

**DRAFT OF ENVIRONMENTAL IMPACT ASSESSMENT
AND
ENVIRONMENT MANAGEMENT PLAN**

FOR OBTAINING

Environmental Clearance under EIA Notification – 2006

Schedule S. No. 1 (a) (i): Mining Project

“B1” CATEGORY – MINOR MINERAL – CLUSTER – NONFOREST LAND

CLUSTER EXTENT = 10.45.00 hectares

NADUMANDALAM ROUGH STONE QUARRY

At

Nadumandalam Village, Natham Taluk, Dindigul District, Tamil Nadu.

ToR issued vide Lr. No. SEIAA-TN/F. No. 8787/SEAC/ToR-1151/2021,

Dated:23.05.2022

NAME AND ADDRESS OF THE PROPOSED PROJECT PROPONENT

NAME AND ADDRESS	EXTENT & S.F. NO.
Thiru.A.GOVINDARAJAN S/o. Amirhalingadoss, D.No.6, Manmalai Kovil street, K.Pudur, Madurai North, Madurai District – 625007.	1.20.0 ha & S. F. No. 569/1(Part-4)

Environmental Consultant

GEO TECHNICAL MINING SOLUTIONS

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NABET ACC. NO: NABET/EIA/2023/IA0067

Valid till : 29th Dec.2023



Environment Lab

ENVIRONMENTAL LAB

RICHARDSON & CRUDDAS (1972)

LIMITED

NABL Accredited & Recognised Laboratory

No.1/61, VOC Nagar Main Road,

Maduravoyal, Chennai, Tamilnadu

Baseline Study Period – March to May 2022

Proposed Quarries				
Code	Name of the Owner	Village Name & S.F. Nos.	Extent (ha)	Lease Period
P1	A.Govindarajan S /o. Amirthlingadoss, 56-6, Manmalai Road, K.Pudur, Madurai District.	Nadumandalam SF.No. 569 / 1(P)(B-4)	1.20.0	Applied area
P2	A. Lakshmipathy S/ o. Amirthalingadoss, 6(3), Manmalaisamy Street, K. Pudur, Madurai North, Madurai.	Velampatty S.F.No. 289/1 (P)	1.05.0	Tender cum Auction conducted Poramboke land
Total			2.25.0	
Existing Quarries				
E1	R.Thiyagarajan, S/o.Rengasamy Naidu, Sengulam Village, Natham Taluk, Dindigul.	Nadumandalam S.F.No. 569/ 1(P)(B-3)	2.00.0	27.06.2019 to 26.06.2023
E2	N.Nallamani, S/o. Nallamani, Andaman, Madurai.	Nadumandalam SF.No. 569/ 1(P)(B-2)	1.20.0	10.06.2019 to 09.06.2029
Total			3.20.0	
Abandoned/ Expired Quarry				
Ep1	R.Thiyagarajan, S/o.Rengasamy Naidu, Sengulam Village, Natham Taluk, Dindigul	Nadumandalam SF.No. 569 /1(P)(B-1)	4.00.0	26.10.2015 to 25.05.2020
Ep2	Thiru.A. Lakshmipathy, S /o. Amirthalingadoss, 6(3), Manmalaisamy Street, K. Pudur, Madurai North, Madurai	Nadumandalam SF.No. 569 / 1 (P)(B-2)	1.00.0	29.02.2016 to 28.02.2021
Total			5.00.0	
Total Cluster Extent			10.45.0	

Source: i). AD Letter – Rc.No.112/ 2021/ Mines, Dated: 12.07.2021

* Cluster area calculated as per MoEF & CC Notification – S.O. 2269(E)

Dated:01.07.2016

TERMS OF REFERENCE (ToR) COMPLIANCE

A.Govindarajan,

“ToR issued vide Letter No.SEIAA-TN/F.No.8787/SEAC/ 1151/2021

dated 23.05.2022.

SPECIFIC CONDITIONS		
1	The proponent shall carry out the cumulative & comprehensive impact study due to mining operations carried out in the quarry specifically with reference to the environment in terms of air pollution, water pollution, impact on existing agricultural operations & health impacts, accordingly the environment Management plan should be prepared keeping the concerned quarry and the surrounding habitations in the mind.	The cumulative impact study has been carried out and discussed in section 7.4, pp.150-158 under chapter VII.
2.	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?	All the information will be included in the final EIA report.
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.	
3.	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	Project lease boundary pillars coordinates – Figure 2.4, p. 11 Geology map of the project area covering 10 km radius – Figure 2.6, p.16.

	proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).	Geomorphology map of the study area covering 10 km radius – Figure 2.7, p.17.
4.	The Proponent shall furnish photographs of adequate fencing, green belt along the periphery including replantation of existing tree & safety distance between the adjacent quarries & water bodies nearby provided as per the approved mining plan.	The consultant has advised the project proponent to establish fencing and develop green belt around the proposed project area. The works are under process. The photographs of fencing and green belt development will be submitted during final EIA presentation.
5.	The project proponent shall provide the details of Geological reserves and mineable reserves, planned production capacity, proposed working methodology with justifications, the anticipated impacts of the mining operations on the surrounding environment and the remedial measures for the same.	The details have been provided in sections 2.5, pp.15 and 18-19 under chapter II.
6.	The project proponent shall provide the Organization chart indicating the appointment of various statutory officials and other competent persons to be appointed as per the provisions of Mines Act 1952 and the MMR,1961 for carrying out the quarrying Operations scientifically and systematically in order to ensure safety and to protect the environment.	The details have been provided in sections 2.7, p.25 under chapter II.
7.	The project proponent shall conduct the hydro – geological study considering the contour map of the water table detailing the number of groundwater pumping wells, 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 wells due to mining activity. Based on actual monitored data, it may	The details have been provided in sections 3.3 pp.39-51 under chapter III.

	clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided.	
8.	The proponent shall furnish the baseline data for the environment and ecological parameters with regard to surface water /ground water quality, air quality, soil quality & flora/fauna including traffic/vehicular movement study.	The details have been provided in sections 3.3-3.6, pp.39-98 under chapter III. Traffic details have been given in section 3.8, pp.104-105 under chapter III.
9.	A detailed study shall be carried out in order to ascertain the status of existing trees (nos., name of the species, age, diameter etc.,) both within the mining lease applied area & 300m buffer zone and its management during mining activity	The green belt development proposal has been disclosed in the sections 4.6.2.1-4.6.4, pp.125-128 under chapter IV.
10.	A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site – specific.	Mine closure Plan is a part of approved mining plan Enclosed as Annexure III.
11.	The Public hearing advertisement shall be published in one major National daily and one most circulated vernacular daily. All information given to the public in the public hearing should be in Tamil.	The information about the public hearing will be updated in the final EIA report.
12.	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.No758/2016, 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).	This EIA draft has been prepared in accordance with the Terms of Reference issued by SEIAA as per the order of the Hon’ble NGT, Principal Bench, New Delhi.

13.	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 a given in the appendix in consultation with the DFO, State Agriculture University and local school/collage 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.	The detailed greenbelt development Plan has been provided in the sections 4.6.2.1-4.6.4, pp.125-128 under chapter IV.
14.	Taller/one year old saplings raised in appropriate size of bags; preferably eco-friendly bags should be planted in proper spacing as per the advice of local forest authorities/botanist/Horticulturist with regard to site specific choices. The proponent shall earmark the greenbelt area with GPS coordinates all along the boundary of the project site with at least 3 meters wide and in between blocks in an organized manner.	The FAE of ecology and biodiversity has advised the project proponent that saplings of one year old raised in the eco-friendly bags should be purchased and planted with the spacing of 3 m between each plant around the proposed project area as per the advice of local forest authorities/botanist.
15	A Disaster management Plan shall be prepared and included in the EIA/EMP Report.	Details regarding disaster management plan have been provided in section 7.3, pp.146-149 under chapter VII.
16.	A Risk Assessment and management plan shall be prepared and included in the EIA/EMP Report.	The details have been provided in section 7.2, pp.143 -145 under chapter VII.
17.	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.	The socio-economic studies were carried out for 5 km buffer zone from proposed project site and the results have been discussed in section 3.6 under chapter III, pp.98-104.

18	The PP shall use drone video to cover the cluster area showing clearly the extent of operation and the surrounding environment and submit the video as part of EIA report.	The drone video covering the cluster area will be submitted along with the final EIA report.
19.	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.	The application to the detailed compliance to previous EC conditions is under the process. The compliance report will be submitted along with the final EIA report.
20.	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.	The EIA report has been prepared keeping in mind the fact that concealing any factual information or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may lead to withdrawal of this terms of reference besides attracting penal provisions in the Environment (Protection) Act, 1986.
ADDITIONAL CONDITIONS		
1	Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area on the nearby Villages, Water-bodies/ Rivers, & any ecological fragile areas.	The impact of mining on the various environmental components and relevant mitigation measures has been discussed in chapter IV, pp.106-135.
2	The project proponent shall furnish VAO certificate with reference to 300m radius regard to approved habitations, schools, Archaeological structures etc.	The 300 m radius VAO letter has been attached with this report in the annexure section.
3	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.	The concerns raised during the public consultation and all the activities proposed will be updated in the final EIA report.

4	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	Greenbelt development plan as discussed in section 4.6.2.1- 4.6.4, pp.125-128 under chapter IV has been designed to reduce the impact of carbon emission on the environment.
5	The Environmental Impact Assessment should study the biodiversity, the natural ecosystem, the soil micro flora, fauna and soil seed banks and suggest measures to maintain the natural Ecosystem.	The matter including the results of the soil's micro flora, fauna and soil seed banks and the suitable remedial measures will be included in the final EIA report.
6	Action should specifically suggest for sustainable management of the area and restoration of ecosystem for flow of goods and services.	The FAE of ecology and biodiversity has advised the project proponent that replantation work, particularly for the project area where plants of 4 years old exist should be carried out in the vacant areas available.
7	The project proponent shall study impact on fish habitats and the food WEB/ food chain in the water body and Reservoir.	An analysis for food chain in aquatic ecosystem is under process and report will be added to the final EIA report.
8	The Terms of Reference should specifically study impact on soil health, soil erosion, the soil physical, chemical components and microbial components.	The impact of mining on soil environment has been discussed in section 4.2, under chapter IV, pp.107-108.
9	The environment impact assessment should study impact on biodiversity, vegetation, endemic, vulnerable and endangered indigenous flora and fauna.	The ecological details have been provided in section 3.6, pp.68-98 under chapter III.
10	The environmental impact assessment should study impact on standing trees and the trees should be numbered and action suggested for protection.	There are no trees within the lease area. Therefore, the protection measures have not been included in this report.
11	The environmental impact assessment should study on wetlands, water bodies, river streams, lakes and farmer sites.	All the studies including wetlands, water bodies, river streams, lakes and farmer sites have been included in Table 3.3 in chapter III, p.33.

12	The environmental impact assessment should hold detailed study on EMP with budget for green belt development and mine closure plan including disaster management plan.	The details have been given in Table 10.11 and pp.178-182 under chapter X.
13	The environmental impact assessment should study impact on climate change, temperate rise, pollution and above soil & below soil carbon stock.	The information will be included in the final EIA report.
14	The Environmental Impact Assessment should study impact on Protected Areas, Reserve Forests, National Parks, Corridors and Wildlife pathways near project site.	There are no Protected Areas, National Parks, Corridors and Wildlife pathways near project site. The list of reserve forests within 10 km radius has been provided in Table 3.31 under chapter III, p.86.
15	The project proponent shall study and furnish the impact of project on sites located close to plantations in adjoining Patta lands, horticulture and Agriculture and livestock	The impact of project on the land environment has been discussed in section 4.1 under chapter IV, p.107.
16	The project proponent shall study and furnish the details on potential fragmentation impact of natural environment, by the activities.	The impacts of the proposed project have been discussed in chapter IV, pp.106-135.
17	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..	The impact of the proposed project on aquatic plants and animals in water bodies has been discussed in sections 4.6.5-4.6.6 under chapter IV, pp.129-131.
18	The project proponent shall study and furnish the possible pollution due to plastic and microplastic on the environment. The ecological risks and impacts of plastic & microplastics on aquatic environment and fresh water systems due to activities, contemplated during mining may be investigated and reported.	The matter on plastic waste management has been given in section 7.5 under chapter VII, p.158.

19	The project proponent shall study on impact of mining on Reserve forests free ranging wildlife.	The project proponent shall do barbed wire fencing work and develop a green belt around the lease area to prevent wildlife from entering the site among other environmental protection measures.
20	Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area covering the entire mine lease period as per precise area communication order issued from reputed research institutions on the following a) Soil health & bio-diversity. b) Climate change leading to Droughts, Floods etc. c) Pollution leading to release of Greenhouse gases (OHO), rise in Temperature, & Livelihood of the local people. d) Possibilities of water contamination and impact on aquatic ecosystem health. e) Agriculture, Forestry & Traditional practices. f) Hydrothermal/Geothermal effect due to destruction in the Environment. g) Bio-geochemical processes and its foot prints including environmental stress. h) Sediment geochemistry in the surface streams.	All the studies will be included in the final EIA report.
21	Hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) so as to assess the impacts on the nearby waterbodies due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and	Detailed hydrogeological studies were conducted for the period of 3 months (March-May 2022). The water table and potentiometric surface contour maps including groundwater flow vectors have been given in section 3.3.5 under chapter III, pp.44-51.

	documentation in this regard may be provided, covering the entire mine lease period.	
22	To furnish disaster management plan and disaster mitigation measures in regard to all aspects to avoid/reduce vulnerability to hazards & to cope with disaster/untoward accidents in & around the proposed mine lease area due to the proposed method of mining activity & its related activities covering the entire mine lease period as per precise area communication order issued.	Disaster management plan and the mitigation measures have been provided in section 7.3 under chapter VII, pp.146-149.
23	To furnish risk assessment and management plan including anticipated vulnerabilities during operational and post operational phases of Mining.	The risk assessment plan has been discussed in section 7.2 under chapter VII, pp.143-145.
24	Detailed Mine Closure Plan covering the entire mine lease period as per precise area communication order issued	A detailed mine closure plan has been given in the approved mining plan that has been added in the annexure section.
25	Detailed Environment Management Plan along with adaptation, mitigation & remedial strategies covering the entire mine lease period as per precise area communication order issued	The detailed environment management plan has been provided in chapter X, pp.165-183.
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 proposed site for quarrying is a Govt. Poromboke Land. Relevant document is enclosed along with the approved mining plan in annexure III.

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.	All the documents related to mining plan, EIA and public hearing are compatible to each other and have been provided in the annexure part.
4.	All corner coordinates of the mine lease area, superimposed on a high-resolution imagery/toposheet, 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 lease boundary pillars coordinates – Figure 2.4, p.11. Geology map of the project area covering 10 km radius – Figure 2.6, p.16. Geomorphology map of the study area covering 10 km radius – Figure 2.7, p.17.
5.	Information should be provided in Survey of India Toposheet in 1:50,000 scale indicating geology 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.	Water, soil, air and noise sampling locations have been provided in toposheets of survey of India.
6.	Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority.	The applied area was inspected by the officers of Department of Geology along with revenue officials and found that the land is fit for quarrying under the policy of State Government.
7.	It should be clearly stated whether the proponent company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating process/procedures to bring into focus any infringement/deviation/violation of the environmental or forest norms/conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for	The proponent has framed Environmental Policy and the same has been discussed in section 10.1, pp.165-166 under chapter X.

	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 involving semi mechanized method. As the rock is a hard, compact and homogeneous body, the height 5m and width of the bench 5m will be maintained as 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.	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 of the study area delineating forest area, agricultural land, grazing land, water bodies, human settlements and other ecological features has been discussed in Figure 3.1, p.31 under chapter III. Land use plan of the project area showing pre-operational, operational and post-operational phases are discussed in Table 2.8, p.21 under chapter II.
11.	Details of the land for any Over Burden Dumps outside the mine lease, such as extent	Not Applicable. There is no waste anticipated during

	of land area, distance from mine lease, its land use, R&R issues, if any, should be given.	this quarry operation. The entire quarried out rough stone will be transported to the needy customers. Hence, no dumps are proposed outside the lease area.
12.	Certificate from the competent authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.	Not Applicable. There is no forest land involved within the proposed project area. Moreover, a certificate from DFO will be obtained and attached with the final EIA report.
13.	Status of forestry clearance for the broken-up area and virgin forestland involved in the project including deposition of Net Present Value (NPV) and compensatory afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.	Not Applicable. The proposed project area does not involve any forest land.
14	Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.	Not Applicable. The project doesn't attract Recognition of Forest Rights Act, 2006.
15	The vegetation in the RF / PF areas in the study area, with necessary details, should be given.	No Reserve Forest is found within 1 km radius. And details of vegetation found in the forests occurring beyond the 1 km radius have been given in Table 3. 31 under chapter III, p.86.
16	A study d be 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	Not Applicable. There is no any wildlife/protected area within 10 km radius from the periphery of the project area.

	any other protected area and accordingly, detailed mitigative measures required, should be worked out with cost implications and submitted.	
17	Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar Site, Tiger/ Elephant Reserves/ (existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished.	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.	A detailed biological study was carried out in both core and buffer zones and the results have been discussed in pp.68-98 under chapter III. There is no schedule I species of animals observed within study area as per Wildlife Protection Act, 1972 and no species falls in vulnerable, endangered or threatened category as per IUCN. There is no endangered red list species found in the study area.
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	Not Applicable. Project area / Study area is not declared in 'Critically Polluted' Area and does not come under 'Aravalli Range.

	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).	Not Applicable. The project doesn't attract the C.R.Z. Notification, 2018.
21	R&R plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need-based sample survey, family-wise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be clearly brought out whether the village(s) located in the mine lease area will be shifted or not. The issues relating to shifting of village(s) including their R&R and socio-economic aspects should be discussed in the report.	Not Applicable. There are no approved habitations within a radius of 300 meters. Therefore, R&R plan / compensation details for the Project Affected People (PAP) is not anticipated.
22	One season (non-monsoon) [i.e., March-May (Summer Season); October-December (post monsoon season); December – February (winter season)] primary baseline data on	Baseline data were collected for the period of March- May 2022 as per CPCB notification and MoEF & CC Guidelines. Details have been included

	<p>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 predominant downwind direction. The mineralogical composition of PM10, particularly for free silica, should be given.</p>	<p>in sections 3.1-3.6, pp.30-98 under chapter III.</p>
23	<p>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 predominant wind direction may also be indicated on the map.</p>	<p>Air quality modelling for prediction of incremental GLCs of pollutants was carried out using AERMOD view 4.4.2.3. The model results have been given in pp.117-118 under the chapter IV.</p>
24	<p>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.</p>	<p>The water requirement details have been provided in Table 2.11 in p.24 under chapter II.</p>
25	<p>Necessary clearance from the competent authority for drawl of requisite quantity of water for the project should be provided.</p>	<p>Not Applicable. Water for dust suppression, greenbelt development and domestic use will be sourced from accumulated</p>

		<p>rainwater/seepage water in mine pits and purchased from local water vendors through water tankers on daily requirement basis.</p> <p>Drinking water will be sourced from the approved water vendors.</p>
26	<p>Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.</p>	<p>Part of the working pit will be allowed to collect rain water during the spell of rain. The water thus collected will be used for greenbelt development and dust suppression.</p> <p>The mine closure plan has been prepared for converting the excavated pit into rain water harvesting structure and serve as water reservoir for the project village during draught season.</p>
27	<p>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.</p>	<p>Impact studies and mitigation measures of water environment including surface water and ground water have been discussed in section 4.3, pp. 108-110 under the chapter IV.</p>
28	<p>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 hydrogeological 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 should be furnished.</p>	<p>The ground water table is found at the depth of 50m below ground level.</p> <p>The depth of quarry is 35m BGL Therefore, the mining activity will not intersect the ground water table. Data regarding the occurrence of groundwater table have been provided in p.44-51 under the chapter III.</p>
29	<p>Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion proposed, if any, and</p>	<p>Not Applicable.</p> <p>There are no streams, seasonal or other water bodies passing within the project</p>

	the impact of the same on the hydrology should be brought out.	area. Therefore, no modification or diversion of water bodies is anticipated.
30	Information on site elevation, working depth, groundwater table etc. should be provided both in AMSL and BGL. A schematic diagram may also be provided for the same.	The mean elevation of the project area is 276 m AMSL. Ultimate depth of the mine is 35m below ground level (BGL). Depth to the water level in the area is 50m BGL.
31	A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed prior to commencement of the project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution.	Greenbelt development plan has been given in section 4.6.2, pp.125-127 under chapter IV.
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	Traffic density survey was carried out to analyse the impact of transportation in the study area as per IRC guidelines 1961 and it is inferred that there is no significant impact due to the proposed transportation from the project area. Details have been provided in section 3.8, pp.104-105 under chapter III.

	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.	Infrastructure & other facilities will be provided to the mine workers after the grant of quarry lease and the same has been discussed in section 2.6.6, p.24 under chapter II.
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.	Mine closure plan is a part of approved mining plan enclosed in Annexure III.
35	Occupational health impacts of the project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.	Occupational health impacts of the project and preventive measures have been explained in detail in section 4.8 pp.132-133 under chapter IV.
36	Public health implications of the project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.	No public health implications are anticipated due to this project. Details of CSR and CER have been given in sections 8.6 and 8.7, pp.162-163 under the chapter VIII.
37	Measures of socio-economic significance and influence to the local community proposed to be provided by the project proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.	No negative impact on socio-economic environment of the study area is anticipated and this project shall benefit the Socio-Economic environment by offering employment for 26 people directly as discussed in section 8.1,p.161 under chapter VIII.
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	Detailed environment management plan for the project to mitigate the anticipated impacts has been included in pp.165-183 under chapter X.

	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.	The outcome of public hearing proceedings will be given in the final EIA/EMP report.
40	Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.	No litigation is pending in any court against this project.
41	The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.	Project cost is Rs. 38,95,000 /- CER cost is Rs. 77,900/-. In order to implement the environmental protection measures, an amount of Rs.15,87,000/- as capital cost and Rs.18,58,000/- as recurring cost is proposed considering present market scenario for the proposed project in p.183 under chapter X.
42	A disaster management plan shall be prepared and included in the EIA/EMP report.	Details regarding disaster management plan have been provided in section 7.3, pp.146-149 under chapter VII.
43	Benefits of the project if the project is implemented should be spelt out. The benefits of the project shall clearly indicate environmental, social, economic, employment potential, etc.	Details have been given in p.161 – 164 under chapter VIII.
44	Besides the above, the below mentioned general points are also to be followed:	
a)	Executive summary of the EIA/EMP report	Enclosed as separate booklet.
b)	All documents to be properly referenced with index and continuous page numbering.	All the documents have been 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 have been mentioned.

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	Original Baseline monitoring reports will be submitted in the final EIA report.
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.	The questionnaire 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 4 th 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 4 th August, 2009 have been followed while preparing the EIA report.
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.	Not applicable.
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.	The application to obtain the report of the status of compliance of the conditions stipulated in the environment clearance for the existing operations of the project is under process. The report will be submitted to the respective authority at the time of EIA presentation.
j)	The EIA report should also include (i) surface plan of the area indicating contours of main	Surface & geological plans have been

	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.	included in Figure 2.8 in p.18. Closure plan has been included in Figure 2.11 in p.23.
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LIST OF ABBREVIATIONS AND ACRONYMS

AAQ	Ambient Air Quality
AMSL	Above Mean Sea Level
AGL	Above Ground Level
BGL	Below Ground Level
BMTPC	Building Materials & Technology Promotion Council
BW	Bore Well
CPCB	Central Pollution Control Board
CER	Corporate Environment Responsibility
CSR	Corporate Social Responsibility
CTE	Consent to Establish
CTO	Consent to Operate
DGM	Department of Geology & Mining
DGMS	Directorate General of Mines Safety
DGPS	Differential Global Positioning System
DMF	District Mineral Foundation
EC	Environment Clearance
EMP	Environment Management Plan
EIA	Environmental Impact Assessment
EMC	Environmental Management Cell
FAE	Functional Area Experts
FDS	Fine Dust Samplers

GIS	Geographical Information System
GW	Ground Water
GLC	Ground Level Concentration
GPS	Global Positioning System
GSI	Geological Survey of India
GTMS	Geo Technical Mining Solution
HEMM	Heavy Earth Moving Machinery
HMV	Heavy Motor Vehicle
HSD	High Speed Diesel
HP	Horse Power
IMD	India Meteorological Department
IUCN	International Union for Conservation of Nature
ISRO	Indian Space Research Organization
LEQ	Equivalent Noise Level
LC/ LU	Land Cover/ Land Use
LC	Least Concern
LMV	Light Motor Vehicle
HSE	Health, Safety and Environment
Ha	Hectare
KLD	Kilo Liters Per -Day
KM	Kilo Meter
MMR	Metalliferous Mines Regulations
MMDR	Mines And Minerals Development and Regulation
MOEF & CC	Ministry of Environment Forest and Climate Change
M	Meter
NE	Northeast
NW	Northwest
NAAQ	National Ambient Air Quality Standards
NABET	National Accreditation Board for Education & Training
NABL	National Accreditation Board for Testing and Calibration Laboratories
NH	National Highway
NOC	No Objection Certificate
NONEL	Non-Electric
NNRMS	National Natural Resources Management System
NL	Not Listed
NT	Near Threatened
OW	Open Well
PCU	Passenger Car Unit

PFR	Pre-Feasibility Report
pH	Potential of Hydrogen
PM	Particulate Matter
PSI	Pounds Per Square Inch
PPE	Personal Protective Equipment
PPV	Peak Particle Velocity
QCI	Quality Council of India
RET	Rare Endangered Threatened Species
RDS	Respiratory Dust Samplers
RF	Reserve Forest
SW	Surface Water
SE	Southeast
SW	Southwest
SEIAA	State Environmental Impact Assessment Authority
SEAC	State Expert Appraisal Committee
SOI	Survey of India
SH	State Highway
SPM	Suspended Particulate Matter
TDS	Total Dissolved Solids
TM	Team Member
TS	Transport Service
TNPCB	Tamil Nadu Pollution Control Board
TOR	Terms of Reference
VES	Vertical Electric Sounding
WW	Well Water
NO ₂	Nitrogen Dioxide
SO ₂	Sulphur Dioxide
µg/m ³	Micro Gram Per Meter Cube
µm	Micro Meter
Dia.	Diameter
CUM	Cubic Meter
dB	Decibel
gm/sec	Gram Per Second
gm/cc	Gram Per Cubic Meter
hr/day	Hour Per Day
kg	Kilogram
kg/hr	Kilogram Per Hour
kg/ha	Kilogram Per Hectare
m	Meter

mg/kg	Milligrams Per Kilogram
mg/l	Milligram Per Litter
mm	Millimeter
Sq.km	Square Kilometre

CHAPTER I

INTRODUCTION

1.0 PREAMBLE

Environmental Impact Assessment (EIA) study is a process used to identify the environmental, social and economic impacts of a project prior to decision-making. EIA systematically examines both beneficial and adverse consequences of the proposed project and ensure that these impacts are considered during the project designing. According to the Ministry of Environment and Forests, Govt. of India, 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, all the mining projects are broadly classified into two categories, i.e., category A and category B, based on the spatial extent of the projects. The category B projects are further divided in to B1 and B2 on the basis of the guidelines issued of the Ministry of Environment and Forests. All mining projects included in category B1 require an EIA report for obtaining environmental clearance from the State Environment Impact Assessment Authority (SEIAA). As the proposed project falls within the cluster of quarries of overall extent of greater than 5 ha and less than 100 ha, the proposed project falls under the category B1 and the project requires preparation and submission of an EIA report after public consultation to SEIAA for obtaining environmental clearance.

In compliance with ToR obtained vide letter No. SEIAA-TN/F.No.8787/SEAC/ToR-1151/2021, Dated:23.05.2022 this EIA report is prepared for the project proponent, A. Govindarajan applied for rough stone quarry lease in the Government Poramboke land falling in S. F. No. 569/1(Part-4) over an extent of 1.20.0 ha in Nadumandalam Village, Natham Taluk, Dindigul District and Tamil Nadu, considering cumulative load of all the rough stone quarry projects including 2 existing quarries, 2 Expired quarries and 2 proposed quarries falling in the cluster of 500m radius from the periphery of the proposed project. The total extent of all the quarries in the cluster is **10.45.0 ha**. All the quarries in the cluster are shown in Figure 1.1.p

1.1 PURPOSE OF THE REPORT

The purpose of the report is to study baseline environmental conditions in and around the proposed project area for the period of **March – May 2022** according to the provisions of MoEF & CC Office Memorandum dated 29.08.2017 and MoEF & CC Notification, S.O. 996 (E) dated 10.04.2015.

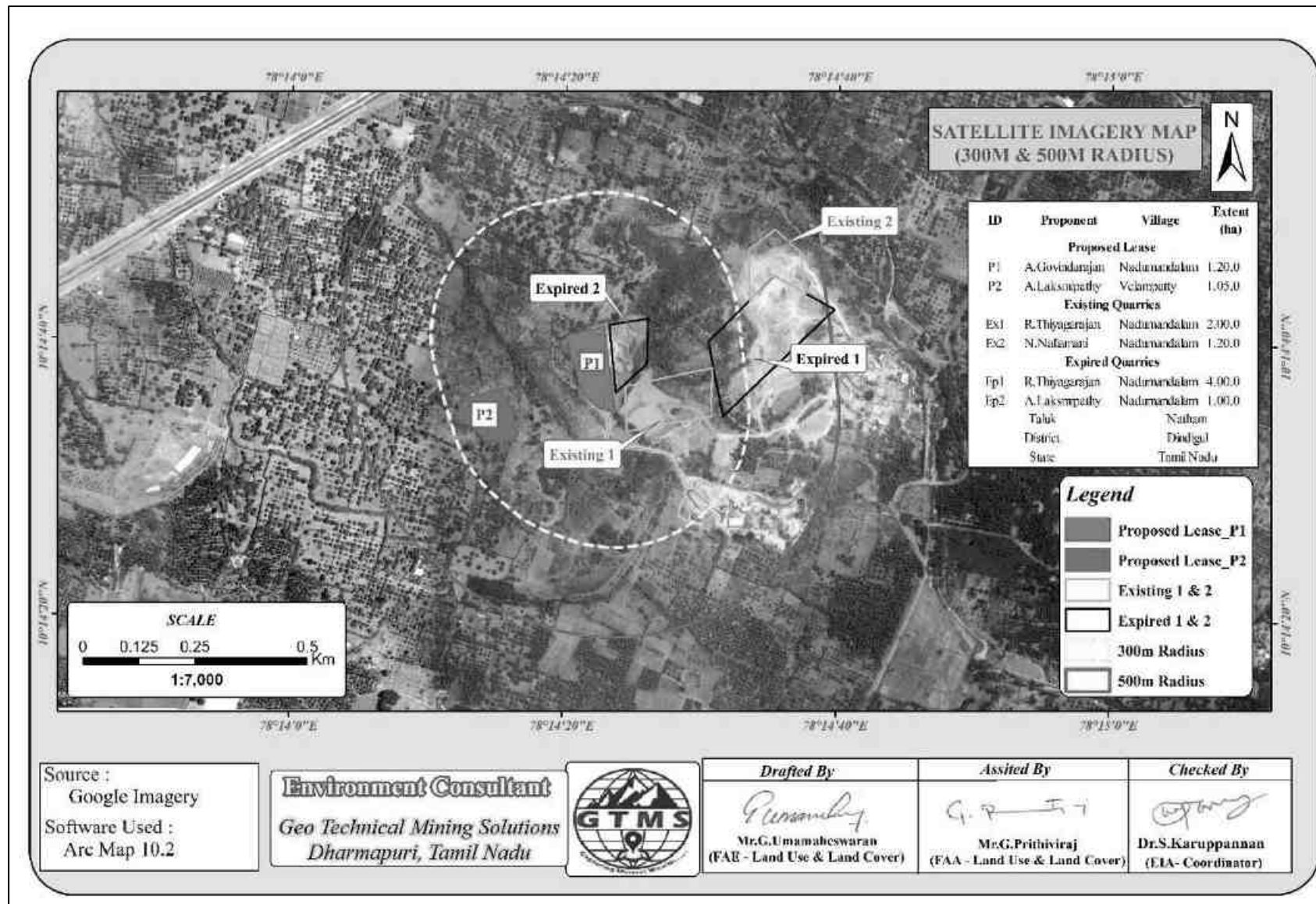


Figure 1.1 Location of the proposed and existing rough stone quarries in the cluster of 500m radius

1.2 ENVIRONMENTAL CLEARANCE

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

- ❖ Screening
- ❖ Scoping
- ❖ Public consultation &
- ❖ Appraisal

1.2.1 Screening

Screening is the first stage of the EIA process. In this stage, the State level Expert Appraisal Committee (SEAC) examined the application of EC made by the proponent in Form 1 through online (proposal No. SIA/TN/ MIN/ 67376 /2021, Dated: 09.09.2021) and decided whether the project requires detailed environmental studies for the preparation of EIA report or not.

1.2.2 Scoping

During scoping, the SEAC framed a comprehensive Terms of Reference (ToR) based on the information provided in the Form 1 and information collected from the proposed project site visit and issued ToR to the proponent vide letter No. SEIAA-TN/F.No. 8787/SEAC/ToR-1151/2021 dated 23.05.2022 for the preparation of an EIA report.

1.2.3 Public Consultation

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

1.2.4 Appraisal

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

1.3 TERMS OF REFERENCE (ToR)

Compliance to ToR issued vide

- ❖ ToR Lr.No. SEIAA-TN/F.No. 8787/SEAC/ToR-1151/2021 dated 23.05.2022.

1.4 POST ENVIRONMENT CLEARANCE MONITORING

After obtaining EC, the project proponent will submit a half-yearly compliance report of stipulated environmental clearance terms and conditions to MoEF & CC Regional Office & SEIAA on 1st June and 1st December of every year.

1.5 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. The generic structure of the EIA document should be as under:

- ❖ Introduction
- ❖ Project Description
- ❖ Description of the Environment
- ❖ Anticipated Environmental Impact & Mitigation Measures
- ❖ Analysis of Alternatives (Technology & Site)
- ❖ Environmental Monitoring Program
- ❖ Additional Studies
- ❖ Project Benefits
- ❖ Environmental Cost Benefit Analysis
- ❖ Environmental Management Plan (EMP)
- ❖ Summary & Conclusion
- ❖ Disclosure of Consultants engaged.

1.1 DETAILS OF PROJECT PROPONENT

Name of the Project Proponent	Thiru.A.GOVINDARAJAN
Address	S/o.Amirhalingadoss, D.No.6, Manmalai Kovil street, K.Pudur, Madurai North, Madurai District – 625007.
Status	Proprietor

1.2 BRIEF DESCRIPTION OF THE PROJECT

Name of the Quarry	Thiru. A. GOVINDARAJAN - Rough stone quarry	
Toposheet No	58-J/04	
Latitude	10°14'34.88"N to 10°14'41.04"N	
Longitude	78°14'20.33"E to 78°14'23.92"E	
Highest Elevation	290m AMSL	
Ultimate depth of Mining as for Tor	35m (10m AGL+ 20m BGL)	
Geological Resources	Rough Stone in m ³	Topsoil m ³
	2,77,070	3367
Mineable Reserves	Rough Stone in m ³	Topsoil m ³
	1,05,820	1917
Proposed reserve for five years upto the depth of 35m (10m AGL + 25mBGL)	1,05,820	1917
Ultimate Pit Dimension as for ToR	142m (L) x 35m (W) x 35m (D)	
Method of Mining	Opencast Mechanized Mining Method involving drilling and blasting	
Topography	Elevated terrain	
Machinery proposed	Jack Hammer	2 Nos
	Compressor	1 Nos
	Hydraulic Excavator	1 Nos
	Tippers	2 Nos
Blasting Method	Controlled Blasting Method by shot hole drilling and small dia of 25mm slurry explosive are proposed to be used for shattering and heaving effect for removal and winning of Rough Stone. No deep hole drilling is proposed.	
Proposed Manpower Deployment	26 Nos	
Project Cost	Rs.38,95,000 /-	
CER Cost @ 2% of Project Cost	Rs. 77,900/-	
Proposed Water Requirement	3.3 KLD	
Nearest Habitation	540m - South	

1.6 SCOPE OF THE STUDY

The main scope of the EIA study is to quantify the cumulative impact of the quarries in the cluster on the study area and formulate the effective mitigation measures for each individual lease. A detailed account of the emission sources, emissions control equipment, background air quality levels, meteorological measurements, dispersion model and all other aspects of pollution like effluent discharge, and dust generation has been provided in this report. The baseline monitoring study has been carried out during the period of **March – May 2022** for various environmental components such as land, soil, air, water, noise, ecology, etc. to assess the anticipated impacts of the cluster quarry projects on the environment and suggest suitable mitigation measures for likely adverse impacts due to the proposed project. The sampling methodologies for the various environmental parameters required for the study, frequency of sampling, method of sample analysis, etc., are given in Table 3.1 in chapter III.

1.7 REFERENCES

The report has been prepared using the following references:

- ❖ Guidance Manual of Environmental Impact Assessment for Mining of Minerals, Ministry of Environment and Forests, February, 2010
- ❖ EIA Notification, 14th September, 2006
- ❖ Terms of Reference (ToR) issued by SEIAA
- ❖ Approved Mining Plan of this project
- ❖ In addition, other relevant standards for individual activities such as sampling and testing of environmental attributes.

CHAPTER II

PROJECT DESCRIPTION

2.0 GENERAL INTRODUCTION

The open cast mining method, also known as open-pit mining has been proposed to extract the mineral deposit. It is the most commonly used surface mining method all over the world and is generally suitable for mining low-grade mineral deposits that are found close to the surface of the earth and distributed uniformly over a large area. Open pits are also termed quarries when the pits are used for the extraction of building materials and dimension stones.

Opencast mining starts with the development of benches, the widths of which will be determined in such a way to accommodate the use of heavy machinery. The walls of open pits will be dug at an angle that will be decided based on well-established industry standards to provide safety. In some cases where the walls are composed of weak material such as soil and highly weathered rocks, dewatering holes will be drilled horizontally to relieve the water pressure to avoid wall collapse inside the mine site.

The required mine-related infrastructures will be established close to the open pit. The mining infrastructures may include an administration building, a maintenance garage, and a warehouse. The materials mined from open pits will be brought to the surface using trucks. The waste rocks will be piled up in a suitable location, usually close to the open pit. The structure produced by the waste rock pile is known as a waste dump. The dimension of the waste dump will be determined based on industrial safety standards to prevent the rocks from falling into the surrounding area.

2.1 DESCRIPTION OF THE PROJECT

The proponent, **A.Govindarajan** is involved in the undertaking of establishment, construction, development, and closure of open cast mines. He, through the exploration phase, identified the proposed project site as the one that has a great potential of producing an economically viable quantity of rough stone. Therefore, the proponent had applied for quarry lease on 25.02.2021 to extract rough stone. The precise area communication letter was issued by Geology and Mines Department, Dindigul vide letter No.112/2021-minerals dated 06.05.2021. Based on the precise area communication letter, mining plan was prepared. The mining plan approved by Assistant Director of Geology and Mining, Dindigul (letter No.112/2021(Mines) dated: 12.07.2021). The overall view of the project site is shown in Figure 2.1.



Figure 2.1 Overall View of Proposed project site

2.2 LOCATION AND ACCESSIBILITY

The proposed quarry project falls in Nadumandalam Village, Natham Taluk, Dindigul District, as shown in Figure 2.2. The project site lies between the Latitudes from $10^{\circ}14' 34.88''\text{N}$ to $10^{\circ}14' 41.04''\text{N}$ and Longitudes from $78^{\circ}14' 20.33''\text{E}$ to $78^{\circ}14' 23.92''\text{E}$. Accessibility routes to the proposed project site have been shown in Figure 2.3.

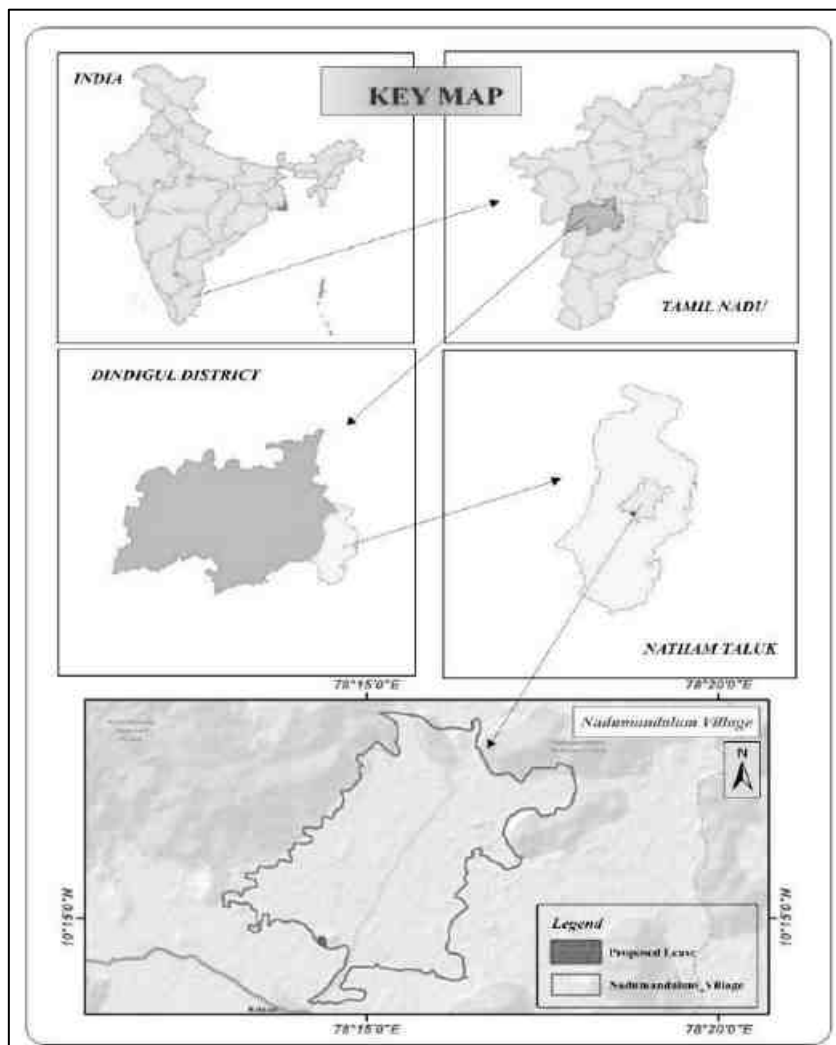


Figure 2.2 Key Map Showing location of the project site

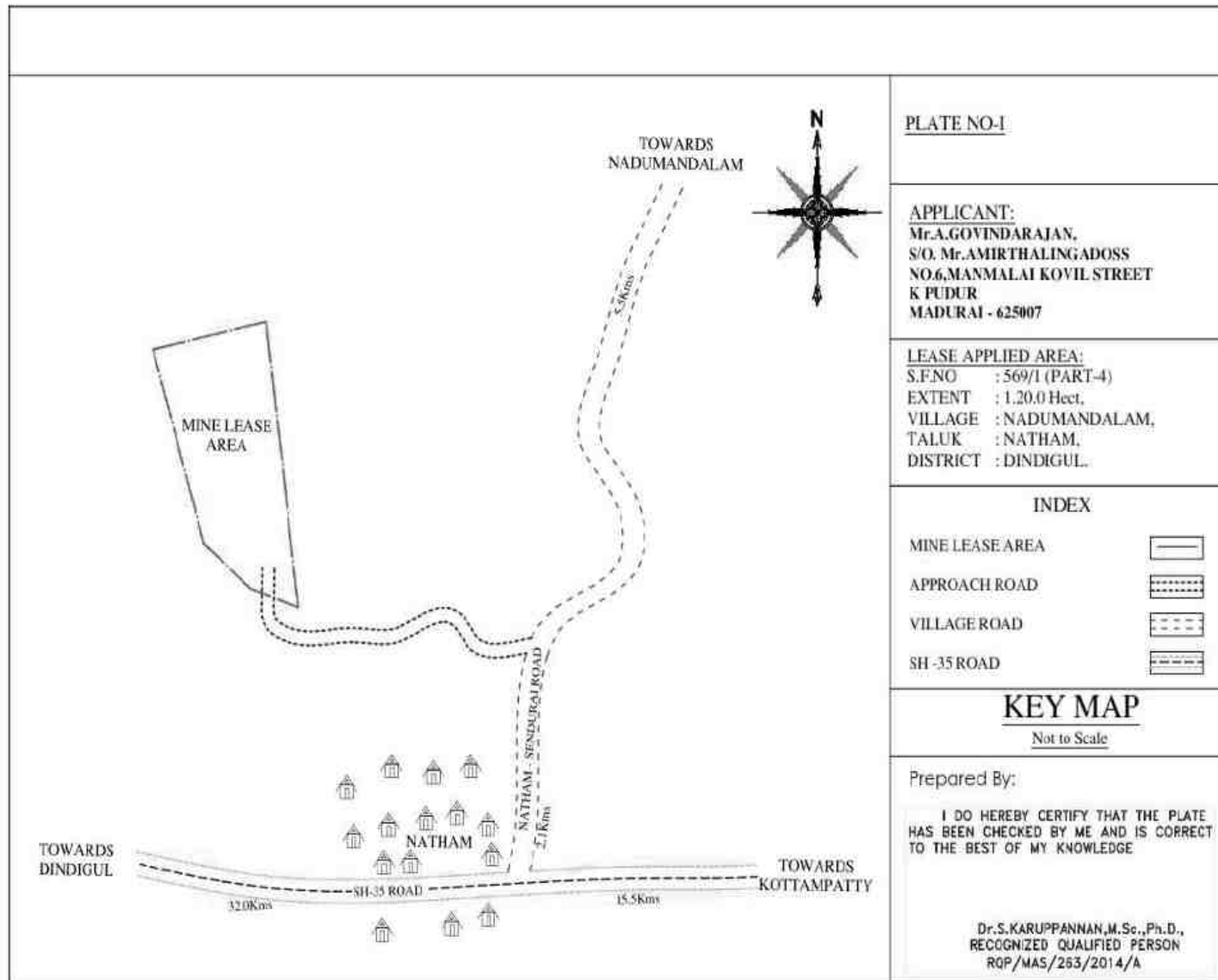


Figure 2.3 Map showing Accessibility Route to the Proposed Project Site

Table 2.1 Site Connectivity to the Project Area

Nearest Roadway	Nearest State Highway – 383 Dindigul- Natham- Kottampatti – 8.5km South Village Road Natham to Nadumandalam-644– 0.70km east
Nearest Village	Nadumandalam – 1.5 km-North
Nearest Town	Natham – 2.20 km – South
Nearest Railway Station	Dindigul – 30 km – West
Nearest Airport	Madurai – 47 km- South
Nearest Seaport	Thoothukudi- 163 km – South

2.3 LEASEHOLD AREA

- ❖ The extent of the proposed project site is **1.20.0 ha**.
- ❖ The proposed project is site specific
- ❖ There is no mineral beneficiation or processing proposed inside the project area
- ❖ There is no forest land involved in the proposed area and is devoid of major vegetation and trees

2.3.1 Corner Coordinates

The boundary corner coordinates are given in Table 2.2 and the location of 5 boundary corners are shown in Figure 2.4.

Table 2.2 Corner Geographic Coordinates of Proposed Project

Boundary Pillar No.	Latitude	Longitude
1	10°14' 41.04"N	78°14' 23.09"E
2	10°14' 34.88"N	78°14' 23.92"E
3	10°14' 35.30"N	78°14' 22.73"E
4	10°14' 36.30"N	78°14' 21.57"E
5	10°14' 40.42"N	78°14' 20.33"E

Source: Approved Mining plan

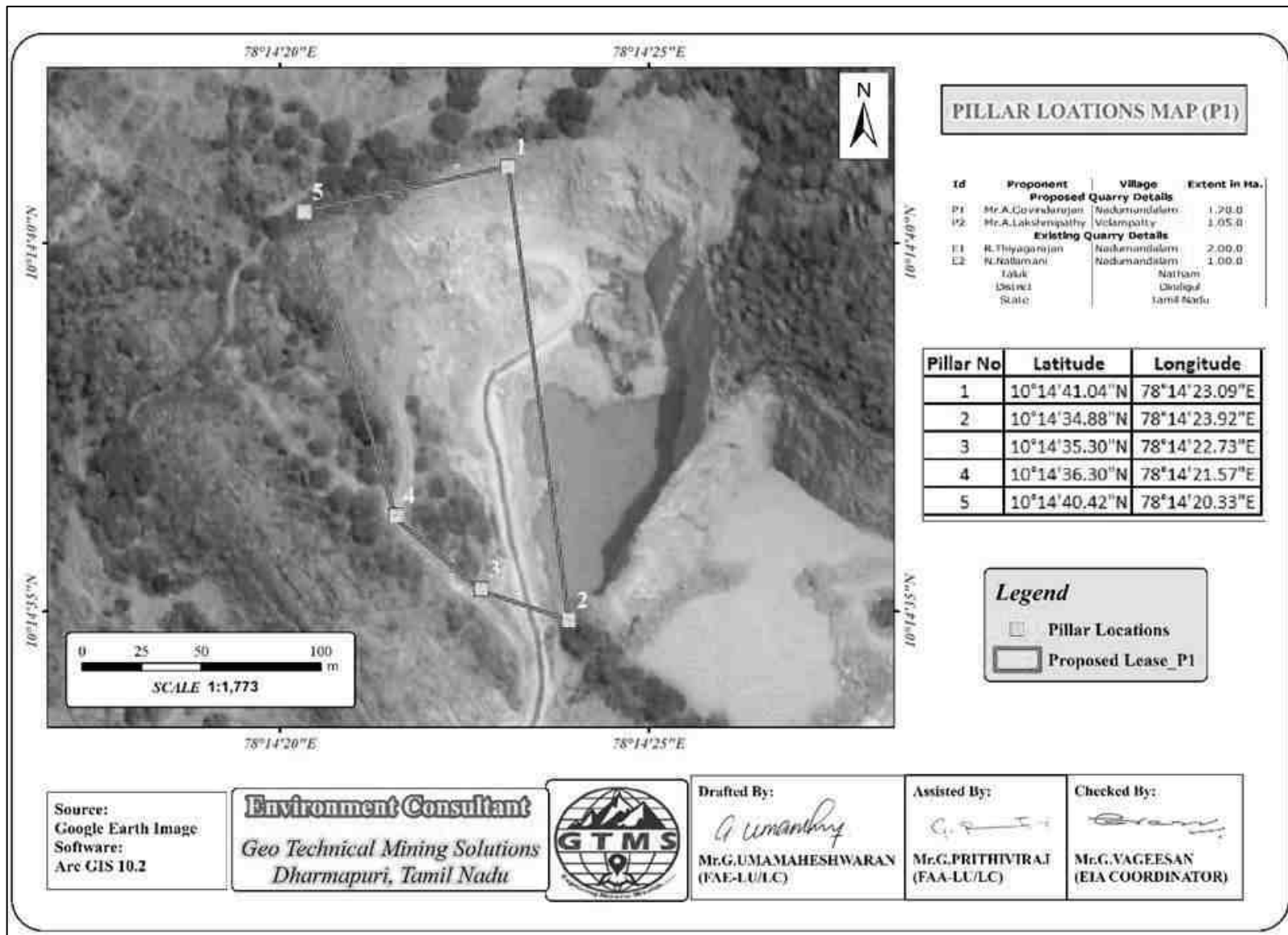


Figure 2.4 Map showing Pillar locations

2.4 GEOLOGY

2.4.1 Regional Geology of Dindigul District

The district is essentially a high-grade gneissic terrain characterized by highly deformed rocks, which can be classified under three groups as 1) Khondalite Group, 2) Charnockite Group and 3) Migmatite Group. The terrain also exposes basic/ultrabasic and younger acid intrusives.

Khondalite Group comprises quartzite, calc granulite / crystalline limestone, garnet-sillimanite gneiss, garnet-cordierite gneiss and garnet quartz-feldspar gneiss. Quartzite is an important member of the group, which occurs as linear bands of 5 m to 50 m thick and occupies the crest of linear ridges. It is white or smoky grey and consists of interlocking grains of quartz with minerals like garnet, biotite, diopside, sillimanite and magnetite as accessories. Magnetitequartzite bands are of restricted thickness. Calcgneiss is grey or green and banded, which shows typical ribbed weathering. It consists of diopside, calcite, scapolite, wollastonite and sphene in various proportions with a small amount of quartz and garnet. With decrease in silicate minerals and increase in carbonates, it grades into crystalline limestone. Crystalline limestone is white, medium to coarse, with interlocking calcite, with a small amount of diopside, biotite and magnetite. Garnet-sillimanite gneiss is medium to coarse grained, 5 to 100 m thick and can be traced over a few kilometers along strike. It is mainly made of bands of quartz-k-feldspar rich layers alternating with layers rich in biotite, sillimanite and garnet. Garnet porphyroblasts up to 3 cm in diameter and sillimanite needles upto 5 cm x 2.5 mm size, are seen at a few places. This rock also has thin inter bands of garnet-cordierite gneiss and garnet quartz-feldspar gneiss.

The metasedimentary rocks occur either as individual bands or as swathes of bands repeated several times with width varying from 10 m to 100 m and exposed length from 100 m to a few kilometers, within the Charnockites and Migmatites. These bands are repeated several times because of tectonic slicing.

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

forms high hills / hill ranges and also occupies the plains, covered by 1-2 m thick soil. Migmatite is a group of banded felsic rocks of varying mineralogical composition that are formed due to the influx of quartzo-feldspathic material into high grade metamorphic rocks. Two types of migmatite are seen in the Dindigul district, one is grey and the other is pink. Next to charnockite, migmatite gneiss is the second most extensive rock. The migmatite gneiss consists of quartz, kfeldspar, plagioclase, hornblende and biotite in varying proportions. Intrusive igneous rocks are seen in the area are meta-gabbro and anorthosites as for example around Oddanchatram and east of Vedasandur. Meta gabbro is coarse grained, dark grey, mainly comprising pyroxene, amphibole and plagioclase. Anorthosite is pale pink to light brown, medium to coarse grained rock essentially made up of plagioclase with a small amount of pyroxene and amphibole. Quartz and pegmatite veins are of restricted areal extent. Minor bodies of younger granite are exposed in the area east of Vedasandur. Foliation/ gneissosity, the prominent planar structure seen in the metamorphic rocks is ENE-WSW in the west and near N-S in the central part of the district. The eastern part of the district shows complicated folded structures due to interference of two phases of folding, forming a series of domes and basins. Faults and shear zones trend N-S in the central part, and NW-SE in the southern part.

Table 2.3 Stratigraphy of the district

Age	Group	Lithology
QUATERNARY	Recent to Pleistocene	Kankar Laterite
PROTEROZOIC	Acid intrusives	Quartz veins Pegmatite Granite
	Migmatite Group	Pink migmatite Granitic gneiss Hornblende-biotite gneiss
	Basic/Ultrabasic Intrusives	Anorthosite Amphibolite / Norite / Gabbro Ultramafics
ARCHAEO-PROTEROZOIC	Charnockite Group	Magnetite quartzite Pyroxene granulite Charnockite
	Khondalite Group	Garnet quartz - feldspar gneiss Garnet - sillimanite gneiss ± cordierite Calc-gneiss / Limestone Quartzite

Source: District Survey Report for Minor Minerals Dindigul District – [https:// Dindigul.nic.in/document/district-survey-report-minor-minerals-all/](https://Dindigul.nic.in/document/district-survey-report-minor-minerals-all/)

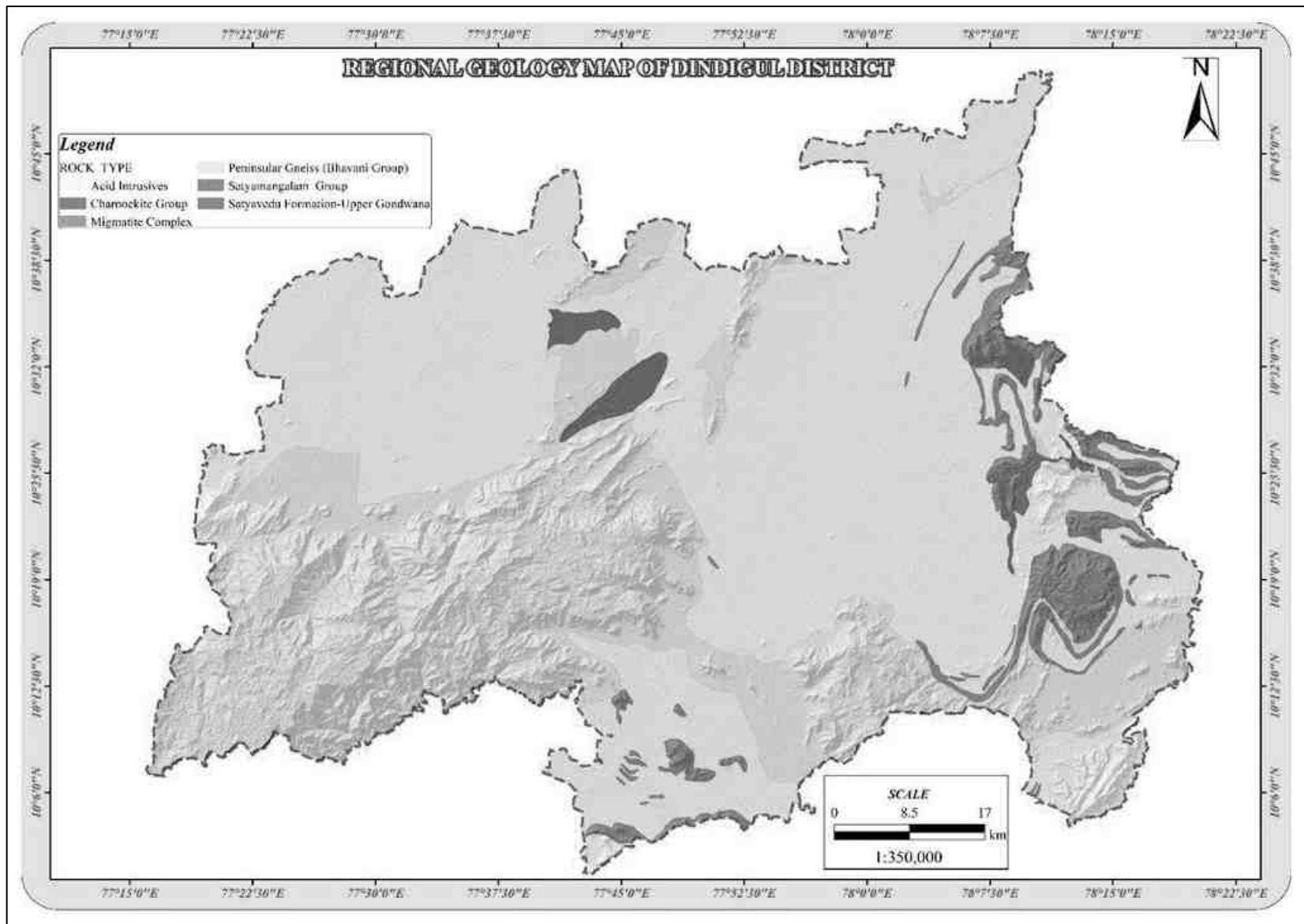


Figure 2.5 Regional Geology Map of Dindigul District

2.4.2 Local Geology and geomorphology

Peninsular gneiss forms the oldest rock formations, in which the massive formation of Granitic Gneiss lies over with rich accumulation of recent quaternary formation. On regional scale of the Granitic Gneiss formation trending towards N45°E – S45°W with dipping towards SE70°. The general geological sequences of the rocks in this area are given below:

AGE FORMATION

Recent – Quaternary formation (Topsoil + Weathered Rock)

-----Unconformity-----

Archaean– Charnockite

Peninsular Gneiss complex

Geomorphologically, the area is dominantly composed of shallow weathered shallow buried pediplain and moderately weathered buried pediplain, followed by ridge type structural hills.

2.5 QUANTITY OF RESERVES

The Resources and Reserves of Rough Stone were calculated based on Cross-Section Method by plotting sections to cover the maximum lease area for the proposed project. Based on the availability of Geological Resources the Mineable Reserves are calculated by considering excavation system of bench formation and leaving essential safety distance of 7.5m, 10m cemetery safety distance as per precise area communication letter and deducting the locked-up reserves during bench formation (also called as Bench Loss) and the mineable reserves is calculated considering there is no waste / overburden / side burden (100% Recovery anticipated) for the proposed project.

Table 2.4 Estimated Resources and Reserves of the Project

Resource Type	Rough Stone in m ³	Topsoil in m ³
Geological Resource in m ³	2,77,070	3367
Mineable Resource in m ³	1,05,820	1917

Table 2.5 Year-Wise Production Plan

YEAR	ROUGH STONE (m ³)
I	23,235
II	21,285
III	21,300
IV	19,350
V	20,650
TOTAL	1,05,820

Source: Approved Mining Plan & ToR

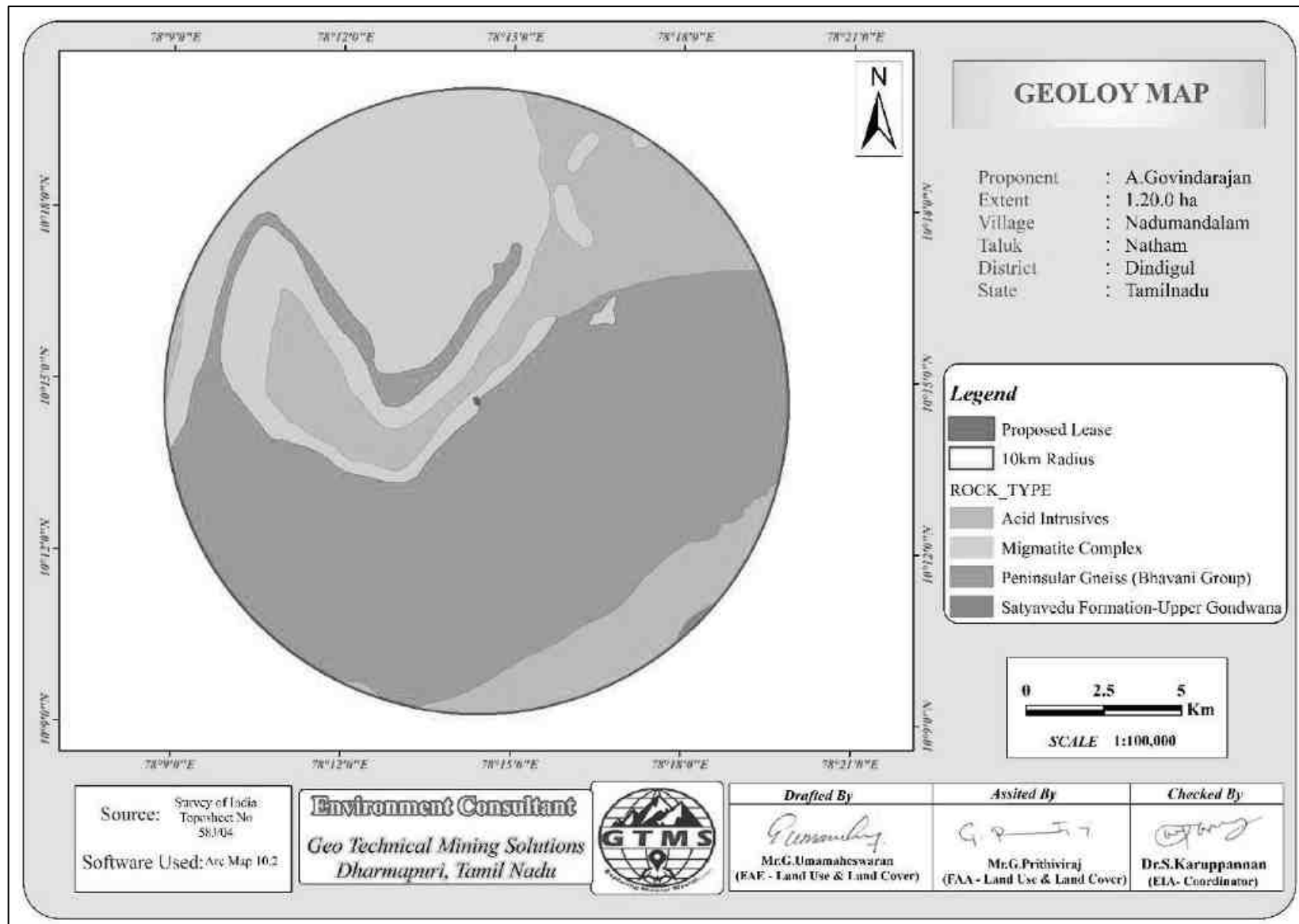


Figure 2.6 Geology map of 10km radius from the proposed Project Site

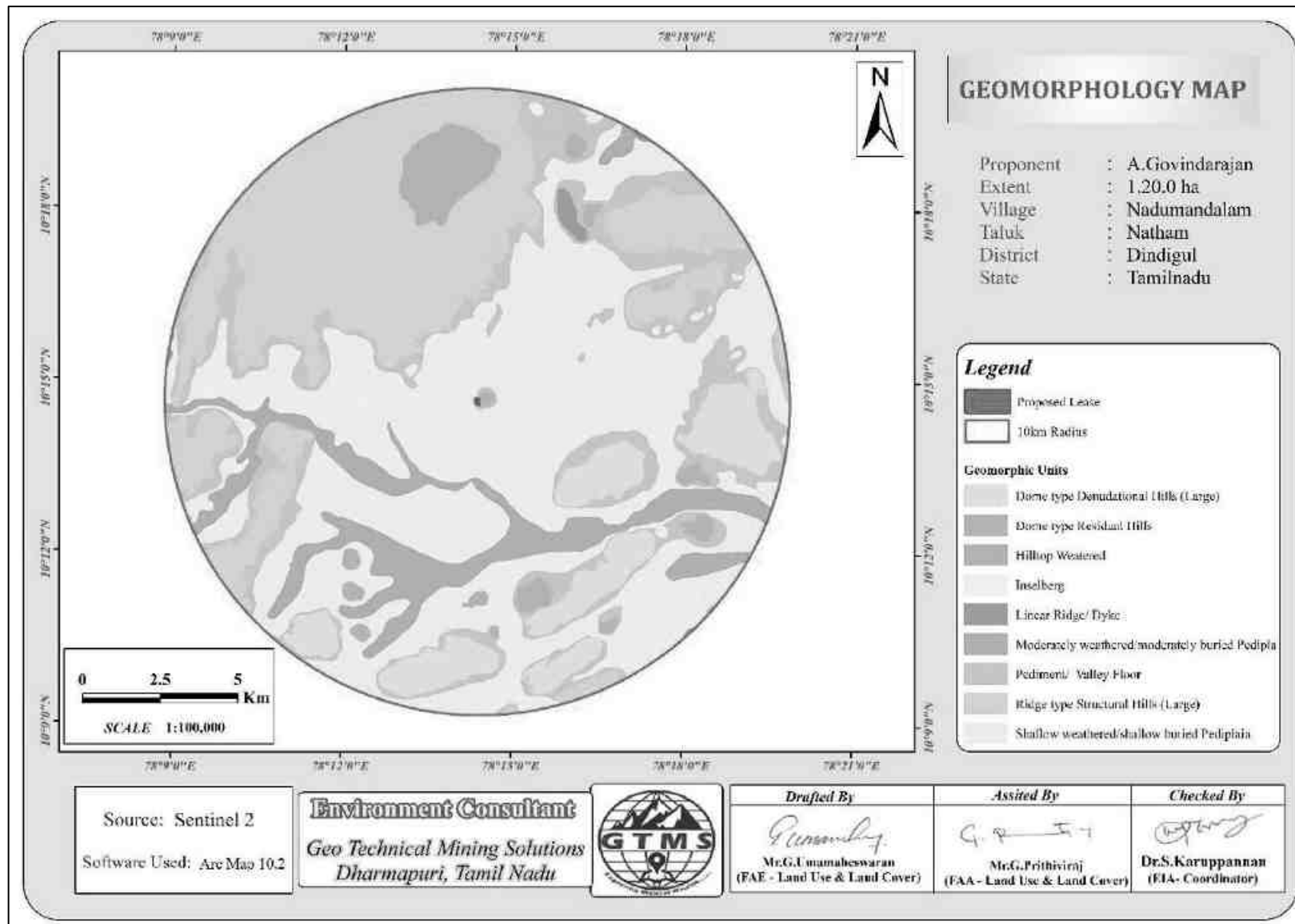


Figure 2.7 Geomorphology map of 10km radius from the proposed Project site

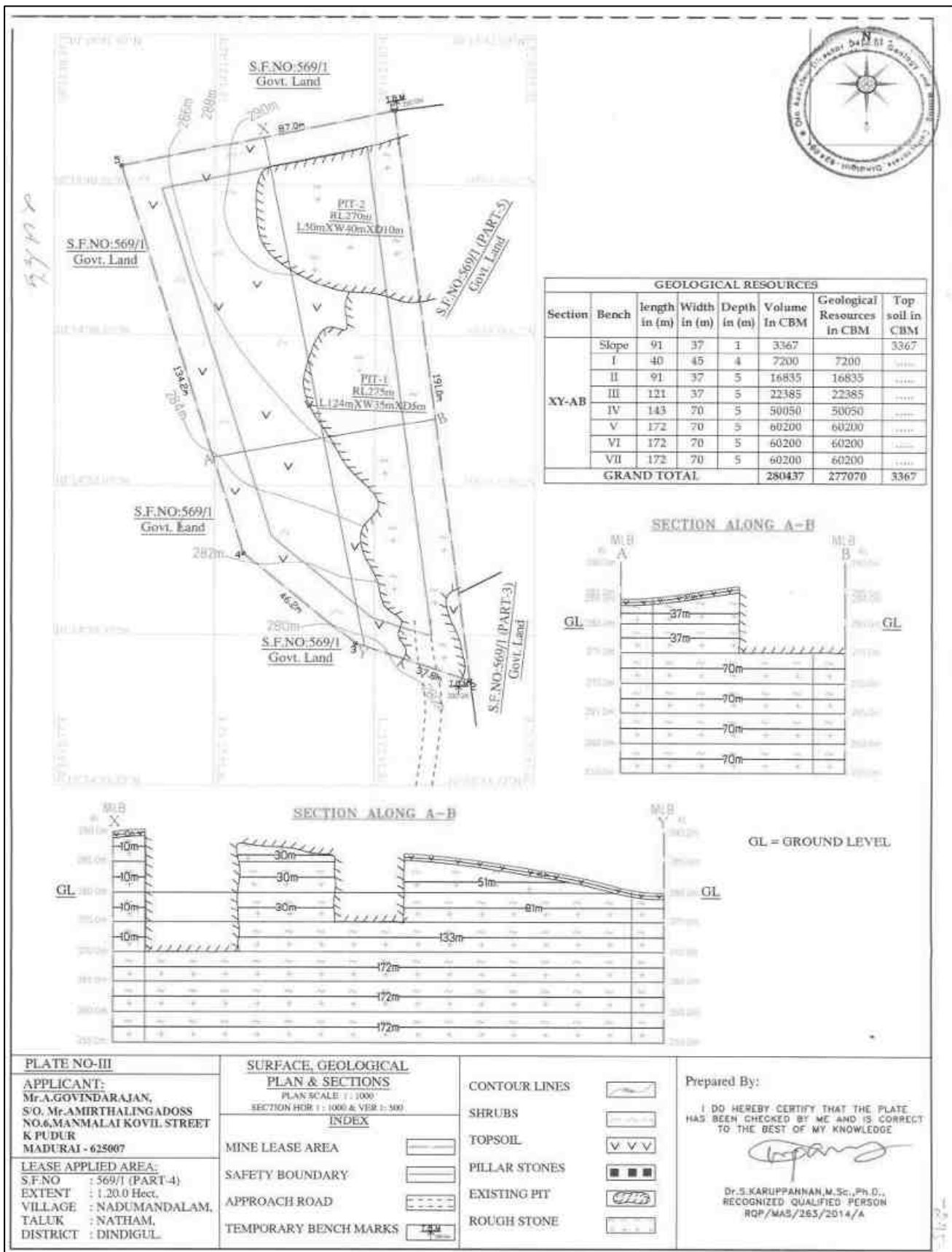


Figure 2.8 Topography, Geological Plan and Sections

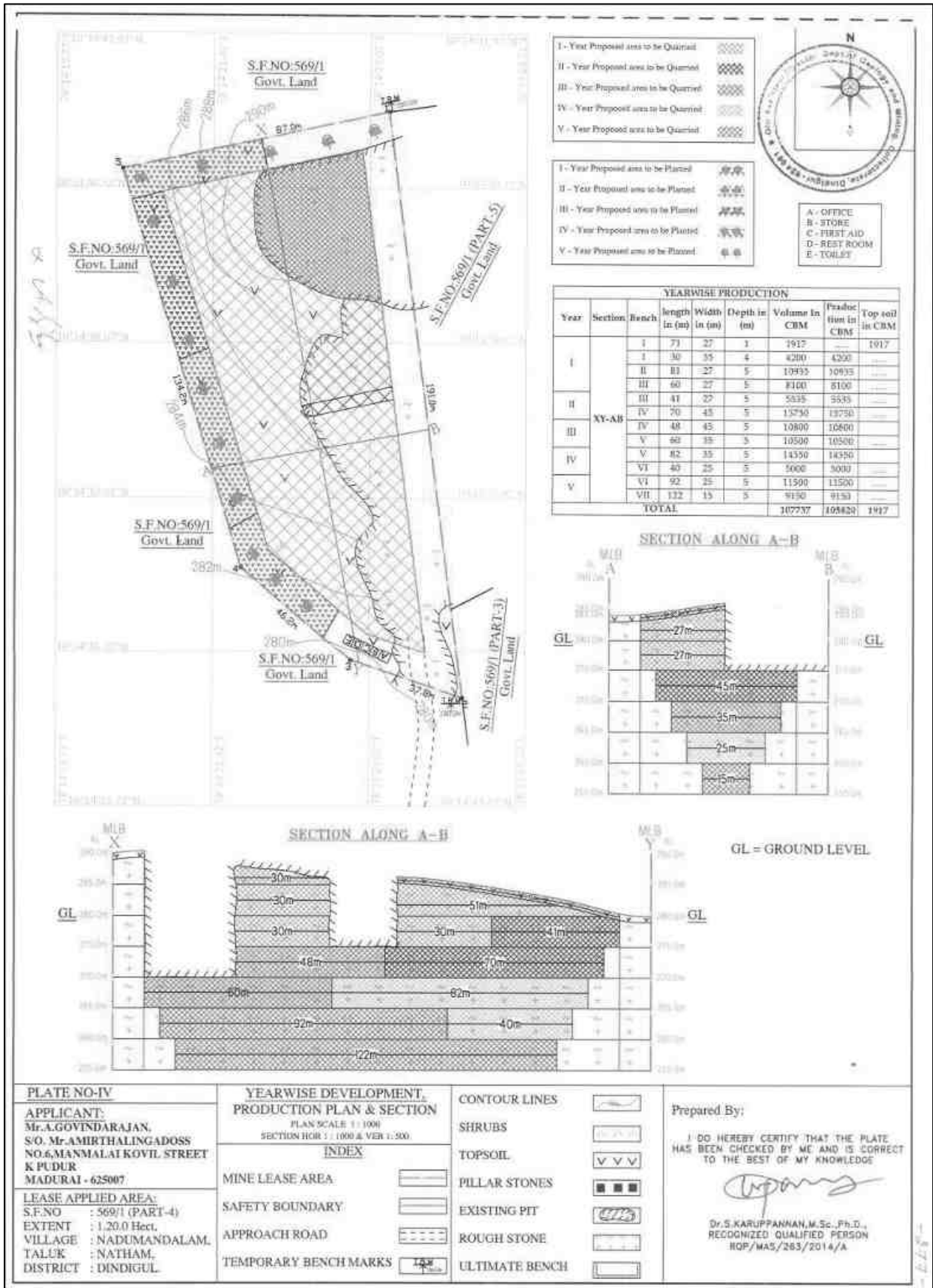


Figure 2.9 Year wise development and production plan and sections

2.6 MINING METHOD

The quarrying operation is proposed to be carried out by opencast semi-mechanized mining method with the bench height and width of 5m each. The open cast mining method offers several benefits to the proponent when compared to the more complex underground mining methods. The most important benefits include relatively smaller capital and operating costs, lesser safety hazards, ease of use for mass production, small closure costs, no restrictions on the use of heavy machinery if required, and easy drainage of subsurface water. Moreover, it provides a reasonable return on investments to the proponent and contributes to the growth of the local economy.

Excavators will be used in this method. In addition, drilling and blasting activities are inevitable in any quarry operations. In this project, shallow drilling with spacing of 1 m, burden of 0.8 m, and the depth of 1 m is proposed. After drilling, blasting operation will be carried out to remove overburden and weathered portions. This blasting is carried out for splitting the blocks from parent rock mass.

2.6.1 Magnitude of Operation

Based on the results of estimated production for the 5 years as shown in Table 2.5, details about the size of operation have been provided in Table 2.6.

Table 2.6 Operational Details for Proposed Project

	Rough Stone
Number of Working Days /Annum	300
Production of /Day (m ³)	71
No. of Lorry Loads	12

2.6.2 Extent of Mechanization

List of machineries proposed for the quarrying operation is given in Table 2.7.

Table 2.7 Machinery Details

Drilling Equipment					
Type	No. of Unit	Dia. of Hole (mm)	Size capacity	Make	Motive Power
Compressor	1	-	450/150psi	Atlas Capco	Diesel Drive
Jack Hammer	2	32	1.2 to 6m	Atlas Copco	Compressed air
Excavator	1	-	300	Tata Hitachi	Diesel Drive
Haulage & Transport Equipment					
Tipper	2		20 tons	TATA	Diesel Drive

2.6.3 Progressive Quarry closure plan

The Progressive quarry closure plan of the proposed project showing past, present, and future land use statistics, as provided in Table 2.8 is shown in Figure 2.10. According to the present land use data, about 0.78.0 ha of land is used for quarrying;

Table 2.8 Land use data at present, during scheme of mining, and at the end of mine life

Description	Present area in (ha)	Area at the end of life of quarry (ha)
Area under quarry	0.55.00	0.78.00
Infrastructure	Nil	0.01.00
Roads	Nil	0.03.00
Green Belt	0.65.00	0.24.00
Un – utilized area	Nil	0.14.00
Total	1.20.00	1.20.00

2.6.4 Quarry closure plan Budget

As the proposed project has the enormous potential for continuous operations even after the expiry of lease period, mine closure plan is not proposed for now. Based on the progressive mine closure plan for the scheme period, the mine closure cost is given in Table 2.9.

Table 2.9 Mine Closure Budget

Activity	Plantation in the construction phase (3Months) Year	Cost	Total Cost
Plantation in 7.5m, 10m Safety distance (in Nos.)	420	@ Rs 300 Per Sapling	Rs.1,26,600
Plantation in quarry approach road	180		Rs.54,000
Renovation of Wire Fencing	1.2hect * 2,00,000 and maintenance 5*20,000	Per Hectare fencing Cost @ Rs. 2,00,000/- with Maintenance of Rs 20,000/- per annum	Rs.3,20,000
Renovation of Garland Drain	1.2hect * 10,000 and maintenance 5*5,000	Provision for garland drain @ Rs. 10,000/- per Hectare with maintenance of Rs. 5,000/- per annum	Rs. 37,000
Total			Rs.5,48,600

Source: Mining plan

2.6.5 Conceptual Mining Plan

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

Table 2.10 Ultimate Pit Dimension

Pit I	Length in (m)	Width in (m)	Depth in (m)
I	142	35	35m

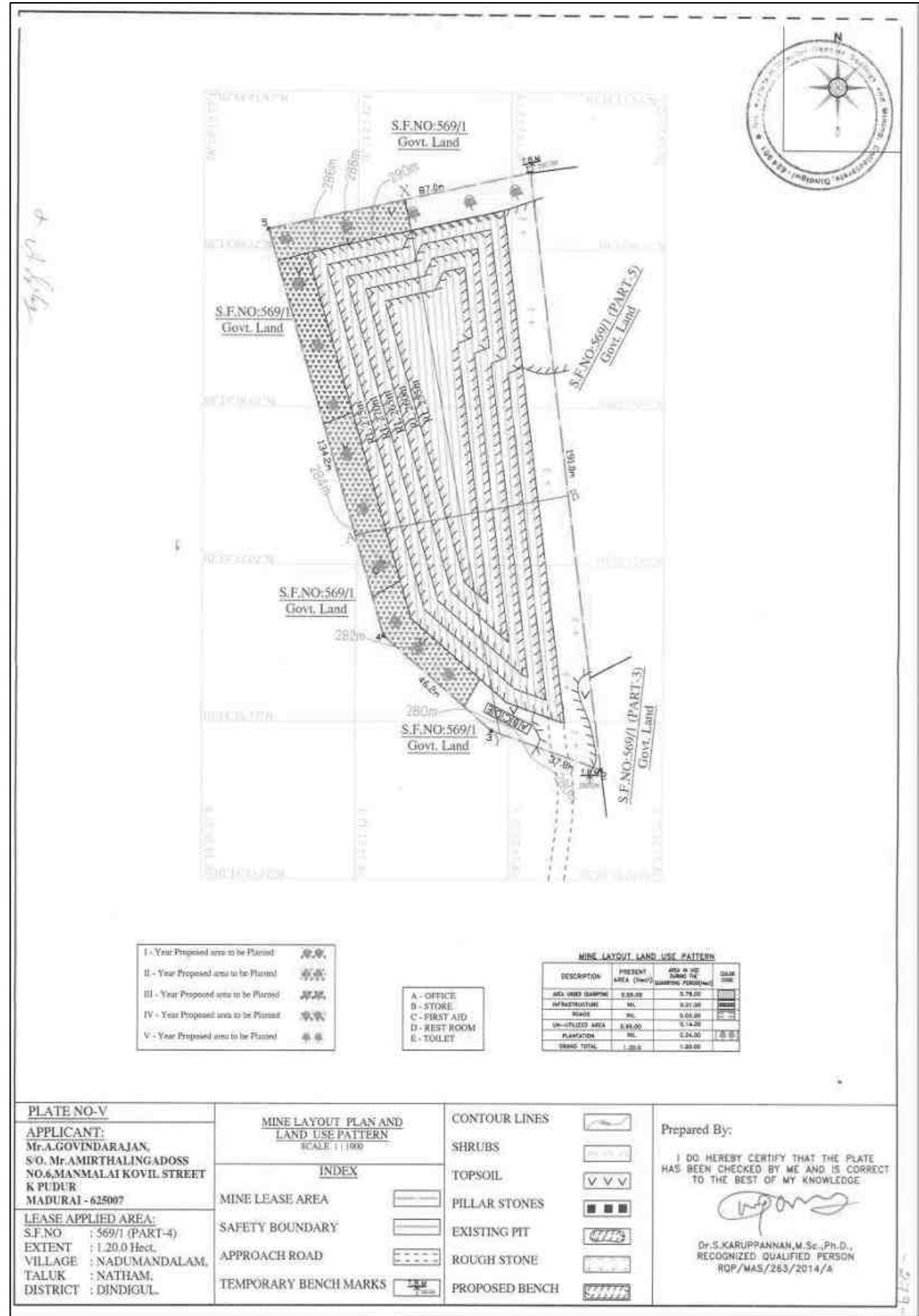


Figure 2.10. Mine layout plan and land use pattern

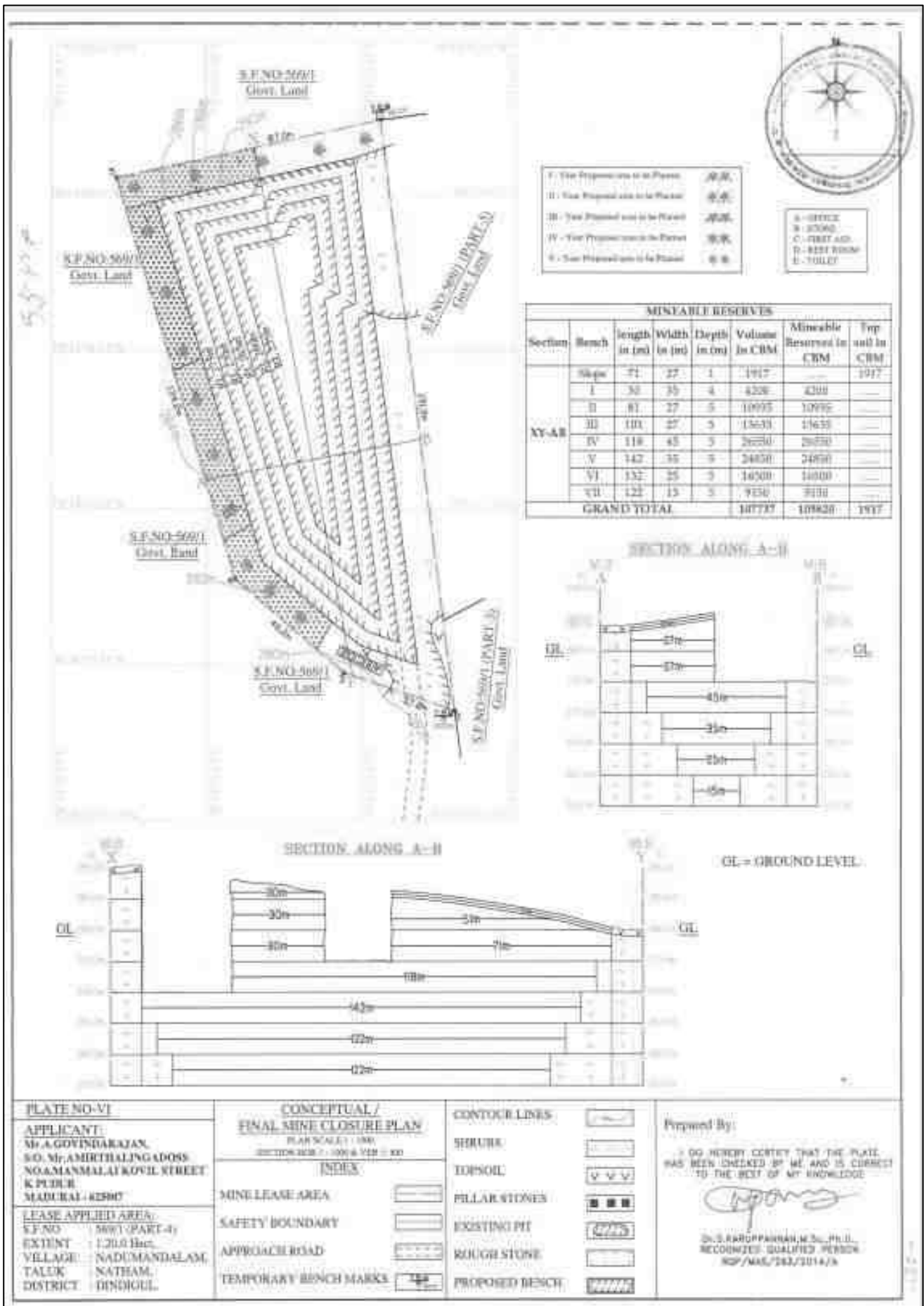


Figure 2.11 Conceptual Plan, Final mine closure plan and sections

2.6.6 Infrastructures

Infrastructures like mines office, temporary rest shelters for workers, latrine and urinal facilities have been constructed as per the Mine Rule after the grant of quarry lease. There is no proposal for the mineral processing or ore beneficiation plants in this project.

