

**DRAFT ENVIRONMENTAL IMPACT ASSESSMENT  
AND  
ENVIRONMENT MANAGEMENT PLAN  
FOR OBTAINING**

**Environmental Clearance under EIA Notification – 2006**

**Schedule Sl. No. 1 (a) (i): Mining Project**

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

**CLUSTER EXTENT = 13.77.55 hectares**

**ROUGHSTONE QUARRY**

**At**

**Anjur Village, Pugalur Taluk, Karur District,**

**Tamil Nadu State**

**TOR File No.10577**

**TOR Identification No. TO23B0108TN5620847N, Dated.13/03/2024**

**NAME AND ADDRESS OF THE PROPOSED PROJECT PROPONENT**

Name and Address	Extent & S.F.No.	Production
<b>M/s.Kousic and Co Blue Metals Door.No.24/A, Housing Unit, Kollampalayam, Kasipalayam, Erode Taluk and District</b>	3.23.00ha & 770/2B (P), 778/3B1 (P), 778/3B2 (P)	Rough stone-277958m <sup>3</sup>

**ENVIRONMENTAL CONSULTANT**

**GEO TECHNICAL MINING SOLUTIONS**

No: 1/213-B, Ground Floor, Natesan Complex

Oddapatti, Collectorate Post office,

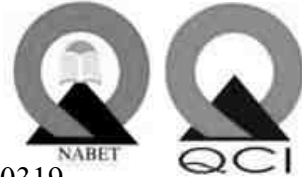
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NABET ACC. NO: NABET/EIA/23-26/RA 0319

Valid till: 31.12.2026



**ENVIRONMENTAL LAB**

**ACCURACY ANALABS AND**

**ENVIRO FARMERS LABS & TECHNOLOGIES**

**Baseline Study Period – March through May 2023**



## TERMS OF REFERENCE (ToR) COMPLIANCE

ToR File No.10577

ToR Identification No. TO23B0108TN5620847N, dated.13/03/2024

M/s.Kousic and Co Blue Metals, Rough Stone Quarry.

### Specific Terms of Reference for (Mining of Minerals)

#### 1. Mining

S.No	Terms of Reference		
1.1	1	The proponent is requested to carry out a survey and enumerate on the structures located within the radius of (i) 50 m, (ii) 100 m, (iii) 200 m, (iv) 300 m, (v) 500 m with details such as dwelling houses with number of occupants, whether it belongs to the owner or not, places of worship, industries, factories, sheds, etc with indicating the owner of the building nature of construction, age of the building, number of residents, their profession and income, etc.	There are no structures such as dwelling houses, places of worship, industries, factories, sheds, etc. within the radius of 500m from the proposed project area. The map showing the area of 50m, 100m, 200m, 300m, 500m is attached in the Annexure VII.
	2	The project proponent shall furnish Certified Compliance Report (CCR) obtained from IRO (SZ), MoEF & CC and with mitigation measures along with the budgetary allocation for the non-compliance	CCR will be attached in the final EIA report.
	3	The PP shall submit a detailed hydrological report indicating the impact of proposed quarrying operations on the waterbodies like rake, water tanks, etc are	Detailed hydrological study is attached in the Annexure VIII.

	located within 1km of the proposed quarry.	
4	The Proponent shall justify the selection of the site for carrying out the stone quarrying with the total volume arrived for the excavation & production adequate details such as lithology of the deposit, reserve estimation, place for waste dump/mined mineral storage, end-use of mined materials, identified potential customers/end-users and travel path.	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.
5	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.	Photographs of adequate fencing, green belt along the periphery of the project area and the photographs showing nearby water bodies will be included in the final EIA report.
6	The PP shall carry out a detailed hydrogeological study to spell out the water management plan for the proposed site.	The hydrogeological study is discussed in the Section 3.2.3 under Chapter III, pp.37-50.
7	The Proponent shall carry out Bio diversity study through Department of Ecology and Environmental Sciences, Pondicherry University and the same shall be included in EIA Report.	The detailed Biodiversity report through Pondicherry University will be submitted in the final EIA report.
8	The PP shall prepare the EMP for the entire life of mine and also furnish the sworn affidavit stating to abide the EMP for the entire life of mine.	A detailed environment management plan has been prepared following the suggestion made by SEAC, as shown in Chapter X, pp.133-140. The sworn affidavit stating to abide the EMP

			for the entire life of mine will be submitted along with final EIA.
	9	The PP shall prepare a conceptual working plan accommodating the remedial actions such as inclusion of haul road accessibility keeping the benches intact, based on the studies carried out to assess the slope stability of the working benches to be constructed and existing quarry will apart from the proposed mining methodology.	The details of haul road accessibility keeping the benches intact, based on the studies carried out to assess the slope stability of the working benches to be constructed and existing quarry will apart from the proposed mining methodology is attached in the approved mining plan plates in the Annexure III.

## 2. SEAC Standard Conditions

S.No	Terms of Reference		
2.1	1	In the case of existing/operating mines, a letter obtained from the concerned AD (Mines) shall be submitted and it shall include the following:	
		(i)	Original pit dimension
		(ii)	Quantity achieved Vs EC Approved Quantity
		(iii)	Balance Quantity as per Mineable Reserve calculated.
		(iv)	Mined our Depth as on date Vs EC permitted depth
		(v)	Details of illegal/illicit mining
		(vi)	Violation in the quarry during the past working.
		(vii)	Quantity of material mined out outside the mine lease area
		(viii)	Condition of Safety zone/benches
			The details regarding the AD (Mines) letter is attached in the Annexure IV.

	(ix)	Revised/Modified Mining plan showing the benches of not exceeding 6 m height and ultimate depth of not exceeding 50m.	
2		Details of habitations around the proposed mining area and latest VAO certificate regarding the location of habitations within 300m radius from the periphery of the site	The VAO certificate is attached in Annexure V.
3		The proponent is requested to carry out a survey and enumerate on the structures located within the radius of (i) 50 m, (ii) 100 m, (iii) 200 m, (iv) 300 m, (v) 500 m with details such as dwelling houses with number of occupants, whether it belongs to the owner or not, places of worship, industries, factories, sheds, etc with indicating the owner of the building nature of construction, age of the building, number of residents, their profession and income, etc.	There are no structures such as dwelling houses, places of worship, industries, factories, sheds, etc. within the radius of 500m from the proposed project area. The map showing the area of 50m, 100m, 200m, 300m, 500m is attached in the Annexure VII.
4		The PP shall submit a detailed hydrological report indicating the impact of proposed quarrying operations on the water bodies like lake, water tanks, etc are located within 1 km of the proposed quarry.	Detailed hydrological study is discussed in the Annexure VIII.

5	The proponent shall carry out Bio diversity study through reputed institution and the same shall be included in EIA Report.	The details of Bio diversity from the reputed institution will be submitted in the final EIA report.
6	The DFO letter stating that the proximity distance of Reserve Forests, Protected Areas, Sanctuaries, Tiger reserve etc, up to a radius of 25 km from the proposed site.	The DFO letter is attached in the Annexure VI.
7	In the case of proposed lease in an existing (or old) quarry where the benches are not formed (or) partially formed as per the approved mining Plan, the Project Proponent (PP) shall the PP shall carry out the scientific studies to assess the slope stability of the working benches to be constructed and existing quarry wall, by involving any one of the reputed Research and Academic Institutions – CSIR-Central Institute of Mining & Fuel Research / Dhanbad, NIRM/Bangalore, Division of Geotechnical Engineering-IIT-Madras, NIT-Dept of Mining Engg. Surathkal, and Anna University Chennai-CEG Campus. The PP shall submit a copy of the aforesaid report indicating the stability status of the quarry wall and possible mitigation measures during the time of appraisal for obtaining the EC.	The details regarding Slope Stability will be submitted in the final EIA report.

8	However, in case of the fresh/virgin quarries, the Proponent shall submit a conceptual 'Slope Stability Plan' for the proposed quarry during the appraisal while obtaining the EC, when the depth of the working is extended beyond 30 m below ground level.	The Slope Stability Plan of the quarry will be submitted in the final EIA report.
9	The PP Shall furnish the affidavit stating that the blasting operation in the proposed quarry is carried out by the statutory competent person as per the MMR 1961 such as blaster. mining mate, mine foreman. II/I Class mines manager appointed by the proponent.	The affidavit for blasting has been enclosed in the approved mining plan report in Annexure III.
10	The PP shall present a conceptual design for carrying out only controlled blasting operation involving line drilling and muffle blasting in the proposed quarry such that the blast-induced ground vibrations are controlled as well as no fly rock travel beyond 30 m from the blast site.	A conceptual design of blasting has been given in Section 2.6 under Chapter II, pp.21-31.
11	The EIA coordinators shall obtain and furnish the details of quarry/quarries operated by the proponent in the past, either in the same location or elsewhere in the State with video and photographic evidences.	Photographic evidence showing the project proponent's mining activities shall be submitted in the final EIA report.

12	If the proponent has already carried out the mining activity in the proposed mining lease area after 15.01.2016. then the proponent shall furnish the following details from AD/DD, mines,	
13	What was the period of the operation and stoppage of the earlier mines with last work permit issued by the AD/DD mines?	
14	Quantity of minerals mined out.	
	<ul style="list-style-type: none"> <li>• Highest production achieved in any one year</li> <li>• Detail of approved depth of mining.</li> <li>• Actual depth of the mining achieved earlier.</li> <li>• Name of the person already mined in that lease area.</li> <li>• If EC and CTO already obtained, the copy of the same shall be submitted.</li> <li>• Whether the mining was carried out as per the approved mine plan (or EC if issued) with stipulated benches.</li> </ul>	The details regarding AD Mines letter is submitted in the Annexure III & IV.
15	All corner coordinates of the mine lease area. superimposed on a High-Resolution Imagery/Toposheet, topographic sheet, geomorphology, lithology and geology of the mining lease area should be provided. Such an Imagery of the proposed area should	All corner coordinates of the mine lease area have been superimposed on a high-resolution Google Earth Image, as shown in Figure 2.3, under Chapter II, p.12.



	clearly show the land use and other ecological features of the study area (core and buffer zone).	
16	The PP shall carry out Drone video survey covering the cluster, green belt, fencing etc.,	The drone video will be submitted during final EIA presentation.
17	The proponent shall furnish photographs of adequate fencing, green belt along the periphery including replantation of existing trees & safety distance between the adjacent quarries & water bodies nearby provided as per the approved mining plan.	Photographs of adequate fencing, green belt along the periphery of the project area and the photographs showing nearby water bodies will be included in final EIA report.
18	The Project Proponent shall provide the details of mineral reserves and mineable reserves, planned production capacity, proposed working methodology with justifications, The anticipated impacts of the mining operations on the surrounding environment, and the remedial measures for The same.	The 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. The plate used for reserve estimation has been presented in Figure 2.5 results of geological resources and reserves have been shown in Table 2.3. under Chapter II. pp.14-15.
19	The Project Proponent shall provide the Organization chart indicating the appointment of various statutory officials and other competent persons to be appointed as per the provisions of Mines Act, 1952 and the MMR, 1961 for carrying out the quarrying operations scientifically and	Details of manpower required for this project have been given in Table 2.14 under Chapter II, p.24.

		systematically in order to ensure safety and to protect the environment.	
20		The Project Proponent shall conduct the hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) along with the collected water level data for both monsoon and non-monsoon seasons from the PWD/ TWAD so as to assess the impacts on the wells due to mining activity. Based on actual monitored data, it may clearly – be shown whether working will intersect groundwater, Necessary data and documentation in this regard may be provided.	The hydrological study is attached in the Annexure VIII.
21		The proponent shall furnish the baseline data for the environmental and ecological parameters with regard to surface water/ground water quality, air quality, soil quality & flora/fauna including traffic/vehicular movement study.	The baseline data were collected for the environmental components including land, soil, water, air, noise, biology, socio-economy, and traffic and the results have been discussed under Chapter III, pp. 25-91.
22		The Proponent shall carry out the Cumulative impact study due to mining operations carried out in the quarry specifically with reference to the specific environment in terms of soil health, biodiversity, air pollution, water	Results of cumulative impact study due to mining operations are given in Section 7.4 under Chapter VII, pp.121-128.

	<p>pollution, climate change and flood control &amp; health impacts. Accordingly, the Environment Management plan should be prepared keeping the concerned quarry and the surrounding habitations in the mind.</p>	
23	<p>Rain water harvesting management with recharging details along with water balance (both monsoon &amp; non-monsoon) be submitted.</p>	<p>As part of rainwater harvesting measures, the rain water from garland drainage system will be diverted to nearby check dams after treating the water in settling tanks. The detailed rain water harvesting report will be submitted in the final EIA report.</p>
24	<p>Land use of the study area delineating forest area, agricultural land, gazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.</p>	<p>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 has been discussed in Section 3.1, pp.26-36 under Chapter III. The details of surrounding sensitive ecological features have been provided in Table 3.40 under Chapter III, p.88. Land use plan of the project area showing pre-operational, operational and post-operational phases are discussed in Table 2.8 under Chapter II, p.20.</p>
25	<p>Details of the land for storage of Overburden/Waste Dumps (or) Rejects outside the mine lease. such as extent of land area, distance from mine lease' its land use, R&amp;R issues. If any, should be provided.</p>	<p>This condition is not applicable to this project because no dumps have been proposed outside the lease area.</p>

26	Proximity to Areas declared as 'Critically Polluted, (or) the project areas which attracts the court restrictions for mining operations. Should also be indicated and where so required. Clearance certifications from the prescribed Authorities, such as the TNPCB (or) Dept. of Geology and Mining should be secured and furnished to the effect that the proposed mining activities could be considered.	Not Applicable.  Project area / Study area is not declared in 'Critically Polluted' Area and does not come under 'Aravalli Range.
27	Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.	As part of rainwater harvesting measures, the rain water from garland drainage system will be diverted to nearby check dams after treating the water in settling tanks. The detailed rain water harvesting report will be submitted in the final EIA report.
28	Impact on local transport infrastructure due to the project should be indicated.	Details regarding the impact of the project on traffic are given in Section 3.7 under Chapter III, pp.85-87.
29	A tree survey study shall be carried out (nos., name of the species, age, diameter etc,) both within the mining lease applied area & 300m buffer zone and its management during mining activity.	A detailed tree survey was carried out within 300 m radius and the results have been discussed in Section 3.5 under Chapter III, pp.65-81.
30	A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific.	A progressive mine closure plan has been attached with the approved mining plan report in Annexure III. The budget details for the progressive mine closure plan are shown in Table 2.9 under Chapter II, p.20.

	<p>31 As a part of the study of flora and fauna around the vicinity of the proposed site, the EIA coordinator shall strive to educate the local students on the importance of preserving local flora and fauna by involving them in the study, wherever possible.</p>	<p>The EIA coordinator and the FAE for ecology and biodiversity visited the study area and educated the local students about the importance of protecting the biological environment.</p>
	<p>32 The purpose of green belt around the project is to capture the fugitive emissions, carbon sequestration and to attenuate the noise generated, in addition to improving the aesthetics A wide range of indigenous plant species should be planted as given in the appendix-I in consultation with the DFO, State Agriculture University and local school/college authorities. The plant species with dense/moderate canopy of native origin should be chosen. Species of small/medium/tall trees alternating with shrubs should be planted in a mixed manner.</p>	<p>A detailed greenbelt development plan has been provided in Section 4.6 under Chapter IV, pp.103-107.</p>
	<p>33 Taller/one year old Saplings raised in appropriate size of bags, preferably eco-friendly bags should be planted as per the advice of local forest authorities, botanist/Horticulture 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</p>	<p>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.</p>

		wide and in between blocks in an organized manner.	
34		A Disaster management plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.	A disaster management plan for the project has been provided in Section 7.3 under Chapter VII, pp.120-121.
35		A Risk Assessment and management plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.	A risk assessment plan for the project has been provided in Section 7.2 under Chapter VII, pp.117-119.
36		Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.	Occupational health impacts of the project and preventive measures have been discussed in detail in Section 4.8 under Chapter IV, pp.107-108.
37		Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.	No public health implications are anticipated due to this project. Details of CSR and CER activities have been discussed in Sections 8.6 and 8.7 under Chapter VIII, pp.130 - 131.

38	The Socio-economic studies should be carried out within a 5 km buffer zone from the mining activity. Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.	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 16 people directly as discussed in Section 8.1 under Chapter VIII, p.129.
39	Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.	No litigation is pending in any court against this project.
40	Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.	Benefits of the project details have been given under Chapter VIII, pp.129-131.
41	If any quarrying operation 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.	CCR will be submitted in the final EIA report.
42	The PP Shall prepare the EMP for the entire life/lease period of mine and also	A detailed environment management plan has been prepared following the suggestion made

	Furnish the sworn affidavit starting to Abide the EMP for the entire life of mine.	by SEAC, as shown in Chapter X, pp.133-140. The sworn affidavit stating to abide the EMP for the entire life of mine will be submitted during final EIA presentation.
43	Concealing any factual information or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this Terms of Conditions besides attracting penal provisions in the Environment (Protection) Act' 1986.	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.

#### Standard Terms of Reference for (Mining of minerals)

S.No	Terms of Reference	
1.1	An EIA-EMP Report shall be prepared for peak capacity (...MTPA) operation in an ML/project area of... ha based on the generic structure specified in Appendix III of the EIA Notification, 2006.	Yes, it is based on the generic structure specified in Appendix III of the EIA Notification, 2006. i.e., the peak capacity of the proposed quarry is 277958 MTPA and operation in an ML/project area of 3.23.0 ha.
1.2	An EIA-EMP Report would be prepared for peak capacity operation to cover the impacts and environment management plan for the project specific activities on the environment of the region, and the environmental quality encompassing air, water, land, biotic community, etc. through collection of data and information, generation of data on impacts including prediction modelling for... MTPA of	The baseline environment quality represents the background environmental scenario of various environmental components such as land, water, air, noise, biological and socio-economic status of the study area. Field monitoring studies to evaluate the base line status of the project site were carried out covering March through May 2023 with CPCB guidelines. The detailed baseline environmental monitoring studies were carried out and the results are discussed in the Chapter III and



	mineral production based on approved project/Mining Plan for.... MTPA. Baseline data collection can be for any season (three months) except monsoon.	the approved mining plan is attached in the Annexure III.
1.3	Proper KML file with pin drop and coordinate of mine at 500-1000 m interval be provided	The KML file with proper pin drop and coordinate of the mine will be uploaded during the online submission.
1.4	A Study area map of the core zone (project area) and 10 km area of the buffer zone (1: 50,000 scale) clearly delineating the major topographical features such as the land use, surface drainage pattern including rivers/streams/nullahs/canals, locations of human habitations, major constructions including railways, roads, pipelines, major industries, mines and other polluting sources. In case of ecologically sensitive areas such as Biosphere Reserves/National Parks/WL Sanctuaries/ Elephant Reserves, forests (Reserved/Protected), migratory corridors of fauna, and areas where endangered fauna and plants of medicinal and economic importance found in the 15 km study area should be given. The above details to be furnished in tabular form also	The details of environmentally sensitive ecological features in the study area are given in the Table 3.40 under Chapter III, p.88.
1.5	Map showing the core zone delineating the agricultural land (irrigated and un-irrigated, uncultivable land as defined in the revenue records, forest areas (as per records), along with other physical features such as water bodies, etc should be furnished.	The map showing the lease area with cluster details is shown in the Figure 1.1, Chapter I, p.4. The details are given in the Table 3.40 under Chapter III, p.88.

1.6	A contour map showing the area drainage of the core zone and 25 km of the study area (where the water courses of the core zone ultimately join the major rivers/streams outside the lease/project area) should also be clearly indicated in the separate map.	The contour map is attached in the Annexure VII.
1.7	Catchment area with its drainage map of 25 km area within and outside the mine shall be provided with names, details of rivers/ riverlet system and its respective order. The map should clearly indicate drainage pattern of the catchment area with basin of major rivers. Diversion of drains/ river need elaboration in form of length, quantity and quality of water to be diverted.	The catchment area map is attached in the Annexure VII.
1.8	(Details of mineral reserves, geological status of the study area and the seams to be worked, ultimate working depth and progressive stage-wise working scheme until the end of mine life should be provided on the basis of the approved rated capacity and calendar plans of production from the approved Mining Plan. Geological maps and sections should be included. The Progressive mine development and Conceptual Final Mine Closure Plan should also be shown in figures. Details of mine plan and mine closure plan approval of Competent Authority should be furnished for green field and expansion projects.	The reserve details are discussed in the Section 2.5, in Chapter II, pp.15-16.

1.9	Details of mining methods, technology, equipment to be used, etc., rationale for selection of specified technology and equipment proposed to be used vis-à-vis the potential impacts should be provided.	The details of mining method, technology, equipment, etc is discussed in the Section 2.6, in the Chapter II, pp.17-24.
1.10	Impact of mining on hydrology, modification of natural drainage, diversion and channelling of the existing rivers/water courses flowing though the ML and adjoining the lease/project and the impact on the existing users and impacts of mining operations thereon.	There is no any drainage within or around the lease area. The drainage map is shown in Figure 3.1 under Chapter III, pp.26-36.
1.11	A detailed Site plan of the mine showing the proposed break-up of the land for mining operations such as the quarry area, OB dumps, green belt, safety zone, buildings, infrastructure, Stockyard, township/colony (within and adjacent to the ML), undisturbed area -if any, and landscape features such as existing roads, drains/natural water bodies to be left undisturbed along with any natural drainage adjoining the lease /project areas, and modification of thereof in terms of construction of embankments/bunds, proposed diversion/re-channelling of the water courses, etc., approach roads, major haul roads, etc should be indicated.	<p>Land use plan of the project area showing pre-operational, operational and post-operational phases are discussed in Table 2.8 under Chapter II, p.20.</p> <p>There is no any drainage within or around the lease area. The drainage map is shown in Figure 3.1 under Chapter III, p.28.</p> <p>The traffic survey conducted based on the transportation route of material, the Rough Stone and gravel is proposed to be transported mainly through Village Road and Muthur – Kodumudi (SH-189) and Erode to Vellakovil (SH-381A) as shown in Table 3.36 and in Figure 3.27 under Chapter III. pp. 86-87.</p>
1.12	Original land use (agricultural land/forestland/grazing land / wasteland / water bodies) of the area should be provided as per the tables given below. Impacts of project, if any on the land use, in particular, agricultural land/forestland/grazing land/water bodies falling within the	

	lease/project and acquired for mining operations should be analyzed. Extent of area under surface rights and under mining rights should be specified. Area under Surface Rights.					
	S.No	ML/Project Land use	Area under Surface Area Rights(ha)	Area Under Mining Rights(ha)	Area under Both (ha)	
	1	Agricultural land	---	---	---	
	2	Forest Land	---	---	---	
	3	Grazing Land	---	---	---	
	4	Settlements	---	---	---	
	5	Others (specify)	3.23.0	3.23.0	3.23.0	
	S.No	Details		Area (ha)		
	1	Buildings		---		
	2	Infrastructure		---		
	3	Roads		---		
	4	Others (area under quarry)		3.23.00		
	Total			3.23.00		
1.13	Study on the existing flora and fauna in the study area (10km) should be carried out by an institution of relevant discipline. The list of flora and fauna duly authenticated separately for the core and study area and a statement clearly specifying whether the study area forms a part of the migratory corridor of any endangered fauna should be given. If the study area has endangered flora and fauna, or if the area is occasionally visited or used as a habitat by Schedule-I species, or if the project falls within 15 km of an ecologically sensitive area, or used as a migratory corridor then a Comprehensive			The details on flora and fauna have been provided in Section 3.5 under Chapter III, pp.65-81.		

	<p>Conservation Plan along with the appropriate budgetary provision should be prepared and submitted with EIA-EMP Report; and comments/observation from the CWLW of the State Govt. should also be obtained and furnished.</p>	
1.14	<p>One-season (other than monsoon) primary baseline data on environmental quality - air (PM10, PM2.5, SO<sub>x</sub>, NO<sub>x</sub> and heavy metals such as Hg, Pb, Cr, As, etc), noise, water (surface and groundwater), soil - along with one-season met data coinciding with the same season for AAQ collection period should be provided. The detail of NABL/ MoEF&amp;CC certification of the respective laboratory and NABET accreditation of the consultant to be provided.</p>	<p>The baseline environment quality represents the background environmental scenario of various environmental components such as land, water, air, noise, biological and socio-economic status of the study area. Field monitoring studies to evaluate the base line status of the project site were carried out covering March through May 2023 with CPCB guidelines. Environmental baseline data were collected by an NABL accredited and MoEF notified <i>Enviro Farmers Labs &amp; Technologies and Accuracy Analabs</i> for the environmental attributes including soil, water, air, and noise and by FAEs for ecology and biodiversity, traffic, and socio-economy.</p>
1.15	<p>Map (1: 50, 000 scale) of the study area (core and buffer zone) showing the location of various sampling stations superimposed with location of habitats, other industries/mines, polluting sources, should be provided. The number and location of the sampling stations in both core and buffer zones should be selected on the basis of size of lease/project area, the proposed impacts</p>	<p>The detailed study is discussed in the Chapter III, pp. 25-91.</p>

	<p>in the downwind (air)/downstream (surface water)/groundwater regime (based on flow). One station should be in the upwind/upstream/non-impact/non-polluting area as a control station. The monitoring should be as per CPCB guidelines and parameters for water testing for both ground water and surface water as per ISI standards and CPCB classification wherever applicable. Observed values should be provided along with the specified standards.</p>	
1.16	<p>For proper baseline air quality assessment, Wind rose pattern in the area should be reviewed and accordingly location of AAMSQ shall be planned by the collection of air quality data by adequate monitoring stations in the downwind areas. Monitoring location for collecting baseline data should cover overall the 10 km buffer zone i.e. dispersed in 10 km buffer area. In case of expansion, the displayed data of CAAQMS and its comparison with the monitoring data to be provided.</p>	<p>10km baseline study can be conducted only when total cluster area extent of the projects is above 25ha. Here, the proposed cluster area of the projects is less than 25ha, (i.e,13.77.55ha) and so baseline monitoring study is done for 5 km only.</p> <p>The baseline study of the air quality is discussed in the Section 3.3, in Chapter III, pp.50-61.</p>
1.17	<p>A detailed traffic study along with presence of habitation in 100m distance from both side of road, the impact on the air quality with its proper measures and plan of action with timeline for widening of road. The project will increase the no. of vehicle along</p>	<p>There is no need of road widening, the details of traffic study are discussed in the Section 3.7 under Chapter III, pp.85-87.</p> <p>Carbon released from quarrying machineries and tippers during quarrying would be 2337 kg per day, 631059 kg per year and 3155293 kg over five years.</p>

	the road which will indirectly contribute to carbon emission so what will be the compensatory action plan should be clearly spell out in EIA/ EMP report.	
1.18	The socio-economic study to conducted with actual survey report and a comparative assessment to be provided from the census data should be provided in EIA/EMP report also occupational status & economic status of the study area and what economically project will contribute should be clearly mention. The study also include the status of infrastructural facilities and amenities present in the study area and a comparative assessment with census data to be provided and to link it with the initialization and quantification of need based survey for CSR activities to be followed.	The socio-economic study is discussed in the Section 3.6, in Chapter III, pp. 81-87.
1.19	The Ecology and biodiversity study should also indicate the likely impact of change in forest area for surface infrastructural development or mining activity in relation to the climate change of that area and what will be the compensatory measure to be adopted by PP to minimize the impact of forest diversion.	There is no forest within 10km. The Ecology and biodiversity study is discussed in the Section 3.5 in Chapter III, pp.65-81.  To mitigate carbon emission due to mining activities, we recommend planting trees around the quarry to offset the carbon emission during quarrying. A tree can sequester 38721 kg of carbon per year. Therefore, we recommend planting large number of trees around the quarry and near school campuses, government wasteland, roadsides etc.
1.20	Baseline data on the health of the population in the impact zone and measures for occupational health and safety of the	The occupational health and safety of the personnel and manpower for the mine is submitted in the Section 4.8 in Chapter IV, pp.107-109.

	personnel and manpower for the mine should be submitted.			
1.21	Impact of proposed project/activity on hydrological regime of the area shall be assessed and report be submitted. Hydrological studies as per GEC 2015 guidelines to be prepared and submitted.	Hydrological studies as per GEC 2015 guidelines will be prepared and submitted in the final EIA report.		
1.22	Impact of mining and water abstraction from the mine on the hydrogeology and groundwater regime within the core zone and 10 km buffer zone including long-term monitoring measures should be provided. Details of rainwater harvesting and measures for recharge of groundwater should be reflected in case there is a declining trend of groundwater availability and/or if the area falls within dark/grey zone.	Artificial recharge structures will be established in suitable locations as part of the rainwater harvesting management program. The detailed rain water harvesting will be submitted in the final EIA report.		
1.23	Study on land subsidence including modelling for prediction, mitigation/prevention of subsidence, continuous monitoring measures, and safety issues should be carried out.	The Slope Stability Plan will be submitted in the final EIA report.		
1.24	Detailed water balance should be provided. The breakup of water requirement as per different activities in the mining operations, including use of water for sand stowing should be given separately. Source of water for use in mine, sanction of the Competent Authority in the State Govt. and impacts	<b>Purpose</b>	<b>Quantity</b>	<b>Source</b>
		Dust Suppression	1.5 KLD	The water requirement is purchased from the authorized water vendor.
		Green Belt development	1.75 KLD	
		Drinking & Domestic	1.5 KLD	



	vis-à-vis the competing users should be provided.	<b>Total</b>	<b>4.75 KLD</b>	
1.25	PP shall submit design details of all Air Pollution control equipment (APCEs) to be implemented as part of Environment Management Plan vis-à-vis reduction in concentration of emission for each APCEs	Quarry project proponent controls air pollution by water sprinkling method on roads and quarry sites and green belt development method is adopted.		
1.26	PP shall propose to use LNG/CNG based mining machineries and trucks for mining operation and transportation of mineral. The measures adopted to conserve energy or use of renewable sources shall be explored	The PP is advised to use LNG/CNG trucks in mining operation because these trucks can control air pollution and noise pollution.		
1.27	PP to evaluate the greenhouse emission gases from the mine operation/ washery plant and corresponding carbon absorption plan.	There is no greenhouse emission in the project lease area.		
1.28	Site specific Impact assessment with its mitigation measures, Risk Assessment and Disaster Preparedness and Management Plan should be provided.	The details are discussed in the Section 7.2 & 7.3 in Chapter VII, pp. 117-121.		
1.29	Impact of choice of mining method, technology, selected use of machinery and impact on air quality, mineral transportation, handling & storage/stockyard, etc, Impact of blasting, noise and vibrations should be provided.	The impact on the air quality is discussed in the Section 4.4 in Chapter IV, pp. 94-98.		
1.30	Impacts of mineral transportation within the mining area and outside the lease/project along with flow-chart indicating the specific areas generating fugitive emissions should be provided. Impacts of	The details regarding is discussed in the Section 4.5.2 under Chapter IV, pp.100-101.		

	<p>transportation, handling, transfer of mineral and waste on air quality, generation of effluents from workshop etc, management plan for maintenance of HEMM and other machinery/equipment should be given. Details of various facilities such as rest areas and canteen for workers and effluents/pollution load emanating from these activities should also be provided.</p>	
1.31	<p>Details of various facilities to be provided to the workers in terms of parking, rest areas and canteen, and effluents/pollution load resulting from these activities should also be given.</p>	<p>The details are given in the Section 2.6 under Chapter II, p.17-24.</p>
1.32	<p>The number and efficiency of mobile/static water jet, Fog cannon sprinkling system along the main mineral transportation road inside the mine, approach roads to the mine/stockyard/siding, and also the frequency of their use in impacting air quality should be provided.</p>	<p>Quarry project proponent controls air pollution by water sprinkling method on roads and quarry sites and green belt development method is adopted.</p>
1.33	<p>Conceptual Final Mine Closure Plan and post mining land use and restoration of land/habitat to the pre- mining status should be provided. A Plan for the ecological restoration of the mined-out area and post mining land use should be prepared with detailed cost provisions. Impact and management of wastes and issues of re-handling (wherever applicable) and backfilling and progressive mine closure and reclamation should be furnished.</p>	<p>The ultimate mining is proposed to an average depth 45m bgl. the mined-out area will be fenced on top of working bench with SI fencing to arrest the entry of cattle's and public in to the quarry site.</p> <p>The details of mine closure budget is discussed in the Section 2.6.4 under Chapter II, p.20.</p>

1.34	Adequate greenbelt nearby areas, mineral stock yard and transportation area of mineral shall be provided with details of species selected and survival rate Greenbelt development should be	The details are given in the Section 4.6 under Chapter IV, pp.103-107.
1.35	Cost of EMP (capital and recurring) should be included in the project cost and for progressive and final mine closure plan.	The detailed EMP is given in the Chapter X, pp.133-140.
1.36	Details of R&R. Detailed project specific R&R plan with data on the existing socio-economic status of the population (including tribals, SC/ST, BPL families) found in the study area and broad plan for resettlement of the displaced population, site for the resettlement colony, alternate livelihood concerns/employment for the displaced people, civic and housing amenities being offered, etc and costs along with schedule of the implementation of the R&R plan should be given.	Not Applicable. The proposed lease area belongs to the lessee and there is no any habitation in the lease area.
1.37	CSR Plan along with details of villages and specific budgetary provisions (capital and recurring) for specific activities over the life of the project should be given.	The CSR plan is discussed in the Section 8.6 in Chapter VIII, p.130.
1.38	Corporate Environment Responsibility:	
1.39	a) The Company must have a well laid down Environment Policy approved by the Board of Directors.	The CER plan is discussed in the Section 8.7 in Chapter VIII, p.131.
1.40	b) The Environment Policy must prescribe for standard operating process/procedures to bring into	

		focus any infringements/deviation/violation of the environmental or forest norms/conditions.	
1.41	c)	The hierarchical system or Administrative Order of the company to deal with environmental issues and for ensuring compliance with the environmental clearance conditions must be furnished.	
1.42	d)	To have proper checks and balances, the company should have a well laid down system of reporting of non-compliances/violations of environmental norms to the Board of Directors of the company and/or shareholders or stakeholders at large.	
1.43	e)	Environment Management Cell and its responsibilities to be clearly spelled out in EIA/ EMP report	
1.44	f)	In built mechanism of self-monitoring of compliance of environmental regulations should be indicated.	
1.45		Status of any litigations/ court cases filed/pending on the project should be provided.	No litigation is pending in any court against this project.
1.46		PP shall submit clarification from DFO that mine does not fall under corridors of any National Park and Wildlife Sanctuary with	The DFO letter is attached in the Annexure VI.

	certified map showing distance of nearest sanctuary.					
1.47	Copy of clearances/approvals such as Forestry clearances, Mining Plan Approval, mine closer plan approval. NOC from Flood and Irrigation Dept. (if req.), etc. wherever applicable.		The clearance copy of approved mining plan letter is attached in the Annexure III.			
1.48	Details on the Forest Clearance should be given as per the format given:					
	Total ML Project Area	Total Forest land (ha) If more than one provides details of each FC	Date of FC	Extent of Forest Land	Balance area for which FC is yet to be obtained	Status of appl For diversion of forest land
	NA	NA	NA	NA	NA	NA
1.49	In case of expansion of the proposal, the status of the work done as per mining plan and approved mine closure plan shall be detailed in EIA/ EMP report		Approved Mining plan of the expansion proposal is attached in the Annexure III and the mine closure plan is discussed in the Section 2.6.4 in Chapter II, p.20.			
1.50	Details on Public Hearing should cover the information relating to notices issued in the newspaper, proceedings/minutes of Public Hearing, the points raised by the general public and commitments made by the proponent and the time bound action proposed with budgets in suitable time frame. These details should be presented in a tabular form. If the Public Hearing is in the regional language, an authenticated English Translation of the same should be provided.		The public hearing comments will be submitted during final EIA report.			
1.51	PP shall carry out survey through drone highlighting the ground reality for atleast 10 minutes		The drone video survey will be submitted in the final EIA report.			

1.52	Detailed Chronology of the project starting from the first lease deed allotted/Block allotment/ Land acquired to its No. of renewals, CTO /CTE with details of no. renewals, previous EC(s) granted details and its compliance details, NOC details from various Govt bodies like Forest NOC(s), CGWA permissions, Power permissions, etc as per the requisites respectively to be furnished in tabular form.	The required documents for the proposed quarry are provided in the chronology order in Annexure III.
1.53	The first page of the EIA/ EMP report must mention the peak capacity production, area, detail of PP, Consultant (NABET accreditation) and Laboratory (NABL / MoEF & CC certification)	The first page of the EIA report mentions the peak capacity production, area, project proponent details, Consultant and NABET details and authorized Laboratory (NABL / MoEF & CC certification) details.
1.54	The compliances of ToR must be properly cited with respective chapter section and page no in tabular form and also mention sequence of the respective ToR complied within the EIA-EMP report in all the chapter's section.	ToR Compliance is cited with respective chapter section and page no in tabular form.

### Additional Terms of Reference

Cluster Management Committee		
1	Cluster Management Committee shall be framed which must include all the proponents in the cluster as members including the existing as well as proposed quarry.	A cluster management committee including all the proponents of the rough stone quarrying projects within the cluster of 500 m radius will be constituted for the effective implementation of green belt development plan, water sprinkling, blasting, etc.

2	The members must coordinate among themselves for the effective implementation of EMP as committed including Green Belt Development Water sprinkling, tree plantation, blasting etc.,	The members of the cluster management committee will be instructed to carry out EMP in coordination.
3	The List of members of the committee formed shall be submitted to AD/Mines before the execution of mining lease and the same shall be updated every year to the AD/Mines.	The list of members of the committee formed will be submitted to AD/Mines before the execution of mining lease.
4	Detailed Operational Plan must be submitted which must include the blasting frequency with respect to the nearby quarry situated in the cluster, the usage of haul roads by the individual quarry in the form of route map and network.	All the information has been discussed in Section 2.6 under Chapter II, pp.17-24.
5	The committee shall deliberate on risk management plan pertaining to the cluster in a holistic manner especially during natural calamities like intense rain and the mitigation measures considering the inundation of the cluster and evacuation plan.	It will be informed to the committee.
6	The Cluster Management Committee shall form Environmental Policy to practice sustainable mining in a scientific and systematic manner in accordance with the law. The role played by the committee in implementing the environmental policy devised shall be given in detail.	It will be advised to the cluster management committee to practice sustainable mining in a scientific and systematic manner in accordance with the law. The role played by the committee in implementing the environmental policy devised will be given in detail.

7	The committee shall furnish action plan regarding the restoration strategy with respect to the individual quarry falling under the cluster in a holistic manner.	A proper action plan regarding the restoration will be followed by the committee.
8	The committee shall furnish the Emergency Management plan within the cluster.	The committee will submit the emergency management plan to the respective authority in the stipulated time period.
9	The committee shall deliberate on the health of the workers/staff involved in the mining as well as the health of the public.	The information on the health of the workers and the local people will be updated periodically.
10	The committee shall furnish an action plan to achieve sustainable development goals with reference to water, sanitation & safety.	A proper action plan with reference to water, sanitation & safety will be devised and submitted by the committee to the respective authority.
11	The committee shall furnish the fire safety and evacuation plan in the case of fire accidents.	The committee will submit the fire safety and evacuation plan as discussed in Section 7.3 under Chapter VII, pp.120-121.
Impact study of mining		
12	Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area covering the entire mine lease period as per precise area communication order issued from reputed research institutions on the following.	
	a)	Soil health & soil biological, physical land chemical features.
	b)	Climate change leading to Droughts, Floods etc.
	c)	Pollution leading to release of Greenhouse gases (GHG), rise in Temperature, & Livelihood of the local People.
		Soil health and biodiversity have been discussed in Sections 3.1 and 3.5 respectively under Chapter III, pp.26-36 & pp.65-81.
		Climatic condition of the proposed project area has been discussed in Section 3.3.1.1 under Chapter III, pp.50-51.
		The information about CO <sub>2</sub> emission has been added to Section 4.6 under Chapter IV, pp.103-107.



	d)	Possibilities of water contamination and impact on aquatic ecosystem health.	Possibilities of both surface and ground water contamination have been discussed in Section 4.3 under Chapter IV, pp.93-94. The impact on aquatic species has been discussed in Section 4.6 under Chapter IV, pp. 103-107.
	e)	Agriculture, Forestry, & Traditional practices.	Sorgum, millet, groundnut, and coconut are the primary crops that are cultivated in the study area.
	f)	Hydrothermal/Geothermal effect due to destruction in the Environment.	The average geothermal gradient of earth is 25 <sup>0</sup> C/km. As the proposed depth of mining is 45 m below the local ground level, the temperature will increase by 1.12 <sup>0</sup> C at the depth of mining.
	g)	Bio-geochemical processes and its foot prints including environmental stress.	Data is not included.
	h)	Sediment geochemistry in the surface streams.	The details of sediment geochemistry are discussed in the Table 3.4 under Chapter III, p.35.
<b>Agriculture &amp; Agro-Biodiversity</b>			
13	Impact on surrounding agricultural fields around the proposed mining area.		There shall be negligible air emissions or effluents from the project site. During loading the truck, dust generation will be likely. This shall be a temporary effect and not anticipated to affect the surrounding vegetation significantly, as shown in Section 4.6 under Chapter IV, pp. 103-107.
14	Impact on soil flora & vegetation around the project site.		The details on flora have been provided in Section 3.5 under Chapter III, pp.65-81. There is no schedule I species of animals observed within study area as per Wildlife Protection Act, 1972 and no species falls in vulnerable, endangered or threatened category as per IUCN. There is no endangered red list species found in the study area.

15	Details of type of vegetations including no. of trees & shrubs within the proposed mining area shall be given and if so, transplantation of such vegetations all along the boundary of the proposed mining area shall committed mentioned in EMP.	Details of vegetation in the lease area have been provided in Section 3.5 under Chapter III, pp.65-81. Details about transplantation of plants have been provided in Section 4.6 under Chapter IV, pp. 103-107.
16	The Environmental Impact Assessment should study the biodiversity, the natural ecosystem, the soil micro flora, fauna and soil seed banks and suggest measures to maintain the natural Ecosystem.	The ecological details have been provided in Section 3.5 under Chapter III, pp.65-81 and measures have been provided in Section 4.6 under Chapter IV, pp.103-107.
17	Action should specifically suggest for sustainable management of the area and restoration of ecosystem for flow of goods and services.	All the essential environmental protective measures will be followed by the proponent to manage the surrounding environment and restore the ecosystem, as discussed in Chapter IV, pp.92-110.
18	The project proponent shall study and furnish the impact of project on plantations in adjoining patta lands, Horticulture, Agriculture and livestock.	The impact of project on the land environment has been discussed in Section 4.1 under Chapter IV, pp.92-93.
	Forests	
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.
20	The Environmental Impact Assessment should study impact on forest, vegetation, endemic, vulnerable and endangered indigenous flora and fauna.	The impacts of the project on ecology and biodiversity have been discussed in Section 4.6 under Chapter IV, pp. 103-107.

21	The Environmental Impact Assessment should study impact on standing trees and the existing trees should be numbered and action suggested for protection.	The impacts of the project on standing trees and the existing trees have been discussed in Section 4.6 under Chapter IV, pp.103-107.
22	The Environmental Impact Assessment should study impact on protected areas, Reserve Forests, National parks, corridors and wildlife pathways, near project site.	The protected areas, National Parks, Corridors and Wildlife pathways near project site within 10 km radius has been provided in Table 3.40 under Chapter III, p.88.
Water Environment		
23	Hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) so as to assess the impacts on the nearby waterbodies due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided, covering the entire mine lease period.	The hydrogeological study is discussed in the Section 3.2.3 under Chapter III, pp.40-53.
24	Erosion control measures.	Garland drainage structures will be constructed around the lease area to control the erosion, as discussed in Section 4.3 under Chapter IV, pp.93-94.
25	Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area on the nearby villages, waterbodies/rivers & any ecological fragile areas.	The matter has been discussed under Chapter IV, pp.92-110.

26	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 has been discussed in Section 3.5 under Chapter 3, pp. 65-81.
27	The project proponent shall study and furnish the details on potential fragmentation impact on natural environment, by the activities.	The impacts of the proposed project on the surrounding environment have discussed in Chapter IV, pp. 92-110.
28	The project proponent shall study and furnish the impact on aquatic plants and animals in water bodies and possible scars on the landscape, damages to nearby caves, heritage site, and archaeological sites possible land form changes visual and aesthetic impacts.	The impact of the proposed project on aquatic plants and animals in water bodies has been discussed in Section 4.6 under Chapter IV, pp. 103-107.
29.	The Terms of Reference should specifically study impact on soil health, soil erosion, the soil physical, chemical components.	The impact of mining on soil environment has been discussed in Section 4.2 under Chapter IV, p.93.
30	The Environmental Impact Assessment should study on wetlands, water bodies, rivers streams, lakes and farmer sites.	The impacts on water bodies, streams, lakes have been discussed in Section 4.3 under Chapter IV, pp.93-94.
Energy		
31	The measures taken to control Noise, Air, water, Dust control and steps adopted to efficiently utilise the Energy shall be furnished.	The measures taken to control noise, air, water, and dust have been given under Chapter IV, pp. 92-110.
Climate Change		
32	The Environmental Impact Assessment shall study in detail the carbon emission and also suggest the measures to mitigate carbon emission including development of carbon sinks and temperature reduction	The carbon emission and the measures to mitigate carbon emission have been discussed in Section 4.6 under Chapter IV, pp. 103-107.

	including control of other emission and climate mitigation activities.	
33	The Environmental Impact Assessment should study impact on climate change, temperature rise, pollution and above soil & below soil carbon stock.	The matter has been discussed in Chapter IV, pp.92-110.
Mine Closure Plan		
34	Detailed Mine closure plan covering the entire mine lease period as per precise area communication order issued.	A progressive mine closure plan has been attached with the approved mining plan report in Annexure III. The budget details for the progressive mine closure plan are shown in Table 2.9 under Chapter II, p.20.
EMP		
35	Detailed Environment Management plan along with adaptation, mitigation & remedial strategies covering the entire mine lease period as per precise area communication order issued.	A detailed Environment Management plan has been given under Chapter X, pp.133-140.
36	The Environmental Impact Assessment should hold detailed study on EMP with budget for green belt development and mine closure plan including disaster management plan.	A detailed Environment Management plan has been given in Tables 10.1 & 10.2 under Chapter X, pp.134-140.
Risk Assessment		
37	To furnish risk assessment and management plan including anticipated vulnerabilities during operational and post operational phases of Mining.	The risk assessment and management plan for this project has been provided in Section 7.2 under Chapter VII, pp.117-119.

Disaster Management Plan		
38	To furnish disaster management plan and disaster mitigation measures in regard to all aspects to avoid/reduce vulnerability to hazards & to cope with disaster/untoward accidents in & around the proposed mine lease area due to the proposed method of mining activity & its related activities covering the entire mine lease period as per precise area communication order issued.	The disaster management plan for this project has been provided in Section 7.3 under Chapter VII, pp.120-121.
Others		
39.	The project proponent shall furnish VAO certificate with reference to 300 m radius regard to approved habitations, schools, Archaeological sites, structures, railway lines, roads, water bodies such as streams, odai, vaari, canal, river, lake pond, tank etc.	The VAO certificate of 300 m radius have been attached in the attached in the Annexure IV.
40	As per the MoEF & CC office memorandum F.No.22-65/2017-IA.III dated: 30.09.2020 and 20.10.2020 the proponent shall address the concerns raised during the public consultation and all the activities proposed shall be part of the Environment Management plan.	The concerns raised during the public consultation is submitted in final EIA.
41	The project proponent shall study and furnish the possible pollution due to plastic and microplastic on the environment. The ecological risks and impacts of plastic & microplastics on aquatic environment and fresh water systems due to activities, contemplated during mining may be investigated and reported.	The matter on plastic waste management has been given in Section 7.5 under Chapter VII, p.128.

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# 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 14<sup>th</sup> September 2006 and its subsequent amendments as per Gazette Notification S.O. 3977 (E) of 14<sup>th</sup> 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 50 ha in the case of non-coal mine lease, 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 as per the order dated 04.09.2018 & 13.09.2018 passed by Hon'ble National Green Tribunal, New Delhi in O.A. No. 173 of 2018 & O.A. No, 186 of 2016 and MoEF & CC Office Memorandum F. No. L-11011/175/2018-IA-II (M) Dated: 12.12.2018.

In compliance with ToR obtained vide TOR File No.10577 and TOR Identification No. TO23B0108TN5620847N, dated.13/03/2024, this EIA report has been prepared for the project proponent, M/s.Kousic and Co Blue Metals, applied for rough stone quarry lease in the Patta land falling in S.F.No.770/2B (Part), 778/3B1(Part) and 778/3B2 (Part) over an extent of 3.23.0 ha in Anjur Village, Pugalur Taluk, Karur District, Tamil Nadu. This EIA report takes into account the rough stone quarries within the cluster of 500 m radius from the periphery of the proposed project site. The cluster contains four proposed projects known as P1, P2, P3 and P4. All the projects mentioned above have been taken for cluster extent calculation as per MoEF & CC Notification S.O. 2269 (E) Dated 1<sup>st</sup> July 2016. The total extent of all the quarries is 13.77.55 ha, also known as the cluster extent. The quarries involved in the calculation of cluster extent are shown in Figure 1.1.

**Table 1.1 Details of Quarries within the cluster area of 500 m radius**

<b>Proposed Quarries</b>					
<b>Code</b>	<b>Name of the Owner</b>	<b>S.F. No</b>	<b>Village</b>	<b>Extent (ha)</b>	<b>Status</b>
<b>P1</b>	M/s.Kousic & Co Blue Metals	770/2B (P), 778/3B1 (P), 778/3B2 (P)	Anjur	3.23.00	Proposed Area
<b>P2</b>	Thiru.S. Kuppusamy	764/3, 765/3, 766/1, 766/2, 766/3A, 767/1, 767/2A	Anjur	4.82.70	Applied Area
<b>P3</b>	Thiru.P.Pazhanisami	773/2, 776/3, 777/1, 777/1, 778/1A(P), 807/2C2	Anjur	4.47.85	Applied Area
<b>P4</b>	Thiru. V.Arunprashath	767/3	Anjur	1.24.0	Applied Area
<b>Existing Quarry</b>					
-- Nil --					
<b>Expired Quarries</b>					
-- Nil --					
<b>Total Cluster Extent</b>				<b>13.77.55</b>	---

**Source:**

*DD Letter - Rc.No.510/Mines/2022, Dated:17.10.2023.*

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

### **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 2023** 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, to analyse impacts and provide mitigation measures.

## **1.2 ENVIRONMENTAL CLEARANCE**

The Environmental Clearance process for the project will comprise of four stages. These stages are screening, scoping, public consultation & appraisal.

### ***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/ 454547/2023, dated 06.12.2023) and decided that the project requires detailed environmental studies for the preparation of EIA report. Therefore, the proponent submitted application for Terms of Reference (ToR) on 06.12.2023.

### ***Scoping***

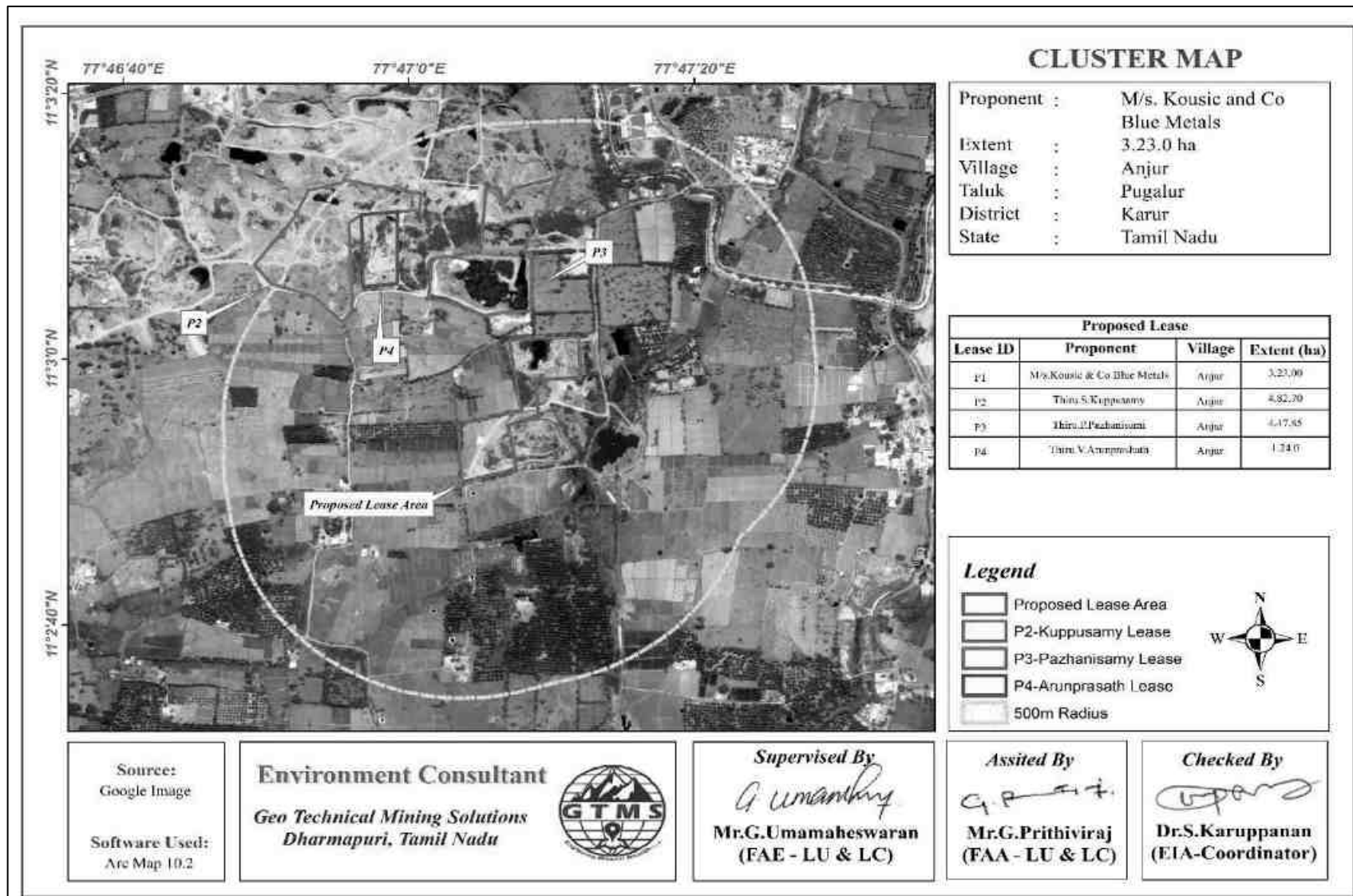
The proposal was placed in the 441<sup>th</sup> meeting of SEAC on 31.01.2024. Based on the presentation and documents furnished by the project proponent, SEAC decided to recommend the proposal for the grant of Terms of Reference (ToR) and the recommendation for ToR is subjected to the outcome of the Honourable NGT, Principal Bench, New Delhi (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).

### ***Public Consultation***

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

### ***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.



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

### 1.3 TERMS OF REFERENCE (ToR)

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 TOR File No.10577 and TOR Identification No. TO23B0108TN5620847N, dated.13/03/2024,

### 1.4 POST ENVIRONMENT CLEARANCE MONITORING

For category B projects, irrespective of its clearance by MoEF/SEIAA, the project proponent shall prominently advertise in the newspapers indicating that the project has been accorded environmental clearance and the details of MoEF website where it is displayed.

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 1<sup>st</sup> June and 1<sup>st</sup> December of every year.

### 1.5 TRANSFERABILITY OF ENVIRONMENTAL CLEARANCE

A prior environmental clearance granted for a specific project or activity to an applicant may be transferred during its validity to another legal person entitled to undertake the project or activity on application by the transferor or the transferee with a written “no objection” by the transferor, to, and by the regulatory authority concerned, on the same terms and conditions under which the prior environmental clearance was initially granted, and for the same validity period (EIA Guidance Manual for Mining of Minerals, 20).

### 1.6 IDENTIFICATION OF THE PROJECT PROPONENT

The profile of the project proponent who has involved in this quarrying project has been given in Table 1.2.

**Table 1.2 Details of Project Proponent**

<b>Name of the Project Proponent</b>	<b>M/s.Kousic and Co Blue Metals</b>
Address	Door.No.24/A, Housing Unit, Kollampalayam, Kasipalayam, Erode Taluk and District
Status	Proprietor

### 1.7 BRIEF DESCRIPTION OF THE PROJECT

The proposed project deals with excavation of rough stone which is primarily used in construction projects. The method adopted for rough stone excavation is Open Cast Semi Mechanized mining method involving formation of benches with 5 m height and 5 m width. The proposed project site is located in Anjur Village, Pugalur Taluk, Karur District, Tamil Nadu. Some of the important features of the proposed project have been provided in Table 1.3.



**Table 1.3 Salient Features of the Proposed Project**

Name of the Quarry	M/s.Kousic and Co Blue Metals Rough Stone Quarry			
Type of Land	Patta Land			
Extent	3.23.0 Ha			
S.F.No	770/2B (Part), 778/3B1 (Part), 778/3B2 (Part)			
Toposheet No	58-E/16			
Location of Project Site	11° 2'50.76"N to 11° 3'1.69"N 77°47'3.49"E to 77°47'12.09"E			
Highest Elevation	195 m AMSL			
Existing Pit Dimensions	Pit Level	Length (m)	Width (m)	Depth (m)
	I	48	59	1
	IA	78	16	1
	II	32	28	5
	III	20	15	7
	IV	18	13	8
V	11	14	13	
Ultimate depth of Mining	45 m BGL			
Geological Resources	Rough Stone in m <sup>3</sup>		Top Soil in m <sup>3</sup>	
	1278843		20877	
Mineable Reserves	Rough Stone in m <sup>3</sup>		Top Soil in m <sup>3</sup>	
	277958		8730	
Proposed reserves for five years	Rough Stone in m <sup>3</sup>		Top Soil in m <sup>3</sup>	
	277958		8730	
Method of Mining	Open-Cast Semi Mechanized mining			
Topography	Flat Topography			
Machinery proposed	Jack Hammer		2	
	Compressor		1	
	Tipper		4	
	Excavator		1	
Blasting Method	The quarrying operation is proposed to carried out by open cost, using jack hammer drilling followed by manual breaking will be adopted to release the rough stone and nonel blasting is proposed in this lease area.			
Proposed Manpower Deployment	16 Nos			
Project Cost	Rs.83,62,000			
CER Cost	Rs. 5,00,000			
Proposed Water Requirement	4.75 KLD			

## **1.8 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 2023** 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.

## **1.9 Legislation Applicable to Mining of Mineral Sector**

A few important legislations are given below:

- ❖ The Mines Act, 1952.
- ❖ The Mines and Mineral (Development and Regulation) Act, 1957.
- ❖ Mines Rules, 1955.
- ❖ Mineral Concession Rules, 1960
- ❖ Mineral Conservation and Development Rules, 1988.
- ❖ State Minor Mineral Concession Rules, 1960.
- ❖ Granite Conservation and Development Rule, 1999.
- ❖ The Water (Prevention and Control of pollution) Act, 1974.
- ❖ The Air (Prevention and Control of pollution) Act, 1981.
- ❖ The Environment (Protection) Act, 1986.
- ❖ The Forest (Conservation) Act, 1988.
- ❖ The Wildlife (Protection) Act, 1972.

## 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

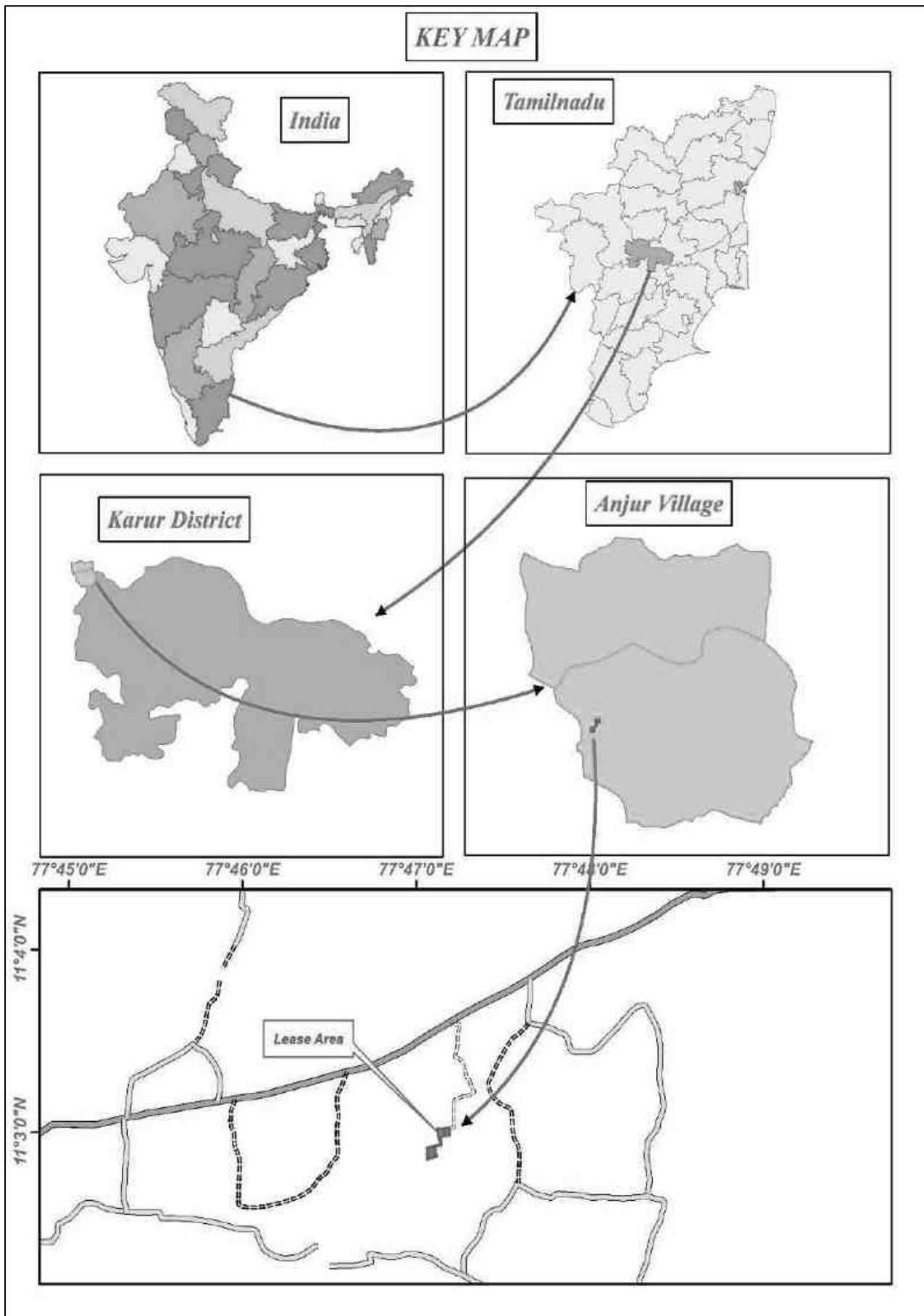
The proponent, **Mr.Kousic and Co Blue Metals** is involved in the undertaking of establishment, construction, development, and closure of opencast mines. He, through the exploration phase, identified the proposed project site as the one that has a great potential of producing an economically viable quantity of rough stone and gravel. Therefore, the proponent had applied for quarry lease on 13.10.2022 to extract rough stone. The precise area communication letter was issued by Department of Geology and Mining, Karur vide Rc.No.510/Mines/2022 Dated:19.09.2023. Based on the precise area communication letter, mining plan was prepared. The mining plan thus prepared was approved by Deputy Director Department of Geology and Mining, Karur Rc.No.45/Mines/2023, dated:04.10.2023. 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 is located in Anjur Village, Pugalur Taluk, Karur District, Tamil Nadu as shown in Figure 2.2 & 2.3. The area lies between Latitudes from 11°2'50.76"N to 11°3'1.69"N and Longitudes from 77°47'3.49"E to 77°47'12.09"E. The maximum altitude of the project area is 195 m AMSL. Accessibility details to the proposed project site have been given in Table 2.1.



