2 Water Regime:

It is a simple opencast quarry operation. The quality of water will not be affected due to this quarrying operation. However, mitigation measures will be carried out like Garland drains constructed on all sides of quarry pit to avoid surface run-off rain water entering into the pit.







The waste water discharged to water bodies will be met the standard prescribed under the Environment (Protection) Act – 1986 by The Ministry of Environment, Forest and Climate change.

10.3 Flora and Fauna:

TABLE-11

| S.No. | Name of the plant (Scientific) | Family Name | Common Name | Habit | Picture |
|-------|--------------------------------|-----------------------|----------------------|-------|--|
| 1. | <i>Cocos nucifera</i> | <i>Arecaceae</i> | Coconut, Thennai | Tree |  |
| 2. | <i>Curcuma longa</i> | <i>Zingiberaceae</i> | Turmeric | Herb |  |
| 3. | <i>Sorghum bicolor</i> | <i>Poaceae</i> | Solam | Grass |  |
| 4. | <i>Borassus flabellifera</i> | <i>Arecaceae</i> | Palmyra Palm | Tree |  |
| 5. | <i>Calotropis gigantea</i> | <i>Asclepiadaceae</i> | Crown Flower, Erukku | Shrub |  |

List of Fauna

| S.No. | Scientific Name | Common Name | Picture |
|-------|-----------------------------|----------------------|---|
| 1. | <i>Egretta garzetta</i> | Little egret |  |
| 2. | <i>Boiga spp</i> | Cat snake |  |
| 3. | <i>Dicrurus macrocercus</i> | Black drongo |  |
| 4. | <i>Calotes versicolor</i> | Garden Lizard |  |
| 5. | <i>Funambulus palmarum</i> | Indian palm squirrel |  |
| 6. | <i>Hieroglyphus sp</i> | Grasshopper |  |

10.4 Climatic Conditions:

The area receives rainfall of about 689mm/annum and the rainy season is mainly from Oct - Dec during monsoon. The summer is hot with maximum temperature of 35°C and winter encounters a minimum temperature of 20°C.

10.5 Human settlement:

There are few villages located in this area within 5km radius; the approximate distance and population are given below:

TABLE-12

| S. No | Name of the Village | Approximate distance & Direction from lease applied area | Approximate population |
|-------|---------------------|--|------------------------|
| 1. | Vadapudur | 3km - North | 5,300 |
| 2. | Vadakkipalayam | 2km - Southeast | 4,100 |
| 3. | Muthur | 2km - Southwest | 1,500 |
| 4. | Kuthiraiampalayam | 2km - Northwest | 1,500 |

Basic human welfare Amenities such as Health Centre, Schools, Communication Facilities, and Commercial Centres etc., are available at Kinathukadavu located at a distance of 3km on the Northeastern side of the area.

10.6 Plan for air, dust suppression:

The air quality will be affected by the Suspended Particulate Matter (SPM) generated by the slurry blasting, Jack hammer drilling, loading and unloading during the Rough stone quarry operation.

The following Mitigations measures will be carried out:

- Mist Water spraying will be carried out by means of water sprinklers to suppress the dust emission in the Haul roads.
- Vegetations will be formed on the non quarrying area.
- Avoiding spillages during the transportation.

Air quality will be monitored periodically as per Norms and Mitigative measures carried out to prevent dust and Air propagation in to air. The estimated budget for dust suppression would be around **Rs.52,000/year**.

10.7 Plan for Noise level control:

The noise level increased due to the Drilling, Blasting, Excavation and Transportation.

Engineering Noise control:

Noise will be created due to the usage of Machineries and Vehicles. The Noise will be controlled in the following manner.

- Selection of new low – noise equipment's is proposed to be deployed for the Rough stone quarry operation.
- Modifications of older equipments.
- Implementation of effective preventive maintenance which reduces noise more than 50%.
- Developing Green belts which act as Acoustic barrier, pollution absorbent and noise controller.
- The drivers will be strictly instructed to move the vehicle during the transportation not exceed 40km per hour.
- Sentries with flags & whistle will posted in village road junction and populated area to control and regulate traffic.

Shallow holes of 32mm diameter and maximum depth of 1.5m will be drilled and conventional low power explosives such as slurry explosives, ordinary safety fuse will be used for Rough stone. Hence, ground vibration and noise pollution i.e., minimal and restricted within the quarry working area.

Noise level monitoring and other Mitigation measures will be carried out to reduce Noise and Vibration. The estimated budget for Noise level monitoring would be around **Rs.2,000/Year**.

10.8 Environment impact assessment statement describing impact of mining on the five years:

In the mining plan proposed for a production of Rough stone does not involve deep hole drilling and blasting. Such limited mining activity is not likely to cause any impact adversely on the environment. As far as pollution of air, water and noise concerned, the Environment impact studies will be conducted as per EIA notification issued by MoEF&CC. It is B2 Category mine. The estimated budget would be around **Rs.3,80,000/-**.

10.9 Proposal for waste management:

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

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

In the mining plan proposed only to a maximum depth of 41m [16m above ground level + 25m below ground level] has been envisaged as workable depth for safe & economic mining during entire lease applied area. There is no waste generated hence, backfilling is not possible. Hence, the quarry area will be fenced with Barbed wire fencing also safety bund constructed around the quarry to prevent inadvertent entry of public and cattle. The barbed wire fencing cost would be around **Rs.1,71,000/-**.

10.11 Programme of Greenbelt development (indicate extend, number, name of species to be afforested):

The safety zone all along the boundary barrier has been identified to be utilized for Greenbelt development. Appropriate native species of Neem, Pongamia Pinnata, Casuarina, etc., trees will be planted in a phased manner as described below.

TABLE-13

| Years | No. of trees proposed to be planted | Survival % | Area to be covered sq.m | Name of the species | No. of trees expected to be grown |
|-------|-------------------------------------|------------|-------------------------|---|-----------------------------------|
| I | 30 | 80 | 300 | Neem, Pongamia Pinnata, Casuarina, etc., | 24 |
| II | 30 | 80 | 300 | | 24 |
| III | 30 | 80 | 300 | | 24 |
| IV | 30 | 80 | 300 | | 24 |
| V | 30 | 80 | 300 | | 24 |

Nearly 1,500sq.m area is proposed to use under Greenbelt by planting 30 Number of tree saplings during every year with an anticipated survival rate of 80% (Please refer Plate No. III). The estimated budget for plantation and maintenance of Greenbelt development would be around **Rs.15,000/-** for the period of five years.

The Greenbelt Development will be formed in around the approach road and nearby village roads of the lease applied area. The cost would be around **Rs.10,000/-**.

10.12 Proposed financial estimate / budget for (EMP) environment management:

Budget Provision for the entire quarrying period:

TABLE-14

| S. No | Monitory and Analysis Description | Rate per location | No. of location | Total Charges/ six months | Total Charges/ year |
|-----------------------------|-----------------------------------|-------------------|-----------------|---------------------------|---------------------|
| 1 | Ambient air quality monitoring | 6500 | 4 | 26000 | 52000 |
| 2 | Noise level monitoring | 250 | 4 | 1000 | 2000 |
| 3 | Ground vibration monitoring | 1000 | 2 | 2000 | 4000 |
| 4 | Water sampling and analysis | 9000 | 1 | 9000 | 18000 |
| Total EMP Cost/ year | | | | | 76,000 |

The EMP cost would be around **Rs.3,80,000/-** for the period of five years.

A. Project / investment / Operational cost

| | | |
|--------------------------|---|------------------|
| i) Land cost | The Land value as per the Government Guideline land cost is about, Rs.13,25,000/ha, hence the total land cost is calculated about 2.36.5ha X Rs.13,25,000/- = Rs.31,33,625/- i.e., Rs.31,34,000/- (source: https://tnreginet.gov.in/portal/) | = Rs.31,34,000/- |
| ii) Machinery to be used | The following machineries are proposed to meet out the productions. Excavator attached with rock breaker, Tippers, Tractor mounted compressor with Jack hammer and loose tools (Rental Basis) | = Rs.20,00,000/- |
| iii) Refilling/ Fencing | Fencing will be constructed around the quarry pit to prevent the inadvertent entry of public and cattles cost would be around | = Rs.1,71,000/- |
| iv) Labourers shed | Labour sheds will be constructed as semi permanent structure. The cost would be around | = Rs.1,30,000/- |
| v) Sanitary facility | Adequate latrine and urinal accommodation shall be provided at conveniently accessible places the cost would be around | = Rs.60,000/- |

Mining Plan and PQCP

Vadapudur Rough stone Quarry

| | | |
|--|---|-------------------------|
| vi) Others items | First aid room & accessories | = Rs.55,000/- |
| vii) Drinking water facility for the labourers | Packaged drinking water will be provided for all the Labours. Drinking water will be readily available at conveniently accessible points during the whole of the working shift the cost would be around | = Rs.1,23,000/- |
| viii) Sanitary arrangement | The latrine and urinal will keep clean and sanitary condition. The maintenance cost would be around | = Rs.55,000/- |
| ix) Safety kit | All the Safety kit such as Helmet, Earmuffs, Goggles, Reflector Jackets, Safety shoes etc., will be provided to the workers by the applicant own cost which would be around | = Rs.55,000/- |
| x) Water sprinkling | Water will be sprinkled in the haul roads by water sprinklers the cost would be around | = Rs.1,50,000/- |
| xi) Garland drains Construction | Construction of garland drains to divert surface runoff from virgin area away from mining area | = Rs.1,53,000/- |
| xii) Greenbelt etc. | Greenbelt program will be carried out in the boundary barriers the cost would be around | = Rs.15,000/- |
| | Greenbelt program will be carried out in the approach road and nearby village roads | = Rs.10,000/- |
| | Total Operational Cost | = Rs.61,11,000/- |

Mining Plan and PQCP

| B. EMP Cost:- (Per year) | |
|---|--------------------|
| Air Quality monitoring | Rs.52,000/- |
| Water Quality Sampling | Rs.18,000/- |
| Noise Monitoring | Rs. 2,000/- |
| Ground Vibration test | Rs. 4,000/- |
| Total Cost | Rs.76,000/- |
| Total EMP Cost for the five years period is Rs.3,80,000/- | |
| Description | Amount (Rs.) |
| A. Operational Cost | 61,11,000 |
| B. EMP Cost | 3,80,000 |
| Total Project Cost (A+ B) | 64,91,000 |
| The applicant indents to involve corporate environment responsibilities (CER) activity like Water purifier and Medicine storage rack facilities to the nearby Dispensary and Water Purifier and Sanitary facility to the nearby Govt. School at 2.0% from the total project cost. The Cost would be around Rs.1,30,000/- . | 1,30,000 |
| Total Cost | 66,21,000 |
| The Total cost would be around sixty six lakhs and twenty one thousands only. | |

**11.0 PROGRESSIVE QUARRY CLOSURE PLAN****11.1 Introduction:**

The Progressive Quarry Closure Plan for Rough stone quarry over an extent of 2.36.5ha of Patta land in S.F.No.423/2 (P) of Vadapudur Village, Kinathukadavu Taluk, Coimbatore District, Tamil Nadu State has been prepared for **Tmt.K.Sangeetha**, W/o. Kumaresh, residing at No.13, Nethaji Street, Bagavathipalayam, Kinathukadavu, Coimbatore District – 642 109, Tamil Nadu State.

11.2 Present Land use pattern:LAND USE TABLE-15

| Description | Present area in (ha) |
|--------------------|----------------------|
| Quarrying Pit | 1.61.0 |
| Infrastructure | Nil |
| Roads | 0.02.0 |
| Green Belt | Nil |
| Unutilized Area | 0.73.5 |
| Grand Total | 2.36.5 |

11.3 Method of Mining:

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

However, as far as the quarrying of Rough stone is concerned, observance of the provisions of Regulation 106 (2) (b) as above is seldom possible due to various inherent petro genetic factors coupled with mining difficulties. Hence it is proposed to obtain relaxation to the provisions of the above regulation from the Director of Mines Safety for which necessary provision is available with the Regulation 106 (2) (b) of MMR-1961, under Mine Act – 1952.

11.4 Mineral Processing Operations:

The quarried out Rough stone will be transported by the 20tons capacity Tipper to the needy crushers. Splitting of rock mass of considerable volume from the parent rock mass by Jack hammer drilling and blasting, hydraulic excavators are used for loading the Rough stone from pithead to the needy crushers.



11.5 Reasons for closure:

As the mineral is not going to be exhausted during the proposed plan period no immediate closure is planned and sufficient reserves are available to carry on the activities. The reason for closure will be discussed in the ensuing mining plan.

11.6 Statutory obligations:

The applicant ensures to comply all the conditions were imposed while granting the precise area communication letter before the execution of lease deed and during the course of quarry operations.

11.7 Progressive quarry closure plan preparation:

Name and address of the Qualified Person who prepared the progressive closure plan and name and address of the executing agency who is involved in the preparation of progressive quarry closure plan.

| | | |
|-----------|---|---|
| Name | : | Dr. P. Thangaraju, M.Sc., Ph.D., Qualified Person |
| Address | : | Reg. No.17, Advaita Ashram Road, Alagapuram, Salem District – 636 004. |
| Telephone | : | 0427- 2431989 (Office) |
| Cell No | : | +91 94422 78601 & 94433 56539 |

Applicant will himself implement the closure plan; no outside agency will be involved.

11.8 Review of Implementation of Mining Plan including Progressive Closure Plan upto the Final Closure Plan:

There is no waste generated during entire life of quarry, hence backfilling is not possible in the quarried out pit. The entire quarry area is an active also no proposal given for Progressive quarry closure plan in the previous mining plan hence, the applicant has not taken any action for progressive quarry closure. Hence, review of implementation of progressive quarry closure does not arise at present. However, if any work done for progressive quarry closure plan during this plan period, it will be discuss in the ensuing Mining Plan.

11.9 Closure Plan:

(i) Mined Out Land:

At the end of mining plan period, about 1.61.0ha of area will be mined out. Land use at various stages is given in the table below.

LAND USE TABLE-16

| Description | Present area in (ha) | Area at the end of this quarrying period (ha) |
|--------------------|----------------------|---|
| Quarrying Pit | 1.61.0 | 1.61.0 |
| Infrastructure | Nil | 0.01.0 |
| Roads | 0.02.0 | 0.02.0 |
| Green Belt | Nil | 0.15.0 |
| Unutilized Area | 0.73.5 | 0.57.5 |
| Grand Total | 2.36.5 | 2.36.5 |

The Greenbelt Development will be formed in around the approach road and nearby village roads of the lease applied area.

(ii) Water quality management:

Following control measures will be adopted for controlling water pollution:

- Construction of garland drains to divert surface run-off from virgin area away from mining area.
- Construction of check dams / gully plugs at strategic places to arrest silt wash off from broken up area.
- Collection of surface run-off from broken up area in mine pits for settling and only properly settled excess water from mine pit will be discharged to nearby users. The storm water/ mine water will be used for dust suppression, greenbelt development, etc.
- Periodic analysis of mine pit water and ground water quality in nearby villages.
- The quarried out pit will be allowed to collect rain and seepage water which will act as a reservoir for storage. This water storage will enhance the static level and ground water recharge of nearby wells and it will be used for agriculture purpose to the nearby agriculture land.
- Domestic sewage from site office & urinals/latrines provided in QL is discharged in septic tank followed by soak pits.

(iii) Air Quality Management:

The proposed mining method is not likely to produce much of dust and fugitive emissions to cause damage to ambient air quality of the area. Workers will be provided with personnel protective equipment like face-mask, earplug/ muffs.

For air pollution management at the progressive quarry closure plan, greenbelt will be developed to prevent and control air pollution.

(iv) Top Soil and Waste Management:

There is no topsoil or waste generated during the proposed plan period. The entire quarried out Rough stone is utilized (100%). Hence, waste management does not arise.

(v) Disposal of mining machinery:

All the machineries will be engage on rental basis. Hence, disposal or decommissioning of mining machinery does not arise.

(vi) Safety & Security:

Safety measures will be implemented to prevent access in the excavation area an un-authorized persons as per Mine Act 1952, MMR 1961.

- Safety measures will be implemented as per Mine Act 1952, MMR 1961, and Mines Rules 1955.
- Provisions of MMR 1961 shall be strictly followed and all roads shall be wider than the height of the bench or equal to the height of the bench and have a gradient of not more than 1 in 16.
- The bench height will be 5.0m.
- Width of working bench will be kept about 5.0m for ease of operations and provide sufficient room for the movement of equipments.
- Protective equipment like dust masks, ear-plugs/ muffs and other equipments shall be provided for use by the work persons.
- Notices giving warning to prevent inadvertent entry of persons shall be displayed at all conspicuous places and in particular near mine entries.
- Danger signs shall be displayed near the excavations and proper signal by siren alarm will be provide before blasting time to prevent any accident.
- Security guards will be posted.
- In the event of temporary closer, approaches will be fenced off and notice displayed.

(vii) Disaster Management and Risk Assessment:

This should deal with action plan for high risk accidents like landslides, subsidence, flood, fire, seismic activities, tailing dam failures etc. and emergency plan proposed for quick evacuation, ameliorative measures to be taken etc. The capability of applicant to meet such eventualities and the assistance to be required from the local authorities should be described.

- The mechanized mining activities in the area may involve any high risk accident due to side falls/collapse, flying stones due to blasting etc.
- The complete quarrying operation will be carried out under the Management and control of experienced and qualified Mines Manager having Certificate of Competency to manage the mines granted by DGMS.
- All the provisions of Mines Act 1952, MMR 1961 and Mines Rules 1955, TNMMCR 1959 and other laws applicable to mine will be strictly complied with.
- During heavy rainfall the mining activities will be suspended.
- All persons in supervisory capacity will be provided with proper communication facilities.
- Competent persons will be provided FIRST AID kits which they will always carry.
- The Greenbelt Development will be formed in around the approach road and nearby village roads of the lease applied area.

(viii) Care and Maintenance during Temporary Discontinuance:

In case of any temporary discontinuance due to court order or due to statutory requirement or any other unforeseen circumstance following measures shall be taken for care, maintenance and monitoring of conditions.

- Notice of temporary discontinuance of work in mine shall be given to the DGMS as per the MMR 1961.
- All the mining machinery shall be shifted to a safe place.
- Entrance to the mine or part of the mine, to be discontinued shall be fenced off. Fencing shall be as per the circular 11/1959 from DGMS.
- Security Guards shall be posted for the safety and to prevent any unauthorized entry to the area.

- Carry out regular maintenance of the facilities/area detailed below in such a way as would have been done as if the mines were operation:
 - Quarry roads and approach roads,
 - Fencing on approach roads,
 - Checking and maintenance of machines and equipment,
 - Drinking water arrangements,
 - Quarry office, first aid stations etc.
- Competent persons shall inspect the area regularly.
- Air, water and other environmental monitoring shall be carried out as per CPCB and IBM Guideline.
- Care and upkeep of plantation shall be carried out on regular basis.
- Status of the working and status monitoring for re-opening of the mines shall be discussed daily.

In case of discontinuance due to any natural calamities/abnormal conditions, quarrying operation will be restarted as early as possible after completing rescue work, restoring safety and security, repairs of roads etc.

(ix) Economic Repercussion of Closure of Quarry and manpower Retrenchments:

The Quarry Lease is granted for a period of maximum five years only. As per the production Programme envisaged, there will be no effect on the man power as the majority of persons belong to nearby villages and will have an option either to be available for employment for the next contract/ lease or do the agriculture in their fields.

(x) Time Scheduling for Abandonment:

The lease applied area has enormous potential for continuance of operations even after the expiry of the lease period. The details of time schedule of all abandonment will be given at the time of final closure plan.

Mining Plan and PQCP

Vadapudur Rough stone Quarry

(xi) Abandonment Cost:

As at present mining is not going to be closed so abandonment cost could not be assessed. However, based on the progressive quarry closure activities during the plan period, cost is assessed as given below:

LAND USE TABLE-17

| ACTIVITY | | YEAR | | | | | RATE | COST (Rs.) |
|--|------|--------|------|------|------|------|---------------------|-------------------|
| | | I | II | III | IV | V | | |
| Plantation under safety zone | Nos. | 30 | 30 | 30 | 30 | 30 | @100 Rs Per sapling | 15,000/- |
| | Cost | 3000 | 3000 | 3000 | 3000 | 3000 | | |
| Plantation in the approach road and nearby village roads | Nos. | 20 | 20 | 20 | 20 | 20 | @100 Rs Per sapling | 10,000/- |
| | Cost | 2000 | 2000 | 2000 | 2000 | 2000 | | |
| Wire Fencing (In Mtrs) 570 Mtrs | | 171000 | - | - | - | - | @300 Rs Per Meter | 1,71,000/- |
| Garland drain (In Mtrs) 510 Mtrs | | 153000 | - | - | - | - | @300 Rs Per Meter | 1,53,000/- |
| TOTAL | | | | | | | | 3,49,000/- |


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செய்தகட்டுரை விவரமலகம்
 22-9-21

12.0 ANY OTHER DETAILS INTEND TO FURNISH BY THE APPLICANT ? SEP 2021

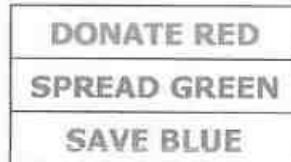
This Mining Plan for Rough stone (Charnockite) is under Rules 41 & 42 as per the Amended under Tamil Nadu Minor Mineral Concession Rules, 1959. The provisions of the Mines Act, Rules and Regulations and orders made there under shall be complied within the quarrying operation, so that the safety of the mine, machinery and person will be well protected. Permission, relaxation or exemption wherever required for the safe and scientific quarrying of the deposit will be obtained from the Department of Mines Safety. Any violation pointed out by the inspecting authorities shall be rectified as per the guidelines of the Concerned Department.

Prepared by


 Dr. P. Thangaraju, M.Sc., Ph.D.,
 Qualified person


Place: Salem

Date: 06.08.2021



This Mining Plan is Approved subject to the conditions / stipulation & indicated in the Mining Plan Approval Letter No: T64/Mines/2020dt 22-9-21 office of the A.D. Geology & Mining Coimbatore

This Mining Plan is Approved based on the incorporation of the particulars specified in the letter of the commissioner of Geology and Mining, Chennai ref No: 3883/LC/2012 Dated 19.11.2012 and subjected to further fulfilment of the condition laid down under Tamilnadu Minor Mineral Concession Rules 1959


ASSISTANT DIRECTOR
 DEPARTMENT OF GEOLOGY & MINING
 COIMBATORE DISTRICT.


 22/9/21

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ந.க.எண்.764/கனிமம்/2020

உதவி இயக்குநர் அலுவலகம்,
புவியியல் மற்றும் சுரங்கத்துறை,
மாவட்ட ஆட்சியர் அலுவலக வளாகம்,
கோயம்புத்தூர் - 18.

நாள்: 03.08.2021

குறிப்பாணை

பொருள்: கனிமங்களும் குவாரிகளும் - கோயம்புத்தூர் மாவட்டம் - கிணத்துக்கடவு வட்டம் - வடபுதூர் கிராமம் - புல எண். 423/2 (பகுதி)-ல் 2.36.5 ஹெக்டேர் பரப்பளவுள்ள பட்டா பூமியில் சாதாரணகற்கள் வெட்டியெடுக்க திரு.கு.சங்கீதா - குவாரி குத்தகை அனுமதி வழங்குவது - தொடர்பாக.

- பார்வை:**
1. திரு.கு.சங்கீதா, க/பெ. குமரேஷ், 13, நேதாஜி பகவதி பாளையம், கிணத்துக்கடவு, கோயம்புத்தூர் என்பவரது விண்ணப்பம் நாள் 19.10.2020.
 2. இவ்வலுவலக கடிதம் இதே எண். நாள்: 19.10.2020
 3. சார் ஆட்சியர், பொள்ளாச்சி அவர்களின் கடித ந.க.எண். 2452/2020/அ2 நாள்: 10.02.2021.
 4. உதவி புவியியலாளர், புவியியல் மற்றும் சுரங்கத்துறை, கோயம்புத்தூர் அவர்களின் தணிக்கை அறிக்கை நாள்: 26.07.2021
 5. இயக்குநர், புவியியல் மற்றும் சுரங்கத்துறை, சென்னை கடிதம் எண். 1870/எம்.எம்-1/2020 நாள்: 12.08.2020.

பார்வை 1-ல் கோயம்புத்தூர் மாவட்டம், கிணத்துக்கடவு வட்டம், நேதாஜி பகவதி பாளையம், 13 என்ற முகவரியில் வசிக்கும் திரு.வே.குமரேஷ் என்பவரின் மனைவி திருமதி.கு.சங்கீதா என்பவர் கோயம்புத்தூர் மாவட்டம், கிணத்துக்கடவு வட்டம், வடபுதூர் கிராமம், புல எண். 423/2(பகுதி)-ல் 2.36.5 ஹெக்டேர் பரப்பளவுள்ள பட்டா பூமியில் சாதாரணகற்கள் வெட்டியெடுக்க குவாரி குத்தகை உரிமம் கோரி உரிய ஆவணங்களுடன் விண்ணப்பித்துள்ளார்.

மேற்படி மனு தொடர்பாக, பொள்ளாச்சி சார் ஆட்சியர் மற்றும் கோயம்புத்தூர் புவியியல் மற்றும் சுரங்கத்துறை உதவி புவியியலாளர் ஆகியோர் புலத்தணிக்கை மேற்கொண்டு கோயம்புத்தூர் மாவட்டம், கிணத்துக்கடவு வட்டம், நேதாஜி பகவதி பாளையம், 13 என்ற முகவரியில் வசிக்கும் திரு.வே.குமரேஷ் என்பவரின் மனைவி திருமதி.கு.சங்கீதா என்பவருக்கு கோயம்புத்தூர் மாவட்டம், கிணத்துக்கடவு வட்டம், வடபுதூர் கிராமம், புல எண். 423/2(பகுதி)-ல் 2.36.5 ஹெக்டேர் பரப்பளவுள்ள பட்டா பூமியில் சாதாரணகற்கள் வெட்டியெடுக்க சில நிபந்தனைகளுடன் பரிந்துரை செய்துள்ளார்கள்.

அனுமதி கோரும் புல எண். 423/2 ஆனது பட்டா எண். 116-ன் படி திரு. ஞானசுந்தரசாமி என்பவரின் மகள் சங்கீதா (மனுதாரர்) மற்றும் ஆனந்தவினோதினி காப்பாளர் திருமதி.சங்கீதா என்பவர்கள் பெயரில் கூட்டுபட்டாவாக கிராம கணக்கில் தாக்கலாகியுள்ளது. மேற்படி பூமியில் திருமதி.கு.சங்கீதா என்பவர் 5 ஆண்டுகளுக்கு சாதாரண கற்கள்



வெட்டியெடுக்க தனக்கு எவ்வித ஆட்சேபணையும் இல்லை என கூட்டு பட்டாதாரான ஆனந்த வினோதின் என்பவர் சம்மத கடிதம் அளித்துள்ளார். எனவே மேற்படி பூமியில் மனுதாரர் குவாரி குத்தகை உரிமை பெற தகுதியுடையவர் ஆவார்.

எனவே, சார் ஆட்சியர், பொள்ளாச்சி மற்றும் உதவி புவியியலாளர், புவியியல் மற்றும் சுரங்கத்துறை, கோயம்புத்தூர் ஆகியோரின் பரிந்துரைகளின் அடிப்படையில் கோயம்புத்தூர் மாவட்டம், கிணத்துக்கடவு வட்டம், நேதாஜி பகவதி பாளையம், 13 என்ற முகவரியில் வசிக்கும் திரு.வே.குமரேஷ் என்பவரின் மனைவி திருமதி.கு.சங்கீதா என்பவருக்கு கோயம்புத்தூர் மாவட்டம், கிணத்துக்கடவு வட்டம், வடபுதூர் கிராமம், புல எண். 423/2(பகுதி)-ல் 2.36.5 ஹெக்டேர் பரப்பளவுள்ள பட்டா பூமியில் 1959-ஆம் ஆண்டு தமிழ்நாடு சிறுகனிம சலுகை விதிகளில் விதி 19(1) மற்றும் 20-ன் படி குத்தகை ஒப்பந்த பத்திரம் நிறைவேற்றும் நாளிலிருந்து 5 (ஐந்து) ஆண்டுகளுக்கு சாதாரண கற்கள் வெட்டியெடுக்க கீழ்கண்ட நிபந்தனைகளுக்குட்பட்டு குவாரி குத்தகை வழங்குவதற்குரிய நிலப்பரப்பாக (Precise Area Communication) கருதப்படுகிறது.

நிபந்தனைகள்

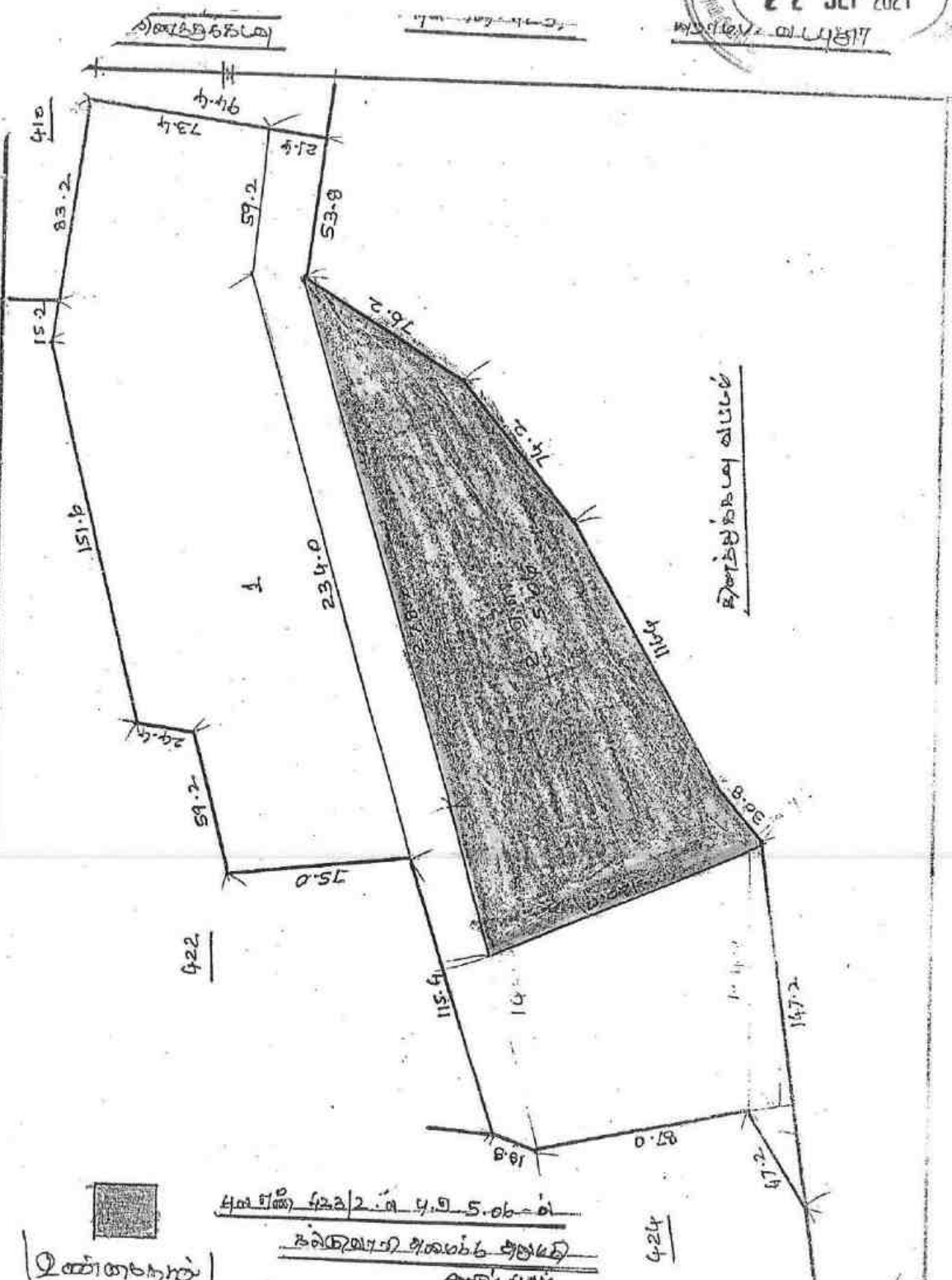
1. அருகிலுள்ள பட்டா நிலங்களுக்கும் மற்றும் பொது மக்களுக்கும், எவ்வித இடையூறும் இன்றி குவாரி பணி மேற்கொள்ள வேண்டும்.
2. அருகில் உள்ள பட்டா நிலத்திற்கு 7.5 மீட்டர் பாதுகாப்பு இடைவெளி விட்டு குவாரிப்பணி மேற்கொள்ள வேண்டும்.
3. மெருகேற்றக்கூடிய கிராண்ட் கற்களை வெட்டியெடுக்க கூடாது.
4. குழந்தை தொழிலாளர்களை வேலைக்கு அமர்த்தல் கூடாது.

மேலும், தமிழ்நாடு சிறுகனிம சலுகை விதிகள்-1959 விதி எண். 41 மற்றும் 42-ன் படி குவாரிப்பணி மேற்கொள்வது தொடர்பாக வரைவு சுரங்க திட்டத்தினை 90 தினங்களுக்குள் சமர்ப்பிக்குமாறும், மாநில சுற்றுச்சூழல் தாக்க மதிப்பீட்டு அதிகார அமைப்பின் அனுமதியினை பெற்று சமர்ப்பிக்கவும் மனுதாரரை கேட்டுக் கொள்ளப்படுகிறது.

உதவி இயக்குநர்,
புவியியல் மற்றும் சுரங்கத்துறை
கோயம்புத்தூர்.

பெறுநர்:
திருமதி.கு.சங்கீதா,
க/பெ. குமரேஷ்,
13, நேதாஜி பகவதி பாளையம்,
கிணத்துக்கடவு,
கோயம்புத்தூர்.

6/8/21
3/8/21



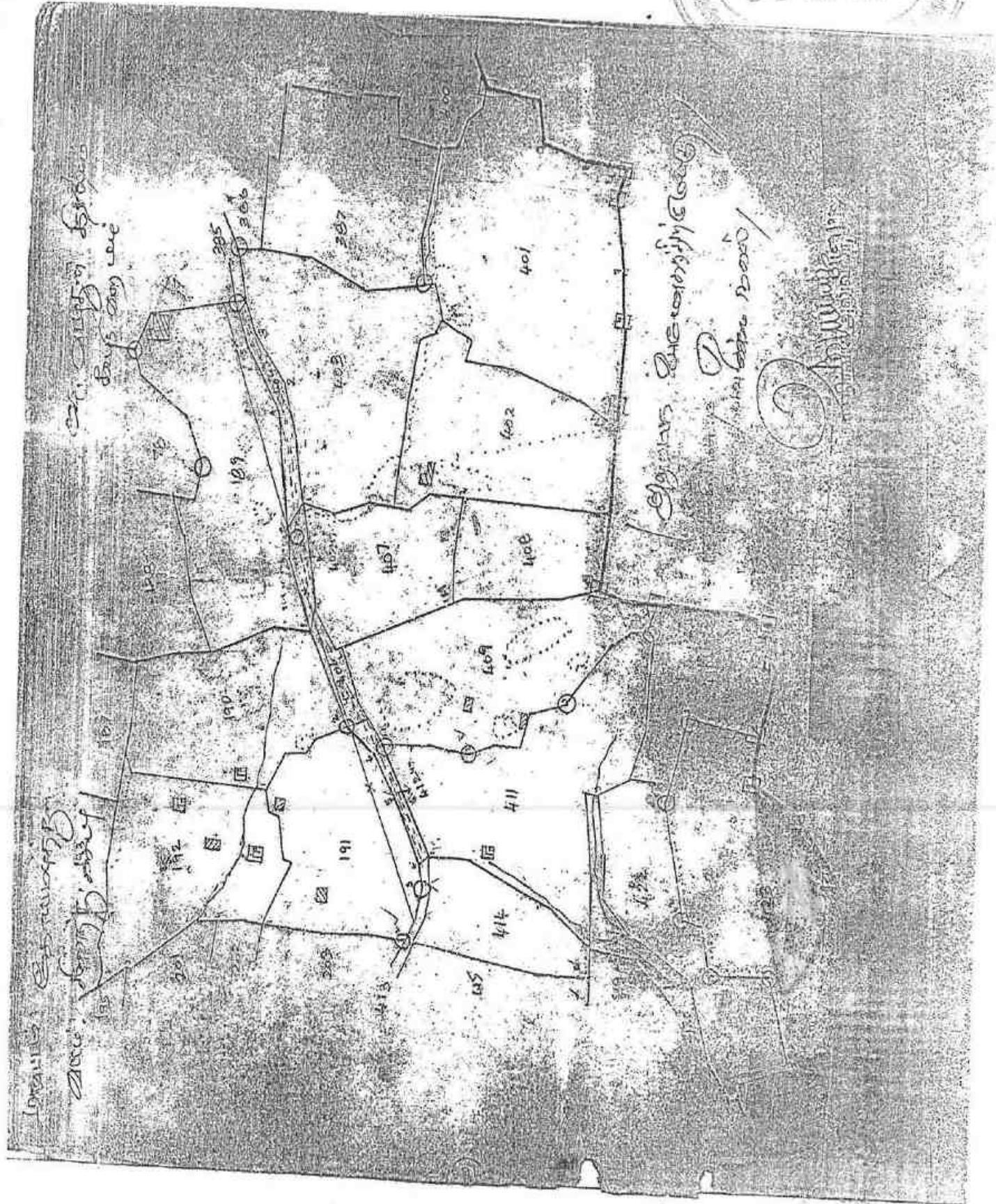
புறக்கட்டுவகை அட்டை


சுண்ணாம்பு

422/2-01 4.9 5.06-01
 கட்டுவகை அட்டை
 424

கிராம சபை
 4, ராஜகிராமம்

LEASE APPLIED AREA



LEASE APPLIED AREA 



தமிழக அரசு

வருவாய்த் துறை

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

மாவட்டம் : கோயம்புத்தூர்

வட்டம் : கிணத்துக்கடவு

வருவாய் கிராமம் : வடபுதூர்

பட்டா எண் : 116

உரிமையாளர்கள் பெயர்

1. ஞானசுந்தரசாமி

மகள்

சங்கீதா

2. கா.சங்கீதா

காப்பாளர்

ஆனந்தவினோதினி

| புல எண் | உட்பிரிவு | புன்செய் | | நன்செய் | | மற்றவை | | குறிப்புரைகள் |
|---------|-----------|------------|---------|------------|---------|------------|---------|---------------|
| | | பரப்பு | தீர்வை | பரப்பு | தீர்வை | பரப்பு | தீர்வை | |
| | | ஹெக் - ஏர் | ரூ - பை | ஹெக் - ஏர் | ரூ - பை | ஹெக் - ஏர் | ரூ - பை | |
| 328 | A | 0 - 16.50 | 0.56 | -- | -- | -- | -- | KR14/1200--- |
| 422 | 1 | 1 - 91.50 | 2.65 | -- | -- | -- | -- | -- 09-10-2001 |
| 423 | 2 | 3 - 78.00 | 5.29 | -- | -- | -- | -- | 09-10-2001 |
| | | 5 - 86.00 | 8.50 | | | | | KR14/1200--- |
| | | | | | | | | -- 09-10-2001 |

குறிப்பு 2 :



1. மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் <https://eservices.tn.gov.in> என்ற இணைய தளத்தில்-12/12/007/00116/10788 என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.
2. இத் தகவல்கள் 03-08-2020 அன்று 11:24:49 AM நேரத்தில் அச்சடிக்கப்பட்டது.
3. கைப்பேசி கேமராவின் 2D barcode படப்பான் மூலம் படித்து 3G/GPRS வழி இணையதளத்தில் சரிபார்க்கவும்

22 SEP 2021

92

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
|----|----------|-------|-----|-----|-----|-----|-----|----------------------|--------|----------|--|------------------------------|
| | | | | | | | | உ. ம. ம. ம. ம. ம. ம. | | உ. ம. ம. | | |
| 10 | 423/1 | 423/1 | J 4 | | | | | | | | | |
| 11 | 2 | 423/1 | J 4 | | | 8-4 | 6 | 1.38 | 2.63.0 | 3.65 | 394. கட்டிடம் கட்டிடம் கட்டிடம் கட்டிடம் கட்டிடம் கட்டிடம் கட்டிடம் கட்டிடம் | Change |
| 1 | | | | | | 8-4 | 6 | 1.38 | 3.78.0 | 5.29 | 110. கட்டிடம் கட்டிடம் கட்டிடம் கட்டிடம் கட்டிடம் கட்டிடம் கட்டிடம் கட்டிடம் | per |
| 2 | | | | | | | | | | | கட்டிடம் கட்டிடம் கட்டிடம் கட்டிடம் கட்டிடம் கட்டிடம் கட்டிடம் கட்டிடம் கட்டிடம் | TK. 8A- |
| 3 | | | | | | | | | 6.41.0 | 8.94 | கட்டிடம் கட்டிடம் கட்டிடம் கட்டிடம் கட்டிடம் கட்டிடம் கட்டிடம் கட்டிடம் கட்டிடம் | 46-21-51 |
| 4 | with | | | | | | | | | | | J.P. Ramela |
| 5 | Th. Copy | | | | | | | | | | | 5.5 Jiska Sun Kintukka |
| 6 | | | | | | | | | | | | |

மேல்க்கண்ட

(Signature)
 உறுதிப்படுத்தப்பட்டது
 உறுதிப்படுத்தப்பட்டது
 உறுதிப்படுத்தப்பட்டது

412

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414

415

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22 SEP 2021
11

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
|-----|------------|----|-----|-----|-----|-----|------|--------|-------|---|
| 417 | 417 | சு | 4.0 | ... | ... | ... | ... | 0 14.0 | ... | ... |
| 418 | 418 | சு | 4.0 | ... | ... | ... | ... | 0 19.0 | ... | ... |
| 419 | 1 419-1ur | சு | 4 | ... | 8-3 | 5 | 2 00 | 1 70.5 | 3 41 | 46 பெர். சுதந்திரக் கவுண்டர். |
| | 2 419-2ur | சு | 4 | ... | 8-3 | 5 | 2 00 | 1 89.0 | 3 78 | 122 பெர். செவ்வம் கவர். |
| | | | | | | | | 3 59.5 | 7 19 | ... |
| 420 | 420 | சு | 4.0 | ... | ... | ... | ... | 0 76.0 | ✓ ... | ... |
| 421 | 421 | சு | 4.0 | ... | ... | ... | ... | 0 63.5 | ✓ ... | ... |
| 422 | 1 422-1ur | சு | 4 | ... | 8-4 | 6 | 1 38 | 1 91.5 | 2 65 | 45 செ. சுதந்திரக் கவுண்டர். |
| | 2 -1ur | சு | 4 | ... | 8-4 | 6 | 1 38 | 1 20.0 | 1 66 | 287 ப. சாமசாயிக் கவுண்டர். |
| | | | | | | | | 3 11.5 | 4 31 | ... |
| 423 | 1 423 | சு | 4 | ... | 8-4 | 6 | 2 38 | 6 41.0 | 8 94 | 394 ப. ச. சாமசாயிக் கவுண்டர் (1), செ. சுதந்திரக் கவுண்டர். (2). |
| | 2 423 | சு | 4 | ... | 8-4 | 6 | 1 38 | 1 98.5 | 2 77 | 29 பெர். சுதந்திரக் கவுண்டர். |
| 424 | 1 424-1ur | சு | 4 | ... | 8-4 | 6 | 1 38 | 0 07.0 | 0 10 | 471 பெர். பழனிக் கவுண்டர் மற்றும் குவர்*. |
| | 2 -1ur | சு | 4 | ... | 8-4 | 6 | 1 38 | 1 66.5 | 2 32 | 29 பெர். சுதந்திரக் கவுண்டர். |
| | | | | | | | | 3 71.5 | 5 19 | ... |
| 425 | 425 | சு | 4.0 | ... | ... | ... | ... | 0 37.0 | ✓ ... | ... |
| 426 | 1A 426-1ur | சு | 4 | ... | 8-3 | 5 | 2 00 | 0 01.5 | 0 06 | 489 ச. மாசாத்தர் மற்றும் தாலவர்*. |
| | 1B -1ur | சு | 4 | ... | 8-3 | 5 | 2 00 | 0 17.5 | 0 31 | 472 சி. பழனிக் கவுண்டர் (1), மற்றும் குவர்*. |
| | | | | | | | | 0 33.0 | ... | ... |
| | | | | | | | | 0 52.0 | 0 37 | ... |
| 427 | 427-1ur | சு | 4 | ... | 8-3 | 5 | 2 00 | 5 68.0 | 11 36 | 545 ப. தாசாத்தர் மற்றும் தாலவர்*. |

153

ANNEXURE VII

தமிழ்நாடு அலுவலகம்

22 SEP 2014



தமிழ்நாடு தமிழ்நாடு TAMIL NADU

4-9-2014

Sangeetha

etc

T. Radhamani

55AA 648023

T. RADHAMANI

S TAMP VENDOR

L.No: 8935/E1/2017 dt. 11.01.2018

Shop No.16, Old Post Office Road

013, UMS Building,

Coimbatore - 641 018.