2.6.6.1 Other Infrastructure Requirement

No workshops are proposed inside the project area. Hence, there will not be any process effluent generation from the proposed lease area. Domestic effluent from the mine office will be discharged to septic tank and soak pit. As there is no toxic effluent expected to generate in the form of solid, liquid or gaseous form, there is no requirement of waste treatment plant.

2.6.7 Water Requirement

Detail of water requirement in KLD is given in Table 2.11.

Table 2.11 Water Requirement for the Project

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

Source: Prefeasibility Report

2.6.8 Energy Requirement

As per the data shown in Table 2.12, High speed Diesel (HSD) will be used for quarrying machineries. Around 84,976 liters of HSD will be used during this 5 years plan period. It will be brought to the site from nearby diesel pumps.

Table 2.12 Fuel Requirement Details

	Rough stone	Topsoil
Excavator fuel consumption	16 litres / hour	10litres/hour
Capacity of excavator	20m ³ / hour	60m ³ of Gravel/hour
Quantity of material to be quarried out	1,05,820 m ³	1917 m ³
Hours required	1,05,820/20 = 5291 hours	1917/60 = 32 hours
Total diesel consumption for 5291 hours	5291 hours x 16 litres = 84,656 litres	32 hours x 10 litres = 320 litres

2.6.9 Capital Requirement

Table 2.13 Capital Requirement Details

S. No.	Description	Cost (Rs.)
1	Operational Cost	35,95,000
2	EMP Cost	3,80,000
Total Project Cost		38,95,000

Source: Mining plan report

2.7 MANPOWER REQUIREMENT

The skilled, competent qualified statutory persons will be engaged for quarrying operation, preference will be given to the local community. Number of employees required for this project have been provided in Table 2.14.

Table 2.14 Employment Potential for the proposed project

1.	Highly Skilled	Quarry Manger	1
		Mines Forman	---
		Mechanical Engineer	---
		Account cum & Admin	1
2.	Skilled	Earth moving Operator	2
		Driver	3
		Mechanic	1
		Blaster/Mat	1
3.	Semi – skilled	Helpers, Greaser's	4
4.	Unskilled	Musdoor / Labours	8
		Cleaners	4
		Attendant's	1
Total			26 Nos

Source: Approved Mining Plan

2.8 PROJECT IMPLEMENTATION SCHEDULE

The commercial operation will commence after the grant of Environmental Clearance. CTO and CTE 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. Expected time schedule for the quarrying operation is given Table 2.15.

Table 2.15 Expected Time Schedule

S.No.	Particulars	Time Schedule (in months)					Remarks if any
		1 st	2 nd	3 rd	4 th	5 th	
1	Environmental Clearance						
2	Consent to Establish						Project Establishment Period
3	Consent to operate						Production starting period.
Time line may vary; subjected to rules and regulations /& other unforeseen circumstances							

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

CHAPTER III

DESCRIPTION OF THE 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 sites were carried out for the period covering **March, April, and May 2022** with CPCB guidelines. Environmental data have been collected by **Richardson & Cruddas (1972) Ltd, ISO 9001:2015** certified & MoEF notified laboratory for the following environmental components:

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

Study Area

An area of 10 km radius (aerial distance) around the periphery of the cluster is considered for EIA study. The data collection has been used to understand the existing environment scenario around the cluster against which the potential impacts of the project can be assessed. The study area has been divided into two zones: **core zone** and **buffer zone**. Core zone is considered as lease area and buffer zone as 5 km radius from the periphery of the cluster. Both core and buffer zones are taken as the study area.

Study Period

The baseline study was conducted during the post-monsoon season, i.e., **March 2022 to May 2022**.

Study Methodology

- The project area was surveyed in detail with the help of total station to pick the boundary pillars. The boundary coordinates were superimposed on the satellite imagery to understand the relief of the area. Besides, land use pattern of the area was studied through the Bhuvan (ISRO).
- Soil samples were collected and analysed for relevant physio-chemical characteristics, exchangeable cations, nutrients & micro nutrients etc., in order to assess the impact due to mining activities and to recommend saplings for Greenbelt development.
- Ground water samples were collected during the study period from the existing bore wells, while surface water was collected from ponds in the buffer zone. The samples were analysed for parameters necessary to determine water quality (based on IS: 10500:2012 criteria) and those which are relevant from the point of view of environmental impact of the proposed mines.
- An onsite meteorological station was setup in cluster area to collect data about wind speed, wind direction, temperature, relative humidity, rainfall and general weather conditions were recorded throughout the study period.
- In order to assess the Ambient Air Quality (AAQ), samples of ambient air were collected using Respiratory Dust Samplers (RDS) for fugitive dust, PM₁₀, and SO₂, NO_x with gaseous attachments & Fine Dust Samplers (FDS) for PM_{2.5} and other parameters as per NAAQ norms and analysed for primary air pollutants to work out the existing status of air quality.
- The noise level measurements were also made at various locations in different intervals of time with the help of sound level meter to establish the baseline noise levels in the impact zone.
- Baseline biological studies were carried out to assess the ecology of the study area to study the existing flora and fauna pattern of the area.
- Socio-economic survey was conducted at village and household level in the study area to understand the present socio-economic conditions and assess the extent of impact due to the proposed mining project.

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

Table 3.1 Monitoring Attributes and Frequency of Monitoring

Attributes	Parameters	Frequency of Monitoring	No. of Locations	Protocol
Land Use/ Land Cover	Land-use Pattern within 10 km radius of the study area	Data from census handbook 2011 and from the satellite imagery	Study Area	Satellite Imagery Primary Survey
*Soil	Physico-Chemical characteristics	Once during the study period	7 (1 core & 6 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	3 Surface water, 6 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 (February to April 2022.)	6 (1 core & 5 buffer)	IS 5182 Part 1-23 National Ambient Air Quality Standards, CPCB
*Noise Levels	Ambient noise	Hourly observation for 24 hours per location	7 (1 core & 6 buffer zone)	IS 9989 As per CPCB Guidelines
Ecology	Existing flora and fauna	Through field visit during the study period	Study area	Primary Survey by Quadrate & Transect Study Secondary Data – Forest Working Plan
Socio Economic Aspects	Socio-economic characteristics, Population statistics and existing infrastructure in the study area	Site visit & Census Handbook, 2011	Study area	Primary Survey, census handbook & need based assessments.

Source: On-site monitoring/sampling by Richardson & Cruddas (1972) Ltd in association with GTMS

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

3.1 LAND ENVIRONMENT

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

3.1.1 Land Use/ Land Cover

Land use pattern of the area was studied through LISS III imagery of Bhuvan (ISRO) using supervised classification algorithm. In this study, LISS III imagery of 10 km radius from the boundary limits of the proposed project sites was taken for analysis of land use cover. Ground truth data were collected in the field and used during the supervised classification. Spatial variations in LU/LCs have been shown in Figure 3.1.

Table 3.2 LULC Statistics of the Study Area

S. No.	Classification	Area (ha)	Area (%)
1	Barren Land	159	0.53
2	Crop Land	13337	44.22
3	Dense Forest	4680	15.52
4	Fallow land	3627	12.03
5	Land with Salinity	5	0.02
6	Land with / without scrub	1918	6.36
7	Plantations	6336	21.01
8	Settlement	99	0.33
	Total	30161	100

Source: LISS III Satellite Imagery

According to the table (3.2), majority of the land in the study area is crop land constituting about 44% of total area, followed by plantations 21% and Dense Forest covering about 15.52% and Fallow land about 12%, respectively. Among all the land use and land covers, mining sites only cover 0.03% of total land area. This small percentage of mining activities shall not have any significant impact on the environment.

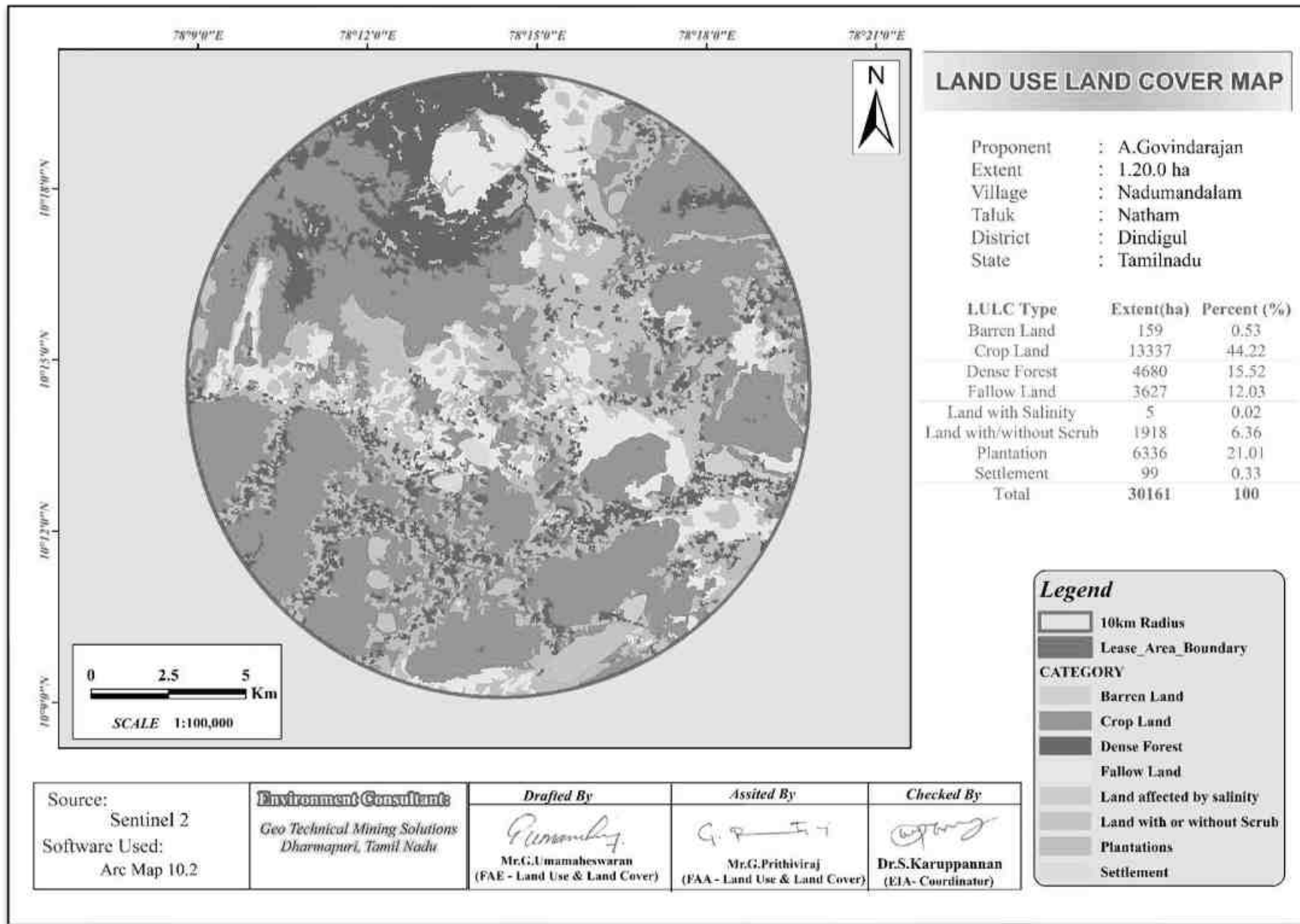


Figure 3.1 LULC map of 10km radius from the proposed project site

3.1.2 Topography

The lease area exhibits almost elevated terrain with the gentle slope towards South. The average elevation of the area is 290m above mean sea level.

3.1.3 Drainage Pattern of the Area

Drainage pattern is the pattern formed by the streams, rivers, and lakes in a particular drainage basin over time that reveals characteristics of the kind of rocks and geological structures in a landscape. They are governed by the topography of the land, whether a particular region is dominated by hard or soft rocks and the gradient of the land. There are no streams, canals or water bodies crossing within the project area. The drainage pattern of the proposed area is dendritic – sub dendritic indicating uniform lithology beneath the surface as shown in Figure 3.2.

3.1.4 Seismic Sensitivity

The proposed project site falls in the seismic Zone II, low damage risk zone as per BMTPC, as shown in 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.

(Source: https://moes.gov.in/writereaddata/files/LS_EN_20032020_385.pdf)

3.1.5 Environmental Features in the Study Area

There are no Wildlife Sanctuaries, National Park and Archaeological monuments within the project area. No Protected and Reserved Forest area is located within the project area. Therefore, there will be no need of acquisition/diversion of forest land. The details related to the environmentally sensitivity features around the proposed mine lease area are given in the Tables 3.3 and the nearby water bodies in the Table 3.3.

Table 3.3 Details of Environmentally Sensitive Ecological Features Within 10km Radius

SI. No	Sensitive Ecological Features	Name	Areal Distance in km from cluster
1	National Park / Wild life Sanctuaries	None	Nil within 10km radius
2	Reserve Forest	Karanadamalai RF	2.43 NW
		Erakamalai RF	8.17 West
		Pappanmalai RF	5.30 West
		Vellaimalai RF	8.22S West
		Chembulimalai RF	7.38 SSW
		Motamalai RF	5.90 SE
		Pulamalai RF	3.48 SE
		Budakudimalai RF	6.34 ESE
		Nedunkuttu RF	5.41 NE
	Madukamalai RF	6.60 NE	
3	Lakes/Reservoirs/ Dams/Streams/Rivers	Tank	0.31km South
		Tank	0.73km SW
		odi	0.53km NE
		Sengulam Tank	1.57km East
		Tank	1.64km NE
		Thirumani River	2.4km SW
		Kadumittanpatti Dam	9.2km SW
4	Tiger Reserve/Elephant Reserve/ Biosphere Reserve	None	Nil within 10km radius
5	Critically Polluted Areas	None	Nil within 10km radius
6	Mangroves	None	Nil within 10km radius
7	Mountains/Hills	None	Nil within 10km radius
8	Notified Archaeological Sites	None	Nil within 10km radius
9	Industries/ Thermal Power Plants	None	Nil within 10km radius
10	Defence Installation	None	Nil within 10km radius

Table 3.4 Water Bodies Nearby the Proposed Project

PROPOSED SITE		
	Name	Areal Distance in km from cluster
1	Tank	0.31km South
2	Tank	0.73km SW
3	Odi	0.53km NE
4	Sengulam Tank	1.57km East
5	Tank	1.64km NE
6	Thirumani River	2.4km SW
7	Kadumittanpatti Dam	9.2km SW

Source: Village Cadastral Map and Field Survey

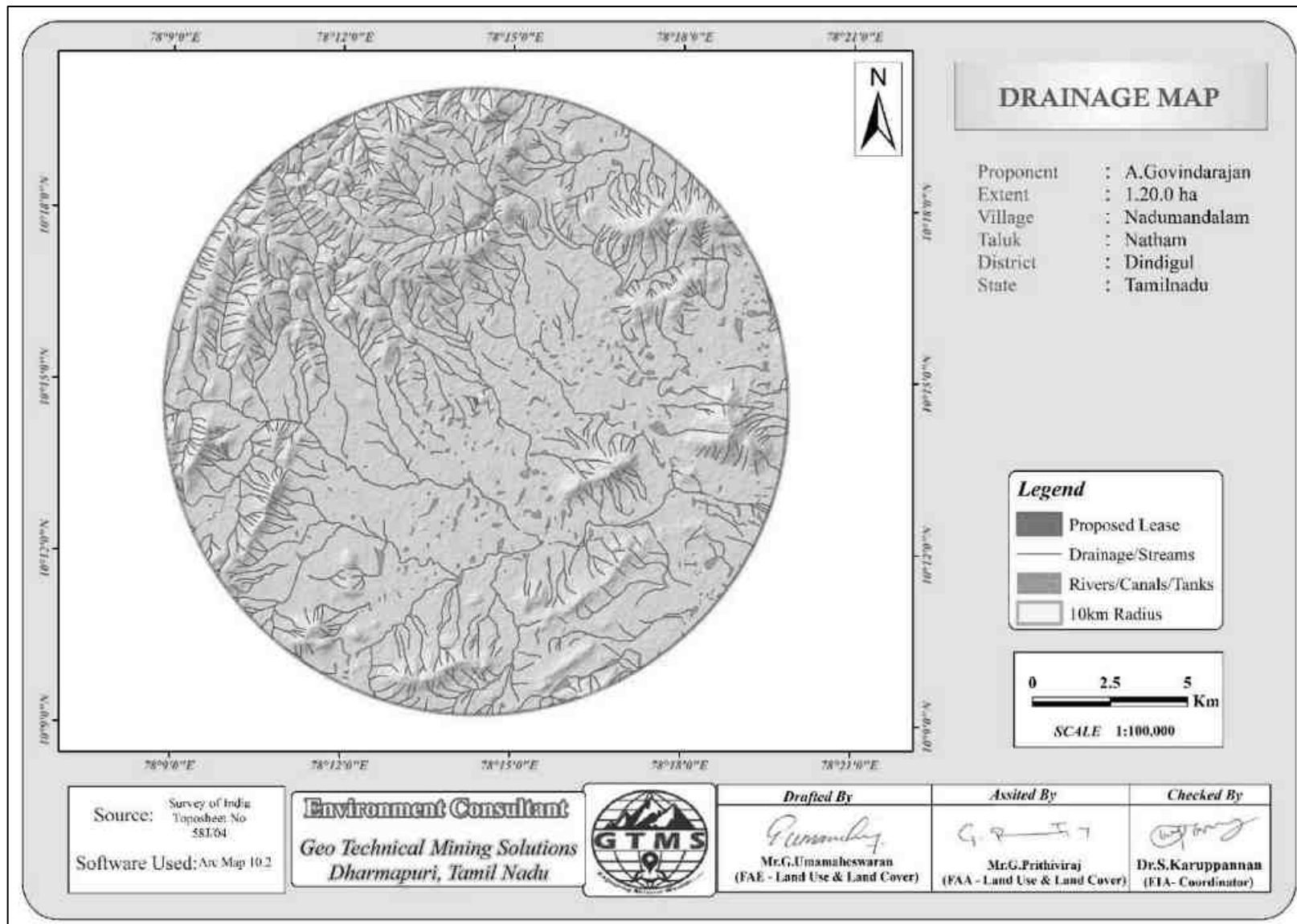


Figure 3.2 Drainage map around 10km radius from the proposed project site

3.2 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 shown in Table 3.5 and Figure 3.3. The objective of the soil sampling is:

- ❖ to determine the baseline soil characteristics of the study area
- ❖ to study the impact of proposed mining activity on soil characteristics and
- ❖ to study the impact of the activity on agriculture production

Table 3.5 Soil Sampling Locations

S. No	Location Code	Monitoring Locations	Aerial distance & Direction from Mine site	Geographic-Coordinates
1	S-1	Core Zone	-	10°14'38.64"N, 78°14'20.69"E
2	S-2	Velampatti	1.52km SSE	10°13'48.13"N, 78°14'6.77"E
3	S-3	Nadumandalam	3.3 km SE	10°14'6.23"N, 78°16'7.87"E
4	S-4	Chellappanaickenpatti	4.8km SW	10°12'15.59"N, 78°13'10.75"E
5	S-5	Punnappatti	4.1km SW	10°14'32.29"N, 78°12'4.57"E
6	S-6	Nadumandalam	2.78 km NW	10°16'10.10"N, 78°14'13.28"E
7	S-7	Nadumandalam	4.8km NE	10°16'51.49"N, 78°15'48.66"E

Source: On-site monitoring/sampling by Richardson & Cruddas (1972) Ltd in association with GTMS

3.2.1 Methodology

For studying soil quality, sampling locations were selected to assess the existing soil conditions in and around the project sites representing various land use conditions. The samples were collected by auger boring into the soil up to 90-cm depth. Seven (7) locations were selected for soil sampling on the basis of soil types, vegetative cover, industrial & residential activities including infrastructure facilities, which would accord an overall idea of the soil characteristics. The samples were analysed for physical and chemical characteristics. The samples were sent to laboratory for analysis. The samples were filled in Polythene bags, coded and sent to laboratory for analysis and the details of methodology are given in Table 3.6.

Table 3.6 Details of Soil Sampling

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 depth levels 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 Richardson & Cruddas (1972) Ltd in association with GTMS

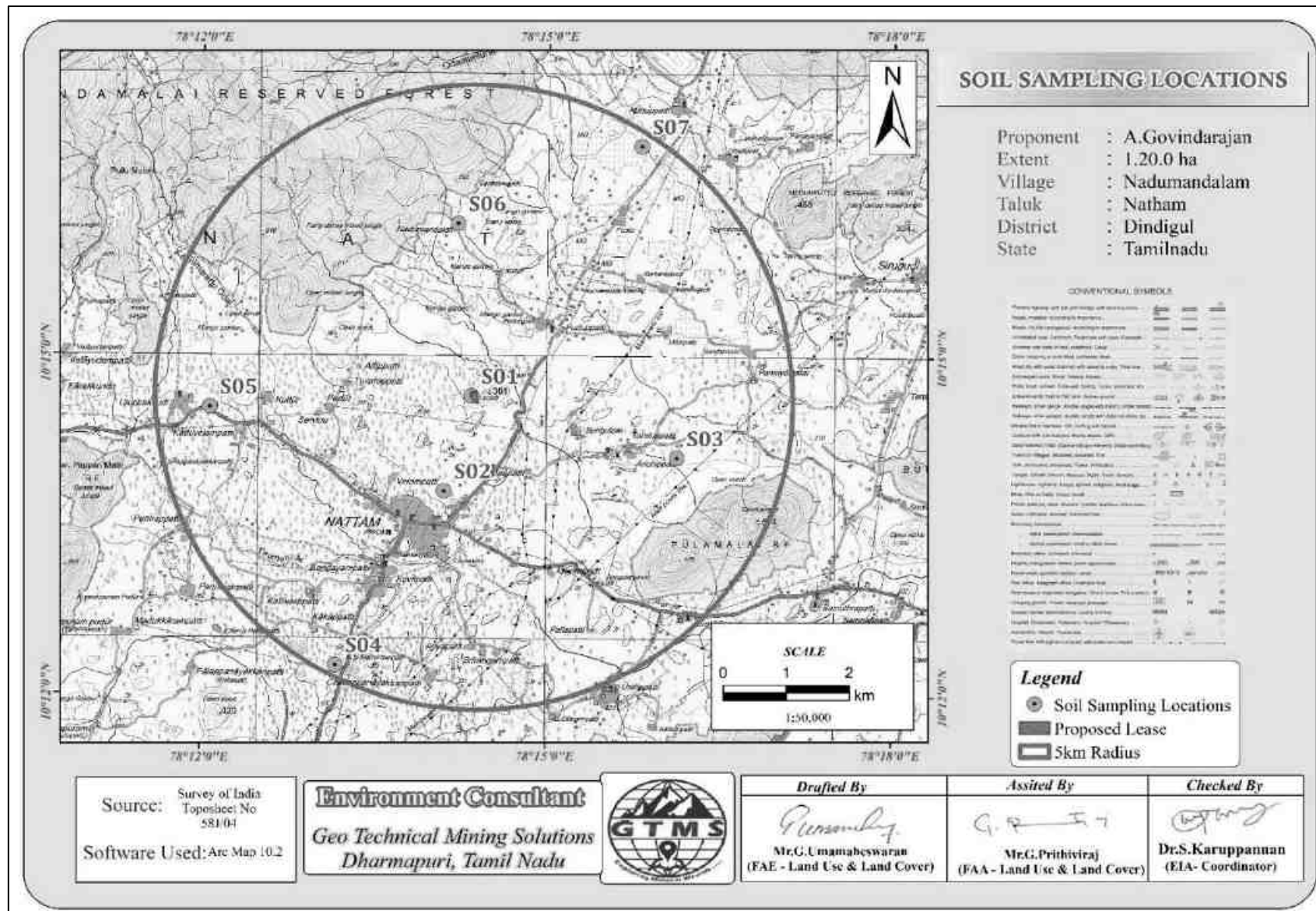


Figure 3.3 Geo-referenced Toposheet showing soil sampling locations within 5km radius around the proposed project site

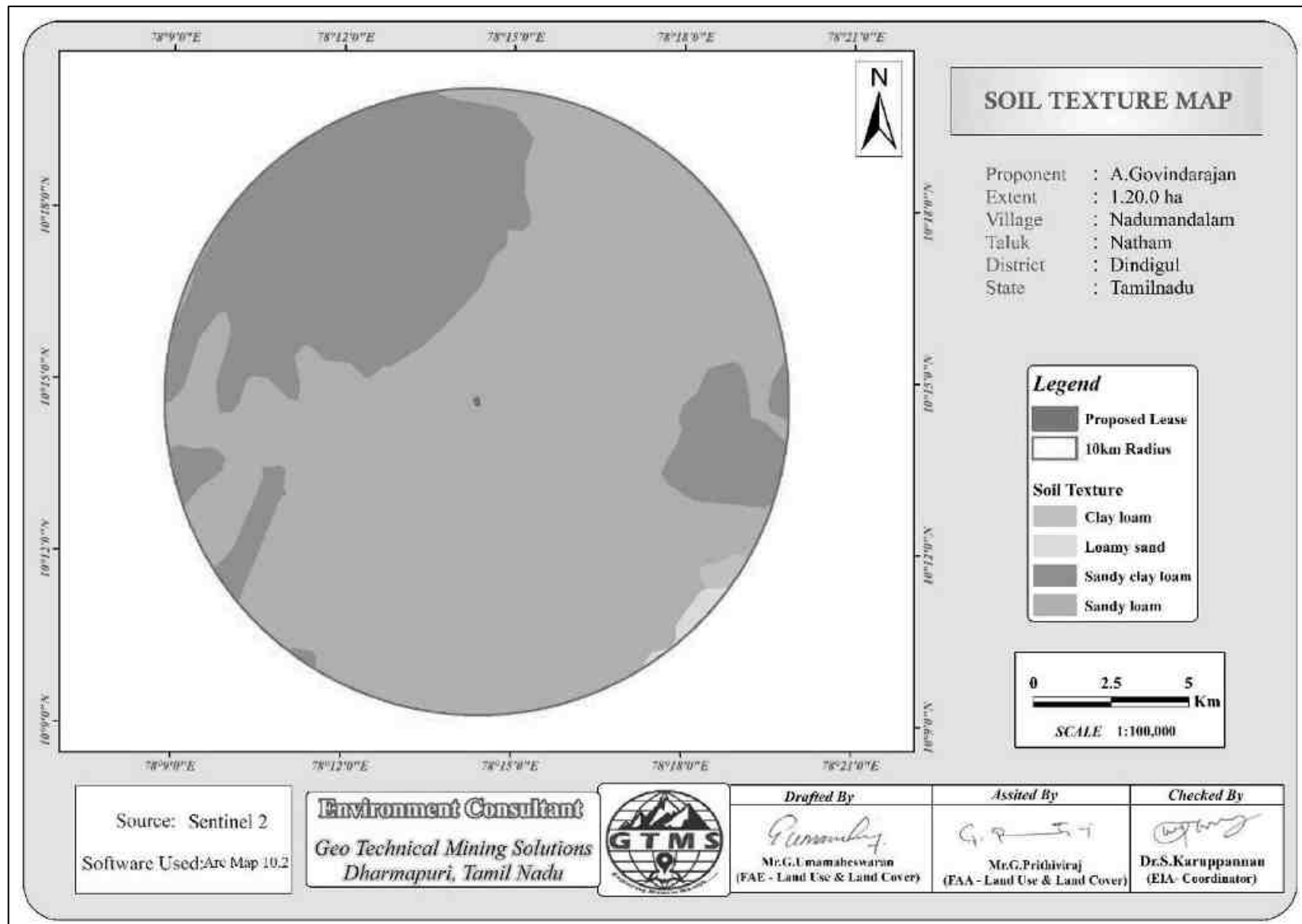


Figure 3.4 map showing soil taxonomy for the area of 10km radius around the proposed project site

Table 3.7 Soil Quality of the Study Area

S.No	Parameters	Unit	S-1	S-2	S-3	S-4	S-5	S-6	S-7
Physical Parameters									
1.	pH @ 10% solution	-	6.5	6.1	5.7	6.9	7.4	6.3	6.0
2.	EC @ 10% solution	µs/cm	261	243	220	274	354	253	260
3.	Texture	-	Sandy clay	Sandy clay	Sandy clay	Sandy clay	Sandy clay	Sandy clay	Sandy clay
4.	Moisture	%	13.56	15.46	11.34	12.19	14.56	14.23	13.20
5.	Sand	%	58.6	53.4	61.8	59.3	54.5	59.7	62.3
6.	Slit	%	15.1	18.5	15.6	15.3	18.2	16.4	12.9
7.	Clay	%	26.3	28.1	22.6	25.4	27.3	23.9	24.8
8.	Water Holding Capacity	%	16.34	17.56	15.45	18.42	17.51	18.67	19.74
9.	Bulk Density	g cm ⁻³	1.34	1.25	1.12	1.34	1.21	1.41	1.32
Chemical Parameters									
10.	Nitrogen (N)	mg/kg ⁻¹	23.69	13.26	19.67	21.23	23.86	19.43	18.34
11.	Phosphorus (P)	mg/kg ⁻¹	3.79	3.24	2.93	3.89	4.23	4.18	4.23
12.	Potassium (K)	mg/kg ⁻¹	12.56	14.56	11.45	16.778	11.56	17.80	19.23
13.	Calcium (Ca)	mg/kg ⁻¹	98.3	110.5	93.2	124.1	127.1	109.1	119.6
14.	Magnesium (Mg)	mg/kg ⁻¹	23.7	32.6	17.3	32.2	24.6	28.4	35.8
15.	Sodium (Na)	mg/kg ⁻¹	108	134	112	132	135	139	146
16.	Sulfur (S)	mg/kg ⁻¹	17.24	16.36	16.12	17.89	19.56	16.23	16.89
17.	Copper (Cu)	mg/kg ⁻¹	0.56	0.23	0.29	0.36	0.52	0.49	0.62
18.	Iron (Fe)	mg/kg ⁻¹	3.54	4.63	5.78	4.42	3.89	4.21	4.69
19.	Manganese (Mn)	mg/kg ⁻¹	0.94	0.78	0.91	0.89	0.65	0.89	0.42
20.	Zinc (Zn)	mg/kg ⁻¹	0.62	0.59	0.73	0.58	0.69	0.54	0.61
21.	Boron (B)	mg/kg ⁻¹	0.63	0.89	0.61	0.69	0.73	0.84	0.93
22.	Organic carbon	%	0.37	0.48	0.31	0.42	0.51	0.39	0.42
23.	Organic matter	%	1.01	1.24	1.09	1.32	1.23	1.07	1.45
24.	Cation exchange capacity (CEC)	meq/100g	10.28	11.3	9.1	12.6	13.3	11.5	13.2

Source: Sampling Results by Richardson & Cruddas (1972) Ltd.

3.2.2 Soil Testing Results

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, Nitrogen, Phosphorous and Potassium. The standard classifications of soil are presented in Figure 3.4 and the physico-chemical characteristics of the soil & test results in Table 3.7.

3.2.3 Results and Discussion

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 Sandy clay. The bulk density of soils in the study area varies between 1.12 and 1.41 g/cc. The water holding capacity varies from 16.34 to 19.74.

Chemical Characteristics

- ❖ The nature of soil is slightly alkaline to strongly alkaline with pH ranging from 5.7 to 7.4
- ❖ The nitrogen ranges between 13.26 and 23.86 mg/kg
- ❖ The phosphorus ranges between 2.93 and 4.23 mg/kg
- ❖ The Sodium ranges between 108 and 146 mg/kg
- ❖ The potassium ranges between 11.45 and 19.23 mg/kg
- ❖ The Calcium ranges between 93.2 and 127.1 mg/kg
- ❖ The Magnesium ranges between 17.3 and 35.8 mg/kg

3.3 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 critical water quality 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.

3.3.1 Surface Water Resources

The rainfall over the area is moderate, the rainwater storage in open wells is in practice over the area and the stored water acts as the source of drinking water for few months after rainy season.

3.3.2 Ground Water Resources

Groundwater occurs in all the crystalline formations of Achaean and Recent alluvium. The occurrence and behaviour of groundwater are controlled by rainfall, topography, geomorphology, geology, structures etc. Ground water occurs in phreatic conditions in weathered and fractured rocks. The movement of the groundwater is controlled by the intensity of weathering and fracturing. Dug wells and bore wells are the most common ground water abstraction structures in the area. The diameter of the dug well is in the range of 6 to 8 m and depths of dug wells range from 9 to 13m bgl.

3.3.3 Methodology

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

- Drainage pattern
- Location of residential areas /likely impact areas
- Likely areas which can represent baseline conditions

Three (3) surface, and Six (6) bore well water samples were collected from the study area and were analysed for physico-chemical conditions, heavy metals and bacteriological contents in order to assess the effect of mining and other activities on surface and ground water. The samples were analysed as per the procedures specified by CPCB, IS-10500:2012 and ‘Standard methods for the examination of water and wastewater’ published by American Public Health Association (APHA). The water sampling locations are given in Figure 3. 5 and Table 3.8.

Table 3.8 Water Sampling Locations

S. No.	Code	Locations	Distance from Proposed Project	Geo-Coordinate
SURFACE WATER				
1	SW1	Natham (TP)	1.93km SW	10°13'33.97"N 78°14'8.58"E
2	SW2	Natham (TP)	3.3km SW	10°13'0.48"N 78°13'33.50"E
3	SW3	Nadumandalam	3.23km NE	10°16'2.26"N 78°15'30.97"E
GROUND WATER				
1	GW-1	Velanpatti	0.31km SE	10°14'28.18"N 78°14'31.69"E
2	GW-2	Natham(TP)	2.2km SW	10°13'27.15"N 78°13'56.82"E
3	GW-3	Uralipatti	4.8km SE	10°12'41.99"N 78°16'12.13"E
4	GW-4	Punnappatti	4.40km SW	10°14'31.18"N 78°11'55.86"E
5	GW-5	Nadumandalam	3.40km NE	10°16'29.66"N 78°14'38.68"E
6	GW-6	Panimalai	4.31 km NE	10°15'2.37"N 78°16'43.17"E

Source: On-site monitoring/sampling by Richardson & Cruddas (1972) Ltd in association with GTMS

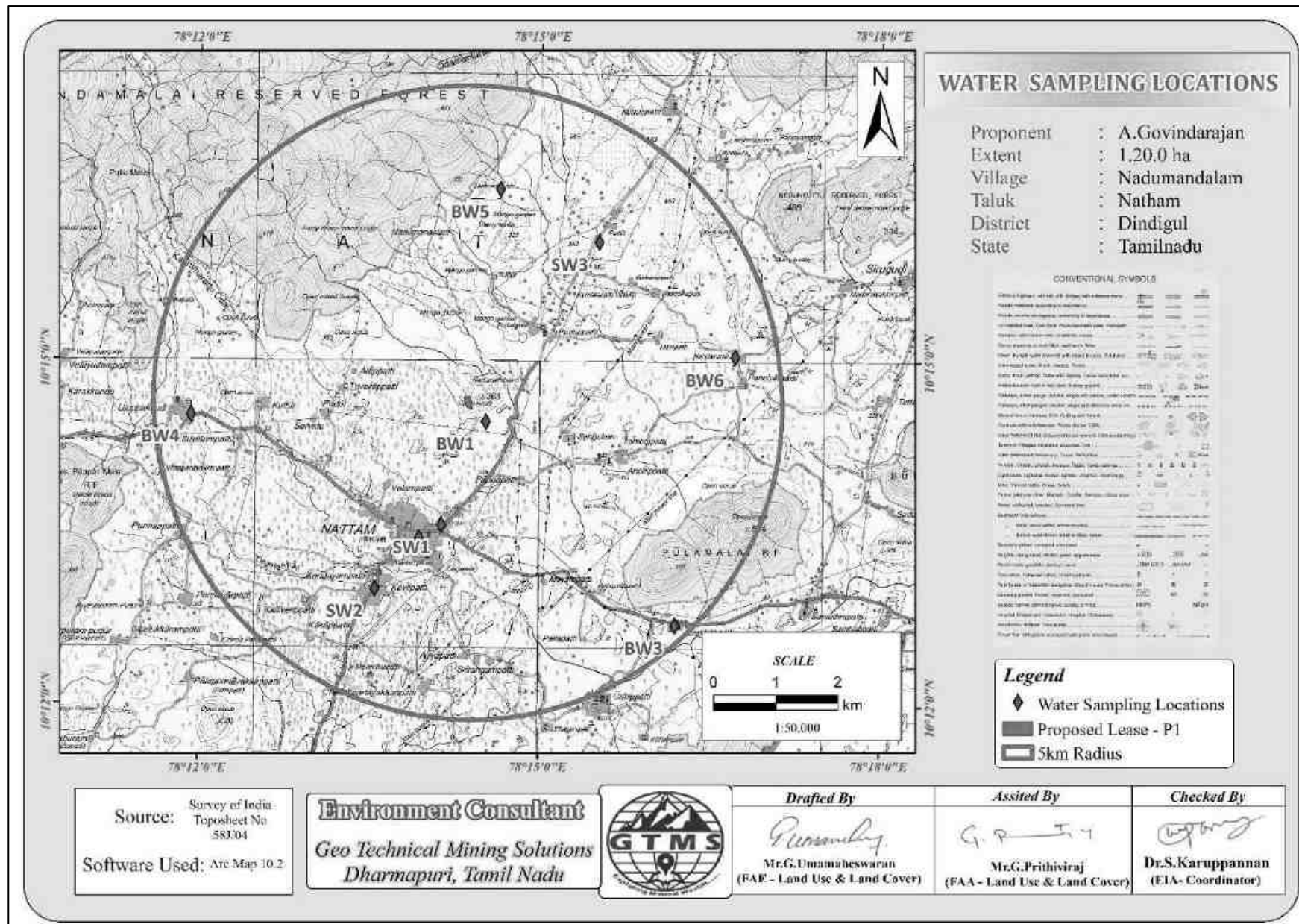


Figure 3.5 Geo-referenced Toposheet showing water sampling locations within 5km radius around the proposed project site

Table 3.9 Ground Water Quality Results

S.No.	Parameters	Units	RESULTS						Standards as Per IS 10500: 2012	
			GW1	GW2	GW3	GW4	GW5	GW6	Acceptable limit	Permissible limit
I	Physical Parameters									
1.	Color	Hazen	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	5	15
2.	Odor	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
3.	pH@ 25°C	-	7.5	7.8	7.3	7.1	8.0	7.9	6.5 – 8.5	6.5 – 8.5
4.	Turbidity	NTU	≤1	≤1	≤1	≤1	≤1	≤1	1	5
5.	Electrical conductivity @ 25°C	µs/cm	1785	1751	1893	1819	1927	1853	Not specified	Not specified
II	Chemical Parameters									
6.	TDS	mg/l	1029	967	1048	1014	1069	985	500	2000
7.	Total Hardness	mg/l	535	457	548	511	561	452	200	600
8.	Calcium (Ca)	mg/l	89	76	96	82	94	93	75	200
9.	Magnesium (Mg)	mg/l	76	65	73	76	81	82	30	100
10.	Sodium (Na)	mg/l	156	186	182	177	182	164	200(WHO)	200
11.	Potassium (K)	mg/l	09	11	09	09	12	09	12(WHO)	12
12.	Bicarbonate (HCO ₃)	µg/l	241	231	256	243	256	251	50(WHO)	400
13.	Sulphate (SO ₄)	mg/l	81	86	86	86	56	96	200	200
14.	Chloride (Cl)	mg/l	412	411	434	423	482	423	250	1000
15.	Nitrates (NO ₃)	mg/l	21	19	40	32	34	28	45	45
16.	Fluoride (F)	mg/l	0.8	1.0	1.2	1.1	1.2	0.9	1	1.5
III	Biological Parameters									
17	Total Coliform	MPN/100ml	-	-	-	-	-	-	Shall not be detectable in any 100 ml water	Shall not be detectable in any 100 ml water
18	E-Coli	MPN/100ml	-	-	-	-	-	-	Shall not be detectable in any 100 ml water	Shall not be detectable in any 100 ml water

* 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.

Table 3.10 Surface Water Quality Results

S. No.	Parameters	Units	RESULTS			CPCB designated best use
			SW01	SW02	SW03	
I	Physical Parameters					
1.	Color	Hazen	5	5	4	300
2.	Odor	-	Agreeable	Agreeable	Agreeable	Not specified
3.	pH@ 25°C	-	7.3	6.8	7.1	6.5-8.5
4.	Turbidity	NTU	4.1	6.4	5.3	10
5.	Electrical conductivity @ 25°C	µs/cm	726	698	925	Not specified
II	Chemical Parameters					
6.	TDS	mg /l	410	381	484	1500
7.	Total Hardness	mg/l	256	246	329	Not specified
8.	Calcium (Ca)	mg/l	46	36	41	Not specified
9.	Magnesium (Mg)	mg/l	31	39	54	Not specified
10.	Sodium (Na)	mg/l	52	42	59	200(WHO)
11.	Potassium (K)	mg/l	06	4	5	3
12.	Bicarbonate (HCO ₃)	mg/l	50	131	112	400(WHO)
13.	Sulphate (SO ₄)	mg/l	32	48	43	400
14.	Chloride (Cl)	mg/l	198	124	212	600
15.	Nitrates (NO ₃)	mg/l	12	17	29	50
16.	Fluoride (F)	mg /l	00	00	00	1.5
17.	BOD 3 days @ 27°C	mg O ₂ /l	3	2	3	5
18.	COD	mg O ₂ /l	16	14	17	20
III	Biological Parameters					
19	Total Coliform	MPN/100ml	Absent	Absent	Absent	5000
20	E-Coli	MPN/100ml	Absent	Absent	Absent	Not specified

3.3.4 Results and Discussion

Results of important water quality parameters were compared with the standards of IS 10500:2012 and have been discussed in the following sections.

3.3.4.1 Surface Water

The pH varies from 6.8 to 7.3, while turbidity is found within the acceptable limits. TDS including carbonates, bicarbonates, chlorides, phosphates, nitrates, calcium, magnesium, and sodium in the surface water varies from 381 to 484 mg/l. Total Hardness varies from 246 to 329

mg/l; Chloride varies from 124 to 212 mg/l; nitrate varies from 12 to 29 mg/l, whereas sulphate from 32 to 48 mg/l.

3.3.4.2 Ground Water

The pH of the water samples falls within the acceptable limit of 6.5 to 8.5, ranging from 7.1 to 8.0 Sulphates and chlorides of water samples from all the sources are within the acceptable limits as per the water quality standard. Turbidity in the water samples meets the requirement. TDS are found in the range of 967- 1069 mg/l in all samples. The water sample from (GW5) Nadumandalam Village has the highest TDS of 1069 mg/l. The total hardness varies between 452 - 561 mg/l for all samples. The water sample from (GW5) Nadumandalam Village has the highest total hardness 561 mg/l.

3.3.5 Hydrogeological Studies

The major part of the district is underlain by Archaean crystalline metamorphic complex. The important aquifer systems encountered in the district are classified into Fissured, fractured and weathered crystalline formations consisting of Charnockite, Granite Gneisses and valley fill sediments (unconsolidated sediments) comprising clay, sand, silt and kankar. Valley fill sediments have been observed along valley portions in the depth range of 35 to 40 m bgl in Natham and Sanarpatti blocks. They are characterized by deeper water levels showing high fluctuations. In general, dug wells are used to extract groundwater from these zones and the wells can yield about 200 m³ per day and can sustain pumping of 3 – 4 hrs in a day.

In case of crystalline formations, groundwater occurs under water table condition in weathered and shallow fractures and under semi-confined to confined conditions in deeper fractures. The depth of weathering varies from place to place from less than a metre to a maximum of 40 m bgl. The number of saturated fracture zones varied from 1 to 6 occurring at depths between 10 and 164 m bgl. The ground water exploration in deeper aquifer reveals that in about 11 per cent of the wells drilled, the yield was more than 3 lps, whereas in about 15 per cent of the wells, the yield ranges from 1 to 3 lps. A few of the wells have been abandoned due to poor yield. Dug wells are used extract groundwater from weathered formation while deeper fractures are tapped through bore wells and dug cum bore wells. The yield of open wells in the district tapping the weathered mantle of crystalline rocks generally ranges from 100 to 400 lpm for draw down ranging from 2 to 4.5 m. The dug wells can sustain a pumping of 3-4 hrs in a day. The wells tapping the deep-seated fracture system can yield about 1 – 5 lps and can sustain a pumping of 6-8 hrs a day.

Source: http://cgwb.gov.in/District_Profile/TamilNadu/Dindigul.pdf

3.3.5.1 Post-and Pre-Monsoon Groundwater Levels

The ground water levels were measured from 51 observation wells in Dindigul District during Post-Monsoon and Pre-Monsoon periods. The groundwater level averaged using the data of the 51 observation wells is given for 5 years from 2017-2021 in **Table 3.11**. From the data, it is clear that the highest water level fluctuation occurred in 2020, followed by that in the year of 2021 indicating rapid decrease of groundwater level in the district. In the five-year period, the rate of water level fluctuation is -8.14 m/year indicating negative groundwater level trend from year to year.

Table 3.11 Groundwater Level of Post-Monsoon and Pre-Monsoon

S. No.	Post-Monsoon		Pre-Monsoon	
	Period	Groundwater Level BGL(m)	Period	Groundwater Level BGL(m)
1	Jan 2017	15.2	May 2017	21.5
2	Jan 2018	10	May 2018	17
3	Jan 2019	9.7	May 2019	16.3
4	Jan 2020	9.6	May 2020	20.9
5	Jan 2021	9.4	May 2021	18.9
Average		10.78	Average	18.92

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

3.2.5.2 Groundwater Levels and Flow Direction

As the groundwater moves from the points of highest static groundwater elevation to the points of lowest static groundwater elevation under the influence of gravity, data regarding depth to groundwater levels are essential to infer the direction of groundwater movement within the study area. Knowledge of groundwater flow direction is must in choosing location for background groundwater quality monitoring well and in locating recharge and discharge areas. Therefore, data regarding groundwater elevations were collected from 9 open wells and 9 bore wells at various locations within 1km radius around the proposed project sites for the period from March through May 2022. The data thus collected from the open wells and borewells within the radius of 2 km from the proposed project area are provided in **Tables 3.12 and 3.13**. According to the data, average depths to the static water table in open wells range from 9 to 13.8 m; average depths to static potentiometric surface in borewells from 49.5 to 59.6 m. The depths to static water table and potentiometric surface data were used to calculate static groundwater table and potentiometric surface elevations for open wells and borewells, respectively to draw contour lines connecting groundwater elevation (also known as equipotential hydraulic head) to determine the groundwater flow direction perpendicular to the contour lines.

The maps thus produced are shown in **Figures 3.6 and 3.7**. From the maps of groundwater flow direction, it is understood that most of the open well groundwater flows towards the open well number 2 located in SE of the proposed project site and that most of the borewell groundwater flows towards the bore well number 9 located in SE of the proposed project site. On the basis of the groundwater flow information, both open wells and bore wells mentioned above can be chosen for water quality monitoring purpose as the wells may get easily affected by the contaminants resulting from the mining activities of the sites in future.

Table 3.12 Water Level of Open Wells within 2 km Radius

Station ID	Depth to Static Water Table BGL(m)				Latitude	Longitude
	Mar 2022	Apr 2022	May2022	Average		
DW1	13.2	13.5	14.7	13.8	10°14'53.05"N	78°14'19.96"E
DW2	12.5	13.7	13.9	13.3	10°14'25.53"N	78°14'50.00"E
DW3	11.2	12.7	12.9	12.2	10°15'8.75"N	78°15'7.14"E
DW4	10.2	11.5	11.8	11.1	10°15'26.02"N	78°15'8.35"E
DW5	8.4	8.9	9.7	9.0	10°15'23.53"N	78°13'53.40"E
DW6	9.5	10.3	10.8	10.2	10°14'41.85"N	78°13'27.89"E
DW7	12.4	12.7	13.5	12.8	10°14'23.03"N	78°13'41.90"E
DW8	12.5	13.4	13.9	13.2	10°13'58.05"N	78°14'17.78"E
DW9	12.5	12.7	13.7	13.7	10°14'27.47"N	78°13'54.58"E

Source: Onsite monitoring data

Table 3.13 Water Level of Borewells within 2 km Radius

Station Code	Depth to Static Potentiometric Surface BGL(m)				Latitude	Longitude
	Mar 2022	Apr 2022	May 2022	Average		
BW1	55.6	57.4	61.2	58.0	10°14'27.16"N	78°14'33.68"E
BW2	54.5	55.3	57.4	55.7	10°14'44.19"N	78°14'52.88"E
BW3	52.5	53.4	55.6	53.8	10°15'5.12"N	78°14'27.32"E
BW4	51.6	52.8	60.4	54.9	10°15'34.02"N	78°14'16.94"E
BW5	48.7	49.6	50.4	49.5	10°15'0.99"N	78°13'54.68"E
BW6	54.5	55.3	57.4	55.7	10°14'20.24"N	78°14'14.51"E
BW7	52.5	53.4	55.6	53.8	10°14'40.70"N	78°14'0.27"E
BW8	54.7	55.5	57.2	55.8	10°13'54.20"N	78°13'50.17"E
BW9	58.6	59.8	60.4	59.6	10°14'0.01"N	78°14'50.54"E

Source: Onsite monitoring data

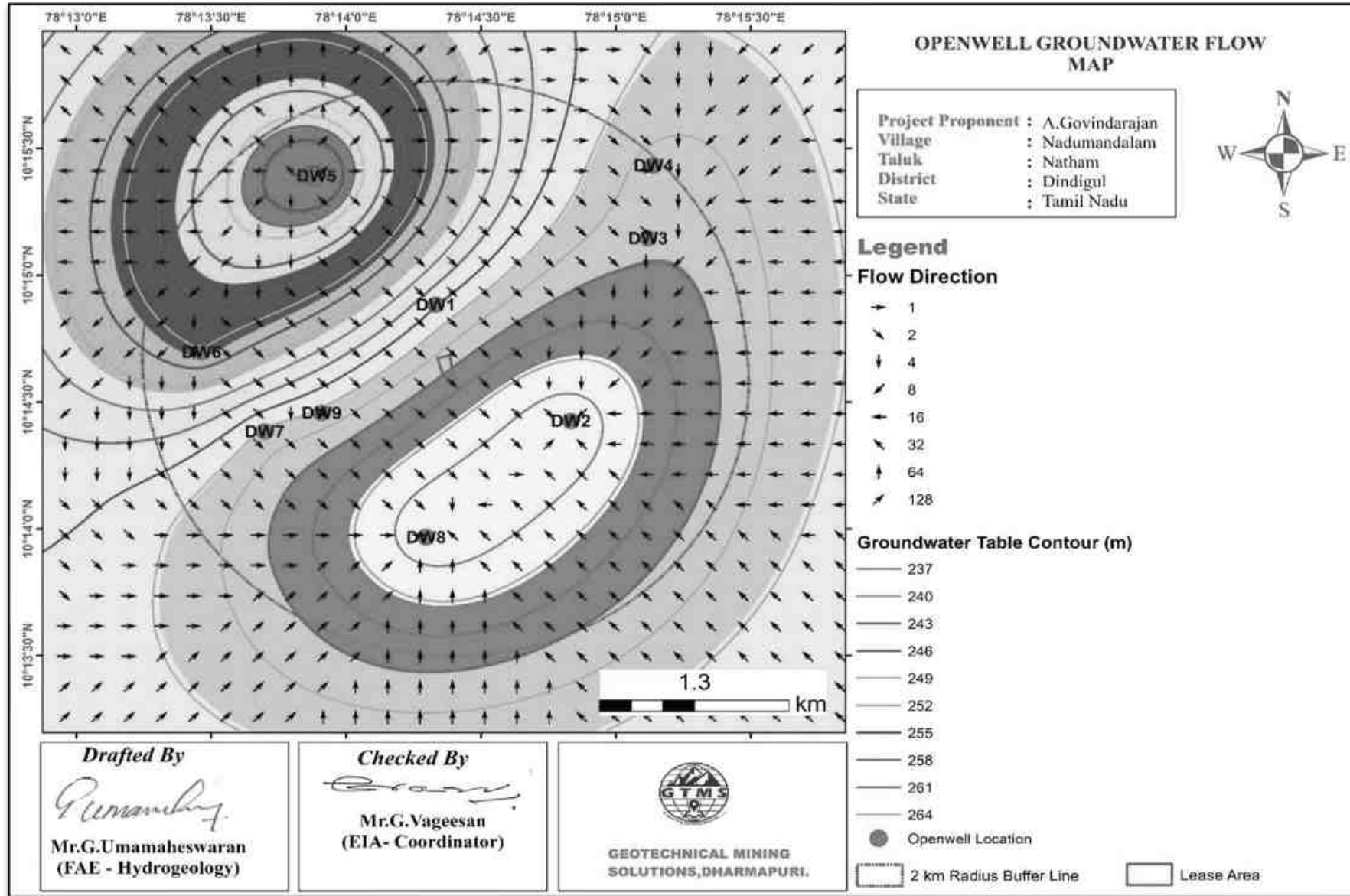


Figure 3.6 Open well static groundwater elevation map showing the direction of groundwater flow within unconfined aquifer

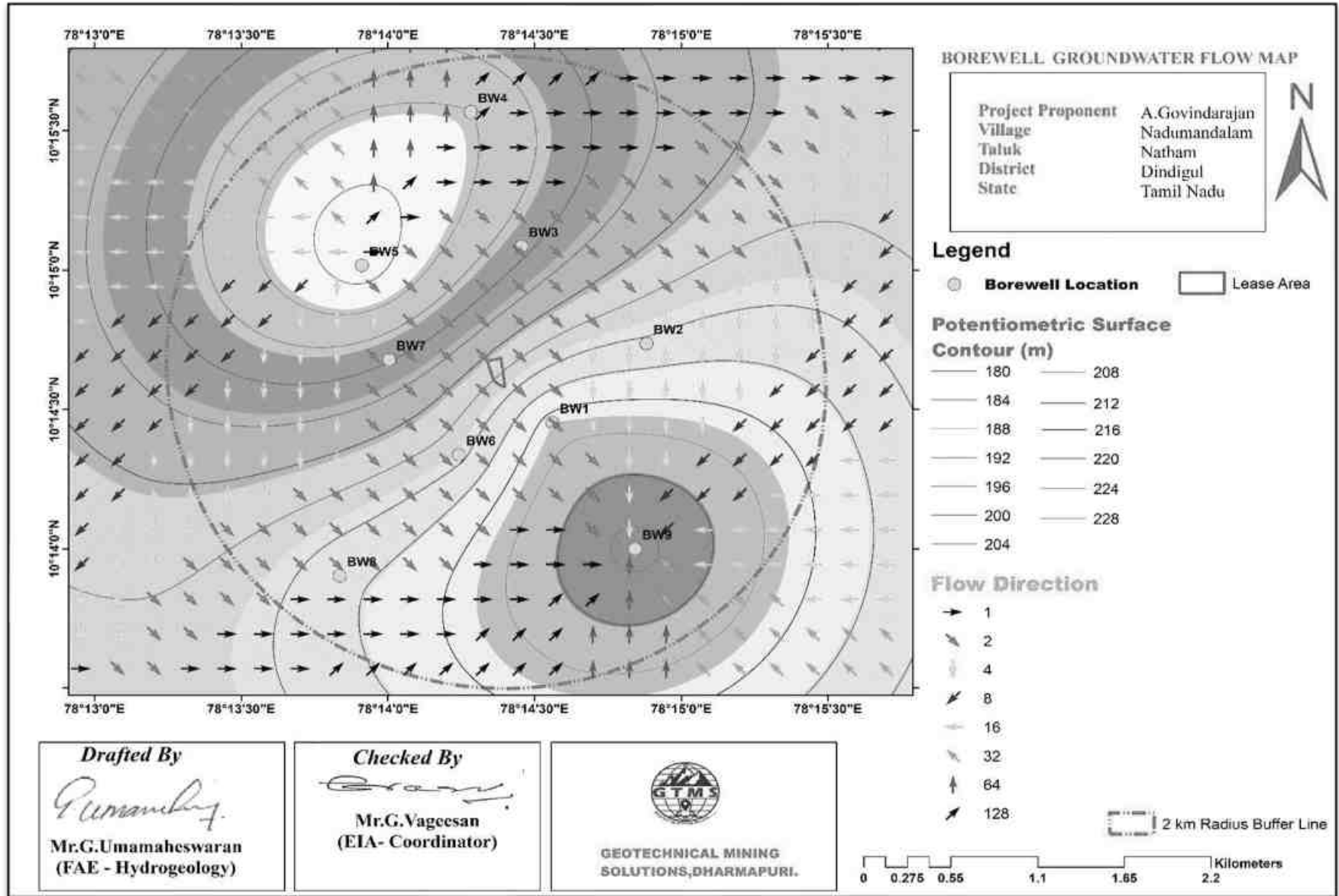


Figure 3.7 Borewell static groundwater elevation map showing the direction of groundwater flow within confined aquifer

3.3.5.3 Electrical Resistivity Investigation

For understanding subsurface hydrogeological conditions geophysical investigation is carried out. The geophysical investigation is especially useful in the areas where there are no adequate exploratory well data about the aquifer conditions. Electric resistivity method is one of the well-known geophysical methods for delineating lateral as well vertical discontinuities in the resistivities of the earth's subsurface layers. It is mainly applied to locate aquifers in the field of hydrogeology. The present study makes use of vertical electric sounding (VES) to delineate earth's subsurface layers. The electrical resistivity investigation used four electrodes collinear set up where current is sent through outer electrodes into the ground and the inner electrodes measure the potential difference, as shown in Figure 3.8.

3.3.5.4 Methodology and Data Acquisition

The present study uses Schlumberger array for making vertical electrical sounding measurements since it is least influenced by lateral inhomogeneities and is capable of providing higher depth of investigation. The main goal of the present study is to search the vertical inhomogeneities that is consistent with the measured data.

For a Schlumberger, the apparent resistivity can be calculated as follows:

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

ΔV = potential difference

G = Geometric Factor.

The field equipment deployed for the study is a deep resistivity meter with a model of SSR – MP – ATS, This Signal Stacking Resistivity meter is a high-quality data acquisition system incorporating several innovation features for earth resistivity measurements. For more information about the instrument, refer to the manufacturer's manual.

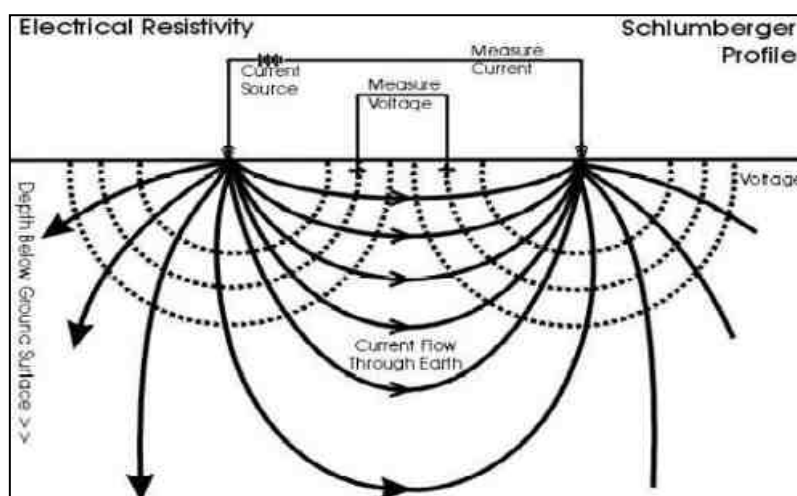


Figure 3.8 Principle of electrical resistivity investigation

3.3.5.5 Data Presentation

The Geophysical VES data obtained from the project sites have been shown in Table 3.14. The field data obtained from a detailed geophysical investigation were plotted for interpretation. The plots have been shown in Figures 3.9

Table 3.14 Vertical Electrical Sounding Data for Proposed Project

Geo- Coordinates 10°14'41.65"N, 78°14'21.11"E					
S. No.	AB/2(m)	MN/2(m)	Geometrical factor (G)	Resistance (Ω)	Apparent Resistivity (ρ _a) in Ωm
1	2	0.5	11.78	9.40	110.26
2	4	0.5	49.50	7.325	362
3	6	0.5	112.36	4.123	463
4	8	0.5	200.37	2.985	598
5	10	2	313.51	2.346	736
6	15	2	173.51	6.099	1059
7	20	2	311.16	4.389	1366
8	25	2	188.58	8.859	1671
9	30	5	704.03	2.768	1949
10	35	5	959.46	2.301	2208
11	40	5	495.02	4.894	2423
12	45	5	628.60	4.545	2800
13	50	5	777.89	4.455	3450
14	60	10	550.03	5.899	3266
15	70	10	754.32	5.756	4342
16	80	10	990.05	4.621	4575
17	90	10	1257.25	3.912	4918
18	100	10	1555.79	3.236	5035
19	120	20	1100.05	5.768	6345
20	140	20	1508.64	4.125	6223
21	160	20	1980.04	3.056	6051

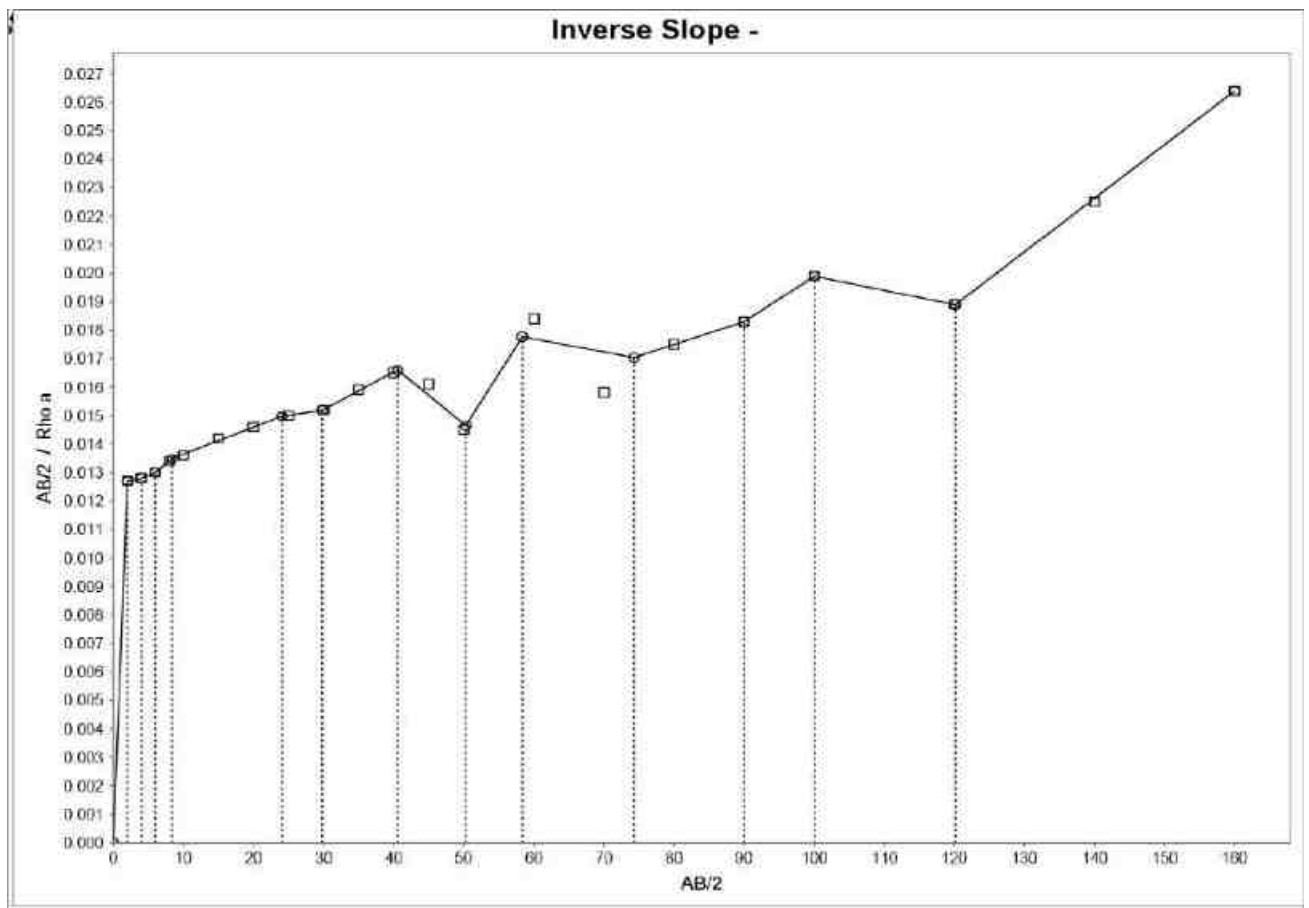


Figure 3.9 Graph showing occurrence of water bearing fracture zones at the depth range of 50 m below ground level in proposed project

3.3.5.6 Geophysical Data Interpretation

The rock formation with low resistivities indicating occurrence of ground water occurs at the depth range of 50 m below ground level, as shown in Figures 3.9 The maximum depth proposed for the proposed project is 35m (10m Above ground level,25m below ground level). Therefore, the mining operation will not affect the aquifer throughout the entire mine life period.

3.4 AIR ENVIRONMENT

The existing ambient air quality of the area is important for evaluating the impact of mining activities on the ambient air quality. The baseline studies on air environment include identification of specific air pollution parameters and their existing levels in ambient air. The ambient air quality with respect to the study zone of 5 km radius around the cluster forms the baseline information. The sources of air pollution in the region are mostly due to vehicular traffic, dust arising from unpaved village road and domestic & agricultural activities. The prime objective of the baseline air quality study was to establish the existing ambient air quality of the study area. These will also be useful for assessing the conformity to standards of the

ambient air quality during the operation of proposed project in cluster. This section describes the identification of sampling locations, methodology adopted during the monitoring period and sampling frequency.

3.4.1 Meteorology

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.

3.4.1.1 Primary Meteorological Data

Table 3.15 Meteorological Data Recorded at Site

S. No.	Parameters		March, 2022	April, 2022	May, 2022
1	Temperature (°C)	Min	17.23	22.85	23.37
		Max	38.46	38.4	37.5
		Avg	28.13	28.84	29.28
2	Relative Humidity (%)	Min	21	28.38	35.44
		Max	100	98.56	96
		Avg	62.52	71.01	69.30
3	Wind Speed (m/s)	Min	0.14	0.1	0.24
		Max	7.17	5.81	7.02
		Avg	2.75	2.24	2.75
4	Wind Direction (degree)	Min	0	2.53	0.78
		Max	359.57	358.8	357.98
		Avg	138.80	167.55	240.66
5	Surface Pressure(mbar)	Min	978.5	978.5	975.7
		Max	990.1	989.4	985.3
		Avg	984.01	983.38	980.71

According to the onsite data as shown in Table 3.15, the temperature in March, 2022 varied from 17.23 to 38.46°C with the average of 28.13°C; in April, 2022 from 22.85 to 38.4°C with the average of 28.84°C; and in May, 2022 from 23.37 to 37.5°C with the average of 29.28°C. In March, 2022, relative humidity ranged from 21 to 100 % with the average of 62.52

%; in April, 2022, from 28.38 to 98.56 % with the average of 71.01 %; and in May, 2022, from 35.44 to 96 % with the average of 69.30 %. When speaking about wind speed, the wind speed in March, 2022 varied from 0.14 to 7.17 m/s with the average of 2.75 m/s; in April, 2022 from 0.1 to 5.81 m/s with the average of 2.24 m/s; and in May, 2022 from 0.24 to 7.02 m/s with the average of 2.75 m/s. In March, 2022, the wind direction varied from 0 to 359.57 degree with the average of 138.80 degree; in April, 2022, from 2.53 to 358.8 degree with the average of 167.55 degree; and in May ,2022, from 0.78 to 357.98 degree with the average of 240.66 degree. When surface pressure was estimated, in March, 2022 the surface pressure varied from 978.5 to 990.1 mbar with the average of 983.38 mbar; in April, 2022 from 975.7 to 985.3 mbar with the average of 985.81 mbar; and in May ,2022 from 979.4 to 990 mbar with the average of 980.71 mbar.

3.4.1.2 Rainfall

Table 3.16 Average annual rainfall

Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average
Rainfall(mm)	2485	2455	2032	1810	1010	449	1016	757	1920	2098	1028	1551

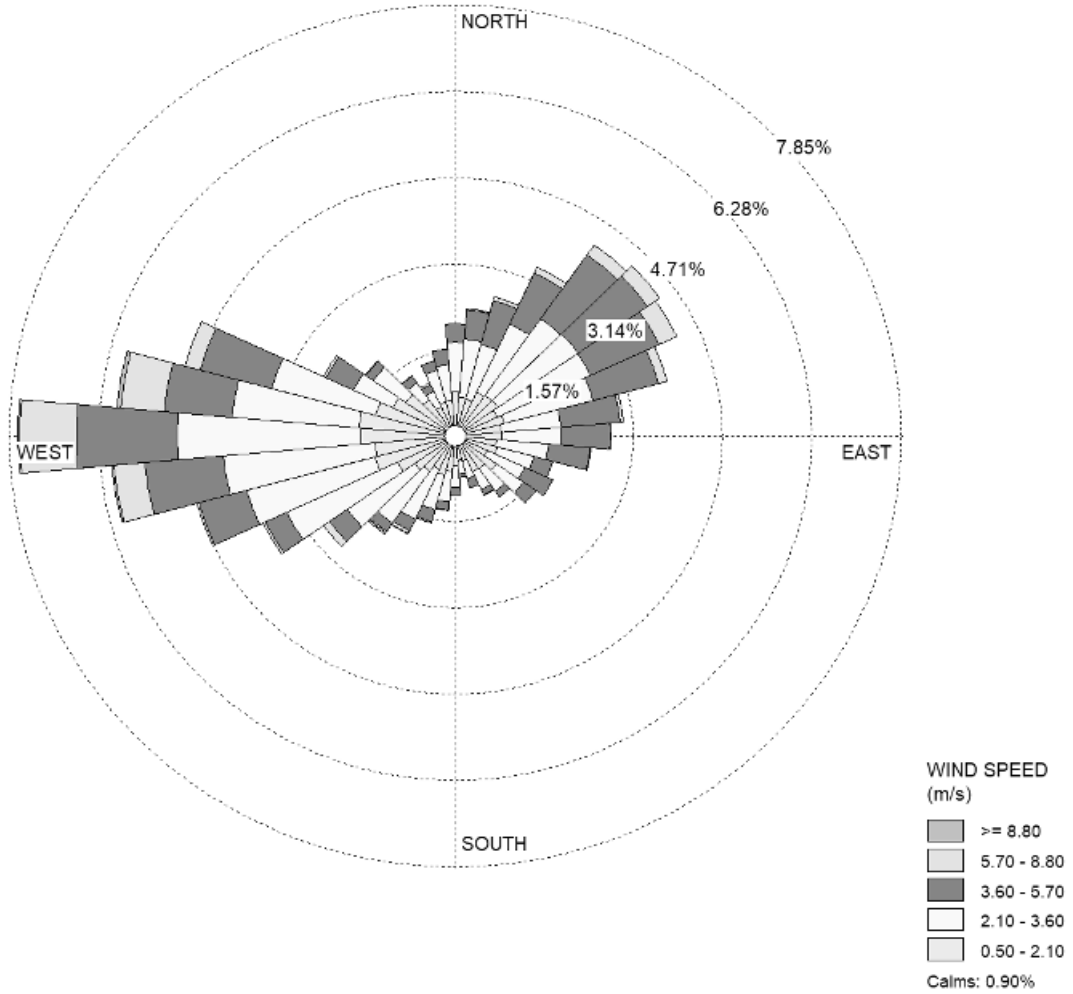
From the data for the period of 2011-2021, the average annual rainfall has been calculated to be 1551 mm. Of the 11 years, the lowest rainfall (449 mm) occurred in the year 2016, while the highest rainfall (2485 mm) in the year 2011.

3.4.1.3 Wind Pattern

Local wind pattern will largely influence the dispersion pattern of air pollutants and noise from the proposed project sites. Analysis of wind pattern requires hourly site-specific data of wind speed and direction over a period of 3 months. The wind rose thus produced, as shown in Figure 3.10 and 3.10(a) reveals that:

- The measured average wind velocity during the study period is 2.84 m/s
- Predominant wind direction during the study period is West to East.

WIND ROSE PLOT:
GOVINDARAJAN ROUGHSTONE QUARRY



COMMENTS:	DATA PERIOD: Start Date: 01-03-2021 - 00:00 End Date: 01-03-2022 - 05:00	COMPANY NAME: GEOTECHNICAL MINING SOLUTIONS	
	CALM WINDS: 0.90%	TOTAL COUNT: 8759 hrs.	
	AVG. WIND SPEED: 2.84 m/s		PROJECT NO.:

WRPLOT View - Lakes Environmental Software

Figure 3.10 Onsite Wind Rose Diagram

3.4.2 Methodology and Objectives

The prime objective of the ambient air quality study is to assess the existing air quality of the 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
- ❖ Historical data on wind speed and wind direction

3.4.3 Sampling and Analytical Techniques

Table 3.17 Methodology and Instrument Used for AAQ Analysis

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

Source: Sampling methodology based on Richardson & Cruddas (1972) Limited & CPCB Notification

Table 3.18 National Ambient Air Quality Standards

Sl. No.	Pollutant	Time Weighted Average	Concentration in ambient air	
			Industrial, Residential, Rural & other areas	Ecologically Sensitive area (Notified by Central Govt.)
1	Sulphur Dioxide (µg/m ³)	Annual Avg.*	50.0	20.0
		24 hours**	80.0	80.0
2	Nitrogen Dioxide (µg/m ³)	Annual Avg.	40.0	30.0
		24 hours	80.0	80.0

3	Particulate matter (size less than 10µm) PM ₁₀ (µg/m ³)	Annual Avg. 24 hours	60.0 100.0	60.0 100.0
4	Particulate matter (size less than 2.5 µm PM _{2.5} (µg/m ³)	Annual Avg. 24 hours	40.0 60.0	40.0 60.0

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

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

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

3.4.4 Frequency and Parameters for Sampling

Ambient air quality monitoring has been carried out with a frequency of two samples per week at Six (6) locations, adopting a continuous 24 hourly (3 shift of 8-hour) schedule for the period March– May 2022. The baseline data of ambient air has been generated for PM₁₀, PM_{2.5}, sulphur dioxide (SO₂) and nitrogen dioxide (NO₂). Monitoring has been carried out as per the CPCB, MoEF guidelines and notifications.

It was ensured that the equipment was placed preferably at a height of at least 3 ± 0.5 m above the ground level at each monitoring station for negating the effects of wind-blown ground dust. The equipment was placed at open space free from trees and vegetation which otherwise act as a sink of pollutants resulting in lower levels in monitoring results.

3.4.5 Ambient Air Quality Monitoring Stations

Six monitoring stations were set up in the study area as depicted in **Figure 3.11** for the assessment of the existing ambient air quality. During the selection of the monitoring stations, wind rose diagram drawn using one year windspeed and wind direction data was used as one of the important factors. The historical wind rose diagram has been shown in **Figure 3.10(a)**. Details of the sampling locations are given in the **Table 3.19**. The concentrations of air pollutants measured from the proposed project site have been given in **Tables 3.20 - 3.21** and the bar charts for easy visualisation as shown in **Figures 3.12-3.16**.