**Figure 2.2 Key Map Showing Location of the Project Site**

**Table 2.1 Site Connectivity to the Project Area**

Nearest Roadways	SH-189 Muthur – Kodumudi	0.92 km N
	NH – 381 A Erode - Vellakoil	5.33 km W
	MDR – 332 Noyal – K.Paramathi	4.98 km W
Nearest Town	Muthur	5.06 km W
Nearest Railway Station	Kodumudi	11.5 km NE
Nearest Airport	Coimbatore	81.5 km E
Nearest Seaport	Tuticorin	253.5 km S
Nearest Villages	Kulathapalayam	0.97 km N
	Pillapalayam	0.5 km E
	Nagappalayam	0.37 km S
	Thottipalayam	1.19 km W

**2.3 LEASEHOLD AREA**

- ❖ The extent of the proposed project site is 3.23.0 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 geographic coordinates are given in Table 2.2 and the proposed project site with boundary coordinates has been shown in Figure 2.3.

**Table 2.2 Corner Coordinates of Proposed Project**

Pillar ID	Latitude	Longitude	Pillar ID	Latitude	Longitude
1	11°3'1.69''N	77°47'11.87''E	8	11°2'50.76''N	77°47'3.79''E
2	11°2'58.62''N	77°47'12.09''E	9	11°2'52.60''N	77°47'3.51''E
3	11°2'58.43''N	77°47'8.90''E	10	11°2'53.47''N	77°47'3.61''E
4	11°2'55.53''N	77°47'9.13''E	11	11°2'55.11''N	77°47'3.49''E
5	11°2'55.42''N	77°47'8.40''E	12	11°2'56.17''N	77°47'7.96''E
6	11°2'55.03''N	77°47'6.97''E	13	11°2'56.93''N	77°47'7.74''E
7	11°2'51.75''N	77°47'7.52''E	14	11°3'01.49''N	77°47'7.03''E

**2.4 GEOLOGY**

The lease area geologically occurs Hornblende–Biotite Gneiss. The Charnockite, commercially called as Roughstone occurs within the migmatite rock. Also, the lease area geomorphologically occurs pediment pediplain complex.

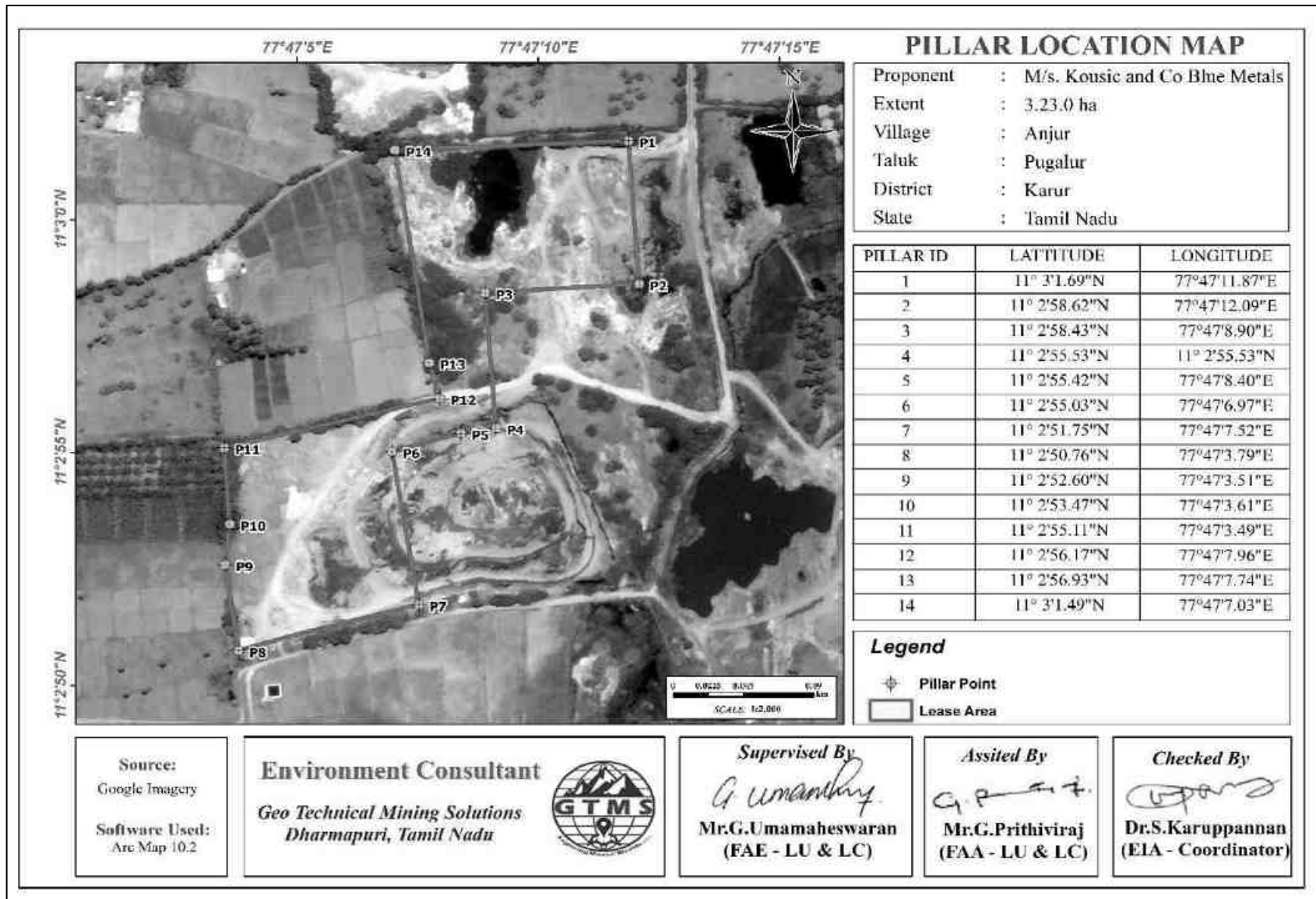


Figure 2.3 Google Earth Image Showing Lease Area with Pillars

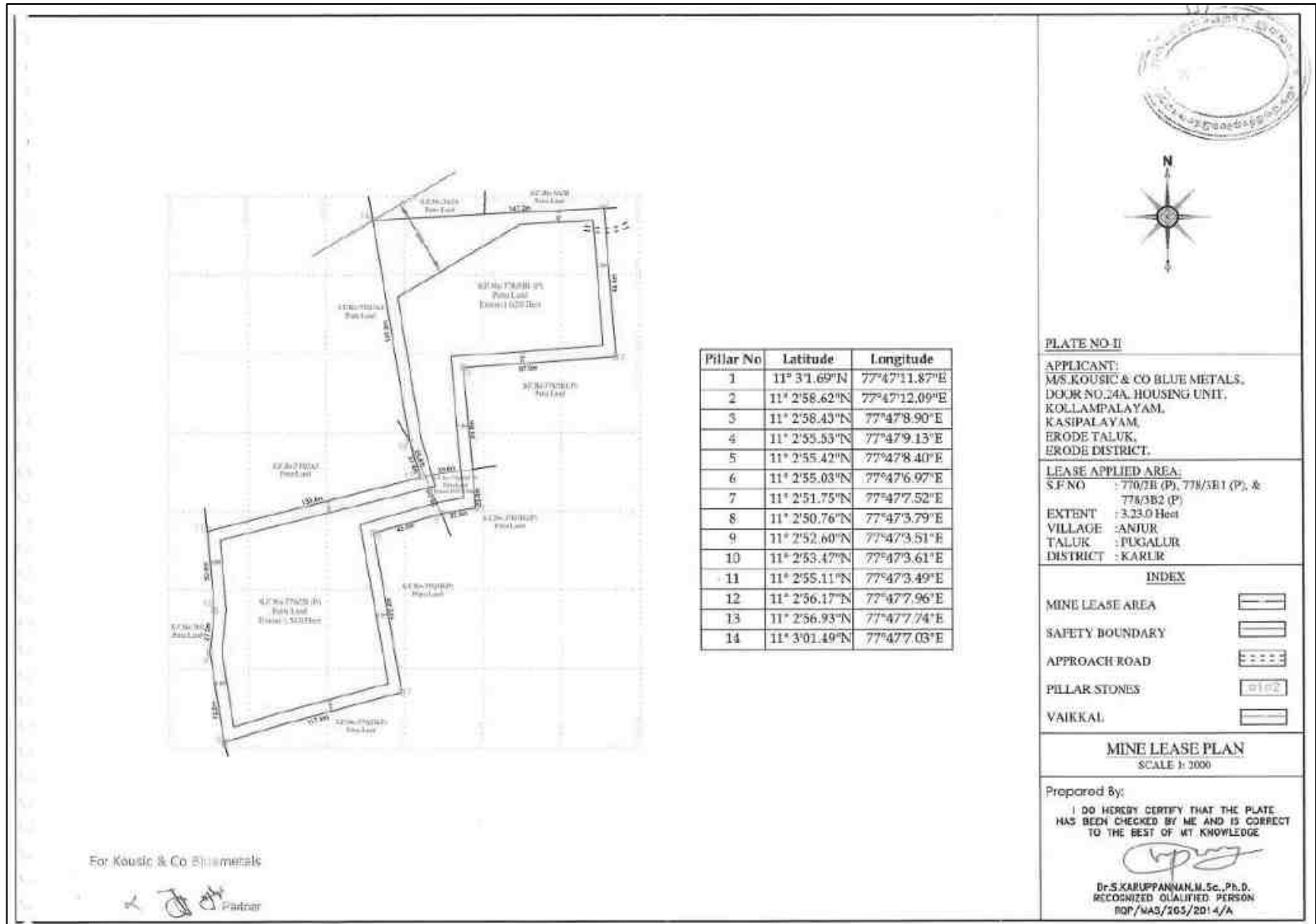
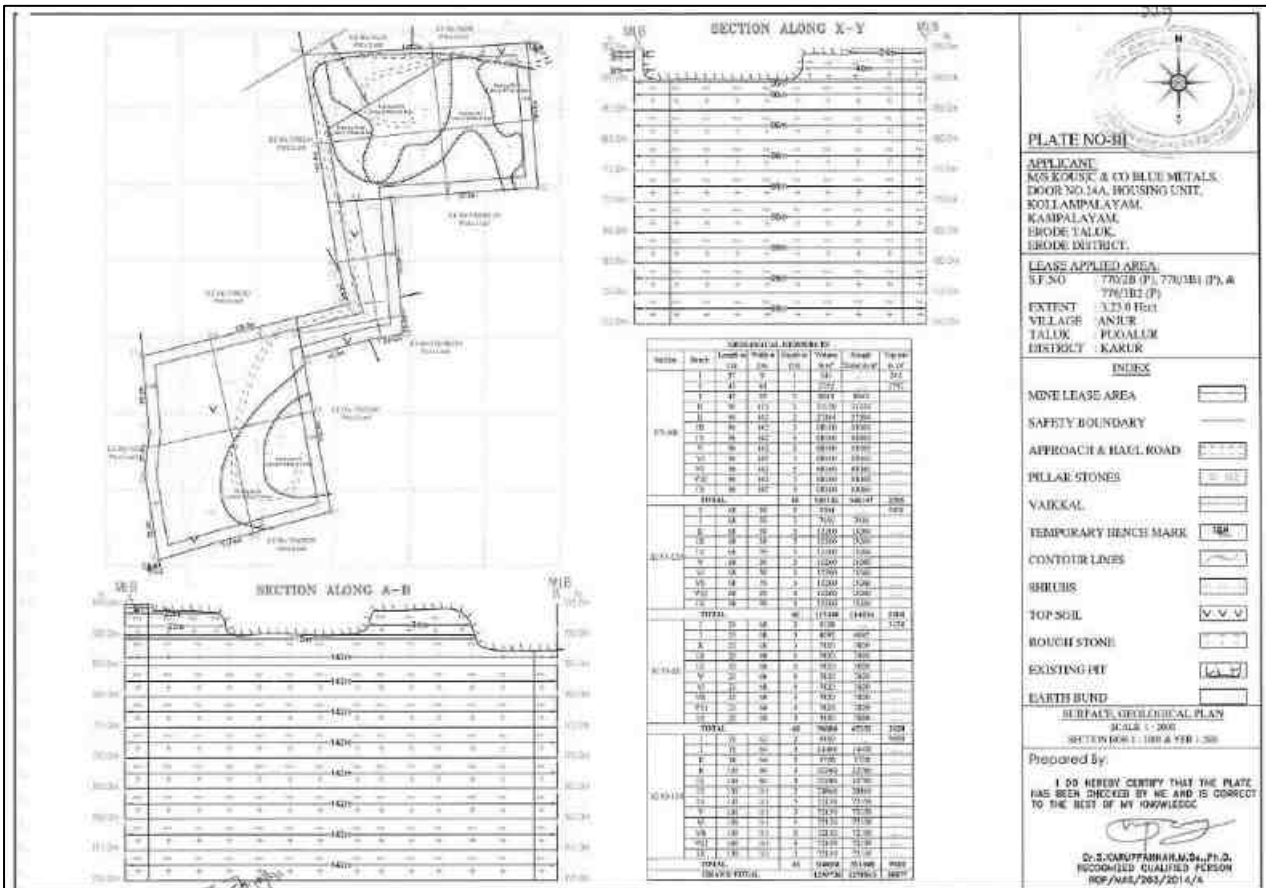


Figure 2.4 Mine Lease Plan





**PLATE NO-BI**

**APPLICANT:**  
MS.ROUSE & CO BLUE METALS,  
DOOR NO.34A, HOUSING UNIT,  
KOLLAMPALAYAM,  
ERODE TALUK,  
ERODE DISTRICT.

**LEASE APPLIED AREA:**  
S.F.NO : 77A(B) (P), 77(B) (P), A  
77(B) (P)

**EXTENT :** 3.23.0 Hect  
**VILLAGE :** ANUR  
**TALUK :** PUGALUR  
**DISTRICT :** KARUR

**INDEX**

MINE LEASE AREA

SAFETY BOUNDARY

APPROACH & HAUL ROAD

PILLAR STONES

VAIKAL

TEMPORARY BENCH MARK

CONTOUR LINES

SHRUBS

TOP SOIL

ROUGH STONE

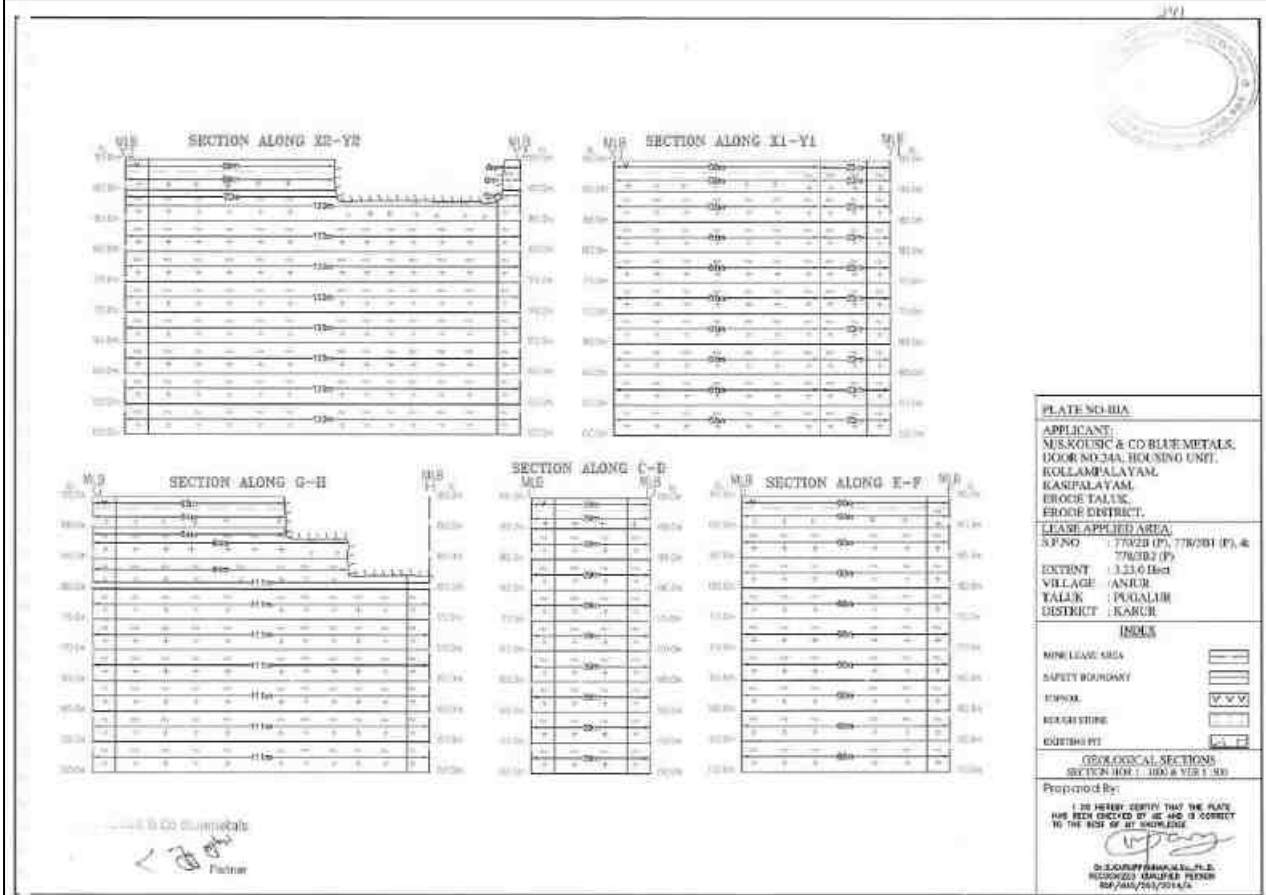
EXISTING PIT

EARTH BUND

**SURFACE GEOLOGICAL PLAN**  
SCALE 1:2000  
SECTION HO-1: 100 & Y-1: 200

Prepared by:  
I DO HEREBY CERTIFY THAT THE PLATE  
HAS BEEN CHECKED BY ME AND IS CORRECT  
TO THE BEST OF MY KNOWLEDGE

*[Signature]*  
D. S. KARUPPANAHARAN, P.E.,  
REGISTERED QUALIFIED PERSON  
ROP/MS/263/2014/A



**PLATE NO-BIA**

**APPLICANT:**  
MS.ROUSE & CO BLUE METALS,  
DOOR NO.34A, HOUSING UNIT,  
KOLLAMPALAYAM,  
ERODE TALUK,  
ERODE DISTRICT.

**LEASE APPLIED AREA:**  
S.F.NO : 77A(B) (P), 77(B) (P), &  
77(B) (P)

**EXTENT :** 3.23.0 Hect  
**VILLAGE :** ANUR  
**TALUK :** PUGALUR  
**DISTRICT :** KARUR

**INDEX**

MINE LEASE AREA

SAFETY BOUNDARY

VAIKAL

ROUGH STONE

EXISTING PIT

**GEOLOGICAL SECTIONS**  
SECTION HO-1: 100 & Y-1: 200

Prepared by:  
I DO HEREBY CERTIFY THAT THE PLATE  
HAS BEEN CHECKED BY ME AND IS CORRECT  
TO THE BEST OF MY KNOWLEDGE

*[Signature]*  
D. S. KARUPPANAHARAN, P.E.,  
REGISTERED QUALIFIED PERSON  
ROP/MS/263/2014/A

Figure 2.5 Surface & Geological Plan and Sections

## 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 7.5 m and 10 m safety distance as per precise area communication letter and deducting the locked-up reserves during bench formation (also called as Bench Loss). The mineable reserves are calculated up to the depth of 50 m considering there is no waste / overburden / side burden (100% Recovery anticipated) for the proposed project. The plate used for reserve estimation has been shown in Figure 2.5 and 2.5a results of geological resources and reserves have been shown in Table 2.3.

**Table 2.3 Estimated Resources and Reserves of the Project**

Resource Type	Rough Stone in m <sup>3</sup>	Top Soil in m <sup>3</sup>
Geological Resource in m <sup>3</sup>	1278843	20877
Mineable Reserves in m <sup>3</sup>	277958	8730
Proposed production for 5 years m <sup>3</sup>	277958	8730

Based on the year wise development and production plan and sections, the year wise production results have been given in Table 2.4 & Figure 2.7.

**Table 2.4 Year-Wise Production Details**

Year	Rough Stone in (m <sup>3</sup> )	Top Soil in (m <sup>3</sup> ) / 1 year
I	59626	1898
II	63505	---
III	57837	6832
IV	63490	---
V	33500	---
<b>Total</b>	<b>277958</b>	<b>8730</b>

*Source: Approved Mining Plan & Tord*

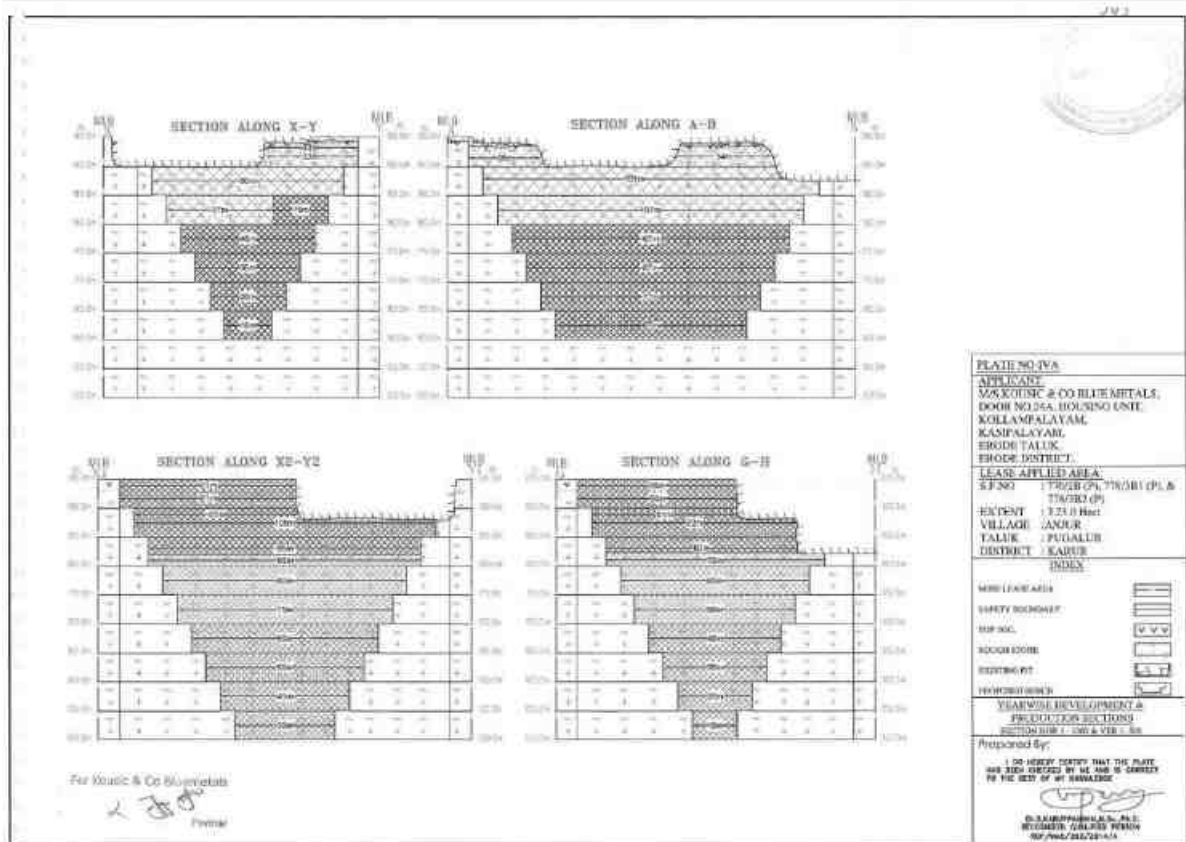
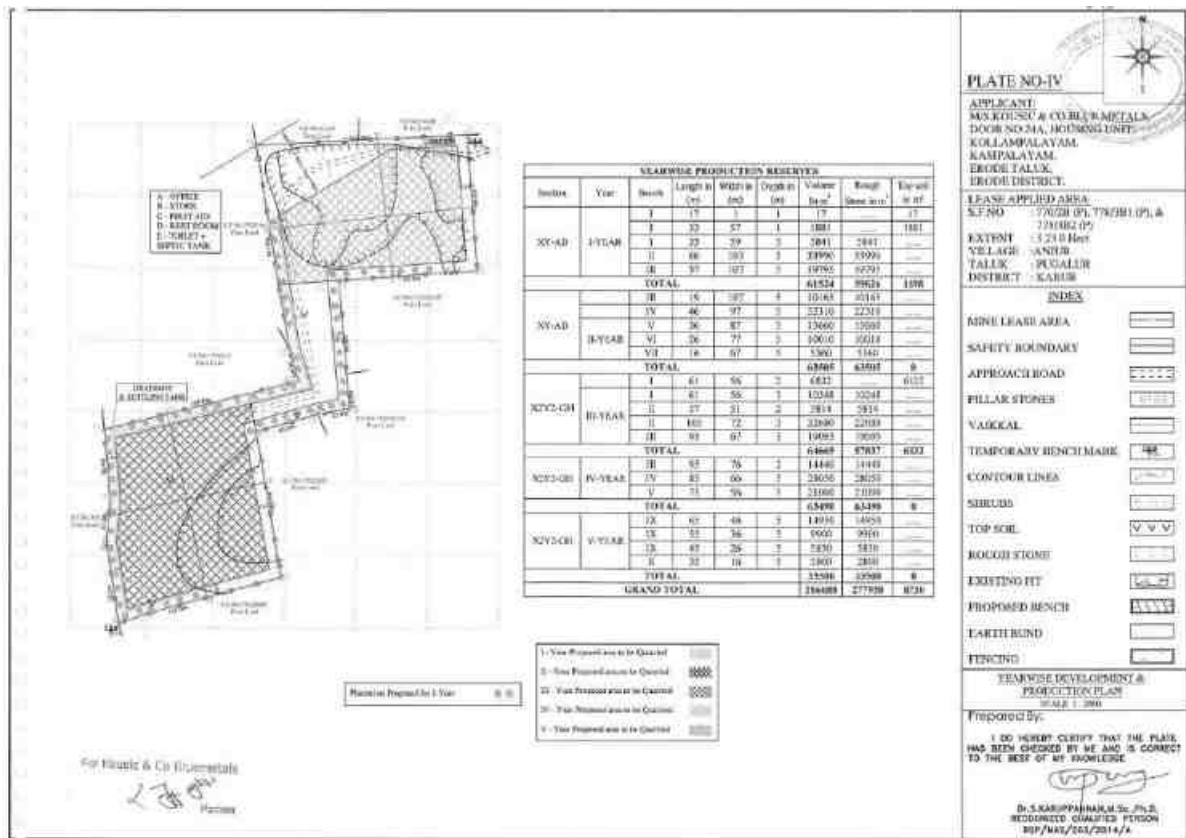


Figure 2.6 Year wise Production Plan & Sections

## 2.6 MINING METHOD

The Quarrying operation is proposed to be carried out by open cast semi-mechanized mining method with the bench height and width of 5 m each. The open cast semi-mechanized method involving drilling and blasting is proposed to extract rough stone and gravel. The extracted rough stone will be loaded manually to the trucks for dispatch to the customers. In this project, NONEL blasting will be adopted to extract rough stone.

### Conceptual Blasting Design

In this project, NONEL blasting will be employed to win rough stone. This method will involve closed spaced perimeter holes to reduce the overbreak/backbreak on a blast. The objective of the blasting design is to prevent fly rocks from damaging the nearby structures.

### Rules of Thumb for Blast Design

Based on practical experience and technical information, a set of rules for blasting have been provided as below ([Chapter8 \(nps.gov\)](#)). These rules will be applied to blast rocks in the proposed project.

**Rule 1: The detonation velocity (VOD) of the explosive should be close to the same value of the sonic velocity (VSO) of the rock to be blasted.**

The sonic velocity of a rock is considered to be a reliable indicator of its structural integrity and resistance to fragmentation. As the VOD of the explosive approaches close to the VSO of the rock, the blasting would result in relatively smaller size of fragmentation with uniformity. There is no value in using an explosive that has a VOD greatly in excess of the VSO of the rock, since there is little or no improvement in fragmentation above the VSO. When selecting an explosive to match up the VSO of a rock mass, variance of <10% in the velocities is acceptable.

**Rule 2: Generally, select the densest explosive possible.**

When the density of explosives is higher, the potential energy of the explosives can be greater and the more of it can be placed within a borehole of a given size.

**Rule 3: Select explosives according to the characteristics of the rock formation to be blasted.**

When planes of separation in the rock are smaller than the degree of fragmentation required, the rock can often be blasted by using lower density and lower detonation velocity explosives.

**Rule 4: When using slurry or water gel explosives, always determine the critical temperature below which the explosive will fail to reliably detonate.**

Almost all slurry explosives have a critical temperature below which they may not detonate, or may not sustain detonation in elongated columns. The explosives should not be used when the temperature of the explosive at time of loading is below that critical temperature.

**Rule 5: The distance between holes (spacing) should not be greater than one-half the depth of the borehole.**

When the distance between holes in a row is greater than one-half the depth of the hole, the angles of breakage intersect above the bottom of the holes. This causes both a great deal of vertical throw and a very uneven bottom.

**Rule 6: Stemming should be equal to the burden.**

Stemming is useful to confine and maximize efficient use of the explosive's energy. It also reduces noise as much as possible. If the stemming is greater than the burden, the rock at the top of the borehole will have less cracking from reflection and refraction of compressive and tensile waves. Therefore, stemming should be equal to burden. Drill fines can be used for loading the borehole.

**Rule 7: Subdrill (if necessary) should be between 0.3 and 0.5 of spacing/burden.**

Subdrill should be equal to 0.3 of burden. It will work when there is row-for-row delay. In blasts where the delay system is both row-for-row and hole-for-hole, the subdrill should be determined by the largest dimension, which can be the spacing or the burden. An average subdrill of 0.4 of spacing is best to use for planning purposes. Based on the above-mentioned rules, blasting design has been conceptualized and has been provided in Table 2.5.

**Table 2.5 Conceptual Blasting Design**

Blasthole Diameter (D) in mm	32
Burden (B) in m	1.5
Spacing (S) in m	1.30
Subdrill in m	0.45
Charge length (C) in m	0.64
Stemming	1.5
Hole Length (L) in m	2.6
Bench Height (BH) in m	2.1
Mass of explosive/hole in g	400
Stemming material size in mm	3.2
Burden stiffness ratio	1.43
Blast volume/hole in m <sup>3</sup>	4.16

Production of rough stone/day in m <sup>3</sup>	206
Number of blastholes/day	50
Blasthole pattern	Staggered / Rectangular
Mass of explosive /day in kg	19.81
Powder factor in kg/m <sup>3</sup>	0.10
Loading density	0.63
Type of explosives	Slurry
Diameter of packaging in mm	25
Initiation system	NONEL
Fly rock distance in m	19

### 2.6.1 Magnitude of Operation

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

**Table 2.6 Operational Details for Proposed Project**

	<b>Rough Stone in m<sup>3</sup>5 years</b>
Proposed production for 5 years	277958
Number of Working Days /Annum	270
Production of /Day (m <sup>3</sup> )	206
No. of Lorry Loads	34

### 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**

<b>S. No.</b>	<b>Type</b>	<b>No of Unit</b>	<b>Size /Capacity</b>	<b>Make</b>	<b>Motive Power</b>
1	Jack Hammers	2	Hand held	--	Diesel
2	Compressor	1	Air	--	Diesel
3	Hydraulic Excavator	1	2.9-4.5 m <sup>3</sup>	--	Diesel
4	Tipper	4	15MT	--	Diesel

### 2.6.3 Progressive Quarry Closure Plan

The progressive quarry closure plan (Figure 2.8) of the proposed project shows past, present, and future land use statistics. According to the land use results, as shown in Table 2.8 At Present about 1.49.93 ha of land is used for quarrying, 1.04.94 ha of land is unutilized, 0.02.00 is used for road, 0.66.13 is used for green belt. Whereas, at the end of the mine life, about 0.52.15 ha of land is unutilized; about 0.24.50 ha of land is used for green belt and 0.05.0 will be used for roads and 0.03.00 is used for infrastructure.

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

<b>Description</b>	<b>Present Area (ha)</b>	<b>Area at the end of life of quarry (ha)</b>
Area under quarry	1.49.93	2.33.98
Infrastructure	Nil	0.03.00
Roads	0.02.00	0.05.0
Green Belt & Dump	0.66.13	0.24.50
Drainage & Settling Tank	Nil	0.04.37
Unutilized area	1.04.94	0.52.15
<b>Total</b>	<b>3.23.00</b>	<b>3.23.00</b>

**2.6.4 Progressive Quarry Closure 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**

<b>Activity</b>	<b>Capital Cost</b>
646 plants inside the lease area	129200
969 plants outside the lease area	290700
Wire Fencing	646000
Renovation of Garland Drain	32300
<b>Total</b>	<b>10,98,200</b>

*Source: Environment Management 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. Details of ultimate pit dimensions have been derived from given in Table 2.10 and Figure 2.8.

**Table 2.10 Ultimate Pit Dimension**

<b>Pit</b>	<b>Length (m)</b>	<b>Width (m) (Max)</b>	<b>Depth (m)</b>
I	105	107	45

*Source: Approved Mining Plan & ToR*

**2.6.6 Infrastructures**

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

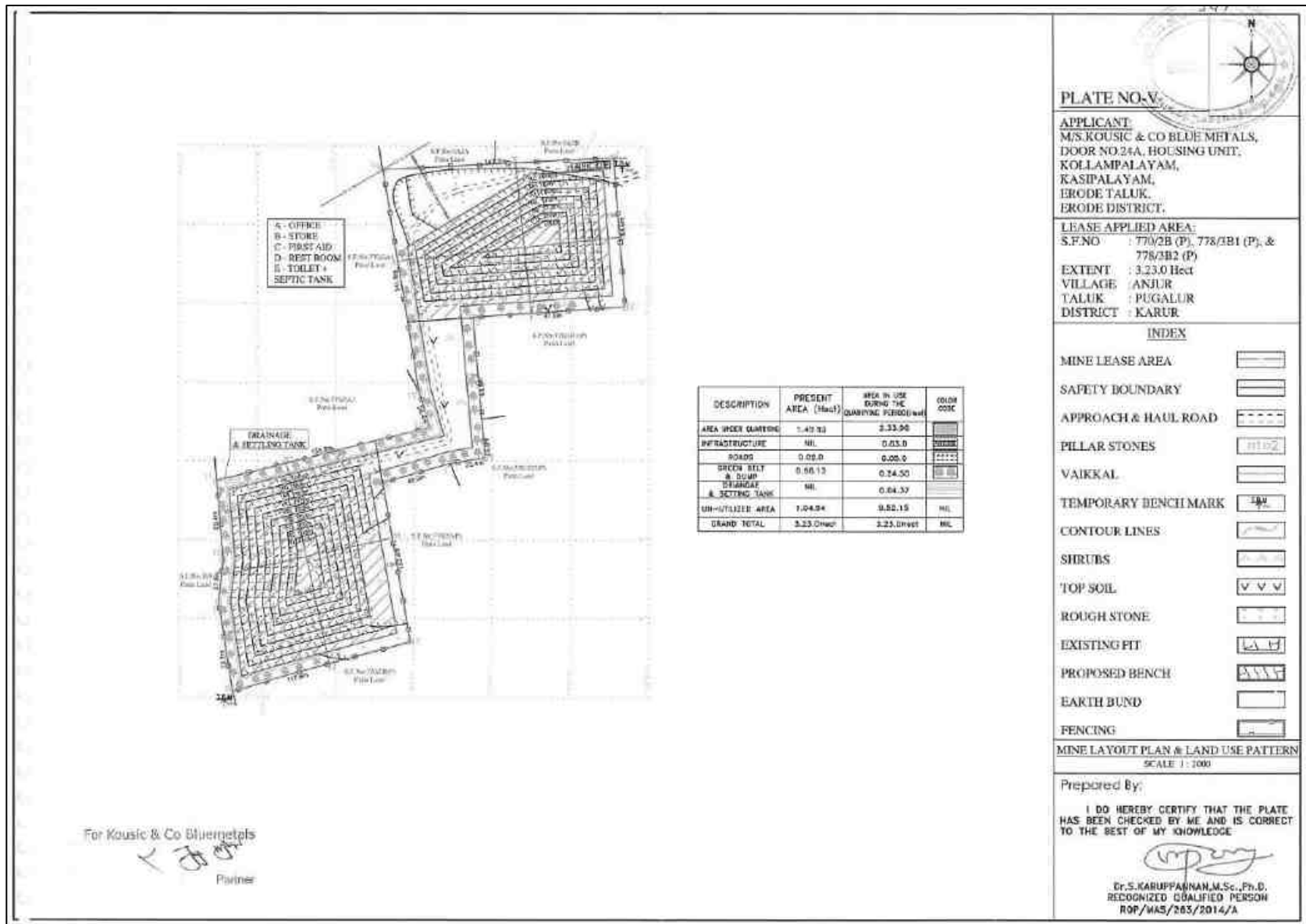


Figure 2.7 Mine Layout Plan and Land Use Pattern



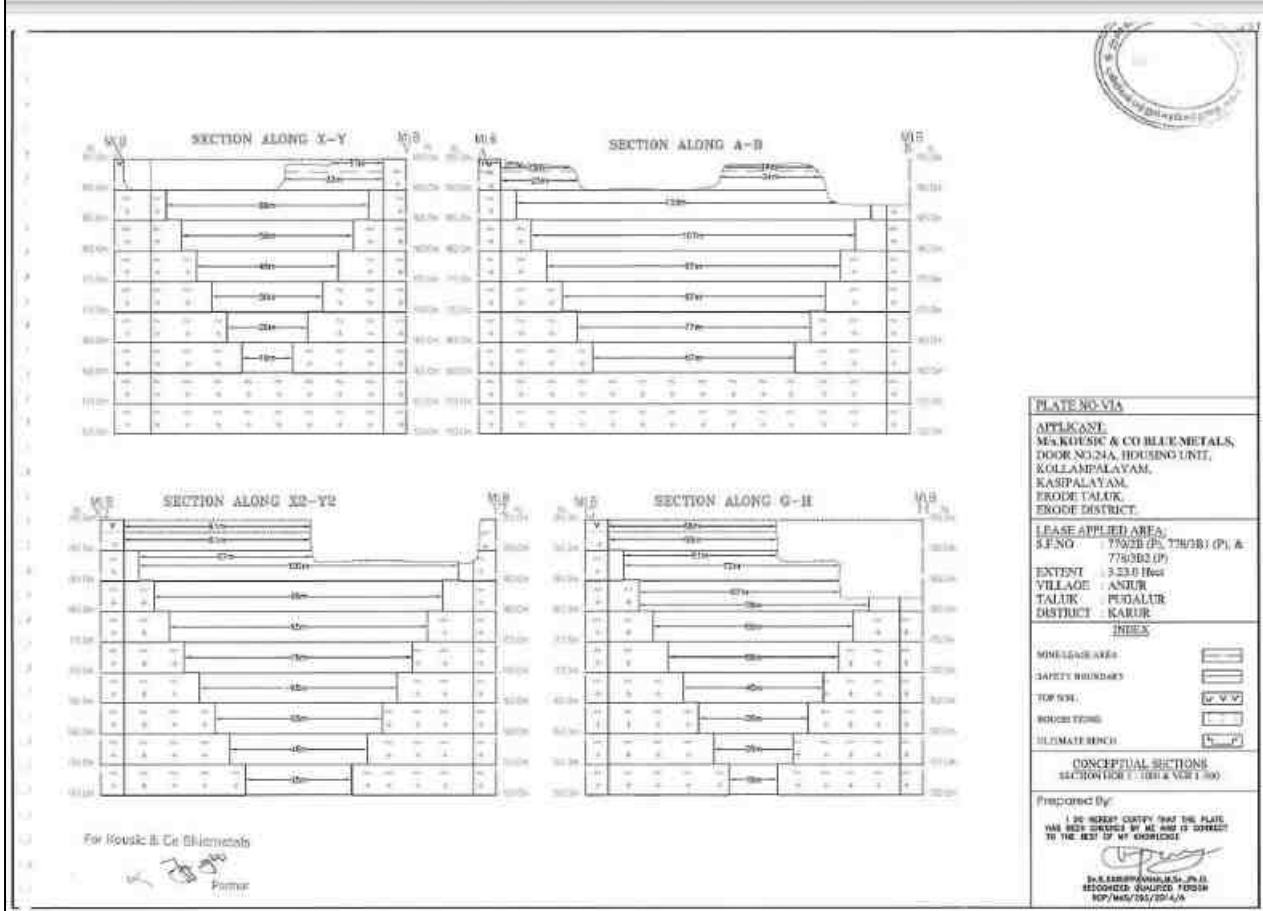
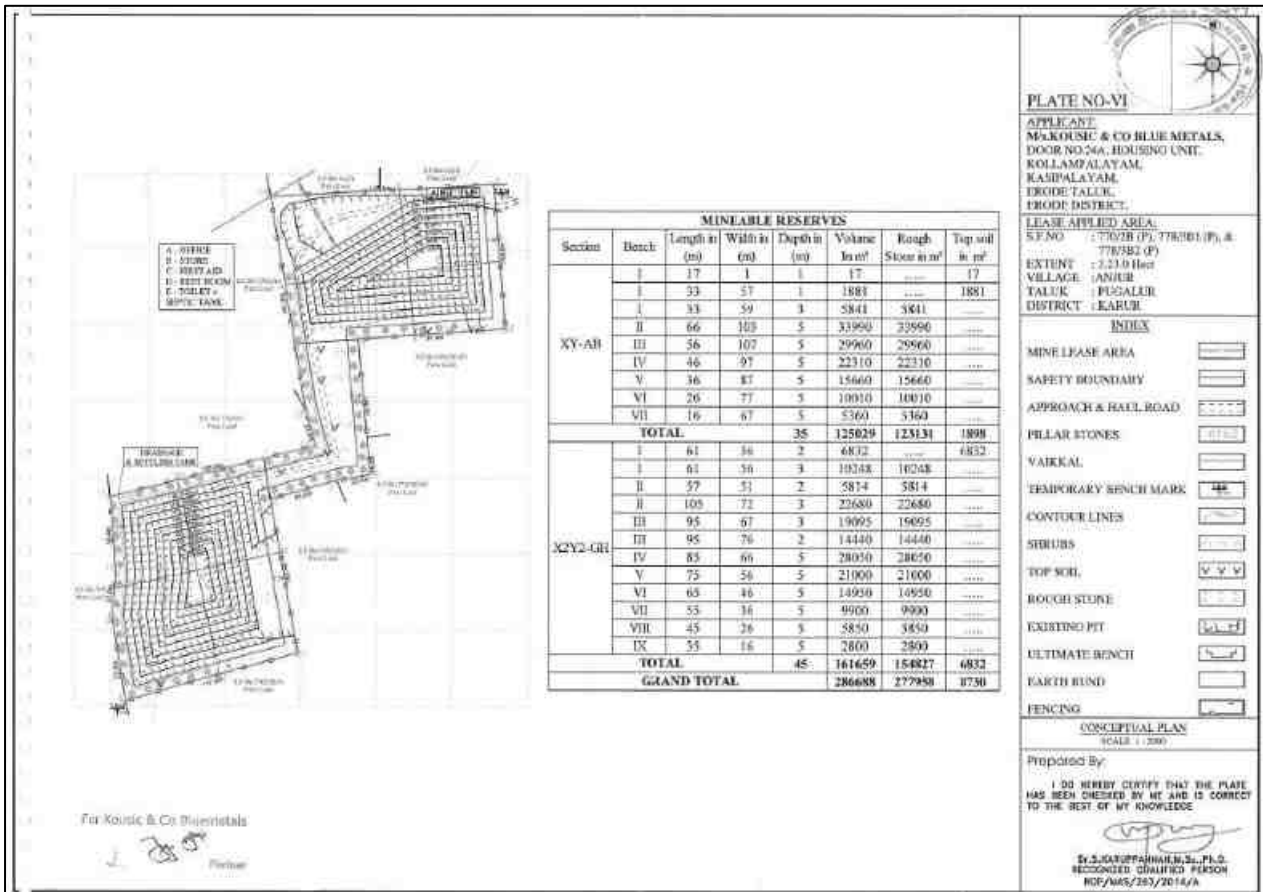


Figure 2.8 Conceptual Plan & Sections

### 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 4.75 KLD is given in Table 2.11.

**Table 2.11 Water Requirement for the Project**

Purpose	Quantity	Source
Dust Suppression	1.5 KLD	Existing bore wells nearby the lease area
Green Belt development	1.75 KLD	Existing bore wells nearby the lease area
Drinking & Domestic	1.5 KLD	Existing bore wells and approved water vendors
<b>Total</b>	<b>4.75 KLD</b>	

Source: Prefeasibility Report

### 2.6.8 Energy Requirement

High speed Diesel (HSD) will be used for quarrying machineries. As per the data shown in Table 2.12, Around 1177348 litres of HSD will be used for rough stone and gravel extraction during this 5 years plan period. The diesel will be brought to the site from nearby diesel pumps.

**Table 2.12 Fuel Requirement Details**

<b>Fuel Requirement for Excavator</b>			
Details	Rough Stone (277958 m <sup>3</sup> )	Gravel (8730 m <sup>3</sup> )	Total Diesel (litre)
Average Rate of Fuel Consumption (l/hr)	16	10	---
Working Capacity (m <sup>3</sup> /hr)	20	60	---
Time Required (hours)	13898	146	---
Total Diesel Consumption for 5 years (litre)	222366	1455	<b>223821</b>
<b>Fuel Requirement for Compressor</b>			
Average Rate of Fuel Consumption/hole (litre)	0.4	---	---
Number of Drillholes/day	50	---	---
Total Diesel Consumption for 5 years (litre)	27000	---	<b>27000</b>
<b>Fuel Requirement for Tipper</b>			
Average Rate of Fuel Consumption/Trip (litre)	20	20	---
Carrying Capacity in m <sup>3</sup>	6	---	---
Number of Trips / days	34	---	---
Number of Trips / 5 years	46326	---	---
Total Diesel Consumption for 5 years (litre)	926527	---	<b>926527</b>
<b>Total Diesel Consumption by Excavator, Compressor and Tipper</b>			<b>1177348</b>

\* Number of truck loads for gravel has been normalized for 5 years.

## 2.6.9 Capital Requirement

The project proponent will invest **Rs.83,62,000/-** to the project. The breakup summary of the investment has been given in Table 2.13.

**Table 2.13 Capital Requirement Details**

S. No.	Description	Cost (Rs.)
1	Fixed Asset Cost	20,50,000/-
2	Machinery cost	30,00,000/-
3	EMP Cost	33,12,000/-
<b>Total Project Cost</b>		<b>83,62,000/-</b>

*Source: Approved Mining Plan*

## 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**

S. No.	Category	Role	Nos.
1.	Highly Skilled	Mine manager	1
		Mine Engineer	1
		Mine Geologist	1
		Blaster	1
2.	Unskilled	Musdoor/ Labours	12
<b>Total</b>			<b>16</b>

*Source: Prefeasibility Report*

## 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 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	
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 site were carried out covering **March through May 2023** with CPCB guidelines. Environmental baseline data were collected by an NABL accredited and MoEF notified *Enviro Farmers Labs & Technologies and Accuracy Analabs* for the environmental attributes including soil, water, air, and noise and by FAEs for ecology and biodiversity, traffic, and socio-economy.

**Study Area**

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, except for ecological study, which considers 10 km as buffer zone. Both core and buffer zones are taken as the study area. The data was collected from the study area to understand the existing environment conditions of the above-mentioned environmental components. Sampling methodologies for the various environmental parameters, including frequency of sampling, method of sample analysis, etc., are briefly given in Table 3.1.

**Table 3.1 Monitoring Attributes and Frequency of Monitoring**

<b>Attribute</b>	<b>Parameters</b>	<b>Frequency of Monitoring</b>	<b>No. of Locations</b>	<b>Protocol</b>
Land Use/ Land Cover	Land-use Pattern within 5 km radius of the study area	Once during the study period	Study Area	Satellite Imagery & Primary Survey
*Soil	Physico-Chemical characteristics	Once during the study period	8 (1 in core & 7 in 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	10 (4 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 <sub>10</sub> PM <sub>2.5</sub> SO <sub>2</sub> NO <sub>x</sub>	24 hours, twice a week	10 (1 core & 9 buffer)	IS 5182 Part 1-23 National Ambient Air Quality Standards, CPCB
*Noise Levels	Ambient noise	Hourly observation for 24 hours per location	13 (1 core & 12 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.

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

### 3.1 LAND ENVIRONMENT

#### 3.1.1 Geology and Geomorphology

Study area is mainly composed of hornblende-biotite genesis and phroxene granulite, as shown in Figure 3.1. The lease area occurs in migmatite terrain.

Among the geomorphic units, shallow weathered/buried pediment and pediplain dominate the study area, as shown in Figure 3.2. The lease area occurs in shallow weathered/buried pediplain terrain.

### 3.1.2 Land Use/ Land Cover

Land Use and Land Cover (LULC) map, as shown in Figure 3.3 was prepared using Sentinel II image for the study area of 5 km radius to provide a baseline status of the study area covering 5 km radius around the proposed mine site. Totally, 8 LULCs were mapped. The areal extent of each LULC is provided in Table 3.2. Of the total area, mining area covers only 82.95 ha accounting for 1.06 %, of which lease area of 3.23.0 ha contributes only about 0.041 %. This small percentage of mining activities shall not have any significant impact on the land environment.

**Table 3.2 LULC Statistics of the Study Area**

S. No.	Classification	Area (ha)	Area (%)
1	Crop Land	4734.59	60.38
2	Dense Forest	12.27	0.16
3	Fallow Land	813.83	10.38
4	Mining/Industrial lands	82.95	1.06
5	Land with or without scrub	9.16	0.12
6	Plantations	1912.60	24.39
7	Settlements	47.96	0.61
8	Water Bodies	228.40	2.91
<b>Total</b>		<b>7841.76</b>	<b>100.0</b>

Source: Sentinel II Satellite Imagery

### 3.1.3 Topography

The proposed lease area is located in a flat terrain with an altitude range of 195 m AMSL.

### 3.1.4 Drainage Pattern

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. The proposed area shows dendritic drainage pattern indicating uniform lithology beneath the surface, as shown in Figure 3.4.

### 3.1.5 Seismic Sensitivity

The proposed lease area is situated in a Seismic Zone II, as defined by National Centre for Seismology ([Official Website of National Centre of Seismology](#)). The Zone II is defined as the region where only minor damage is expected from seismic events. In this respect, the proposed lease area is located in a low earthquake hazard area.

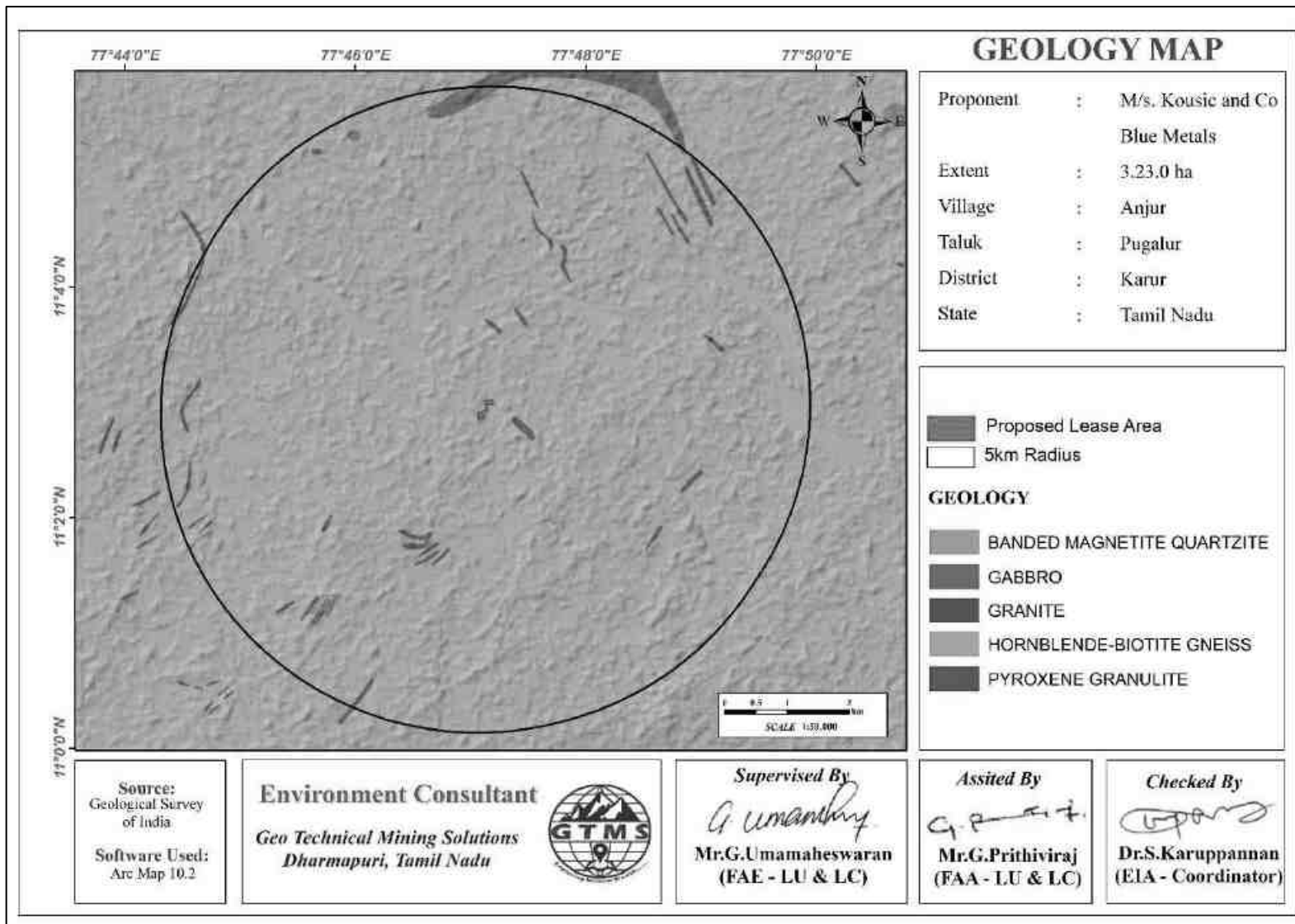


Figure 3.1 Geology Map of 5 km Radius from Proposed Project Site

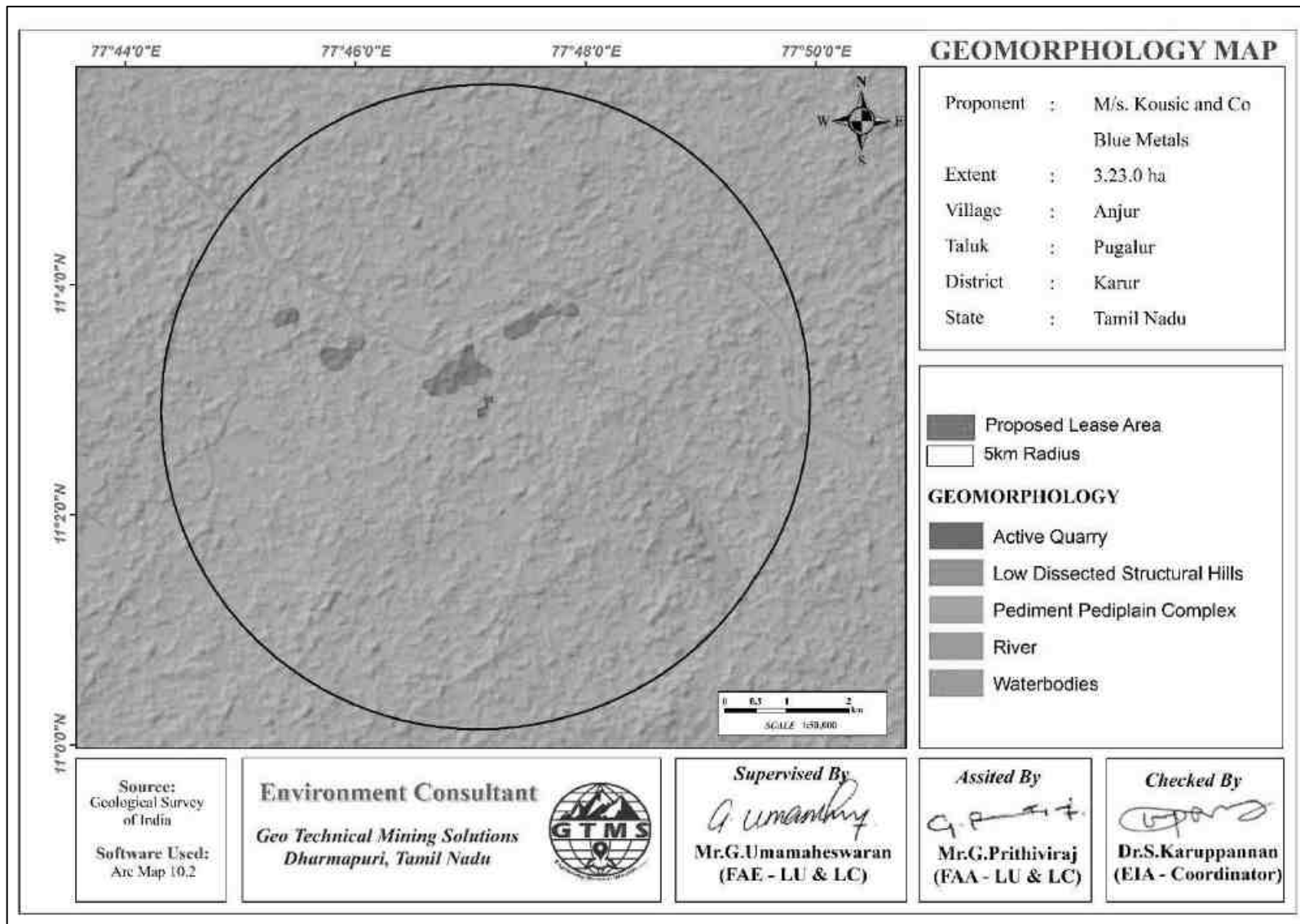


Figure 3.2 Geomorphology Map of 5 km Radius from Proposed Project Site



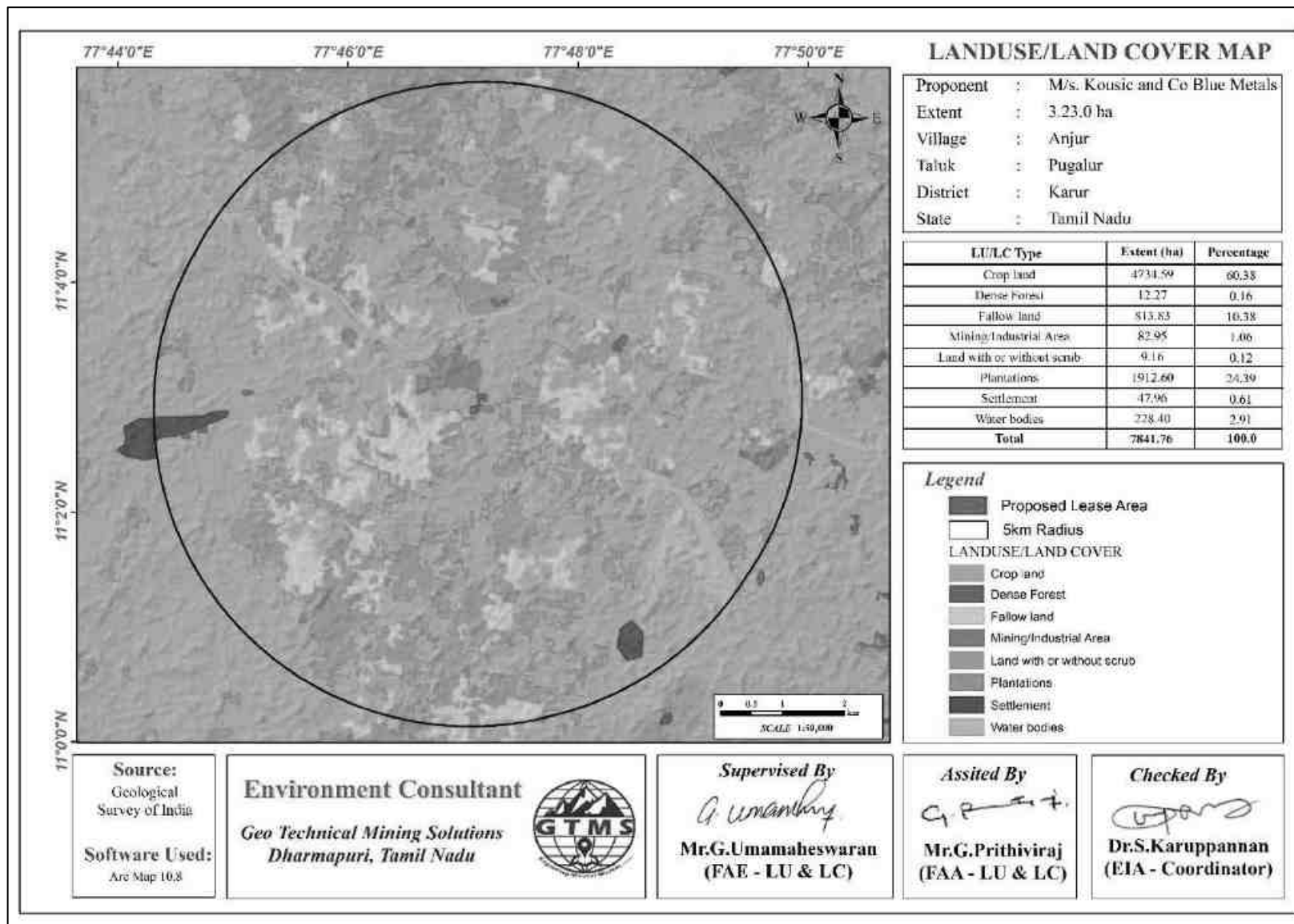


Figure 3.3 LULC Map of 5 km Radius from Proposed Project Site

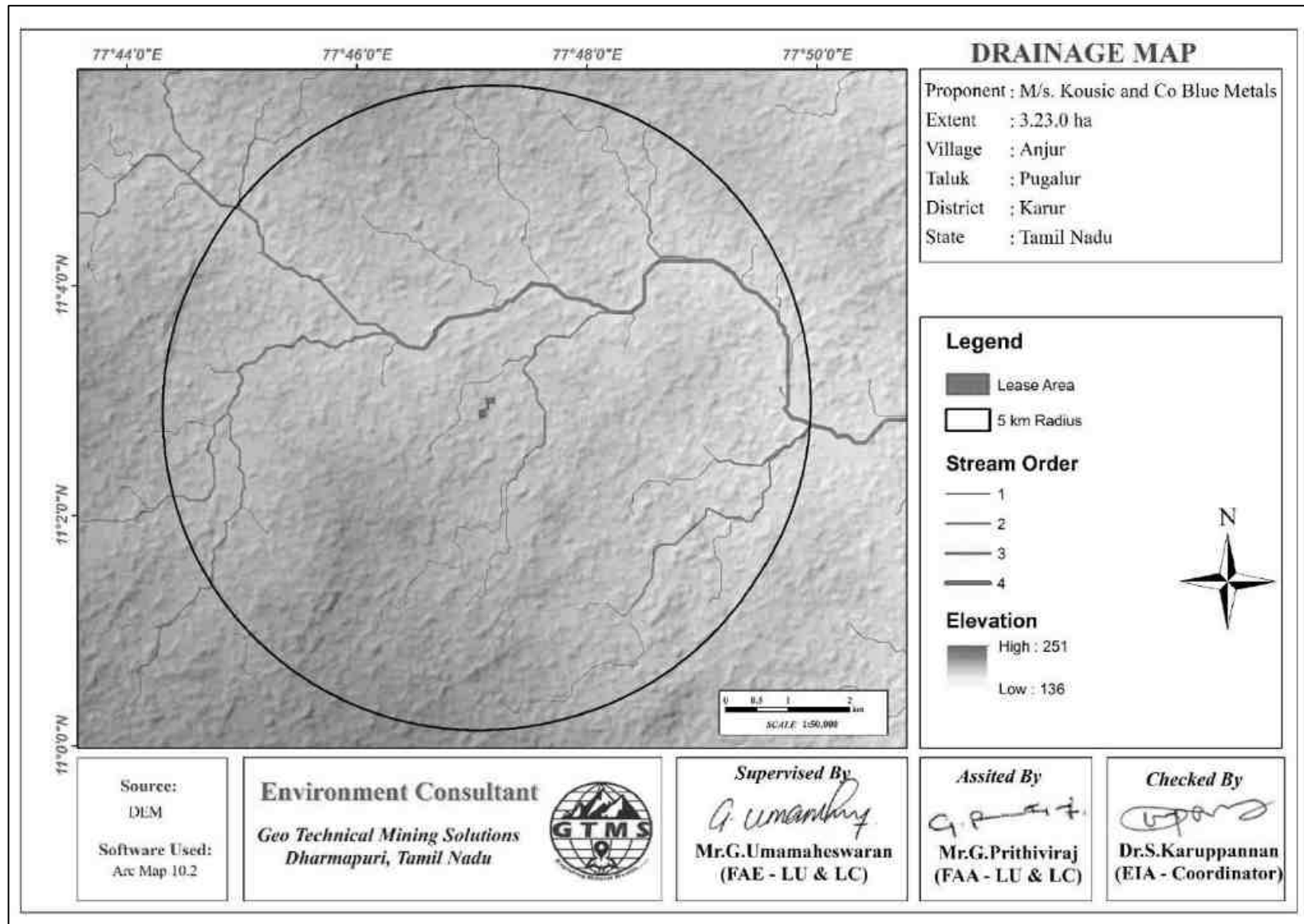


Figure 3.4 Drainage Map of 5 km Radius from Proposed Project Site

### 3.1.6 Soil

Composite soil samples were collected from 8 locations of the study area to determine the baseline soil characteristics of the soil. The locations were selected for soil sampling based on soil types, vegetative cover, and industrial & residential activities including infrastructure facilities. Soil samples were collected up to 90 cm depth, filled in polythene bags, coded and sent to laboratory for analysis. The locations of the sampling sites are shown in Table 3.3 and Figure 3.5. The samples thus collected were analysed for physical and chemical characteristics. The physical and chemical characteristic results of soil samples are provided in Table 3.4.