சம்மதக்கடிதம்

கோயம்புத்தூர் மாவட்டம், கிணத்துக்கடவு தாலூக்கா, பகவதிபாளையம், நேதாஜி வீதி, கதவு எண்.13, என்ற விலாசத்தில் வசித்து வரும் G. ஆனந்த வினோதினி D/o.P.ஞானசந்தாசாமி ஆகிய நான் அளிக்கும் சம்மதக்கடிதம் என்னவென்றால்,



G. Anandha Vinodhini

சென்னை இயக்குநர் அலுவலகம்
22 SEP 2021



தமிழ்நாடு தமில்நாடு TAMIL NADU

4-9-2020
Sangeetha
Uc


T. P. 55AA 648024
HARANI
VENDOR
L.No: 8936/2017 dt. 11.01.2018
Shop No.16, Old Post Office Road,
813, UMS Building,
Coimbatore - 641 018,

கோயமுத்துர் ஊவட்டம், கிணத்துக்கடவு வட்டம், வடபுதூர் கிராமம், க.ச.எண்.423/2-ல் 3.78 ஹெக்டேர் பூமியானது எனக்கும், எனது சகோதரியுமான திருமதி. K.சங்கீதா W/o.V.குமரேஷ் ஆகிய இருவருக்கும் கூட்டாக பர்த்தியப்பட்டதாகும். மேற்படி பூமியில் எனது சகோதரி திருமதி. K.சங்கீதா W/o.V.குமரேஷ் என்பவருக்கும் சாதாரண கல் மற்றும் கிராவல் வெட்டுவதற்காக குவாரி குத்தகை அனுமதி அளிக்கும் நாளிலிருந்து 5(ஐந்து) வருடங்களுக்கு எவ்வித ஆட்சேபனையும் இல்லை என்பதை இந்த பிரமாணத்தின் மூலம் தெரிவித்துக் கொள்கிறேன்.



இப்படிக்கு,
G. Anandha Kumodhini

N. Poongodi 04.09.2020
N. POONGODI, B.A., B.L.,
ADVOCATE & NOTARY PUBLIC
G.O. MS. 67/2019
18, Saranvathi Apartments, 3rd Street,
Ganapathy, Coimbatore-641 006.
Cell: 99943 72101, 0422-4378467

भारत सरकार
ஆதார

உனது ஆதாரம்
Government of India

உனது தனிப்பட்ட அடையாள அடையாளம்
Unique Identification Authority of India


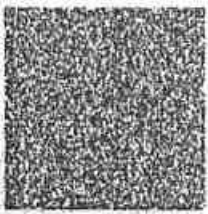
பதிவேட்டு எண்/ Enrolment No.: 2193/10307/81138

Download Date: 14/09/2020

Issue Date: 09/09/2020


To
கு சங்கீதா
K Sangeetha
C/O: V Kumaresh
13
NETHAJI STREET
KINATHUKADAVU
BAGAVATHIPALAYAM
Kinathukadavu
Kinathukadavu
Coimbatore Tamil Nadu - 642109
9677446783

Signature valid

உங்கள் ஆதார எண் / Your Aadhaar No. :
4614 3846 6353
VID : 9187 7822 0112 0948

எனது ஆதார. எனது அடையாளம்




भारत सरकार
ஆதார



உனது ஆதாரம்
Government of India

Download Date: 14/09/2020

Issue Date: 09/09/2020



கு சங்கீதா
K Sangeetha
பிறந்த நாள்/DOB: 19/08/1992
பாலின/ FEMALE

Signature valid

4614 3846 6353
VID : 9187 7822 0112 0948

எனது ஆதார. எனது அடையாளம்

भारत सरकार
ஆதார

உனது ஆதாரம்
Government of India

22 SEP 2021

தகவல்

- ஆதார அடையாளத்திற்கான சான்று குடியறிமைக்கு அல்ல.
- பாதுகாப்பான OR குறியீடு ஆப்லைவ் XML / ஆன்லைவ் அங்கீகாரத்தைப் பயன்படுத்தி அடையாளத்தை சரிபார்க்கவும்
- இது எலக்ட்ரானிக் செயல்முறை மூலம் தயாரிக்கப்பட்ட கடிதமாகும்.

INFORMATION

- Aadhaar is a proof of identity, not of citizenship.
- Verify identity using Secure QR Code/ Offline XML/ Online Authentication.
- This is electronically generated letter.

- ஆதார நாடு முழுவதிலும் செல்லுபடியாகும்.
- பல்வேறு அரசு மற்றும் அரசு சாரா சேவைகளை எளிதில் பெற ஆதார உதவுகிறது.
- உங்கள் மொபைல் எண் மற்றும் மின்னஞ்சல் மூலம் ஆதாரில் புதுப்பிக்கவும்
- Aadhaar செயலியைப் பயன்படுத்தி உங்கள் எம்மார்ட் போனில் ஆதாரை எடுத்துச் செல்லுங்கள்



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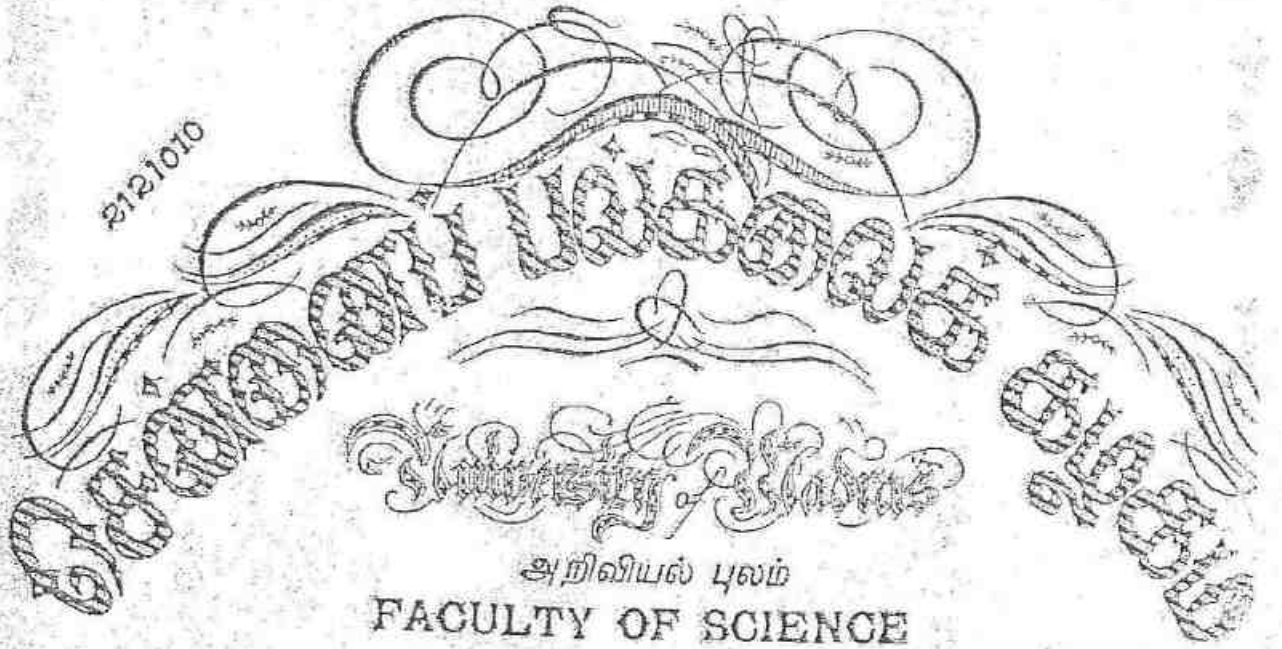
கு சங்கீதா
K Sangeetha
பிறந்த நாள்/DOB: 19/08/1992
பாலின/ FEMALE

Signature valid

4614 3846 6353
VID : 9187 7822 0112 0948

1947 | help@uidai.gov.in | www.uidai.gov.in



சென்னைப் பல்கலைக் கழகப் பேரவை..... 1994 ஆம் ஆண்டு..... ஜூன்..... மாதம் நடந்த..... கணிமதியல்..... தேர்வு..... வி. தங்கராசு..... என்பவர்..... முதல்..... வகுப்பில் தேர்ச்சி பெற்றார் என்று தக்க கோவாளர்கள் சான்றளித்தபடி அறிவியல் நிறைஞர் என்னும் பட்டத்தை அவருக்குப் பல்கலைக் கழக இவச்சினைபுள்ள வழங்குகிறது.

The Senate of the UNIVERSITY OF MADRAS hereby makes known that..... P. Thangaraju..... has been admitted to the Degree of Master of Science, he/she having been certified by duly appointed Examiners to be qualified to receive the same in..... Geology..... and was placed in the..... First..... Class, at the Examination held in April 1994.



Given under the seal of the University,

செயலாளர், Chennai
சென்னை, Madras
திகதி: Dated: 25-01-1999

பதிவுரை
Registrar

P.T. Jeyaraj
திணைக்கல்வி
திரு. சுவாமி

22 SEP 2021

GOVERNMENT OF INDIA
MINISTRY OF LABOUR AND REHABILITATION
OFFICE OF THE DIRECTOR GENERAL OF MINES SAFETY

Certificate of Practical experience granted by the Manager to a candidate for a Manager's / Surveyor's / Foremen's / Over man's / Sirdar's / Mate's / Short firer's/ Blaster's Certificate of competency (Restricted) examination under the Metalliferous Mines Regulations 1961.

I T.VENKATARAJAGOPALAN being the Mines Agent of M/S.LIMENAPH CHEMICALS, RAJAPALAYAM OF LIMESTONE PRODUCTS (Thenmali Limestone Mine) do hereby certify that Thiru. P.THANGARAJU, son of S.PERIASAMY (whose signature is appended) worked as a Geologist in the above mine from 02.05.1994 to 30.12.1999. During his term of work aforesaid, he has obtained practical experience as detailed overleaf. The duties connected with his work have involved continuous attendance at the mine and have been efficiently performed by him.

I believe him to be of good character and a fit and proper candidate to be examined for Certificate of Competency.

TRENMALI LIME STONE MINES

(Signature with date and official Seal)
[T.VENKATARAJAGOPALAN]

Mines Agent:

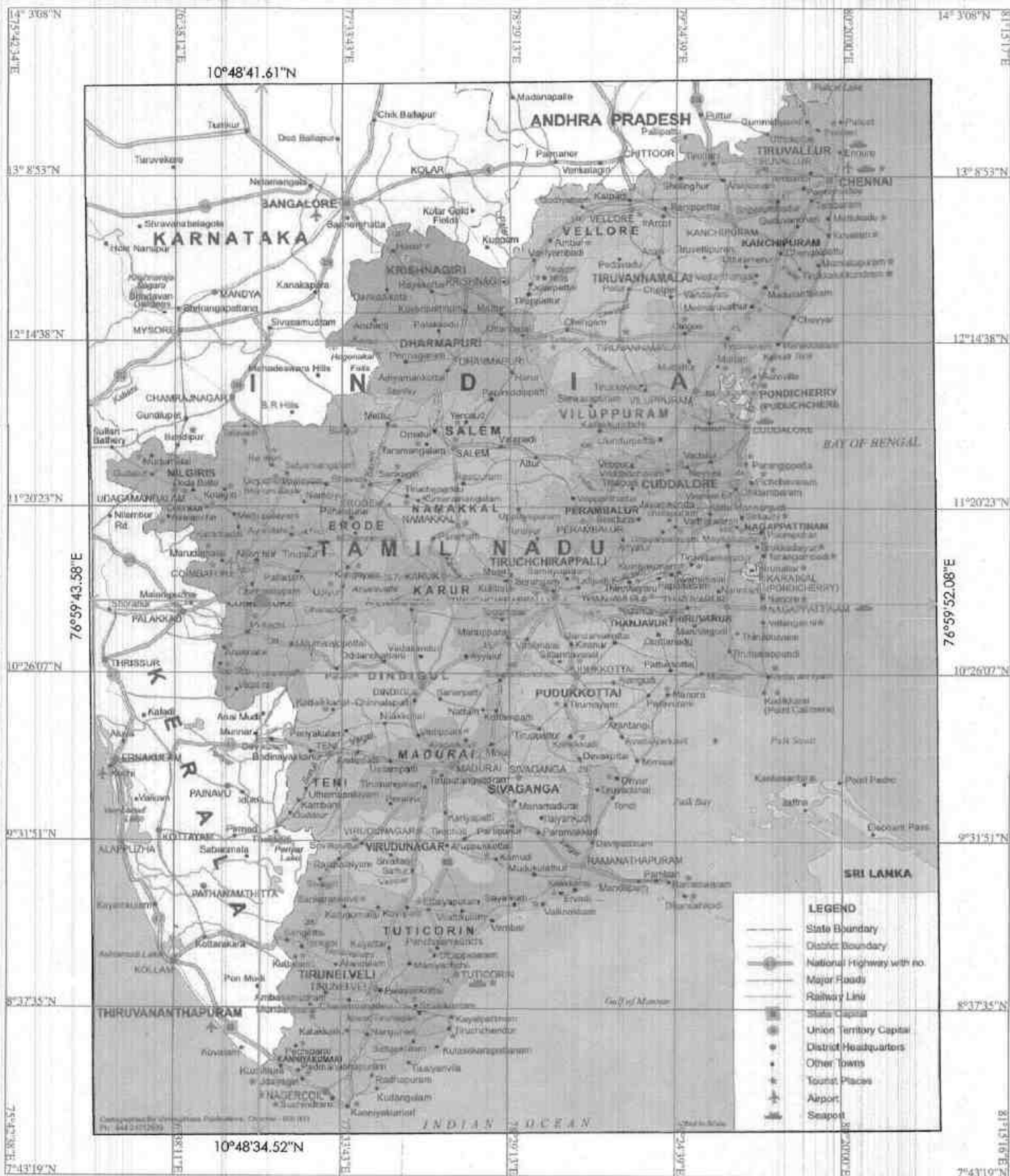
P.O. : ARUKANGULAM

District : TIRUNELVELI

State : TAMIL NADU

(Signature of Candidate)
(Signature of Candidate)

(State name of Mineral) : LIMESTONE



INDEX

Q.L.APPLIED AREA : ●

TOPO SHEET NO. : 58 B/13

LATITUDE : 10°48'34.52"N to 10°48'41.61"N
 LONGITUDE : 76°59'43.58"E to 76°59'52.08"E

APPLICANT :

Tmt.K. SANGEETHA,
 W/o. KUMARESH,
 No.13, NETHAJI STREET, BAGAVATHIPALAYAM
 KINATHUKADAVU TALUK,
 COIMBATORE - 642 109.

LOCATION OF Q.L. APPLIED AREA:

S.F.No : 423/ 2 (Part).
 EXTENT : 2.36.5 Ha.
 VILLAGE : VADAPUDUR,
 TALUK : KINATHUKADAVU,
 DISTRICT : COIMBATORE,
 STATE : TAMIL NADU.

PLATE NO - I

DATE OF SURVEY : 04.08.2021

LOCATION PLAN

SCALE: 1:24,00,000

PREPARED BY :

THIS IS TO CERTIFY THAT THE INFORMATION IN THIS
 PLATE IS TRUE AND CORRECT TO THE BEST OF MY
 KNOWLEDGE BASED UPON THE LEASE MAP
 AUTHENTICATED BY STATE GOVERNMENT

[Signature]
 G.M. THARAKAN, M.Sc., Ph.D.,
 QUALIFIED PERSON



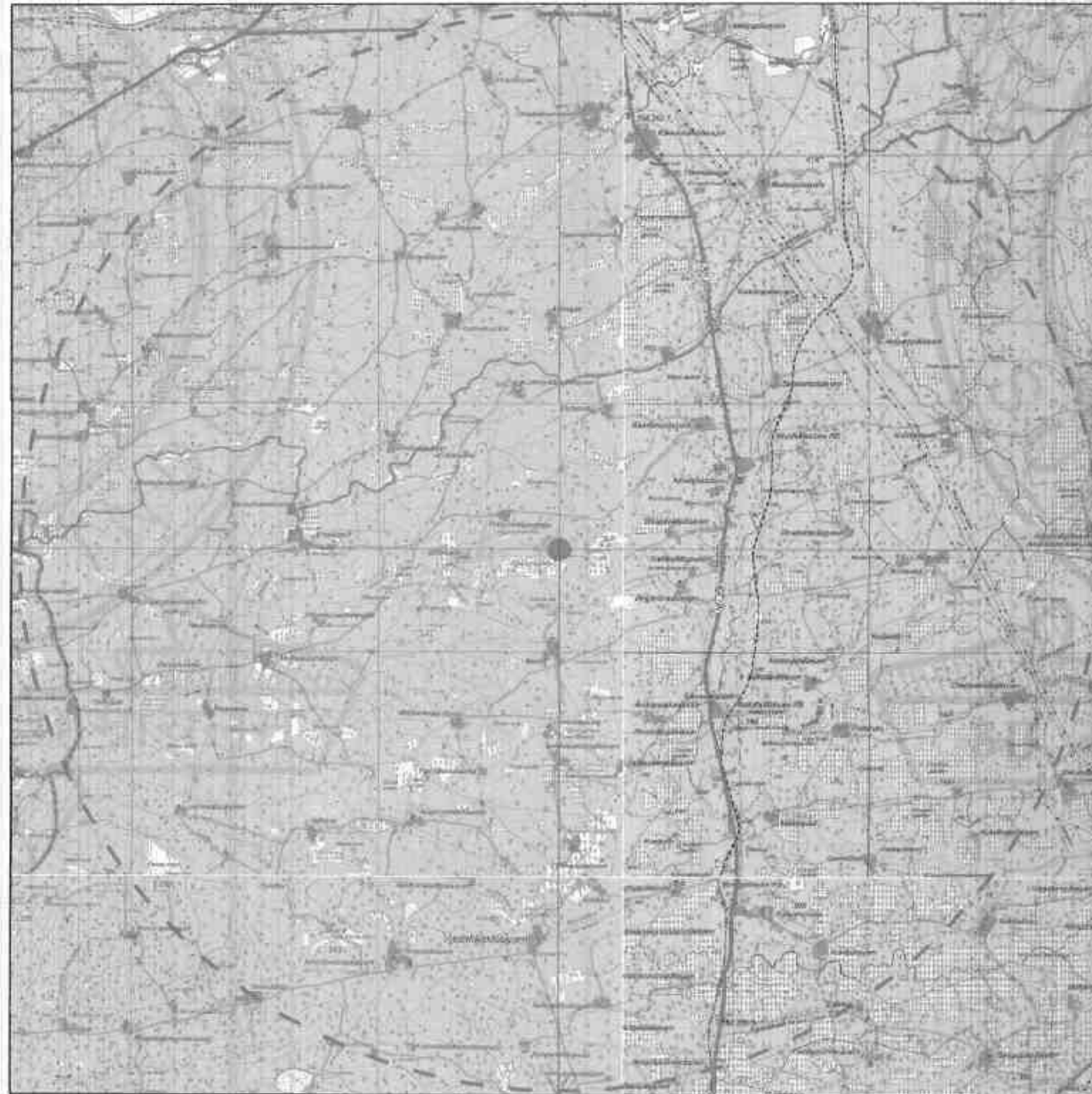
10° 54' 06.99"N

| | |
|--|--|
| Express highway: with toll; with bridge; with distance stone..... | |
| Roads metalled according to importance..... | |
| Roads, double carriageway; according to importance..... | |
| Unmetalled road. Cart-track. Pack-track with pass. Foot-path..... | |
| Streams: with track in bed; undefined. Canal..... | |
| Dams: masonry or rock-filled; earthwork. Weir..... | |
| River; dry with water channel; with island & rocks. Tidal river..... | |
| Submerged rocks. Shoal. Swamp. Reeds..... | |
| Wells: lined; unlined. Tubewell. Spring. Tanks; perennial; dry..... | |
| Embankments: road or rail; tank. Broken ground..... | |
| Railways, broad gauge: double; single with station; under constrm..... | |
| Railways, other gauges: double; single with distance stone; do..... | |
| Mineral line or tramway. Kiln. Cutting with tunnel..... | |
| Contours with sub-features. Rocky slopes. Cliffs..... | |
| Sand features: (1) flat. (2) sand-hills(permanent). (3) dunes(shifting)..... | |
| Towns or Villages: inhabited; deserted. Fort..... | |
| Huts: permanent; temporary. Tower. Antiquities..... | |
| Temple. Chhatra. Church. Mosque. Idgah. Tomb. Graves..... | |
| Lighthouse. Lightship. Buoys: lighted; unlighted. Anchorage..... | |
| Mine. Vine on trellis. Grass. Scrub..... | |
| Palms: palmyra; other. Plantain. Conifer. Bamboo. Other trees..... | |
| Areas: cultivated; Wooded. Surveyed trees..... | |
| Boundary, international..... | |
| Boundary, state: demarcated; undemarcated..... | |
| Boundary, district; subdivision; tahsil or taluk; forest..... | |
| Boundary pillars: surveyed; unlocated..... | |
| Heights, triangulated: station: point; approximate..... | |
| Bench-mark: geodetic; tertiary; canal..... | |
| Post office. Telegraph office. Overhead tank..... | |
| Rest house or inspection bungalow. Circuit house. Police station..... | |
| Camping Ground. Forest: reserved; protected..... | |
| Spaces names: administrative; locality or tribal..... | |
| Hospital. Dispensary. Veterinary: Hospital/Dispensary..... | |
| Aerodrome. Helipad. Tourist site..... | |
| Powerline: with pylons surveyed; with poles unsurveyed..... | |

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--|
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1:200 | 1:200 | 1:200 | 1:200 | 1:200 | 1:200 | 1:200 | 1:200 | 1:200 | 1:200 | 1:200 | 1:200 | 1:200 | 1:200 | 1:200 | 1:200 | 1:200 | 1:200 | 1:200 | 1:200 | 1:200 | 1:200 | 1:200 | 1:200 | 1:200 | 1:200 | 1:200 | 1:200 | 1:200 | |
| 5M 63/3 | 5M 63/3 | 5M 63/3 | 5M 63/3 | 5M 63/3 | 5M 63/3 | 5M 63/3 | 5M 63/3 | 5M 63/3 | 5M 63/3 | 5M 63/3 | 5M 63/3 | 5M 63/3 | 5M 63/3 | 5M 63/3 | 5M 63/3 | 5M 63/3 | 5M 63/3 | 5M 63/3 | 5M 63/3 | 5M 63/3 | 5M 63/3 | 5M 63/3 | 5M 63/3 | 5M 63/3 | 5M 63/3 | 5M 63/3 | 5M 63/3 | 5M 63/3 | |
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| 1:200 | 1:200 | 1:200 | 1:200 | 1:200 | 1:200 | 1:200 | 1:200 | 1:200 | 1:200 | 1:200 | 1:200 | 1:200 | 1:200 | 1:200 | 1:200 | 1:200 | 1:200 | 1:200 | 1:200 | 1:200 | 1:200 | 1:200 | 1:200 | 1:200 | 1:200 | 1:200 | 1:200 | 1:200 | |

76° 54' 14.47"E

77° 05' 21.20"E



10° 43' 09.13"N

TOPO SHEET NO. : 58 B/13

LATITUDE : 10°48'34.52"N to 10°48'41.61"N
 LONGITUDE : 76°59'43.58"E to 76°59'52.08"E

10km RADIUS : Q.L. APPLIED AREA : **APPLICANT :**

Tmt.K. SANGEETHA,
 W/o. KUMARESH,
 No.13, NETHAJI STREET, BAGAVATHIPALAYAM,
 KINATHUKADAVU TALUK,
 COIMBATORE - 642 109.

LOCATION OF Q.L. APPLIED AREA:

S.F.No : 423/ 2 (Part).
 EXTENT : 2.36.5 Ha.
 VILLAGE : VADAPUDUR,
 TALUK : KINATHUKADAVU,
 DISTRICT : COIMBATORE,
 STATE : TAMIL NADU.

PLATE NO - I-A

DATE OF SURVEY : 04.08.2021

**TOPO SKETCH OF QUARRY LEASE
APPLIED AREA FOR 10Km RADIUS**

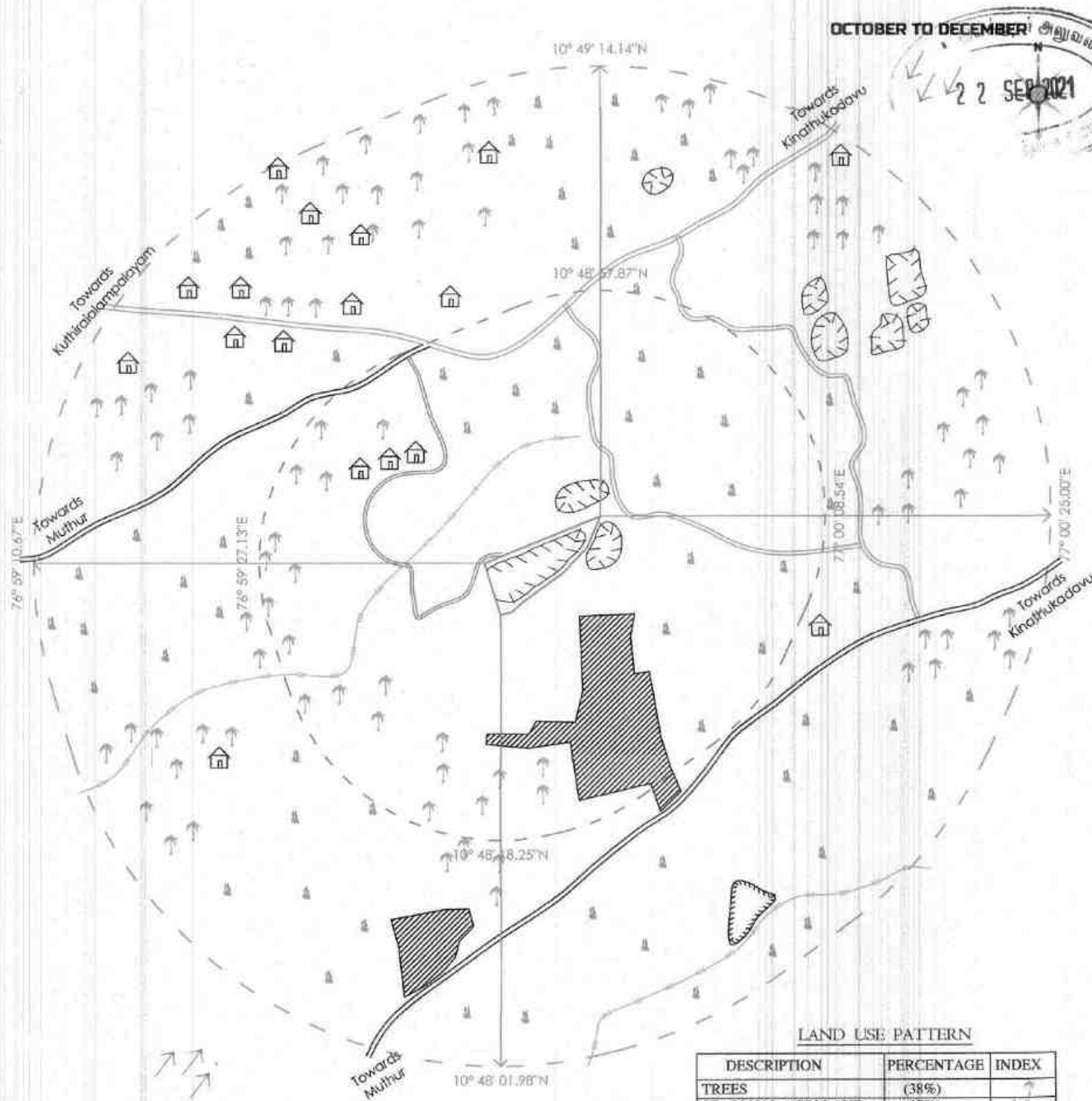
SCALE. 1:1,00,000

PREPARED BY :

THIS IS TO CERTIFY THAT THE INFORMATION IN THIS
 PLATE IS TRUE AND CORRECT TO THE BEST OF MY
 KNOWLEDGE BASED UPON THE LEASE MAP
 AUTHENTICATED BY STATE GOVERNMENT

Dr. THIRUMALA RAO, M.Sc., Ph.D., 84 A
 QUALIFIED PERSON

160



OCTOBER TO DECEMBER
22 SEP 2021

INDEX

- Q.L. APPLIED AREA
- 1 Km RADIUS
- 500m RADIUS
- SEASONAL AGRICULTURE LAND
- TREES
- HABITATION & INFRASTRUCTURE
- WIND DIRECTION
- VILLAGE ROAD
- APPROACH ROAD
- EARTHEN ROAD
- ODAI
- QUARRY PIT

APPLICANT :

Tmt.K. SANGEETHA,
W/o. KUMARESH,
No.13, NETHAJI STREET, BAGAVATHIPALAYAM,
KINATHUKADAVU TALUK,
COIMBATORE - 642 109.

LOCATION OF Q.L. APPLIED AREA:

S.F.No : 423/ 2 (Part).
EXTENT : 2.36.5 Ha.
VILLAGE : VADAPUDUR,
TALUK : KINATHUKADAVU,
DISTRICT : COIMBATORE,
STATE : TAMIL NADU.

PLATE NO - I-B

DATE OF SURVEY : 04.08.2021

ENVIRONMENTAL & LAND USE PLAN

SCALE. 1:10,000

PREPARED BY :

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[Signature]
85 A.D.,
QUALIFIED PERSON

LAND USE PATTERN

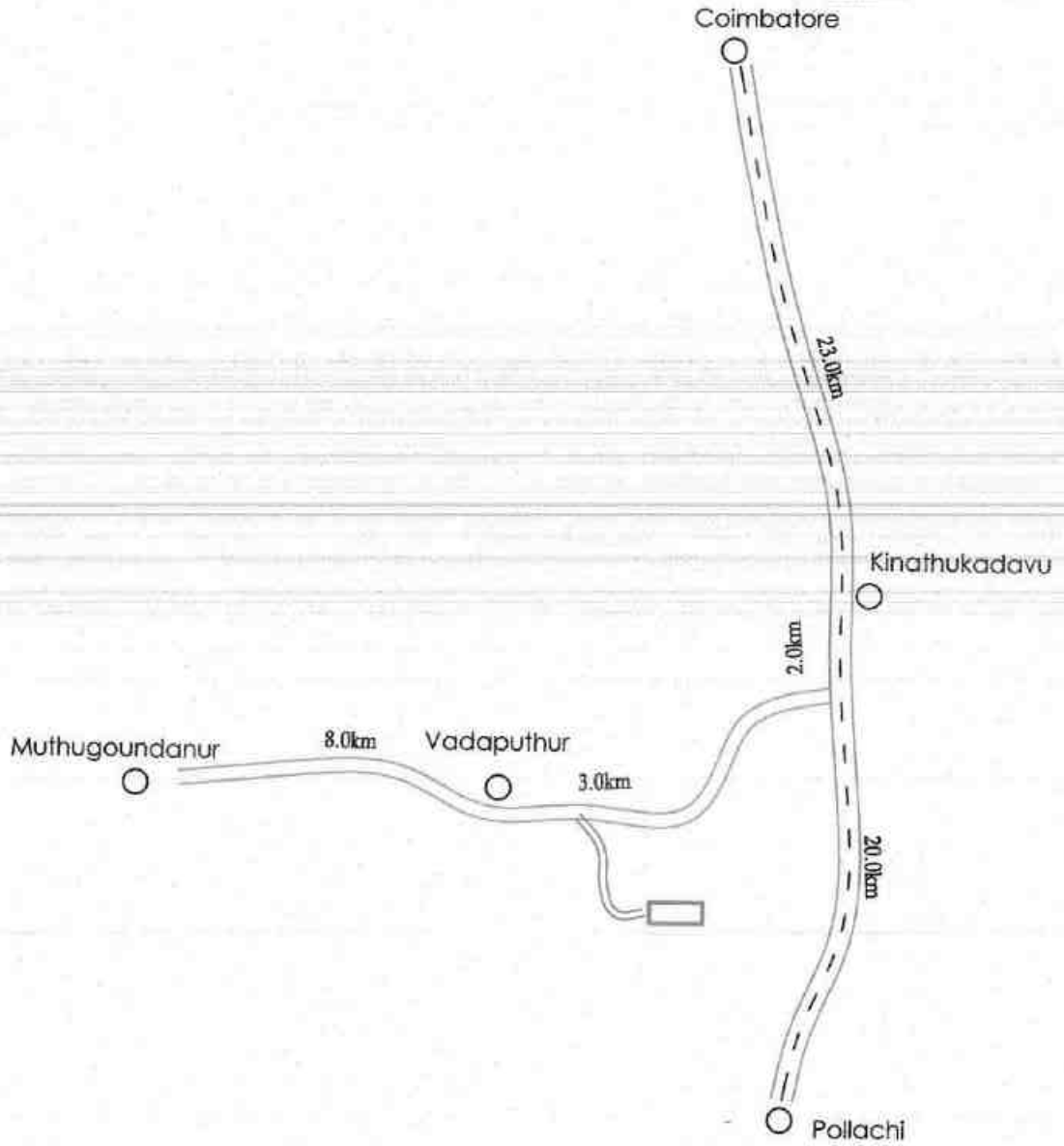
| DESCRIPTION | PERCENTAGE | INDEX |
|--------------------|------------|-------|
| TREES | (38%) | |
| SEASONAL AGRI LAND | (27%) | |
| ODAI | (02%) | |
| HABITATION&INFRA.. | (15%) | |
| QUARRY PIT | (08%) | |
| ROADS | (10%) | |
| TOTAL | 100% | |

JULY TO SEPTEMBER

TOPO SHEET NO. : 58 B/13
LATITUDE : 10°48'34.52"N to 10°48'41.61"N
LONGITUDE : 76°59'43.58"E to 76°59'52.08"E

PLATE NO : I-C

ROUTE MAP



| <u>INDEX</u> | |
|--------------------|--|
| LEASE APPLIED AREA | |
| NATIONAL HIGHWAY | |
| APPROACH ROAD | |
| VILLAGE ROAD | |

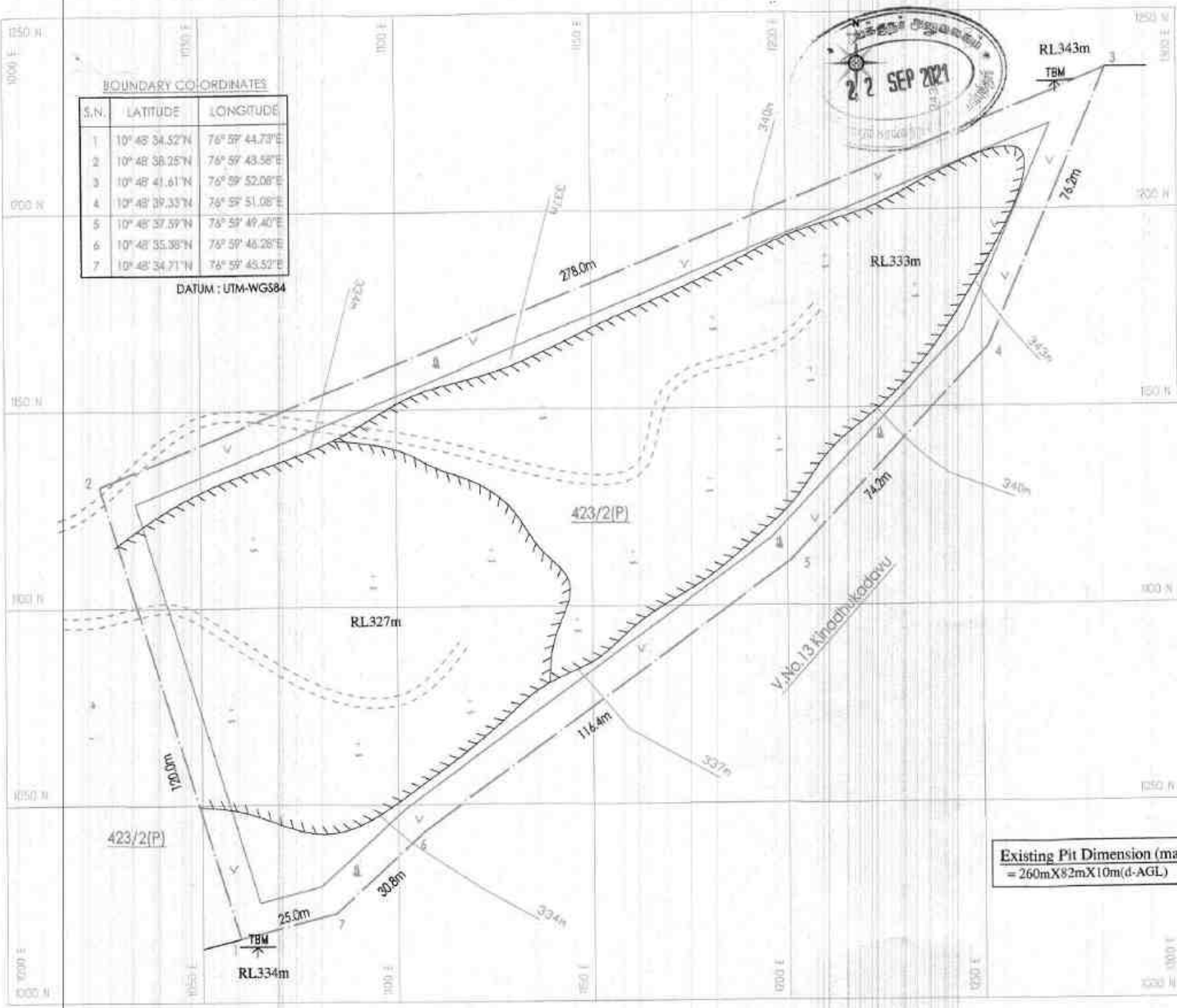
APPLICANT :
Tmt.K. SANGEETHA,
W/o. KUMARESH,
No.13, NETHAJI STREET, BAGAVATHIPALAYAM,
KINATHUKADAVU TALUK,
COIMBATORE - 642 109.