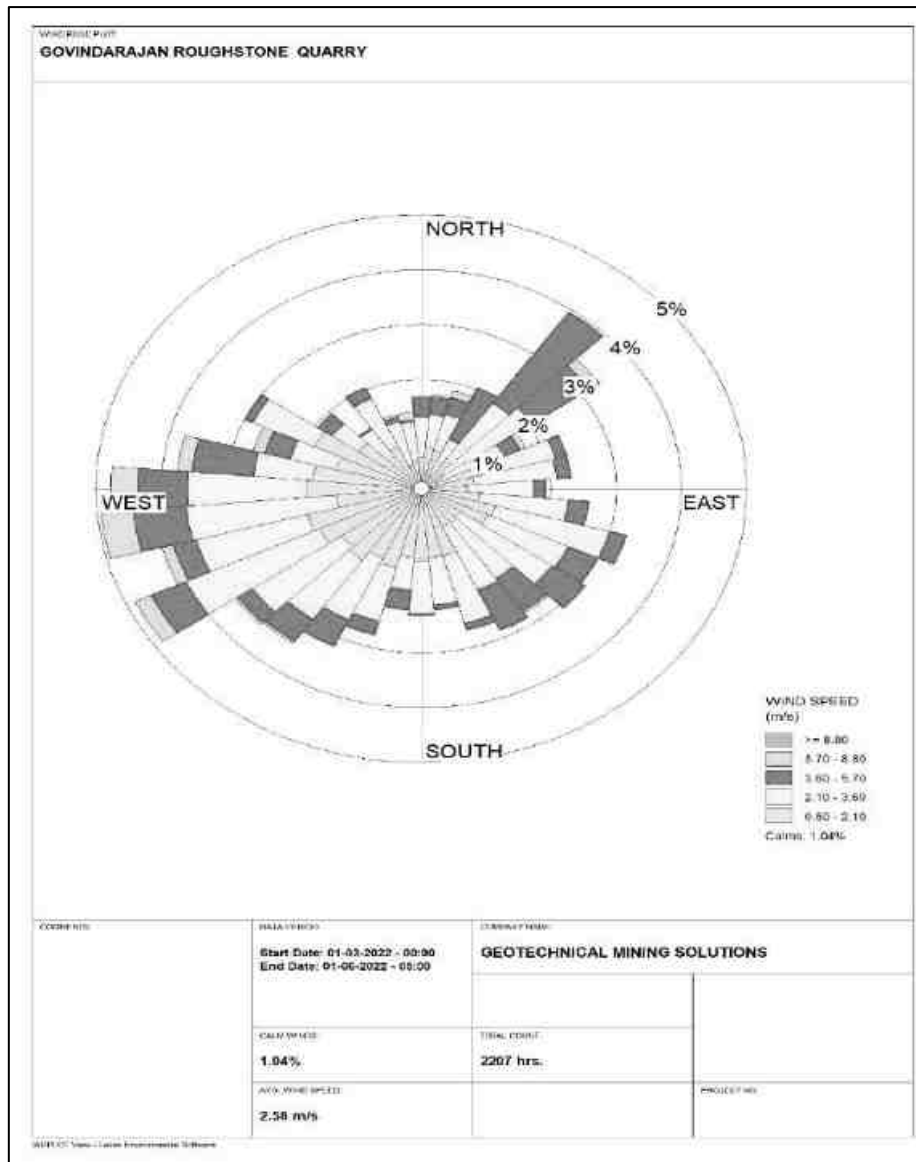


Figure 3.10(a) Historical Wind Rose Diagram Used for Selection of AAQ Monitoring Stations

Table 3.19 Ambient Air Quality (AAQ) Monitoring Locations

S. No.	Location Code	Monitoring Locations	Proposed Project	Geo-Coordinates
1	AAQ-1	Core Zone	Project Area	10°14'33.10"N, 78°14'23.15"E
2	AAQ-2	Natham (TP)	2.1 km SSW	10°13'31.63"N, 78°14'2.91"E
3	AAQ-3	Velanpatti	2.40 km SW	10°14'28.12"N, 78°13'3.17"E
4	AAQ-4	Panniyamalai	4.3 km NE	10°15'3.92"N, 78°16'43.15"E
5	AAQ-5	Uralipatti	5.00 km SE	10°12'5.73"N, 78°15'29.29"E
6	AAQ-6	Nadumandalam	1.66 km NE	10°16'22.50"N, 78°14'17.33"E

Source: On-site monitoring/sampling by Richardson & Cruddas (1972) Limited in association with GTMS

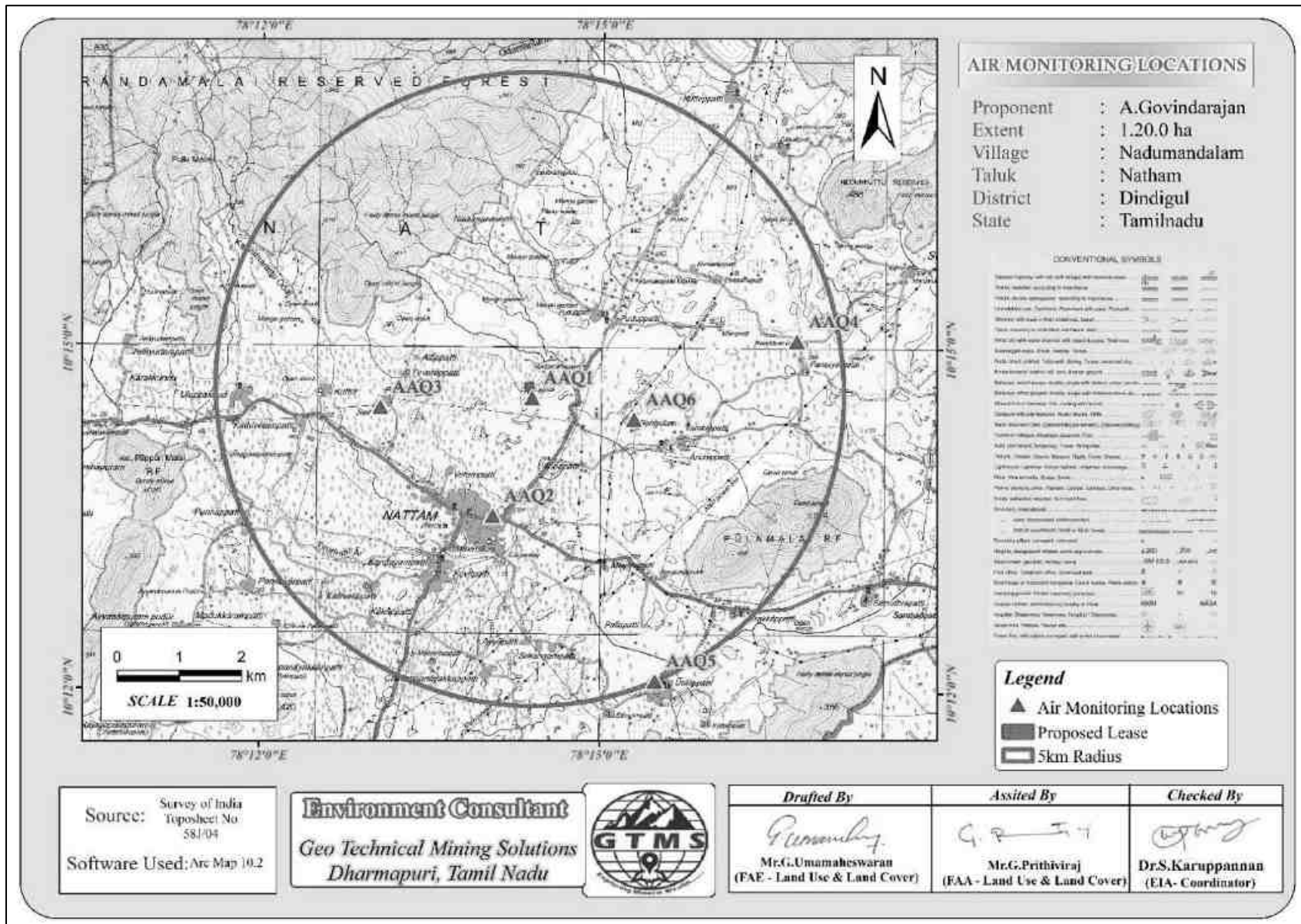


Figure 3.11 Geo- referenced toposheet showing Ambient air quality monitoring station locations around 5km radius from the proposed project site

Table 3.20 Summary of AAQ Result

Particulate matter PM_{2.5}					
Station ID	Max	Min	Mean	98 Percentile	STDEV
AAQ-1	25.8	23.1	24.62	25.8	0.70011
AAQ-2	23.5	22.1	22.74	23.5	0.367779
AAQ-3	23.7	22.6	23.21	23.5	0.339321
AAQ-4	24.5	21.7	22.90	24.4	0.744839
AAQ-5	22.6	21.5	21.94	22.6	0.308645
AAQ-6	22.9	21.5	22.22	22.9	0.413093
Particulate matter PM₁₀					
Station ID	Max	Min	Mean	98 Percentile	STDEV
AAQ-1	45.8	35.7	42.30	45.7	2.744449
AAQ-2	34.9	33.1	34.15	34.85	0.456273
AAQ-3	36.9	35.7	36.34	36.85	0.356845
AAQ-4	36.9	33.5	34.63	36.75	0.947231
AAQ-5	35.8	34.5	35.11	35.75	0.35364
AAQ-6	36.7	34.3	35.36	36.6	0.62429
Sulphur Di-oxide as SO₂					
Station ID	Max	Min	Mean	98 Percentile	STDEV
AAQ-1	9.6	8.1	8.88	9.6	0.433607
AAQ-2	8.7	7.3	7.98	8.6	0.363187
AAQ-3	7.3	6.2	6.74	6.9	0.281671
AAQ-4	7.9	6.2	7.07	7.85	0.445214
AAQ-5	6.8	5.5	6.14	6.75	0.3488
AAQ-6	6.7	5.1	5.72	6.6	0.40892
Oxide of Nitrogen as NO₂					
Station ID	Max	Min	Mean	98 Percentile	STDEV
AAQ-1	26.7	25.5	26.15	26.7	0.336132
AAQ-2	23.8	21.8	23.00	23.75	0.57235
AAQ-3	23.4	22.2	22.82	23.35	0.300692
AAQ-4	26.7	25.1	25.85	26.7	0.452769
AAQ-5	22.6	21.3	21.77	22.5	0.328353
AAQ-6	22.4	21.1	21.65	22.35	0.344361

Table 3.21 Maximum, Minimum, Average And 98th Percentile of Average Air Pollutant Concentrations Over the Study Area

S.No.	Parameter	Pollutant Concentration, µg/m³			
		PM_{2.5}	PM₁₀	SO₂	NO₂
1	Maximum	23.83	37.83	7.83	24.27
2	Minimum	22.08	34.43	6.40	22.83
3	Mean	22.94	36.32	7.09	23.54
4	98 th percentile	23.78	37.75	7.72	24.22
5	NAAQ Norms	60	100	80	80

Note: PM_{2.5}-Particulate Matter size less than 2.5 µm; PM₁₀- Particulate Matter size less than 10 µm; SO₂-Sulphur dioxide; NO_x-Oxides of Nitrogen; SD-Standard Deviation

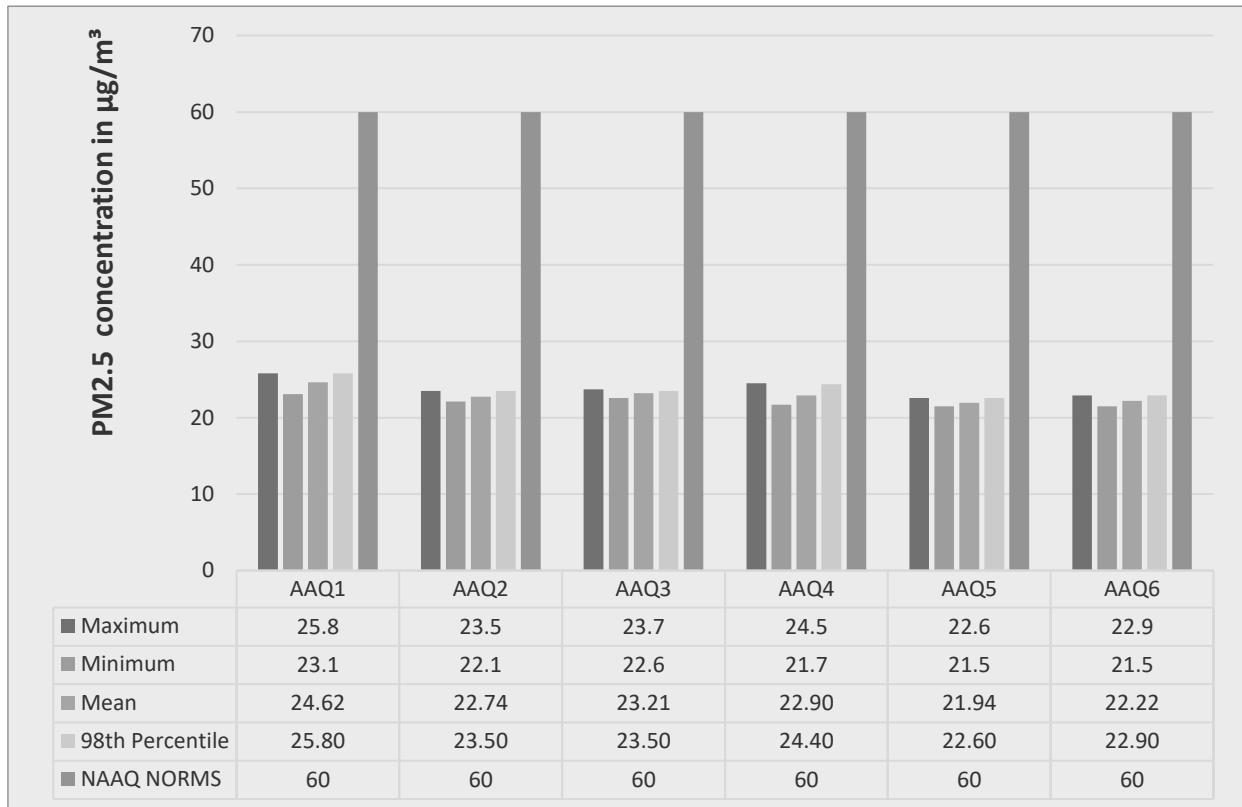


Figure 3.12 Bar chart showing maximum, minimum, and the average concentrations of PM_{2.5} measured from the six air quality monitoring stations within 5km radius

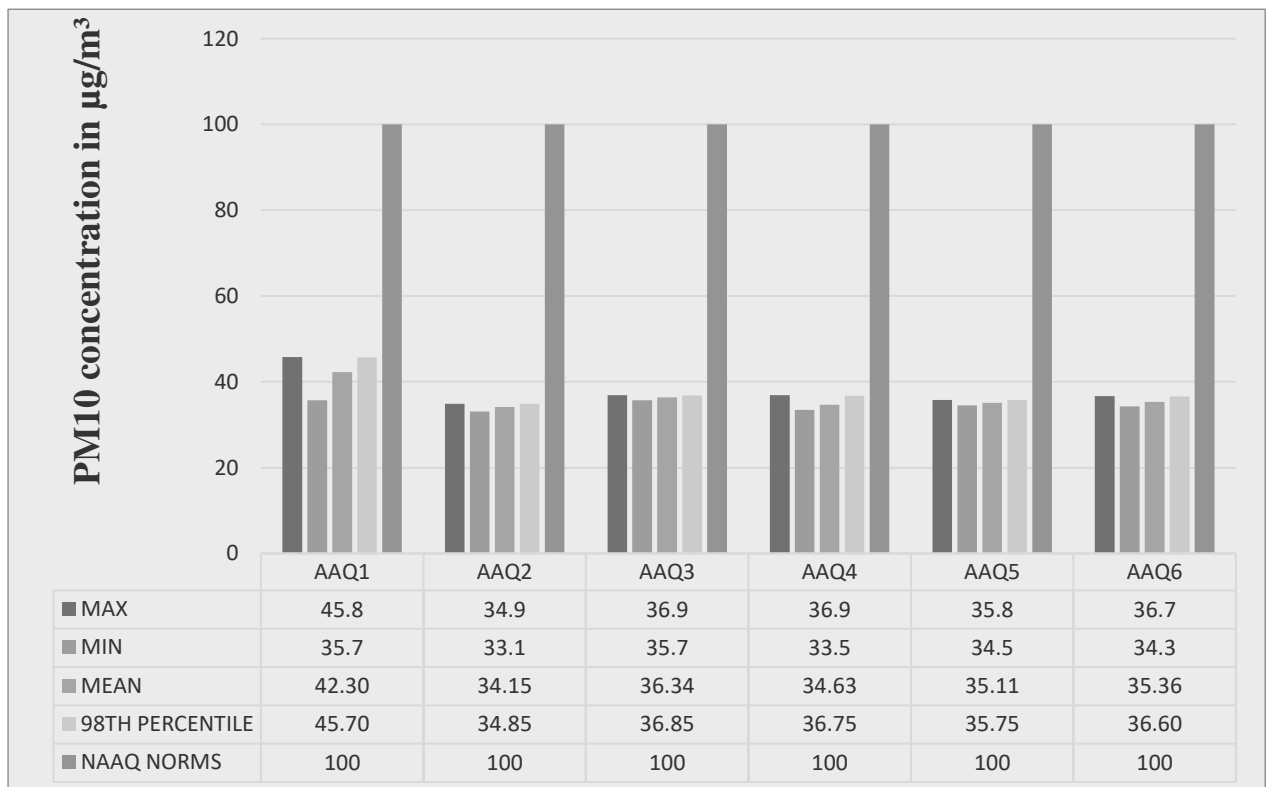


Figure 3.13 Bar chart showing maximum, minimum, and the average concentrations of PM₁₀ measured from the Six air quality monitoring stations within 5km radius

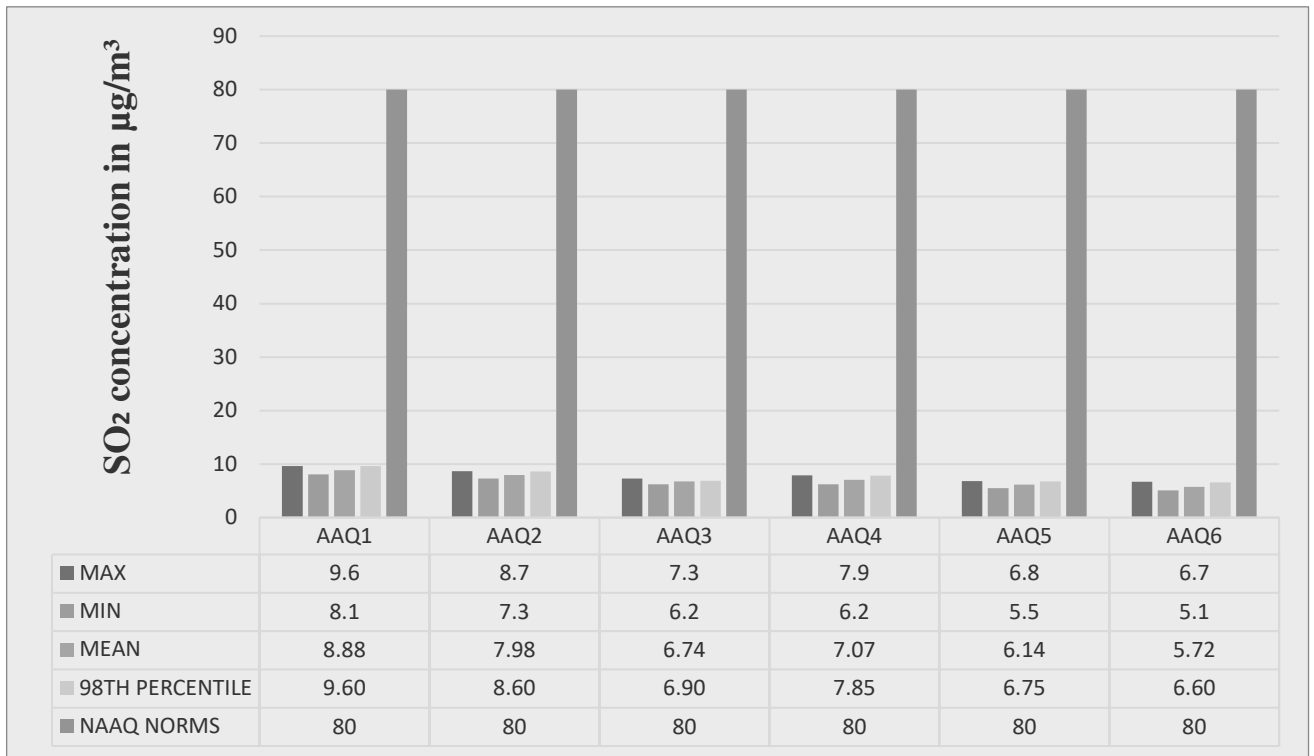


Figure 3.14 Bar chart showing maximum, minimum, and the average concentrations of SO₂ measured from the Six air quality monitoring stations within 5km radius

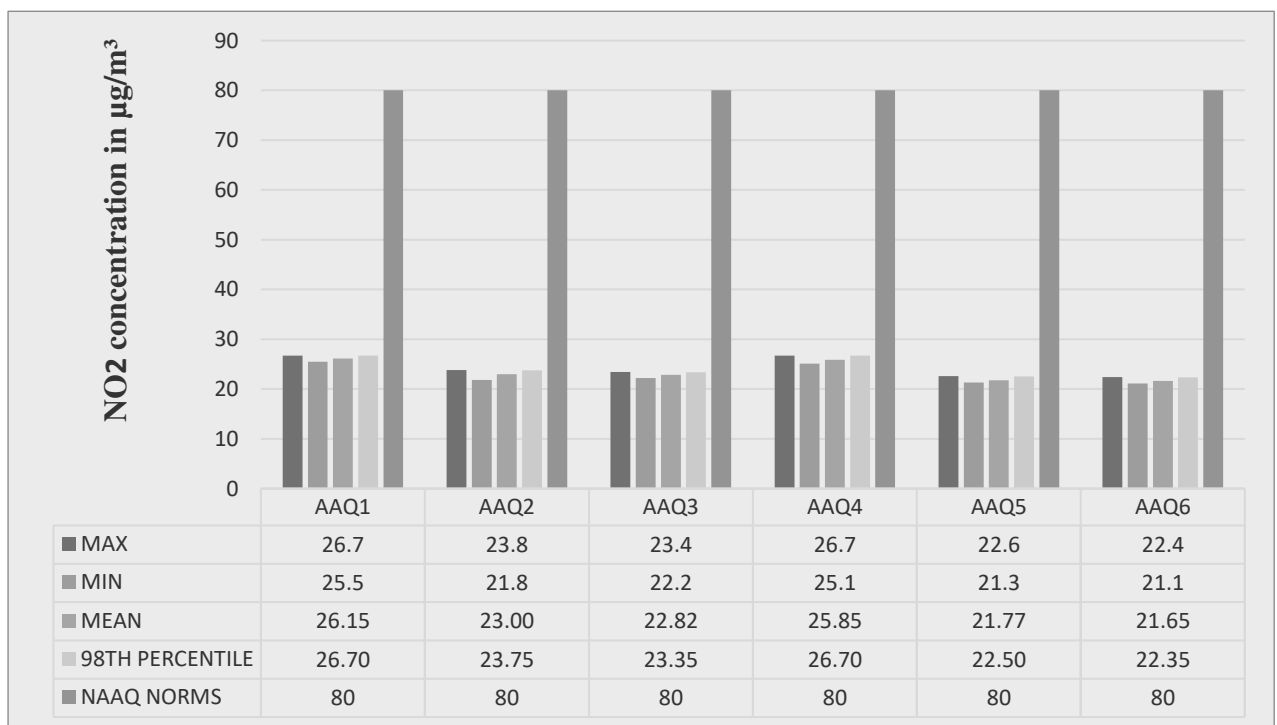


Figure 3.15 Bar chart showing maximum, minimum, and the average concentrations of NO₂ measured from the Six air quality monitoring stations within 5km radius

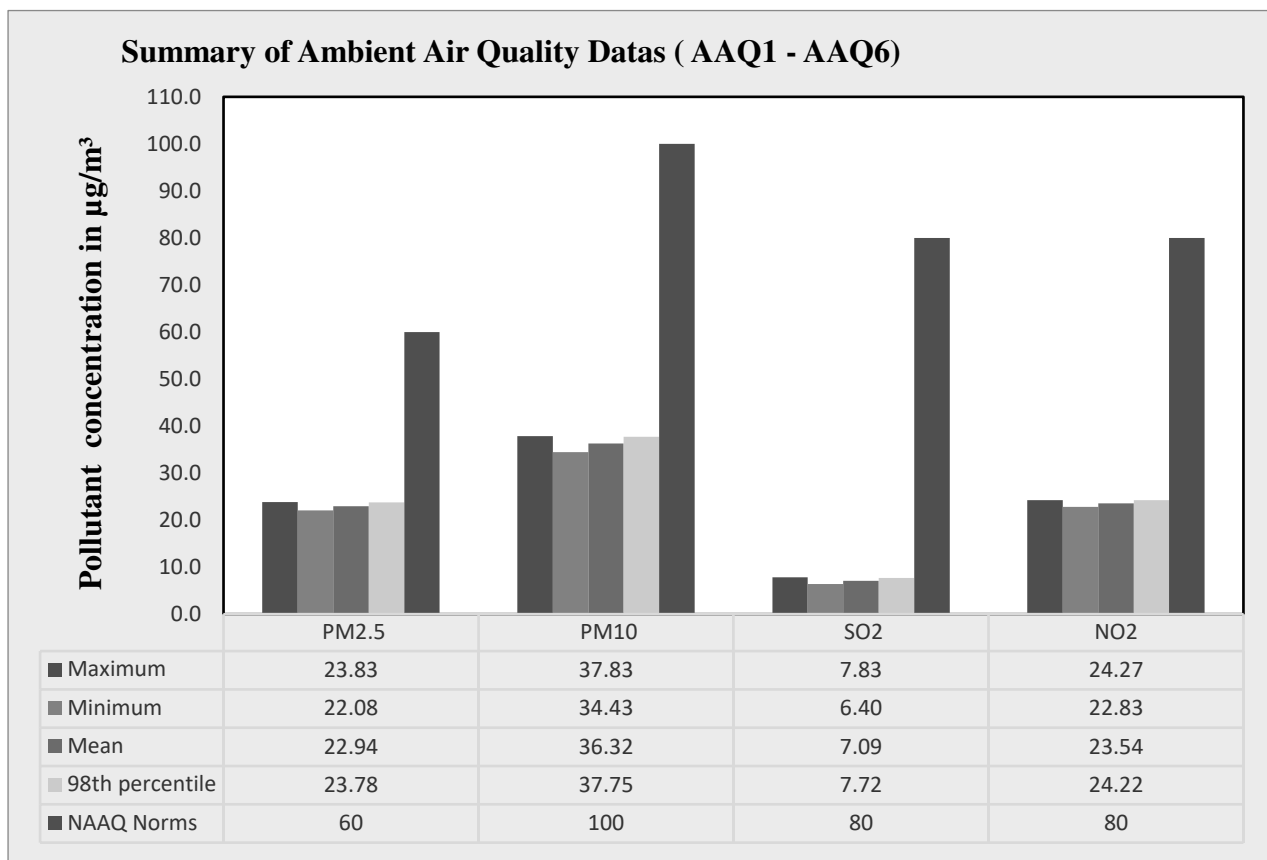


Figure 3.16 Bar chart showing maximum, minimum, and the average concentrations of pollutants in the atmosphere within 5km radius

3.4.6 Results & Discussion

Ambient air quality was monitored for the period of February 2022 – April 2022 at Six locations within 10 km radius from the project site. As per the monitoring data, PM_{2.5} ranges from 21.5 µg/m³ to 25.8 µg/m³; PM₁₀ from 33.1 µg/m³ to 45.8 µg/m³; SO₂ from 5.1 µg/m³ to 9.6 µg/m³; NO₂ from 21.1 µg/m³ to 26.7 µg/m³. The concentration levels of the pollutants fall within the acceptable limits of NAAQS prescribed by CPCB.

3.5 NOISE ENVIRONMENT

The vehicular movement on road and mining activities is the major sources of noise in the 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 measure the baseline noise level and assess the total noise expected to be generated during the project operations around the project sites.

3.5.1 Identification of Sampling Locations

In order to assess the ambient noise levels within the study area, noise monitoring was carried out at Seven (7) locations as shown in **Table 3.22 and Figure 3.17**, covering commercial, residential, rural areas within the radius of 10km. A suitable noise monitoring methodology was chosen to meet the purpose and objectives of the study.

Table 3.22 Details of Noise Monitoring Locations

S. No	Location Code	Monitoring Locations	Distance and Direction from Project area	Geo-Coordinates
1	N1	Core zone	Project Area	10°14'32.73"N78°14'23.29"E
2	N2	Velanpatti	0.54 km SW	10°14'20.04"N78°14'14.32"E
3	N3	Natham(TP)	2.1 km SW	10°13'30.93"N78°14'3.39"E
4	N4	Velanpatti	2.40 km SW	10°14'28.07"N78°13'3.21"E
5	N5	Panniyamalai	4.33km NE	10°15'4.08"N78°16'43.41"E
6	N6	Uralipatti	5 km SE	10°12'5.81"N78°15'29.38"E
7	N7	Nadumandalam	3.5km NW	10°16'29.51"N,78°14'39.52"E

Source: On-site monitoring/sampling by Richardson & Cruddas (1972) Limited in association with GTMS

3.5.2 Method of Monitoring

Digital Sound Level Meter was used f

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

$$Leq = 10 \text{ Log } L / T \sum (10L_n/10)$$

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

T = Time interval of observation

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

3.5.3 Analysis of Ambient Noise Level in the Study Area

The Digital Sound pressure level has been measured by a sound level meter (Model: HTC SL-1352). An analysis of the different Leq data obtained during the study period has been made. Variation was noted during the day-time as well as night-time. The results are presented in **Table 3.23 and Figures 3.18 & 3.19**.

Day time: 6:00 hours to 22.00 hours.

Night time: 22:00 hours to 6.00 hours.

Table 3.23 Ambient Noise Quality Result

S. No	Locations	Noise level (dB (A) Leq)		Ambient Noise Standards
		Day Time	Night Time	
1	Core zone	44.46	37.52	Industrial Day Time- 75 dB (A) Night Time- 70 dB (A) Residential Day Time- 55 dB (A) Night Time- 45 dB (A)
2	Velanpatti	43.27	36.95	
3	Natham(TP)	44.81	38.47	
4	Velanpatti	43.58	37.32	
5	Panniyamalai	43.27	36.98	
6	Uralipatti	42.45	36.76	
7	Nadumandalam	40.45	36.35	

Source: On-site monitoring/sampling by Richardson & Cruddas (1972) Limited in association with GTMS

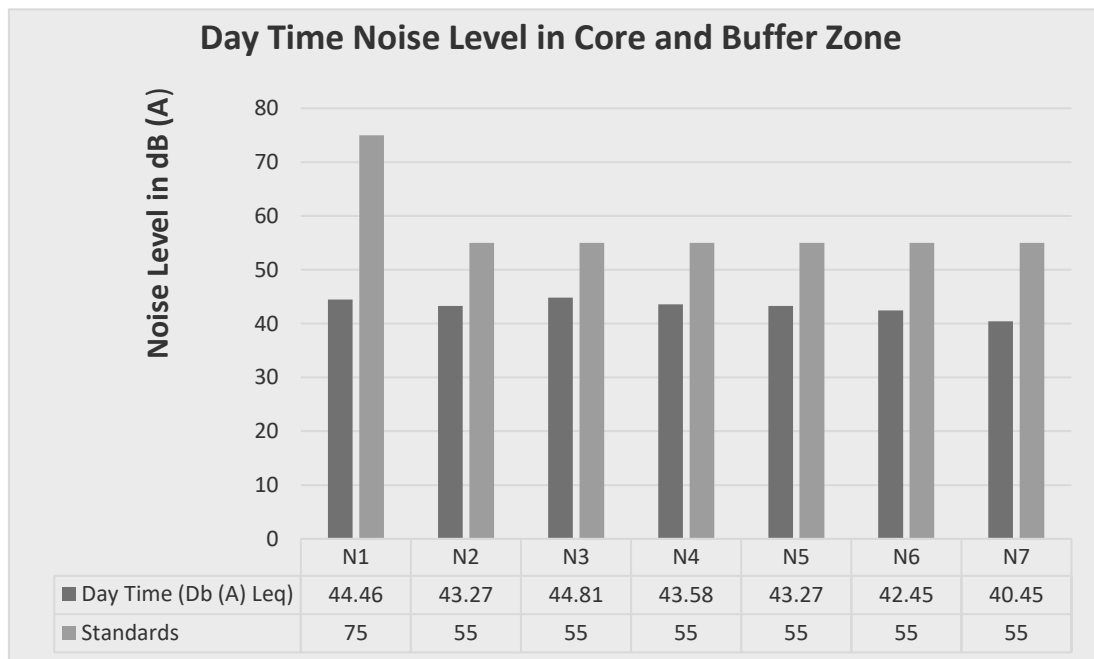


Figure 3.18 Bar chart showing day time noise levels measured in core and buffer zones

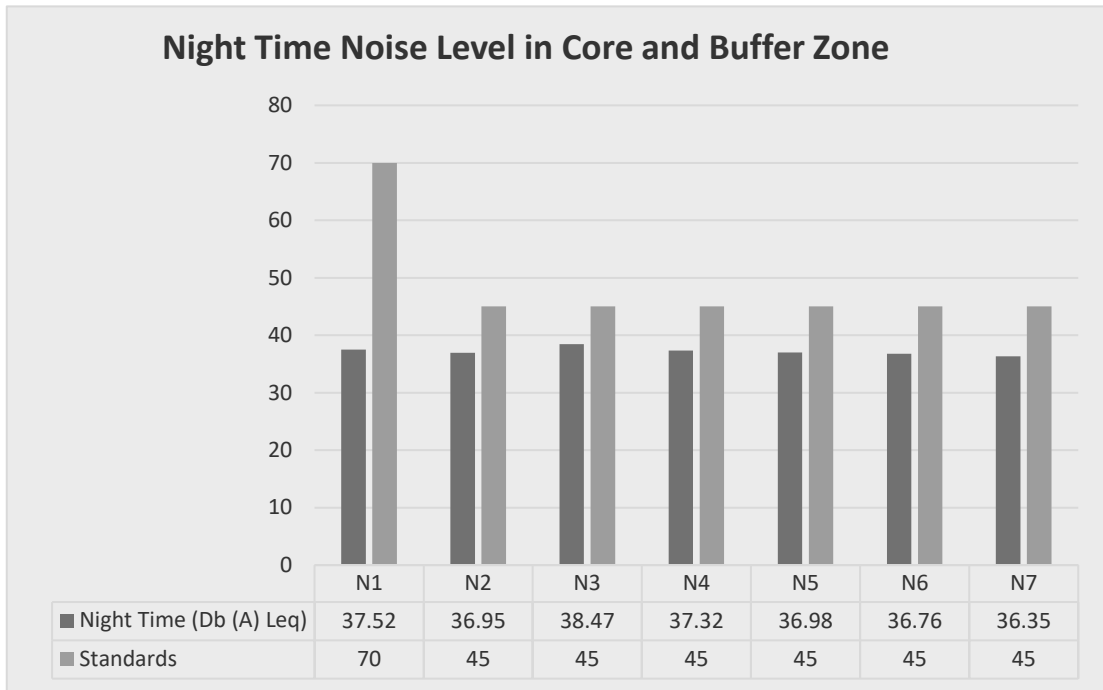


Figure 3.19 Bar chart showing night time noise levels measured in core and buffer zones

3.5.4 Results & Discussion

Ambient noise levels were measured at 6 locations around the proposed project area. Noise levels recorded in core zone during day time was 44.46 dB (A) Leq and during night time was 37.52 dB (A) Leq. Noise levels recorded in buffer zone during day time varied from 40.45 to 44.81 dB (A) Leq and during night time from 36.35 to 38.47 dB (A) Leq. Thus, the noise level for industrial and residential area meets the requirements of CPCB.



Figure 3.20 Soil Sample Collection using Motorized Auger for Soil Chemistry Analysis.



Figure 3.21 Surface and Borewell water sample collection for water quality analysis



Figure 3.22 Ambient air quality data collecting in core and Buffer Zone



Figure 3.23 Noise level monitoring in core zone and buffer zone



Figure 3.24 Quadrates sampling methods of flora Core Zone and Buffer Zone

3.6 ECOLOGICAL ENVIRONMENT

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

Tamil Nadu is the southernmost state of the Indian peninsula, spread over 1, 30, 058Sq.Km. Among the southern states, Tamil Nadu contains the maximum number of 9 of the totals of 16 major forest types recognized in India by Champion and Seth. Within the major types 48 subtypes in the zone in which they are present.

3.6.1 Scope of Work

Scope of work for this study includes identification of ecologically sensitive receptors based on literature survey, field investigations, and their mitigation with conservation action plan. The study was carried out in the core as well as buffer zone of the Proposed Rough stone quarry. The study was carried out systematically and scientifically using primary and secondary data in order to bring out factual information on the ecological conditions of the mine site and 10 km radius study area.

The study involved assessment of general habitat type, vegetation pattern, preparation of inventory of flora and fauna of terrestrial ecosystem within 10 km radius from the boundary of the proposed quarry site. Biological assessment of the site was done to identify ecologically sensitive areas and whether there are any rare, endangered, endemic or threatened (REET) species of flora & fauna in the core area as well its buffer zone to be impacted. The study has also been designed to suggest suitable mitigation measures, if necessary, for protection of wildlife habitats and conservation of REET species if any.

3.6.2. Study area ecology

The core area extent of 1.20.0 ha of rough stone quarry has an impact on diversity of flora and fauna of surrounding area but present work was carried out on detailed study of the impacts of rough stone quarry on ecology and biodiversity of core lease area with the proper mitigation and sustainable management plan. The quarry lease applied area is a plain

topography whereas in buffer zone some places agricultural land is dominated. The following methods were applied during the baseline study of flora, fauna and diversity assessment.

3.6.3 Objectives of Biological Studies

The present study was undertaken with the following objectives:

- ❖ To study the likely impact of the proposed mining project on the local biodiversity and to suggest mitigation measures, if required, for vulnerable biota.
- ❖ To assess the nature and distribution of vegetation (Terrestrial and Aquatic) in and around the mining activity.
- ❖ To collect details of flora and fauna, Endemic, Rare, Endangered and Threatened (RET Species) separately from the core and buffer area and to clearly indicate the schedule of fauna present.
- ❖ To prepare the necessary plan along with budgetary provisions for their conservation in consultation with State Forest and Wildlife Department and details furnished, in case of any schedule- I fauna found in the study area.
- ❖ To devise effective management & conservation measures for biodiversity.

3.6.4 Methodology of Sampling

The present study was carried out in steps as below:

- ❖ Field survey was conducted by visual encounter survey for flora present within the 10 km radius study area of proposed mine site.
- ❖ After surveying the core and buffer areas, a detailed floral inventory has been compiled. List of all plants of the study area was prepared and their habitats were recorded.
- ❖ Verification of Rare, Endangered and Threatened Flora species from IUCN Red Data Book.

3.6.4.1 Site selection criteria

Selection of sampling locations was made with reference to topography, land use, vegetation pattern, etc. The observations were taken on natural vegetation, roadside plantation and non-forest area (agricultural field, in plain areas, Village wasteland, etc.) for quantitative representation of different species. A methodology of Sampling Flora and fauna studies were carried out during the Post monsoon season to assess the list of terrestrial plant and animal species that occur in the core area and the buffer area up to 10 km radius from the project site. No damage is created to flora and fauna during the sampling.

In order to provide representative ecological status for the study area, the 10-km buffer zone has been divided into four quartiles for biodiversity sampling, i.e., NE (Quartile-1), NW (Quartile-2) SW (Quartile-3) and SE (Quartile-4). Each of the quartiles have been examined for representative flora on randomly sampled quadrats for trees (20x20-m), shrubs (10x10-m) and herbs (2x2-m) depending upon prevailing geographical conditions and biodiversity aspects of study area.

3.6.4.2 Quadrats Method

Quadrats of 20 × 20m were laid down randomly within core and 5km buffer area; each quadrat was laid to assess the trees (>5 cm GBH) and one, 10 × 10m sub-quadrat nested within the quadrat for shrubs. The quadrats were laid randomly to cover the area to maximize the sampling efforts and minimize the species homogeneity, such as small stream area, trees in agricultural bunds, tank bunds, farm forestry plantations, wildlife areas, natural forest area, avenue plantations, house backyards, etc. In each quadrat individuals belonging to tree (20 × 20m) and shrub (10 × 10m) were recorded separately and have been identified on the field. Quadrates sampling methods is given in **Figure.3.25**.



Figure 3.25 Random sampling of Quadrats Method in study Area

3.6.5 Flora

Flora study was conducted using the above said methodology to inventory the existing terrestrial plants in both core and buffer zones. Details of plants have been described in the succeeding sections.

3.6.5.1 Flora in the Core Zone

As the lease area is entirely composed of massive rock, there is no any kind of flora and fauna.

3.6.5.1.2 Flora Within 500 m Radius Zone from the Periphery of Lease Area

Taxonomically a total of 27 species belonging to 21 families have been recorded from the core mining lease area. The lease applied area is flat terrain. Based on habitat classification of the enumerated plants the majority of species were Herbs, Climbers 19 followed by Trees 4 Shrub 4 The result of core zone of flora studies shows that Fabaceae and Lamiaceae are the main dominating species in the study area it mentioned in **Table 3.24**. Species Richness (margalef Index) in the study area it mentioned in **Table 3.25-3.26**

3.6.5.2 Flora in Buffer Zone Between 500 m Radius Zone And 10 km Radius Zone

Similar type of environment also in buffer area but with more flora diversity compare than core zone area because nearby agriculture land but presently there are no cultivation. It contains a total of 64 species belonging to 35 families have been recorded from the buffer zone. The floral (64) varieties among them Trees (28), shrubs (14) and thirty herbs, Climbers Creepers and Grasses, (32) were identified. The result of buffer zone of flora studies shows that Fabaceae and Poaceae, Cucurbitaceae are the main dominating species in the study area it mentioned in **Table 3.27**. There is no Rare, Endangered and Threatened Flora species in mining area and their surrounding area. Details of flora with the scientific name were mentioned in **Table 3.27**. Species Richness (margalef Index) in the study area it mentioned in **Table 3.28-3.29**

Table 3.24 Flora Within 500 m Radius Zone from the Periphery of Lease Area

S. No	Local Name	Scientific name	Family name	Total No. of species	Total of Quadrants with species	Total No. of Quadrants	Density	Frequency (%)	Abundance	Relative Density	Relative Frequency	IVI	IUCN Conservation Status
TREE													
1	Nuna maram	<i>Morinda citrifolia</i>	Rubiaceae	2	2	5	0.4	40.0	1.0	13.3	16.7	30.0	Not Listed
2	Vembu	<i>Azadirachta indica</i>	Meliaceae	2	2	5	0.4	40.0	1.0	13.3	16.7	30.0	Not Listed
3	Velikathan maram	<i>Prosopis juliflora</i>	Fabaceae	5	4	5	1.0	80.0	1.3	33.3	33.3	66.7	Not Listed
SHRUBS													
1	Aavarai	<i>Senna auriculata</i>	Fabaceae	7	6	10	0.7	60.0	1.2	23.3	23.1	46.4	Not Listed
2	Erukku	<i>Calotropis gigantea</i>	Apocynaceae	8	7	10	0.8	70.0	1.1	26.7	26.9	53.6	Not Listed
3	Unichedi	<i>Lantana camara</i>	Verbenaceae	9	8	10	0.9	80.0	1.1	30.0	30.8	60.8	Not Listed
4	Milk multiplier	<i>Euphorbia cooperi</i>	Euphorbiaceae	6	5	10	0.6	50.0	1.2	20.0	19.2	39.2	Not Listed
HERBS & CLIMBERS													
1	Thumbai	<i>Leucas aspera</i>	Lamiaceae	7	6	15	0.5	40.0	1.2	5.1	5.3	10.4	Not Listed
2	Nerunji	<i>Tribulus terrestris</i>	Zygophyllales	6	5	15	0.4	33.3	1.2	4.4	4.4	8.8	Not Listed
3	Korai	<i>Cyperus rotundus</i>	Cyperaceae	5	4	15	0.3	26.7	1.3	3.7	3.5	7.2	Not Listed
4	Poolai poondu	<i>Aerva lanata</i>	Amaranthaceae	4	3	15	0.3	20.0	1.3	2.9	2.6	5.6	Not Listed
5	Arugampul	<i>Cynodon dactylon</i>	Poaceae	10	9	15	0.7	60.0	1.1	7.4	7.9	15.2	Not Listed

6	Vishnukrandi	<i>Evolvulus alsinoides</i>	Convolvulaceae	7	6	15	0.5	40.0	1.2	5.1	5.3	10.4	Not Listed
7	Reilpoondu	<i>Croton bonplandianus</i>	Euphorbiaceae	6	5	15	0.4	33.3	1.2	4.4	4.4	8.8	Not Listed
8	Cinnamon garlic	<i>Sida acuta</i>	Malvaceae	8	7	15	0.5	46.7	1.1	5.9	6.1	12.0	Not Listed
9	Kenathup poondu	<i>Tridax procumbens L</i>	Asteraceae	5	4	15	0.3	26.7	1.3	3.7	3.5	7.2	Not Listed
10	Simai Mukkirattai	<i>Boerhavia coccinea Mill</i>	Nyctaginaceae	7	6	15	0.5	40.0	1.2	5.1	5.3	10.4	Not Listed
11	windmills	<i>allionia incarnata</i>	Nyctaginaceae	5	4	15	0.3	26.7	1.3	3.7	3.5	7.2	Not Listed
12	Kattamanaku	<i>Jatropha gossypifolia</i>	Euphorbiaceae	6	5	15	0.4	33.3	1.2	4.4	4.4	8.8	Not Listed
13	Amaranth	<i>Gomphrena serrata L.</i>	Amaranthaceae	4	3	15	0.3	20.0	1.3	2.9	2.6	5.6	Not Listed
14	Kumatti	<i>Citrullus colocynthis</i>	Cucurbitaceae	7	6	15	0.5	40.0	1.2	5.1	5.3	10.4	Not Listed
15	Naivelai	<i>Cleome viscosa</i>	Cleomaceae	4	3	15	0.3	20.0	1.3	2.9	2.6	5.6	Not Listed
16	Kolunji	<i>Tephrosia purpurea</i>	Fabaceae	8	7	15	0.5	46.7	1.1	5.9	6.1	12.0	Not Listed
17	devil weed	<i>chromolaena odorata</i>	Asteraceae	5	4	15	0.3	26.7	1.3	3.7	3.5	7.2	Not Listed
18	Tigajeluga	<i>Aeschynomene indica</i>	Aeschynomene	6	5	15	0.4	33.3	1.2	4.4	4.4	8.8	Not Listed
19	Unagodi	<i>Ipomoea muricata</i>	Convolvulaceae	8	7	15	0.5	46.7	1.1	5.9	6.1	12.0	Not Listed
20	Digitaria	<i>Digitaria sanguinalis</i>	Poaceae	6	5	15	0.4	33.3	1.2	4.4	4.4	8.8	Not Listed
21	Perandai	<i>Cissus quadrangularis</i>	Vitaceae	9	8	15	0.6	53.3	1.1	6.6	7.0	13.6	Not Listed

Table 3.25 calculation of species diversity in core zone

S.No	Common name	Scientific name	No. of Species	Pi	In (Pi)	Pi x in (Pi)
Tree						
1	Nuna maram	<i>Morinda citrifolia</i>	2	0.13	-2.01	-0.27
2	Vembu	<i>Azadirachta indica</i>	2	0.13	-2.01	-0.27
3	Velikathan maram	<i>Prosopis juliflora</i>	5	0.33	-1.10	-0.37
H (Shannon Diversity Index) =1.52						
Shrubs						
1	Aavarai	<i>Senna auriculata</i>	7	0.23	-1.46	-0.34
2	Erukku	<i>Calotropis gigantea</i>	8	0.27	-1.32	-0.35
3	Unichedi	<i>Lantana camara</i>	9	0.30	-1.20	-0.36
4	Milk multiplier	<i>Euphorbia cooperi</i>	6	0.20	-1.61	-0.32
H (Shannon Diversity Index) =1.38						
herbs						
1	Thumbai	<i>Leucas aspera</i>	7	0.05	-2.97	-0.15
2	Nerunji	<i>Tribulus terrestris</i>	6	0.04	-3.12	-0.14
3	Korai	<i>Cyperus rotundus</i>	5	0.04	-3.30	-0.12
4	Poolai poondu	<i>Aerva lanata</i>	4	0.03	-3.53	-0.10
5	Arugampul	<i>Cynodon dactylon</i>	10	0.07	-2.61	-0.19
6	Karunthulasi	<i>Ocimum basilicum</i>	3	0.02	-3.81	-0.08
7	Vishnukrandi	<i>Evolvulus alsinoides</i>	7	0.05	-2.97	-0.15
8	Reilpoondu	<i>Croton bonplandianus</i>	6	0.04	-3.12	-0.14
9	Cinnamon garlic	<i>Sida acuta</i>	8	0.06	-2.83	-0.17
10	Kenathuppoondu	<i>Tridax procumbens L</i>	5	0.04	-3.30	-0.12
11	Simai Mukkirattai	<i>Boerhavia coccinea Mill</i>	7	0.05	-2.97	-0.15
12	windmills	<i>allionia incarnata</i>	5	0.04	-3.30	-0.12
13	Kattamanaku	<i>Jatropha gossypiiifolia</i>	6	0.04	-3.12	-0.14
14	Amaranth	<i>Gomphrena serrata L.</i>	4	0.03	-3.53	-0.10
15	Kumatti	<i>Citrullus colocynthis</i>	7	0.05	-2.97	-0.15
16	Naivelai	<i>Cleome viscosa</i>	4	0.03	-3.53	-0.10
17	Kolunji	<i>Tephrosia purpurea</i>	8	0.06	-2.83	-0.17
18	devil weed	<i>chromolaena odorata</i>	5	0.04	-3.30	-0.12
19	Tigajeluga	<i>Aeschynomene indica</i>	6	0.04	-3.12	-0.14
20	Unagodi	<i>Ipomoea muricata</i>	8	0.06	-2.83	-0.17
21	Digitaria	<i>Digitaria sanguinalis</i>	6	0.04	-3.12	-0.14
22	Perandai	<i>Cissus quadrangularis</i>	9	0.07	-2.72	-0.18
H (Shannon Diversity Index) =2.91						

Table 3.26 species richness in core zone

Details	H	H max	Evenness	Species Richness (margalef Index)
Tree	1.52	1.61	0.95	1.48
Shrubs	1.38	1.39	0.99	0.88
Herbs	3.05	3.09	0.99	4.27

Table 3.27 Flora in Buffer Zone

S.No	Local Name	Scientific name	Family name	Total No. of species	Total of Quadrants with species	Total No. of Quadrants	Density	Frequency (%)	Abundance	Relative Density	Relative Frequency	IVI	IUCN Conservation Status
TREE													
1	Vembu	<i>Azadirachta indica</i>	Meliaceae	5	4	10	0.5	40.0	1.3	3.1	2.9	6.0	Not Listed
2	Karuvelam maram	<i>Vachellia nilotica</i>	Fabaceae	6	5	10	0.6	50.0	1.2	3.8	3.6	7.4	Not Listed
3	Arai nelli	<i>Phyllanthus acidus</i>	Phyllanthaceae	5	4	10	0.5	40.0	1.3	3.1	2.9	6.0	Not Listed
4	Nuna maram	<i>Morinda citrifolia</i>	Rubiaceae	7	6	10	0.7	60.0	1.2	4.4	4.4	8.8	Not Listed
5	Puliyamaram	<i>Tamarindus indica</i>	Fabaceae	6	5	10	0.6	50.0	1.2	3.8	3.6	7.4	Not Listed
6	Nochi	<i>Vitex negundo</i>	Lamiaceae	5	4	10	0.5	40.0	1.3	3.1	2.9	6.0	Not Listed
7	Moonghil	<i>Bambusa bambo</i>	Poaceae	3	2	10	0.3	20.0	1.5	1.9	1.5	3.3	Not Listed
8	Thailam maram	<i>Eucalyptus tereticornis</i>	Myrtaceae	6	5	10	0.6	50.0	1.2	3.8	3.6	7.4	Not Listed
9	Manga	<i>Mangifera indica</i>	Anacardiaceae	7	6	10	0.7	60.0	1.2	4.4	4.4	8.8	Not Listed
10	Athi	<i>Ficus recemosa</i>	Moraceae	5	4	10	0.5	40.0	1.3	3.1	2.9	6.0	Not Listed
11	Thekku	<i>Tectona grandis</i>	Lamiaceae	6	5	10	0.6	50.0	1.2	3.8	3.6	7.4	Not Listed
12	Kadukkai	<i>Terminalia chebula</i>	Combretaceae	8	7	10	0.8	70.0	1.1	5.0	5.1	10.1	Not Listed
13	Navalmaram	<i>Sygygium cumini</i>	Myrtaceae	6	5	10	0.6	50.0	1.2	3.8	3.6	7.4	Not Listed
14	Pappali maram	<i>Carica papaya L</i>	Caricaceae	7	6	10	0.7	60.0	1.2	4.4	4.4	8.8	Not Listed
15	pongam	<i>Millettia pinnata</i>	Fabaceae	5	4	10	0.5	40.0	1.3	3.1	2.9	6.0	Not Listed
16	Alamaram	<i>Ficus benghalensis</i>	Moraceae	5	6	10	0.5	60.0	0.8	3.1	4.4	7.5	Not Listed
17	Koyya	<i>Psidium guajava</i>	Myrtaceae	7	6	10	0.7	60.0	1.2	4.4	4.4	8.8	Not Listed

18	Ezhumuchaipalam	Citrus lemon	Rutaceae	5	4	10	0.5	40.0	1.3	3.1	2.9	6.0	Not Listed
19	Murunga maram	Moringa oleifera	Moringaceae	8	7	10	0.8	70.0	1.1	5.0	5.1	10.1	Not Listed
20	Marudaani	Lawsonia inermis	Lythraceae	9	8	10	0.9	80.0	1.1	5.6	5.8	11.5	Not Listed
21	Kattu Nelli	Phyllanthus emblica	Phyllanthaceae	6	7	10	0.6	70.0	0.9	3.8	5.1	8.9	Not Listed
22	Nettilinkam	Polylathia longifolia	Annonaceae	5	4	10	0.5	40.0	1.3	3.1	2.9	6.0	Not Listed
23	Vaagai	Albizia lebbeck	Fabaceae	7	6	10	0.7	60.0	1.2	4.4	4.4	8.8	Not Listed
24	Panai maram	Borassus flabellifer	Arecaceae	4	3	10	0.4	30.0	1.3	2.5	2.2	4.7	Not Listed
25	seethapazham	Annona reticulata	Annonaceae	6	5	10	0.6	50.0	1.2	3.8	3.6	7.4	Not Listed
26	Arasanmaram	Ficus religiosa	Moraceae	5	4	10	0.5	40.0	1.3	3.1	2.9	6.0	Not Listed
27	Vazhaimaram	Musa acuminata	Musaceae	6	5	10	0.6	50.0	1.2	3.8	3.6	7.4	Not Listed
SHRUBS													
1	Avarai	Senna auriculata	Fabaceae	9	8	15	0.6	53.3	1.1	7.5	7.6	15.1	Not Listed
2	Erukku or Crown flower	Calotropis gigantea	Apocynaceae	6	5	15	0.4	33.3	1.2	5.0	4.8	9.8	Not Listed
3	Kattamanakku	Jatropha curcas	Euphorbiaceae	7	6	15	0.5	40.0	1.2	5.8	5.7	11.5	Not Listed
4	Thuthi	Abutilon indicum	Meliaceae	8	7	15	0.5	46.7	1.1	6.7	6.7	13.3	Not Listed
5	Sundaika	Solanum torvum	Solanaceae	9	8	15	0.6	53.3	1.1	7.5	7.6	15.1	Not Listed
6	Chaturakalli	Euphorbia antiquorum	Euphorbiaceae	8	7	15	0.5	46.7	1.1	6.7	6.7	13.3	Not Listed
7	Neermulli	Hydrophila auriculata	Acanthaceae	6	5	15	0.4	33.3	1.2	5.0	4.8	9.8	Not Listed
8	Thottalchinungi	Mimosa pudica	Fabaceae	9	8	15	0.6	53.3	1.1	7.5	7.6	15.1	Not Listed
9	Kundumani	Abrus precatorius	Fabaceae	7	6	15	0.5	40.0	1.2	5.8	5.7	11.5	Not Listed
10	Nithyakalyani	Cathranthus roseus	Apocynaceae	8	7	15	0.5	46.7	1.1	6.7	6.7	13.3	Not Listed

11	Chemparuthi	<i>Hibiscu rosa-sinensis</i>	Malvaceae	9	8	15	0.6	53.3	1.1	7.5	7.6	15.1	Not Listed
12	Arali	<i>Nerium indicum</i>	Apocynaceae	10	9	15	0.7	60.0	1.1	8.3	8.6	16.9	Not Listed
13	Virali	<i>Dodonaea viscosa</i>	Sapindaceae	7	6	15	0.5	40.0	1.2	5.8	5.7	11.5	LC
14	Nocchi	<i>Vitex negundo</i>	Lamiaceae	8	7	15	0.5	46.7	1.1	6.7	6.7	13.3	Not Listed
15	Kaṟivēppilai maram	<i>Murraya koenigii</i>	Rutaceae	9	8	15	0.6	53.3	1.1	7.5	7.6	15.1	Not Listed
HERBS&CLIMBER &CREEPER &GRASSES													
1	Parttiniyam	<i>Parthenium hysterophorus</i>	Asteraceae	7	6	25	0.3	24.0	1.2	3.2	3.1	6.3	Not Listed
2	Kuppaimeni	<i>Acalypha indica</i>	Euphorbiaceae	8	7	25	0.3	28.0	1.1	3.6	3.6	7.2	Not Listed
3	Arugampul	<i>Cynodon dactylon</i>	Poaceae	11	10	25	0.4	40.0	1.1	5.0	5.2	10.2	Not Listed
4	Thulasi	<i>Ocimum tenuiflorum</i>	Lamiaceae	12	11	25	0.5	44.0	1.1	5.4	5.7	11.1	Not Listed
5	Korai	<i>Cyperus rotundus</i>	Cyperaceae	8	7	25	0.3	28.0	1.1	3.6	3.6	7.2	Not Listed
6	Thumbai	<i>Leucas aspera</i>	Lamiaceae	6	5	25	0.2	20.0	1.2	2.7	2.6	5.3	Not Listed
7	Kunnakora	<i>Cyperus compressus</i>	Cyperaceae	8	7	25	0.3	28.0	1.1	3.6	3.6	7.2	Not Listed
8	Keelaneeli	<i>Phyllanthus niruri</i>	Phyllanthaceae	6	5	25	0.2	20.0	1.2	2.7	2.6	5.3	Not Listed
9	Kanamvazha	<i>Commelina benghalensis</i>	Commelinaceae	7	6	25	0.3	24.0	1.2	3.2	3.1	6.3	Not Listed
10	Mukurattai	<i>Boerhavia diffusa</i>	Nyctaginaceae	5	4	25	0.2	16.0	1.3	2.3	2.1	4.3	Not Listed
11	Veetukaayapoondur	<i>Tridax procumbens</i>	Asteraceae	8	7	25	0.3	28.0	1.1	3.6	3.6	7.2	Not Listed
12	Nai kadugu	<i>Celome viscosa</i>	Cleomaceae	9	8	25	0.4	32.0	1.1	4.1	4.1	8.2	Not Listed
13	Manathakkali	<i>Solanum nigrum</i>	Solanaceae	8	7	25	0.3	28.0	1.1	3.6	3.6	7.2	Not Listed
14	Kovai	<i>Coccinia grandis</i>	Cucurbitaceae	6	5	25	0.2	20.0	1.2	2.7	2.6	5.3	Not Listed
15	Kovakkai	<i>Trichosanthes dioica</i>	Cucurbitaceae	7	6	25	0.3	24.0	1.2	3.2	3.1	6.3	Not Listed

16	Karkakartum	<i>Clitoria ternatea</i>	Fabaceae	6	5	25	0.2	20.0	1.2	2.7	2.6	5.3	Not Listed
17	Perandai	<i>Cissus quadrangularis</i>	Vitaceae	9	8	25	0.4	32.0	1.1	4.1	4.1	8.2	Not Listed
18	Nannari	<i>Hemidesmus indicus</i>	Apocynaceae	6	5	25	0.2	20.0	1.2	2.7	2.6	5.3	Not Listed
19	Pavarkai	<i>Momordica charantia</i>	Cucurbitaceae	8	7	25	0.3	28.0	1.1	3.6	3.6	7.2	Not Listed
20	Sirupunaikkali	<i>Passiflora foetida</i>	Passifloraceae	6	5	25	0.2	20.0	1.2	2.7	2.6	5.3	Not Listed
21	Korai	<i>Cyperus rotundus</i>	Cyperaceae	5	4	25	0.2	16.0	1.3	2.3	2.1	4.3	Not Listed
22	Vallikeerai	<i>Ipomoea aquatica</i>	Convolvulaceae	6	5	25	0.2	20.0	1.2	2.7	2.6	5.3	Not Listed
23	Siru puladi	<i>Desmodium triflorum</i>	Fabaceae	8	7	25	0.3	28.0	1.1	3.6	3.6	7.2	Not Listed
24	Elikkathilai	<i>Merremia gangetica</i>	Convolvulaceae	5	4	25	0.2	16.0	1.3	2.3	2.1	4.3	Not Listed
25	Pullu	<i>Eragrostis ferruginea</i>	Poaceae	9	8	25	0.4	32.0	1.1	4.1	4.1	8.2	Not Listed
26	Arugampul	<i>Cynodon dactylon</i>	Poaceae	10	9	25	0.4	36.0	1.1	4.5	4.7	9.2	Not Listed
27	Chevvarakupul	<i>Chloris barbata</i>	Poaceae	8	7	25	0.3	28.0	1.1	3.6	3.6	7.2	Not Listed
28	milkvetch	<i>Astragalus balearicus</i>	Fabaceae	5	4	25	0.2	16.0	1.3	2.3	2.1	4.3	Not Listed
29	basora prieta	<i>Waltheria indica</i>	Malvaceae	7	6	25	0.3	24.0	1.2	3.2	3.1	6.3	Not Listed
30	Sulli Flower	<i>Barleria prionitis L</i>	Acanthaceae	8	9	25	0.3	36.0	0.9	3.6	4.7	8.3	Not Listed
31	Cappattukkalli	<i>Opuntia dillenii</i>	Cactaceae	6	5	25	0.2	20.0	1.2	2.7	2.6	5.3	Not Listed
32	Carrion Flower	<i>Stapelia gettliffei</i>	Apocynaceae	8	7	25	0.3	28.0	1.1	3.6	3.6	7.2	Not Listed

Table 3.28 Calculation of Species Diversity in Buffer Zone

S.No	Common name	Scientific name	No. of Species	Pi	In (Pi)	Pi x in (Pi)
Tree						
1	Vembu	Azadirachta indica	5	0.03	-3.47	-0.11
2	Karuvclam maram	Vachellia nilotica	6	0.04	-3.28	-0.12
3	Arai nelli	Phyllanthus acidus	5	0.03	-3.47	-0.11
4	Nuna maram	Morinda citrifolia	7	0.04	-3.13	-0.14
5	Puliyamaram	Tamarindus indica	6	0.04	-3.28	-0.12
6	Nochi	Vitex negundo	5	0.03	-3.47	-0.11
7	Moonghil	Bambusa bambo	3	0.02	-3.98	-0.07
8	Thailam maram	Eucalyptus tereticornis	6	0.04	-3.28	-0.12
9	Manga	Mangifera indica	7	0.04	-3.13	-0.14
10	Athi	Ficus recemosa	5	0.03	-3.47	-0.11
11	Thekku	Tectona grandis	6	0.04	-3.28	-0.12
12	Kadukkai	Terminalia chebula	8	0.05	-3.00	-0.15
13	Navalmaram	Sygygium cumini	6	0.04	-3.28	-0.12
14	Pappali maram	Carica papaya L	7	0.04	-3.13	-0.14
15	pongam	Millettia pinnata	5	0.03	-3.47	-0.11
16	Alamaram	Ficus benghalensis	5	0.03	-3.47	-0.11
17	Koyya	Psidium guajava	7	0.04	-3.13	-0.14
18	Ezhumuchaipalam	Citrus lemon	5	0.03	-3.47	-0.11
19	Murunga maram	Moringa oleifera	8	0.05	-3.00	-0.15
20	Marudaani	Lawsonia inermis	9	0.06	-2.88	-0.16
21	Kattu Nelli	Phyllanthus emblica	6	0.04	-3.28	-0.12
22	Nettilinkam	Polylathia longifolia	5	0.03	-3.47	-0.11
23	Vaagai	Albizia lebbek	7	0.04	-3.13	-0.14
24	Panai maram	Borassus flabellifer	4	0.03	-3.69	-0.09
25	seethapazham	Annona reticulata	6	0.04	-3.28	-0.12
26	Arasanmaram	Ficus religiosa	5	0.03	-3.47	-0.11
27	Vazhaimaram	Musa acuminata	6	0.04	-3.28	-0.12
H (Shannon Diversity Index) =3.30						
Shrubs						
1	Avarai	Senna auriculata	9	0.08	-2.59	-0.19
2	Erukku or Crown flower	Calotropis gigantea	6	0.05	-3.00	-0.15
3	Kattamanakku	Jatropha curcas	7	0.06	-2.84	-0.17
4	Thuthi	Abutilon indicum	8	0.07	-2.71	-0.18
5	Sundaika	Solanum torvum	9	0.08	-2.59	-0.19
6	Chaturakalli	Euphorbia antiquorum	8	0.07	-2.71	-0.18
7	Neermulli	Hydrophila auriculata	6	0.05	-3.00	-0.15
8	Thottalchinungi	Mimosa pudica	9	0.08	-2.59	-0.19
9	Kundumani	Abrus precatorius	7	0.06	-2.84	-0.17
10	Nithyakalyani	Cathranthus roseus	8	0.07	-2.71	-0.18
11	Chemparuthi	Hibiscu rosa-sinensis	9	0.08	-2.59	-0.19
12	Arali	Nerium indicum	10	0.08	-2.48	-0.21

13	Virali	Dodonaea viscosa	7	0.06	-2.84	-0.17
14	Nocchi	Vitex negundo	8	0.07	-2.71	-0.18
15	Karivēppilai maram	Murraya koenigii	9	0.08	-2.59	-0.19
H (Shannon Diversity Index) =2.55						
HERBS & CLIMBER & CREEPER & GRASS & CATUS						
1	Parttiniyam	<i>Parthenium hysterophorus</i>	7	0.03	-3.52	-0.10
2	Kuppaimeni	<i>Acalypha indica</i>	8	0.03	-3.38	-0.11
3	Arugampul	<i>Cynodon dactylon</i>	11	0.05	-3.07	-0.14
4	Thulasi	<i>Ocimum tenuiflorum</i>	12	0.05	-2.98	-0.15
5	Korai	<i>Cyperus rotundus</i>	8	0.03	-3.38	-0.11
6	Thumbai	<i>Leucas aspera</i>	6	0.03	-3.67	-0.09
7	Kunnakora	<i>Cyperus compressus</i>	8	0.03	-3.38	-0.11
8	Keelaneeli	<i>Phyllanthus niruri</i>	6	0.03	-3.67	-0.09
9	Kanamvazha	<i>Commelina benghalensis</i>	7	0.03	-3.52	-0.10
10	Mukurattai	<i>Boerhavia diffusa</i>	5	0.02	-3.85	-0.08
11	Veetukaayapoondu	<i>Tridax procumbens</i>	8	0.03	-3.38	-0.11
12	Nai kadugu	<i>Celome viscosa</i>	9	0.04	-3.27	-0.12
13	Manathakkali	<i>Solanumnigrum</i>	8	0.03	-3.38	-0.11
14	Kovai	<i>Coccinia grandis</i>	6	0.03	-3.67	-0.09
15	Kovakkai	<i>Trichosanthes dioica</i>	7	0.03	-3.52	-0.10
16	Karkakartum	<i>Clitoria ternatea</i>	6	0.03	-3.67	-0.09
17	Perandai	<i>Cissus quadrangularis</i>	9	0.04	-3.27	-0.12
18	Nannari	<i>Hemidesmus indicus</i>	6	0.03	-3.67	-0.09
19	Pavarkai	<i>Momordica charantia</i>	8	0.03	-3.38	-0.11
20	Sirupunaikkali	<i>Passiflora foetida</i>	6	0.03	-3.67	-0.09
21	Korai	<i>Cyperus rotandus</i>	5	0.02	-3.85	-0.08
22	Vallikeerai	<i>Ipomoea aquatica</i>	6	0.03	-3.67	-0.09
23	Siru puladi	<i>Desmodium triflorum</i>	8	0.03	-3.38	-0.11
24	Elikkathilai	<i>Merremia gangetica</i>	5	0.02	-3.85	-0.08
25	Pullu	<i>Eragrostis ferruginea</i>	9	0.04	-3.27	-0.12
26	Arugampul	<i>Cynodon dactylon</i>	10	0.04	-3.16	-0.13
27	Chevvarakupul	<i>Chloris barbata</i>	8	0.03	-3.38	-0.11
28	milkvetch	<i>Astragalus balearicus</i>	5	0.02	-3.85	-0.08
29	basora prieta	<i>Waltheria indica</i>	7	0.03	-3.52	-0.10
30	Sulli Flower	<i>Barleria prionitis L</i>	8	0.03	-3.38	-0.11
31	Cappattukkalli	<i>Opuntia dillenii</i>	6	0.03	-3.67	-0.09
32	Carrion Flower	<i>Stapelia gettliffei</i>	8	0.03	-3.38	-0.11
H (Shannon Diversity Index) =3.42						

Table 3.29 Species Richness in (Buffer Zone)

Details	H	H max	Evenness	Species Richness (margalef Index)
Tree	3.27	3.30	0.99	5.12
Shrubs	2.70	2.71	1.00	2.92
Herbs	3.44	3.47	0.99	5.67

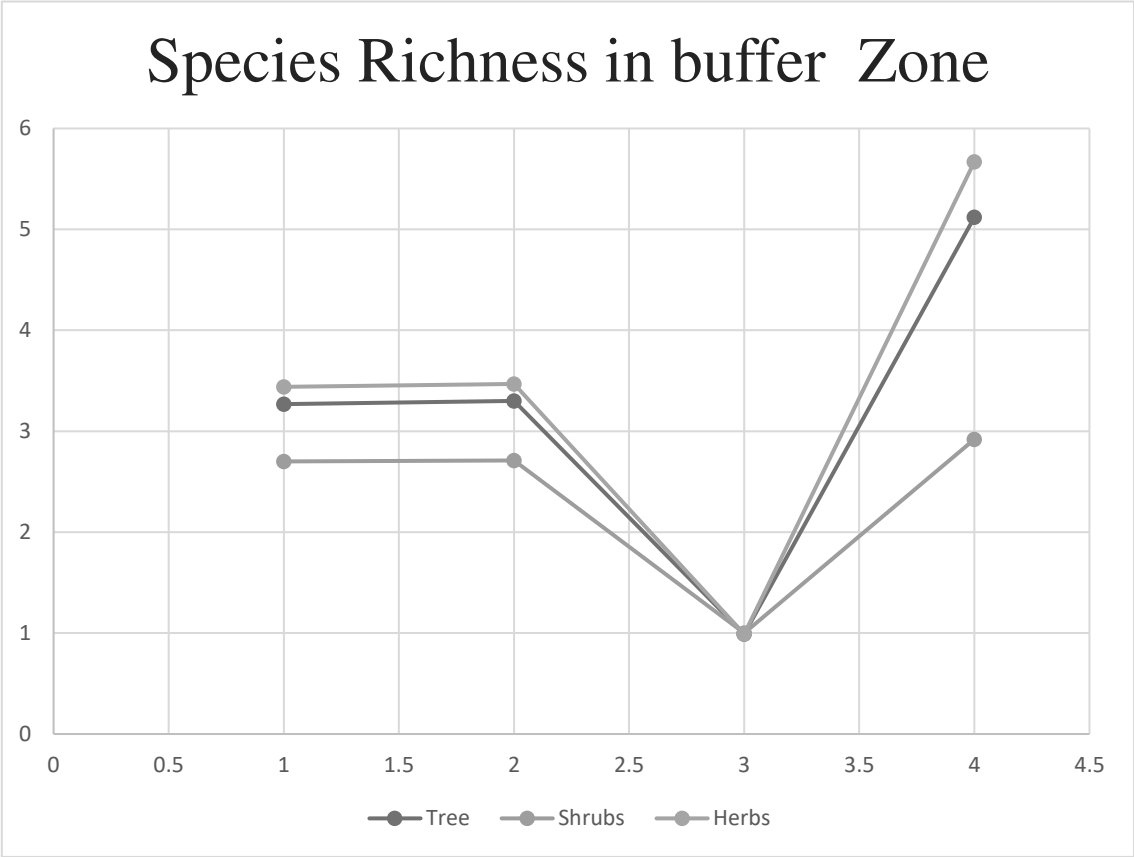
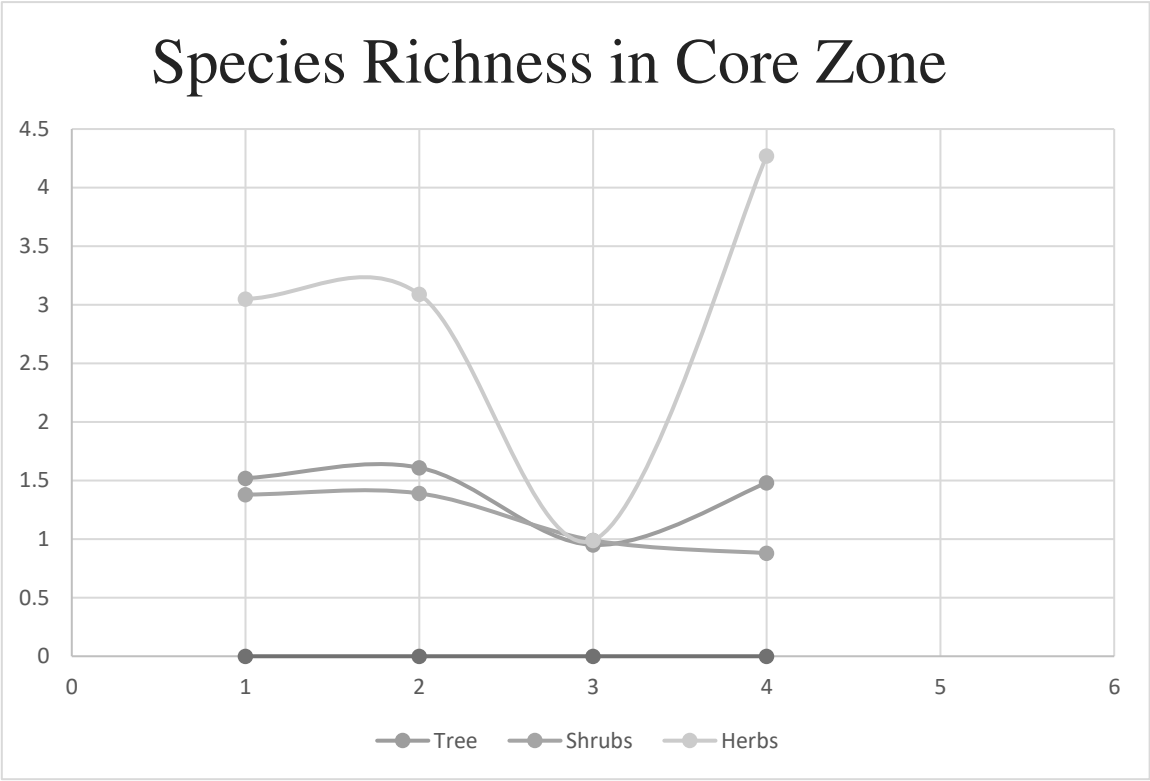
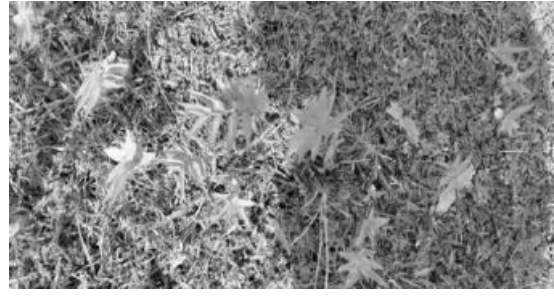


Figure 3.26 Floral diversity species Richness (Index) in core and buffer zone



Jatropha gossypifolia L.



Sida acuta



Senna auriculata



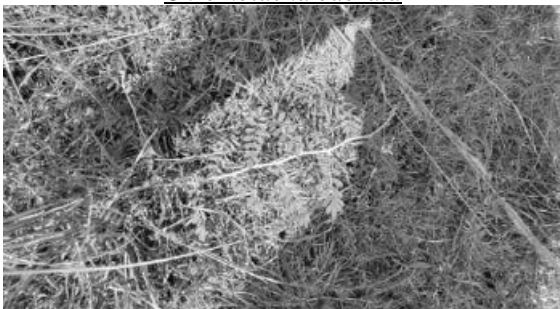
Chloris verticillate Nutt.



Chromolaena odorata



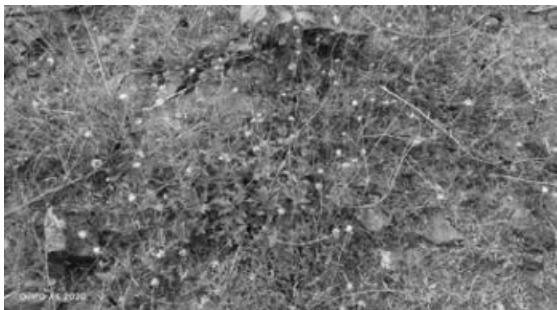
Prosopis juliflora



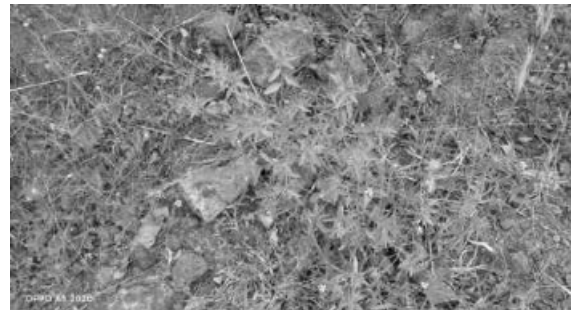
Tephrosia purpurea



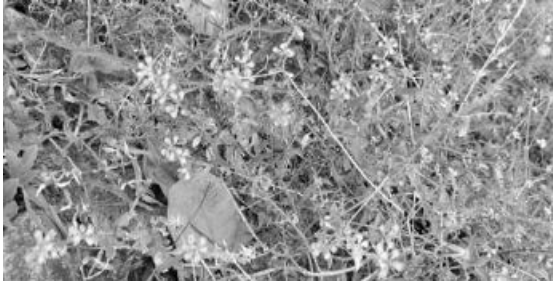
Borassus flabellifer



Tridax procumbens



croton bonplandianus



Ocimum tenuiflorum



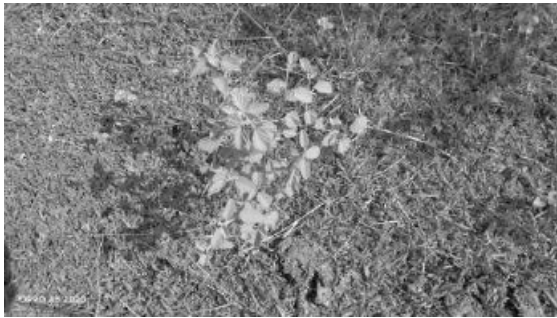
Senna siamea



Lantana camara



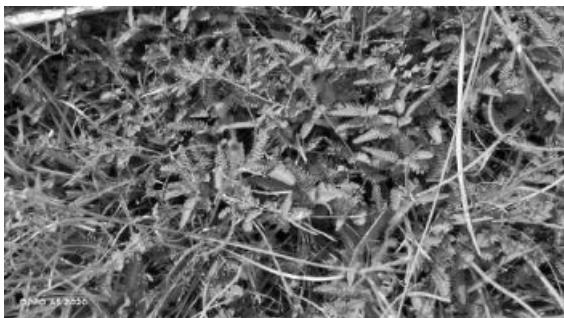
Ipamoea



Waltheria indica



opuntia megapotamica



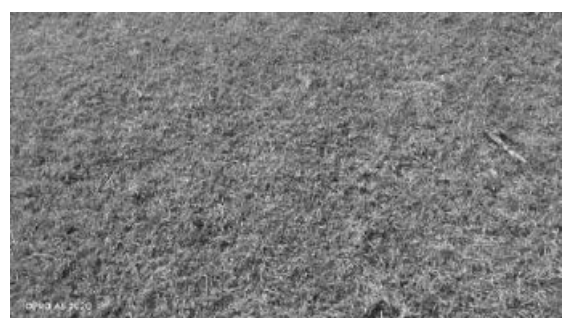
Aeschynomene indica



cassia roxburghii



Aerva lanata



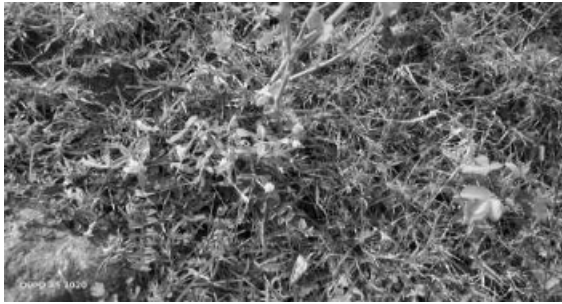
cenchrus clandestinus



sida cordifolia



Cissus quadrangularis



Alternanthera paronychioides



cordia lutea Lam.



chrysopogon Zizanioides



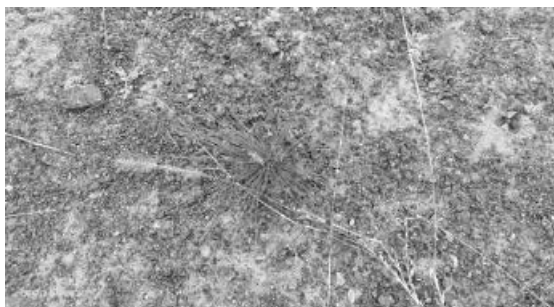
Wrightia tinctoria



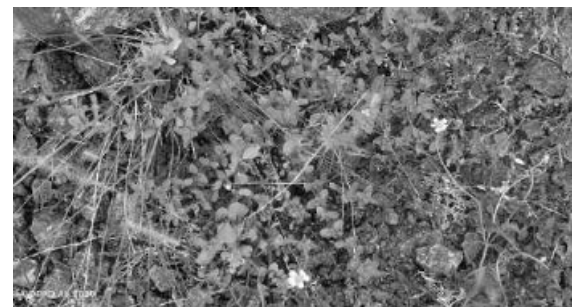
Leucas aspera



Tamarindus indica L.



Bulbostylis barbata



Justicia procumbens L.

Figure 3.27 Flora species observation in the study area

3.6.5.3 Aquatic Vegetation

The field survey for assessing the aquatic vegetation was also undertaken during the study period. The list of aquatic plants observed in the study area is given in **Table 3.30**.

Table 3.30 Aquatic Vegetation

Sl.No	Scientific name	Common Name	Vernacular Name (Tamil)	IUCN Red List of Threatened Species
1	<i>Eichornia crassipe</i>	Water hyacinth	Agayatamarai	NA
2	<i>Aponogeton natans</i>	Floating laceplant	Kottikizhnagu	NA
3	<i>Nymphaea nouchali</i>	Blue water lily	Nellambal	LC
4	<i>Pistia stratiotes</i>	Water lettuce	Kuzhithamarai	NA

*LC- Least Concern, NA-Not yet assessed

However, the information required as per the Standard Terms of Reference (ToR):

Tor 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. Impact, if any, of change of land use should be given.

There are no protected or ecologically sensitive areas such as the Wildlife sanctuaries or 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. Even in the 10 km buffer zone around the mine lease area, there are no reserve forests or 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.

Tor No: 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.

Karanadamalai RF 2.43km NW, Erakamalai RF 8.17km W, Pappanmalai RF 5.30km W, Vellaimalai RF 8.22km SW, Chembulimalai RF 7.38km SSW, Motamalai RF 5.90km SE, Pulamalai RF 3.48km SE, Budakudimalai RF 6.34km ESE, Nedunkuttu RF 5.41km NE, Madukamalai RF 6.60km NE, all the reserve forest away from the proposed project site. No protected (PF) forests either in the mine lease area. Thus, no forest land is involved in any manner. Hence, no certificate from the Forest department is required.

Tor No: 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.

As stated earlier, no forest land is involved in the proposed project in any manner. Hence no forest clearance is required.

Tor No: 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.

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.

Tor No: 15) The vegetation in the RF / PF areas in the study area, with necessary details, should be given.

Ten reserve forests are found in 10 km radius (Buffer Zone). They are shown in **Table 3.31**. Data on flora found in the forests were collected during March to May 2022 (Summer season) using the line transect survey method. During the flora survey, only one location was selected for each forest. The location of the sampling point has been given in Figure 3.28 List of flora that are commonly found in the forests has been given in **Table 3.32**.

Table 3.31 List of Reserve Forest within 10 km Radius

RF ID	RF Name	Distance from Proposed project (km)	Direction	Sampling Location
RF01	Karanadamalai RF	2.43	NW	10°15'19.822"N
				78°12'50.205"E
RF02	Erakamalai RF	8.17	W	10°14'14.496"N
				78°9'49.772"E
RF03	Pappanmalai RF	5.30	W	10°13'38.884"N
				78°11'8.883"E
RF04	Vellaimalai RF	8.22	SW	10°10'36.553"N
				78°14'0.293"E
RF05	Chembulimalai RF	7.38	SSW	10°10'36.54"N
				78°14'1.596"E
RF06	Motamalai RF	5.90	SE	10°11'31.137"N
				78°15'30.713"E
RF07	Pulamalai RF	3.48	SE	10°13'16.575"N
				78°16'6.956"E
RF08	Budakudimalai RF	6.34	ESE	10°14'35.098"N
				78°18'32.351"E
RF09	Nedunkuttu RF	5.41	NE	10°16'19.178"N
				78°17'7.453"E
RF10	Madukamalai RF	6.60	NE	10°17'22.537"N
				78°16'53.778"E

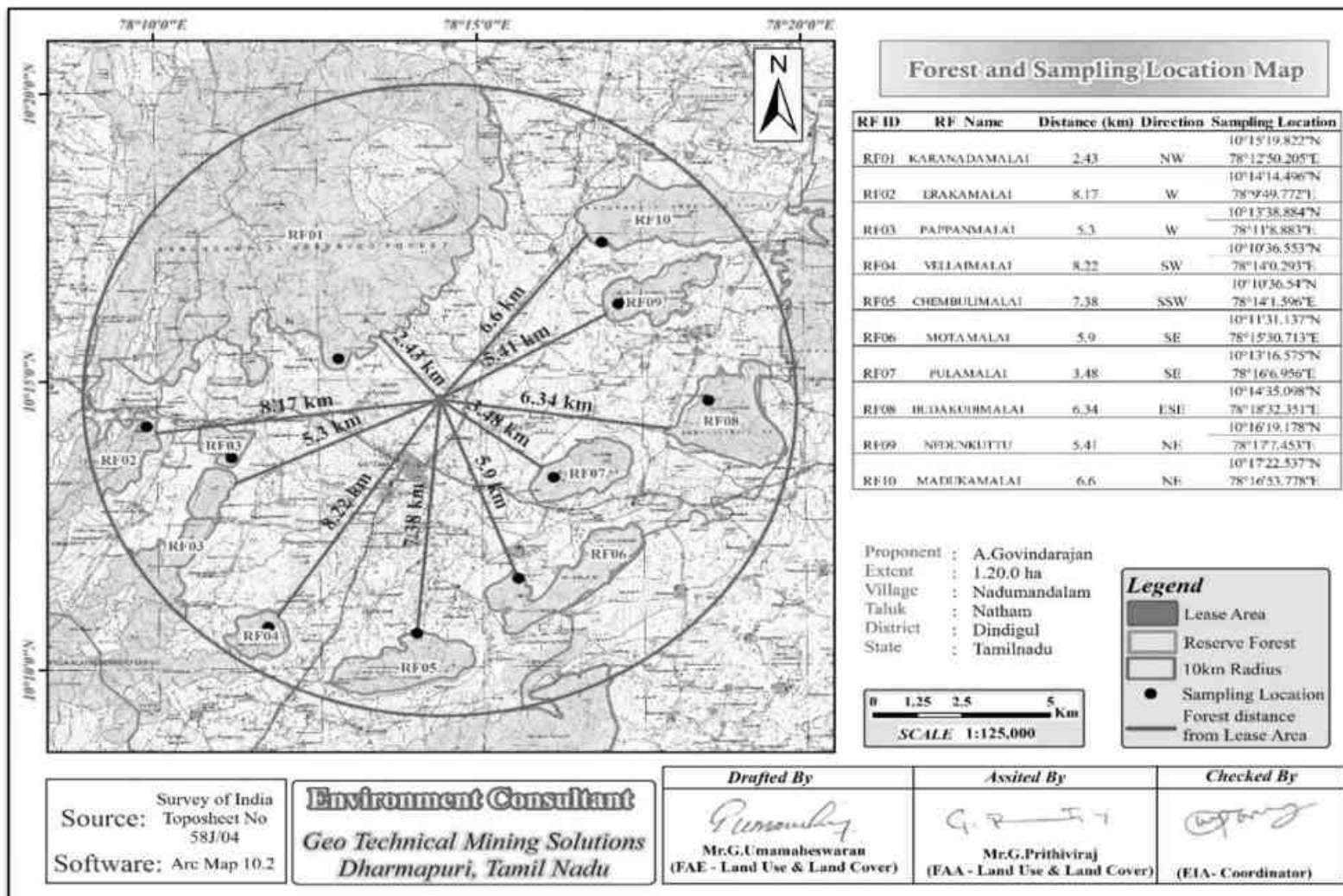


Figure 3.28 Toposheet showing Reserve Forest around 10km Radius from proposed project site

Table No.3.32 Vegetation details in the Reserve Forest area

S.NO	Scientific name	Family Name	RF01	RF02	RF03	RF04	RF05	RF06	RF07	RF08	RF09	RF10
1	<i>Ailanthus excelsa</i>	Simaroubaceae	-	+	+	-	+	+	-	-	+	-
2	<i>Tamarindus indica</i>	Fabaceae	+	-	-	-	+	-	+	+	-	+
3	<i>Leucaena leucocephala</i>	Fabaceae	-	+	+	+	-	-	+	-	+	+
4	<i>Albizia lebbeck</i>	Fabaceae	+	+	+	-	+	-	+	-	-	-
5	<i>Albizia amara,</i>	Fabaceae	-	+	+	+	+	+	+	+	+	-
6	<i>Azadirachta indica</i>	Meliaceae	+	-	+	+	-	+	-	+	+	-
7	<i>Tectonia grandis</i>	Lamiaceae	-	-	-	+	-	+	+	+	-	+
8	<i>Peltophorum pterocarpum</i>	Fabaceae	-	+	-	-	+	-	-	+	+	-
9	<i>Terminalia Arjuna</i>	Combretaceae	+	-	+	+	-	+	-	+	-	+
10	<i>Ziziphus mauritiana</i>	Rhamnaceae	-	-	+	-	+	-	-	-	+	+
11	<i>Bambusa arundinacea</i>	Poaceae	-	+	-	+	+	+	+	-	-	-
12	<i>Dalbergia lanceolaria</i>	Fabaceae	+	-	+	-	+	-	-	+	+	-
13	<i>Wrightia tinctoria</i>	Apocynaceae	-	-	+	+	+	-	+	+	+	-
14	<i>Syzygium cumini</i>	Myrtaceae	+	-	+	-	+	+	-	-	-	+
15	<i>Hardwickia binata</i>	Fabaceae	+	-	+	-	+	-	+	-	+	-
16	<i>Lannea coromandelica</i>	Anacardiaceae	-	+	-	+	-	-	+	-	-	+
17	<i>Diospyros melanoxylon</i>	Ebenaceae	+	-	+	-	+	+	-	+	+	+
18	<i>Trema orientalis</i>	Cannabaceae	-	+	+	-	+	-	+	+	-	-
19	<i>Anogeissus latifolia</i>	Combretaceae	-	+	-	+	-	-	-	-	+	-
20	<i>Ficus benghalensis</i>	Moraceae	+	-	+	-	+	+	-	+	+	-
21	<i>Dalbergia sissoo</i>	Fabaceae	-	-	-	+	-	-	+	-	-	+
22	<i>Melia azedarach</i>	Meliaceae	-	+	+	-	+	-	-	+	+	-
23	<i>Albizia odoratissima</i>	Fabaceae	+	-	+	-	-	+	-	-	-	+
24	<i>Acacia catechu</i>	Fabaceae	-	+	-	+	-	+	+	+	+	+
25	<i>Prosopis juliflora</i>	Fabaceae	+	-	+	-	+	-	+	-	-	-

+ (present) – (absent) L (Line Transect)

List out endangered and endemic species as per the schedule of the Wildlife Protection Act 1972

1. Rare and Endangered Flora in the Study Area

The IUCN Red List is the world's most comprehensive inventory of the global conservation status of plant and animal species. It uses a set of criteria to evaluate the extinction risk of thousands of species and subspecies. These criteria are relevant to all species and all regions of the world. With its strong scientific base, the IUCN Red List is recognized as the most authoritative guide to the status of biological diversity. Among the enumerated flora in the study area, none of them were assigned any threat category.

2. Endemic Plants of the Study Area

De Candolle (1855) first used the concept of “**Endemic**”, which is defined as an area of a taxonomic unit, especially a species which has a restricted distribution or habitat, isolated from its surrounding region through geographical, ecological or temporal barriers. Among recorded plant species none are assigned the status of endemic plant of this region.

3. Biodiversity Hotspots

There are no particular Biodiversity Hotspots in the study area. There is no threat to the Flora and Fauna species.

3.6.6 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 core area.

3.6.6.1 Fauna Methodology

The study of fauna takes substantial amount of time to understand the specific faunal characteristics of the area. The assessment of fauna has been done on the bases of primary data collected from the lease sites. The presence was also confirmed from the local inhabitants depending on the animal sightings and the frequency of their visits in the project area. In addition, officials, local peoples were another source of information for studying the fauna of the area. Field activities are physical/active search, covering rocks, burrows, hollow inspection and location of nesting sites and habitat assessment etc. Taxonomical identification was done by the field guide book and wildlife ENVIS data base (wiienvis.nic.in/Database/Schedule

Species Database) and Zoological Survey of India (ZSI). Detailed faunas are mentioned in the Tables 3.33 and 3.34.

3.6.6.1.1 Survey and Monitoring of Mammals

Intensive survey has been done by line transect methods (Walking and in vehicle) for all major habitats for surveying of mammals by direct and indirect evidence. Indirect methods such as faecal matter (i.e., scat) and pug mark by establishing 10 × 100 -m linear transects depending on the habitat (i.e., existing wildlife game routes/forest trails used).

Direct observation technique has been used for surveying large and medium sized mammals. But this technique is perfectly suitable for surveying of diurnal mammals; however, good photographs were also taken for species identification.

3.6.6.1.2 Survey and Monitoring of Birds

Birds are sampled by using point count methods, and opportunistic bird sightings. By the bird vocal sounds and photographs, the species were identified in consultation with village local people. Point count: in these methods, the observer will stand in a randomly chosen point and birds seen or heard in 50m radius are recorded for 5min. This observation is repeated in another point at least 30m from the first point. We have enumerated 20-point counts in each quartile, which constitute a total of 80-point counts (20 x 4) within 10 km radius area.

Opportunistic bird sightings: while traveling in study area, many bird species will be detected in survey time. Such species are recorded by their appearance or by their call.

3.6.6.1.3 Survey and monitoring of reptiles

Several survey techniques such as standard walk transect visual encounter survey methods were used to sampling reptiles in each and every habitat of the study area. While doing this survey, photographs were taken for identification of species. Species identification was done by using standard field guides in consultation with village people expert.

The butterfly was enumerated by 2 linear transects of 10 × 100 m were laid within each quartile at minimum interval of 1 km. Further, amphibians and fishes documented in existing literature and secondary information in consultation with local people and wildlife experts.

3.6.6.2 Fauna Within 500 m Radius Zone from the Periphery of Lease Area

A total of 36 varieties of species observed in the Core zone of Nadumandalam Village, Rough stone quarry (Table 3.29) among them numbers of Insects 12(33%), Reptiles 5 (13%),

Mammals 3 (8%) Avian 13 (36%). A total of 36 species belonging to 36 families have been recorded from the core mining lease area. None of these species are threatened or endemic in the study area and surroundings. There is no Schedule I species and four species are under schedule IV according to Indian wild life Act 1972. A total nine species of bird were sighted in the mining lease area. Dominant species are mostly birds and insects and no amphibians were observed during the field visit. There are no critically endangered, vulnerable and endemic species were observed. Details of fauna in core zone with the scientific name were mentioned in Table. 3.33

3.6.6.3 Fauna in Buffer Zone

Taxonomically a total of 48 species belonging to 34 families have been recorded from the buffer mining lease area. Based on habitat classification the majority of species were Birds 13(35%) followed by Insects 7 (20%), Reptiles 9 (19%), Mammals 3 (6%) and, Amphibians 3 (6%). Aves 16(33%) There are four Schedule II species and twenty-six are under schedule IV according to Indian wild life Act 1972. A total 16 species of bird were sighted in the mining lease area. There are no critically endangered, endangered, vulnerable and endemic species were observed.

Dominant species are mostly birds and insects and three amphibians were observed during the extensive field visit (*Hoplobatrachus tigerinus*), (*Rana hexadactyla*), (*Sphaerotheca breviceps*). The result of core & Buffer zone of fauna studies shows that Nymphalidae and Agamidae, Mantidae are the main dominating species in the study area, it is mentioned in Table 3.34 There is no schedule I Species in study area. There are no critically endangered, endangered, vulnerable and endemic species were observed.