**Table 3.3 Soil Sampling Locations**

S. No.	Sampling ID	Location	Distance (km)	Direction	Coordinates
1	S01	Kuppusamy lease	0.37	NW	11° 3'4.84"N 77°46'55.22"E
2	S02	Sambathkumar Lease	0.65	N	11° 3'21.43"N 77°46'59.51"E
3	S03	Valayapalayam	2.75	ESE	11° 3'15.90"N 77°48'41.23"E
4	S04	Aathupalayam Dam	3.41	SE	11° 2'5.39"N, 77°48'49.62"E
5	S05	Muthur	2.80	SW	11° 2'2.13"N 77°45'45.79"E
6	S06	Siluvampalayam	3.25	NNE	11° 4'46.51"N 77°47'26.65"E
7	S07	Poolavalasu	4.57	NW	11° 4'41.32"N 77°45'15.53"E
8	S08	Core	---	---	11° 2'59.10"N 77°47'10.33"E

Source: On-site monitoring/sampling *Enviro Farmers Labs & Technologies*, in association with GTMS.

#### ***Physical Characteristics & Chemical Characteristics***

The soil samples in the study area show loamy textures varying between silty clay loam, silty loam and sandy loam. pH of the soil varies from 6.93 to 8.2 indicating slightly acidic to slightly alkaline nature. Electrical conductivity of the soil varies from 3.91 to 4.8  $\text{dsm}^{-1}$ . Bulk density ranges between 0.79 and 0.95  $\text{g/cm}^3$ . Nitrogen ranges between 0.96 and 2.4 %. Potassium ranges between 1.69 and 5.22 %. Calcium ranges between 2056 and 3956 mg/kg. Organic matter content ranges between 20.6 and 30.2 %. Manganese ranges between 1553 and 2653 mg/kg.

#### ***Soil Quality Assessment***

Soil quality is the foundation of sustainable crop production. Soil quality assessment helps to understand soil conditions and adopt suitable production practices. It can be done using physical, chemical, and biological properties of soil. For this assessment, four soil quality parameters including PH, EC, OM, and BD were taken into account. The soil quality score for each sample has been provided in Table 3.4.

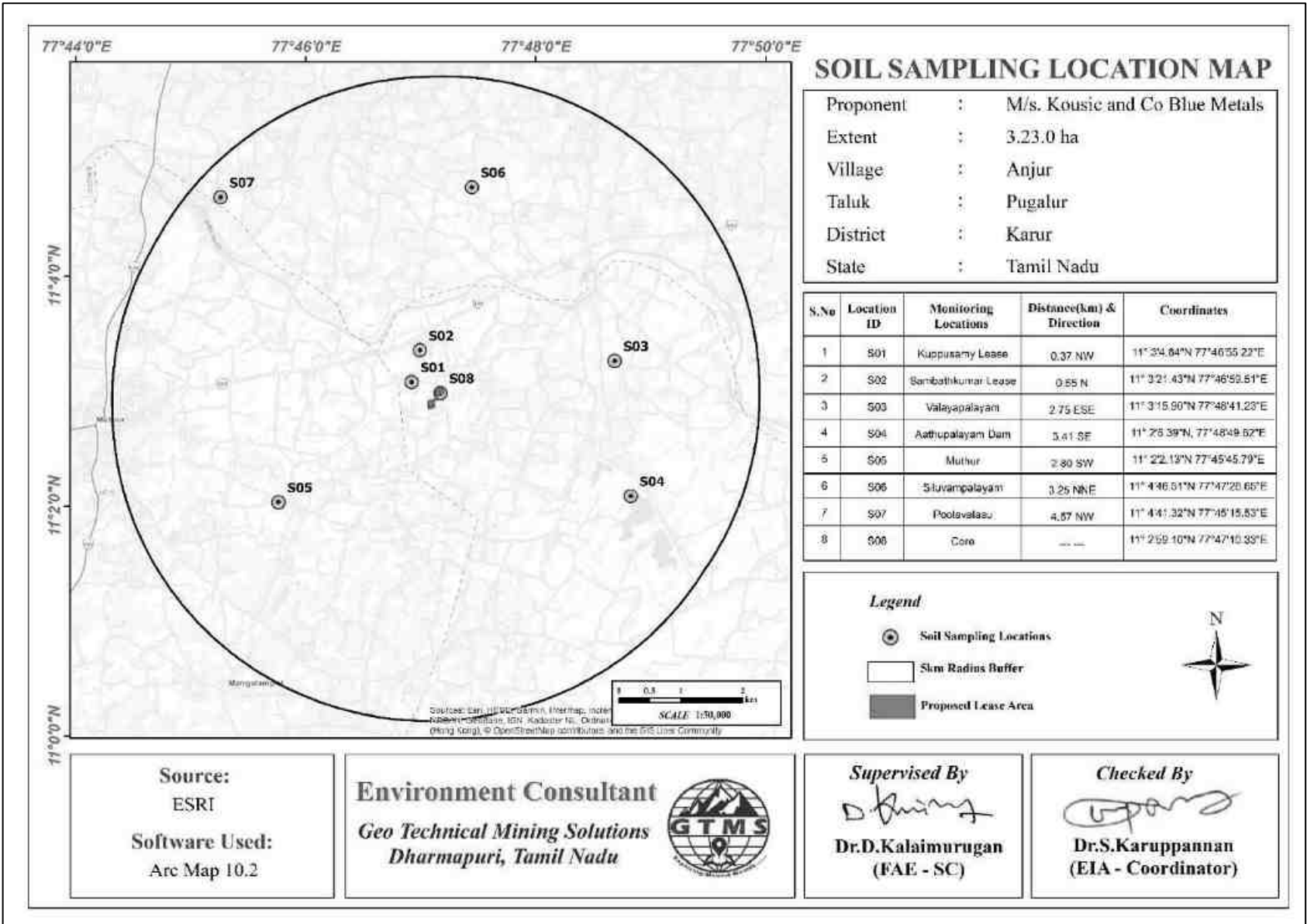


Figure 3.5 Toposheet Showing Soil Sampling Locations within 5 km Radius around Proposed Project Site

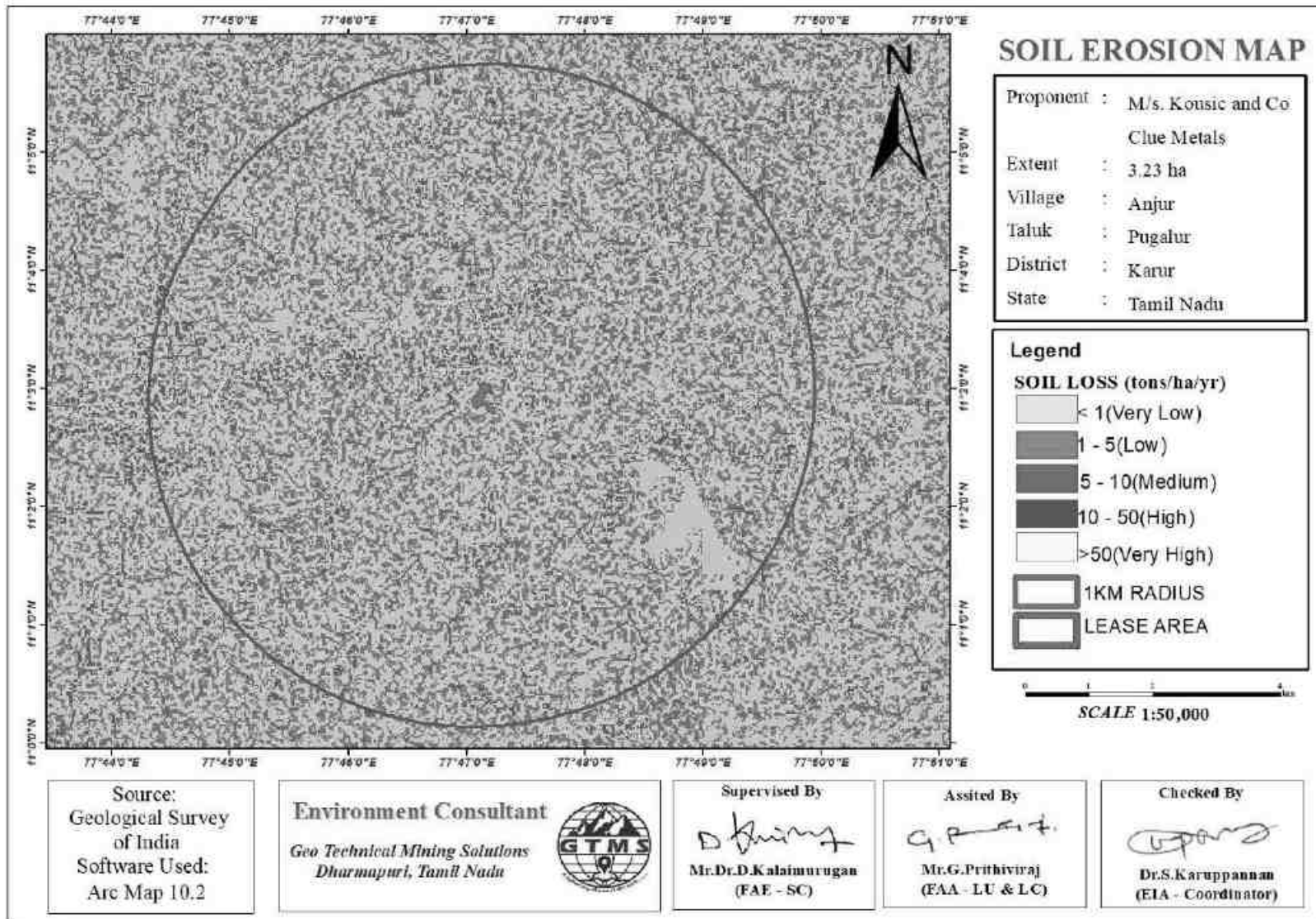


Figure 3.6 Soil Erosion map within 5 km Radius around the Proposed Project Site

**Table 3.4 Soil Quality of the Study Area**

S. No	Parameters	Unit	S08 Core zone	Minimum	Maximum	Average
1	Colour	-	Brown colour	Brown colour	Brown colour	Brown colour
2	Odour		No foul odour	No foul odour	No foul odour	No foul odour
3	Moisture @ 105 <sup>0</sup> C	%	22.5	18.3	31.2	20.94
4	Bulk Density	g/cm <sup>3</sup>	0.78	0.79	0.95	0.88
5	pH @ 25 <sup>0</sup> C in 5% Solution	-	6.55	6.93	8.2	7.37
6	Specific EC @ 25 <sup>0</sup> C	dsm <sup>-1</sup>	3.98	3.91	4.8	4.18
7	Total Nitrogen (N)	%	1.75	0.96	2.4	1.95
8	Total phosphorus (P)	%	2.56	2.05	3.62	3.03
9	Potassium (K)	%	5.3	1.69	5.22	4.06
10	Total Organic Carbon	%	26.4	20.6	30.2	26.51
11	C: N Ratio	-	13.3:1	12.2:1	18.4:1	14.3:1
12	Arsenic (As)	mg/kg	BDL [DL 0.1]	BDL [DL 0.1]	BDL [DL 0.1]	BDL [DL 0.1]
13	Mercury (Hg)	mg/kg	BDL [DL 0.001]	BDL [DL 0.001]	BDL [DL 0.001]	BDL [DL 0.001]
14	Lead (Pb)	mg/kg	24.1	23.5	39.1	31.7
15	Cadmium (Cd)	mg/kg	0.48	0.39	0.63	0.5
16	Chromium (Cr)	mg/kg	16.6	13.2	16.1	14.7
17	Copper (Cu)	mg/kg	27.16	22.7	30.2	26.7
18	Zinc (Zn)	mg/kg	259.1	196.1	356.1	301.3
19	Nickel (Ni)	mg/kg	BDL [DL 0.1]	BDL [DL 0.1]	BDL [DL 0.1]	BDL [DL 0.1]
20	Calcium (Cr)	mg/kg	3251	2056	3956	2972
21	Manganese (Mn)	mg/kg	1959	1553	2653	2014
22	Porosity	%	1.35	0.85	3.34	2
23	Water retention	Inch of water/foot of soil	1.26	1.32	2.42	2
24	Salinity	PPT	11.2	6.27	14.2	9
25	SAR Value	-	3.4	2.6	4.5	3
26	Texture	-	Clay	Clay Lom, sandy clay Lom		
27	Sand	%	16.3	12.56	44.31	32.76
28	Clay	%	66.6	27.42	66.2	39.61
29	silt	%	17.46	17.46	42.29	27.64

*Source: Sampling Results by Enviro Farmers Labs & Technologies in association with GTMS.*

**Table 3.4a Assigning Scores to Soil Quality Indicators**

Soil Quality Score						
S. No.	OM	BD	PH	EC	Total Score	Recommendation
S01	33	13	13	11	71	The Soil Requires Major and Immediate Treatment
S02	33	13	13	11	71	
S03	56	13	13	2	84	The Soil Requires Moderate Treatment
S04	56	13	13	2	84	
S05	56	13	13	2	84	
S06	33	13	13	11	71	The Soil Requires Major and Immediate Treatment
S07	33	13	13	11	71	
S08	33	13	20	11	78	

OM (Organic Matter) BD (Bulk Density) PH (Potential of Hydrogen) EC (Electrical Conductivity)

### 3.2 WATER ENVIRONMENT

The water resources, both surface and groundwater play a significant role in the development of the area. The purpose of this study is to assess the baseline quality of surface and ground water.

**Table 3.5 Water Sampling Locations**

S. No	Sampling ID	Location	Distance (km)	Direction	Coordinates
1	SW01	Noyyal River, Anjur	1.29	NW	11° 3'25.94"N 77°46'32.39"E
2	SW02	Noyyal River, Korakkattupudur,	3.82	NE	11° 4'12.99"N 77°48'54.85"E
3	SW03	Noyyal River, Muthur	5.09	NW	11° 4'40.73"N 77°44'52.65"E
4	SW04	Aathupalayam Dam	2.91	SE	11° 2'20.60"N 77°48'40.09"E
5	OW01	Siluvampalayam	3.19	N	11° 4'45.46"N 77°47'14.21"E
6	OW02	Nagapalayam	1.86	S	11° 1'52.43"N 77°47'19.26"E
7	OW03	Athupalayam	3.93	SE	11° 1'35.61"N, 77°48'51.55"E
8	BW01	Poondipalayam	4.37	S	11° 0'30.59"N, 77°47'26.56"E
9	BW02	Sallyankattupalayam	0.98	NW	11° 3'9.46"N 77°46'35.52"E
10	BW03	Mangalapatti	2.88	SW	11° 1'53.88"N 77°45'48.30"E

Source: On-site monitoring/sampling by *Accuracy Analabs*, in association with *GTMS*.

#### 3.2.1 Surface Water Resources and Quality

Noyyal River is the prominent surface water resources present in the study area. This river was ephemeral in nature, which convey water only after rainfall events. The proposed project area is located 1.29 km NW of Noyyal River, as shown in Table 3.5 and Figure 3.7. Four surface water sample, known as SW01 were collected from the Noyyal River (Anjur, 0.1.29 km NW), SW02 were collected from the Noyyal River (Korakkattupudur, 3.82 km NE),

SW03 were collected from the Noyyal River (Muthur, 5.09km NW), SW04 were collected from Aathupalayam Dam (4.13 km SE) to assess the baseline water quality. Table 3.6b summarizes surface water quality data of the collected sample.

Result for surface water sample in the Table 3.6b indicate that the physical, chemical and biological parameters, and heavy metals are within permissible limits in comparison with standards of IS10500:2012.

### **3.2.2 Ground Water Resources and Quality**

Groundwater in the study area occurs in the crystalline rocks of Archaean age and recent alluvium. The movement of the groundwater is controlled by the intensity of weathering and fracturing of crystalline rocks. Dug wells and bore wells are the most common ground water abstraction structures in the area. However, in dry season, people in the study area heavily rely on bore wells for their domestic and agriculture purpose. Six groundwater samples, known as OW01, OW02, OW03, BW01, BW02 and BW03, were collected from bore wells and open wells were analysed for physico-chemical conditions, heavy metals and bacteriological contents in order to assess baseline quality of ground water. Ground water sampling locations and their distance and direction from the lease area are provided in Table 3.5 and the spatial occurrence of water sampling locations is shown in Figure 3.7. Table 3.6a summarizes ground water quality data of the six samples. Results for ground water samples in the Table 3.6a indicate that the physical, chemical and biological parameters, and heavy metals are within permissible limits in comparison with standards of IS10500:2012.

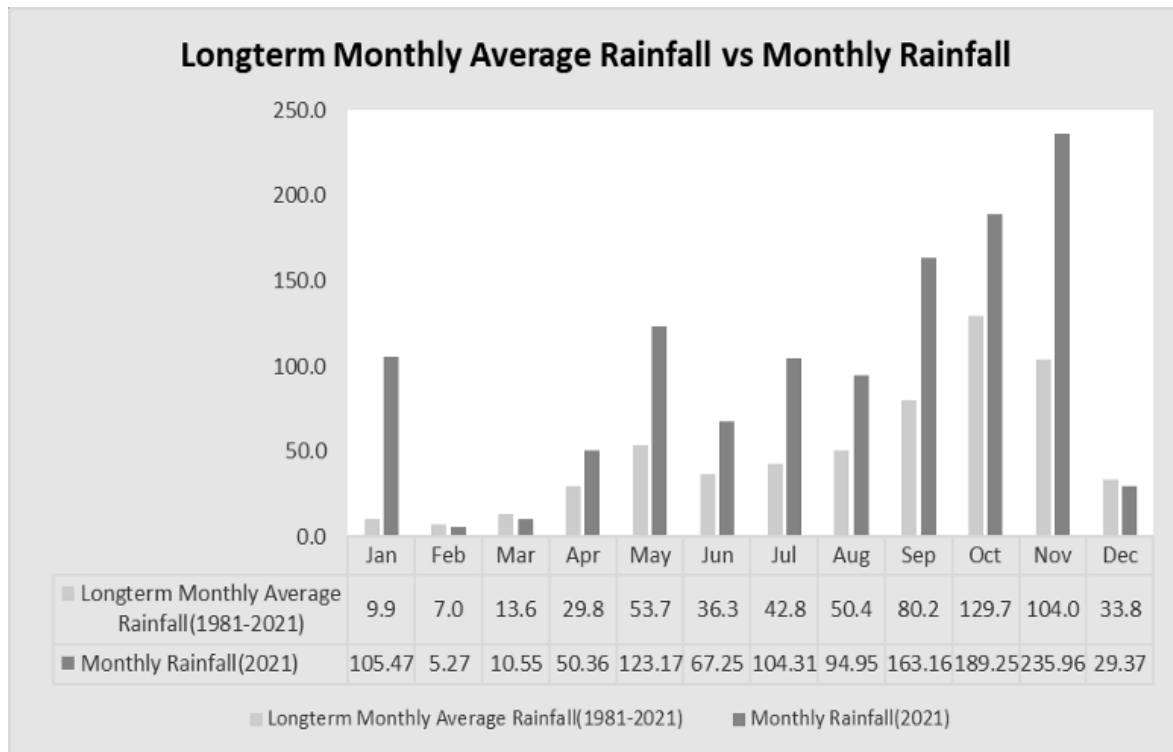
### **3.2.3 Hydrogeological Studies**

The area within 2 km radius consists of numerous open wells and deep wells. Groundwater level data were collected both from open wells and bore wells for two monsoon seasons as discussed in the following section.

#### ***Rainfall***

Rainfall data for the study area were collected for the period of 1981-2021([POWER | Data Access Viewer \(nasa.gov\)](#)). Long term monthly average rainfall was estimated from the data of 1981-2021 and compared with the monthly rainfall for the year 2021, shown in Figure 3.10. The Figure 3.7 shows that rainfall is generally high in the months of September through November in every year. Particularly, rainfall in September through November of 2021 is higher than the previous years.



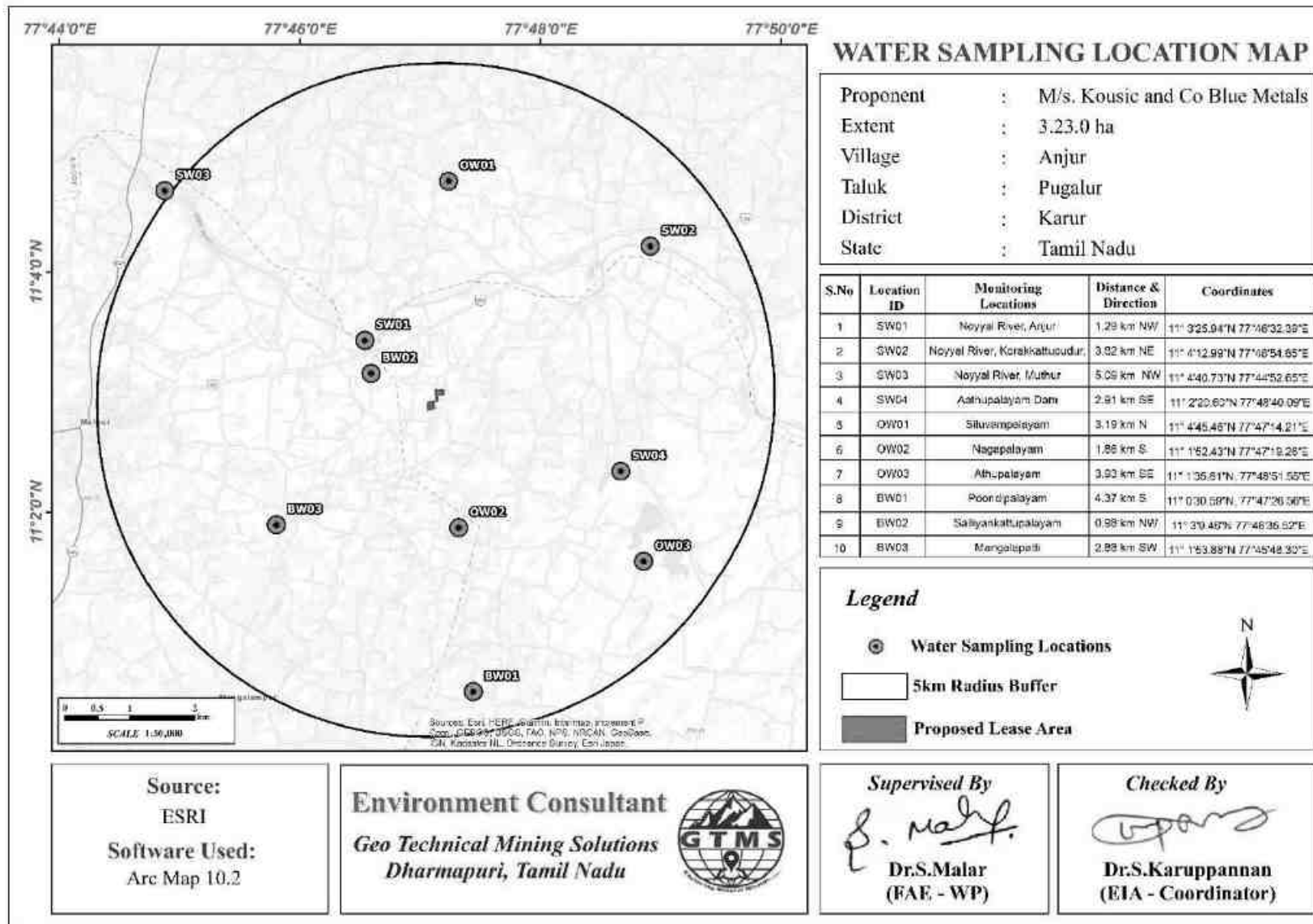


**Figure 3.7 Long-Term Monthly Average Rainfall Vs Monthly Rainfall**

### 3.2.3.1 Groundwater Levels and Flow Direction

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 2 km radius around the proposed project sites for the period from March through May 2023 (Pre-Monsoon Season) and from October through December 2022, (Post Monsoon Season).

The open well water level data thus collected onsite are provided in Tables 3.7 and 3.8. According to the data, average depths to the static water table in open wells range from 20.6 to 23.6 m BGL in pre monsoon and 11.6 to 16.3 m BGL in post monsoon. The bore well data thus collected onsite are provided in Tables 3.9 and 3.10. The average depths to static potentiometric surface in bore wells for the period of October through December (Post-Monsoon Season) vary from 62.3 to 66.2 m and from 63.8 to 67.7 m for the period of March through May, (Pre-Monsoon Season). Data on the depths to static water table and potentiometric surface were used to draw contour lines connecting groundwater elevation (also known as equipotential hydraulic head) to determine the groundwater flow direction perpendicular to the contour lines.



**Figure 3.8 Map Showing Water Sampling Locations within 5 km Radius around Proposed Project Site**

**Table 3.6a Ground Water Quality Result**

S.No.	Parameters	Units	Result of Ground Water			Acceptable Limits As per IS10500:2012	Permissible Limits As Per IS 10500:2012
			Minimum	Maximum	Average		
1	Colour	Hazen	<0	6	3	5	15
2	Odour	Odourless	Odourless	Odourless	Odourless	Agreeable	Agreeable
3	pH@ 25°C	-	7.46	7.9	7.73	6.5 – 8.5	No relaxation
4	TDS @ 180 <sup>0</sup> C	mg/l	403	1717	1381.3	500	2000
5	Total Hardness (as CaCO <sub>3</sub> )	mg/l	192	392	334.66	200	600
6	Calcium Hardness	mg/l	140	260	221.3	-	-
7	Magnesium Hardness	mg/l	52	132	113.3	-	-
8	Calcium (as Ca)	mg/l	56	104	88.6	75	200
9	Magnesium (as Mg)	mg/l	13	32.1	27.51	30	100
10	Chloride (as Cl)	mg/l	86	516	387	250	1000
11	Total Alkalinity (as CaCO <sub>3</sub> )	mg/l	120	310	245.6	200	600
12	Sulphate (as SO <sub>4</sub> )	mg/l	43	180	142	200	400
13	Turbidity	NTU	<1.0	<1.0	<1.0	1.0	5
<b>BIOLOGICAL REPORT</b>							
14	E. coli	MPN/100ml	7	17	11.8	-	1600
15	Coliform	MPN/100ml	9	16	16	-	1600

Source: Sampling Results by *Accuracy Analabs*, in association with *GTMS*

**Table 3.6b Surface Water Quality Result**

S.No.	Parameters	Units	Result of Surface Water			Acceptable Limits As per IS10500:2012	Permissible Limits As Per IS 10500:2012
			Minimum	Maximum	Average		
1	Colour	Hazen	10	10	10	5	15
2	Odour	Odourless	Odourless	Odourless	Odourless	Agreeable	Agreeable
3	pH@ 25°C	-	7.31	8.12	7.69	6.5 – 8.5	No relaxation
4	TDS @ 180° C	mg/l	1300	1322	1293	500	2000
5	Total Hardness (as CaCO <sub>3</sub> )	mg/l	344	360	351	200	600
6	Calcium Hardness	mg/l	226	240	231.5	-	-
7	Magnesium Hardness	mg/l	115	122	119	-	-
8	Calcium (as Ca)	mg/l	83	96	89.5	75	200
9	Magnesium (as Mg)	mg/l	21	31	26	30	100
10	Chloride (as Cl)	mg/l	425	454	438.5	250	1000
11	Total Alkalinity (as CaCO <sub>3</sub> )	mg/l	306	325	312.7	200	600
12	Sulphate (as SO <sub>4</sub> )	mg/l	108	140	123	200	400
13	Turbidity	NTU	1	5	2.7	1.0	5
<b>BIOLOGICAL REPORT</b>							
14	E. coli	MPN/100ml	8	14	11.25	-	1600
15	Coliform	MPN/100ml	13	14	13.75	-	1600

Source: Sampling Results by *Accuracy Analabs*, in association with *GTMS*

**Table 3.6c Weighted Arithmetic Water Quality Index (WAWQI) Method for ground water (Brown et al., 1972)**

S. No.	Water Quality Index (WQI)						WQI Range	Classification	Grading
	OW1	OW2	OW3	BW1	BW2	BW3			
1							0 – 25	Excellent	A
2	47.78			46.72			25 – 50	Good	B
3		60.81	57.72		61.34	52.45	50 – 75	Poor	C
4							75 – 100	Very Poor	D
5							> 100	Unsuitable	E

**Table 3.6d Weighted Arithmetic Water Quality Index as per WAWQI Method for surface water (Brown et al., 1972)**

S. No.	Water Quality Index (WQI)				WQI Range	Classification	Grading
	SW1	SW2	SW3	SW4			
1					0 – 25	Excellent	A
2					25 – 50	Good	B
3	55.45	52.13	61.34	50.12	50 – 75	Poor	C
4					75 – 100	Very Poor	D
5					> 100	Unsuitable	E

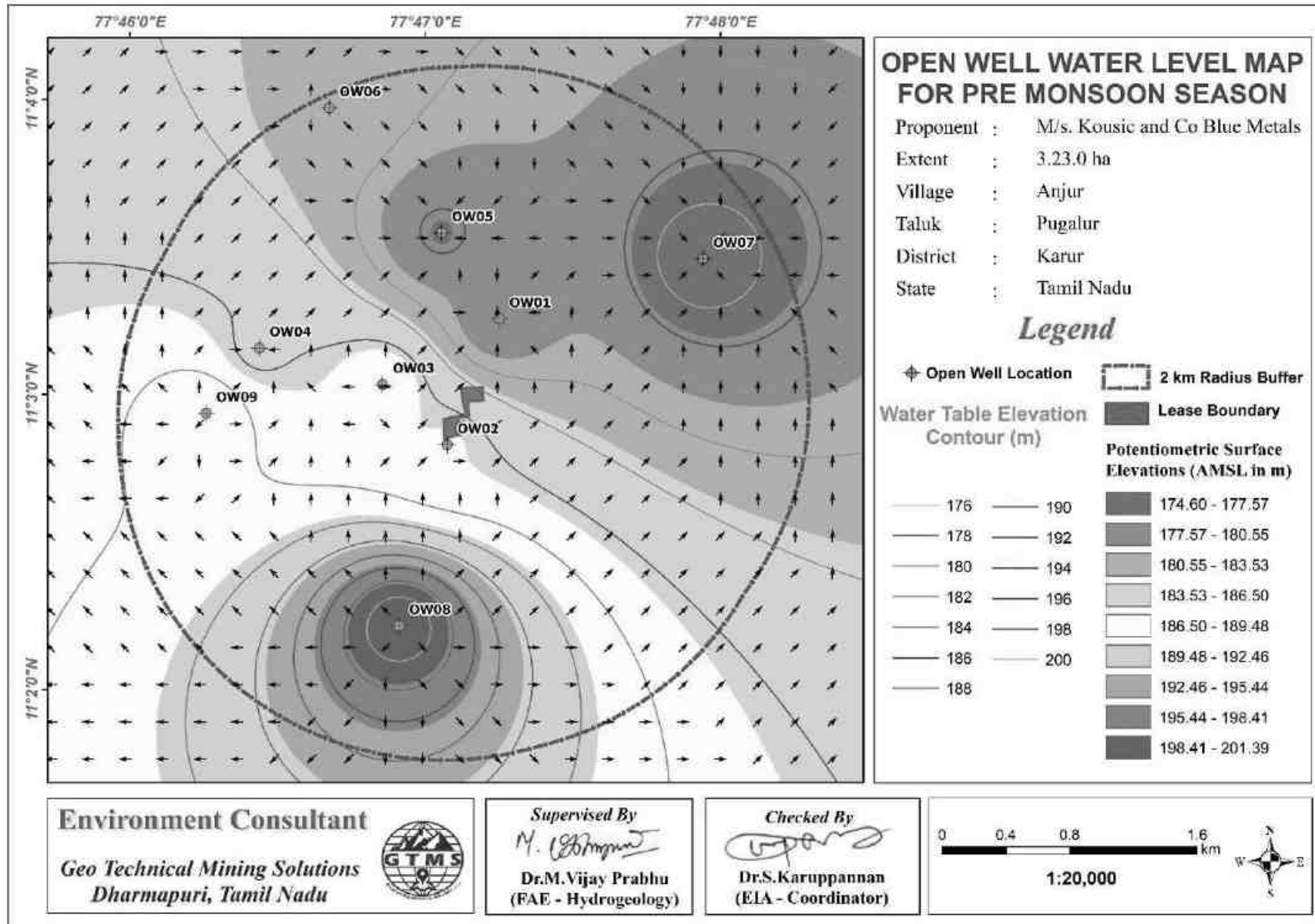


Figure 3.9 Open Well Static Groundwater Elevation Map Showing Direction of Groundwater Flow during Pre-Monsoon Season

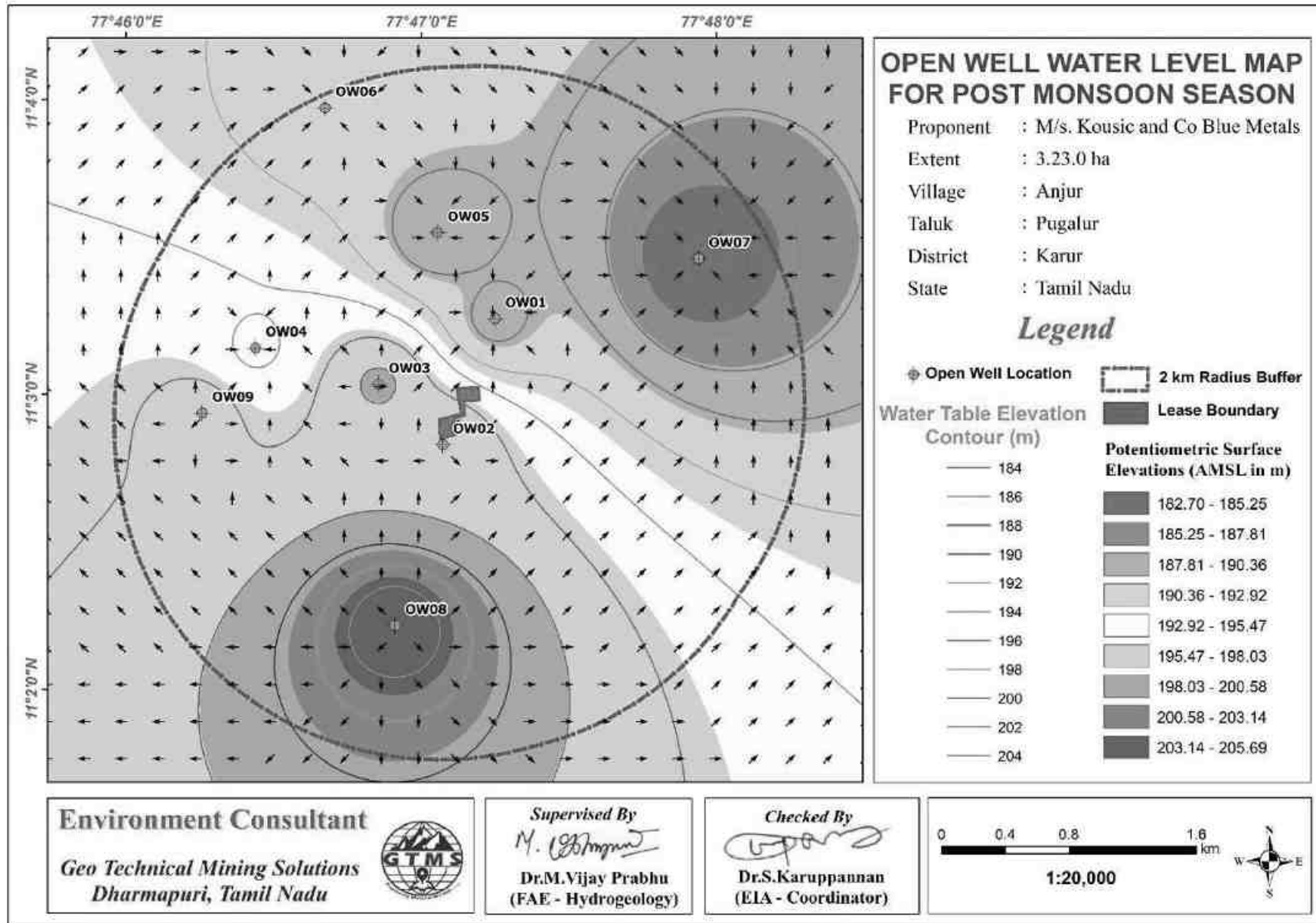


Figure 3.10 Open Well Static Groundwater Elevation Map Showing Direction of Groundwater Flow during Post-Monsoon Season

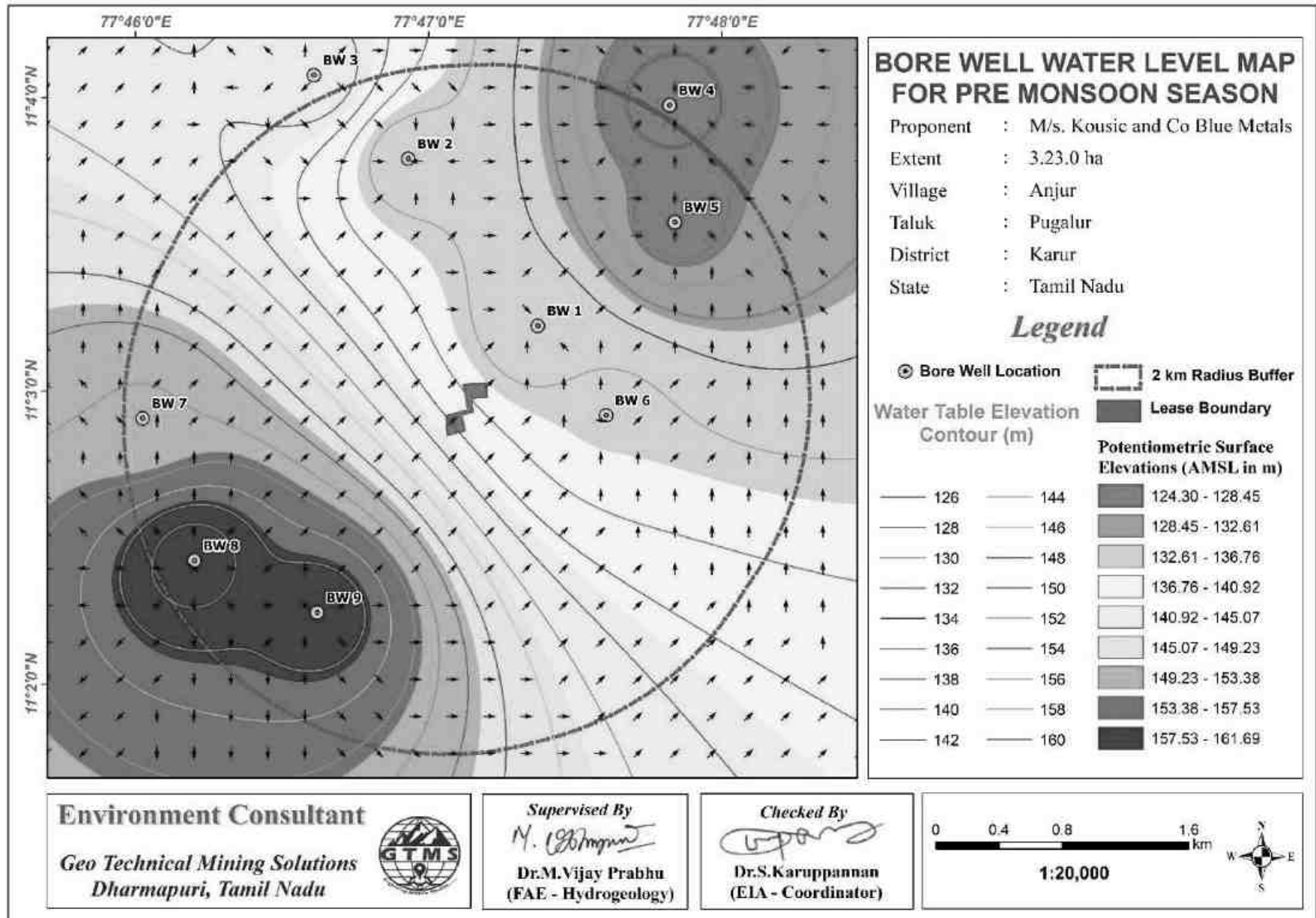


Figure 3.11 Borewell Static Groundwater Elevation Map Showing Direction of Groundwater Flow during Pre-Monsoon Season



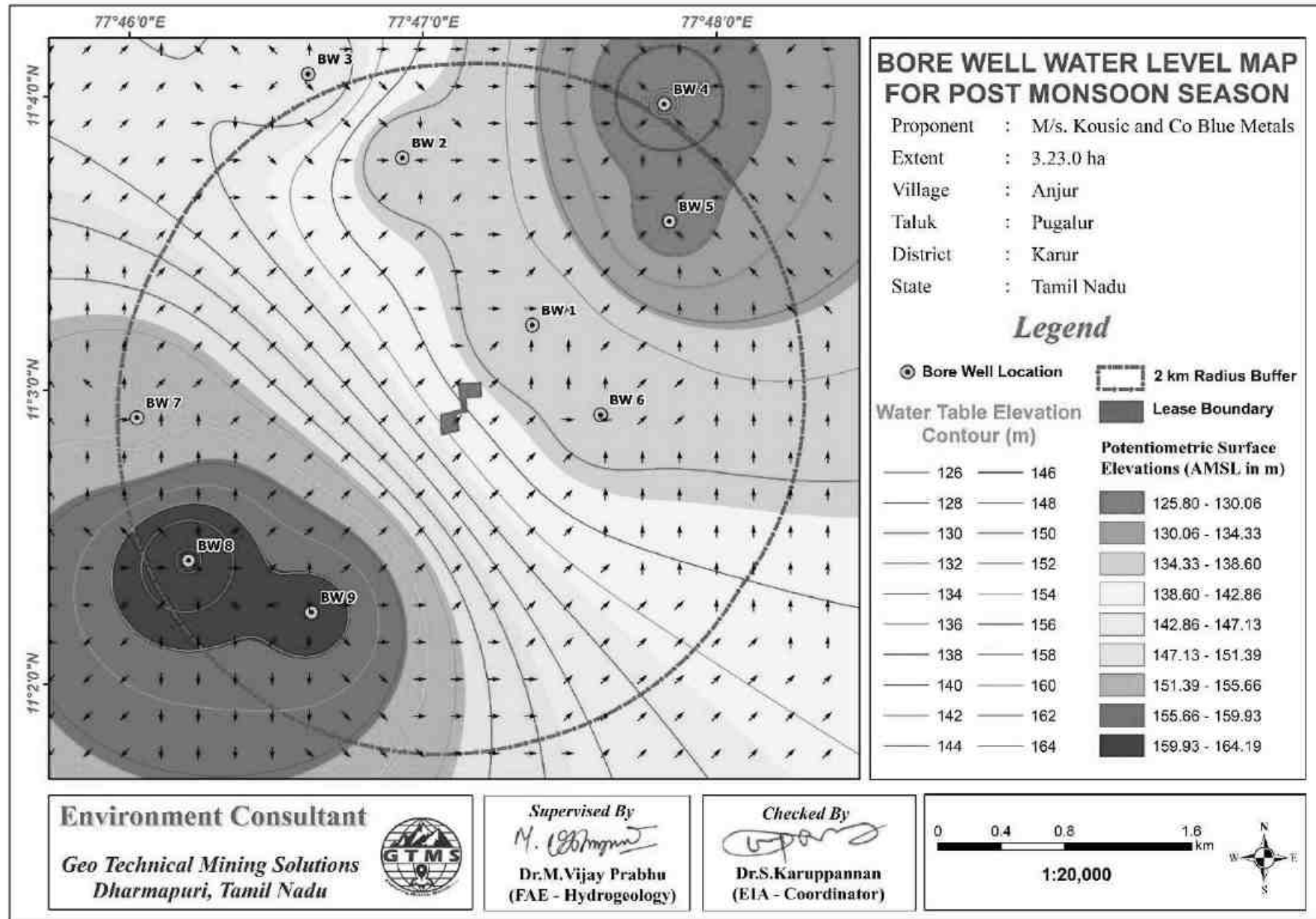


Figure 3.12 Borewell Static Groundwater Elevation Map Showing Direction of Groundwater Flow during Post-Monsoon Season

The WQI is a unique digital rating expression that expresses overall water quality status viz: excellent, good, poor, very poor and unsuitable based on various water quality parameters. It is used as an important tool to compare the quality of groundwater and their management in a particular region. The WQI of the ground water, as shown Table 3.6c indicates that two groundwater samples are of good quality and four groundwater samples is of poor quality. The WQI of ground water samples fall under good and suitable for domestic and agriculture purpose. poor quality indicating their not suitability for drinking and suitable for domestic and agriculture purpose. The WQI of the surface water, as shown in Table 3.6d shows that all the four surface water samples fall under poor quality indicating their not suitability for drinking, domestic and agriculture purpose.

From the maps of open well groundwater flow direction shown in Figures 3.9-3.10, it is understood that most of the open well groundwater for the post- and pre-monsoon seasons flows towards the open well number 1 located in north direction of the proposed project site. The groundwater flow maps in Figures 3.11-3.12 show that most of the bore well groundwater for the post- and pre-monsoon seasons flow towards the bore well number 1 and 5. It is located in northeastern direction 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 3.7 Pre-Monsoon Water Level of Open Wells within 2 km Radius**

Station ID	Depth to Static Water Table BGL (m)				Latitude	Longitude
	Mar-2023	Apr-2023	May- 2023	Average		
OW01	21.5	22.7	23.0	22.4	11° 3'15.42"N	77°47'15.03"E
OW02	22.0	23.5	24.6	23.4	11° 2'49.79"N	77°47'4.44"E
OW03	21.0	22.5	23.5	22.3	11° 3'2.06"N	77°46'51.35"E
OW04	20.5	21.0	22.5	21.3	11° 3'9.45"N	77°46'26.30"E
OW05	22.5	23.7	24.5	23.6	11° 3'32.89"N	77°47'3.33"E
OW06	20.5	21.7	22.5	21.6	11° 3'58.28"N	77°46'40.50"E
OW07	22.0	23.5	24.7	23.4	11° 3'27.60"N	77°47'56.45"E
OW08	19.5	20.5	21.8	20.6	11° 2'13.02"N	77°46'54.68"E
OW09	21.5	22.7	23.5	22.6	11° 2'56.21"N	77°46'15.47"E

*Source: Onsite monitoring data*

**Table 3.8 Post-Monsoon Water Level of Open Wells within 2 km Radius**

Station ID	Depth to Static Water Table BGL(m)				Latitude	Longitude
	Oct-2022	Nov- 2022	Dec-2022	Average		
OW01	12.5	11.9	10.4	11.6	11° 3'15.42"N	77°47'15.03"E
OW02	13.4	12.5	11.0	12.3	11° 2'49.79"N	77°47'4.44"E
OW03	12.7	11.5	10.5	11.6	11° 3'2.06"N	77°46'51.35"E
OW04	14.5	13.5	12.0	13.3	11° 3'9.45"N	77°46'26.30"E
OW05	13.7	12.4	11.5	12.5	11° 3'32.89"N	77°47'3.33"E
OW06	15.5	14.5	13.0	14.3	11° 3'58.28"N	77°46'40.50"E
OW07	16.5	15.5	14.0	15.3	11° 3'27.60"N	77°47'56.45"E
OW08	17.5	16.5	15.0	16.3	11° 2'13.02"N	77°46'54.68"E
OW09	16.5	15.5	14.0	15.3	11° 2'56.21"N	77°46'15.47"E

Source: Onsite monitoring data

**Table 3.9 Pre-Monsoon Water Level of Bore Wells within 2 km Radius**

Station ID	Depth to Static Potentiometric Surface BGL(m)				Latitude	Longitude
	Mar-2023	Apr-2023	May- 2023	Average		
BW01	64.0	65.5	66.5	65.3	11° 3'13.34"N	77°47'22.38"E
BW02	63.5	64.0	65.5	64.3	11° 3'47.51"N	77°46'55.83"E
BW03	65.0	66.5	67.5	66.3	11° 4'4.61"N	77°46'36.55"E
BW04	66.5	67.5	69.0	67.7	11° 3'58.45"N	77°47'49.36"E
BW05	66.0	67.5	68.5	67.3	11° 3'34.53"N	77°47'50.41"E
BW06	64.0	65.5	66.5	65.3	11° 2'55.01"N	77°47'36.34"E
BW07	62.0	63.5	66.0	63.8	11° 2'54.42"N	77°46'1.53"E
BW08	65.0	66.5	67.5	66.3	11° 2'25.28"N	77°46'12.11"E
BW09	63.5	65.0	67.5	65.3	11° 2'14.68"N	77°46'37.23"E

Source: Onsite monitoring data

**Table 3.10 Post-Monsoon Water Level of Bore Wells within 2 km Radius**

Station ID	Depth to Static Potentiometric Surface BGL(m)				Latitude	Longitude
	Oct-2022	Nov-2022	Dec-2022	Average		
BW01	64.5	63.5	62.0	63.3	11° 3'13.34"N	77°47'22.38"E
BW02	63.5	62.5	61.0	62.3	11° 3'47.51"N	77°46'55.83"E
BW03	65.5	64.0	63.0	64.2	11° 4'4.61"N	77°46'36.55"E
BW04	68.0	66.0	64.5	66.2	11° 3'58.45"N	77°47'49.36"E
BW05	66.5	64.5	64.0	65.0	11° 3'34.53"N	77°47'50.41"E
BW06	66.0	64.5	63.0	64.5	11° 2'55.01"N	77°47'36.34"E
BW07	63.5	62.5	61.0	62.3	11° 2'54.42"N	77°46'1.53"E
BW08	66.0	63.5	62.0	63.8	11° 2'25.28"N	77°46'12.11"E
BW09	65.5	64.0	62.5	64.0	11° 2'14.68"N	77°46'37.23"E

Source: Onsite monitoring data

### 3.2.3.2 Electrical Resistivity Investigation

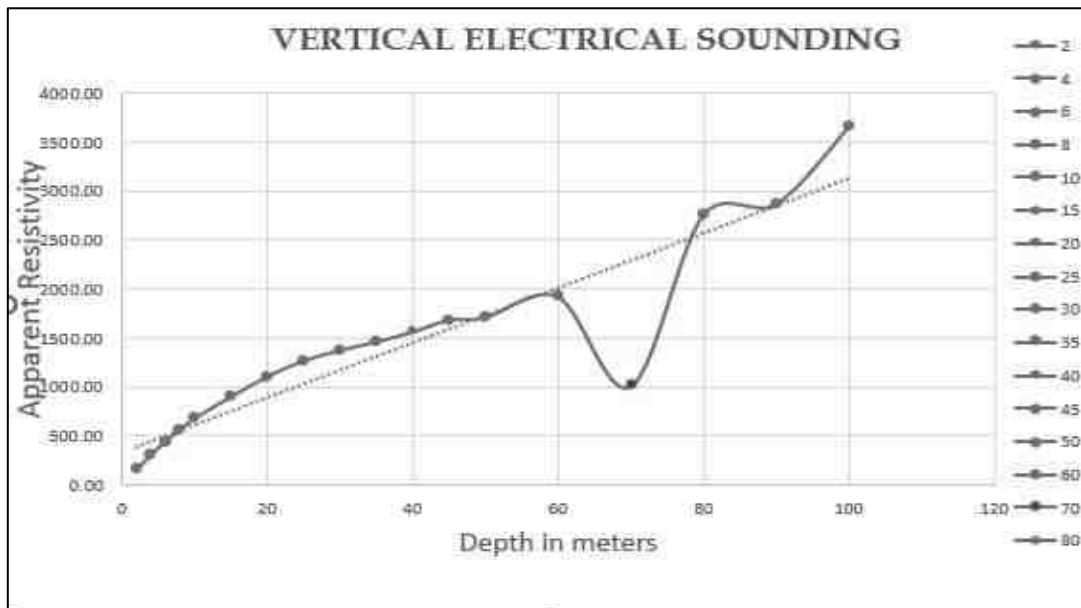
Electrical resistivity investigation is especially useful in the areas where there are no adequate exploratory well data about the aquifer conditions. The present study makes use of vertical electric sounding (VES) to delineate earth's subsurface layers. The electrical resistivity investigation uses four electrodes set up where current is sent through outer electrodes into the ground and the inner electrodes measure the potential difference.

#### **Result**

The Geophysical VES data obtained from the project site have been shown in Table 3.11. The field data obtained from a detailed geophysical investigation were plotted using excel spreadsheet for interpretation. The plot for the purpose of interpretation has been shown in Figure 3.13.

**Table 3.11 Vertical Electrical Sounding Data**

Location Coordinates - 11° 2'59.10"N 77°47'10.33"E					
S. No.	AB/2 (m)	MN/2 (m)	Geometrical Factor (G)	Resistance in $\Omega$	Apparent Resistivity in $\Omega m$
1	2	2	11.78	13.248	156.061
2	4	2	49.46	6.127	303.041
3	6	5	112.26	3.937	441.968
4	8	5	200.18	2.798	560.104
5	10	5	75.36	8.997	678.014
6	15	10	173.49	5.188	900.066
7	20	10	310.86	3.558	1106.04
8	25	10	487.49	2.603	1268.94
9	30	10	274.75	5.001	1374.02
10	35	10	376.8	3.883	1463.11
11	40	10	494.55	3.160	1562.78
12	45	10	628	2.683	1684.92
13	50	10	777.15	1.943	1710.13
14	60	20	453.6	2.213	1922.1
15	70	20	989.1	2.651	1003.82
16	80	20	1256	2.196	2758.18
17	90	20	1554.3	1.846	2869.24
18	100	20	1653.6	2.213	3659.42



**Figure 3.13 Graph Showing Occurrence of Water Bearing Fracture Zones at the Depth of 70 m Below Ground Level in Proposed Project**

The rock formation of low resistivity values indicates occurrence of water at the depth of about 70 m below ground level. The maximum depth proposed for the proposed project is 45 m below ground level. Therefore, the mining operation will not affect the aquifer throughout the entire mine life period.

### 3.3 AIR ENVIRONMENT

The baseline studies on air environment include identification of specific air pollutants and their existing levels in ambient air. The sources of air pollution in the region are mostly due to vehicular traffic, dust arising from unpaved village road and domestic & agricultural activities.

#### 3.3.1 Meteorology

##### 3.3.1.1 Climatic Variables

A temporary meteorological station was installed at the project sites by covering cluster quarries. The station was installed at a height of 3 m above the ground level as there are no obstructions facilitating flow of wind, wind speed, wind direction, humidity and temperature. Meteorological data obtained from the onsite monitoring station are provided in Table 3.12.

According to the onsite data, the temperature in March,2023 varied from 16.70 to 39.93<sup>0</sup>C with the average of 28.46<sup>0</sup>C; in April, 2023 from 23.18 to 41.15<sup>0</sup>C with the average of 31.32<sup>0</sup>C; and in May,2023 from 22.62 to 36.18<sup>0</sup>C with the average of 27.99<sup>0</sup>C. In March,2023, relative humidity ranged from 15.06 to 95.56 % with the average of 53.56%; in April, 2023, from 12.50 to 89.94 % with the average of 47.23 %; and in May,2023, from 37.50

to 97.38 % with the average of 75.95 %. The wind speed in March,2023 varied from 0.18 to 6.42 m/s with the average of 2.64 m/s; in April, 2023 from 0.05 to 7.07 m/s with the average of 2.70 m/s; and in May,2023 from 0.044 to 6.64 m/s with the average of 3.42 m/s. In March,2023, wind direction varied from 0.00 to 359.03<sup>0</sup> with the average of 42.05<sup>0</sup>; in April, 2023, from 4.19 to 358.19<sup>0</sup> with the average of 158.66<sup>0</sup>; and in May,2023, 0.00 to 343.10<sup>0</sup> with the average of 245.49<sup>0</sup>. In March,2023, surface pressure varied 95.38 to 96.74 kPa with the average of 96.16 kPa; in April, 2023, from 95.24 to 96.68 kPa with the average of 96.20 kPa; and in May,2023, from 96.12 to 97.03 kPa with the average of 96.57 kPa

**Table 3.12 Onsite Meteorological Data**

S. No.	Parameters		March,2023	April,2023	May,2023
1	Temperature (°C)	Min	16.70	23.18	22.62
		Max	39.93	41.15	36.18
		Avg	28.46	31.32	27.99
2	Relative Humidity (%)	Min	15.06	12.50	37.50
		Max	95.56	89.94	97.38
		Avg	53.56	47.23	75.95
3	Wind Speed (m/s)	Min	0.18	0.05	0.44
		Max	6.42	7.07	6.64
		Avg	2.64	2.70	3.42
4	Wind Direction (degree)	Min	0.00	4.19	0.00
		Max	359.03	358.19	343.10
		Avg	142.05	158.66	245.49
5	Surface Pressure(kPa)	Min	95.38	95.24	96.12
		Max	96.74	96.68	97.03
		Avg	96.16	96.20	96.57

Source: On-site monitoring/sampling by *Accuracy Analabs* in association with GTMS

### 3.3.1.2 Wind Pattern

Wind pattern will largely influence the dispersion pattern of air pollutants and noise from the proposed project site. Analysis of wind pattern requires hourly site-specific data of wind speed and direction. Two types of wind rose were generated: historical seasonal wind rose for the period of March through May of the years from 2019 to 2022 and the seasonal wind rose for the study period of March through May 2023. The wind rose diagrams thus produced are shown in Figures 3.14-3.14a. Figure 3.15 reveals that:

- ❖ The measured average wind velocity during the study period is 2.97 m/s.
- ❖ Predominant wind was dominant in the directions ranging from Southwest to Northeast.