LOCATION OF Q.L. A. AREA:
S.F.No : 423/ 2 (Part),
EXTENT : 2.36.5 Ha.
VILLAGE : VADAPUDUR,
TALUK : KINATHUKADAVU,
DISTRICT : COIMBATORE,
STATE : TAMIL NADU.

SCALE :
NOT TO SCALE

PREPARED BY:
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KNOWLEDGE BASED UPON THE LEASE MAP
AUTHENTICATED BY STATE GOVERNMENT

M. THANARAJ, M.Sc., Ph.D.,
QUALIFIED PERSON



BOUNDARY CO-ORDINATES

| S.N. | LATITUDE | LONGITUDE |
|------|-----------------|-----------------|
| 1 | 10° 48' 34.52"N | 76° 59' 44.73"E |
| 2 | 10° 48' 38.26"N | 76° 59' 43.58"E |
| 3 | 10° 48' 41.61"N | 76° 59' 52.08"E |
| 4 | 10° 48' 39.33"N | 76° 59' 51.08"E |
| 5 | 10° 48' 37.59"N | 76° 59' 49.40"E |
| 6 | 10° 48' 35.38"N | 76° 59' 48.28"E |
| 7 | 10° 48' 34.71"N | 76° 59' 45.52"E |

DATUM : UTM-WGS84

- INDEX**
- Q.L. APPLIED AREA BOUNDARY
 - 7.5m SAFETY DISTANCE
 - TEMPORARY BENCH MARK
 - TOP SOIL
 - ROUGHSTONE
 - QUARRY PIT
 - CONTOUR
 - SHRUBS
 - QUARRY HAUL ROAD
 - APPROACH ROAD

APPLICANT :
 Tmt.K. SANGEETHA,
 W/o. KUMARESH,
 No.13, NETHAJI STREET, BAGAVATHIPALAYAM,
 KINATHUKADAVU TALUK,
 COIMBATORE - 642 109.

LOCATION OF Q.L. APPLIED AREA:
 S.F.No : 423/ 2 (Part),
 EXTENT : 2.36.5 Ha.
 VILLAGE : VADAPUDUR,
 TALUK : KINATHUKADAVU,
 DISTRICT : COIMBATORE,
 STATE : TAMIL NADU.

PLATE NO - II
 DATE OF SURVEY : 04.08.2021

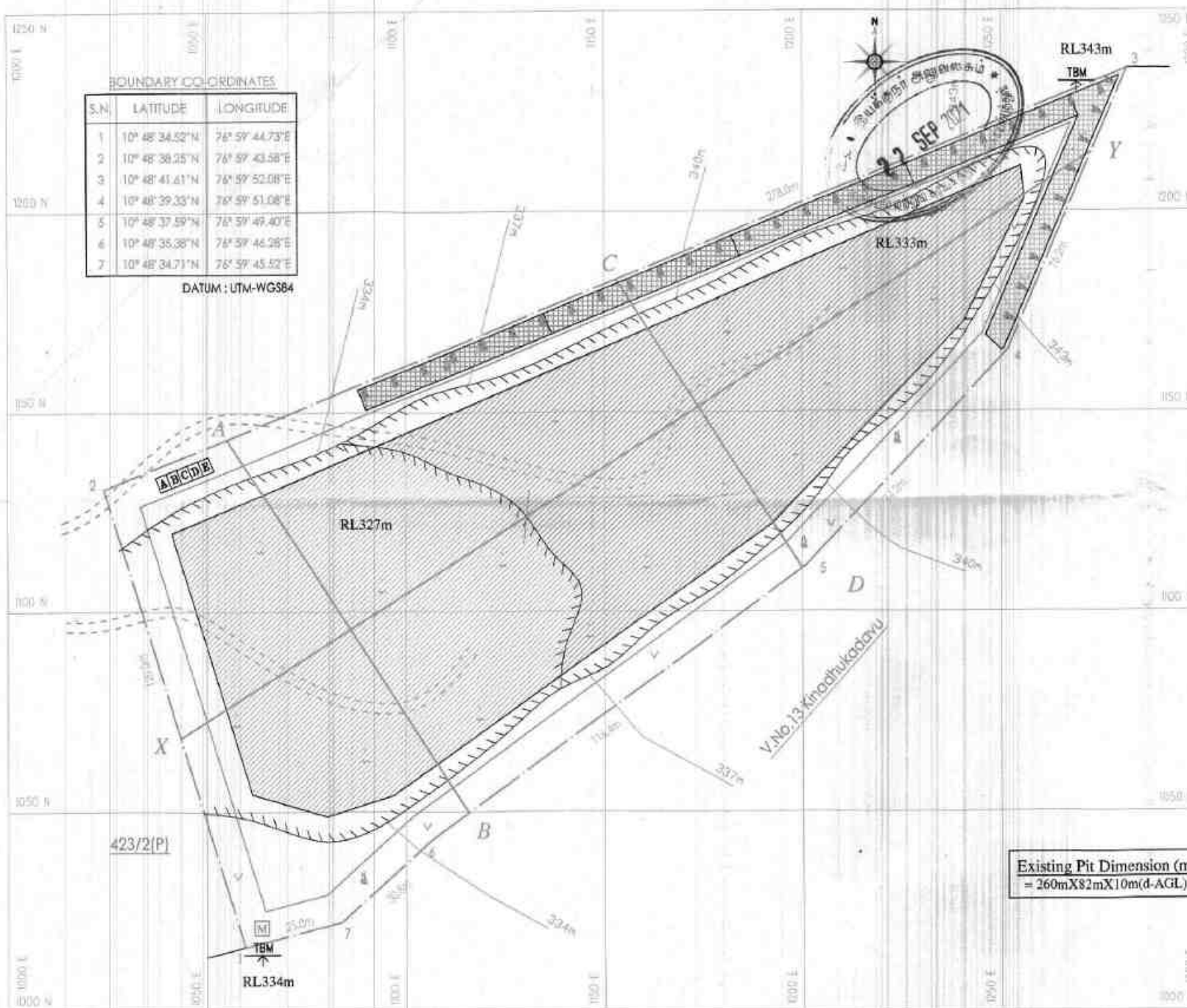
QUARRY LEASE PLAN & SURFACE PLAN
 SCALE: 1:1000

PREPARED BY :
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 PLATE IS TRUE AND CORRECT TO THE BEST OF MY
 KNOWLEDGE BASED UPON THE LEASE MAP
 AUTHENTICATED BY STATE GOVERNMENT

[Signature]
 D.P. THANGARAJAN, M.Sc., Ph.D.,
 QUALIFYING PERSON

Existing Pit Dimension (max)
 = 260mX82mX10m(d-AGL)

163



- I - yr Proposed area to be Quarried
- II - yr Proposed area to be Quarried
- III - yr Proposed area to be Quarried
- IV - yr Proposed area to be Quarried
- V - yr Proposed area to be Quarried

- I - yr Proposed area to be Planted
- II - yr Proposed area to be Planted
- III - yr Proposed area to be Planted
- IV - yr Proposed area to be Planted
- V - yr Proposed area to be Planted

- INDEX**
- Q.L. APPLIED AREA BOUNDARY
 - 7.5m SAFETY DISTANCE
 - TEMPORARY BENCH MARK
 - TOP SOIL
 - ROUGHSTONE
 - STRIKE & DIP
 - QUARRY PIT
 - SHRUBS
 - CONTOUR
 - QUARRY HAUL ROAD
 - APPROACH ROAD
 - D.O.E DEPTH OF ESTIMATION

APPLICANT :
 Trn.K. SANGEETHA,
 W/o. KUMARESH,
 No.13, NETHAJI STREET, BAGAVATHIPALAYAM,
 KINATHUKADAVU TALUK,
 COIMBATORE - 642 109.

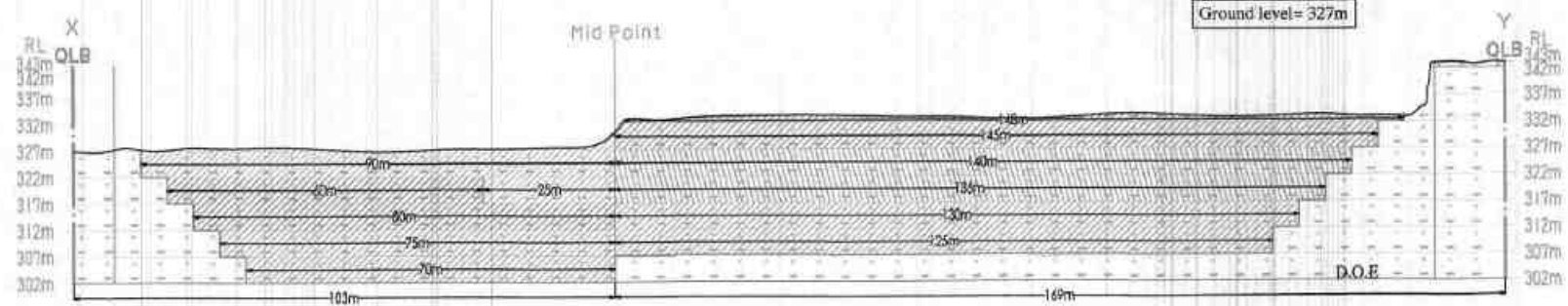
LOCATION OF Q.L. APPLIED AREA:
 S.F.No : 423/ 2 (Part),
 EXTENT : 2.36.5 Ha.
 VILLAGE : VADAPUDUR,
 TALUK : KINATHUKADAVU,
 DISTRICT : COIMBATORE,
 STATE : TAMIL NADU.

PLATE NO - III
 DATE OF SURVEY : 04.08.2021

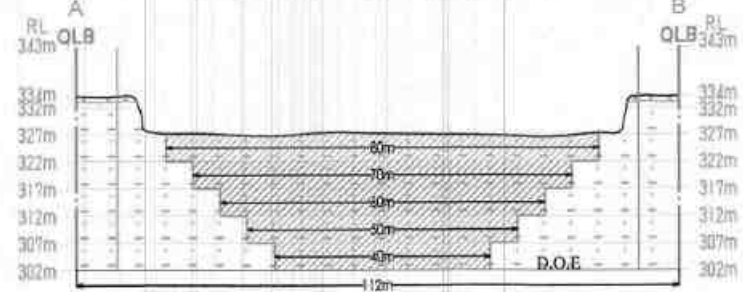
**TOPOGRAPHY, GEOLOGICAL PLAN
 YEARWISE DEVELOPMENT &
 PRODUCTION PLAN & SECTIONS**
 SCALE :- 1 : 1000

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 AUTHENTICATED BY STATE GOVERNMENT.

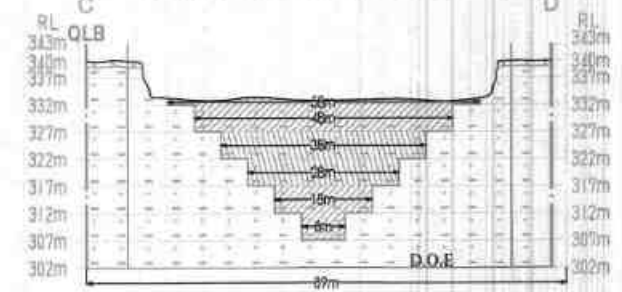
SECTION ALONG X-Y



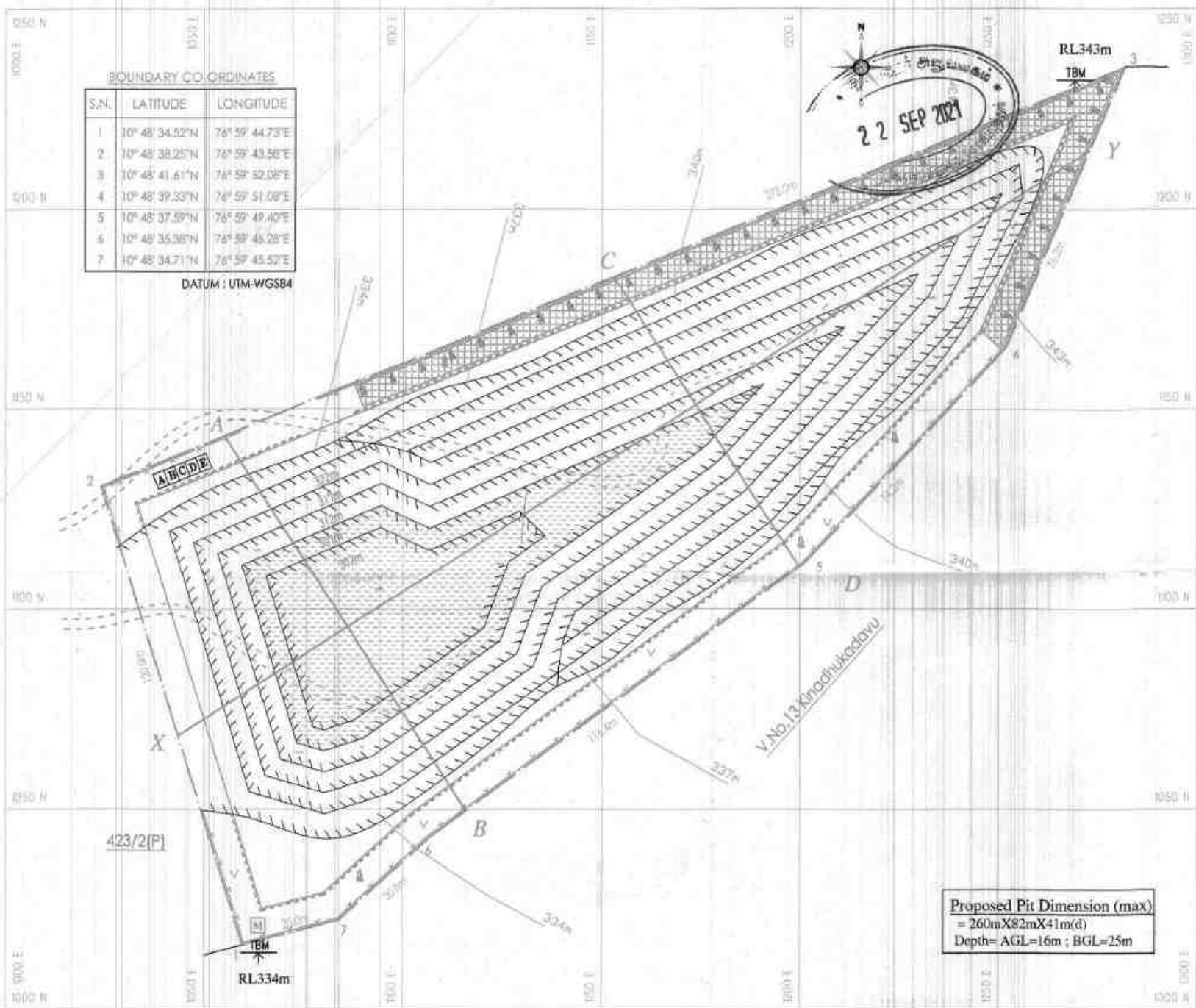
SECTION ALONG A-B



SECTION ALONG C-D



- SITE SERVICES
 (Proposed)**
- A - OFFICE
 - B - STORE ROOM
 - C - FIRST AID ROOM
 - D - REST SHED
 - E - TOILET
 - M - MAGAZINE



BOUNDARY CO-ORDINATES

| S.N. | LATITUDE | LONGITUDE |
|------|-----------------|-----------------|
| 1 | 10° 48' 34.52"N | 76° 59' 44.73"E |
| 2 | 10° 48' 38.25"N | 76° 59' 43.58"E |
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| 6 | 10° 48' 35.38"N | 76° 59' 45.28"E |
| 7 | 10° 48' 34.71"N | 76° 59' 45.52"E |

DATUM : UTM-WGS84

LAND USE PATTERN

| DESCRIPTION | PRESENT AREA IN (Ha) | AREA AT THE END OF THIS QUARRYING PERIOD (Ha) |
|------------------|----------------------|---|
| QUARRYING PIT | 1.67.0 | 1.67.0 |
| INFRASTRUCTURE | Nil | 0.01.0 |
| ROADS | 0.02.0 | 0.02.0 |
| GREEN BELT | Nil | 0.15.0 |
| UN-UTILIZED AREA | 0.67.5 | 0.51.5 |
| TOTAL | 2.36.5 | 2.36.5 |

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- Q.L. APPLIED AREA BOUNDARY
- 7.5m SAFETY DISTANCE
- TEMPORARY BENCH MARK
- TOP SOIL
- ROUGHSTONE
- STRIKE & DIP
- QUARRY PIT
- SHRUBS
- CONTOUR
- QUARRY HAUL ROAD
- APPROACH ROAD
- I-V Yr PLANTATION
- BARBED WIRE FENCING
- EXISTING LAND FORM
- PROPOSED GARLAND DRAIN
- OLD SURFACE LEVEL
- FINISHED SURFACE LEVEL
- RAIN WATER STORAGE

Proposed Pit Dimension (max)
 = 260m X 82m X 41m (d)
 Depth = AGL=16m ; BGL=25m

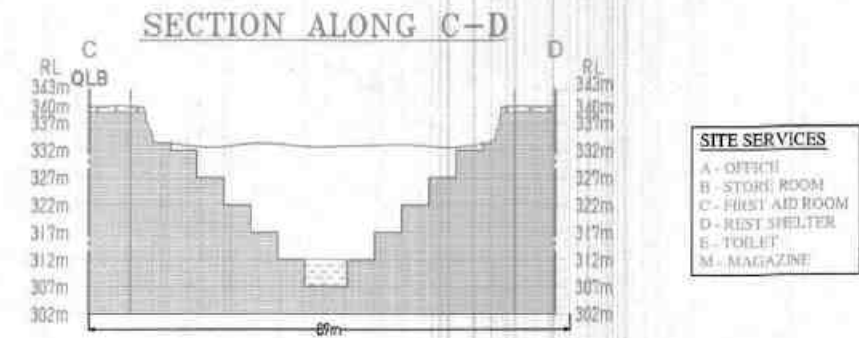
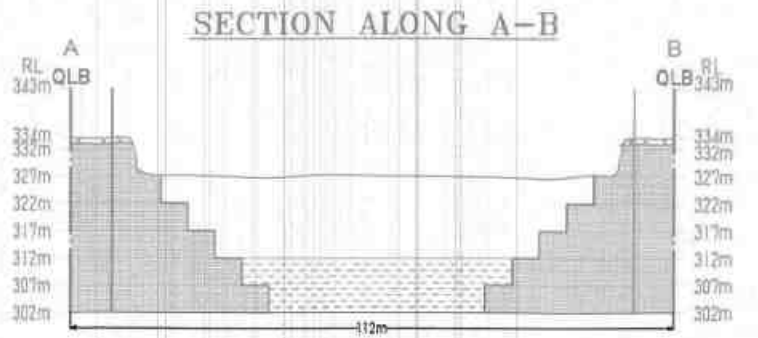
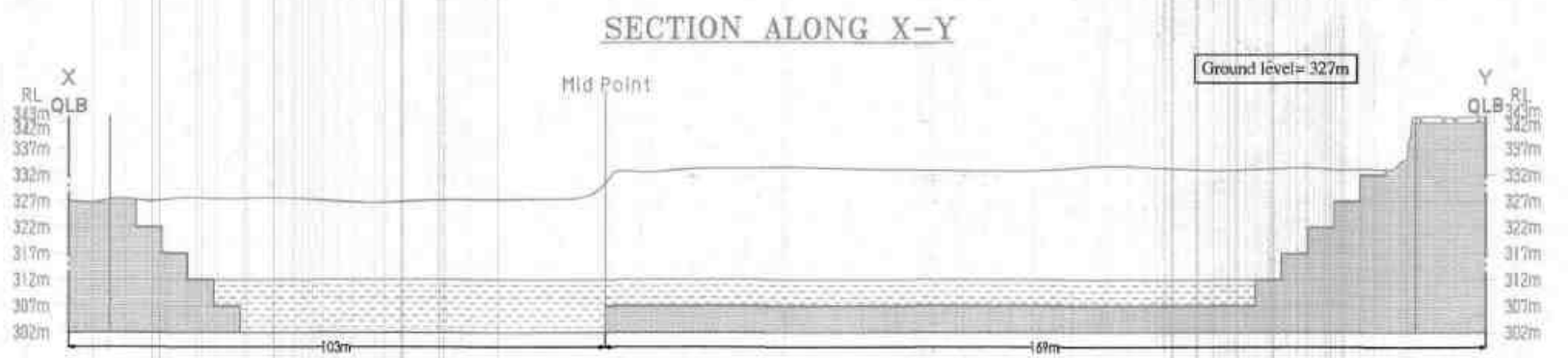
APPLICANT :
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 W/o. KUMARESH,
 No.13, NETHAJI STREET, BAGAVATHIPALAYAM,
 KINATHUKADAVU TALUK,
 COIMBATORE - 642 109.

LOCATION OF Q.L. APPLIED AREA:
 S.F.No : 423/ 2 (Part),
 EXTENT : 2.36.5 Ha.
 VILLAGE : VADAPUDUR,
 TALUK : KINATHUKADAVU,
 DISTRICT : COIMBATORE,
 STATE : TAMIL NADU.

PLATE NO - IV
 DATE OF SURVEY : 04.08.2021

PROGRESSIVE QUARRY CLOSURE PLAN & SECTIONS
 SCALE. 1:1000

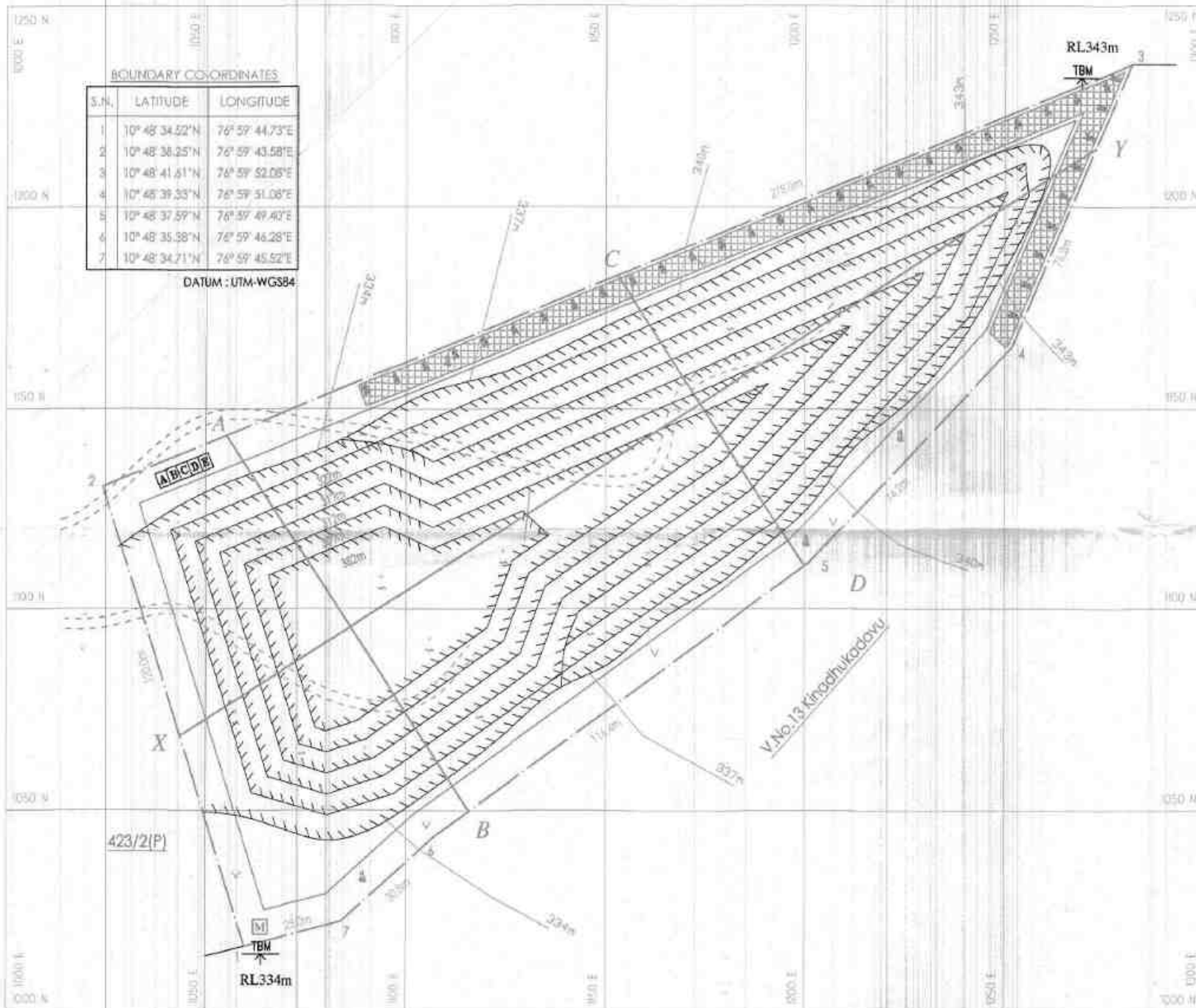
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SITE SERVICES

- A - OFFICE
- B - STORE ROOM
- C - FIRST AID ROOM
- D - REST SHELTER
- E - TOILET
- M - MAGAZINE

89 A
 QUALIFIED PERSON



Ultimate Pit Dimension (max)
 = 260mX82mX41m(d)
 Depth= AGL=16m ; BGL=25m

| INDEX | |
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| | Q.L. APPLIED AREA BOUNDARY |
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| | QUARRY PIT |
| | SHRUBS |
| | CONTOUR |
| | QUARRY HAUL ROAD |
| | APPROACH ROAD |
| | I-V Yr PLANTATION |

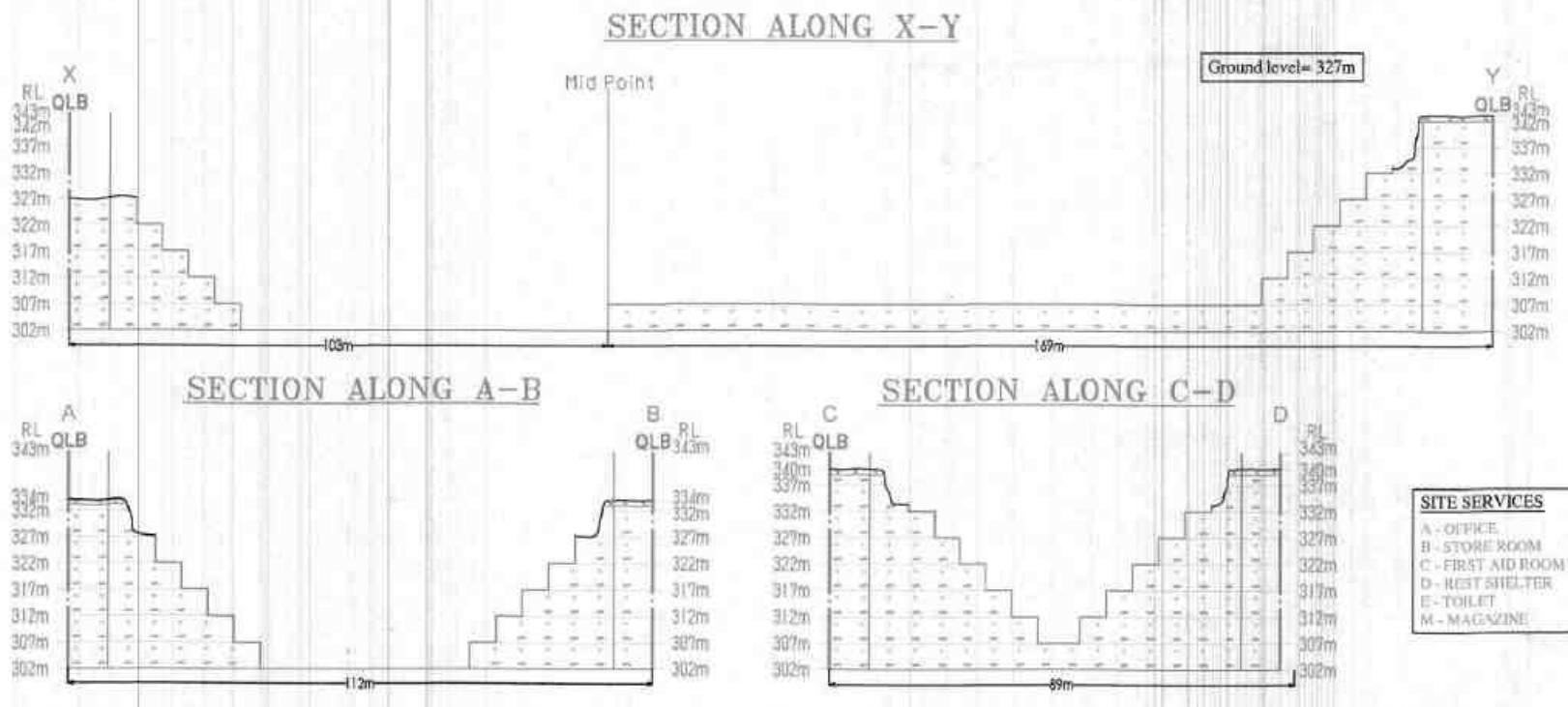
APPLICANT :
 Tmt.K. SANGEETHA,
 W/o. KUMARESH,
 No.13, NEIHAJI STREET, BAGAVATHIPALAYAM,
 KINATHUKADAVU TALUK,
 COIMBATORE - 642 109.

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 TALUK : KINATHUKADAVU,
 DISTRICT : COIMBATORE,
 STATE : TAMIL NADU.

PLATE NO - V
 DATE OF SURVEY : 04.08.2021

CONCEPTUAL PLAN & SECTIONS
 SCALE > 1 : 1000

PREPARED BY :
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| SITE SERVICES | |
|---------------|----------------|
| A | OFFICE |
| B | STORE ROOM |
| C | FIRST AID ROOM |
| D | REST SHELTER |
| E | TOILET |
| M | MAGAZINE |

90 A
 QUALIFIED PERSON

Hydrogeological Report For
Rough stone Quarry Over an
Extent of 2.36.5ha,
S.F.No. 423/2 (P),
Vadapudur Village, Kinathukadavu Taluk,
Coimbatore District, Tamil Nadu State

K. Sangeetha

HYDROGEOLOGICAL REPORT FOR VADAPUDUR

ROUGH STONE QUARRY.

The applicant requires detailed information on ground water occurrences at proposed project site of Rough stone quarry. The objective of the present study is to assess the availability of groundwater and comment on aspects of depth to potential aquifers, aquifer availability and type, possible yields and water quality. For this purpose all available hydrogeological information of the areas has been analyzed, and a geophysical survey was done.

1. INTRODUCTION

NAME OF THE APPLICANT WITH ADDRESS-

Name of the applicant : **Tmt.K.Sangeetha**
Address : W/o. Kumaresh,
No.13, Nethaji Street,
Bagavathipalayam, Kinathukadavu,
Coimbatore District – 642 109.
State : Tamil Nadu.

DETAILS OF THE AREA-

Land Classification : Patta land
Survey No : 423/2 (P)
Extent : 2.36.5ha
Village : Vadapudur
Taluk : Kinathukadavu
District : Coimbatore

The investigations involved hydrogeological, geophysical field investigations and a detailed study in which the available relevant geological and hydrogeological data were collected, analyzed, collated and evaluated within the context of the Client's requirements.

The data sources consulted were mainly:

- Central Ground Water Board (CGWB) Data
- State & District Geological and Hydrogeological Reports and Maps.
- Technical reports of the area by various organizations.

2. SCOPE OF THE WORKS –

The scope of works includes:

- ❖ Site visits to familiarize with the project areas. Identify any issues that might impact the Ground Water Scenario due to proposed mining activities.
- ❖ To obtain, study and synthesize background information including the geology, hydrogeology and existing borehole data, for the purpose of improving the quality of assessment and preparing comprehensive hydrogeological reports,
- ❖ To carry out hydrogeological evaluation and geophysical investigations in the selected sites in order to determine potential for groundwater at project site.
- ❖ To prepare hydrogeological survey reports in conformity with the provisions of the rules and procedure outlined by the Central Ground Water Board (CGWB), by Assessment of water quality and potential infringement of National standards, Assessment of availability of groundwater and Impact of proposed activity on aquifer, water quality and other abstractors.

3. BACKGROUND INFORMATION

Geographical information of the study area-

| | |
|--------------|---------------------------------------|
| Toposheet No | 58 - B/13 |
| Latitude | 10°48'34.52"N to 10°48'41.61"N |
| Longitude | 76°59'43.58"E to 76°59'52.08"E |

GEOMORPHOLOGY OF COIMBATORE DISTRICT

Coimbatore district forms part of the upland plateau region of Tamil Nadu with many hill ranges, hillocks and undulating topography with a gentle slope towards east except for the hilly terrain in the west. The undulating topography with innumerable depressions, are used as tanks for storage of rainwater for agriculture.

The prominent geomorphic units in the district are 1) Structural hills, 2) Ridges, 3) Inselbergs, 4) Bazada, 5) Valley fill, 6) Pediment, 7) Shallow Pediments and 8) Deep Pediments.

The Nilgiris on the northwest and Anamalai on the south are the important ranges, which attain a heights of over 2513m above mean sea level (MSL) and the highest elevation in the valleys adjoining the hills is 600 M above MSL. The 'Palghat Gap', which is an east-west trending mountain pass, is an important physiographic feature is located in the western part of the district.

Soils

The soils of Coimbatore district can be broadly classified into 6 major soils types viz, Red calcareous Soil, Black Soil, Red non-calcareous, Alluvial and Colluvial Soil, Brown Soil, and Forest Soil. About sixty per cent of the district is covered by red soils, of which red calcareous soil is predominant. They occupy most parts of Palladam, Coimbatore, Mettupalayam and Udumalpet taluks. Medium to deep red calcareous soils are found mainly in Pollachi and Udumalpet taluks. Parts of Palladam, Avinashi and Udumalpet taluks are occupied by red non-calcareous soils.

The highlands in Coimbatore, Palladam and Avinashitaluks are mostly occupied by the black soils, which are dark gray to grayish brown in colour. The Alluvial soils are found in small patches along the Noyil river mainly in the upper reaches. The Colluvial soils are found mainly in Chinnathadagam and Chitrachavadi sub-basins and as scattered patches at the foothills of the Anaimalai. The Forest soils are confined to the reserve forest area and have a surface layer of organic matter.

Rainfall

The district receives the rain under the influence of both southwest and northeast monsoons. The northeast monsoon chiefly contributes to the rainfall in the district and summer rains are negligible.

Rainfall data from six stations over the period 1901-2000 were utilized and a perusal of the analysis shows that the normal annual rainfall over the district varies from about 550mm to 900mm. It is the minimum around Suler (550 mm) in the eastern part of the district. It gradually increases towards south and attains a maximum around Anaimalai hills.

Climate

The district enjoys a tropical climate. The weather is pleasant during the period from November to January. Mornings in general are more humid than the afternoons, with the humidity exceeding 78% on an average. In the period June to November the afternoon humidity exceeds 66% on an average. In the rest of the year the afternoons are drier, the summer afternoons being the driest. The period from April to June is generally hot and dry. The temperature recorded varies from 11.7°C to 42.6°C.

GEOLOGY

Regional Geology of Coimbatore District-

The district is occupied by Charnockite Group of rocks consisting of Charnockite, pyroxene granulites and associated magnetite quartzite, the Knodalite Group comprising gametiferous – sillimanite gneiss, calc-granulite, crystalline limestone, sillimanitequartzites and associated migmatitic gneisses. The fissile hornblende gneisses (Peninsular gneiss – younger phase) of Bhavani Group with enclaves of schistose, micaceous and amphibolitic rocks, fuchsite – kyanitequartzites, ferruginous quartzite (Satyamangalam Group) intruded by a number of ultramafic and basic rocks and granites are seen in the Northern portions of the district especially around Mettupalayam, Avinashi and Northern areas of Coimbatore. The granites are Proterozoic age and occupy the Western end and Eastern Part of the District as separate bodies and are recognized as Maruthamalai Granite and Punjapuliampatti Granites respectively. The quaternary alluvium is seen in the West and Northwestern areas of Udumalaipettai and Western areas of Coimbatore town. The alluvium is more than 30m thick in the Chinnathadagam valley northwest of Coimbatore and in the Siruvani valley west of Coimbatore. In the Udumalaipettai taluk area, it overlies the kankar deposit.

It is revealed the Coimbatore district is occupied by the rocks of Sathiyamangalam, Peninsular gneissic complex-I and Charnockite group of Archaean age, Peninsular Gneissic Complex-II of Archaean to Palaeoproterozoic age, Basic intrusive of Mesoproterozoic age, Younger intrusive of Neoproterozoic age and recent alluvium.

The Peninsular gneissic complex-I comprising hornblende biotite gneiss and granite area the major rock types exposed. Hornblende biotite granite is medium to coarse grained and mesocratic and considered to be retrograded product of product of Charnockite – Pyroxene granulite. It is medium grained, White to pale pink colored with disseminations of limonitised magnetite. The white colored granite appears to be older and the pink colored cuts across the white colored granite. The younger phase of coarse grained granite occur as thin stringers and lesser in the southern part. The peripheral part of granite close to the gneiss is granitic in nature.

STRATIGRAPHY SUCCESSION

| Lithology | Group | Super Group | Age |
|--------------------------------------|------------------------|---------------------------------|-------------------------------|
| Gypseous clay | | | Holocene |
| Granite | Acid intrusives | | Neoproterozoic |
| Dolerite /basic dyke | Basic intrusives | | Mesoproterozoic |
| Quartzofeldspathic Gneiss Garnet. | | Peninsular Gneissic complex- II | Archaean to Palaeoproterozoic |
| Hornblende biotite gneiss | | | |
| Charnockite | | Southern Granulite Complex | Archaean |
| Grey HornblendBiotite gneiss | | Peninsular Gneissic complex- I | |
| Gabbro | Sitampundi | | |
| Amphibolite | Mettupalayam Complex | | |
| Magnetite Quartzite | | | |
| Talc – Termolite – Actinolite Schist | Sathiyamanagalam Group | | |

4. GEOPHYSICAL INVESTIGATION METHODS

A variety of methods are available to assist in the assessment of geological sub-surface conditions. The main emphasis of the fieldwork undertaken was to determine the thickness and composition of the sub-surface formations and to identify water-bearing zones. This information was principally obtained in the field using, and vertical electrical soundings (VES). The VES probes the resistivity layering below the site of measurement. This method is described below.

Resistivity Method

Vertical electrical soundings (VES) were carried out to probe the condition of the sub-surface and to confirm the existence of deep groundwater. The VES investigates the resistivity layering below the site of measurement.

Basic Principles

The electrical properties of rocks in the upper part of the earth's crust are dependent upon the lithology, porosity, and the degree of pore space saturation and the salinity of the pore water. Saturated rocks have lower resistivity than unsaturated and dry rocks. The higher the porosity of the saturated rock, or the higher the salinity of the saturating fluids, the lower is the resistivity. The presence of clays and conductive minerals also reduces the resistivity of the rock.

The resistivity of earth materials can be studied by measuring the electrical potential distribution produced at the earth's surface by an electric current that is passed through the earth. Current is moved through the subsurface from one current electrode to the other and the potential difference is recorded as the current passes. From this information, resistivity values of various layers are acquired and layer thickness can be identified.

The apparent resistivity values determined are plotted as a log function versus the log of the spacing between the electrodes. These plotted curves identify thickness of layers. If there are multiple layers (more than 2), the acquired data is compared to a master curve to determine layer thickness.

This method is least influenced by lateral in-homogeneities and capable of providing higher depth of investigation.