Table 3.33 Fauna in Core Zone

Sl.No	Common name/English Name	Family Name	Scientific Name	Schedule list wildlife Protection act 1972	IUCN Red List data
Insects					
1	Indian honey bee	Apidae	<i>Apis cerana</i>	Schedule IV	LC
2	Grasshopper	Acrididae	<i>Hieroglyphus sp</i>	NL	LC
3	Blue tiger	Nymphalidae	<i>Tirumala limniace</i>	Schedule IV	LC
4	Striped tiger	Nymphalidae	<i>Danaus plexippus</i>	Schedule IV	LC
5	Jewel beetle	Buprestidae	<i>Eurythyrea austriaca</i>	Schedule IV	NA
6	Dragonfly	Gomphidae	<i>Ceratogomphus pictus</i>	Schedule IV	LC
7	Red-veined darter	Libellulidae	<i>Sympetrum fonscolombii</i>	NL	LC
8	Ant	Formicidae	<i>Camponotus Vicinus</i>	NL	NL
9	Tawny coster	Nymphalidae	<i>Danaus chrysippus</i>	Schedule IV	LC
10	Common Indian crow	Nymphalidae	<i>Euploea core</i>	Schedule IV	LC
11	Milkweed butterfly	Nymphalidae	<i>Danainae</i>	NL	LC
12	Praying mantis	Mantidae	<i>Mantis religiosa</i>	NL	NL
Reptiles					
1	Common house gecko	Gekkonidae	<i>Hemidactylus frenatus</i>	NL	LC
2	Fan-Throated Lizard	Agamidae	<i>Sitanaponticeriana</i>	NL	LC
3	Brahminy skink	Scincidae	<i>Eutropis carinata</i>	NL	LC
4	Olive keel back water snake	Natricidae	<i>Atretium schistosum</i>	Sch II (Part II)	LC
5	Garden lizard	Agamidae	<i>Calotes versicolor</i>	NL	LC
Mammals					

1	Indian palm squirrel	Sciuridae	<i>Funambulus palmarum</i>	Schedule IV	LC
2	Asian Small Mongoose	Herpestidae	<i>Herpestes javanicus</i>	Schedule II	LC
3	Indian Field Mouse	Muridae	<i>Mus booduga</i>	Schedule IV	LC
Aves					
1	Cattle egret	Ardeidae	<i>Bubulcus ibis</i>	NL	LC
2	Shikra	Accipitridae	<i>Accipiter badius</i>	NL	LC
3	Black drongo	Dicruridae	<i>Dicrurus macroceRCus</i>	Schedule IV	LC
4	Grey Francolin	Phasianidae	<i>Francolinus pondicerianus</i>	Schedule IV	LC
5	Koel	Cucalidae	<i>Eudynamys</i>	Schedule IV	LC
6	Asian green bee-eater	Meropidae	<i>Meropsorientalis</i>	NL	LC
7	Common myna	Sturnidae	<i>Acridotheres tristis</i>	NL	LC
8	Common Quail	Phasianidae	<i>Coturnix coturnix</i>	Schedule IV	LC
9	Rose-ringed parkeet	Psittaculidae	<i>Psittacula krameri</i>	NL	LC
10	House crow	Corvidae	<i>Corvussplendens</i>	NL	LC
11	White-breasted water hen	Rallidae	<i>Amaurornis phoenicurus</i>	NL	LC
12	Red-vented Bulbul	Pycnonotidae	<i>Pycnonotuscafer</i>	Schedule IV	LC
13	Common quail	Phasianidae	<i>Coturnix coturnix</i>	Schedule IV	LC
Amphibians					
1	Indian Burrowing frog	Dicroglossidae	<i>Sphaerotheca breviceps</i>	Schedule IV	LC
2	Green Pond Frog	Ranidae	<i>Rana hexadactyla</i>	Schedule IV	LC
3	Tiger Frog	Chordata	<i>Hoplobatrachus tigerinus (Rana tigerina)</i>	Schedule IV	LC

*NE- Not evaluated; LC- Least Concern, NT –Near Threatened, T-Threatened

Table 3.34 Fauna in Buffer Zone

S. No.	Common Name/English Name	Family Name	Scientific Name	Schedule List Wildlife Protection Act 1972	IUCN Red List Data
INSECTS					
1	Tawny coster	Nymphalidae	<i>Danaus chrysippus</i>	Schedule IV	LC
2	Milkweed butterfly	Nymphalidae	<i>Danainae</i>	NL	LC
3	Blue tiger	Nymphalidae	<i>Tirumala limniace</i>	Schedule IV	LC
4	Common Indian crow	Nymphalidae	<i>Euploea core</i>	Schedule IV	LC
5	Green marsh hawk	Libellulidae	<i>Orthetrum sabina</i>	NL	LC
6	Mottled emigrant	Peridae	<i>Catopsilia pyranthe</i>	NL	LC
7	Striped tiger	Nymphalidae	<i>Danaus plexippus</i>	Schedule IV	LC
8	Ant	Formicidae	<i>Camponotus Vicinus</i>	NL	NL
9	Red-veined darter	Libellulidae	<i>Sympetrum fonscolombii</i>	NL	LC
10	Lesser grass blue	Lycaenidae	<i>Zizina Otis indica</i>	Schedule IV	LC
11	Praying mantis	Mantidae	<i>mantis religiosa</i>	NL	NL
12	Grasshopper	Acrididae	<i>Hieroglyphus sp</i>	NL	LC
13	Common Tiger	Nymphalidae	<i>Danaus genutia</i>	Schedule IV	LC
REPTILES					
1	Chameleon	Chamaeleonidae	<i>Chameleon zeylanicus</i>	Sch II (Part II)	LC
2	Garden lizard	Agamidae	<i>Calotes versicolor</i>	NL	LC
3	Green Vine snake	Colubridae	<i>Ahaetulla nasuta</i>	Schedule IV	LC
4	Common house gecko	Gekkonidae	<i>Hemidactylus frenatus</i>	NL	LC
5	Rat snake	Colubridae	<i>Ptyas mucosa</i>	Sch II (Part II)	LC
6	Fan-Throated Lizard	Agamidae	<i>Sitanaponticeriana</i>	NL	LC
7	Indian cobra	Elapidae	<i>Naja naja</i>	Schedule IV	LC

MAMMALS					
1	Indian palm squirrel	Sciuridae	<i>Funambuluspalmarum</i>	ScheduleIV	LC
2	Indian Field Mouse	Muridae	<i>Mus booduga</i>	ScheduleIV	LC
3	Home mouse	Muridae	<i>Mus musculus tytleri</i>	NL	LC
AVES					
1	House crow	Corvidae	<i>Corvussplendens</i>	NL	LC
2	Cattle egret	Ardeidae	<i>Bubulcus ibis</i>	NL	LC
3	Black drongo	Dicruridae	<i>Dicrurus macrocercus</i>	ScheduleIV	LC
4	Red-vented Bulbul	Pycnonotidae	<i>Pycnonotuscafer</i>	ScheduleIV	LC
5	Indian pond heron	Ardeidae	<i>Ardeola grayii</i>	ScheduleIV	LC
6	Asian green bee-eater	Meropidae	<i>Meropsorientalis</i>	NL	LC
7	Small Sunbird	Nectariniidae	<i>Nectarinia asiatica</i>	ScheduleIV	LC
8	Common myna	Sturnidae	<i>Acridotheres tristis</i>	NL	LC
9	Blue Rock Pigeon	Columbidae	<i>Columba livia</i>	ScheduleIV	LC
10	Common Coot	Rallidae	<i>Fulica atra</i>	ScheduleIV	LC
11	Common quail	Phasianidae	<i>Coturnix coturnix</i>	ScheduleIV	LC
12	Small blue Kingfisher	Alcedinidae	<i>Alcedo atthis</i>	ScheduleIV	LC
13	Rose-ringed parkeet	Psittaculidae	<i>Psittacula krameri</i>	NL	LC
14	Grey Francolin	Phasianidae	<i>Francolinus pondicerianus</i>	Schedule IV	LC
15	Two-tailed Sparrow	Dicruridae	<i>Dicrurus macrocercus</i>	ScheduleIV	LC
16	White-breasted waterhen	Rallidae	<i>Amaurornis phoenicurus</i>	NL	LC
AMPHIBIANS					
1	Indian Burrowing frog	Dicroglossidae	<i>Sphaerotheca breviceps</i>	ScheduleIV	LC
2	Green Pond Frog	Ranidae	<i>Rana hexadactyla</i>	ScheduleIV	LC
3	Tiger Frog	Chordata	<i>Hoplobatrachus tigerinus</i> (<i>Rana tigerina</i>)	ScheduleIV	LC

*NL-Not listed, LC-Least concern, NT-Near threatened.

Tor No: 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.

Out of the total mine lease area of 1.20 ha, just about 0.78 ha, is proposed to be used for mining activity during the first five years as per the mining plan. Blasting, noise and vibrations and other disturbances including dust generation are likely to have an adverse impact on wildlife. But these impacts are unlikely to extend beyond 500 m from the actual mine area. There are two Schedule II species and eighteen are under schedule IV according to Indian wild life Act 1972. A total 13 species of bird were sighted in the buffer zone 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.

Tor No: 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.

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. Karanadamalai RF 2.43km NW, Erakamalai RF 8.17km W, Pappanmalai RF 5.30km W, Vellaimalai RF 8.22km SW, Chembulimalai RF 7.38km SSW, Motamalai RF 5.90km SE, Pulamalai RF 3.48km SE, Budakudimalai RF 6.34km ESE, Nedunkuttu RF 5.41km NE, Madukamalai RF 6.60km NE, all the reserve forest away from the proposed project site. No protected (PF) forests either in the mine lease area. Thus, no forest land is involved in any manner. Hence, no certificate from the Forest department is required. Hence submission of clearance from the National Board of Wildlife does not arise.

Tor No: 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.

A detailed biological study of the study area [core zone and buffer zone of 10 km radius of the periphery of the mine lease] has been carried out and the results are presented under in Tables 3.26 to 3.30. There are two Schedule II species and Eighteen species are under schedule IV according to Indian wild life Act 1972. A total 13 species of bird were sighted in the study area. The main threat to the bird is the use of pesticides in agriculture. 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.

Tor No: 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.

Only about 0.32.0 ha of the mine lease area is going to be used for Greenbelt Development during the first five years. Regional Trees like Neem, Pongamia Pinnata, Casuarina will be planted along the Lease boundary and avenues as well as over non-active dumps.

3.6.6.4. Rare and Endangered fauna of the study area

1. As per Indian Wild Life (Protection) Act, 1972,

Wild Life (Protection) Act, 1972, as amended on 17th January 2003, is an Act to provide for the protection of wild animals, birds and plants and for matters connected therewith or ancillary or incidental thereto with a view to ensuring the ecological and environmental security of the country. Some of the sighted faunas were given protection by the Indian Wild Life (Protection) Act, 1972 by including them in different schedules. Here no endemic, endangered migratory fauna found in the area. This area is not also a migratory path of any faunal species.

2. As per IUCN RED (2013) List,

The IUCN Red List is the world's most comprehensive inventory of the global conservation status of plant and animal species. It uses a set of criteria to evaluate the extinction risk of thousands of species and subspecies. These criteria are relevant to all species and all regions of the world. With its strong scientific base, the IUCN Red List is recognized as the most authoritative guide to the status of biological diversity. Among reported species Schedule II and IV in the buffer zone are presented below,

1. Schedule II species

Chameleon, Rat snake, Saw scaled viper, Russell's viper.

2. Schedule IV species

Green Pond Frog, Indian Burrowing frog, Black drongo, Red-vented Bulbul, Koel, Indian Field Mouse, Indian palm squirrel, Lesser grass, Common Indian crow, striped tiger, Common Tiger, Blue tiger, Tawny coster, Indian wall lizard, Indian pond heron, Grey Heron etc.,

3.6.7 Results and Discussion

There is no schedule I species of animals observed within study area as per Wildlife Protection Act 1972 and no species in vulnerable, endangered or threatened category as per IUCN. There is no endangered red list species found in the study area. Hence, this small mining operation over short period of time will not have any significant impact on the surrounding flora and fauna.

3.7 SOCIO-ECONOMIC ENVIRONMENT

Socio-economic study is an essential part of environmental study. It includes demographic structure of the area, provision of basic amenities viz., housing, education, health and medical services, occupation, water supply, sanitation, communication, transportation, prevailing diseases pattern as well as features like temples, historical monuments etc., at the baseline level. This will help in visualizing and predicting the possible impact depending upon the nature and magnitude of the project.

It is expected that the socio-economic status of the area will substantially improve because of the proposed projects. Moreover, the proposed projects will provide direct and indirect employment and improve the infrastructural facilities in that area, thus leading to the improvement of their standard of living.

3.7.1 Objectives of the Study

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

- To study the socio-economic status of the people living in the study area of the proposed mining projects
- To assess the impact of the project on quality of life of the people in the study area

- To recommend community development measures to be taken up in the study area

3.7.2 Scope of Work

- To study the socio-economic environment of the area from the secondary sources
- Data Collection & Analysis
- Prediction of project impact
- Mitigation Measures

3.7.3 District Profile

Dindigul district of Tamil Nadu has total population of 2,159,775 as per the Census 2011. Out of which 1,080,938 are males while 1,078,837 are females. In 2011 there were total 560,773 families residing in Dindigul district. The Average Sex Ratio of Dindigul district is 998. As per Census 2011 out of total population, 37.4% people live in Urban areas while 62.6% lives in the Rural areas. The average literacy rate in urban areas is 83.9% while that in the rural areas is 71.7%. Also, the Sex Ratio of Urban areas in Dindigul district is 1,008 while that of Rural areas is 992. The population of Children of age 0-6 years in Dindigul district is 216576 which is 10% of the total population. There are 111955 male children and 104621 female children between the age 0-6 years. Thus, as per the Census 2011 the Child Sex Ratio of Dindigul is 934 which is less than Average Sex Ratio (998) of Dindigul district. The total literacy rate of Dindigul district is 76.26%. The male literacy rate is 75.51% and the female literacy rate is 61.7% in Dindigul district.

3.7.4 Socio-Economic Status of Study area

Twenty-Two villages falling within the 10km radius of area around the proposed project sites, as shown in Table 3.31 were subject to socio-economic study. The data relevant to socio-economic studies have been given in Tables 3.35-3.37.

3.7.4 .1 Nadumandalam Village Population

Nadumandalam is a large village located in Natham Taluka of Dindigul district, Tamil Nadu with total 2114 families residing. The Nadumandalam village has population of 8830 of which 4495 are males while 4335 are females as per Population Census 2011. In Nadumandalam village population of children with age 0-6 is 1040 which makes up 11.78 % of total population of village. Average Sex Ratio of Nadumandalam village is 964 which is lower than Tamil Nadu state average of 996. Child Sex Ratio for the Nadumandalam as per census is 1012, higher than Tamil Nadu average of 943. Nadumandalam village has lower literacy rate compared to Tamil Nadu. In 2011, literacy rate of Nadumandalam village was 70.24 % compared to 80.09 % of Tamil Nadu. In Nadumandalam Male literacy stands at 81.07 % while female literacy rate was 58.95 %.



Figure 3.29 Socio Economic Primary Survey Photographs

Table 3.35 Population and Literacy Data of Study Area

S. No.	Village Name	Total population of village	Total population male	Total population female	Total Population in the age group 0-6	Population in the age group 0-6 Male	Population in the age group 0-6 Female	Scheduled Castes population	Scheduled Tribes population	Literates Persons	Illiterate Persons
1	Sirangattupatti	6717	3361	3356	729	378	351	83	0	4276	2441
2	Kottaiyur	3925	1993	1932	459	261	198	200	0	2452	1473
3	Seithur	8222	4135	4087	1108	582	526	338	0	4789	3433
4	Sirugudi	9524	4770	4754	928	492	436	1669	0	6002	3522
5	Nadumandalam	8830	4495	4335	1040	517	523	1960	1	5472	3358
6	Punnapatti	7576	3812	3764	839	407	432	988	0	4851	2725
7	Velanpatti	9873	5025	4848	1169	592	577	750	31	7290	2583
8	Avichchippatti	2325	1169	1156	240	125	115	95	0	1489	836
9	Pannimalai	2068	1065	1003	239	138	101	371	0	1365	703
10	Budagudi	1425	726	699	177	84	93	93	0	941	484
11	Samudrapatti	3929	1945	1984	437	228	209	687	0	2645	1284
12	Pannuvarpatti	1218	617	601	134	75	59	622	0	778	440
13	Palappanayakkanpatti	780	385	395	83	41	42	106	0	463	317
14	Sattambadi	6210	3221	2989	671	368	303	825	0	3845	2365
15	Mulaiyur	4549	2324	2225	535	271	264	112	0	2818	1731
16	Idayapatti	583	295	288	86	48	38	4	0	315	268
17	Uralipatti	3896	1948	1948	417	213	204	333	1	2367	1529
18	Chellappanaickenpatti	4876	2435	2441	583	309	274	552	0	2986	1890
19	Reddiapatti	7680	3952	3728	915	459	456	988	0	4830	2850
20	Sakkiliankodai	2059	1044	1015	300	156	144	0	0	940	1119
21	Thimmananallur	5147	2585	2562	600	313	287	1973	0	3467	1680
22	Kanavaipatti	4731	2367	2364	614	312	302	1296	0	2702	2029

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

Table 3.36 Communication & Transport Facilities in the Study Area

S.No	Village Name	Tractors	Carts Driven by Animals	Black Topped (pucca) Road	ATM	Commercial Bank	Cooperative Bank	Agricultural Credit Societies	Public Distribution System (PDS) Shop	Mandis/Regular Market	Weekly Haat	Agricultural Marketing Society	Power Supply for Agriculture Use Summer	Power Supply for Commercial	Agricultural Commodities (First)	Manufacturers Commodities (First)	Net Area Sown
1	Sirangattupatti	2	2	1	2	2	2	1	1	2	2	2	1	1	Paddy	Bricks	
2	Kottaiyur	2	2	1	2	2	2	2	1	2	2	2	1	1	Paddy		
3	Seithur	2	2	1	2	2	2	2	1	1	1	2	1	2	Coconut		
4	Sirugudi	2	2	1	2	1	1	1	1	1	1	1	1	1	Paddy		
5	Nadumandalam	2	2	1	2	1	1	2	1	2	2	2	1	1	Paddy	Bricks	
6	Punnappatti	2	2	1	2	1	2	1	1	2	2	2	1	1	Groundnut	Rope	Coconut thatch
7	Velanpatti	2	2	1	1	1	1	1	1	1	1	1	1	1	Coconut	Bricks	Mud pots
8	Avichchippatti	2	2	1	2	2	2	2	1	2	2	2	1	2	Vegetables	Bricks	
9	Panimalai	2	2	1	2	2	2	2	1	2	2	2	1	2	Paddy	Bricks	
10	Budagudi	2	2	1	2	2	2	2	1	2	2	2	1	1	Paddy	Bricks	Mud pots
11	Samudrapatti	2	2	1	2	2	2	2	1	2	2	2	1	1	Paddy	Rope	Coconut thatch
12	Pannuvarpatti	2	2	1	2	2	2	2	1	2	2	2	1	1	Coconut		
13	Palappanayakkanpatti	2	2	1	2	2	2	2	1	2	2	2	1	1	Coconut		
14	Sattambadi	2	2	1	2	2	1	2	1	2	2	2	1	1	Mango	Bricks	Baskets
15	Mulaiyur	2	2	1	2	2	2	1	1	2	2	2	1	1	Paddy	Bricks	Mud pots
16	Idayapatti	2	2	1	2	2	2	2	1	2	2	2	1	1	Mango	Bricks	
17	Uralipatti	2	2	1	2	2	2	2	1	2	2	2	1	1	Cotton	Bricks	Mud pots
18	Chellappanaickenpatti	2	2	1	2	2	2	2	1	2	2	2	1	1	Mango		Mud pots
19	Reddiapatti	2	2	1	2	2	2	2	1	2	1	2	1	1	Mango		
20	Sakkiliankodai	2	2	1	2	2	2	2	1	2	2	2	1	1	Tamarind		
21	Thimmananallur	2	2	1	2	2	2	2	1	2	2	2	1	1	Coconut		
22	Kanavaipatti	2	2	1	2	2	1	1	1	2	2	2	1	1	Tamarind		

<https://censusindia.gov.in/2011census/dchb/DCHB.html>

Table 3.37 Other Facilities in the Study Area

S.No.	Village Name	Govt Primary School	Govt Vocational Training School/ITI	Primary Health Sub Centre (Numbers)	Tap Water Untreated	River/Canal	Is the Area Covered under Total	Telephone (landlines)	Public Bus Service	Gravel (kuchha) Roads	Commercial Bank	Agricultural Credit Societies	Self - Help Group (SHG)	Nutritional Centers-Anganwadi Centre	Community Centre with/without TV	Power Supply For Domestic Use
1	Sirangattupatti	1	2	1	1	2	2	1	1	1	2	1	1	1	1	1
2	Kottaiyur	1	2	1	1	2	2	1	1	1	2	2	1	1	2	1
3	Seithur	1	2	1	1	2	2	1	1	1	2	2	2	1	1	1
4	Sirugudi	1	2	1	1	2	1	1	1	1	1	1	1	1	1	1
5	Nadumandalam	1	2	1	1	1	2	1	1	1	1	2	1	1	1	1
6	Punnapatti	1	2	1	1	2	1	1	1	1	1	1	1	1	1	1
7	Velanpatti	1	2	1	1	2	1	1	1	1	1	1	1	1	1	1
8	Avichchippatti	1	2	1	1	2	1	1	1	1	2	2	1	1	2	1
9	Pannimalai	1	2	0	1	2	2	1	1	1	2	2	1	1	2	1
10	Budagudi	1	2	0	1	2	2	1	1	1	2	2	1	1	1	1
11	Samudrapatti	1	2	1	1	2	2	1	1	1	2	2	1	1	2	1
12	Pannuvarpatti	1	2	1	1	2	1	1	2	1	2	2	1	1	1	1
13	Palappanayakkanpatti	1	2	0	2	2	1	1	2	1	2	2	1	1	1	1
14	Sattambadi	1	2	1	1	2	2	1	1	1	2	2	1	1	2	1
15	Mulaiyur	1	2	1	1	2	2	1	2	1	2	1	1	1	1	1
16	Idayapatti	1	2	1	1	2	2	1	2	2	2	2	1	1	2	1
17	Uralipatti	1	2	1	1	2	2	1	1	1	2	2	1	1	1	1
18	Chellappanaickenpatti	1	2	1	1	2	1	1	1	1	2	2	1	1	1	1
19	Reddiapatti	1	2	1	1	2	1	1	1	1	2	2	1	1	1	1
20	Sakkiliankodai	1	2	0	1	2	1	1	1	1	2	2	1	1	1	1
21	Thimmananallur	1	2	3	1	2	1	1	1	1	2	2	1	1	1	1
22	Kanavaipatti	1	2	1	1	2	1	1	1	1	2	1	1	1	1	1

<https://censusindia.gov.in/2011census/dchb/DCHB.html>

3.7.5 Recommendation and Suggestion

- Awareness program should be conducted to make the population aware of education and to get a better livelihood.
- Vocational training programme should be organized to make the people self - employed, particularly for women and unemployed youth.
- On the basis of qualification and skills local community may be preferred. Long term and short-term employments should be generated.
- Health care centre and ambulance facility should be provided to the population to get easy access to medical facilities. Maternity facility should be made available at the place to avoid going to distant places for treatment which involves risks. Apart from that, as these areas are prone to various diseases a hospital with modern facilities should be opened on a priority basis in a central place to provide better health facilities to the villagers around the project.
- While developing an Action Plan, it is very important to identify the population who falls under the marginalized and vulnerable groups. So that special attention can be given to these groups with special provisions while making action plans.

3.7.6 Summary & Conclusion

The socio-economic study in the study area gives a clear picture of its population, average household size, literacy rate and sex ratio etc. It is also found that a part of population is suffering from a lack of permanent job to run their day-to-day life. Their expectation is to earn some income for their sustainability on a long-term basis.

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

3.8 Traffic Density

The traffic survey conducted based on the transportation route of material, the rough stone is proposed to be transported mainly through Nadumandalam Village metal Road connecting Dindigul – Karaikudi NH-383 road.

Traffic density measurements were performed at two locations:

1. Nadumandalam -Natham -Village metal Road.
2. Dindigul - Karaikudi NH-383 Road.

Traffic density measurements 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 3.38 Traffic Survey Locations

Station Code	Road Name	Distance and Direction	Type of Road
TS1	Nadumandalam Village Metal Road	645m E	Village Road
TS2	Dindigul - Karaikudi NH-383	2 km-SW	NH-383 Road

Source: On-site monitoring by GTMS FAE & TM

Table 3.39 Existing Traffic Volume

Station code	HMV		LMV		2/3 Wheelers		Total PCU
	No	PCU	No	PCU	No	PCU	
TS1	106	318	42	42	246	123	483
TS2	215	645	168	168	678	339	1152

Source: On-site monitoring by GTMS FAE & TM

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

Table 3.40 Rough Stone Hourly Transportation Requirement

Transportation of Rough Stone Per Day		
Capacity of trucks	No. of Trips per day	Volume in PCU
20 tonnes	12	36

Source: Approved Mining Plan

Table 3.41 Summary of Traffic Volume

Route	Existing Traffic volume in PCU	Incremental traffic due to the project	Total traffic volume	Hourly Capacity in PCU as per IRC – 1960 guidelines
Nadumandalam -Natham	483	36	519	1200
Dindigul - Karaikudi NH-383	1152	36	1188	1500

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

- ❖ Due to this project the existing traffic volume will not exceed
- ❖ As per the IRC 1960, this existing village road can handle 1,200 PCU in hour and Major district road can handle 1500 PCU in hour. Hence there will not be any conjunction due to this proposed transportation.

CHAPTER IV

ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

4.0 GENERAL

Environmental impacts both direct and indirect on various environmental attributes due to proposed mining activity will be created in the surrounding environment, during the operational and post–operational phases. The occurrence of mineral deposits, being site specific, their exploitation, often, does not allow for any choice except adoption of eco-friendly operation. The methods are required to be selected in such a manner, so as to maintain environmental equilibrium ensuring sustainable development.

In order to maintain the environmental commensuration with the mining operation, it is essential to undertake studies on the existing environmental scenario and assess the impact on different environmental components. This would help in formulating suitable management plans sustainable resource extraction.

Several scientific techniques and methodologies are available to predict impacts of physical environment. Mathematical models are the best tools to quantitatively describe the cause-and-effect relationships between sources of pollution and different components of environment. In cases where it is not possible to identify and validate a model for a particular situation, predictions have been arrived at based on logical reasoning / consultation / extrapolation. The following parameters are of significance in the environmental impact assessment and are being discussed in detail:

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

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

4.1 LAND ENVIRONMENT

4.1.1 Anticipated Impact

- ❖ Permanent or temporary change on land use and land cover.
- ❖ Change in topography of the mine lease area will change at the end of the life of the mine.
- ❖ Problems to agricultural land and human habitations due to dust, and noise caused by movement of heavy vehicles.
- ❖ Degradation of the aesthetic environment of the core zone due to quarrying.
- ❖ Soil erosion and sediment deposition in the nearby water bodies due to earthworks during the rainy season.
- ❖ Siltation of water course due to wash off from the exposed working area.

4.1.2 Common Mitigation Measures from Proposed Project

- ❖ 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 and 10m safety barrier and other safety provided) so as to help minimize 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.

4.2 SOIL ENVIRONMENT

The proposed project area is covered by thin layer of topsoil with the average thickness of about 1m.

4.2.1 Anticipated Impact on Soil Environment

Following impacts are anticipated due to mining operations:

- ❖ 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
- ❖ Exposure of subsurface materials which are unsuitable for vegetation establishment

4.2.2 Common Mitigation Measures from proposed project

- ❖ Run-off diversion – Garland drains will be constructed 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.

4.2.3 Waste Dump Management

There is no waste anticipated in this rough stone quarrying operation. The entire quarried out materials will be utilized.

4.3 WATER ENVIRONMENT

4.3.1 Anticipated Impact

The major sources of water pollution normally associated with mining and allied operations are:

- ❖ Generation of waste water from vehicle washing
- ❖ Washouts from surface exposure or working areas
- ❖ Domestic sewage
- ❖ Disturbance to drainage course in the project area

- ❖ Mine pit water discharge
- ❖ Increase in sediment load during monsoon in downstream of lease area
- ❖ This being a mining project, there will be no process effluent. Waste from washing of machinery may result in discharge of Oil & grease, suspended solids
- ❖ The sewage from soak pit may percolate to the ground water table and contaminate it
- ❖ Surface drainage may be affected due to Mining
- ❖ Abstraction of water may lead to depletion of water table

4.3.2 Details of water requirements in KLD

Table 4.1 Water Requirements

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

Source: Approved Mining Plan Pre-Feasibility Report

4.3.3 Common Mitigation Measures for the Proposed Project

- ❖ Garland drainage system and settling tank will be constructed along the proposed mining lease area. The garland drainage will be connected to settling tank and sediments will be trapped in the settling tanks and only clear water will be discharged to the natural drainage.
- ❖ Rainwater from the mining pits will be collected in sump and will be allowed to store and pumped out to surface settling 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.
- ❖ Benches will be provided with inner slopes and through a system of drains and channels, rain water will be allowed to descent into surrounding drains to minimize the effects of erosion and water logging arising out of uncontrolled descent of water.
- ❖ The water collected will be reused during storm for dust suppression and greenbelt development within the mines.

- ❖ Interceptor traps/oil separators will be installed to remove oils and greases. Water from the tipper wash-down facility and machinery maintenance yard will be passed through interceptor traps/oil separators prior to its reuse.
- ❖ Flocculating or coagulating agents will be used to assist in the settling of suspended solids during monsoon seasons.
- ❖ Periodic (once every 6 months) analysis of ground water quality of quarry pit water and ground water of nearby villages will be conducted.
- ❖ Domestic sewage from site office and 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 (once every 6 months) and analysing the quality of water in open well, bore wells and surface water.

4.4 AIR ENVIRONMENT

4.4.1 Anticipated Impact from proposed project

- ❖ During mining at various stages of 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.

4.4.2 Emission Estimation

Emission resulting from different mining activities is estimated using relevant empirical formulae developed by Chauhya et al.,2001. The equations used for SPM, SO₂, and NO_x emission estimation have been given in Table 4.2.

Table 4.2 Empirical Formula for Emission Rate from Overall Mine

	Pollutant	Source Type	Empirical Equation	Parameters
Overall Mine	SPM	Area	$E=[u0.4a0.2\{9.7+0.01p+b/(4+0.3b)\}]$	u = Wind speed(m/s); p = Mineral production (Mt/yr); b = Overburden handling (Mm ³ /yr); a = Lease area(km ²); E = Emission rate(g/s).
Overall Mine	SO ₂	Area	$E=a0.14\{u/(1.83+0.93u)\} [p/(0.48+0.57p) +\{b/(14.37+1.15b)\}]$	u = Wind speed(m/s); p = Mineral production (Mt/yr); b = Overburden handling (Mm ³ /yr); a = Lease area(km ²); E = Emission rate(g/s).
Overall Mine	NO _x	Area	$E=a0.25\{u/(4.3+32.5u)\} [1.5p+\{b/(0.06+0.08b)\}]$	u = Wind speed(m/s); p = Mineral production (Mt/yr); b= Overburden handling (Mm ³ /yr); a = Lease area(km ²); E = Emission rate(g/s).

The emission rate thus calculated using the empirical formula is used as one of the inputs in the AERMOD modelling. As the SPM emission calculation for overall mine is not considering pollution control measures, one-third of the SPM value is taken for derivation of PM₁₀ keeping in mind that proper control measures are followed. It is important to note that PM₁₀ emission rate is derived from the SPM estimation in the background that PM₁₀ constitutes 52% of SPM emission. The PM₁₀, SO₂ and NO_x emission results have been given in Table 4.3.

Table 4.3 Estimated Emission Rate

Activity	Pollutant	Calculated Value (g/s)	Lease Area in m²	Calculated Value (g/s/m²)
Overall Mine	PM ₁₀	0.023499016	12000	0.0000019827
Overall Mine	PM _{2.5}	0.013499016	12000	0.0000011389
Overall Mine	SO _x	0.014023135	12000	0.0000011831
Overall Mine	NO _x	0.010798203	12000	0.0000009110

4.4.2.1 Frame work of Computation and Model Details

By using the above-mentioned inputs, Ground Level Concentrations (GLC) due to the quarrying activities have been estimated to know the incremental concentration in ambient air quality and impact in the study area. The effect of air pollutants upon receptors are influenced by concentration of pollutants and their dispersion in the atmosphere.

Air quality modelling is an important tool for prediction, planning and evaluation of air pollution control activities besides identifying the requirements for emission control to meet the regulatory standards and to apply mitigation measures to reduce impact caused by quarrying activities. Suspended Particulate Matter (SPM) is the major pollutant occurred during quarrying activities. The prediction includes the impacts 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.

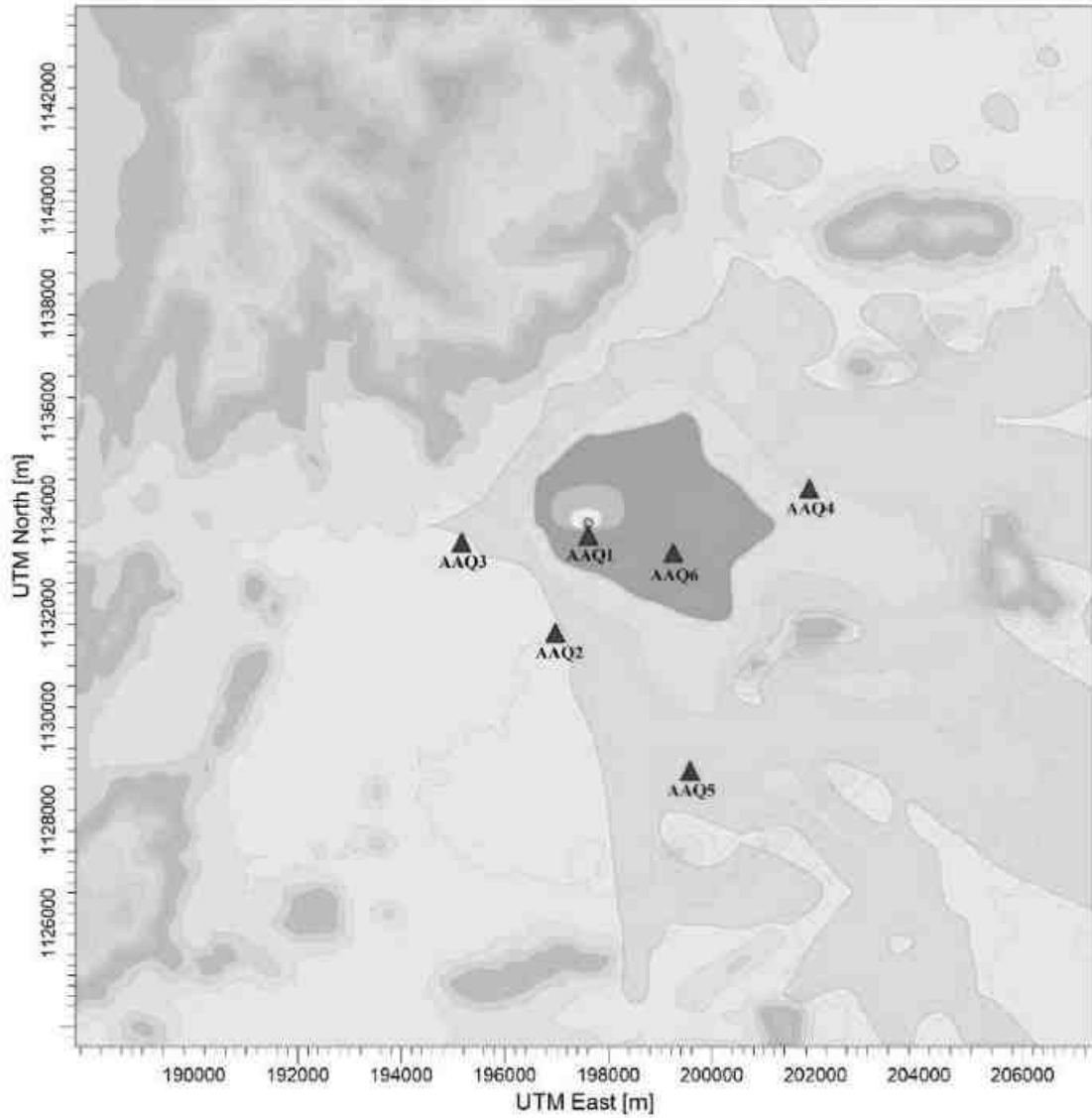
The model was used to predict the impact on the ambient air environment at each receptor at various localities within 10km radius around the project site and the maximum incremental GLC at the project site. All the prediction models in Figures 4.1- 4.4 shows the maximum concentrations of PM_{2.5}, PM₁₀, SO₂, NO_x, and fugitive dust close to the proposed project site due to low to moderate wind speeds.

4.4.2.2 Modelling of Incremental Concentration

The air borne particulate matter such as PM₁₀ and PM_{2.5} generated by quarrying operation, transportation, and wind erosion of the exposed areas and emissions of sulphur dioxide (SO₂) and oxides of nitrogen (NO_x) due to excavation and loading equipment's and vehicles plying on haul roads are the significant air pollutants arising from mining operation, leading to an adverse impact on the ambient air environment in and around the project area.

Anticipated incremental concentration and net increase in emissions due to quarrying activities within 500m around the project area is predicted by open pit source modelling using AERMOD Software and the incremental values of the air pollutants were added to the base line data monitored at the proposed site to predict total GLC of the pollutants, as shown in Tables 4.4 - 4.7.

PROJECT TITLE:
GOVINDARAJAN ROUGHSTONE QUARRY- PM10



COMMENTS:

SOURCES:

1

COMPANY NAME:

GEOTECHNICAL MINING SOLUTIONS

RECEPTORS:

447

OUTPUT TYPE:

Concentration

SCALE:

1:127,000

0 5 km

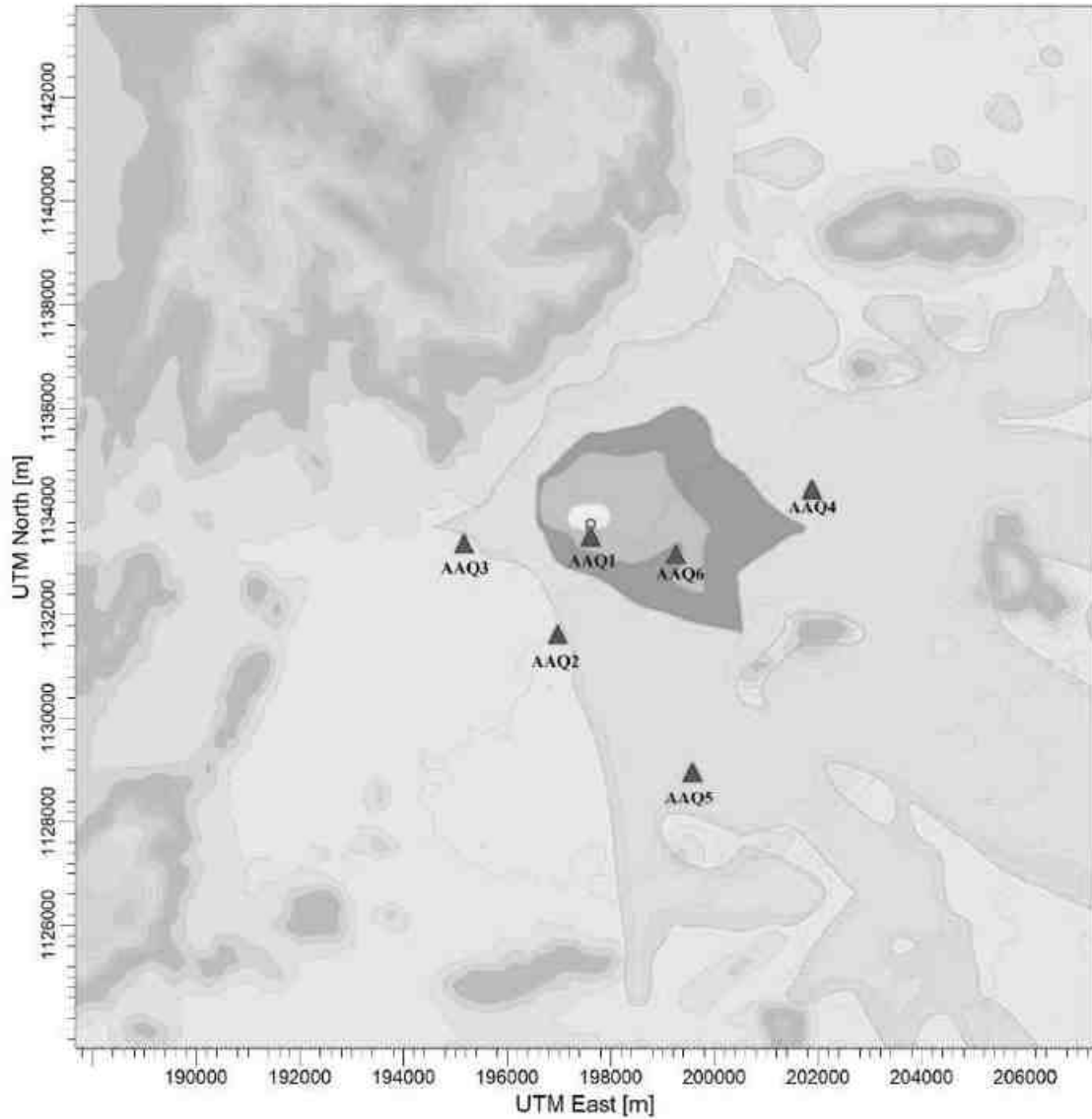
MAX:

13.5 ug/m³

PROJECT NO.:

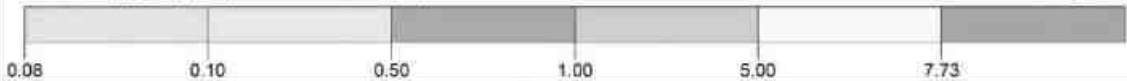
Figure 4.1 Predicted Incremental Concentration of PM10

PROJECT TITLE:
GOVINDARAJAN ROUGHSTONE QUARRY - PM2.5



Max: 7.73 [$\mu\text{g}/\text{m}^3$] at (197541.21, 1133701.91)

$\mu\text{g}/\text{m}^3$



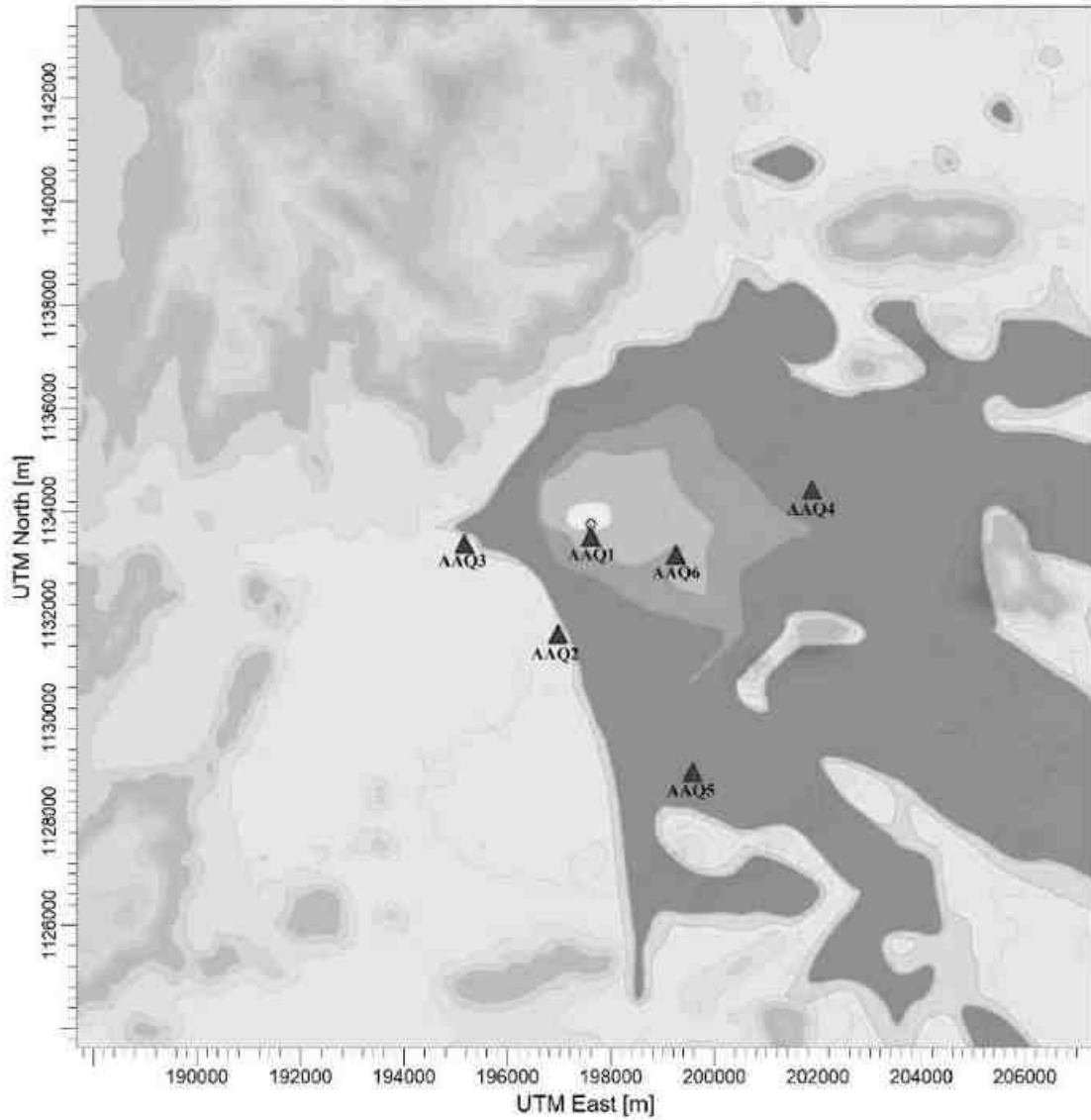
COMMENTS:	SOURCES: 1	COMPANY NAME: GEOTECHNICAL MINING SOLUTIONS	
	RECEPTORS: 447		
	OUTPUT TYPE: Concentration	SCALE: 1:127,000	
	MAX: 7.73 $\mu\text{g}/\text{m}^3$		
		PROJECT NO.:	

AERMOD View - Lakes Environmental Software

C:\Users\Admin\Desktop\Govindraj\GOVINDARAJAN PM2.5\GOVINDARAJAN PM2.5.nc

Figure 4.2 Predicted Incremental Concentration of PM_{2.5}

PROJECT TITLE:
GOVINDARAJAN ROUGHSTONE QUARRY- SO₂



COMMENTS:

SOURCES:

1

COMPANY NAME:

GEOTECHNICAL MINING SOLUTIONS

RECEPTORS:

447

OUTPUT TYPE:

Concentration

SCALE:

1:127,000

0 5 km

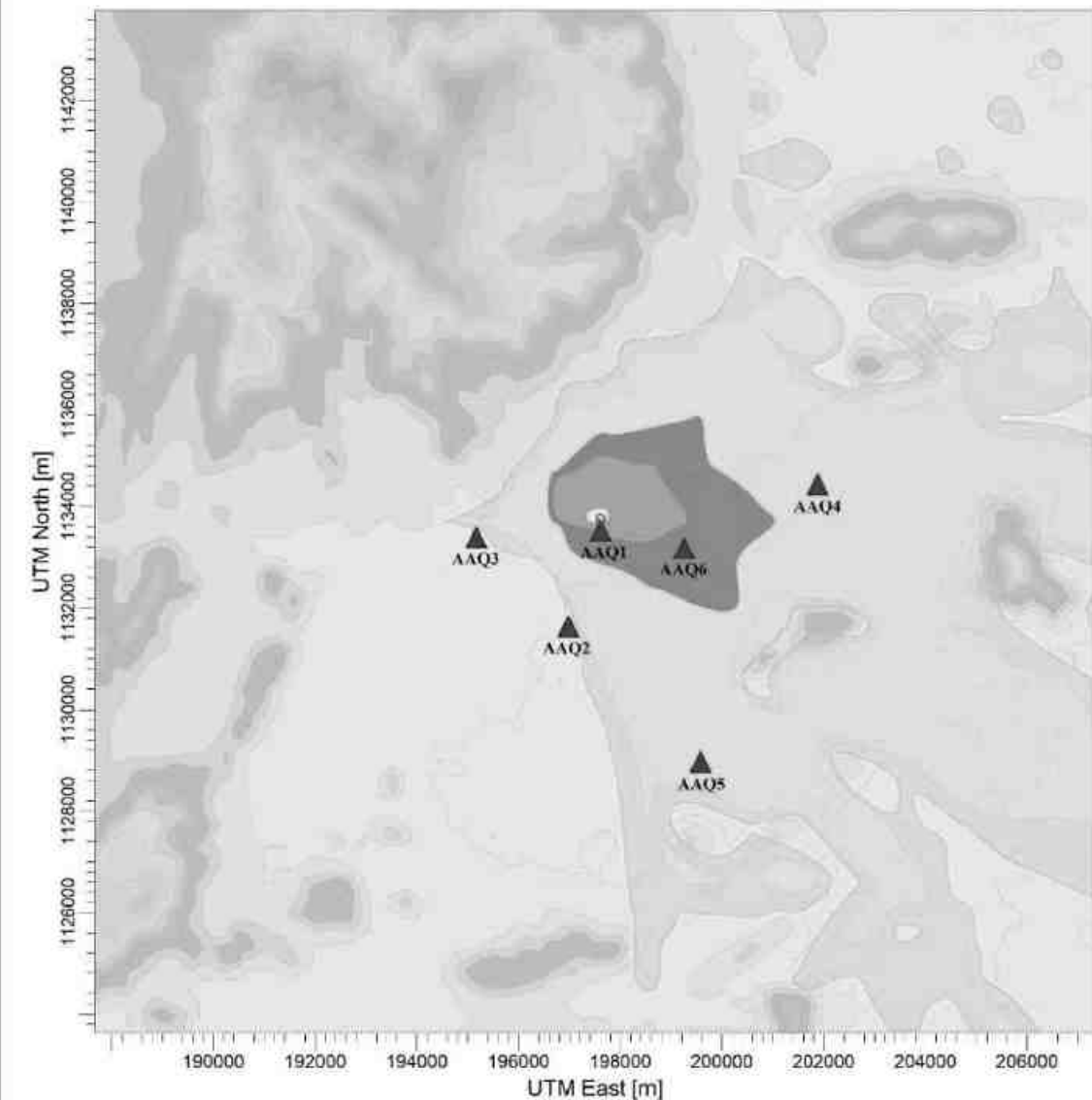
MAX:

8.03 ug/m³

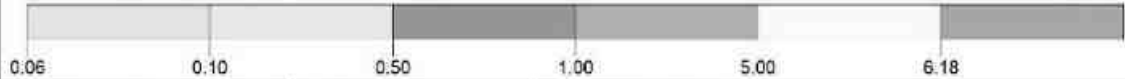
PROJECT NO.:

Figure 4.3 Predicted Incremental Concentration of SO₂

PROJECT TITLE:
GOVINDARAJAN ROUGHSTONE QUARRY-NOx



Max: 6.18 [ug/m³] at (197541.21, 1133701.91) ug/m³



COMMENTS:	SOURCES: 1	COMPANY NAME: GEOTECHNICAL MINING SOLUTIONS	
	RECEPTORS: 447		
	OUTPUT TYPE: Concentration	SCALE: 1:127,000 0 ——— 5 km	
	MAX: 6.18 ug/m ³		PROJECT NO.:

Figure 4.4 Predicted Incremental Concentration of NOx

4.4.2.3 Model Results

The post project Resultant Concentrations of PM₁₀, PM_{2.5}, SO₂ & NO_x is given in the table shown below:

Table 4.4 Incremental & Resultant GLC of PM₁₀

Station Code	Location	Average Baseline PM ₁₀ (µg/m ³)	Incremental value of PM ₁₀ due to mining (µg/m ³)	Total PM ₁₀ (µg/m ³)
AAQ1	10°14'33.10"N, 78°14'23.15"E	42.30	10	52.3
AAQ2	10°13'31.63"N, 78°14'02.91"E	34.15	0	34.15
AAQ3	10°14'28.12"N, 78°13'03.17"E	36.34	0	36.34
AAQ4	10°15'3.92"N, 78°16'43.15"E	34.63	1	35.63
AAQ5	10°12'5.73"N, 78°15'29.29"E	35.11	0.5	35.61
AAQ6	10°14'22.50"N, 78°15'17.33"E	35.36	5	40.36

Table 4.5 Incremental & Resultant GLC OF PM_{2.5}

Station Code	Location	Average Baseline PM _{2.5} (µg/m ³)	Incremental value of PM _{2.5} due to mining (µg/m ³)	Total PM _{2.5} (µg/m ³)
AAQ1	10°14'33.10"N, 78°14'23.15"E	24.62	7.72	32.34
AAQ2	10°13'31.63"N, 78°14'02.91"E	22.74	0	22.74
AAQ3	10°14'28.12"N, 78°13'03.17"E	23.21	0	23.21
AAQ4	10°15'3.92"N, 78°16'43.15"E	22.90	0.5	23.4
AAQ5	10°12'5.73"N, 78°15'29.29"E	21.94	0.5	22.44
AAQ6	10°14'22.50"N, 78°15'17.33"E	22.22	1	23.22

Table 4.6 Incremental & Resultant GLC of SO₂

Station Code	Location	Average Baseline SO ₂ (µg/m ³)	Incremental value of SO ₂ due to mining (µg/m ³)	Total SO ₂ (µg/m ³)
AAQ1	10°14'33.10"N, 78°14'23.15"E	8.88	8.0	16.88
AAQ2	10°13'31.63"N, 78°14'02.91"E	7.98	0	7.98
AAQ3	10°14'28.12"N, 78°13'03.17"E	6.74	0	6.74
AAQ4	10°15'3.92"N, 78°16'43.15"E	7.07	0.5	7.57
AAQ5	10°12'5.73"N, 78°15'29.29"E	6.14	0.5	6.64
AAQ6	10°14'22.50"N, 78°15'17.33"E	5.72	1	6.72

Table 4.7 Incremental & Resultant GLC of NO₂

Station Code	Location	Average Baseline Nox ($\mu\text{g}/\text{m}^3$)	Incremental value of Nox due to mining ($\mu\text{g}/\text{m}^3$)	Total Nox ($\mu\text{g}/\text{m}^3$)
AAQ1	10°14'33.10"N, 78°14'23.15"E	26.15	6.18	32.33
AAQ2	10°13'31.63"N, 78°14'02.91"E	23.00	0	23
AAQ3	10°14'28.12"N, 78°13'03.17"E	22.82	0	22.82
AAQ4	10°15'3.92"N, 78°16'43.15"E	25.85	0.5	26.35
AAQ5	10°12'5.73"N, 78°15'29.29"E	21.77	0.5	22.27
AAQ6	10°14'22.50"N, 78°15'17.33"E	21.65	1	22.65

From the resultant of cumulative concentration i.e., Background + Incremental Concentration of pollutant in all the receptor locations without effective mitigation measures are still within the prescribed NAAQ limits of 100, 60, 80 & 80 $\mu\text{g}/\text{m}^3$ for PM₁₀, PM_{2.5}, SO₂ & NO_x respectively. By adopting suitable mitigation measures, the pollutant levels in the atmosphere can be further being controlled.

4.4.2.4 Common Mitigation Measures

4.4.2.4.1 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 becomes very effective and the work environment will be improved from the point of view 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.

4.4.2.4.2 Blasting

- ❖ Suitable time of blasting will be chosen according to the local conditions and water will be sprinkled on blasting face.
- ❖ Blasting will be avoided when temperature inversion is likely to occur and strong wind blows towards residential areas.

- ❖ Controlled blasting will be carried out using suitable explosive charge and short delay detonators, adequate stemming of holes at collar zone.
- ❖ Blasting will be restricted to a particular time of the day i.e., at the time of lunch hours.
- ❖ 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.

4.4.2.4.3 Haul Road and 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 to < 20 km/hr to avoid generation of dust.
- ❖ Water sprinkling on haul roads and 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 and reduces pollution.
- ❖ The un-metalled haul roads will be compacted weekly before being put into use.
- ❖ Overloading of tippers will be avoided to prevent spillage.
- ❖ It will be ensured that all transportation vehicles carry a valid PUC certificate.
- ❖ Haul roads and service roads will be graded to clear accumulation of loose materials.

4.4.2.4.4 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 tractors/tippers
- ❖ Green belt of adequate width will be developed around the project site

4.4.2.4.5 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 and tipper drivers.
- ❖ Ambient air quality monitoring will be conducted every six months to assess effectiveness of mitigation measures proposed.

4.5 NOISE ENVIRONMENT

Noise pollution is mainly due to operation like drilling, blasting and plying of trucks & HEMM. These activities will not cause any problem to the inhabitants of this area because there is no human settlement 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 1,10° 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 a mathematical model based on first principle.

$$L_{p2} = L_{p1} - 20 \log (r_2/r_1) - A_{e1,2}$$

Where,

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

$A_{e1,2}$ is the excess attenuation due to environmental conditions. Combined effect of all sources can be determined at various locations by logarithmic addition.

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

4.5.1 Anticipated Impact

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

- Source data
- Receptor data
- Attenuation factor

Source data has been computed considering of all the machinery and activities used in the mining process. Same has been listed in Table 4.8. The total noise to be produced by mining

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

Table 4.8 Predicted Noise Incremental Values

Noise Monitoring Location	Distance From Project Site(m)	Baseline Noise Level (dBA)m During Day Time	Predicted Noise Level(dBA)	Baseline + Predicted Noise Level(dBA)	Total(dBA)
Core zone	100	44.46	57.15	44.46+57.15	57.38
Velanpatti	540	43.27	42.51	43.27+42.51	45.94
Natham(TP)	2100	44.81	30.71	44.81+30.71	44.97
Velanpatti	2400	43.58	29.55	43.58+29.55	43.74
Panniyamalai	4330	43.27	24.42	43.27+24.42	43.32
Uralipatti	5000	42.45	23.18	42.45+23.18	42.50
Nadumandalam	3500	40.45	26.27	40.45+26.27	40.61
NAAQ Standards	Industrial Day Time - 75 dB (A) & Night Time- 70 dB (A) Residential Day Time -55 dB (A) & Night Time- 45 dB (A)				

The incremental noise level is found within the range of 57.15 dB (A) in core zone and 23.18 – 42.51 dB (A) in buffer zone. The noise level at different receptors in buffer zone is lower due to the distance involved and other topographical features adding to the noise attenuation. The resultant noise level due to monitored values and calculated values at the receptors are based on the mathematical formula considering attenuation due to several factors including ground reflection, atmosphere, wind speed, temperature, trees, and buildings as 35.5 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.).

4.5.2 Common Mitigation Measures

The following noise mitigation measures are proposed for control of noise:

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

4.5.3 Ground Vibrations

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

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

The ground vibrations due to the blasting in the quarry are calculated using the empirical equation.

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

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

Where,

V = Peak particle velocity (mm/s)

K = Site and rock factor constant (500)

Q = Maximum instantaneous charge (kg)

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

R = Distance from charge (m)

Table 4.9 Predicted PPV Values due to Blasting

Location ID	Maximum Charge in kgs	Nearest Habitation in m	PPV in mm/s
P1	24	540	0.60

The peak particle velocity produced by the charge of 24 kg is well below that of 8 mm/s as per Directorate General of Mines Safety for safe level criteria through Circular No. 7 dated 29/8/1997. But the project proponent ensures that the charge per blast shall be less than 24 kg and that the proponent shall carry out blasting twice or thrice a day based on the onsite conditions under the supervision of competent person employed. However, as per statutory requirement control measures will be adopted to avoid the impacts due to ground vibrations and fly rocks due to blasting.

4.5.3.1 Common Mitigation Measures

- ❖ The blasting operations in the cluster quarries are carried out without deep hole drilling and blasting using delay detonators which reduce the ground vibrations.
- ❖ Proper quantity of explosives, 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 in such a way that the predicted peak particle velocity shall not exceed 0.251mm/s.
- ❖ Vibration monitoring will be carried out every 6 months to check the efficacy of blasting practices.

4.6 ECOLOGY AND BIODIVERSITY

4.6.1. Anticipated Impact on Flora

The impact of the mining activity on the biological environment is as follows:

- A. The mining lease area does not include any forest land. There will be no cutting of trees during the mining activity so no deforestation activity will be under taken.
- B. The existing vegetation within the ML area includes few trees and scrub vegetation which are sparsely scattered. They will not be disturbed due to the mining activity. So, the impact on the vegetation is very less.
- C. The transportation of Rough Stone quarry waste may create dust pollution which may create loss of biodiversity of the area.
- D. Dust in atmosphere, contributed by mining and associated activities, when deposited on the leaves of the plants in the surrounding areas may retard their growth.
- E. The growth of vegetation and agriculture in and around the complexes. Noise and vibrations due to blasting and operation of the machines drive away the wild animals and birds from the nearby areas.
- F. The lease area and its buffer zone are devoid of any Eco sensitive area. The impact on the biodiversity and wild life is minimal.

4.6.2 Mitigation Measures

4.6.2.1. Green Belt Development

The project site should have a land to develop greenbelt in and around the limits of the mine, along roads and other 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 by 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.
- ❖ It improves the ambient air quality by controlling Suspended Particulate Matter (SPM) in air.
- ❖ It helps in noise abatement for the surrounding area.
- ❖ It helps in settlement of new birds and insects within itself.
- ❖ It maintains the ecological balance.
- ❖ It increases the aesthetic value of site.

4.6.2.2. Green Belt Plan

Greenbelt is an important sink of air pollutants and noise. Green cover in mining area not only helps in reducing pollution level, but also improves the ecological conditions and prevents soil erosion to great extent. It further improves the aesthetics and beneficially influences the microclimate of the surrounding. However, green belts of the lease area will include the local species which are suitable for the area. Plant species, selected for greenbelt have rapid growth, ever green, large crown volume and small/pendulous leave with smooth surface. A combination of different plant species is sought while selecting trees for vegetation cover. Greenbelt should be developed in following areas:

- ❖ Along mine boundary
- ❖ Along the side of major roads
- ❖ On backfill areas

The species of plantation should be selected considering the soil quality, place of plantation, chances of survival, commercial value etc. Only indigenous species will be planted. Mixed plantation should be done keeping optimum spacing between the saplings.

4.6.3. Afforestation

More number of trees has been observed along the approach road in the lease area, which is developed by the lease owner. The 7.5m Safety distance along the boundary has been identified to be utilized for subsequent Afforestation. However, the afforestation should always be carried out in a systematic and scientific manner. Regional trees like *Azadirachta indica*, *Nerium indicum*, and *Albizia lebbek* will be planted along the lease boundary and avenue plantation will be carried out in respective proposed project. Recommended species for Greenbelt Development Plan is given in Table 4.11. The rate of survival expected to be 80% in this area and budget of green belt development plan are given in Table 4.12.

After complete extraction of mineral, the pit will be allowed to collect rain 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.

4.6.3.1. Species Recommendation for Plantation granted in the district

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

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

Table 4.10 Recommended Species for Greenbelt Development Plan

S. No	Botanical Name of the Plant	Family Name	Common Name	Category	Dust Capturing Efficiency Features
1	<i>Azadirachta indica</i>	Meliaceae	Neem, Vembu	Tree	Well distinct thick at both the layer Well distinct in Palisade & Spongy parenchyma. Spongy
2	<i>Tectona grandis</i>	Lamiaceae	Teak	Tree	
3	<i>Polyalthia longifolia</i>	Annonaceae	Nettilingam	Tree	
4	<i>Albizia lebbek</i>	Fabaceae	Vagai	Tree	

5	<i>Delonix regia</i>	Fabaceae	Cemmayir-konrai	Tree	parenchyma is present at lower epidermis Many vascular bundles arranged almost parallel series
6	<i>Bauhinia racemosa</i>	Fabaceae	Aathi	Tree	
7	<i>Cassia fistula</i>	Fabaceae	Sarakondrai	Tree	
8	<i>Aegle marmelos</i>	Rutaceae	Vilvam	Tree	
9	<i>Pongamia pinnata</i>	Fabaceae	Pungam	Tree	
10	<i>Thespesia populnea</i>	Malvaceae	Puvarasu	Tree	

Table 4.11 Greenbelt Development Plan

S. No	No. of trees proposed to be planted	Survival %	Area to be covered in m ²	Name of the species	No. of trees expected to be grown
Plantation in the construction phase (3Months)	Plantation under safety distance and dumb (In Nos.)			<i>Azadirachta indica</i> <i>Albizia lebbeck</i> <i>Delonix regia</i> <i>Tectona grandis</i> , etc.,	336
	420	80%	3800		
	Plantation in quarry approach road Side and village road side (In Nos.)				144
	180	80%	1600		

Table 4.12 Budget for greenbelt development plan

Activity	Plantation in the construction phase (3Months)	Cost	Capital Cost (RS)	Recurring Cost
Plantation in 7.5m, Safety distance and dumb (in Nos.)	420	@ 300 Rs/ saplings (including the cost of digging, and plantation, and the labour)	Rs 1,26,000	-
Plantation in Quarry Approach Road side (in Nos.)	180		Rs 54,000	-
Maintenance (Rs.) (Manuring, watering, gardener etc.)	600 plants *Rs 50 = Rs. 30000 per year		-	Rs 1,50,000
Total			Rs 1,80,000	Rs 1,50,000

4.6.3.2 Location of Seedlings Supplying Facility

Seedlings required for green belt development can be purchased from the district forest office of Dindigul. The location map of the seedlings store is shown in Figure 4.5

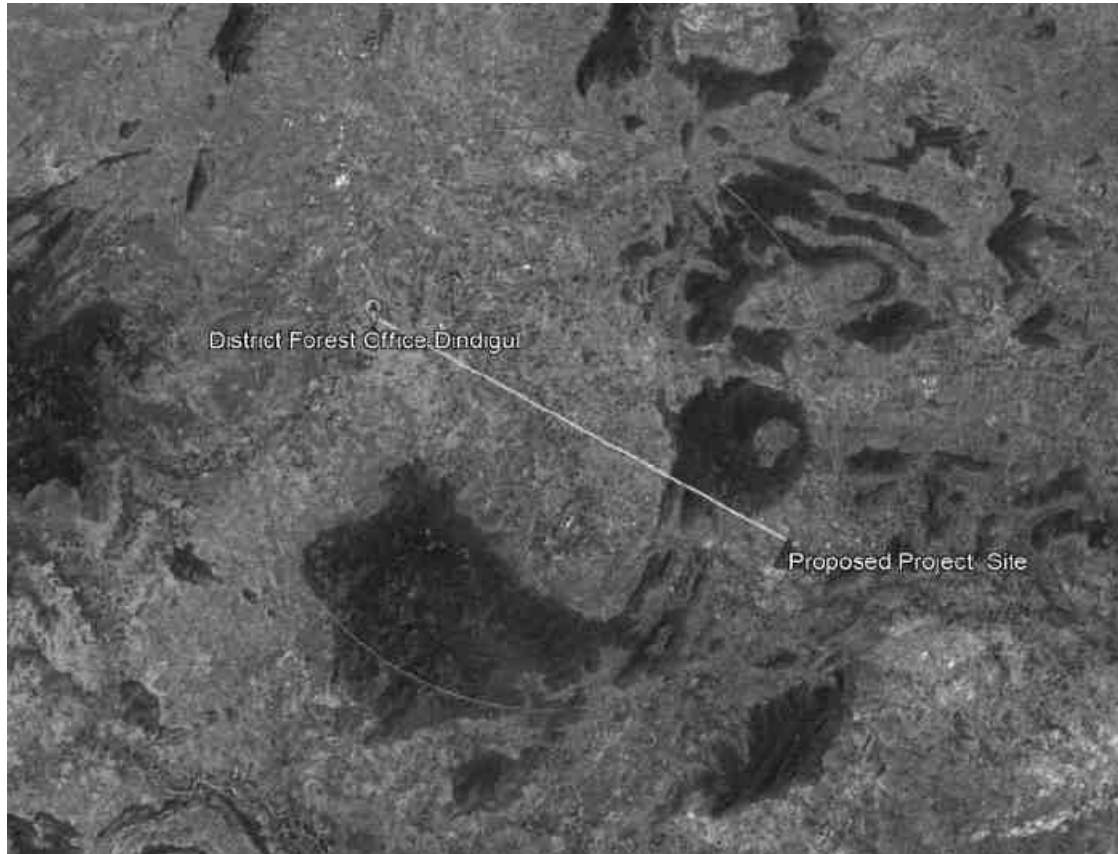


Figure 4.5 Location of the District Forest Office supplying Seedlings

4.6.4. Anticipated Impact on Fauna

- ❖ There is no Wildlife Sanctuary and Biosphere Reserve within 10 km radius of the project site.
- ❖ No rare, endemic & endangered species are reported in the buffer zone. However, during the course of mining, the management will practice scientific method of mining with 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.

4.6.4.1. Measures for protection and conservation of wildlife species

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

4.6.4.2. Mitigation Measures

- ❖ Suitable plan for conservation of Schedule-I Species have prepared and necessary fund for implement for the same will be made
- ❖ All the preventive measures will be taken for growth & development of fauna
- ❖ Creating and development awareness for nature and wildlife in the adjoin villages
- ❖ The workers shall be trained to not harm any wildlife, should it come near the project site and no work shall be carried out after 6.00 pm

4.6.5. Impact on Aquatic Biodiversity

Mining activities will not disturb the existing 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. There are few seasonal water bodies on the North and eastern side. It is away from the applied lease area. There are no impacts to aquatic biodiversity. Aquatic biodiversity is observed in the water body.

4.6.6. Impact Assessment on Biological Environment

This chapter highlights the various impacts on ecology and biodiversity due to mining activity. It addresses the baseline data and its Effect on flora and wild life fauna especially threatened species (Critically Endangered, Endangered, and Vulnerable) in core mining lease area. A detail of impact and assessments was mentioned in Table 4.13.

Table 4.13 Ecological impact assessments

S. No	Attributes	Assessment
1	Activities of the project affects the breeding/nesting sites of birds and animals	No breeding and nesting site was identified in mining lease site. The fauna sighted mostly migrated from buffer area.
2	Located near an area populated by rare or endangered species	No endangered, critically endangered, vulnerable species sighted in core mining lease area.
3	Proximity to national park/wildlife sanctuary/reserve forest /mangroves/ coastline/estuary/sea	No national park or eco-sensitive zone around 10km radius. There is no forest within 10 km radius NOC given by Madurai Forest department. Kindly refer the annexure.
4	Proposed project restricts access to waterholes for wildlife	No.
5	Proposed mining project impact surface water quality that also provide water to wildlife	No scheduled or threatened wildlife animal sighted regularly core in core area.
6	Proposed mining project increase siltation that would affect nearby biodiversity area.	Surface runoff management such as drains is constructed properly. So there will be no siltation affect in 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 chances of water become polluted is low.
9	Mining project effect the forest Based livelihood/ any specific forest product on which local livelihood depended	No.
10	Project likely to affect migration routes	No migration route observed during monitoring period.
11	Project likely to affect 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 likely to affect wetlands, Fish breeding grounds, marine ecology	No. Wetland was not present in near core mining lease area. No breeding and nesting ground is present in core mining area.

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

4.6.6. Impact evaluation

Table 4.14 Impact Evaluation for Biological Resources

Impact Evaluation Element	Change in the biological resources of the area due to mine development & operation and generation of emissions.			
Potential Effect/Concern	Loss of habitat, Impact on health of biological receptors due to area and line sources of air emissions including fugitive dust emissions during rough stone quarry development & operation activities.			
Characteristics of Impacts				
Nature	Positive		Negative	Neutral
	○		●	○
Type	Direct	Indirect	Cumulative	
	●	○	○	
Extent	Project Area	Local	Zonal	Regional
	●	○	○	○
Duration	Short – term		Long- term	
	○		●	
Intensity	Low		Medium	High
	●		○	○
Frequency	Remote (R)	Occasional (O)	Periodic (P)	Continuous (C)
	○	○	○	●
Significance of Impact				
Significance	Insignificant	Minor	Moderate	Major
	●	○	○	○

*Note: Mark ‘●’ indicates the Yes and ‘○’ indicates the No.

4.7 SOCIO ECONOMIC ENVIRONMENT

4.7.1 Anticipated Impact from Proposed and Existing 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.

4.7.2 Common Mitigation Measures for Proposed Project

- ❖ 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.

4.8 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

4.8.1 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

4.8.2 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

4.8.3 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 will be taken up.

4.8.4 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, Spiro metric 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.

4.9 MINE WASTE MANAGEMENT

The overburden in the form of topsoil will be safely removed during the mining plan period. The quarried-out topsoil will be preserved within the applied area, utilized for construction of bund, backfilled in the part of the quarry pit and also spread out the quarried out top bench to facilitate the greenbelt development. The weathered rock 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.

4.10 MINE CLOSURE

Mine closure plan is the most important environmental requirement in mining project. The mine closure plan should cover technical, environmental, social, legal and financial aspects

dealing with progressive and post closure activities. The closure operation is a continuous series of activities starting from the decommissioning of the project. 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.

4.10.1 Mine Closure Criteria

The criteria involved in mine closure are discussed below:

4.10.1.1 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.,

4.10.1.2 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.

4.10.1.3 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, and 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 V

ANALYSES OF ALTERNATIVES (TECHNOLOGY AND SITE)

5.0 INTRODUCTION

Consideration of alternatives to a project proposal is a requirement of EIA process. During the scoping process, alternatives to a proposal can be considered or refined, either directly or by reference to the key issues identified. A comparison of alternatives helps to determine the best method of achieving the project objectives with minimum environmental impacts or indicates the most environmentally friendly and cost-effective options.

5.1 FACTORS BEHIND THE SELECTION OF PROJECT SITE

Thiru A. Govindarajan rough stone quarry project located at Nadumandalam Village, is a mining project for excavation of rough stone, which is site specific. The project 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 areas.
- ❖ Availability of skilled, semi-skilled and unskilled workers in this region.
- ❖ All the basic amenities such as medical, firefighting, education, transportation, communication and infrastructural facilities are well connected and accessible.
- ❖ The mining operations will not intersect the ground water level. Hence, no impact on ground water environment.
- ❖ Study area falls in seismic zone – II, there is no major history of landslides, earthquake, subsidence etc., recorded in the past history.

5.2 ANALYSIS OF ALTERNATIVE SITE

No alternatives are suggested as the mine site is mineral specific.

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 proposed mining lease areas have following advantages:

- ❖ As the mineral deposition is homogeneous and batholith formation, therefore opencast method of working is preferred over underground method.
- ❖ The material will be loaded with the help of excavators into tractors / trippers and transported to the need by 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 mining 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.

CHAPTE R VI

ENVIRONMENTAL MONITORING PROGRAMME

6.0 GENERAL

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

The main objective of environmental monitoring is to ensure that the obtained results in respect of environmental attributes and prevailing conditions during operation stage are in conformity with the prediction during the planning stage. In case of substantial deviation from the earlier prediction of results, this forms as base data to identify the cause and suggest remedial measures. Environmental monitoring is mandatory to meet compliance of statutory provisions under the Environment (Protection) Act, 1986 relevant conditions regarding monitoring covered under EC orders issued by the SEIAA-TN as well as the conditions set forth under the order issued by Tamil Nadu Pollution Control Board while granting CTE/CTO.

6.1 METHODOLOGY OF MONITORING MECHANISM

Implementation of EMP and periodic monitoring will be carried out by respective project proponents. A comprehensive monitoring mechanism has been devised for monitoring of impacts due to proposed project; Environmental protection measures like dust suppression, control of noise and blast vibrations, maintenance of machinery and vehicles, housekeeping in the mine premises, plantation, implementation of Environmental Management Plan and environmental clearance conditions will be monitored by the respective mine management. On the other hand, implementation of area level protection measures like green belt development, environmental quality monitoring etc., are taken up by a senior executive who reports to their Mine Management.

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

The responsibilities of this cell will be:

- ❖ Implementation of pollution control measures
- ❖ Monitoring programme implementation
- ❖ Post-plantation care
- ❖ To check the efficiency of pollution control measures taken

- ❖ Any other activity as may be related to environment
- ❖ Seeking expert’s advice when needed.

The environmental monitoring cell will co-ordinate all monitoring programs at site and data thus generated will be regularly furnished to the state regulatory agencies as compliance status reports.

The sampling and analysis report of the monitored environmental attributes will be submitted to the Tamil Nadu Pollution Control Board (TNPCB) at a frequency of half-yearly and yearly by each proposed project proponent. The half-yearly reports are submitted to Ministry of Environment and Forest, Regional Office and SEIAA-TN 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), as shown in Figure 6.1.

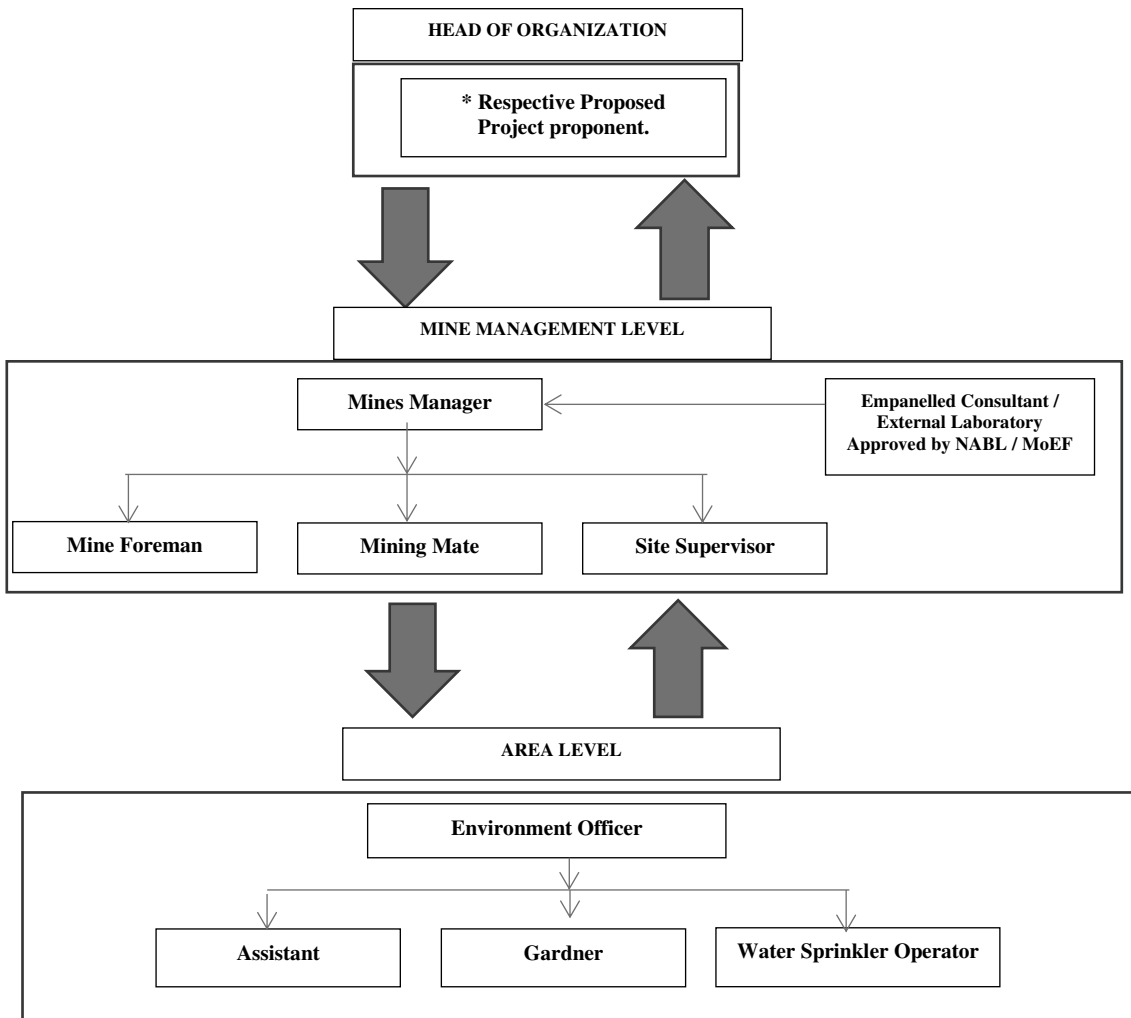


Figure 6.1 Proposed environmental monitoring chart

6.2 IMPLEMENTATION SCHEDULE OF MITIGATION MEASURES

The mitigation measures proposed in chapter IV 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 for Proposed Project

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

6.3 MONITORING SCHEDULE AND FREQUENCY

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

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

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

The details of monitoring are detailed in Table 6.2.

Table 6.2 Proposed Monitoring Schedule Post EC for the Proposed Quarry

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

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

6.4 BUDGETARY PROVISION FOR EMP

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

The proposed capital cost for Environmental Monitoring Programme is Rs 3,45,000/- and the recurring cost is Rs 69,000/- per annum for each Proposed Project.

Table 6.3 Environment Monitoring Budget

S. No.	Parameter	Capital Cost	Recurring Cost Per Annum
1	Air Quality	Rs. 3,45,000/-	Rs. 69,000/-
2	Meteorology		
3	Water Quality		
4	Hydrology		
5	Soil Quality		
6	Noise Quality		
7	Vibration Study		
Total		Rs. 3,45,000/-	Rs. 69,000/-

Source: Approved Mining Plan

6.5 REPORTING SCHEDULES OF MONITORED DATA

The monitored data on air quality, water quality, noise levels and other environmental attributes will be periodically examined by the cluster mine management coordinator and respective Head of Organization for taking necessary corrective measures. The monitoring data will be submitted to Tamil Nadu State Pollution Control Board in the Compliance to CTO conditions & environmental audit statements every year to MoEF & CC and Half-Yearly Compliance Monitoring Reports to MoEF & CC Regional Office and SEIAA.

Periodical reports to be submitted to:

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

Besides the Mines Manager/Agent of respective project will submit the periodical reports to:

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

CHAPTER VII

ADDITIONAL STUDIES

7.0 GENERAL

The following additional studies were done as per items identified by project proponents and items identified by regulatory authority. And items identified by public and other stakeholders will be incorporated after Public Hearing.

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

7.1 PUBLIC CONSULTATION FOR PROPOSED PROJECT

Application along with the EIA / EMP drafts will be submitted 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 and the outcome of public hearing proceedings will be detailed in the final EIA/EMP reports.

7.2 RISK ASSESSMENT FOR PROPOSED PROJECT

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

The whole quarry operation will be carried out under the direction of a Qualified Competent Mine Manager holding certificate of competency to manage a metalliferous mine granted by the DGMS, Dhanbad for proposed project. Risk Assessment is all about prevention of accidents and to take necessary steps to prevent it from happening.

Factors of risks involved due to human induced activities in connection with these proposed mining & allied activities with detailed analysis of causes and control measures for the mine is given in below Table 7.1.

Table 7.1 Risk Assessment& Control Measures for Proposed Project

S. No.	Risk factors	Causes of risk	Control measures
1	Accidents due to explosives and heavy mining machineries	Improper handling and unsafe working practice	All safety precautions and provisions of Mine Act, 1952, Metalliferous Mines Regulation, 1961 and Mines Rules, 1955 will be strictly followed during all mining operations; Workers will be sent to the Training in the nearby Group Vocational Training Centre Entry of unauthorized persons will be prohibited; Fire-fighting and first-aid provisions in the mine office complex and mining area; Provisions of all the safety appliances such as safety boot, helmets, goggles etc. will be made available to the employees and regular check for their use Working of quarry, as per approved plans and regularly updating the mine plans; Cleaning of mine faces on daily basis shall be daily done in order to avoid any overhang or undercut; Handling of explosives, charging and firing shall be carried out by competent persons only under the supervision of a Mine Manager; Maintenance and testing of all mining equipment as per manufacturer 's guidelines.
2	Drilling	Improper and unsafe practices Due to high pressure of compressed air, hoses may burst Drill Rod may break	Safe operating procedure established for drilling (SOP) will be strictly followed. Only trained operators will be deployed. No drilling shall be commenced in an area where shots have been fired until the blaster/blasting foreman has made a thorough Examination of all places, Drilling shall not be carried on simultaneously on the benches at places directly one above the other. Periodical preventive maintenance and replacement of worn-out accessories in the compressor and drill equipment as per operator manual.

			<p>All drills unit shall be provided with wet drilling shall be maintained in efficient working in condition.</p> <p>Operator shall regularly use all the personal protective equipment.</p>
4	Blasting	<p>Fly rock, ground vibration, Noise and dust.</p> <p>Improper charging, stemming & Blasting/ fining of blast holes</p> <p>Vibration due to movement of vehicles</p>	<p>Restrict maximum charge per delay as per regulations and by optimum blast hole pattern, vibrations will be controlled within the permissible limit and blasting can be conducted safely.</p> <p>SOP for Charging, Stemming & Blasting/Firing of Blast Holes will be followed by blasting crew during initial stage of operation</p> <p>Shots are fired during daytime only.</p> <p>All holes charged on any one day shall be fired on the same day.</p> <p>The danger zone will be distinctly demarcated (by means of red flags)</p>
5	Transportation	<p>Potential hazards and unsafe workings contributing to accident and injuries</p> <p>Overloading of material</p> <p>While reversal & overtaking of vehicle</p> <p>Operator of truck leaving his cabin when it is loaded.</p>	<p>Before commencing work, drivers personally check the truck/tipper for oil(s), fuel and water levels, tyre inflation, general cleanliness and inspect the brakes, steering system, warning devices including automatically operated audio-visual reversing alarm, rear view mirrors, side indicator lights etc., are in good condition.</p> <p>Not allow any unauthorized person to ride on the vehicle nor allow any unauthorized person to operate the vehicle.</p> <p>Concave mirrors should be kept at all corners</p> <p>All vehicles should be fitted with reverse horn with one spotter at every tipping point</p> <p>Loading according to the vehicle capacity</p> <p>Periodical maintenance of vehicles as per operator manual</p>
6	Natural Calamities	Unexpected happenings	<p>Escape Routes will be provided to prevent inundation of storm water</p> <p>Fire Extinguishers & Sand Buckets</p>
7	Failure of mine benches and pit slope	Slope geometry, Geological structure	Ultimate or over all pit slope shall be below 60° and each bench height shall be 5m height.

Source: Analysed and Proposed by FAE & EC

7.3 DISASTER MANAGEMENT PLAN FOR PROPOSED PROJECT

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

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

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

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

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

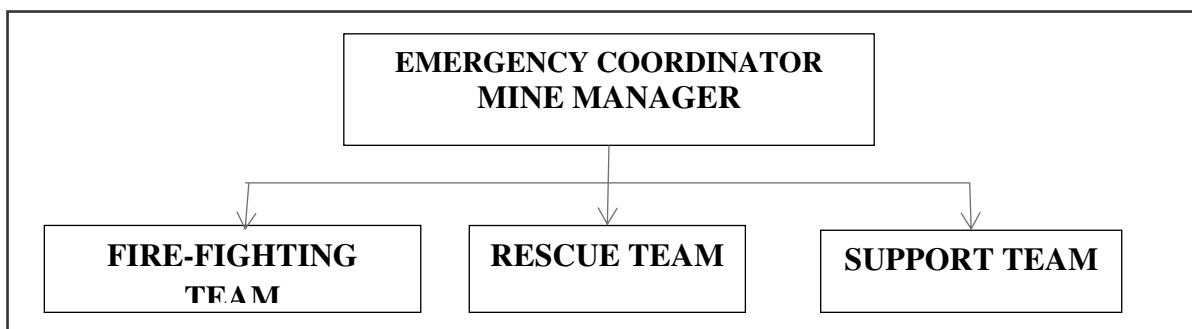


Figure 7.1 Disaster management team layout for proposed project

The emergency organization shall be headed by emergency coordinator who will be qualified competent mines manager. In his absence senior most people available at the mine shall be emergency coordinator till arrival of mines 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 for 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 for respective proposed quarries. 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.

7.3.1 Roles and Responsibilities of Emergency Team

(a) Emergency coordinator (EC)

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

(b) Incident controller (IC)

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

(c) Communication and advisory team

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

(d) Roll call coordinator

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

(e) Search and rescue team

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

(f) Emergency security controller

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

7.3.2 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 MECCR 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

7.3.3 Proposed Fire Extinguishers

The following type of fire extinguishers has been proposed at strategic locations within the mine.

Table 7.3 Proposed Fire Extinguishers at Different Locations in P1

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

7.3.4 Alarm System

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.

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

7.4 CUMULATIVE IMPACT STUDY

For easy representation of Proposed and Existing quarries in the Cluster are given unique codes and identifies and studied in this EIA & EMP Report.