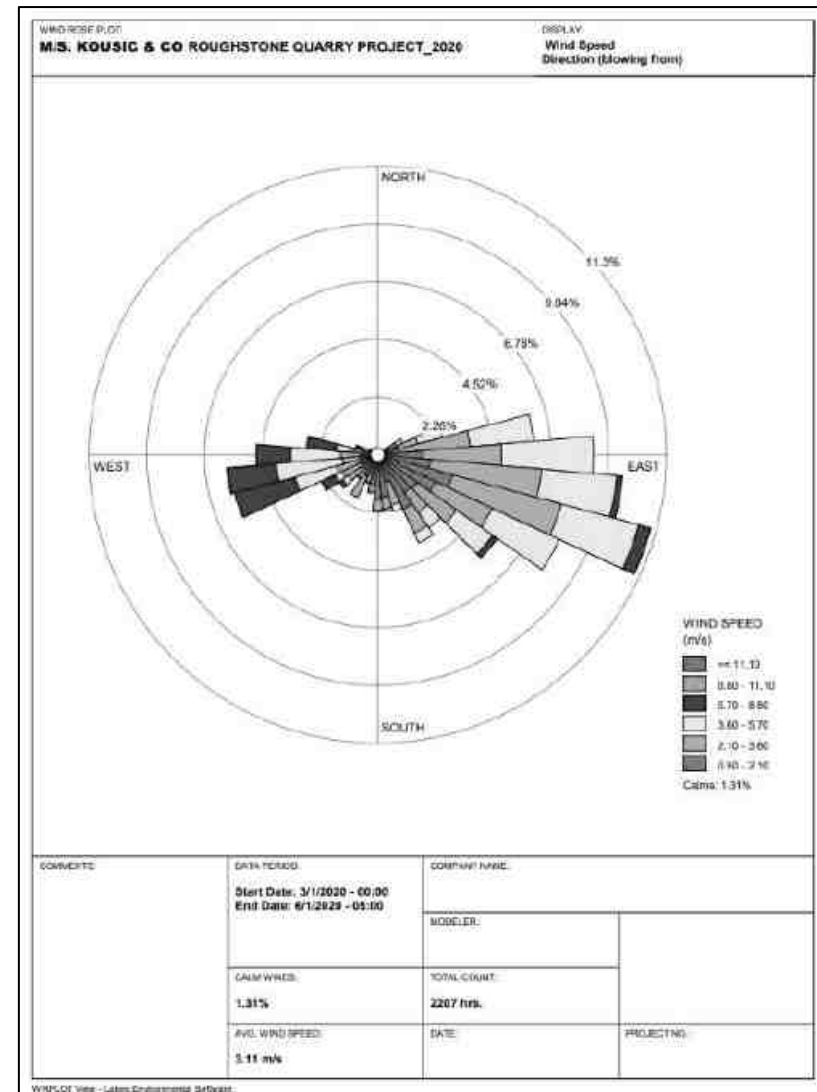
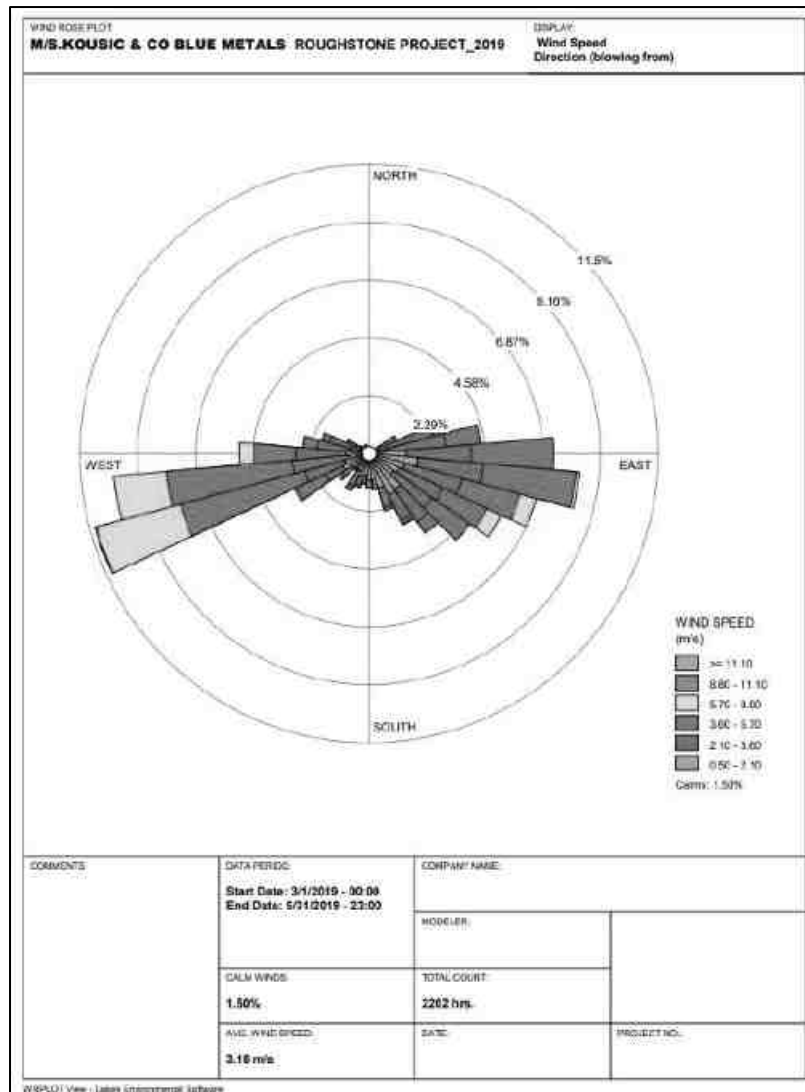


Figure 3.14 Windrose Diagram for 2019 and 2020 (March to May)

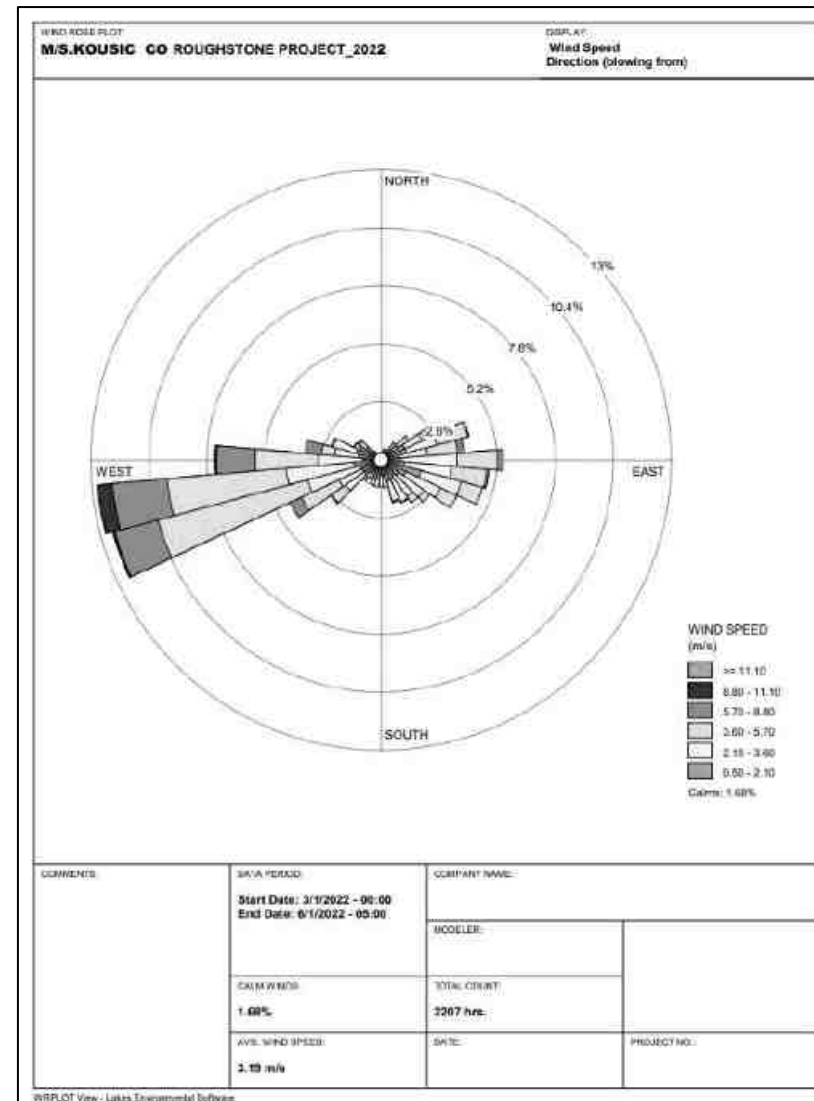
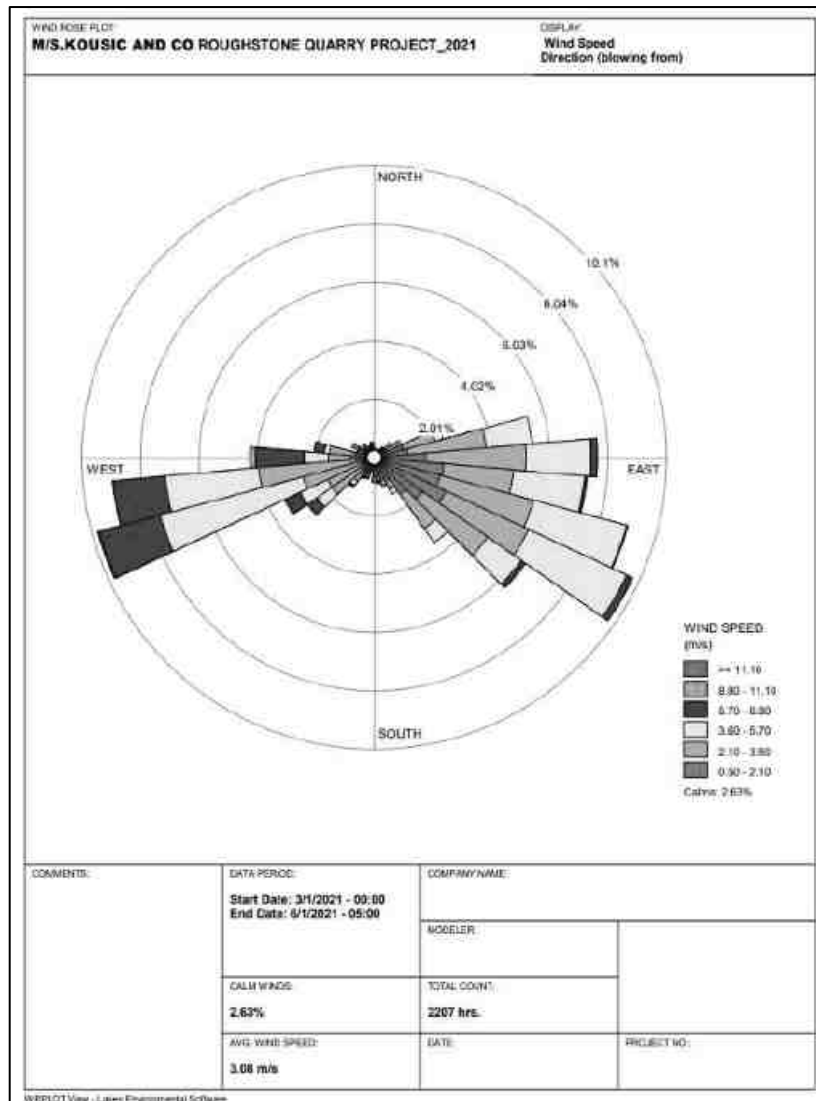
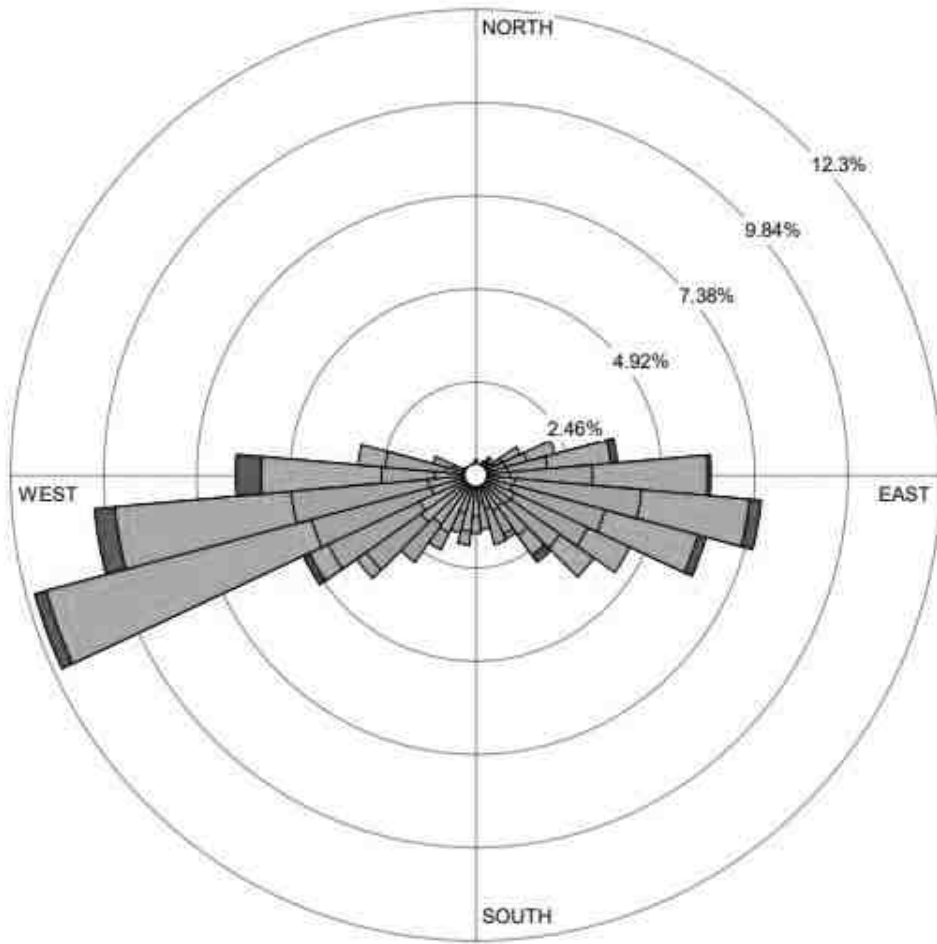


Figure 3.14a Windrose Diagram for 2021 and 2022 (March to May)



WIND ROSE PLOT:  
**M/S.KOUSIC & CO ROUGHSTONE PROJECT\_2023**

DISPLAY:  
**Wind Speed  
 Direction (blowing from)**



**WIND SPEED (m/s)**

- >= 11.10
- 8.80 - 11.10
- 5.70 - 8.80
- 3.60 - 5.70
- 2.10 - 3.60
- 0.50 - 2.10

Calms: 0.82%

COMMENTS:	DATA PERIOD:	COMPANY NAME:	
	Start Date: 3/1/2023 - 00:00 End Date: 6/1/2023 - 05:00	MODELER:	
	CALM WINDS:	TOTAL COUNT:	
	0.82%	2207 hrs.	
AVG. WIND SPEED:	DATE:	PROJECT NO.:	
2.97 m/s			

WRPLOT View - Lakes Environmental Software

**Figure 3.15 Onsite Wind Rose Diagram**

### 3.3.2 Ambient Air Quality Study

The baseline ambient air quality is studied 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

**Table 3.13 Methodology and Instrument Used for AAQ Analysis**

Parameter	Method	Instrument
PM <sub>2.5</sub>	Gravimetric method Beta attenuation method	Fine Particulate Sampler
PM <sub>10</sub>	Gravimetric method Beta attenuation method	Respirable Dust Sampler
SO <sub>2</sub>	IS-5182 Part II (Improved West & Gaeke method)	Respirable Dust Sampler with gaseous attachment
NO <sub>x</sub>	IS-5182 Part II (Jacob & Hoch heiser modified method)	Respirable Dust Sampler with gaseous attachment
Free Silica	NIOSH – 7601	Visible Spectrophotometry

*Source: Sampling Methodology based Accuracy Analabs & CPCB Notification*

**Table 3.14 National Ambient Air Quality Standards**

S. No.	Pollutant	Time Weighted Average	Concentration in ambient air	
			Industrial, Residential, Rural & other areas	Ecologically Sensitive area (Notified by Central Govt.)
1	SO <sub>2</sub> (µg/m <sup>3</sup> )	Annual Avg.* 24 hours**	50.0 80.0	20.0 80.0
2	NO <sub>x</sub> (µg/m <sup>3</sup> )	Annual Avg. 24 hours	40.0 80.0	30.0 80.0
3	PM <sub>10</sub> (µg/m <sup>3</sup> )	Annual Avg. 24 hours	60.0 100.0	60.0 100.0
4	PM <sub>2.5</sub> (µg/m <sup>3</sup> )	Annual Avg. 24 hours	40.0 60.0	40.0 60.0

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

## Methodology

Ambient air quality monitoring was carried out with a frequency of two samples per week at nine (10) locations, adopting a continuous 24 hourly (3 shift of 8-hour) schedule for the period March-May, 2023 as per the CPCB, MoEF guidelines and notifications.

It was ensured that the equipment was placed preferably at a height of at least  $3 \pm 0.5\text{m}$  above the ground level at each monitoring station for negating the effects of wind-blown ground dust. The equipment was placed at space free from trees and vegetation which otherwise act as a sink of pollutants resulting in lower levels in monitoring results. The baseline data of ambient air were generated for  $\text{PM}_{2.5}$ ,  $\text{PM}_{10}$ , sulphur dioxide ( $\text{SO}_2$ ) and nitrogen dioxide ( $\text{NO}_x$ ). The sampling locations are shown in Figure 3.16 and average concentrations of air pollutants are summarized in Tables 3.15 and are shown in Figures 3.16-3.20.

**Table 3.15 Ambient Air Quality (AAQ) Monitoring Locations**

S. No.	Location Code	Monitoring Locations	Distance (km)	Direction	Coordinates
1	AAQ1	Near kuppusamy core	0.76	NNW	11° 3'23.73"N 77°46'55.97"E
2	AAQ2	Ramanathapuram	2.16	NNW	11° 4'3.84"N 77°46'33.73"E
3	AAQ3	Pillalalayam	0.81	E	11° 2'53.39"N 77°47'35.80"E
4	AAQ4	Poolavalasu	4.69	NW	11° 4'58.88"N 77°45'28.10"E
5	AAQ5	Nallasellipalayam	3.92	NE	11° 4'36.66"N 77°48'38.35"E
6	AAQ6	Thottiyapalayam	1.90	WNW	11° 3'9.32"N 77°46'2.55"E
7	AAQ7	Muthur	4.86	W	11° 2'48.78"N 77°44'23.53"E
8	AAQ8	Oodayam	2.31	S	11° 1'35.50"N 77°47'1.12"E
9	AAQ9	Nadupalayam	2.98	NE	11° 4'32.47"N 77°47'46.37"E
10	AAQ10	Near Core	0.12	W	11° 4'58.74"N 77°47'03.40"E

Source: On-site monitoring/sampling by *Accuracy Analabs* in association with *GTMS*

## Results

As per the monitoring data,  $\text{PM}_{2.5}$  ranges from  $18.5 \mu\text{g}/\text{m}^3$  to  $22.9 \mu\text{g}/\text{m}^3$ ;  $\text{PM}_{10}$  from  $37.7 \mu\text{g}/\text{m}^3$  to  $42.1 \mu\text{g}/\text{m}^3$ ;  $\text{SO}_2$  from  $6.0 \mu\text{g}/\text{m}^3$  to  $8.9 \mu\text{g}/\text{m}^3$ ;  $\text{NO}_x$  from  $18.3 \mu\text{g}/\text{m}^3$  to  $23.4 \mu\text{g}/\text{m}^3$ . The concentration levels of the pollutants fall within the acceptable limits of NAAQS prescribed by CPCB.

## Air quality Index

The AQI shows that the air quality of the study area falls within good category 40 causing minimal impact to human health.

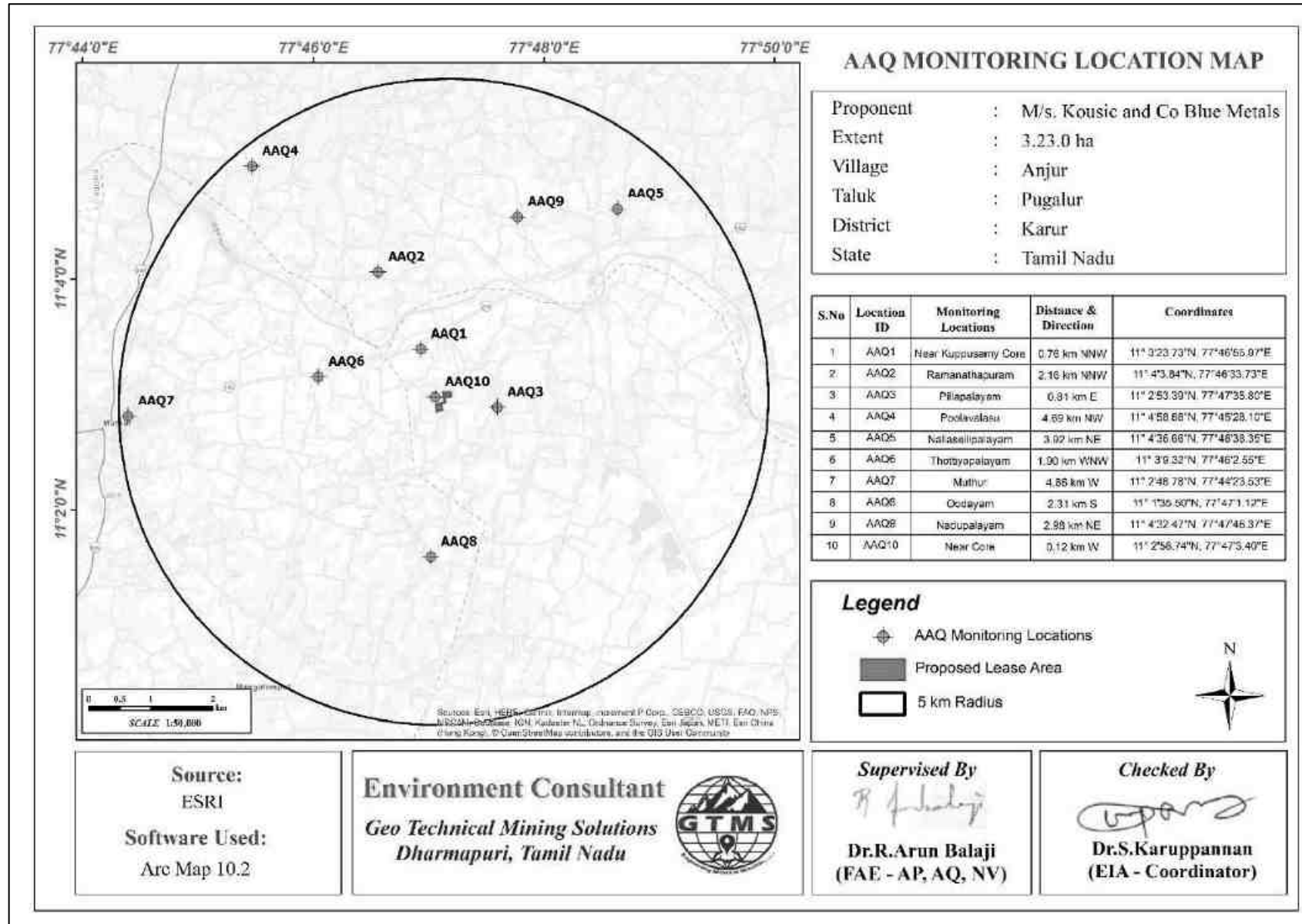
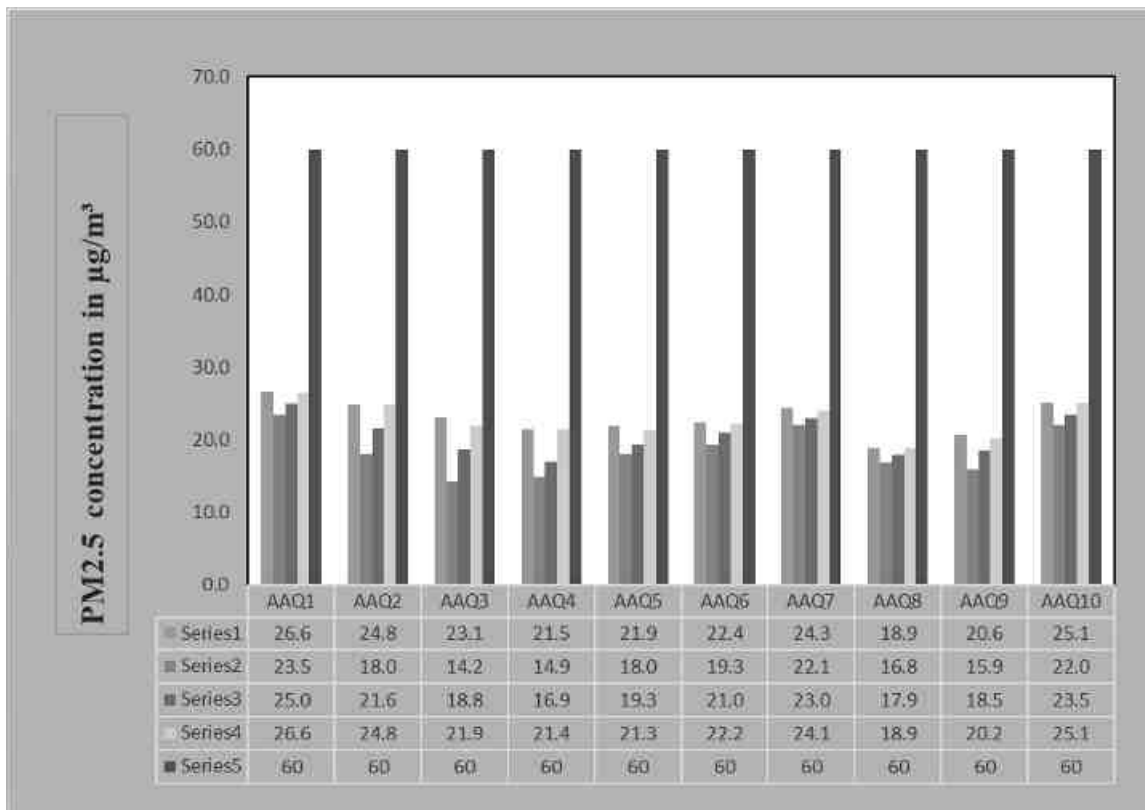


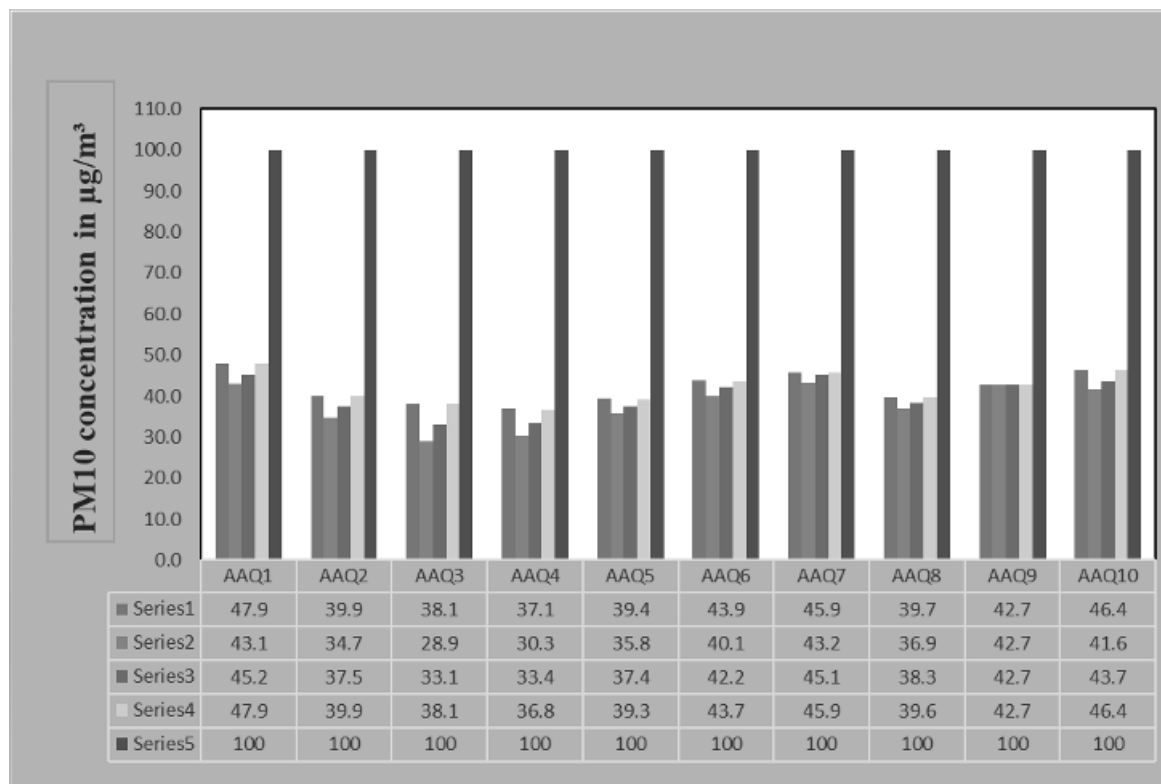
Figure 3.16 Map Showing Ambient Air Quality Monitoring Station Locations Around 5 km Radius from Proposed Project Site

**Table 3.16 Summary of AAQ Result**

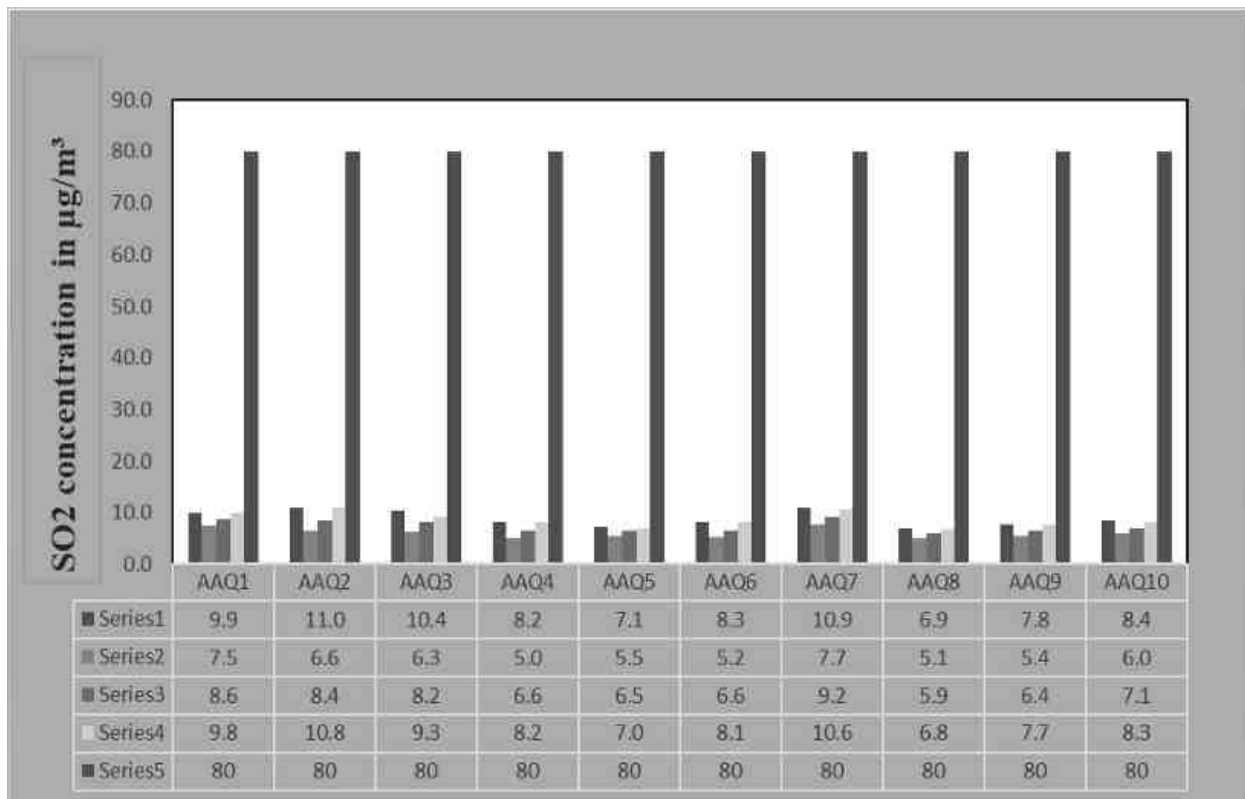
PM <sub>2.5</sub>					PM <sub>10</sub>			
Station ID	Max	Min	Mean	98 <sup>th</sup> Percentile	Max	Min	Mean	98 <sup>th</sup> Percentile
AAQ1	26.6	23.5	25.0	26.6	47.9	43.1	45.2	47.9
AAQ2	24.8	18.0	21.6	24.8	39.9	34.7	37.5	39.9
AAQ3	23.1	14.2	18.8	21.9	38.1	28.9	33.1	38.1
AAQ4	21.5	14.9	16.9	21.4	37.1	30.3	33.4	36.8
AAQ5	21.9	18.0	19.3	21.3	39.4	35.8	37.4	39.3
AAQ6	22.4	19.3	21.0	22.2	43.9	40.1	42.2	43.7
AAQ7	24.3	22.1	23.0	24.1	45.9	43.2	45.1	45.9
AAQ8	18.9	16.8	17.9	18.9	39.7	36.9	38.3	39.6
AAQ9	20.6	15.9	18.5	20.2	42.7	37.1	39.6	42.7
AAQ10	25.1	22.0	23.5	25.1	46.4	41.6	43.7	46.4
SO <sub>2</sub>					NO <sub>x</sub>			
AAQ1	9.9	7.5	8.6	9.8	26.9	24.2	25.9	26.9
AAQ2	11.0	6.6	8.4	10.8	26.8	8.9	17.8	25.8
AAQ3	10.4	6.3	8.2	9.3	18.4	12.5	15.4	18.2
AAQ4	8.2	5.0	6.6	8.2	17.6	10.5	13.9	17.6
AAQ5	7.1	5.5	6.5	7.0	22.5	20.1	21.2	22.2
AAQ6	8.3	5.2	6.6	8.1	24.9	21.5	23.2	24.9
AAQ7	10.9	7.7	9.2	10.6	26.4	23.1	24.7	25.5
AAQ8	6.9	5.1	5.9	6.8	20.5	18.2	19.1	20.4
AAQ9	7.8	5.4	6.4	7.6	24.9	21.4	23.5	24.9
AAQ10	8.4	6	7.07	8.3	25.4	22.7	24.4	25.4



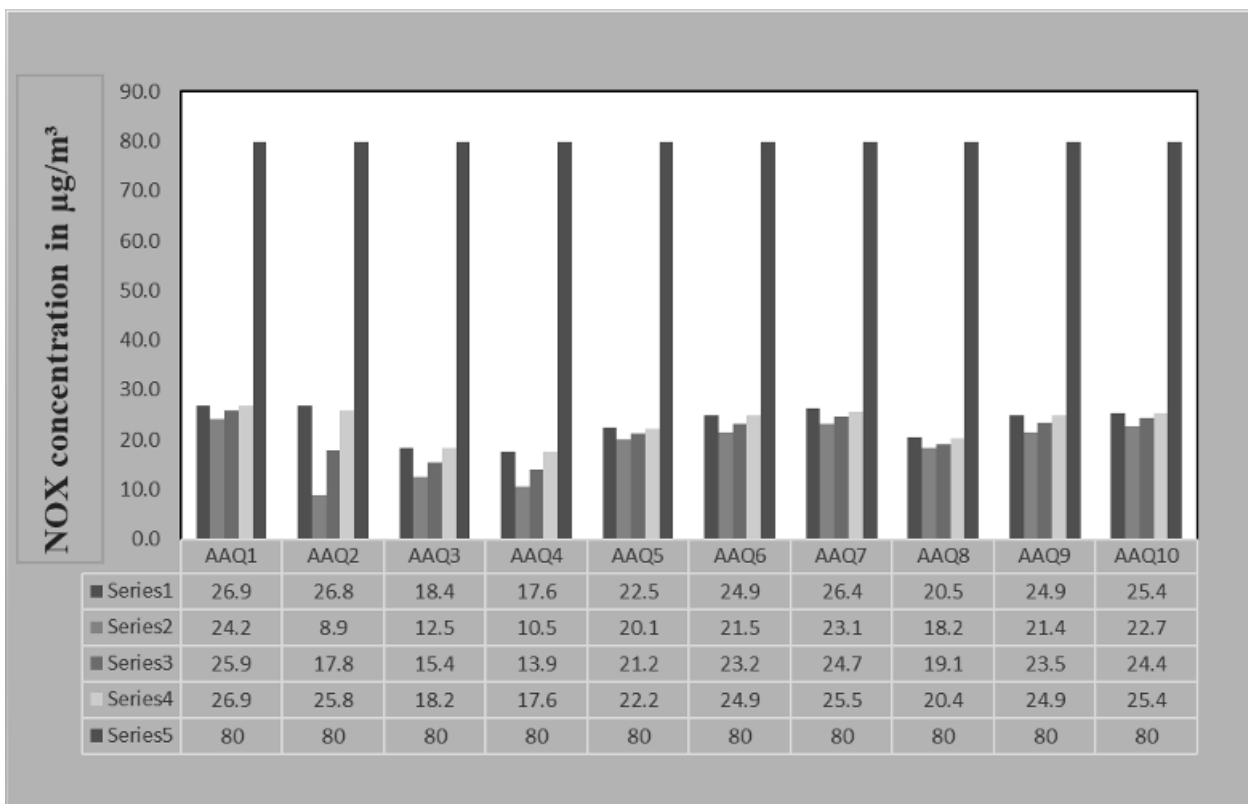
**Figure 3.17 Bar Chart Showing Maximum, Minimum, and Average Concentrations of PM<sub>2.5</sub> Measured from 10 Air Quality Monitoring Stations within 5 km Radius**



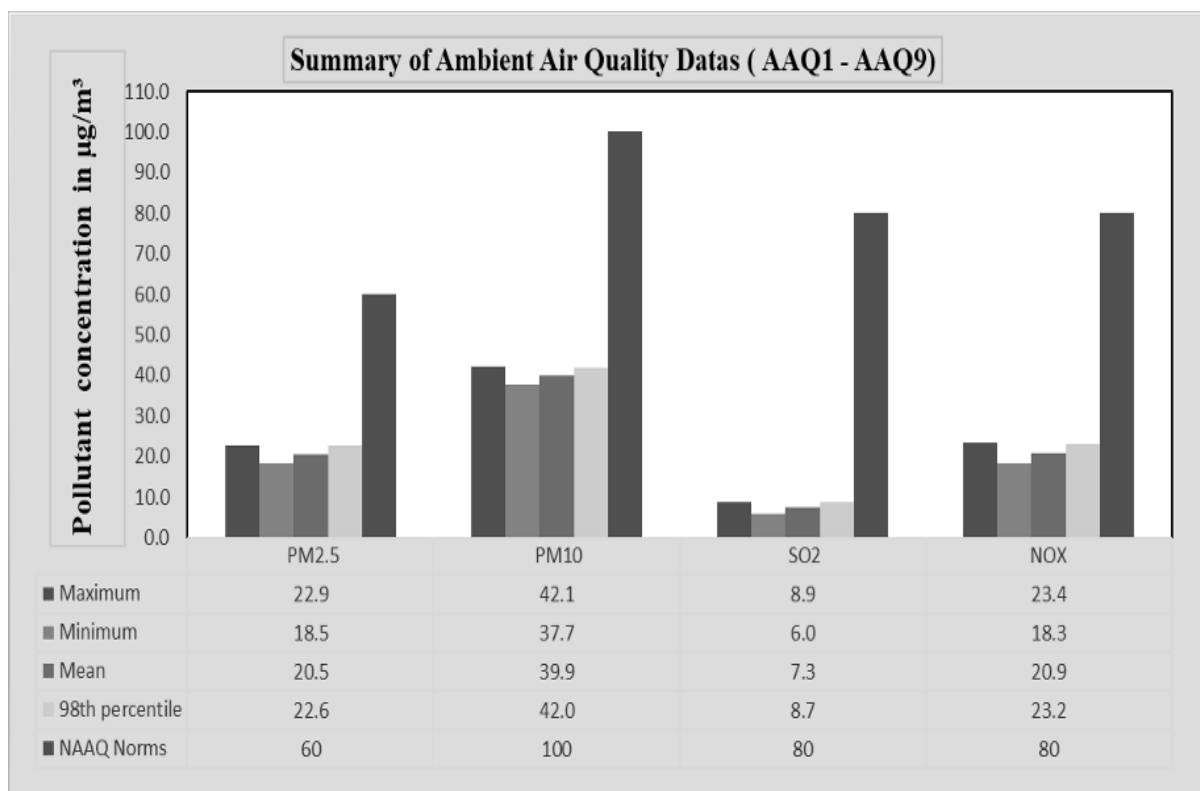
**Figure 3.18 Bar Chart Showing Maximum, Minimum, and Average Concentrations of PM<sub>10</sub> Measured from 10 Air Quality Monitoring Stations within 5 km Radius**



**Figure 3.19 Bar Chart Showing Maximum, Minimum, and Average Concentrations of SO<sub>2</sub> Measured from 10 Air Quality Monitoring Stations within 5 km Radius**



**Figure 3.20 Bar Chart Showing Maximum, Minimum, and Average Concentrations of NO<sub>x</sub> Measured from 10 Air Quality Monitoring Stations within 5km Radius**



**Figure 3.21 Bar Chart Showing Maximum, Minimum, And Average Concentrations of Pollutants in Atmosphere within 5 km Radius**

### 3.4 NOISE ENVIRONMENT

The vehicular movement on road and mining activities is the major sources of noise in the study area. The main objective of noise monitoring in the study area is to establish the baseline noise level, which will in turn be used to assess the impact of the total noise expected to be generated during the project operations around the project site. In order to assess the ambient noise levels within the study area, noise monitoring was carried out at thirteen (13) locations covering commercial, residential, rural areas within the radius of 5 km. Details of noise monitoring locations are provided in Table 3.17 and spatial occurrence of the locations are shown in Figure 3.22.

**Table 3.17 Noise Monitoring Locations**

S. No	Location Code	Monitoring Locations	Distance in km	Direction	Coordinates
1	N1	Sampathkumar Lease	0.63	NNW	11° 3'21.08"N 77°47'1.32"E
2	N2	Kuppusamy lease	0.39	NNW	11° 3'12.09"N 77°47'0.12"E
3	N3	Nagappalayam	0.25	W	11° 2'50.28"N 77°46'55.58"E
4	N4	Vellaiyankattu pudur	1.05	NW	11° 3'18.57"N 77°46'37.06"E
5	N5	Ramanathapuram	2.15	NNW	11° 4'2.34"N 77°46'32.52"E



6	N6	Pillapalayam	0.75	E	11° 2'54.66"N 77°47'36.47"E
7	N7	Poolavalasu	4.68	NW	11° 4'58.49"N 77°45'28.35"E
8	N8	Nallasellipalayam	3.91	NE	11° 4'34.72"N 77°48'39.97"E
9	N9	Thottiyapalayam	1.99	WNW	11° 3'11.03"N 77°46'2.17"E
10	N10	Muthur	4.79	W	11° 2'49.05"N 77°44'25.94"E
11	N11	Oodayam	2.29	S	11° 1'36.03"N 77°47'0.36"E
12	N12	Nadupalayam	2.97	NNE	11° 4'31.98"N 77°47'47.40"E
13	N13	Nerby core	--	--	11° 2'56.30"N 77°47'8.15"E

Source: On-site monitoring/sampling by **Accuracy Analabs) Limited** in association with GTMS

**Table 3.18 Ambient Noise Quality Result**

Station ID	Location	Environmental setting	Average day noise level (dB(A))	Average night noise level (dB(A))	Day time (6.00 AM – 10.00 PM)	Night time (10.00 PM – 6.00 AM)
					Standard ( $L_{eq}$ in dB (A))	
N1	Sampathkumar Lease	Industrial Area	42.8	33.8	75	70
N2	Kuppusamy Lease		43.4	34.4		
N3	Nagappalayam	Residential Area	41.2	36.6	55	45
N4	Vellaiyankattu pudur		44.2	39.0		
N5	Ramanathapuram		37.9	29.6		
N6	Pillapalayam		39.2	28.2		
N7	Poolavalasu		39.8	30.2		
N8	Nallasellipalayam		39.2	30.2		
N9	Thottiyapalayam		42.2	30.3		
N10	Muthur		45.6	35.6		
N11	Oodayam		36.9	28.0		
N12	Nadupalayam		37.5	28.6		
N13	Core	Industrial Area	45.8	34.2	75	70

Source: On-site monitoring/sampling by **Accuracy Analabs) Limited** in association with GTMS

The Table 3.18 shows that noise level in core zone was 45.8 dB (A) Leq during day time and 34.2 dB(A) Leq during night time. Noise levels recorded in buffer zone during day time varied from 36.9 to 45.6dB (A) Leq and during night time from 28.0 to 39.0dB (A) Leq. Thus, the noise level for industrial and residential area meets the requirements of CPCB. The results are also depicted below in Figures 3.23 and 3.24.

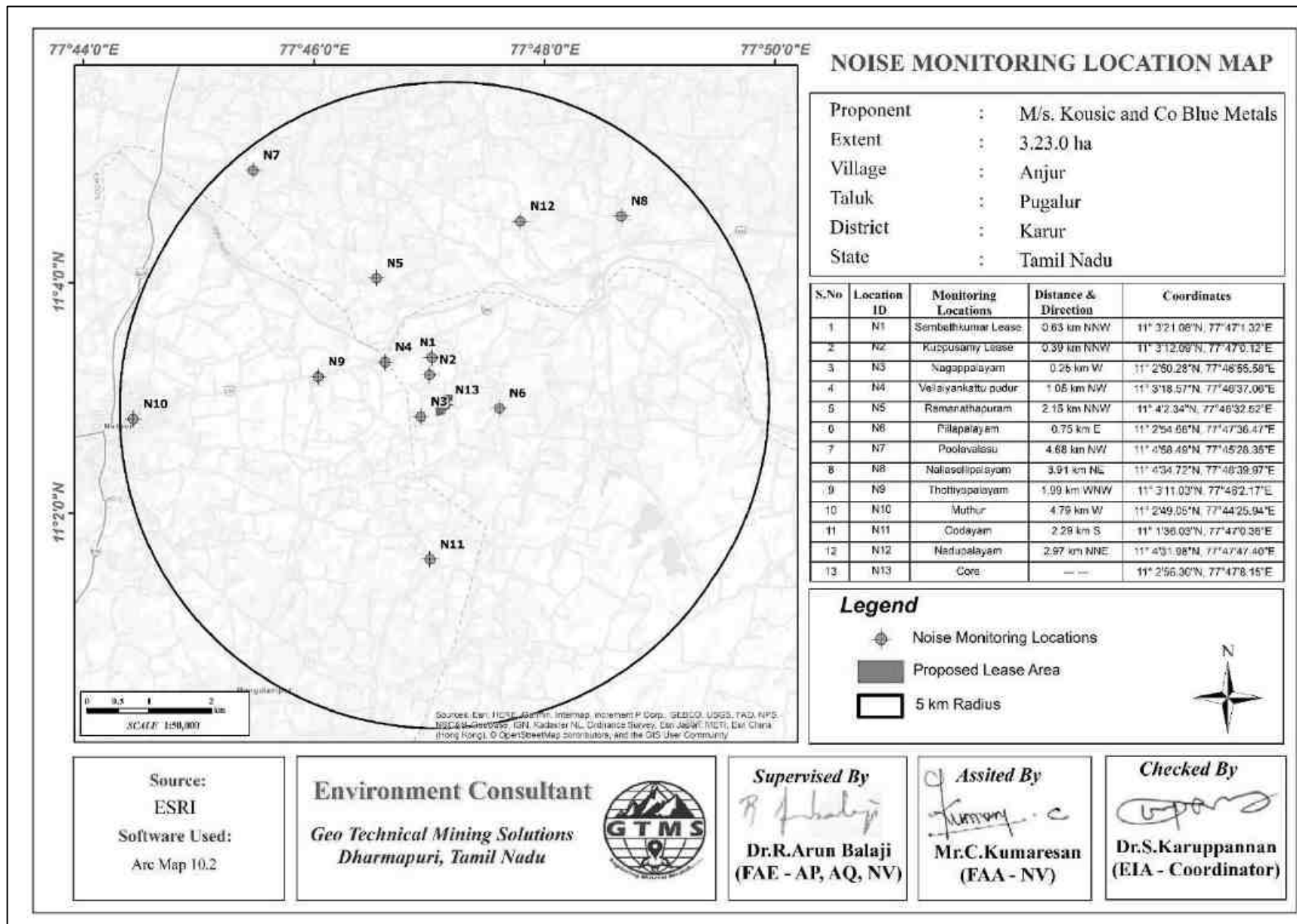
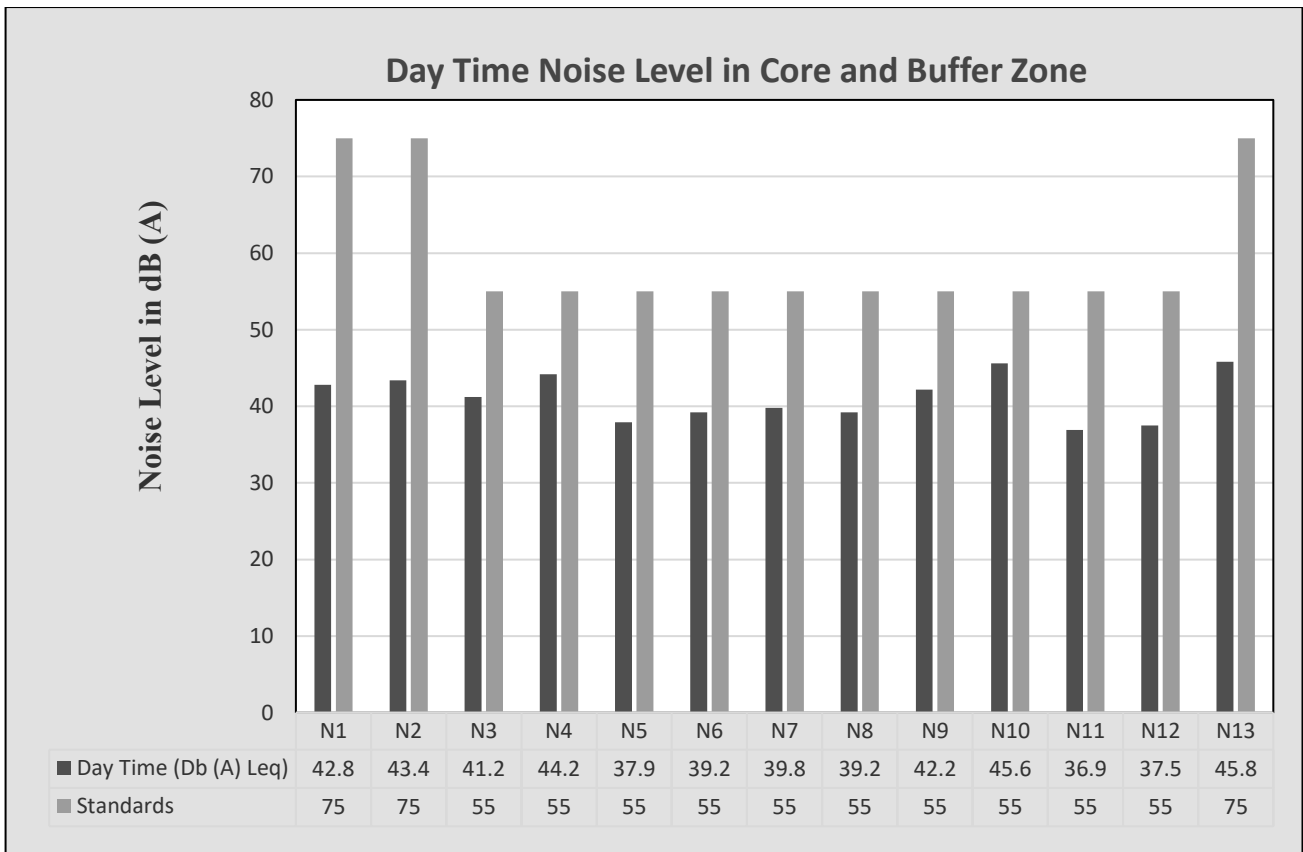
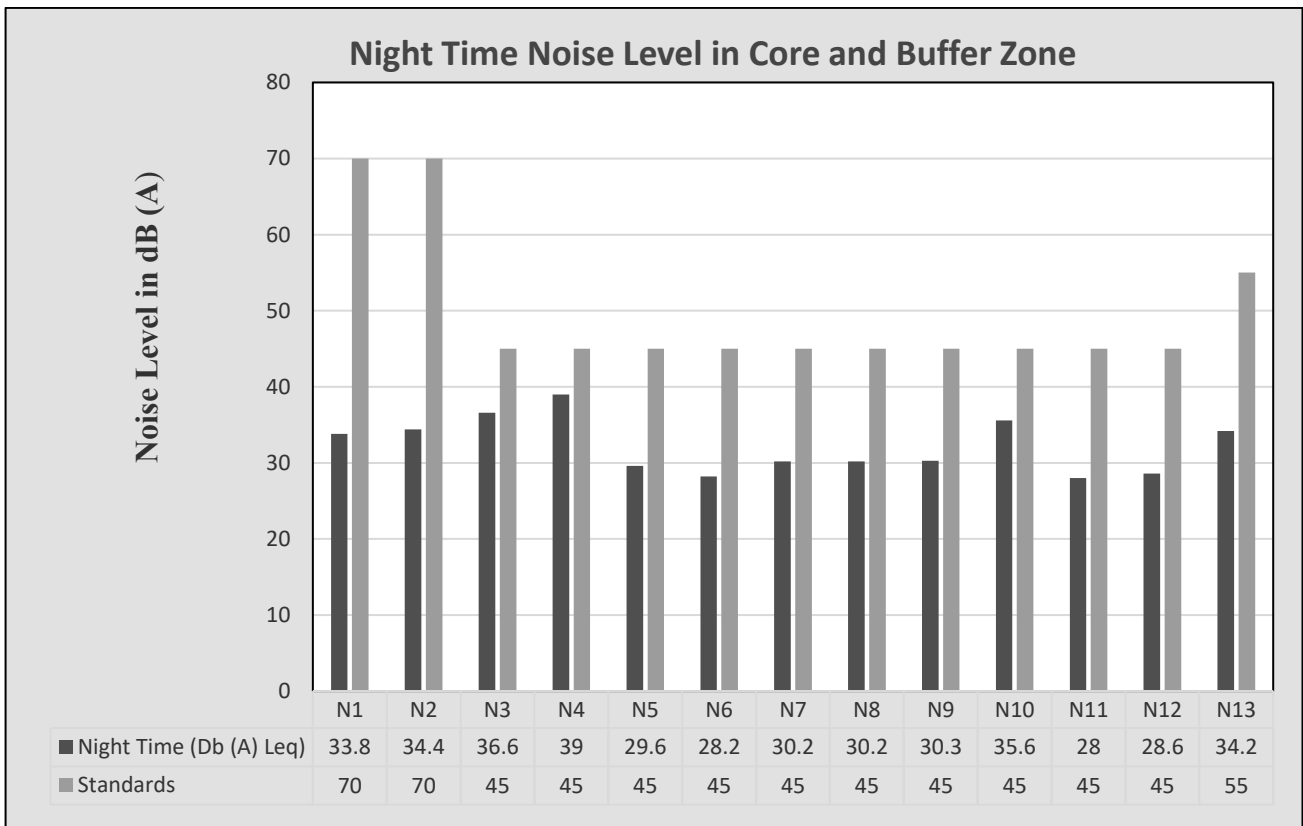


Figure 3.22 Map Showing Noise Level Monitoring Station Locations around 5 km Radius from Proposed Project Site



**Figure 3.23 Bar Chart Showing Day Time Noise Levels Measured in Core and Buffer Zones**



**Figure 3.24 Bar Chart Showing Night Time Noise Levels Measured in Core and Buffer Zones**

### 3.5 BIOLOGICAL ENVIRONMENT

An ecological survey was conducted to collect the baseline data regarding flora and fauna in the study area of 10 km radius. Data were collected from different sources, i.e., government departments such as District Forest Office and Government of Tamil Nadu. On the basis of onsite observations as well as forest department records the checklist of flora and fauna was prepared.

#### *Methodology*

Sampling locations were selected with reference to topography, land use, vegetation pattern, etc. In this study, quadrats of 25 m × 25 m were laid down to assess trees and quadrats of 10 m × 10 m were laid down for shrubs, as shown in Figure 3.25.



**Figure 3.25** Quadrates Sampling Methods of Flora

#### *Phyto-Sociological Studies*

Phyto sociological parameters, such as *Density, Frequency, Abundance and Importance Value Index* of individual species were determined in randomly placed quadrat of different sizes in the study area, as shown in Table 3.19. Relative frequency, and relative density were calculated and the sum of these three represented Importance Value Index (IVI) for various species. For shrubs, herbs and grasses, *Density, Frequency, Relative Density & Relative Frequency were found*. Sample plots were selected in such a way to get maximum representation of different types of vegetation and plots were laid out in different part of the study area of 10 km radius. Analysis of the vegetation will help in determining the relative importance of each species in the study area and to reveal if any economically valuable species is threatened in the process.

**Table 3.19 Calculation of Density, Frequency (%), Dominance, Relative Density, Relative Frequency, Relative Dominance & Important Value Index**

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

***Shannon – Wiener Index, Evenness and Richness***

Biodiversity index is a quantitative measure that reflects how many different types of species, there are in a dataset, and simultaneously takes into account how evenly the basic entities (such as individuals) are distributed among those types of species. The value of biodiversity index increases both when the number of types increases and when evenness increases. For a given number of type of species, the value of a biodiversity index is maximized when all type of species is equally abundant. The corresponding formulas are given in Table 3.20.

**Table 3.20 Calculation of Species Diversity by Shannon – Wiener Index, Evenness and Richness**

Description	Formula
Species diversity – Shannon – Wien Index	$H = -\sum [(p_i) * \ln(p_i)]$ Where $p_i$ : Proportion of total sample represented by species $i$ : number of individuals of species $i$ / total number samples
Evenness	$H/H_{max}$ , $H_{max} = \ln(s)$ = maximum diversity possible $S$ =No. of species
Species Richness by Margalef	$RI = S-1/\ln N$ Where $S$ = Total Number of species in the community $N$ = Total Number of individuals of all species in the Community

**3.5.1 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. Photographs showing various species are provided in Figure 3.26.

### ***Flora in mine lease area (core zone)***

The mine lease area contains total of 17 species belonging to 9 families have been recorded from the mine lease area. 4 Trees, 4 shrubs, 9 herbs were identified. It is a grassy land. There are no endangered species in mine lease area. Details of vegetation with scientific name indicated in Table 3.21.

**Table 3.21 Flora in mine lease area**

<b>S.no</b>	<b>Local name</b>	<b>Scientific name</b>	<b>Family name</b>
<b>Trees</b>			
1	Karuvealan	<i>Prosopis juliflora</i>	Fabaceae
2	Unjai maram	<i>Albizia amara</i>	Fabaceae
3	Vetpalai	<i>Wrightia tinctoria</i>	Apocynaceae
4	Vealli vealan	<i>Vachellia leucophloea</i>	Fabaceae
<b>Shrubs</b>			
1	Avaram chadi	<i>Senna auriculata</i>	Fabaceae
2	Earuku	<i>Calotropis gigantea</i>	Apocynaceae
3	communist pacha	<i>Chromolaena odorata</i>	Asteraceae
4	Unnichadi	<i>Lantana camara</i>	Verbenaceae
<b>Herbs /Climber</b>			
1	Perandai	<i>Cissus quadrangularis</i>	Vitaceae
2	Thathapodu	<i>Tridax procumbens</i>	Asteraceae
3	Kolunji chadi	<i>Tephrosia purpurea</i>	Fabaceae
4	Nayuruvi	<i>Achyranthes aspera</i>	Amaranthaceae
5	Nearunji mull	<i>Tribulus zeyheri</i>	Zygophyllaceae
6	Pulapoo	<i>Aerva lanata</i>	Amaranthaceae
7	American mint	<i>Hyptis suaveolens</i>	Lamiaceae
8	Veetukaayapoandu	<i>Tridax procumbens</i>	Asteraceae
9	Mukkirattai	<i>Boerhaavia diffusa</i>	Nyctaginaceae

### ***The Flora in lease area and 300 m radius (buffer zone)***

There is no agricultural land nearby lease area. It contains a total of 34 species belonging to 21 families have been recorded from the buffer zone. 6 Trees (17%), 5 Shrubs (17%) and 22 Herbs and Climbers, Creeper, Grass & Cactus 20 (64%) were identified. Details of flora with the scientific name details and of diversity species Richness index were mentioned in Table 3.22-24 and Figure 3.26. There is no threatened species in 300 m radius.

### ***Flora in 10 km radius buffer zone***

Similar type of environment occurs in both core and buffer zone but more floral diversity noticed in buffer zone compared with core zone area. Buffer area contains a total species belonging to 38 families have been recorded. The floral (75) varieties among them 35 Trees (46%), 15 Shrubs (15%) Herbs and Climbers, Creeper, Grass & Cactus, 25 (33%) were identified. Details of flora with the scientific name mentioned in Table 3.25 and Figure 3.27.