The resistance R of a certain material is directly proportional to its length L and cross-sectional area A , expressed as:

$$R = R_s * L/A \text{ (in Ohm)}$$

Where R_s is known as the specific resistivity (characteristic of the material and independent of its shape or size)

With Ohm's Law,

$$R = dV/I \text{ (Ohm)}$$

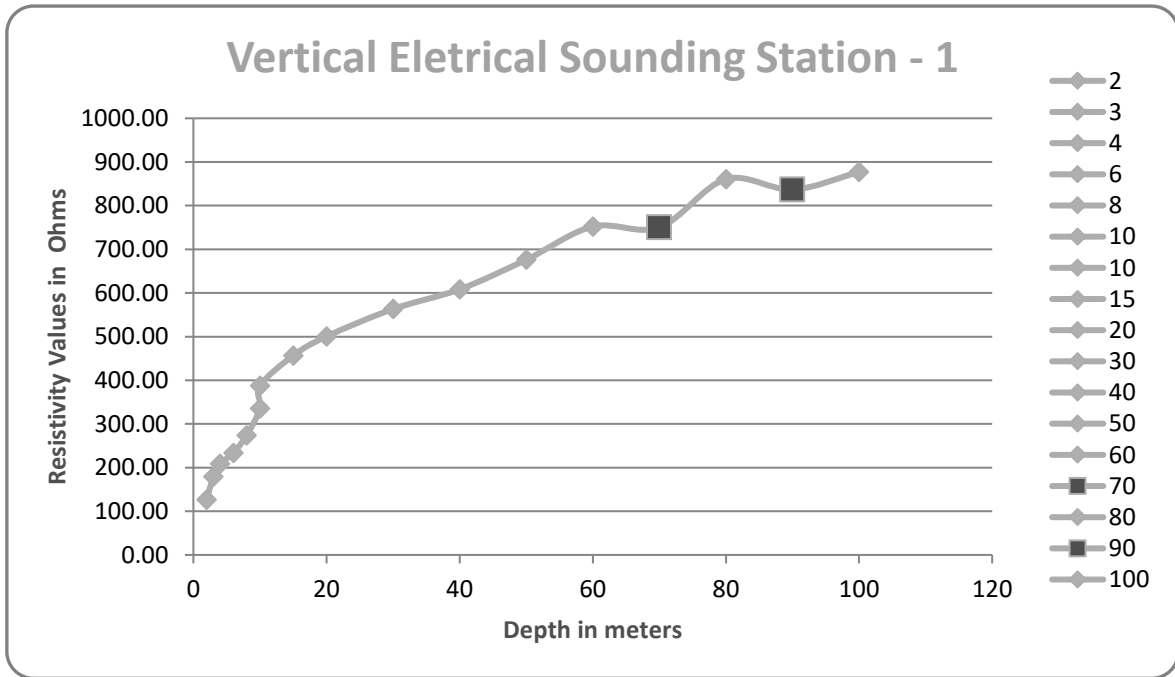
Where dV is the potential difference across the resistor and I is the electric current through the resistor. The specific resistivity may be determined by:

$$R_s = (A/L) * (dV/I) \text{ (in Ohm m)}$$

Vertical Electrical Sounding (VES)

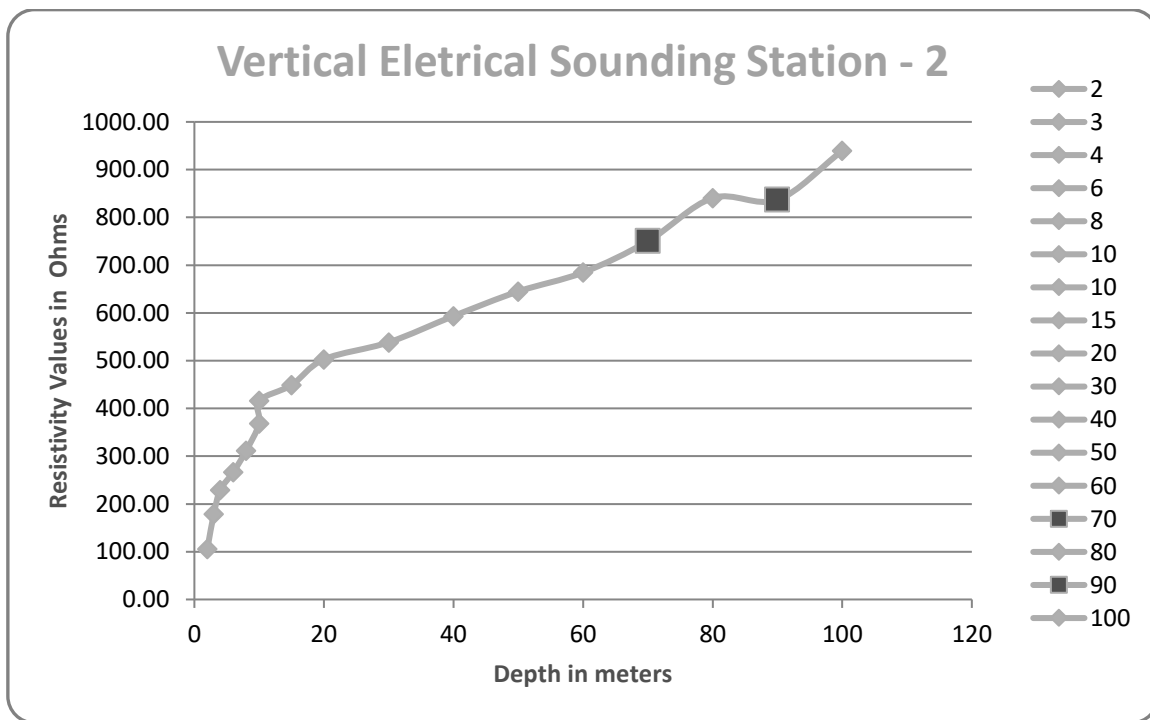
When carrying out a resistivity sounding, current is led into the ground by means of two electrodes. With two other electrodes, situated near the center of the array, the potential field generated by the current is measured. From the observations of the current strength and the potential difference, and taking into account the electrode separations, the ground resistivity can be determined. During a resistivity sounding, the separation between the electrodes is step-wise increased (known as a Schlumberger Array), thus causing the flow of current to penetrate greater depths. When plotting the observed resistivity values against depth on double logarithmic paper, a resistivity graph is formed, which depicts the variation of resistivity with depth. This graph can be interpreted with the aid of a computer, and the actual resistivity layering of the subsoil is obtained. The depths and resistivity values provide the hydro geologist with information on the geological layering and thus the occurrence of groundwater.

| Vertical Electrical Sounding Station - 1 | | | | | |
|---|---------|---------|------------------------|--------------------------|-----------------------------|
| GPS Coordinates - 10°48'36.56"N 76°59'45.03"E | | | | | |
| S.No | Ab/2(m) | Mn/2(m) | Geometrical Factor (G) | Resistance Value in Ohms | Apparent Resistance in Ohms |
| 1 | 2 | 1 | 4.68 | 26.87 | 126.56 |
| 2 | 3 | 1 | 12.57 | 14.25 | 178.98 |
| 3 | 4 | 1 | 23.54 | 8.87 | 208.89 |
| 4 | 6 | 1 | 54.96 | 4.25 | 233.54 |
| 5 | 8 | 1 | 98.90 | 2.77 | 273.98 |
| 6 | 10 | 1 | 155.44 | 2.16 | 335.77 |
| 7 | 10 | 5 | 23.55 | 16.45 | 387.40 |
| 8 | 15 | 5 | 62.82 | 7.27 | 456.56 |
| 9 | 20 | 5 | 117.74 | 4.25 | 500.44 |
| 10 | 30 | 5 | 274.75 | 2.05 | 563.24 |
| 11 | 40 | 5 | 494.56 | 1.23 | 608.30 |
| 12 | 50 | 5 | 777.14 | 0.87 | 676.12 |
| 13 | 60 | 5 | 1122.55 | 0.67 | 752.11 |
| 14 | 70 | 5 | 1530.77 | 0.49 | 750.07 |
| 15 | 80 | 5 | 2001.75 | 0.43 | 860.75 |
| 16 | 90 | 5 | 2535.57 | 0.33 | 836.73 |
| 17 | 100 | 5 | 3132.15 | 0.28 | 877.00 |



Above the graphs purple colour is fracture zone points

| Vertical Electrical Sounding Station - 2 | | | | | |
|---|---------|---------|------------------------|--------------------------|-----------------------------|
| GPS Coordinates - 10°48'39.41"N 76°59'50.08"E | | | | | |
| S.No | Ab/2(m) | Mn/2(m) | Geometrical Factor (G) | Resistance Value in Ohms | Apparent Resistance in Ohms |
| 1 | 2 | 1 | 4.70 | 22.45 | 105.74 |
| 2 | 3 | 1 | 12.55 | 14.27 | 179.23 |
| 3 | 4 | 1 | 23.54 | 9.73 | 229.14 |
| 4 | 6 | 1 | 54.94 | 4.85 | 266.51 |
| 5 | 8 | 1 | 98.92 | 3.15 | 311.57 |
| 6 | 10 | 1 | 155.45 | 2.37 | 368.42 |
| 7 | 10 | 5 | 23.55 | 17.67 | 416.13 |
| 8 | 15 | 5 | 62.80 | 7.15 | 449.02 |
| 9 | 20 | 5 | 117.76 | 4.27 | 502.79 |
| 10 | 30 | 5 | 274.72 | 1.96 | 538.51 |
| 11 | 40 | 5 | 494.56 | 1.20 | 593.46 |
| 12 | 50 | 5 | 777.15 | 0.83 | 645.03 |
| 13 | 60 | 5 | 1122.54 | 0.61 | 684.76 |
| 14 | 70 | 5 | 1530.75 | 0.49 | 750.07 |
| 15 | 80 | 5 | 2001.74 | 0.42 | 840.74 |
| 16 | 90 | 5 | 2535.55 | 0.33 | 836.73 |
| 17 | 100 | 5 | 3132.15 | 0.30 | 939.65 |

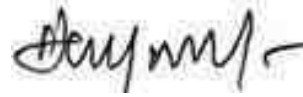


Above the graphs purple color is fracture zone points

K. Sangeetha

5. Conclusion –

Based on the available information and the geophysical investigations it is concluded that the project area is considered to have medium groundwater potential. Productive aquifers are expected at depth of 85m to 90m where minor fractures are observed and shallow aquifers are expected above 65m-70m BGL. The ultimate pit limit as per the approved mining plan depth is 41m (1m Topsoil + 40m Rough stone) [16m above ground level + 25m below ground level] which will have no impact on the Ground Water.



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K. Sangeetha



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TAMILNADU POLLUTION CONTROL BOARD**CONSENT ORDER NO. 160516449169****DATED: 31/08/2016.****PROCEEDINGS NO.F.1212CBS/RS/DEE/TNPCB/CBS/W/2016 DATED: 31/08/2016**

SUB: Tamil Nadu Pollution Control Board –CONSENT TO OPERATE – DIRECT -M/s. K.SANGEETHA QUARRY , S.F.No. 423/2, VADAPUDUR village Kinathukadavu Taluk and Coimbatore District - Consent for the operation of the plant and discharge of sewage and/or trade effluent under Section 25 of the Water (Prevention and Control of Pollution) Act, 1974 as amended in 1988 (Central Act 6 of 1974) – Issued- Reg.

Ref: 1. Unit's Application for Consent to Operate (Direct) dated: 14.08.2016.
2. IR.No : F.1212CBS/RS/AE/CBS/2016 dated 26.08.2016.
3. Minutes of the 40th ZLCCC meeting held dated 30.08.2016 (Item No. 40-21).

CONSENT TO OPERATE is hereby granted under Section 25 of the Water (Prevention and Control of Pollution) Act, 1974 as amended in 1988 (Central Act, 6 of 1974) (hereinafter referred to as "The Act") and the rules and orders made there under to

The Proprietrix,
M/s . K.SANGEETHA QUARRY
S.F No.423/2,
VADAPUDUR Village,
Kinathukadavu Taluk,
Coimbatore District.

Authorising the occupier to make discharge of sewage and /or trade effluent.

This is subject to the provisions of the Act, the rules and the orders made there under and the terms and conditions incorporated under the Special and General conditions stipulated in the Consent Order issued earlier and subject to the special conditions annexed.

This CONSENT is valid for the period ending March 31, 2021

Signature
21/9/16
District Environmental Engineer,
Tamil Nadu Pollution Control Board,
COIMBATORE SOUTH

To ✓
The Proprietrix,
M/s.K.SANGEETHA QUARRY ,
SF No.423/2, Vadaputhur Village, Kinathukadavu Taluk, Coimbatore District,
Pin: 642109

Copy to:

- 1.The Commissioner, KINATHUKADAVU-Panchayat Union, Kinathukadavu Taluk, Coimbatore District .
2. Copy submitted to the Member Secretary, Tamil Nadu Pollution Control Board, Chennai for favour of kind information.
3. Copy submitted to the JCEE-Monitoring, Tamil Nadu Pollution Control Board, Coimbatore for favour of kind information.
4. File

POLLUTION PREVENTION PAYS**அகம் தூய்மை வாய்மைக்கு ! புறம் தூய்மை வாழ்வுக்கு !**



TAMILNADU POLLUTION CONTROL BOARD



POLLUTION PREVENTION PAYS

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TAMILNADU POLLUTION CONTROL BOARD**SPECIAL CONDITIONS**

1. This consent to operate is valid for operating the facility for the manufacture of products (Col. 2) at the rate (Col. 3) mentioned below. Any change in the products and its quantity has to be brought to the notice of the Board and fresh consent has to be obtained.

| Sl. No. | Description | Quantity | Unit |
|------------------------|--|----------|--------------|
| Product Details | | | |
| 1. | Rough Stone and Gravel Quarrying Area in SF No.423/2, Vadaputhur Village, Kinathukadavu Taluk, Coimbatore District | 3.68 | Hectares |
| 2. | Rough Stone | 24000 | Cu.m/5 Years |
| 3. | Gravel | 5650 | Cu.m/5 Years |

2. This consent to operate is valid for operating the facility with the below mentioned permitted outlets for the discharge of sewage/trade effluent. Any change in the outlets and the quantity has to be brought to the notice of the Board and fresh consent has to be obtained.

| Outlet No. | Description of Outlet | Maximum daily discharge in KLD | Point of disposal |
|---------------------------------------|-----------------------|--------------------------------|-----------------------|
| Effluent Type : Sewage | | | |
| 1. | Sewage | 0.24 | On Industrys own land |
| Effluent Type : Trade Effluent | | | |

3. The effluent discharge shall not contain constituents in excess of the tolerance Limits as laid down hereunder.

**POLLUTION PREVENTION PAYS****அகம் தூய்மை வாய்மைக்கு ! புறம் தூய்மை வாழ்வுக்கு !**



TAMILNADU POLLUTION CONTROL BOARD

| Sl. No. | Parameters | Unit | TOLERANCE LIMITS - OUTLETS -Nos | | | |
|---------|--|----------------|---------------------------------|----------------|--|--|
| | | | Sewage | Trade Effluent | | |
| | | | 1 | | | |
| 1. | Temperature | oC | - | | | |
| 2. | Total Suspended Solids | mg/l | 30 | | | |
| 3. | Total Dissolved solids (inorganic) | mg/l | - | | | |
| 4. | Oil & Grease | mg/l | - | | | |
| 5. | Biochemical Oxygen Demand (3 days at 27oC) | mg/l | 20 | | | |
| 6. | pH | - | 5.5 to 9 | | | |
| 7. | Particle size of Suspended solids | - | - | | | |
| 8. | Chemical Oxygen Demand | mg/l | - | | | |
| 9. | Chloride (as Cl) | mg/l | - | | | |
| 10. | Sulphates (as SO4) | mg/l | - | | | |
| 11. | Total Residual Chlorine | mg/l | - | | | |
| 12. | Ammonical Nitrogen (as N) | mg/l | - | | | |
| 13. | Total Kjeldahl Nitrogen (as N) | mg/l | - | | | |
| 14. | Free Ammonia (as NH3) | mg/l | - | | | |
| 15. | Arsenic (as As) | mg/l | - | | | |
| 16. | Mercury (as Hg) | mg/l | - | | | |
| 17. | Lead (as Pb) | mg/l | - | | | |
| 18. | Cadmium(as Cd) | mg/l | - | | | |
| 19. | Hexavalent Chromium (as Cr+6) | mg/l | - | | | |
| 20. | Total Chromium (as Cr) | mg/l | - | | | |
| 21. | Copper (as Cu) | mg/l | - | | | |
| 22. | Zinc (as Zn) | mg/l | - | | | |
| 23. | Selenium (as Se) | mg/l | - | | | |
| 24. | Nickel (as Ni) | mg/l | - | | | |
| 25. | Boron (as B) | mg/l | - | | | |
| 26. | Percent Sodium | % | - | | | |
| 27. | Cyanide (as CN) | mg/l | - | | | |
| 28. | Fluoride (as F) | mg/l | - | | | |
| 29. | Residual Sodium Carbonate | mg/l | - | | | |
| 30. | Dissolved Phosphates(as P) | mg/l | - | | | |
| 31. | Radioactive materials b). Beta emitters | micro curie/ml | - | | | |
| 32. | Sulphide (as S) | mg/l | - | | | |
| 33. | Radioactive materials a) Alpha emitters | micro curie/ml | - | | | |
| 34. | Pesticides | mg/l | - | | | |
| 35. | Phenolic Compounds (as C6H5OH) | mg/l | - | | | |

4. All units of the sewage and Trade effluent treatment plants shall be operated efficiently and continuously so as to achieve the standards prescribed in Sl No.3 above or to achieve the zero liquid discharge of effluent as applicable.

POLLUTION PREVENTION PAYS

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TAMILNADU POLLUTION CONTROL BOARD

5. The occupier shall maintain the Electro Magnetic Flow Meters/water Meters installed at the inlet of the water supply connection for each of the purposes mentioned below for assessing the quantity of water used and ensuring that such meters are easily accessible for inspection and maintenance and for other purposes of the Act.
 - a. Industrial Cooling, Spraying in mine pits or boiler feed.
 - b. Domestic purpose.
 - c. Process.
6. The occupier shall maintain the Electro Magnetic Flow Meters with computer recording arrangement for measuring the quantity of effluent generated and treated for the monitoring purposes of the Act.
7. Log book for each of the unit operations of ETP have to be maintained to reflect the working condition of ETP along with the readings of the Electro Magnetic Flow Meters installed to assess effluent quantity and the same shall be furnished for verification of the Board officials during inspection.
8. The occupier shall at his own cost get the samples of effluent/surface water/ground water collected in and around the unit by Board officials and analyzed by the TNPC Board Laboratory periodically.
9. Any upset condition in any of the plants of the factory which is, likely to result in increased effluent discharge and result in violation of the standards mentioned in Sl. No.3 above shall be reported to the Member Secretary / Joint Chief Environmental Engineer-Monitoring and the concerned District/Assistant Environmental Engineer of the Board by e-mail immediately and subsequently by Post with full details of such upset condition.
10. The occupier shall always comply and carryout the order/directions issued by the Board in this Consent Order and from time to time without any negligence. The occupier shall be liable for action as per provisions of the Act in case of non compliance of any order/directions issued.
11. The occupier shall develop adequate width of green belt at the rate of 400 numbers of trees per Hectare.
12. The occupier shall provide and maintain rain water harvesting facilities.
13. The occupier shall ensure that there shall not be any discharge of effluent either treated or untreated into storm water drain at any point of time.
14. In the case of zero liquid discharge of effluent units, the occupier shall adhere the following conditions as laid under.
 - i). The occupier shall ensure zero liquid discharge of effluent, thereby no discharge of untreated / treated effluent on land or into any water bodies either inside or outside the premises at any point of time.
 - ii) The occupier shall operate and maintain the Zero liquid discharge treatment components comprising of Primary, Secondary and tertiary treatment systems at all times and ensure that the RO permeate/Evaporator condensate shall be recycled in the process and the final RO reject shall be disposed off with the reject management system ensuring zero liquid discharge of effluents in the premises.
 - iii) The occupier shall operate and maintain the reject management system effectively and recover the salt from the system which shall be reused in the process if reusable or shall be disposed off as ETP sludge.
 - iv) In case of failure to achieve zero discharge of effluents for any reason, the occupier shall stop its production and operations forthwith and shall be reported to the Member Secretary/Joint Chief Environmental Engineer-Monitoring and the concerned District/Assistant Environmental Engineer of the Board by e-mail immediately and subsequently by Post with full details of such upset condition.
 - v) The occupier shall restart the production only after ascertaining that the Zero discharge treatment system can perform effectively for achieving zero discharge of effluents.

Additional Conditions:

POLLUTION PREVENTION PAYS

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TAMILNADU POLLUTION CONTROL BOARD

- 1) The unit shall ensure that the Rough Stone & Gravel quarrying activity is of 24000 Cu.m of Rough Stone & 5650 Cu.m of Gravel over a period of 5 years from 25.07.2016 to 24.07.2021 in the Latitude 10°48'33" N to 10°48'42" N; Longitude 76°59'40"E to 76°59'54"E.
- 2) Mine working shall be Opencast Semi Mechanized Mining and is proposed up to a depth of 11.0 meters.
- 3) The unit shall provide adequate sanitary facilities within the quarry area as proposed.
- 4) The unit shall dispose the solid waste then and there without accumulation within the premises.
- 5) The unit shall collect the waste water, if any, shall be properly treated through septic tank arrangements so as to conform and meet the standards prescribed by the Board.
- 6) The unit shall ensure that the waste oils, used oils generated from the EM machines, mining operations, if any, shall be disposed as per the Hazardous Wastes (Management, Handling and trans boundary movement) Rules, 2008 and its amendments thereof to the recyclers authorized by TNPCCB.
- 7) The proponent shall do the Rough stone quarrying manually or in strict accordance with the orders of the Government of Tamil Nadu, as upheld by the Hon'ble High Court of Madras.
- 8) The unit shall ensure that there shall not be any adverse impacts due to quarrying operation on the nearby human habitations, by way of pollution to the environment.
- 9) The unit shall be ensured that the mining operation shall be carried out only between 7 AM and 5 PM. The loading shall not be done during night hours.
- 10) The unit shall ensure that drilling and blasting shall be done only either by licensed explosive agent or by the proponent after obtaining required approvals from Competent Authorities.
- 11) The unit shall ensure that the blasting shall be carried out after announcing to the public through adequate public address system to avoid any accident.
- 12) The unit shall ensure that the explosives shall be stored at site as per the conditions stipulated in the permits issued by the licensing Authority.
- 13) The proponent shall ensure that there shall not be any adverse impacts due to quarrying operation on the nearby human habitations, by way of pollution to the environment.
- 14) The unit shall ensure that quarrying is not carried out below ground water table under any circumstances. If the ground water table occurs/intervenes within the permitted depth, then also quarrying shall be stopped.
- 15) The unit shall ensure that permission from the competent authority should be obtained for drawal of ground water, if any, required for this project.
- 16) The unit shall ensure that the mined out pits should be backfilled wherever warranted and area should be suitably landscaped to prevent environmental degradation.
- 17) The unit shall ensure that no change in mining technology and scope of working should be made without prior approval of State Level Environmental Impact Assessment Authority (SEIAA).
- 18) The unit shall carry out Water Sprinkling as Air Pollution Control Measures to control the high levels of Particulate Matter such as loading and unloading and all transfer points.
- 19) The unit shall provide acoustic measures so as to satisfy the Ambient Noise Level Standards prescribed by the Board.
- 20) The unit shall provide necessary Air Pollution Control Measures so as to achieve the Ambient Air Quality/ Emission Standards prescribed by the Board.
- 21) The unit shall take appropriate measures to ensure that the GLC shall comply with the revised National Ambient Air Quality norms notified by MoEF, Gol on 16.11.2009.
- 22) The unit shall ensure that the transportation of materials shall be done by covering the trucks/tractors with tarpaulin or other suitable mechanism so that no spillage of mineral /dust takes place.
- 23) The unit shall ensure that the topsoil, if any, shall be stacked properly with proper slope with adequate measures and should be used for plantation purpose.
- 24) The unit shall ensure that the workers employed shall be provided with protection equipment and earmuffs etc.
- 25) The unit shall ensure that the speed of trucks entering or leaving the mine is to be limited to moderate speed of 25 kmph to prevent undue noise from empty trucks.
- 26) The unit shall undertake plantation/afforestation work by planting the native species on all side of the quarry lease area and the approach road.
- 27) The unit shall maintain the village road through which transportation of mineral is carried out at his own cost. The roads shall be blacks stopped to the extent required.
- 28) The unit shall provide rain water harvesting facilities to collect and utilize the entire water falling in land area within the premises so as to increase the recharging of groundwater in that area.
- 29) The unit shall ensure that periodical medical examination of the workers engaged in the project shall be carried out and records maintained. For the purpose, schedule of health examination of the workers should be drawn and followed accordingly. The workers shall be provided with personnel protective measures such as masks, gloves, boots etc.
- 30) In addition to the above conditions, the unit shall comply with the conditions stipulated in the EC issued by State Level Environment Impact Assessment Authority, Tamil Nadu vide Lr. No. SEIAA-TN/F.No.3857/1(a)/EC.No.3397/2015, dated: 25.07.2016.

POLLUTION PREVENTION PAYS

அகம் தூய்மை வாய்மைக்கு ! புறம் தூய்மை வாழ்வுக்கு !



TAMILNADU POLLUTION CONTROL BOARD

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**District Environmental Engineer,
Tamil Nadu Pollution Control Board,
COIMBATORE SOUTH**

M. George
21/11/16
02/11/16



POLLUTION PREVENTION PAYS

அகம் தூய்மை வாய்மைக்கு ! புறம் தூய்மை வாழ்வுக்கு !



TAMILNADU POLLUTION CONTROL BOARD

GENERAL CONDITIONS

1. The occupier shall make an application along with the prescribed consent fee for grant of renewal of consent at least 60 days before the date of expiry of this Consent Order along with all the required particulars ensuring that there is no change in Production quantity and change in sewage/Trade effluent.
2. This Consent is issued by the Board in consideration of the particulars given in the application. Any change or alteration or deviation made in actual practice from the particulars furnished in the application will also be ground for review/variation/revocation of the Consent Order under Section 27 of the Act and to make such variation as deemed fit for the purpose of the Act.
3. The consent conditions imposed in this order shall continue in force until revoked under Section 27(2) of the Act.
4. After the issue of this order, all the 'Consent to Operate' orders issued previously under Water (Prevention and Control of Pollution) Act, 1974 as amended stands defunct.
5. The occupier shall maintain an Inspection Register in the factory so that the inspecting officer shall record the details of the observations and instructions issued to the unit at the time of inspection for adherence.
6. The occupier shall provide and maintain an alternate power supply along with separate energy meter for the Effluent Treatment Plant sufficient to ensure continuous operation of all pollution control equipments to maintain compliance.
7. The occupier shall provide all facilities to the Board officials for inspection and collection of samples in and around the factory at any time.
8. The occupier shall display the flow diagram of the sources of effluent generation and pollution control systems provided at the ETP site.
9. The solid waste such as sweepings, wastage, package, empty containers, residues, sludge including that from air pollution control equipments collected within the premises of the industrial plant shall be collected in an earmarked area and shall be disposed off properly.
10. The occupier shall collect, treat the solid wastes like food waste, green waste generated from the canteen and convert into organic compost.
11. The occupier shall segregate the Hazardous waste from other solid wastes and comply in accordance with Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008.
12. The occupier shall maintain good house-keeping within the factory premises.
13. All pipes, valves, sewers and drains shall be leak proof. Floor washings shall be admitted into the trade effluent collection system only and shall not be allowed to find their way in storm drains or open areas.
14. The occupier shall ensure that there shall not be any diversion or by-pass of trade effluent on land or into any water sources.
15. The occupier shall ensure that solar Evaporation pans shall be constructed in such a way that the bottom of the solar pan is at least 1 m above the Ground level (if applicable).
16. The occupier shall furnish the following returns in the prescribed formats to the concerned District office regularly.
 - a) Monthly water consumption returns of each of the purposes with water meter readings in Form-I on or before 5th of every month.
 - b) Yearly return on Hazardous wastes generated and accumulated for the period from 1st April to 31st March in Form-4 before the end of the subsequent 30th June of every year (if applicable).
 - c) Yearly Environmental Statement for the period from 1st April to 31st March in Form -V before the end of the subsequent 30th September of every year(if applicable).
17. If applicable, the occupier has to comply with the provisions of Public Liability Insurance Act, 1991 to provide immediate relief in the event of any hazard to human beings, other living creatures/plants and properties while handling and storage of hazardous substances.
18. The issuance of this consent does not authorize or approve the construction of any physical structures or facilities or the undertaking of any work in any natural watercourse or in Government Poramboke lands.
19. The issuance of this Consent does not convey any property right in either real personal property or any exclusive privileges, nor does it authorize any injury to private property or Government property or any invasion of personal rights nor any infringement of Central, State laws or regulation.

POLLUTION PREVENTION PAYS

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TAMILNADU POLLUTION CONTROL BOARD

20. The occupier shall forth with keep the Board informed of any accident of unforeseen act or event of any poisonous, noxious or polluting matter or emissions are being discharged into stream or well or air as a result of such discharge, water or air is being polluted.
21. If due to any technological improvements or otherwise the Board is of opinion that all or any of the conditions referred to above requires variation (including the change of any treatment system, either in whole or in part) the Board shall, after giving the applicant an opportunity of being heard, vary all or any of such conditions and thereupon the applicant shall be bound to comply with the conditions as so varied.
22. In case there is any change in the constitution of the management, the occupier of the new management shall file fresh application under Water (Prevention and Control of Pollution) Act, 1974, as amended in Form-II alongwith relevant documents of change of management immediately and get the necessary amendment with renewal of consent order.
23. In case there is any change in the name of the company alone, the occupier shall inform the same with relevant documents immediately and get the necessary amendments for the change of name from the Board.
24. The occupier shall display this consent order granted to him in a prominent place for perusal of the inspecting Officers of this Board.



M. Senthil
22/10

District Environmental Engineer,
Tamil Nadu Pollution Control Board,
COIMBATORE SOUTH

M
02/9/16

POLLUTION PREVENTION PAYS

அகம் தூய்மை வாய்மைக்கு ! புறம் தூய்மை வாழ்வுக்கு !



TAMILNADU POLLUTION CONTROL BOARD



POLLUTION PREVENTION PAYS

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TAMILNADU POLLUTION CONTROL BOARD**CONSENT ORDER NO. 160526449169****DATED: 31/08/2016.****PROCEEDINGS NO.F.1212CBS/RS/DEE/TNPCB/CBS/A/2016 DATED: 31/08/2016**

SUB: Tamil Nadu Pollution Control Board –CONSENT TO OPERATE –DIRECT –M/s. K.SANGEETHA QUARRY , S.F.No. 423/2, VADAPUDUR village Kinathukadavu Taluk and Coimbatore District - Consent for operation of the plant and discharge of emissions under Section 21 of the Air (Prevention and Control of Pollution) Act, 1981 as amended in 1987 (Central Act 14 of 1981) –Issued- Reg.

Ref: 1. Unit's Application for Consent to Operate (Direct) dated: 14.08.2016.
2. IR.No : F.1212CBS/RS/AE/CBS/2016 dated 26.08.2016.
3. Minutes of the 40th ZLCCC meeting held dated 30.08.2016 (Item No. 40-21).

CONSENT TO OPERATE is hereby granted under Section 21 of the Air (Prevention and Control of Pollution) Act, 1981 as amended in 1987 (Central Act 14 of 1981) (hereinafter referred to as "The Act") and the rules and orders made there under to

The Proprietrix,
M/s. K.SANGEETHA QUARRY
S.F No.423/2,
VADAPUDUR Village,
Kinathukadavu Taluk,
Coimbatore District.

Authorizing the occupier to operate the industrial plant in the Air Pollution Control Area as notified by the Government and to make discharge of emission from the stacks/chimneys.

This is subject to the provisions of the Act, the rules and the orders made there under and the terms and conditions incorporated under the Special and General conditions stipulated in the Consent Order issued earlier and subject to the special conditions annexed.

This CONSENT is valid for the period ending March 31, 2021

M. Hemish
4/9/16
District Environmental Engineer,
Tamil Nadu Pollution Control Board,
COIMBATORE SOUTH

To
The Proprietrix,
M/s.K.SANGEETHA QUARRY ,
SF No.423/2, Vadaputhur Village, Kinathukadavu Taluk, Coimbatore District,
Pin: 642109

Copy to:

- 1.The Commissioner, KINATHUKADAVU-Panchayat Union, Kinathukadavu Taluk, Coimbatore District.
2. Copy submitted to the Member Secretary, Tamil Nadu Pollution Control Board, Chennai for favour of kind information.
3. Copy submitted to the JCEE-Monitoring, Tamil Nadu Pollution Control Board, Coimbatore for favour of kind information.
4. File

POLLUTION PREVENTION PAYS**அகம் தூய்மை வாய்மைக்கு ! புறம் தூய்மை வாழ்வுக்கு !**



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TAMILNADU POLLUTION CONTROL BOARD

SPECIAL CONDITIONS

1. This consent to operate is valid for operating the facility for the manufacture of products (Col. 2) at the rate (Col. 3) mentioned below. Any change in the products and its quantity has to be brought to the notice of the Board and fresh consent has to be obtained.

| Sl. No. | Description | Quantity | Unit |
|------------------------|--|----------|--------------|
| Product Details | | | |
| 1. | Rough Stone and Gravel Quarrying Area in SF No.423/2, Vadaputhur Village, Kinathukadavu Taluk, Coimbatore District | 3.68 | Hectares |
| 2. | Rough Stone | 24000 | Cu.m/5 Years |
| 3. | Gravel | 5650 | Cu.m/5 Years |

2. This consent to operate is valid for operating the facility with the below mentioned emission/noise sources along with the control measures and/or stack. Any change in the emission source/control measures/change in stack height has to be brought to the notice of the Board and fresh consent/Amendment has to be obtained.

| I Point source emission with stack : | | | | |
|---|------------------------------------|--------------------------------|-------------------------------------|--|
| Stack No. | Point Emission Source | Air pollution Control measures | Stack height from Ground Level in m | Gaseous Discharge in Nm ³ /hr |
| 01 | Quarrying Process | Water sprinkler arrangements | 0 | -- |
| II Fugitive/Noise emission : | | | | |
| Sl. No. | Fugitive or Noise Emission sources | Type of emission | Control measures | |

- 3(a). The emission shall not contain constituents in excess of the tolerance limits as laid down hereunder :

| Sl. | Parameter | Unit | Tolerance limits | Stacks |
|-----|-----------|------|------------------|--------|
|-----|-----------|------|------------------|--------|

Annexure enclosed if applicable. :-

- 3.(b) The Ambient Air in the industrial plant area shall not contain constituents in excess of the tolerance limits prescribed below.

| Sl. No. | Pollutant | Time Weighted Average | Unit | Tolerance Limits | |
|---------|--|-----------------------|--|---|---|
| | | | | Industrial, Residential, Rural and other area | Ecologically Sensitive Area (notified by Central Govt.) |
| 1. | Sulphur Dioxide (SO ₂) | Annual 24 hours | microgram/m ³ microgram/m ³ | 50 80 | 20 80 |
| 2. | Nitrogen Dioxide (NO ₂) | Annual 24 hours | microgram/m ³ microgram/m ³ | 40 80 | 30 80 |
| 3. | Particulate Matter (Size Less than 10 micro M) or PM ₁₀ | Annual 24 hours | microgram/m ³ microgram/m ³ | 60 100 | 60 100 |
| 4. | Particulate Matter (Size Less than 2.5 micro M) or PM _{2.5} | Annual 24 hours | microgram/m ³ microgram/m ³ | 40 60 | 40 60 |
| 5. | Ozone (O ₃) | Annual 24 hours | 8 Hours 1 Hour | 100 180 | 100 180 |

POLLUTION PREVENTION PAYS

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TAMILNADU POLLUTION CONTROL BOARD

| Sl. No. | Pollutant | Time Weighted Average | Unit | Tolerance Limits | |
|---------|--|-----------------------|--|---|---|
| | | | | Industrial, Residential, Rural and other area | Ecologically Sensitive Area (notified by Central Govt.) |
| 6. | Lead (Pb) | Annual 24 hours | microgram/m ³ microgram/m ³ | 0.5 1.0 | 0.5 1.0 |
| 7. | Carbon Monoxide (CO) | 8 Hours 1 Hour | miligram/m ³ miligram/m ³ | 02 04 | 02 04 |
| 8. | Ammonia (NH ₃) | Annual 24 hours | microgram/m ³ microgram/m ³ | 100 400 | 100 400 |
| 9. | Benzene (C ₆ H ₆) | Annual | microgram/m ³ | 5 | 5 |
| 10. | Benzo(O) Pyrene (BaP) -particulate phase only | Annual | nanogram/m ³ | 01 | 01 |
| 11. | Arsenic (As) | Annual | nanogram/m ³ | 06 | 06 |
| 12. | Nickel (Ni) | Annual | nanogram/m ³ | 20 | 20 |

3(c) The Ambient Noise Level in the industrial plant area shall not exceed the limits prescribed below:

| Limits in L _{eq} -dB(A) | Day Time | Night Time |
|----------------------------------|----------|------------|
| Residential Area | 55 | 45 |

4. All units of the Air pollution control measures shall be operated efficiently and continuously so as to achieve the standards prescribed in Sl. No.3 above.
5. The occupier shall not change or alter quality or quantity or the rate of emission or replace or alter the air pollution control equipment or change the raw material or manufacturing process resulting in change in quality and/or quantity of emissions without the previous written permission of the Board.
6. The occupier shall maintain log book regarding the stack monitoring system or operation of the plant or any other particulars for each of the unit operations of air pollution control systems to reflect the working condition which shall be furnished for verification of the Board officials during inspection.
7. The occupier shall at his own cost get the samples of emission/air/noise levels collected and analyzed by the TNPC Board Laboratory once in every 6 months/once in a year/periodically for the parameters as prescribed.
8. Any upset condition in any of the plants of the factory which is likely to result in increased emissions and result in violation of the standards mentioned in Sl.No.3 shall be reported to the Member Secretary / Joint Chief Environmental Engineer-Monitoring and the concerned District/Assistant Environmental Engineer of the Board by e-mail immediately and subsequently by Post with full details of such upset condition.
9. The occupier shall always comply and carryout the order/directions issued by the Board in this Consent Order and from time to time without any negligence. The occupier shall be liable for action as per provisions of the Act in case of non compliance of any order/directions issued.

Additional Conditions:

POLLUTION PREVENTION PAYS

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TAMILNADU POLLUTION CONTROL BOARD

- 1) The unit shall ensure that the Rough Stone & Gravel quarrying activity is of 24000 Cu.m of Rough Stone & 5650 Cu.m of Gravel over a period of 5 years from 25.07.2016 to 24.07.2021 in the Latitude 10°48'33" N to 10°48'42" N; Longitude 76°59'40"E to 76°59'54"E.
- 2) Mine working shall be Opencast Semi Mechanized Mining and is proposed up to a depth of 11.0 meters.
- 3) The unit shall provide adequate sanitary facilities within the quarry area as proposed.
- 4) The unit shall dispose the solid waste then and there without accumulation within the premises.
- 5) The unit shall collect the waste water, if any, shall be properly treated through septic tank arrangements so as to conform and meet the standards prescribed by the Board.
- 6) The unit shall ensure that the waste oils, used oils generated from the EM machines, mining operations, if any, shall be disposed as per the Hazardous Wastes (Management, Handling and trans boundary movement) Rules, 2008 and its amendments thereof to the recyclers authorized by TNPCB.
- 7) The proponent shall do the Rough stone quarrying manually or in strict accordance with the orders of the Government of Tamil Nadu, as upheld by the Hon'ble High Court of Madras.
- 8) The unit shall ensure that there shall not be any adverse impacts due to quarrying operation on the nearby human habitations, by way of pollution to the environment.
- 9) The unit shall be ensured that the mining operation shall be carried out only between 7 AM and 5 PM. The loading shall not be done during night hours.
- 10) The unit shall ensure that drilling and blasting shall be done only either by licensed explosive agent or by the proponent after obtaining required approvals from Competent Authorities.
- 11) The unit shall ensure that the blasting shall be carried out after announcing to the public through adequate public address system to avoid any accident.
- 12) The unit shall ensure that the explosives shall be stored at site as per the conditions stipulated in the permits issued by the licensing Authority.
- 13) The proponent shall ensure that there shall not be any adverse impacts due to quarrying operation on the nearby human habitations, by way of pollution to the environment.
- 14) The unit shall ensure that quarrying is not carried out below ground water table under any circumstances. If the ground water table occurs/intervenes within the permitted depth, then also quarrying shall be stopped.
- 15) The unit shall ensure that permission from the competent authority should be obtained for drawal of ground water, if any, required for this project.
- 16) The unit shall ensure that the mined out pits should be backfilled wherever warranted and area should be suitably landscaped to prevent environmental degradation.
- 17) The unit shall ensure that no change in mining technology and scope of working should be made without prior approval of State Level Environmental Impact Assessment Authority (SEIAA).
- 18) The unit shall carry out Water Sprinkling as Air Pollution Control Measures to control the high levels of Particulate Matter such as loading and unloading and all transfer points.
- 19) The unit shall provide acoustic measures so as to satisfy the Ambient Noise Level Standards prescribed by the Board.
- 20) The unit shall provide necessary Air Pollution Control Measures so as to achieve the Ambient Air Quality/ Emission Standards prescribed by the Board.
- 21) The unit shall take appropriate measures to ensure that the GLC shall comply with the revised National Ambient Air Quality norms notified by MoEF, Gol on 16.11.2009.
- 22) The unit shall ensure that the transportation of materials shall be done by covering the trucks/tractors with tarpaulin or other suitable mechanism so that no spillage of mineral /dust takes place.
- 23) The unit shall ensure that the topsoil, if any, shall be stacked properly with proper slope with adequate measures and should be used for plantation purpose.
- 24) The unit shall ensure that the workers employed shall be provided with protection equipment and earmuffs etc.
- 25) The unit shall ensure that the speed of trucks entering or leaving the mine is to be limited to moderate speed of 25 kmph to prevent undue noise from empty trucks.
- 26) The unit shall undertake plantation/afforestation work by planting the native species on all side of the quarry lease area and the approach road.
- 27) The unit shall maintain the village road through which transportation of mineral is carried out at his own cost. The roads shall be blacks stopped to the extent required.
- 28) The unit shall provide rain water harvesting facilities to collect and utilize the entire water falling in land area within the premises so as to increase the recharging of groundwater in that area.
- 29) The unit shall ensure that periodical medical examination of the workers engaged in the project shall be carried out and records maintained. For the purpose, schedule of health examination of the workers should be drawn and followed accordingly. The workers shall be provided with personnel protective measures such as masks, gloves, boots etc.
- 30) In addition to the above conditions, the unit shall comply with the conditions stipulated in the EC issued by State Level Environment Impact Assessment Authority, Tamil Nadu vide Lr. No. SEIAA-TN/F.No.3857/1(a)/EC.No.3397/2015, dated: 25.07.2016.