Table 7.4 List of Quarries within 500-meter Radius.

PROPOSED QUARRIES				
CODE	Name of the Owner	Village Name & S.F. Nos	Extent	Lease Period
P1	A.Govindarajan, S/o. Amirthalingados, 56-6, Manmalai Road, K.Pudur, Madurai District.	Nadumandalam SF.No. 569 / 1(P)(B-4)	1.20.0	applied area
P2	A. Lakshmipathy, S/ o. Amirthalingadoss, 6(3), Manmalaisamy Street, K. Pudur, Madurai North, Madurai	Velampatty SF.No. 289/1 (P)	1.05.0	Tender cum Auction conducted Poramboke land
TOTAL			2.25.0 ha	
EXISTING QUARRIES				
E1	R.Thiyagarajan, S/o.Rengasamy Naidu, Sengulam Village, Natham Taluk, Dindigul	Nadumandalam SF.No. 569/ 1(P)(B-3)	2.00.0	27.06.2019 to 26.06.2023
E2	N.Nallamani, S/o. Nallamani, Andaman, Madurai	Nadumandalam SF.No. 569/ 1(P)(B-2)	1.20.0	10.06.2019 to 09.06.2029
TOTAL			3.20.0	
EXPIRED QUARRIES				
EX1	R.Thiyagarajan, S/o.Rengasamy Naidu, Sengulam Village, Natham Taluk, Dindigul	Nadumandalam SF.No. 569 /1(P)(B-1)	4.00.0	26.10.2015 to 25.05.2020
EX2	Thiru.A. Lakshmipathy, S/o. Amirthalingadoss, 6(3), Manmalaisamy Street, K. Pudur, Madurai North, Madurai	Nadumandalam SF.No. 569 / 1 (P)(B-2)	1.00.0	29.02.2016 to 28.02.2021
TOTAL			5.00.0 ha	
Total Cluster Extent			10.45.0 ha	

Note: -

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

Table 7.5 Salient Features of Proposed Project Site

Name of the Quarry	Thiru. A. Govindarajan - Rough stone quarry	
Toposheet No	58-J/04	
Latitude	10°14'34.88"N to 10°14'41.04"N	
Longitude	78°14'20.33"E to 78°14'23.92"E	
Highest Elevation	290m AMSL	
Ultimate depth of Mining as for Tor	35m (10m AGL+ 20m BGL)	
Geological Resources	Rough Stone in m ³	Topsoil m ³
	2,77,070	3367
Mineable Reserves	Rough Stone in m ³	Topsoil m ³
	1,05,820	1917
Proposed reserve for five years upto the depth of 35m (10m AGL + 25mBGL)	1,05,820	1917
Ultimate Pit Dimension as for ToR	142m (L) x 35m (W) x 35m (D)	
Method of Mining	Opencast Mechanized Mining Method involving drilling and blasting	
Topography	Elevated terrain	
Machinery proposed	Jack Hammer	2 Nos
	Compressor	1 Nos
	Hydraulic Excavator	1 Nos
	Tippers	2 Nos
Blasting Method	Controlled Blasting Method by shot hole drilling and small dia of 25mm slurry explosive are proposed to be used for shattering and heaving effect for removal and winning of Rough Stone. No deep hole drilling is proposed.	
Proposed Manpower Deployment	26 Nos	
Project Cost	Rs.38,95,000 /-	
CER Cost @ 2% of Project Cost	Rs. 77,900/-	
Proposed Water Requirement	3.3 KLD	
Nearest Habitation	540m - South	

Source: Approved Mining Plan & obtained ToR

Table 7.6 Salient Features of Proposed Quarry “P2”

Name of the Quarry	Thiru. A. Lakshmipathy Rough Stone Quarry	
Toposheet No	58-J/04	
Latitude between	10°14'32.78"N to 10°14'36.59"N	
Longitude between	78°14'12.31"E to 78°14'16.87"E	
Proposed Depth of Mining	40 m	
Geological Resources	Rough Stone in m ³	Top soil m ³
	3,86,446	10,670
Mineable Reserves	Rough Stone in m ³	Top soil m ³
	1,39,376	7,626
Production	99,186	7,626
Method of Mining	Opencast Semi Mechanized Mining Method involving drilling and blasting	
Machinery proposed	Jack Hammer, Compressor	3 Nos
	Compressor	1 Nos
	Hydraulic Excavator	1 Nos
	Tippers	2 Nos
Blasting Method	Controlled Blasting Method by shot hole drilling and small dia of 25mm slurry explosive are proposed to be used for shattering and heaving effect for removal and winning of Rough Stone. No deep hole drilling is proposed.	
Proposed Manpower Deployment	27 Nos	
Project Cost	Rs. 43,15,000/-	
CER Cost @ 2% of Project Cost	Rs 86,300/-	

Table 7.7 Salient Features of Existing Quarry “E1”

Name of the Quarry	Thiru. R.Thiyagarajan, Rough Stone Quarry	
Toposheet No	58-J/04	
Latitude between	10°14'33"N to 10°14'38"N	
Longitude between	78°14'26"E to 78°14'32"E	
Proposed Depth of Mining	40 m	
Mineable Reserves	Rough Stone in m ³	Top soil m ³
	1,88,075	-
Method of Mining	Opencast Semi Mechanized Mining Method involving drilling and blasting	

Machinery proposed	Jack Hammer, Compressor	3 Nos
	Compressor	1 Nos
	Hydraulic Excavator	1 Nos
	Tippers	2 Nos
Blasting Method	Controlled Blasting Method by shot hole drilling and small dia of 25mm slurry explosive are proposed to be used for shattering and heaving effect for removal and winning of Rough Stone. No deep hole drilling is proposed.	
Proposed Manpower Deployment	27 Nos	
Project Cost	Rs. 47,25,000/-	
CER Cost @ 2% of Project Cost	Rs 94,500/-	

Table 7.8 Salient Features of Existing Quarry “E2”

Name of the Quarry	Thiru. N.Nallamani, Rough Stone Quarry	
Toposheet No	58-J/04	
Latitude between	10°14'41.59"N to 10°14'46.41"N	
Longitude between	78°14'34.44"E to 78°14'39.29"E	
Proposed Depth of Mining	40 m	
Mineable Reserves	Rough Stone in m ³	Top soil m ³
	66,285	-
Method of Mining	Opencast Semi Mechanized Mining Method involving drilling and blasting	
Machinery proposed	Jack Hammer, Compressor	3 Nos
	Compressor	1 Nos
	Hydraulic Excavator	1 Nos
	Tippers	2 Nos
Blasting Method	Controlled Blasting Method by shot hole drilling and small dia of 25mm slurry explosive are proposed to be used for shattering and heaving effect for removal and winning of Rough Stone. No deep hole drilling is proposed.	
Proposed Manpower Deployment	18 Nos	
Project Cost	Rs. 54,00,000/-	
CER Cost @ 2% of Project Cost	Rs 1,080,00/-	

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.

7.4.1 Air Environment

Calculating the Cumulative Load of Mining within the cluster is as shown in table 7.9

Table 7.9 Cumulative Production Load of Rough Stone

PROPOSED PRODUCTION DETAILS				
Quarry	5 Years in m ³	Per Year in m ³	Per Day in m ³	Number of Lorry Load Per Day
P1	1,05,820	21,164	71	12
P2	99,186	19,837	66	11
E1	1,88,075	37,615	125	21
E2	66,285	11,946	40	7
Grand Total	4,59,366	90,562	302	51

On a cumulative basis considering the one proposed quarry, it can be seen that the overall production of rough stone is **302m³** per day with a capacity of **51trips** of Rough Stone per day from the cluster.

Note: Per day production of Rough Stone is calculated for 5 Years Lease Period and for Topsoil production with 1 years of period. And the load of existing quarries is covered under existing environment of the cluster.

Based on the above production quantities the emissions due to various activities in all the 4 mines includes various activities like ground preparation, excavation, handling and transport of ore. These activities have been analysed systematically basing on USEPA-Emission Estimation Technique Manual, for Mining AP-42, to arrive at possible emissions to the atmosphere and estimated emissions are given in Table 7.10.

7.4.1.1 Cumulative Impact of Air Pollution

The results on the cumulative impact of the 2 proposed projects on air environment have been provided in Table 7.10. The cumulative values resulting from the 2 projects for each pollutant do not exceed the permissible limits set by CPCB.

Table 7.10 Cumulative Impact Results from the 2 proposed projects

Pollutants	Baseline Data(µg/m ³)	Incremental Values(µg/m ³)		Cumulative Value (µg/m ³)
		P1	P2	
PM _{2.5}	24.62	7.72	7.24	39.58
PM ₁₀	42.30	10.0	9.37	61.67
SO ₂	8.88	8.00	7.50	24.38
NO ₂	26.15	6.18	5.79	38.12

7.4.2 Noise Environment

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

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

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

Where:

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

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

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

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

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

7.4.2.1 Cumulative Impact of Noise

Analyses on cumulative impact of noise from the 2 proposed quarries on the 1 nearby habitations was conducted using baseline data and modelled data. The results of cumulative impact have been tabulated in Table 7.11

Table.7.11 Cumulative Impact of Noise from 2 Proposed Quarries on Velanpatti Habitation

Location ID	Distance (m)	Direction	Background Value (Day) dB(A)	Incremental Value dB(A)	Total Predicted dB(A)	Residential Area Standards dB(A)
Habitation Near P1	540m	SW	43.27	42.51	45.91	55
Habitation Near P2	390m	S	43.27	45.33	47.43	
Cumulative Noise (dB(A))					49.75	

The cumulative analysis of noise due to 2 proposed projects shows that habitation of Velanpatti will receive about 49.75 dB (A), respectively. The cumulative result for the village in consideration do not exceed the limit set by CPCB for residential areas for day time.

7.4.3 Ground Vibrations

Ground vibrations due to mining activities in the all the 4 Mines within cluster are anticipated due to operation of Mining Machines like Excavators, drilling and blasting, transportation vehicles, etc. 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.

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 7.12 Cumulative Effect of Ground Vibrations resulting from 4 Mines on Habitation of Velanpatti

Location ID	Maximum Charge in kgs	Nearest Habitation in m	PPV in mm/s
P1	24	540m	0.60
P2	22	390m	0.96
E1	42	530m	0.98
E2	15	930m	0.17
Total			2.71

Results from the above table 7.12 indicate that the cumulative PPV value of habitation 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.

7.4.4 Socio Economic Environment

The 4 Mines shall contribute towards CER and the community shall develop.

Table 7.13 Socio Economic Benefits From 4 Mines

Code	Project Cost	CER @ 2%
P1	Rs.38,95,000 /-	Rs. 77,900/-
P2	Rs. 43,15,000/-	Rs 86,300/-
E1	Rs. 47,25,000/-	Rs 94,500/-
E2	Rs. 54,00,000/-	Rs 1,080,00/-
Total	Rs. 1,83,35,000/-	Rs. 3,66,700/-

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

- ❖ Proposed projects shall fund towards CER – **Rs 1,64,200/-**
- ❖ Existing projects shall fund towards CER – **Rs. 2,02,500/-**

Table 7.14 Employment Benefits From 4 Mines

Code	Employment
P1	26
P2	27
E1	27
E2	18
Total	98

A total of 53 people will get employment due to proposed mine in cluster and 45 people are already employed at existing mines.

Table 7.15 Greenbelt Development Benefits From 4 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	600	80%	5400	Neem, Casuarina, Pongamia	480
P2	311	80%	2800	Neem, Casuarina, Pongamia	249
E1	600	80%	5400	Neem, Casuarina, Pongamia	480
E2	422	80%	3800	Neem, Casuarina, Pongamia	338
Total	1933		17400		1547

Based on the Proposed Mining Plans it's anticipated that 600 native tree species like Neem, Teak, etc will be planted in the project premises over a period of 5 Years with Survival Rate of 80%. The expected growth is around 480 Trees over an area of 5400Sqm in Proposed Quarry.

7.5 PLASTIC WASTE MANAGEMENT PLAN FOR PROPOSED PROJECT

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.

7.5.1 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 7.16 Action Plan to Manage Plastic Waste

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

Source: Proposed by FAE's and EC

7.6 POST COVID HEALTH MANAGEMENT PLAN FOR PROPOSED PROJECT

COVID – 19 diseases caused by SARS-CoV-2 Coronavirus is relatively a new disease, with fresh information being known on a dynamic basis about the natural history of the disease, especially in terms of post-recovery events.

After acute COVID-19 illness, recovered patients may continue to report wide variety of signs and symptoms including fatigue, body ache, cough, sore throat, difficulty in breathing, etc. As of now there is limited evidence of post-COVID sequelae and further research is required and is being actively pursued. A holistic approach is required for follow up care and well-being of all post COVID recovering patients.

7.6.1 Post-COVID Follow Up Protocol

- ❖ Continue COVID appropriate behaviour (use of mask, hand & respiratory hygiene, physical distancing).
- ❖ Drink adequate amount of warm water (if not contra-indicated).
- ❖ Make sure your workplaces are clean and hygienic
- ❖ Surfaces (e.g., desks and tables) and objects (e.g., telephones, helmet) need to be wiped with disinfectant regularly
- ❖ Put sanitizing hand rub dispensers in prominent places around the workplace. Make sure these dispensers are regularly refilled
- ❖ Display posters promoting hand-washing
- ❖ Make sure that staff, contractors and customers have access to places where they can wash their hands with soap and water
- ❖ Display posters promoting respiratory hygiene.
- ❖ Brief your employees, contractors and customers that if COVID-19 starts spreading in your community anyone with even a mild cough or low-grade fever (37.3°C or more) need to stay at home. They should also stay home (or work from home) if they have had to take simple medications, such as paracetamol/acetaminophen, ibuprofen or aspirin, which may mask symptoms of infection
- ❖ Keep communicating and promoting the message that people need to stay at home even if they have just mild symptoms of COVID-19.
- ❖ Consider whether a face-to-face meeting or event is needed. Could it be replaced by a teleconference or online event?
- ❖ Could the meeting or event be scaled down so that fewer people attend?

- ❖ Pre-order sufficient supplies and materials, including tissues and hand sanitizer for all employees. Have surgical masks available to offer anyone who develops respiratory symptoms.
- ❖ It is also suggested by the Ministry of AYUSH that the use of Chyawanprash in the morning (1 teaspoonful) with Luke warm water/milk is highly recommended (under the direction of Registered Ayurveda physician) as in the clinical practice Chyawanprash is believed to be effective in post-recovery period.
- ❖ If there is persistent dry cough / sore throat, do saline gargles and take steam inhalation. The addition of herbs/spices for gargling/steam inhalation. Cough medications, should be taken on advice of medical doctor or qualified practitioner of Ayush.
- ❖ Look for early warning signs like high grade fever, breathlessness, Sp O₂ < 95%, unexplained chest pain, new onset of confusion, focal weakness.
- ❖ Avoid smoking and consumption of alcohol.
- ❖ Communicate to your employees and contractors about the plan and make sure they are aware of what they need to do – or not do – under the plan. Emphasize key points such as the importance of staying away from work even if they have only mild symptoms or have had to take simple medications (e.g., paracetamol, ibuprofen) which may mask the symptoms.

The plan should address how to keep your business running even if a significant number of employees, contractors and suppliers cannot come to your place of business - either due to local restrictions on travel or due to illness.

CHAPTER VIII

PROJECT BENEFITS

8.0 GENERAL

One Proposed Project for Quarrying Rough Stone at Nadumandalam Village aims to produce 1,05,820 Rough Stone over a period of 5 Years. This will enhance the socio-economic activities in the adjoining areas and will result in the following benefits

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

8.1 EMPLOYMENT POTENTIAL

It is proposed to provide employment to about 26 persons for carrying out mining operations and give preference to the local people in providing employment in this cluster. In addition, there will be opportunity for indirect employment to many people in the form of contractual jobs, business opportunities, service facilities etc. the economic status of the local people will be enhanced due to mining project.

8.2 SOCIO-ECONOMIC WELFARE MEASURES PROPOSED

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

8.3 IMPROVEMENT IN PHYSICAL INFRASTRUCTURE

The proposed quarries are located in Nadumandalam Village, Natham Taluk and Dindigul District of Tamil Nadu and the area have communications, roads and other facilities already well established. The following physical infrastructure facilities will further improve due to proposed mine.

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

8.4 IMPROVEMENT IN SOCIAL INFRASTRUCTURE

Employment is expected during civil construction period, in trade, garbage lifting, sanitation and other ancillary services, Employment in these sectors will be primarily

temporary or contractual and involvement of unskilled labour will be more. A major part of the labour force will be mainly from local villagers who are expected to engage themselves both in agriculture and mining activities. This will enhance their income and lead to overall economic growth of the area.

8.5 OTHER TANGIBLE BENEFITS

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

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

8.6 CORPORATE SOCIAL RESPONSIBILITY

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

Under this programme, the project proponent will take-up following programmes for social and economic development of villages within 10 km of the project site. For this purpose, separate budget will be provided every year. For finalization of these scheme's proponent will interact with Local Self Government. 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 Nadumandalam Village mainly contributing to education, health, training of women self-help groups and contribution to infrastructure etc., CSR budget is allocated as 2.5% of the profit.

8.7 CORPORATE ENVIRONMENT RESPONSIBILITY

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

As per para 6 (II) of the office memorandum, being a green field project & capital investment is \leq 100 crores, the proposed and existing projects shall contribute 2% of Capital Investment towards CER as per directions of EAC/SEAC. Capital cost is 38,95,000 /- and 2% of the same works out to Rs 77,900/-.

Table 8.1 CER – Action Plan

Activity	Beneficiaries	Total
Developing the Drinking water facilities in Nadumandalam Village	Nadumandalam villagers	Rs. 77,900/-
TOTAL		Rs.77,900/-

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

CHAPTER IX

ENVIRONMENTAL COST BENEFIT ANALYSIS

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

CHAPTER X

ENVIRONMENTAL MANAGEMENT PLAN

10.0 GENERAL

Environment Management Plan (EMP) aims at the preservation of ecological system by considering in-built pollution abatement facilities at the proposed site. Good practices of environmental management plan will ensure to keep all the environmental parameters of the project in respect of ambient air quality, water quality, socio economic improvement standards.

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

10.1 ENVIRONMENTAL POLICY

The project proponent is committed to conduct all its operations and activities in an environmentally responsible manner and to continually improve environmental performance. The Proponent, A. Govindarajan will:

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

10.1.1 Description of the Administration and Technical Setup

The Environment Monitoring Cell discussed under Chapter VI 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 program.
- ❖ Compliance to statutory provisions, norms of State Pollution Control Board, Ministry of Environment and Forests and the conditions of the environmental clearance as well as the consents to establish and consents to operate.

10.2 LAND ENVIRONMENT MANAGEMENT

Landscape of the area will be changed due to the quarrying operation, restoration of the land by converting the quarry pit into temporary reservoir and the remaining part of the area (unutilized areas, infrastructure, haul Roads) will be utilized for greenbelt development. Aesthetic of the Environment will not be affected. There is no major vegetation in the project area during the course of quarrying operation and after completion of the quarrying operation thick plantation will be developed under greenbelt development program.

Table 10.1 Proposed Controls for Land Environment

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

Source: Proposed by FAEs & EIA Coordinator

10.3 SOIL MANAGEMENT

There is no overburden or waste anticipated from proposed project.

Table 10.2 Proposed Controls for Soil Management

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

Source: Proposed by FAEs & EIA Coordinator

10.4 WATER MANAGEMENT

In the proposed quarrying project, no process is involved for the effluent generation, only oil & grease from the machinery wash is anticipated and domestic sewage from mine office. The quarrying operation is proposed up to a depth of 35m BGL (10m AGL + 25m BGL). The water table in the area is 50m below ground level; hence the proposed project 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 FAEs & EIA Coordinator

10.5 AIR QUALITY MANAGEMENT

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

Table 10.4 Proposed Controls for Air Environment

Control	Responsibility
Generation of dust during excavation is minimized by daily (twice) water sprinkling on working face and daily (twice) water sprinkling on haul road	Mines Manager
Wet drilling procedure /drills with dust extractor system to control dust generation during drilling at source itself is implemented	Mines Manager
Maintenance as per operator manual of the equipment and machinery in the mines to minimizing air pollution	Mines Manager
Ambient Air Quality Monitoring carried out in the project area and in surrounding villages to 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 FAEs & EIA Coordinator

10.6 NOISE POLLUTION CONTROL

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

Table 10.5 Proposed Controls for Noise Environment

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

Sharp drill bits are used to minimize noise from drilling	Mines Foreman
Controlled blasting technologies are adopted by using delay detonators to minimize noise from blasting	Mines Manager
Annual ambient noise level monitoring is carried out in the project area and in surrounding villages to assess the impact due to the mining activities and the efficacy of the adopted noise control measures. Additional noise control measures will be adopted if required as per the observations during monitoring	Mines Manager
Reduce maximum instantaneous charge using delays while blasting	Mining Mate
Change the burden and spacing by altering the drilling pattern and/or delay layout, or altering the hole inclination	Mines Manager
Undertake noise or vibration monitoring	Mines Manager

Source: Proposed by FAE's & EIA Coordinator

10.7 GROUND VIBRATION AND FLY ROCK CONTROL

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

Table 10.6 Proposed Controls for Ground Vibrations & Fly Rock

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 & 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 program 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 420 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. The proposed green belt development plan has been given in Table 10.7.

Table 10.7 Proposed Greenbelt Activities for 5 Year Plan Period

Year	No. of trees proposed to be planted	Survival %	Area to be covered in m ²	Name of the species	No. of trees expected to be grown
Plantation under safety zone And quarry approach road (In Nos.)					
I	84	80%	760	<i>Azadirachta</i>	67
II	84	80%	760	<i>indica</i>	67
III	84	80%	760	<i>Albizia lebbeck</i>	67
IV	84	80%	760	<i>Delonix regia</i>	67
V	84	80%	760	<i>Techtona grandis</i> <i>Nerium indicum,</i> etc.,	67

Source: Conceptual Plan of Approved Mining plan & proposed by FAE & 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

S. No	Botanical Name of the Plant	Family Name	Common Name	Category	Dust Capturing Efficiency Features
1	<i>Azadirachta indica</i>	Meliaceae	Neem, Vembu	Tree	Well distinct thick at both the layer Palisade & Spongy parenchyma. Spongy parenchyma is present at lower epidermis Many vascular bundles arranged almost parallel series
2	<i>Tectona grandis</i>	Lamiaceae	Teak	Tree	
3	<i>Polyalthia longifolia</i>	Annonaceae	Nettilingam	Tree	
4	<i>Albizia lebbek</i>	Fabaceae	Vagai	Tree	
5	<i>Delonix regia</i>	Fabaceae	Cemmayir-konrai	Tree	
6	<i>Bauhinia racemosa</i>	Fabaceae	Aathi	Tree	
7	<i>Cassia fistula</i>	Fabaceae	Sarakondrai	Tree	
8	<i>Aegle marmelos</i>	Rutaceae	Vilvam	Tree	
9	<i>Pongamia pinnata</i>	Fabaceae	Pungam	Tree	
10	<i>Thespesia populnea</i>	Malvaceae	Puvarasu	Tree	

Source: FAE

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, Sperm Count 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

S.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 color 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 centers. All personal protective equipment's will be provided to them.
- ❖ A safety committee meeting every month will be organized to discuss the safety of the mines and the persons employed.
- ❖ Celebration of annual mines safety week and environmental week in order to develop safety awareness and harmony amongst employees and co quarry owners.



Figure 10.1 Personal Protective Equipment to the Mine Workers

10.9.3 Health and Safety Training Program

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 Centers 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

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 & 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

Attribute	Activity	Mitigation measures	Provision for Implementation	Capital Cost INR	Recurring Cost INR Per annum
Air Quality	Haul Road Dust Suppression	Compaction, gradation and drainage on both sides	Rental Dozer & drainage construction on haul road @ Rs. 50,000/- per Hectare and Yearly Maintenance @ Rs. 50,000/- per Hectare (Proposed Project Area 1.20 Ha)	60,000/-	60,000/-
		Fixed water sprinkling arrangements + water sprinkling by own water tankers twice a day	Water @ Rs 150/- per tanker	8,00,000/-	1,35,000/-
		Air Quality will be regularly monitored as per norms within ML area & Ambient Area	Yearly Compliance as per CPCB norms	0	50,000/-
	Mine Pit Operations	Wet drilling will be practiced	Provision made in Operating Cost	0	0
		Controlled delay blasting will be used			
	Truck Loading	No overloading of trucks/tippers/tractors	Manual Monitoring through Security guard	0	5,000/-
		Stone carrying trucks will be covered by tarpaulin to avoid escape of fines to the atmosphere	Monitoring if trucks will be covered by tarpaulin	0	10,000/-
		Enforcing speed limits of 20 km/hr within ML area	Manual Monitoring through Security guard	5000	0
		Regular monitoring of exhaust fumes as per RTO norms	Monitoring of Exhaust Fumes	0	5000/-
	Road Maintenance	Regular sweeping and maintenance of roads for at least about 200 m from quarry entrance	Provision for 2 labours @ Rs.10,000/labour (Contractual)	0	20,000/-
		Installing wheel wash system near exit gate of quarry	Installation + Maintenance + Supervision	50,000/-	20,000/-

Attribute	Activity	Mitigation measure	Provision for Implementation	Cost of EMP INR	
				Capital Cost INR	Recurring Cost INR
Noise Management	Mine Pit Operations	Source of noise will be transportation vehicles, and 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
		Plantation along periphery of lease area will act as attenuation barrier.	Provision made in Operating Cost	0	0
Vibrations	Drilling & Blasting	Safety tools and implementations that are required will be kept adequately near blasting site at the time of charging.	Provision made in OHS part	0	0
		NONEL Blasting will be practiced to control Ground vibration and fly rocks	Rs. 30/- per 1Cbm of Blasted Material	0	500000
		Proper warning system before blasting will be adopted and clearance of the area before blasting will be ensured.	Blowing Whistle by Mining Mate / Blaster / Competent Person	0	0
		Provision for Portable blaster shed	Installation of Portable blasting shelter	50,000/-	3,000/-

Attribute	Activity	Mitigation measures	Provision for Implementation	Cost of EMP INR	
				Capital Cost INR	Recurring Cost INR
Surface Water	Water collected during Monsoon period	During monsoon period surface runoff around the quarry will follow the garland drains/storm water drains as per natural drain pattern. Eroded sediments through a garland drain will be entrapped before being discharged to the natural drainage system. Otherwise, the water from garland drains shall be collected in temporary pit reservoirs. After settling, this collected water shall be used for a plantation and dust suppression.	Provision for garland drain @ Rs. 10,000/- per Hectare with maintenance of Rs. 5,000/- per annum (1.20-hectare X 10000)	12,000/-	6,000/-
Solid Waste	Mine Pit Operations	Any domestic waste generated due to human activity will be collected and handed over to solid waste handling agency.	Provision for domestic waste collection and disposal through authorized agency (Capital Cost Member ship fee + recurring cost for collection /disposal charges)	25,000/-	20,000/-
		Provision for dust bins etc.	Installation of dust bins	5,000/-	2,000/-
Toilets/ Sanitation	Mine Pit Operations	Bio toilets will be made available outside mine lease on the land of owner itself	Provision made in Operating Cost	0	0
EC Condition	Display Board		Fixed Display Board at the Quarry Entrance as permanent structure	10000/-	1000/-

Attribute	Activity	Mitigation measure	Provision for Implementation	Cost of EMP INR	
				Capital Cost INR	Recurring Cost INR
Occupational Health and Safety	Mine Pit Operations	Workers will be provided with Personal Protective Equipment	Provision of 26 kits	0	1,04,000/-
		Health checkup for workers will be provisioned	IME & PME Health checkup @ Rs. 2000/- per employee	0	52,000/-
		First aid facility will be provided	Provision of 7 kits	0	14,000/-
		Mine will have safety precaution signages, boards.	Provision for signages and boards made	20,000/-	2,000/-
		Barbed Wire Fencing to quarry area will be provisioned.	Per Hectare fencing Cost @ Rs. 2,00,000/- with Maintenance of Rs 20,000/- per annum (1.20 hectare)	240000/-	24,000/-
Development of Green Belt	Mine Pit Operations Transportation over roads	Green belt development - 500 trees per one hectare	"Site clearance, preparation of land, digging of pits / trenches, soil amendments, transplantation of saplings @ 200 per plant (capital) for plantation inside the lease area and @ 300 per plant (capital) for plantation outside the lease area and @ 50 per plant maintenance	1,80,000/-	30,000/-

			(recurring)"		
Mine Closure Activity	Mine Pit Operations	Closure includes Greenbelt development, wire fencing, drains	Provision made in Closure Cost	0	0
Traffic Management	Mine Pit Operations Transportation over roads	No parking will be provided on the transport routes. Separate provision on the Northern part of ML will be made for vehicles /HEMMs. Flaggers will be deployed for traffic management	Parking area with shelter and flags	1,00,000/-	10,000/-
Monitoring System	Mine Pit Operation & Vehicle movement	Installation of CCTV Cameras in the mines mine entrance	Camera Nos, DVR, Monitor with internet facility	30,000	5000
		Implementation as per Mining Plan and ensure safe quarry working	Mines Manager (1st Class / 2nd Class / Mine Foreman) under regulation 34 / 34 (6) of MMR, 1961 and Mining Mate under regulation 116 of MMR,1961	0	780000
TOTAL EMP BUDGET				15,87,000/-	18,58,000/-

In order to implement the environmental protection measures, an amount of Rs.15,87,000 as capital cost and recurring cost as Rs. 18,58,000 as recurring cost is proposed considering present market price considering present market scenario for the proposed project.

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 XI
SUMMARY AND CONCLUSION

11.0 INTRODUCTION

This EIA report is prepared by considering cumulative load of 2 proposed and 2 existing quarries as well as 2 Expired quarries with the total extent of cluster of **10.45.0 ha** in Nadumandalam Village, Natham Taluk, Dindigul 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 –ToR Letter No. TN/F.No. 8787/SEAC/ToR-1151/2021 dated 23.05.2022. and the Baseline Monitoring study has been carried out during the period of March 2022 – May 2022

11.1 PROJECT DESCRIPTION

Table 11.1 Salient Features of the Proposed Project

Name of the Quarry	Thiru. A. Govindarajan - Rough stone quarry	
Toposheet No	58-J/04	
Lattitude	10°14'34.88"N to 10°14'41.04"N	
Longitude	78°14'20.33"E to 78°14'23.92"E	
Highest Elevation	290m AMSL	
Ultimate depth of Mining as for Tor	35m (10m AGL+ 20m BGL)	
Geological Resources	Rough Stone in m ³	Topsoil m ³
	2,77,070	3367
Mineable Reserves	Rough Stone in m ³	Topsoil m ³
	1,05,820	1917
Proposed reserve for five years upto the depth of 35m (10m AGL + 25mBGL)	1,05,820	1917
Ultimate Pit Dimension as for ToR	142m (L) x 35m (W) x 35m (D)	
Method of Mining	Opencast Mechanized Mining Method involving drilling and blasting	
Topography	Elevated terrain	
Machinery proposed	Jack Hammer	2 Nos
	Compressor	1 Nos
	Hydrualic Excavator	1 Nos
	Tippers	2 Nos

Blasting Method	Controlled Blasting Method by shot hole drilling and small dia of 25mm slurry explosive are proposed to be used for shattering and heaving effect for removal and winning of Rough Stone. No deep hole drilling is proposed.
Proposed Manpower Deployment	26 Nos
Project Cost	Rs.38,95,000 /-
CER Cost @ 2% of Project Cost	Rs. 77,900/-
Proposed Water Requirement	3.3 KLD
Nearest Habitation	540m - South

Source: Approved Mining Plan and Survey of India Toposheet

Table 11.2 Land Use Pattern of the Proposed Project

Description	Present area in (ha)	Area at the end of life of quarry (ha)
Area under quarry	0.55.00	0.78.00
Infrastructure	Nil	0.01.00
Roads	Nil	0.03.00
Green Belt	0.65.00	0.24.00
Un – utilized area	Nil	0.14.00
Total	1.20.00	1.20.00

Source: Approved Mining plan

Table 11.3 Resources and Reserves of Proposed Project

Resource Type	Rough Stone in m ³	Topsoil in m ³
Geological Resource in m ³	2,77,070	3367
Mineable Resource in m ³	1,05,820	1917

Source: Approved mining plan

Table 11.4 Ultimate Pit Dimension

Pit	Length (Max) (m)	Width (Max) (m)	Depth (Max)
I	142	35	35m

Table 11.5 Water Requirement of the Proposed Project

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

Source: Prefeasibility report

11.2 DESCRIPTION OF THE ENVIRONMENT

The baseline monitoring study was carried out during March 2022 – May 2022 to assess the existing environmental scenario in the area. For the purpose of EIA studies, project area was considered as the core zone and area outside the project area up to 10km radius from the periphery of the project site was considered as buffer zone.

Baseline Environmental data has been collected with reference to proposed mine for:

- a) Land
- b) Water
- c) Air
- d) Noise
- e) Biological
- f) Socio-economic status

11.2.1 Land Environment

The existing land use pattern of the study area based on the latest satellite imagery is given below:

Table 11.6 Land Use / Land Cover Statistics for 10 km Radius

S. No.	Classification	Area (ha)	Area (%)
1	Barren Land	159	0.53
2	Crop Land	13337	44.22
3	Dense Forest	4680	15.52
4	Fallow land	3627	12.03
5	Land with Salinity	5	0.02
6	Land with / without scrub	1918	6.36
7	Plantations	6336	21.01
8	Settlement	99	0.33
	Total	30161	100

11.3 SOIL CHARACTERISTICS

11.3.1 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 Sandy clay. The bulk density of soils in the study area varies between 1.12 and 1.41 g/cc. The water holding capacity varies from 16.34 to 19.74

11.3.2 Chemical Characteristics

- ❖ The nature of soil is slightly alkaline to strongly alkaline with pH ranging from 5.7 to 7.4
- ❖ The nitrogen ranges between 13.26 and 23.86 mg/kg
- ❖ The phosphorus ranges between 2.93 and 4.23 mg/kg
- ❖ The Sodium ranges between 108 and 146 mg/kg
- ❖ The potassium ranges between 11.45 and 19.23 mg/kg
- ❖ The Calcium ranges between 93.2 and 127.1 mg/kg
- ❖ The Magnesium ranges between 17.3 and 35.8 mg/kg

11.4 WATER ENVIRONMENT

11.4.1 Surface Water

The pH varies from 6.8 to 7.3, while turbidity is found within the acceptable limits. TDS including carbonates, bicarbonates, chlorides, phosphates, nitrates, calcium, magnesium, and sodium in the surface water varies from 381 to 484 mg/l. Total Hardness varies from 246 to 329 mg/l; Chloride varies from 124 to 212 mg/l; nitrate varies from 12 to 29 mg/l, whereas sulphate from 32 to 48 mg/l.

11.4.2 Ground Water

The pH of the water samples falls within the acceptable limit of 6.5 to 8.5, ranging from 7.1 to 8.0 Sulphates and chlorides of water samples from all the sources are within the acceptable limits as per the water quality standard. Turbidity in the water samples meets the requirement. TDS are found in the range of 967- 1069 mg/l in all samples. The water sample from (GW5) Nadumandalam Village has the highest TDS of 1069 mg/l. The total hardness varies between 452 - 561 mg/l for all samples. The water sample from (GW5) Nadumandalam Village has the highest total hardness 561 mg/l.

11.5 AIR ENVIRONMENT

11.5.1 Site Specific Meteorology

Site specific meteorology during the study period was recorded by an automated weather station.

Table 11.7 Meteorological Data Recorded at Site

S. No.	Parameters		March, 2022	April, 2022	May, 2022
1	Temperature (°C)	Min	17.23	22.85	23.37
		Max	38.46	38.4	37.5
		Avg	28.13	28.84	29.28
2	Relative Humidity (%)	Min	21	28.38	35.44
		Max	100	98.56	96
		Avg	62.52	71.01	69.30
3	Wind Speed (m/s)	Min	0.14	0.1	0.24
		Max	7.17	5.81	7.02
		Avg	2.75	2.24	2.75
4	Wind Direction (degree)	Min	0	2.53	0.78
		Max	359.57	358.8	357.98
		Avg	138.80	167.55	240.66
5	Surface Pressure(mbar)	Min	978.5	978.5	975.7
		Max	990.1	989.4	985.3
		Avg	984.01	983.38	980.71

Source: On-site monitoring/sampling by Richardson & Cruddas (1972) Ltd in association with GTMS

11.5.2 Ambient Air Quality Results

The results of ambient air quality monitoring for the period (March to April 2022) are presented in the report. Data has been compiled for three months. As per the monitoring data, PM_{2.5} ranges from 21.5 µg/m³ to 25.8 µg/m³; PM₁₀ from 33.1 µg/m³ to 45.8 µg/m³; SO₂ from 5.1 µg/m³ to 9.6 µg/m³; NO₂ from 21.1 µg/m³ to 26.7 µg/m³. The concentration levels of the pollutants fall within the acceptable limits of NAAQS prescribed by CPCB.

11.6 NOISE ENVIRONMENT

Ambient noise levels were measured at 7 locations around the proposed project area. Noise levels recorded in core zone during day time was 44.46 dB (A) Leq and during night time was 37.52 dB (A) Leq. Noise levels recorded in buffer zone during day time varied from 40.45 to 44.81 dB (A) Leq and during night time from 36.35 to 38.47 dB (A) Leq. Thus, the noise level for industrial and residential area meets the requirements of CPCB.

11.7 BIOLOGICAL ENVIRONMENT

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. Hence this small mining operation over short period of time will not have any significant impact on the surrounding flora and fauna.

11.8 SOCIO-ECONOMIC ENVIRONMENT

An attempt has been made to assess the impact of the proposed mining project at Nadumandalam Village on Socio-economic aspect of the study area. The various attributes that have been taken into account are population composition, employment generation, occupational shift, household income and consumption pattern. Implementation of the Proposed Mine Project will generate both direct and indirect employment. Besides, Mining operation will be legally valid and it will bring income to the state exchequer. At present seasonal agriculture is the main occupation of the people as more than half of the population depends on it. With the implementation of the proposed mining project the occupational pattern of the people in the area will change making more people engaged in mining-based activities rather in seasonal agriculture.

11.9 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES FOR PROPOSED PROJECT

The summary of anticipated adverse environmental impacts due to the proposed project and mitigation measures are given below:

Table 11.8 Anticipated Impacts & Mitigation Measures

Impact	Mitigation Measure
Land Environment	
<ul style="list-style-type: none">❖ Destruction of natural landscapes❖ Changes in soil characteristics❖ Soil erosion and slope instability	<ul style="list-style-type: none">❖ Mining will be carried out as per approved mine plan in scientific and systematic way❖ Safety Zone or Buffer area will be maintained and will not be mined and instead plantation will be carried out in the safety zone❖ Barbed wire fencing will be provided all along the proposed mine boundary❖ At conceptual stage, the land use pattern of the

	<p>quarry will be changed into Greenbelt area and temporary reservoir</p> <ul style="list-style-type: none"> ❖ Construction of garland ❖ Construction of garland drains all around the quarry pit and construction of settling traps at strategic location in lower elevations to prevent soil erosion due to surface runoff during rainfall and also to collect the storm water for various uses within the proposed area
Water Environment	
<ul style="list-style-type: none"> ❖ Decrease in aquifer recharge and increase in surface runoff; ❖ Disturbance to land drainage, overload and erosion of watercourses; ❖ Changes to the surface over which water flows; ❖ Changes to surface and groundwater resources quantity and quality due to stream blockage and contamination by particulate matter or waste; ❖ Contamination of aquifers due to removal of the natural filter medium. 	<ul style="list-style-type: none"> ❖ Construction of garland drains all around the quarry pit and construction of settling traps at strategic location in lower elevations to prevent soil erosion due to surface runoff during rainfall and also to collect the storm water for various uses within the proposed area ❖ De-silting will be carried out before and immediately after the monsoon season and the settling tank and drains will be cleaned weekly, especially during monsoons ❖ Domestic sewage from site office & urinals/latrines provided in project area will be discharged through septic tank followed by soak pit system. ❖ Tippers & HEMM will be washed in a designated area and the washed water will be routed through drains to a settling tank, which has an oil & grease trap, only clear water will be reused for greenbelt development.
Air Environment	
<ul style="list-style-type: none"> ❖ Generation of Fugitive Dust ❖ Dust will be generated mainly during excavation, loading 	<ul style="list-style-type: none"> ❖ Haul roads will be well maintained by sprinkling water twice a day ❖ The access road will be cleaned and brushed to

<p>&unloading activities.</p> <ul style="list-style-type: none"> ❖ Gaseous pollutants will be generated mostly by the traffic. ❖ Reduction in visibility due to dust plumes. ❖ Coating of surfaces leading to annoyance and loss of amenity. ❖ Physical and/or chemical contamination and corrosion. ❖ Increase in the concentration of suspended particles in runoff water. ❖ Coating of vegetation leading to reduced photosynthesis, ❖ Inhibited growth, destroying of foliage, degradation of crops; ❖ Increase in health hazards due to inhalation of dust. 	<p>ensure that mud and dust deposits do not accumulate.</p> <ul style="list-style-type: none"> ❖ To ensure that dust and debris is minimized on the access road, all the tipper drivers will be instructed to use water spray system on all the tyres and spray water on the loaded material that is provided at the compound area before leaving the site ❖ Speed restrictions will be imposed to avoid spillage of loaded materials upon the road and to reduce wear and tear of the road. ❖ Weekly inspections of the condition of the access road by competent person employed, and immediate action will be taken to address any potholes or damage to the road surface. ❖ Dust wetting agents can be mixed with the water applied to haul roads during hot, dry weather conditions to increase the duration that the road surface remains damp. ❖ Personal Protective Equipment's will be provided to all workers ❖ All drilling rods used will have dust suppression systems fitted which injects water into the hole. ❖ Wet gunny bags will be used as a cover while drilling. ❖ The blast zone will be kept damp by the application of water from the rain gun fitted to the water tanker prior to each blast to control any fugitive dust emissions that could arise from the surface during detonation. ❖ A daily visual inspection shall be conducted by the site manager who will keep a daily log of all process operations and site activities and note
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	<p>any malfunctions which could lead to abnormal emissions from the quarry operations.</p> <ul style="list-style-type: none"> ❖ A site speed limit of 20 km/h will be set to minimize the potential for dust generation ❖ Weekly maintenance program me to identify machinery due for maintenance, based on the number of hours it has been in operation. ❖ Air filters are renewed after every 1000 hours of use, unless otherwise indicated by an on-board computer system. ❖ All site machineries & tippers will be serviced and maintained 6 months once and drivers will report any defects immediately to the site manager to enable repairs to be carried out promptly.
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Noise & Vibration

<ul style="list-style-type: none"> ❖ Annoyance and deterioration of the quality of life; ❖ Propelling of rocks fragments by blasting. ❖ Shaking of buildings and people due to blasting; 	<ul style="list-style-type: none"> ❖ Usage of sharp drill bits while drilling which will help in reducing noise; ❖ Secondary blasting will be totally avoided and hydraulic rock breaker will be used for breaking boulders; ❖ Controlled blasting with proper spacing, burden, stemming and optimum charge/delay will be maintained; ❖ The blasting will be carried out during favorable atmospheric condition and less human activity timings by using nonelectrical initiation system; ❖ Proper maintenance, oiling and greasing of machines will be done every week to reduce generation of noise; ❖ Provision of sound insulated chambers for the workers working on machines (HEMM)
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	<p>producing higher levels of noise;</p> <ul style="list-style-type: none"> ❖ Silencers / mufflers will be installed in all machineries; ❖ Green Belt/Plantation will be developed around the project area and along the haul roads. The plantation minimizes propagation of noise; ❖ Personal Protective Equipment (PPE) like ear muffs/ear plugs will be provided to the operators of HEMM and persons working near HEMM and their use will be ensured through training and awareness.
Biological Environment	
<ul style="list-style-type: none"> ❖ Direct impacts include land clearance and excavation causing destruction of flora and fauna and loss of habitats; ❖ Indirect impacts include habitat degradation due to noise, dust, and human activity. 	<ul style="list-style-type: none"> ❖ Only some common herbs, shrubs and grass will be cleared. So there will be no impact on the biodiversity. ❖ Green belt development with suitable species will enhance the biodiversity of the project area. ❖ The core zone or buffer zone does not encompass any threatened flora or fauna species.
Socio-Economic Environment	
<ul style="list-style-type: none"> ❖ Health and safety of workers and the general public; ❖ Increase in traffic volumes and sizes of road vehicles; ❖ Economic issues, including the increase in employment opportunities; 	<ul style="list-style-type: none"> ❖ The mining activity puts negligible change in the socio-economic profile. ❖ Around 17 local workers will get employment opportunities along with periodical training to generate local skills. ❖ New patterns of indirect employment/ income will generate. ❖ Regular health check-up camp. ❖ Assistance to schools and scholarship to children will be provided.
Occupational Health & Safety	
<ul style="list-style-type: none"> ❖ Exposure to Dust 	<ul style="list-style-type: none"> ❖ Provision of rest shelters for mine workers with

<ul style="list-style-type: none"> ❖ Noise and Vibration Exposure ❖ Physical Hazards ❖ Respiratory hazards due to Dust exposure 	<p>amenities like drinking water etc.</p> <ul style="list-style-type: none"> ❖ All safety measures like use of safety appliances, such as dust masks, helmets, shoes, safety awareness programs, awards, posters, slogans related to safety etc. ❖ Training of employees for use of safety appliances and first aid in vocational training center. ❖ Weekly maintenance and testing of all equipment as per manufacturers' guidelines. ❖ Pre placement and Yearly Medical Examination of all workers by a medical Officer ❖ First Aid facility will be provided at the mine site. ❖ Close surveillance of the factors in working environment and work practices which may affect environment and worker's health by the mines manager employed. ❖ Working of mine as per approved mining plan and environmental plans
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11.10 ANALYSIS OF ALTERNATIVES

There are no alternatives suggested as the proposed mining area has the following advantages
The mineral deposit occurs in a non-forest area.

- ❖ There is no habitation within the applied lease area; hence no R & R issues exist.
- ❖ There is no river, stream, nallas and water bodies in the or passing through the applied mine lease area.
- ❖ Availability of skilled, semi-skilled and unskilled workers in this region.
- ❖ All the basic amenities such as medical, firefighting, education, transportation, communication and infrastructural facilities are accessible.
- ❖ Mine connectivity through road and rail is good.
- ❖ The proposed mining operations do not intersect the ground water level. Hence, no impact on ground water environment.

11.11 ENVIRONMENTAL MONITORING PROGRAM

Environmental Monitoring program will be conducted for various environmental components as per conditions stipulated in Environmental Clearance Letter issued by SEIAA & Consent to Operate issued by TNPCB.

Table 11.9 Post Project Monitoring Program for Proposed Project

S.NO.	ACTIVITY	SCHEDULE
Air Pollution Monitoring		
1	Ambient Air Monitoring of parameters specified by TNPCB/SEIAA in their CTO/EC Order within the Applied Area	Once in every Six Months
2	Ambient Air Monitoring of parameters specified by TNPCB/SEIAA in their CTO/EC Order outside the Applied Area	Once in every Six Months
Water Quality Monitoring		
3	Monitoring water quality of rain water collected in mine pit area. Rain water will be used for plantation purpose.	Once in every Six Months
4	Monitoring of samples of tube well and open well or Surface Water bodies in nearby location. Parameters as per IS: 10500:1991	Once in every Six Months
5	Monitoring of water spray units	Log-sheet of water spray will be maintained on daily basis
Noise Quality Monitoring		
6	Noise in the ambient atmosphere within and outside the applied area	Once in every Six Months
Greenbelt Maintenance		
7	Monitor schedule for Greenbelt development as per approved mining plan	Once in every Six Months
Soil Quality Monitoring		
8	Grab Samples within and around the applied area	Once in every Six Months

11.12 ADDITIONAL STUDIES

11.12.1 Public Consultation for Proposed Project

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

11.12.2 Risk Analysis & Disaster Management Plan for Proposed Project

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 31stDecember, and 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.

In the unlikely event that a consequence has occurred, disaster management kicks in. This includes instituting procedures pertaining to a number of issues such as communication, rescue, and rehabilitation. These are addressed in the disaster management plan. Both, the RA and DMP, are living documents and need to be updated whenever there are changes in operations, equipment, or procedures. Assessment is all about preventing accidents and taking necessary steps to prevent it from happening.

The Disaster Management Plan (DMP) is a guide, giving general considerations, directions, and procedures for handling emergencies likely to arise from planned operations. The DMP has been prepared on the basis of the Risk Assessment and related findings covered in the report.

11.13 PROJECT BENEFITS

Various benefits are envisaged due to the proposed mine and a comprehensive description of various advantages and benefits anticipated from the proposed project to the locality, neighborhood, region and nation as a whole are:

- ❖ Improved road communication
- ❖ Rain water harvesting structures to augment the water availability for irrigation and plantation and ground water recharge
- ❖ Creation of community assets (infrastructure) like school buildings, village roads/ linked roads, dispensary & health Centre, community Centre, market place etc.,
- ❖ Strengthening of existing community facilities through the Community Development Program
- ❖ Skill development & capacity building like vocational training
- ❖ Awareness program and community activities, like health camps, medical aids, sports & cultural activities, plantation etc.

In order to implement the environmental protection measures, an amount of Rs.19.45 lakhs as capital cost and recurring cost as Rs 6.95 lakhs as recurring cost is proposed considering present market price considering present market scenario for the proposed project.

11.14 CONCLUSION

EIA study was performed as per the approved ToR. Various environmental attributes were studied relating with aspects of mining activities. The related impacts were identified and evaluated. Considering all the possible ways to mitigate the environmental concerns Environmental Management Plan was prepared and accordingly fund was allocated. The EMP has been dynamic, flexible and subject to periodic review. CER activities were identified and for its time bound implementation, fund has been allocated.

The project will increase the revenue of the State Govt. as well as it will help in the social upliftment of the local community. The green belt development program will help in increasing the green cover in the area. Thus, the proposed project is not likely to affect the environment or adjacent ecosystem adversely.

The mine management will be responsible for the project 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 XII

DISCLOSURES OF CONSULTANT

The Project Proponent, **Thiru.A. Govindarajan** has engaged **Geo Technical Mining Solutions**, a NABET Accredited Organization for carrying out the EIA study as per the ToR issued.

Name and address of the consultancy:

GEO TECHNICAL MINING SOLUTIONS

No: 1/213B Natesan Complex,
Oddapatti, Dharmapuri – 636705,
Tamil Nadu, India.
Email: info.gtmsdpi@gmail.com
Web: www.gtmsind.com
Phone: 04342 232777.

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

S.No	Name of the expert	In house/ Empanelled	FAE		
			Sector	Functional Area	Category
Approved Functional Area Experts					
1.	Shri G. Vageesan	EIA Coordinator (EC) In-house	1(a)(i)	Mining	B
2.	Dr.S. Karuppannan	In-house, FAE	1(a)(i)	LU, HG, GEO	B
3.	Dr.M. VijayPrabhu	In-house, FAE	1(a)(i)	HG, LU, GEO	B
4.	Dr.J. Rajarajeswari	In-house	1(a)(i)	EB, SC	B
5.	Dr.G. Prabakaran	In-house	1(a)(i)	SE	B
6.	Dr.R. ArunBalaji	In-house, FAE	1(a)(i)	AP, AQ, NV	B
7.	Mr.J.N. Manikandan	Empanelled	1(a)(i)	RH, SHW, AP	B
8.	Dr.S. Malar	In-house, FAE	1(a)(i)	WP	B
9.	Mr.G. UmaMaheswaran	In-house,FAE	1(a)(i)	HG, LU, GEO	B
10.	Mr. S. Gopala Krishnan	In-house,FAE	1(a)(i)	HG, GEO	B

Approved Functional Area Associates					
11.	Mr.G. Prithiviraj	FAA	1(a)(i)	LU, HG	B
12.	Mr.C. Kumaresan	FAA	1(a)(i)	NV	B
13.	Mr.N. GokulPraveen	FAA	1(a)(i)	HG	B
14.	Mr.S. Dinesh	FAA	1(a)(i)	HG, GEO	B
15.	Mr.P. Vellaiyan	FAA	1(a)(i)	HG, GEO	B
Abbreviations					
EC	EIA Coordinator	NV	Noise and Vibration		
FAE	Functional Area Expert	SE	Socio Economics		
FAA	Functional Area Associates	HG	Hydrology, ground water and water conservation		
TM	Team Member	SC	Soil conservation		
GEO	Geology	RH	Risk assessment and hazard management		
WP	Water pollution monitoring, prevention and control	SHW	Solid and hazardous wastes		
AP	Air pollution monitoring, prevention and control	MSW	Municipal Solid Wastes		
LU	Land Use	ISW	Industrial Solid Wastes		
AQ	Meteorology, air quality modeling, and prediction	HW	Hazardous Wastes		
EB	Ecology and bio-diversity	GIS	Geographical Information System		

DECLARATION BY EXPERTS CONTRIBUTING TO THE EIA & EMP

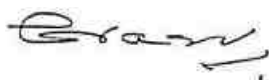
Declaration by experts contributing to the EIA/EMP for A. Govindarajan Rough Stone Quarry project located within the cluster of 10.45.0 hectares in Nadumandalam Village, Natham Taluk, Dindigul District of Tamil Nadu. It is also certified that information furnished in the EIA report are true and correct 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 : **Shri. G. VAGEESAN**

Designation : **EIA Coordinator**

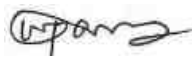




Date & Signature





Period of Involvement: **January 2021 to till date**


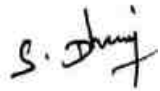

FUNCTIONAL AREA EXPERTS ENGAGED IN THE PROJECT

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.J.N. Manikandan	
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.S. Malar	
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.M. Vijay Prabhu	
			Mr.G.UmaMaheswaran	
			Dr.S. Karuppannan	
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. 	Mr.S.GopalaKrishnan	
			Mr.G.UmaMaheswaran	
			Dr.M. Vijay Prabhu	
			Dr.S. Karuppannan	
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. 	Dr.G. Prabhakaran	
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. 	Dr.J. Rajarajeshwari	
7	RH	<ul style="list-style-type: none"> ○ Identification of hazards and hazardous substances ○ Risks and consequences analysis 	Mr.J.N. Manikandan	

		<ul style="list-style-type: none"> ○ Vulnerability assessment ○ Preparation of Emergency Preparedness Plan ○ Management plan for safety. 		
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. 	Dr.S. Karuppannan	
9	NV	<ul style="list-style-type: none"> ○ Identify impacts due to noise and vibrations ○ Suggesting appropriate mitigation measures for EMP. 	Dr.R. Arun Balaji	
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 	Dr.R. ArunBalaji	
11	SC	<ul style="list-style-type: none"> ○ Assessing the impact on soil environment and proposed mitigation measures for soil conservation 	Dr.J. Rajarajeshwari	
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.J.N. Manikandan	

LIST OF FUNCTIONAL AREAS ASSOCIATE ENGAGED IN THIS PROJECT

S.No.	Name	Functional Area	Involvement	Signature
1	Mr.G. Prithviraj	AQ, AP, LU, HG	<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 ○ Analyse & provide inputs and assist FAE with meteorological data, emission estimation, AERMOD modelling and suggesting control measures 	
2	Mr.N.GokulPraveen	HG	<ul style="list-style-type: none"> ○ Site visit with FAE ○ Assisting FAE on sources of water pollution, its impacts and suggest control measures ○ Assisting FAE in preparation of land use maps 	

3	Mr.C. Kumaresan	NV	<ul style="list-style-type: none"> ○ Assist in Resources & Reserve Calculation and preparation of Production Plan & Conceptual Plan 	
4	Mr. S. Dinesh	HG; 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 	
5	Mr.P. Vellaiyan	HG; GEO	<ul style="list-style-type: none"> ○ Site visit with FAE ○ Assist FAE with collection of data ○ Provide inputs by analysing primary and secondary data 	

DECLARATION BY THE HEAD OF THE ACCREDITED CONSULTANT ORGANIZATION

I, **Dr. S. KARUPPANNAN**, Managing Partner, **Geo Technical Mining Solutions**, hereby, confirm that the above-mentioned functional area experts and team members prepared the EIA/EMP report for A. Govindarajan Rough Stone Quarry Project located within the cluster of 10.45.0 hectares in Nadumandalam Village, Natham Taluk, Dindigul District of Tamil Nadu. It is also certified that information furnished in the EIA report is true and correct to the best of our knowledge.

Signature : 

Name : **Dr. S. Karuppannan**

Designation : **Managing Partner**

Name of the EIA Consultant Organization : **Geo Technical Mining Solutions**

NABET Certificate No & Issue Date : **NABET/EIA/2023/IA0067 & March 30, 2021**

Validity : **Valid till 29.12.2023**

Minutes of 254th Accreditation Committee Meeting for Initial Accreditation held on 29.01.2021.



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.8787/SEAC/ToR-1151/2021 Dated :23.05.2022

To

Thiru.A.Govindarajan
S/o.Amirthalingadoss
No.6, Manmalai Kovil Street
K.Pudur Madurai North
Madurai District-625007

Sir / Madam,

Sub: SEIAA, Tamil Nadu – Terms of Reference with Public Hearing (ToR) for the Proposed Rough stone quarry lease over an extent of 1.20.0 Ha at S.F.No. 569/1(part-4) Govt Poramboke land of Nadumandalam Village, Natham Taluk, Dindigul District, Tamil Nadu by Thiru. A.Govindarajan - 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/67376/2021, dated: 09.09.2021
 2. Your application seeking Terms of Reference submitted on: 14.09.2021
 3. Minutes of the 248th SEAC meeting held on 24.02.2022
 4. Lr.No.SEIAA-TN/C.No.000930/2022 dated 29.03.22
 5. Minutes of the 265th Meeting of SEAC held on 21.04.2022
 6. Minutes of the 510th Meeting of SEIAA held on 23.05.2022.

Kindly refer to your proposal submitted to the State Level Impact Assessment Authority for Terms of Reference.

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The project proponent, Thiru.A.Govindarajan has submitted application seeking ToR under B1 category project in Form-I, for the Proposed Rough stone quarry lease over an extent of 1.20.0 Ha at S.F.No. 569/1(part-4) Govt Poramboke land of Nadumandalam Village, Natham Taluk, Dindigul District, Tamil Nadu and has furnished Pre-feasibility report.

Discussion by SEAC and the Remarks:-

The proposal was placed in 248th SEAC meeting held on 24.02.2022. The details of the project furnished by the proponent are given in the website (parivesh.nic.in).

The SEAC noted the following:


1. The Project Proponent, Thiru.A.Govindarajan has applied for Terms for Reference for the proposed Rough stone quarry lease over an extent of 1.20.0 Ha at S.F.No. 569/1(part-4) of Nadumandalam Village, Natham Taluk, Dindigul 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 the total quantity of recoverable should not exceed 105820cu.m of Rough stone with an ultimate depth of mining is 35m (10m AGL + 25m BGL). The Annual peak production as per mining plan is 23,235 cu.m of rough stone.

Based on the discussion and documents furnished by the project proponent. SEAC noted that the Ministry of Mines, GoI vide order Dt: 03.06.2020 has issued certain guidelines for auction of minerals block for pre-embedded clearance for mining project. As this proposal also is in the government poramboke land, SEAC sought a clarification through SEIAA to MoEF&CC in this regard and the same decided to defer this subject.

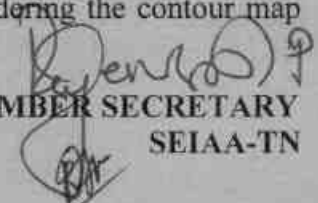
Now on receipt of clarification from SEIAA vide Lr.No.SEIAA-TN/C.No.000930/2022 dated 29.03.22, the proposal was placed for appraisal in this 265th meeting of SEAC held on 21.04.2022.

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**, subject to the following TOR, 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 environmental impact

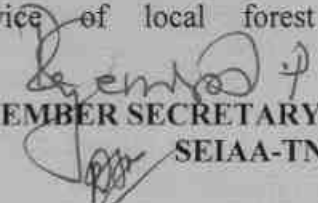

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- assessment study due to mining operations carried out in the quarry cluster specifically with reference to the environment in terms of air pollution, water pollution, & health impacts, and accordingly the Environment Management plan should be prepared keeping the concerned quarry and the surrounding habitations in the mind.
2. 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(s) 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.
 3. 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).
 4. 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.
 5. The Project Proponent shall provide the details of geological 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 proposed mitigation measures for the same.
 6. 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.
 7. The Project Proponent shall conduct the hydro-geological study considering the contour map


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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.

8. 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.
9. A detailed study shall be carried out in order to ascertain the status of existing trees (nos., name of the species, age, diameter etc.,) both within the mining lease applied area & 300m buffer zone and its management during mining activity.
10. A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific, along with the exclusive photographs/images/plans showing the proposed closure activities conceptually.
11. The Public hearing advertisement shall be published in one major National daily and one most circulated vernacular daily. All information given to the public in the public hearing should be in Tamil.
12. 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).
13. The purpose of Green belt around the project is to capture the fugitive dust emissions, carbon sequestration and to attenuate the noise generated, in addition to reduce the visual impacts. A wide range of indigenous plant species should be planted as given in the **appendix** in consultation with the DFO, State Agriculture University and local school/college authorities. The plant species with dense/moderate canopy of native origin should be chosen. Species of small/medium/tall trees alternating with shrubs should be planted in a mixed manner.
14. Taller/one year old Saplings raised in appropriate size of bags, preferably eco-friendly bags should be planted in proper spacing as per the advice of local forest


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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.

15. A Disaster management Plan shall be prepared and included in the EIA/EMP Report.
16. A Risk Assessment and management Plan shall be prepared and included in the EIA/EMP Report.
17. 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.
18. **The PP shall use drone video to cover the cluster area showing clearly the extent of operation and the surrounding environment and submit the video as part of EIA report.**
19. 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.
20. 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 the penal provisions as given in the Environment (Protection) Act, 1986.

Appendix -I
List of Native Trees Suggested for Planting

1. *Aeglemarmelos*-Vilvam
2. *Adenaantherapavonina*-Manjadi
3. *Albizialebeck*-Vaagai
4. *Albiziaamara*-Usil
5. *Bauhinia purpurea* - Mantharai
6. *Bauhinia racemosa* - Aathi
7. *Bauhinia tomentosa*-Iruvathi
8. *Buchananiaaillaris*-Kattuma
9. *Borassusflabellifer*- Panai
10. *Buteamonosperma* - Murukkamaram
11. *Bobaxceiba*- Ilavu, Sevvilavu
12. *Calophylluminophyllum* - Punnai
13. *Cassia fistula*- Sarakondrai

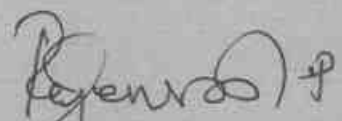

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14. *Cassia roxburghii*- Sengondrai
15. *Chloroxylonsweitenia* - Purasamaram
16. *Cochlospermumreligiosum*- Kongu, ManjalIlavu
17. *Cordiadichotoma*- Mookuchalimaram
18. *Cretevaadansonii*-Mavalingum
19. *Dilleniaindica*- Uva, Uzha
20. *Dilleniapentagyna*- SiruUva, Sitruzha
21. *Diospyrosebenum*- Karungali
22. *Diospyroschloroxylon*- Vaganai
23. *Ficusamplissima*- Kalltchi
24. *Hibiscus tiliaceous*-Aatrupoovarasu
25. *Hardwickiabinata*- Aacha
26. *Holopteliaintegrifolia*-Aayili
27. *Lanneacoromandelica* - Odhiam
28. *Lagerstroemia speciosa* - Poo Marudhu
29. *Lepisanthustetraphylla*- Neikottaimaram
30. *Limoniaacidissima* - Vila maram
31. *Litseaglutinosa*-Pisinpattai
32. *Madhucalongifolia* - Illuppai
33. *Manilkarahexandra*-UlakkaiPaalai
34. *Mimusopselengi* - Magizhamaram
35. *Mitragynaparvifolia* - Kadambu
36. *Morindapubescens*-Nuna
37. *Morindacitrifolia*- VellaiNuna
38. *Phoenix sylvestre*-Eachai
39. *Pongamiapinnata*-Pungam
40. *Premnamollissima*- Munnai
41. *Premnaserratifolia*- Narumunnai
42. *Premnatomentosa*-PurangaiNaari, PudangaNaari
43. *Prosopiscinerea* - Vannimaram
44. *Pterocarpusmarsupium* - Vengai
45. *Pterospermumcanescens*-Vennangu, Tada
46. *Pterospermumxylocarpum* - Polavu
47. *Puthranjivaroxburghii*-Puthranjivi
48. *Salvadorapersica*- UgaaMaram
49. *Sapindusemarginatus*- Manipungan, Soapukai
50. *Saracaasoca* - Asoca
51. *Streblusasper*- Pirayamaram
52. *Strychnosnuxvomica*-Yetti
53. *Strychnopotatorum* - TherthangKottai
54. *Syzygiumcumini* - Naval
55. *Terminaliabellerica*- Thandri

56. **Terminalia arjuna**- Venmarudhu
57. **Toona ciliate** – Sandhanavembu
58. **Thespesiapopulnea**- Puvarasu
59. **Walsuratrifoliata**–valsura
60. **Wrightiatinctoria**- Vep

The proposal was placed in the 510th Authority meeting held on 23.05.2022. 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. Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area on the nearby Villages, Water-bodies/ Rivers, & any ecological fragile areas.
2. The project proponent shall furnish VAO certificate with reference to 300m radius regard to approved habitations, schools, Archaeological structures etc.
3. 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.
4. 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.
5. 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.
6. Action should specifically suggest for sustainable management of the area and restoration of ecosystem for flow of goods and services.
7. The project proponent shall study impact on fish habitats and the food WEB/ food chain in the water body and Reservoir.
8. The Terms of Reference should specifically study impact on soil health, soil erosion, the soil physical, chemical components and microbial components.

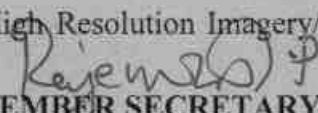

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9. The Environmental Impact Assessment should study impact on forest, vegetation, endemic, vulnerable and endangered indigenous flora and fauna.
10. The Environmental Impact Assessment should study impact on standing trees and the existing trees should be numbered and action suggested for protection.
11. The Environmental Impact Assessment should study on wetlands, water bodies, rivers streams, lakes and farmer sites.
12. The Environmental Impact Assessment should hold detailed study on EMP with budget for Green belt development and mine closure plan including disaster management plan.
13. The Environmental Impact Assessment should study impact on climate change, temperature rise, pollution and above soil & below soil carbon stock.
14. The Environmental Impact Assessment should study impact on protected areas, Reserve Forests, National Parks, Corridors and Wildlife pathways, near project site.
15. The project proponent shall study and furnish the impact of project on plantations in adjoining patta lands, Horticulture, Agriculture and livestock.
16. The project proponent shall study and furnish the details on potential fragmentation impact of natural environment, by the activities.
17. 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.
18. 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.
19. The project proponent shall detailed study on impact of mining on Reserve forests free ranging wildlife.
20. Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area covering the entire mine lease period as per precise area communication order issued from reputed research institutions on the following
 - a) Soil health & bio-diversity.
 - b) Climate change leading to Droughts, Floods etc.
 - c) Pollution leading to release of Greenhouse gases (GHG), rise in Temperature, & Livelihood of the local people.

- d) Possibilities of water contamination and impact on aquatic ecosystem health.
 - e) Agriculture, Forestry & Traditional practices.
 - f) Hydrothermal/Geothermal effect due to destruction in the Environment.
 - g) Bio-geochemical processes and its foot prints including environmental stress.
 - h) Sediment geochemistry in the surface streams.
21. Hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) so as to assess the impacts on the nearby waterbodies due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided, covering the entire mine lease period.
22. To furnish disaster management plan and disaster mitigation measures in regard to all aspects to avoid/reduce vulnerability to hazards & to cope with disaster/untoward accidents in & around the proposed mine lease area due to the proposed method of mining activity & its related activities covering the entire mine lease period as per precise area communication order issued.
23. To furnish risk assessment and management plan including anticipated vulnerabilities during operational and post operational phases of Mining.
24. Detailed Mine Closure Plan covering the entire mine lease period as per precise area communication order issued.
25. Detailed Environment Management Plan along with adaptation, mitigation & remedial strategies covering the entire mine lease period as per precise area communication order issued.

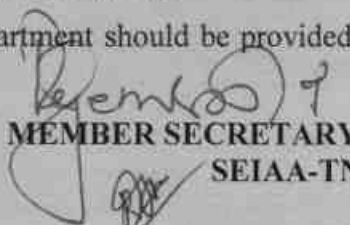
A. STANDARD TERMS OF REFERENCE

- 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/


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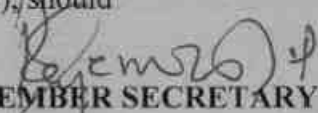
topo sheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).

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


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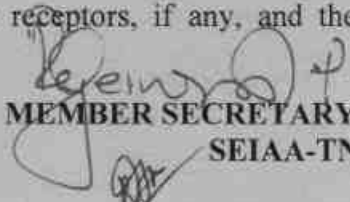
confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests,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

- 13) Status of forestry clearance for the broken up area and virgin forestland involved in the Project including deposition of Net Present Value (NPV) and Compensatory Afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.
- 14) Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.
- 15) The vegetation in the RF / PF areas in the study area, with necessary details, should be given.
- 16) A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly, detailed mitigative measures required, should be worked out with cost implications and submitted.
- 17) Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves/(existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished.
- 18) A detailed biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled-I fauna found in the study area, the necessary plan along with budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost.
- 19) Proximity to Areas declared as 'Critically Polluted' or the Project areas likely to come under the 'Aravali Range', (attracting court restrictions for mining operations), should


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also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Department should be secured and furnished to the effect that the proposed mining activities could be considered.

- 20) Similarly, for Coastal Projects, a CRZ map duly authenticated by one of the authorized agencies demarcating LTL, HTL, CRZ area, location of the mine lease with respect to CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority).
- 21) R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need based sample survey, family-wise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be clearly brought out whether the village(s) located in the mine lease area will be shifted or not. The issues relating to shifting of village(s) including their R&R and socio-economic aspects should be discussed in the Report.
- 22) One season (non-monsoon) [i.e. March-May (Summer Season); October-December (post monsoon season) ; December-February (winter season)]primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM10, particularly for free silica, should be given.
- 23) Air quality modeling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of Vehicles for transportation of mineral. The details of the model used and input parameters used for modeling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the



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- habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.
- 24) The water requirement for the Project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the Project should be indicated.
 - 25) Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.
 - 26) Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.
 - 27) Impact of the Project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided.
 - 28) Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. The Report inter-alia, shall include details of the aquifers present and impact of mining activities on these aquifers. Necessary permission from Central Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished.
 - 29) Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion proposed, if any, and the impact of the same on the hydrology should be brought out.
 - 30) Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and bgl. A schematic diagram may also be provided for the same.
 - 31) A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution.
 - 32) Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those


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outside the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as State Government) should be covered. Project Proponent shall conduct Impact of Transportation study as per Indian Road Congress Guidelines.

- 33) Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.
- 34) Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report.
- 35) Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.
- 36) Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.
- 37) Measures of socio economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.
- 38) Detailed Environmental Management Plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project.
- 39) Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project.
- 40) Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.
- 41) The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.
- 42) A Disaster management Plan shall be prepared and included in the EIA/EMP Report.


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

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


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

1. Project name and location (Village, District, State, Industrial Estate (if applicable)).
2. Process description in brief, specifically indicating the gaseous emission, liquid effluent and solid and hazardous wastes.
3. Measures for mitigating the impact on the environment and mode of discharge or disposal.
4. Capital cost of the project, estimated time of completion.
5. The proponent shall furnish the contour map of the water table detailing the number of wells located around the site and impacts on the wells due to mining activity.
6. A detailed study of the lithology of the mining lease area shall be furnished.
7. Details of village map, "A" register and FMB sketch shall be furnished.
8. Detailed mining closure plan for the proposed project approved by the Geology of Mining department shall be submitted along with EIA report.
9. Obtain a letter /certificate from the Assistant Director of Geology and Mining standing that there is no other Minerals/resources like sand in the quarrying area within the approved depth of mining and below depth of mining and the same shall be furnished in the EIA report.
10. EIA report should strictly follow the Environmental Impact Assessment Guidance Manual for Mining of Minerals published February 2010.
11. Detail plan on rehabilitation and reclamation carried out for the stabilization and restoration of the mined areas.
12. The EIA study report shall include the surrounding mining activity, if any.
13. Modeling study for Air, Water and noise shall be carried out in this field and incremental increase in the above study shall be substantiated with mitigation measures.
14. A study on the geological resources available shall be carried out and reported.
15. A specific study on agriculture & livelihood shall be carried out and reported.
16. Impact of soil erosion, soil physical chemical and biological property changes may be assumed.
17. Site selected for the project - Nature of land - Agricultural (single/double crop), barren, Govt./ private land, status of its acquisition, nearby (in 2-3 km.) water body, population, within 10km other industries, forest, eco-sensitive zones, accessibility, (note - in case of industrial estate this information may not be necessary)
18. Baseline environmental data - air quality, surface and ground water quality, soil characteristic,


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

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

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

- d. While preparing the EIA report, the instructions for the proponents and instructions for the consultants issued by MoEF & CC vide O.M. No. J-11013/41/2006-IA.II (I) dated 4th August, 2009, which are available on the website of this Ministry should also be followed.
- e. The consultants involved in the preparation of EIA/EMP report after accreditation with Quality Council of India (QCI)/National Accreditation Board of Education and Training (NABET) would need to include a certificate in this regard in the EIA/EMP reports prepared by them and data provided by other organization/Laboratories including their status of approvals etc. In this regard circular no F. No.J -11013/77/2004-IA-II(I) dated 2nd December, 2009, 18th March 2010, 28th May 2010, 28th June 2010, 31st December 2010 & 30th September 2011 posted on the Ministry's website <http://www.moef.nic.in/> may be referred.
- After preparing the EIA (as per the generic structure prescribed in Appendix-III of the EIA Notification, 2006) covering the above mentioned points, the proponent will take further necessary action for obtaining environmental clearance in accordance with the procedure prescribed under the EIA Notification, 2006.
 - The final EIA report shall be submitted to the SEIAA, Tamil Nadu for obtaining Environmental Clearance.
 - The TORs with public hearing prescribed shall be **valid for a period of three years** from the date of issue, for submission of the EIA/EMP report as per OMNo.J-11013/41/2006-IA-II(I)(part) dated 29th August, 2017.


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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, Dindigul District.
7. Stock File.



From

V.Sasikumar, M.Sc.,
Assistant Director,
Geology and Mining,
Dindigul.

To

Thiru.A.Govindarajan,
S/o.Amirthalingadoss,
No.6, Manmalaisamy Street,
K.Pudur, Madurai North,
Madurai

Roc.No. 112/2021 (Mines), dated: .07.2021

Sir,

Sub: Mines and Mineral - Minor Mineral - Rough Stone - Dindigul District - Natham Taluk - Nadumandalam Village, SF.No. 569/1(P-4) - over an extent of 1.20.0 hecets - Precise area communicated to Thiru.A.Govindarajan, the highest Tenderor - existing/ proposed/ abandoned quarries situated within 500mts radial distance - requested by the lessee - details furnished - regarding.

Ref:

1. Dindigul District Gazette Extraordinary issue No.4 dated: 09.02.2021
2. The District Collector, Dindigul precise area communication Letter No.112/2021 (Mines) dated: 06.05.2021
3. Assistant Director, Geology and Mining, Dindigul mining plan approved letter No. 112/2021 (Mines) dated:12.07.2021
4. Letter Thiru.A.Govindarajan, S/o.Amirthalingadoss, Madurai dated: 12.07.2021

Thiru.A.Govindarajan, Madurai has applied for grant of quarrying lease for quarrying Roughstone over an extent of 1.20.0 hecets in SF.No.569/1(P-4) of Nadumandalam Village, Natham Taluk, Dindigul District for a period of 5 years under rule 8(1) of Tamil Nadu Minor Mineral Concession Rules 1959.

In the reference 3rd cited, the applicant company was directed to produce the mining plan for approval and for obtaining Environmental Clearance from State Level Environmental impact Assessment Authority to grant rough stone quarry lease over an extent of 1.20.0 hecets in SF.No.569/1(P-4) of Nadumandalam Village, Natham Taluk, Dindigul District.

In the reference 4th cited, Thiru.A.Govindarajan, Madurai has requested to furnish the details of all mines/ quarry located within 500mts. radius from the lease area for obtaining Environmental Clearance form State Level Environmental Impact Assessment Authority (SEIAA), Chennai.

In this regard, it is informed that at present the following abandoned/existing/ proposed quarries are located within 500mts radial distance from the periphery of the applied area as detailed below,

Existing Quarry

Sl. No	Name of the quarry Owner	Name of the Village & Survey Number	Extent (in Hects)	Remarks
1.	R.Thiyagarajan, S/o.Rengasamy Naidu, Sengulam Village, Natham Taluk, Dindigul	Nadumandalam SF.No. 569/1(P)(B-3)	2.00.0	27.06.2019 to 26.06.2023
2.	N.Nallamani, S/o.Nallamani, Andaman, Madurai	Nadumandalam SF.No. 569/1(P)(B-2)	1.20.0	10.06.2019 to 09.06.2029
Total			3.20.0	

Abandoned/ Expired Quarry

Sl. No	Name of the quarry Owner	Name of the Village & Survey Number	Extent (in Hects)	Remarks
1.	R.Thiyagarajan, S/o.Rengasamy Naidu, Sengulam Village, Natham Taluk, Dindigul	Nadumandalam SF.No. 569/1(P)(B-1)	4.00.0	26.10.2015 to 25.05.2020
2.	Thiru.A.Lakshmipathy, S/o.Amirthalingadoss, 6(3), Manmalaisamy Street, K.Pudur, Madurai North, Madurai	Nadumandalam SF.No. 569/1(P)(B-2)	1.00.0	29.02.2016 to 28.02.2021
Total			5.00.0	

Proposed Quarry

Sl. No	Name of the quarry Owner	Name of the Village & Survey Number	Extent (in Hects)	Classification of land
1.	Thiru.A.Lakshmipathy, S/o.Amirthalingadoss, 6(3), Manmalaisamy Street, K.Pudur, Madurai North, Madurai	Velampatty SF.No. 289/1 (P)	1.05.0	Tender cum Auction conducted Poramboke land
2.	A.Govindarajan, S/o.Amirthados, 56-6, Manmalai Road, K.Pudur, Madurai District.	Nadumandalam SF.No. 569/1(P)(B-4)	1.20.0	Tender cum Auction conducted Poramboke land
Total			2.25.0	

[Signature]
Assistant Director,
Geology and Mining,
Dindigul

MINING PLAN

FOR NADUMANDALAM VILLAGE ROUGH STONE QUARRY LEASE INCLUDING
PROGRESSIVE QUARRY CLOSURE PLAN

Govt. Poramboke land/Open cast-Semi Mechanized mining/Non-fore
Non-Captive Use - "B2" Category

Lease period 5 Years (from the date of lease execution)

(Prepared under rule 41 (3) (i) of Tamil Nadu Minor Mineral Concession Rules, 1959)

LOCATION OF THE APPLIED AREA

STATE : TAMILNADU
DISTRICT : DINDIGUL
TALUK : NATHAM
VILLAGE : NADUMANDALAM
S.F.NO'S : 569/1 (Part-4)
EXTENT : 1.20.0 Hect

APPLICANT

Mr.A.GOVINDARAJAN

S/O. Mr.Amirthalingadoss
NO.6,Manmalai Kovil Street
K Pudur
Madurai - 625007

Dr. S.KARUPPANNAN.M.Sc., Ph.D.,

RQP/MAS/263/2014/A

GEO TECHNICAL MINING SOLUTIONS

(A NABET Accredited & ISO Certified Company)

No: 1/213-B, Ground Floor, Natesan Complex,
Oddapatti, Collectorate Post office, Dharmapuri-636705

Ph: +91 9443937841, +917010076633

E-mail: info.gtmsdpi@gmail.com,

Website: www.gtmsind.com



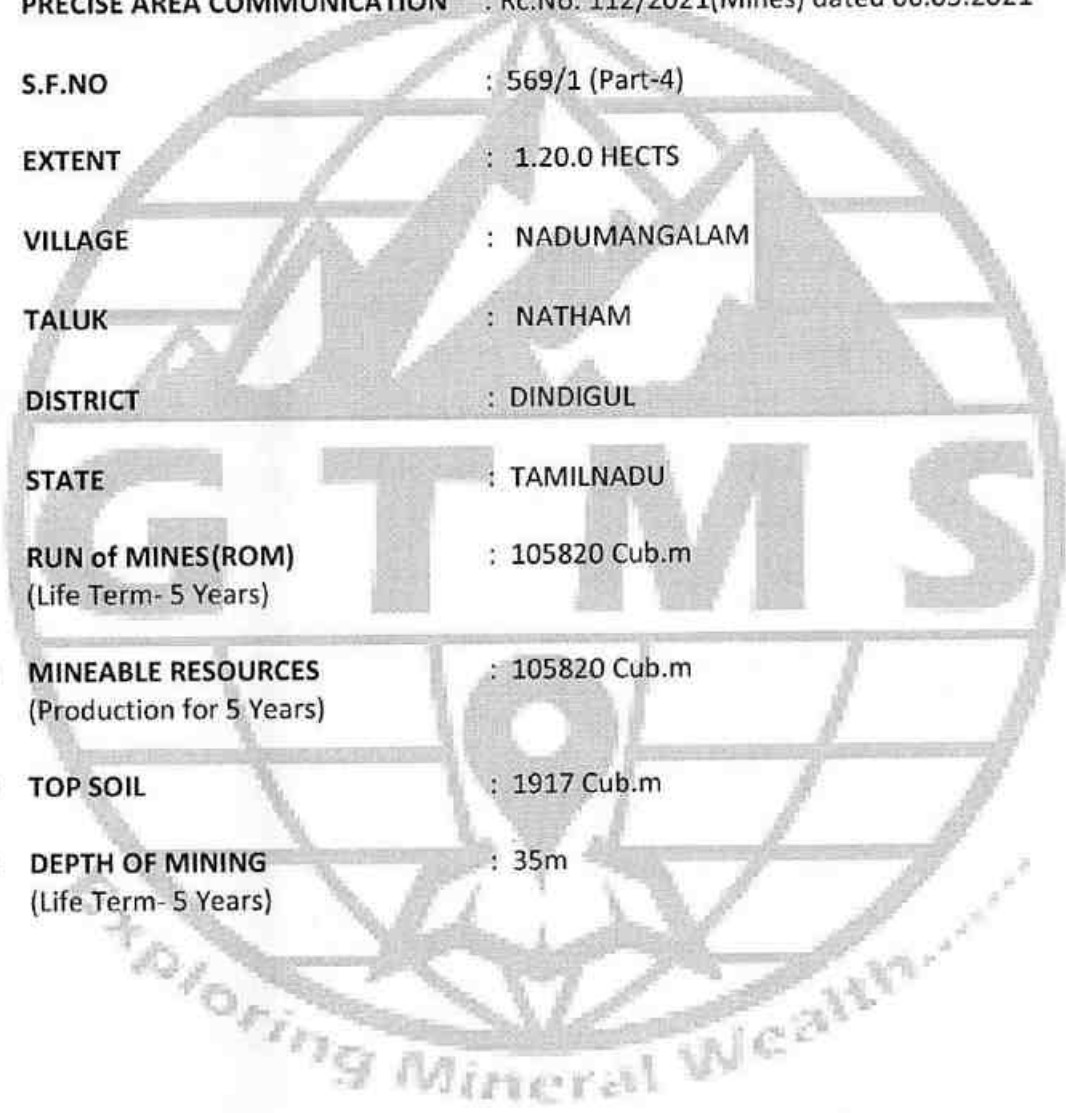
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**ABSTRACT OF THE ESTIMATED RESOURCES AND
PRODUCTION OF THE LEASE**

LOCATION OF THE LEASE AREA:

- **NAME OF THE MINERAL** : ROUGH STONE
- **PRECISE AREA COMMUNICATION** : Rc.No. 112/2021(Mines) dated 06.05.2021
- **S.F.NO** : 569/1 (Part-4)
- **EXTENT** : 1.20.0 HECTS
- **VILLAGE** : NADUMANGALAM
- **TALUK** : NATHAM
- **DISTRICT** : DINDIGUL
- **STATE** : TAMILNADU
- **RUN of MINES(ROM)** : 105820 Cub.m
(Life Term- 5 Years)
- **MINEABLE RESOURCES** : 105820 Cub.m
(Production for 5 Years)
- **TOP SOIL** : 1917 Cub.m
- **DEPTH OF MINING** : 35m
(Life Term- 5 Years)

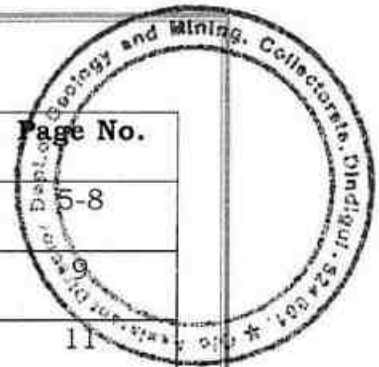


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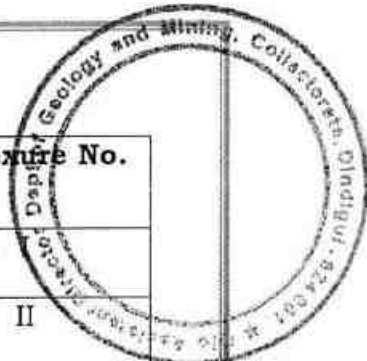
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L.A. Ghosh

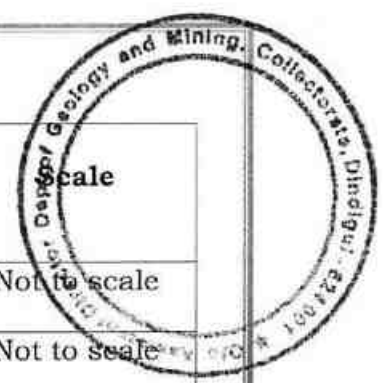
ANNEXURES



Sl. No.	Description	Annexure No.
1.	Copy of precise area communication letter	
2.	Copy of Tender Gazette notification for collector order	II
3.	Copy of FMB (Field Measurement book)	III
4.	Copy of Village Map	IV
5.	Copy of "A" registered	V
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7.	Photo copy of the proposed Lease area	VII
8.	Copy of Explosive License & Agreement from Explosive License holder	VIII
9.	Copy of ID Proof of the lessee	IX
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L. A. 227

LIST OF PLATES

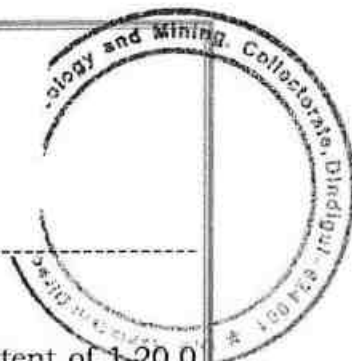


SI. No.	Description	Plate No.	Scale
1	Key Map	I	Not to scale
2	Location Plan	I-A	Not to scale
3	Topo Sheet Map	I-B	1:1,00,000
4	Satellite Imagery Map	I-C	1:5,000
5	Environmental Plan	I-D	1:5,000
6	Mine Lease Plan	II	1:1000
7	Surface, Geological Plan & Sections	III	1:1000 HOR 1:1000 VER 1:500
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L. A. [Signature] 228

Mr.A.GOVINDARAJAN

S/O. Mr.Amirthalingadoss
NO.6,Manmalai Kovil Street
K Pudur
Madurai - 625007



CONSENT LETTER FROM THE APPLICANT

The Mining Plan in respect of Rough Stone quarry over an extent of 1.20.0 hectares in S.F.No's:569/1 (Part-4) of Nadumandalam Village, Natham Taulk and Dindigul District, Tamil Nadu State has been prepared by

Dr. S.KARUPPANNAN.M.Sc., Ph.D., Reg. No. RQP/MAS/263/2014/A

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

Dr. S.KARUPPANNAN.M.Sc.,Ph.D.,
RQP/MAS/263/2014/A
GEO TECHNICAL MINING SOLUTIONS
(A NABET Accredited & ISO Certified Company)
No: 1/213-B, Ground Floor, Natesan Complex,
Oddapatti, Collectorate Post office, Dharmapuri-636705
Ph: +91 9443937841, 7010076633
E-mail: info.gtmsdpi@gmail.com,
Website: www.gtmsind.com

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

Place: Dindigul, TN

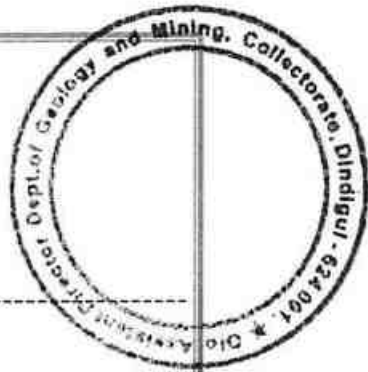
Date:

Signature of the Applicant

(A.Govindarajan)

Mr.A.GOVINDARAJAN

S/O. Mr.Amirthalingadoss
NO.6,Manmalai Kovil Street
K Pudur
Madurai - 625007



DECLARATION

The Mining Plan in respect of Rough Stone quarry over an extent of 1.20.0 hectares in S.F.No's: 569/1 (Part-4) of Nadumandalam Village, Natham Taluk and Dindigul District, Tamil Nadu State has been prepared with my consultation and I have understood the contents and agree to implement the same in accordance with the Mining Laws.