Table 3.22 Flora in 300 m Radius

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
<b>Trees</b>													
1	Karuvealan	<i>Prosopis juliflora</i>	Fabaceae	4	3	5	0.8	60.0	1.3	16.7	16.7	33.3	Not Listed
2	Palm tree	<i>Borassus flabellifer</i>	Fabaceae	3	2	5	0.6	40.0	1.5	12.5	11.1	23.6	Not Listed
3	Vembu	<i>Azadirachta indica</i>	Meliaceae	5	4	5	1.0	80.0	1.3	20.8	22.2	43.1	Not Listed
4	Vealli vealan	<i>Vachellia leucophloea</i>	Babesiae	4	3	5	0.8	60.0	1.3	16.7	16.7	33.3	least concern
5	Unjai maram	<i>Albizia amara</i>	Fabaceae	3	2	5	0.6	40.0	1.5	12.5	11.1	23.6	Not Listed
6	Vetpalai	<i>Wrightia tinctoria</i>	Apocynaceae	5	4	5	1.0	80.0	1.3	20.8	22.2	43.1	Not Listed
<b>Shrubs</b>													
1	Erukku	<i>Calotropis gigantea</i>	Apocynaceae	8	7	10	0.8	70.0	1.1	21.6	21.9	43.5	Not Listed
2	Uumaththai	<i>Datura metel</i>	Solanaceae	6	5	10	0.6	50.0	1.2	16.2	15.6	31.8	Not Listed
3	Thuthi	<i>Abutilon indicum</i>	Meliaceae	7	6	10	0.7	60.0	1.2	18.9	18.8	37.7	Not Listed
4	Avarai	<i>Senna auriculata</i>	Fabaceae	9	8	10	0.9	80.0	1.1	24.3	25.0	49.3	Not Listed
5	Unichadi	<i>Lantana camara</i>	Verbenaceae	7	6	10	0.7	60.0	1.2	18.9	18.8	37.7	Not Listed
<b>Herbs</b>													
1	Nayuruv	<i>Achyranthes aspera</i>	Amaranthaceae	6	5	15	0.4	33.3	1.2	3.9	3.8	7.7	Not Listed
2	Nearunji mull	<i>Tribulus zeyheri</i> Sond	Zygophyllaceae	7	6	15	0.5	40.0	1.2	4.6	4.5	9.2	Not Listed

3	pill	<i>Cenchrus ciliaris</i>	Poaceae	9	8	15	0.6	53.3	1.1	5.9	6.1	12.0	Not Listed
4	pulapoo	<i>Aerva lanata</i>	Amaranthaceae	8	7	15	0.5	46.7	1.1	5.3	5.3	10.6	Not Listed
5	kapok bush	<i>Aerva javani</i>	Amaranthaceae	6	5	15	0.4	33.3	1.2	3.9	3.8	7.7	Not Listed
6	Rail poondu	<i>Croton bonplandianus</i>	Euphorbiaceae	8	7	15	0.5	46.7	1.1	5.3	5.3	10.6	Not Listed
7	Yanai neariji	<i>pedalium murex</i>	Pedaliaceae	7	6	15	0.5	40.0	1.2	4.6	4.5	9.2	Not Listed
8	Perandai	<i>Cissus quadrangularis</i>	Vitaceae	10	9	15	0.7	60.0	1.1	6.6	6.8	13.4	Not Listed
9	Thumbai chadi	<i>Leucas aspera</i>	Lamiaceae	6	5	15	0.4	33.3	1.2	3.9	3.8	7.7	Not Listed
10	Umathai	<i>Datura metel</i>	Solanaceae	7	6	15	0.5	40.0	1.2	4.6	4.5	9.2	Not Listed
11	Sethamutti	<i>Sida cordata</i>	Malvaceae	8	7	15	0.5	46.7	1.1	5.3	5.3	10.6	Not Listed
12	Kolunji	<i>Tephrosia purpurea</i>	Fabaceae	9	8	15	0.6	53.3	1.1	5.9	6.1	12.0	Not Listed
13	Ishappukol Vitai	<i>Plantago coronopus</i>	Plantaginaceae	6	5	15	0.4	33.3	1.2	3.9	3.8	7.7	Not Listed
14	Vealiparuthi	<i>Pergularia daemia</i>	Apocynaceae	7	6	15	0.5	40.0	1.2	4.6	4.5	9.2	Not Listed
15	Seppu nerinji	<i>Indigofera linnaei Ali</i>	Fabaceae	8	7	15	0.5	46.7	1.1	5.3	5.3	10.6	Not Listed
16	Sapathikalli	<i>Opuntia ficus-indica</i>	Cactaceae	9	8	15	0.6	53.3	1.1	5.9	6.1	12.0	Not Listed
17	Pal kodi	<i>Cynanchum viminale</i>	Apocynaceae	6	5	15	0.4	33.3	1.2	3.9	3.8	7.7	Not Listed
18	Ilia perandai	<i>Cissus rotundifolia</i>	Vitaceae	8	7	15	0.5	46.7	1.1	5.3	5.3	10.6	Not Listed
19	Katralai	<i>Aloe vera</i>	Asphodelaceae	9	8	15	0.6	53.3	1.1	5.9	6.1	12.0	Not Listed
20	Seammulli	<i>Barleria prionitis</i>	Acanthaceae	8	7	15	0.5	46.7	1.1	5.3	5.3	10.6	Not Listed



**Table 3.23 Calculation of Species Diversity in 300 m Radius**

S.No.	Common name	Scientific name	No. of Species	Pi	In (Pi)	Pi x in (Pi)
<b>Trees</b>						
1	Karuvealan	<i>Prosopis juliflora</i>	4	0.17	-1.79	-0.30
2	Palm tree	<i>Borassus flabellifer</i>	3	0.13	-2.08	-0.26
3	Vembu	<i>Azadirachta indica</i>	5	0.21	-1.57	-0.33
4	Vealli vealan	<i>Vachellia leucophloea</i>	4	0.17	-1.79	-0.30
5	Unjai maram	<i>Albizia amara</i>	3	0.13	-2.08	-0.26
6	Vetpalai	<i>Wrightia tinctoria</i>	5	0.21	-1.57	-0.33
H (Shannon Diversity Index) =1.77						
<b>Shrubs</b>						
1	Erukku	<i>Calotropis gigantea</i>	8	0.22	-1.53	-0.33
2	Uumaththai	<i>Datura metel</i>	6	0.16	-1.82	-0.29
3	Thuthi	<i>Abutilon indicum</i>	7	0.19	-1.67	-0.32
4	Avarai	<i>Senna auriculata</i>	9	0.24	-1.41	-0.34
5	Unichadi	<i>Lantana camara</i>	7	0.19	-1.67	-0.32
H (Shannon Diversity Index) =1.60						
<b>Herbs</b>						
1	Nayuruv	<i>Achyranthes aspera</i>	6	0.04	-3.23	-0.13
2	Nearunji mull	<i>Tribulus zeyheri</i> Sond	7	0.05	-3.08	-0.14
3	Pill	<i>Cenchrus ciliaris</i>	9	0.06	-2.83	-0.17
4	pulapoo	<i>Aerva lanata</i>	8	0.05	-2.94	-0.15
5	kapok bush	<i>Aerva javani</i>	6	0.04	-3.23	-0.13
6	Rail poondu	<i>Croton bonplandianus</i>	8	0.05	-2.94	-0.15
7	Mookuthi poondu	<i>pedalium murex</i>	7	0.05	-3.08	-0.14
8	Perandai	<i>Cissus quadrangularis</i>	10	0.07	-2.72	-0.18
9	Thumbai chadi	<i>Leucas aspera</i>	6	0.04	-3.23	-0.13
10	Umathai	<i>Datura metel</i>	7	0.05	-3.08	-0.14
11	Sethamutti	<i>Sida cordata</i>	8	0.05	-2.94	-0.15
12	Kolunji	<i>Tephrosia purpurea</i>	9	0.06	-2.83	-0.17
13	Ishappukol Vitai	<i>Plantago coronopus</i>	6	0.04	-3.23	-0.13
14	Vealiparuthi	<i>Pergularia daemia</i>	7	0.05	-3.08	-0.14
15	Seppu nerinji	<i>Indigofera linnaei</i> Ali	8	0.05	-2.94	-0.15
16	Sapathikalli	<i>Opuntia ficus-indica</i>	9	0.06	-2.83	-0.17
17	Pal kodi	<i>Cynanchum viminalis</i>	6	0.04	-3.23	-0.13
18	Ilia perandai	<i>Cissus rotundifolia</i>	8	0.05	-2.94	-0.15
19	Katralai	<i>Aloe vera</i>	9	0.06	-2.83	-0.17
20	Seammulli	<i>Barleria prionitis</i>	8	0.05	-2.94	-0.15
H (Shannon Diversity Index) =2.98						

**Table 3.24 Species Richness (Index) in 300 m radius**

Details	H	H max	Evenness	Species Richness
<b>Trees</b>	1.77	1.79	0.99	1.57
<b>Shrubs</b>	1.60	1.61	0.99	1.11
<b>Herbs</b>	2.98	3.00	1.00	3.78

**Table 3.25 Flora in Buffer Zone**

S.No	Local Name	Scientific name	Family name
<b>TREES</b>			
1	Vembu	<i>Azadirachta indica</i>	Meliaceae
2	Thekku	<i>Tectona grandis</i>	Verbenaceae
3	Pongam oiltree	<i>Pongamia pinnata</i>	Fabaceae
4	Thennai maram	<i>Cocos nucifera</i>	Arecaceae
5	Manga	<i>Mangifera indica</i>	Anacardiaceae
6	Puliyamaram	<i>Tamarindus indica</i>	Legumes
7	Vadanarayani	<i>Delonix elata</i>	Fabaceae
8	Thenpazham	<i>Muntingia calabura</i>	Tiliaceae
9	Punnai	<i>Calophyllum inophyllum</i>	Calophyllaceae
10	Ilanthai	<i>Ziziphus jujubha</i>	Rhamnaceae
11	Karuvelam	<i>Acacia nilotica</i>	Mimosaceae
12	Nettilinkam	<i>Polyalthia longifolia</i>	Annonaceae
13	Arai nelli	<i>Phyllanthus acidus</i>	Euphorbiaceae
14	Panai maram	<i>Borassus flabellifer</i>	Arecaceae
15	Sapota	<i>Manilkara zapota</i>	Sapotaceae
16	Navalmaram	<i>Syzygium cumini</i>	Myrtaceae
17	Alamaram	<i>Ficus benghalensis</i>	Moraceae
18	Vazhaimaram	<i>Musa</i>	Musaceae
19	Karuvelam maram	<i>Vachellia nilotica</i>	Fabaceae
20	Nelli	<i>Emblica officinalis</i>	Phyllanthaceae
21	Eucalyptus	<i>Eucalyptus globules</i>	Myrtaceae
22	Maramalli	<i>Millingtonia hortensis</i>	Bignoniaceae
23	Kuduka puli	<i>Pithecellobium dulce</i>	Mimosaceae
24	Karungali	<i>Acacia sundra</i>	Legumes
25	Nochi	<i>Vitex negundo</i>	Lamiaceae
26	Karimurungai	<i>Moringa olefera</i>	Moraginaceae
27	Pappali maram	<i>Carica papaya L</i>	Caricaceae
28	Poovarasu	<i>Thespesia populnea</i>	Malvaceae
29	Arasanmaram	<i>Ficus religiosa</i>	Moraceae
30	Vilvam	<i>Aegle marmelos</i>	Rutaceae
31	Nuna maram	<i>Morinda citrifolia</i>	Rubiaceae
32	Nettilingam	<i>Polyalthia longifolia</i>	Annonaceae
33	Koyya	<i>Psidium guajava</i>	Myrtaceae
34	Seethapazham	<i>Annona reticulata</i>	Annonaceae
35	Savukku	<i>Casuarina L.</i>	Casuarinaceae
<b>SHRUBS</b>			
1	Avarai	<i>Senna auriculata</i>	Fabaceae
2	Sundaika	<i>Solanum torvum</i>	Solanaceae
3	Puramuttai	<i>Chrozophora rottleri</i>	Euphorbiaceae
4	Arali	<i>Nerium indicum</i>	Apocynaceae
5	Seemaigaththi	<i>Cassia alata</i>	Caesalpinaceae
6	Chemparuthi	<i>Hibiscu rosa-sinensis</i>	Malvaceae
7	Kattamanakku	<i>Jatropha curcas</i>	Euphorbiaceae
8	Chaturakalli	<i>Euphorbia antiquorum</i>	Euphorbiaceae
9	Idlipoo	<i>xoracoc cineia</i>	Rubiaceae

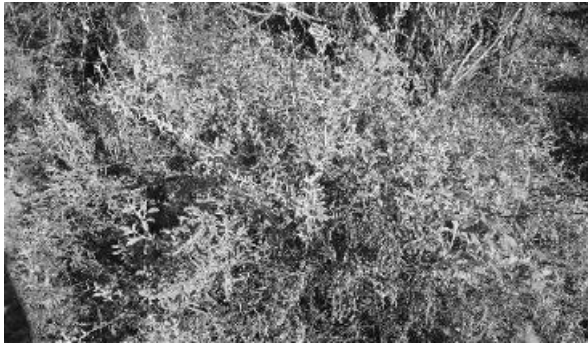
10	Thuthi	<i>Abutilon indicum</i>	Meliaceae
11	Nithyakalyani	<i>Cathranthus roseus</i>	Apocynaceae
12	Uumaththai	<i>Datura metel</i>	Solanaceae
13	Kundumani	<i>Abrus precatorius</i>	Fabaceae
14	Erukku	<i>Calotropis gigantea</i>	Apocynaceae
15	Neermulli	<i>Hydrophila auriculata</i>	Acanthaceae
<b>Herbs, Climber, Creeper &amp; Grasses</b>			
1	Nayuruv	<i>Achyranthes aspera</i>	Amaranthaceae
2	Veetukaayapoond	<i>Tridax procumbens</i>	Asteraceae
3	Mukkirattai	<i>Boerhaavia diffusa</i>	Nyctaginaceae
4	Kuppaimeni	<i>Acalypha indica</i>	Euphorbiaceae
5	Karisilanganni	<i>Eclipta prostrata</i>	Asteraceae
6	Korai	<i>Cyperus rotundus</i>	Cyperaceae
7	Thumbai	<i>Leucas aspera</i>	Lamiaceae
8	Nai kadugu	<i>Celome viscosa</i>	Capparidaceae
9	Parttiniyam	<i>Parthenium hysterophorus</i>	Asteraceae
10	Thulasi	<i>Ocimum tenuiflorum</i>	Lamiaceae
11	Arugampul	<i>Cynodon dactylon</i>	Poaceae
12	Thoiya keerai	<i>Digeria muricata</i>	Amaranthaceae
13	Kovai	<i>Coccinia grandis</i>	Cucurbitaceae
14	Perandai	<i>Cissus quadrangularis</i>	Vitaceae
15	Mudakkotan	<i>Cardiospermum helicacabum</i>	Sapindaceae
16	Karkakartum	<i>Clitoria ternatea</i>	Fabaceae
17	Kovakkai	<i>Trichosanthes dioica</i>	Cucurbitaceae
18	Sangupoo	<i>Clitoriaternatia</i>	Fabaceae
19	Siru puladi	<i>Desmodium triflorum</i>	Fabaceae
20	Sithrapaalavi	<i>Euphorbia prostrata</i>	Euphorbiaceae
21	Thumattikai	<i>Cucumis callosus</i>	Cucurbitaceae
22	mookuthi poond	<i>Wedelia trilobata</i>	Asteraceae
23	Kattu kanchippul	<i>Apluda mutica</i>	Poaceae
24	Musthaku	<i>Kyllinga brevifolia</i>	Cyperaceae
25	Nagathali	<i>Opuntia dillenii</i>	Cactaceae



*Albizia amara*



*Aerva lanata*



*Aerva javanica*



*Escontria chiotilla*



*Datura metel*



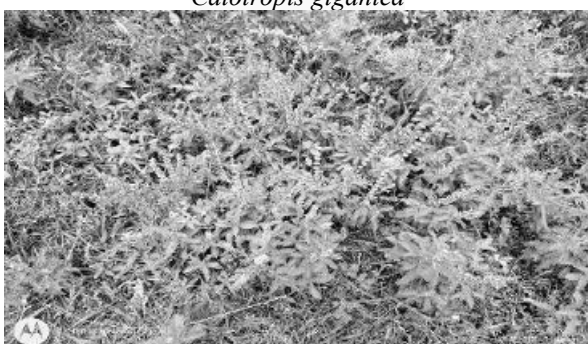
*Leucas aspera*



*Calotropis gigantea*



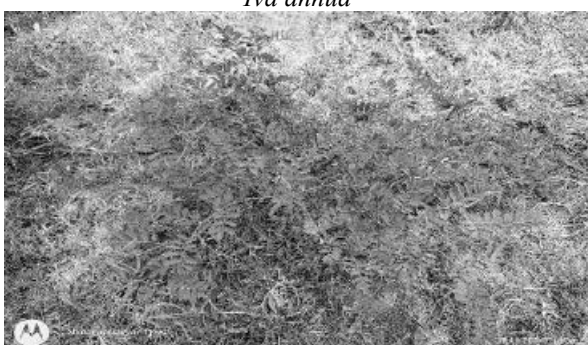
*Mangifera indica*



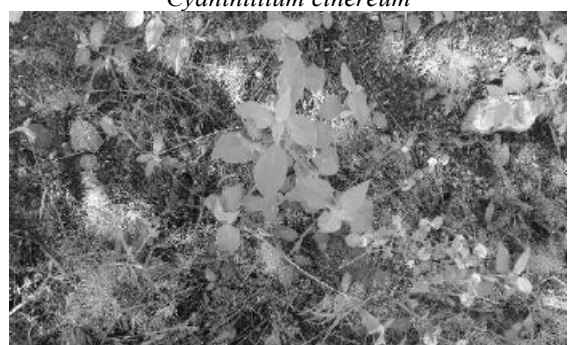
*Iva annua*



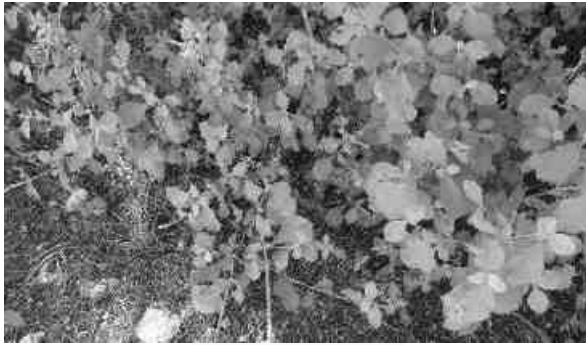
*Cyanthillium cinereum*



*Tephrosia purpurea*



*Acalypha indica*



*Achyranthes aspera*



*Prosopis juliflora*



*Senna auriculata*



*Plantago coronopus*



*Cenchrus polystachios*



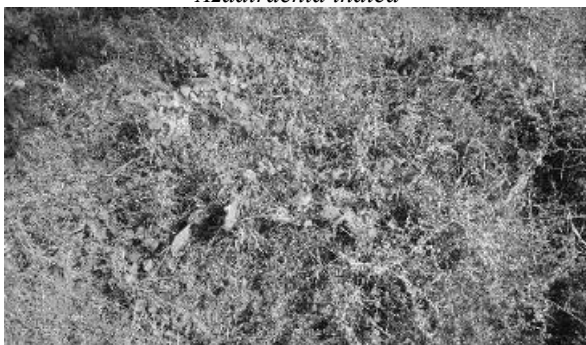
*Vachellia leucophloea*



*Azadirachta indica*



*Pedalium murex*



*Opuntia ficus-indica*



*Wrightia tinctoria*



*Cynanchum viminale*



*Cocos nucifera*



*Borassus flabellifer*



*Zizyphus Oenoplia*



*Ruellia tuberosa L*



*Euphorbia hirta*



*Xanthium orientale*



*Barleria prionitis*

**Figure 3.26 Flora in Core and Buffer Area**

### ***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 3.26

**Table 3.26 Aquatic Vegetation**

S. No.	Scientific Name	Common Name	Vernacular Name (Tamil)	IUCN Red List of Threatened Species
1	<i>Eichornia Crassipe</i>	Water Hyacinth	Agayatamarai	NA
2	<i>Aponogeton natans</i>	Floating Lace Plant	Kottikizhangu	NA
3	<i>Nymphaea Nouchali</i>	Blue Water Lily	Nellambal	LC
4	<i>Carex Cruciata</i>	Cross Grass	Koraipullu	NA
5	<i>Cynodon Dactylon</i>	Scutch Grass	Arugampullu	LC
6	<i>Cyperus Exaltatus</i>	Tall Flat Sedge	Koraikizhangu	LC

\*Lc- Least Concern, Na-Not Yet Assessed

### **Food chain**

The food chain in aquatic ecosystems often begins with the algae or phytoplankton producers, and then the zooplankton that feed on them. This type of food chain is found in Noyal River by phytoplankton, zooplankton, fish and Artiola gray.

Ex: Phytoplankton→Zooplankton→small fish→large fish

### **Forest Vegetation**

The biosphere reserves or reserve forest or wildlife sanctuaries or National parks or Important Bird Areas (IBAs), and migratory routes of fauna. There are no 10km radius. The area under study (Mine lease area and the 10 km buffer zone) is not ecologically sensitive.

### **Endangered and endemic species as per the IUCN Red List**

There are no rare, endangered and endemic species found in the study area. There are no biosphere reserves or wildlife sanctuaries or National parks or Important Bird Areas (IBAs), ecologically sensitive zone.

### **3.5.2 Fauna**

The faunal survey was carried out for Mammals, Birds, Reptiles, Amphibians and Butterflies. There are no rare, endangered, threatened (RET) and endemic species present in core area.

**Table 3.27 Methodology applied during survey of fauna**

S. No.	Taxa	Method of Sampling	References
1	Insects	Random walk, Opportunistic observations	Pollard (1977); Kunte (2000)
2	Reptiles	Visual encounter survey (Direct Search)	Daniel J.C (2002)
3	Amphibians	Visual encounter survey (Direct Search)	
4	Mammals	Tracks and Signs	Menon V (2014)
5	Avian	Random walk, Opportunistic observations.	Grimmett R (2011); Ali S (1941)

### ***Fauna in Core Zone***

The 25 varieties of species observed in the core zone. Among them numbers of Insects 8 (32%), Reptiles 3 (12%), Mammals 5 (20%) and Avian 9 (36%). A total of 25 species belonging to 22 families have been recorded from the core mining lease area. Number of species decreases towards the mining area this might be due the lack of vegetation. None of these species are threatened or endemic. There is no Schedule I species and eight species are under schedule IV according to Indian wild life Act 1972. A total eight species of birds were sighted in the mining lease area. There are no critically endangered, endangered, vulnerable and endemic species were observed. Details of fauna in core zone with the scientific name were mentioned in Table. 3.28.

### ***Fauna in Buffer Zone***

A total of 47 species belonging to 34 families were recorded in the buffer zone. Based on habitat classification the majority of species were Birds 18 (40%), followed by Insects 15 (31%), Reptiles 7 (15%), 4 Mammals (8%) and amphibians 3 (6%). There are 4 schedule II species and 24 schedule IV species according to Indian wild life Act 1972. There are no critically endangered, vulnerable and endemic species observed. List of fauna in the buffer zone is provided in Table 3.29.

**Table 3.28 Fauna in Core Zone**

<b>S. No</b>	<b>Common name/English Name</b>	<b>Family Name</b>	<b>Scientific Name</b>	<b>Schedule list wildlife Protection act 1972</b>	<b>IUCN Red List data</b>
<b>INSECTS</b>					
1	Common Tiger	Nymphalidae	<i>Danaus genutia</i>	NL	NL
2	Red-veined darter	Libellulidae	<i>Sympetrum fonscolombii</i>	NL	LC
3	Grasshopper	Acrididae	<i>Hieroglyphus sp</i>	NL	LC
4	Blue tiger	Nymphalidae	<i>Tirumala limniace</i>	Schedule IV	LC
5	Stick insect	Lonchodidae	<i>carausius morosus</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	Acraea violae	Nymphalidae	<i>Acraea violae</i>	NL	LC
<b>REPTILES</b>					
1	Garden lizard	Agamidae	<i>Calotes versicolor</i>	NL	LC
2	Common house gecko	Gekkonidae	<i>Hemidactylus frenatus</i>	NL	LC
3	Fan-Throated Lizard	Agamidae	<i>Sitanaponticeriana</i>	NL	LC
<b>MAMMALS</b>					
1	Indian Field Mouse	Muridae	<i>Mus booduga</i>	Schedule IV	NL
2	Cow	Bovidae	<i>Bos taurus</i>	NL	NL



3	Common dog	Canidae	<i>Canis lupus familiaris</i>	NL	NL
4	Common cat	Felidae	<i>Felis silvestris catus</i>	NL	NL
5	Squirrel	Sciuridae	<i>Funambulus palmarum</i>	NL	NL
<b>AVES</b>					
1	Asian green bee-eater	Meropidae	<i>Meropsorientalis</i>	NL	LC
2	Koel	Cucalidae	<i>Eudynamys</i>	Schedule IV	LC
3	Common myna	Sturnidae	<i>Acridotheres tristis</i>	NL	LC
4	Cattle egret	Ardeidae	<i>Bubulcus ibis</i>	NL	LC
5	House crow	Corvidae	<i>Corvus splendens</i>	NL	LC
6	Koel	Cucalidae	<i>Eudynamys scolopaceus</i>	Schedule IV	LC
7	Crow Pheasant	Cucalidae	<i>Centropus sinensis</i>	Schedule IV	LC
8	Indian pond heron	Ardeidae	<i>Ardeola grayii</i>	Schedule IV	LC
9	Grey drongo	Dicruridae	<i>Dicrurus leucophaeus</i>	Schedule IV	LC

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

**Table 3.29 Fauna in Buffer Zone**

S. No.	Common Name/English Name	Family Name	Scientific Name	Schedule List Wildlife Protection Act 1972	IUCN Red List Data
<b>INSECTS</b>					
1	Blue tiger	Nymphalidae	<i>Tirumala limniace</i>	Schedule IV	LC
2	Milkweed butterfly	Nymphalidae	<i>Danainae</i>	NL	LC
3	Tawny coster	Nymphalidae	<i>Danaus chrysippus</i>	Schedule IV	LC
4	Indian honey bee	Apidae	<i>Apis cerana</i>	Schedule IV	LC
5	Grasshopper	Acrididae	<i>Hieroglyphus sp</i>	NL	LC
6	Red-veined darter	Libellulidae	<i>Sympetrum fonscolombii</i>	NL	LC
7	Lime butterfly	Papilionidae	<i>Papilio demoleus</i>	Schedule IV	LC
8	Ant	Formicidae	<i>Camponotus Vicinus</i>	NL	NL
9	Dragonfly	Gomphidae	<i>Ceratogomphus pictus</i>	Schedule IV	LC
10	Common Tiger	Nymphalidae	<i>Danaus genutia</i>	Schedule IV	LC
11	Common Indian crow	Nymphalidae	<i>Euploea core</i>	Schedule IV	LC
12	Praying mantis	Mantidae	<i>mantis religiosa</i>	NL	NL
13	Striped tiger	Nymphalidae	<i>Danaus plexippus</i>	Schedule IV	LC
14	Lesser grass blue	Lycaenidae	<i>Zizina otis indica</i>	Schedule IV	LC
15	Jewel beetle	Buprestidae	<i>Eurythyrea austriaca</i>	Schedule IV	NA
<b>REPTILES</b>					
16	Garden lizard	Agamidae	<i>Calotes versicolor</i>	NL	LC
17	Common house gecko	Gekkonidae	<i>Hemidactylus frenatus</i>	NL	LC

18	Indian chameleon	Chamaeleonidae	<i>Chamaeleo zeylanicus</i>	Sch II (Part I)	LC
19	Olive keelback water snake	Natricidae	<i>Atretium schistosum</i>	Sch II (Part II)	LC
20	Brahminy skink	Scincidae	<i>Eutropis carinata</i>	NL	LC
21	Rat snake	Colubridae	<i>Ptyas mucosa</i>	Sch II (Part II)	LC
22	Common skink	Scincidae	<i>Mabuya carinatus</i>	NL	LC
<b>MAMMALS</b>					
23	Indian palm squirrel	Sciuridae	<i>Funambulus palmarum</i>	Schedule IV	LC
24	Indian hare	Leporidae	<i>Lepus nigricollis</i>	Schedule IV	LC
25	Indian Field Mouse	Muridae	<i>Mus booduga</i>	Schedule IV	LC
26	Asian Small Mongoose	Herpestidae	<i>Herpestes javanicus</i>	Schedule (Part II)	LC
<b>AVES</b>					
27	Indian pond heron	Ardeidae	<i>Ardeola grayii</i>	Schedule IV	LC
28	Black drongo	Dicruridae	<i>Dicrurus macrocercus</i>	Schedule IV	LC
29	Asian green bee-eater	Meropidae	<i>Merops orientalis</i>	NL	LC
30	Red-breasted parakeet	Psittaculidae	<i>Psittacula alexandri</i>	NL	LC
31	Common Coot	Rallidae	<i>Fulica atra</i>	Schedule IV	LC
32	Common myna	Sturnidae	<i>Acridotheres tristis</i>	NL	LC
33	Shikra	Accipitridae	<i>Accipiter badius</i>	NL	LC
34	Koel	Cuculidae	<i>Eudynamis</i>	Schedule IV	LC
35	Common Quail	Phasianidae	<i>Coturnix coturnix</i>	Schedule IV	LC
36	Red-vented Bulbul	Pycnonotidae	<i>Pycnonotus cafer</i>	Schedule IV	LC
37	Brahminy starling	Sturnidae	<i>Sturnia pagodarum</i>	Schedule IV	LC
38	golden oriole	Oriolidae	<i>Oriolus kundoo</i>	Schedule IV	LC
39	Rose-ringed parakeet	Psittaculidae	<i>Psittacula kramera</i>	NL	LC
40	Common quail	Phasianidae	<i>Coturnix coturnix</i>	Schedule IV	LC
41	White-breasted waterhen	Rallidae	<i>Amaurornis phoenicurus</i>	NL	LC
42	Two-tailed Sparrow	Dicruridae	<i>Dicrurus macrocercus</i>	Schedule IV	LC
43	Grey Francolin	Phasianidae	<i>Francolinus pondicerianus</i>	Schedule IV	LC
44	House crow	Corvidae	<i>Corvus splendens</i>	NL	LC
<b>AMPHIBIANS</b>					
45	Indian Burrowing frog	Dicroglossidae	<i>Sphaerotheca breviceps</i>	Schedule IV	LC
46	Green Pond Frog	Ranidae	<i>Rana hexadactyla</i>	Schedule IV	LC
47	Tiger Frog	Chordata	<i>Hoplobatrachus tigerinus (Rana tigerina)</i>	Schedule IV	LC

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

### 3.5.3 Agriculture & Horticulture in Karur district:

The principal crops of the district are paddy, millets, pulses, oilseeds, sugarcane and banana. The major paddy area is in Kulithalai and Krishnarayapuram taluks. Pulses are grown in rice fallow areas. In uplands millets like sorghum, pearl millet pulses such as red gram, horse gram oilseeds such as groundnut, gingelly and sunflower are grown both under irrigated and rain fed conditions.

#### **Major Agricultural Crops 1km radius**

Major horticulture crops cultivated in this district are vegetables crops like tomato, brinjal, chillies, onion and turmeric. Details of major field crops and horticulture in 1km radius is given in Table. 3.30.

**Table 3.30 Major Crops in 1km radius**

S. No	Major crops	Scientific name	Families
1	Sorghum	<i>Sorghum bicolor</i>	Poaceae
2	Gingelly	<i>Sesamum indicum</i>	Pedaliaceae
3	Groundnut	<i>Arachis hypogaea</i>	Legumes
4	Sugarcane	<i>Saccharum officinarum</i>	Poaceae
5	Millets	<i>Panicum miliaceum L</i>	Poaceae
6	Sesame	<i>Sesamum indicum</i>	Pedaliaceae
7	Cotton	<i>Gossypium herbaceum</i>	Malvaceae

#### **Major Horticulture Crops 1km radius**

Horticulture includes cultivation of fruits, vegetables, nuts, seeds, herbs, sprouts, mushrooms, algae, flowers, seaweeds and non-food crops such as grass and ornamental trees and plants. It also includes plant conservation, landscape restoration, landscape and garden design.

#### **Horticulture 1km radius**

Major horticulture crops cultivated in Karur district are fruit crops like mango, banana, Sapota and guava, vegetables like tomato, brinjal, Veandai, chillies, onion and tapioca, spices like turmeric. Details of major field crops and horticulture cultivation in 1km radius is given in Table 3.31.

**Table 3.31 Major Field Crops & Horticulture cultivation in 1km radius.**

S. No	Common Name	Scientific Name	Family
<b>Major Horticultural Crops</b>			
1	Guava	<i>Psidium guajava</i>	Myrtaceae
2	Sapota	<i>Manilkara zapota</i>	Sapotaceae
3	Lemon	<i>Citrus × limon</i>	Rutaceae
4	Papaya	<i>Carica papaya</i>	Caricaceae
<b>Vegetables</b>			
5	Onion	<i>Allium cepa</i>	Amaryllidaceae
6	Tapioca	<i>Manihot esculenta</i>	Spurges

7	Brinjal	<i>Solanum melongena</i>	Nightshade
8	Tomato	<i>Solanum lycopersicum</i>	Nightshade
9	Bottle Gourd	<i>Lagenaria siceraria</i>	Cucurbits
10	Veandai kai	<i>Abelmoschus esculentus</i>	Mallows
11	Moringa	<i>Moringa oleifera</i>	Moringaceae

### **Results**

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. The study found that there is no endemic, endangered migratory fauna found in the area. This area is not also a migratory path of any faunal species. Hence, this small mining operation over short period of time will not have any significant impact on the surrounding flora and fauna.

## **3.6 SOCIO ECONOMICS ENVIRONMENT**

### **3.6.0 Introduction**

An essential part of environmental study is socio-economic environment incorporating various facts related to socio-economic conditions in the area, which deals with the total environment. Socio economic study includes demographic structure of the area, provision of basic amenities viz., housing, education, health and medical services, occupation, water supply, sanitation, communication, transportation, prevailing diseases pattern as well as feature of aesthetic significance such as temples, historical monuments etc. at the baseline level. This would help in visualizing and predicting the possible impact depending upon the nature and magnitude of the project. Socio-economic study of an area provides a good opportunity to assess the socio-economic condition and possibly makes a change in living and social standards of the particular area benefitted due to the project.

### **3.6.1 Objectives of the Study**

The main objectives of the study are as follows:

- ❖ To know the current socio-economic condition in the region to cover the sub sectors education, health, sanitation, and water & food security.
- ❖ To recommend practical strategic interventions in the sector.
- ❖ To help in providing better living standards.
- ❖ To understand skill sets and plan for employment opportunities which shall be created.

### 3.6.2 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

### 3.6.3 Socio-Economic Status of Study area

The study area covers 10 villages including Karvazhi, Ichipalayam, Monjanur (West), Murungiyampalayam, Mangalapatti, Vadivullamangalam, Vallipuram, Kollankoil (TP), Muthur (TP) and Sivagiri (TP). As Anjur is the village in which the proposed project site is located, the summary of population facts for the village is exclusively provided in Table 3.32 and for other 10 villages in Tables 3.33 - 3.35.

**Table 3.32 Anjur Village Population Facts**

<b>Anjur Village</b>	
Number of Households	935
Population	3144
Male Population	1553
Female Population	1591
Children Population	230
Sex-ratio	1024
Literacy	1933
Male Literacy	1141
Female Literacy	792
Scheduled Tribes (ST) %	0
Scheduled Caste (SC) %	771
Total Workers	2067
Main Worker	835
Marginal Worker	7

**Table 3.33 Population and Literacy Data of Study Area**

Village	No of Households	Total Population Person	Total Population Male	Total Population Female	Literates Population Person	Literates Population Male	Literates Population Female	Illiterate Persons	Illiterate Male	Illiterate Female
Karvazhi	427	1319	676	643	823	508	315	496	168	328
Ichipalayam	1682	5615	2770	2845	3733	2114	1619	1882	656	1226
Monjanur (West)	451	1348	662	686	815	482	333	533	180	353
Mangalapatti	1058	3512	1734	1778	2177	1225	952	1335	509	826
Murungiyampalayam	267	826	412	414	545	308	237	281	104	177
Vadivullamangalam	218	663	325	338	397	232	165	266	93	173
Vallipuram	358	1141	563	578	744	421	323	397	142	255
Kollankoil (TP)	2833	9196	4617	4579	6098	3428	2670	3098	1189	1909
Muthur (TP)	3948	13212	6588	6624	8621	3789	4832	4591	2835	1756
Sivagiri (TP)	6796	23040	11641	11399	14535	8206	6329	8630	3413	5217

**Table 3.34 Details on Educational Facilities, Water, and Drainage & Health Facilities**

Village	Private Primary School (Numbers)	Govt. Vocational Training	Primary Health Centre (Numbers)	Tap Water Untreated	River/Canal	Is the Area Covered under Total	Telephone (landlines)	Public Bus Service	Gravel (kutchu) Roads	Commercial Bank	Agricultural Credit Societies	Self - Help Group (SHG)	Nutritional Centres- Anganwadi	Community Centre with/without	Power Supply For Domestic Use
Karvazhi	0	2	1	1	2	2	1	1	1	1	1	1	1	1	1
Mangalapatti	0	2	0	1	2	1	1	1	1	2	1	1	1	1	1
Ichipalayam	0	2	1	1	2	2	1	1	1	1	2	1	1	1	1
Monjanur (West)	0	2	0	2	2	1	1	1	1	2	1	1	1	2	1
Murungiyampalayam	0	2	0	1	1	2	1	2	1	2	2	1	1	2	1
Vadivullamangalam	0	2	0	1	2	2	1	2	1	2	2	1	1	2	1
Vallipuram	0	2	0	1	2	1	1	2	2	2	2	1	1	1	1

**Table 3.35 Workers' Profile of Study Area**

<b>Village</b>	<b>Total Worker Population Person</b>	<b>Total Worker Population Male</b>	<b>Total Worker Population Female</b>	<b>Main Working Population Person</b>	<b>Main Working Population Male</b>	<b>Main Working Population Female</b>	<b>Main Cultivator Population Person</b>	<b>Main Agricultural Labourers Population Person</b>	<b>Main Other Workers Population Person</b>	<b>Non-Working Population Person</b>
Karvazhi	974	504	470	711	370	341	363	220	114	345
Mangalapatti	3334	1862	1472	3257	1841	1416	958	1788	477	2281
Ichipalayam	955	512	443	949	511	438	390	405	142	393
Monjanur (West)	2296	1237	1059	1605	921	684	470	721	376	1216
Murungiyampalayam	598	305	293	598	305	293	289	188	47	228
Vadivullamangalam	423	246	177	377	235	142	167	145	60	240
Vallipuram	758	396	362	744	390	354	338	357	43	383
Kollankoil (TP)	5430	3121	2309	1137	687	450	1137	1823	1899	3766
Muthur (TP)	1521	923	598	1303	806	206	489	346	450	1652
Sivagiri (TP)	11498	6793	4705	9219	5729	3490	273	4510	4085	11542

### **3.6.7 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. 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.

### **3.6.8 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.

### **3.7 TRAFFIC DENSITY**

The traffic survey conducted based on the transportation route of material, the Rough Stone and gravel is proposed to be transported mainly through Village Road and Muthur – Kodumudi (SH-189) and Erode to Vellakovil (SH-381A) as shown in Table 3.35 and in Figure 3.27. 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. Direction for counting the traffic. At the end of each hour, fresh counting and recording was undertaken.



**Table 3.36 Traffic Survey Locations**

Station Code	Road Name	Distance and Direction	Type of Road
TS1	Village Road	0.15 Km-E	Village Road
TS2	SH-189 Muthur – Kodumudi	0.92 Km-N	Muthur – Kodumudi (SH-189)
TS3	NH – 381 A Erode - Vellakoil	5.53 Km-W	Erode toVellakovil (SH-381A)

Source: On-site monitoring by GTMS FAE & TM

**Table 3.37 Existing Traffic Volume**

Station code	HMV		LMV		2/3 Wheelers		Total PCU
	No	PCU	No	PCU	No	PCU	
TS1	45	135	54	54	89	45	234
TS2	104	285	60	60	96	48	393
TS3	120	360	67	67	131	66	493

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 3.38 Rough Stone Transportation Requirement**

Transportation of Rough Stone Per day		
Capacity of trucks	No. of Trips per day	Volume in PCU
15 tonnes	34	102

Source: Approved Mining Plan

**Table 3.39 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
Village Road	234	102	336	1200
Kangayam to Kodumudi (SH-189)	393	102	495	1200
Erode toVellakovil (SH-381A)	493	102	595	1200

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

- Due to these projects the existing traffic volume will not exceed the traffic limit. 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

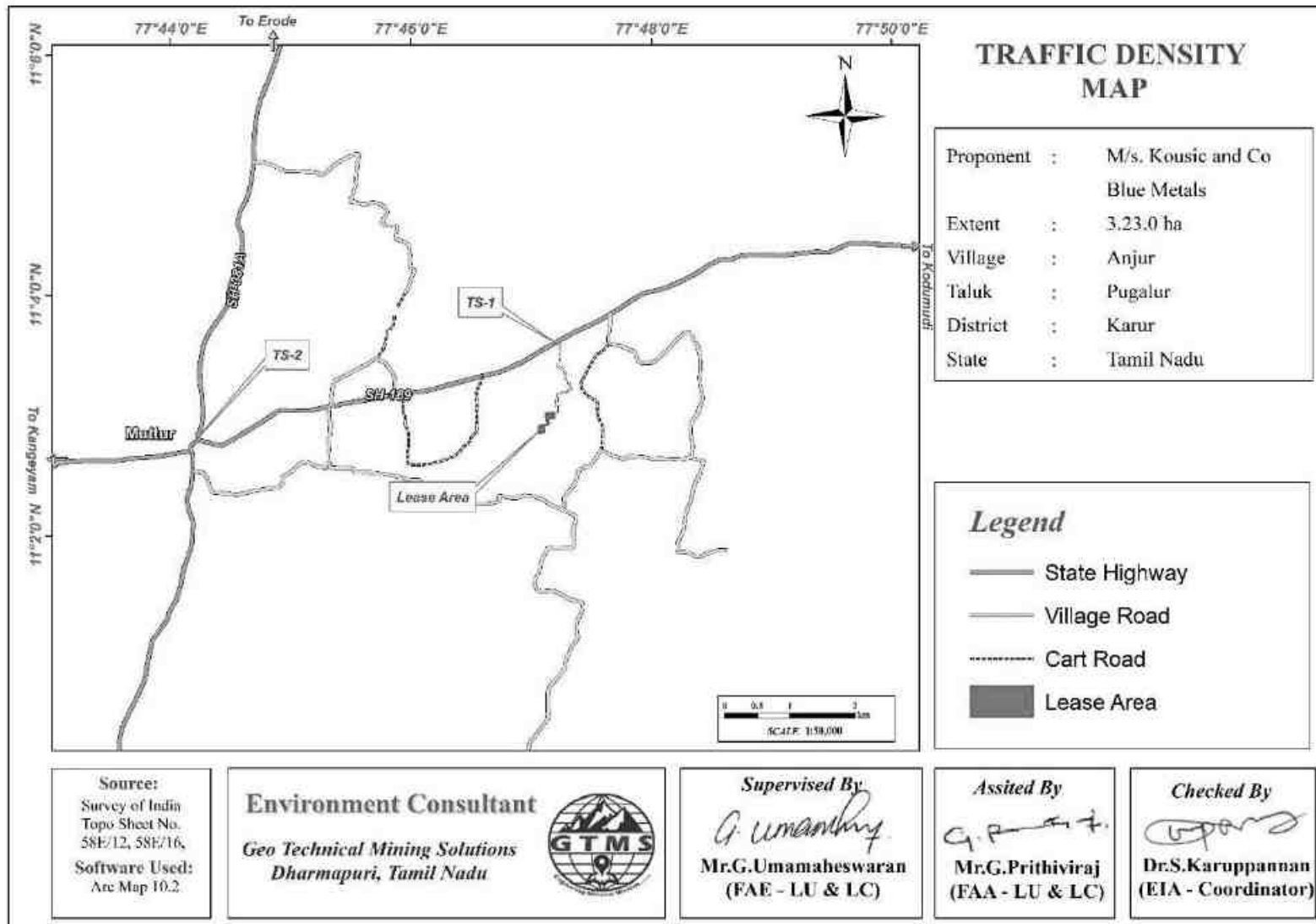


Figure 3.27 Traffic Density Map

### 3.8 SITE SPECIFIC FEATURES

There are no Wildlife Sanctuaries, Reserve Forest and National Park within 10 km radius. Therefore, there will be no need of acquisition/diversion of forest land. The details related to the environmentally sensitive areas around the proposed mine lease area i.e., 10 km radius and the nearby water bodies are given in the Table 3.40.

**Table 3.40 Details of Environmentally Sensitive Ecological Features in the Study Area**

S. No.	Sensitive Ecological Features	Name	Areal Distance in km
1	National Park / Wild life Sanctuaries	None	Nil within 10 km radius
		None	Nil within 10 km radius
2	Reserve Forest	Arachalur R.F	15.75km NW
		Chennimalai R.F	23.77km NW
3	Lakes/Reservoirs/ Dams/Streams/Rivers	Cauvary River	11.65km NE
		Noyyal River	1.39 km North
		Amaravathi River	17.71 km South
		Aathupalayam Dam	2.70 km SE
4	Tiger Reserve/Elephant Reserve/ Biosphere Reserve	None	Nil within 10 km radius
5	Densely Polluted Areas	None	Nil within 10 km radius
6	Mangroves	None	Nil within 10 km radius
7	Mountains/Hills	None	Nil within 10 km radius
8	Centrally Protected Archaeological Sites	None	Nil within 10 km radius
9	Industries/ Thermal Power Plants	None	Nil within 10 km radius
10	Defence Installation	None	Nil within 10 km radius

Source: Survey of India Toposheet







Figure 3.28 Field Study Photographs

## CHAPTER IV

### ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

#### 4.0 GENERAL

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. This chapter discusses the anticipated impacts on soil, land, water, air, noise, biological, and socioeconomic environments.

#### 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 mitigate measures like phase wise development of greenbelt etc.
- ❖ Construction of garland drains all around the quarry pits and construction of check dam at strategic location in lower elevations to prevent erosion due to surface runoff during rainfall and also to collect the storm water for various uses within the proposed area.
- ❖ Green belt development along the boundary within safety zone. The small quantity of water stored in the mined-out pit will be used for greenbelt
- ❖ Thick plantation will be carried out on unutilized area, top benches of mined out pits, on safety barrier, etc.,
- ❖ At conceptual stage, the land use pattern of the quarry will be changed into Greenbelt area and temporary reservoir.

- ❖ In terms of aesthetics, natural vegetation surrounding the quarry will be retained (such as in a buffer area i.e., 7.5 m safety barrier and other safety provided) so as to help 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**

### **4.2.1 Anticipated Impact on Soil Environment**

Following impacts are anticipated due to mining operations:

- Removal of protective vegetation cover
- 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.

## **4.3 WATER ENVIRONMENT**

### **4.3.1 Anticipated Impact**

- ❖ Surface and ground water resources may be contaminated due to pit water discharge, domestic sewage, discharge of oil and grease bearing waste water from washing of vehicles and machineries, and washouts from surface exposure or working areas
- ❖ As the proposed project acquires 4.75KLD of water from water vendors, it will not extract water by developing abstraction structures in the lease area. Therefore, the project will not have impact on depletion of aquifer beneath the lease area.



### **4.3.2 Common Mitigation Measures for the Proposed Project**

- ❖ Rain water from mine pit will be treated in settling tanks before being used for dust suppression and tree plantation purposes
- ❖ Domestic sewage from site office will be discharged in septic tank and then directed to soak pits
- ❖ Water from the tipper wash-down facility and machinery maintenance yard will be passed through interceptor traps/oil separators prior to its reuse
- ❖ 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
- ❖ Periodic (every 6 month once) analysis of ground water quality of quarry pit water and ground water of nearby villages will be conducted
- ❖ Artificial recharge structures will be established in suitable locations as part of the rainwater harvesting management program.

## **4.4 AIR ENVIRONMENT**

### **4.4.1 Anticipated Impact from proposed project**

- ❖ During mining at various stages of activities such as excavation, drilling and transportation of materials, particular matter ( $PM_{10}$  and  $PM_{2.5}$ ) 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 Chaulya et al.,2001. The equations used for SPM emission estimation have been given in Table 4.1.

**Table 4.1 Empirical Formula for Emission Rate from Overall Mine**

	<b>Pollutant</b>	<b>Source Type</b>	<b>Empirical Equation</b>	<b>Parameters</b>
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 <sup>3</sup> /yr); a = Lease area(km <sup>2</sup> ); 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. It is important to note that PM<sub>10</sub> emission rate is derived from the SPM estimation in the background that PM<sub>10</sub> constitutes 52% of SPM emission. The PM<sub>2.5</sub> and PM<sub>10</sub> emission results have been given in Table 4.2.

**Table 4.2 Estimated Emission Rate**

<b>Activity</b>	<b>Pollutant</b>	<b>Calculated Value (g/s)</b>	<b>Lease Area in m<sup>2</sup></b>	<b>Calculated Value (g/s/m<sup>2</sup>)</b>
Overall Mine	PM <sub>2.5</sub>	0.186730445	32300	5.78113E-06
Overall Mine	PM <sub>10</sub>	1.244869632	32300	3.85409E-05

**4.4.2.1 Modelling of Incremental Concentration**

Anticipated incremental concentration and net increase in emissions due to quarrying activities within 500 m 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 4.3-4.6.

**4.4.2.2 Model Results**

The post project resultant concentrations of PM<sub>10</sub> and PM<sub>2.5</sub> (GLC) is given in Tables 4.3-4.4.

**Table 4.3 Incremental & Resultant GLC of PM<sub>2.5</sub>**

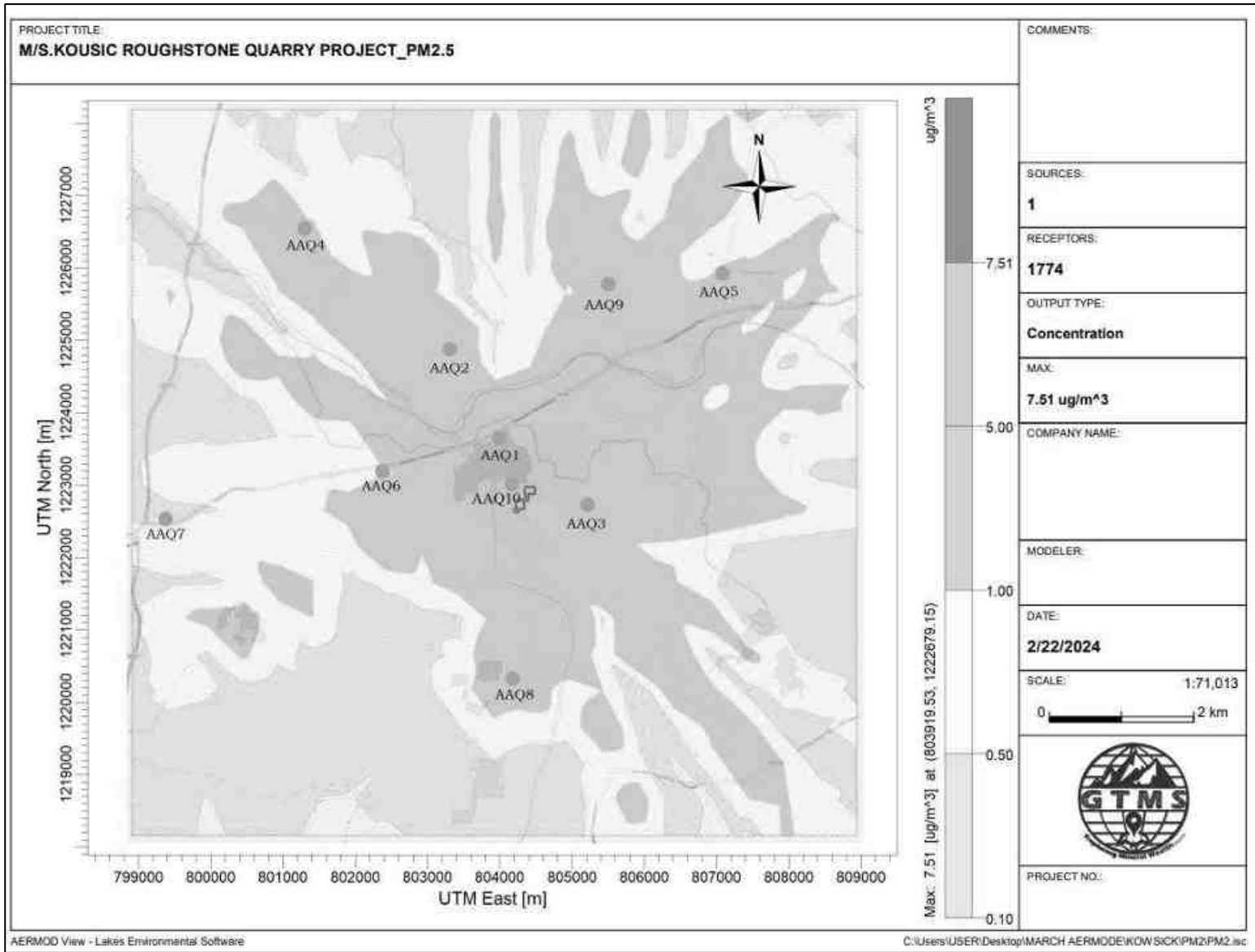
<b>Station ID</b>	<b>Distance to core area (km)</b>	<b>Direction</b>	<b>PM 2.5 concentrations(µg/m<sup>3</sup>)</b>			<b>Comparison against air quality standard</b>	<b>Magnitude of change (%)</b>	<b>Significance</b>
			<b>Baseline</b>	<b>Predicted</b>	<b>Total</b>			
AAQ1	0.76	NNW	25.0	1	26	Below standard	4.00	Not significant
AAQ2	2.16	NNW	21.6	1	22.6		4.63	
AAQ3	0.81	E	18.8	1	19.8		5.32	

AAQ4	4.69	NW	16.9	1	17.9		5.92	
AAQ5	3.92	NE	19.3	1	20.3		5.18	
AAQ6	1.90	WNW	21.0	1	22		4.76	
AAQ7	4.86	W	23.0	0.1	23.1		0.43	
AAQ8	2.31	S	17.9	1	18.9		5.59	
AAQ9	2.98	NE	18.5	1	19.5		5.41	
AAQ10	0.12	W	23.5	7.51	31.01		31.96	

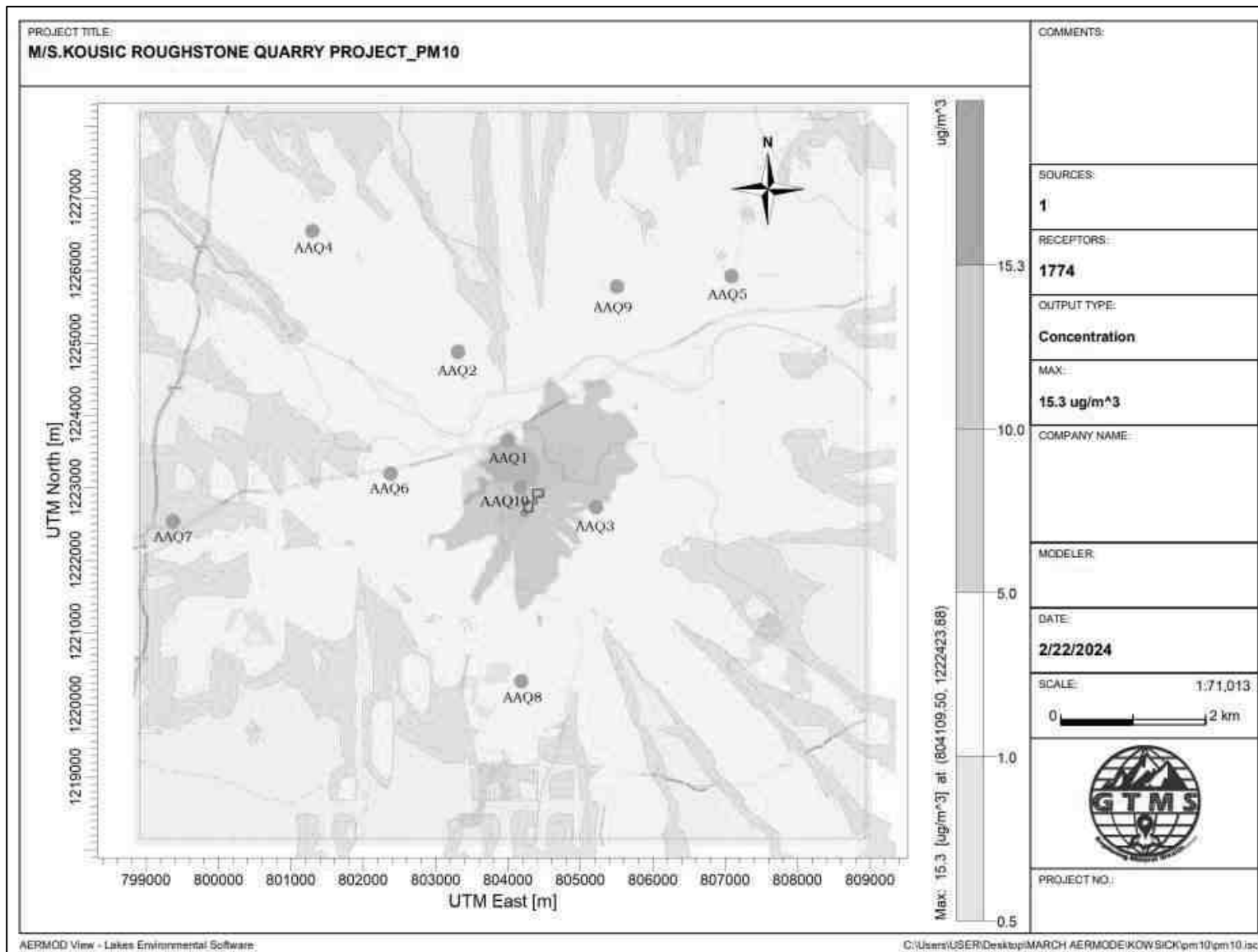
**Table 4.4 Incremental & Resultant GLC of PM<sub>10</sub>**

Station ID	Distance to core area (km)	Direction	PM <sub>10</sub> concentrations(µg/m <sup>3</sup> )			Comparison against air quality standard (100 µg/m <sup>3</sup> )	Magnitude of change (%)	Significance
			Baseline	Predicted	Total			
AAQ1	0.76	NNW	45.2	1	46.2	Below standard	2.21	Not significant
AAQ2	2.16	NNW	37.5	1	38.5		2.67	
AAQ3	0.81	E	33.1	1	34.1		3.02	
AAQ4	4.69	NW	33.4	1	34.4		2.99	
AAQ5	3.92	NE	37.4	1	38.4		2.67	
AAQ6	1.90	WNW	42.2	1	43.2		2.37	
AAQ7	4.86	W	45.1	0.1	45.2		0.22	
AAQ8	2.31	S	38.3	1	39.3		2.61	
AAQ9	2.98	NE	39.6	1	40.6		2.53	
AAQ10	0.12	W	43.7	15.3	59		35.01	

The values of cumulative concentration i.e., background + incremental concentration of pollutant in all the receptor locations are still within the prescribed NAAQ limits without effective mitigation measures. By adopting suitable mitigation measures, the pollutant levels in the atmosphere can be controlled further.



**Figure 4.1 Predicted Incremental Concentration of PM<sub>2.5</sub>**



**Figure 4.2 Predicted Incremental Concentration of PM<sub>10</sub>**

## 4.5 NOISE ENVIRONMENT

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

For hemispherical sound wave propagation through homogeneous loss free medium, one can estimate noise levels at various locations at different sources using 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

The attenuation due to several factors including ground reflection, atmosphere, wind speed, temperature, trees, and buildings as 35.5 dB (A), the barrier effect. 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, and attenuation factor. Source data has been computed taking into account of all the machinery and activities used in the mining process. Same has been listed in Table 4.7.

**Table 4.7 Activity and Noise Level Produced by Machinery**

S. No.	Machinery / activity	Impact on environment?	Noise produced in dB(A) at 50 ft from source*
1	Blasting	Yes	94
2	Jack hammer	Yes	88
3	Compressor	No	81
4	Excavator	No	85
5	Tipper	No	84
<b>Total</b>			<b>95.8</b>

The total noise to be produced by mining activity is calculated to be 95.8 dB (A). Generally, most mining operations produce noise between 95.8 dB (A).

**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)	Total (dBA)
Sampathkumar Lease	630	42.8	27.97	42.94
Kuppusamy lease	390	43.4	32.14	43.71
Nagappalayam	250	41.2	36.00	42.35
Vellaiyankattu pudur	1050	44.2	23.54	44.24
Ramanathapuram	2150	37.9	17.31	37.94
Pillapalayam	750	39.2	26.46	39.43
Poolavalasu	4680	39.8	10.55	39.81
Nallasellipalayam	3910	39.2	12.12	39.21
Thottiyapalayam	1990	42.2	17.98	42.22
Muthur	4790	45.6	10.35	45.60
Oodayam	2290	36.9	16.76	36.94
Nadupalayam	2970	37.5	14.50	37.52
Nerby core	100	45.8	43.96	47.99
NAAQ Standards	Industrial Day Time - 75 dB (A) & Night Time- 70 dB (A) Residential Day Time -55 dB (A) & Night Time- 45 dB (A)			

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. Therefore, no impact is anticipated on the noise environment due to the project

#### 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
- ❖ Greenbelt/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 kutcha houses are more prone to cracks and damage due to the vibrations induced by blasting whereas RCC framed structures can withstand more ground vibrations. Apart from this, the ground vibrations may develop a fear factor in the nearby settlements.

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

The empirical equation for assessment of peak particle velocity (PPV) is 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	Fly rock distance in m	Air Blast	
					Pressure (kPa)	Sound Level (dB)
P1	19.8	250	0.79	19	0.16	138

**Table 4.10 Predicted PPV Values due to Blasting at 100-500 m radius**

Location ID	Maximum Charge in kgs	Radial Distance in m	PPV in mm/s	Fly rock distance in m	Air Blast	
					Pressure (kPa)	Sound Level (dB)
P1	19.8	100	3.43	19	0.47	17
		200	1.13		0.21	140
		300	0.59		0.13	136
		400	0.37		0.09	133
		500	0.26		0.07	131

#### 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, 2<sup>nd</sup> Class Mines Manager/ 1<sup>st</sup> 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 Impact on Ecology and Biodiversity**

- There shall be negligible air emissions or effluents from the project site. During loading the truck, dust generation will be likely. This shall be a temporary effect and not anticipated to affect the surrounding vegetation significantly
- Most of the land in the buffer area is undulating terrain with crop lands, grass patches and small shrubs. Hence, there will be no effect on flora of the region.
- Carbon released from quarrying machineries and tippers during quarrying would be 2337 kg per day, 631059 kg per year and 3155293 kg over five years, as provided in Table 4.11.

**Table 4.11 Carbon Released During Five Years of Rough Stone and Gravel Production**

	<b>Per day</b>	<b>Per year</b>	<b>Per five years</b>
Fuel consumption of excavator	166	44764	223821
Fuel consumption of compressor	20	5400	27000
Fuel consumption of tipper	686	185305	926527
Total fuel consumption in liters	872	235470	1177348
Co <sub>2</sub> emission in kg	2337	631059	3155293

##### **4.6.2 Mitigation Measures on Flora**

- ❖ During conceptual stage, the top bench will be re-vegetated by planting local /native species and lower benches will be converted into rainwater harvesting structure following completion of mining activities, which will replace habitat resources for fauna species in this locality over a longer time.
- ❖ Existing roads will be used; new roads will not be constructed to reduce impact on flora.

### Carbon Sequestration

- ❖ To mitigate carbon emission due to mining activities, we recommend planting trees around the quarry to offset the carbon emission during quarrying. A tree can sequester 38721 kg of carbon per year. Therefore, we recommend planting large number of trees around the quarry and near school campuses, government wasteland, roadsides etc.
- ❖ As per the greenbelt development plan as recommended by SEAC (Table 4.13), about 1615 trees will be planted within three months from the beginning of mining. These trees, when grown up would sequester carbon of about 193606 kg of the total carbon, as provided in Table 4.12.