POLLUTION PREVENTION PAYS

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TAMILNADU POLLUTION CONTROL BOARD

Assembly
02/9/16
District Environmental Engineer,
Tamil Nadu Pollution Control Board,
COIMBATORE SOUTH



POLLUTION PREVENTION PAYS

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TAMILNADU POLLUTION CONTROL BOARD

GENERAL CONDITIONS

1. The occupier shall make an application along with the prescribed consent fee for grant of renewal of consent at least 60 days before the date of expiry of this Consent Order along with all the required particulars ensuring that there is no change in production quantity and emission.
2. This Consent is given by the Board in consideration of the particulars given in the application. Any change or alteration or deviation made in actual practice from the particulars furnished, in the application will also be ground for review/variation/revocation of the Consent Order under Section 21 of the Act.
3. The conditions imposed shall continue in force until revoked under Section 21 of the Act.
4. After the issue of this order, all the 'Consent to Operate' orders issued previously under Air (Prevention and Control of Pollution) Act, 1981 as amended stands defunct.
5. The occupier shall maintain an Inspection Register in the factory so that the inspecting officer shall record the details of the observations and instructions issued to the unit at the time of inspection for adherence.
6. The occupier shall provide and maintain an alternate power supply along with separate energy meter for the Air Pollution Control measures sufficient to ensure continuous operation of all pollution control equipments to ensure compliance.
7. The occupier shall provide all facilities to the Board officials for collection of samples in and around the factory at any time.
8. The applicant shall display the flow diagram of the sources of emission and pollution control systems provided at the site.
9. The liquid effluent arising out of the operation of the air pollution control equipment shall also be treated in a manner and to the satisfaction of standards prescribed by the Board in accordance with the provisions of Water (Prevention and Control of Pollution) Act, 1974 as amended.
10. The air pollution control equipments, location of inspection chambers and sampling port holes shall be made easily accessible at all time.
11. In case of any episodal discharge of emission, the industry shall take immediate action to bring down the emission within the limits prescribed by the Board.
12. If applicable, the occupier has to comply with the provisions of Public Liability Insurance Act, 1991 to provide immediate relief in the event of any hazard to human beings, other living creatures/plants and properties while handling and storage of hazardous substances.
13. The issuance of this consent does not authorize or approve the construction of any physical structures or facilities or the undertaking of any work in any natural watercourse or in Government Poramboke lands.
14. The issuance of this Consent does not convey any property right in either real personal property or any exclusive privileges, nor does it authorize any injury to private property or Government property or any invasion of personal rights nor any infringement of Central, State laws or regulation.
15. The occupier shall forth with keep the Board informed of any accident of unforeseen act or event of any poisonous, noxious or polluting matter or emissions are being discharged into stream or well or air as a result of such discharge, water or air is being polluted.
16. If due to any technological improvements or otherwise the Board is of opinion that all or any of the conditions referred to above requires variation (including the change of any treatment system, either in whole or in part) the Board shall, after giving the applicant an opportunity of being heard, vary all or any of such conditions and thereupon the applicant shall be bound to comply with the conditions as so varied.
17. In case there is any change in the constitution of the management, the occupier of the new management shall file fresh application under Air (Prevention and Control of Pollution) Act, 1981, as amended in Form-I alongwith relevant documents of change of management immediately and get the necessary amendment with renewal of consent order.
18. In case there is any change in the name of the company alone, the occupier shall inform the same with relevant documents immediately and get the necessary amendments for the change of name from the Board.

POLLUTION PREVENTION PAYS

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TAMILNADU POLLUTION CONTROL BOARD

19. The occupier shall display this consent order granted to him in a prominent place for perusal of the inspecting Officers of this Board.

[Handwritten Signature]
District Environmental Engineer,
Tamil Nadu Pollution Control Board,
COIMBATORE SOUTH
102/9/116



POLLUTION PREVENTION PAYS

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SENTHIL EXPLOSIVES

20, PANCHAYAT OFFICE STREET, SULUR, COIMBATORE - 641 402

Date. 23/08/20

To

K.Sangeetha,
No.11,Thilagar Street
Bagavathipalayam,
Coimbatore-642109

Sir,

Sub: Regarding blasting work using Explosives in your proposed quarry.

We are having explosives license in from 22 holding No.E42667 situate in survey number SF.NO: 126/2(V) NO:80, Sulur village, Sulur Taluk, Coimbatore District, our office functioning at address.

Senthil Explosives, 20, Panchayat office street, Sulur, Coimbatore-641402.

We are enacting 4 explosives vans for transporting detonators and class: 2 separately for our magazine to our work site and well experienced and licensed blasters and mate for safe blasting work since 5 years without untoward incident.

We are willing to undertake blasting work on contract basic at your proposed quarry at SF.Nos: 423/2, Vadapudur village, Kinathukadavu Taluk,Coimbatore District.

FOR SENTHIL EXPLOSIVES
For SENTHIL EXPLOSIVES

Partner Signature Partner

Enclosure: 1. Licence Copies

अनुज्ञप्ति प्ररूप एन.ई.-3 | LICENCE FORM LE-3

(विस्फोटक नियम, 2008 की अनुसूची 4 के भाग 1 के अनुच्छेद 3(क) से (घ) देखिए।)
(See article 3(a) to (d) of Part 1 of Schedule IV of Explosives Rules, 2008)

(ग) उपयोग के लिए एक समय पर वर्ग 1,2,3,4,5 या वर्ग 7 के विस्फोटक या किसी मैगजीन में वर्ग 6 के विस्फोटक रखने
Licence to possess : (c) for use explosives of class 1, 2,3,4,5,6 or 7 in a magazine

अनुज्ञप्ति सं. (Licence No.) : E/HQ/TN/22/377(E42667)
वार्षिक फीस रुपए (Annual Fee Rs): 9800/-



Licence is hereby granted to

M/s Senthil Explosives. (अधिगामी / Occupier : S.S. SAKTHIVELU), 20, PANCHAYAT OFFICE STREET, SULUR,
COIMBATORE Dist., Town/Village -, SULUR, District-COIMBATORE, State-Tamil Nadu, Pincode - 641402

को अनुज्ञप्ति अनुदत्त की जाती है।

2. अनुज्ञप्तिधारी की प्रारिथिति | Status of licensee : Partnership Firm

3. अनुज्ञप्ति निम्नलिखित प्रयोजनों के लिए विधिमान्य है।

Licence is valid only for the following purpose.

possess for use of Slurry Explosives, Safety Fuse, Detonating Fuse, Detonators, - के उपयोग के लिए

4. अनुज्ञप्ति विस्फोटकों के निम्नलिखित किस्मों, प्रकार और मात्रा के लिए विधिमान्य है।

Licence is valid for the following kinds and quantity of explosives: - (क) (a)

| क्र. सं. Sr. No. | नाम और विवरण Name and Description | वर्ग और प्रभाग Class & Division | उप-प्रभाग Sub-division | मात्रा किसी एक समय में Quantity at any one time |
|---------------------|--------------------------------------|------------------------------------|---------------------------|--|
| 1 | Slurry Explosives | 2, 0 | 0 | 4900 Kg |
| 2 | Safety Fuse | 6, 1 | 0 | 20000 Mtrs |
| 3 | Detonating Fuse | 6, 2 | 0 | 10000 Mtrs |
| 4 | Detonators | 6, 3 | 0 | 44000 Nox. |

(ख) किसी एक कलेंडर मास में खरीदे जाने वाले विस्फोटक की मात्रा (अनुच्छेद 3(ख) और (ग) के अधीन अनुज्ञप्ति के लिए)

(b) Quantity of explosives to be purchased in a calendar month [applicable for licence under article 3(b) and (c)]

14 times
as above.

5. निम्नलिखित रेखाचित्र (रेखाचित्रों) से अनुज्ञप्त परिसर की पुष्टि होती है।

The licensed premises shall conform to the following drawing(s):

रेखाचित्र क्र. (Drawing No.) E/HQ/TN/22/377(E42667)
दिनांक (Dated) 23/09/1991

6. अनुज्ञप्ति परिसर निम्नलिखित पते पर स्थित हैं। The licensed premises are situated at following address:

Service No(s): 126/2, (v) No. 89, ग्राम (Town/Village) : SULUR
जिला (District) : COIMBATORE

राज्य (State) : Tamil Nadu
ई मेल (E-Mail)

पुलिस थाना (Police Station) : COIMBATORE
पिनकोड (Pincode)
फैक्स (Fax)

7. अनुज्ञप्ति परिसर में निम्नलिखित सुविधाएं अंतर्विष्ट हैं।

The licensed premises consist of following facilities:

a main magazine room, a lobby and a detonator storage room.

8. अनुज्ञप्ति समय - समय पर यथासंशोधित विस्फोटक अधिनियम, 1884 और उनके अधीन विरचित विस्फोटक नियम, 2004 के उपबंधों, शर्तों और अतिरिक्त शर्तों और निम्नलिखित उपाबंधों के अधीन रहते हुए अनुदत्त की जाती है।

The licence is granted subject to the provision of Explosives Act 1884 as amended from time to time and the Explosives Rules, 2008 framed there under and the conditions, additional conditions and the following Annexures.

- उपर्युक्त क्रम से 5 में यथा कथित रेखाचित्र (स्थान, सन्निर्माण संबंधी और अन्य विवरण दर्शित करते हुए)।
Drawings (showing site, constructional and other details) as stated in serial No. 5 above.
- अनुज्ञप्ति प्राधिकारी द्वारा हस्ताक्षरित इस अनुज्ञप्ति की शर्तों और अतिरिक्त शर्तों।
Conditions and Additional Conditions of this licence signed by the licensing authority.
- दूरी प्ररूप DE-2 | Distance Form DE-2.

9. यह अनुज्ञप्ति तारीख 31 मार्च 1993 तक विधिमान्य रहेगी। This licence shall remain valid till 31st day of March 1993.

यह अनुज्ञप्ति, अधिनियम या उसके अधीन विरचित नियमों या अनुसूची V के भाग 4 के प्रति निर्दिष्ट सेट-VII के अधीन तथा उपर्युक्त इस अनुज्ञप्ति की शर्तों का अधिक्रमण करने या यदि अनुज्ञप्त परिसर योजना या उससे संलग्न उपबंध में दर्शित विवरण के अनुरूप नहीं पाए जाने पर निलंबित या प्रतिरिक्त की जा सकती है, जहां वह लागू हो।

This licence is liable to be suspended or revoked for any violation of the Act or Rules framed there under or the conditions of this licence as set forth under Set VIII, wherever applicable, referred to in Part 4 of Schedule V or if the licensed premises are not found conforming to the description shown in the plans and Annexure attached hereto.

तारीख | The Date - 23/09/1991

Sd/-
मुख्य विस्फोटक नियंत्रक | Chief Controller of Explosives

Amendments :

- Amendment of Quantity of Explosives/Monthly Purchase Limit dated : 27/08/2013
- Amendment of Quantity of Explosives/Monthly Purchase Limit dated : 29/03/2013
- Amendment of Quantity of Explosives/Monthly Purchase Limit dated : 07/01/2019

नवीनीकरण के पृष्ठांकन के लिए स्थान
Space for Endorsement of Renewal

नवीकरण की तारीख
Date of Renewal

समाप्ति की तारीख
Date of Expiry

अनुज्ञापन प्राधिकारी के हस्ताक्षर और स्टाम्प
Signature of licensing authority and stamp

08/02/2019

31/03/2024

JL Chief Controller of Explosives, South Circle, Chennai

दस्तावेज सं.
No. of Document 1047



खान अधिनियम, १९५२
THE MINES ACT, 1952

विस्फोटकर्ता समर्थता प्रमाण-पत्र
BLASTER'S CERTIFICATE OF COMPETENCY

(घातु उत्पादक खान विनियमावली, १९६१ के अधीन)
Under Metalliferous Mines Regulations, 1961
(Restricted to metalliferous mines opencast workings only)

श्री..... सुपुत्र..... गांव.....
धाना..... जिला..... राज्य.....

को जिनकी जन्मतिथि..... है अपनी आयु, आरोग्यता, अच्छे आचरण, साक्षरता और अनुभव के संबंध में संतोषजनक प्रमाण दे देने और..... में तारीख..... १९..... को हुई मौखिक परीक्षा पास कर लेने पर घातु उत्पादक खान विनियमावली, १९६१ के अधीन विस्फोटकर्ता प्रमाण-पत्र दिया जाता है।

R. Luthusany (Name)

of Village..... Alangulam..... Thana..... Sattur.....
District..... Ramanathapuram..... State..... Tamil Nadu.....
born on..... 3rd December, 1952..... son of..... Ramasamy.....

having given satisfactory evidence of his age, medical fitness, good conduct, literacy and experience and having passed an oral examination held at..... Salem..... on..... 7.8.1975..... 19....., is hereby granted a **BLASTER'S CERTIFICATE** under the Metalliferous Mines Regulations, 1961.

सचिव
खनन परीक्षा बोर्ड
Secretary,
Board of Mining Examinations.

अध्यक्ष
खनन परीक्षा बोर्ड
Chairman,
Board of Mining Examinations.

तारीख..... १९.....
Dated..... 7.10.2013..... 19.....

Certified that he was medically examined on 15-10-2012 and found fit to carry out the prescribed duties upto 14-10-2013

[Signature]
25/10/2012

Director of Mines Safety, Chennai Region.



बाएं हाथ के अंगूठे का निशान
Left hand thumb impression

प्रमाणित किया जाता है कि उसकी स्वास्थ्य परीक्षा कर ली गई है और वह दृष्टि, संशय दृष्टि या अन्य किसी ऐसी मानसिक अथवा शारीरिक अशक्तता से मुक्त पाया गया है जो उसके कर्तव्यों को प्रभावी रूप से करने में बाधक हो।

Certified that he was examined and found free from deafness, defective vision or any other infirmity, mental or physical likely to interfere with the efficient discharge of his duties.

- 1 On 26.9.81 को *[Signature]*
Director of Mines Safety (Chennai)
- 2 On 3/9/86 को *[Signature]*
Director of Mines Safety (Chennai)
- 3 On 24/09/86 को *[Signature]*
Director of Mines Safety (Chennai)
- 4 On 23/9/2001 को *[Signature]*
Director of Mines Safety (Chennai)
- 5 On को
- 6 On को

**TOPOGRAPHICAL VIEW OF VADAPUDUR ROUGH STONE
QUARRY LEASE APPLIED AREA**



Name of the Applicant : **K.Sangeetha,**
W/o. Kumaresh,
Address : No.13, Nethaji Street, Bagavathipalayam,
Kinathukadavu,
Coimbatore District – 642 109,
Tamil Nadu State.

LOCATION DETAILS

Extent : 2.36.5ha
S.F.No. : 423/2 (P)
Village : Vadapudur
Taluk : Kinathukadavu
District : Coimbatore
State : Tamil Nadu

Signature of the applicant

K. Sangeetha

K.Sangeetha

(Signature)
Sikemori
(Village) Administrative Officer
4, வட்டார அலுவலகம்,
கிணத்துக்கடவு வட்டம்.
Attestation

From
Thiru.S.Rameshkumar, M.Sc.,
Assistant Director,
Dept. of Geology and Mining,
Coimbatore.

To
Thiru.S.Ramesh,
S/o.A.Subramaniam,
No.14/35, Vinayagar Kovil Street,
Othakkal Mandapam,
Madukkarai,
Coimbatore District.

Rc.No.408/Mines/2020 Dated: 19.02.2021

Sir,

Sub: Mines & Minerals - Minor Mineral - Coimbatore District - Kinathukadavu Taluk - Vadapudur Village - Survey No. 423/1(P) - over an extent of 1.52.0 hectares of patta land - Application preferred by Thiru.S.Ramesh for quarrying Roughstone and gravel - Precise area communicated - Details of quarries situated within 500 meter radial distance - Requested - furnished - reg.

- Ref. 1. Assistant Director, Dept. of Geology and Mining, Coimbatore Letter Rc.No.408/Mines/2020, Dated: 12.02.2021.
2. Thiru.S.Ramesh letter dated: 16.02.2021

I invite kind attention to the reference cited wherein Thiru.S.Ramesh has been issued precise area for the grant of quarry lease for Rough Stone and Gravel over an extent of 1.52.0 hectares of patta land in Survey No. 423/1(P) of Vadapudur Village, Kinathukadavu Taluk, Coimbatore District.

In the reference 2nd cited of Thiru.S.Ramesh has requested to furnish details of quarries situated within 500 meter radial distance from the proposed area.

In this connection the details of abandoned, expired, existing and proposed quarries situated within 500 meter radial distance from the proposed area is furnished below.

i) Existing Quarries

| Sl. No. | Name of the Owner | Village & S.F.Nos. | Extent in Hect. | Lease period | Remarks |
|---------|-------------------------|-------------------------|-----------------|--------------------------|---------|
| 1 | Thiru.Ramalinga Gounder | Kinathukadavu 148/1C(P) | 1.45.0 | 03.03.2016 to 02.03.2021 | |
| 2. | Tmt.Sangeetha | Vadapudur 423/2 | 3.78.0 | 23.09.2016 to 22.09.2021 | |

ii) Expired Quarries

| Sl. No. | Name of the Owner | Village & S.F.Nos. | Extent in Hect. | Lease period | Remarks |
|-----------|-------------------|--------------------|-----------------|--------------|---------|
| ---NIL--- | | | | | |

iii) Abandoned quarries

| Sl. No. | Name of the Owner | Village & S.F.Nos. | Extent in Hect. | Lease period | Remarks |
|---------|-------------------|-----------------------|-----------------|--------------------------------|---------|
| 1. | Thiru.V.Marimuthu | Vadapudur 131/1C2A | 1.27.0 | 04.05.1999 to 03.05.2004 | |

iv) Proposed quarries

| Sl. No. | Name of the Owner | Village & S.F.Nos. | Extent in Hect. | Remarks |
|---------|-------------------|-----------------------|-----------------|--|
| 1 | Thiru.S.Ramesh | Vadapudur 423/1(P) | 1.52.0 | Subject Area Precise area communicated |
| 2. | Thiru.A.Kandasamy | Vadapudur 424/3 | 1.66.5 | - |

v) Future Proposed quarries

| Sl. No. | Name of the Owner | Village & S.F.Nos. | Extent in Hect. | Remarks |
|-----------|-------------------|--------------------|-----------------|---------|
| ---NIL--- | | | | |

[Signature]
Assistant Director,
Dept. of Geology and Mining,
Coimbatore.

[Signature]
19/2/21

TEST REPORT

| | | | |
|---------------------------|--|-------------------------|------------|
| Report No | EHS360/TR/2022-23/001 | Report Date | 06.03.2023 |
| Site Location | M/s. VADAPUDUR ROUGH STONE AND GRAVEL QUARRIES S.F.Nos. 423/1(P), 423/2 (P), Vadapudur Village, Kinathukadavu Taluk ,Coimbatore | | |
| Sampling Method | IS 5182 | Sample Drawn by | Laboratory |
| Sample Name | Air | Sample Code | EHS360/001 |
| Sample Description | Ambient Air Quality Monitoring | Sample Condition | Good |
| Sampling Location | AAQ 1 – CORE ZONE 10°48'37.09"N 76°59'48.31"E | | |

| Date | Period. hrs | PM10(µg/m3) | PM2.5(µg/m3) | SO2 (µg/m3) | NO2 (µg/m3) | O3 (µg/m3) | NH3 (µg/m3) | CO (mg/ m3) |
|----------------|-------------|-------------|--------------|-------------|-------------|-------------|-------------|--------------|
| 01.12.2022 | 7:00-7:00 | 33.2 | 22.6 | 6.2 | 22.3 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 02.12.2022 | 7:15-7:15 | 34.1 | 24.3 | 5.3 | 21.2 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 08.12.2022 | 7:00-7:00 | 33.7 | 26.5 | 7.6 | 23.5 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 09.12.2022 | 7:15-7:15 | 33.5 | 22.3 | 8.2 | 22.0 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 15.12.2022 | 7:00-7:00 | 35.6 | 21.0 | 6.0 | 21.3 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 16.12.2022 | 7:15-7:15 | 34.2 | 22.6 | 5.6 | 23.6 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 22.12.2022 | 7:00-7:00 | 32.3 | 24.3 | 6.2 | 22.4 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 23.12.2022 | 7:15-7:15 | 35.0 | 25.1 | 7.8 | 20.5 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 29.12.2022 | 7:00-7:00 | 34.2 | 26.8 | 8.0 | 21.3 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 30.12.2022 | 7:15-7:15 | 32.0 | 22.0 | 6.3 | 22.6 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 05.01.2023 | 7:00-7:00 | 33.1 | 21.3 | 7.0 | 23.5 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 06.01.2023 | 7:15-7:15 | 34.6 | 22.6 | 5.2 | 22.5 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 12.01.2023 | 7:00-7:00 | 35.1 | 24.6 | 6.3 | 21.0 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 13.01.2023 | 7:15-7:15 | 32.3 | 26.5 | 8.0 | 22.3 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 19.01.2023 | 7:00-7:00 | 34.1 | 24.3 | 7.2 | 22.6 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 20.01.2023 | 7:15-7:15 | 35.3 | 23.9 | 6.3 | 22.0 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 26.01.2023 | 7:00-7:00 | 34.2 | 24.5 | 5.4 | 23.8 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 27.01.2023 | 7:15-7:15 | 31.2 | 22.6 | 8.8 | 21.4 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 02.02.2023 | 7:00-7:00 | 34.0 | 25.3 | 6.3 | 23.6 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 03.02.2023 | 7:15-7:15 | 32.3 | 26.0 | 7.2 | 22.5 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 09.02.2023 | 7:00-7:00 | 31.0 | 25.0 | 5.4 | 21.4 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 10.02.2023 | 7:15-7:15 | 33.0 | 21.0 | 6.8 | 22.5 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 16.02.2023 | 7:00-7:00 | 35.6 | 24.3 | 7.2 | 23.6 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 17.02.2023 | 7:15-7:15 | 33.2 | 22.3 | 8.3 | 22.5 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 23.02.2023 | 7:00-7:00 | 34.8 | 21.5 | 6.1 | 23.4 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 24.02.2023 | 7:15-7:15 | 32.0 | 22.4 | 7.5 | 22.5 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| NAAQ* Standard | | <100 | <60 | <80 | <80 | <100 | <400 | <4 |

Note: BDL: Below Detection Limit ;DL: Detection Limit

Remarks: The values observed for the pollutants given above are within the CPCB standards.

*****End of Report*****

Page 1 of 1

Verified by



Authorised Signatory

Name: Santhosh Kumar A
Designation: Quality Manager

- Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

TEST REPORT

| | | | |
|---------------------------|--|-------------------------|------------|
| Report No | EHS360/TR/2022-23/001 | Report Date | 06.03.2023 |
| Site Location | M/s. VADAPUDUR ROUGH STONE AND GRAVEL QUARRIES S.F.Nos. 423/1(P), 423/2 (P), Vadapudur Village, Kinathukadavu Taluk ,Coimbatore | | |
| Sampling Method | IS 5182 | Sample Drawn by | Laboratory |
| Sample Name | Air | Sample Code | EHS360/001 |
| Sample Description | Ambient Air Quality Monitoring | Sample Condition | Good |
| Sampling Location | AAQ 1 – CORE ZONE 10°48'37.09"N 76°59'48.31"E | | |

| Date | Period. hrs | SPM ($\mu\text{g}/\text{m}^3$) | As (ng/m^3) | C6H6 ($\mu\text{g}/\text{m}^3$) | BaP (ng/m^3) | Pb ($\mu\text{g}/\text{m}^3$) | Ni (ng/m^3) |
|----------------|-------------|----------------------------------|-------------------------------|-----------------------------------|--------------------------------|---------------------------------|-------------------------------|
| 01.12.2022 | 7:00-7:00 | 56.2 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 02.12.2022 | 7:15-7:15 | 55.2 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 08.12.2022 | 7:00-7:00 | 57.3 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 09.12.2022 | 7:15-7:15 | 60.2 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 15.12.2022 | 7:00-7:00 | 55.0 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 16.12.2022 | 7:15-7:15 | 57.3 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 22.12.2022 | 7:00-7:00 | 56.2 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 23.12.2022 | 7:15-7:15 | 57.0 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 29.12.2022 | 7:00-7:00 | 55.8 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 30.12.2022 | 7:15-7:15 | 56.2 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 05.01.2023 | 7:00-7:00 | 55.1 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 06.01.2023 | 7:15-7:15 | 57.6 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 12.01.2023 | 7:00-7:00 | 58.2 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 13.01.2023 | 7:15-7:15 | 59.1 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 19.01.2023 | 7:00-7:00 | 60.3 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 20.01.2023 | 7:15-7:15 | 58.2 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 26.01.2023 | 7:00-7:00 | 56.2 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 27.01.2023 | 7:15-7:15 | 55.3 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 02.02.2023 | 7:00-7:00 | 57.2 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 03.02.2023 | 7:15-7:15 | 55.0 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 09.02.2023 | 7:00-7:00 | 56.3 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 10.02.2023 | 7:15-7:15 | 57.8 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 16.02.2023 | 7:00-7:00 | 58.3 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 17.02.2023 | 7:15-7:15 | 59.4 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 23.02.2023 | 7:00-7:00 | 58.6 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 24.02.2023 | 7:15-7:15 | 60.5 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| NAAQ* Standard | | <200 | 6 | 5 | 1 | 1 | 20 |

Note: BDL: Below Detection Limit ;DL: Detection Limit

Remarks: The values observed for the pollutants given above are within the CPCB standards.

*****End of Report*****



Verified by

[Signature]

Authorised Signatory

[Signature]

Name: Santhosh Kumar A
Designation: Quality Manager

- Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

TEST REPORT

| | | | |
|---------------------------|--|-------------------------|------------|
| Report No | EHS360/TR/2022-23/002 | Report Date | 06.03.2023 |
| Site Location | M/s. VADAPUDUR ROUGH STONE AND GRAVEL QUARRIES S.F.Nos. 423/1(P), 423/2 (P), Vadapudur Village, Kinathukadavu Taluk ,Coimbatore | | |
| Sampling Method | IS 5182 | Sample Drawn by | Laboratory |
| Sample Name | Air | Sample Code | EHS360/002 |
| Sample Description | Ambient Air Quality Monitoring | Sample Condition | Good |
| Sampling Location | AAQ 2 – Core zone - 10°48'44.18"N 76°59'53.43"E | | |

| Date | Period. hrs | PM10(µg/m3) | PM2.5(µg/m3) | SO2 (µg/m3) | NO2 (µg/m3) | O3 (µg/m3) | NH3 (µg/m3) | CO (mg/ m3) |
|----------------|-------------|-------------|--------------|-------------|-------------|-------------|-------------|--------------|
| 01.12.2022 | 7:00-7:00 | 36.2 | 26.3 | 6.2 | 22.3 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 02.12.2022 | 7:15-7:15 | 37.3 | 25.1 | 5.0 | 23.4 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 08.12.2022 | 7:00-7:00 | 38.2 | 27.3 | 7.2 | 21.0 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 09.12.2022 | 7:15-7:15 | 39.3 | 25.0 | 8.0 | 22.5 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 15.12.2022 | 7:00-7:00 | 36.1 | 26.3 | 6.2 | 23.6 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 16.12.2022 | 7:15-7:15 | 35.3 | 27.1 | 7.2 | 21.5 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 22.12.2022 | 7:00-7:00 | 38.3 | 27.0 | 8.3 | 23.2 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 23.12.2022 | 7:15-7:15 | 36.2 | 26.3 | 5.2 | 22.4 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 29.12.2022 | 7:00-7:00 | 39.2 | 25.1 | 6.0 | 21.5 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 30.12.2022 | 7:15-7:15 | 36.1 | 26.3 | 5.8 | 22.6 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 05.01.2023 | 7:00-7:00 | 37.0 | 27.4 | 7.2 | 23.5 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 06.01.2023 | 7:15-7:15 | 38.2 | 26.3 | 6.2 | 24.3 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 12.01.2023 | 7:00-7:00 | 39.1 | 25.4 | 5.4 | 22.5 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 13.01.2023 | 7:15-7:15 | 37.5 | 27.3 | 6.8 | 23.6 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 19.01.2023 | 7:00-7:00 | 36.3 | 26.5 | 5.9 | 22.1 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 20.01.2023 | 7:15-7:15 | 36.0 | 27.0 | 5.0 | 23.8 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 26.01.2023 | 7:00-7:00 | 35.2 | 25.3 | 6.4 | 22.0 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 27.01.2023 | 7:15-7:15 | 37.1 | 26.2 | 7.0 | 23.6 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 02.02.2023 | 7:00-7:00 | 38.6 | 25.0 | 6.3 | 24.0 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 03.02.2023 | 7:15-7:15 | 39.2 | 27.3 | 5.0 | 22.8 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 09.02.2023 | 7:00-7:00 | 38.0 | 26.5 | 5.3 | 23.6 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 10.02.2023 | 7:15-7:15 | 36.3 | 25.4 | 6.8 | 21.0 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 16.02.2023 | 7:00-7:00 | 37.2 | 27.0 | 5.9 | 23.6 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 17.02.2023 | 7:15-7:15 | 39.2 | 26.8 | 6.2 | 24.5 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 23.02.2023 | 7:00-7:00 | 36.3 | 25.4 | 5.1 | 22.1 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 24.02.2023 | 7:15-7:15 | 37.2 | 27.1 | 8.2 | 23.6 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| NAAQ* Standard | | <100 | <60 | <80 | <80 | <100 | <400 | <4 |

Note: BDL: Below Detection Limit ;DL: Detection Limit

Remarks: The values observed for the pollutants given above are within the CPCB standards.

*****End of Report*****



Verified by

Authorised Signatory

Name: Santhosh Kumar A
Designation: Quality Manager

- Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

TEST REPORT

| | | | |
|--------------------|--|------------------|------------|
| Report No | EHS360/TR/2022-23/002 | Report Date | 06.03.2023 |
| Site Location | M/s. VADAPUDUR ROUGH STONE AND GRAVEL QUARRIES S.F.Nos. 423/1(P), 423/2 (P), Vadapudur Village, Kinathukadavu Taluk ,Coimbatore | | |
| Sampling Method | IS 5182 | Sample Drawn by | Laboratory |
| Sample Name | Air | Sample Code | EHS360/002 |
| Sample Description | Ambient Air Quality Monitoring | Sample Condition | Good |
| Sampling Location | AAQ 2 – Core zone - 10°48'44.18"N 76°59'53.43"E | | |

| Date | Period. hrs | SPM ($\mu\text{g}/\text{m}^3$) | As (ng/m^3) | C6H6 ($\mu\text{g}/\text{m}^3$) | BaP (ng/m^3) | Pb ($\mu\text{g}/\text{m}^3$) | Ni (ng/m^3) |
|----------------|-------------|----------------------------------|-------------------------------|-----------------------------------|--------------------------------|---------------------------------|-------------------------------|
| 01.12.2022 | 7:00-7:00 | 62.5 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 02.12.2022 | 7:15-7:15 | 63.0 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 08.12.2022 | 7:00-7:00 | 64.5 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 09.12.2022 | 7:15-7:15 | 65.0 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 15.12.2022 | 7:00-7:00 | 63.5 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 16.12.2022 | 7:15-7:15 | 62.5 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 22.12.2022 | 7:00-7:00 | 61.2 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 23.12.2022 | 7:15-7:15 | 60.8 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 29.12.2022 | 7:00-7:00 | 62.3 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 30.12.2022 | 7:15-7:15 | 63.0 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 05.01.2023 | 7:00-7:00 | 64.2 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 06.01.2023 | 7:15-7:15 | 65.0 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 12.01.2023 | 7:00-7:00 | 62.3 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 13.01.2023 | 7:15-7:15 | 63.1 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 19.01.2023 | 7:00-7:00 | 64.2 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 20.01.2023 | 7:15-7:15 | 65.8 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 26.01.2023 | 7:00-7:00 | 64.2 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 27.01.2023 | 7:15-7:15 | 63.5 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 02.02.2023 | 7:00-7:00 | 62.1 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 03.02.2023 | 7:15-7:15 | 64.5 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 09.02.2023 | 7:00-7:00 | 65.8 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 10.02.2023 | 7:15-7:15 | 60.2 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 16.02.2023 | 7:00-7:00 | 62.3 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 17.02.2023 | 7:15-7:15 | 63.5 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 23.02.2023 | 7:00-7:00 | 64.5 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 24.02.2023 | 7:15-7:15 | 65.0 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| NAAQ* Standard | | <200 | 6 | 5 | 1 | 1 | 20 |

Note: BDL: Below Detection Limit ;DL: Detection Limit

Remarks: The values observed for the pollutants given above are within the CPCB standards.

*****End of Report*****

Page 1 of 1

Verified by

[Signature]



Authorised Signatory

Name: Santhosh Kumar A
Designation: Quality Manager

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TEST REPORT

| | | | |
|---------------------------|--|-------------------------|------------|
| Report No | EHS360/TR/2022-23/003 | Report Date | 06.03.2023 |
| Site Location | M/s. VADAPUDUR ROUGH STONE AND GRAVEL QUARRIES S.F.Nos. 423/1(P), 423/2 (P), Vadapudur Village, Kinathukadavu Taluk ,Coimbatore | | |
| Sampling Method | IS 5182 | Sample Drawn by | Laboratory |
| Sample Name | Air | Sample Code | EHS360/003 |
| Sample Description | Ambient Air Quality Monitoring | Sample Condition | Good |
| Sampling Location | AAQ3 – Muthur - 10°47'35.49"N 76°59'14.93"E | | |

| Date | Period. hrs | PM10(µg/m3) | PM2.5(µg/m3) | SO2 (µg/m3) | NO2 (µg/m3) | O3 (µg/m3) | NH3 (µg/m3) | CO (mg/ m3) |
|----------------|-------------|-------------|--------------|-------------|-------------|-------------|-------------|--------------|
| 05.12.2022 | 7:00-7:00 | 40.2 | 24.2 | 5.2 | 19.2 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 06.12.2022 | 7:15-7:15 | 43.2 | 23.2 | 6.3 | 20.0 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 12.12.2022 | 7:00-7:00 | 44.1 | 25.1 | 5.1 | 19.8 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 13.12.2022 | 7:15-7:15 | 40.3 | 24.3 | 6.0 | 21.3 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 19.12.2022 | 7:00-7:00 | 41.2 | 23.0 | 5.8 | 29.3 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 20.12.2022 | 7:15-7:15 | 42.2 | 25.7 | 6.3 | 20.1 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 26.12.2022 | 7:00-7:00 | 43.0 | 23.2 | 5.2 | 22.3 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 27.12.2022 | 7:15-7:15 | 42.3 | 24.1 | 6.4 | 21.4 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 02.01.2023 | 7:00-7:00 | 40.1 | 23.8 | 6.0 | 19.2 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 03.01.2023 | 7:15-7:15 | 44.2 | 24.0 | 5.8 | 20.3 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 09.01.2023 | 7:00-7:00 | 43.3 | 25.3 | 6.5 | 22.4 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 10.01.2023 | 7:15-7:15 | 40.2 | 23.0 | 5.3 | 21.6 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 16.01.2023 | 7:00-7:00 | 43.0 | 25.0 | 6.1 | 19.3 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 17.01.2023 | 7:15-7:15 | 42.2 | 24.2 | 5.3 | 20.0 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 23.01.2023 | 7:00-7:00 | 44.0 | 23.1 | 6.2 | 21.5 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 24.01.2023 | 7:15-7:15 | 43.2 | 25.4 | 5.1 | 23.6 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 30.01.2023 | 7:00-7:00 | 45.6 | 25.3 | 6.5 | 22.0 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 31.01.2023 | 7:15-7:15 | 43.0 | 25.0 | 7.3 | 23.8 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 06.02.2023 | 7:00-7:00 | 42.0 | 24.1 | 5.5 | 24.2 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 07.02.2023 | 7:15-7:15 | 45.3 | 23.6 | 6.3 | 23.6 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 13.02.2023 | 7:00-7:00 | 41.2 | 25.8 | 7.2 | 21.0 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 14.02.2023 | 7:15-7:15 | 44.2 | 24.6 | 6.8 | 22.8 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 20.02.2023 | 7:00-7:00 | 43.0 | 23.9 | 5.4 | 23.0 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 21.02.2023 | 7:15-7:15 | 42.3 | 24.8 | 7.2 | 22.8 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 27.02.2023 | 7:00-7:00 | 44.1 | 22.1 | 8.2 | 21.6 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 28.02.2023 | 7:15-7:15 | 43.6 | 25.3 | 6.3 | 22.9 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| NAAQ* Standard | | <100 | <60 | <80 | <80 | <100 | <400 | <4 |

Note: BDL: Below Detection Limit ;DL: Detection Limit

Remarks: The values observed for the pollutants given above are within the CPCB standards.

*****End of Report*****

Page 1 of 1

Verified by



Authorised Signatory

Name: Santhosh Kumar A
Designation: Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

TEST REPORT

| | | | |
|--------------------|--|------------------|------------|
| Report No | EHS360/TR/2022-23/003 | Report Date | 06.03.2023 |
| Site Location | M/s. VADAPUDUR ROUGH STONE AND GRAVEL QUARRIES S.F.Nos. 423/1(P), 423/2 (P), Vadapudur Village, Kinathukadavu Taluk ,Coimbatore | | |
| Sampling Method | IS 5182 | Sample Drawn by | Laboratory |
| Sample Name | Air | Sample Code | EHS360/003 |
| Sample Description | Ambient Air Quality Monitoring | Sample Condition | Good |
| Sampling Location | AAQ3 – Muthur - 10°47'35.49"N 76°59'14.93"E | | |

| Date | Period. hrs | SPM ($\mu\text{g}/\text{m}^3$) | As (ng/m^3) | C6H6 ($\mu\text{g}/\text{m}^3$) | BaP (ng/m^3) | Pb ($\mu\text{g}/\text{m}^3$) | Ni (ng/m^3) |
|----------------|-------------|----------------------------------|-------------------------------|-----------------------------------|--------------------------------|---------------------------------|-------------------------------|
| 05.12.2022 | 7:00-7:00 | 62.3 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 06.12.2022 | 7:15-7:15 | 63.5 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 12.12.2022 | 7:00-7:00 | 64.2 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 13.12.2022 | 7:15-7:15 | 62.0 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 19.12.2022 | 7:00-7:00 | 63.8 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 20.12.2022 | 7:15-7:15 | 64.2 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 26.12.2022 | 7:00-7:00 | 61.2 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 27.12.2022 | 7:15-7:15 | 62.3 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 02.01.2023 | 7:00-7:00 | 64.5 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 03.01.2023 | 7:15-7:15 | 62.3 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 09.01.2023 | 7:00-7:00 | 63.5 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 10.01.2023 | 7:15-7:15 | 62.5 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 16.01.2023 | 7:00-7:00 | 63.1 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 17.01.2023 | 7:15-7:15 | 64.3 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 23.01.2023 | 7:00-7:00 | 63.5 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 24.01.2023 | 7:15-7:15 | 62.1 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 30.01.2023 | 7:00-7:00 | 64.3 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 31.01.2023 | 7:15-7:15 | 63.0 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 06.02.2023 | 7:00-7:00 | 62.5 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 07.02.2023 | 7:15-7:15 | 61.5 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 13.02.2023 | 7:00-7:00 | 63.5 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 14.02.2023 | 7:15-7:15 | 64.5 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 20.02.2023 | 7:00-7:00 | 62.8 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 21.02.2023 | 7:15-7:15 | 63.5 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 27.02.2023 | 7:00-7:00 | 64.2 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 28.02.2023 | 7:15-7:15 | 62.8 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| NAAQ* Standard | | <200 | 6 | 5 | 1 | 1 | 20 |

Note: BDL: Below Detection Limit ;DL: Detection Limit

Remarks: The values observed for the pollutants given above are within the CPCB standards.