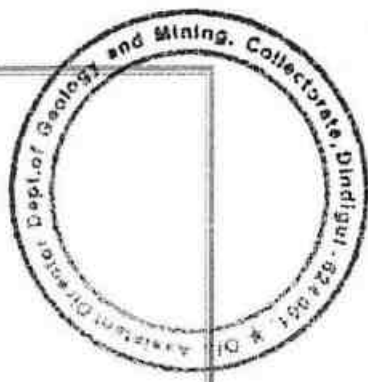
Place: Dindigul, TN

Date:

Signature of the Applicant

(A.Govindarajan)

A. Govindarajan 230



Dr. S.KARUPPANNAN.M.Sc.,Ph.D.,

RQP/MAS/263/2014/A

GEO TECHNICAL MINING SOLUTIONS

(A NABET Accredited & ISO Certified Company)

No: 1/213-B, Ground Floor, Natesan Complex,
Oddapatti, Collectorate Post office, Dharmapuri-636705

Ph: +91 9443937841, 7010076633

E-mail: info.gtmsdpi@gmail.com,

Website: www.gtmsind.com

CERTIFICATE

This is to certify that, the provisions of 8(1) Tamil Nadu Minor Mineral Concession Rules, 1959 have been observed in the Mining Plan for the grant of rough stone quarry lease over an extent of 1.20.0hectares in S.F.No's: 569/1 (Part-4) of Nadumandalam Village, Natham Taluk and Dindigul District, Tamil Nadu State applied by **Mr.A.Govindarajan.**

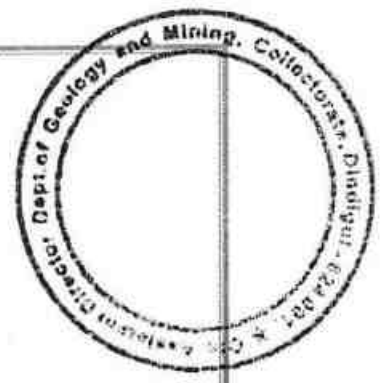
Wherever specific permission / exemptions / relaxations or approvals are required, the applicant will approach the concerned authorities of State and Central governments for granting such permissions etc.

Place: Dharmapuri, TN

Date :

Signature of the Recognized Qualified Person

Dr. S. KARUPPANNAN, M.Sc.,Ph.D.,
RQP/MAS/263/2014/A
GEO TECHNICAL MINING SOLUTIONS
1/213-B, Ground Floor, Natesan Complex,
Collectorate Post Office, Oddapatti,
Dharmapuri - 636 705, Tamil Nadu, India.



Dr. S.KARUPPANNAN.M.Sc.,Ph.D.,

RQP/MAS/263/2014/A

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Ph: +91 9443937841, 7010076633

E-mail: info.gtmsdpi@gmail.com,

Website: www.gtmsind.com

CERTIFICATE

Certified that, in Preparation of Mining Plan for rough stone quarry over an extent of 1.20.0hectares in S.F.No's: 569/1 (Part-4) of Nadumandalam Village, Natham Taluk and Dindigul District, Tamil Nadu State for **Mr.A.Govindarajan** covers all the provisions of Mines Act, Rules, and Regulations etc. Made there under and whenever specific permission are required, the applicant will approach the Director General of Mines Safety, Chennai. The standards prescribed by DGMS in respect of Mines Health will be strictly implemented.

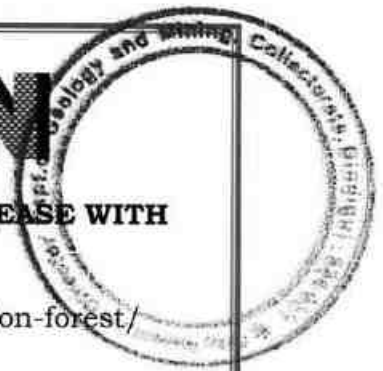
Place: Dharmapuri, TN

Signature of the Recognized Qualified Person

Date:

Dr. S. KARUPPANNAN, M.Sc.,Ph.D.,
RQP/MAS/263/2014/A
GEO TECHNICAL MINING SOLUTIONS
1/213-B, Ground Floor, Natesan Complex,
Collectorate Post Office, Oddapatti,
Dharmapuri - 636 705, Tamil Nadu, India.

MINING PLAN



FOR NADUMANDALAM VILLAGE ROUGH STONE QUARRY LEASE WITH PROGRESSIVE QUARRY CLOSURE PLAN

Govt Poramboke land/Open cast-Semi-Mechanized mining/Non-forest/
Non-Captive Use- "B2' Category

Lease period 5 Years (from the date of lease execution)

(Prepared under rule 41 (3) (i) of Tamil Nadu Minor Mineral Concession Rules, 1959)

INTRODUCTORY NOTES:

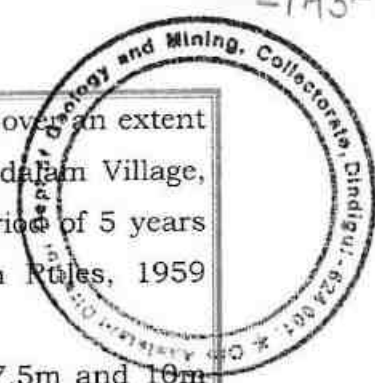
a) **Introduction:** Special publication No.4 dated 09.02.2021 and eligible Govt Poramboke lands lease quarries through tender cum auction. The District Collector was appointed the direct Officer and conducted tender cum auction dated on 25.02.2021.

At the auction held on 25.02.2021, **Mr.A.Govindarajan** has requested the highest bid amount of ₹.18,00,000/-. Therefore, the district collector granted rough stone quarry lease in Govt Poramboke land for a period of 5 years as per rule 8 (1), Tamilnadu Minor Mineral concession rules, 1959 as per precise area communication letter vide **Roc. No. 112/2021(Mines) dated 06.05.2021**, over an extent of 1.20.0Hectare in S.F.No: 569/1 (Part-4), Nadumandalam Village, Natham Taluk, Dindigul District.

The Mining Plan with progressive quarry closure plan is prepared for **Mr.A.Govindarajan S/o. Mr.Amirthalingadoss** residing at No.6, Manmalai kovil street, K. Pudur, Madurai-625007 and got auction of quarry lease for rough stone, over an extent of 1.20.0Hectare in S.F.No 569/1 (Part-4) of Nadumandalam Village, Natham Taluk, Dindigul District, Tamil Nadu State.

b). **Lease area particulars:** The Assistant Director, Department of Geology and Mining, District Collectorate, Dindigul has directed to the applicant **Mr.A.Govindarajan** through his precise area communication letter **Rc.No.112/2021/Mines, Dated 06.05.2021**, before execution of lease deed should submit the mining plan for approval and obtain Environmental Clearance from the competent authority of State Level Environment Impact Assessment Authority-TamilNadu (SEIAA) as per EIA Notification 2006 and S.O.141 (E) dated 15th January, 2016, 1st July 2016 & S.O.3977 (E), dated 14th August 2018 and MoEF & CC office memorandum vide letter no. L-11011/175/2018- IA-II (M) dated: 12th December, 2018. Accordingly, the

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mining plan prepared for a grant of quarrying of rough stone, over an extent of 1.20.0 Hectares in S.F.No's: 569/1 (Part-4) of Nadumandalam Village, Natham Taluk, Dindigul District, Tamil Nadu State for a period of 5 years under Rule 8(1) of Tamil Nadu Minor Mineral Concession Rules, 1959 subject to the following conditions,

1. The project proponent should leave a safety distance of 7.5m and 10m for the adjoining patta land and Govt Poramboke land respectively and should not cause any hindrance to them while quarrying.
2. The proponent should follow all other conditions strictly which is prescribed in the precise area communication letter. (Ref.Annuxure-I).

c). **Previous lease particulars:** The proposed lease area in S.F.No.569/1 (Part-4) was previously granted for quarrying of Rough stone, over an extent of 1.20.0hectares in favour of Mr.A.Lakshmi pathi by District Collector Dindigul Proceedings vide Roc. No.578/2007 (Mines), dated 23.07.2007, the lease was executed on 23.07.2007 to 22.07.2017 for a period of 10years. They are two existing pits levels are noticed with an average pit dimension of Pit level-1 is L124m X W35m X D5m, Pit level-2 is L50m X W40m X D10m. Hence, the present lease is applied for quarrying rough stone it will be continue from the existing depth. The existing pit levels are marked in the surface and Geological plan (Ref Plate No: III).

d). **Preparation and Submission of Mining Plan:** The Mining Plan and progressive quarry mine closure has been prepared under rule 41 (1) (i) and submission under rule 41, 42 of Tamil Nadu Minor Mineral Concession Rules, 1959 for a mining lease as per conditions mentioned in the precise area communication letter **Rc.No.112/2021/Mines, Dated 06.05.2021.**

e). **Geological Resources and Mineable Reserves:** Geological resource of rough stone are estimated as **277070Cbm** and topsoil is **3367Cbm** upto a depth of 35m from elevated terrain which is 10m above ground level (R.L. 290-280m) and 25m below ground level (R.L.280-255m) (Refer Plate No.III). Mineable reserves of rough stone are estimated about **105820Cbm** as respectively up to depth of 35m from elevated terrain which is 10m above ground level (R.L. 290-280m) and 25m below ground level (R.L.280-255m) (Refer Plate No.VI) for the five years plan periods after leaving necessary safety distance from the lease boundary.

f). **Proposed Production Schedule:** Total Proposed production of rough stone are **105820Cbm** for the five years plan periods. Average production shall be **21164Cbm** of rough stone per year. (Refer Plate No.IV)

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L. V. S.



g). Environmental Sensitivity of the Proposed Lease Area:-

- a). **Interstate boundary:** There is no interstate boundary found within radius of 10Kms.
- b). **Wildlife Protection Act, 1972:** There is no wild life animal sanctuary within 10Kms radius from the project site area under the Wildlife (Protection) Act, 1972.
- c). **Indian Reserve Forest Act, 1980:** There is no nearest reserve found around 1km radius.
- d). **CRZ Notification, 1991:** There is no coastal zone found within 10kms radius and this project site doesn't attract CRZ Notification, 1991.

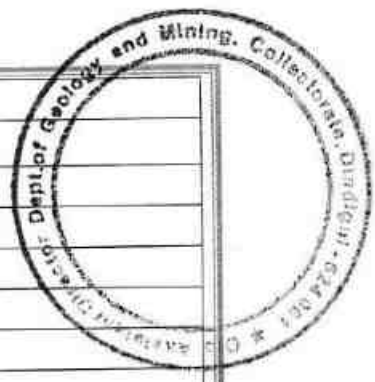
h). Environmental measures to be adopted shall be during the ongoing activity period,

- i) Avoid uneven rat hole mining and follow scientific and systematic mining by safe bench system of open cast mining
- ii) Unnecessary land degradation should be avoided or damaged land should be reclaimed or rehabilitated.
- iii) Wet drilling method is to be adopted to control dust emissions. Delay detonators and shock tube initiation system for blasting shall be used so as to reduce vibration and dust.
- iv) Drilling and blasting shall be done only either by licensed explosive agent or by the proponent after obtaining required approvals from Competent Authorities.
- v) Emission test of vehicles should be in stack to maintain minimum emission level of flue gases.
- vi) And any other conditions as stipulated by the concerned authorities should be followed to protect the environment.

1.0 GENERAL:

a.	Name of the Applicant	:	Mr.A.Govindarajan
	Applicant Address	:	Mr.A.Govindarajan, S/O. Mr.Amirthalingadoss NO.6,Manmalai Kovil Street K Pudur Madurai - 625007
	District	:	Madurai
	State	:	Tamil Nadu
	Pin Code	:	625007
	Phone	:	+91 9047019081
	Fax	:	Nil
	Gram	:	Nil

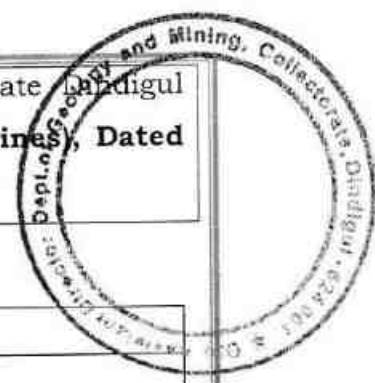
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J.A. [Signature]



	Telex	: Nil
	E-mail	: Nil
b.	Status of the Applicant	
	Private Individual	: Private Individual
	Cooperative Association	: ---
	Private Company	: ---
	Public Company	: ---
	Public Sector Undertaking	: ---
	Joint Sector Undertaking	: ---
	Other (pl. specify)	: ---
c.	Mineral(s) Which are occurring in the area and which the applicant intends to mine	: Rough Stone (Charnockite) quarry lease
d.	Period for which the mining lease granted /renewed/ proposed to be applied	: Mining lease were granted for five years from the date of lease execution.
e.	Name of the RQP Preparing the Mining Plan	: Dr. S.KARUPPANNAN.M.Sc.,Ph.D.,
	Address	: Dr. S.KARUPPANNAN.M.Sc.,Ph.D., RQP/MAS/263/2014/A GEO TECHNICAL MINING SOLUTIONS (A NABET Accredited & ISO Certified Company) No: 1/213-B, Ground Floor, Natesan Complex, Oddapatti, Collectorate Post office, Dharmapuri-636705 Website: www.gtmsind.com
	Phone	: +91 9443937841, 7010076633.
	Fax	: Nil
	e-mail	: info.gtmsdpi@gmail.com
	Telex	: 04342-232777
	Registration Number	: RQP/MAS/263/2014/A
	Date of Grant/Renewal	: 16.12.2014
	Valid upto	: 15.12.2024
f.	Name of the Prospecting Agency	: Geo Technical Mining Solutions (A NABET Accredited & ISO Certified Company)
	Address	: No: 1/213-B, Ground Floor, Natesan Complex, Oddapatti, Collectorate Post office, Dharmapuri-636705 Web site: www.gtmsind.com
	Phone	: +91 9443937841, 7010076633.
g.	Reference No. and date of consent letter from the state government	: The precise area communication letter was received from the Assistant Director, Department of Geology and

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S. A. / [Signature]

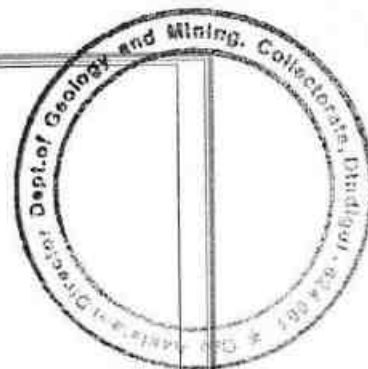
Mining, District collectorate Dindigul
vide Rc.No.112/2021 (Mines), Dated
06.05.2021.



2.0 LOCATION AND ACCESSIBILITY:

a.	Details of the Area	: Refer plate no: I, IA & IB,																		
	District & State	: Dindigul, Tamil Nadu																		
	Taluk	: Natham																		
	Village	: Nadumandalam																		
	Khasra No./ Plot No./ Block Range/Felling Series etc.	: 569/1 (Part-4)																		
	Lease Area (hectares)	: 1.20.00 Hectares																		
	Whether the area is recorded to be in forest (please specify whether protected, reserved, etc)	: The proposed lease area is recorded as Govt. Poramboke land (Ref. Annexure No: V).																		
	Ownership / Occupancy	: This is a Govt of Tamilnadu (Ref. Annexure No: V).																		
	Existence of Public Road / Railway line if any nearby and approximate distance	: * Exploited materials shall be transported through the approach road is situated on the southern side. * The SH-35 road is situated about 700m away on eastern side which is connecting Natham – Sendurai road. * There is no Railway line around 5kms radius.																		
	Toposheet No. with latitude and longitude	: Toposheet No. 58 J/04 Latitude: From 10°14'34.88"N to 10°14'41.04"N Longitude: From 78°14'20.33"E to 78°14'23.92"E																		
Geo-Coordinates of the Lease Boundary																				
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">Pillar ID</th> <th style="width: 35%;">Latitude</th> <th style="width: 50%;">Longitude</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td>10°14'41.04"N</td> <td>78°14'23.09"E</td> </tr> <tr> <td style="text-align: center;">2</td> <td>10°14'34.88"N</td> <td>78°14'23.92"E</td> </tr> <tr> <td style="text-align: center;">3</td> <td>10°14'35.30"N</td> <td>78°14'22.73"E</td> </tr> <tr> <td style="text-align: center;">4</td> <td>10°14'36.30"N</td> <td>78°14'21.57"E</td> </tr> <tr> <td style="text-align: center;">5</td> <td>10°14'40.42"N</td> <td>78°14'20.33"E</td> </tr> </tbody> </table>			Pillar ID	Latitude	Longitude	1	10°14'41.04"N	78°14'23.09"E	2	10°14'34.88"N	78°14'23.92"E	3	10°14'35.30"N	78°14'22.73"E	4	10°14'36.30"N	78°14'21.57"E	5	10°14'40.42"N	78°14'20.33"E
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5	10°14'40.42"N	78°14'20.33"E																		
	Land use pattern (Forest, Agricultural, Grazing, Barren etc.)	: It is a barren and waste land																		
b).	Attach a general location and vicinity map	: Refer plate no-IA & IB																		

L.A.S. 237



showing area boundaries and existing and proposed access routes. It is preferred that the area to be marked on a survey of India topographical map or a cadastral map or forest map as the case may be. However if none of these are available, the area should be shown on an accurate sketch map on scale of 1 : 5000.

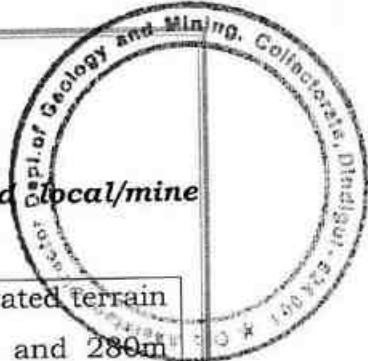
i) INFRASTRUCTURE AND COMMUNICATION:

a.	Nearest post office	:	Postal head office, Natham - 2.17Km - southern side of the lease area.
b.	Nearest police station	:	Natham - 2.25km - Southern side of the lease area.
c.	Nearest fire station	:	Natham - 2.3km - Southern side of the lease area.
d.	Nearest Medical facility	:	Natham - 2.35km Southern side of the lease area.
e.	Nearest school	:	Natham - 1.2km - Northeast side of the lease area.
f.	Nearest Taluk road	:	0.83km - Natham - Sendurai road on eastern side
g.	Nearest Rail Head	:	Dindigul - 30km-West
h.	Nearest port facility	:	Thuthookodi port - 163km- south
i.	Nearest Airport	:	Madurai airport - 47km-south
j.	Nearest DSP office	:	Dindigul - 44km - Northwest
k.	Nearest Villages	:	i. North - Thummalapatti - 3.8kms ii. South - Nadumandalam - 2.5km iii. East - Amarappundi - 3.0kms iv. West - Pudur - 4.2kms

ii) BOUNDARY OF THE LEASE AREA:

i.	Boundary		i. North - Nadumandalam - 1.1km ii. South - Velampatty - 1.5km iii. East - Sengulam - 2.0km iv. West - Pudur - 1.9km
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L. A. S.



PART - A

3.0 GEOLOGY AND MINERAL RESERVES:

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

(i)	Topography	: The applied lease area exhibits elevated terrain with altitude of 290m maximum and 280m minimum from the MSL. The slope is towards S side and falls in toposheet no. 58 J/04.
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(ii) **a) Geomorphology:** The Charnockite Group comprises pyroxene granulite and charnockite. The pyroxene granulite is dark grey, medium grained granulitic rock with typical salt and pepper texture, seen on the weathered surface. It consists of diopside, hypersthene, plagioclase, hornblende, biotite and quartz. Charnockite is the predominant rock in the area. It is grey, medium to coarse grained, greasy looking with foliation seen prominently on the weathered surface. It is essentially made of smoky or grey quartz, pale grey microcline and hypersthene as major minerals with plagioclase, hornblende and biotite as accessories. It forms high hills / hill ranges and also occupies the plains, covered by 1-2 m thick soil.

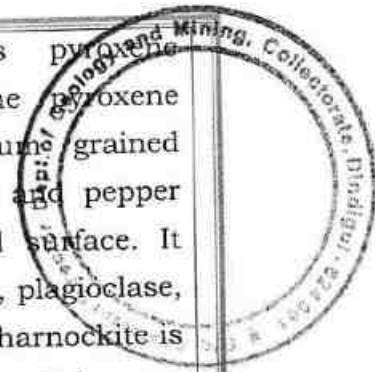
b) Soils: The analysis of the soil type reveals that the study area is predominantly covered by red soil is a mixture of sand, silt and clay.

c) Lineaments: A lineament may be a fault, fracture, master joint, a long and linear geological formation, vegetation served may be the result of faulting and fracturing and hence it is inferred that they are the areas and zones of increased porosity and permeability in hard rock areas. The data have been checked by field studies and Survey of India topographical maps at the 1:1,00,000 scale.

Age	Group	Rock Formation
Recent to Sub recent	----	Alluvium Soil,
Archaean to Lower Proterozoic	----	Pink migmatite, Younger Granite
Archaean	Charnockite Group	Quartzite, Charnockite.

(iii)	i) Topography of the proposed lease area:	i) Topography of the proposed lease area: The proposed lease area exhibits elevated terrain with altitude of 290m to 280m from the MSL. The slope is towards south side. The
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Charnockite Group comprises pyroxene granulite and Charnockite. The pyroxene granulite is dark grey, medium grained granulitic rock with typical salt and pepper texture, seen on the weathered surface. It consists of diopside, hypersthene, plagioclase, hornblende, biotite and quartz. Charnockite is the predominant rock in the area. It is grey, medium to coarse grained, greasy looking with foliation seen prominently on the weathered surface. It is essentially made of smoky or grey quartz, pale grey microcline and hypersthene as major minerals with plagioclase, hornblende and biotite as accessories.

ii) Mode of origin:

The Charnockite series originally was assumed to have developed by the fractional crystallization of silicate magma. The constituents of the rock suggests of its origin in particularly dry and high temperature conditions which is deduced to have an important bearing in explicating prehistoric crustal development of the earth.

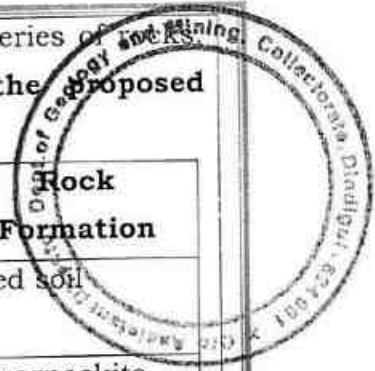
iii) Physiography of the rocks:

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

iv) Chemical composition of rocks:

The compositional characteristics of coexisting orthopyroxene, garnet and biotite have established several petrographic varieties within the Charnockites-Enderbites such as the granulites and gneisses. The mineral composition shows an unvarying presence of pleochroic rhombic pyroxene. Plagioclase feldspars, alkali feldspars and quartz are the

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L.A. [Signature]

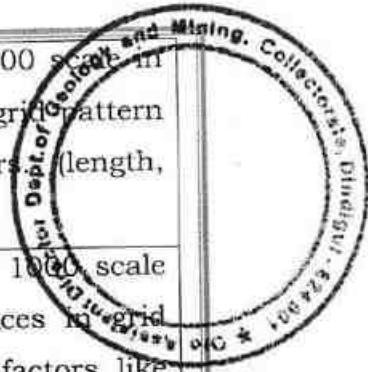


		<p>salic minerals present in this series of rocks.</p> <p>Order of superposition of the proposed lease area,</p> <table border="1"> <thead> <tr> <th>Age</th> <th>Group</th> <th>Rock Formation</th> </tr> </thead> <tbody> <tr> <td>Recent to Sub recent</td> <td>----</td> <td>Red soil</td> </tr> <tr> <td>Archaean</td> <td>Charnockite Group</td> <td>Charnockite.</td> </tr> </tbody> </table>	Age	Group	Rock Formation	Recent to Sub recent	----	Red soil	Archaean	Charnockite Group	Charnockite.
Age	Group	Rock Formation									
Recent to Sub recent	----	Red soil									
Archaean	Charnockite Group	Charnockite.									
(iv)	Drainage Pattern	: There is no major river located within a 50m radius. The drainage pattern of the area is sub dendritic appear only in rainy season.									

(b) ***The topographic plan of the lease area prepared on a scale of 1:1000 or 1: 2000 with contour interval of 3 to 10m depending upon the topography of the area should be taken as the base plan for preparation of geological plan. The details of exploration already carried out including evidences of mineral existence should be shown on the geological plan:***

a. Present status	: The proposed lease area in S.F.No.569/1 (Part-4) was previously granted for quarrying of Rough stone, over an extent of 1.20.0hectares in favour of Mr.A.Lakshmipathi by District Collector Dindigul Proceedings vide Roc. No.574/2007 (Mines), dated 23.07.2007, the lease was executed on 23.07.2007 to 22.07.2017 for a period of 10years. They are three existing pits levels are noticed with an average pit dimension of Pit level-1 is L124m X W35m X D5m, Pit level-2 is L50m X W40m X D10m. Hence, the present lease is applied for quarrying rough stone it will be continue from the existing depth. The existing pit levels are marked in the surface and Geological plan (Ref Plate No: III).
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L.A.N.V.



- b. Surface Plan : Surface plan is prepared as 1: 1000 scale in ground level at various places in grid pattern behalf various lithological factors (length, width and depth) (Ref Plate No: III).
- (c) Geological sections should be prepared at suitable intervals on a scale of 1:1000 /1: 2000 : Geological plan is prepared as 1: 1000 scale with ground level at various places in grid pattern with various lithological factors like length, width and depth and sections are prepared boundary to boundary perpendicular to the strike of the rock with proper scale of 1:1000 in horizontal axis, 1:500 in vertical axis. It is given as plate no-III.

(d) **Broadly indicate the Yearwise future programme of exploration, taking into consideration the future production programme planned in next five years as in table below :-**

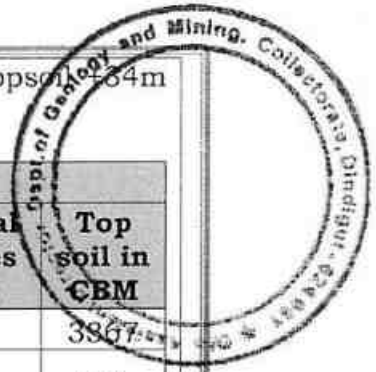
Year	No. of boreholes	Total meterage	No. of Pits and Dimensions	No. of Trenches and Dimensions
First	N.A	---	---	N.A
Second	N.A	---	---	N.A
Third	N.A	---	---	N.A
Fourth	N.A	---	---	N.A
Fifth	N.A	---	---	N.A

No future exploration programme is proposed in this area. It's a massive charnockites homogeneous parent rock. Hence, exploration proposal is not required to this mining project.

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

The Geological resources were computed in cross section method on suitably chosen two-line axis. The one longitudinal (XY) axis and one horizontal (AB) axis of deposit have been drawn. The proposed area for quarrying is a elevated terrain and depth of geological resources has been computed up to depth of 35m which is 10m from above ground level (R.L.290-280m) and 25m below ground level (R.L.280-255m) (Refer Plate No's. III). The total Geological resources of rough stone are **277070Cbm**, topsoil is **3367cbm**

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A. Jeyaraj



up to depth of 35m from the above ground level (which is 1m Topsoil 34m Rough Stone) as respectively.

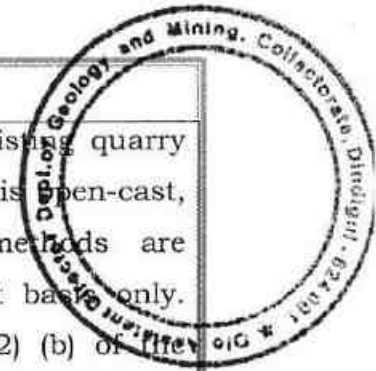
GEOLOGICAL RESOURCES							
Section	Bench	length in (m)	Width in (m)	Depth in (m)	Volume In CBM	Geological Resources in CBM	Top soil in CBM
XY-AB	Slope	91	37	1	3367		3367
	I	40	45	4	7200	7200	.....
	II	91	37	5	16835	16835	.....
	III	121	37	5	22385	22385	.....
	IV	143	70	5	50050	50050	.....
	V	172	70	5	60200	60200	.....
	VI	172	70	5	60200	60200	.....
	VII	172	70	5	60200	60200	.....
GRAND TOTAL					280437	277070	3367

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

The mineable reserves of rough stone estimated as 105820Cbm up to depth of 35m from elevated terrain which is 10m above ground level (R.L. 290-280m) and 25m below ground level (R.L.280-255m) (Refer Plate No.III) for a period of five years by deducting the reserves blocked under benches from the total geological resources and the commercially viable rough stone has been prepared on 1: 1000 Scales and sections are prepared as 1: 1000 as horizontal axis, 1:500 as vertical axis. It is given as plate no-VI.

MINEABLE RESERVES							
Section	Bench	length in (m)	Width in (m)	Depth in (m)	Volume In CBM	Mineable Reserves in CBM	Top soil in CBM
XY-AB	Slope	71	27	1	1917	.....	1917
	I	30	35	4	4200	4200	.....
	II	81	27	5	10935	10935	.....
	III	101	27	5	13635	13635	.....
	IV	118	45	5	26550	26550	.....
	V	142	35	5	24850	24850	.....
	VI	132	25	5	16500	16500
	VII	122	15	5	9150	9150
GRAND TOTAL					107737	105820	1917

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L.A. [Signature]



4.0 MINING:

a. Briefly describe the existing / proposed method for developing / working the deposit with all design parameters.
(Note: In case of pocket deposits, sequence of development/working may be indicated on the same plan)

: The proposed area is an existing quarry lease. The mining operation is open-cast, semi-mechanized mining methods are adopted and on single shift basis only. Under the regulation 106 (2) (b) of Metalliferous Mines Regulations, 1961 in all open cast workings in hard rock, the benches and sides should be properly benched and sloped. The bench height should not exceed 5m and the bench width should not less than the bench height. The slope of the benches should not exceed 45° from horizontal.

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

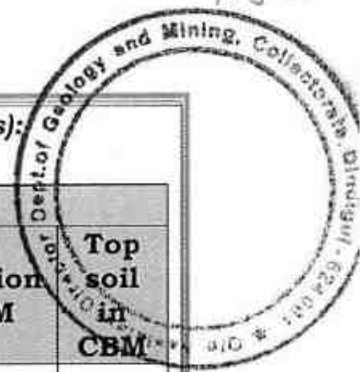
Total proposed production of rough stone is **105820Cbm** up to depth of 35m from elevated terrain which is 10m above ground level (R.L. 290-280m) and 25m below ground level (R.L.280-255m) for the five years plan periods (Refer plate No. IV). Average production shall be **21164Cbm** of rough stone per year.

Year	Pit No.(s)	Topsoil/Overburden (Cbm)	ROM (Cbm)	Saleable Rough Stone (Cbm) @ 100%	Rough stone rejects(Cbm)	Sub grade/ Weathered rock in (Cbm)	Saleable Gravel (Cbm)	Rough Stone to Overburden ratio
First	I	1917	25152	23235	---	---	---	1:0.08
Second	I	---	21285	21285	---	---	---	---
Third	I	---	21300	21300	---	---	---	---
Fourth	I	---	19350	19350	---	---	---	---
Fifth	I	---	20650	20650	---	---	---	---
Total	---	1917	107737	105820	---	---	---	---

The regular working of the quarry and its production depends upon the demand from the market. The market is always fluctuating and flexible one. Accordingly, there is a possibility to increase or decrease the production

c. **Composite plans and Year wise sections (In case of 'A' class mines):** : Not applicable

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L.A.



Composite plans and Year wise sections (In case of 'B' class mines):

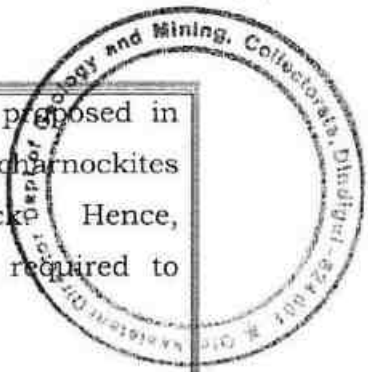
YEARWISE PRODUCTION								
Year	Section	Bench	length in (m)	Width in (m)	Depth in (m)	Volume In CBM	Production in CBM	Top soil in CBM
I	XY-AB	I	71	27	1	1917	.....	1917
		I	30	35	4	4200	4200	.....
		II	81	27	5	10935	10935	.....
		III	60	27	5	8100	8100	.....
II		III	41	27	5	5535	5535	.....
		IV	70	45	5	15750	15750	.....
III		IV	48	45	5	10800	10800	
		V	60	35	5	10500	10500	.....
IV		V	82	35	5	14350	14350	
		VI	40	25	5	5000	5000	.....
V	VI	92	25	5	11500	11500	.....
	VII	122	15	5	9150	9150	.....
TOTAL						107737	105820	1917

d. Attach supporting composite plan and section showing pit layouts, dumps, stacks of sub-grade mineral, if any, etc. : The recovery of rough stone is 100%, hence no waste to be handled in this quarry.

e. **Indicate proposed rate of production when the mine is fully developed and the expected life of the mine and the year from which effected:**
 The proposed production is **1763Cbm/month**. At this rate of production, the expected life of quarry is calculated as given below:-
 Mineable reserves of Rough Stone = **105820Cbm**
 Yearly production = **21164Cbm**
 Estimated life of mine(105820Cbm/21164Cbm) = **5 years**
 The regular working of the quarry and its production depends upon the demand from the market. The market is always fluctuating and flexible one. Accordingly, there is a possibility to increase or decrease the production.

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

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L.A. Shekhar



i) Time frame of completion of mineral exploration program in leasehold area: Give broad description identified potential areas to be covered in the given time frame:

: Exploration program is not proposed in this area. It's a massive and homogeneous parent rock. Hence, exploration proposal is not required to this mining project.

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

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

ULTIMATE PIT LIMIT XY-AB					
Bench	Bench R.L	Overburden/ Mineral	Length (m)	Width (m)	Depth (m)
I	Slope	Top soil	71	27	1
I	R.L.289-285m	Rough stone	30	35	4
II	R.L.285-280m	Rough stone	81	27	5
III	R.L.280-275m	Rough stone	101	27	5
IV	R.L.275-270m	Rough stone	118	45	5
V	R.L.270-265m	Rough stone	142	35	5
VI	R.L.265-260m	Rough stone	132	25	5
VII	R.L.260-255m	Rough stone	122	15	5
Total					35m

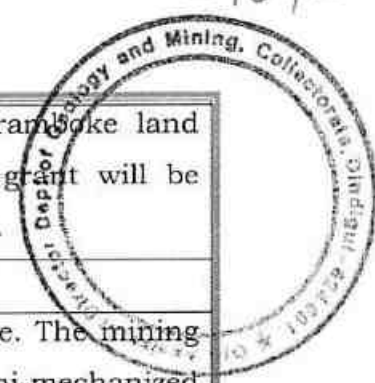
iii) Whether the site for disposal of waste rock or an un-saleable material have/ has been examined for adequacy of land and suitability of long term use in the event of continuation of mining activity: -

: The recovery of rough stone in this quarry is 100%. There is no waste rock will be proposed in this lease area. If rough stone may be unsold will keep within the lease boundary.

iv) Whether back filling of pits after recovery of mineral upto technoeconomically feasible depth envisaged. If so, describe the broad features of the proposal:-

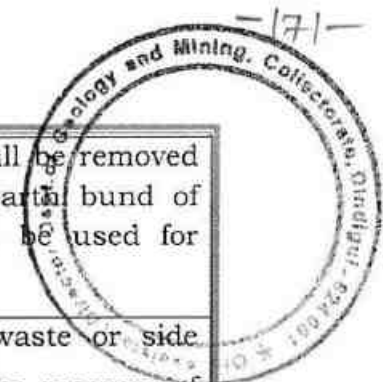
: The persistence of the deposit may likely to continue for further depth. So, no backfilling proposed.

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S. A. N. S.



v) iv) Whether post mining land use envisaged:-	: No, It is a government poramboke land lease, hence further lease grant will be through tender cum auction.
g. Open cast Mines:	
i). Describe briefly giving salient features of the mode of working (Mechanized, Semi-Mechanized, manual)	: It is an existing quarry lease. The mining operation is open-cast, semi-mechanized methods of mining are adopted and on single shift basis only. Under the regulation 106 (2) (b) of the Metalliferous Mines Regulations, 1961 in all open cast workings in hard rock, the benches and sides should be properly benched and sloped. The bench height should not exceed 5m and the bench width should not less than the bench height. The slope of the benches should not exceed 45° from horizontal. Machineries like Tractor mounted compressor attached with Jack hammers is proposed to drilling and blasting. Hydraulic Excavators and tipper combination are adopted.
ii) Describe briefly the layout of mine workings, the layout of faces and sites for disposal of overburden/waste. A reference to the plans enclosed under 4(b) and 4(d) will suffice	: The rough stone is proposed to quarry at 5m bench height & width conventional opencast semi-mechanized method. It is a semi mechanized quarrying operation using shot hole drilling with the help of tractor mounted compressor attached with jack hammers, smooth blasting and waste and are removal using hydraulic excavator and loaded directly to the tippers and transported to the needy customer. Bench height = 5mts. Bench width = 5mts.

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a. Details of Topsoil/ Overburden	: The topsoil is 1917Cbm shall be removed and shall be stacked for earth bund of lease hold area which will be used for plantation purposes.																					
b. Rough Stone waste and side burden waste:-	: There is no rough stone waste or side burden shall be removed. The recovery of rough stone is 100%.																					
h. Underground Mines:	: It is an open cast quarry operation only.																					
i. Extent of mechanization: Describe briefly including the calculation for adequacy and type of machinery and equipment proposed to be used in different mining operations.																						
<p>(1) Drilling Machines:</p> <p>Drilling of shot holes will be carried out using tractor mounted compressor and jack hammer. Depth of holes shall be 1 to 2m bench height and spacing shall be 0.75m and burden shall be 0.60m from the preface. Details of drilling equipments are given below.</p> <table border="1"> <thead> <tr> <th>Type</th> <th>Nos</th> <th>Dia of hole (mm)</th> <th>Size / Capacity</th> <th>Make</th> <th>Motive power</th> <th>H.P</th> </tr> </thead> <tbody> <tr> <td>Jack Hammer</td> <td>2</td> <td>32 mm</td> <td>Hand held</td> <td>Atlas copco</td> <td>Diesel</td> <td>60</td> </tr> <tr> <td>Compressor</td> <td>1</td> <td>---</td> <td>Air</td> <td>Escorts Formtrac</td> <td>Diesel</td> <td>42</td> </tr> </tbody> </table>		Type	Nos	Dia of hole (mm)	Size / Capacity	Make	Motive power	H.P	Jack Hammer	2	32 mm	Hand held	Atlas copco	Diesel	60	Compressor	1	---	Air	Escorts Formtrac	Diesel	42
Type	Nos	Dia of hole (mm)	Size / Capacity	Make	Motive power	H.P																
Jack Hammer	2	32 mm	Hand held	Atlas copco	Diesel	60																
Compressor	1	---	Air	Escorts Formtrac	Diesel	42																
<p>(2) Loading Equipment:</p> <p>Hydraulic excavator (0.90m³ capacities) and attached with rock breaker shall utilized for internal transport sizeable rough stone lumps and deliver to the consumer area.</p>																						
<p>(3) Haulage and Transport Equipment</p> <p>(a) Haulage within the mining leasehold:</p> <table border="1"> <thead> <tr> <th>Type</th> <th>Nos</th> <th>Size / Capacity</th> <th>Make</th> <th>Motive power</th> <th>H.P.</th> </tr> </thead> <tbody> <tr> <td>Tipper</td> <td>2</td> <td>15 M.T</td> <td>Ashok Leyland</td> <td>Diesel</td> <td>110</td> </tr> </tbody> </table> <p>Whether the dumpers are fitted with exhaust conditioner should be indicated:</p> <p>The dumpers are not used in this quarry; hence it's a small B2 category quarry.</p>		Type	Nos	Size / Capacity	Make	Motive power	H.P.	Tipper	2	15 M.T	Ashok Leyland	Diesel	110									
Type	Nos	Size / Capacity	Make	Motive power	H.P.																	
Tipper	2	15 M.T	Ashok Leyland	Diesel	110																	
(b) Transport from mine head to the destination	: 15 M.T capacity of tipper will be use for transport Rough Stone from the mine head to needy customer.																					

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c. Describe briefly the transport system (please specify)	:	The hired tipper and excavator will be used for carrying out day to day mining activities on the day basis or hourly basis as per market scenario.
d. Ore transported by: own trucks / hired trucks	:	Hired trucks for initially production purposes
e. Main destination to which ore is transported (giving to and from distance)	:	The excavated stone materials road metal will be supplied to the consumers like road laying, earth filling, building construction, etc

f. Details of hauling / transport equipment :

Type	Nos	Size / Capacity	Make	Motive power	H.P.
Tipper	1	15 M.T	Ashok Leyland	Diesel	110

(4).Miscellaneous:

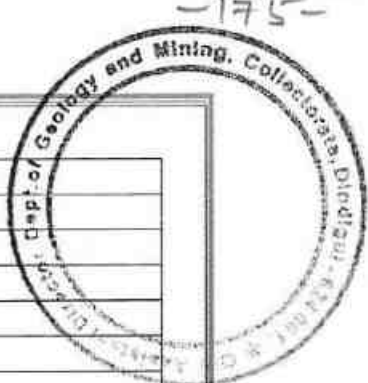
Describe briefly any allied operations and machineries related to the mining of the deposit not covered earlier.

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

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

Blasting pattern:

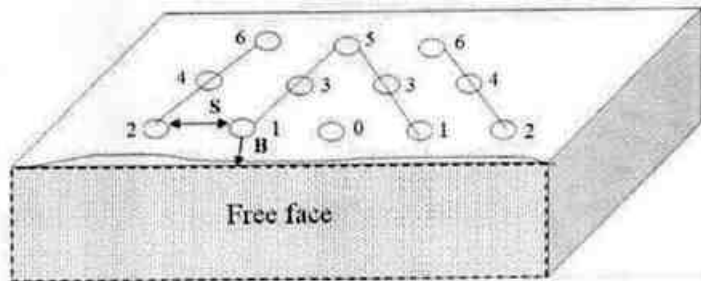
The quarrying operation is proposed to carry out by open cast, semi-mechanized mining in conjunction with conventional method of mining using jack hammer drilling and blasting for shattering effect and loosen the rough stone.



Drilling and blasting parameters are as follows

Depth of each hole	:	1.5m
Diameter of hole	:	30-32mm
Spacing between hole	:	1.2m
Burden for hole	:	1.0m
Pattern of hole	:	Zigzag -Multi rows
Inclination of hole	:	80° from horizontal
Use of delay detonators	:	25 millisecond relay
Detonating fuse	:	" Detonating" cord
Quantity of rock broken per day	:	70m ³ x 2.8 = 196MT
Blasting efficiency @95%	:	1.05MT / hole
Charge per hole	:	140 gms of 25mm dia cartridge
Quantity of rock broken per day	:	196MT per day
Requirement of explosive per day (6M.T per kg of explosives)	:	32kg per day
Number of holes per day	:	196/1.05= 186 holes per day

BLASTING PATTERN DRAWING



Staggered "V" pattern of blasting design

Spacing	=	1.2m
Burden	=	1.0m
Depth of hole	=	1.5m
No of holes proposed per day	=	186holes

b) Type of explosives used / to be used:

Following explosives are recommended for efficient blasting with safe practice.

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

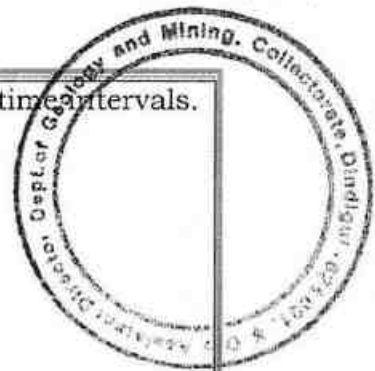
c) Measures proposed to minimize ground vibration due to blasting:

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

Shallow depths jackhammer drilling and blasting is proposed to be carried out with minimum use of explosive mainly to give hearing effect in Rough Stone for easy excavation and to control fly rock.

Delay detonators:

Delay blasting permits to divide the shot to smaller charges, which are



detonated in a predetermined millisecond sequence at specific time intervals.

The major advantages of delay blasting are:

- ❖ Reduction of ground vibration
- ❖ Reduction in air blast
- ❖ Reduction in over break
- ❖ Improved fragmentation
- ❖ Better control of fly rock

Blasting program for the production per day

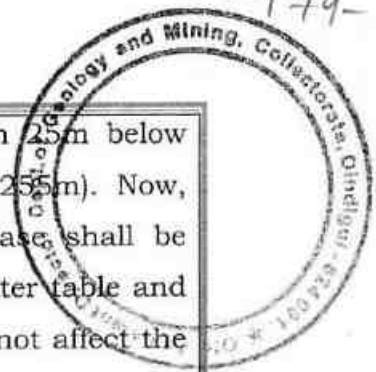
No of holes	:	186holes
Yield	:	196tons
Powder factor	:	6 Tons/Kg of explosives
Total explosive required	:	32kg-Slurry explosives
Charge per hole	:	0.5kg
Blasting at day time only	:	12.00-1.00p.m

d) Powder factor in ore and overburden / waste / development heading / stope	:	Powder factor is proposed as 6 tonnes per kg of explosives
e) Whether secondary blasting is needed, if so describe it briefly	:	Irrespective of the method of primary blasting employed, it may be necessary to re-blast a proportion of the rock on the quarry floor so as to reduce it to a suitable size for handling by the excavators.
f) Storage of explosives (like capacity and type of explosive magazine)	:	<ol style="list-style-type: none"> 1. The applicant is advised to engage an authorized explosive agency to carry out blasting. 2. The blasting time at a day is proposed to be 12.00 PM to 2.00 PM. 3. First Aid Box will be keeping ready at all the time. 4. Necessary precautionary announcement will be carried out before the blasting operation.

6. MINE DRAINAGE:

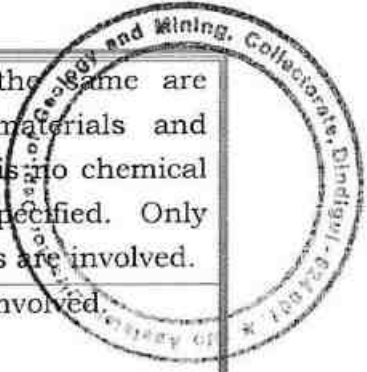
a) Likely depth of water table based on observations from nearby wells and water bodies	:	The ground water table is reported as of 55m bgl in summer and 50m bgl in rainy season from the general ground level in the adjacent bore wells of the area.
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A. J. J.



<p>b) Workings expected to be _____ m. above / reach below water table by the year _____ .</p>	<p>: Proposed mining depth 25m below ground level (R.L.280-255m). Now, the present Mining lease shall be proposed above the water table and hence, quarrying may not affect the ground water.</p>
<p>c) Quantity and quality of water likely to be encountered, the pumping arrangements and places where the mine water is finally proposed to be discharged.</p>	<p>: The ground water may not rise immediately in this type of mining. However, the rain water percolation and collection of water from the seepage shall be less than 300 Lpm and it shall be pumped out periodically by a stand by diesel powered Centrifugal pump motivated with 7.5 H.P. Motor.</p>
<p>7. STACKING OF MINERAL REJECTS AND DISPOSAL OF WASTE:</p>	
<p>a) Indicate briefly the nature and quantity of top soil, overburden / waste and mineral rejects likely to be generated during the next five years : 1917Cbm of topsoil is used for plantation purpose. No waste proposed.</p>	
<p>b) Land chosen for disposal of waste with proposed justification</p>	<p>: The topsoil is 1917Cbm shall be removed and shall be stacked for earth bund of lease hold area which will be used for plantation purposes.</p>
<p>c) Attach a note indicating the manner of disposal and configuration, sequence of buildup of dumps along with the proposals for the stacking of sub-grade ore, to be indicated year wise.</p>	<p>: There is no weathered rock.</p>
<p>8. USE OF MINERAL:</p>	
<p>a) Describe briefly the end-use of the mineral (sale to intermediary parties, captive consumption, export, industrial use etc.,)</p>	<p>: The excavated stone materials road metal will be supplied to the consumers like road making, building construction, etc</p>
<p>b) Indicate physical and chemical</p>	<p>: Basically, the materials produced at this quarry are rough stone</p>

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specifications stipulated by buyers	(Charnockites) and the same are used for building materials and road metal, so there is no chemical specifications are specified. Only physical specifications are involved.
c) Give details in case blending of different grades of ores is being practiced or is to be practiced at the mine to meet specifications stipulated by buyers.	: No blending process involved.

9. OTHERS

<p>Describe briefly the following</p> <p>a) Site services</p>	: Infrastructure required for such mines like office, stores, canteen, first aid station, shelter latrine and booth rooms have been provide as per the Metalliferous Mines Rules, 1961 as a welfare amenities for mine laborers. No manual mines no stack of spares, lubricant and fuels are required to be maintained at the mine site. Approach road is available from the mine road to the site.
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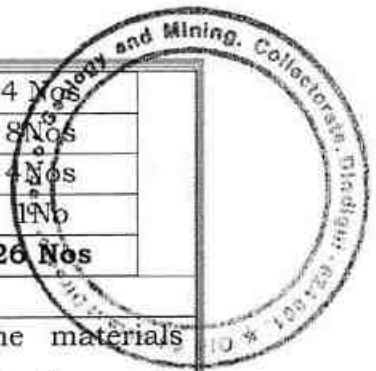
b) Employment Potential:

As per Mines safety under the provisions of 116 (3) (a) Metalliferous Mines Rules, 1961, whenever the workers are employed more than 10, it is preferred to have a qualified Mining Mate and Geologist to keep all the production workers directly under his control and supervision.

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

1.	Highly Skilled	Quarry Manger	1No.
		Mines Forman	---
		Mechanical Engineer	---
		Account cum & Admin	1No.
2.	Skilled	Earth moving Operator	2 Nos.
		Driver	3 Nos.
		Mechanic	1 Nos.
		Blaster/Mat	1 Nos.

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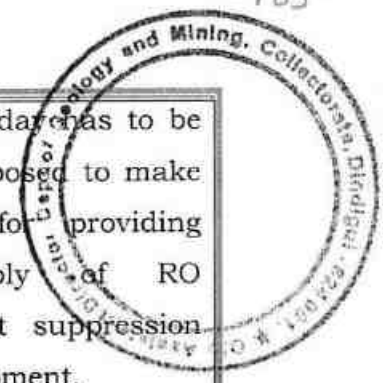


3.	Semi - skilled	Helpers, Greaser's	4 Nos
4.	Unskilled	Musdoor / Labours	8 Nos
		Cleaners	4 Nos
		Attendant's	1 No
Total =			26 Nos

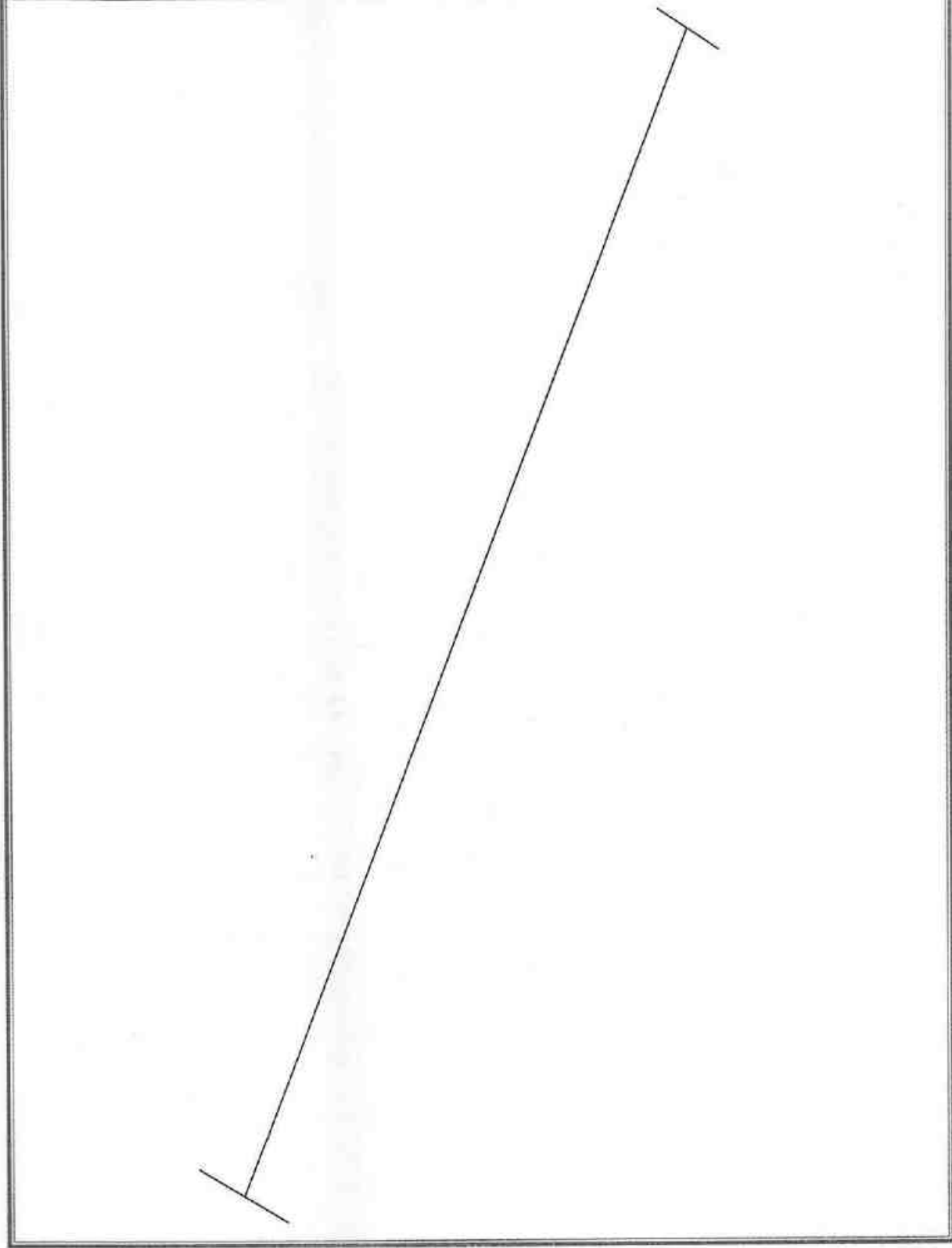
10 MINERAL PROCESSING/BENEFICIATIONS:

<p>a) If processing / beneficiations of the ore or minerals mined is planned to be conducted on site or adjacent to the extraction area, briefly describe the nature of the processing /beneficiation. This should indicate size and grade of feed material and concentrate (finished marketable product), recovery rate.</p>	:	<p>Excavated rough stone materials shall be directly sale to the needy customer. The recovery of Rough Stone in this quarry is 100%.</p>
<p>b) Explain the disposal method for tailings or waste from the processing plant (quantity and quality of tailings proposed to be discharged, size and capacity of tailing pond, toxic effect of such tailings, if any, with process adopted to neutralize any such effect before their disposal and dealing of excess water from the tailing dam).</p>	:	<p>No water shall be used for quarrying or any other processing except drinking water to be drawn from public sources. Some stagnation of rain water in the pit shall be used for drilling and spraying haul roads. Therefore, need for tailing dam doesn't arise. But tailing control of rain water flow during rainy season has to be done by decanting the suspended particle matter (SPM) in a pit before passing the water in to natural system.</p>
<p>c) A flow sheet or schematic diagram of the processing procedure should be attached.</p>	:	<p>Not applicable.</p>
<p>d) Specify quantity and type of chemicals to be used in the processing plant.</p>	:	<p>Not applicable</p>
<p>e) Specify quantity and type of chemicals to be stored on site / plant.</p>	:	<p>Not applicable</p>
<p>f) Indicate quantity (Cu.m. per day) of water required for mining and processing and sources of supply of water. Disposal of water and extent of recycling.</p>	:	<p>Drinking is 0.180KLD, utilized water is 0.620 KLD, Dust suppression is 1.0 KLD and Green Belt is 1.5KLD. Minimum quantity</p>

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A. A. S. S.



of water 3.3KLD per day has to be maintained. It is proposed to make an own borewell for providing uninterrupted supply of RO drinking water, dust suppression and Green belt development.



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A. M.

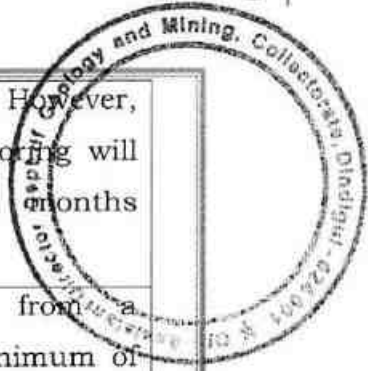
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PART - B

11.0 ENVIRONMENTAL MANAGEMENT PLAN:

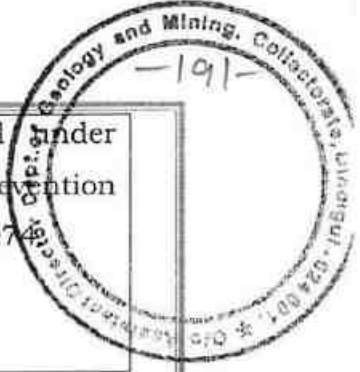
a) Attach a note on the status of baseline information with regard to the following :

11.1	Existing land use pattern indicating the area already degraded due to quarrying /pitting, dumping, roads, processing plant, workshop, township etc in a tabular form. The present and proposed land use pattern is given as below.																													
	<table border="1"><thead><tr><th>S.No</th><th>Land Use</th><th>Present Area (Hect)</th><th>Area in use during the quarrying period (Hect)</th></tr></thead><tbody><tr><td>1.</td><td>Under Quarrying area</td><td>0.55.00</td><td>0.78.00</td></tr><tr><td>2.</td><td>Infrastructure</td><td>---</td><td>0.01.00</td></tr><tr><td>3.</td><td>Site Road</td><td>---</td><td>0.03.00</td></tr><tr><td>4.</td><td>Un-utilized</td><td>0.65.00</td><td>0.14.00</td></tr><tr><td>5.</td><td>Dump, Safety & Green Belt</td><td>Nil</td><td>0.24.00</td></tr><tr><td colspan="2" style="text-align: right;">Total</td><td>1.20.00</td><td>1.20.00</td></tr></tbody></table>	S.No	Land Use	Present Area (Hect)	Area in use during the quarrying period (Hect)	1.	Under Quarrying area	0.55.00	0.78.00	2.	Infrastructure	---	0.01.00	3.	Site Road	---	0.03.00	4.	Un-utilized	0.65.00	0.14.00	5.	Dump, Safety & Green Belt	Nil	0.24.00	Total		1.20.00	1.20.00	
S.No	Land Use	Present Area (Hect)	Area in use during the quarrying period (Hect)																											
1.	Under Quarrying area	0.55.00	0.78.00																											
2.	Infrastructure	---	0.01.00																											
3.	Site Road	---	0.03.00																											
4.	Un-utilized	0.65.00	0.14.00																											
5.	Dump, Safety & Green Belt	Nil	0.24.00																											
Total		1.20.00	1.20.00																											
11.2	Water Regime	:	Water table in this area is noticed at a depth of 55m bgl in summer and 50m bgl in rainy season from the general ground level. For drinking water, dust suppression and Green belt development the proponent will procure water from outside vendors.																											
11.3	Flora and Fauna	:	There is no major flora found in this area. No other valuable trees are noticed in the lease area. Further, neither flora of botanical interest nor fauna of zoological interest is noticed in this area.																											
11.4	Quality of air, ambient noise level and water	:	Air or dust expected to be generated from drilling process, hauling roads, places of excavation etc., will be suppressed by periodical wetting of land using water sprayer. Quarrying of rough stone will be carried out by drilling and blasting by using low power explosives, and hence, noise																											



			will be very minimum. However, periodical noise level monitoring will be carried out every six months around the quarry site.																										
11.5	Climatic conditions	:	The temperature ranges from a maximum of 37 °C to a minimum of 25°C. Like the rest of the state, April to June is the hottest months and December to January are the coldest. Rainfall of this area is southwest monsoon, with an onset in June and lasting up to September, brings rainfall of 517.1 mm, with September being the rainiest month.																										
11.6	Human Settlement: The nearest villages are found in the buffer zone with population as per 2011 census.																												
	<table border="1"> <thead> <tr> <th>S.No</th> <th>Village</th> <th>Direction</th> <th>Distance in Kms</th> <th>Population</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Nadumandalam</td> <td>North</td> <td>1.1kms</td> <td>8830</td> </tr> <tr> <td>2</td> <td>Velampatty</td> <td>South</td> <td>1.5kms</td> <td>1436</td> </tr> <tr> <td>3</td> <td>Sengulam</td> <td>East</td> <td>2.0kms</td> <td>1123</td> </tr> <tr> <td>4</td> <td>Pudur</td> <td>West</td> <td>1.9kms</td> <td>6168</td> </tr> </tbody> </table>				S.No	Village	Direction	Distance in Kms	Population	1	Nadumandalam	North	1.1kms	8830	2	Velampatty	South	1.5kms	1436	3	Sengulam	East	2.0kms	1123	4	Pudur	West	1.9kms	6168
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11.7	Public buildings, places of worship and monuments	:	No infrastructure like residential building, places of special interest like archeological monuments etc., are not found around 300m radius.																										
11.8	Attach plans showing the locations of sampling stations	:	The proposed Ambient air quality, Water quality Ambient noise level and vibration are periodically tested for every season (6 months once) around 5km radius as per the guidance of MoEF and EIA Notification 2006 and also covering DGMS norms.																										

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11.9	Does area (partly or fully) fall under notified area under Water (Prevention & Control of Pollution), Act, 1974	:	The proposed area not fall under notified area under water (Prevention & Control of Pollution), Act, 1974
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b) Attach an Environmental Impact Assessment Statement describing the impact of Mining and beneficiation on environment on the following over the next five years (and upto conceptual plan period for 'A' category mines)

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

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

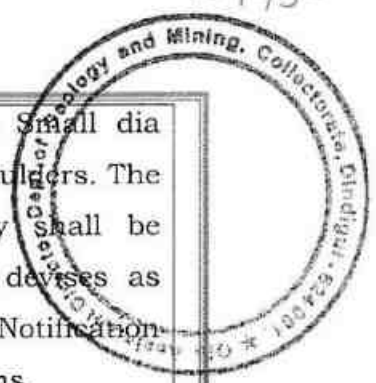
S.No	Land Use	Present Area (Hect)	Area in use during the quarrying period (Hect)
1.	Under Quarrying area	0.55.00	0.78.00
2.	Infrastructure	---	0.01.00
3.	Site Road	---	0.03.00
4.	Un-utilized	0.65.00	0.14.00
5.	Dump, Safety & Green Belt	Nil	0.24.00
Total		1.20.00	1.20.00

ii). **Air Quality**
Air or dust expected to be generated from drilling process, hauling roads, places of excavation etc., will be suppressed by periodical wetting of land using water sprayer.

iii). **Water quality**
A water sample from the open/bore wells was tested to NABL approved lab to assess hardness, Salinity, colour, Specific gravity, etc.,

iv). **Noise levels**
Quarrying of rough stone will be carried out by drilling and blasting by using low power explosives, and hence, noise will be very minimum. However, periodical noise level monitoring will be carried out every six months around the quarry site.

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L.A. [Signature]



v).	Vibration levels (due to blasting)	No deep hole blasting envisaged. Small dia shot holes are used for breaking boulders. The maximum peak particles velocity shall be recoded using mini seismograph devices as per the guidance of MoEF and EIA Notification 2006 and also covering DGMS norms.
vi).	Water regime	No major river is found around 50m radius.
vii).	Socio-economics	1. To provide Employment opportunities of the nearby villagers. 2. For the cultural development of the nearby villagers.
viii).	Historical monuments etc.	There are no historical monuments found around 10kms radius.

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

i).	Temporary storage and utilization of topsoil	: The topsoil shall be removed about 1917Cbm and stacked for earth bund of safety area for afforestation and to prevent inherent entry of cattle's and human as per rules 119 (1), Metalliferous Mines Regulations, 1961.
ii).	Year wise proposal for reclamation of land affected by abandoned quarries and other mining activities during first five years (and upto conceptual plan period for 'A' category mines) clarifying the extent of back filling and re-contouring and / or alternative use of unfilled / partially filled excavations / road sides / slopes and mine. In case abandoned quarries / pits are proposed to be	: The present mining is proposed to an ultimate depth of 35m from elevated terrain which is 10m above ground level (R.L. 290-280m) and 25m below ground level (R.L.280-255m) has been envisaged as workable depth for safe & economic mining during the lease period. The mined-out area will be fenced on top of open cast working with S1 fencing. Low lying areas with water logging shall be used for fish culture. No immediate proposals for closure of pit as the rough stone persist still at deeper level.

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L.A. [Signature]



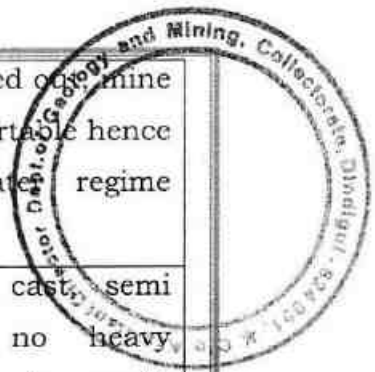
used as reservoir, their size, water holding capacity and proposal for utilization of such water is given.

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

10.0m safety barrier and Nearest Panchayat Roads has been identified to be utilized for Greenbelt appropriate native species of Neem, Pungan, etc and other regional trees will be planted in a phased manner as described below

Year	Place	Type of Trees	No. of Plants	Rate of survival
First	Lease boundary and Village road	Neem, Pungan and other regional trees	80	80%
Second	Lease boundary and Village road	Neem, Pungan and other regional trees	80	80%
Third	Lease boundary and Village road	Neem, Pungan and other regional trees	80	80%
Fourth	Lease boundary and Village road	Neem, Pungan and other regional trees	80	80%
Fifth	Lease boundary and Village road	Neem, Pungan and other regional trees	80	80%

iv).	Stabilization and vegetation of dumps along with waste dump management Yearwise for the first five years (and upto conceptual plan period for 'A' category mines).	:	There is no other mine waste shall be proposed. The top soil is 1917Cbm shall be removed and stacked for earth bund of lease hold area which will be used for plantation purposes and to prevent inherent entry of cattle's and human as per rules 119 (1), Metalliferous Mines Regulations, 1961.
v).	Measures to control erosion / sedimentation of water courses.	:	Not applicable. There are no major dumps are stabilized in this lease area.
vi).	Treatment and disposal of water from mine.	:	It will not be harmful and it does not require any treatment before discharging into the natural courses.



vii).	Measures for minimizing adverse effects on water regime.	: There is no water to be pumped out of the mine water will be very pure and potable hence it will not affect any water regime surrounding the quarry.
viii)	Protective measures for ground vibrations / air blast caused by blasting,	: It is a B2 category open cast semi mechanized mining and no heavy machinery shall be used. The only smooth blasting is proposed, therefore no change for ground vibration or noise from the quarry.
ix).	Measures for protecting historical monuments and for rehabilitation of human settlements likely to be disturbed due to mining activity.	: No historical monuments and for rehabilitation of human settlements doesn't to be disturbed during mining activity.
x).	Socioeconomic benefits arising out of mining.	: The nearest villages are will get employment medical and education benefits.,

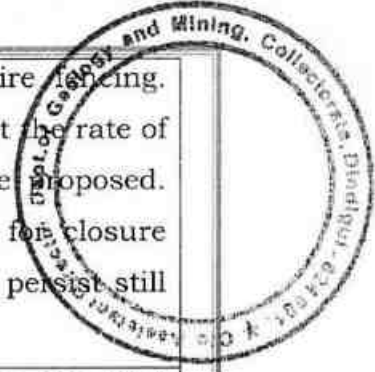
d). Monitoring schedules for different environmental components after the commencement of mining and other related activities. (For 'A' category mines only)

Not applicable. It is B2 category quarry

12.0 PROGRESSIVE QUARRY CLOSURE PLAN:

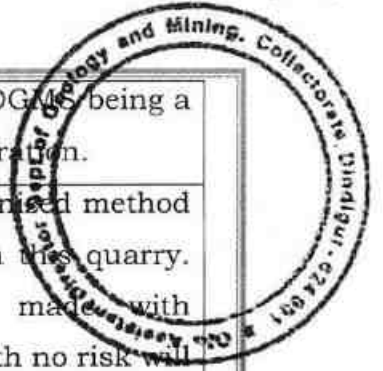
12.1	Steps proposed for phased restoration, reclamation of already mined out area.	: The present mining is proposed to an average depth of 35m from elevated terrain which is 10m above ground level (R.L. 290-280m) and 25m below ground level (R.L.280-255m). The mined-out area will be fenced on top of open cast working with S1 fencing to arrest the entry of cattle's and public in to the quarry site.
12.2	Measures to be under taken on mine closure as per Act &	: Measures will be taken as per the Acts and Rules. The quarried pit will

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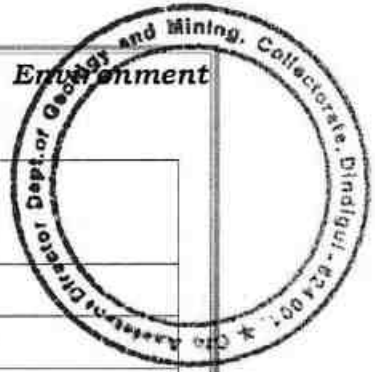
	Rules	be fenced by Barbed wire fencing. Green belt development at the rate of 80 trees per year will be proposed. No immediate proposals for closure of pit as the rough stone persist still at deeper level.
12.3	Mitigation measures to be undertaken for safety and restoration/ reclamation of the already mined out area	: The quarry lease is a renewed mining lease
12.4	Mine closure activity	: The present mining is proposed to an average depth of 35m from elevated terrain which is 10m above ground level (R.L. 290-280m) and 25m below ground level (R.L.280-255m) has been envisaged as workable depth for safe & economic mining during the lease period. The mined-out area will be fenced on top of open cast working with S1 fencing. Low lying areas with water logging shall be used for fish culture. No immediate proposals for closure of pit as the rough stone persist still at deeper level.
12.5	Safety and security	: Safety measures implement to the prevent access to surface opening excavations will be taken as Metalliferous Mine Rules, 1961, it is a small open cast mining method has been adopted. Safety provisions like helmet, goggles, safety shoes, Dust mask, Ear muffs etc., have to be provided as per the circulars and amendments made for Mine labours

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		under the guidance of DGMs being a mechanized mining operation.
12.6	Disaster Management and Risk Assessment	: Open cast, semi-mechanised method of mining is adopted in this quarry. If the benches are made with proposed height and with no risk will be there. Even then if any minor or major accident happens the quarry staffs having First aid facilities with first aid box with all necessary medicine and stretches etc., to give first aid treatment at the site and will arrange immediately the vehicle to reach nearest hospital, if any disaster happens the lessee is capable to meet such eventualities. At the time of any accident during mining activity, proposal of first aid facility at quarry and one vehicle always ready at quarry site.
12.7	Care and maintenance during temporary discontinuance	: During temporary discontinuance the working place will be fenced completely and a board of discontinuance will be changed on the main entrance of the working place. One watch man will be kept on the quarry area for security purposes also look after the survival of the plants.
12.8	Economic repercussions of closure of quarry and man power entrenchments	: During the five years mining period the employment potential will be generated, general financial status and socio-economic conditions of approx. 26 labors will be improved.

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

Management:

A. Fixed Asset Cost/Investment:		
1. Capital Cost (Tender cost)	:	Rs. 18,00,000/-
2. Infrastructure (Labour Shed)	:	Rs. 1,00,000/-
3. Sanitary Facility	:	Rs. 1,00,000/-
4. Fencing	:	Rs. 1,00,000/-
5. Others	:	Rs. 1,50,000/-
Total	:	Rs. 22,50,000/-
B. Operational cost		
1. Machinery's	:	Rs. 10,00,000/- (Hire basis)
C. EMP Cost: per year (Minimum 2 station * 2 season):		
1. Air quality test	:	Rs. 20,000/-
2. Water quality sampling (2 Nos)	:	Rs. 15,000/-
3. Noise test	:	Rs. 17,000/-
4. Soil analysis	:	Rs. 17,000/-
Total cost	:	Rs. 69,000/- per year
Total cost for 5 Years	:	Rs. 3,45,000/-
D. Expenditure cost (for five years)		
1. Drinking Water Facility for the labours	:	Rs. 1,00,000/-
2. Sanitary Maintenance	:	Rs. 75,000/-
3. Water Sprinkling	:	----
4. Afforestation and maintained	:	Rs. 75,000/-
5. Safety Kits	:	Rs. 50,000/-
Total	:	Rs. 3,00,000/-
E. Total Project Cost(A+B+C+D)	:	Rs. 38,95,000/-

13.0 FINANCIAL ASSURANCE:

Not applicable, it is a small B2 rough stone quarry.

14.0 CERTIFICATES:

All required certificates are enclosed.

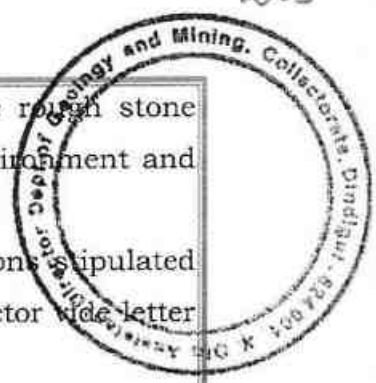
15.0 PLAN AND SECTIONS, ETC:

Plan and sections are submitted along with mining plan.

16.0 ANY OTHER DETAILS INTEND TO FURNISH BY THE APPLICANT

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

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L.A. Sanyal



- (ii) The applicant will endeavor every attempt to quarry the rough stone economically without any wastage and to improve the environment and ecology.
- (iii) The mining plan is prepared by incorporating the conditions stipulated in the precise area communication issued by District collector vide letter **Rc.No.112/2021 (Mines) Dated 06.05.2021.**
- (iv) Total Proposed production of rough stone is **105820Cbm** up to depth of 35m from elevated terrain which is 10m above ground level (R.L. 290-280m) and 25m below ground level (R.L.280-255m) for the five years mining plan periods.

17.0 CSR Expenditure:

CSR (Corporate Social Responsibility) shall provide by the lessee @ 2.5% of average net profit of the company for the last three financial years to the neighboring villages on the provisions under section 135(1) of the companies Act, 2013 and Rule 3(2) companies CSR Rules, 2014 as circular no.05/01/2014.

Place: Dharmapuri, TN

Date :

Signature of the Recognized Qualified Person

Dr. S. KARUPPANNAN, M.Sc., Ph.D.,
RQP/MAS/263/2014/A
GEO TECHNICAL MINING SOLUTIONS
1/213-B, Ground Floor, Natesan Complex,
Collectorate Post Office, Oddapatti,
Dharmapuri - 636 705. Tamil Nadu, India.

RoC.No 112/2021 (Mines) Date. 07.2021

This Mining Plan is approved based on instruction and conditions given by the Commissioner of Geology and Mining, Chennai vide letter No. 3808/1/2012 dated 19.11.2012 and conditions laid by the District Collector, Dindigul in Precise Area Communication Letter No. 112/2021 (Mines), dated 06.05.2021.

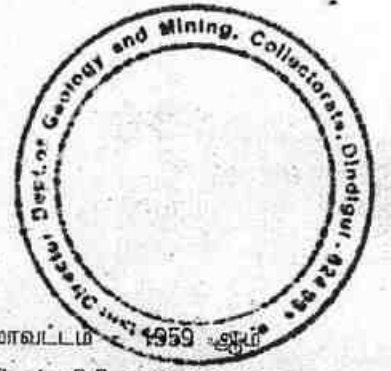
Assistant Director,
Geology and Mining
Dindigul.

அனுப்பநர்

பெறுநர்

திருமதி.மு.விஜயலட்சுமி, இ.ஆ.ப.,
மாவட்ட ஆட்சித்தலைவர்,
திண்டுக்கல் மாவட்டம்
திண்டுக்கல்.

திரு.அ.கோவிந்தராஜன்,
த/பெ.அமிர்தலிங்கதாஸ்,
6, மண்மலை சாமி தெரு,
கே.புதூர், மதுரை.



ந.க.எண். 112/2021 (கனிமம்), நாள்: 06.05.2021

பொருள்: கனிமங்களும் குவாரிகளும் - திண்டுக்கல் மாவட்டம் வரடத்திய தமிழ்நாடு சிறுகனிமச் சலுகை விதிகள் விதி எண் 8(1)-ன் கீழ் நத்தம் வட்டம், நடுமண்டலம் கிராமம், அரசுப் புறம்போக்கு புல எண்: 569/1 (பகுதி-4) 1.20.0 ஹெக்டேர் புறம்போக்கில் உள்ள கல்குவாரி ஐந்து ஆண்டுகளுக்கு 25.02.2021 அன்று டெண்டர் முறையில் தேர்ந்தெடுக்கப்பட்ட திரு.அ.கோவிந்தராஜன் என்பவர் ஏற்பளிக்கப்பட்ட சுரங்கத்திட்டம் மற்றும் மாநில அளவிலான சுற்றுப்புறச்சூழல் செயல்விழைவு ஆணையம் சான்றிதழ் அனுப்பக் கோருதல் - தொடர்பாக.

- பார்வை:
1. திண்டுக்கல் மாவட்ட அரசிதழ் சிறப்பு வெளியீடு எண்: 4, நாள்: 09.02.2021
 2. இவ்வலுவலக குறிப்பாணை ந.க.எண்:112/2021(கனிமம்), நாள்: 25.02.2021
 3. அரசாணை எண்.79/எம்.எம்.சி1/தொழில் துறை நாள் 06.04.2015

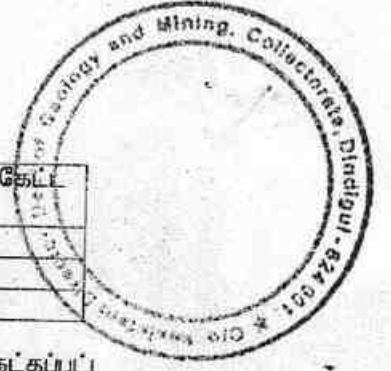
திண்டுக்கல் மாவட்டத்தில் தகுதிலாய்ந்த கல்குவாரிகளை ஐந்து ஆண்டுகள் காலத்திற்கு டெண்டர்/ ஏலம் மூலம் குத்தகைக்கு விடுவதற்கு, திண்டுக்கல் மாவட்ட அரசிதழ் சிறப்பு வெளியீடு எண்.4, நாள்.09.02.2021-ன்படி அறிவிக்கையும், நாளிதழில் விளம்பரமும் வெளியிடப்பட்டது. மாவட்ட ஆட்சித்தலைவரால் ஏலம் நடத்தும் அலுவலராக மாவட்ட ஆட்சியரின் நேர்முக உதவியாளர்(பொது) அவர்கள் நியமிக்கப்பட்டு 25.02.2021 அன்று ஏலம் நடத்தப்பட்டது.

25.02.2021 அன்று நடைபெற்ற ஏலத்தில், நத்தம் வட்டம், நடுமண்டலம் கிராமம், அரசுப் புறம்போக்கு 569/1 (பகுதி-4) 1.20.0 ஹெக்டேர் பரப்பளவுள்ள அரசு புறம்போக்கு குவாரிக்கு ஐந்து ஆண்டு காலத்திற்கு குத்தகை கோரி டெண்டர் விண்ணப்பம் அளித்தவர்கள் விவரம், குறிப்பிட்ட தொகை மற்றும் பொது ஏலத்தில் கலந்து கொண்டவர்கள் விவரம், ஏலம் கேட்ட அதிபைச்ச தொகை ஆகியவை பின்வருமாறு.

I. டெண்டர் விண்ணப்பம் செய்தவர்களின் பட்டியல்.

வ. எண்.	டெண்டர் விண்ணப்பதாரர் பெயர்	குறிப்பிட்ட தொகை
1.	அ.கோவிந்தராஜன்	ரூ.18,00,000/-
2.	எஸ்.கண்ணன்	ரூ.2,50,000/-

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II. பொது ஏலத்தில் கேட்டவர்கள் பட்டியல்.

வ. எண்.	ஏலதாரர் பெயர்	அதிகபட்சமாக ஏலம் கேட்ட தொகை
1.	அ.கோவிந்தராஜன்	ரூ.18,00,000/-
2.	எஸ்.கண்ணன்	ரூ.17,50,000/-
3.	அ.ஸட்சமிபதி	ரூ.17,40,000/-

மேற்படி கல்குவாரிக்கு ஏலதாரர் திரு.அ.கோவிந்தராஜன் என்பவரால் கேட்கப்பட்ட ஏலத்தொகை ரூ.18,00,000/- அரசால் நிர்ணயம் செய்யப்பட்ட மதிப்பு தொகையை விட கூடுதலாக இருந்த காரணத்தினால் திரு.அ.கோவிந்தராஜன் என்பவரால் கோரப்பட்ட டெண்டர் தொகை ஏற்கப்பட்டு பார்வை 3-ல் கண்ட இவ்வலுவலக குறிப்பாணையின் மூலம் மீதமுள்ள 90 சதவீத ஏலத் தொகையான ரூ.15,45,000/-ஐ பதினைந்து நாட்களுக்குள் அதாவது 11.03.2021-க்குள் செலுத்தாமறு கேட்டுக் கொள்ளப்பட்டது. அதன்படி டெண்டர்தாரர் கோரிய முழுத் தொகையையும் உரிய காலத்தில் கீழ்க்கண்டவாறு அரசுக் கணக்கில் செலுத்தியுள்ளார்.

வ. எண்.	செலுத்திய விபரம்	அரசுக் கணக்கில் செலுத்தப்பட்ட சலாள் விபரம்	அரசுக் கணக்கில் செலுத்தப்பட்ட வரைவோலை விபரம்	மொத்தம் (ரூ)
1.	10 சதவீதத் தொகை		ரூ.2,30,000/- SBI, Dgl DD No: 495797, Dt: 24.02.2021	2,30,000/-
2.			ரூ.25,000/- SBI, Dgl DD No: 495792, Dt: 24.02.2021	25,000/-
மொத்தம்				2,55,000/-
3.	90 சதவீதத் தொகை	ரூ.15,45,000/- பா.பா.வ, திண்டுக்கல் நாள்: 05.03.2021		15,45,000/-
மொத்தம்				15,45,000/-
ஆக மொத்தம் (2,55,000 + 15,45,000)				18,00,000/-

எனவே, நத்தம் வட்டம், நடுவண்டலம் கிராமம், அரசுப் புறம்போக்கு 569/1 (பகுதி-4) 1.20.0 ஹெக்டேர் புறம்போக்கு நிலத்திற்கான ஏலத்தில் அதிகபட்ச டெண்டர் தொகையை கோரியதற்காக திரு.அ.கோவிந்தராஜன் என்பவருக்கு 1959 ஆம் வருடத்திய தமிழ்நாடு சிறுகனிமச் சலுகை விதிகள் விதி எண் 8(1)-வ்கீழ் மேற்குறிப்பிட்ட பரப்பில் கற்கள் வெட்டியெடுத்து குவாரியை சேர்ந்த நடைமுறையில் உள்ள அனைத்து விதிகள் மற்றும் கீழ்க்கண்ட நிபந்தனைகளுக்குட்பட்டு ஈழத்து வருடங்களுக்கு குத்தகை அனுமதி வழங்குவதற்கான (Precise Area) பரப்பாகக் கருதப்படுகிறது.

பார்வை 3-ல் கண்ட அரசாணையின்படி 1959 ஆம் வருடத்திய தமிழ்நாடு சிறு கனிமச் சலுகை விதிகளில் திருத்தம் செய்யப்பட்டு விதி எண் 41 மற்றும் விதி எண் 42 உடனடியாக 06.04.2015 முதல் நடைமுறைப்படுத்தப்பட்டுள்ளது. எனவே, மேற்கண்ட விதிகளின்படி டெண்டர்தாரர் உடனடியாக கீழ்க்கண்ட ஆவணங்களை சமர்ப்பிக்க கேட்டுக் கொள்ளப்படுகிறார்.

2 14 267



1) பார்வை 3-ல் கண்ட அரசாணையின்படியும் மற்றும் திண்டுக்கல் மாவட்ட சிறப்பு அரசிதழ் வெளியீட்டின்படி மாவட்ட ஆட்சித்தலைவர் மூலம் குத்தகை வழங்க கருதப்பட்ட பரப்பிற்கு வரைவு சுரங்கத்திட்ட அறிக்கை சமர்ப்பிக்க அறிவுறுத்திய கடிதம் குத்தகைதாரரால் பெறப்பட்ட நாளிலிருந்து 90 நாட்களுக்குள் பதிவு பெற்ற தகுதி வாய்ந்த நபரால் (RQP) தயாரிக்கப்பட்ட சுரங்க திட்ட வரைபடம் மூன்று பிரதிகள் மாவட்ட அளவில் உள்விட உதவி இயக்குநர், புவியியல் மற்றும் சுரங்கத்துறை அலுவலகத்தில் சமர்ப்பிக்கப்பட வேண்டும்.