**Table 4.12 CO<sub>2</sub> Sequestration**

CO <sub>2</sub> sequestration in kg	143	38721	193606
Remaining CO <sub>2</sub> not sequestered in kg	2194	592337	2961687
Trees required for environmental compensation	24681		
Area required for environmental compensation in hectares	49		

**Table 4.13 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 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	Nettilling	Tree	
4	<i>Albizia lebbek</i>	Fabaceae	Vagai	Tree	
5	<i>Delonix regia</i>	Fabaceae	Cemmayir-konrai	Tree	
6	<i>Bauhinia racemose</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 4.14 Greenbelt Development Plan**

	No. of trees proposed for plantation	No. of trees expected to survive @ 80%	Area to be covered(m <sup>2</sup> )
Plantation in the construction phase (3 months)	Number of plants inside the mine lease area		
	646	517	5814
	Number of plants outside the mine lease area		
	969	775	8721
<b>Total</b>	<b>1615</b>	<b>1292</b>	<b>14535</b>

**Table 4.15 Budget for Greenbelt Development Plan**

Activity	Plantation in the construction phase(3Months)	Cost	Capital Cost (Rs.)	Recurring Cost-per annum
Plantation inside the mine lease area (in safety margins)	646	Site clearance, preparation of land, digging of pits / trenches, soil amendments, transplantation of saplings @ 200 per plant (capital) for plantation inside the lease area and @ 30 per plant maintenance (recurring))"	129200	19380
Plantation outside the area	969	Avenue Plantation @ 300 per plant (capital) for plantation outside the lease area and @ 30 per plant maintenance (recurring)	290700	29070
<b>Total</b>			<b>4,19,900</b>	<b>48,450</b>

Source: EMP budget

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

### **4.6.3. Anticipated Impact on Fauna**

- ❖ Direct impact is anticipated on fauna of core zone
- ❖ Insignificant impact is anticipated on fauna in the buffer area due to air emissions, noise, vibration, transportation, waste water discharges, and changes in land use

### **4.6.4 Mitigation Measures on Fauna**

- ❖ Fencing will be constructed around the proposed mine lease area to restrict the entry of stray animals
- ❖ The workers shall be trained not to harm any wildlife near the project site

### **4.6.5 Impact on agriculture and horticulture crops in 1km Radius**

- ❖ Problems to agricultural and horticulture land due to dust caused by movement of heavy vehicles.
- ❖ Soil erosion and sediment deposition in the nearby water bodies due to earthworks during the rainy season.
- ❖ The fugitive dust released from the mining operations may cause effect on the agricultural and horticulture land who are directly exposed to the fugitive dust.
- ❖ Dust from the quarries is likely to affect reproductive systems in nearby agricultural and horticulture lands.
- ❖ Dust from quarries can affect plant growth and reduce vegetable yields.

### **4.6.6 Mitigation Measures on agriculture and horticulture crops.**

- ❖ The main objective of the green belt is to provide a barrier between the source of pollution and the surrounding areas. In order to compensate the loss of vegetation cover, it is suggested to carry out afforestation program mainly inside and outside of the lease area in different phases.
- ❖ It is a granite quarry, no explosives are used, there is no possibility of vibration and dust, thus there is no possibility of damage to the adjacent agricultural land.
- ❖ Quarry approach roads are sprayed with water 3 times a day to control dust. Thus, the damage to the nearby farmlands is controlled.
- ❖ A green belt will be created in 7.5 safety zone around the quarry to contain the dust from the quarry and prevent the dust from spreading to the adjacent agricultural land.
- ❖ 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.

### ***Aquatic Biodiversity***

Mining activities will not disturb the existing aquatic ecology as there is no effluent discharge proposed from the rough stone and gravel quarry. There is no natural perennial surface water body within the mine lease area. Hence, aquatic biodiversity is not observed in the mine lease area.

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

#### **4.8.4 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, Spirometric tests
- ❖ Periodic medical examination – yearly
- ❖ Lung function test – yearly, those who are exposed to dust
- ❖ Eye test

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

#### **4.9 MINE WASTE MANAGEMENT**

No waste is anticipated from any of the proposed quarries.

#### **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, 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.
- ❖ Where it is desirable to get a quick growth response from the native flora during those times when moisture is not a limiting factor. For example, 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**

### **ANALYSIS OF ALTERNATIVES (TECHNOLOGY AND SITE)**

#### **5.0 INTRODUCTION**

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

#### **5.1 FACTORS BEHIND THE SELECTION OF PROJECT SITE**

The proposed project is site specific and has the following advantages:

- ❖ The mineral deposit occurs in a non-forest area.
- ❖ There is no habitation within the project area; hence no R & R issues exist.
- ❖ There is no river, stream, nallah and water bodies in the applied mine lease area.
- ❖ Availability of skilled, semi-skilled and unskilled workers in this region.
- ❖ All the basic amenities such as medical, 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.
- ❖ As the proposed project 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**

Manual open cast mining method with secondary blasting will be applied to extract rough stone and gravel in the area. The proposed mining lease areas have following advantages:

- ❖ As the mineral deposition is homogeneous and batholith formation, opencast method of working is preferred over underground method.
- ❖ The material will be loaded with the help of excavators into tractors/tippers and transported to the need by customers.
- ❖ Semi-skilled labours fit for quarrying operations are easily available around the nearby villages.

#### **5.4 ANALYSIS OF ALTERNATIVE TECHNOLOGY**

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

## **CHAPTER 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:

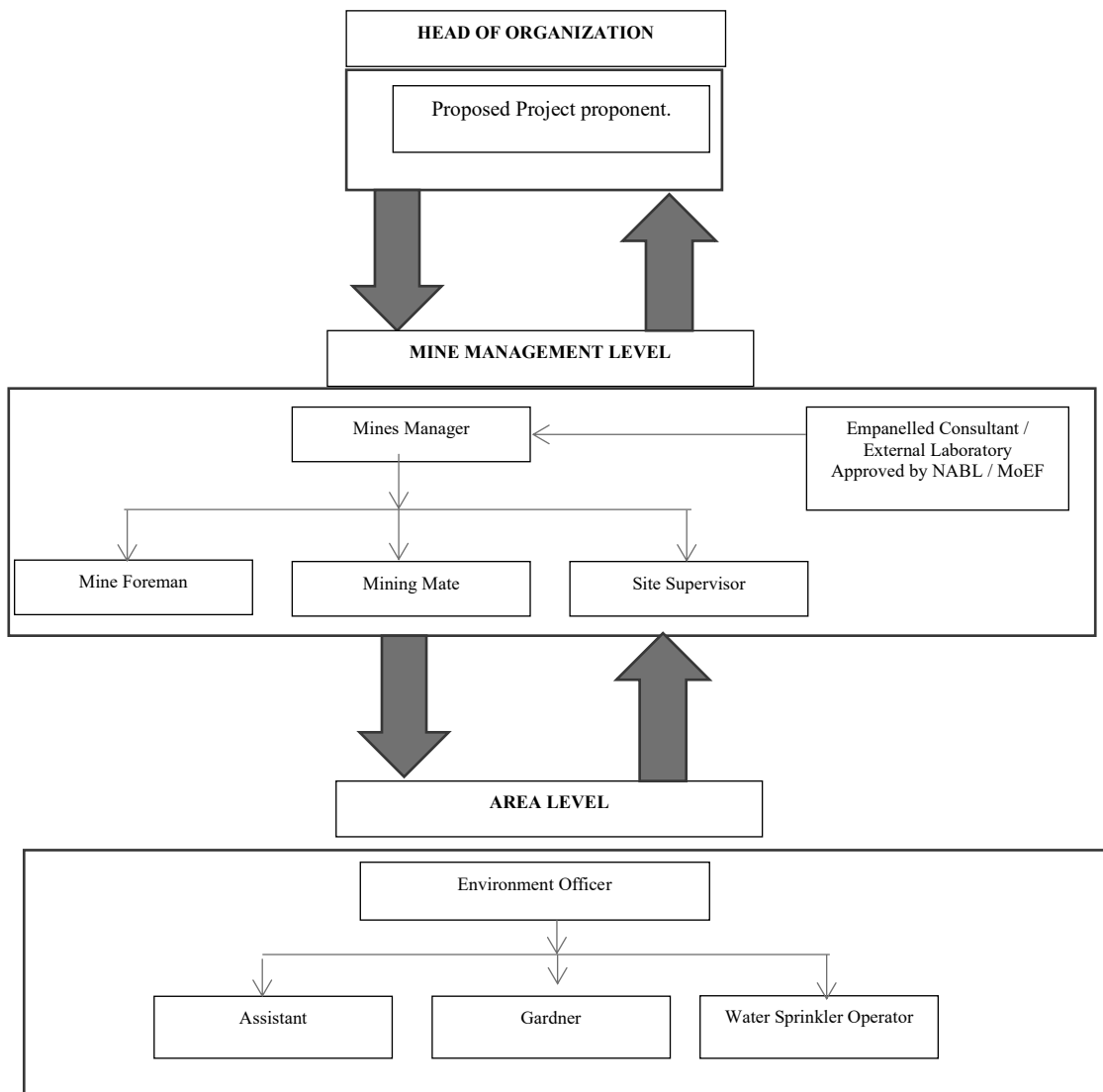
- ❖ Implementation of pollution control measures
- ❖ Monitoring programme implementation
- ❖ Post-plantation care
- ❖ To check the efficiency of pollution control measures taken
- ❖ Any other activity as may be related to environment

- ❖ 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 the 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). The Environmental Monitoring Cell will be formed for the proposed project. The structure of the cell will be 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 proposed monitoring schedule have been provided 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 <sub>2.5</sub> , PM <sub>10</sub> , SO <sub>2</sub> and NO <sub>x</sub> .
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 m 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 ENVIRONMENT MONITORING PROGRAM

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 recurring cost for Environmental Monitoring Programme is Rs 2,95,000 /- per annum for the proposed project site.

**Table 6.3 Environment Monitoring Budget**

S. No.	Parameter	Capital Cost	Recurring Cost per annum
1	Air Quality	-	Rs 60,000/-
2	Meteorology	-	Rs 15,000/-
3	Water Quality	-	Rs 20,000/-
4	Water Level Monitoring		Rs 10,000/-
5	Soil Quality	-	Rs 20,000/-
6	Noise Quality	-	Rs 10,000/-
7	Vibration Study	-	Rs 1,50,000/-
8	Greenbelt	-	Rs 10,000/-
<b>Total</b>		-	<b>Rs 2,95,000 /-</b>

Source: Field Data

#### 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**

Additional studies deal with:

- ❖ Public Consultation for Proposed Project
- ❖ Risk Assessment
- ❖ Disaster Management Plan
- ❖ Cumulative Impact Study
- ❖ Plastic Waste Management

#### **7.1 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 was made and the public opinions on the proposed project will be updated in the final EIA/EMP report.

#### **7.2 RISK ASSESSMENT FOR PROPOSED PROJECT**

Risk Assessment is all about prevention of accidents and to take necessary steps to prevent it from happening. The methodology for the risk assessment is based on the specific risk assessment guidance issued by the Directorate General of Mine Safety (DGMS), Dhanbad, vide circular No.13 of 2002, dated 31<sup>st</sup> 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.

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 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	<ul style="list-style-type: none"> <li>✓ 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.</li> <li>✓ Workers will be sent to the Training in the nearby Group Vocational Training Centre Entry of unauthorized persons will be prohibited.</li> <li>✓ Fire-fighting and first-aid provisions in the mine office complex and mining area.</li> <li>✓ 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.</li> <li>✓ Working of quarry, as per approved plans and regularly updating the mine plans.</li> <li>✓ Cleaning of mine faces on daily basis shall be daily done in order to avoid any overhang or undercut.</li> <li>✓ Handling of explosives, charging and firing shall be carried out by competent persons only under the supervision of a Mine Manager.</li> <li>✓ Maintenance and testing of all mining equipment as per manufacturer's guidelines.</li> </ul>
2	Drilling	Improper and unsafe practices; Due to high pressure of compressed air, hoses may burst; Drill Rod may break;	<ul style="list-style-type: none"> <li>✓ Safe operating procedure established for drilling (SOP) will be strictly followed.</li> <li>✓ Only trained operators will be deployed.</li> <li>✓ 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,</li> <li>✓ Drilling shall not be carried on simultaneously on the benches at places directly one above the other.</li> </ul>

			<ul style="list-style-type: none"> <li>✓ Periodical preventive maintenance and replacement of worn-out accessories in the compressor and drill equipment as per operator manual.</li> <li>✓ All drills unit shall be provided with wet drilling shall be maintained in efficient working in condition.</li> <li>✓ Operator shall regularly use all the personal protective equipment.</li> </ul>
3	Transportation	<p>Potential hazards and unsafe workings contributing to accident and injuries</p> <p>Overloading of material</p> <p>While reversal &amp; overtaking of vehicle</p> <p>Operator of truck leaving his cabin when it is loaded.</p>	<ul style="list-style-type: none"> <li>✓ 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.</li> <li>✓ Not allow any unauthorized person to ride on the vehicle nor allow any unauthorized person to operate the vehicle.</li> <li>✓ Concave mirrors should be kept at all corners</li> <li>✓ All vehicles should be fitted with reverse horn with one spotter at every tipping point</li> <li>✓ Loading according to the vehicle capacity</li> <li>✓ Periodical maintenance of vehicles as per operator manual</li> </ul>
4	Natural calamities	Unexpected happenings	<ul style="list-style-type: none"> <li>✓ Escape Routes will be provided to prevent inundation of storm water</li> <li>✓ Fire Extinguishers &amp; Sand buckets</li> </ul>
5	Failure of Mine Benches and Pit Slope	Slope geometry, Geological structure	<ul style="list-style-type: none"> <li>✓ Ultimate or over all pit slope shall be below 60° and each bench height shall be 5m.</li> </ul>

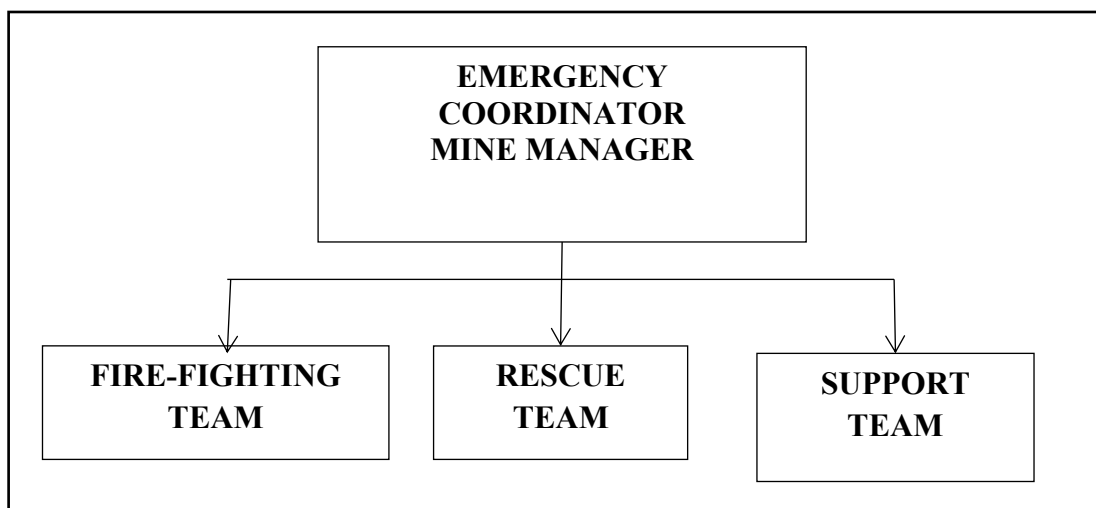
*Source: Analysed and proposed by FAE & EC*

### 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. Structure of the team has been shown in Figure 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.

### 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 MECR with members of his advisory and communication team and will assume absolute control of the site.
- ❖ He will receive information continuously from incident controller and give decisions and directions to:
  - ❖ Incident controller
  - ❖ Mine control rooms
  - ❖ Emergency security controller

### 7.4 CUMULATIVE IMPACT STUDY

The Cumulative Impact is mainly anticipated due to drilling & blasting and excavation and transportation activities in all the quarries within the cluster and major impact anticipated is on Air & Noise Environment and Ground Vibrations due to blasting. For this cumulative study, 4 proposed projects, known as P1, P2, P3, P4 are taken into consideration. The details of P1 have been given in Table 1.3 and the details of P2, P3, P4 are given in the Table 7.2, 7.3 and 7.4.

**Table 7.2 Salient Features of the Proposed Project P2**

Name of the Quarry	Mr. S. Kuppusamy Rough Stone and Gravel Quarry
Type of Land	Patta Land
Extent	4.82.7 Ha

S.F.No	764/3, 765/3, 766/1, 766/2, 766/3A, 767/1, 767/2A			
Toposheet No	58-E/16			
Location of Project Site	11° 3'2.77"N to 11° 3'13.51"N 77°46'49.20"E to 77°47'0.88"E			
Highest Elevation	190 m AMSL			
Existing Pit Dimensions	Pit Level	Length (m)	Width (m)	Depth (m)
		82	140	16
Ultimate depth of Mining	50 m BGL			
Geological Resources	Rough Stone in m <sup>3</sup>		Gravel in m <sup>3</sup>	
	2616836		37692	
Mineable Reserves	Rough Stone in m <sup>3</sup>		Gravel in m <sup>3</sup>	
	799894		31276	
Proposed reserves for five years	Rough Stone in m <sup>3</sup>		Gravel in m <sup>3</sup> /1 year	
	747425		31276	
Method of Mining	Open-Cast Semi Mechanized mining			
Topography	Flat Topography			
Machinery proposed	Jack Hammer		5	
	Compressor		3	
	Tipper		10	
	Excavator		2	
Blasting Method	The quarrying operation is proposed to carried out by open cost, using jack hammer drilling followed by manual breaking will be adopted to release the rough stone and nonel blasting is proposed in this lease area.			
Proposed Manpower Deployment	29 Nos			
Project Cost	Rs.1,13,87,000/-			
CER Cost	Rs. 5,00,000/-			
Proposed Water Requirement	8.0 KLD			

**Table 7.3 Salient Features of the Proposed Project P3**

Name of the Quarry	Thiru.P.Pazhanisami Rough Stone and Gravel Quarry			
Type of Land	Patta Land			
Extent	4.47.85 Ha			
S.F.No	773/2, 776/3, 777/1, 778/1A (Part) and 807/2C2			
Toposheet No	58-E/16			
Location of Project Site	11° 3'03.27"N to 11°3'13.65"N 77° 47'1.45"N to 77°47'10.37"N			
Highest Elevation	185m AMSL			
Existing Pit Dimensions	Pit Level	Length (m)	Width (m)	Depth (m)
	1	97	21	5
	2	132	193	17
	3	51	78	18
	4	48	114	19
Depth of Mining	50m BGL			
Geological Resources	Rough Stone in m <sup>3</sup>		Top Soil in m <sup>3</sup>	
	1523633		7340	
Mineable Reserves	Rough Stone in m <sup>3</sup>		Gravel in m <sup>3</sup>	
	596924		4068	
Proposed reserves for five years	Rough Stone in m <sup>3</sup>		Top Soil	
	596924		4068	
Method of Mining	Open-Cast Semi Mechanized mining			
Topography	Flat Topography			
Machinery proposed	Jack Hammer		3	
	Compressor		2	
	Tipper		8	
	Excavator		1	
Blasting Method	The quarrying operation is proposed to carried out by open cost, using jack hammer drilling followed by manual breaking will be adopted to			

	release the rough stone and nonel blasting is proposed in this lease area.
Proposed Manpower Deployment	22 Nos
Project Cost	Rs.80,35,000/-
CER Cost	Rs. 5,00,000/-
Proposed Water Requirement	6.0 KLD

**Table 7.4 Salient Features of the Proposed Project P4**

Name of the Quarry	Mr.V.Arunprashath Rough Stone and Gravel Quarry			
Type of Land	Patta Land			
Extent	1.24.0 ha			
S.F.No	767/3			
Toposheet No	58-E/16			
Location of Project Site (Centre Point)	11° 03'05.42"N to 11° 03'10.93"N 77°46'56.76"E 77°46'59.20"E			
Highest Elevation	186AMSL			
Existing Pit Dimensions	Pit Level	Length (m)	Width (m)	Depth (m)
	I	71	61	30
Ultimate depth of Mining	30m BGL			
Geological Resources	Rough Stone in m <sup>3</sup>		Gravel in m <sup>3</sup>	
	1308418		18846	
Mineable Reserves	Rough Stone in m <sup>3</sup>		Gravel in m <sup>3</sup>	
	436139		21256	
Proposed reserves for five years	Rough Stone in m <sup>3</sup>		Gravel in m <sup>3</sup>	
	436139		21256	
Method of Mining	Open-Cast Semi Mechanized mining			
Machinery proposed	Jack Hammer		3	
	Compressor		1	
	Tipper		4	
	Excavator		1	

Blasting Method	The quarrying operation is proposed to carried out by open cost, using jack hammer drilling followed by manual breaking will be adopted to release the rough stone and nonel blasting is proposed in this lease area.
Proposed Manpower Deployment	12Nos
Project Cost	Rs.56,93,500
CER Cost	Rs. 5,00,000
Proposed Water Requirement	3.7KLD

#### 7.4.1 Air Environment

As the production of rough stone and gravel plays a vital role in affecting the air environment. The data on the cumulative production resulting from four proposed project have been given in Tables 7.5 and 7.6.

**Table 7.5 Cumulative Production Load of Rough Stone**

<b>Proposed Production Details</b>				
<b>Quarry</b>	<b>5 Years in m<sup>3</sup></b>	<b>Per Year in m<sup>3</sup></b>	<b>Per Day in m<sup>3</sup></b>	<b>Number of Lorry Load Per Day</b>
P1	277958	55592	206	34
P2	747425	149485	554	92
P3	596924	119384	442	74
P4	436139	87228	323	54
<b>Grand Total</b>	<b>2058446</b>	<b>411689</b>	<b>1525</b>	<b>254</b>

**Table 7.6 Cumulative Production Load of Gravel**

<b>Quarry</b>	<b>Production for 5 Years (m<sup>3</sup>)</b>	<b>Yearly Production (m<sup>3</sup>)</b>	<b>Daily Production (m<sup>3</sup>)</b>	<b>Number of Lorry Loads Per Day</b>
P1	---	---	---	---
P2	31276	6255	23	4
P3	---	---	---	--
P4	21256	4251	16	3
<b>Grand Total</b>	<b>52532</b>	<b>10506</b>	<b>29</b>	<b>7</b>

The cumulative study shows that the overall production of rough stone from the quarry is 1525 m<sup>3</sup> per day with a capacity of 254 trips of rough stone per day and that production of gravel from four proposed quarry is 29 m<sup>3</sup> per day accounting for 7 trips/day.



#### 7.4.1.1 Cumulative Impact of Air Pollutants

The results on the cumulative impact of the four proposed projects on air environment of the cluster have been provided in Table 7.7. The cumulative values resulting from the 4 projects for each pollutant do not exceed the permissible limits set by CPCB.

**Table 7.7 Cumulative Impact Results from the four proposed projects**

Pollutants	Baseline Data ( $\mu\text{g}/\text{m}^3$ )	Incremental Values ( $\mu\text{g}/\text{m}^3$ )				Cumulative Value ( $\mu\text{g}/\text{m}^3$ )
		P1	P2	P3	P4	
PM <sub>2.5</sub>	20.5	7.51	6.42	9.09	4.23	47.75
PM <sub>10</sub>	39.9	15.3	9.6	17.7	8.20	90.7

#### 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.

**Table.7.8 Cumulative Impact of Noise from four Proposed Quarries**

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	250	SSW	41.2	41.2	36.0	<b>55</b>
Habitation Near P2	380	S	41.2	45.5	46.9	
Habitation Near P3	470	SSW	41.2	30.52	41.5	
Habitation Near P4	450	S	41.2	44.1	45.8	
<b>Cumulative Noise (dB (A))</b>					50.2	

*Source: Lab Monitoring Data*

The cumulative analysis of noise due to four proposed projects shows that habitation will receive about 50.2 dB (A) respectively. The cumulative results for all the villages in consideration do not exceed the limit set by CPCB for residential areas for day time.

#### **Ground Vibrations**

Cumulative results of ground vibrations due to mining activities in the all the 4 Quarries have been shown in Table 7.9.

**Table 7.9 Cumulative Effect of Ground Vibrations Resulting from four Quarries**

Location ID	Maximum Charge in kgs	Nearest Habitation in m	PPV in mm/s
P1	19.8	250	0.79
P2	53	380	0.89
P3	42.55	470	0.53
P4	6	450	0.12
<b>Total</b>			<b>2.33</b>

Results from the above tables 7.11 indicate that the cumulative PPV value of each 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.

### 7.4.3 Socio Economic Environment

Socio Economic benefits of the four proposed project were calculated and the results have been shown in Table 7.10 the four quarries together will contribute Rs. 20,00,000/- towards CER fund.

**Table 7.10 Socio Economic Benefits from four Quarries**

Location ID	Project Cost	CER Cost
P1	Rs.83,62,000	Rs. 5,00,000
P2	Rs.1,13,87,000	Rs. 5,00,000
P3	Rs.80,35,000	Rs. 5,00,000
P4	Rs. 56,93,500	Rs. 5,00,000
<b>Grand Total</b>	<b>Rs. 3,34,77,500</b>	<b>Rs. 20,00,000</b>

**Table 7.11 Employment Benefits from four Quarries**

Location ID	Employment
P1	16
P2	29
P3	22
P4	12
<b>Grand Total</b>	<b>79</b>

A total of 79 people will get employment due to four proposed Quarries in cluster

### 7.4.4 Ecological Environment

**Table 7.12 Greenbelt Development Benefits from four Quarries**

Code	Number of Trees proposed	Area to be covered (m <sup>2</sup> )	No. of Trees expected to be grown @ 80% survival rate	Species recommended
P1	1615	14535	517	<i>Azadirachta indica, Albizia lebbeck, Delonix regia, Techtona grandis, etc.,</i>
P2	2414	21722	1931	
P3	2239	20153	1791	
P4	620	5580	496	
<b>Total</b>	<b>6888</b>	<b>61990</b>	<b>4735</b>	

Cumulative studies show that the four proposed Quarries will plant about 6888 native tree species like *Azadirachta indica*, *Albizia lebbeck*, *Delonix regia*, *Tectona grandis*, etc inside and outside the lease area. It is expected that 80 % of trees, i.e., 4735 trees will survive in this green belt development program.

## 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.

A detailed action plan to manage plastic waste has been provided in Table 7.13.

**Table 7.13 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 FAEs and EC

## **CHAPTER VIII**

### **PROJECT BENEFITS**

#### **8.0 GENERAL**

The proposed project at Anjur Village aims to produce **277958 m<sup>3</sup>** of rough stone and 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 16 persons for carrying out mining operations and give preference to the local people in providing employment in this cluster. In addition, there will be an opportunity for indirect employment to the form of contractual jobs, business opportunities, and service facilities etc. Because of this, the economic status of the local people will improve.

#### **8.2 SOCIO-ECONOMIC WELFARE MEASURES PROPOSED**

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

#### **8.3 IMPROVEMENT IN PHYSICAL INFRASTRUCTURE**

The proposed quarry project is located in Anjur Village, Pugalur Taluk, Karur District, Tamil Nadu. The area has already well-established communications roads and other facilities. The following physical infrastructure facilities will further improve due to proposed project.

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

Under this programme, the project proponents will take-up following programmes for social and economic development of villages within 5 km of the project site. For this purpose, separate budget will be provided every year. For finalization of these schemes, proponent will interact with LSG. The schemes will be selected from the following broad areas –

- ❖ Health Services
- ❖ Social Development
- ❖ Infrastructure Development
- ❖ Education & Sports
- ❖ Self-Employment
- ❖ CSR Cost Estimation

- ❖ CSR activities mainly contributing to education, health, training of women self-help groups and infrastructure etc., will be taken up in the Anjur Village. CSR budget is allocated.

## 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 project shall contribute 2% of capital investment towards CER as per directions of EAC/SEAC. However, the SEAC has suggested to allocate CER fund on the basis of the extent of the project. Therefore, Rs. 5,00,000 is allocated for CER. The proposed utilization of the budget of CER activities is given in Table 8.1.

**Table 8.1 CER Action Plan**

S. No.	Activity	Budget (Rs.in Lakh)
1	The applicant Indents to involve in corporate environment responsibilities (CER) activities such as renovation of existing toilet, plantation within the school premises, donating environment related books to the nearby school library, etc.	Rs.5,00,000
	<b>Total</b>	<b>Rs.5,00,000</b>

*Source: Field survey conducted by FAE in consultation with project proponent*

## 8.8 SUMMARY OF PROJECT BENEFITS

The project would pay about **Rs. 3,05,19,464** to the state government through various ways, as provided in Table 8.2.

**Table 8.2 Project Benefits to the State Government**

Particulars	Budget for Rough Stone (Rs.)
CER	5,00,000
Seigniorage @ Rs.90/m <sup>3</sup> of rough stone	2,50,16,220
District Mineral Foundation Tax @ 10% of Seigniorage	25,01,622
Green Tax @ 10% of Seigniorage	25,01,622
<b>Total</b>	<b>3,05,19,464</b>

**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 M/s.Kousic and Co Blue Metals 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 Budgetary Provision for Environmental Management

Adequate budgetary provision has been made by the company for execution of Environmental Management Plan. The Table 10.1 gives overall investment on the environmental safeguards and recurring expenditure for successful monitoring and implementation of control measures.

**Table 10.1 EMP Budget for Proposed Project**

Attribute	Mitigation measures	Provision for Implementation	Capital Cost	Recurring Cost/annum
			(Rs.)	(Rs.)
Air Environment	Compaction, gradation and drainage on both sides	Rental Dozer & drainage construction on haul road @ Rs. 10,000/- per hectare and yearly maintenance @ Rs. 10,000/- per hectare	32300	32300
	Fixed Water Sprinkling Arrangements + Water sprinkling by own water tankers	Fixed sprinkler installation and new water tanker cost for capital; and water sprinkling (thrice a day) cost for recurring	800000	50000
	Air quality will be regularly monitored as per	Yearly compliance as per CPCB norms	0	50000

	norms within ML area & ambient area			
	Muffle blasting – To control fly rocks during blasting	Blasting face will be covered with sand bags / steel mesh / old tyres / used conveyor belts	0	5000
	Wet drilling procedure / latest eco-friendly drill machine with separate dust extractor unit	Dust extractor @ Rs. 25,000/- per unit deployed as capital & @ Rs. 2500 per unit recurring cost for maintenance	50000	5000
	No overloading of trucks/tippers/tractors	Manual Monitoring through Security guard	0	5000
	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	10000
	Enforcing speed limits of 20 km/hr within ML area	Installation of Speed Governors @ Rs. 5000/- per tipper/dumper deployed	20000	0
	Regular monitoring of exhaust fumes as per RTO norms	Monitoring of Exhaust Fumes	0	5000
	Regular sweeping and maintenance of roads for at least about 200 m from quarry entrance	Provision for 2 labours @ Rs.10,000/labour (Contractual) / hectare	0	64600
	Installing wheel wash system near exit gate of quarry	Installation + Maintenance + Supervision	50000	20000
<b>Total Air Environment</b>			952300	246900
	Source of noise will be transportation vehicles,	Provision made in Operating Cost	0	0

<b>Noise Environment</b>	and HEMM. For this, proper maintenance will be done at regular intervals.			
	Oiling & greasing of Transport vehicles and HEMM at regular interval will be done.	Provision made in Operating Cost	0	0
	Adequate silencers will be provided in all the diesel engines of vehicles.	Provision made in Operating Cost	0	0
	It will be ensured that all transportation vehicles carry a fitness certificate.	Provision made in Operating Cost	0	0
	Safety tools and implementations that are required will be kept adequately near blasting site at the time of charging.	Provision made in OHS part	0	0
	Line Drilling all along the boundary to reduce the PPV from blasting activity and implementing controlled blasting.	Provision made in Operating Cost	0	0
	Proper warning system before blasting will be adopted and clearance of the area before blasting will be ensured.	Blowing Whistle by Mining Mate / Blaster / Competent Person	0	0
	Provision for Portable blaster shed	Installation of portable blasting shelter	50000	2000

	NONEL Blasting will be practiced to control Ground vibration and fly rocks	Rs. 30/- per 6 tons of blasted material	0	778282
<b>Total Noise Environment</b>			50000	780282
<b>Water Environment</b>	Water Management	Provision for garland drain @ Rs. 10,000/- per hectare with maintenance of Rs. 5,000/- per annum (4.82.7 ha X 10000)	32300	16150
<b>Total Water Environment</b>			32300	16150
<b>Waste Management</b>	Waste management (Spent Oil, Grease etc.,)	Provision for domestic waste collection and disposal through authorized agency (capital cost, recurring cost for collection /disposal).	25000	20000
		Installation of dust bins	5000	2000
	Bio toilets will be made available outside mine lease on the land of owner itself	Provision made in Operating Cost	0	0
<b>Total Waste Management</b>			30000	22000
<b>Implementation of EC, Mining Plan &amp; DGMS Condition</b>	Size 6' X 5' with blue background and white letters as mentioned in MoM Appendix II by the SEAC TN	Fixed display board at the quarry entrance as permanent structure	10000	1000
<b>Total Implementation of EC, Mining Plan</b>			10000	1000

<b>Occupational Health and Safety</b>	Workers will be provided with Personal Protective Equipment	Provision of PPE @ Rs. 4000/- per employee with recurring based on wear and tear (say, @ Rs. 1000/- per employee)	64000	16000
	Health checkup for workers will be provisioned	IME & PME Health checkup @ Rs. 1000/- per employee	0	16000
	First aid facility will be provided	Provision of 2 Kits per Hectare @ Rs. 2000/-	0	12920
	Mine will have safety precaution signages, boards.	Provision for signages and boards made	10000	2000
	Barbed Wire Fencing to quarry area will be provisioned.	Per Hectare fencing Cost @ Rs. 2,00,000/- with Maintenance of Rs 10,000/- per annum (4.82.7 hectare)	646000	32300
	No parking will be provided on the transport routes. Separate provision on the south side of the hill will be made for vehicles /HEMMs. Flaggers will be deployed for traffic management	Parking area with shelter and flags @ Rs. 50,000/- per hectare project and Rs. 10,000/- as maintenance cost	161500	32300
	Installation of CCTV cameras in the mines and mine entrance	Camera 4 Nos, DVR, Monitor with internet facility	30000	5000
	Implementation as per Mining Plan and ensure safe quarry working	Mines Manager (1 <sup>st</sup> Class / 2 <sup>nd</sup> Class / Mine Foreman) under regulation 34 / 34 (6) of MMR, 1961 and Mining Mate under regulation 116	0	780000

		of MMR,1961 @ 40,000/- for Manager & @ 25,000/- for Foreman / Mate		
<b>Total Occupational Health and Safety</b>			911500	896520
<b>Developm ent of Green Belt</b>	Green belt development - 500 trees per hectare (200 Inside Lease Area & 300 Outside Lease Area)	Site clearance, preparation of land, digging of pits /trenches, soil amendments, transplantation of saplings @ 200 per plant (capital) for plantation inside the lease area and @ 30 per plant maintenance (recurring))"	129200	19380
		Avenue Plantation @ 300 per plant (capital) for plantation outside the lease area and @ 30 per plant maintenance (recurring)	290700	29070
<b>Total Development of Green Belt</b>			419900	48450
<b>Mine Closure</b>	Closure includes 10% of the amount allotted for Greenbelt development, wire fencing, and garland drainage (Rule 27 in MCDR 2017 for Cat B mines will pay 2 lakhs per hectare or minimum amount of financial assurance of 5 lakhs)		0	109820
	G.O.(Ms)No.23, Dated: 28.09.2021	Section IVA of TNMMCR 1959 (@10% of Seigniorage Fee) (Seigniorage Fee for rough stone = Rs.90)	2501622	0
<b>TOTAL</b>			<b>4907622</b>	<b>2011302 (Exclude. Mine Closure)</b>

**Table 10.2 Estimation of Overall EMP Budget after Adjusting 5% Annual Inflation**

I <sup>st</sup> Year	II <sup>nd</sup> Year	III <sup>rd</sup> Year	IV <sup>th</sup> Year	V <sup>th</sup> Year (including Mine Closure Cost)	Total Recurring Cost	Total EMP Cost
2011302	2111868	2217461	2328334	2554571	11223535	16131157

In order to implement the environmental protection measures, an amount of **Rs.4907622** as capital cost and recurring cost as **Rs.2011302** as recurring cost/annum is proposed considering present market price considering present market scenario for the proposed project. After the adjustment of 5% inflation per year, the overall EMP cost for 5 years will be **Rs.1,61,31157** as shown in Table 10.2.

### 10.3 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

#### 11.1 INTRODUCTION

As the proposed rough stone mining project (P1) falls within the quarry cluster of 500 m radius with the total extent of 13.77.55 ha, it requires submission of EIA report for grant of Environmental Clearance (EC) after conducting public hearing. The proposed project falling in S.F.No. 770/2B (Part), 778/3B1(Part) and 778/3B2 (Part) over the extent of 3.23.0 ha is situated in the cluster falling in Anjur Village, Pugalur Taluk, Karur District, Tamil Nadu. The quarries involved in the calculation of cluster extent are four proposed quarries.

#### 11.2 PROJECT DESCRIPTION

The proposed project area is located between Latitudes from 11°2'50.76"N to 11° 3'1.69"N Longitudes from 77°47'3.49"E to 77°47'12.09"E in Anjur Village, Pugalur Taluk, Karur District, Tamil Nadu. According to the approved mining plan, about 277958m<sup>3</sup> of rough stone and 8730 m<sup>3</sup> of top soil will be mined up to the depth of 45 m BGL in the five years. The quarrying operation is proposed to be carried out by open cast manual mining method involving drilling and formation of benches of the prescribed dimensions.

#### 11.3 DESCRIPTION OF THE ENVIRONMENT

Baseline data were collected to evaluate the existing environmental condition in the core and buffer areas during March - May, 2023 as per CPCB guidelines. The data were collected by both the FAEs and NABL accredited and MoEF notified **Enviro Farmers Labs & Technologies and Accuracy Analabs** for the environmental attributes including soil, water, noise, air and by FAEs for ecology and biodiversity, traffic, and socio-economy.

##### 11.3.1 Land Environment

Land use pattern of the area of 5 km radius was studied using Sentinel II imagery. LULC types and their extent are given in Table 11.1.

**Table.11.1 LULC Statistics of the Study Area**

<b>S. No.</b>	<b>Classification</b>	<b>Area (ha)</b>	<b>Area (%)</b>
1	Crop Land	4734.59	60.38
2	Dense Forest	12.27	0.16
3	Fallow Land	813.83	10.38
4	Mining/Industrial lands	82.95	1.06
5	Land with or without scrub	9.16	0.12
6	Plantations	1912.60	24.39
7	Settlements	47.96	0.61
8	Water Bodies	228.40	2.91
<b>Total</b>		<b>7841.76</b>	<b>100.0</b>



### **11.3.2 Soil Environment**

The soil samples in the study area show loamy textures varying between silty clay loam, silty loam and sandy loam. pH of the soil varies from 6.93 to 8.2 indicating slightly acidic to slightly alkaline nature. Electrical conductivity of the soil varies from 3.91 to 4.8  $\text{dsm}^{-1}$ . Bulk density ranges between 0.79 and 0.95  $\text{g/cm}^3$ . Nitrogen ranges between 0.96 and 2.4 %. Potassium ranges between 1.69 and 5.22 %. Calcium ranges between 2056 and 3956 mg/kg. Organic matter content ranges between 20.6 and 30.2 %. Manganese ranges between 1553 and 2653 mg/kg.

### **11.3.3 Water Environment**

Groundwater in the study area occurs in the crystalline rocks of Archaean age and recent alluvium. The movement of the groundwater is controlled by the intensity of weathering and fracturing of crystalline rocks. Dug wells and bore wells are the most common ground water abstraction structures in the area. However, in dry season, people in the study area heavily rely on bore wells for their domestic and agriculture purpose. Six groundwater samples, known as OW01, OW02, OW03, BW01, BW02 and BW03, were collected from bore wells and open wells were analysed for physico-chemical conditions, heavy metals and bacteriological contents in order to assess baseline quality of ground water. Ground water sampling locations and their distance and direction from the lease area are provided in Table 3.5 and the spatial occurrence of water sampling locations is shown in Figure 3.7. Table 3.6a summarizes ground water quality data of the six samples. Results for ground water samples in the Table 3.6a indicate that the physical, chemical and biological parameters, and heavy metals are within permissible limits in comparison with standards of IS10500:2012.

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 2 km radius around the proposed project sites for the period from March through May 2023 (Pre-Monsoon Season) and from October through December 2022, (Post Monsoon Season).

The open well water level data thus collected onsite are provided in Tables 3.7 and 3.8. According to the data, average depths to the static water table in open wells range from 20.6 to 23.5 m BGL in pre monsoon and 11.5 to 16.3 m BGL in post monsoon. The bore well data thus collected onsite are provided in Tables 3.9 and 3.10. The average depths to static potentiometric surface in bore wells for the period of October through December (Post-Monsoon Season) vary

from 62.3 to 65.8 m and from 63.8 to 67.6 m for the period of March through May, (Pre-Monsoon Season). Data on the depths to static water table and potentiometric surface were used to draw contour lines connecting groundwater elevation (also known as equipotential hydraulic head) to determine the groundwater flow direction perpendicular to the contour lines.

#### **11.3.4 Air Environment**

As per the monitoring data, PM<sub>2.5</sub> ranges from 18.5 µg/m<sup>3</sup> to 22.9 µg/m<sup>3</sup>; PM<sub>10</sub> from 37.7 µg/m<sup>3</sup> to 42.1 µg/m<sup>3</sup>; SO<sub>2</sub> from 6.0 µg/m<sup>3</sup> to 8.9µg/m<sup>3</sup>; NO<sub>x</sub> from 18.3µg/m<sup>3</sup> to 23.4g/m<sup>3</sup>. The concentration levels of the pollutants fall within the acceptable limits of NAAQS prescribed by CPCB.

#### ***Air quality Index***

The AQI shows that the air quality of the study area falls within good category 40 causing minimal impact to human health.

#### **11.3.5 Noise Environment**

Noise level in core zone was 45.8 dB (A) Leq during day time and 34.2 dB(A) Leq during night time. Noise levels recorded in buffer zone during day time varied from 36.9 to 45.6dB (A) Leq and during night time from 28.0 to 39.0dB (A) Leq. Thus, the noise level for industrial and residential area meets the requirements of CPCB

#### **11.3.6 Biological Environment**

The study found that there is no endemic, endangered migratory fauna found in the area. This area is not also a migratory path of any faunal species. Hence, this small mining operation over short period of time will not have any significant impact on the surrounding flora and fauna.

#### ***Flora in core zone***

The mine lease area contains total of 16 species belonging to 9 families have been recorded from the mine lease area. 3 Trees, 4 shrubs, 9 herbs were identified. It is a grassy land. There are no endangered species in mine lease area

#### ***Flora in 300 m radius zone***

There is no agricultural land nearby lease area. It contains a total of 34 species belonging to 21 families have been recorded from the buffer zone. 6 Trees (17%), 5 Shrubs (17%) and 22 Herbs and Climbers, Creeper, Grass & Cactus 20 (64%) were identified.

#### ***Fauna in Core Zone***

The 25 varieties of species observed in the core zone. Among them numbers of Insects 8 (32%), Reptiles 3 (12%), Mammals 5 (20%) and Avian 9 (36%). A total of 25 species belonging to 22 families have been recorded from the core mining lease area. Number of

species decreases towards the mining area this might be due the lack of vegetation. None of these species are threatened or endemic

### ***Fauna in Buffer Zone***

A total of 47 species belonging to 34 families were recorded in the buffer zone. Based on habitat classification the majority of species were Birds 18 (40%), followed by Insects 15 (31%), Reptiles 7 (15%), 4 Mammals (8%) and amphibians 3 (6%). There are 4 schedule II species and 24 schedule IV species according to Indian wild life Act 1972. There are no critically endangered, vulnerable and endemic species observed.

### **11.3.7 Socio Economic Environment**

The proposed project will provide direct and indirect employment and improve the infrastructural facilities in that area, thus leading to the improvement of people's standard of living.

## **11.4 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES**

### **11.4.1 Land Environment**

#### **Anticipated Impact**

- Change in land use and land cover and topography of the mine lease area
- Problems to human habitations due to dust and noise caused by movement of heavy vehicles
- Soil erosion and sediment deposition in the nearby water bodies during the rainy season
- Siltation of water course due to wash off from the exposed working area
- Deterioration of soil quality in the surrounding area due to runoff from the project area
- Decrease in the agricultural productivity of the surrounding land due to soil quality degradation

#### **Mitigation Measures**

- Construction of garland drains, settling pits, and check dams to prevent runoff and siltation
- Runoff water will be discharged into the settling tanks to reduce suspended sediment loads before runoff is discharged from the quarry site
- The vegetation will be retained at the site wherever possible
- Weekly monitoring and daily maintenance of erosion control systems so that they perform as specified specially during rainy season

## **11.4.2 Water Environment**

### **Anticipated Impact**

- Surface and ground water resources may be contaminated due to pit water discharge, domestic sewage, discharge of oil and grease bearing waste water from washing of vehicles and machineries, and washouts from surface exposure or working areas
- As the proposed project acquires 4.75 KLD of water from water vendors, it will not extract water by developing abstraction structures in the lease area. Therefore, the project will not have impact on depletion of aquifer beneath the lease area.

### **Mitigation Measures**

- Rain water from mine pit will be treated in settling tanks before being used for dust suppression and tree plantation purposes
- Domestic sewage from site office will be discharged in septic tank and then directed to soak pits
- Water from the tipper wash-down facility and machinery maintenance yard will be passed through interceptor traps/oil separators prior to its reuse
- 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
- Periodic (every 6 month once) analysis of ground water quality of quarry pit water and ground water of nearby villages will be conducted
- Artificial recharge structures will be established in suitable locations as part of the rainwater harvesting management program

## **11.4.3 AIR ENVIRONMENT**

### **Anticipated Impact**

Anticipated increase of the air pollutants due to quarrying activities have been predicted using AERMOD software. The values of cumulative concentration i.e., background + incremental concentration of pollutant in all the receptor locations are still within the prescribed NAAQ limits without effective mitigation measures. By adopting suitable mitigation measures, the pollutant levels in the atmosphere can be controlled further

### **Mitigation Measures**

- 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

- 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
- 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
- The un-metalled haul roads will be compacted weekly before being put into use
- 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
- Planting of trees all along main mine haul roads and around the project site will be practiced to prevent the generation of dust
- Dust mask will be provided to the workers and their use will be strictly monitored

#### **11.4.4 Noise Environment**

##### ***Anticipated Impact***

Total noise level in all the sampling areas is well below the CPCB standards for industrial and residential areas. The peak particle velocity produced by the charge of 19.8kg is well below that of 0.3 mm/s as per Directorate General of Mines Safety for safe level criteria through Circular No. 7 dated 29/8/1997.

##### ***Mitigation Measures***

- The blasting operations in the cluster quarries will use shallow holes and delay detonators to reduce the ground vibrations
- Proper quantity of explosives, suitable stemming materials and appropriate delay system will be used during 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
- 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, 2<sup>nd</sup> Class Mines Manager/ 1<sup>st</sup> 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
- Vibration monitoring will be carried out every 6 months to check the efficacy of blasting practices.

#### **11.4.5 Biological Environment**

##### ***Anticipated Impact***

- During loading the truck, dust generation will be likely. This shall be a temporary effect and not anticipated to affect the surrounding vegetation significantly
- The Number of plants in the mining lease area is given in Chapter 3 which vegetation in the lease area may be removed during mining.
- Carbon released from quarrying machineries and tippers during quarrying would be 2337 kg per day, 631059 kg per year and 3155293 kg over five years, as provided in Table 4.11.

##### ***Mitigation Measures***

- ❖ During conceptual stage, the top bench will be re-vegetated by planting local /native species and lower benches will be converted into rainwater harvesting structure following completion of mining activities, which will replace habitat resources for fauna species in this locality over a longer time.
- ❖ Existing roads will be used; new roads will not be constructed to reduce impact on flora.
- ❖ To mitigate carbon emission due to mining activities, we recommend planting trees around the quarry to offset the carbon emission during quarrying. A tree can sequester 38721 kg of

carbon per year. Therefore, we recommend planting large number of trees around the quarry and near school campuses, government wasteland, roadsides etc.

- ❖ As per the greenbelt development plan as recommended by SEAC (Table 4.13), about 1615 trees will be planted within three months from the beginning of mining. These trees, when grown up would sequester carbon of about 193606 kg of the total carbon

#### **11.4.6 Socio Economic Environment**

##### ***Anticipated Impact***

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

##### ***Mitigation Measures***

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

#### **11.4.7 Occupational Health**

- All the persons will undergo pre-employment and periodic medical examination
- Employees will be monitored for occupational diseases by conducting medical tests: General physical tests, Audiometric tests, Full chest, X-ray, Lung function tests, Spirometric tests, Periodic medical examination – yearly, Lung function test – yearly, those who are exposed to dust and 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.

## 11.5 Environment Monitoring Program

**Table 11.2 Environment Monitoring Program**

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 <sub>2.5</sub> , PM <sub>10</sub> , SO <sub>2</sub> and NO <sub>x</sub> .
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 m 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*

## **11.6 ADDITIONAL STUDIES**

### **11.6.1 Risk Assessment**

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. 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.

### **11.6.2 Disaster Management Plan**

The objective of the disaster management plan is to make use of the combined resources of the mine and the outside services to:

- Rescue and treat 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.

### **11.6.3 Cumulative Impact Study**

The results on the cumulative impact of the four proposed projects on air environment of the cluster do not exceed the permissible limits set by CPCB for air pollutants.

- The cumulative results of noise for the habitation in consideration do not exceed the limit set by CPCB for residential areas for day time
- PPV resulting from four proposed project is well below the permissible limit of Peak Particle Velocity of 5 mm/s

- The proposed four projects will allocate Rs. 20,00,000/- towards CER as recommended by SEAC
- The proposed four projects will directly provide jobs to 79 local people, in addition to indirect jobs
- The proposed four projects will plant 6888 about trees in and around the lease area
- The proposed four projects will add 783 PCU per day to the nearby roads.

### **11.7 Project Benefits**

Various benefits are envisaged due to the three proposed mine and benefits anticipated from the proposed project to the locality, neighbourhood, region and nation as a whole are:

- Direct employment to 29 local people
- 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.
- Rs. 5,00,000 will be allocated for CER

### **11.8 ENVIRONMENT MANAGEMENT PLAN**

In order to implement the environmental protection measures, an amount of Rs.4907622 as capital cost and recurring cost as Rs.2011302 as recurring cost/annum is proposed considering present market price considering present market scenario for the proposed project. After the adjustment of 5% inflation per year, the overall EMP cost for 5 years will be Rs.16131157.

## CHAPTER XII

### DISCLOSURES OF CONSULTANT

The Project Proponent, M/s.Kousic and Co Blue Metals has engaged **Geo Technical Mining Solutions**, a NABET accredited consultancy for carrying out the EIA study as per the ToR issued.

**Address of the consultancy:**

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

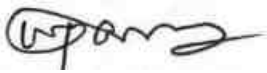
The accredited experts and associated members who were engaged in this EIA study are given below:

S.No	Name of the expert	In house/ Empanelled	Sector	Functional Area	Category
<b>Approved Functional Area Experts &amp; EC</b>					
1	Dr. S. Karuppannan	EIA Coordinator (EC) In-house	1(a)(i)	Mining	B
2	Dr. M. Vijayprabhu	In-house, FAE	1(a)(i)	HG, LU, GEO	B
3	Dr. J. Rajarajeswari	In-house, FAE	1(a)(i)	EB, SC	B
4	Dr. G. Prabakaran	In-house, FAE	1(a)(i)	SE	B
5	Dr. R. Arunbalaji	In-house, FAE	1(a)(i)	AP, AQ, NV	B
6	J.N. Manikandan	Empanelled FAE	1(a)(i)	RH, SHW, AP	B
7	Dr. S. Malar	In-house, FAE	1(a)(i)	WP	B
8	G. Umamaheswaran	In-house, FAE	1(a)(i)	HG, LU, GEO	B
9	S. Gopalakrishnan	In-house, FAE	1(a)(i)	HG, GEO	B
10	P. Venkatesh	In-house, FAE	1(a)(i)	AP	B
11	Dr. D.Kalaimurugan	In-house, FAE	1(a)(i)	SC	B
<b>Approved Functional Area Associates</b>					
12	G. Prithiviraj	FAA	1(a)(i)	LU, HG	B
13	C. Kumaresan	FAA	1(a)(i)	NV	B

14	P. Vellaiyan	FAA	1(a)(i)	HG, GEO	B
15	P. Dhatchayini	FAA	1(a)(i)	AQ	B
16	V. Malavika	FAA	1(a)(i)	NV, SHW	B
<b>Abbreviations</b>					
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 modelling, and prediction	HW	Hazardous Wastes		
EB	Ecology and bio-diversity	GIS	Geographical Information System		

**DECLARATION BY EXPERTS CONTRIBUTING TO THE EIA & EMP**

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

Signature : 

Date :

Name : **Dr. S. Karuppanan**



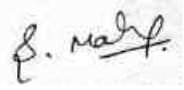




Designation : EIA Coordinator







Name of the EIA Consultant Organization : Geo Technical Mining Solutions

Period of Involvement : Till date







We, the FAEs and FAAs hereby declare that information furnished in this EIA/EMP report for M/s.Kousic and Co Blue Metals rough stone quarry project with the extent of 3.23.0 ha situated in the cluster with the extent of 13.77.55 ha in Anjur Village, Pugalur Taluk, Karur District of Tamil Nadu is true and correct to the best of our knowledge.

### List of Functional Area Experts Engaged in this Project

S. No.	Functional Area	Involvement	Name of the Experts	Signature
1	AP	<ul style="list-style-type: none"> <li>○ Identification of different sources of air pollution due to the proposed mine activity</li> <li>○ Prediction of air pollution and propose mitigation measures / control measures</li> </ul>	J.N. Manikandan	
			P.Venkatesh	
2	WP	<ul style="list-style-type: none"> <li>○ Suggesting water treatment systems, drainage facilities</li> <li>○ Evaluating probable impacts of effluent/waste water discharges into the receiving environment/water bodies and suggesting control measures.</li> </ul>	Dr.S. Malar	
3	HG	<ul style="list-style-type: none"> <li>○ Interpretation of ground water table and predict impact and propose mitigation measures.</li> <li>○ Analysis and description of aquifer Characteristics</li> </ul>	Dr.M. Vijay Prabhu	
4	GEO	<ul style="list-style-type: none"> <li>○ Field Survey for assessing the regional and local geology of the area.</li> <li>○ Preparation of mineral and geological maps.</li> <li>○ Geology and Geo morphological analysis/description and Stratigraphy/Lithology.</li> </ul>	G.Gopala Krishnan	
5	SE	<ul style="list-style-type: none"> <li>○ Revision in secondary data as per Census of India, 2011.</li> <li>○ Impact Assessment &amp; Preventive Management Plan</li> <li>○ Corporate Environment Responsibility.</li> </ul>	Dr. G. Prabhakaran	
6	EB	<ul style="list-style-type: none"> <li>○ Collection of Baseline data of Flora and Fauna.</li> <li>○ Identification of species labelled as Rare, Endangered and</li> </ul>	Dr.J. Rajarajeshwari	

		<p>threatened as per IUCN list.</p> <ul style="list-style-type: none"> <li>○ Impact of the project on flora and fauna.</li> <li>○ Suggesting species for greenbelt development.</li> </ul>		
7	RH	<ul style="list-style-type: none"> <li>○ Identification of hazards and hazardous substances</li> <li>○ Risks and consequences analysis</li> <li>○ Vulnerability assessment</li> <li>○ Preparation of Emergency Preparedness Plan</li> <li>○ Management plan for safety.</li> </ul>	J.N. Manikandan	
8	LU	<ul style="list-style-type: none"> <li>○ Construction of Land use Map</li> <li>○ Impact of project on surrounding land use</li> <li>○ Suggesting post closure sustainable land use and mitigative measures.</li> </ul>	G.Uma Maheswaran	
9	NV	<ul style="list-style-type: none"> <li>○ Identify impacts due to noise and vibrations</li> <li>○ Suggesting appropriate mitigation measures for EMP.</li> </ul>	Dr.R. Arun Balaji	
10	AQ	<ul style="list-style-type: none"> <li>○ Identifying different source of emissions and propose predictions of incremental GLC using AERMOD.</li> <li>○ Recommending mitigations measures for EMP</li> </ul>	Dr.R. Arun Balaji	
11	SC	<ul style="list-style-type: none"> <li>○ Assessing the impact on soil environment and proposed mitigation measures for soil conservation</li> </ul>	Dr. D.Kalaimurugan	
12	SHW	<ul style="list-style-type: none"> <li>○ Identify source of generation of non-hazardous solid waste and hazardous waste.</li> <li>○ Suggesting measures for minimization of generation of waste and how it can be reused or recycled.</li> </ul>	J.N. Manikandan	

**List of Functional Area Associate Engaged in this Project**

S.No.	Name	Functional Area	Involvement	Signature
1	G. Prithiviraj	LU, HG	<ul style="list-style-type: none"> <li>○ Site visit with FAE</li> <li>○ Provide inputs &amp; Assisting FAE for LU and HG</li> </ul>	
2	C. Kumaresan	NV	<ul style="list-style-type: none"> <li>○ Assistance to FAE in both primary and secondary data collection</li> <li>○ Assistance in noise prediction modelling</li> </ul>	
3	P. Vellaiyan	HG & GEO	<ul style="list-style-type: none"> <li>○ Field visits along with FAE</li> <li>○ Assistance to FAE in both primary and secondary data collection</li> </ul>	
4	S.Vasugi	AQ	<ul style="list-style-type: none"> <li>○ Field visits along with FAE</li> <li>○ Assistance to FAE in both primary and secondary data collection</li> </ul>	
5	P. Dhatchayini	AQ	<ul style="list-style-type: none"> <li>○ Site visit with FAE</li> <li>○ Assistance to FAE in collection of both primary and secondary data</li> </ul>	
6	V. Malavika	NV, SHW	<ul style="list-style-type: none"> <li>○ Site visit along with FAE</li> <li>○ Assistance in report preparation</li> </ul>	

**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 M/s.Kousic and Co Blue Metals rough stone quarry project with the extent of 3.23.0 ha situated in the cluster with the extent of 13.77.55 ha in Anjur Village, Pugalur Taluk, Karur District of Tamil Nadu is true and correct to the best of my knowledge.

Signature : 

Date :

Name : **Dr. S. Karuppannan**

Designation : Managing Partner

Name of the EIA Consultant Organization : Geo Technical Mining Solutions

NABET Certificate No & Issue Date : NABET/EIA/23-26/RA 0319

Validity : Till 31.12.2026



**File No: 10577**  
**Government of India**  
**Ministry of Environment, Forest and Climate Change**  
**(Issued by the State Environment Impact Assessment**  
**Authority(SEIAA), TAMIL NADU)**

\*\*\*



Dated 13/03/2024



To,

Mohanraj K G  
KOUSIC & CO BLUE METALS  
M/s.Kousic & Co Blue Metals, Door.No.24/A, Housing Unit, Kollampalayam, Kasipalayam, Erode Taluk, Erode Distict, TamilNadu State, Kollampalayam, ERODE, TAMIL NADU, Kasipalayam, 638002  
kousicandcobluemetals02@gmail.com

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

**Sir/Madam,**

This is in reference to your application for Grant of Terms of Reference under the provision of the EIA Notification 2006-regarding in respect of project Anjur Village rough stone mining project submitted to Ministry vide proposal number SIA/TN/MIN/454547/2023 dated 06.12.2023.

2. The particulars of the proposal are as below :

(i) TOR Identification No.	TO23B0108TN5620847N
(ii) File No.	10577
(iii) Clearance Type	TOR
(iv) Category	B1
(v) Project/Activity Included Schedule No.	1(a) Mining of minerals
(vii) Name of Project	Anjur Village rough stone mining project
(viii) Name of Company/Organization	KOUSIC & CO BLUE METALS
(ix) Location of Project (District, State)	KARUR, TAMIL NADU
(x) Issuing Authority	SEIAA
(xii) Applicability of General Conditions	no
(xiii) Applicability of Specific Conditions	no

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

4. The above-mentioned proposal has been considered by SEIAA in the meeting held on 11/03/2024. The minutes of



the meeting and all the Application and documents submitted [(viz. Form-1, EMP)] are available on PARIVESH portal which can be accessed by scanning the QR Code above.