*****End of Report*****

Page 1 of 1

Verified by

[Signature]



Authorised Signatory

Name: Santhosh Kumar A
Designation: Quality Manager

- Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

TEST REPORT

| | | | |
|---------------------------|--|-------------------------|------------|
| Report No | EHS360/TR/2022-23/004 | Report Date | 06.03.2023 |
| Site Location | M/s. VADAPUDUR ROUGH STONE AND GRAVEL QUARRIES S.F.Nos. 423/1(P), 423/2 (P), Vadapudur Village, Kinathukadavu Taluk ,Coimbatore | | |
| Sampling Method | IS 5182 | Sample Drawn by | Laboratory |
| Sample Name | Air | Sample Code | EHS360/004 |
| Sample Description | Ambient Air Quality Monitoring | Sample Condition | Good |
| Sampling Location | AAQ4 – Sankarayapuram - 10°46'46.86"N 76°58'16.81"E | | |

| Date | Period. hrs | PM10(µg/m3) | PM2.5(µg/m3) | SO2 (µg/m3) | NO2 (µg/m3) | O3 (µg/m3) | NH3 (µg/m3) | CO (mg/ m3) |
|----------------|-------------|-------------|--------------|-------------|-------------|-------------|-------------|--------------|
| 05.12.2022 | 7:00-7:00 | 43.2 | 23.5 | 5.5 | 23.2 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 06.12.2022 | 7:15-7:15 | 44.3 | 24.2 | 6.2 | 22.1 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 12.12.2022 | 7:00-7:00 | 42.0 | 25.6 | 7.2 | 20.3 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 13.12.2022 | 7:15-7:15 | 45.6 | 26.3 | 5.3 | 21.5 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 19.12.2022 | 7:00-7:00 | 46.3 | 27.1 | 6.2 | 20.0 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 20.12.2022 | 7:15-7:15 | 44.0 | 26.0 | 5.0 | 21.8 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 26.12.2022 | 7:00-7:00 | 43.1 | 24.3 | 7.4 | 22.3 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 27.12.2022 | 7:15-7:15 | 44.2 | 25.0 | 6.3 | 21.3 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 02.01.2023 | 7:00-7:00 | 45.6 | 26.5 | 7.2 | 23.6 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 03.01.2023 | 7:15-7:15 | 46.2 | 27.1 | 6.4 | 22.5 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 09.01.2023 | 7:00-7:00 | 42.1 | 25.3 | 7.0 | 21.4 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 10.01.2023 | 7:15-7:15 | 43.2 | 24.1 | 7.5 | 23.5 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 16.01.2023 | 7:00-7:00 | 44.5 | 26.3 | 6.3 | 22.8 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 17.01.2023 | 7:15-7:15 | 46.3 | 25.4 | 6.5 | 20.1 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 23.01.2023 | 7:00-7:00 | 47.8 | 27.0 | 7.1 | 23.9 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 24.01.2023 | 7:15-7:15 | 43.6 | 25.3 | 6.3 | 21.5 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 30.01.2023 | 7:00-7:00 | 44.5 | 26.0 | 7.3 | 22.5 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 31.01.2023 | 7:15-7:15 | 45.2 | 24.8 | 6.0 | 21.0 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 06.02.2023 | 7:00-7:00 | 46.8 | 25.0 | 6.8 | 23.6 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 07.02.2023 | 7:15-7:15 | 43.2 | 26.3 | 7.2 | 23.0 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 13.02.2023 | 7:00-7:00 | 42.1 | 24.3 | 5.3 | 21.8 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 14.02.2023 | 7:15-7:15 | 45.6 | 26.5 | 5.0 | 22.5 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 20.02.2023 | 7:00-7:00 | 46.2 | 25.0 | 6.8 | 22.0 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 21.02.2023 | 7:15-7:15 | 42.3 | 23.0 | 7.1 | 23.6 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 27.02.2023 | 7:00-7:00 | 44.1 | 24.1 | 6.0 | 22.1 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 28.02.2023 | 7:15-7:15 | 45.8 | 25.6 | 5.8 | 21.0 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| NAAQ* Standard | | <100 | <60 | <80 | <80 | <100 | <400 | <4 |

Note: BDL: Below Detection Limit ;DL: Detection Limit

Remarks: The values observed for the pollutants given above are within the CPCB standards.

*****End of Report*****

Page 1 of 1

Verified by



Authorised Signatory

Name: Santhosh Kumar A
Designation: Quality Manager

- Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

TEST REPORT

| | | | |
|--------------------|--|------------------|------------|
| Report No | EHS360/TR/2022-23/004 | Report Date | 06.03.2023 |
| Site Location | M/s. VADAPUDUR ROUGH STONE AND GRAVEL QUARRIES S.F.Nos. 423/1(P), 423/2 (P), Vadapudur Village, Kinathukadavu Taluk ,Coimbatore | | |
| Sampling Method | IS 5182 | Sample Drawn by | Laboratory |
| Sample Name | Air | Sample Code | EHS360/004 |
| Sample Description | Ambient Air Quality Monitoring | Sample Condition | Good |
| Sampling Location | AAQ4 – Sankarayapuram - 10°46'46.86"N 76°58'16.81"E | | |

| Date | Period. hrs | SPM ($\mu\text{g}/\text{m}^3$) | As (ng/m^3) | C6H6 ($\mu\text{g}/\text{m}^3$) | BaP (ng/m^3) | Pb ($\mu\text{g}/\text{m}^3$) | Ni (ng/m^3) |
|----------------|-------------|----------------------------------|-------------------------------|-----------------------------------|--------------------------------|---------------------------------|-------------------------------|
| 05.12.2022 | 7:00-7:00 | 64.5 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 06.12.2022 | 7:15-7:15 | 65.3 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 12.12.2022 | 7:00-7:00 | 66.2 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 13.12.2022 | 7:15-7:15 | 67.3 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 19.12.2022 | 7:00-7:00 | 65.0 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 20.12.2022 | 7:15-7:15 | 66.3 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 26.12.2022 | 7:00-7:00 | 67.2 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 27.12.2022 | 7:15-7:15 | 65.0 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 02.01.2023 | 7:00-7:00 | 66.3 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 03.01.2023 | 7:15-7:15 | 67.2 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 09.01.2023 | 7:00-7:00 | 66.2 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 10.01.2023 | 7:15-7:15 | 64.3 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 16.01.2023 | 7:00-7:00 | 65.2 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 17.01.2023 | 7:15-7:15 | 67.3 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 23.01.2023 | 7:00-7:00 | 65.2 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 24.01.2023 | 7:15-7:15 | 66.0 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 30.01.2023 | 7:00-7:00 | 67.3 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 31.01.2023 | 7:15-7:15 | 64.3 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 06.02.2023 | 7:00-7:00 | 65.4 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 07.02.2023 | 7:15-7:15 | 66.3 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 13.02.2023 | 7:00-7:00 | 67.2 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 14.02.2023 | 7:15-7:15 | 64.0 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 20.02.2023 | 7:00-7:00 | 65.8 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 21.02.2023 | 7:15-7:15 | 66.3 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 27.02.2023 | 7:00-7:00 | 67.2 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 28.02.2023 | 7:15-7:15 | 64.2 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| NAAQ* Standard | | <200 | 6 | 5 | 1 | 1 | 20 |

Note: BDL: Below Detection Limit ;DL: Detection Limit

Remarks: The values observed for the pollutants given above are within the CPCB standards.

*****End of Report*****

Page 1 of 1

Verified by

[Signature]



Authorised Signatory

Name: Santhosh Kumar A
Designation: Quality Manager

- Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

TEST REPORT

| | | | |
|---------------------------|--|-------------------------|------------|
| Report No | EHS360/TR/2022-23/005 | Report Date | 06.03.2023 |
| Site Location | M/s. VADAPUDUR ROUGH STONE AND GRAVEL QUARRIES S.F.Nos. 423/1(P), 423/2 (P), Vadapudur Village, Kinathukadavu Taluk ,Coimbatore | | |
| Sampling Method | IS 5182 | Sample Drawn by | Laboratory |
| Sample Name | Air | Sample Code | EHS360/005 |
| Sample Description | Ambient Air Quality Monitoring | Sample Condition | Good |
| Sampling Location | AAQ5 – Vadakkipalayam -10°48'13.73"N 77°0'42.20"E | | |

| Date | Period. hrs | PM10(µg/m3) | PM2.5(µg/m3) | SO2 (µg/m3) | NO2 (µg/m3) | O3 (µg/m3) | NH3 (µg/m3) | CO (mg/ m3) |
|----------------|-------------|-------------|--------------|-------------|-------------|-------------|-------------|--------------|
| 05.12.2022 | 7:00-7:00 | 40.2 | 22.1 | 6.2 | 20.2 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 06.12.2022 | 7:15-7:15 | 41.2 | 23.2 | 7.3 | 18.2 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 12.12.2022 | 7:00-7:00 | 42.0 | 24.5 | 8.2 | 19.3 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 13.12.2022 | 7:15-7:15 | 43.2 | 25.1 | 6.5 | 20.0 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 19.12.2022 | 7:00-7:00 | 41.2 | 24.3 | 7.3 | 22.6 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 20.12.2022 | 7:15-7:15 | 44.5 | 25.0 | 8.2 | 19.0 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 26.12.2022 | 7:00-7:00 | 42.6 | 23.8 | 6.3 | 21.3 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 27.12.2022 | 7:15-7:15 | 44.3 | 22.1 | 6.1 | 22.3 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 02.01.2023 | 7:00-7:00 | 43.2 | 20.5 | 7.3 | 23.6 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 03.01.2023 | 7:15-7:15 | 42.0 | 21.3 | 8.2 | 21.0 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 09.01.2023 | 7:00-7:00 | 40.3 | 24.5 | 6.0 | 28.6 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 10.01.2023 | 7:15-7:15 | 41.2 | 25.3 | 7.2 | 19.3 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 16.01.2023 | 7:00-7:00 | 43.2 | 25.3 | 8.3 | 20.4 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 17.01.2023 | 7:15-7:15 | 42.0 | 24.1 | 7.0 | 22.5 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 23.01.2023 | 7:00-7:00 | 41.3 | 22.6 | 6.3 | 18.6 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 24.01.2023 | 7:15-7:15 | 43.0 | 24.5 | 7.1 | 19.5 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 30.01.2023 | 7:00-7:00 | 42.2 | 25.8 | 8.2 | 20.3 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 31.01.2023 | 7:15-7:15 | 41.1 | 22.3 | 6.9 | 22.5 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 06.02.2023 | 7:00-7:00 | 43.0 | 20.5 | 7.3 | 20.5 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 07.02.2023 | 7:15-7:15 | 40.2 | 21.6 | 8.4 | 21.3 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 13.02.2023 | 7:00-7:00 | 43.3 | 24.6 | 6.5 | 22.6 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 14.02.2023 | 7:15-7:15 | 44.2 | 25.3 | 7.2 | 19.5 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 20.02.2023 | 7:00-7:00 | 45.0 | 22.5 | 7.5 | 20.3 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 21.02.2023 | 7:15-7:15 | 43.1 | 23.5 | 8.2 | 22.4 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 27.02.2023 | 7:00-7:00 | 42.6 | 24.1 | 6.3 | 21.5 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 28.02.2023 | 7:15-7:15 | 45.2 | 26.3 | 7.2 | 22.3 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| NAAQ* Standard | | <100 | <60 | <80 | <80 | <100 | <400 | <4 |

Note: BDL: Below Detection Limit ;DL: Detection Limit
Remarks: The values observed for the pollutants given above are within the CPCB standards.

*****End of Report*****

Page 1 of 1

Verified by



Authorised Signatory

Name: Santhosh Kumar A
 Designation: Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report.
 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client.
 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

TEST REPORT

| | | | |
|---------------------------|---|-------------------------|------------|
| Report No | EHS360/TR/2022-23/005 | Report Date | 06.03.2023 |
| Site Location | M/s. VADAPUDUR ROUGH STONE AND GRAVEL QUARRIES S.F.Nos. 423/1(P), 423/2 (P), Vadapudur Village, Kinathukadavu Taluk ,Coimbatore | | |
| Sampling Method | IS 5182 | Sample Drawn by | Laboratory |
| Sample Name | Air | Sample Code | EHS360/005 |
| Sample Description | Ambient Air Quality Monitoring | Sample Condition | Good |
| Sampling Location | AAQ5 – Vadakkipalayam -10°48'13.73"N 77°0'42.20"E | | |

| Date | Period. hrs | SPM ($\mu\text{g}/\text{m}^3$) | As (ng/m^3) | C6H6 ($\mu\text{g}/\text{m}^3$) | BaP (ng/m^3) | Pb ($\mu\text{g}/\text{m}^3$) | Ni (ng/m^3) |
|----------------|-------------|----------------------------------|-------------------------------|-----------------------------------|--------------------------------|---------------------------------|-------------------------------|
| 05.12.2022 | 7:00-7:00 | 63.2 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 06.12.2022 | 7:15-7:15 | 62.4 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 12.12.2022 | 7:00-7:00 | 64.3 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 13.12.2022 | 7:15-7:15 | 65.2 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 19.12.2022 | 7:00-7:00 | 66.3 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 20.12.2022 | 7:15-7:15 | 64.1 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 26.12.2022 | 7:00-7:00 | 62.0 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 27.12.2022 | 7:15-7:15 | 63.5 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 02.01.2023 | 7:00-7:00 | 65.1 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 03.01.2023 | 7:15-7:15 | 64.0 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 09.01.2023 | 7:00-7:00 | 63.5 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 10.01.2023 | 7:15-7:15 | 62.1 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 16.01.2023 | 7:00-7:00 | 64.3 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 17.01.2023 | 7:15-7:15 | 65.2 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 23.01.2023 | 7:00-7:00 | 64.0 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 24.01.2023 | 7:15-7:15 | 66.2 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 30.01.2023 | 7:00-7:00 | 64.2 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 31.01.2023 | 7:15-7:15 | 62.3 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 06.02.2023 | 7:00-7:00 | 64.0 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 07.02.2023 | 7:15-7:15 | 65.2 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 13.02.2023 | 7:00-7:00 | 66.0 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 14.02.2023 | 7:15-7:15 | 65.2 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 20.02.2023 | 7:00-7:00 | 62.3 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 21.02.2023 | 7:15-7:15 | 64.0 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 27.02.2023 | 7:00-7:00 | 63.2 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 28.02.2023 | 7:15-7:15 | 62.1 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| NAAQ* Standard | | <200 | 6 | 5 | 1 | 1 | 20 |

Note: BDL: Below Detection Limit ;DL: Detection Limit

Remarks: The values observed for the pollutants given above are within the CPCB standards.

*****End of Report*****

Page 1 of 1

Verified by

[Signature]



Authorised Signatory

Name: Santhosh Kumar A
Designation: Quality Manager

- Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

TEST REPORT

| | | | |
|---------------------------|--|-------------------------|------------|
| Report No | EHS360/TR/2022-23/006 | Report Date | 06.03.2023 |
| Site Location | M/s. VADAPUDUR ROUGH STONE AND GRAVEL QUARRIES S.F.Nos. 423/1(P), 423/2 (P), Vadapudur Village, Kinathukadavu Taluk ,Coimbatore | | |
| Sampling Method | IS 5182 | Sample Drawn by | Laboratory |
| Sample Name | Air | Sample Code | EHS360/006 |
| Sample Description | Ambient Air Quality Monitoring | Sample Condition | Good |
| Sampling Location | AAQ 6 – Nallattipalayam- 10°47'14.69"N 77°1'52.50"E | | |

| Date | Period. hrs | PM10(µg/m3) | PM2.5(µg/m3) | SO2 (µg/m3) | NO2 (µg/m3) | O3 (µg/m3) | NH3 (µg/m3) | CO (mg/ m3) |
|----------------|-------------|-------------|--------------|-------------|-------------|-------------|-------------|--------------|
| 05.12.2022 | 7:00-7:00 | 45.2 | 22.5 | 6.2 | 18.5 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 06.12.2022 | 7:15-7:15 | 44.0 | 24.3 | 7.1 | 17.2 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 12.12.2022 | 7:00-7:00 | 46.3 | 25.3 | 8.0 | 19.3 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 13.12.2022 | 7:15-7:15 | 45.0 | 26.0 | 6.3 | 20.0 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 19.12.2022 | 7:00-7:00 | 44.2 | 24.1 | 7.0 | 18.3 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 20.12.2022 | 7:15-7:15 | 46.0 | 25.0 | 8.2 | 19.2 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 26.12.2022 | 7:00-7:00 | 44.1 | 26.3 | 6.0 | 17.2 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 27.12.2022 | 7:15-7:15 | 45.2 | 23.0 | 7.2 | 19.3 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 02.01.2023 | 7:00-7:00 | 46.3 | 24.5 | 6.3 | 18.0 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 03.01.2023 | 7:15-7:15 | 44.8 | 26.5 | 8.1 | 20.3 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 09.01.2023 | 7:00-7:00 | 45.2 | 24.0 | 7.4 | 17.0 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 10.01.2023 | 7:15-7:15 | 44.3 | 25.1 | 6.5 | 18.5 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 16.01.2023 | 7:00-7:00 | 46.0 | 21.0 | 8.2 | 19.3 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 17.01.2023 | 7:15-7:15 | 44.8 | 22.3 | 6.8 | 18.5 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 23.01.2023 | 7:00-7:00 | 45.3 | 24.6 | 7.5 | 17.3 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 24.01.2023 | 7:15-7:15 | 44.2 | 22.0 | 6.8 | 19.2 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 30.01.2023 | 7:00-7:00 | 45.8 | 23.5 | 7.3 | 19.0 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 31.01.2023 | 7:15-7:15 | 44.3 | 24.1 | 6.9 | 20.5 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 06.02.2023 | 7:00-7:00 | 46.2 | 23.0 | 7.1 | 17.2 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 07.02.2023 | 7:15-7:15 | 44.0 | 24.8 | 8.2 | 18.4 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 13.02.2023 | 7:00-7:00 | 46.0 | 25.0 | 7.2 | 19.2 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 14.02.2023 | 7:15-7:15 | 45.2 | 26.1 | 6.8 | 20.5 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 20.02.2023 | 7:00-7:00 | 46.3 | 25.6 | 8.3 | 18.2 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 21.02.2023 | 7:15-7:15 | 44.9 | 25.0 | 6.5 | 19.3 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 27.02.2023 | 7:00-7:00 | 45.0 | 24.1 | 7.2 | 20.0 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 28.02.2023 | 7:15-7:15 | 43.6 | 23.1 | 6.3 | 19.5 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| NAAQ* Standard | | <100 | <60 | <80 | <80 | <100 | <400 | <4 |

Note: BDL: Below Detection Limit ; DL: Detection Limit

Remarks: The values observed for the pollutants given above are within the CPCB standards.

*****End of Report*****

Page 1 of 1

Verified by




Authorised Signatory

Name: Santhosh Kumar A
Designation : Quality Manager

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TEST REPORT

| | | | |
|--------------------|--|------------------|------------|
| Report No | EHS360/TR/2022-23/006 | Report Date | 06.03.2023 |
| Site Location | M/s. VADAPUDUR ROUGH STONE AND GRAVEL QUARRIES S.F.Nos. 423/1(P), 423/2 (P), Vadapudur Village, Kinathukadavu Taluk ,Coimbatore | | |
| Sampling Method | IS 5182 | Sample Drawn by | Laboratory |
| Sample Name | Air | Sample Code | EHS360/006 |
| Sample Description | Ambient Air Quality Monitoring | Sample Condition | Good |
| Sampling Location | AAQ 6 – Nallattipalayam- 10°47'14.69"N 77°1'52.50"E | | |

| Date | Period. hrs | SPM ($\mu\text{g}/\text{m}^3$) | As (ng/m^3) | C6H6 ($\mu\text{g}/\text{m}^3$) | BaP (ng/m^3) | Pb ($\mu\text{g}/\text{m}^3$) | Ni (ng/m^3) |
|----------------|-------------|----------------------------------|-------------------------------|-----------------------------------|--------------------------------|---------------------------------|-------------------------------|
| 05.12.2022 | 7:00-7:00 | 62.5 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 06.12.2022 | 7:15-7:15 | 63.4 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 12.12.2022 | 7:00-7:00 | 65.1 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 13.12.2022 | 7:15-7:15 | 62.0 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 19.12.2022 | 7:00-7:00 | 64.2 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 20.12.2022 | 7:15-7:15 | 65.3 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 26.12.2022 | 7:00-7:00 | 66.0 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 27.12.2022 | 7:15-7:15 | 64.2 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 02.01.2023 | 7:00-7:00 | 63.5 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 03.01.2023 | 7:15-7:15 | 60.2 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 09.01.2023 | 7:00-7:00 | 62.5 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 10.01.2023 | 7:15-7:15 | 63.0 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 16.01.2023 | 7:00-7:00 | 64.1 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 17.01.2023 | 7:15-7:15 | 65.2 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 23.01.2023 | 7:00-7:00 | 66.5 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 24.01.2023 | 7:15-7:15 | 64.0 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 30.01.2023 | 7:00-7:00 | 63.2 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 31.01.2023 | 7:15-7:15 | 62.1 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 06.02.2023 | 7:00-7:00 | 63.0 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 07.02.2023 | 7:15-7:15 | 62.1 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 13.02.2023 | 7:00-7:00 | 63.8 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 14.02.2023 | 7:15-7:15 | 64.5 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 20.02.2023 | 7:00-7:00 | 65.0 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 21.02.2023 | 7:15-7:15 | 62.3 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 27.02.2023 | 7:00-7:00 | 66.0 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 28.02.2023 | 7:15-7:15 | 65.8 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| NAAQ* Standard | | <200 | 6 | 5 | 1 | 1 | 20 |

Note: BDL: Below Detection Limit ;DL: Detection Limit

Remarks: The values observed for the pollutants given above are within the CPCB standards.

*****End of Report*****

Page 1 of 1

Verified by

[Signature]



Authorised Signatory

Name: Santhosh Kumar A
Designation: Quality Manager

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TEST REPORT

| | | | |
|---------------------------|--|-------------------------|------------|
| Report No | EHS360/TR/2022-23/007 | Report Date | 06.03.2023 |
| Site Location | M/s. VADAPUDUR ROUGH STONE AND GRAVEL QUARRIES S.F.Nos. 423/1(P), 423/2 (P), Vadapudur Village, Kinathukadavu Taluk ,Coimbatore | | |
| Sampling Method | IS 5182 | Sample Drawn by | Laboratory |
| Sample Name | Air | Sample Code | EHS360/007 |
| Sample Description | Ambient Air Quality Monitoring | Sample Condition | Good |
| Sampling Location | AAQ7 – Kinathukadavu -10°49'49.15"N 77°0'44.08"E | | |

| Date | Period. hrs | PM10(µg/m3) | PM2.5(µg/m3) | SO2 (µg/m3) | NO2 (µg/m3) | O3 (µg/m3) | NH3 (µg/m3) | CO (mg/ m3) |
|----------------|-------------|-------------|--------------|-------------|-------------|-------------|-------------|--------------|
| 05.12.2022 | 7:00-7:00 | 45.5 | 22.3 | 6.2 | 18.5 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 06.12.2022 | 7:15-7:15 | 43.2 | 24.3 | 7.3 | 19.2 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 12.12.2022 | 7:00-7:00 | 46.1 | 23.0 | 6.3 | 17.2 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 13.12.2022 | 7:15-7:15 | 40.2 | 25.1 | 7.1 | 18.0 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 19.12.2022 | 7:00-7:00 | 45.0 | 26.0 | 6.3 | 17.3 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 20.12.2022 | 7:15-7:15 | 41.2 | 22.1 | 7.0 | 20.2 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 26.12.2022 | 7:00-7:00 | 44.3 | 23.5 | 6.2 | 17.5 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 27.12.2022 | 7:15-7:15 | 45.3 | 24.0 | 7.3 | 19.2 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 02.01.2023 | 7:00-7:00 | 43.2 | 25.3 | 6.4 | 18.0 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 03.01.2023 | 7:15-7:15 | 40.5 | 22.3 | 6.0 | 19.2 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 09.01.2023 | 7:00-7:00 | 41.2 | 23.4 | 7.8 | 18.8 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 10.01.2023 | 7:15-7:15 | 43.2 | 24.5 | 6.3 | 17.2 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 16.01.2023 | 7:00-7:00 | 43.0 | 25.6 | 7.1 | 19.2 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 17.01.2023 | 7:15-7:15 | 44.2 | 26.1 | 6.8 | 20.3 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 23.01.2023 | 7:00-7:00 | 40.2 | 22.4 | 7.2 | 19.0 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 24.01.2023 | 7:15-7:15 | 41.0 | 25.3 | 7.0 | 17.2 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 30.01.2023 | 7:00-7:00 | 45.6 | 26.1 | 6.5 | 19.2 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 31.01.2023 | 7:15-7:15 | 40.9 | 24.3 | 7.2 | 20.5 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 06.02.2023 | 7:00-7:00 | 45.0 | 25.0 | 6.1 | 19.0 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 07.02.2023 | 7:15-7:15 | 44.8 | 26.1 | 7.8 | 18.8 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 13.02.2023 | 7:00-7:00 | 42.3 | 25.0 | 6.1 | 20.8 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 14.02.2023 | 7:15-7:15 | 43.5 | 26.0 | 7.4 | 17.2 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 20.02.2023 | 7:00-7:00 | 44.2 | 24.8 | 6.5 | 18.2 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 21.02.2023 | 7:15-7:15 | 45.3 | 23.5 | 7.2 | 19.2 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 27.02.2023 | 7:00-7:00 | 39.8 | 22.1 | 6.3 | 20.2 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 28.02.2023 | 7:15-7:15 | 40.7 | 23.8 | 7.8 | 19.5 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| NAAQ* Standard | | <100 | <60 | <80 | <80 | <100 | <400 | <4 |

Note: BDL: Below Detection Limit ;DL: Detection Limit

Remarks: The values observed for the pollutants given above are within the CPCB standards.

*****End of Report*****

Page 1 of 1

Verified by



Authorised Signatory

Name: Santhosh Kumar A
Designation: Quality Manager

- Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

TEST REPORT

| | | | |
|--------------------|--|------------------|------------|
| Report No | EHS360/TR/2022-23/007 | Report Date | 06.03.2023 |
| Site Location | M/s. VADAPUDUR ROUGH STONE AND GRAVEL QUARRIES S.F.Nos. 423/1(P), 423/2 (P), Vadapudur Village, Kinathukadavu Taluk ,Coimbatore | | |
| Sampling Method | IS 5182 | Sample Drawn by | Laboratory |
| Sample Name | Air | Sample Code | EHS360/007 |
| Sample Description | Ambient Air Quality Monitoring | Sample Condition | Good |
| Sampling Location | AAQ7 – Kinathukadavu -10°49'49.15"N 77°0'44.08"E | | |

| Date | Period. hrs | SPM ($\mu\text{g}/\text{m}^3$) | As (ng/m^3) | C6H6 ($\mu\text{g}/\text{m}^3$) | BaP (ng/m^3) | Pb ($\mu\text{g}/\text{m}^3$) | Ni (ng/m^3) |
|----------------|-------------|----------------------------------|-------------------------------|-----------------------------------|--------------------------------|---------------------------------|-------------------------------|
| 05.12.2022 | 7:00-7:00 | 63.5 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 06.12.2022 | 7:15-7:15 | 62.0 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 12.12.2022 | 7:00-7:00 | 66.3 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 13.12.2022 | 7:15-7:15 | 65.4 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 19.12.2022 | 7:00-7:00 | 66.2 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 20.12.2022 | 7:15-7:15 | 67.2 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 26.12.2022 | 7:00-7:00 | 63.1 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 27.12.2022 | 7:15-7:15 | 64.0 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 02.01.2023 | 7:00-7:00 | 65.2 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 03.01.2023 | 7:15-7:15 | 66.0 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 09.01.2023 | 7:00-7:00 | 63.1 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 10.01.2023 | 7:15-7:15 | 64.0 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 16.01.2023 | 7:00-7:00 | 65.2 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 17.01.2023 | 7:15-7:15 | 66.8 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 23.01.2023 | 7:00-7:00 | 67.2 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 24.01.2023 | 7:15-7:15 | 64.3 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 30.01.2023 | 7:00-7:00 | 63.2 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 31.01.2023 | 7:15-7:15 | 62.0 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 06.02.2023 | 7:00-7:00 | 64.5 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 07.02.2023 | 7:15-7:15 | 62.3 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 13.02.2023 | 7:00-7:00 | 65.4 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 14.02.2023 | 7:15-7:15 | 66.3 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 20.02.2023 | 7:00-7:00 | 67.2 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 21.02.2023 | 7:15-7:15 | 65.4 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 27.02.2023 | 7:00-7:00 | 66.3 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 28.02.2023 | 7:15-7:15 | 67.0 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| NAAQ* Standard | | <200 | 6 | 5 | 1 | 1 | 20 |

Note: BDL: Below Detection Limit ;DL: Detection Limit

Remarks: The values observed for the pollutants given above are within the CPCB standards.

*****End of Report*****

Page 1 of 1

Verified by

[Signature]



Authorised Signatory

Name: Santhosh Kumar A
Designation: Quality Manager

- Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

TEST REPORT

| | | | |
|---------------------------|--|-------------------------|------------|
| Report No | EHS360/TR/2022-23/008 | Report Date | 06.03.2023 |
| Site Location | M/s. VADAPUDUR ROUGH STONE AND GRAVEL QUARRIES S.F.Nos. 423/1(P), 423/2 (P), Vadapudur Village, Kinathukadavu Taluk ,Coimbatore | | |
| Sampling Method | IS 5182 | Sample Drawn by | Laboratory |
| Sample Name | Air | Sample Code | EHS360/008 |
| Sample Description | Ambient Air Quality Monitoring | Sample Condition | Good |
| Sampling Location | AAQ8 –Kallapuram - 10°50'9.59"N 76°58'56.34"E | | |

| Date | Period. hrs | PM10(µg/m3) | PM2.5(µg/m3) | SO2 (µg/m3) | NO2 (µg/m3) | O3 (µg/m3) | NH3 (µg/m3) | CO (mg/ m3) |
|----------------|-------------|-------------|--------------|-------------|-------------|-------------|-------------|--------------|
| 05.12.2022 | 7:00-7:00 | 43.5 | 24.2 | 5.5 | 22.3 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 06.12.2022 | 7:15-7:15 | 44.2 | 23.2 | 6.2 | 23.4 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 12.12.2022 | 7:00-7:00 | 45.6 | 25.1 | 8.2 | 24.5 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 13.12.2022 | 7:15-7:15 | 46.2 | 26.2 | 7.2 | 20.2 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 19.12.2022 | 7:00-7:00 | 42.1 | 27.1 | 5.0 | 22.3 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 20.12.2022 | 7:15-7:15 | 43.2 | 28.3 | 6.2 | 23.0 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 26.12.2022 | 7:00-7:00 | 44.5 | 25.5 | 7.2 | 24.5 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 27.12.2022 | 7:15-7:15 | 44.0 | 26.5 | 5.0 | 21.2 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 02.01.2023 | 7:00-7:00 | 45.0 | 27.3 | 6.3 | 22.6 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 03.01.2023 | 7:15-7:15 | 46.3 | 28.1 | 7.4 | 21.0 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 09.01.2023 | 7:00-7:00 | 44.0 | 23.0 | 6.1 | 23.5 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 10.01.2023 | 7:15-7:15 | 42.3 | 26.1 | 5.4 | 24.6 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 16.01.2023 | 7:00-7:00 | 45.0 | 25.1 | 5.0 | 22.1 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 17.01.2023 | 7:15-7:15 | 43.2 | 24.0 | 6.2 | 23.2 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 23.01.2023 | 7:00-7:00 | 42.1 | 23.5 | 5.4 | 20.2 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 24.01.2023 | 7:15-7:15 | 46.2 | 25.0 | 7.0 | 21.5 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 30.01.2023 | 7:00-7:00 | 45.2 | 24.8 | 8.2 | 22.6 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 31.01.2023 | 7:15-7:15 | 43.0 | 26.2 | 6.0 | 23.4 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 06.02.2023 | 7:00-7:00 | 44.2 | 25.0 | 7.4 | 24.1 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 07.02.2023 | 7:15-7:15 | 42.0 | 23.1 | 5.0 | 21.0 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 13.02.2023 | 7:00-7:00 | 43.1 | 24.5 | 6.3 | 22.5 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 14.02.2023 | 7:15-7:15 | 45.1 | 23.0 | 5.4 | 23.0 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 20.02.2023 | 7:00-7:00 | 46.5 | 26.8 | 6.2 | 22.4 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 21.02.2023 | 7:15-7:15 | 43.5 | 227.3 | 7.2 | 23.6 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 27.02.2023 | 7:00-7:00 | 44.2 | 28.2 | 5.8 | 23.0 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| 28.02.2023 | 7:15-7:15 | 42.1 | 26.2 | 6.2 | 21.5 | BDL(DL:5.0) | BDL(DL:1.0) | BDL(DL:1.14) |
| NAAQ* Standard | | <100 | <60 | <80 | <80 | <100 | <400 | <4 |

Note: BDL: Below Detection Limit ;DL: Detection Limit

Remarks: The values observed for the pollutants given above are within the CPCB standards.

*****End of Report*****

Page 1 of 1

Verified by



Authorised Signatory

Name: Santhosh Kumar A
Designation: Quality Manager

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TEST REPORT

| | | | |
|---------------------------|--|-------------------------|------------|
| Report No | EHS360/TR/2022-23/008 | Report Date | 06.03.2023 |
| Site Location | M/s. VADAPUDUR ROUGH STONE AND GRAVEL QUARRIES S.F.Nos. 423/1(P), 423/2 (P), Vadapudur Village, Kinathukadavu Taluk ,Coimbatore | | |
| Sampling Method | IS 5182 | Sample Drawn by | Laboratory |
| Sample Name | Air | Sample Code | EHS360/008 |
| Sample Description | Ambient Air Quality Monitoring | Sample Condition | Good |
| Sampling Location | AAQ8 –Kallapuram - 10°50'9.59"N 76°58'56.34"E | | |

| Date | Period. hrs | SPM ($\mu\text{g}/\text{m}^3$) | As (ng/m^3) | C6H6 ($\mu\text{g}/\text{m}^3$) | BaP (ng/m^3) | Pb ($\mu\text{g}/\text{m}^3$) | Ni (ng/m^3) |
|----------------|-------------|----------------------------------|-------------------------------|-----------------------------------|--------------------------------|---------------------------------|-------------------------------|
| 05.12.2022 | 7:00-7:00 | 64.2 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 06.12.2022 | 7:15-7:15 | 66.3 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 12.12.2022 | 7:00-7:00 | 65.2 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 13.12.2022 | 7:15-7:15 | 66.1 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 19.12.2022 | 7:00-7:00 | 67.0 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 20.12.2022 | 7:15-7:15 | 68.2 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 26.12.2022 | 7:00-7:00 | 64.3 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 27.12.2022 | 7:15-7:15 | 66.2 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 02.01.2023 | 7:00-7:00 | 65.1 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 03.01.2023 | 7:15-7:15 | 68.0 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 09.01.2023 | 7:00-7:00 | 67.4 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 10.01.2023 | 7:15-7:15 | 65.2 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 16.01.2023 | 7:00-7:00 | 66.0 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 17.01.2023 | 7:15-7:15 | 64.1 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 23.01.2023 | 7:00-7:00 | 67.2 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 24.01.2023 | 7:15-7:15 | 66.0 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 30.01.2023 | 7:00-7:00 | 65.2 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 31.01.2023 | 7:15-7:15 | 66.8 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 06.02.2023 | 7:00-7:00 | 67.0 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 07.02.2023 | 7:15-7:15 | 66.4 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 13.02.2023 | 7:00-7:00 | 65.0 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 14.02.2023 | 7:15-7:15 | 64.2 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 20.02.2023 | 7:00-7:00 | 66.0 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 21.02.2023 | 7:15-7:15 | 64.3 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 27.02.2023 | 7:00-7:00 | 68.2 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| 28.02.2023 | 7:15-7:15 | 67.0 | BDL (DL:0.1) | BDL (DL:1.0) | BDL (DL:1.0) | BDL (DL:0.1) | BDL (DL:0.1) |
| NAAQ* Standard | | <200 | 6 | 5 | 1 | 1 | 20 |

Note: BDL: Below Detection Limit ;DL: Detection Limit

Remarks: The values observed for the pollutants given above are within the CPCB standards.

*****End of Report*****



Verified by

Authorised Signatory

Name: Santhosh Kumar A
Designation: Quality Manager

- Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

TEST REPORT

| | | | |
|---------------------------|--|------------------------------|-------------|
| Report No | EHS360/TR/2022-23/ 009 | Report Date | 06.03.2023 |
| Site Location | M/s. VADAPUDUR ROUGH STONE AND GRAVEL QUARRIES S.F.Nos. 423/1(P), 423/2 (P), Vadapudur Village, Kinathukadavu Taluk ,Coimbatore | | |
| Sampling Method | IS 9989 | Sample Drawn by | Laboratory |
| Sample Name | Noise Level Monitoring | Sample Code | EHS360/ 009 |
| Sample Description | Ambient Noise | Sample Collected Date | 28.02.2023 |

| Location | N1 – Core Zone - 10°48'35.96"N 76°59'46.86"E | | | N2 – Core Zone - 10°48'43.71"N 76°59'53.67"E | | |
|-------------|--|-------|--------|--|-------|--------|
| Parameter | Min | Max | Result | Min | Max | Result |
| Time | dB(A) | dB(A) | dB(A) | dB(A) | dB(A) | dB(A) |
| 06:00-07:00 | 42.5 | 45.2 | 44.1 | 42.3 | 45.3 | 44.1 |
| 07:00-08:00 | 41.2 | 43.2 | 42.3 | 41.8 | 43.2 | 42.6 |
| 08:00-09:00 | 40.3 | 42.1 | 41.3 | 40.2 | 42.3 | 41.4 |
| 09:00-10:00 | 42.3 | 43.5 | 42.9 | 38.2 | 40.2 | 39.3 |
| 10:00-11:00 | 41.5 | 45.2 | 43.7 | 39.2 | 42.3 | 41.0 |
| 11:00-12:00 | 43.5 | 44.2 | 43.9 | 41.2 | 44.1 | 42.9 |
| 12:00-13:00 | 40.1 | 42.1 | 41.2 | 43.2 | 45.2 | 44.3 |
| 13:00-14:00 | 42.3 | 44.3 | 43.4 | 41.5 | 43.2 | 42.4 |
| 14:00-15:00 | 44.5 | 46.2 | 45.4 | 42.5 | 45.2 | 44.1 |
| 15:00-16:00 | 42.1 | 44.3 | 43.3 | 43.6 | 45.6 | 44.7 |
| 16:00-17:00 | 41.3 | 44.2 | 43.0 | 40.2 | 42.1 | 41.3 |
| 17:00-18:00 | 40.2 | 42.3 | 41.4 | 42.1 | 43.5 | 42.9 |
| 18:00-19:00 | 44.2 | 46.2 | 45.3 | 41.1 | 42.5 | 41.9 |
| 19:00-20:00 | 43.1 | 46.5 | 45.1 | 39.2 | 42.3 | 41.0 |
| 20:00-21:00 | 39.2 | 43.2 | 41.6 | 38.1 | 40.2 | 39.3 |
| 21:00-22:00 | 38.5 | 40.2 | 39.4 | 37.2 | 40.5 | 39.2 |
| 22:00-23:00 | 35.6 | 38.2 | 37.1 | 36.2 | 38.9 | 37.8 |
| 23:00-00:00 | 36.6 | 40.2 | 38.8 | 35.2 | 39.2 | 37.6 |
| 00:00-01:00 | 37.2 | 39.2 | 38.3 | 34.1 | 38.9 | 37.1 |
| 01:00-02:00 | 36.1 | 39.1 | 37.9 | 38.2 | 39.5 | 38.9 |
| 02:00-03:00 | 35.6 | 39.5 | 38.0 | 36.5 | 38.2 | 37.4 |
| 03:00-04:00 | 34.2 | 38.2 | 36.6 | 33.2 | 35.6 | 34.6 |
| 04:00-05:00 | 38.2 | 39.1 | 38.7 | 34.2 | 36.9 | 35.8 |
| 05:00-06:00 | 36.2 | 39.2 | 38.0 | 35.9 | 38.6 | 37.5 |
| Result | Day Means | | 42.6 | Day Means | | 41.8 |
| | Night Means | | 38.0 | Night Means | | 37.0 |

Note: CPCB Norms Industrial Area Day Time:75 dB(A); Night Time:70 dB(A)
The Noise level in the above location exists within the permissible limits of CPCB.