2) குத்தகைதாரர் மூலம் பெறப்பட்ட வரைவு சுரங்கத்திட்ட அறிக்கையில் உதவி இயக்குநர் புவியியல் மற்றும் சுரங்கத்துறை பார்வை 3-ல் தெரிவித்துள்ளபடி ஆய்வு செய்து ஒப்புதல் செய்து குத்தகைதாரருக்கு வழங்கவேண்டும்.

3) குத்தகைதாரர் ஏற்பளிக்கப்பட்ட வரைவு சுரங்கத்திட்ட அறிக்கை பெறப்பட்டவுடன் அத்துடன் மேலும் பார்வை 3-ல் தெரிவித்தபடி மாநில அளவிலான சுற்றுப்புற சூழல் செயல்விழைவு மதிப்பீடு ஆணையத்திலிருந்து சான்றிதழ் பெற கீழ்க்கண்ட ஆவணங்களை இணைத்து மாநில அளவிலான சுற்றுப்புறச் சூழல் செயல் விழைவு மதிப்பீடு ஆணையம், (State Level Environment Impact Assessment Authority) சென்னை-600 009 அலுவலகத்திற்கு விண்ணப்பித்து அதன் அறிக்கை 90 நாட்களுக்குள் பெற்று சமர்ப்பிக்க வேண்டும்.

- அ) படிவம்-I (Environment Impact Assessment Authority Notification 2006)
- ஆ) An Environment impact Assessment Report
- இ) An Approved Mining Plan, by the Competent Authority

4) மாநில அளவிலான சுற்றுப்புறச் சூழல் செயல் விழைவு மதிப்பீடு ஆணையத்தின் ஏற்பளிக்கப்பட்ட சுரங்கத்திட்டம் மற்றும் தடையில்லாச் சான்று பெற்ற பின்னர் அதனடிப்படையில் 1959 ஆம் வருடத்திய தமிழ்நாடு சிறுகனிமச் சலுகை விதி எண். 8(1)-ன்படி மாவட்ட ஆட்சித்தலைவர் அவர்களால் டெண்டர் தாரருக்கு குத்தகை உரிமம் வழங்க இறுதி ஆணை பிறப்பிக்க முடிவு எடுக்கப்படும்.

எனவே, டெண்டர் முறையில் தேர்ந்தெடுக்கப்பட்ட நபர் மேற்படி விண்ணப்ப புலத்திற்கு சுரங்கத்திட்ட அறிக்கையை (Mining Plan) இக்கடிதம் கிடைக்கப்பெற்ற நாளிலிருந்து 90 நாட்களுக்குள் தவறாது திண்டுக்கல் மாவட்ட புவியியல் மற்றும் சுரங்கத்துறை துணை இயக்குநரின் ஒப்புதலுக்கு சமர்ப்பிக்க வேண்டும். ஏற்பளிக்கப்பட்ட சுரங்க திட்ட அறிக்கை கிடைக்கப்பெற்ற பின்னர் மாநில அளவிலான சுற்றுப்புறச் சூழல் தாக்க மதிப்பீட்டு ஆணையத்திற்கு விண்ணப்பித்து தடையில்லாச் சான்று பெற்று சமர்ப்பிக்க குத்தகைதாரரை அறிவுறுத்தப்படுகிறார். மாநில அளவிலான சுற்றுச் சூழல் தாக்க மதிப்பீட்டு ஆணையத்தின் தடையில்லாச் சான்று பெற்று சமர்ப்பித்தவுடன் குத்தகை உரிமம் வழங்கி ஆணையிடப்படும் என தெரிவிக்கப்படுகிறது. தவறும் பட்சத்தில் 1959 ஆம் வருடத்திய தமிழ்நாடு சிறுகனிமச் சலுகை விதிகள் 8(1), 41 மற்றும் 42-ன்படி தெரிவிக்கப்பட்டுள்ள உரிய விதிகளின்படியும் இறுதி முடிவு எடுக்கப்படும் என்ற விபரம் தெரிவிக்கப்படுகிறது.

L. A. Siva



நிபந்தனைகள்

1. குத்தகை உரியம் வழங்கப்பட்ட பகுதியில் முப்பரிமாண அளவுகள் வெளிக்கொணரவும் வகையில் (Total Station Survey) முறையில் அரசு அங்கீகாரம் பெற்ற RQP மூலம் அளவீடு செய்து சுரங்கத்திட்ட வரைபடம் தயார் செய்து சமர்ப்பிக்க வேண்டும்.
2. 1959 ஆம் வருடத்திய தமிழ்நாடு சிறுகணிமச் சலுகை விதிகள் விதி எண் 8, 36(1), 41 மற்றும் 42-ன்படி குறிப்பிடப்பட்டுள்ள அனைத்து விதிகளும் கடைப்பிடிக்கப்பட வேண்டும்.
3. குவாரிப் பணி செய்யும் பகுதியினை சுற்றிலும் உள்ள மட்டா மற்றும் அரசுப் புறம்போக்கு நிலங்களுக்கு முறையே 7.5 மீட்டர் மற்றும் 10 மீட்டர் பாதுகாப்பு இடைவெளி கடைப்பிடிக்கப்பட வேண்டும்.
4. மாநில அளவிலான சுற்றுப்புறச் சூழல் செயல் விழைவு மதிப்பீடு ஆணையத்தின் வழிமுறைகள் படி சுரங்கத்திட்டம் சமர்ப்பிக்கப்பட வேண்டும்.
5. மாநில அளவிலான சுற்றுப்புறச் சூழல் ஆணையத்திடமிருந்து தடையில்லா சான்று பெற்று சமர்ப்பிக்கப்பட வேண்டும்.

ஓம்/-மு.விஜயலட்சுமி,
மாவட்ட ஆட்சித்தலைவர்,
திண்டுக்கல்.

//உ.ப.உ.ப//

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மாவட்ட ஆட்சித் தலைவருக்காக,
உதவி இயக்குநர்,
புவியியல் மற்றும் சுரங்கத்துறை,
திண்டுக்கல்

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10/05/21

நகல்:-

1. தலைவர்,
மாநில அளவிலான சுற்றுப்புறச் சூழல் செயல்விழைவு ஆணையம்,
சைதாப்பேட்டை,
சென்னை - 600 009
2. ஆணையர், புவியியல் மற்றும் சுரங்கத்துறை, கிண்டி, சென்னை - 32.


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Dr. S. KARUPPANNAN, M.Sc., Ph.D.,
RQP/MAS/263/2014/A

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தமிழ்நாடு அரசு
2021

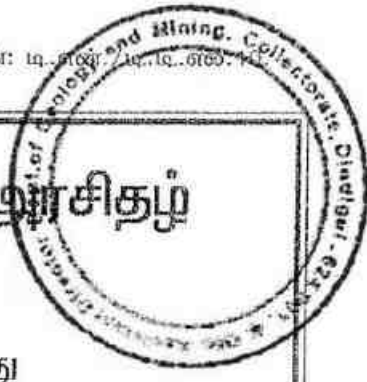
பதிவேண்: டி.எண்/டி.டி.எண்/...



திண்டுக்கல் மாவட்ட ஆட்சித் துறை

சிறப்பு வெளியீடு

ஆணையின்படி வெளியிடப்பட்டது



திண்டுக்கல், பிப்ரவரி 9, 2021
தை 27, சார்வரி, திருவள்ளூர் ஆண்டு-2052

[எண் 4]

மாவட்ட ஆட்சியர் அறிவிக்கை

(ந.க.எண்:40/2021 (கனிமம்), நாள்:08.02.2021)

கல்குவாரிகள் ஏல அறிவிப்பு

திண்டுக்கல் மாவட்டத்தில் உள்ள அரசு புறம்போக்கு நிலங்களில் தேர்வு செய்யப்பட்டுள்ள கல்குவாரிகளிலிருந்து கட்டுமான பணிக்கு பயன்படும் உடைகல், ஐல்லி, கரணை கல், கட்டுக்கல், வேலிக்கல் உடைத்து எடுத்துக்கொள்ள மூடி முத்திரையிடப்பட்ட மறைமுக டெண்டருடன் இணைந்த திறந்த முறை பொது ஏலம் மூலம் குவாரி குத்தகை வழங்குவது தொடர்பான அறிவிக்கை.

தமிழ்நாடு சிறுவகைக் கனிமச் சலுகை விதிகள் 1959 விதி எண் 8 உள்விதி (1)-(அ)-ன்படி இந்த அறிவிப்புடன் இணைக்கப்பட்டுள்ள அட்டவணையில் கண்டுள்ள அரசு புறம்போக்கு நிலங்களில் அமைந்துள்ள சாதாரண கற்குவாரிகளில் இருந்து கட்டிடம் மற்றும் சாலை அமைக்க பயன்படும் சாதாரண-பொது உபயோக சிறுவகை கனிமங்கள், அதாவது சரளை, சக்கை, கல்தூண், ஐல்லி, முண்டுக்கல், கட்டுக்கல் மட்டும் வெட்டி எடுத்துச் செல்ல உரிமம் வழங்க ஐந்தாண்டு மற்றும் பத்தாண்டு காலத்திற்கு குத்தகை பெற, மூடி முத்திரையிடப்பட்ட மறைமுக டெண்டருடன் இணைந்த திறந்த முறை ஏலம் மூலம் குவாரி குத்தகை கோரும் டெண்டர் மனுக்கள் திண்டுக்கல் மாவட்ட ஆட்சியரால் 24.02.2021 மாலை 5.00 மணி வரையிலும் டெண்டர் விண்ணப்பங்கள் பெறப்படும்.

திறந்த முறை ஏலம் மற்றும் மறைமுக டெண்டர் விண்ணப்பங்கள் திறப்பது ஆகிய நடைமுறைகள், திண்டுக்கல் மாவட்ட ஆட்சியர் அலுவலகத்திலுள்ள கூட்ட அரசங்கத்தில் மாவட்ட ஆட்சித்தலைவரால் அல்லது அவரால் அங்கீகரிக்கப்பட்ட அலுவலரால் 25.02.2021 அன்று காலை 10.30 மணிக்கு தொடங்கி பட்டியலில் கண்டுள்ள வரிசைப்படி தொடர்ந்து நடத்தப்படும்.

நேரடியாக பொது ஏலத்தில் கலந்துகொள்ள விரும்புவர்கள் பகுதி-I-ல் கண்ட நிபந்தனை-3-ல் குறிப்பிடப்பட்டவாறு மனு மற்றும் ஆவணங்களை அசல் மற்றும் இரண்டு நகல்களை 25.02.2021 அன்று காலை 10.30 மணி முதல் பகுதி - I இன் நிபந்தனை 4-ல் குறிப்பிடப்பட்ட அலுவலரிடம் ஏலம் நடைபெறுவதற்கு முன்னதாக ஒப்படைத்து உரிய படிவத்தில் ஒப்புதல் கடிதம் பெற்றுக்கொள்ள வேண்டும்.

[1]



பகுதி - I மனு செய்வதற்கான நிபந்தனைகள்

1. இந்த அறிவிக்கை தொடர்பாக குத்தகைக் கோரும் டெண்டர் மனுக்கள் தமிழ்நாடு சிறுவகை கனிம சலுகை விதிகள் 1959-ல் பின்னிணைப்பு IV-ல் கட்டுள்ள படிவத்தில் அசல் மற்றும் இரண்டு நகலுடன் கொடுக்கப்பட வேண்டும். அதன் மாதிரி படிவம் இவ்வறிக்கையின் கடைசியில் இணைக்கப்பட்டுள்ளது. உரிய படிவத்தில் இல்லாத விண்ணப்பங்கள் நிராகரிக்கப்படும்.

2. இந்த அறிவிக்கையின் இறுதியில் கண்டுள்ள அட்டவணையில் கொடுக்கப்பட்ட ஒவ்வொரு இனத்திற்கும் தனித்தனியாக மனுக்கள் கொடுக்கப்பட வேண்டும்.

3. டெண்டர் மனுவுடன் கீழ்கண்ட சான்றிதழ்கள் மற்றும் ஆவணங்கள் அசல் மற்றும் இரண்டு நகல்கள் மனுவுடன் இணைத்து கொடுக்கப்பட வேண்டும்.

அ. திரும்ப பெற இயலாத விண்ணப்ப படிவ கட்டணமாக ரூ.1500/-யை அரசு கருவூலத்தில் செலுத்தி மனுவுடன் இணைக்கப்பட வேண்டும் அல்லது ஏதேனும் ஒரு தேசியமயமாக்கப்பட்ட வங்கியில், வங்கி வரைவோலை "மாவட்ட ஆட்சியர்" திண்டுக்கல் என்று பதவியின் பெயரில் குறிப்பிட்டு எடுத்து இணைக்கப்பட வேண்டும்.

ஆ. பிணைய லவப்புத் தொகையாக ரூ.25,000/- மட்டும் மாவட்ட ஆட்சியர் திண்டுக்கல் என்ற பெயருக்கு ஏதேனும் ஒரு தேசியமயமாக்கப்பட்ட வங்கியில், வங்கி வரைவோலை பெற்று மனுவுடன் இணைக்கப்பட வேண்டும். தனிநபர் பெயருக்கு எடுத்துக் கொடுக்கப்படும் வங்கி வரைவோலை ஏற்றுக் கொள்ளப்பட மாட்டாது.

இ. டெண்டர் மனுதாரர் தான் மறைமுகமாக குறிப்பிடும் அதிகப்படுத்த டெண்டர் தொகையில் 10 சதவீதத் தொகைக்கான வங்கி வரைவோலையை மாவட்ட ஆட்சியர் திண்டுக்கல் என்ற பெயருக்கு ஏதேனும் ஒரு தேசியமயமாக்கப்பட்ட வங்கியில், வங்கி வரைவோலை பெற்று மனுவுடன் இணைக்கப்பட வேண்டும்.

ஈ. டெண்டர் மனுதாரர் தனியாகவோ அல்லது மற்றவருடன் கூட்டாகவோ இணைந்து, தமிழ்நாட்டில் எந்த ஒரு மாவட்டத்திலும் (i) ஏற்கனவே காலாவதியான குவாரி குத்தகைகளும், (ii) நடப்பிலுள்ள குவாரி குத்தகைகளும், (iii) குத்தகை கோரி மனுச் செய்யப்பட்டு நிலுவையிலுள்ள மனுக்கள் விபரம் மற்றும் (iv) தற்போதைய மனுவுடன் ஒரே நேரத்தில் வேறு பகுதியில் குத்தகைக் கோரும் மனுக்கள் விபரம் ஆகியவைகள் அடங்கிய ஆணை உறுதி ஆவணத்தில் ஒப்பமிட்டு சான்று உறுதி அலுவலரின் (Notary Public) ஒப்புதல் பெற்று இணைக்க வேண்டும்.

உ.) டெண்டர் மனுதாரர் நிபந்தனை (ஈ) யில் கண்ட விவரப்படி ஏற்கனவே குவாரி குத்தகை பெற்றிருப்பவரையின் சுரங்க வரியினங்களான, ராயல்டி, சீனியரேஜ் தொகை, முடக்குவரி, பரப்புவரி, ஸ்தல வரி மற்றும் ஸ்தல வரிக்கான கூடுதல் வரி, மற்றும் அபராதம் ஏதேனும் விதிக்கப்பட்டிருப்பின் அந்த தொகைகளை செலுத்தியதற்கான "சுரங்கவரி நிலுவையில்லாச் சான்று" சம்பந்தப்பட்ட மாவட்டத்தில் பெற்று ஒப்படைக்க வேண்டும்.

ஊ.) டெண்டர் மனுதாரர், வருமானவரி செலுத்துபவரையின், செல்லுபடியாகத்தக்க வருமானவரிச் சான்று பெற்று ஒப்படைப்பதுடன் (i) நான்கு தேதிவரை வருமானவரி தொடர்பான கணக்குகளை அத்துறைக்கு சமர்ப்பித்ததாகவும், (ii) கணக்கீடு செய்யப்பட்ட வருமான வரிடீச் செலுத்துவதாகவும் சமர்ப்பிக்க வேண்டும். பிற நபர்கள் 1961 ஆம் ஆண்டு வருமானவரிச் சட்டத்தின்படி கணக்கீடு செய்ததின் அடிப்படையில் வருமானவரி செலுத்த அவசியம் எழவில்லை எனக் குறிப்பிட்டு அதனை ஆணை உறுதி ஆவணத்தில் ஒப்பமிட்டு, சான்று உறுதி அலுவலரின் இசைவு பெற்று மனுவுடன் இணைக்க வேண்டும்.

எ) மனுதாரர் இருப்பிடச் சான்று தொடர்பாக, ஒட்டுநர் உரிமம், வாக்காவர் அடையாள அட்டை, குடும்ப அட்டை மற்றும் ஆதார் அட்டை ஆகியவற்றில் ஏதாவது ஒன்றின் நகல் இணைக்கவேண்டும்.

(Handwritten signature)



4. மேற்கண்ட இணைப்புகளுடன், அசல் மனு மற்றும் இரண்டு நகல்கள் ஆகியவற்றை, மூடி முத்திரையிடப்பட்ட உறையில் வைத்து உறையின்மேல் கல்கொடரி அட்டவணைகளில் கண்ட அட்டவணை எண், வரிசை எண், வட்டம், கிராமம், புல எண், விஸ்தீர்ணம் ஆகியவற்றைக் குறிப்பிட்டு, குத்தகை கோரும் டெண்டர் மனு என்று குலைப்பீட்டும், அதன் கடி டெண்டர் மனுதாரரின் பெயர் மற்றும் சரியான முகவரி எழுதியும், பெறுநர் : மாவட்ட ஆட்சியர், திண்டுக்கல் மாவட்டம் என்று தெளிவாகவும் எழுதி, கீழ் குறிப்பிடப்பட்ட அலுவலகக்கு 24.02.2021 அன்று மாலை 5.00 மணிக்குள் கிடைக்குமாறு அனுப்பி வைக்க வேண்டும்.

"உதவி இயக்குநர், அறை எண். 277, இரண்டாம் தளம், புலியியல் மற்றும் கரங்கத்துறை, திண்டுக்கல் மாவட்ட ஆட்சியர் அலுவலக வளாகம், திண்டுக்கல்." தொலைபேசி எண்: 0451-2460061

5. நேரடியாக அலுவலகத்தில் கொடுக்கப்படும் முத்திரை இடப்பட்ட டெண்டர் உறைகளை பெற்றுக் கொண்டமைக்காக, தமிழ்நாடு சிறுவகைக் கமிஷன் சலுகை விதிகள் 1959 ன் பின்னிணைப்பு IX-இல் கண்ட படிவத்தில் ஒப்பந்தல் கடிதம் வழங்கப்படும்.

6. குறிப்பிடப்பட்ட காலக்கெடு முடிந்த பின்னர், மேற்படி அலுவலரால் பெறப்படும் மூடி முத்திரை வைத்த டெண்டர் உறைகள், உறையின்மீது, "பெறுநர் : மாவட்ட ஆட்சியர், திண்டுக்கல் மாவட்டம்" எனக் குறிப்பிடப்படாத டெண்டர் உறைகள் மற்றும் குவாரியின் வரிசை எண், வட்டம், கிராமம், புல எண், விஸ்தீர்ணம் குறிப்பிடப்படாத உறைகள் ஏற்றுக் கொள்ளப்பட மாட்டாது. செய்தித்தாள் மூலமாகவோ, மாவட்ட அரசிதழ் மூலமாகவோ துறிலிப்பு செய்யப்படாத குவாரிகளுக்கு ஏதாவது ஒப்பந்தப்புள்ளி விண்ணப்பங்கள் பெறப்பட்டால் அவையாவும் முதிர்ச்சி அடையாத விண்ணப்பமாகக் கருதப்பட்டு மாவட்ட ஆட்சியரால் உடனடியாக நிராகரிக்கப்படும்.

7. மூன் குறிப்பிடப்பட்ட நிபந்தனைகளின்படி பெறப்பட்ட டெண்டர் உறை அனுப்பிய மனுதாரர்கள், ஒப்பந்தல் கடிதம் காண்பிக்கும் பட்சத்தில் டெண்டர் உறைகள் திறக்கப்படும்போது ஏல அரங்கில் இருக்க அனுமதிக்கப்படுவர்.

8. அலுவலரால் பெறப்பட்ட மூடி முத்திரையிடப்பட்ட டெண்டர் உறைகள் குவாரி இனம் வாரியாக திறக்கப்படுவதற்கு மூன் அந்த இனத்திற்கு திறந்தமுறை பொது ஏலம் நடத்தப்படும். இந்த அறிவிக்கையுடன் இணைக்கப்பட்டுள்ள அட்டவணையில் குறிப்பிடப்பட்ட ஒவ்வொரு இனங்களுக்கும் திறந்தமுறை பொது ஏலம் 25.02.2021 அன்று மாலை 10.30 மணியளவில் தொடங்கி தொடர்ந்து நடத்தப்படும்.

பகுதி II திறந்த பொது ஏலத்தில் கலந்துகொள்வதற்கான நிபந்தனைகள்

1. திறந்தமுறை பொது ஏலத்தில் கலந்துகொள்ள மனு கொடுப்போர், மனுவின் இனம் 9-ல் கண்டுள்ள வினாவில் மனுச் செய்யும் சமயத்தில் டெண்டர்/கேட்புத் தொகை குறிப்பிடத் தேவையில்லை.
2. மூடி முத்திரையிடப்பட்ட உறையின் மூலம் டெண்டர் மனு கொடுத்துள்ள நபர் இரண்டாம் முறையாக மனு கொடுக்க தேவையில்லை. ஆனால் அவர்கள் நேரடியாக திறந்தமுறை பொது ஏலத்திலும் கலந்துகொள்ளலாம்.
3. மூடி முத்திரை இடப்பட்ட டெண்டர் உறை கொடுத்துள்ள மனுதாரர் மற்றும் பொது ஏலத்தில் கலந்துகொள்ள உள்ள மனுதாரர் ஆகியோர், பொது ஏலத்தில் கலந்துகொள்ள இயலாத நிலையில் அவர்களது நியமனம் பெற்ற மற்றொரு நபர் மனுதாரரின் ஒப்பந்தல் கடிதம் பெற்று அதனை சான்று உறுதி அலுவலரின் மேலொப்பம் பெற்று அதனையும், விண்ணப்பம் கொடுத்ததற்கான அலுவலரிடமிருந்து பெறப்பட்ட அசல் ஒப்பந்தல் கடிதத்தையும் ஏலம் நடத்தும் அலுவலரிடம் ஒப்படைத்துவிட்டு, ஏலத்தில் கலந்துகொள்ள வேண்டும். ஏலம் முடிவடைந்தவுடன் அலுவலர் கொடுத்த ஒப்பந்தல் கடிதம் மட்டும் திரும்ப ஒப்படைக்கப்படும்.



4.(அ) மாவட்ட ஆட்சியரோ அல்லது அவரது அதிகார அனுமதி பெற்ற அலுவலரோ குவாரி குத்தகை தொடர்பாக குவாரி இலம் வாரியாக தனித்தனியே திறந்தமுறை ஏலம் நடத்துவார் அப்போது அந்த இனத்திற்கு திறந்தமுறை ஏலத்திற்கு மனு கொடுத்துள்ளவர்கள் மற்றும் டெண்டர் உறை கொடுத்தவர்களும், தான் கூற விருமடும் ஏலத்தொகையை கூற அனுமதிக்கப்படுவர்.

(ஆ) மனுதாரர் அல்லது அவரது அதிகாரம் பெற்ற நபர் பட்டியலும் ஏலத்தில் கலந்துகொள்ளாதபோதும், ஏலம் நடத்தப்பட்டு, டெண்டர் உறைகள் திறக்கப்பட்டு விதிமுறைகளின்படி, மேல் நடவடிக்கை தொடரப்படும்.

5. ஏலம் முடிந்தபின் ஏலம் நடத்தும் அலுவலர், அந்த இனத்திற்கு திறந்தமுறை ஏலத்திற்கு பெறப்பட்ட மொத்த மனுக்களின் எண்ணிக்கை, மனு கொடுத்துள்ளவர்களின் பெயர், அதிகபட்சமாக கூறப்பட்ட ஏலத்தொகையை குறிப்பிட்டு ஏலம் கூறிய நபர் மற்றும் முகவரி ஆகியவற்றை ஏலம் நடத்தப்படும் இடத்திலேயே அறிவிப்பார்.

6. பின்னர் அந்த இனத்திற்கு குத்தகை கோரி பெறப்பட்ட எல்லா மூடி முத்திரை இடப்பட்ட டெண்டர் உறைகளும் திறக்கப்பட்டு, அவற்றில் உள்ள மனுக்கள், ஏலதாரர்கள் மற்றும் டெண்டர்தாரர்கள் முன்னிலையில் ஆய்வு செய்யப்படும்.

7. பகுதி - I இல் கண்ட நிபந்தனை 3-ல் குறிப்பிடப்பட்டுள்ள சான்றிதழ்கள், ஆவணங்கள் மற்றும் வங்கி வரையோலைகள் இணைக்கப்படாத மனுக்களும், விண்ணப்பத்தில் காணும் விபரங்களில் உள்ள 9-ல் தெரிவித்தபடி டெண்டர் தொகையினை தெளிவாக குறிப்பிடாத மனுக்களும், டெண்டர்தாரரின் கையொப்பம் இடப்படாத மனுக்களும் விண்ணப்பத்தில் தவறான விபரங்கள் தரப்பட்ட மனுக்களும் செல்லத்தகாதவை என்று முடிவு செய்யப்பட்டு ஏலக் கூடத்திலேயே அறிவிக்கப்படும். இதற்காக தனியே எழுத்து மூலமாக ஆணை ஏதும் பிறப்பிக்கப்படமாட்டாது.

8. செல்லுபடியாகத்தக்க மனுக்கள் ஆய்வு செய்யப்பட்டு அவற்றில் அதிகபட்ச டெண்டர் தொகை குறிப்பிடப்பட்டுள்ள டெண்டர்தாரரின் பெயர், முகவரி மற்றும் தொகை ஆகியவை ஏலக்கூடத்தில் அறிவிக்கப்படும்.

9. அத்தந்த குவாரி இனங்களுக்கு பொது ஏலத்தில் கூறப்பட்ட அதிகபட்ச ஏலத்தொகை மற்றும் அதிகபட்ச டெண்டர் கோரிய தொகை இவற்றில் எது அதிகமோ அதனை கோரியவர் குத்தகை பெற தகுதியானவர் என அறிவிக்கப்படுவார்.

10. பொது ஏலத்தில் கூறப்பட்ட அதிகபட்ச ஏலத்தொகையைவிட அதிகமாக மறைமுக டெண்டர் முறையில் இரண்டு அல்லது அதற்கு மேற்பட்ட நபர்கள் ஒரே டெண்டர் தொகையை குறிப்பிட்டிருந்தால் அவ்வாறு குறிப்பிட்ட டெண்டர்தாரர்களிடையே, இரண்டாம் நிலை திறந்தமுறை பொதுஏலம் நடத்தப்பட்டு, அதில் அதிகத் தொகை செலுத்த முன்வருபவர் குவாரி குத்தகை பெற தகுதியானவர் என்று அறிவிக்கப்படுவார்.

11. திறந்தமுறை பொது ஏலத்தில் கூறப்பட்ட அதிகபட்ச ஏலத்தொகையும் மறைமுக டெண்டர் முறையில், குறிப்பிடப்பட்ட அதிகபட்ச டெண்டர் தொகையும், ஒரே தொகையாக இருந்தால் அவ்விரு தொகைகளை கூறிய நபர்களிடையே இரண்டாம் நிலை திறந்தமுறை பொது ஏலம் நடத்தப்பட்டு அதில் அதிகத்தொகை செலுத்த முன்வருபவர் குவாரி குத்தகை பெற தகுதியானவர் என்று அறிவிக்கப்படுவார்.

12. (அ) அதிகபட்ச ஏலத்தொகை/டெண்டர் கேட்ட நபர் குவாரி குத்தகை பெற தகுதியானவர் என்று அறிவிக்கப்படும்பட்சத்தில் அவரால் கேட்கப்பட்ட ஏலம்/டெண்டர் தொகையில் 10% சதவீதம் மற்றும் கூடுதலாக 2 சதவீதம் வருமான வரியும் உடனடியாக ஏலம் நடத்திய அலுவலரிடம் செலுத்தி ஒப்பந்தக் கடிதம் பெற்றுக்கொள்ளவேண்டும்.

(Handwritten signature)



13. (அ). அதிகபட்ச ஏலம்/டெண்டர் கேட்ட நபர்/ குத்தகை பெறத்தகுந்தவரின் அளிவிக்கப்பட்ட நபர் உடனடியாக 10% சதவீத தொகை செலுத்தாத நிலையில் தலுக்கு அடுத்தபடியாக அதிக ஏலம் / டெண்டர் தொகை ஏற்படையது என மாவட்ட ஆட்சியர் அவருக்கு அவரது அதிகாரம் பெற்ற அலுவலர் கருதும் பட்சத்தில் குறிப்பிட்ட நபர் குத்தகை பெறத் தகுதியானவர் என்று அறிவிக்கப்பட்டு அவர் குறிப்பிட்டுள்ள குத்தகைத் தொகையில் பத்து சதவிகிதத் தொகை மற்றும் 2சதவீதம் வருமானவரியும் செலுத்தப்பட்சத்தில் அவர் குத்தகை பெறத் தகுதியானவர் என்று அறிவிக்கப்படுவார்.

(ஆ) மேற்கண்டவாறு குத்தகை பெற தகுதியானவர் என்று அறிவிக்கப்பட்ட இரண்டாவது நபரும் 10% சதவீத தொகையை செலுத்தாதபோது மேற்கண்ட வழிமுறை மீண்டும் நடைமுறைப்படுத்தப்படும் அல்லது ஏலத்தொகை ஏற்படையது அல்ல என்று கருதினால், உரிய குவாரியை மறு டெண்டர்/ ஏலம் மூலம் குத்தகைக்கு விடலாம்.

14. குவாரி குத்தகை பெற தகுதியானவர் பெயர் அறிவிக்கப்பட்ட பின்னர், இதர மனுதாரருக்கு விண்ணப்பக் கட்டணம் தவிர பிற இனங்களுக்கான வரைவோலையை திரும்ப வழங்க நடவடிக்கை எடுக்கப்படும்.

15.(அ). குத்தகை பெற தகுதியானவர் என்று அறிவிக்கப்பட்ட நபர் நிலுவையிலுள்ள 10% சதவீத குத்தகைத் தொகையுடன் பிணை வைப்பத் தொகை கழித்தது போக 90% குத்தகைத் தொகையுடன் 2 சதவீதம் வருமான வரியும் தமிழ்நாடு சிறுகனிமச் சலுகை விதிகள் 1959 விதி எண்: 8(5)(vii)-ன்படி 7(ஏழு) நாட்களுக்குள் செலுத்தி அரசு சலாணை ஒப்படைக்க வேண்டும்.

(ஆ).மேற்குறிப்பிட்ட 90% சதவீதத் தொகை மேற்குறிப்பிட்ட காலக்கெடுவான 7(ஏழு) நாட்களுக்குள் செலுத்தப்படாவிட்டால், குத்தகை கோரும் நபர் ஏற்கனவே செலுத்தியுள்ள 10 சதவீத தொகை மற்றும் முன்வைப்பு தொகையான ரூ.25,000/- ஆகியவை அரசு கணக்கில் ஆதாயமாக்கப்படும்.

(இ). நிபந்தனை 14(ஆ)-யின்படியும் கோரப்பட்ட குத்தகைத் தொகை செலுத்தப்படாவிட்டால், தொடர்புடைய கல் குவாரி டெண்டர்/ பொது ஏலம் மூலம் குத்தகைக்கு விட மறு அறிவிப்பு செய்யப்பட்டு நடவடிக்கை தொடரப்படும்.

16.(அ) குவாரி குத்தகை கோரி ஒரே ஒரு மறைமுக டெண்டர் மனு கொடுக்கப்பட்டு திறந்த முறை பொது ஏலத்தில் கலந்துகொள்ள யாரும் முன்வரவில்லையெனில், டெண்டர் தொகை அரசுக்கு ஆதாயமானது என்று மாவட்ட ஆட்சியர் கருதினால், அந்த டெண்டர் மனுதாரருக்கு குவாரி குத்தகை வழங்க மாவட்ட ஆட்சியர் ஒப்புதல் அளிக்கலாம். டெண்டர் தொகை அரசுக்கு ஆதாயமானதல்ல என்று மாவட்ட ஆட்சியர் கருதும்பட்சத்தில், மனுவைத் தள்ளுபடி செய்து ஆணையிடப்பட்டு மறு ஏலம்/டெண்டர் மூலம் குவாரி குத்தகை வழங்க மாவட்ட ஆட்சியருக்கு அதிகாரம் உண்டு.

(ஆ). இரண்டு அல்லது அதற்கு அதிகமான மனுக்கள் பெறப்பட்டாலும்கூட அதிகபட்ச டெண்டர்/ ஏலத் தொகை அரசுக்கு ஆதாயமானதல்ல என்று மாவட்ட ஆட்சியர் கருதினால் மனுவை தள்ளுபடி செய்து மறு ஏலம்/டெண்டர் நடத்த மாவட்ட ஆட்சியருக்கு அதிகாரம் உண்டு.

(இ). குத்தகைத் தொகை மற்றும் உரிமத்தொகை (சீனியரேஜ்) மீதான வருமானவரியை (TCS) மத்திய அரசால் அவ்வப்போது நிர்ணயம் செய்யப்படும் கணக்கீட்டின்படி செலுத்தப்படவேண்டும்.

17) கல்குவாரி குத்தகை தற்போது உள்ள இயல்பு நிலையிலேயே கொண்டு வரப்படுகிறது. குத்தகை பரப்பை நிலவியலாக பூரணமாக தெரிந்து பின்னர் கலந்து கொள்ள வேண்டும். தவறுப்பட்சத்தில் குத்தகை நிலம் தொடர்பாக பிரச்சனை ஏழ்ப்ப குத்தகைதாரர் தகுதியற்றவர் ஆவார்.

18) குவாரி குத்தகை விண்ணப்பிக்கும் போது குவாரியினை விண்ணப்பதாரர் தனது சொந்த செலவில் சொந்த பொறுப்பில் பார்வையிட்டு கனிய அளவு, தரம் ஆகியவற்றை தெரிந்து கொண்டு விண்ணப்பிக்க வேண்டும்.

A. S. S.

19) பிரகரிக்கப்பட்ட இனங்களில் நீதியின்ற வழக்கு அல்லது தொய்வகும் பட்சத்தில், அந்த இனங்களை நிறுத்தி வைக்கவும் மற்றும் விண்ணப்பத்தை குறைத்து நிர்ணயம் செய்திடவும், மாவட்ட ஆட்சியருக்கு முழு அதிகாரம் உண்டு.

20) இந்த அறிவிப்பு பிரகரிக்கப்பட்ட பின்னரே குத்தகை உறுதி ஆணை பிறப்பிப்பதற்கு முன்னரே அல்லது பின்னரே நித்தனைகளை மாற்றவோ, ரத்து செய்யவோ மற்றும் பட்டியலில் கண்டுள்ள எல்லா குவாரிகளின் குத்தகை உரிமம் கோரும் விண்ணப்பத்தை எக்காரணமின்றி ரத்து செய்யவோ, அல்லது மேற்படி மனுக்களின் உறைகளை நிறக்கும் நான், நேரம் ஆகியவைகளை தள்ளி வைக்கவோ, நிறுத்தி வைக்கவோ மாவட்ட ஆட்சியருக்கு முழு அதிகாரமுண்டு. அதற்கு விண்ணப்பதாரர் எந்தவித இழப்பீடும் கோர உரிமையில்லை.

பகுதி II (ஆ) சிறப்பு நிபந்தனைகள்:

1. இவ்விதிகளின் கீழ் குத்தகை உரிமம் வழங்கப்படும் போது மாவட்ட ஆட்சித் தலைவர் அவர்களால் தேர்வு செய்யப்படும் குத்தகை பெற தகுதியானவர் என்று அறிவிக்கப்பட்ட நபர் நிலுவையிலுள்ள 90% சதவீத குத்தகைத் தொகையுடன் கூடுதலாக குத்தகைத் தொகையில் 2 சதவீதம் வசூலான வரிபும் உடன் செலுத்திய நபர் மாவட்ட ஆட்சித்தலைவர் அவர்களால் தேர்ந்தெடுக்கப்பட்ட தகுதியானவர் என பெயர் அறிவிக்கப்பட்டு குவாரி உரிமம் வழங்க உத்தேசிக்கப்பட்டுள்ள பரப்பாக கருதி உத்தரவை வழங்கி சுரங்கத்திட்ட அறிக்கை தயாரித்து ஒப்புதல் பெற்று சமர்ப்பிக்குமாறு அறிவுறுத்தப்படும்.

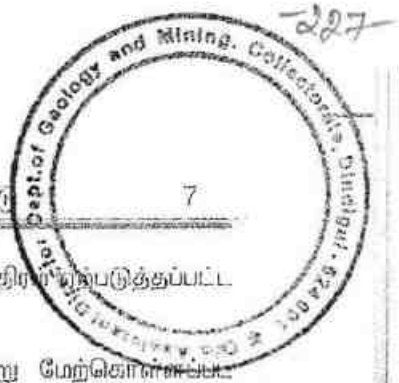
2. மேற்படி உத்தரவை பெற்ற நபர் தகுதியான சுரங்கத் திட்ட அறிக்கையை அங்கீகரிக்கப்பட்ட (RQP) நபரிடமிருந்து தயார் செய்து சமர்ப்பிக்க உதவி இயக்குநரின் ஒப்புதலுக்கு மூன்று மாதத்திற்குள் சமர்ப்பிக்க வேண்டும். சுரங்கத்திட்ட அறிக்கை அரசால் அங்கீகரிக்கப்பட்ட (RQP) நபரால் மட்டும் அரசு தெரிவித்துள்ள விதிகள் மற்றும் வழிகாட்டுதலின்படி தயாரிக்கப்பட்டிருக்க வேண்டும்.

3. சம்பந்திய உச்சநீதிமன்றம் தீர்ப்பாணை LA.Nos.12-13/11 in Special Leave petition (C).No.19628-19629/2009 etc., நாள்:27.02.2012-ன் படியும், மத்திய சுற்றுச் சூழல் மற்றும் வளத்துறை அமைச்சகம், புதுடெல்லி சுற்றறிக்கை எண் L-11011/47/2011-IA-II(M) நாள் 18.05.2012-ன் படியும், மாநில சுற்றுச்சூழல் பாதுகாப்பு அமைப்பு, தமிழ்நாடு, சென்னை நே.மு.க நாள் 17.09.2012 -ன் படியும் ஆணையர், கடித எண். SEIAA-TN/Minor Minerals/2012 நாள் 19.11.2012-ன் படியும் புவியியல் மற்றும் சுரங்கத்துறை, சென்னை கடித எண்.3868/LC/2012 நாள் 19.11.2012-ன் படியும் சிறுகனிபாங்கான கல் மணல், சவுடு மற்றும் மணல் குவாரிகளுக்கு குத்தகை உரிமம் வழங்குவதற்கு முன்பாக மாநில சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையத்தின் தடையின்மைச்சான்று பெற்று சமர்ப்பிக்கப்பட வேண்டும். எனவே இவ்விதியின் கீழ் குவாரி உரிமம் பெறுவோர் மேற்படி மாநில சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையத்தின் தடையின்மைச் சான்றை பெற்று சமர்ப்பிக்கும் பட்சத்தில் மட்டுமே குவாரி உரிமம் வழங்கப்படும்.

4. சமர்ப்பிக்கப்பட்ட உதவி இயக்குநரால் ஒப்புதல் செய்யப்பட்ட சுரங்கத் திட்ட அறிக்கையை தேர்வு செய்யப்பட்ட நபர் மாநில சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையத்தின் தடையின்மை சான்று கோரி விண்ணப்பித்து தடையின்மைச் சான்று பெற்று சமர்ப்பிக்கும் பட்சத்தில் மாவட்ட ஆட்சித்தலைவர் அவர்களால் தகுதி பெற்ற ஏலதாரர் / டெண்டர்தாரர்களுக்கு குவாரி உரிமம் வழங்க நடவடிக்கை எடுக்கப்படும்.

5. இவ்விதியின்கீழ் தேர்வு செய்யப்பட்ட நபர் சுரங்கத்திட்ட அறிக்கை மற்றும் மாநில சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணைய தடையின்மை சான்றை குறிப்பிட்ட காலத்திற்குள் சமர்ப்பிக்க தவறும்பட்சத்தில் மாவட்ட ஆட்சித்தலைவர் அவர்கள் வழங்கிய உத்தரவை சமர்ப்பிக்கப்பட்ட நபரை நேரடி விசாரணை மேற்கொண்டு ரத்து செய்ய நேரிடும்.

6. இவ்விதியின்கீழ் தேர்வு செய்யப்பட்ட நபர் சுரங்கத்திட்ட அறிக்கை மற்றும் மாநில சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணைய தடையின்மை சான்று மற்றும் யாசககட்டுப்பாட்டு வாரியத்தின் இசைவு பெற்று சமர்ப்பிக்கும் பட்சத்தில் மேற்படி தேர்வு பெற்ற நபருக்கு குத்தகை உரிமம் வழங்கப்பட்டதற்கான ஆணை வழங்கப்பட்டு பின்னர் குத்தகை ஒப்பந்த பத்திரம் நிறைவேற்ற தேவையான ஆணைகள் பெற்று குத்தகை ஒப்பந்த பத்திரம் நிறைவேற்றப்படும்.



7. சுரங்கத் திட்ட அறிக்கை குவாரிப்பணி செய்ய குத்தகை ஒப்பந்தத்திற்கு ஒப்புபடுத்தப்பட்ட நான் முதல் ஐந்தாண்டிற்கு மட்டும் செல்லத்தக்கதாகும்.

8. குவாரிப்பணிகள் சுரங்கத்திட்ட அறிக்கையில் தெரிவித்துள்ளவாறு மேற்கொள்ளப்பட வேண்டும். அவ்வாறு சுரங்கத்திட்ட அறிவிக்கையில் தெரிவித்ததற்கு மாறாக குவாரிப்பணிகள் மேற்கொள்வது கண்டறியப்பட்டால் மேற்படி குவாரிப்பணியை நிறுத்தி வைப்பதற்கு மாவட்ட ஆட்சித்தலைவர் அவர்களால் நடவடிக்கை மேற்கொள்ளப்படும்.

9. இந்த அறிவிப்பில் கண்டுள்ள எந்த குவாரியையும், பரப்பளவையும் முன் அறிவிப்பின்றி நீக்க/குறைக்க மாவட்ட ஆட்சியருக்கு அதிகாரமுண்டு.

பகுதி - III குவாரி குத்தகை பெறுவதற்கான நிபந்தனைகள்

1. அ) தமிழ்நாட்டில், எல்லா மாவட்டங்களிலும் சேர்த்து இவ்வாறான இளங்களில் ஒரு மனுதாரருக்கு இரண்டு கஸ்குவாரி குத்தகைக்கு மேல் வழங்கப்படமாட்டாது, தவறான தகவல் தந்து இரண்டுக்கு மேற்பட்ட குத்தகைகள் பெறப்பட்டிருப்பது பின்னர் தெரிய வந்தால் கடைசியாக கொடுக்கப்பட்ட குத்தகையை ரத்து செய்ய நடவடிக்கை எடுக்கப்படும்.

ஆ) தமிழ்நாடு சிறுவகைக் கனிமச் சலுகை விதிகள் 1959 இன் பின்னிணைப்பு i-ல் கண்டுள்ள படிவத்தில் ஒப்பந்த கருத்துகளில் சேர்க்கை, நீக்கம், மாற்றங்கள் மற்றும் குத்தகைப் பரப்பை காட்டும் புலப்படத்தில் தேவையான மாறுதல்களை செய்திட மாவட்ட ஆட்சியருக்கு அதிகாரம் உண்டு.

இ) மாவட்ட ஆட்சியரால் ஏலம்/டெண்டர் முறையில் தேர்வு செய்யப்பட்ட நபர் மாநில அளவிலான சுற்று புறச்சூழல் செயல் விழைவு ஆணையத்தின் தடையில்லாச் சான்று பெற்று சமர்ப்பித்த பின்னர் குத்தகை ஒப்பந்தப் பத்திரத்தினை நிறைவேற்ற மாவட்ட ஆட்சியரால் குறிப்பிடக் காலக்கெடுவிற்குள் கீழ்க்கண்ட ஆவணங்கள் மற்றும் தொகைகளை செலுத்தி அவற்றை மாவட்ட ஆட்சித் தலைவரிடம் ஒப்படைக்க வேண்டும்.

1. ரூ.20,000/- அல்லது மொத்த குத்தகை தொகையில் 20 சதவீத தொகை இவற்றில் எது அதிகமோ, அத்தொகையை காப்புத் தொகையாக செலுத்தப்பட வேண்டும்.
- II. மாவட்ட ஆட்சியரின் அறிவிக்கையில் கோரியுள்ளவாறு நீதிமன்றம்சாரா முத்திரைத்தாள்களில் குத்தகை ஒப்பந்த ஆவணம் தயாரித்து மாவட்ட ஆட்சித் தலைவருடன் குத்தகை ஒப்பந்தம் நிறைவேற்றும் பொருட்டு புலப்படத்தூடன் கொடுக்கப்பட வேண்டும்.

2. உரிய காலக்கெடுவுக்குள், முன் குறிப்பிடப்பட்ட காப்புத் தொகையை அரசுக்குச் செலுத்தி ஆவணங்களை மாவட்ட ஆட்சியரிடம் ஒப்படைக்காத நபருக்கு ஏற்கனவே குவாரி குத்தகை வழங்கப்படும் என்று கொடுக்கப்பட்ட அறிவிப்பு ரத்து செய்யப்பட்டு, அந்த நான்வரை அவரால் செலுத்தப்பட்ட தொகைகள் அரசுக்கு ஆதாயமாக்கப்படும்.

3. கோரப்படும் ஆவணங்கள் மற்றும் தொகைகளை குத்தகை பெறுவள்ள மனுதாரர் அரசுக்குச் செலுத்தியபின், அறிவிக்கை மூலம் தெரிவிக்கப்படும் நாளில் மேற்படி குத்தகைதாரர் மாவட்ட ஆட்சியரின் முன்பு ஆஜராகி குத்தகை ஒப்பந்த ஆவணங்களில் கையெழுத்திட்டபின் குத்தகையாளராக அறிவிக்கப்படுவர்.

4. அ) கஸ்குவாரி குத்தகை காலம் குத்தகை ஒப்பந்தப் பத்திரம் நிறைவேற்றப்பட்ட நாளில் இருந்து ஐந்து ஆண்டுகளாகும்.

ஆ) ஒப்பந்த ஆவணத்தில் குறிப்பிட்டுள்ளபடி குத்தகை முடிவுறும் தேதிக்கு பின்னர் குத்தகைகாலம் எந்த கோரிக்கையின் அடிப்படையிலும் நீட்டிப்பு செய்யப்படமாட்டாது.



இ) டெண்டர் மற்றும் பொது ஏலத்தின் மூலம் வழங்கப்படும் குத்தகை உரிமங்கள் புதுப்பிக்கப்படமாட்டாது. இது குறித்து புதுப்பித்தல் மனு அனுப்பப்படாது அது விசாரணையின்மீது தள்ளுபடி செய்யப்படும்.

ஈ). கல்குவாரி குத்தகை தற்போது உள்ள இயல்பு நிலையிலேயே ஏலம்/டெண்டர் கொண்டு வரப்படுகிறது. ஏலம் /டெண்டர்தாரர் குத்தகை பரப்பை நிலவியலாக பூரணமாக தெரிந்து பின்னர் கலந்து கொள்ள வேண்டும். குத்தகை வழங்கப்பட்ட பின்னர், குத்தகை நிலம் தொடர்பாக பிரச்சனை எழுப்ப குத்தகைதாரர் தகுதியற்றவர் ஆவார்.

5. குவாரி குத்தகை ஒப்பந்தப் பத்திரத்தில் மாவட்ட ஆட்சியருடன் மனுதாரர் கையொப்பம் இடுவதற்கு முன், குத்தகை பரப்பில் கனிமங்கள் வெட்டியெடுத்தாரானால் அப்பணி குத்தகை பெறாமல் செய்ததாக கருதப்பட்டு, விதிமுறைகளின்படி, மேல் நடவடிக்கை தொடரப்பட்டு அபராதம் விதிக்க நடவடிக்கை எடுக்கப்படும். நிறைவேற்றப்படும் குத்தகை ஒப்பந்தப் பத்திரம் குத்தகைதாரர் பொறுப்பில் பதிவு செய்து மீள் சமர்ப்பிக்கப்பட வேண்டும்.

6. அ) குவாரி குத்தகை காலம் முடிவடைந்தவுடன் குத்தகைதாரர் குத்தகை பரப்பை அரசுக்கு திரும்ப ஒப்படைத்து அதற்கான கடிதத்தை உரிய கிராம நிர்வாக அலுவலர் வசம் ஒப்புவித்து அதற்கான ஆணை உறுதி ஆவணம் தயாரித்து மாவட்ட ஆட்சியரிடம் ஒப்படைக்க வேண்டும்.

ஆ) குத்தகை காலம் முடிவுற்ற பின் அல்லது குத்தகை நடைமுறை காலத்தில் ஆணை நீக்கம் செய்யப்பட்டால் குத்தகையாளர் குத்தகை பரப்பை, அரசுக்கு திரும்ப ஒப்படைக்காமல் தன்வசம் வைத்திருப்பாரானால் தமிழ்நாடு சிறுவகைக் கனிமச் சலுகை விதி 1959 இல் விதி 36-ஏ(4) இன்படி, அவர் மீது மேல்நடவடிக்கை எடுக்கப்படுவதுடன் குத்தகை பரப்பிலிருந்து அவரை வெளியேற்ற உரிய நடவடிக்கை எடுக்கப்படும். இந்நடவடிக்கையை மேற்கொள்ள மாவட்ட ஆட்சியரால் அதிகாரம் வழங்கப்படும் அலுவலர் குத்தகையாளரை வெளியேற்ற தேவைப்படும் அளவிற்கு வலிமையுடைய நடவடிக்கை எடுக்க தகுதி பெற்றவராவார்.

பகுதி IV குவாரிப்பணி செய்வது தொடர்பான விதிமுறைகள்

1. குவாரி பணி செய்வதற்கான பொது விதிமுறைகள், மாவட்ட ஆட்சியருடன் ஏலதாரர்/டெண்டர்தாரர் கையொப்பமிடும் குத்தகை ஆவணத்தில் குறிப்பிடப்பட்டிருக்கும்.

2. மேலும் ஒவ்வொரு புலத்திற்கும், சிறப்பு நிபந்தனைகள் ஏதும் இருக்குமானால் அவைகள் மாவட்ட ஆட்சியரால் குறிப்பிடப்படும் அனுமதி ஆணையில் குறிப்பிடப்படும். குத்தகை பெற்றவர் அவ்வனுமதி ஆணையை ஏற்று நடக்கவேண்டும்.

3. செலுத்தப்பட்ட குத்தகைத் தொகை தவிர, தமிழ்நாடு சிறுவகைக் கனிமச் சலுகை விதிகள் 1959 - ன் பின்னிணைப்பு II-ல் கண்டவாறு குவாரியிலிருந்து வெளியில் கொண்டு செல்லப்படும் கனிமத்திற்கு சீனியரேஜ் தொகை அல்லது ஒவ்வொரு ஆண்டிற்கான முடக்குவரி இவற்றில் எது அதிகமோ அது செலுத்தப்படவேண்டும். அந்தந்த ஆண்டுகளுக்குரிய பரப்பு வரியினையும் செலுத்த வேண்டும். சீனியரேஜ் தொகை அல்லது முடக்குவரி செலுத்தப்படாவிட்டால் குவாரி குத்தகையை ரத்துசெய்ய நடவடிக்கை எடுக்கப்படும்.

4. மேற்குறிப்பிட்டவை தவிர பின்வரும் சிறப்பு நிபந்தனைகளும் குத்தகைதாரரால் குத்தகை காலத்தில் கடைபிடிக்கப்பட வேண்டும் :-

i) குவாரியின் எல்லைகள் தெளிவாக தெரியும்படி கலந்து அடையாளமிட்ட பிறகு குவாரிப்பணி செய்ய வேண்டும். எல்லைக் கற்கள் குத்தகை கால முழுமைக்கும் சரியானபடி பராமரிக்கப்பட்டு வரவேண்டும். குத்தகையாளர் குத்தகைப் பகுதியில் வெட்டியெடுத்து வெளியில் அனுப்பும் சிறுவகைக் கனிமத்திற்கு உரிய கணக்குகளைத் திண்டுக்கல் மாவட்ட புவியியல் மற்றும் சுரங்கத்துறை உதவி இயக்குநர் குறிப்பிடும் படிவத்தில் சுரங்க விவரப் பதிவேடு ஏற்படுத்தி விவரங்கள் எழுதி, ஒவ்வொரு மாதத்திற்கும் விவரப்பட்டியல் தயாரித்து அதனை அடுத்த மாதம் ஐந்தாம் தேதிக்குள் உதவி இயக்குநருக்கு அனுப்ப வேண்டும்.



ii) குத்தகைக்கு விடப்பட்ட இடங்களை எந்த நேரத்திலும், புலியியல் மற்றும் சுரங்கத்துறை மற்றும் வருவாய்த்துறை அலுவலர்கள் பார்வையிட அதிகாரமுண்டு. இது சம்பந்தமாக பராமரிக்கப்படும் கணக்குகளை துணிக்கை செய்யவும் அதிகாரம் உண்டு. குத்தகை காலத்தில் ஏற்படுத்தப்பட்ட சுரங்க விவரப்பதிவேடுகளை குத்தகையாளர் குத்தகைகாலம் முடிந்த பின்னரும் பாதுகாத்து அரசு அலுவலர்கள் ஆய்வுக்கு கேட்கும்போது ஒப்படைக்க வேண்டும்.

iii) குத்தகையாளர் கனிமங்களை வெளியில் அனுப்ப அனுப்புகை சீட்டுகளில் உதவி இயக்குநர் ஒப்புதல் பெற வரும்போது உரிய மனு அளித்து, சீனியரேஜ் தொகையைச் செலுத்தி, அலுவலகத்திலிருந்து வழங்கப்படும் மொத்த இசைவானைச் சீட்டுடன் (Bulk permit) அனுப்புகை சீட்டுகளில் உரிய அலுவலரின் கையொப்ப முத்திரை மற்றும் அலுவலக முத்திரைகளைப் பெற்றுச் சென்று பயன்படுத்தவேண்டும்.

iv) கனிமங்களை குத்தகைப் பகுதியிலிருந்து வெளியில் அனுப்பும்போது அனுப்பப்படும் கனிமத்தின் வகை, அதன் அளவு, எடுத்துச் செல்லும் வாகனத்தின் வகை, மற்றும் பதிவு எண், கனிமம் கொண்டு சேர்க்கப்படும் இடம், குவாரியிலிருந்து வாகனம் புறப்படும் நேரம் மற்றும் சென்றடைய உத்தேச நேரம் ஆகிய விவரங்களை அசல் சீட்டில் ஒரே பேனாவாலும் நகலை காப்பன் பேப்பர் அழுத்தம் மூலமும் எழுதி அசலை வாகனத்துடன் அனுப்பி நகலை (அடிக்கட்டு) அடுத்தமுறை அனுமதிபெற வரும்போது ஆய்வுக்கு காண்பித்துவிட்டு திரும்ப பெற்றுச்சென்று பாதுகாப்பாக வைத்திருக்கவேண்டும். குவாரிப்பகுதியில் இருந்து மட்டுமே நடைச்சீட்டு வழங்கப்பட வேண்டும். குத்தகை எடுத்த நபர்கள் வேறு நபருக்கு உள் குத்தகைக்கு விடவோ அல்லது பிற காரியங்களுக்காக உபயோகிக்கவோ கூடாது.

v) அனுப்புகைச் சீட்டில் எல்லா விவர வினாக்களுக்கும் விவரங்கள் எழுதப்படாமலோ (Over writing) அல்லது திருத்தப்பட்டோ அல்லது மேல் எழுதப்பட்டோ அல்லது வெவ்வேறு மையினால் எழுதப்பட்டிருப்பின் அந்த அனுப்புகைச் சீட்டுடன் எடுத்துச்செல்லப்படும் கனிமம், அனுமதியின்றி எடுத்துச் செல்லப்படுவதாகக் கருதி, விதிமுறைகளின்படி நடவடிக்கை எடுக்கப்படும்.

vi) குத்தகைதாரர் தனது சொந்தப் பொறுப்பில் குத்தகைப் பகுதிக்குச் செல்ல பாதை வசதி அமைத்துக்கொள்ள வேண்டும். இது தொடர்பாக ஏற்படும் தகராறுகளுக்கு அரசு பொறுப்பேற்காது. குத்தகை எடுத்தவர் எந்த காரணத்தை முன்னிட்டும் தனக்கு இழப்பு ஏற்படின் அதற்கு அரசு பொறுப்பு ஏற்காது.

vii) கல்குவாரிப் பணியில் 8 வயது முதல் 14 வயதிற்குட்பட்ட குழந்தை தொழிலாளர்களை பணியமர்த்தக் கூடாது.

viii) குவாரிகளுக்கு அருகில் உள்ள போக்குவரத்து சாலைகள், வண்டிப்பாதைகள், மின்கம்பங்கள் மற்றும் இதர நிலையான அமைப்புகள் இவற்றில் இருந்து நிர்ணயிக்கப்பட்ட பாதுகாப்பு இடைவெளி விட்டு மீதமுள்ள இடத்திற்குள்ள்தான் குவாரிப்பணி செய்யவேண்டும். மேற்கண்ட பொதுமக்கள் உபயோகிக்கும் இடங்கள், பட்டா நிலங்கள், பொது சொத்துக்கள் ஆகியவற்றிற்கு சேதம் ஏதும் நேரிட்டால் அதற்கு குத்தகைதாரரே முழுப்பொறுப்பு ஏற்கவேண்டும்.

ix) அருகில் உள்ள பட்டா நிலங்களுக்கு எவ்வித பாதிப்பில்லாமலும், ஓடை மற்றும் நீர்நிலைகள் பாதிக்காவண்ணம் குவாரி செய்ய வேண்டும்.

x). 1952-ஆம் ஆண்டைய சுரங்கச் சட்டம் மற்றும் அதன் கீழ் வரையறுக்கப்பட்ட விதிகள் 1961 ஆம் ஆண்டைய மெட்டாலிபெரஸ் மைன்ஸ் ரெகுலேசன்ஸ், 1936 ஆம் ஆண்டைய சம்பளம் வழங்குதல் சட்டம், 1884 ஆம் ஆண்டின் இந்திய ஹைபொருட்கள் சட்டம், குறைந்தபட்ச ஊதிய சட்டம் மற்றும் தமிழ்நாடு வருவாய் வகுல் சட்டம் 1864 ஆகியவற்றின் கருத்துகளுக்கு உட்பட்டு குத்தகையாளர் கனிமங்கள் குவாரி செய்ய வேண்டும்.

xi). குத்தகைப்பகுதியில் இருந்து மெருகேற்றுவதற்கு தகுந்த கிராண்டை சுந்துண்டங்கள் வெட்டுதல் கூடாது. அவ்வாறு தகுதி வாய்ந்த கிராண்டை சுந்துண்டங்கள் எடுக்க வாய்ப்பு ஏற்படுமானால் குவாரி குத்தகை ரத்து செய்யப்படும்.



xii). குத்தகைதாரரை தமிழ்நாடு சிறுகனிம சலுகை விதிகள் 1959 மற்றும் சுரங்கங்கள் மற்றும் கனிமங்கள் (ஒழுங்கு முறை மற்றும் அபிவிருத்தி) சட்டம் 2015, மற்றும் அரசால் அவ்வப்போது அறிவிக்கப்படும் ஆணைகளும், விதிகளும் கட்டுப்படுத்தும். இவ்வப்போது அரசால் அறிவிக்கப்படும் கட்டளைகளை செலுத்த வேண்டும்.

xiii). தொழிலாளர்களுக்கு தகுந்த பாதுகாப்பு அளிக்க வேண்டும். குவாரியின் வேலை செய்யும் தொழிலாளர்களுக்கும் மற்றும் இதர நபர்களுக்கும் விபத்து ஏற்படின் முழுப்பொறுப்பும் குத்தகைதாரரையே சேரும். இதற்கு அரசு பொறுப்பில் விபத்து குறித்த தகவல்களை உடனடியாக மாவட்ட ஆட்சியருக்கு தெரிவிக்க வேண்டும்.

xiv). குத்தகைதாரர் ஒவ்வொரு மாதமும் குவாரியில் வேலை செய்யும் தொழிலாளர்கள் விவரமும், குவாரி செய்த அளவிற்குரிய கணக்குகளை பிரதி திங்கள் 5 ஆம் நாளுக்குள் உதவி இயக்குநர், புளியியல் மற்றும் சுரங்கத்துறை, திண்டுக்கல் அவர்களுக்கு தணிக்கைக்கு ஆஜர் செய்ய வேண்டும்.

xv). மேலே கண்ட நிபந்தனைகளை மீறி குத்தகைதாரரோ, அவரது அதிகாரம் பெற்ற நபரோ அல்லது மற்றவர்களோ கனிமம் வெட்டினாலோ அல்லது எடுத்துச் சென்றாலோ, தமிழ்நாடு சிறுகனிமச் சலுகை விதிகள் 1959, சுரங்கங்கள் மற்றும் கனிமங்கள் (அபிவிருத்தி மற்றும் ஒழுங்குமுறை) சட்டம் 2015 ஆகியவற்றில் உள்ள குற்றத் தடுப்புப் பிரிவின்படி தண்டனை பெறவும் மற்றும் அபராதம் செலுத்தப்படவும் குத்தகைதாரர் பொறுப்புடையவர் ஆவார். குத்தகை காலத்திலோ அதற்கு பின்னரோ கிராமம் தவறி குத்தகையை பயன்படுத்துவதில் ஏற்படும் சகல நஷ்டங்களுக்கும் குத்தகைதாரர்கள் பொறுப்பு ஏற்கவேண்டும். இதற்காக விதிக்கப்படும் அபராதமும் செலுத்த வேண்டும்.

5. குத்தகை ஒப்பந்தப் பத்திரத்தில் உள்ள நிபந்தனைகளை மாற்றவோ அல்லது புதிய நிபந்தனைகளைச் சேர்க்கவோ மாவட்ட ஆட்சியருக்கு முழு அதிகாரமுண்டு.

6. குத்தகை ஒப்பந்தப் பத்திரம் குவாரியின் எல்லை வரையறை செய்யப்பட்ட வரைபடத்துடன் மாவட்ட ஆட்சியரால் நிர்ணயிக்கப்பட்ட நாளில் நிறைவேற்றப்பட வேண்டும். ஒப்பந்தப் பத்திரம் நிறைவேற்றிய பின்னர் ஒப்பந்தப் பத்திரத்தை (Indian Registration Act 1908) இந்திய பதிவு சட்டம் 1908 -பிரிவு 17(1)-ன் படி குத்தகைதாரர் செலவில் கட்டாயமாக பதிவு செய்யப்பட வேண்டும்.

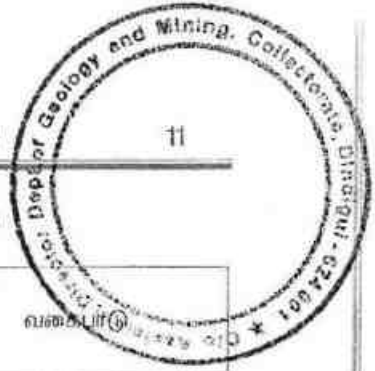
7. இவ்விதியின் மீது வழங்கப்படும் குத்தகை உரிமங்கள் புதுப்பிக்கப்படமாட்டாது. எக்காரணத்ததைக் கொண்டும் குத்தகைக் கால நீட்டிப்பு வழங்கப்பட மாட்டாது.

8. நிர்வாகக் காரணம் மற்றும் பொது நலனைக் கருத்திற்கொண்டு குத்தகைக்கு விடப்பட்ட பரப்பினை குறைத்து நிர்ணயிக்கவும், குத்தகை ரத்து செய்யவும் மாவட்ட ஆட்சியர் அவர்களுக்கு முழு அதிகாரமுண்டு.

9. குத்தகை எடுத்த நபர்கள் வேறு நபர்களுக்கு உள் குத்தகைக்கு விடவோ அல்லது பிற காரியங்களுக்காக உபயோகிக்கவோ கூடாது.

10. குத்தகை எடுத்தவர் எந்தக் காரணத்தை முன்னிட்டும் தனக்கு எவ்விதமான இயற்கை/செயற்கை இழப்பு ஏற்படின் இழப்பீடு கோரக் கூடாது.

11. குத்தகைதாரரை மேற்குறிப்பிட்ட நிபந்தனைகளும் 1959 ஆம் ஆண்டு தமிழ்நாடு சிறுகனிமச் சலுகை அனைத்து விதிகளும் மற்றும் சுரங்கங்கள் மற்றும் கனிமங்கள் (ஒழுங்குமுறை மற்றும் அபிவிருத்தி) சட்டம் 2015 மற்றும் அரசால் அவ்வப்போது அறிவிக்கப்படும் ஆணைகளும் விதிகளும் கட்டுப்படுத்தும்.



5 ஆண்டுகளுக்கு உரிமம் வழங்கப்படவுள்ள கல்குவாரிகள் பட்டியல்

வ. எண்	கிராமம்	புல எண்.	மொத்த விஸ்தீரணம் (ஹெக்டேரில்)	ஏலம் விடும் பரப்பு (ஹெக்டேரில்)	வகைபாடு
நத்தம் வட்டம்					
1.	நடுமண்டலம்	569/1 (பகுதி-4)	27.81.5	1.20.0	குன்று கரடு
2.	நடுமண்டலம்	346/2 (பகுதி)	6.27.0	2.50.0	கோவில் பாறை தரிசு
நிலக்கோட்டை வட்டம்					
3.	முகவனூத்து	481/2 (பகுதி-1)	48.50.0	2.00.0	தீர்வை ஏற்படாத தரிசு
4.	முகவனூத்து	481/2 (பகுதி-2)	48.50.0	2.00.0	தீர்வை ஏற்படாத தரிசு
5.	ரெய்கப்ப நாயக்கன் பட்டி	79 (பகுதி)	2.65.0	1.00.0	கல்லாங்குத்து (அரசு புறம்புகல்)
6.	மல்லணம்பட்டி	302/2 (பகுதி)	0.78.5	0.64.5	கல்லாங்குத்து
7.	ஐம்புதுரைக் கோட்டை	341 (பகுதி)	6.13.0	1.50.0	தீர்வை ஏற்படாத தரிசு
பழனி வட்டம்					
8.	புளியம்பட்டி	181/11 (பகுதி)	12.56.0	1.00.0	பாறை
ஓட்டன்சத்திரம் வட்டம்					
9.	கடத்தம்புண்டி	1059	1.52.0	1.50.0	கல்லாங்குத்து
வேடசந்தூர் வட்டம்					
10.	அம்மாபட்டி	229	1.08.95 0.89.6	1.08.95 0.89.6	பாறை

10 ஆண்டுகளுக்கு உரிமம் வழங்கப்படவுள்ள கல்குவாரிகள் பட்டியல்

வ. எண்	கிராமம்	புல எண்.	மொத்த விஸ்தீரணம் (ஹெக்டேரில்)	ஏலம் விடும் பரப்பு (ஹெக்டேரில்)	வகைபாடு
நத்தம் வட்டம்					
1.	பன்னியாமலை	46	2.04.0	2.04.0	தீர்வை ஏற்படாத தரிசு
2.	வேலம்பட்டி	289/1	2.03.5	1.05.0	தீர்வை ஏற்படாத தரிசு கல்லாங்குத்து

இடம்: திண்டுக்கல்
நாள்: 08.02.2021

ஒப்பம்,
மாவட்ட ஆட்சித்தலைவர்,
திண்டுக்கல்.

(Handwritten signature)



இணைப்பு - VI

(தமிழ்நாடு சிறுவகைக் கனிமச் சலுகை விதிகள் 1959 ன் விதி எண்.8 ஐ காண்க) குவாரி குத்தகை கோரும் டெண்டர் /ஏல விண்ணப்பம் (அசல் மற்றும் இரண்டு நகல்களில் கொடுக்கவும்)

அனுப்புநர் :

அலுவலர் பயன்படுத்த

அ) மனு பெறப்படும் நாள்

ஆ) பெறப்படும் இடம்

ஒப்பம்

பெறுநர் :

மாவட்ட ஆட்சியர்,
திண்டுக்கல் மாவட்டம்,
திண்டுக்கல்.

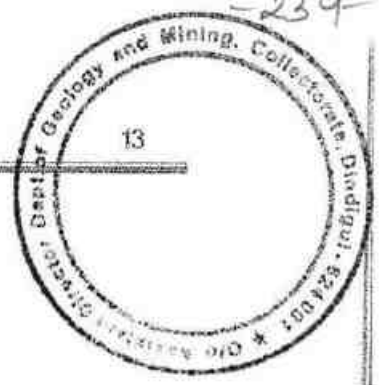
அய்யா,

திண்டுக்கல் மாவட்ட அரசிதழ் எண்..... நாள்
அல்லது செய்தித்தாள் விளம்பர
நாள்..... ல், வெளியிடப்பட்டுள்ளது தொடர்பாக, தமிழ்நாடு
சிறுவகைக் கனிமச் சலுகை விதிகள் 1959-ன் இன் விதி 8ன்படி நாள் /நாங்கள் இந்த
விண்ணப்பத்தை சமர்ப்பிக்கிறேன்/சமர்ப்பிக்கின்றோம்.
தேவையான விவரங்கள் கீழே கொடுக்கப்படுகிறது :

1. மனுதாரர் பெயர் மற்றும் முழு முகவரி :
2. அ) மனுதாரர் தனிநபரா/ தனியார் :
கம்பெனியா/ கூட்டு நிறுவனமா
(அல்லது) கூட்டமைப்பா.

ஆ) மனுதாரர் தனி நபரானால் எந்த :
நாட்டினர்
இ) மனுதாரர் தனியார் கம்பெனி/
வியாபார ஸ்தாபனம் அல்லது :
சங்கமாயின் அதன் இயக்குநர்/
பங்குதாரர்கள் / உறுப்பினர்கள் எந்த
நாட்டவர் என்ற விவரம் (சான்று
இணைக்கப்படவேண்டும்).

3. பிணைவைப்புத்தொகை செலுத்திய :
விவரம் : (வங்கி கேட்பு வரைவோலை
எண் மற்றும் நாள் ஆகிய விவரங்களை
அளிக்கவும்)



4. விண்ணப்பதாரர் கீழ்க்கண்ட விவரங்கள் :
ஆடங்கிய ஆணை உறுதி ஆவணம் அளித்துள்ளாரா?
- அ) நடப்பு தேதி வரையிலான வருமான வரி விவரப்பட்டியல் சமர்ப்பிக்கப் பட்டுள்ளதா?
- ஆ) மனுதாரருக்கு விதிக்கப்பட்ட வருமான வரி தொகையை செலுத்தியுள்ளாரா? மற்றும்
- இ) வருமான வரிச் சட்டம் 1961ல் குறிப்பிட்டவாறு சுய மதிப்பீட்டின் அடிப்படையில் வருமான வரி செலுத்தியுள்ளாரா?
5. மனுதாரர் எந்த சிறுவகைக் கனிமத்தைக் குவாரி செய்ய விரும்புகிறார் என்ற விவரம்
6. கோரப்படும் குத்தகையின் கால அளவு :
7. குத்தகைக்கு கோரப்படும் இடத்தின் மொத்த பரப்பு
8. டெண்டர் மனு அளித்துள்ள புலத்தின் விவரங்கள்.

மாவட்டம்	வட்டம்	கிராமம்	புல எண்	பரப்பு (ஹெக்டேரில்)
1	2	3	4	5

9. குவாரி குத்தகை பெற விரும்பும் மனுதாரர் அளிக்க விரும்பும் அதிகபட்ச டெண்டர் தொகை (எண்ணாலும், எழுத்தாலும் குறிப்பிடவும்)
10. மனுதாரர் தமிழ்நாட்டில் ஏற்கனவே குவாரி அனுமதி பெற்றுள்ள இடங்கள் குறித்த விவரங்கள்
11. அ) குவாரி நிலுவைத் தொகை செலுத்தியது தொடர்பான சுரங்கவரி நிலுவையின்மைச் சான்று (தேவையெனில் இணைக்க)

ஆ) விண்ணப்பம் அளிக்கும் நாளில் :
விண்ணப்பதாரர் குவாரி குத்தகை அல்லது
சுரங்க குத்தகை பெற்றிராவிட்டால் அது
குறித்து ஆணை உறுதி ஆவணம்
இணைக்கவும்.

12 விண்ணப்பதாரர் வேறு ஏதேனும் விவரம் :
அளிக்க விரும்பினால் அது குறித்த
விவரம்.

நான்/ நாங்கள் மேலே எங்களால் அளிக்கப்பட்ட விவரங்கள் உண்மையானவை
என்று உறுதியளிக்கிறேன் / உறுதியளிக்கிறோம். நான் / நாங்கள், அரசாங்கம் அல்லது
மாவட்ட ஆட்சியரால் கோரப்படும் இதர விவரங்கள் மற்றும் காப்புத் தொகை ஆகியவற்றை
அளிக்க தயாராக உள்ளேன் / உள்ளோம். தமிழ்நாடு சிறுவகைக் கனிமச் சலுகை விதிகள்
1959-ல் கண்டவாறு, குவாரி குத்தகை பெறுவது தொடர்பாகவும், குவாரி பணி செய்வது
தொடர்பாகவும் விதிக்கப்பட்ட நிபந்தனை, சட்ட உடன்படிக்கை குறித்து நன்றாக அறிவேன்
/ அறிவோம் என உறுதி அளிக்கிறேன் / அளிக்கிறோம்.

(2) சாதாரண கற்கள் வெட்ட வழங்கப்பட்ட கற்குவாரியில் அறுத்து மெருகேற்றி
கட்டுமானப்பணிக்கு பயன்படும் கிரானைட் கற்குண்டங்கள் வெட்டமாட்டோம் எனவும்,
அவ்வாறு கிரானைட் பாளங்கள் கிடைக்குமானால் குத்தகையை மாவட்ட ஆட்சியர் ரத்து
செய்ய நாங்கள் ஒப்புக்கொள்கிறோம் என உறுதியளிக்கிறோம்.

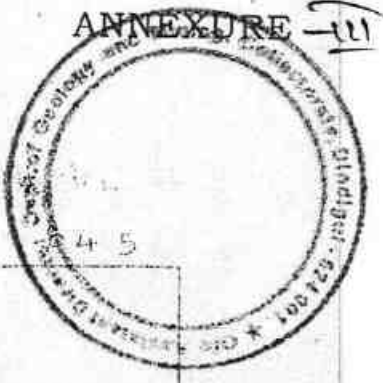
தங்கள் உண்மைபுள்ள

இடம் :

மனுதாரர் கையொப்பம்

நாள் :

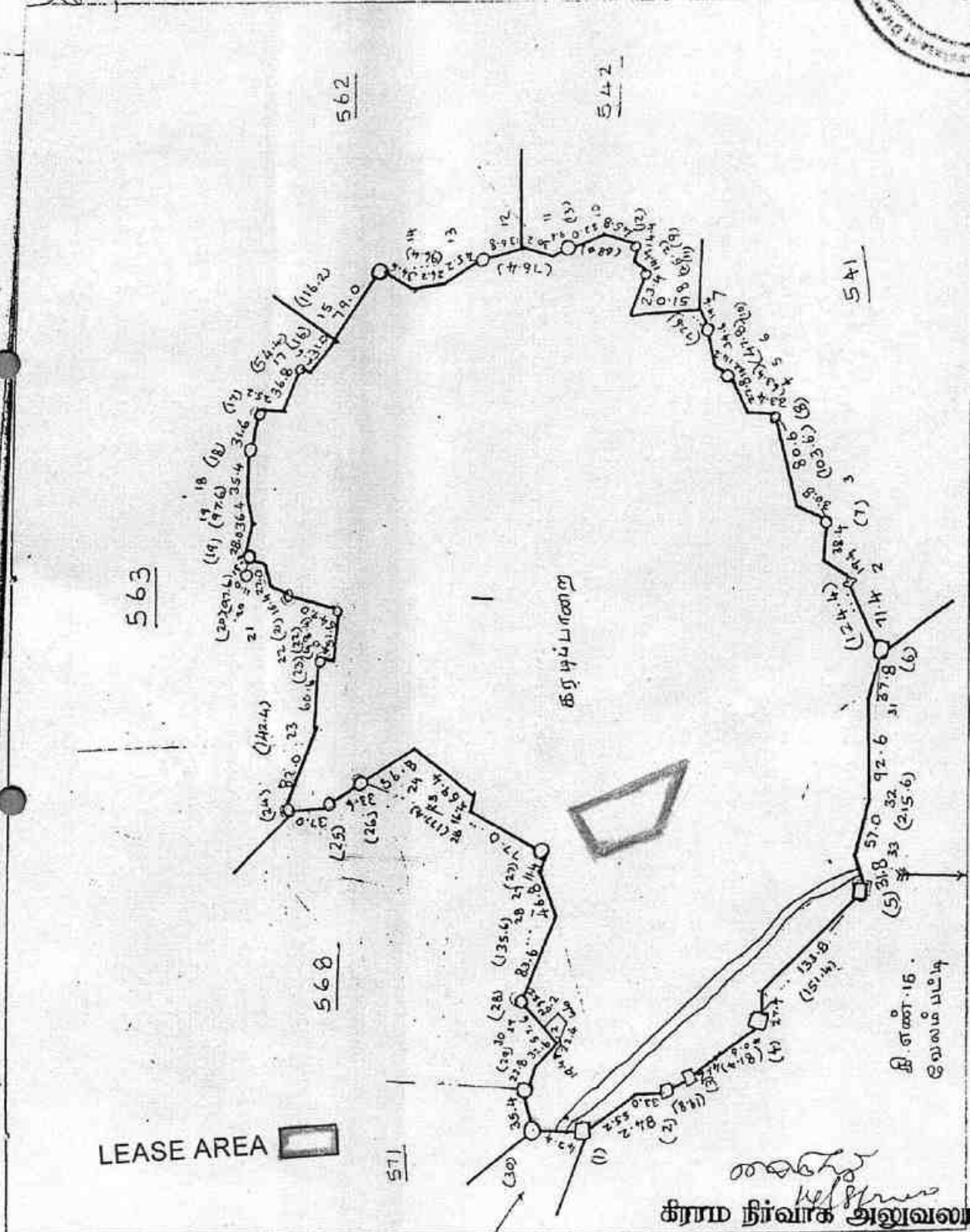
தமிழ்நாடு எழுதுபொருள் மற்றும் அச்சுத்தறை ஆணையரால் மதுரை அரசு கிளை அச்சத்தில் அச்சிடப்பட்டு
மாவட்ட ஆட்சியரால் வெளியிடப்பட்டது.



கரீபுரம் 569

தாலுகா - வேலூர் 27

பகுதி 45



LEASE AREA

கரீபுரம் பரணை

தி.எண்-16.
வேலூர் பட்டி

Prepared by
V. Suresh
10.1.84.

Compared by V. Jayaraman

அளவு. 1:1000

TAHSILDAR
VELUR

கிராம நிர்வாக அலுவலர்

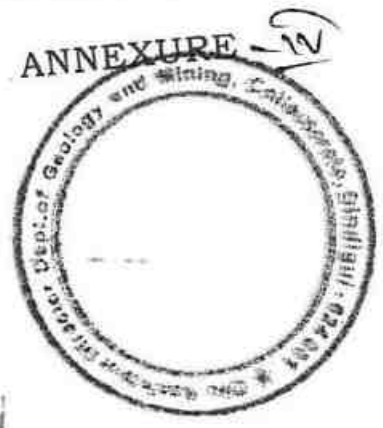
13, நடுமண்டலம் கிராமம்

நத்திதி வட்டம், திண்டுக்கல் மாவட்டம்

(Signature)

Dr. S. KARUPPANNAN, M.Sc.
RQP/MAS/263/2014/A

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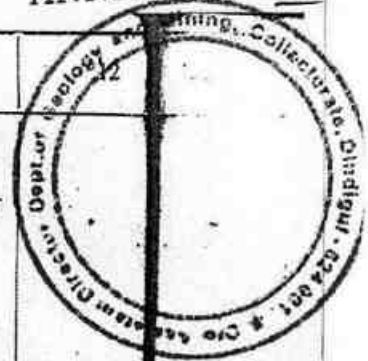


LEASE AREA 285

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Dr. S. KARUPPANNAN, M.Sc., Ph.D.,
RQP/MAS/263/2014/A



1	2	3	4	5	6	7	8	9	10	11	
567	...	567	ர	4	...	8-1	4	2 77	2 01.5	5 58	2303 மு. வெங்கிடா சலம் மற்றும் மூன்று பேர் களும்.*
568	1	568-1	ர	4	...	8-1	4	2 77	0 12.5	0 35	2303 மு. வெங்கிடா சலம் மற்றும் மூன்று பேர் களும்.*
	2	-2	ர	4	...	8-1	4	2 77	1 33.5	3 70	1973 மைதீன் என்ற ரையதயம்மாள் (1), சே. சகரு பான் (2).
	3A	-3A	ர	4	...	8-1	4	2 77	0 53.5	1 48	953 ரா. தில்வையம் பன்.
	3B	-3B	ர	4	...	8-1	4	2 77	0 30.5	0 84	1694 ஹ. கிருஷ்ணன்.
	3C	-3C	ர	4	...	8-1	4	2 77	0 27.0	0 75	1330 ப. பெரியப்பா நாயுடு.
	4A	-4A	ர	4	...	8-1	4	2 77	0 28.5	0 79	599 அ. சித்திரவேல்.
	4B	-4B	ர	4	...	8-1	4	2 77	0 38.0	1 05	1823 மு. வெங்கடா சலம்.
	4C	-4C	ர	4	...	8-1	4	2 77	0 33.0	0 91	1640 மு. ராமன்.
	4D	-4D	ர	4	...	8-1	4	2 77	0 35.5	0 98	1823 மு. வெங்கடா சலம்.
	4E	-4E	ர	4	...	8-1	4	2 77	0 70.5	1 95	467 மு. சண்முகம்.
	4F	-4F	ர	4	...	8-1	4	2 77	0 26.0	0 72	599 அ. சித்திரவேல்.
									4 88.5	13 52	
569	1	569-1	அ	த.ஏ.க	...	...	...	...	27 81.5	...	...
	2	-2	ர	4	...	8-1	4	2 77	0 03.0	0 08	1329 வெ. பெரியாப் பிள்ளை.
									27 84.5	0 08	
570	...	570	அ	4ற	...	...	...	...	0 67.5	...	...
571	1	571-1	ர	4	...	8-1	4	2 77	1 84.5	5 11	1748 வெ. வெள்ளையன் என்ற வீரப்பன் செட்டியார்.
	2	-2	ர	4	...	8-1	4	2 77	0 86.0	2 39	1748 வெ. வெள்ளையன் என்ற வீரப்பன் செட்டியார்.

* விவரப்பட்டியைப் பார்க்கவும்.

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Dr. S. KARUPPANNAN, M.Sc. Ph.D.
RQP/MAS/263/2014/A

286
TASILDAR
NATHAN

கிராம நிர்வாக அலுவலர்
13, நடுமண்டலம் கிராமம்

நீர்வாங்கல் மற்றும் கால்வாய் துறை

143- ஆம் பசலியில் தீண்டல்

நில வரித் திட்டத்தின்படி
புலன்களின் விபரம்.

(1) நில அளவை எண்.	(2) உட்பிரிவு எண்.	(3) பரப்பு.	(4) தீர்வை.	(5) ஒரு பொகம் அல்லது இரு பொகம்.	(6) கைப்பற்று தாரருடைய பெயரும் எண்ணும் அல்லது அனுபோக தாரருடைய பெயர்.
478	6	0.233			
569	1	27.81.5			
609	1	5.35 ⁰			
707	4	0.72 ⁰			
707	12	0.58 ⁰			

அடங்கல் கணக்கு

(18அ) என்று பதிவுசெய்த நிலம் - கணக்கு பிரகார மாடுகளில் நிர் பாய்ச்சப்பட்ட நிலங்கள்.	(19) கீழ்க்கண்டவகையில் பயிரிடப்படாத உள்ள நிலத்தின் தன்மை மற்றும் பரப்பின் விவரங்கள் ஒவ்வொரு தர அளவை எண் அல்லது அதன் பகுதியில்.
	(அ) வளம், (ஆ) பயனற்ற பயிரிடப்படாத இயலாத நிலம், (இ) விவசாயம் மற்றும் இதர காரியங்களுக்கு பயன் இடப்படும் நிலம், (ஈ) பயிரிட தகுக்க தரிக (உ) நிலையான புல் தரைகளை மற்றும் இதர மேய்ச்சல் நிலங்களை (ஊ) விதைக்கப்பட்ட நிகர பரப்பில் சேர்க்கப்படாத மரவகைப் பயிர்களும் தோப்புகளும், (எ) நடப்புத் தரிககள் (ஐ) இதர தரிக நிலங்கள்.