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

#### **Copy To**

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

#### **Annexure 1**

#### **Specific Terms of Reference for (Mining Of Minerals)**

#### **1. Mining**

<b>S. No</b>	<b>Terms of Reference</b>
<b>1.1</b>	1. The proponent is requested to carry out a survey and enumerate on the structures located within the radius of (i) 50 m, (ii) 100 m, (iii) 200 m and (iv) 300 m (v) 500m with details such as dwelling

S. No	Terms of Reference
	<p>houses with number of occupants, whether it belongs to the owner (or) not, places of worship, industries, factories, sheds, etc with indicating the owner of the building, nature of construction, age of the building, number of residents, their profession and income, etc.</p> <p>2. The project proponent shall furnish Certified Compliance Report (CCR) obtained from IRO(SZ), MoEF&amp;CC and with mitigation measures along with the budgetary allocation for the non-compliance stated therein.</p> <p>3. The PP shall submit a detailed hydrological report indicating the impact of proposed quarrying operations on the waterbodies like lake, water tanks, etc located within 1 km of the proposed quarry.</p> <p>4. The Proponent shall justify the selection of the site for carrying out the stone quarrying with the total volume arrived for the excavation &amp; production adequate details such as lithology of the deposit, reserve estimation, place for waste dump/mined mineral storage, end-use of mined materials, identified potential customers/end-users and travel path.</p> <p>5. The proponent shall furnish photographs of adequate fencing, green belt along the periphery including replantation of existing trees &amp; safety distance between the adjacent quarries &amp; water bodies nearby provided as per the approved mining plan.</p> <p>6. The PP shall carry out a detailed hydrogeological study to spell out the water management plan for the proposed site.</p> <p>7. The Proponent shall carry out Bio diversity study through Department of Ecology and Environmental Sciences, Pondicherry University and the same shall be included in EIA Report.</p> <p>8. The PP shall prepare the EMP for the entire life of mine and also furnish the sworn affidavit stating to abide the EMP for the entire life of mine.</p> <p>9. The PP shall prepare a conceptual working plan accommodating the remedial actions such as inclusion of haul road accessibility keeping the benches intact, based on the studies carried out to assess the slope stability of the working benches to be constructed and existing quarry wall apart from the proposed mining methodology.</p>

## 2. Seac Standard Conditions

S. No	Terms of Reference
2.1	<p>1. In the case of existing/operating mines, a letter obtained from the concerned AD (Mines) shall be submitted and it shall include the following:</p> <ul style="list-style-type: none"> <li>(i) Original pit dimension</li> <li>(ii) Quantity achieved Vs EC Approved Quantity</li> <li>(iii) Balance Quantity as per Mineable Reserve calculated.</li> <li>(iv) Mined out Depth as on date Vs EC Permitted depth</li> <li>(v) Details of illegal/illicit mining</li> <li>(vi) Violation in the quarry during the past working.</li> <li>(vii) Quantity of material mined out outside the mine lease area</li> <li>(viii) Condition of Safety zone/benches</li> <li>(ix) Revised/Modified Mining Plan showing the benches of not exceeding 6 m height and ultimate depth of not exceeding 50m.</li> </ul> <p>2. Details of habitations around the proposed mining area and latest VAO certificate regarding the location of habitations within 300m radius from the periphery of the site.</p> <p>3. The proponent is requested to carry out a survey and enumerate on the structures located within the radius of (i) 50 m, (ii) 100 m, (iii) 200 m and (iv) 300 m (v) 500m shall be enumerated with details such as dwelling houses with number of occupants, whether it belongs to the owner (or) not, places of worship, industries, factories, sheds, etc with indicating the owner of the building, nature of construction, age of the building, number of residents, their profession and income, etc.</p> <p>4. The PP shall submit a detailed hydrological report indicating the impact of proposed quarrying operations on the waterbodies like lake, water tanks, etc are located within 1 km of the proposed</p>

S. No	Terms of Reference
	<p>quarry.</p> <p>5. The Proponent shall carry out Bio diversity study through reputed Institution and the same shall be included in EIA Report.</p> <p>6. The DFO letter stating that the proximity distance of Reserve Forests, Protected Areas, Sanctuaries, Tiger reserve etc., up to a radius of 25 km from the proposed site.</p> <p>7. In the case of proposed lease in an existing (or old) quarry where the benches are not formed (or partially formed as per the approved Mining Plan, the Project Proponent (PP) shall the PP shall carry out the scientific studies to assess the slope stability of the working benches to be constructed and existing quarry wall, by involving any one of the reputed Research and Academic Institutions - CSIR-Central Institute of Mining &amp; Fuel Research / Dhanbad, NIRM/Bangalore, Division of Geotechnical Engineering-IIT-Madras, NIT-Dept of Mining Engg, Surathkal, and Anna University Chennai-CEG Campus. The PP shall submit a copy of the aforesaid report indicating the stability status of the quarry wall and possible mitigation measures during the time of appraisal for obtaining the EC.</p> <p>8. However, in case of the fresh/virgin quarries, the Proponent shall submit a conceptual 'Slope Stability Plan' for the proposed quarry during the appraisal while obtaining the EC, when the depth of the working is extended beyond 30 m below ground level.</p> <p>9. The PP shall furnish the affidavit stating that the blasting operation in the proposed quarry is carried out by the statutory competent person as per the MMR 1961 such as blaster, mining mate, mine foreman, II/I Class mines manager appointed by the proponent.</p> <p>10. The PP shall present a conceptual design for carrying out only controlled blasting operation involving line drilling and muffle blasting in the proposed quarry such that the blast-induced ground vibrations are controlled as well as no fly rock travel beyond 30 m from the blast site.</p> <p>11. The EIA Coordinators shall obtain and furnish the details of quarry/quarries operated by the proponent in the past, either in the same location or elsewhere in the State with video and photographic evidences.</p> <p>12. If the proponent has already carried out the mining activity in the proposed mining lease area after 15.01.2016, then the proponent shall furnish the following details from AD/DD, mines,</p> <p>13. What was the period of the operation and stoppage of the earlier mines with last work permit issued by the AD/DD mines?</p> <p>14. Quantity of minerals mined out.</p> <ul style="list-style-type: none"> <li>● Highest production achieved in any one year</li> <li>● Detail of approved depth of mining.</li> <li>● Actual depth of the mining achieved earlier.</li> <li>● Name of the person already mined in that leases area.</li> <li>● If EC and CTO already obtained, the copy of the same shall be submitted.</li> <li>● Whether the mining was carried out as per the approved mine plan (or EC if issued) with stipulated benches.</li> </ul> <p>15. All corner coordinates of the mine lease area, superimposed on a High-Resolution Imagery/Topo sheet, topographic sheet, geomorphology, lithology and geology of the mining lease area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).</p> <p>16. The PP shall carry out Drone video survey covering the cluster, green belt, fencing, etc.,</p> <p>17. The proponent shall furnish photographs of adequate fencing, green belt along the periphery including replantation of existing trees &amp; safety distance between the adjacent quarries &amp; water bodies nearby provided as per the approved mining plan.</p> <p>18. The Project Proponent shall provide the details of mineral reserves and mineable reserves, planned production capacity, proposed working methodology with justifications, the anticipated impacts of the mining operations on the surrounding environment, and the remedial measures for the same.</p> <p>19. The Project Proponent shall provide the Organization chart indicating the appointment of</p>

S. No	Terms of Reference
	<p>various statutory officials and other competent persons to be appointed as per the provisions of the Mines Act 1952 and the MMR, 1961 for carrying out the quarrying operations scientifically and systematically in order to ensure safety and to protect the environment.</p> <p>20. The Project Proponent shall conduct the hydro-geological study considering the contour map of the water table detailing the number of groundwater pumping &amp; open wells, and surface water bodies such as rivers, tanks, canals, ponds, etc. within 1 km (radius) along with the collected water level data for both monsoon and non-monsoon seasons from the PWD / TWAD so as to assess the impacts on the wells due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided.</p> <p>21. The proponent shall furnish the baseline data for the environmental and ecological parameters with regard to surface water/ground water quality, air quality, soil quality &amp; flora/fauna including traffic/vehicular movement study.</p> <p>22. The Proponent shall carry out the Cumulative impact study due to mining operations carried out in the quarry specifically with reference to the specific environment in terms of soil health, biodiversity, air pollution, water pollution, climate change and flood control &amp; health impacts. Accordingly, the Environment Management plan should be prepared keeping the concerned quarry and the surrounding habitations in the mind.</p> <p>23. Rain water harvesting management with recharging details along with water balance (both monsoon &amp; non-monsoon) be submitted.</p> <p>24. Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.</p> <p>25. Details of the land for storage of Overburden/Waste Dumps (or) Rejects outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&amp;R issues, if any, should be provided.</p> <p>26. Proximity to Areas declared as 'Critically Polluted' (or) the Project areas which attracts the court restrictions for mining operations, should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the TNPCB (or) Dept. of Geology and Mining should be secured and furnished to the effect that the proposed mining activities could be considered.</p> <p>27. Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.</p> <p>28. Impact on local transport infrastructure due to the Project should be indicated.</p> <p>29. A tree survey study shall be carried out (nos., name of the species, age, diameter etc.,) both within the mining lease applied area &amp; 300m buffer zone and its management during mining activity.</p> <p>30. A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific.</p> <p>31. As a part of the study of flora and fauna around the vicinity of the proposed site, the EIA coordinator shall strive to educate the local students on the importance of preserving local flora and fauna by involving them in the study, wherever possible.</p> <p>32. The purpose of Green belt around the project is to capture the fugitive emissions, carbon sequestration and to attenuate the noise generated, in addition to improving the aesthetics. A wide range of indigenous plant species should be planted as given in the appendix-I in consultation with the DFO, State Agriculture University. The plant species with dense/moderate canopy of native origin should be chosen. Species of small/medium/tall trees alternating with shrubs should be planted in a mixed manner.</p> <p>33. Taller/one year old Saplings raised in appropriate size of bags, preferably ecofriendly bags should be planted as per the advice of local forest authorities/botanist/Horticulturist with regard to</p>

S. No	Terms of Reference
	<p>site specific choices. The proponent shall earmark the greenbelt area with GPS coordinates all along the boundary of the project site with at least 3 meters wide and in between blocks in an organized manner</p> <p>34. A Disaster management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.</p> <p>35. A Risk Assessment and management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period.</p> <p>36. Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.</p> <p>37. Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.</p> <p>38. The Socio-economic studies should be carried out within a 5 km buffer zone from the mining activity. Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.</p> <p>39. Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.</p> <p>40. Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.</p> <p>41. If any quarrying operations were carried out in the proposed quarrying site for which now the EC is sought, the Project Proponent shall furnish the detailed compliance to EC conditions given in the previous EC with the site photographs which shall duly be certified by MoEF&amp;CC, Regional Office, Chennai (or) the concerned DEE/TNPCB.</p> <p>42. The PP shall prepare the EMP for the entire life of mine and also furnish the sworn affidavit stating to abide the EMP for the entire life of mine</p> <p>43. Concealing any factual information or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this Terms of Conditions besides attracting penal provisions in the Environment (Protection) Act, 1986.</p>

**Standard Terms of Reference for (Mining of minerals)**

**1.**

S. No	Terms of Reference
1.1	An EIA-EMP Report shall be prepared for peak capacity (.....MTPA)operation in an ML/project area of.....ha based on the generic structure specified in Appendix III of the EIA Notification, 2006.
1.2	An EIA-EMP Report would be prepared for peak capacity operation to cover the impacts and environment management plan for the project specific activities on the environment of the region, and the environmental quality encompassing air, water, land, biotic community, etc. through collection of data and information, generation of data on impacts including prediction modeling for..... MTPA of mineral production based on approved project/Mining Plan for.....MTPA. Baseline data collection can be for any season (three months) except monsoon.
1.3	Propoer KML file with pin drop and coordinate of mine at 500-1000 m interval be provided

S. No	Terms of Reference
1.4	A Study area map of the core zone (project area) and 10 km area of the buffer zone (1: 50,000 scale) clearly delineating the major topographical features such as the land use, surface drainage pattern including rivers/streams/nullahs/canals, locations of human habitations, major constructions including railways, roads, pipelines, major industries, mines and other polluting sources. In case of ecologically sensitive areas such as Biosphere Reserves/National Parks/WL Sanctuaries/ Elephant Reserves, forests (Reserved/Protected), migratory corridors of fauna, and areas where endangered fauna and plants of medicinal and economic importance found in the 15 km study area should be given. The above details to be furnished in tabular form also
1.5	Map showing the core zone delineating the agricultural land (irrigated and un-irrigated, uncultivable land as defined in the revenue records, forest areas (as per records), along with other physical features such as water bodies, etc should be furnished.
1.6	A contour map showing the area drainage of the core zone and 25 km of the study area (where the water courses of the core zone ultimately join the major rivers/streams outside the lease/project area) should also be clearly indicated in the separate map.
1.7	Catchment area with its drainage map of 25 km area within and outside the mine shall be provided with names, details of rivers/ riverlet system and its respective order. The map should clearly indicate drainage pattern of the catchment area with basin of major rivers. Diversion of drains/ river need elaboration in form of length, quantity and quality of water to be diverted
1.8	(Details of mineral reserves, geological status of the study area and the seams to be worked, ultimate working depth and progressive stage-wise working scheme until the end of mine life should be provided on the basis of the approved rated capacity and calendar plans of production from the approved Mining Plan. Geological maps and sections should be included. The Progressive mine development and Conceptual Final Mine Closure Plan should also be shown in figures. Details of mine plan and mine closure plan approval of Competent Authority should be furnished for green field and expansion projects.
1.9	Details of mining methods, technology, equipment to be used, etc., rationale for selection of specified technology and equipment proposed to be used vis-à-vis the potential impacts should be provided.
1.10	Impact of mining on hydrology, modification of natural drainage, diversion and channeling of the existing rivers/water courses flowing through the ML and adjoining the lease/project and the impact on the existing users and impacts of mining operations thereon.
1.11	A detailed Site plan of the mine showing the proposed break-up of the land for mining operations such as the quarry area, OB dumps, green belt, safety zone, buildings, infrastructure, Stockyard, township/colony (within and adjacent to the ML), undisturbed area -if any, and landscape features such as existing roads, drains/natural water bodies to be left undisturbed along with any natural drainage adjoining the lease /project areas, and modification of thereof in terms of construction of embankments/bunds, proposed diversion/re-channelling of the water courses, etc., approach roads, major haul roads, etc should be indicated.
1.12	Original land use (agricultural land/forestland/grazing land/wasteland/water bodies) of the area should be provided as per the tables given below. Impacts of project, if any on the land use, in particular, agricultural land/forestland/grazing land/water bodies falling within the lease/project and acquired for mining operations should be analyzed. Extent of area under surface rights and under

S. No	Terms of Reference																																																
	<p>mining rights should be specified. Area under Surface Rights</p> <table border="1"> <thead> <tr> <th>S.N</th> <th>ML/Project Land use</th> <th>Area under Surface Rights(ha)</th> <th>Area Under Mining Rights(ha)</th> <th>Area under Both (ha)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Agricultural land</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>Forest Land</td> <td></td> <td></td> <td></td> </tr> <tr> <td>3</td> <td>Grazing Land</td> <td></td> <td></td> <td></td> </tr> <tr> <td>4</td> <td>Settlements</td> <td></td> <td></td> <td></td> </tr> <tr> <td>5</td> <td>Others (specify)</td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>S.N.</th> <th>Details</th> <th>Area (ha)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Buildings</td> <td></td> </tr> <tr> <td>2</td> <td>Infrastructure</td> <td></td> </tr> <tr> <td>3</td> <td>Roads</td> <td></td> </tr> <tr> <td>4</td> <td>Others (specify)</td> <td></td> </tr> <tr> <td></td> <td>Total</td> <td></td> </tr> </tbody> </table>	S.N	ML/Project Land use	Area under Surface Rights(ha)	Area Under Mining Rights(ha)	Area under Both (ha)	1	Agricultural land				2	Forest Land				3	Grazing Land				4	Settlements				5	Others (specify)				S.N.	Details	Area (ha)	1	Buildings		2	Infrastructure		3	Roads		4	Others (specify)			Total	
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1.13	<p>Study on the existing flora and fauna in the study area (10km) should be carried out by an institution of relevant discipline. The list of flora and fauna duly authenticated separately for the core and study area and a statement clearly specifying whether the study area forms a part of the migratory corridor of any endangered fauna should be given. If the study area has endangered flora and fauna, or if the area is occasionally visited or used as a habitat by Schedule-I species, or if the project falls within 15 km of an ecologically sensitive area, or used as a migratory corridor then a Comprehensive Conservation Plan along with the appropriate budgetary provision should be prepared and submitted with EIA-EMP Report; and comments/observation from the CWLW of the State Govt. should also be obtained and furnished.</p>																																																
1.14	<p>One-season (other than monsoon) primary baseline data on environmental quality - air (PM10, PM2.5, SOx, NOx and heavy metals such as Hg, Pb, Cr, As, etc), noise, water (surface and groundwater), soil - along with one-season met data coinciding with the same season for AAQ collection period should be provided. The detail of NABL/ MoEF&amp;CC certification of the respective laboratory and NABET accreditation of the consultant to be provided.</p>																																																
1.15	<p>Map (1: 50, 000 scale) of the study area (core and buffer zone) showing the location of various sampling stations superimposed with location of habitats, other industries/mines, polluting sources, should be provided. The number and location of the sampling stations in both core and buffer zones should be selected on the basis of size of lease/project area, the proposed impacts in the downwind (air)/downstream (surface water)/groundwater regime (based on flow). One station should be in the upwind/upstream/non-impact/non-polluting area as a control station. The monitoring should be as per CPCB guidelines and parameters for water testing for both ground water and surface water as per ISI standards and CPCB classification wherever applicable. Observed values should be provided along with the specified standards.</p>																																																
1.16	<p>For proper baseline air quality assessment, Wind rose pattern in the area should be reviewed and accordingly location of AAMSQ shall be planned by the collection of air quality data by adequate monitoring stations in the downwind areas. Monitoring location for collecting baseline data should cover overall the 10 km buffer zone i.e. dispersed in 10 km buffer area. In case of expansion, the displayed data of CAAQMS and its comparison with the monitoring data to be provided</p>																																																

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1.17	A detailed traffic study along with presence of habitation in 100 mts distance from both side of road, the impact on the air quality with its proper measures and plan of action with timeline for widening of road. The project will increase the no. of vehicle along the road which will indirectly contribute to carbon emission so what will be the compensatory action plan should be clearly spell out in EIA/ EMP report.
1.18	The socio-economic study to conducted with actual survey report and a comparative assessment to be provided from the census data should be provided in EIA/ EMP report also occupational status & economic status of the study area and what economically project will contribute should be clearly mention. The study should also include the status of infrastructural facilities and amenities present in the study area and a comparative assessment with census data to be provided and to link it with the initialization and quantification of need based survey for CSR activities to be followed.
1.19	The Ecology and biodiversity study should also indicate the likely impact of change in forest area for surface infrastructural development or mining activity in relation to the climate change of that area and what will be the compensatory measure to be adopted by PP to minimize the impact of forest diversion.
1.20	Baseline data on the health of the population in the impact zone and measures for occupational health and safety of the personnel and manpower for the mine should be submitted.
1.21	Impact of proposed project/activity on hydrological regime of the area shall be assessed and report be submitted. Hydrological studies as per GEC 2015 guidelines to be prepared and submitted
1.22	Impact of mining and water abstraction from the mine on the hydrogeology and groundwater regime within the core zone and 10 km buffer zone including long-term monitoring measures should be provided. Details of rainwater harvesting and measures for recharge of groundwater should be reflected in case there is a declining trend of groundwater availability and/or if the area falls within dark/grey zone.
1.23	Study on land subsidence including modeling for prediction, mitigation/prevention of subsidence, continuous monitoring measures, and safety issues should be carried out.
1.24	Detailed water balance should be provided. The break up of water requirement as per different activities in the mining operations, including use of water for sand stowing should be given separately. Source of water for use in mine, sanction of the Competent Authority in the State Govt. and impacts vis-à-vis the competing users should be provided.
1.25	PP shall submit design details of all Air Pollution control equipment (APCEs) to be implemented as part of Environment Management Plan vis-à-vis reduction in concentration of emission for each APCEs
1.26	PP shall propose to use LNG/CNG based mining machineries and trucks for mining operation and transportation of mineral. The measures adopted to conserve energy or use of renewable sources shall be explored
1.27	PP to evaluate the green house emission gases from the mine operation/ washery plant and corresponding carbon absorption plan.
1.28	Site specific Impact assessment with its mitigation measures, Risk Assessment and Disaster



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

S. No	Terms of Reference														
1.41	c) The hierarchical system or Administrative Order of the company to deal with environmental issues and for ensuring compliance with the environmental clearance conditions must be furnished.														
1.42	d) To have proper checks and balances, the company should have a well laid down system of reporting of non-compliances/violations of environmental norms to the Board of Directors of the company and/or shareholders or stakeholders at large.														
1.43	e) Environment Management Cell and its responsibilities to be clearly spelled out in EIA/ EMP report														
1.44	f) In built mechanism of self-monitoring of compliance of environmental regulations should be indicated.														
1.45	Status of any litigations/ court cases filed/pending on the project should be provided.														
1.46	PP shall submit clarification from DFO that mine does not fall under corridors of any National Park and Wildlife Sanctuary with certified map showing distance of nearest sanctuary.														
1.47	Copy of clearances/approvals such as Forestry clearances, Mining Plan Approval, mine closure plan approval. NOC from Flood and Irrigation Dept. (if req.), etc. wherever applicable.														
1.48	<p>Details on the Forest Clearance should be given as per the format given:</p> <table border="1"> <thead> <tr> <th>Total Project Area (ha)</th> <th>ML Forest land (ha)</th> <th>Total Forest land (ha)</th> <th>Date of FC</th> <th>Extent of Forest Land</th> <th>Balance area for which FC is yet to be obtained</th> <th>Status of appl For diversion of forest land</th> </tr> </thead> <tbody> <tr> <td colspan="7">If more than one provide details of each FC</td> </tr> </tbody> </table>	Total Project Area (ha)	ML Forest land (ha)	Total Forest land (ha)	Date of FC	Extent of Forest Land	Balance area for which FC is yet to be obtained	Status of appl For diversion of forest land	If more than one provide details of each FC						
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1.49	In case of expansion of the proposal, the status of the work done as per mining plan and approved mine closure plan shall be detailed in EIA/ EMP report														
1.50	Details on Public Hearing should cover the information relating to notices issued in the newspaper, proceedings/minutes of Public Hearing, the points raised by the general public and commitments made by the proponent and the time bound action proposed with budgets in suitable time frame. These details should be presented in a tabular form. If the Public Hearing is in the regional language, an authenticated English Translation of the same should be provided.														
1.51	PP shall carry out survey through drone highlighting the ground reality for atleast 10 minutes														
1.52	Detailed Chronology of the project starting from the first lease deed allotted/Block allotment/ Land acquired to its No. of renewals, CTO /CTE with details of no. renewals, previous EC(s) granted details and its compliance details, NOC details from various Govt bodies like Forest NOC(s), CGWA permissions, Power permissions, etc as per the requisites respectively to be furnished in tabular form.														
1.53	The first page of the EIA/ EMP report must mention the peak capacity production, area, detail of PP, Consultant (NABET accreditation) and Laboratory (NABL / MoEF & CC certification)														

S. No	Terms of Reference
1.54	The compliances of ToR must be properly cited with respective chapter section and page no in tabular form and also mention sequence of the respective ToR complied within the EIA-EMP report in all the chapter,s section.

### **Additional Terms of Reference**

#### **Cluster Management Committee**

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

#### **Impact study of mining**

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

#### **Agriculture & Agro-Biodiversity**

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

Horticulture, Agriculture and livestock.

#### **Forests**

19. The project proponent shall detailed study on impact of mining on Reserve forests free ranging wildlife.
20. The Environmental Impact Assessment should study impact on forest, vegetation, endemic, vulnerable and endangered indigenous flora and fauna.
21. The Environmental Impact Assessment should study impact on standing trees and the existing trees should be numbered and action suggested for protection.
22. The Environmental Impact Assessment should study impact on protected areas, Reserve Forests, National Parks, Corridors and Wildlife pathways, near project site.

#### **Water Environment**

23. Hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) so as to assess the impacts on the nearby waterbodies due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided, covering the entire mine lease period.
24. Erosion Control measures.
25. Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area on the nearby Villages, Water-bodies/ Rivers, & any ecological fragile areas.
26. The project proponent shall study impact on fish habitats and the food WEB/ food chain in the water body and Reservoir.
27. The project proponent shall study and furnish the details on potential fragmentation impact on natural environment, by the activities.
28. The project proponent shall study and furnish the impact on aquatic plants and animals in water bodies and possible scars on the landscape, damages to nearby caves, heritage site, and archaeological sites possible land form changes visual and aesthetic impacts.
29. The Terms of Reference should specifically study impact on soil health, soil erosion, the soil physical, chemical components and microbial components.
30. The Environmental Impact Assessment should study on wetlands, water bodies, rivers streams, lakes and farmer sites.

#### **Energy**

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

#### **Climate Change**

32. The Environmental Impact Assessment shall study in detail the carbon emission and also suggest the measures to mitigate carbon emission including development of carbon sinks and temperature reduction including control of other emission and climate mitigation activities.
33. The Environmental Impact Assessment should study impact on climate change, temperature rise, pollution and above soil & below soil carbon stock.

#### **Mine Closure Plan**

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

#### **EMP**

35. Detailed Environment Management Plan along with adaptation, mitigation & remedial strategies covering the entire mine lease period as per precise area communication order issued.
36. The Environmental Impact Assessment should hold detailed study on EMP with budget for Green belt development and mine closure plan including disaster management plan.

#### **Risk Assessment**

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

#### **Disaster Management Plan**

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

#### **Others**

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

river, lake pond, tank etc.

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

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

## Annexure 2

### Details of Products & By-products

Name of the product /By-product	Product / By-product	Quantity	Unit	Mode of Transport / Transmission	Remarks (eg. CAS number)
Rough Stone	Rough Stone	277958	C.u.m for five years	Road	As per approved Mining Plan

From  
Dr.P.Jayapal M.Sc., Ph.D.,  
Deputy Director,  
Geology and Mining,  
Karur.

To  
M/s.Kousic & Co Blue Metals,  
Door No.24/A, Housing Unit,  
Kollampalayam,  
Kasipalayam,  
Erode Taluk and District.

Rc.No.510/Mines/2022, Dated:17.10.2023

Sir,

Sub: Mines and Minerals - Minor Mineral - Karur District -  
Pugalur Taluk - Anjur Village - S.F.Nos. 770/2B(Part)  
1.54.0 hectares, 778/3B1(Part) 1.62.0 hectares and  
778/3B2 (Part) 0.07.0 hectares Over an extant 3.23.00  
hectares - Quarry lease application for Rough Stone and  
Gravel - Preferred by M/s.Kousic & Co Blue Metals -  
Mining Plan approved - requested for the details of Existing/  
Proposed/Expired/Abandoned quarries situated within  
500 mts radial distance - furnished - Regarding.

- Ref:
1. Quarry lease application for Rough stone and Gravel preferred by M/s.Kousic & Co Blue Metals, Door No.24/A, Housing Unit, Kollampalayam, Kasipalayam, Erode Taluk and District, dated:13.10.2022.
  2. Precise Area Communication Notice Rc.No.510/Mines/2022, Dated:19.09.2023.
  3. Mining Plan submitted by M/s.Kousic & Co Blue Metals, Letter dated: 26.09.2023.
  4. The Deputy Director, Geology and Mining, Karur Mining Plan approved letter Rc.No. 510/Mines/2022, Dated:04.10.2023.
  5. M/s.Kousic & Co Blue Metals letter dated:06.10.2023.

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In the reference 1<sup>st</sup> cited, M/s.Kousic & Co Blue Metals have applied quarry lease for quarrying Rough stone and Gravel in S.F.Nos. 770/2B(Part) 1.54.0 hectares, 778/3B1(Part) 1.62.0 hectares and 778/3B2 (Part) 0.07.0 hectares Over an extant 3.23.00 hectares of patta lands in Anjur Village, Pugalur Taluk, Karur District. The Deputy Director of Geology and Mining, Karur had issued precise area letter to the proposed lease area vide reference 2<sup>nd</sup> cited.

For Kousic & Co Bluemetals

  
Partner

Accordingly, the applicant firm have submitted the 3 copies of draft Mining Plan and the same was approved by the Deputy Director, Geology and Mining, Karur vide reference 4<sup>th</sup> cited.

In the reference 5<sup>th</sup> cited, the applicant firm have requested the Deputy Director of Geology and Mining, Karur to provide the details of existing, proposed and abandoned quarries situated within 500 meter radial distance from subject area and same has been furnished as follows:-

**I. Existing Quarries: -**

Sl No.	Name of the lessee/firm it holder	Name of the Mineral	Taluk & Village	S.F.No.	Extent (hect)	Lease Period
1			-- Nil --			

**II. Proposed Quarries: -**

Sl No.	Name of the lessee/firm it holder	Name of the Mineral	Taluk & Village	S.F.No.	Extent (hect)	Lease Period
1	M/s.Kousic & Co Blue Metals, Door No.24/A, Housing Unit, Kollampalayam, Kasipalayam, Erode Taluk and District.	Rough Stone and Gravel	Pugalur, Anjur	770/2B(P) 778/3B1(P) 778/3B2 (P)	3.23.00	Proposed Area
2	Thiru.S.Kuppusamy, S/o.Samiappagounder, Door-No.95, Saliangkattupallam, Thotiyapalayam, Muthur, Kangeyam Taluk, Tiruppur District - 638 105.	Rough Stone and Gravel	Pugalur, Anjur	764/3 765/3 766/1 766/2 766/3A 767/1 767/2A (Patta land)	4.82.70	Adjacent Applied Field
3	Thiru.P.Pazhanisami, S/o.Periyasamy, Door No.104/107, Saliyankattupallam, Thotiyapalayam, Muthur, Kangeyam Taluk, Tiruppur District - 638 105	Rough Stone and Gravel	Pugalur, Anjur (Patta land)	773/2, 776/3, 777/1, 777/1, 778/1A(P), 807/2C2	4.47.85	Adjacent Applied Field

For Kousic & Co Bluemetals

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 Partner

4	Thiru.V.Arunprashath, S/o.Vadivel, Door Perumalkovilputhur, Ichipalayam, Kodumudi T.K., Eorde District	No.60, Rough Stone and Gravel	Pugalur, Anjur	767/3 (Patta land)	1.24.0	Applied Field
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**III. Lease Expired Quarries :-**

Sl No.	Name of the lessee/firm it holder	Name of the Mineral	Taluk & Village	S.F.No.	Extent (hect)	Lease Period
1	Thiru.P.Duraisamy S/o.PeriyasamyGounder ThatharakaduThottam, Anjur Village Erode Taluk & District.	Rough Stone	Pugalur, Anjur	762/4 763/4 764/1 765/1 (Patta land)	1.59.5	07.08.2017 to 06.08.2022
2	Thiru.P.Ravi S/o.Palanisamy Chinnakangeyam palayam Mankalappatti post Kangeyam Taluk, Tiruppur District.	Rough Stone	Pugalur, Anjur	759/3 759/4 763/5 764/2 765/2 (Patta land)	4.18.0	07.08.2017 to 06.08.2022

**III. Abandoned Quarries :-**

Sl No.	Name of the lessee/firm it holder	Name of the Mineral	Taluk & Village	S.F.No.	Extent (hect)	Lease Period
1	Nil					

Deputy Director,  
Geology and Mining,  
Karur.

17/10/2023

For Kousic & Co Bluemetals

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Partner



From  
Dr.P.Jayapal M.Sc., Ph.D.,  
Deputy Director,  
Geology and Mining,  
Karur.

To  
M/s.Kousic & Co Blue Metals,  
Door No.24/A, Housing Unit,  
Kollampalayam,  
Kasipalayam,  
Erode Taluk and District.

**Rc.No.510/Mines/2022, Dated:04.10.2023**

Sir,

Sub: Mines and Minerals – Minor Mineral – Karur District –  
Pugalur Taluk – Anjur Village - S.F.Nos. 770/2B(Part)  
1.54.0 hectares, 778/3B1(Part) 1.62.0 hectares and  
778/3B2 (Part) 0.07.0 hectares Over an extant 3.23.00  
hectares - Quarry lease application for Rough Stone and  
Gravel – Preferred by M/s.Kousic & Co Blue Metals -  
Precise area communicated - mining plan submitted for  
approval – Approved – Regarding.

- Ref: 1. Quarry lease application for Rough stone and Gravel  
preferred by M/s.Kousic & Co Blue Metals, Door  
No.24/A, Housing Unit, Kollampalayam,  
Kasipalayam, Erode Taluk and District,  
dated:13.10.2022.
2. Order of the Hon'ble Supreme Court of India in  
I.A.Nos.12-13/2011 in SLP (C) No.19628-  
19629/2009, dt: 27.02.2012.
3. Government of India, Ministry of Environment and  
Forest Office Memorandum, Dated:18.05.2012.
4. The Chairman, State Level Environment Impact  
Assessment Authority, Tamil Nadu  
D.O.Lr.No.SEIAA-TN/Minor Minerals/2012, Dated:  
17.09.2012.
5. The Commissioner of Geology and Mining, Chennai  
letter Rc.No.3868/LC/2012, dt: 19.11.2012.
6. Deputy Director, Geology and Mining, Karur Notice  
Rc.No.510/Mines/2022, Dated:19.09.2023
7. Mining Plan submitted by M/s.Kousic & Co Blue  
Metals letter Dated:26.09.2023.

\*\*\*\*\*

M/s.Kousic & Co Blue Metals applied for quarry lease to  
quarry Rough Stone vide in the reference 1<sup>st</sup> cited and Precise area

For Kousic & Co Bluemetals

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Partner

communicated to the applicant firm regarding to submit the mining plan for approval as per rule 41 and also submit the Environmental Clearance as per Rule 42 of Tamil Nadu Minor Mineral Concession Rules

Accordingly, M/s.Kousic & Co Blue Metals has submitted three copies of draft mining plan for approval in respect of Rough stone and Gravel quarry lease applied areas, over an extent of 3.23.00 hectares of patta lands in S.F.Nos. 770/2B(Part) 1.54.0 hectares, 778/3B1(Part) 1.62.0 hectares and 778/3B2 (Part) 0.07.0 hectares of Anjur Village, Pugalur Taluk, Karur District in the reference 7<sup>th</sup> cited.

The above submitted mining plan for the grant of Rough stone and Gravel quarry lease in S.F.Nos. 770/2B(Part) 1.54.0 hectares, 778/3B1(Part) 1.62.0 hectares and 778/3B2 (Part) 0.07.0 hectares Over an extant 3.23.00 hectares of patta lands in Anjur Village, Pugalur Taluk, Karur District has been examined in detail.

As per the guidelines/ instructions issued by the Commissioner of Geology and Mining, Chennai vide letter Rc.No.3868/LC/2012, date: 19.11.2012., the mining plan submitted by the applicant firm is hereby approved, subject to the following conditions:

- (i) The mining plan is approved without prejudice to any other Law applicable to the quarry lease from time to time whether such laws are made by the Central Government, State Government or any other authority.
- (ii) This approval of the mining plan does not in any way imply the approval of the Government in terms or any other provisions of the Mines and Minerals (Development and Regulation) Act, 1957, or any other connected laws including Forest (Conservation) Act, 1980, Forest Conservation Rules, 1981, Environment Protection Act,

For Kousic & Co Bluemetals

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Partner

1980, Explosives Act, 1884 (Central Act IV of 1884) Minor Mineral Concession and Development Rules, 2010 and the Rules made there under and the Tamil Nadu Minor Mineral Concession Rules, 1959.

- (III) The mining plan is approved without prejudice to any other order or direction from any court of competent jurisdiction.
- (IV) As per the Deputy Director, Geology and Mining, Karur notice in Rc.No.510/Mines/2022, Dated.19.09.2023 the following conditions are incorporated in the Mining Plan plates.

1. விண்ணப்ப புல எண்.778/3B1-இன் வடமேற்கில் செல்லும் பொதுப்பணித்துறை வாய்க்காலுக்கு 50 மீட்டர் பாதுகாப்பு இடைவெளி விட்டு யாதொரு சேதமுமின்றி முறையாக குவாரிப்பணி செய்ய வேண்டும்.
2. விண்ணப்ப புலங்களுக்கு அருகில் உள்ள பட்டா நிலங்களுக்கு 7.5 மீட்டர் மற்றும் புறம்போக்கு நிலத்திற்கு 10 மீட்டர் பாதுகாப்பு இடைவெளி விட்டு யாதொரு சேதமுமின்றி முறையாக குவாரிப்பணி செய்ய வேண்டும்.
3. குத்தகைக்காலத்தில் கைத்துளைப்பான் கருவி கொண்டு பாறைகளை துளையிட்டும், மிதமான வெடிபொருள் பயன்படுத்தியும், பொதுமக்களுக்கோ, பொது சொத்துக்களுக்கோ யாதொரு சேதமுமின்றி விதிமுறைகளின்படி குவாரிப்பணி செய்ய வேண்டும்.
4. குவாரித் தொழிலாளர்களின் பாதுகாப்பினை உறுதி செய்ய Mettaliferrous Mines, விதிகளின்படி அகலமானதும், பாதுகாப்பானதுமான Benches அமைத்து பாதுகாப்பான முறையில் குவாரிக்குள் வாகனங்கள் சென்றுவரவும் மற்றும் குவாரி தொழிலாளர்களின் பாதுகாப்பினை உறுதி செய்தும் குவாரிப்பணி செய்ய வேண்டும்.
5. குவாரி குத்தகை வழங்க ஏதுவாக துணை இயக்குநர் (சுரங்கம்) அவர்களால் ஏற்பளிக்கப்பட்ட சுரங்கத்திட்டத்தினையும், மாநில அளவிலான சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையத்தின் (SEIAA) இசைவினை பெற்று மாவட்ட நிர்வாகத்திற்கு விண்ணப்பதாரர் நிறுவனத்தினரால் சமர்ப்பிக்கப்பட வேண்டும்.

- (V) Quarrying shall be done as per the approved Mining Plan and that the mining plan is approved without prejudice to any other law applicable to the quarry lease from time to time whether such laws are made by the Central Government, State Government or any other authority.
- (VI) If anything is found to be concealed as required by the Mines Act in the contents of the Mining Plan and the proposal for rectification has not been made, the approval shall be deemed to have been withdrawn with immediate effect.

Encl: Two copies of Approved Mining Plan.

*[Handwritten Signature]*  
04/10/23

Deputy Director,  
Geology and Mining,  
Karur.

**Copy to:**

Dr.S.Karuppannan, M.Sc., Ph.D,  
RQP/MAS/263/2014/A,  
GEO Technical Mining Solutions,  
No.1/213-B Ground Floor,  
Natesan Complex,  
Oddapatti, Collectorate Post Office,  
Dharmapuri - 636 705.

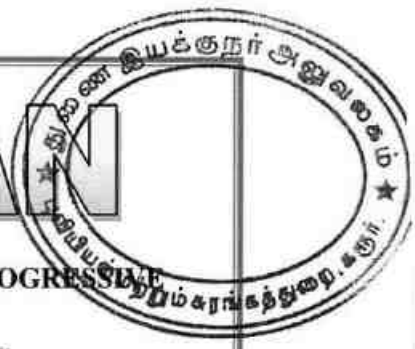
*[Handwritten Signature]*  
04/10/23

Partner & Co Bluemetals

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Partner

# MINING PLAN



**FOR ANJUR VILLAGE ROUGH STONE MINING LEASE WITH PROGRESSIVE QUARRY CLOSURE PLAN**

Patta- Ryotwari land/Opencast-Semi Mechanized mining/ Non- Forest/Non - Captive Use -  
"B2" Category

Lease period 5 Years from the date of lease execution

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

### LOCATION OF THE LEASE AREA

STATE : TAMILNADU  
 DISTRICT : KARUR  
 TALUK : PUGALUR  
 VILLAGE : ANJUR  
 S.F. NO'S : 770/2B (Part), 778/3B1 (Part)  
 and 778/3B2 (Part)  
 EXTENT : 3.23.0 Hectares

### ADDRESS OF THE APPLICANT

**M/s.Kousic and Co Blue Metals,**

Door.No.24/A,  
Housing Unit,  
Kollampalayam,  
Kasipalayam,

*this Mining plan is approved subject to the conditions/stipulations indicated in the Mining Plan approval Letter No: 510/mines/2022 Dated: 04/10/2023*

Erode Taluk and District.

### PREPARED BY

Dr.S.KARUPPANNAN.M.Sc., Ph.D.,  
RQP/MAS/263/2014/A

### **GEO TECHNICAL MINING SOLUTIONS**

No: 1/213 -B, Ground Floor, Natesan Complex,  
Oddapatti, Collectorate Post office,  
Dharmapuri-636705. Tamil Nadu.  
Mob. : +91 9443937841, +917010076633,  
E-mail: [info.gtmsdpi@gmail.com](mailto:info.gtmsdpi@gmail.com) ,  
Website: [www.gtmsind.com](http://www.gtmsind.com)



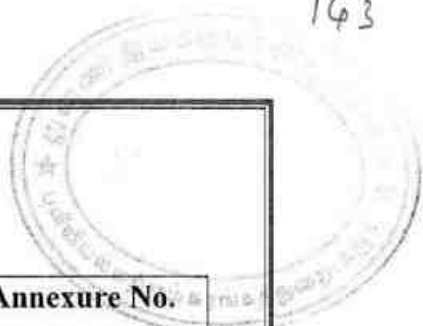
M/s. Kousic & Co Blue Metals

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*[Signature]*  
Partner

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**ANNEXURES**

Sl. No.	Description	Annexure No.
1.	Copy of precise area communication letter	I
2.	Copy of Previous Lease Particulars a) Copy of Environmental Clearance b) Copy of Proceeding letter c) Copy of Lease deed	II
3.	Copy of <b>FMB</b> (Field Measurement book)	III
4.	Copy of Combined sketch	IV
5.	Copy of "A" registered	V
6.	Copy of Chitta & adangal	VI
7.	Copy of Consent Letter	VII
8.	Copy of company registration certificate	VIII
9.	Copy of company GST Certificate	IX
10.	Photocopy of the proposed lease area	X
11.	Copy of ID Proof of the authorized signature	XI
12.	Copy of RQP certificate	XII

*[Handwritten signature]*

## LIST OF PLATES

S. No	Description	Plate No.	Scale
1	Key map	I	Not to scale
2	Location plan	I-A	Not to scale
3	Toposheet map	I-B	Scale 1:1,00,000
4.	Satellite imagery map	I-C	Scale 1: 5,000
5.	Environmental plan	I-D	Scale 1: 5,000
6.	Mine lease plan	II	Plan Scale: 1:2000
7.	Surface, Geological plan and Sections	III	Plan scale: 1:2000 Section: Hor 1:1000 Ver 1:500
8.	Geological sections	IIIA	Section: Hor 1:1000 Ver 1:500
9.	Year wise development & production plan	IV	Plan scale: 1:2000
10.	Year wise development & production sections	IVA	Section: Hor 1:1000 Ver 1:500
11.	Mine layout plan and land use pattern	V	Plan scale: 1:2000
12.	Conceptual plan	VI	Plan scale: 1:2000
13.	Conceptual sections	VIA	Section: Hor 1:1000 Ver 1:500



**M/s.Kousic and Co Blue Metals,**

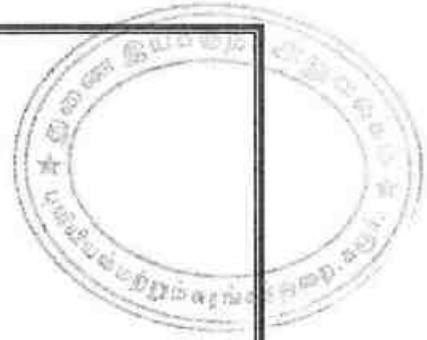
Door.No.24/A,

Housing Unit,

Kollampalayam,

Kasipalayam,

Erode Taluk and District.



**CONSENT LETTER FROM THE APPLICANT**

The Mining Plan for rough stone quarry lease in S.F.No's: 770/2B (Part) (1.54.0Hectares), 778/3B1 (Part) (1.62.0Hectares) and 778/3B2 (Part) (0.07.0Hect) over an extent of 3.23.0hectares, Anjur Village, Pugalur Taluk, Karur District, Tamil Nadu State has been prepared by

**Dr. S. KARUPPANNAN. M.Sc., Ph.D. (Regn. No. RQP/MAS/263/2014/A)**

I request the **Deputy Director, Department of Geology and Mining, Karur 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.**

(Regn. No. 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, +91 7010076633

E-mail: [info.gtmsdpi@gmail.com](mailto:info.gtmsdpi@gmail.com),

Website: [www.gtmsind.com](http://www.gtmsind.com)

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

**For KOUSIC & CO BLUE METALS**

**PARTNER**

Place: Erode, TN

Date:

Signature of the applicant  
(M/s.Kousic and Co Blue Metals)



M/s.Kousic and Co Blue Metals,  
Door.No.24/A,  
Housing Unit,  
Kollampalayam,  
Kasipalayam,  
Erode Taluk and District.

**DECLARATION**

The Mining Plan of rough stone quarry lease in S.F.No's: 770/2B (Part) (1.54.0Hectares), 778/3B1 (Part) (1.62.0Hectares) and 778/3B2 (Part) (0.07.0Hect) over an extent of 3.23.0hectares, Anjur Village, Pugalur Taluk, Karur District, Tamil Nadu State have been prepared with my consultation and I have understood the contents and agree to implement the same in accordance with the Mining Laws.

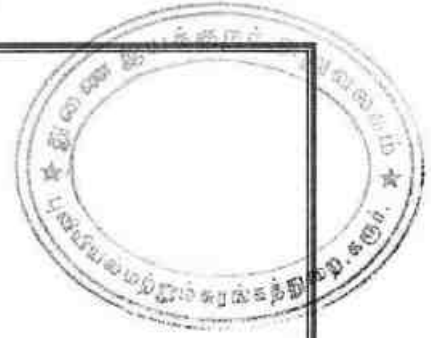
Place: Erode, TN

Date:

For KOUSIC & CO BLUE METALS

**PARTNER**

Signature of the applicant  
(M/s.Kousic and Co Blue Metals)



**Dr. S. KARUPPANNAN. M.Sc., Ph.D.**  
 (Regn. No. RQP/MAS/263/2014/A)  
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 Ph: +91 9443937841, +91 7010076633  
 E-mail: [info.gtmsdpi@gmail.com](mailto:info.gtmsdpi@gmail.com),  
 Website: [www.gtmsind.com](http://www.gtmsind.com)

**CERTIFICATE**

This is to certify that the provisions of 19(1), 20 and 33 of Tamil Nadu Minor Minerals Concession Rules, 1959 have been observed in the mining plan for the grant of rough stone quarry lease in S.F.No's: 770/2B (Part) (1.54.0Hectares), 778/3B1 (Part) (1.62.0Hectares) and 778/3B2 (Part) (0.07.0Hect) over an extent of 3.23.0hectares, Anjur Village, Pugalur Taluk, Karur District, Tamilnadu State applied to **M/s.Kousic and Co Blue Metals**, Erode District, Tamil Nadu.

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.

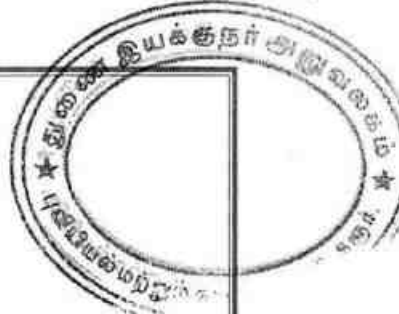
Place: Dharmapuri, TN

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-636705, Tamil Nadu, India.

Partner



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

(Regn. No. RQP/MAS/263/2014/A)

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E-mail: [info.gtmsdpi@gmail.com](mailto:info.gtmsdpi@gmail.com),

Website: [www.gtmsind.com](http://www.gtmsind.com)

**CERTIFICATE**

I certify that the preparation of Mining Plan for rough stone quarry lease in S.F.No's: 770/2B (Part) (1.54.0Hectares), 778/3B1 (Part) (1.62.0Hectares) and 778/3B2 (Part) (0.07.0Hect) over an extent of 3.23.0hectares, Anjur Village, Pugalur Taluk, Karur District, Tamil Nadu prepared to **M/s.Kousic and Co Blue Metals**, Erode District, Tamil Nadu, covers all the provisions of Mines Act, Rules and Regulations etc. made there in and if any specific permission is required the applicant will approach "**The Director General of Mines Safety**", Chennai. The standards prescribed by DGMS regarding Mines Health will be strictly implemented.

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-636705, Tamil Nadu, India.

# MINING PLAN

FOR ANJUR VILLAGE ROUGH STONE MINING LEASE WITH PRE

## QUARRY CLOSURE PLAN

Patta- Ryotwari land/Opencast-Semi Mechanized mining/ Non- Forest/Non - Captive Use -

"B2' Category

Lease period 5 Years from the date of lease execution

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

### INTRODUCTORY NOTES:

- 1) **Introduction:** The applicant M/s.Kousic and Co Blue Metals office at Door.No. 24/A, Housing Unit, Kollampalayam, Kasipalayam, Erode Taluk and District, Tamil Nadu State. The applicant was submit application on 13.10.2022 for request to the Deputy Director, Department of Geology and Mining, Karur, renewed to be continued quarrying operation for rough stone at S.F.No's: 770/2B (Part) (1.54.0Hectares), 778/3B1 (Part) (1.62.0Hectares) and 778/3B2 (Part) (0.07.0Hect) over an extent of 3.23.0hectares of Anjur Village, Pugalur Taluk, Karur District, Tamil Nadu State further the period of 5 years.
- 2) **Precise area communication letter particulars:** The Deputy Director, Department of Geology and Mining, Karur has directed to the applicant M/s.Kousic and Co Blue Metals through his precise area communication letter Rc.No.510/Mines/2022 Dated: 19.09.2023 has recommended quarrying lease for rough stone quarry lease at Tamil Nadu State, Karur District, Pugalur Taluk, Anjur Village in S.F.No's: 770/2B (Part) (1.54.0Hectares), 778/3B1 (Part) (1.62.0Hectares) and 778/3B2 (Part) (0.07.0Hect) over an area of 3.23.0 hectares and should be submitted draft mining plan for approval for the period of 90 days the following conditions for a period of five (5) years under Rule 19 (1), 20 & 33 of Tamil Nadu Minor Mineral Concession Rules, 1959.
  - i) Excavation should be carried out properly without any damage leaving a safety distance of 50 meter to the PWD Vaikkal crossing north-west of S.F.No.778/3B1.
  - ii) A safety distance should be left out nearby the applied area 7.5m for Patta lands and 10m safety distance for Government poramboke land as respectively while quarrying activities.

This Mining Plan is approved subject to the conditions/stipulations

Indicated in the Mining Plan approval

Letter No: 186

Dated: 04/10/2023

For Kousic & Co Bluemetals



Partner

- iii) Quarrying operation to be carried out with controlled blasting techniques viz, hand-hack-Hammer, Driller for drilling shot holes and use mild explosives substance for blasting the rocks.
- iv) To ensure the safety of quarry workers as per Metalliferous Mines Acts should formed wide, safe benches. Inside the quarry in safe manner vehicles come and go, do the quarry work ensuring the safety of the quarry workers.
- v) To provide quarrying lease by the Deputy Director, Karur, approved mining plan, obtain Environmental Clearance from the competent authority of State Level Environment Impact Assessment Authority-Tamil Nadu (SEIAA) and should be submitted.

- 3) **The previous lease particulars:** The proposed lease area was previously granted to quarrying of rough stone in favor of **M/s.Kousic and Co Blue Metals** by the District Collector, Karur Rc.No.B/123/G&M/2007, Date: 04.06.2008 in S.F.No. 770/2B & 778/2B2 Karur District, Aravakurichi Taluk, Anjur Village, over an extent of 3.35.5hectares for a period of 5 years and The proposed lease area was previously granted to quarrying of rough stone in favor of **M/s.Kousic and Co Blue Metals** by the District Collector, Karur Rc.No.B/123/G&M/2007, Date: 12.03.2007 in S.F.No. 778/3B2 Karur District, Aravakurichi Taluk, Anjur Village, over an extent of 1.03.0hectares for a period of 5 years. The lease was executed 15.03.2007 to 14.03.2012 for a period of 5 years.

The proposed lease area was previously granted to quarrying of rough stone in favor of **M/s.Kousic and Co Blue Metals** by the District Collector, Karur proceedings vide Rc.172/Mines/2012 dated: 07.08.2017 in S.F.No. 770/2B (Part), 778/3B2, 778/3B1 Karur District, Aravakurichi Taluk, Anjur Village, over an extent of 4.98.0hectares for a period of 5 years. The lease was executed 07.08.2017 to 06.08.2022 for a period of 5 years. The applicant got Environmental Clearance from SEIAA, Lr.No.SEIAA-TN/F.No.5835/1(a)/EC.No.3926/2016 dated: 07.06.2017.

Now, **Renewal application** for new proposals has submitted to the Deputy Director, Department of Geology and Mining (DDG & M), Karur dated 13.10.2022 and the Deputy Director, recommended to his precise area communication letter Rc.No.510/Mines/2022 Dated: 19.09.2023 for period of five years recommended to favor of **M/s.Kousic and Co Blue Metals**, Karur for quarrying lease rough stone at Tamil Nadu State, Karur District, Pugalur Taluk, Anjur Village in S.F.No: 770/2B

(Part) (1.54.0Hectares), 778/3B1 (Part) (1.62.0Hectares) and 778/3B2 (Part) (0.07.0Hect) over an extent of 3.23.0hectares.

There is an existing pit was noticed with an average pit dimension as given under the table and the existing pit marked in the surface and geological plan (Ref Plate No's: III).

Avg.Existing Pit Dimension			
Pit	Length (m)	Width (m)	Depth(m)
I	48	59	1
IA	78	16	1
II	32	28	5
III	20	15	7
IV	18	13	8
V	11	14	13

- 4) **Preparation and Submission of Mining Plan:** The Mining Plan with progressive quarry closure plan has been prepared under rule 41 and submitted under rule 42 of Tamil Nadu Minor Mineral Concession Rules, 1959, for mining lease as per conditions mentioned in the precise area communication letter **Rc.No.510/Mines/2022 Dated: 19.09.2023**
- 5) **Geological resources and Mineable reserves:** Geological resource of estimated as **1299720m<sup>3</sup>** including the resources of safety zone, and topsoil. Of which, rough stone resources of about **1278843m<sup>3</sup>** and topsoil is about **20877m<sup>3</sup>**. The total mineable reserve is estimated to be **286688m<sup>3</sup>** by deducting the reserve safety zone, block in benches from the total Geological resources. Of which, rough stone is about **277958m<sup>3</sup>** and topsoil is about **8730m<sup>3</sup>** up to a depth of 45m below the ground level (R.L.195m-150m) (Refer Plate No. III, IIIA, IV & VIA).
- 6) **Proposed production schedule:** Total proposed production of **286688m<sup>3</sup>**. Of which, rough stone is **277958m<sup>3</sup>** and topsoil is **8730m<sup>3</sup>** up to a depth of 45m below the ground level (R.L.195m-150m) for five years plan period. Average production is **55592m<sup>3</sup>** of rough stone per year. (Refer Plate No. IV & IVA).
- 7) **Environmental Sensitivity of the proposed lease area: -**
- Interstate boundary:** There is no interstate boundary around 10Km radius periphery of proposed lease area.
  - Wildlife Protection Act, 1972:** There is no wild life sanctuary within radius of 10Km from the project site area under the Wildlife (Protection) Act, 1972.

iii. **Indian Reserve Forest Act, 1980:** No reserved forest situated within radius of 1Km periphery of the proposed site. The Nearest reserve forest is

1. Archalur R.F - 15.0km - Northwest

iv. **CRZ Notification, 1991:** There is no sea coastal zone found within radius of 10km and this project site doesn't attract CRZ Notification, 1991.

8) **Environmental measures to be adopted during the ongoing activity period,**

- a) Controlled blasting includes adoption of suitable explosive charge and short delay detonators, adequate stemming of holes at collar zone and restricting blasting to a particular time of the day i.e. at the time lunch hours, controlled charge per hole as well as charge per round of hole
- b) Usage of sharp drill bits while drilling which will help in reducing noise.
- c) Secondary blasting will be totally avoided and hydraulic rock breaker will be used for breaking boulders.
- d) Controlled blasting with proper spacing, burden, stemming and optimum charge/delay will be maintained.
- e) Green Belt/Plantation will be developed around the project area and along the haul roads. The plantation minimizes propagation of noise.
- f) Water will be sprinkled on haul roads twice a day to avoid dust generation during transportation.
- g) Transportation of material will be carried out during day time and material will be covered with tarpaulin.
- h) The speed of tippers plying on the haul road will be limited below 20 km/hr to avoid generation of dust.
- i) And any other conditions as stipulated by the concerned authorities should be followed to protect the environment.

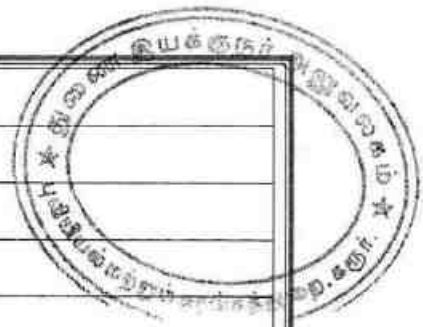
**1.0 GENERAL:**

a.	Name of the Applicant	:	<b>M/s.Kousic and Co Blue Metals</b>
	Applicant address	:	Door.No.24/A, Housing Unit, Kollampalayam, Kasipalayam, Erode Taluk
	District	:	Erode District
	State	:	Tamilnadu

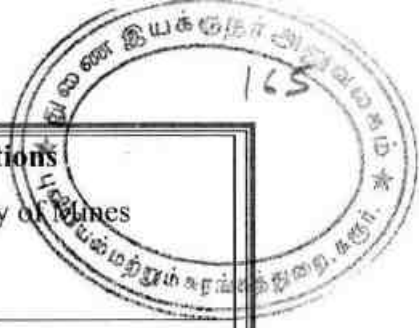
For Kousic & Co Bluemetals

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Pin code	:	
Phone	:	----
Fax	:	Nil
Gram	:	Nil
Telex	:	Nil
E-mail	:	.....
<b>b. Status of the Applicant</b>		
Private individual	:	---
Cooperative Association	:	---
Private company	:	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 quarry lease
d. Period for which the mining lease granted /renewed/ proposed to be applied	:	The precise area has been communicated to the applicant for quarrying period of five (5) years.
e. Name of the RQP preparing the Mining Plan	:	<b>Dr. S.KARUPPANNAN.M.Sc.,Ph.D.,</b>
Address	:	<b>Geo Technical Mining Solutions</b> (A NABET Accredited & ISO certified Company) No: 1/213-B, Ground Floor, Natesan Complex, Oddapatti, Collectorate Post office, Dharmapuri-636705 Web site: <a href="http://www.gtmsind.com">www.gtmsind.com</a>
Phone	:	+91 9443937841, 7010076633
Fax	:	Nil
e-mail	:	<a href="mailto:info.gtmsdpi@gmail.com">info.gtmsdpi@gmail.com</a>
Telex	:	Nil
Certificate Number	:	RQP/MAS/263/2014/A
Date of grant/renewal	:	16.12.2014
Valid up to	:	15.12.2024



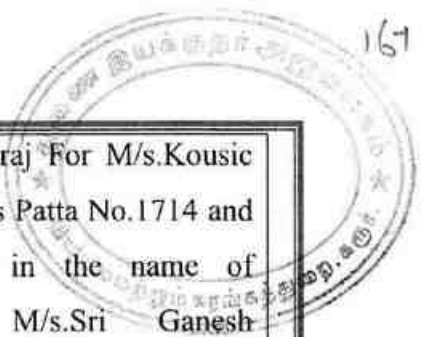
f.	Name of the prospecting agency	: <b>Geo Technical Mining Solutions</b> GSR 286(E) No:272, Ministry of Mines Notification 7th April 2022.
	Address	: No: 1/213-B, Ground Floor, Natesan Complex, Oddapatti, Collectorate Post office, Dharmapuri-636705 Web site: <a href="http://www.gtmsind.com">www.gtmsind.com</a>
	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 Deputy Director, Department of Geology and Mining, District Collectorate, Karur Vide <b>Rc.No.510/Mines/2022 Dated: 19.09.2023</b>

## 2.0 LOCATION AND ACCESSIBILITY:

a.	Details of the Area:	: Refer plate no: IA & IB																																			
	District & State	: Karur, Tamil Nadu																																			
	Taluk	: Pugalur																																			
	Village	: Anjur																																			
Khasra No./ Plot No./ Block Range/ Felling Series etc.																																					
	<table border="1"> <thead> <tr> <th>Survey No.</th> <th>Sub division</th> <th>Total Extent in Hect</th> <th>Patta No.</th> <th>Name of the Land Owner</th> <th>Mine lease Applied S.F. No.</th> <th>Mine lease Applied Area out of total area in hect.</th> </tr> </thead> <tbody> <tr> <td>770</td> <td>2B</td> <td>2.32.5</td> <td>1714</td> <td>K.G.Mohanraj For M/s.Kousic and Co Blue Metals</td> <td>770/2B</td> <td>1.54.0</td> </tr> <tr> <td>778</td> <td>3B1</td> <td>3.02.5</td> <td>1305</td> <td>S.K.Subramani For M/s.Sri Ganesh Bluemetals</td> <td>778/3B1</td> <td>1.62.0</td> </tr> <tr> <td>778</td> <td>3B2</td> <td>1.03.0</td> <td>1714</td> <td>K.G.Mohanraj For M/s.Kousic and Co Blue Metals</td> <td>778/3B2</td> <td>0.07.0</td> </tr> <tr> <td colspan="2"><b>Total Extent</b></td> <td><b>6.38.0</b></td> <td></td> <td colspan="2"><b>Applied lease area extent</b></td> <td><b>3.23.0</b></td> </tr> </tbody> </table>	Survey No.	Sub division	Total Extent in Hect	Patta No.	Name of the Land Owner	Mine lease Applied S.F. No.	Mine lease Applied Area out of total area in hect.	770	2B	2.32.5	1714	K.G.Mohanraj For M/s.Kousic and Co Blue Metals	770/2B	1.54.0	778	3B1	3.02.5	1305	S.K.Subramani For M/s.Sri Ganesh Bluemetals	778/3B1	1.62.0	778	3B2	1.03.0	1714	K.G.Mohanraj For M/s.Kousic and Co Blue Metals	778/3B2	0.07.0	<b>Total Extent</b>		<b>6.38.0</b>		<b>Applied lease area extent</b>		<b>3.23.0</b>	
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	Lease area (hectares)	: 3.23.0 Hectare																																			
	Whether the area is recorded to be in forest (please specify whether protected, reserved, etc)	: No, forest is involved. This is recorded as patta Land.																																			
	Ownership / Occupancy	: S.F.No. 770/2B & 778/3B2 is registered in																																			

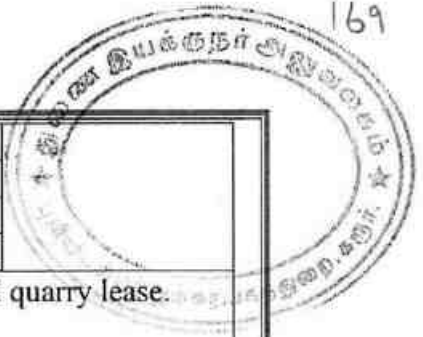
For Kousic & Co Bluemetals

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	<p>the name of K.G.Mohanraj For M/s.Kousic and Co Blue Metals vides Patta No.1714 and 778/3B1 is registered in the name of S.K.Subramani For M/s.Sri Ganesh Bluemetals vides Patta No.1305. Hence the pattadhar given consent to the applicant (Ref. Annex. No:VII).</p>																																	
<p>Existence of Public Road / Railway line if any nearby and approximate distance</p>	<p>✓ Excavated materials will be transported through the approach road on the northeast side of the lease applied area.</p> <p>✓ There is an SH-189 road are situated about 0.92km away from the northern side which is connecting Muthur- Kodumudi.</p> <p>✓ There is an NH-381A road are situated about 5.33km away from the western side which is connecting Erode- Vellakoil.</p> <p>✓ There is an MDR-332 road are situated about 4.98km away from the western side which is connecting Noyal- K.Paramathi Rd.</p> <p>There is no railway line are situated about 5.0km radius.</p>																																	
<p>Toposheet No. with latitude and longitude</p>	<p>SOI Toposheet No. <b>58-E/16</b></p> <p>Latitude : From 11°2'50.76"N to 11°3'1.69"N</p> <p>Longitude : From 77°47'3.49"E to 77°47'12.09"E</p>																																	
<p>Geo-Coordinates of the lease boundary:</p> <table border="1"> <thead> <tr> <th>Pillar No</th> <th>Latitude</th> <th>Longitude</th> </tr> </thead> <tbody> <tr><td>1</td><td>11° 3'1.69"N</td><td>77°47'11.87"E</td></tr> <tr><td>2</td><td>11° 2'58.62"N</td><td>77°47'12.09"E</td></tr> <tr><td>3</td><td>11° 2'58.43"N</td><td>77°47'8.90"E</td></tr> <tr><td>4</td><td>11° 2'55.53"N</td><td>77°47'9.13"E</td></tr> <tr><td>5</td><td>11° 2'55.42"N</td><td>77°47'8.40"E</td></tr> <tr><td>6</td><td>11° 2'55.03"N</td><td>77°47'6.97"E</td></tr> <tr><td>7</td><td>11° 2'51.75"N</td><td>77°47'7.52"E</td></tr> <tr><td>8</td><td>11° 2'50.76"N</td><td>77°47'3.79"E</td></tr> <tr><td>9</td><td>11° 2'52.60"N</td><td>77°47'3.51"E</td></tr> <tr><td>10</td><td>11° 2'53.47"N</td><td>77°47'3.61"E</td></tr> </tbody> </table>		Pillar No	Latitude	Longitude	1	11° 3'1.69"N	77°47'11.87"E	2	11° 2'58.62"N	77°47'12.09"E	3	11° 2'58.43"N	77°47'8.90"E	4	11° 2'55.53"N	77°47'9.13"E	5	11° 2'55.42"N	77°47'8.40"E	6	11° 2'55.03"N	77°47'6.97"E	7	11° 2'51.75"N	77°47'7.52"E	8	11° 2'50.76"N	77°47'3.79"E	9	11° 2'52.60"N	77°47'3.51"E	10	11° 2'53.47"N	77°47'3.61"E
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*[Handwritten Signature]*  
Partner

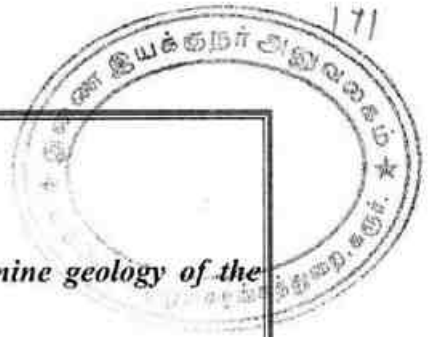


	11	11° 2'55.11"N	77°47'3.49"E
	12	11° 2'56.17"N	77°47'7.96"E
	13	11° 2'56.93"N	77°47'7.74"E
	14	11° 3'01.49"N	77°47'7.03"E
Land use pattern (Forest, Agricultural, Grazing, Barren etc.)	:	It is an existing and renewed quarry lease.	
b) <i>Attach a general location and vicinity map showing area boundaries and existing and proposed access routs. 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>	:	Refer plate no-IA & IB	

**i) INFRASTRUCTURE AND COMMUNICATION:**

S.No	Description	Place	Distance	Direction
a.	Nearest post office	Alampalayam	3.75Km	SW
b.	Nearest police station	Muthur	5.06km	West
c.	Nearest fire station	Kodumudi	9.97km	NE
d.	Nearest medical facility	Muthur	4.84Km	West
e.	Nearest school	Thottiyapalayam	2.58Km	NW
f.	Nearest railway station	Kodumudi	11.5km	NE
g.	Nearest port facility	Tuticorin	253.5km	South
h.	Nearest airport	Coimbatore	81.5km	East
i.	Nearest DSP office	Karur	31.1m	SE
j.	Nearest villages	Kulathapalayam	0.97km	North
		Pillapalayam	0.5km	East
		Nagappalayam	0.37km	South
		Thottipalayam	1.19km	West

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## 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 proposed lease area exhibits flat topography. The maximum elevation (195m) was observed in northern side of the site. The slope is towards southern side and falls in Toposheet no. 58 E/16.
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(ii) **a) Geology of the District:**

The Karur district forms part of the Archean complex of peninsular gneiss. The general rock types of this area are Biotite gneiss. Karur District is blessed with good reserves of crystalline limestone known as "Palayam belt" in Varavanai, Thennilai, Gudalur etc., villages in Kulithalai Taluk and the occurrences of good quality of pegmatite veins constituting with glassy quartz and potash feldspar in lensoid patches in Nagampalli and Pungambadi areas in Aravakurichi Taluk. The major mineral such as limestone, quartz and feldspar are exploited in Karur district and utilized in the mineral-based industries.