*****End of Report*****



Verified by

Authorised Signatory

Name: Santhosh Kumar A
Designation: Quality Manager

- Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

TEST REPORT

| | | | |
|---------------------------|--|------------------------------|-------------|
| Report No | EHS360/TR/2022-23/ 010 | Report Date | 06.03.2023 |
| Site Location | M/s. VADAPUDUR ROUGH STONE AND GRAVEL QUARRIES S.F.Nos. 423/1(P), 423/2 (P), Vadapudur Village, Kinathukadavu Taluk ,Coimbatore | | |
| Sampling Method | IS 9989 | Sample Drawn by | Laboratory |
| Sample Name | Noise Level Monitoring | Sample Code | EHS360/ 010 |
| Sample Description | Ambient Noise | Sample Collected Date | 28.02.2023 |

| Location | N3 – Muthur - 10°47'36.13"N 76°59'16.04"E | | | N4 – Sankarayapuram - 10°46'49.85"N 76° 58'19.13"E | | |
|-------------|---|-------|--------|--|-------|--------|
| Parameter | Min | Max | Result | Min | Max | Result |
| Time | dB(A) | dB(A) | dB(A) | dB(A) | dB(A) | dB(A) |
| 06:00-07:00 | 40.2 | 42.3 | 41.4 | 34.1 | 39.5 | 37.6 |
| 07:00-08:00 | 41.2 | 43.2 | 42.3 | 35.9 | 41.2 | 39.3 |
| 08:00-09:00 | 38.2 | 40.2 | 39.3 | 36.4 | 40.1 | 38.6 |
| 09:00-10:00 | 36.2 | 42.1 | 40.1 | 37.9 | 41.3 | 39.9 |
| 10:00-11:00 | 35.2 | 41.3 | 39.2 | 38.9 | 42.5 | 41.1 |
| 11:00-12:00 | 38.6 | 40.2 | 39.5 | 39.7 | 43.6 | 42.1 |
| 12:00-13:00 | 36.4 | 38.2 | 37.4 | 38.2 | 44.6 | 42.5 |
| 13:00-14:00 | 35.5 | 36.5 | 36.0 | 37.9 | 45.9 | 43.5 |
| 14:00-15:00 | 34.2 | 36.8 | 35.7 | 36.8 | 43.5 | 41.3 |
| 15:00-16:00 | 38.6 | 38.4 | 38.5 | 38.2 | 44.9 | 42.7 |
| 16:00-17:00 | 37.1 | 40.2 | 38.9 | 35.2 | 41.3 | 39.2 |
| 17:00-18:00 | 36.5 | 36.5 | 36.5 | 34.1 | 40.1 | 38.1 |
| 18:00-19:00 | 34.2 | 38.2 | 36.6 | 36.2 | 39.6 | 38.2 |
| 19:00-20:00 | 39.2 | 42.1 | 40.9 | 32.1 | 35.6 | 34.2 |
| 20:00-21:00 | 35.2 | 38.2 | 37.0 | 31.2 | 33.2 | 32.3 |
| 21:00-22:00 | 34.2 | 36.2 | 35.3 | 36.5 | 38.6 | 37.7 |
| 22:00-23:00 | 33.6 | 35.4 | 34.6 | 35.5 | 38.2 | 37.1 |
| 23:00-00:00 | 31.2 | 33.2 | 32.3 | 34.2 | 36.4 | 35.4 |
| 00:00-01:00 | 35.2 | 36.5 | 35.9 | 33.2 | 35.2 | 34.3 |
| 01:00-02:00 | 34.1 | 36.5 | 35.5 | 32.1 | 34.1 | 33.2 |
| 02:00-03:00 | 33.2 | 35.1 | 34.3 | 34.2 | 36.2 | 35.3 |
| 03:00-04:00 | 35.2 | 38.4 | 37.1 | 33.2 | 36.2 | 35.0 |
| 04:00-05:00 | 36.1 | 39.2 | 37.9 | 32.1 | 34.5 | 33.5 |
| 05:00-06:00 | 37.2 | 39.2 | 38.3 | 31.2 | 33.6 | 32.6 |
| Result | Day Means | | 38.2 | Day Means | | 39.1 |
| | Night Means | | 35.9 | Night Means | | 34.2 |

Note: CPCB Norms Industrial Area Day Time:75 dB(A); Night Time:70 dB(A)
The Noise level in the above location exists within the permissible limits of CPCB.

*****End of Report*****



Verified by

Authorised Signatory

Name: Santhosh Kumar A
Designation: Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

TEST REPORT

| | | | |
|---------------------------|---|------------------------------|-------------|
| Report No | EHS360/TR/2022-23/ 011 | Report Date | 06.03.2023 |
| Site Location | M/s. VADAPUDUR ROUGH STONE AND GRAVEL QUARRIES S.F.Nos. 423/1(P), 423/2 (P), Vadapudur Village, Kinathukadavu Taluk ,Coimbatore | | |
| Sampling Method | IS 9989 | Sample Drawn by | Laboratory |
| Sample Name | Noise Level Monitoring | Sample Code | EHS360/ 011 |
| Sample Description | Ambient Noise | Sample Collected Date | 28.02.2023 |

| Location | N5 – Vadakkipalayam - 10°48'15.06"N 77°0'42.12"E | | | N6 – Nallattipalayam - 10°47'14.33"N 77°1'53.00"E | | |
|-------------|---|-------|-------------|---|-------|-------------|
| Parameter | Min | Max | Result | Min | Max | Result |
| Time | dB(A) | dB(A) | dB(A) | dB(A) | dB(A) | dB(A) |
| 06:00-07:00 | 35.5 | 38.6 | 37.3 | 36.2 | 38.6 | 37.6 |
| 07:00-08:00 | 34.2 | 36.5 | 35.5 | 35.2 | 37.2 | 36.3 |
| 08:00-09:00 | 36.4 | 38.2 | 37.4 | 34.1 | 36.1 | 35.2 |
| 09:00-10:00 | 37.1 | 39.2 | 38.3 | 33.6 | 35.2 | 34.5 |
| 10:00-11:00 | 34.2 | 38.2 | 36.6 | 30.2 | 34.6 | 32.9 |
| 11:00-12:00 | 35.1 | 39.1 | 37.5 | 32.5 | 36.9 | 35.2 |
| 12:00-13:00 | 36.2 | 38.4 | 37.4 | 33.6 | 38.2 | 36.5 |
| 13:00-14:00 | 33.5 | 36.4 | 35.2 | 34.1 | 36.5 | 35.5 |
| 14:00-15:00 | 34.2 | 38.5 | 36.9 | 36.8 | 42.3 | 40.4 |
| 15:00-16:00 | 36.8 | 39.2 | 38.2 | 37.1 | 40.2 | 38.9 |
| 16:00-17:00 | 38.6 | 40.2 | 39.5 | 38.2 | 42.1 | 40.6 |
| 17:00-18:00 | 34.2 | 36.2 | 35.3 | 36.1 | 38.9 | 37.7 |
| 18:00-19:00 | 36.9 | 38.6 | 37.8 | 34.2 | 36.5 | 35.5 |
| 19:00-20:00 | 35.2 | 39.8 | 38.1 | 31.2 | 33.2 | 32.3 |
| 20:00-21:00 | 32.1 | 36.5 | 34.8 | 32.2 | 34.5 | 33.5 |
| 21:00-22:00 | 33.2 | 39.9 | 37.7 | 33.1 | 36.2 | 34.9 |
| 22:00-23:00 | 34.2 | 36.4 | 35.4 | 34.6 | 38.1 | 36.7 |
| 23:00-00:00 | 33.1 | 38.2 | 36.4 | 31.2 | 39.2 | 36.8 |
| 00:00-01:00 | 32.1 | 36.1 | 34.5 | 34.1 | 36.4 | 35.4 |
| 01:00-02:00 | 33.4 | 38.2 | 36.4 | 33.6 | 38.9 | 37.0 |
| 02:00-03:00 | 35.4 | 36.4 | 35.9 | 32.1 | 34.6 | 33.5 |
| 03:00-04:00 | 32.1 | 38.2 | 36.1 | 31.5 | 35.2 | 33.7 |
| 04:00-05:00 | 33.5 | 36.2 | 35.1 | 32.6 | 36.2 | 34.8 |
| 05:00-06:00 | 34.5 | 36.1 | 35.4 | 33.4 | 34.1 | 33.8 |
| Result | Day Means | | 37.0 | Day Means | | 37.0 |
| | Night Means | | 35.7 | Night Means | | 35.7 |

Note: CPCB Norms Industrial Area Day Time:75 dB(A); Night Time:70 dB(A)
The Noise level in the above location exists within the permissible limits of CPCB.

*****End of Report*****



Verified by



Authorised Signatory

Name: Santhosh Kumar A
Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2.Any correction of the test report in full or part shall invalidate the report.
3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client.
4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

TEST REPORT

| | | | |
|---------------------------|---|------------------------------|-------------|
| Report No | EHS360/TR/2022-23/ 012 | Report Date | 06.03.2023 |
| Site Location | M/s. VADAPUDUR ROUGH STONE AND GRAVEL QUARRIES S.F.Nos. 423/1(P), 423/2 (P), Vadapudur Village, Kinathukadavu Taluk ,Coimbatore | | |
| Sampling Method | IS 9989 | Sample Drawn by | Laboratory |
| Sample Name | Noise Level Monitoring | Sample Code | EHS360/ 012 |
| Sample Description | Ambient Noise | Sample Collected Date | 28.02.2023 |

| Location | N7 - Kinathukadavu - 10°49'46.29"N 77°0'45.13"E | | | N8 – Kallapuram - 10°50'9.62"N 76° 58'54.13"E | | |
|-------------|--|-------|-------------|---|-------|-------------|
| Parameter | Min | Max | Result | Min | Max | Result |
| Time | dB(A) | dB(A) | dB(A) | dB(A) | dB(A) | dB(A) |
| 06:00-07:00 | 35.5 | 42.3 | 40.1 | 32.1 | 37.8 | 35.8 |
| 07:00-08:00 | 36.2 | 40.2 | 38.6 | 33.6 | 38.9 | 37.0 |
| 08:00-09:00 | 34.2 | 40.1 | 38.1 | 34.5 | 39.1 | 37.4 |
| 09:00-10:00 | 33.2 | 42.3 | 39.8 | 35.7 | 38.7 | 37.5 |
| 10:00-11:00 | 30.5 | 44.2 | 41.4 | 35.6 | 37.6 | 36.7 |
| 11:00-12:00 | 33.2 | 38.2 | 36.4 | 34.2 | 36.6 | 35.6 |
| 12:00-13:00 | 34.5 | 36.2 | 35.4 | 36.5 | 38.2 | 37.4 |
| 13:00-14:00 | 32.5 | 33.6 | 33.1 | 34.2 | 36.5 | 35.5 |
| 14:00-15:00 | 31.6 | 34.2 | 33.1 | 35.5 | 37.2 | 36.4 |
| 15:00-16:00 | 32.5 | 35.6 | 34.3 | 36.2 | 38.2 | 37.3 |
| 16:00-17:00 | 35.6 | 38.2 | 37.1 | 36 | 39.2 | 37.9 |
| 17:00-18:00 | 34.2 | 36.2 | 35.3 | 34.2 | 36.2 | 35.3 |
| 18:00-19:00 | 33.6 | 34.2 | 33.9 | 36.2 | 38.2 | 37.3 |
| 19:00-20:00 | 32.4 | 36.5 | 34.9 | 34.7 | 37.9 | 36.6 |
| 20:00-21:00 | 31.2 | 35.2 | 33.6 | 36.2 | 38.6 | 37.6 |
| 21:00-22:00 | 34.5 | 36.4 | 35.6 | 34.5 | 36.3 | 35.5 |
| 22:00-23:00 | 33.2 | 35.1 | 34.3 | 35.2 | 37.2 | 36.3 |
| 23:00-00:00 | 31.2 | 36.8 | 34.8 | 36.1 | 38.1 | 37.2 |
| 00:00-01:00 | 35.2 | 39.6 | 37.9 | 34.1 | 36.5 | 35.5 |
| 01:00-02:00 | 33.2 | 38.9 | 36.9 | 35.6 | 37.4 | 36.6 |
| 02:00-03:00 | 35.2 | 36.5 | 35.9 | 34.2 | 36.9 | 35.8 |
| 03:00-04:00 | 34.2 | 39.7 | 37.8 | 31.2 | 33.5 | 32.5 |
| 04:00-05:00 | 32.2 | 35.6 | 34.2 | 32.1 | 34.6 | 33.5 |
| 05:00-06:00 | 31.5 | 34.2 | 33.1 | 31.2 | 33.5 | 32.5 |
| Result | Day Means | | 36.2 | Day Means | | 36.7 |
| | Night Means | | 35.8 | Night Means | | 34.8 |

Note: CPCB Norms Industrial Area Day Time:75 dB(A); Night Time:70 dB(A)
The Noise level in the above location exists within the permissible limits of CPCB.

*****End of Report*****

Page 1 of 1

Verified by



Authorised Signatory

Name: Santhosh Kumar A
Designation: Quality Manager

- Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

TEST REPORT

| | | | |
|--------------------------------|--|------------------------------|-------------|
| Report No | EHS360/TR/2022-23/ 013 | Report Date | 06.03.2023 |
| Site Location | M/s. VADAPUDUR ROUGH STONE AND GRAVEL QUARRIES S.F.Nos. 423/1(P), 423/2 (P), Vadapudur Village, Kinathukadavu Taluk, Coimbatore | | |
| Sampling Method | SOP Method | Sample Drawn by | Laboratory |
| Sample Name | Soil | Sample Code | EHS360/ 013 |
| Sample Description | Soil 1 | Sample Collected Date | 28.02.2023 |
| Qty. of Sample Received | 2 KG | Sample Received On | 01.03.2023 |
| Sample Condition | Good | Test Commenced On | 01.03.2023 |
| Sampling Location | Soil – 1 – Core Zone - 10°48'38.51"N 76°59'44.53"E | | |

| S. No | Test Parameters | Protocols | Results |
|-------|-------------------------------------|---|------------------------|
| 01 | pH @ 25°C | IS 2720 Part 26 - 1987 (Reaff:2016) | 7.89 |
| 02 | Conductivity @ 25°C | IS 14767 - 2000 (Reaff : 2016) | 510 µmhos/cm |
| 03 | Water Holding Capacity | By Gravimetric Method | 45.6 % |
| 04 | Bulk Density | By Cylindrical Method | 1.14 g/cm ³ |
| 05 | Porosity | By Gravimetric Method | 38.1 % |
| 06 | Calcium as Ca | Food and Agriculture organization of the united Nation Rome 2007 : 2018 | 147 mg/kg |
| 07 | Magnesium as Mg | | 51.2 mg/kg |
| 08 | Chloride as Cl | | 131 mg/kg |
| 09 | Soluble Sulphate as SO ₄ | | 0.021 % |
| 10 | Total Phosphorus as P | | 1.41 mg/kg |
| 11 | Total Nitrogen as N | IS 14684 : 1999 (Reaff:2019) | 351 mg/kg |
| 12 | Organic Matter | IS : 2720 Part 22: 1972 (Reaff: 2015) | 1.87 % |
| 13 | Organic Carbon | IS : 2720 Part 22: 1972 (Reaff: 2015) | 1.09 % |

*****End of Report*****

Page 1 of 1

Verified by




Authorised Signatory

Name: Santhosh Kumar A
Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

TEST REPORT

| | | | |
|--------------------------------|--|------------------------------|-------------|
| Report No | EHS360/TR/2022-23/ 013 | Report Date | 06.03.2023 |
| Site Location | M/s. VADAPUDUR ROUGH STONE AND GRAVEL QUARRIES S.F.Nos. 423/1(P), 423/2 (P), Vadapudur Village, Kinathukadavu Taluk ,Coimbatore | | |
| Sampling Method | SOP Method | Sample Drawn by | Laboratory |
| Sample Name | Soil | Sample Code | EHS360/ 013 |
| Sample Description | Soil 1 | Sample Collected Date | 28.02.2023 |
| Qty. of Sample Received | 2 KG | Sample Received On | 01.03.2023 |
| Sample Condition | Good | Test Commenced On | 01.03.2023 |
| Sampling Location | Soil – 1 – Core Zone - 10°48'38.51"N 76°59'44.53"E | | |

| S. No | Test Parameters | Protocols | Results |
|-------|--------------------------|--|----------------------|
| 14 | Texture : | | |
| | Clay | Gravimetric Method | 33.1 % |
| | Sand | | 36.2 % |
| | Silt | | 30.7 % |
| 15 | Manganese as Mn | USEPA 3050 B – 1996 & USEPA 6010 C - 2000 | 24.3 mg/kg |
| 16 | Zinc as Zn | | 1.11 mg/kg |
| 17 | Boron as B | | 0.87 mg/kg |
| 18 | Potassium as K | | 29.4 mg/kg |
| 19 | Cadmium as Cd | | BDL (DL : 1.0 mg/kg) |
| 20 | Total Chromium as Cr | | BDL (DL : 1.0 mg/kg) |
| 21 | Copper as Cu | | BDL (DL : 1.0 mg/kg) |
| 22 | Lead as Pb | | 0.95 mg/kg |
| 23 | Iron as Fe | | 2.87 mg/kg |
| 24 | Cation Exchange Capacity | | USEPA 9080 – 1986 |

*****End of Report*****

Page 1 of 1

Verified by

[Signature]



Authorised Signatory

[Signature]

Name : Santhosh Kumar A
Designation : Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

TEST REPORT

| | | | |
|--------------------------------|--|------------------------------|-------------|
| Report No | EHS360/TR/2022-23/ 014 | Report Date | 06.03.2023 |
| Site Location | M/s. VADAPUDUR ROUGH STONE AND GRAVEL QUARRIES S.F.Nos. 423/1(P), 423/2 (P), Vadapudur Village, Kinathukadavu Taluk,Coimbatore | | |
| Sampling Method | SOP Method | Sample Drawn by | Laboratory |
| Sample Name | Soil | Sample Code | EHS360/ 014 |
| Sample Description | Soil 2 | Sample Collected Date | 28.02.2023 |
| Qty. of Sample Received | 2 KG | Sample Received On | 01.03.2023 |
| Sample Condition | Good | Test Commenced On | 01.03.2023 |
| Sampling Location | Soil – 2 – Muthur- 10°47'33.18"N 76°59'12.03"E | | |

| S. No | Test Parameters | Protocols | Results |
|-------|-------------------------------------|---|------------------------|
| 01 | pH @ 25°C | IS 2720 Part 26 - 1987 (Reaff:2016) | 7.75 |
| 02 | Conductivity @ 25°C | IS 14767 - 2000 (Reaff : 2016) | 494 µmhos/cm |
| 03 | Water Holding Capacity | By Gravimetric Method | 41.5 % |
| 04 | Bulk Density | By Cylindrical Method | 1.06 g/cm ³ |
| 05 | Porosity | By Gravimetric Method | 42.13 % |
| 06 | Calcium as Ca | Food and Agriculture organization of the united Nation Rome 2007 : 2018 | 141 mg/kg |
| 07 | Magnesium as Mg | | 53.4 mg/kg |
| 08 | Chloride as Cl | | 132.5 mg/kg |
| 09 | Soluble Sulphate as SO ₄ | | 0.0032 % |
| 10 | Total Phosphorus as P | | 1.64 mg/kg |
| 11 | Total Nitrogen as N | IS 14684 : 1999 (Reaff:2019) | 358 mg/kg |
| 12 | Organic Matter | IS : 2720 Part 22: 1972 (Reaff: 2015) | 2.08 % |
| 13 | Organic Carbon | IS : 2720 Part 22: 1972 (Reaff: 2015) | 1.21 % |

*****End of Report*****

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Name: Santhosh Kumar A
Designation : Quality Manager

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TEST REPORT

| | | | |
|--------------------------------|--|------------------------------|-------------|
| Report No | EHS360/TR/2022-23/ 014 | Report Date | 06.03.2023 |
| Site Location | M/s. VADAPUDUR ROUGH STONE AND GRAVEL QUARRIES S.F.Nos. 423/1(P), 423/2 (P), Vadapudur Village, Kinathukadavu Taluk, Coimbatore | | |
| Sampling Method | SOP Method | Sample Drawn by | Laboratory |
| Sample Name | Soil | Sample Code | EHS360/ 014 |
| Sample Description | Soil 2 | Sample Collected Date | 28.02.2023 |
| Qty. of Sample Received | 2 KG | Sample Received On | 01.03.2023 |
| Sample Condition | Good | Test Commenced On | 01.03.2023 |
| Sampling Location | Soil – 2 – Muthur- 10°47'33.18"N 76°59'12.03"E | | |

| S. No | Test Parameters | Protocols | Results |
|-------|--------------------------|--|----------------------|
| 14 | Texture : | | |
| | Clay | Gravimetric Method | 33.8 % |
| | Sand | | 36.7 % |
| | Silt | | 29.5 % |
| 15 | Manganese as Mn | USEPA 3050 B – 1996 & USEPA 6010 C - 2000 | 27.5 mg/kg |
| 16 | Zinc as Zn | | 2.21 mg/kg |
| 17 | Boron as B | | 1.12 mg/kg |
| 18 | Potassium as K | | 28.4 mg/kg |
| 19 | Cadmium as Cd | | BDL (DL : 1.0 mg/kg) |
| 20 | Total Chromium as Cr | | BDL (DL : 1.0 mg/kg) |
| 21 | Copper as Cu | | BDL (DL : 1.0 mg/kg) |
| 22 | Lead as Pb | | 0.86 mg/kg |
| 23 | Iron as Fe | | 2.94 mg/kg |
| 24 | Cation Exchange Capacity | | USEPA 9080 – 1986 |

*****End of Report*****

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Name: Santhosh Kumar A
Designation: Quality Manager

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TEST REPORT

| | | | |
|--------------------------------|--|------------------------------|-------------|
| Report No | EHS360/TR/2022-23/ 015 | Report Date | 06.03.2023 |
| Site Location | M/s. VADAPUDUR ROUGH STONE AND GRAVEL QUARRIES S.F.Nos. 423/1(P), 423/2 (P), Vadapudur Village, Kinathukadavu Taluk, Coimbatore | | |
| Sampling Method | SOP Method | Sample Drawn by | Laboratory |
| Sample Name | Soil | Sample Code | EHS360/ 015 |
| Sample Description | Soil 3 | Sample Collected Date | 28.02.2023 |
| Qty. of Sample Received | 2 KG | Sample Received On | 01.03.2023 |
| Sample Condition | Good | Test Commenced On | 01.03.2023 |
| Sampling Location | Soil – 3 – Sankarayapuram- 10°46'49.47"N 76°58'13.22"E | | |

| S. No | Test Parameters | Protocols | Results |
|-------|-------------------------------------|---|------------------------|
| 01 | pH @ 25°C | IS 2720 Part 26 - 1987 (Reaff:2016) | 8.12 |
| 02 | Conductivity @ 25°C | IS 14767 - 2000 (Reaff : 2016) | 478 µmhos/cm |
| 03 | Water Holding Capacity | By Gravimetric Method | 39.7 % |
| 04 | Bulk Density | By Cylindrical Method | 1.14 g/cm ³ |
| 05 | Porosity | By Gravimetric Method | 45.8 % |
| 06 | Calcium as Ca | Food and Agriculture organization of the united Nation Rome 2007 : 2018 | 149.2 mg/kg |
| 07 | Magnesium as Mg | | 39.5 mg/kg |
| 08 | Chloride as Cl | | 129.5 mg/kg |
| 09 | Soluble Sulphate as SO ₄ | | 0.029 % |
| 10 | Total Phosphorus as P | | 2.41 mg/kg |
| 11 | Total Nitrogen as N | IS 14684 : 1999 (Reaff:2019) | 387 mg/kg |
| 12 | Organic Matter | IS : 2720 Part 22: 1972 (Reaff: 2015) | 2.31 % |
| 13 | Organic Carbon | IS : 2720 Part 22: 1972 (Reaff: 2015) | 1.34 % |

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Name: Santhosh Kumar A
Designation : Quality Manager

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TEST REPORT

| | | | |
|--------------------------------|---|------------------------------|-------------|
| Report No | EHS360/TR/2022-23/ 015 | Report Date | 06.03.2023 |
| Site Location | M/s. VADAPUDUR ROUGH STONE AND GRAVEL QUARRIES S.F.Nos. 423/1(P), 423/2 (P), Vadapudur Village, Kinathukadavu Taluk, Coimbatore | | |
| Sampling Method | SOP Method | Sample Drawn by | Laboratory |
| Sample Name | Soil | Sample Code | EHS360/ 015 |
| Sample Description | Soil 3 | Sample Collected Date | 28.02.2023 |
| Qty. of Sample Received | 2 KG | Sample Received On | 01.03.2023 |
| Sample Condition | Good | Test Commenced On | 01.03.2023 |
| Sampling Location | Soil – 3 – Sankarayapuram- 10°46'49.47"N 76°58'13.22"E | | |

| S.No | Test Parameters | Protocols | Results |
|------|--------------------------|--|-----------------------|
| 14 | Texture : | | |
| | Clay | Gravimetric Method | 32.9 % |
| | Sand | | 34.7 % |
| | Silt | | 32.4 % |
| 15 | Manganese as Mn | USEPA 3050 B – 1996 & USEPA 6010 C - 2000 | 28.3 mg/kg |
| 16 | Zinc as Zn | | 2.15 mg/kg |
| 17 | Boron as B | | 1.63 mg/kg |
| 18 | Potassium as K | | 29.8 mg/kg |
| 19 | Cadmium as Cd | | BDL (DL : 1.0 mg/kg) |
| 20 | Total Chromium as Cr | | BDL (DL : 1.0 mg/kg) |
| 21 | Copper as Cu | | BDL (DL : 1.0 mg/kg) |
| 22 | Lead as Pb | | 1.23 mg/kg |
| 23 | Iron as Fe | | 2.68 mg/kg |
| 24 | Cation Exchange Capacity | USEPA 9080 – 1986 | 30.8 meq/100g of soil |


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 Designation : Quality Manager

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TEST REPORT

| | | | |
|--------------------------------|--|------------------------------|-------------|
| Report No | EHS360/TR/2022-23/ 016 | Report Date | 06.03.2023 |
| Site Location | M/s. VADAPUDUR ROUGH STONE AND GRAVEL QUARRIES S.F.Nos. 423/1(P), 423/2 (P), Vadapudur Village, Kinathukadavu Taluk, Coimbatore | | |
| Sampling Method | SOP Method | Sample Drawn by | Laboratory |
| Sample Name | Soil | Sample Code | EHS360/ 016 |
| Sample Description | Soil 4 | Sample Collected Date | 28.02.2023 |
| Qty. of Sample Received | 2 KG | Sample Received On | 01.03.2023 |
| Sample Condition | Good | Test Commenced On | 01.03.2023 |
| Sampling Location | Soil – 4 – Nallattipalayam- 10°47'17.55"N 77° 1'51.98"E | | |

| S. No | Test Parameters | Protocols | Results |
|-------|-------------------------------------|---|------------------------|
| 01 | pH @ 25°C | IS 2720 Part 26 - 1987 (Reaff:2016) | 7.46 |
| 02 | Conductivity @ 25°C | IS 14767 - 2000 (Reaff : 2016) | 356 µmhos/cm |
| 03 | Water Holding Capacity | By Gravimetric Method | 40.1 % |
| 04 | Bulk Density | By Cylindrical Method | 0.96 g/cm ³ |
| 05 | Porosity | By Gravimetric Method | 43.9 % |
| 06 | Calcium as Ca | Food and Agriculture organization of the united Nation Rome 2007 : 2018 | 138 mg/kg |
| 07 | Magnesium as Mg | | 50.9 mg/kg |
| 08 | Chloride as Cl | | 133.5 mg/kg |
| 09 | Soluble Sulphate as SO ₄ | | 0.0036 % |
| 10 | Total Phosphorus as P | | 1.72 mg/kg |
| 11 | Total Nitrogen as N | IS 14684 : 1999 (Reaff:2019) | 412 mg/kg |
| 12 | Organic Matter | IS : 2720 Part 22: 1972 (Reaff: 2015) | 2.43 % |
| 13 | Organic Carbon | IS : 2720 Part 22: 1972 (Reaff: 2015) | 1.41 % |

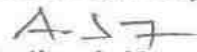
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Name : Santhosh Kumar A
Designation : Quality Manager

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TEST REPORT

| | | | |
|--------------------------------|--|------------------------------|-------------|
| Report No | EHS360/TR/2022-23/ 016 | Report Date | 06.03.2023 |
| Site Location | M/s. VADAPUDUR ROUGH STONE AND GRAVEL QUARRIES S.F.Nos. 423/1(P), 423/2 (P), Vadapudur Village, Kinathukadavu Taluk,Coimbatore | | |
| Sampling Method | SOP Method | Sample Drawn by | Laboratory |
| Sample Name | Soil | Sample Code | EHS360/ 016 |
| Sample Description | Soil 4 | Sample Collected Date | 28.02.2023 |
| Qty. of Sample Received | 2 KG | Sample Received On | 01.03.2023 |
| Sample Condition | Good | Test Commenced On | 01.03.2023 |
| Sampling Location | Soil – 4 – Nallattipalayam- 10°47'17.55"N 77° 1'51.98"E | | |

| S. No | Test Parameters | Protocols | Results |
|-------|--------------------------|--|-----------------------|
| 14 | Texture : | | |
| | Clay | Gravimetric Method | 33.6 % |
| | Sand | | 34.5 % |
| | Silt | | 31.9 % |
| 15 | Manganese as Mn | USEPA 3050 B – 1996 & USEPA 6010 C - 2000 | 27.4 mg/kg |
| 16 | Zinc as Zn | | 1.14 mg/kg |
| 17 | Boron as B | | 1.57 mg/kg |
| 18 | Potassium as K | | 39.1 mg/kg |
| 19 | Cadmium as Cd | | BDL (DL : 1.0 mg/kg) |
| 20 | Total Chromium as Cr | | BDL (DL : 1.0 mg/kg) |
| 21 | Copper as Cu | | BDL (DL : 1.0 mg/kg) |
| 22 | Lead as Pb | | 1.19 mg/kg |
| 23 | Iron as Fe | | 2.73 mg/kg |
| 24 | Cation Exchange Capacity | USEPA 9080 – 1986 | 38.2 meq/100g of soil |

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A S K

Name : Santhosh Kumar A
Designation : Quality Manager

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TEST REPORT

| | | | |
|--------------------------------|--|------------------------------|-------------|
| Report No | EHS360/TR/2022-23/ 017 | Report Date | 06.03.2023 |
| Site Location | M/s. VADAPUDUR ROUGH STONE AND GRAVEL QUARRIES S.F.Nos. 423/1(P), 423/2 (P), Vadapudur Village, Kinathukadavu Taluk,Coimbatore | | |
| Sampling Method | SOP Method | Sample Drawn by | Laboratory |
| Sample Name | Soil | Sample Code | EHS360/ 017 |
| Sample Description | Soil 5 | Sample Collected Date | 28.02.2023 |
| Qty. of Sample Received | 2 KG | Sample Received On | 01.03.2023 |
| Sample Condition | Good | Test Commenced On | 01.03.2023 |
| Sampling Location | Soil – 5 – Kinathukadavu - 10°49'49.74"N 77° 0'23.93"E | | |

| S. No | Test Parameters | Protocols | Results |
|-------|-------------------------------------|---|------------------------|
| 01 | pH @ 25°C | IS 2720 Part 26 - 1987 (Reaff:2016) | 8.13 |
| 02 | Conductivity @ 25°C | IS 14767 - 2000 (Reaff : 2016) | 523 µmhos/cm |
| 03 | Water Holding Capacity | By Gravimetric Method | 45.9 % |
| 04 | Bulk Density | By Cylindrical Method | 1.13 g/cm ³ |
| 05 | Porosity | By Gravimetric Method | 40.8 % |
| 06 | Calcium as Ca | Food and Agriculture organization of the united Nation Rome 2007 : 2018 | 133 mg/kg |
| 07 | Magnesium as Mg | | 59.2 mg/kg |
| 08 | Chloride as Cl | | 133 mg/kg |
| 09 | Soluble Sulphate as SO ₄ | | 0.0041 % |
| 10 | Total Phosphorus as P | | 2.37 mg/kg |
| 11 | Total Nitrogen as N | IS 14684 : 1999 (Reaff:2019) | 412 mg/kg |
| 12 | Organic Matter | IS : 2720 Part 22: 1972 (Reaff: 2015) | 2.49 % |
| 13 | Organic Carbon | IS : 2720 Part 22: 1972 (Reaff: 2015) | 1.45 % |

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Designation : Quality Manager

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TEST REPORT

| | | | |
|--------------------------------|--|------------------------------|-------------|
| Report No | EHS360/TR/2022-23/ 017 | Report Date | 06.03.2023 |
| Site Location | M/s. VADAPUDUR ROUGH STONE AND GRAVEL QUARRIES S.F.Nos. 423/1(P), 423/2 (P), Vadapudur Village, Kinathukadavu Taluk, Coimbatore | | |
| Sampling Method | SOP Method | Sample Drawn by | Laboratory |
| Sample Name | Soil | Sample Code | EHS360/ 017 |
| Sample Description | Soil 2 | Sample Collected Date | 28.02.2023 |
| Qty. of Sample Received | 2 KG | Sample Received On | 01.03.2023 |
| Sample Condition | Good | Test Commenced On | 01.03.2023 |
| Sampling Location | Soil – 5 – Kinathukadavu - 10°49'49.74"N 77° 0'23.93"E | | |

| S. No | Test Parameters | Protocols | Results |
|-------|--------------------------|--|-----------------------|
| 14 | Texture : | | |
| | Clay | Gravimetric Method | 33.6 % |
| | Sand | | 34.3 % |
| | Silt | | 32.1 % |
| 15 | Manganese as Mn | USEPA 3050 B – 1996 & USEPA 6010 C - 2000 | 24.6 mg/kg |
| 16 | Zinc as Zn | | 1.69mg/kg |
| 17 | Boron as B | | 1.41 mg/kg |
| 18 | Potassium as K | | 31.2 mg/kg |
| 19 | Cadmium as Cd | | BDL (DL : 1.0 mg/kg) |
| 20 | Total Chromium as Cr | | BDL (DL : 1.0 mg/kg) |
| 21 | Copper as Cu | | BDL (DL : 1.0 mg/kg) |
| 22 | Lead as Pb | | 1.54 mg/kg |
| 23 | Iron as Fe | | 2.82 mg/kg |
| 24 | Cation Exchange Capacity | USEPA 9080 – 1986 | 42.5 meq/100g of soil |

*****End of Report*****

Page 1 of 1

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Name : Santhosh Kumar A
Designation : Quality Manager

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TEST REPORT

| | | | |
|--------------------------------|--|------------------------------|-------------|
| Report No | EHS360/TR/2022-23/ 018 | Report Date | 06.03.2023 |
| Site Location | M/s. VADAPUDUR ROUGH STONE AND GRAVEL QUARRIES S.F.Nos. 423/1(P), 423/2 (P), Vadapudur Village, Kinathukadavu Taluk,Coimbatore | | |
| Sampling Method | SOP Method | Sample Drawn by | Laboratory |
| Sample Name | Soil | Sample Code | EHS360/ 018 |
| Sample Description | Soil 6 | Sample Collected Date | 28.02.2023 |
| Qty. of Sample Received | 2 KG | Sample Received On | 01.03.2023 |
| Sample Condition | Good | Test Commenced On | 01.03.2023 |
| Sampling Location | Soil – 6 – Kallapuram - 10°50'7.28"N 76°58'58.95"E | | |

| S. No | Test Parameters | Protocols | Results |
|-------|-------------------------------------|---|------------------------|
| 01 | pH @ 25°C | IS 2720 Part 26 - 1987 | 8.06 |
| 02 | Conductivity @ 25°C | IS 14767 - 2000 | 493 µmhos/cm |
| 03 | Water Holding Capacity | By Gravimetric Method | 45.1 % |
| 04 | Bulk Density | By Cylindrical Method | 1.12 g/cm ³ |
| 05 | Porosity | By Gravimetric Method | 43.5 % |
| 06 | Calcium as Ca | Food and Agriculture organization of the united Nation Rome 2007 : 2018 | 129 mg/kg |
| 07 | Magnesium as Mg | | 38.9 mg/kg |
| 08 | Chloride as Cl | | 136.5 mg/kg |
| 09 | Soluble Sulphate as SO ₄ | | 0.0043 % |
| 10 | Total Phosphorus as P | | 1.24 mg/kg |
| 11 | Total Nitrogen as N | IS 14684 : 1999 | 389 mg/kg |
| 12 | Organic Matter | IS : 2720 Part 22: 1972 | 2.22 % |
| 13 | Organic Carbon | IS : 2720 Part 22: 1972 | 1.29 % |

*****End of Report*****

Page 1 of 1

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Name : Santhosh Kumar A
Designation : Quality Manager

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TEST REPORT

| | | | |
|--------------------------------|---|------------------------------|-------------|
| Report No | EHS360/TR/2022-23/ 018 | Report Date | 06.03.2023 |
| Site Location | M/s. VADAPUDUR ROUGH STONE AND GRAVEL QUARRIES S.F.Nos. 423/1(P), 423/2 (P), Vadapudur Village, Kinathukadavu Taluk, Coimbatore | | |
| Sampling Method | SOP Method | Sample Drawn by | Laboratory |
| Sample Name | Soil | Sample Code | EHS360/ 018 |
| Sample Description | Soil 6 | Sample Collected Date | 28.02.2023 |
| Qty. of Sample Received | 2 KG | Sample Received On | 01.03.2023 |
| Sample Condition | Good | Test Commenced On | 01.03.2023 |
| Sampling Location | Soil – 6 – Kallapuram - 10°50'7.28"N 76°58'58.95"E | | |

| S. No | Test Parameters | Protocols | Results |
|-------|--------------------------|--|----------------------|
| 14 | Texture : | | |
| | Clay | Gravimetric Method | 33.3 % |
| | Sand | | 34.7 % |
| | Silt | | 32.0 % |
| 15 | Manganese as Mn | USEPA 3050 B – 1996 & USEPA 6010 C - 2000 | 25.4 mg/kg |
| 16 | Zinc as Zn | | 1.57 mg/kg |
| 17 | Boron as B | | 1.41 mg/kg |
| 18 | Potassium as K | | 25.8 mg/kg |
| 19 | Cadmium as Cd | | BDL (DL : 1.0 mg/kg) |
| 20 | Total Chromium as Cr | | BDL (DL : 1.0 mg/kg) |
| 21 | Copper as Cu | | BDL (DL : 1.0 mg/kg) |
| 22 | Lead as Pb | | 1.46 mg/kg |
| 23 | Iron as Fe | | 2.87 mg/kg |
| 24 | Cation Exchange Capacity | | USEPA 9080 – 1986 |

*****End of Report*****

Page 1 of 1

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Name: Santhosh Kumar A
Designation : Quality Manager

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TEST REPORT

| | | | |
|--------------------------------|--|------------------------------|------------|
| Report No | EHS360/TR/2022-23/ 019 | Report Date | 06.03.2023 |
| Site Location | M/s. VADAPUDUR ROUGH STONE AND GRAVEL QUARRIES S.F.Nos. 423/1(P), 423/2 (P), Vadapudur Village, Kinathukadavu Taluk, Coimbatore | | |
| Sampling Method | SOP Method | Sample Drawn by | Laboratory |
| Sample Name | Water | Sample Code | EHS360/019 |
| Sample Description | Surface Water (SW-1) | Sample Collected Date | 28.02.2023 |
| Qty. of Sample Received | 2 Litres | Sample Received On | 01.03.2023 |
| Sample Condition | Fit for Analysis | Test Commenced On | 01.03.2023 |
| Sampling Location | Kothavadi Lake - 10°48'40.88"N 77° 4'1.08"E | | |

| S.No. | Parameters | Test Method | RESULTS |
|-------|---------------------------------------|--|-------------------|
| | Discipline: Chemical | | |
| 1 | Colour | IS 3025 Part 4:1983 | 9 Hazen |
| 2 | Odour | IS 3025 Part 5:2018 | Agreeable |
| 3 | pH at 25°C | IS 3025 Part 11:1983 | 8.32 |
| 4 | Conductivity @ 25°C | IS 3025 Part 14:2013 | 909 mhos/cm |
| 5 | Turbidity | IS 3025 Part 10:1984 | 5.2 NTU |
| 6 | Total Dissolved Solids | IS 3025 Part 16:1984 | 536 mg/l |
| 7 | Total Hardness as CaCO ₃ | IS 3025 Part 21:2009 | 248 mg/l |
| 8 | Calcium as Ca | IS 3025 Part 40:1991 | 67.3 mg/l |
| 9 | Magnesium as Mg | IS 3025 Part 46:1994 | 19.5 mg/l |
| 10 | Total Alkalinity as CaCO ₃ | IS 3025 Part 23:1986 | 198 mg/l |
| 11 | Chloride as Cl | IS 3025 Part 32:1988 | 149.9 mg/l |
| 12 | Sulphate as SO ₄ | IS 3025 Part 24:1986 | 58.6 mg/l |
| 13 | Iron as Fe | IS 3025 Part 53:2003 | 0.21 mg/l |
| 14 | Residual Free Chlorine | IS 3025 Part 26:1986 | BDL (DL:0.1 mg/l) |
| 15 | Fluoride as F | APHA 23 rd Edn. 2017:4500 F,D | 0.22 mg/l |
| 16 | Nitrate as NO ₃ | IS 3025 Part 34:1988 | 13.8 mg/l |