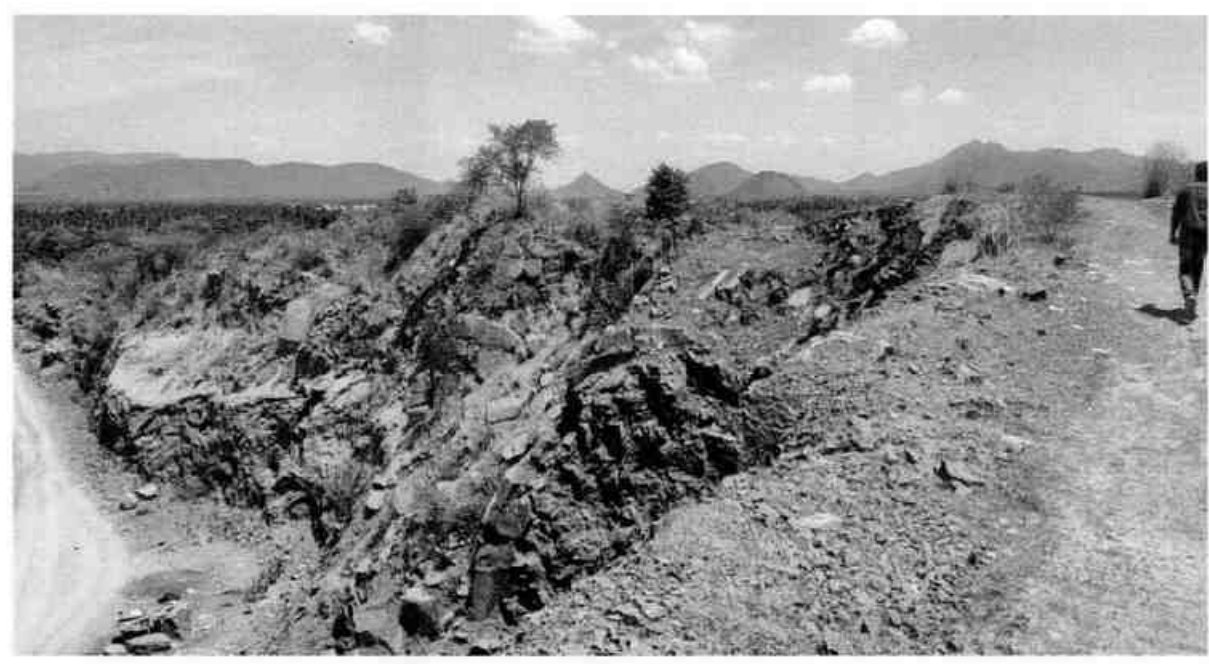
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Dr. S. KARUPPANNAN, M.Sc., Ph.D.,
RQP/MAS/263/2014/A

PHOTOCOPY OF THE PROPOSED LEASE AREA

Field photos in respect of Tender Cum action Rough Stone quarry lease, Govt Poramboke land over an extent of 1.20.0 Hectares in S.F.No: 569/1 (Part-4) of Nadumandalam Village, Natham Taluk, Dindigul District and Tamil Nadu State belongs to **Mr.A.GOVINDARAJAN.**



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Dr. S. KARUPPANNAN, M.Sc., Ph.D.,
ROP/MAS/263/2014/A

अनुज्ञापि प्ररूप एल. 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 वेगलीग में वर्ग 6 के विस्फोटक
Licence to possess (g) for use explosives of class 1, 2, 3, 4, 5, 6 or 7 in a magazine

अनुज्ञापि सं. (Licence No.) : F/SC/EN/22/718(F107164)
वार्षिक फीस/रफ्त (Annual Fee Rs) : 6800/-



Licence is hereby granted to

M/s. Bari Traders (अधिगामी - Occupier : A. Abdul Bari), 1028/31, 1st West Street, Society Colony, Oddanchatram PO & TK, Town Village - Oddanchatram, District-DINDIGUL, State-Tamil Nadu, Pincode - 624619

अनुज्ञापि अनुदत्त की जाती है।

अनुज्ञापि की प्रारंभिकता (Status of licensee) - Partnership Firm

अनुज्ञापि निम्नलिखित प्रयोजनों के लिए विधिमान्य है।

possess for use of Nitrate Mixture, Safety Fuse, Detonating Fuse, Ordinary/Electric/Non Electric Detonators, - के उपयोग के लिए

Licence is valid only for the following purpose

अनुज्ञापि 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	Nitrate Mixture	2.0	0	2500 Kg.
2	Safety Fuse	6.1	0	5000 Mtrs
3	Detonating Fuse	6.2	0	10000 Mtrs
4	Ordinary/Electric/Non Electric Detonators	6.3	0	44000 Nos

एक विस्फोटक कलेंडर मास में हर महीने खरीदने वाले विस्फोटक की मात्रा (अनुच्छेद 3(ख) और (ग) के अधीन अनुज्ञापि के लिए)

10 times as above.

Quantity of explosives to be purchased in a calendar month (applicable for licence under article 3(b) and (c))

अनुज्ञापित रेखाचित्र (रेखाचित्रों) से अनुज्ञापि परिसर की पुष्टि होती है।

रेखाचित्र क्र. (Drawing No.) F/SC/EN/22/718(F107164)
दिनांक (Dated) 13/03/2018

The licensed premises shall conform to the following drawing(s).

अनुज्ञापि परिसर निम्नलिखित पते पर स्थित है। The licensed premises are situated at following address

Survey No. 1, Lakkayankattai Village, ग्राम (Town/Village) - Oddanchatram

पोलिस थाना (Police Station) : Oddanchatram

जिला (District)

DINDIGUL

राज्य (State)

Tamil Nadu

पिनकोड (Pincode)

624619

दूरभाष (Phone)

ई-मेल (E-Mail)

फैक्स (Fax)

अनुज्ञापि परिसर में निम्नलिखित सुविधाएं अंतर्विष्ट हैं।

One RCC magazine

The licensed premises consist of following facilities

अनुज्ञापि सामान्य - सामान्य पर यथासंशोधित विस्फोटक अधिनियम, 1884 और उनके अधीन विरचित विस्फोटक नियम, 2004 के उपबन्धों, शर्तों और अतिरिक्त शर्तों और निम्नलिखित उपबन्धों 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, 2004 framed there under and the conditions, additional conditions and the following Annexures

1. उपर्युक्त क्रम सं. 5 में यथा कथित रेखाचित्र (स्थान, संनिर्माण संबंधी और अन्य विवरण दर्शित करते हुए)

Drawings (showing site, constructional and other details) as stated in serial No. 5 above

2. अनुज्ञापि प्राधिकारी द्वारा हस्ताक्षरित इस अनुज्ञापि की शर्तों और अतिरिक्त शर्तों।

Conditions and Additional Conditions of this licence signed by the licensing authority.

3. दूरी प्ररूप DE-2 - Distance Form DE-2.

यह अनुज्ञापि तारीख 31 मार्च 2021 तक विधिमान्य रहेगी। This licence shall remain valid till 31st day of March 2021.

यदि अनुज्ञापि, अधिनियम या उसके अधीन विरचित नियमों या अनुसूची V के भाग 4 के प्रति निर्दिष्ट रोट-VII के अधीन तथा उपवर्णित इस अनुज्ञापि की शर्तों का अतिक्रमण करने या यदि अनुज्ञापि परिसर योजना या उससे संलग्न उपबन्ध में दर्शित विवरण के अनुरूप नहीं पाए जाने पर निलंबित या प्रतिशोधन की जा सकती है, तथा 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 VII, 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.

दिनांक - The Date - 13/03/2018

संयुक्त मुख्या विस्फोटक नियंत्रक | Joint Chief Controller of Explosives
South Circle, Chennai

नवीनीकरण के पृष्ठांकन के लिए स्थान
Space for Endorsement of Renewal

नवीनीकरण की तारीख
Date of Renewal

समाप्ति की तारीख
Date of Expiry

अनुज्ञापि प्राधिकारी के हस्ताक्षर और स्टाम्प
Signature of licensing authority and stamp

01/01/2021

31/03/2026

J. Chief Controller of Explosives, South Circle, Chennai

कानूनी चेतावनी : विस्फोटकों को गलत ढंग से चलाने, भंडारण, दुरुपयोग विधि के अधीन गंभीर दंडिक अपराध होगा।
Statutory Warning : Mishandling and misuse of explosives shall constitute serious criminal offence under the law.

(Handwritten signature)



தமிழ்நாடு தமிழ்நாடு TAMIL NADU

42AA 591515

கமிட்டாக: குடியம்: 10/-
எண்: 42 தேதி: 05.01.2021
பெயர்: பி. அப்துல் பானி
இடம்: ஒட்டன்சத்திரம்.

[Signature]
சி. சந்திராஜ்,
ஒட்டன்சத்திரம் கிராமபஞ்சாயத்
ஒட்டன்சத்திரம்,
உரியம் எண்: 12/2010

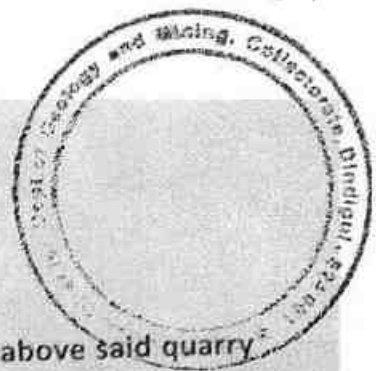
PROPOSED DEED OF BLASTING AGREEMENT

This Proposed deed of blasting agreement is entered into at Oddanchatram on this day of 2nd June 2021 between M/S A.Govintharajan S/o Amirthalingadass, No:6, Manmalai Samy Street, K.Puthur, Madurai(dt), here in after refer to as party of the first part and M/S, Bari Traders, Explosives Blasting Contractor 1025G1 1st West Street Society colony, Oddanchatram, (p.o)& (t.k) Dindigul (D.T) E/SC/TN/22/718(E107164), valid upto 31.3.2026, in form LE-3 of Explosives Rules 2008, herein after referred to as party of the second part.

The party of the first part is going to operate a stone quarry as per ROC NO; 112/2021 (Minerals) Dated 06/05/2021, only after optioning N.O.C from State Environment Impact Assessment Authority Chennai, for a period of five years granted by the District Authority at S.F no;569/1(part4), Nadumandalam Village Natham (tk), Dindigul(dt), over an extant of 1.20.0 Hectors porambok land.

[Signature]
BARI TRADER'S
Proprietor

[Handwritten signature]



Where as the party of the first part wants blasting to be done at the above said quarry site to excavate rough stone, we are ready to accept and operate blasting work at the said site on agreement basis as follows.

The Party of the first part will allot the blasting operations in the above said areas to the party of the second part. who is responsible for blasting rocks and also making his own arrangements for the Explosives and exploding equipment's required for the work. The entire blasting work in the above quarry and the possession of blasting equipment will be handled by the party of the second part and hereby under take the responsibility for the work entrusted. the party of the 2nd part not responsible for the blasting work under taken without the second part and other areas said above. The Entire blasting operation will be carried out only after sunrise and before sunset as per explosives rules 2008.

Payment will be made periodically by the party of the 1st part for the quantity of explosives used and consumed and hours and time of the exploding equipment put in to use, Calculations will be made and settlement will be arrived at every month. The rates for the items of work will as mutually agreed as marginal cost which includes cost of Explosives, Transportation cost and other charges for blasting works. This agreement is made for all blasting work done in the above said areas only..

This agreement is Valid from the date of execution till validity of quarrying leases granted by the state government to the party of first part of terminable earlier by mutual consent with a month's notice.

DE BARI TRADER

[Handwritten signature]
Proprietor

Place ; Oddanchatram,
Date; 02.06.2021
Witness;

- 1.)
- 2.)

[Handwritten signature]

[Handwritten signature]


सत्यमेव जयते


आधार

இந்திய அரசாங்கம்
Unique Identification Authority of India
Government of India

பதிவு அடைபாள் / Enrollment No.: 2007/20616/12667

To
கோவிந்தராஜன் அமிர்தலிங்கதாஸ்
Govindarajan Amirthalingadoss
SiO: Amirthalingadoss
6 MANMALAISAMY KOVIL STREET
K PUDUR
Madurai North
K.pudur
Madurai North Madurai
Tamil Nadu 625007
9047019081

08/04/2013
29521457


MN295214579FT



உங்கள் ஆதார் எண் / Your Aadhaar No.
4582 5371 2746

ஆதார் - சாதாரண மனிதனின் அதிகாரம்


सत्यमेव जयते

இந்திய அரசாங்கம்
Government of India

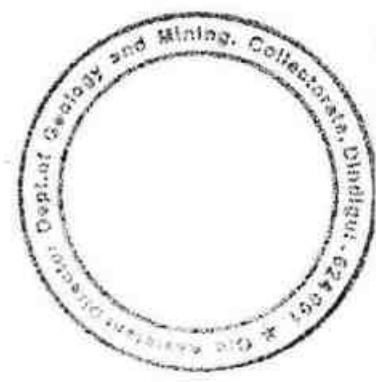
கோவிந்தராஜன் அமிர்தலிங்கதாஸ்
Govindarajan Amirthalingadoss
தந்தை அமிர்தலிங்கதாஸ் வெங்கட்ராமன்
Father: AMIRTHALINGADASS VENKATRAMAN
பிறந்தவகுடம் / Year of Birth: 1975
ஆண்பால் / Male

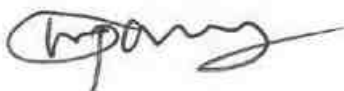


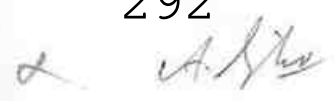


4582 5371 2746

ஆதார் - சாதாரண மனிதனின் அதிகாரம்




Dr. S. KARUPPANNAN, M.Sc., Ph.D.,
RQP/MAS/263/2014/A





Rupannan

अर्हता प्राप्त व्यक्ति के रूप में मान्यता प्रमाण पत्र
(खनिज रियायत नियमावली, 1960 के नियम 22सी के तहत)
CERTIFICATE OF RECOGNITION AS QUALIFIED PERSON
(Under Rule 22C of Mineral Concession Rules, 1960)

श्री एस. करुपणन, मॉंगनीकाडू, मुत्तमपट्टी पोस्ट, बोम्मीडी वर्यो, ओमलूर तालुक, सेलम डीस्ट्रीक्ट, तमिलनाडू - 635 301, जिनका फोटो और हस्ताक्षर ऊपर दिया हुआ है, तथा जिनहोंने अपनी अर्हता और अनुभव का संतोष जनक साक्ष्य दिया है, को खनन योजना तैयार करने हेतु खनिज रियायत नियमावली 1960 के नियम 22सी के तहत अर्हता प्राप्त व्यक्ति के रूप में मान्यता प्रदान की जाती है।

Shri S. Karuppannan, Mangarikadu, Muthampatty (Post), Bommididi (Via), Omalur Taluk, Salem District, Tamilnadu - 635 301, whose **Photograph and signature** is affixed herein above, having given satisfactory evidence of his qualifications & experience hereby **RECOGNISED** under Rule 22C of the Mineral Concession Rule, 1960 as a Qualified Person to prepare Mining Plans.

उनकीपंजीयन संख्या है

His registration number is

RQP /MAS/263/2014/A

यह मान्यता 10 वर्षों की अवधि के लिए मान्यता है जो दिनांक 15.12.2024 को समाप्त होगी।

This recognition is valid for a period of 10 years ending on 15.12.2024.

उनके द्वारा प्रस्तुत खनन योजना में गलत जानकारी / दस्तावेज पाए जाने की स्थिति में यह प्रमाण पत्र वापस लिया जाएगा / निरस्त किया जाएगा।

This certificate will liable to be withdrawn / cancelled in the event of furnishing the wrong information / documents in the Mining Plan submitted by him.

स्थान/ Place : Chennai

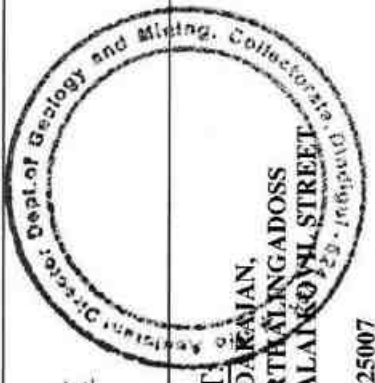
दिनांक/ Date : 16.12.2014.

Rupannan

Dr. S. KARUPPANNAN, M.Sc., Ph.D.,
RQP/MAS/263/2014/A

Murari
क्षेत्रीय खाननियंत्रक / Regional Controller of Mines
293 भारतीय खानब्यूरो/ Indian Bureau of Mines
चेन्नई क्षेत्र / Chennai Region

PLATE NO-I







APPLICANT:
Mr. A. GOVINDARAJAN,
S/O. Mr. AMIRTHALINGADROSS
NO. 6, MANMALAI SOUL STREET,
K PUDUR
MADURAI - 625007

LEASE APPLIED AREA:

S.F.NO : 569/1 (PART-4)
EXTENT : 1.20.0 Hect,
VILLAGE : NADUMANDALAM,
TALUK : NATHAM,
DISTRICT : DINDIGUL.

INDEX

- MINE LEASE AREA 
- APPROACH ROAD 
- VILLAGE ROAD 
- SH - 35 ROAD 

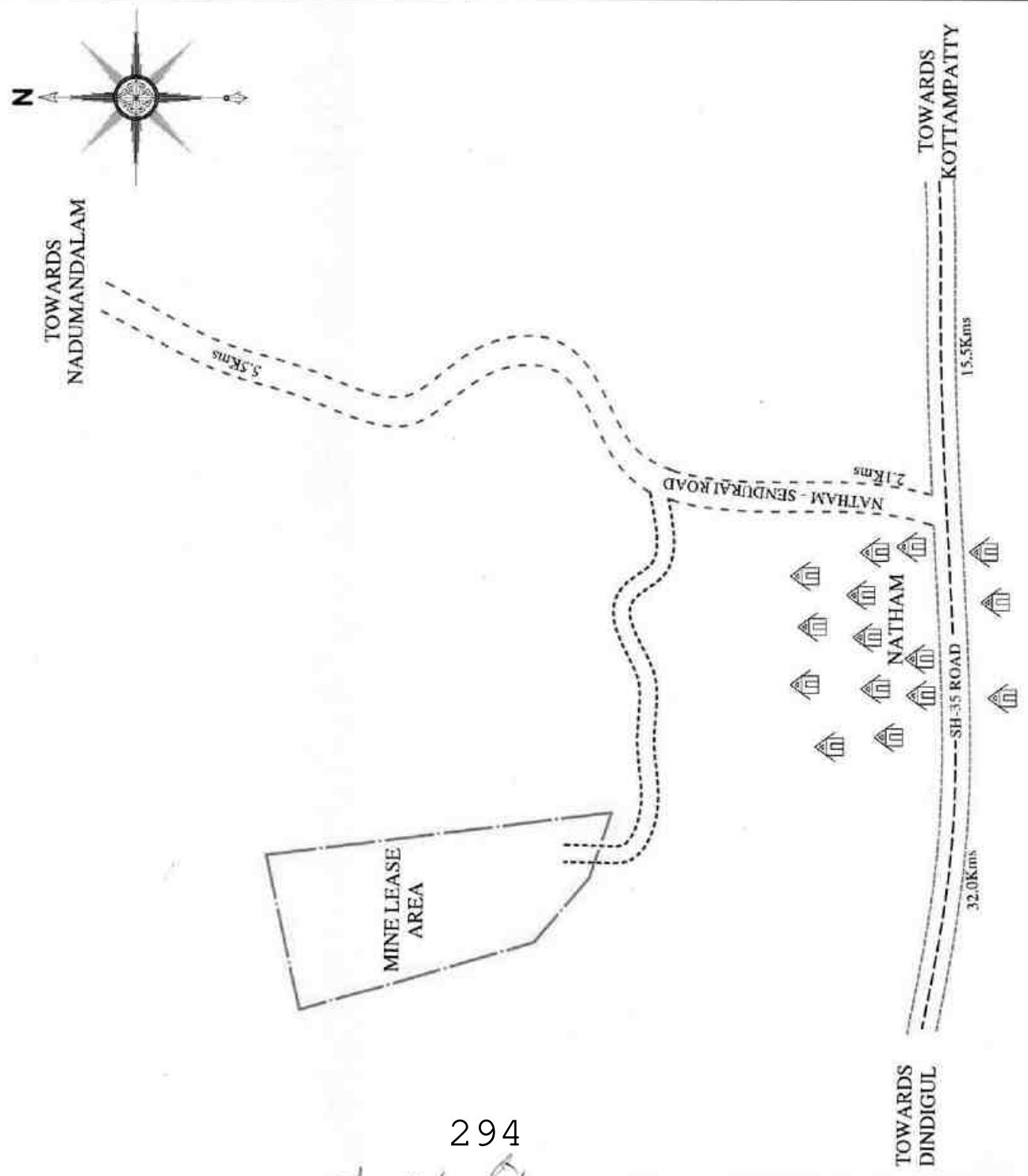
KEY MAP

Not to Scale

Prepared By:

I DO HEREBY CERTIFY THAT THE PLATE HAS BEEN CHECKED BY ME AND IS CORRECT TO THE BEST OF MY KNOWLEDGE

Dr. S. KARUPPANNAN, M.Sc., Ph.D.,
RECOGNIZED QUALIFIED PERSON
RQP/MAS/263/2014/A



10°14'41.04"N

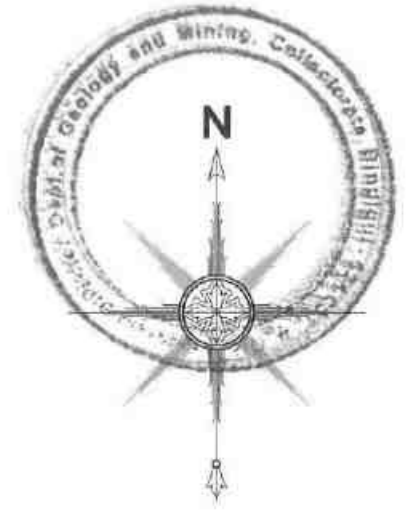


PLATE NO-IA

APPLICANT:
 Mr.A.GOVINDARAJAN,
 S/O. Mr.AMIRTHALINGADOSS
 NO.6,MANMALAI KOVIL STREET
 K PUDUR
 MADURAI - 625007

LEASE APPLIED AREA:
 S.F.NO : 569/1 (PART-4)
 EXTENT : 1.20.0 Hect.
 VILLAGE : NADUMANDALAM,
 TALUK : NATHAM,
 DISTRICT : DINDIGUL.

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MINE LEASE AREA: ●
 TOPO SHEET NO : 58-J/04
 LATITUDE : 10°14'34.88"N to 10°14'41.04"N
 LONGITUDE: 78°14'20.33"E to 78°14'23.92"E

LOCATION PLAN

NOT TO SCALE

Prepared By:

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 TO THE BEST OF MY KNOWLEDGE

Dr.S.KARUPPANNAN,M.Sc.,Ph.D.,
 RECOGNIZED QUALIFIED PERSON
 RQP/MAS/263/2014/A

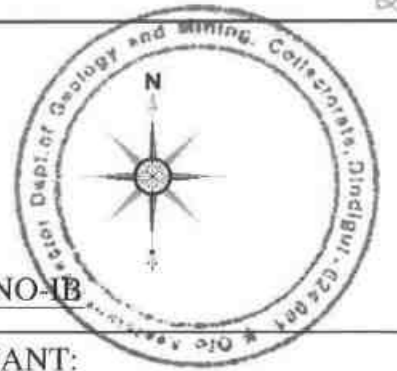


PLATE NO-1B

APPLICANT:
Mr.A.GOVINDARAJAN,
S/O. Mr.AMIRTHALINGADOSS
NO.6,MANMALAI KOVIL STREET
K PUDUR
MADURAI - 625007

LEASE APPLIED AREA:
S.F.NO : 569/1 (PART-4)
EXTENT : 1.20.0 Hect,
VILLAGE : NADUMANDALAM,
TALUK : NATHAM,
DISTRICT : DINDIGUL.

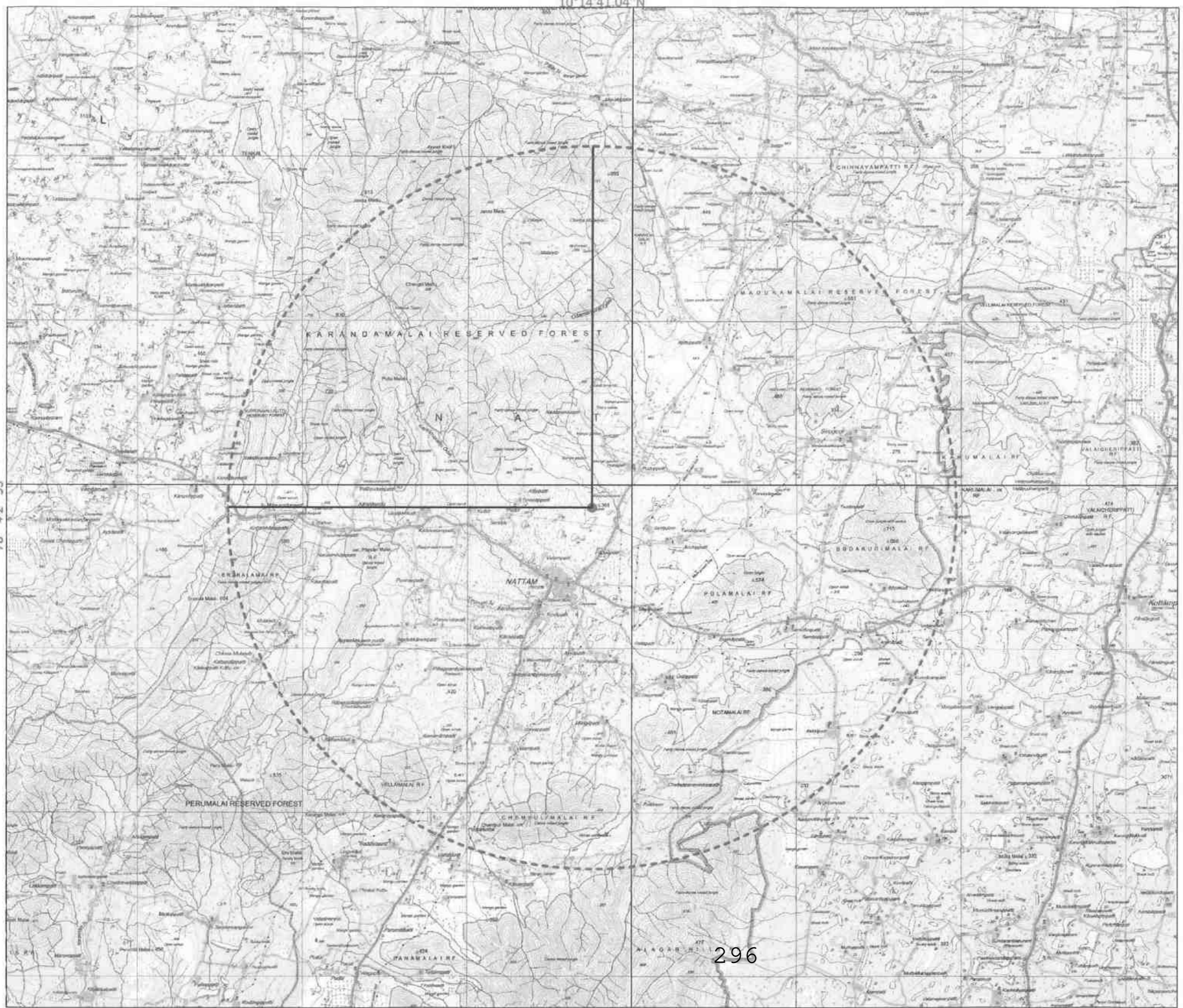
TOPO SHEET NO : 58-J/04

LATITUDE : 10°14'34.88"N to 10°14'41.04"N

LONGITUDE: 78°14'20.33"E to 78°14'23.92"E

MINE LEASE AREA 

10KM RADIUS 



CONVENTIONAL SYMBOLS

Depress features - all set with hachures with opposite direction	
Trails, roads, cart tracks, etc.	
Overhead and overhead power lines	
Trains with and without overhead power	
Canals with and without overhead power	
Trains with overhead power and telegraph lines	
Trains with overhead power and telegraph lines and telegraph lines	
Trains with overhead power and telegraph lines and telegraph lines and telegraph lines	
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Trains with overhead power and telegraph lines and telegraph lines and telegraph lines and telegraph lines and telegraph lines and telegraph lines and telegraph lines and telegraph lines and telegraph lines and telegraph lines and telegraph lines and telegraph lines and telegraph lines and telegraph lines and telegraph lines and telegraph lines and telegraph lines and telegraph lines and telegraph lines	
Trains with overhead power and telegraph lines	
Trains with overhead power and telegraph lines	

TOPO SHEET MAP

SCALE - 1:1,00,000

Prepared By:
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HAS BEEN CHECKED BY ME AND IS CORRECT
TO THE BEST OF MY KNOWLEDGE

Dr.S.KARUPPANNAN, M.Sc., Ph.D.,
RECOGNIZED QUALIFIED PERSON
ROP/MAS/263/2014/A

10°14'41.04"N

3°1'20.1"E








PLATE NO-IC

APPLICANT:
 Mr.A.GOVINDARAJAN,
 S/O. Mr.AMIRTHALINGADOSS
 NO.6,MANMALAI KOVIL STREET
 K PUDUR
 MADURAI - 625007

LEASE APPLIED AREA:
 S.F.NO : 569/1 (PART-4)
 EXTENT : 1.20.0 Hect,
 VILLAGE : NADUMANDALAM,
 TALUK : NATHAM,
 DISTRICT : DINDIGUL.


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APPROACH ROAD	
300m RADIUS	
500m RADIUS	
EXISTING PIT	

TOPO SHEET NO : 58-J/04
 LATITUDE : 10°14'34.88"N to 10°14'41.04"N
 LONGITUDE: 78°14'20.33"E to 78°14'23.92"E

SATELLITE IMAGERY MAP
 SCALE- 1:5000

Prepared By:
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 Dr.S.KARUPPANNAN,M.Sc.,Ph.D.,
 RECOGNIZED QUALIFIED PERSON
 RQP/MAS/263/2014/A

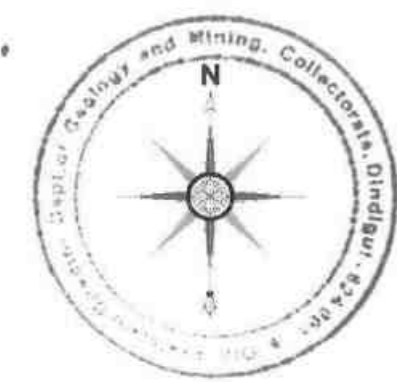







PLATE NO-ID

APPLICANT:
Mr.A.GOVINDARAJAN,
S/O. Mr.AMIRTHALINGADOSS
NO.6,MANMALAI KOVIL STREET
K PUDUR
MADURAI - 625007

LEASE APPLIED AREA:
S.F.NO : 569/1 (PART-4)
EXTENT : 1.20.0 Hect,
VILLAGE : NADUMANDALAM,
TALUK : NATHAM,
DISTRICT : DINDIGUL.

INDEX

- MINE LEASE AREA 
- APPROACH ROAD 
- 300m RADIUS 
- 500m RADIUS 
- EXISTING PIT 

TOPO SHEET NO : 58-J/04
LATITUDE : 10°14'34.88"N to 10°14'41.04"N
LONGITUDE: 78°14'20.33"E to 78°14'23.92"E

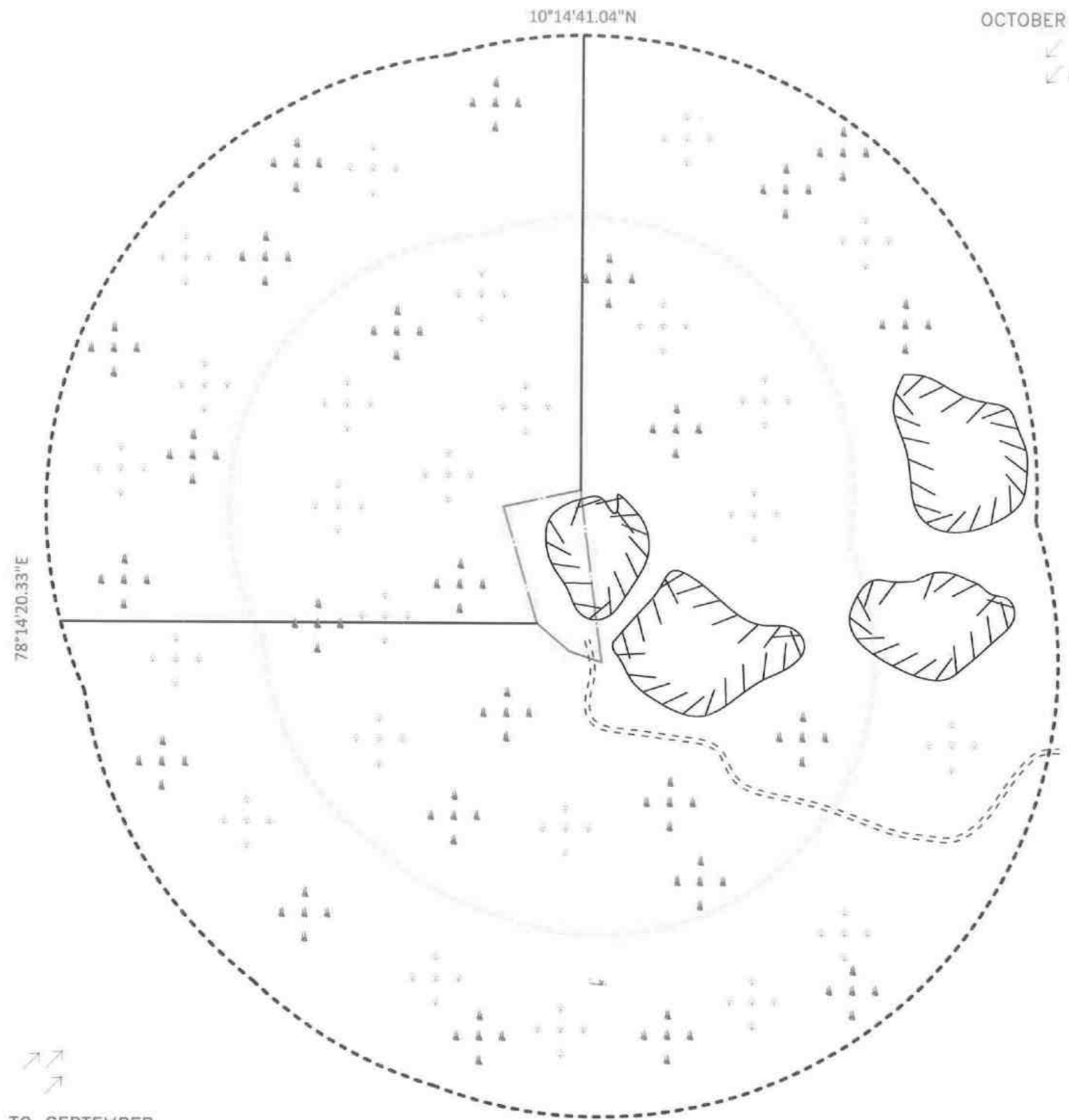
ENVIRONEMNTAL PLAN

SCALE- 1:5000

Prepared By:

I DO HEREBY CERTIFY THAT THE PLATE HAS BEEN CHECKED BY ME AND IS CORRECT TO THE BEST OF MY KNOWLEDGE

Dr.S.KARUPPANNAN,M.Sc.,Ph.D.,
RECOGNIZED QUALIFIED PERSON
RQP/MAS/263/2014/A



OCTOBER TO DECEMBER



78°14'20.33"E

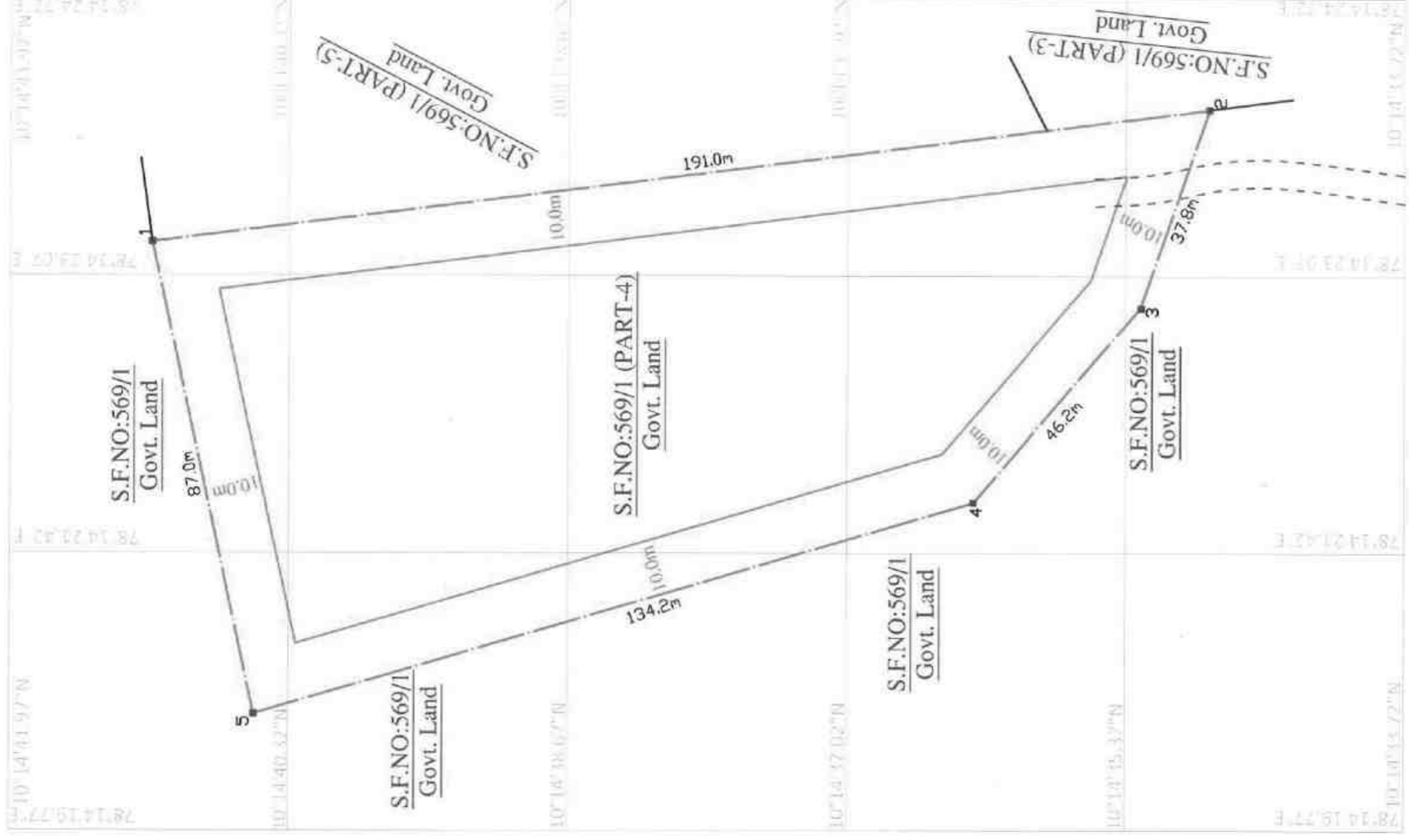
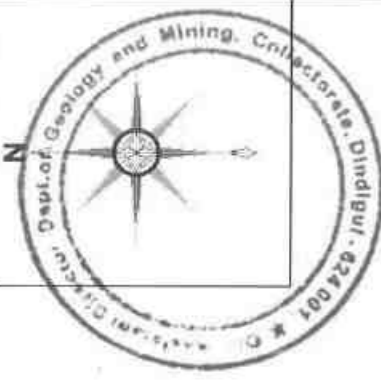
10°14'41.04"N

JULY TO SEPTEMBER



Handwritten signature/initials

24/8/24



Pillar ID	Latitude	Longitude
1	10°14'41.04"N	78°14'23.09"E
2	10°14'34.88"N	78°14'23.92"E
3	10°14'35.30"N	78°14'22.73"E
4	10°14'36.30"N	78°14'21.57"E
5	10°14'40.42"N	78°14'20.33"E

PLATE NO-II

APPLICANT:
 Mr.A.GOVINDARAJAN,
 S/O. Mr.AMIRTHALINGADROSS
 NO.6,MANMALAI KOVIL STREET
 K PUDUR
 MADURAI - 625007

LEASE APPLIED AREA:
 S.F.NO : 569/1 (PART-4)
 EXTENT : 1.20.0 Hect,
 VILLAGE : NADUMANDALAM,
 TALUK : NATHAM,
 DISTRICT : DINDIGUL.

MINE LEASE PLAN
 SCALE 1: 1000

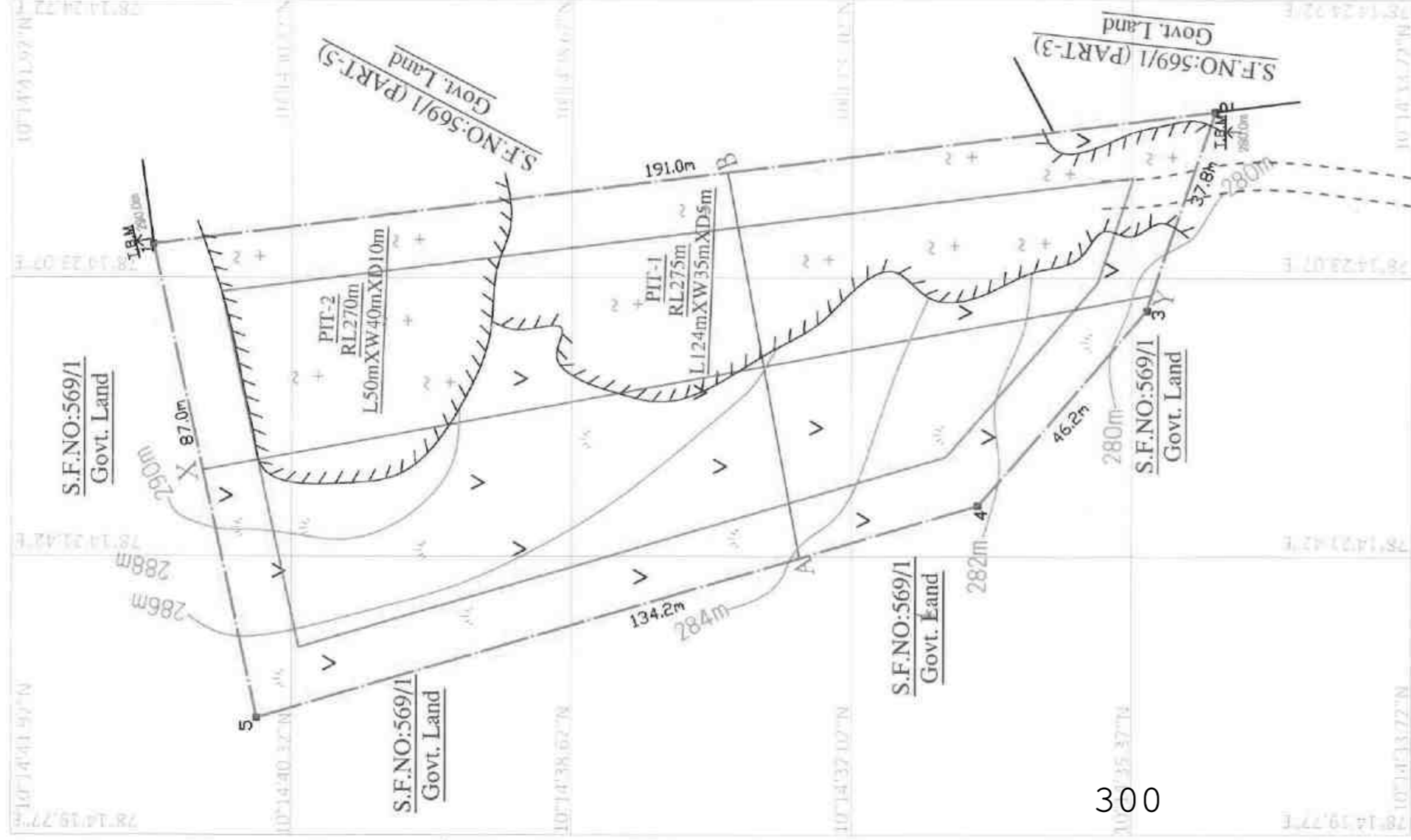
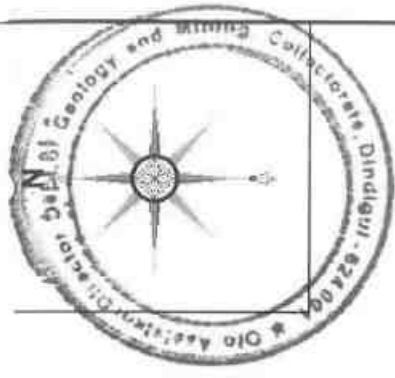
INDEX

- MINE LEASE AREA
- SAFETY AREA
- APPROACH ROAD
- PILLAR STONES

Prepared By:

I DO HEREBY CERTIFY THAT THE PLATE HAS BEEN CHECKED BY ME AND IS CORRECT TO THE BEST OF MY KNOWLEDGE

Dr.S.KARUPPANNAN,M.Sc.,Ph.D.,
 RECOGNIZED QUALIFIED PERSON
 RQP/MAS/263/2014/A



GEOLOGICAL RESOURCES									
Section	Bench	length in (m)	Width in (m)	Depth in (m)	Volume In CBM	Geological Resources in CBM	Top soil in CBM		
XY-AB	Slope	91	37	1	3367		3367		
	I	40	45	4	7200	7200			
	II	91	37	5	16835	16835			
	III	121	37	5	22385	22385			
	IV	143	70	5	50050	50050			
	V	172	70	5	60200	60200			
	VI	172	70	5	60200	60200			
VII	172	70	5	60200	60200				
GRAND TOTAL					280437	277070	3367		

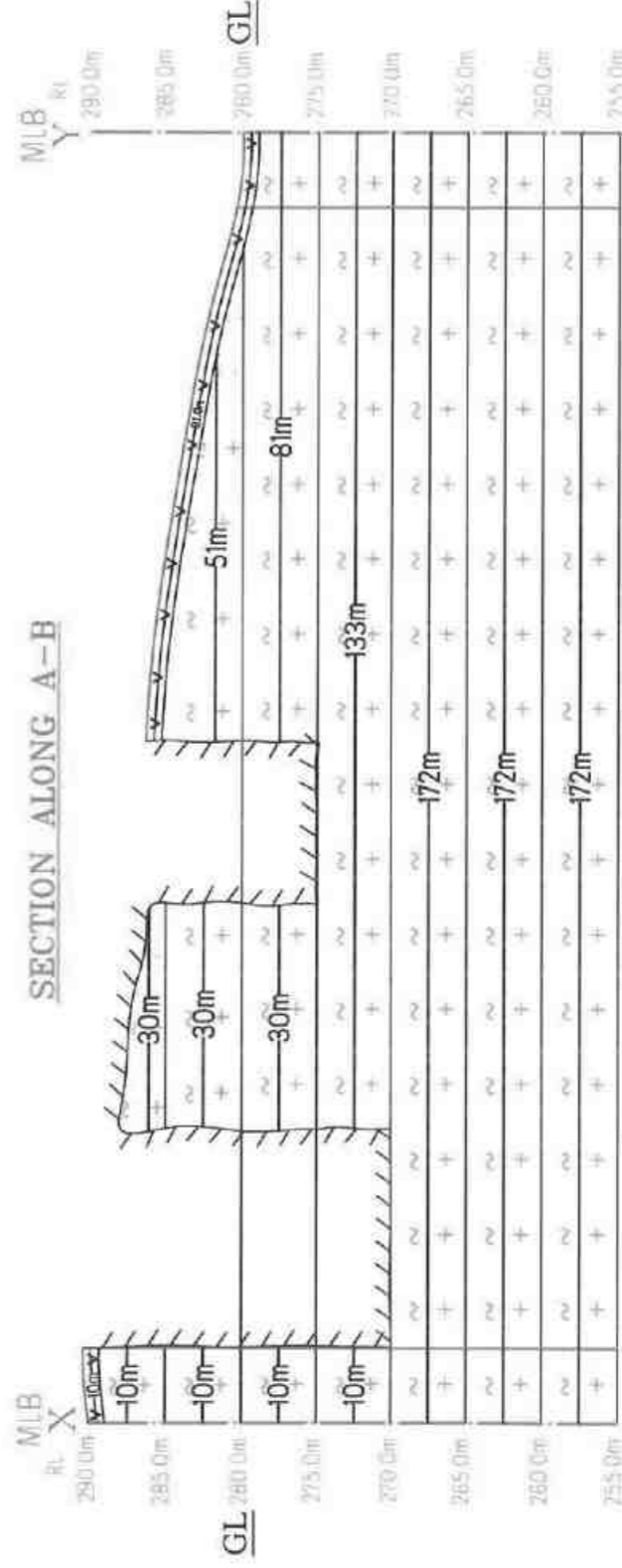
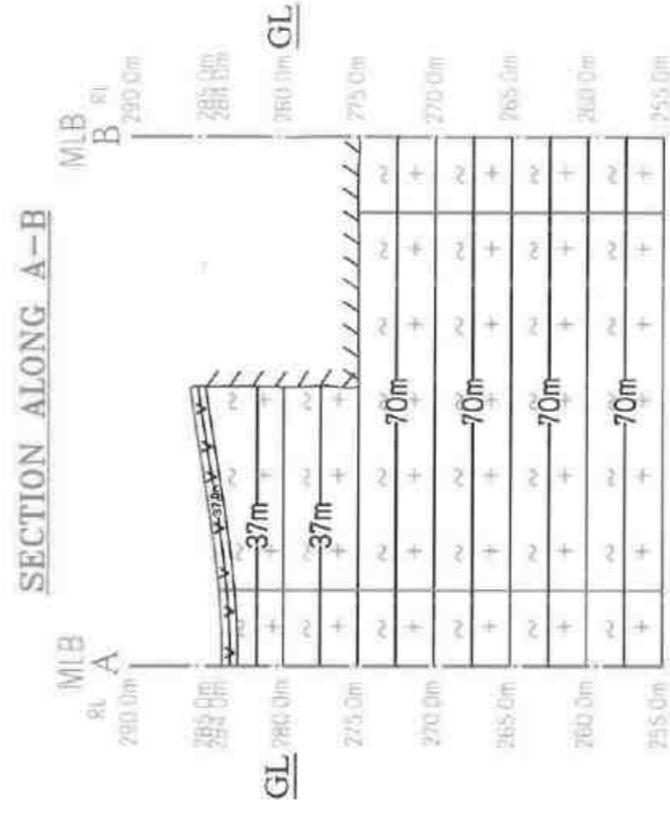


PLATE NO-III

APPLICANT:
Mr.A.GOVINDARAJAN,
S/O. Mr.AMIRTHALINGADOSS
NO.6,MANMALAI KOVIL STREET
K PUDUR
MADURAI - 625007

LEASE APPLIED AREA:
S.F.NO : 569/1 (PART-4)
EXTENT : 1.20.0 Hect,
VILLAGE : NADUMANDALAM,
TALUK : NATHAM,
DISTRICT : DINDIGUL.

SURFACE, GEOLOGICAL

PLAN & SECTIONS

PLAN SCALE 1 : 1000
SECTION HOR 1 : 1000 & VER 1 : 500

INDEX

- MINE LEASE AREA
- SAFETY BOUNDARY
- APPROACH ROAD
- TEMPORARY BENCH MARKS

CONTOUR LINES

SHRUBS

TOPSOIL

PILLAR STONES

EXISTING PIT

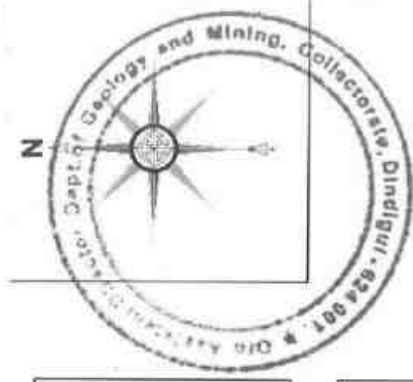
ROUGH STONE

Prepared By:

I DO HEREBY CERTIFY THAT THE PLATE HAS BEEN CHECKED BY ME AND IS CORRECT TO THE BEST OF MY KNOWLEDGE

[Signature]

Dr.S.KARUPPANNAN,M.Sc.,Ph.D.,
RECOGNIZED QUALIFIED PERSON
RQP/MAS/263/2014/A

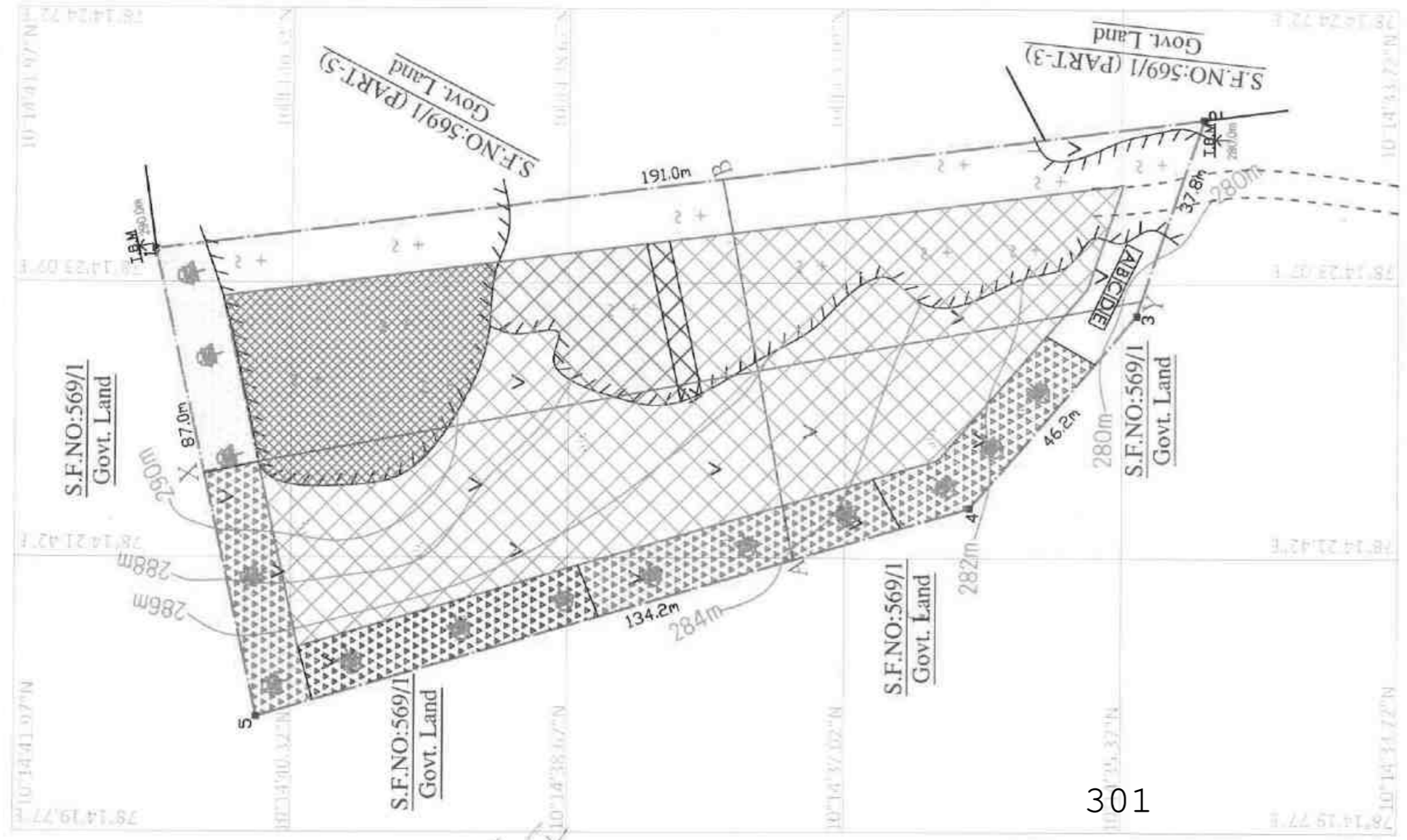


- A - OFFICE
- B - STORE
- C - FIRST AID
- D - REST ROOM
- E - TOILET

- I - Year Proposed area to be Quarried
- II - Year Proposed area to be Quarried
- III - Year Proposed area to be Quarried
- IV - Year Proposed area to be Quarried
- V - Year Proposed area to be Quarried

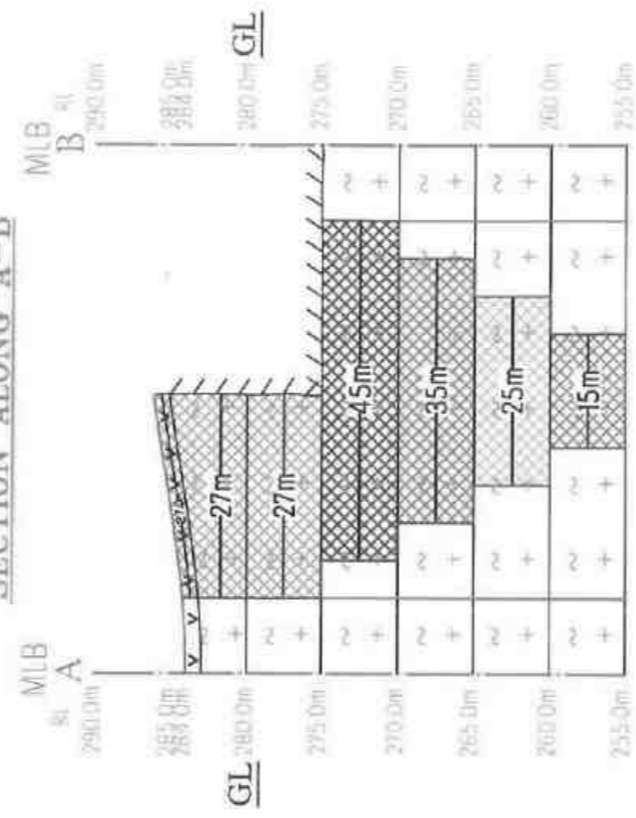
- I - Year Proposed area to be Planted
- II - Year Proposed area to be Planted
- III - Year Proposed area to be Planted
- IV - Year Proposed area to be Planted
- V - Year Proposed area to be Planted

YEARWISE PRODUCTION								
Year	Section	Bench	length in (m)	Width in (m)	Depth in (m)	Volume In CBM	Praduction in CBM	Top soil in CBM
I	XV-AB	I	71	27	1	1917	.....	1917
		II	30	35	4	4200	4200	.....
		III	81	27	5	10935	10935	.....
II	XV-AB	III	60	27	5	8100	8100	.....
		IV	41	27	5	5535	5535	.....
III	XV-AB	IV	70	45	5	15750	15750	.....
		V	48	45	5	10800	10800	.....
IV	XV-AB	V	60	35	5	10500	10500	.....
		VI	82	35	5	14350	14350	.....
V	XV-AB	VI	40	25	5	5000	5000	.....
		VII	92	25	5	11500	11500	.....
TOTAL						107737	105820	1917



301

SECTION ALONG A-B



SECTION ALONG A-B

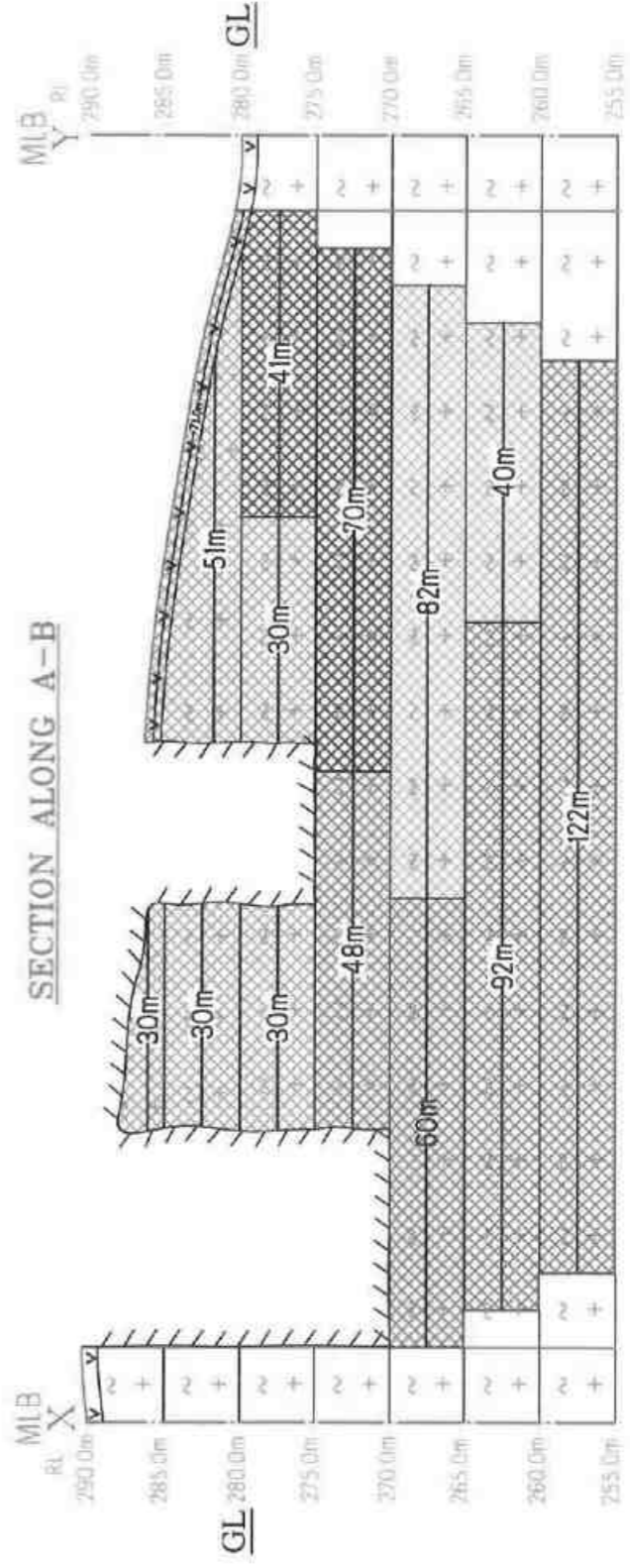


PLATE NO-IV

APPLICANT:
 Mr.A.GOVINDARAJAN,
 S/O. Mr.AMIRTHALINGADOSS
 NO.6,MANMALAI KOVIL STREET
 K PUDUR
 MADURAI - 625007

LEASE APPLIED AREA:
 S.F.NO : 569/1 (PART-4)
 EXTENT : 1.20.0 Hect,
 VILLAGE : NADUMANDALAM,
 TALUK : NATHAM,
 DISTRICT : DINDIGUL.

YEARWISE DEVELOPMENT,
 PRODUCTION PLAN & SECTION

- PLAN SCALE 1 : 1000
 SECTION HOR 1 : 1000 & VER 1 : 500
- INDEX
- MINE LEASE AREA
 - SAFETY BOUNDARY
 - APPROACH ROAD
 - TEMPORARY BENCH MARKS

CONTOUR LINES

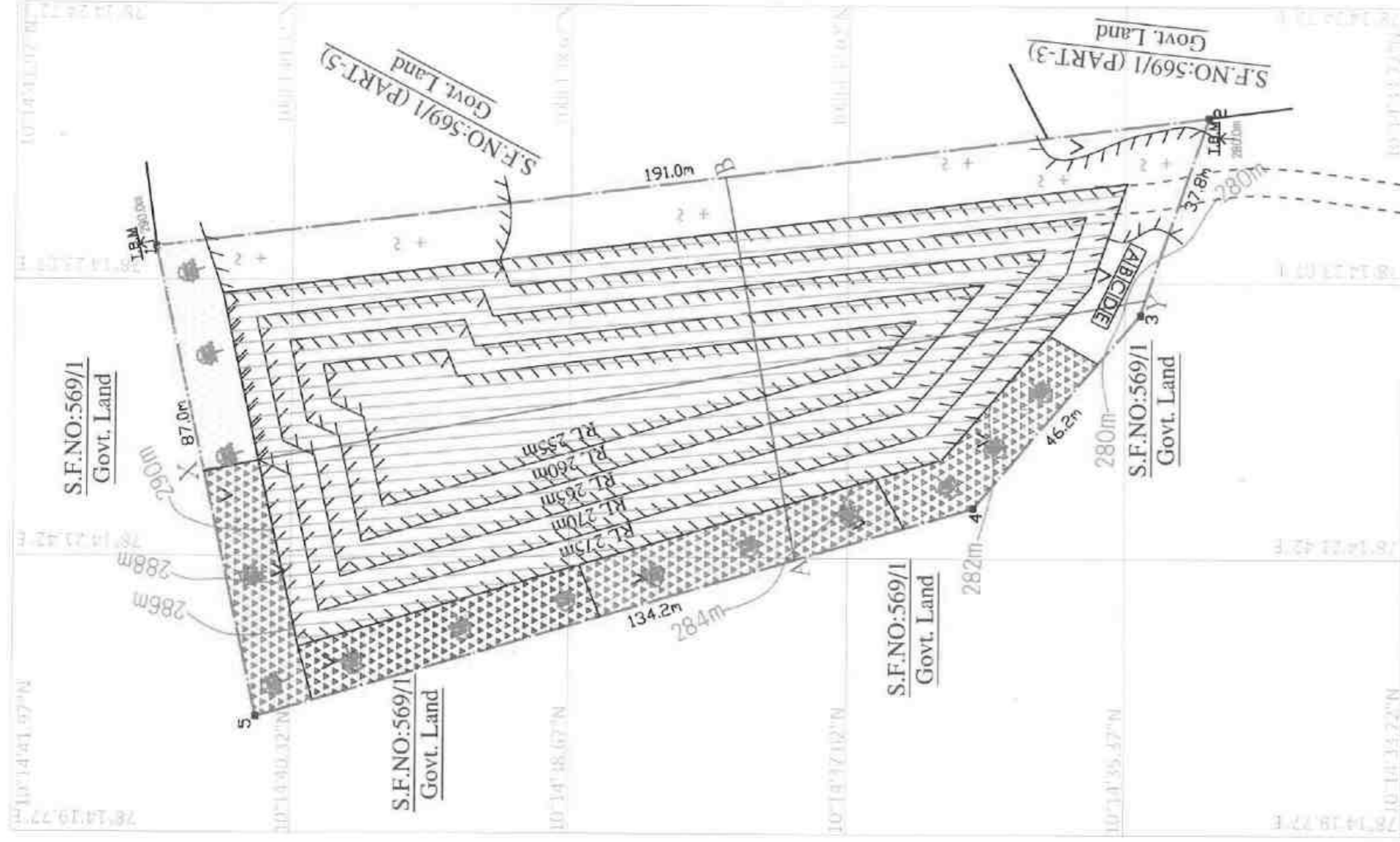
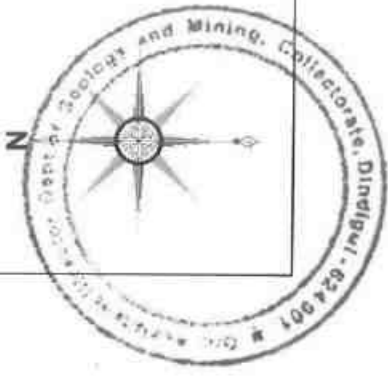
- SHRUBS
- TOPSOIL
- PILLAR STONES
- EXISTING PIT
- ROUGH STONE
- ULTIMATE BENCH

Prepared By:

I DO HEREBY CERTIFY THAT THE PLATE HAS BEEN CHECKED BY ME AND IS CORRECT TO THE BEST OF MY KNOWLEDGE

[Signature]

Dr.S.KARUPPANNAN,M.Sc.,Ph.D.,
 RECOGNIZED QUALIFIED PERSON
 RQP/MAS/263/2014/A



- I - Year Proposed area to be Planted
- II - Year Proposed area to be Planted
- III - Year Proposed area to be Planted
- IV - Year Proposed area to be Planted
- V - Year Proposed area to be Planted

- A - OFFICE
- B - STORE
- C - FIRST AID
- D - REST ROOM
- E - TOILET

MINE LAYOUT LAND USE PATTERN			
DESCRIPTION	PRESENT AREA (Hect)	AREA IN USE DURING THE QUARRING PERIOD(Hect)	COLOR CODE
AREA UNDER QUARRING	0.55.00	0.76.00	■
INFRASTRUCTURE	NIL	0.01.00	■
ROADS	NIL	0.03.00	■
UN-UTILIZED AREA	0.85.00	0.14.00	■
PLANTATION	NIL	0.24.00	■
GRAND TOTAL	1.20.0	1.20.00	

PLATE NO-V

APPLICANT:
Mr.A.GOVINDARAJAN,
S/O. Mr.AMIRTHALINGADOSS
NO.6,MANMALAI KOVIL STREET
K.PUDUR
MADURAI - 625007

LEASE APPLIED AREA:
S.F.NO : 569/1 (PART-4)
EXTENT : 1.20.0 Hect,
VILLAGE : NADUMANDALAM,
TALUK : NATHAM,
DISTRICT : DINDIGUL.

MINE LAYOUT PLAN AND
 LAND USE PATTERN
 SCALE 1 : 1000

INDEX

- MINE LEASE AREA
- SAFETY BOUNDARY
- APPROACH ROAD
- TEMPORARY BENCH MARKS

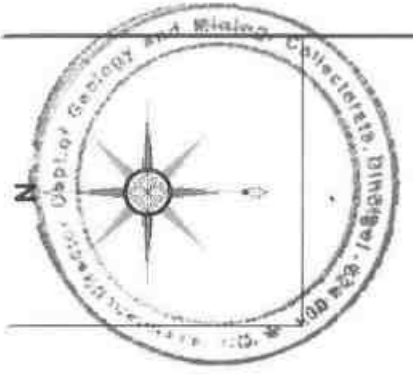
CONTOUR LINES

- SHRUBS
- TOPSOIL
- PILLAR STONES
- EXISTING PIT
- ROUGH STONE
- PROPOSED BENCH

Prepared By:

I DO HEREBY CERTIFY THAT THE PLATE
 HAS BEEN CHECKED BY ME AND IS CORRECT
 TO THE BEST OF MY KNOWLEDGE

Dr.S.KARUPPANNAN,M.Sc.,Ph.D.,
 RECOGNIZED QUALIFIED PERSON
 RQP/MAS/263/2014/A



- A - OFFICE
- B - STORE
- C - FIRST AID
- D - REST ROOM
- E - TOILET

- I - Year Proposed area to be Planted
- II - Year Proposed area to be Planted
- III - Year Proposed area to be Planted
- IV - Year Proposed area to be Planted
- V - Year Proposed area to be Planted

MINEABLE RESERVES							
Section	Bench	length in (m)	Width in (m)	Depth in (m)	Volume In CBM	Mineable Reserves in CBM	Top soil in CBM
XY-AB	Slope	71	27	1	1917	.....	1917
	I	30	35	4	4200	4200	.....
	II	81	27	5	10935	10935	.....
	III	101	27	5	13635	13635	.....
	IV	118	45	5	26550	26550	.....
	V	142	35	5	24850	24850	.....
	VI	132	25	5	16500	16500	.....
GRAND TOTAL						107737	105820

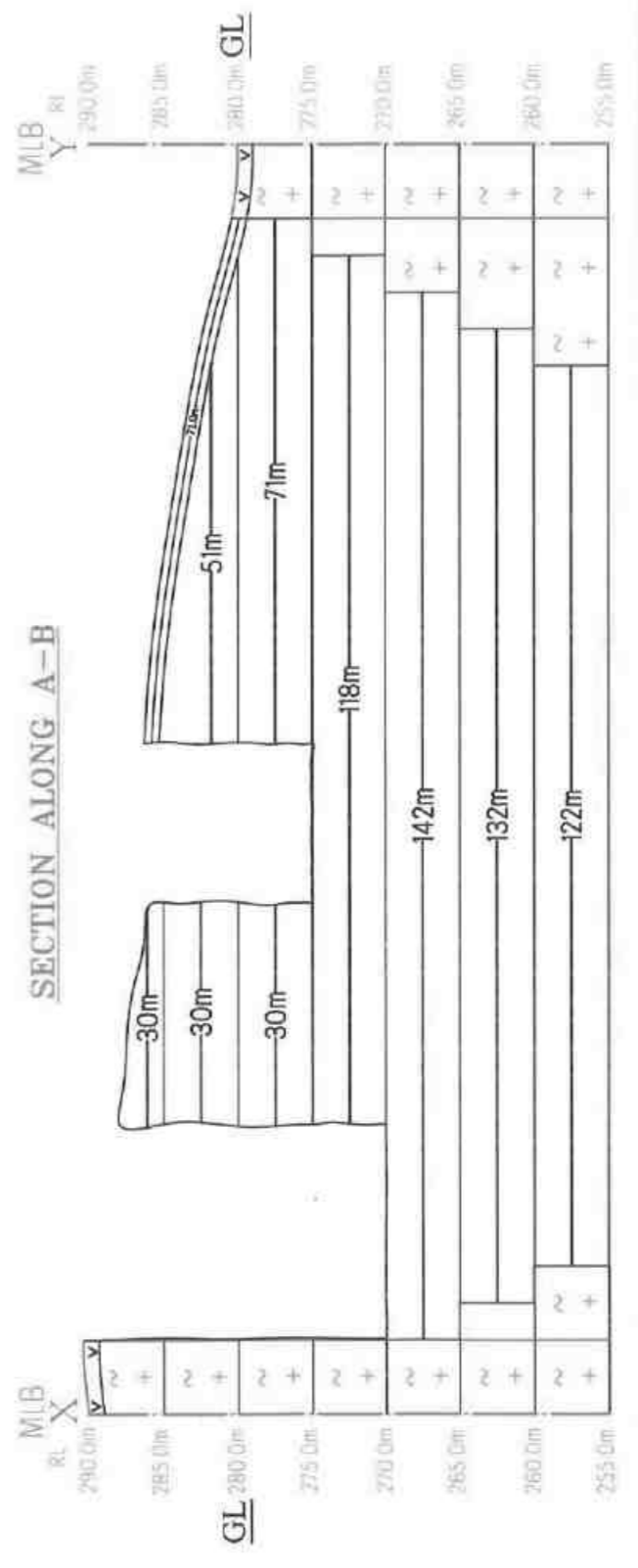
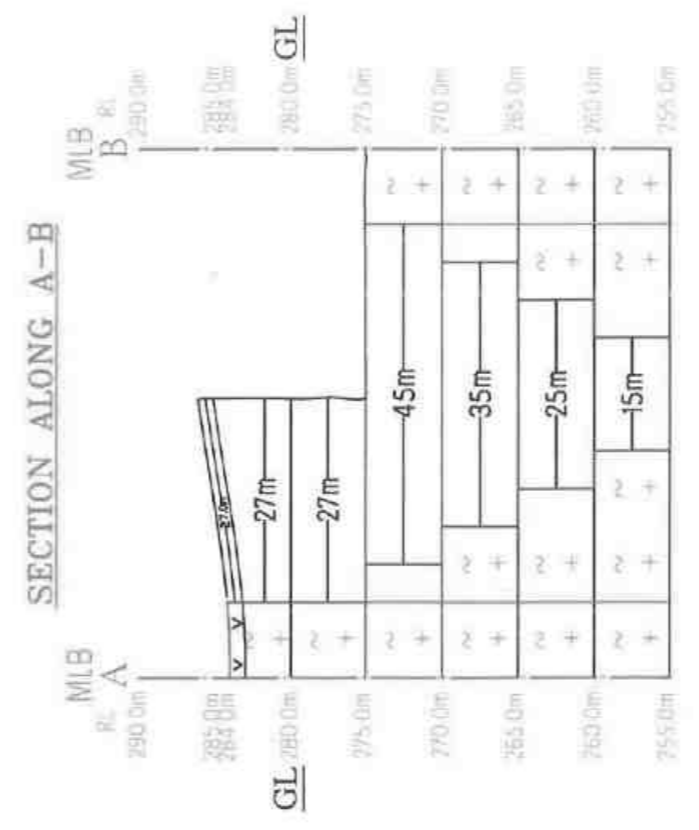
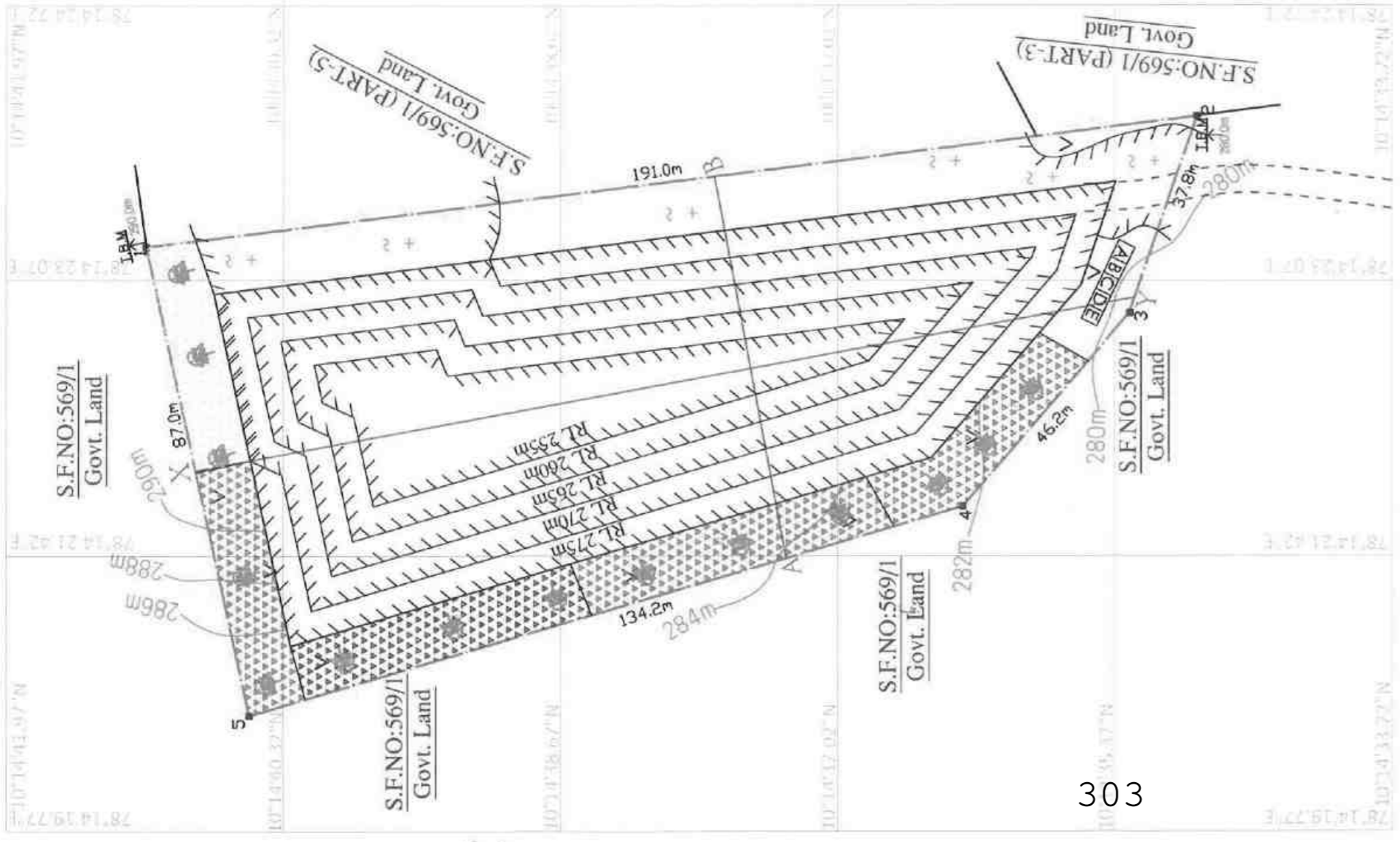


PLATE NO-VI APPLICANT: Mr.A.GOVINDARAJAN, S/O. Mr.AMIRTHALINGADOSS NO.6,MANMALAI KOVIL STREET K PUDUR MADURAI - 625007 LEASE APPLIED AREA: S.F.NO : 569/1 (PART-4) EXTENT : 1.20.0 Hect, VILLAGE : NADUMANDALAM, TALUK : NATHAM, DISTRICT : DINDIGUL.	CONCEPTUAL / FINAL MINE CLOSURE PLAN PLAN SCALE 1 : 1000 SECTION HOR 1 : 1000 & VER 1: 500 INDEX MINE LEASE AREA SAFETY BOUNDARY APPROACH ROAD TEMPORARY BENCH MARKS	CONTOUR LINES SHRUBS TOPSOIL PILLAR STONES EXISTING PIT ROUGH STONE PROPOSED BENCH	Prepared By: I DO HEREBY CERTIFY THAT THE PLATE HAS BEEN CHECKED BY ME AND IS CORRECT TO THE BEST OF MY KNOWLEDGE Dr.S.KARUPPANNAN,M.Sc.,Ph.D., RECOGNIZED QUALIFIED PERSON RQP/MAS/263/2014/A

From

V.Sasikumar, M.Sc.,
Assistant Director,
Geology and Mining,
Dindigul.

To

Thiru.A.Govindarajan,
S/o.Amirthalingadoss,
6(3), Manmalaisamy Street,
K.Pudur, Madurai North,
Madurai

Roc.No.112/2021(Mines), dated: .07.2021

Sir,

Sub: Mines and Minerals - Minor Mineral - Rough Stone - Dindigul District - Natham Taluk - Nadumandalam Village - SF.No. 569/1(P-4) - 1.20.0 hecets of Government Poramboke land - Precise area communicated to Thiru.A.Govindarajan, the highest Tenderor, to submit Mining Plan for approval - Mining Plan submitted - Scrutinized - approval accorded.

- Ref:
1. The Commissioner of Geology and Mining letter in Rc.No.3868/LC/2012 dated: 19.11.2012
 2. Dindigul District Gazette Extraordinary issue No.4 dated: 09.02.2021
 3. This office Memo even no dated: 25.02.2021
 4. Letter No.112/2021 (Mines) dated: 06.05.2021 of the District Collector, Dindigul
 5. The G.O.No.79 Industries (MMC2) Dept dated: 06.04.2015
 6. Mining Plan submitted by Thiru.A.Govindarajan, S/o.Amirthalingadoss, Madurai dated: 12.07.2021

Rough Stone quarry in Government Poramboke land measuring an extent of 1.20.0 hecets in SF.No.569/1 (P-4) of Nadumandalam Village, Natham Taluk, Dindigul District was notified in the District Gazette in the reference 3rd cited to lease out through Tender-Cum-Auction system stipulated in Rule 8(1) of Tamil Nadu Minor Mineral Concession Rules 1959 for a period of 5 years.

2) The Tender-Cum-Auction proceedings were conducted on 24.02.2021 & 25.02.2021 and one Thiru.A.Govindarajan has offered the highest Tender amount of Rs.18,00,000/- and Thiru.A.Govindarajan was declared as the successful Tenderer. As per Rule 8(5)(vi) and 8(6)(c) of Tamil Nadu Minor Mineral Concession Rules 1959, the successful Tenderer has remitted the entire one time lease amount of Rs.18,00,000/- within the stipulated time.

3) Accordingly, the Rough stone quarry situated in an extent of 1.20.0 hecets in SF.No.569/1 (P-4) of Nadumandalam Village, Natham Taluk, Dindigul District was considered as area to be granted an lease and the same was

communicated as Precise Area to the Highest Tenderer Thiru.A.Govindarajan vide this office letter in the reference 4th cited with a request to submit Mining Plan for approval as per Rule 41 of Tamil Nadu Minor Mineral Concession Rules 1959 for obtaining Environmental Clearance as required under Rule 42 of Tamil Nadu Minor Mineral Concession Rules 1959.

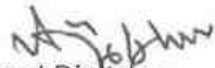
4) Thiru.A.Govindarajan has submitted the Mining Plan prepared by a Qualified Person for approval. On perusal it is observed that the Mining Plan was prepared as per the Guidelines given by the Commissioner of Geology and Mining in the reference 1st cited and as per the provisions contained in the Act and Tamil Nadu Minor Mineral Concession Rules 1959. The Geology and Mineable reserves of Rough stone are discussed in Part - A, Chapter 4 of the Mining Plan. The available mineable reserves of Rough Stone is computed as 105820 cum at the rate of 100% recovery to a depth of 10mts above ground level. The method and mode of mining are discussed in Chapter 5 of the Mining Plan. The blasting pattern and types of explosives, etc are discussed in Chapter 6 of the Mining Plan. In Chapter 10 of the Mining Plan, the Environment Management such as land use pattern, Water Regime, Climatic Conditions, Human Settlement, Environmental Impact Assessment Statement describing the Impact of Mining on the next 5(five) years have been described. The proposal of deplumation of land and programme of afforestation are also discussed in Chapter 10 of the Mining Plan. The mine closure plan in discussed in Chapter 11 of the Mining Plan submitted for approval.

5) On careful examination it is ascertained that the Mining Plan submitted by Thiru.A.Govindarajan covered all the guidelines communicated by the Commissioner of Geology and Mining vide letter in the reference 1st cited and is found in order. Accordingly, in excise of the power delectated by the Commissioner of Geology and Mining vide letter No.3868/LC/2012 dated: 19.11.2012, I hereby approve the Mining Plan submitted by Thiru.A.Govindarajan in respect of the Rough Stone quarry situated in an extent of 1.20.0 heccts in SF.No.569/1 (P-4) of Nadumandalam Village, Natham Taluk, Dindigul District to enable the applicant to obtain Environmental Clearance from SEIAA, Chennai subject to the following conditions:-

1. The Mining Plan is approved without prejudice to any other law applicable to the quarry permission from time to time where such laws are made by the State Government or any other Authority.

2. The approval of the Mining Plan does not in any way imply the approval of the Government in terms of any other provisions of Tamil Nadu Minor Mineral Concession Rules 1959.
3. The Mining Plan is approved without prejudice to any other order or direction from any court of competent jurisdiction.
4. The approval of the Mining Plan does not in any way imply the approval of the Government in terms of any other provisions of the Mines and Minerals (Development and Regulation) Amendment Act, 2015 or any other connected Laws including, Environment Protection Act, 1986, and the Rules made there under in Tamil Nadu Minor Mineral Concession Rules, 1959.
5. Quarrying shall be carried out as per the Approved Mining Plan.
6. Safety distance of 7.5mts to the adjacent Patta lands should be provided and no hindrance shall be caused to the adjacent Patta lands.
7. Safety distance of 10mts shall be allowed to the adjacent Poramboke lands.
8. The applicant should adhere all the safety measures stipulated in Rule 36 of Tamil Nadu Minor Mineral Concession Rules 1959 and as per the Employment Potential and Welfare Measures discussed in Chapter 9 of the Mining Plan.
9. The applicant is directed to submit the Environmental Clearance to be obtained from SEIAA, Chennai as per the Notification issued in S.O.No.141(E) dated: 15.01.2016 & S.O.No.190(E) dated: 20.01.2016 by the MoEF C & C Department of Government of India.

Encl: Two Copies of Mining Plan.


 Assistant Director,
 Geology and Mining,
 Dindigul

Copy submitted

1. The Chairman,
 State Level Environment Impact Assessment Authority,
 Panagal Maligai
 Saidapet, Chennai - 600 009
2. The Director,
 Department of Geology and Mining,
 Guindy, Chennai - 32





13.08.2020 වන විට පැවැත්වූ විවිධ වර්ගයේ ප්‍රවේශන සඳහා අවසරය ලබාදීම.

විවිධ වර්ගයේ ප්‍රවේශන සඳහා අවසරය ලබාදීම. විවිධ වර්ගයේ ප්‍රවේශන සඳහා අවසරය ලබාදීම. විවිධ වර්ගයේ ප්‍රවේශන සඳහා අවසරය ලබාදීම.

13/8/2020

2665/26181/2020 - VII වන වර්ගයේ 1.00.0 ප්‍රවේශන සඳහා අවසරය ලබාදීම. විවිධ වර්ගයේ ප්‍රවේශන සඳහා අවසරය ලබාදීම.

විවිධ වර්ගයේ ප්‍රවේශන සඳහා අවසරය ලබාදීම. විවිධ වර්ගයේ ප්‍රවේශන සඳහා අවසරය ලබාදීම. විවිධ වර්ගයේ ප්‍රවේශන සඳහා අවසරය ලබාදීම.

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කිහිටුම් පිටුවක් පිටුපසට
13, ප්‍රධාන මාර්ගයේ, කිහිටුම්



Quality Council of India



National Accreditation Board for Education & Training

Certificate of Accreditation

Geo Technical Mining Solutions

No-1/213-B, Ground Floor, Natesan Complex, Oddapatti,
Collectorate Post office, Dharmapuri, Tamil Nadu-636705

Accredited as Category – 'B' organization under the QCI-NABET Scheme for Accreditation of EIA Consultant Organizations: Version 3 for preparing EIA/EMP reports in the following sectors:

Sl. No	Sector Description	Sector (as per)		Cat.
		NABET	MoEFCC	
1.	Mining of minerals including opencast / underground mining	1	1 (a) (i)	B

Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in IA AC Minutes dated January 29, 2021 on QCI-NABET website.

The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in NABET's letter of accreditation bearing no. QCI/NABET/ENV/ACO/21/1674 dated March 30, 2021. The accreditation needs to be renewed before the expiry date by Geo Technical Mining Solutions, Dharmapuri following due process of assessment.

Sr. Director, NABET
Dated: March 30, 2021

Certificate No.
NABET/EIA/2023/IA0067

Valid till
December 29, 2023

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