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TEST REPORT

| | | | |
|--------------------------------|--|------------------------------|------------|
| Report No | EHS360/TR/2022-23/019 | Report Date | 06.03.2023 |
| Site Location | M/s. VADAPUDUR ROUGH STONE AND GRAVEL QUARRIES S.F.Nos. 423/1(P), 423/2 (P), Vadapudur Village, Kinathukadavu Taluk, Coimbatore | | |
| Sampling Method | SOP Method | Sample Drawn by | Laboratory |
| Sample Name | Water | Sample Code | EHS360/019 |
| Sample Description | Surface Water (SW-1) | Sample Collected Date | 28.02.2023 |
| Qty. of Sample Received | 2 Litres | Sample Received On | 01.03.2023 |
| Sample Condition | Fit for Analysis | Test Commenced On | 01.03.2023 |
| Sampling Location | Kothavadi Lake - 10°48'40.88"N 77° 4'1.08"E | | |

| S.No. | Parameters | Test Method | RESULTS |
|-------|--|---|----------------------|
| 17 | Copper as Cu | IS 3025 Part 65:2014 | BDL (DL:0.01 mg/l) |
| 18 | Manganese as Mn | IS 3025 Part 65:2014 | BDL (DL:0.02 mg/l) |
| 19 | Mercury as Hg | USEPA 200.8 | BDL (DL:0.0005 mg/l) |
| 20 | Cadmium as Cd | IS 3025 Part 65:2014 | BDL (DL:0.001 mg/l) |
| 21 | Selenium as Se | IS 3025 Part 65:2014 | BDL (DL:0.005 mg/l) |
| 22 | Aluminium as Al | IS 3025 Part 65:2014 (Reaff:2019) | BDL (DL:0.005 mg/l) |
| 23 | Lead as Pb | IS 3025 Part 65:2014 (Reaff:2019) | BDL (DL:0.005 mg/l) |
| 24 | Zinc as Zn | IS 3025 Part 65:2014 (Reaff:2019) | BDL(DL : 0.05 mg/l) |
| 25 | Total Chromium as Cr | IS 3025 Part 65:2014 (Reaff:2019) | BDL(DL : 0.02 mg/l) |
| 26 | Boron as B | IS 3025 Part 65:2014 (Reaff:2019) | BDL(DL : 0.05 mg/l) |
| 27 | Mineral Oil | IS 3025 Part 39-1991 (Reaff. 2019) | BDL(DL : 0.01 mg/l) |
| 28 | Phenolic compounds as C ₆ H ₅ OH | IS 3025 Part 43-1992(Reaff: 2019) | BDL (DL:0.0005 mg/l) |
| 29 | Anionic Detergents (as MBAS) | IS 13428 – 2005 (Reaff:2019) (Annex K) | BDL (DL:0.01 mg/l) |
| 30 | Cyanide as CN | IS 3025 Part 27-1986 (Reaff. 2019) | BDL (DL:0.01 mg/l) |
| 31 | BOD @ 27°C for 3 days | IS 3025 Part 44:1993 (Reaff:2019) | 14.3 mg/l |
| 32 | Chemical Oxygen Demand | IS 3025 Part 58:2006 (Reaff:2017) | 46 mg/l |
| 33 | Dissolved Oxygen | IS 3025 Part 38:1989 (Reaff:2019) | 6.2 mg/l |
| 34 | Barium as Ba | IS 3025 Part 65:2014 (Reaff:2019) | BDL(DL:0.05 mg/l) |
| 35 | Ammonia (as total ammonia-N) | IS 3025 Part 34-1988 (Reaff. 2019) | 3.6 mg/l |
| 36 | Sulphide as H ₂ S | IS 3025 Part 29-1986 (Reaff: 2019) | BDL (DL:0.01 mg/l) |
| 37 | Molybdenum as Mo | IS 3025 Part 65:2014 (Reaff:2019) | BDL (DL:0.02 mg/l) |
| 38 | Total Arsenic as As | IS 3025 Part 65:2014 (Reaff:2019) | BDL (DL:0.005 mg/l) |
| 39 | Total Suspended Solids | IS 3025 Part 17 -1984 (Reaff:2017) | 18.5 mg/l |
| | Discipline: Biological | Group: Water | |
| 40 | Total Coliform | APHA 23 rd Edn. 2017:9221B | 982 MPN/100ml |
| 41 | <i>Escherichia coli</i> | APHA 23 rd Edn. 2017:9221F | 144 MPN/100ml |

*****End of Report*****



Verified by

Authorised Signatory

Name: Santhosh Kumar A
Designation: Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

TEST REPORT

| | | | |
|--------------------------------|--|------------------------------|------------|
| Report No | EHS360/TR/2022-23/ 020 | Report Date | 06.03.2023 |
| Site Location | M/s. VADAPUDUR ROUGH STONE AND GRAVEL QUARRIES S.F.Nos. 423/1(P), 423/2 (P), Vadapudur Village, Kinathukadavu Taluk, Coimbatore | | |
| Sampling Method | SOP Method | Sample Drawn by | Laboratory |
| Sample Name | Water | Sample Code | EHS360/020 |
| Sample Description | Ground Water (WW-1) | Sample Collected Date | 28.02.2023 |
| Qty. of Sample Received | 2 Litres | Sample Received On | 01.03.2023 |
| Sample Condition | Fit for Analysis | Test Commenced On | 01.03.2023 |
| Sampling Location | Near Project Area - 10°48'34.91"N 77° 0'7.95"E | | |

| S.No. | Parameters | Test Method | RESULTS |
|-------|---------------------------------------|--|-------------------|
| | Discipline: Chemical | | |
| 1 | Colour | IS 3025 Part 4:1983 | <5 Hazen |
| 2 | Odour | IS 3025 Part 5:2018 | Agreeable |
| 3 | pH at 25°C | IS 3025 Part 11:1983 | 7.32 |
| 4 | Conductivity @ 25°C | IS 3025 Part 14:2013 | 964 µmhos/cm |
| 5 | Turbidity | IS 3025 Part 10:1984 | 1.9 NTU |
| 6 | Total Dissolved Solids | IS 3025 Part 16:1984 | 568 mg/l |
| 7 | Total Hardness as CaCO ₃ | IS 3025 Part 21:2009 | 232 mg/l |
| 8 | Calcium as Ca | IS 3025 Part 40:1991 | 54.5 mg/l |
| 9 | Magnesium as Mg | IS 3025 Part 46:1994 | 23.3 mg/l |
| 10 | Total Alkalinity as CaCO ₃ | IS 3025 Part 23:1986 | 199.5 mg/l |
| 11 | Chloride as Cl | IS 3025 Part 32:1988 | 165 mg/l |
| 12 | Sulphate as SO ₄ | IS 3025 Part 24:1986 | 49.8 mg/l |
| 13 | Iron as Fe | IS 3025 Part 53:2003 | 0.27 mg/l |
| 14 | Residual Free Chlorine | IS 3025 Part 26:1986 | BDL (DL:0.1 mg/l) |
| 15 | Fluoride as F | APHA 23 rd Edn. 2017:4500 F,D | 0.16 mg/l |
| 16 | Nitrate as NO ₃ | IS 3025 Part 34:1988 | 5.6 mg/l |

*****End of Report*****



Verified by



Authorised Signatory

Name: Santhosh Kumar A
Designation: Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

TEST REPORT

| | | | |
|--------------------------------|--|------------------------------|------------|
| Report No | EHS360/TR/2022-23/ 020 | Report Date | 06.03.2023 |
| Site Location | M/s. VADAPUDUR ROUGH STONE AND GRAVEL QUARRIES S.F.Nos. 423/1(P), 423/2 (P), Vadapudur Village, Kinathukadavu Taluk, Coimbatore | | |
| Sampling Method | SOP Method | Sample Drawn by | Laboratory |
| Sample Name | Water | Sample Code | EHS360/020 |
| Sample Description | Ground Water (WW-1) | Sample Collected Date | 28.02.2023 |
| Qty. of Sample Received | 2 Litres | Sample Received On | 01.03.2023 |
| Sample Condition | Fit for Analysis | Test Commenced On | 01.03.2023 |
| Sampling Location | Near Project Area - 10°48'34.91"N 77° 0'7.95"E | | |

| S.No. | Parameters | Test Method | RESULTS |
|-------|--|--|----------------------|
| 17 | Copper as Cu | IS 3025 Part 65:2014 (Reaff:2019) | BDL (DL:0.01 mg/l) |
| 18 | Manganese as Mn | IS 3025 Part 65:2014 (Reaff:2019) | BDL (DL:0.02 mg/l) |
| 19 | Mercury as Hg | USEPA 200.8 | BDL (DL:0.0005 mg/l) |
| 20 | Cadmium as Cd | IS 3025 Part 65:2014 (Reaff:2019) | BDL (DL:0.001 mg/l) |
| 21 | Selenium as Se | IS 3025 Part 65:2014 (Reaff:2019) | BDL (DL:0.005 mg/l) |
| 22 | Aluminium as Al | IS 3025 Part 65:2014 (Reaff:2019) | BDL (DL:0.005 mg/l) |
| 23 | Lead as Pb | IS 3025 Part 65:2014 (Reaff:2019) | BDL (DL:0.005 mg/l) |
| 24 | Zinc as Zn | IS 3025 Part 65:2014 (Reaff:2019) | BDL(DL : 0.05 mg/l) |
| 25 | Total Chromium as Cr | IS 3025 Part 65:2014 (Reaff:2019) | BDL(DL : 0.02 mg/l) |
| 26 | Boron as B | IS 3025 Part 65:2014 (Reaff:2019) | BDL(DL : 0.05 mg/l) |
| 27 | Mineral Oil | IS 3025 Part 39-1991 (Reaff. 2019) | BDL(DL : 0.01 mg/l) |
| 28 | Phenolic compounds as C ₆ H ₅ OH | IS 3025 Part 43-1992(Reaff: 2019) | BDL (DL:0.0005 mg/l) |
| 29 | Anionic Detergents (as MBAS) | IS 13428 – 2005 (Reaff:2019) (Annex K) | BDL (DL:0.01 mg/l) |
| 30 | Cyanide as CN | IS 3025 Part 27-1986 (Reaff. 2019) | BDL (DL:0.01 mg/l) |
| 31 | Barium as Ba | IS 3025 Part 44:1993 (Reaff:2019) | BDL(DL:0.05 mg/l) |
| 32 | Ammonia (as total ammonia-N) | IS 3025 Part 58:2006 (Reaff:2017) | BDL (DL:0.01 mg/l) |
| 33 | Sulphide as H ₂ S | IS 3025 Part 38:1989 (Reaff:2019) | BDL (DL:0.01 mg/l) |
| 34 | Molybdenum as Mo | IS 3025 Part 65:2014 (Reaff:2019) | BDL (DL:0.02 mg/l) |
| 35 | Total Arsenic as As | IS 3025 Part 34-1988 (Reaff. 2019) | BDL (DL:0.005 mg/l) |
| 36 | Total Suspended Solids | IS 3025 Part 29-1986 (Reaff: 2019) | BDL (DL:1.0 mg/l) |
| | Discipline: Biological | Group: Water | |
| 37 | Total Coliform | APHA 23 rd Edn. 2017:9221B | 130 MPN/100ml |
| 38 | <i>Escherichia coli</i> | APHA 23 rd Edn. 2017:9221F | < 1.8 MPN/100ml |

*****End of Report*****

Page 1 of 1

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Authorised Signatory

 Name: Santhosh Kumar A
 Designation: Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

TEST REPORT

| | | | |
|--------------------------------|---|------------------------------|------------|
| Report No | EHS360/TR/2022-23/ 021 | Report Date | 06.03.2023 |
| Site Location | M/s. VADAPUDUR ROUGH STONE AND GRAVEL QUARRIES S.F.Nos. 423/1(P), 423/2 (P), Vadapudur Village, Kinathukadavu Taluk, Coimbatore | | |
| Sampling Method | SOP Method | Sample Drawn by | Laboratory |
| Sample Name | Water | Sample Code | EHS360/021 |
| Sample Description | Ground Water (WW-2) | Sample Collected Date | 28.02.2023 |
| Qty. of Sample Received | 2 Litres | Sample Received On | 01.03.2023 |
| Sample Condition | Fit for Analysis | Test Commenced On | 01.03.2023 |
| Sampling Location | Kallapuram - 10°50'1.49"N 76°59'8.86"E | | |

| S.No. | Parameters | Test Method | RESULTS |
|-------|---------------------------------------|--|-------------------|
| | Discipline: Chemical | | |
| 1 | Colour | IS 3025 Part 4:1983 | <5 Hazen |
| 2 | Odour | IS 3025 Part 5:2018 | Agreeable |
| 3 | pH at 25°C | IS 3025 Part 11:1983 | 7.84 |
| 4 | Conductivity @ 25°C | IS 3025 Part 14:2013 | 845 µmhos/cm |
| 5 | Turbidity | IS 3025 Part 10:1984 | 2.5 NTU |
| 6 | Total Dissolved Solids | IS 3025 Part 16:1984 | 498 mg/l |
| 7 | Total Hardness as CaCO ₃ | IS 3025 Part 21:2009 | 168 mg/l |
| 8 | Calcium as Ca | IS 3025 Part 40:1991 | 44.8 mg/l |
| 9 | Magnesium as Mg | IS 3025 Part 46:1994 | 13.6 mg/l |
| 10 | Total Alkalinity as CaCO ₃ | IS 3025 Part 23:1986 | 136 mg/l |
| 11 | Chloride as Cl | IS 3025 Part 32:1988 | 148 mg/l |
| 12 | Sulphate as SO ₄ | IS 3025 Part 24:1986 | 59.8 mg/l |
| 13 | Iron as Fe | IS 3025 Part 53:2003 | 0.26 mg/l |
| 14 | Residual Free Chlorine | IS 3025 Part 26:1986 | BDL (DL:0.1 mg/l) |
| 15 | Fluoride as F | APHA 23 rd Edn. 2017:4500 F,D | 0.19 mg/l |
| 16 | Nitrate as NO ₃ | IS 3025 Part 34:1988 | 8.9 mg/l |

*****End of Report*****

Page 1 of 1

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Authorised Signatory

Name: Santhosh Kumar A
Designation: Quality Manager

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TEST REPORT

| | | | |
|--------------------------------|--|------------------------------|------------|
| Report No | EHS360/TR/2022-23/ 021 | Report Date | 06.03.2023 |
| Site Location | M/s. VADAPUDUR ROUGH STONE AND GRAVEL QUARRIES S.F.Nos. 423/1(P), 423/2 (P), Vadapudur Village, Kinathukadavu Taluk, Coimbatore | | |
| Sampling Method | SOP Method | Sample Drawn by | Laboratory |
| Sample Name | Water | Sample Code | EHS360/021 |
| Sample Description | Ground Water (WW-2) | Sample Collected Date | 28.02.2023 |
| Qty. of Sample Received | 2 Litres | Sample Received On | 01.03.2023 |
| Sample Condition | Fit for Analysis | Test Commenced On | 01.03.2023 |
| Sampling Location | Kallapuram - 10°50'1.49"N 76°59'8.86"E | | |

| S.No. | Parameters | Test Method | RESULTS |
|-------------------------------|--|--|----------------------|
| 17 | Copper as Cu | IS 3025 Part 65:2014 (Reaff:2019) | BDL (DL:0.01 mg/l) |
| 18 | Manganese as Mn | IS 3025 Part 65:2014 (Reaff:2019) | BDL (DL:0.02 mg/l) |
| 19 | Mercury as Hg | USEPA 200.8 | BDL (DL:0.0005 mg/l) |
| 20 | Cadmium as Cd | IS 3025 Part 65:2014 (Reaff:2019) | BDL (DL:0.001 mg/l) |
| 21 | Selenium as Se | IS 3025 Part 65:2014 (Reaff:2019) | BDL (DL:0.005 mg/l) |
| 22 | Aluminium as Al | IS 3025 Part 65:2014 (Reaff:2019) | BDL (DL:0.005 mg/l) |
| 23 | Lead as Pb | IS 3025 Part 65:2014 (Reaff:2019) | BDL (DL:0.005 mg/l) |
| 24 | Zinc as Zn | IS 3025 Part 65:2014 (Reaff:2019) | BDL(DL : 0.05 mg/l) |
| 25 | Total Chromium as Cr | IS 3025 Part 65:2014 (Reaff:2019) | BDL(DL : 0.02 mg/l) |
| 26 | Boron as B | IS 3025 Part 65:2014 (Reaff:2019) | BDL(DL : 0.05 mg/l) |
| 27 | Mineral Oil | IS 3025 Part 39-1991 (Reaff. 2019) | BDL(DL : 0.01 mg/l) |
| 28 | Phenolic compounds as C ₆ H ₅ OH | IS 3025 Part 43-1992(Reaff: 2019) | BDL (DL:0.0005 mg/l) |
| 29 | Anionic Detergents (as MBAS) | IS 13428 – 2005 (Reaff:2019) (Annex K) | BDL (DL:0.01 mg/l) |
| 30 | Cyanide as CN | IS 3025 Part 27-1986 (Reaff. 2019) | BDL (DL:0.01 mg/l) |
| 31 | Barium as Ba | IS 3025 Part 44:1993 (Reaff:2019) | BDL(DL:0.05 mg/l) |
| 32 | Ammonia (as total ammonia-N) | IS 3025 Part 58:2006 (Reaff:2017) | BDL (DL:0.01 mg/l) |
| 33 | Sulphide as H ₂ S | IS 3025 Part 38:1989 (Reaff:2019) | BDL (DL:0.01 mg/l) |
| 34 | Molybdenum as Mo | IS 3025 Part 65:2014 (Reaff:2019) | BDL (DL:0.02 mg/l) |
| 35 | Total Arsenic as As | IS 3025 Part 34-1988 (Reaff. 2019) | BDL (DL:0.005 mg/l) |
| 36 | Total Suspended Solids | IS 3025 Part 29-1986 (Reaff: 2019) | BDL (DL:1.0 mg/l) |
| Discipline: Biological | | Group: Water | |
| 37 | Total Coliform | APHA 23 rd Edn. 2017:9221B | 159 MPN/100ml |
| 38 | <i>Escherichia coli</i> | APHA 23 rd Edn. 2017:9221F | < 1.8 MPN/100ml |

*****End of Report*****

Page 1 of 1

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Authorised Signatory

 Name: Santhosh Kumar A
 Designation: Quality Manager

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TEST REPORT

| | | | |
|-------------------------|--|-----------------------|------------|
| Report No | EHS360/TR/2022-23/ 022 | Report Date | 06.03.2023 |
| Site Location | M/s. VADAPUDUR ROUGH STONE AND GRAVEL QUARRIES S.F.Nos. 423/1(P), 423/2 (P), Vadapudur Village, Kinathukadavu Taluk, Coimbatore | | |
| Sampling Method | SOP Method | Sample Drawn by | Laboratory |
| Sample Name | Water | Sample Code | EHS360/022 |
| Sample Description | Ground Water (WW-3) | Sample Collected Date | 28.02.2023 |
| Qty. of Sample Received | 2 Litres | Sample Received On | 01.03.2023 |
| Sample Condition | Fit for Analysis | Test Commenced On | 01.03.2023 |
| Sampling Location | Muthur - 10°47'46.34"N 76°58'54.96"E | | |

| S.No. | Parameters | Test Method | RESULTS |
|-------|---------------------------------------|--|-------------------|
| | Discipline: Chemical | | |
| 1 | Colour | IS 3025 Part 4:1983 | <5 Hazen |
| 2 | Odour | IS 3025 Part 5:2018 | Agreeable |
| 3 | pH at 25°C | IS 3025 Part 11:1983 | 7.49 |
| 4 | Conductivity @ 25°C | IS 3025 Part 14:2013 | 845 µmhos/cm |
| 5 | Turbidity | IS 3025 Part 10:1984 | 2.8 NTU |
| 6 | Total Dissolved Solids | IS 3025 Part 16:1984 | 498 mg/l |
| 7 | Total Hardness as CaCO ₃ | IS 3025 Part 21:2009 | 180 mg/l |
| 8 | Calcium as Ca | IS 3025 Part 40:1991 | 46.5 mg/l |
| 9 | Magnesium as Mg | IS 3025 Part 46:1994 | 15.5 mg/l |
| 10 | Total Alkalinity as CaCO ₃ | IS 3025 Part 23:1986 | 158 mg/l |
| 11 | Chloride as Cl | IS 3025 Part 32:1988 | 121 mg/l |
| 12 | Sulphate as SO ₄ | IS 3025 Part 24:1986 | 42.7 mg/l |
| 13 | Iron as Fe | IS 3025 Part 53:2003 | 0.24 mg/l |
| 14 | Residual Free Chlorine | IS 3025 Part 26:1986 | BDL (DL:0.1 mg/l) |
| 15 | Fluoride as F | APHA 23 rd Edn. 2017:4500 F,D | 0.14 mg/l |
| 16 | Nitrate as NO ₃ | IS 3025 Part 34:1988 | 7.3 mg/l |

*****End of Report*****

Page 1 of 1

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Authorised Signatory

Name: Santhosh Kumar A
Designation: Quality Manager

Note: 1. The test results are only to the sample submitted for test. 2. Any correction of the test report in full or part shall invalidate the report. 3. Sample will be retained for 15 days from the date of reporting except in case of regulatory samples or specifically instructed by client. 4. Perishable samples will be discarded immediately after reporting. 5. Under no circumstance's lab accepts any liability or loss/damage caused by use or misuse of test report after invoicing or issued of test report.

TEST REPORT

| | | | |
|--------------------------------|--|------------------------------|------------|
| Report No | EHS360/TR/2022-23/ 022 | Report Date | 06.03.2023 |
| Site Location | M/s. VADAPUDUR ROUGH STONE AND GRAVEL QUARRIES S.F.Nos. 423/1(P), 423/2 (P), Vadapudur Village, Kinathukadavu Taluk, Coimbatore | | |
| Sampling Method | SOP Method | Sample Drawn by | Laboratory |
| Sample Name | Water | Sample Code | EHS360/022 |
| Sample Description | Ground Water (WW-3) | Sample Collected Date | 28.02.2023 |
| Qty. of Sample Received | 2 Litres | Sample Received On | 01.03.2023 |
| Sample Condition | Fit for Analysis | Test Commenced On | 01.03.2023 |
| Sampling Location | Muthur - 10°47'46.34"N 76°58'54.96"E | | |

| S.No. | Parameters | Test Method | RESULTS |
|-------------------------------|--|--|----------------------|
| 17 | Copper as Cu | IS 3025 Part 65:2014 (Reaff:2019) | BDL (DL:0.01 mg/l) |
| 18 | Manganese as Mn | IS 3025 Part 65:2014 (Reaff:2019) | BDL (DL:0.02 mg/l) |
| 19 | Mercury as Hg | USEPA 200.8 | BDL (DL:0.0005 mg/l) |
| 20 | Cadmium as Cd | IS 3025 Part 65:2014 (Reaff:2019) | BDL (DL:0.001 mg/l) |
| 21 | Selenium as Se | IS 3025 Part 65:2014 (Reaff:2019) | BDL (DL:0.005 mg/l) |
| 22 | Aluminium as Al | IS 3025 Part 65:2014 (Reaff:2019) | BDL (DL:0.005 mg/l) |
| 23 | Lead as Pb | IS 3025 Part 65:2014 (Reaff:2019) | BDL (DL:0.005 mg/l) |
| 24 | Zinc as Zn | IS 3025 Part 65:2014 (Reaff:2019) | BDL(DL : 0.05 mg/l) |
| 25 | Total Chromium as Cr | IS 3025 Part 65:2014 (Reaff:2019) | BDL(DL : 0.02 mg/l) |
| 26 | Boron as B | IS 3025 Part 65:2014 (Reaff:2019) | BDL(DL : 0.05 mg/l) |
| 27 | Mineral Oil | IS 3025 Part 39-1991 (Reaff. 2019) | BDL(DL : 0.01 mg/l) |
| 28 | Phenolic compounds as C ₆ H ₅ OH | IS 3025 Part 43-1992(Reaff: 2019) | BDL (DL:0.0005 mg/l) |
| 29 | Anionic Detergents (as MBAS) | IS 13428 – 2005 (Reaff:2019) (Annex K) | BDL (DL:0.01 mg/l) |
| 30 | Cyanide as CN | IS 3025 Part 27-1986 (Reaff. 2019) | BDL (DL:0.01 mg/l) |
| 31 | Barium as Ba | IS 3025 Part 44:1993 (Reaff:2019) | BDL(DL:0.05 mg/l) |
| 32 | Ammonia (as total ammonia-N) | IS 3025 Part 58:2006 (Reaff:2017) | BDL (DL:0.01 mg/l) |
| 33 | Sulphide as H ₂ S | IS 3025 Part 38:1989 (Reaff:2019) | BDL (DL:0.01 mg/l) |
| 34 | Molybdenum as Mo | IS 3025 Part 65:2014 (Reaff:2019) | BDL (DL:0.02 mg/l) |
| 35 | Total Arsenic as As | IS 3025 Part 34-1988 (Reaff. 2019) | BDL (DL:0.005 mg/l) |
| 36 | Total Suspended Solids | IS 3025 Part 29-1986 (Reaff: 2019) | BDL (DL:1.0 mg/l) |
| Discipline: Biological | | Group: Water | |
| 37 | Total Coliform | APHA 23 rd Edn. 2017:9221B | 143 MPN/100ml |
| 38 | <i>Escherichia coli</i> | APHA 23 rd Edn. 2017:9221F | < 1.8 MPN/100ml |


*****End of Report*****

Page 1 of 1

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Authorised Signatory


 Name: Santhosh Kumar A
 Designation: Quality Manager

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TEST REPORT

| | | | |
|-------------------------|---|-----------------------|------------|
| Report No | EHS360/TR/2022-23/ 023 | Report Date | 06.03.2023 |
| Site Location | M/s. VADAPUDUR ROUGH STONE AND GRAVEL QUARRIES S.F.Nos. 423/1(P), 423/2 (P), Vadapudur Village, Kinathukadavu Taluk,Coimbatore | | |
| Sampling Method | SOP Method | Sample Drawn by | Laboratory |
| Sample Name | Water | Sample Code | EHS360/023 |
| Sample Description | Ground Water (BW-1) | Sample Collected Date | 28.02.2023 |
| Qty. of Sample Received | 2 Litres | Sample Received On | 01.03.2023 |
| Sample Condition | Fit for Analysis | Test Commenced On | 01.03.2023 |
| Sampling Location | Near Project Area - 10°48'46.19"N 76°59'37.69"E | | |

| S.No. | Parameters | Test Method | RESULTS |
|-----------------------------|---------------------------------------|--|-------------------|
| Discipline: Chemical | | | |
| 1 | Colour | IS 3025 Part 4:1983 | <5 Hazen |
| 2 | Odour | IS 3025 Part 5:2018 | Agreeable |
| 3 | pH at 25°C | IS 3025 Part 11:1983 | 7.32 |
| 4 | Conductivity @ 25°C | IS 3025 Part 14:2013 | 717 µmhos/cm |
| 5 | Turbidity | IS 3025 Part 10:1984 | 1.7 NTU |
| 6 | Total Dissolved Solids | IS 3025 Part 16:1984 | 423 mg/l |
| 7 | Total Hardness as CaCO ₃ | IS 3025 Part 21:2009 | 152 mg/l |
| 8 | Calcium as Ca | IS 3025 Part 40:1991 | 30.4 mg/l |
| 9 | Magnesium as Mg | IS 3025 Part 46:1994 | 18.5 mg/l |
| 10 | Total Alkalinity as CaCO ₃ | IS 3025 Part 23:1986 | 132.5 mg/l |
| 11 | Chloride as Cl | IS 3025 Part 32:1988 | 117 mg/l |
| 12 | Sulphate as SO ₄ | IS 3025 Part 24:1986 | 41.8 mg/l |
| 13 | Iron as Fe | IS 3025 Part 53:2003 | 0.14 mg/l |
| 14 | Residual Free Chlorine | IS 3025 Part 26:1986 | BDL (DL:0.1 mg/l) |
| 15 | Fluoride as F | APHA 23 rd Edn. 2017:4500 F,D | 0.12 mg/l |
| 16 | Nitrate as NO ₃ | IS 3025 Part 34:1988 | 7.9 mg/l |

*****End of Report*****



Verified by



Authorised Signatory

Name: Santhosh Kumar A
Designation: Quality Manager

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TEST REPORT

| | | | |
|--------------------------------|--|------------------------------|------------|
| Report No | EHS360/TR/2022-23/ 023 | Report Date | 06.03.2023 |
| Site Location | M/s. VADAPUDUR ROUGH STONE AND GRAVEL QUARRIES S.F.Nos. 423/1(P), 423/2 (P), Vadapudur Village, Kinathukadavu Taluk, Coimbatore | | |
| Sampling Method | SOP Method | Sample Drawn by | Laboratory |
| Sample Name | Water | Sample Code | EHS360/023 |
| Sample Description | Ground Water (BW-1) | Sample Collected Date | 28.02.2023 |
| Qty. of Sample Received | 2 Litres | Sample Received On | 01.03.2023 |
| Sample Condition | Fit for Analysis | Test Commenced On | 01.03.2023 |
| Sampling Location | Near Project Area - 10°48'46.19"N 76°59'37.69"E | | |

| S.No. | Parameters | Test Method | RESULTS |
|-------------------------------|--|--|----------------------|
| 17 | Copper as Cu | IS 3025 Part 65:2014 (Reaff:2019) | BDL (DL:0.01 mg/l) |
| 18 | Manganese as Mn | IS 3025 Part 65:2014 (Reaff:2019) | BDL (DL:0.02 mg/l) |
| 19 | Mercury as Hg | USEPA 200.8 | BDL (DL:0.0005 mg/l) |
| 20 | Cadmium as Cd | IS 3025 Part 65:2014 (Reaff:2019) | BDL (DL:0.001 mg/l) |
| 21 | Selenium as Se | IS 3025 Part 65:2014 (Reaff:2019) | BDL (DL:0.005 mg/l) |
| 22 | Aluminium as Al | IS 3025 Part 65:2014 (Reaff:2019) | BDL (DL:0.005 mg/l) |
| 23 | Lead as Pb | IS 3025 Part 65:2014 (Reaff:2019) | BDL (DL:0.005 mg/l) |
| 24 | Zinc as Zn | IS 3025 Part 65:2014 (Reaff:2019) | BDL(DL : 0.05 mg/l) |
| 25 | Total Chromium as Cr | IS 3025 Part 65:2014 (Reaff:2019) | BDL(DL : 0.02 mg/l) |
| 26 | Boron as B | IS 3025 Part 65:2014 (Reaff:2019) | BDL(DL : 0.05 mg/l) |
| 27 | Mineral Oil | IS 3025 Part 39-1991 (Reaff. 2019) | BDL(DL : 0.01 mg/l) |
| 28 | Phenolic compounds as C ₆ H ₅ OH | IS 3025 Part 43-1992(Reaff: 2019) | BDL (DL:0.0005 mg/l) |
| 29 | Anionic Detergents (as MBAS) | IS 13428 – 2005 (Reaff:2019) (Annex K) | BDL (DL:0.01 mg/l) |
| 30 | Cyanide as CN | IS 3025 Part 27-1986 (Reaff. 2019) | BDL (DL:0.01 mg/l) |
| 31 | Barium as Ba | IS 3025 Part 44:1993 (Reaff:2019) | BDL(DL:0.05 mg/l) |
| 32 | Ammonia (as total ammonia-N) | IS 3025 Part 58:2006 (Reaff:2017) | BDL (DL:0.01 mg/l) |
| 33 | Sulphide as H ₂ S | IS 3025 Part 38:1989 (Reaff:2019) | BDL (DL:0.01 mg/l) |
| 34 | Molybdenum as Mo | IS 3025 Part 65:2014 (Reaff:2019) | BDL (DL:0.02 mg/l) |
| 35 | Total Arsenic as As | IS 3025 Part 34-1988 (Reaff. 2019) | BDL (DL:0.005 mg/l) |
| 36 | Total Suspended Solids | IS 3025 Part 29-1986 (Reaff: 2019) | BDL (DL:1.0 mg/l) |
| Discipline: Biological | | Group: Water | |
| 37 | Total Coliform | APHA 23 rd Edn. 2017:9221B | 146 MPN/100ml |
| 38 | <i>Escherichia coli</i> | APHA 23 rd Edn. 2017:9221F | < 1.8 MPN/100ml |

*****End of Report*****

Page 1 of 1

Verified by



Authorised Signatory

 Name: Santhosh Kumar A
 Designation: Quality Manager

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TEST REPORT

| | | | |
|--------------------------------|---|------------------------------|------------|
| Report No | EHS360/TR/2022-23/ 024 | Report Date | 06.03.2023 |
| Site Location | M/s. VADAPUDUR ROUGH STONE AND GRAVEL QUARRIES S.F.Nos. 423/1(P), 423/2 (P), Vadapudur Village, Kinathukadavu Taluk, Coimbatore | | |
| Sampling Method | SOP Method | Sample Drawn by | Laboratory |
| Sample Name | Water | Sample Code | EHS360/024 |
| Sample Description | Ground Water (BW-2) | Sample Collected Date | 28.02.2023 |
| Qty. of Sample Received | 2 Litres | Sample Received On | 01.03.2023 |
| Sample Condition | Fit for Analysis | Test Commenced On | 01.03.2023 |
| Sampling Location | Vadakkipalayam - 10°48'10.68"N 77° 0'36.48"E | | |

| S.No. | Parameters | Test Method | RESULTS |
|-------|---------------------------------------|--|-------------------|
| | Discipline: Chemical | | |
| 1 | Colour | IS 3025 Part 4:1983 | 5 Hazen |
| 2 | Odour | IS 3025 Part 5:2018 | Agreeable |
| 3 | pH at 25°C | IS 3025 Part 11:1983 | 7.58 |
| 4 | Conductivity @ 25°C | IS 3025 Part 14:2013 | 743 µmhos/cm |
| 5 | Turbidity | IS 3025 Part 10:1984 | 1.5 NTU |
| 6 | Total Dissolved Solids | IS 3025 Part 16:1984 | 438 mg/l |
| 7 | Total Hardness as CaCO ₃ | IS 3025 Part 21:2009 | 164 mg/l |
| 8 | Calcium as Ca | IS 3025 Part 40:1991 | 32.1 mg/l |
| 9 | Magnesium as Mg | IS 3025 Part 46:1994 | 20.4 mg/l |
| 10 | Total Alkalinity as CaCO ₃ | IS 3025 Part 23:1986 | 143 mg/l |
| 11 | Chloride as Cl | IS 3025 Part 32:1988 | 122 mg/l |
| 12 | Sulphate as SO ₄ | IS 3025 Part 24:1986 | 42.8 mg/l |
| 13 | Iron as Fe | IS 3025 Part 53:2003 | 0.26 mg/l |
| 14 | Residual Free Chlorine | IS 3025 Part 26:1986 | BDL (DL:0.1 mg/l) |
| 15 | Fluoride as F | APHA 23 rd Edn. 2017:4500 F,D | 0.17 mg/l |
| 16 | Nitrate as NO ₃ | IS 3025 Part 34:1988 | 4.9 mg/l |

*****End of Report*****

Page 1 of 1

Verified by




Authorised Signatory

Name: Santhosh Kumar A
Designation: Quality Manager

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TEST REPORT

| | | | |
|--------------------------------|--|------------------------------|------------|
| Report No | EHS360/TR/2022-23/ 024 | Report Date | 06.03.2023 |
| Site Location | M/s. VADAPUDUR ROUGH STONE AND GRAVEL QUARRIES S.F.Nos. 423/1(P), 423/2 (P), Vadapudur Village, Kinathukadavu Taluk,Coimbatore | | |
| Sampling Method | SOP Method | Sample Drawn by | Laboratory |
| Sample Name | Water | Sample Code | EHS360/024 |
| Sample Description | Ground Water (BW-2) | Sample Collected Date | 28.02.2023 |
| Qty. of Sample Received | 2 Litres | Sample Received On | 01.03.2023 |
| Sample Condition | Fit for Analysis | Test Commenced On | 01.03.2023 |
| Sampling Location | Vadakkipalayam - 10°48'10.68"N 77° 0'36.48"E | | |

| S.No. | Parameters | Test Method | RESULTS |
|-------|--|--|----------------------|
| 17 | Copper as Cu | IS 3025 Part 65:2014 (Reaff:2019) | BDL (DL:0.01 mg/l) |
| 18 | Manganese as Mn | IS 3025 Part 65:2014 (Reaff:2019) | BDL (DL:0.02 mg/l) |
| 19 | Mercury as Hg | USEPA 200.8 | BDL (DL:0.0005 mg/l) |
| 20 | Cadmium as Cd | IS 3025 Part 65:2014 (Reaff:2019) | BDL (DL:0.001 mg/l) |
| 21 | Selenium as Se | IS 3025 Part 65:2014 (Reaff:2019) | BDL (DL:0.005 mg/l) |
| 22 | Aluminium as Al | IS 3025 Part 65:2014 (Reaff:2019) | BDL (DL:0.005 mg/l) |
| 23 | Lead as Pb | IS 3025 Part 65:2014 (Reaff:2019) | BDL (DL:0.005 mg/l) |
| 24 | Zinc as Zn | IS 3025 Part 65:2014 (Reaff:2019) | BDL(DL : 0.05 mg/l) |
| 25 | Total Chromium as Cr | IS 3025 Part 65:2014 (Reaff:2019) | BDL(DL : 0.02 mg/l) |
| 26 | Boron as B | IS 3025 Part 65:2014 (Reaff:2019) | BDL(DL : 0.05 mg/l) |
| 27 | Mineral Oil | IS 3025 Part 39-1991 (Reaff. 2019) | BDL(DL : 0.01 mg/l) |
| 28 | Phenolic compounds as C ₆ H ₅ OH | IS 3025 Part 43-1992(Reaff: 2019) | BDL (DL:0.0005 mg/l) |
| 29 | Anionic Detergents (as MBAS) | IS 13428 – 2005 (Reaff:2019) (Annex K) | BDL (DL:0.01 mg/l) |
| 30 | Cyanide as CN | IS 3025 Part 27-1986 (Reaff. 2019) | BDL (DL:0.01 mg/l) |
| 31 | Barium as Ba | IS 3025 Part 44:1993 (Reaff:2019) | BDL(DL:0.05 mg/l) |
| 32 | Ammonia (as total ammonia-N) | IS 3025 Part 58:2006 (Reaff:2017) | BDL (DL:0.01 mg/l) |
| 33 | Sulphide as H ₂ S | IS 3025 Part 38:1989 (Reaff:2019) | BDL (DL:0.01 mg/l) |
| 34 | Molybdenum as Mo | IS 3025 Part 65:2014 (Reaff:2019) | BDL (DL:0.02 mg/l) |
| 35 | Total Arsenic as As | IS 3025 Part 34-1988 (Reaff. 2019) | BDL (DL:0.005 mg/l) |
| 36 | Total Suspended Solids | IS 3025 Part 29-1986 (Reaff: 2019) | BDL (DL:1.0 mg/l) |
| | Discipline: Biological | Group: Water | |
| 37 | Total Coliform | APHA 23 rd Edn. 2017:9221B | 176 MPN/100ml |
| 38 | <i>Escherichia coli</i> | APHA 23 rd Edn. 2017:9221F | < 1.8 MPN/100ml |

*****End of Report*****



Verified by

[Signature]

Authorised Signatory

[Signature]

Name: Santhosh Kumar A
Designation: Quality Manager

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National Accreditation Board for Education and Training



Certificate of Accreditation

Geo Exploration & Mining Solutions, Salem

No. 17, Advaita Ashram Road, Fairlands, Salem – 636 004, Tamilnadu, India.

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

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

Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in RAAC minutes dated Jan 06, 2023 and posted on QCI-NABET website.

The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in QCI-NABET's letter of accreditation bearing no QCI/NABET/ENV/ACO/23/2684 dated Feb 20, 2023. The accreditation needs to be renewed before the expiry date by Geo Exploration & Mining Solutions, Salem following due process of assessment.

Sr. Director, NABET
Dated: Feb 20, 2023

Certificate No.
NABET/EIA/2225/RA 0276

Valid up to
August 06, 2025

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