The Granite gneiss rocks are found to occur in K.Paramathi, Athur, Thennilai, Punnam, Godanthur South, Munnur, Punnam, Anjur villages in Karur and Aravakurichi Taluk are exploited to produce building materials and road metal (Jelly) and over burden soil appear as gray to reddish in colour called as gravel. The commercially known "Coloumbo Zubrana" the unique type in the Multi coloured granite / Granite gneiss category is occurring in Thogamalai, Naganur and Kazhugur Villages in Kulithalai Taluk. These rock type belong to minor mineral category. The arrangement of alternate layers of felsic and mafic minerals in linear pattern and exhibits wavy pattern in the rock and giving very good structure for the rock type. The well-developed gneissic pattern with linear arrangement, the rock type have attracted the granite market and found to be suitable for the exploitation of granite blocks. But in this area the banded gneissic rock has many fractures and foliation in it. So, this is not viable for dimensional stone. **Order of superposition of the proposed lease area,**

Age	Group	Rock Formation
Recent to Sub recent	---	Topsoil (1-2m thick),
Proterozoic	Acid intrusive	Pink medium grained granite/ Granite gneiss

  
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Archaean	Charnockite Group	Pyroxene Granulite, (acid to intermediate) limestone / Quartzite	Charnockite Crystalline
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(iii) Local / Mine Geology of the mineral deposit area:

**a) Topography of the proposed lease area:**

The proposed lease area exhibits flat topography. The maximum elevation (195m) was observed in northern side of the site. The slope is towards southern side. The applied lease area is existing, with covered topsoil and beneath the charnockite rocks found based on existing pit nearby the lease area. Surface plan preparing for contour lines, surface features and Geological mapped the applied lease area.

**b) Mode of origin:**

The Charnockite series originally was assumed to have developed by the fractional crystallization of silicate magma. Subsequent studies have shown, however, that many, if not all, of the rocks are metamorphic, formed by recrystallization at high pressures and moderately high temperatures.

**c) 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.

**d) 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 granulite's and gneisses. Plagioclase feldspars, alkali feldspars and quartz are the salic minerals present in this series of rocks.

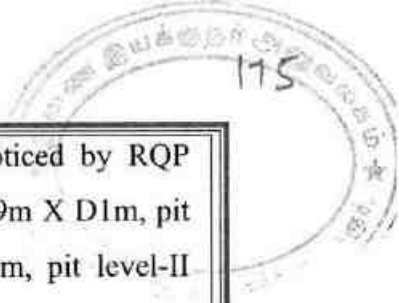
**Order of superposition of rocks in the proposed site:**

Age	Group	Rock Formation
Recent to Sub recent	----	Topsoil
Archaean	Charnockite Group	Charnockite.

(iv) Drainage Pattern

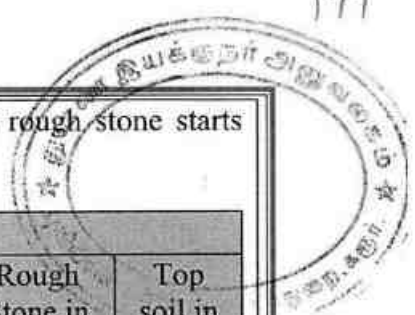
No major river located within 50m radius. The drainage in the area is dendritic in nature.

(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	There is an existing pit was noticed by RQP with a pit level-I is L48m X W59m X D1m, pit level-IA L78m X W16m X D1m, pit level-II L32m X W28m X D5m, pit level-III L20m X W15m X D7m, pit level-IV L18m X W13m X D8m & pit level- V L11m X W14m X D13m, The Charnockite rocks are well seen in the existing pit with covered by lateritic soil over the part of lease area.
b. Surface Plan	Surface plan showing elevation contour, rock exposure, and accessibility road was prepared at the scale of 1: 2000, as shown in Plate No.III.
(c) Geological sections should be prepared at suitable intervals on a scale of 1: 1000 / 1: 2000	Longitudinal and transverse geological cross sections were prepared at the horizontal scale of 1: 1000 and at the vertical scale of 1:500, as shown in Plate No.IIIA.
(d)	<p><i>Broadly indicate the Year wise future programme of exploration, taking into consideration the future production programme planned in next five years as in table below:</i></p> <p>No future programmed proposed in this area. Its massive homogeneous parent rock. Hence exploration proposal is not required to this mining project.</p>
(e)	<p><i>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.</i></p> <p>The geological resources were computed by cross section method with respect to the boundaries of the lease area. In this method, the lease area was divided into three longitudinal and four transverse sections to calculate the volume of material up to the depth of 45m below ground level. The longitudinal and transverse cross sections were assigned (XY-AB), (X1Y1-CD), (X1Y1-EF) &amp; (X2Y2-GH) as respectively. Using the cross-sectional method, total reserve is estimated to be <b>1299720m<sup>3</sup></b> including the resources of safety zone, weathered rock and topsoil. Of which, rough stone is about <b>1278843m<sup>3</sup></b> and topsoil resource of about <b>20877m<sup>3</sup></b>.</p>

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The topsoil is obtained about 0-2m from the surface and a rough stone starts from 2 to 45m below ground level. (Refer plate no.IIIA).

GEOLOGICAL RESOURCES							
Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume In m <sup>3</sup>	Rough Stone in m <sup>3</sup>	Top soil in m <sup>3</sup>
XY-AB	I	27	9	1	243	.....	243
	I	43	64	1	2752	.....	2752
	I	43	67	3	8643	8643	.....
	II	96	115	3	33120	33120	.....
	II	96	142	2	27264	27264	.....
	III	96	142	5	68160	68160	.....
	IV	96	142	5	68160	68160	.....
	V	96	142	5	68160	68160	.....
	VI	96	142	5	68160	68160	.....
	VII	96	142	5	68160	68160	.....
	VIII	96	142	5	68160	68160	.....
IX	96	142	5	68160	68160	.....	
<b>TOTAL</b>				<b>45</b>	<b>549142</b>	<b>546147</b>	<b>2995</b>
XIY1-CD	I	68	39	2	5304	.....	5304
	I	68	39	3	7956	7956	.....
	II	68	39	5	13260	13260	.....
	III	68	39	5	13260	13260	.....
	IV	68	39	5	13260	13260	.....
	V	68	39	5	13260	13260	.....
	VI	68	39	5	13260	13260	.....
	VII	68	39	5	13260	13260	.....
	VIII	68	39	5	13260	13260	.....
	IX	68	39	5	13260	13260	.....
<b>TOTAL</b>				<b>45</b>	<b>119340</b>	<b>114036</b>	<b>5304</b>
XIY1-EF	I	23	68	2	3128	.....	3128
	I	23	68	3	4692	4692	.....
	II	23	68	5	7820	7820	.....
	III	23	68	5	7820	7820	.....
	IV	23	68	5	7820	7820	.....
	V	23	68	5	7820	7820	.....
	VI	23	68	5	7820	7820	.....
	VII	23	68	5	7820	7820	.....
	VIII	23	68	5	7820	7820	.....
	IX	23	68	5	7820	7820	.....
<b>TOTAL</b>				<b>45</b>	<b>70380</b>	<b>67252</b>	<b>3128</b>
X2Y2-GH	I	75	63	2	9450	.....	9450
	I	75	64	3	14400	14400	.....
	II	76	64	2	9728	9728	.....

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II	130	84	3	32760	32760	.....
III	130	84	3	32760	32760	.....
III	130	111	2	28860	28860	.....
IV	130	111	5	72150	72150	.....
V	130	111	5	72150	72150	.....
VI	130	111	5	72150	72150	.....
VII	130	111	5	72150	72150	.....
VIII	130	111	5	72150	72150	.....
IX	130	111	5	72150	72150	.....
<b>TOTAL</b>			<b>45</b>	<b>560858</b>	<b>551408</b>	<b>9450</b>
<b>GRAND TOTAL</b>				<b>1299720</b>	<b>1278843</b>	<b>20877</b>

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

The total mineable reserve is estimated to be **286688m<sup>3</sup>** by deducting the reserve safety zone, block in benches from the total Geological resources up to a depth of 45m (R.L.195-150m) below ground level. Of which, rough stone is about **277958m<sup>3</sup>** and topsoil is about **8730m<sup>3</sup>**. The commercially viable rough stone has been prepared on 1: 2000 scale and sections are prepared in a scale of 1:1000 in horizontal axis and 1:500 as vertical axis (Refer plate no. VIA).

MINEABLE RESERVES							
Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume In m <sup>3</sup>	Rough Stone in m <sup>3</sup>	Top soil in m <sup>3</sup>
XY-AB	I	17	1	1	17	.....	17
	I	33	57	1	1881	.....	1881
	I	33	59	3	5841	5841	.....
	II	66	103	5	33990	33990	.....
	III	56	107	5	29960	29960	.....
	IV	46	97	5	22310	22310	.....
	V	36	87	5	15660	15660	.....
	VI	26	77	5	10010	10010	.....
VII	16	67	5	5360	5360	.....	
<b>TOTAL</b>				<b>35</b>	<b>125029</b>	<b>123131</b>	<b>1898</b>
X2Y2-GH	I	61	56	2	6832	.....	6832
	I	61	56	3	10248	10248	.....
	II	57	51	2	5814	5814	.....
	II	105	72	3	22680	22680	.....
	III	95	67	3	19095	19095	.....
	III	95	76	2	14440	14440	.....
	IV	85	66	5	28050	28050	.....
	V	75	56	5	21000	21000	.....
VI	65	46	5	14950	14950	.....	
VII	55	36	5	9900	9900	.....	
VIII	45	26	5	5850	5850	.....	



IX	35	16	5	2800	2800	.....
<b>TOTAL</b>			<b>45</b>	<b>161659</b>	<b>154827</b>	<b>6832</b>
<b>GRAND TOTAL</b>				<b>286688</b>	<b>277958</b>	<b>8730</b>

**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)

: It is an existing grant lease. The mining operation is open-cast, semi-mechanized method are adopted and on single shift basis only. Under the regulation 106 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

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

Total proposed production **286688m<sup>3</sup>**. Of which, rough stone is **277958m<sup>3</sup>** and topsoil is **8730m<sup>3</sup>** up to a depth of 45m below the ground level (R.L.195m-150m) for five years plan period. Average production is **55592m<sup>3</sup>** of rough stone per year (Refer Plate No. IVA).

Year	Pit No.(s)	Topsoil/Overburden (m <sup>3</sup> )	ROM (m <sup>3</sup> )	Saleable rough stone (m <sup>3</sup> ) @ 100%	Rough stone rejects(m <sup>3</sup> )	Sub grade/Weathered rock in (m <sup>3</sup> )	Saleable Gravel (m <sup>3</sup> )	Rough stone to topsoil ratio
First	I	1898	61524	59626	...	...	...	1:0.03
Second	I	---	63505	63505	...	...	...	1:0.11
Third	I	6832	64669	57837	...	...	...	...
Fourth	I	---	63490	63490	...	...	...	...
Fifth	I	---	33500	33500	...	...	...	...
<b>Total</b>	<b>---</b>	<b>8730</b>	<b>286688</b>	<b>277958</b>	...	...	...	<b>1:0.006</b>

c. Composite plans and Year wise sections (In case of 'A' class mines):

: Not applicable. It is a "B" class, individual quarry lease.



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

YEARWISE PRODUCTION RESERVES								
Section	Year	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume In m <sup>3</sup>	Rough Stone in m <sup>3</sup>	Top soil in m <sup>3</sup>
XY-AB	I-YEAR	I	17	1	1	17	.....	17
		I	33	57	1	1881	.....	1881
		I	33	59	3	5841	5841	.....
		II	66	103	5	33990	33990	.....
		III	37	107	5	19795	19795	.....
<b>TOTAL</b>						<b>61524</b>	<b>59626</b>	<b>1898</b>
XY-AB	II-YEAR	III	19	107	5	10165	10165	.....
		IV	46	97	5	22310	22310	.....
		V	36	87	5	15660	15660	.....
		VI	26	77	5	10010	10010	.....
		VII	16	67	5	5360	5360	.....
<b>TOTAL</b>						<b>63505</b>	<b>63505</b>	<b>0</b>
X2Y2-GH	III-YEAR	I	61	56	2	6832	.....	6832
		I	61	56	3	10248	10248	.....
		II	57	51	2	5814	5814	.....
		II	105	72	3	22680	22680	.....
		III	95	67	3	19095	19095	.....
<b>TOTAL</b>						<b>64669</b>	<b>57837</b>	<b>6832</b>
X2Y2-GH	IV-YEAR	III	95	76	2	14440	14440	.....
		IV	85	66	5	28050	28050	.....
		V	75	56	5	21000	21000	.....
<b>TOTAL</b>						<b>63490</b>	<b>63490</b>	<b>0</b>
X2Y2-GH	V-YEAR	IX	65	46	5	14950	14950	.....
		IX	55	36	5	9900	9900	.....
		IX	45	26	5	5850	5850	.....
		X	35	16	5	2800	2800	.....
<b>TOTAL</b>						<b>33500</b>	<b>33500</b>	<b>0</b>
<b>GRAND TOTAL</b>						<b>286688</b>	<b>277958</b>	<b>8730</b>

d. Attach supporting composite plan and section showing pit layouts, dumps, stacks of sub-grade mineral, if any, etc. : Composite plan not prepared in this proposed lease area. It is "B<sub>2</sub>" category of mine.

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:*  
 At this rate of production, the expected life of quarry is calculated as given below: -

**Rough stone:**

Mineable reserves of rough stone = 277958m<sup>3</sup>  
 Yearly production of rough stone = 55592m<sup>3</sup>  
 Monthly production of rough stone = 4633m<sup>3</sup>

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,

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there is a possibility to increase or decrease the production. The year wise production, anticipated life of quarry etc., are only a tentative figure.

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

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: : Considering the indefinite depth persistence of the rough stone deposit is proved beyond the workable limits about up to a depth of 45m below ground level (R.L.195m-150m) from the petrogenetic character of the rock as well as from the actual mining practice in the area and with the current trend of rough stone production the quarry may sustain for 5 years.

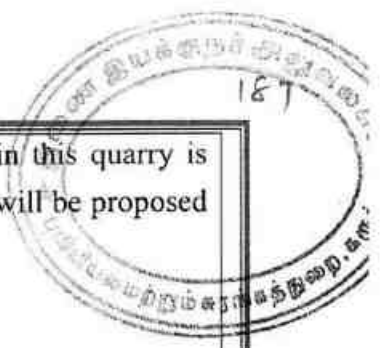
ii) Whether ultimate pit limit has been determined and demarcated on surface and geological plan:-

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

ULTIMATE PIT LIMIT-(XY-AB)						
Bench	Bench R.L	Period	Overburden/ Mineral	L (m)	W (m)	D (m)
I	R.L.195-194m	Five years	Topsoil	17	1	1
I	R.L.194-193m		Topsoil	33	57	1
I	R.L.193-190m		Rough stone	33	59	3
II	R.L.190-185m		Rough stone	66	103	5
III	R.L.185-180m		Rough stone	56	107	5
IV	R.L.180-175m		Rough stone	46	97	5
V	R.L.175-170m		Rough stone	36	87	5
VI	R.L.170-165m		Rough stone	26	77	5
VII	R.L.165-160m	Rough stone	16	67	5	
<b>Total</b>						<b>35m</b>

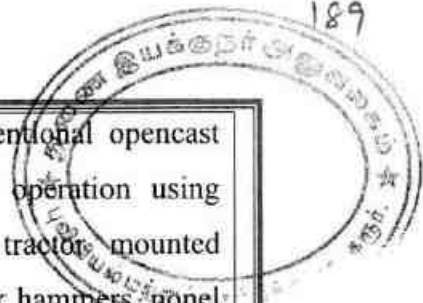
ULTIMATE PIT LIMIT-(X2Y2-GH)						
Bench	Bench R.L	Period	Overburden/ Mineral	L (m)	W (m)	D (m)
I	R.L.195-193m	Five years	Topsoil	61	56	2
I	R.L.193-190m		Rough stone	61	56	3
II	R.L.190-188m		Rough stone	57	51	2
II	R.L.188-185m		Rough stone	105	72	3
III	R.L.185-182m		Rough stone	95	67	3
III	R.L.182-180m		Rough stone	95	76	2
IV	R.L.180-175m		Rough stone	85	66	5
V	R.L.175-170m		Rough stone	75	56	5
VI	R.L.170-165m		Rough stone	65	46	5
VII	R.L.165-160m		Rough stone	55	36	5
VIII	R.L.160-155m		Rough stone	45	26	5
IX	R.L.155-150m		Rough stone	35	16	5
<b>Total</b>						<b>45m</b>

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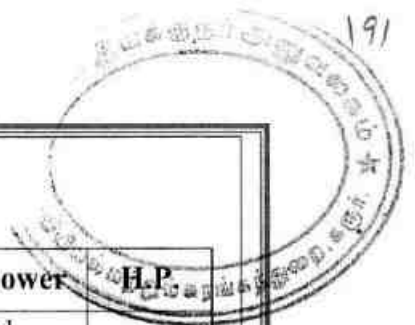
iii) Whether the site for disposal of waste rock or an un-saleable material have/ has been examined for adequacy of land and suitability of long-term use in the event of continuation of mining activity: -	: The recovery of rough stone in this quarry is 100%. There is no waste rock will be proposed in this lease area.
iv) Whether back filling of pits after recovery of mineral up to techno-economically feasible depth envisaged. If so, describe the broad features of the proposal: -	: As the depth of persistence of the deposit may likely to continue for further depth, it is proposed not to backfilled the quarry pit.
v) Whether post mining land use envisaged: -	: At the end of mining activities over the quarry pit may be utilized fish culture or storage of rain water reservoir used for irrigation purposes.
g. <b>Open cast Mines:</b>	
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 are adopted and on single shift basis only. Under the regulation 106 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. Excavators and tipper combination are adapted.
ii) Describe briefly the layout	: The rough stone is proposed to quarry at 5m

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<p>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</p>	<p>bench height &amp; width conventional opencast semi mechanized quarrying operation using drilling with the help of tractor mounted compressor attached with jack hammers, nonel blasting and waste and are removal using Hydraulic excavator and loaded directly to the tippers.</p> <p>Bench height = 5mts. Bench width = 5mts.</p>																																	
<p>a. Details of topsoil/ overburden</p>	<p>The topsoil is 8730m<sup>3</sup> shall be removed and stacked for earth bund lease hold area and to prevent inherent entry of cattle's and human as per rules 119 (1), Metalliferous Mines Regulations, 1961.</p>																																	
<p>b. Rough stone waste and side burden waste:-</p>	<p>The recovery of rough stone in this quarry is 100%. Earth bund is available on the west side of the lease area.</p>																																	
<p>h. <b>Underground Mines:</b></p>	<p>: Not applicable</p>																																	
<p>i. <b>Extent of mechanization:</b></p> <p>Describe briefly including the calculation for adequacy and type of machinery and equipment proposed to be used in different mining operations.</p> <p><b>(1) Drilling Machines:</b></p> <p>Drilling of shot holes will be carried out using tractor mounted compressor and jack hammer. Details of drilling equipment's are given below.</p> <p><b>Details of drilling equipment's are given below.</b></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>---</td> <td>Diesel</td> <td>--</td> </tr> <tr> <td>Compressor</td> <td>1</td> <td>---</td> <td>Air</td> <td>--</td> <td>Diesel</td> <td>--</td> </tr> </tbody> </table> <p><b>(2) Loading Equipment:</b></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>Hydraulic Excavator</td> <td>1</td> <td>2.9-4.5m<sup>3</sup></td> <td>--</td> <td>Diesel</td> <td>--</td> </tr> </tbody> </table>		Type	Nos	Dia of hole (mm)	Size / Capacity	Make	Motive power	H.P	Jack Hammer	2	32 mm	Hand held	---	Diesel	--	Compressor	1	---	Air	--	Diesel	--	Type	Nos	Size / Capacity	Make	Motive power	H.P.	Hydraulic Excavator	1	2.9-4.5m <sup>3</sup>	--	Diesel	--
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**(3) Haulage and Transport Equipment**

(a) Haulage within the mining leasehold:

Type	Nos	Size / Capacity	Make	Motive power	H.P.
Tipper	4	15MT	--	Diesel	--

**Whether the dumpers are fitted with exhaust conditioner should be indicated:**

The dumpers are not used in this quarry; hence it's a small B2 category quarry.

a) Transport from mine head to the destination	:	Tipper will be used for transport rough stone from the mine head to needy customer.
c. Describe briefly the transport system (please specify)	:	Hydraulic excavator and tippers utilized for internal transport sizeable rough stone lumps and deliver to the customer's area.
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)	:	Excavated rough stone minerals directly will be used by the applicant in his own crusher for required size (i.e 1/4", 1/2", 1/3" and 1")  The recovery of rough stone in this quarry is 100%.

f. Details of hauling / transport equipment:

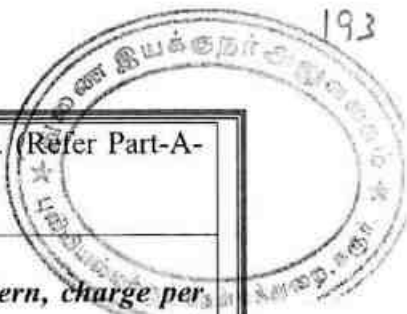
Type	Nos	Size / Capacity	Make	Motive power	H.P.
--	--	--	--	--	--

**(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 opencast, 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

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combination are adapted. (Refer Part-A-4 (i))

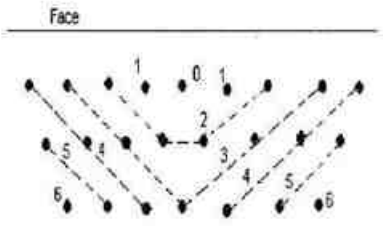
5. **BLASTING:**  
*a) Broad blasting parameters like charge per hole, blasting pattern, charge per delay, maximum number of holes blasted in a round, manner and sequence of firing, etc.*

**Blasting pattern:**

The quarrying operation is proposed to carried out by open cost, using jack hammer drilling followed by manual breaking will be adopted to release the rough stone and nonel blasting is proposed in this lease area.

Drilling and Blasting parameters are as follows.

1	Diameter of the hole	32 mm
2	Spacing between hole	1.2m
3	Burden for hole	1.0m
4	Depth of each hole	1.5m
5	Output per hole = Spacing × Burden × depth $1.2 \times 1.0 \times 1.5 = 1.8 \times 2.8$	5.04 T
6	Output per hole = $1.8 \times 2.8 = 5 T$	5 T
7	Production per annum $55592m^3 * 2.8 = 155658 T$	155658 T
8	Total handling per day (280 working day)	556T
9	Nos. of holes per day ( $556/5.04 = 110$ )	110holes
10	Meterage required per day ( $110 \times 5.5 = 605$ )	605meters
11	Charge per hole	0.375 kg
12	Powder factor ( $110holes \times 0.375 kg = 41$ )	41kg
13	Sequence of blasting = Cord relay with electric detonators / Nonel	--

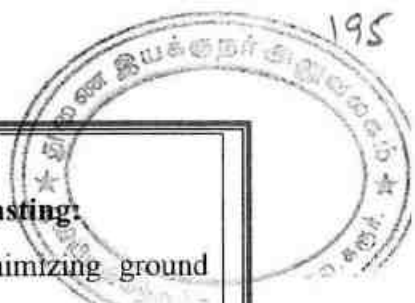


Staggered method of mining

*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

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 Partner





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:

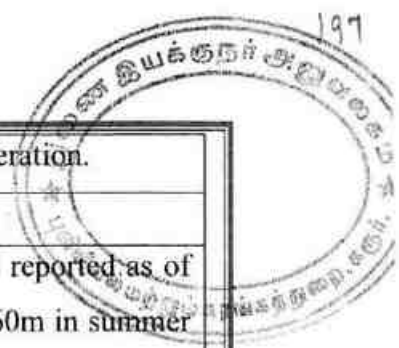
- ❖ Reduction of ground vibration
- ❖ Reduction in air blast
- ❖ Reduction in over break
- ❖ Improved fragmentation
- ❖ Better control of fly rock

Blasting program for the production per day

No of holes	:	110holes
Yield	:	556 tons
Total explosive required	:	41kg-Slurry explosives
Charge per hole	:	0.375kg
Blasting at day time only	:	12.0p.m-1.0p.m

d) Powder factor in ore and overburden / waste / development heading / stope	:	Powder factor is proposed as 0.375kg per holes 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 size suitable for handling by the excavators and rock breakers.
f) Storage of explosives (like capacity and type of explosive magazine)	:	<ol style="list-style-type: none"> <li>1. The applicant is advised to engage an authorized explosive agency to carry out blasting.</li> <li>2. First Aid Box will be keeping ready at all the time.</li> <li>3. Necessary precautionary announcement will be carried out</li> </ol>

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		before the blasting operation.
<b>6. MINE DRAINAGE</b>		
a) Likely depth of water table based on observations from nearby wells and water bodies	:	The ground water table is reported as of 65m in rainy season and 60m in summer from the below ground level in the adjacent bore wells of the area.
b) Workings expected to be _____ m. above / reach below water table by the year _____.	:	Proposed ultimate depth of mining is 45m bgl. Now, the present Mining lease will be proposed above the water table and hence, quarrying may not affect the ground water.
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	:	The ground water may not rise immediately in this type of mining. However, the rain water percolation and collection of water from the seepage will be less than 300 Lpm and it will be pumped out periodically by a stand by diesel powered Centrifugal pump motivated with 7.5 H.P. Motor. The quality of water is potable and doesn't contaminate with any hazardous things.
<b>7. STACKING OF MINERAL REJECTS AND DISPOSAL OF WASTE:</b>		
(a) Indicate briefly the nature and quantity of top soil, overburden / waste and mineral rejects likely to be generated during the next five years: No separate of topsoil will be removed and any other waste or side burden dumps are doesn't proposed.		
(b) Land chosen for disposal of waste with proposed justification	:	The topsoil is 8730m <sup>3</sup> shall be removed and stacked for earth bund lease hold area and to prevent inherent entry of cattle's and human as per rules 119 (1), Metalliferous Mines Regulations, 1961.
(c) Attach a note indicating the manner of disposal and configuration, sequence of buildup of dumps along with the proposals for the stacking	:	There is no waste or any other mineral dumps are proposed. If rough stone may be unsold will be keep within the lease boundary.



	of sub-grade ore, to be indicated year wise.	
<b>8.</b>	<b>USE OF MINERAL:</b>	
(a)	Describe briefly the end-use of the mineral (sale to intermediary parties, captive consumption, export, industrial use)	: The excavated stone materials will be supplied to the consumers like stone pillar, sized stone, etc. For instance, aggregates are mostly used for building, roads and footpaths., etc
(b)	Indicate physical and chemical specifications stipulated by buyers	: Basically, the materials produced at this quarry are rough stone and the same are used for building stone, sized stone materials only, so there are 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.	: Not blending process is involved, after blasting the rough stone will be directly loaded to the needy customer.
<b>9.</b>	<b>OTHERS</b>	
(a)	<b>Describe briefly the following</b> Site services	: Infrastructure required for such mines like office, stores, canteen, first aid station, shelter latrine and booth rooms have been provided as per the Metalliferous Mines Regulations, 1961 as a welfare amenity for our quarry laborers.

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## (b) Employment potential :

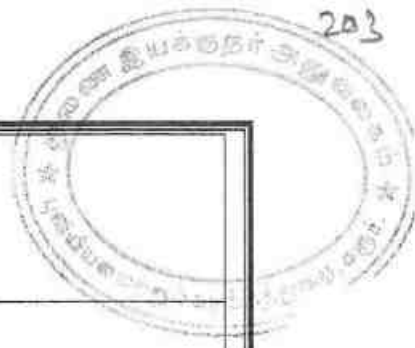
As per Mines safety under the provisions of Metalliferous Mines Regulations, 1961 and under the Mines Act, 1952, whenever the workers are employed more than 10, it is preferred to have a qualified mining mate to keep all the production workers directly under his control and supervision.

The following man power is proposed for quarrying stone material 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 MMR, 1961 norms.

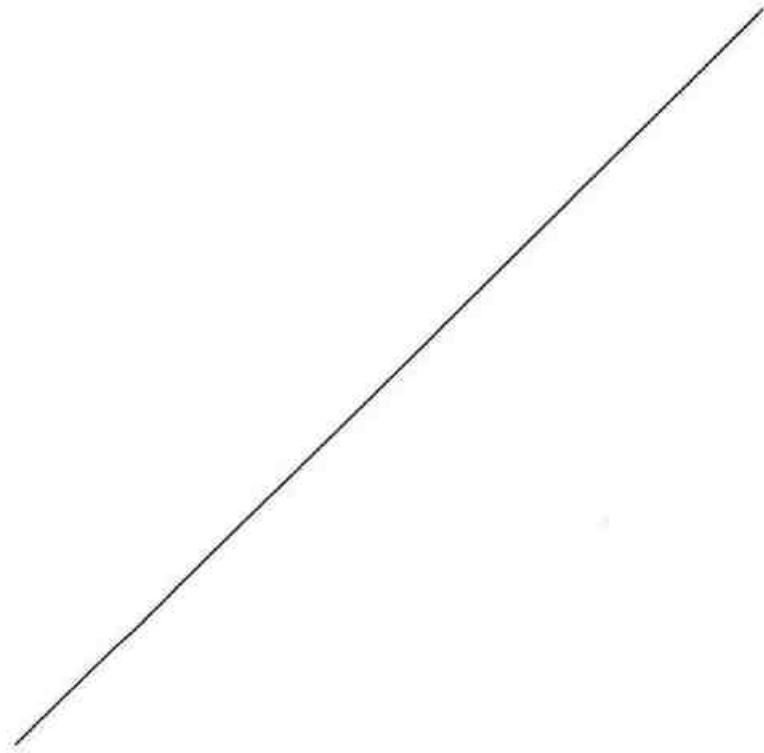
1.	Highly Skilled	Mines Manager	1No.
		Mine Engineer	1No.
		Mine Geologist	1No.
		Blaster	1No.
2.	Unskilled	Musdoor / Labours	12No's
<b>Total =</b>			<b>16 No's</b>

**10 MINERAL PROCESSING/BENEFICIATIONS:**

- |  |  |
|--|--|
| (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.                            | : Excavated rough stone minerals directly will be used by the applicant in his own crusher for required size ½, ¾ and 1½ inches Jelly which are mainly used in road and building construction purpose.<br><br>The recovery of rough stone in this quarry is 100%.  |
| (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). | : No water will 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 will 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 SPM in a pit before passing the water in to natural system. |



(c)	A flow sheet or schematic diagram of the processing procedure should be attached.	: Not applicable.
(d)	Specify quantity and type of chemicals to be used in the processing plant.	: Not applicable
(e)	Specify quantity and type of chemicals to be stored on site / plant.	: Not applicable
(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.	: Drinking is 0.5KLD, utilized water is 1.0KLD, Dust suppression is 1.5KLD and Green Belt is 1.75KLD. Minimum quantity of water 4.75KLD per day. It is proposed to make an own bore well for providing uninterrupted supply of RO drinking water, dust suppression and green belt development.  The sewage water to a tune of 0.8KLD generated from the mine office toilet and mine labour toilet will be diverted to the septic tank followed by soak pit.





**PART – B**

**11.0 ENVIRONMENTAL MANAGEMENT PLAN :**

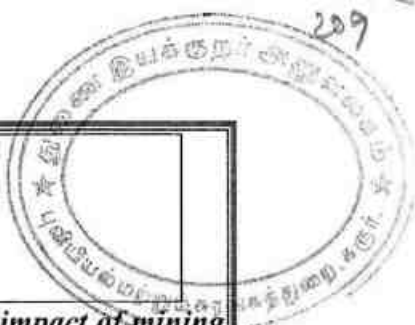
a) Attach a note on the status of Baseline information with regard to the Following :

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 land use pattern is given as below.	<table border="1"> <thead> <tr> <th>Sl. No.</th> <th>Land Use</th> <th>Present area (Hect.)</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>Area under mining</td> <td>1.49.93</td> </tr> <tr> <td>2</td> <td>Infrastructure</td> <td>Nil</td> </tr> <tr> <td>3</td> <td>Road</td> <td>0.02.00</td> </tr> <tr> <td>4</td> <td>Green belt &amp; Earth Bund</td> <td>0.66.13</td> </tr> <tr> <td>5</td> <td>Drainage &amp; Settling Tank</td> <td>Nil</td> </tr> <tr> <td>6</td> <td>Un-utilized area</td> <td>1.04.94</td> </tr> <tr> <td colspan="2"><b>Grand total</b></td> <td><b>3.23.00</b></td> </tr> </tbody> </table>	Sl. No.	Land Use	Present area (Hect.)	1.	Area under mining	1.49.93	2	Infrastructure	Nil	3	Road	0.02.00	4	Green belt & Earth Bund	0.66.13	5	Drainage & Settling Tank	Nil	6	Un-utilized area	1.04.94	<b>Grand total</b>		<b>3.23.00</b>
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11.2	Water Regime	: Water table in this area is noticed at a depth of 65m in summer and 60m in rainy season from the general ground level and presently the quarrying of rough stone is proposed up to a depth of 45m bgl. Hence, it will not affect the ground water depletion of this area. It is made own borewell for providing uninterrupted supply of RO drinking water, dust suppression and green belt development.																								
11.3	Flora and Fauna	: There is no major flora observed in this area and except acacia bushes, 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 by water spraying. 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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11.5	<p><b>Climatic conditions:</b></p> <p><b>Climate:</b></p> <p>The district receives the rain under the influence of both Southwest and Northeast monsoons. The Northeast monsoon chiefly contributes to the rainfall in the district. Most of the precipitation occurs in the form of cyclonic storms caused due to the depressions in Bay of Bengal. The Southwest monsoon rainfall is highly erratic and summer rains are negligible. The average annual rainfall over the district varies from about 620 mm to 745 mm.</p> <p><b>Rainfall:</b></p> <p>The annual rainfall normal (1970-2000) of Karur district is 742 mm.4 Projections of rainfall over Karur for the periods 2010-2040 (2020s), 2040- 2070 (2050s) and 2070-2100 (2080s) with reference to the baseline (1970-2000) indicate a general decrease of 4.0%, 3.0% and 11.0% respectively.</p>																									
11.6	<p><b>Human Settlement:</b></p> <p>The nearest villages are found in the buffer zone with population as per 2011 census.</p> <table border="1"> <thead> <tr> <th>S.N</th> <th>Village</th> <th>Direction</th> <th>Distance in Kms</th> <th>Population</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Kulathapalayam</td> <td>North</td> <td>0.97km</td> <td>750</td> </tr> <tr> <td>2</td> <td>Pillapalayam</td> <td>East</td> <td>0.5km</td> <td>1671</td> </tr> <tr> <td>3</td> <td>Nagappalayam</td> <td>South</td> <td>0.37km</td> <td>650</td> </tr> <tr> <td>4</td> <td>Thottipalayam</td> <td>West</td> <td>1.19km</td> <td>400</td> </tr> </tbody> </table>	S.N	Village	Direction	Distance in Kms	Population	1	Kulathapalayam	North	0.97km	750	2	Pillapalayam	East	0.5km	1671	3	Nagappalayam	South	0.37km	650	4	Thottipalayam	West	1.19km	400
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11.7	<p>Public buildings, places of worship and monuments :</p> <p>No infrastructure like residential building, places of special interest like archeological monuments, sanctuaries etc., are found around 10km radius.</p>																									
11.8	<p>Attach plans showing the locations of sampling stations :</p> <p>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.</p>																									
11.9	<p>Does area (partly or fully) fall under notified area :</p> <p>The proposed area not fall under notified area under water (Prevention &amp; Control of</p>																									



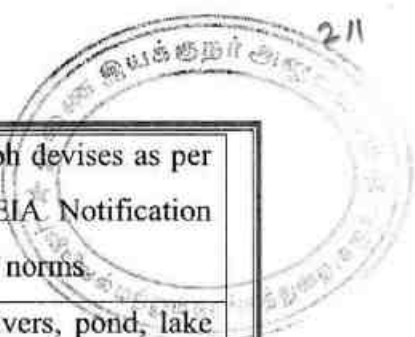
under Water (Prevention & Control of Pollution), Act, 1974	Pollution), Act, 1974
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**b) Attach an Environmental Impact Assessment Statement describing the impact of mining and beneficiation on environment on the following over the next five years (and upto conceptual plan period for 'A' category mines)**

i)	<b>Land area indicating the area likely to be degraded due to quarrying / pitting, dumping, roads, workshop, processing plant, township etc:</b>	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:																								
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">Sl. No.</th> <th style="width: 60%;">Land Use</th> <th style="width: 30%;">Area in use during the quarrying period (Hect)</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>Area under mining</td> <td>2.33.98</td> </tr> <tr> <td>2</td> <td>Infrastructure</td> <td>0.03.00</td> </tr> <tr> <td>3</td> <td>Road</td> <td>0.05.0</td> </tr> <tr> <td>4</td> <td>Green belt</td> <td>0.24.50</td> </tr> <tr> <td>5</td> <td>Drainage &amp; Settling Tank</td> <td>0.04.37</td> </tr> <tr> <td>6</td> <td>Un-utilized area</td> <td>0.52.15</td> </tr> <tr> <td colspan="2" style="text-align: right;"><b>Grand total</b></td> <td><b>3.23.00</b></td> </tr> </tbody> </table>			Sl. No.	Land Use	Area in use during the quarrying period (Hect)	1.	Area under mining	2.33.98	2	Infrastructure	0.03.00	3	Road	0.05.0	4	Green belt	0.24.50	5	Drainage & Settling Tank	0.04.37	6	Un-utilized area	0.52.15	<b>Grand total</b>		<b>3.23.00</b>
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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 by water spraying.																								
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.																								
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 will be																								

  
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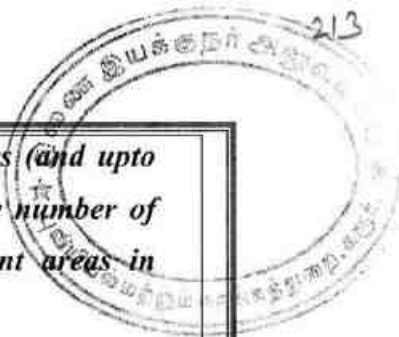




		recoded using mini seismograph devises as per the guidance of MoEF and EIA Notification 2006 and also covering DGMS norms.
vi).	Water regime	No major water bodies like rivers, pond, lake etc., located within a radius of 500m.
vii).	Socio-economics	1. To provide Employment opportunities of the near by villagers. 2. For the cultural development of the nearby villagers.
viii).	Historical monuments etc.	There are no historical monuments, etc found around 10km 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	:	There is no topsoil will be removed.
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 used as reservoir, their size, water holding capacity and proposal for utilization of such water be given.	:	The present mining is proposed to an average depth of 45m bgl has been envisaged as workable depth for safe & economic mining during the lease period. The mined-out area will be fenced on top of working bench with S1 fencing. No immediate proposals for closure of pit as the rough stone persist still at deeper level.



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.*

**Green Belt Development:**

Safety barrier, school and nearest panchayat roads has been identified to be utilized for Greenbelt appropriate native species of Neem, Pungan and other regional trees will be planted in a phased manner as described below.

Year	Place	Area in Sq.m	No.of Plants	Rate of survival	Rate	Amount in Rs
First	Lease Boundary	2450	272	80%	@100 Rs Per sapling	27200/-
Second	Approach road and Nearby Village Road	--	328	80%		32800/-
Third	Schools	--	300	80%		30000/-
<b>Total</b>						<b>90,000/-</b>

iv).	Stabilization and vegetation of dumps along with waste dump management Year wise for the first five years (and up to conceptual plan period for 'A' category mines).	:	No waste or rejects removed in this lease area.
v).	Measures to control erosion / sedimentation of water courses.	:	Not applicable. There are no major dumps are stabilized in this quarry 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 will be very pure and portable and therefore, it will not affect any water regime surrounding the quarry. The worked-out pit will be protected with barbed wire and the mined-out pit will be used as storage rain water pit.  The open pit will be used as rain water storage structure to augment groundwater levels which improve the mine environment.

*[Handwritten signature]*  
Partner

viii).	Protective measures for ground vibrations / air blast caused by blasting,	: It is a small B2 category opencast, semi mechanized method of mining is adopted and no heavy machinery will 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 benefits.

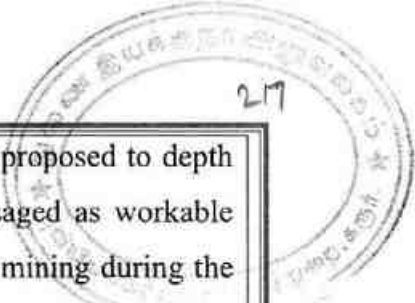
*d). Monitoring schedules for different environmental components after the commencement of mining and other related activities. (for 'A' category mines only)*

Not applicable. It is B2 category quarry

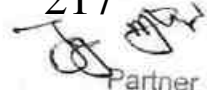
**12.0 PROGRESSIVE QUARRY CLOSURE PLAN:**

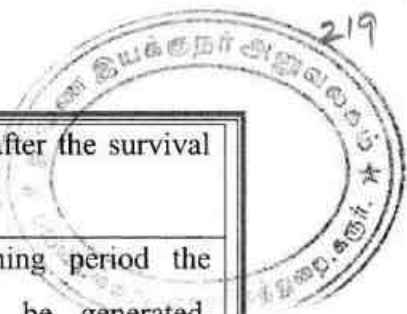
12.1	Steps proposed for phased restoration, reclamation of already mined out area.	: The Ultimate mining is proposed to an average depth of 45m bgl. The mined-out area will be fenced on top of working bench with S1 fencing to arrest the entry of cattle's and public in to the quarry site.
12.2	Measures to be under taken on mine closure as per Act & Rules	: Measures will be taken as per the Acts and Rules. Green belt development at the rate of 272 trees will be proposed in the quarry area. 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 an existing mining lease. No mitigation measures adopted.

*[Handwritten signature]*  
Partner



12.4	Mine closure activity	:	The present mining plan is proposed to depth of 45m bgl 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. 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 regulations, 1961, it is a small open cast mining method 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 under the guidance of DGMS being a mechanized operation.
12.6	Disaster management and Risk Assessment	:	Open cast semi mechanized 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	:	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

  
Partner



		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. 16 labors will be improved.
12.9	Reclamation and Rehabilitation	: Land degradation is one of the major adverse impacts of open-cast mining activities and any effort to control adverse impacts would be incomplete without appropriate land reclamation strategy. After the exhaustion of entire mineable rough stone, mined out pit will be converted in fish culture or storage of rain water reservoir purposes.

**12.9 Proposed Financial Estimate / Budget for (EMP) Environment Management:**

<b>A</b>	<b>Fixed Asset Cost:</b>	
	1. Land Cost (Consent land)	: Rs. 10,00,000/-
	2. Labour Shed	Rs. 1,50,000/-
	3. Sanitary Facility	: Rs. 1,50,000/-
	4. Fencing	: Rs. 4,50,000/-
	5. Other expenses (Security guard, dust bin, etc)	: Rs. 3,00,000/-
	<b>Total</b>	<b>: Rs. 20,50,000/-</b>
<b>B</b>	<b>B. Machinery cost</b>	<b>: Rs. 30,00,000/- (Hire Basis)</b>
<b>C</b>	<b>Total Expenditure of EMP cost (for five years)</b>	
	1. Drinking Water Facility	: Rs. 1,50,000/-
	2. Sanitary facility & Maintenance	: Rs. 75,000/-
	3. Permanent water sprinkler	: Rs. 1,50,000/-

4. Afforestation and its maintenance	:	Rs. 90,000/-
5. Safety Kits	:	Rs. 75,000/-
6. Provision of tyre washing facility	:	Rs. 1,00,000/-
7. Surface runoff management structures like garland drain, settling pond & Bund (0.04.37Hect or 430Sq.m X 400)	:	Rs. 1,72,000/-
8. Blasting materials with blast mat cost	:	Rs. 20,00,000/-
9. Environment monitoring	:	Rs. 5,00,000/-
<b>Total</b>	:	<b>Rs. 33,12,000/-</b>
<b>D</b>	<b>Total Project Cost (A+B+C)</b>	<b>Rs. 83,62,000/-</b>

### 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.

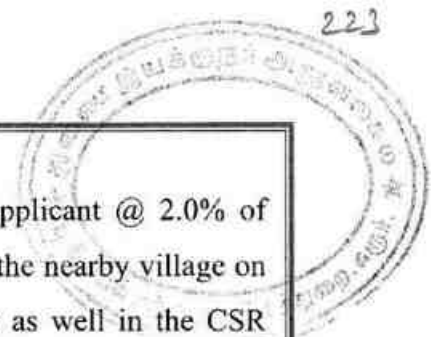
### 16.0 ANY OTHER DETAILS INTEND TO FURNISH BY THE APPLICANT:

- (i) Care and precautionary measures will be taken for the safety of workers as per Rules and Acts.
- (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 the Deputy Director of Geology and Mining, Karur vide letter **Rc.No.510/Mines/2022 Dated: 19.09.2023.**
- (iv) Total proposed production of **286688m<sup>3</sup>**. Of which, rough stone is about **277958m<sup>3</sup>** and topsoil is about **8730m<sup>3</sup>** up to a depth of 45m below the ground level (R.L.195m-150m) for five years plan period. Average production is **55592m<sup>3</sup>** of rough stone per year.

For Kousic & Co Bidemerals

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Partner



**17.0 CSR Expenditure:**

CSR (Corporate Social responsibility) shall provide by the applicant @ 2.0% of average net profit of the company for the last three financial years to the nearby village on the Ministry has notified the amendments in section 135 of the Act as well in the CSR Rules on 22nd January 2021 as circular no. CSR-05/01/2021-CSR-MCA dated 25th August 2021.

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-636705, Tamil Nadu, India.

This Mining Plan is approved based on Incorporation of the particulars specified in clause 7 (iv) of the Commissioner of Geology and Mining Chennai Lr No 3868 / LC / 2012 dt 19-11-2012 and Draft Minor Mineral Conservation & Development Rules 2010

*W. Sreenivasulu Reddy*  
*04/10/2023*

**Deputy Director of Geology and Mining  
Karur District**

This Mining Plan is approved subject to the conditions/stipulations indicated in the Mining Plan approval Letter No: 510/min-4/2022 Dated: 04/10/2023

*S. Srinivasan*  
*04/10/2023*



ந.க.எண்.510/கனிமம்/2022

மாவட்ட ஆட்சியர் அலுவலகம்,  
புவியியல் மற்றும் சுரங்கத்துறை,  
கரூர்

நாள்: 19.09.2023.

குறிப்பாணை

**பொருள்:** கனிமங்களும் குவாரிகளும் - கரூர் மாவட்டம் - புகளூர் வட்டம் - அஞ்சூர் கிராமம் - பட்டா புல எண்கள்.770/2B(பகுதி) 1.54.0 ஹெக்டேர்ஸ், 778/3B1(பகுதி) 1.62.0 ஹெக்டேர்ஸ் மற்றும் 778/3B2 (பகுதி) 0.07.0 ஹெக்டேர்ஸ் ஆகியவற்றின் மொத்தம் 3.23.00 ஹெக்டேர்ஸ் பரப்பு நிலத்தில் மட்டும் தி/ள்.கௌசிக் & கோ புளூமெட்டல்ஸ் நிறுவனத்தார் - சாதாரணகல் குவாரி குத்தகை உரிமம் வேண்டி விண்ணப்பம் செய்தது - உரிமம் வழங்க பரிந்துரை செய்யப்பட்டது - தகுதியான நிலப்பரப்பாக கருதி ஏற்பளிக்கப்பட்ட சுரங்க திட்டம் மற்றும் மாநில சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணைய இசைவினை பெற்று சமர்ப்பிக்கக் கோருதல் - தொடர்பாக.

- பார்வை:**
1. தி/ள்.கௌசிக் & கோ புளூமெட்டல்ஸ், கதவு எண்.24/A, ஹவுசிங் யூனிட், கொல்லம்பாளையம், காசிபாளையம், ஈரோடு வட்டம், ஈரோடு மாவட்டம் என்ற நிறுவனத்தினர் விண்ணப்பம், நாள்: 13.10.2022.
  2. வருவாய் கோட்டாட்சியர், கரூர் அவர்களின் கடிதம் ந.க.எண். அ1/6477/2023, நாள்:07.09.2023
  3. உதவி புவியியலாளர், புவியியல் மற்றும் சுரங்கத்துறை கரூர் என்பவரது புலத்தணிக்கை அறிக்கை நாள்:12.09.2023.
  4. அரசாணை (பல்வகை) எண். 169, தொழில் (எம்எம்.சி-1) துறை நாள்: 04.08.2020 இணைத்து வரப்பெற்றுள்ளது. (தமிழ்நாடு அரசிதழ் சிறப்பு வெளியீடு எண். 315 நாள்: 04.08.2020).

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கரூர் மாவட்டம், புகளூர் வட்டம், அஞ்சூர் கிராமம், பட்டா புல எண்கள்.770/2B(பகுதி) 1.54.0 ஹெக்டேர்ஸ், 778/3B1(பகுதி) 1.62.0 ஹெக்டேர்ஸ் மற்றும் 778/3B2 (பகுதி) 0.07.0 ஹெக்டேர்ஸ் ஆகியவற்றின் மொத்தம் 3.23.00 ஹெக்டேர்ஸ் பரப்பு நிலத்திலிருந்து ஐந்து ஆண்டுகளுக்கு சாதாரண கற்கள் மற்றும் கிராவல் வெட்டியெடுக்க தி/ள்.கௌசிக் & கோ புளூமெட்டல்ஸ், கதவு எண்.24/A, ஹவுசிங் யூனிட், கொல்லம்பாளையம்,





காசிபாளையம், ஈரோடு வட்டம், ஈரோடு மாவட்டம் என்ற நிறுவனத்தினர் பார்வை 1-இல் கண்டுள்ளவாறு விண்ணப்பம் செய்துள்ளனர்.

மேற்படி விண்ணப்பம் தொடர்பாக, வருவாய் கோட்டாட்சியர், கரூர் மற்றும் உதவி புவியியலாளர், புவியியல் மற்றும் சுரங்கத்துறை, கரூர் ஆகியோர் புலத்தண்டிக்கை மேற்கொண்டு கரூர் மாவட்டம், புகளூர் வட்டம், அஞ்சூர் கிராமம், பட்டா புல எண்கள்.770/2B(பகுதி) 1.54.0 ஹெக்டேர்ஸ், 778/3B1(பகுதி) 1.62.0 ஹெக்டேர்ஸ் மற்றும் 778/3B2 (பகுதி) 0.07.0 ஹெக்டேர்ஸ் ஆகியவற்றின் மொத்தம் 3.23.00 ஹெக்டேர்ஸ் பரப்பில் தமிழ்நாடு சிறு கனிமச்சலுகை விதிகளில் விதி எண்கள்.19-(1) 20 மற்றும் 33-இன் கீழ் தி/ள்.கௌசிக் & கோ புளூமெட்டல்ஸ் என்ற நிறுவனத்திற்கு ஐந்து ஆண்டுகளுக்கு சாதாரணக்கல் மற்றும் கிராவல் குவாரி உரிமம் வழங்க கீழ்க்கண்ட நிபந்தனைகளுக்குட்பட்டு அனுமதி வழங்கலாம் என பார்வை 2 மற்றும் 3-இல் கண்டுள்ளவாறு பரிந்துரை செய்துள்ளனர்.

1. விண்ணப்ப புல எண்.778/3B1-இன் வடமேற்கில் செல்லும் பொதுப்பணித்துறை வாய்க்காலுக்கு 50 மீட்டர் பாதுகாப்பு இடைவெளி விட்டு யாதொரு சேதமுமின்றி முறையாக குவாரிப்பணி செய்ய வேண்டும்.
2. விண்ணப்ப புலங்களுக்கு அருகில் உள்ள பட்டா நிலங்களுக்கு 7.5 மீட்டர் மற்றும் புறம்போக்கு நிலத்திற்கு 10 மீட்டர் பாதுகாப்பு இடைவெளி விட்டு யாதொரு சேதமுமின்றி முறையாக குவாரிப்பணி செய்ய வேண்டும்.
3. குத்தகைக்காலத்தில் கைத்துளைப்பான் கருவி கொண்டு பாறைகளை துளையிட்டும், மிதமான வெடிபொருள் பயன்படுத்தியும், பொதுமக்களுக்கோ, பொது சொத்துக்களுக்கோ யாதொரு சேதமுமின்றி விதிமுறைகளின்படி குவாரிப்பணி செய்ய வேண்டும்.
4. குவாரித் தொழிலாளர்களின் பாதுகாப்பினை உறுதி செய்ய Mettalliferous Mines, விதிகளின்படி அகலமானதும், பாதுகாப்பானதுமான Benches அமைத்து பாதுகாப்பான முறையில் குவாரிக்குள் வாகனங்கள் சென்றுவரவும் மற்றும் குவாரி தொழிலாளர்களின் பாதுகாப்பினை உறுதி செய்தும் குவாரிப்பணி செய்ய வேண்டும்.
5. குவாரி குத்தகை வழங்க ஏதுவாக துணை இயக்குநர் (சுரங்கம்) அவர்களால் ஏற்பளிக்கப்பட்ட சுரங்கத்திட்டத்தினையும், மாநில அளவிலான சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையத்தின் (SEIAA) இசைவினை பெற்று மாவட்ட நிர்வாகத்திற்கு விண்ணப்பதாரர் நிறுவனத்தினரால் சமர்ப்பிக்கப்பட வேண்டும்.

For Kousic & Co Bluemetals

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Partner



எனவே, வருவாய் கோட்டாட்சியர், கரூர் மற்றும் உதவி புவியியலாளர், புவியியல் மற்றும் சுரங்கத்துறை, கரூர் ஆகியோரின் பரிந்துரைகள் மற்றும் நிபந்தனைகளின் அடிப்படையில் கரூர் மாவட்டம், புகளூர் வட்டம், அஞ்சூர் கிராமம், பட்டா புல எண்கள்.770/2B(பகுதி) 1.54.0 ஹெக்டேர்ஸ், 778/3B1(பகுதி) 1.62.0 ஹெக்டேர்ஸ் மற்றும் 778/3B2 (பகுதி) 0.07.0 ஹெக்டேர்ஸ் ஆகியவற்றின் மொத்தம் 3.23.00 ஹெக்டேர்ஸ் பரப்பில் 1959-ஆம் வருட தமிழ்நாடு சிறுகனிம சலுகை விதிகள், விதி எண். 19(1), 20 மற்றும் 33-இன்படியும் மேலும் மேற்கண்ட நிபந்தனைகளுக்கும் உட்பட்டு 5 (ஐந்து) ஆண்டு காலத்திற்கு சாதாரணக் கல் குவாரி உரிமம் வழங்க தி/ள்.கௌசிக் & கோ புளூமெட்டல்ஸ் என்ற நிறுவனத்திற்கு அரிதியிட்ட (Precise area) நிலப்பரப்பாக கருதப்படுகிறது.

அதற்கிணங்க, தமிழ்நாடு சிறு கனிம சலுகை விதிகள்-1959 விதி எண்.41-இன்படி குவாரிப்பணி மேற்கொள்வது தொடர்பாக வரைவு சுரங்க திட்டத்தினை 90 தினங்களுக்குள் சமர்ப்பிக்குமாறு தி/ள்.கௌசிக் & கோ புளூமெட்டல்ஸ் என்ற நிறுவனத்தினர் கேட்டுக்கொள்ளப்படுகின்றார். மேலும், ஏற்பளிக்கப்பட்ட சுரங்கத்திட்டத்தின் தொடர்ச்சியாக 1959-ஆம் வருடத்திய தமிழ்நாடு சிறுகனிம சலுகை விதிகள், விதி எண்.42-இன்படி மாநில சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையத்தின் இசைவினைப் பெற்று சமர்ப்பிக்கும் பட்சத்தில் மட்டுமே குவாரி உரிமம் வழங்கப்படும் என இதன் மூலம் தெரிவிக்கப்படுகிறது.

துணை இயக்குநர்,  
புவியியல் மற்றும் சுரங்கத்துறை,  
கரூர்.

பெறுநர்  
தி/ள்.கௌசிக் & கோ புளூமெட்டல்ஸ்,  
கதவு எண்.24/A,  
ஹவுசிங் யூனிட்,  
கொல்லம்பாளையம்,  
காசிபாளையம்,  
ஈரோடு வட்டம்,  
ஈரோடு மாவட்டம்.

நகல்:-

1. மாநில சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையம், சென்னை.
2. இயக்குநர், புவியியல் மற்றும் சுரங்கத்துறை, கிண்டி, சென்னை.

For Music & Co Bluemetals

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Partner



DR. H. MALLESHAPPA, I.F.S  
MEMBER SECRETARY

STATE LEVEL ENVIRONMENT IMPACT ASSESSMENT  
AUTHORITY – TAMIL NADU  
3<sup>RD</sup> Floor, Panagal Maaligai,  
no.1 jeenis road, saidapet, chennai-15  
phone no.044-24359973  
fax no. 044-24359975

**ENVIRONMENTAL CLEARANCE**

Lr.No.SEIAA-TN/F.No.5835/1(a)/ EC.No: 3926/2016 dated: 07.06.2017

To  
M/s. Kousic & Co. Blue Metals  
No. 24A, Housing Unit  
Kollampalayam  
Kasipalayam  
Erode  
Erode



Sir,

Sub: SEIAA-TN – Proposed Rough Stone & Gravel quarry located at S.F.No 770/2B, 778/3B1 & 778/3B2 of Patta Land, Anjur Village, Aravakurichi Taluk, Karur District- issue of Environmental Clearance – Reg.

Ref: 1. Your Application for Environmental Clearance dt: 18.10.2016  
2. Minutes of the 80th SEAC held on 11.11.2016  
3. Minutes of the SEIAA meeting held on 07.06.2017

Details of Minor Mineral Activity:-

This has reference to your application first cited. The proposal is for obtaining environmental clearance for mining/quarrying of minor minerals based on the particulars furnished in your application as shown below.

1	Name of Project Proponent and address	M/s. Kousic & Co. Blue Metals No. 24A, Housing Unit Kollampalayam Kasipalayam Erode Erode
2	Location of the Proposed Activity	
	Survey Number	770/2B, 778/3B1 & 778/3B2 of Patta Land
	Latitude and Longitude	11°3'1.70"N 77°47'12.75"E
	Village	Anjur

For Kousic & Co Bluemetals

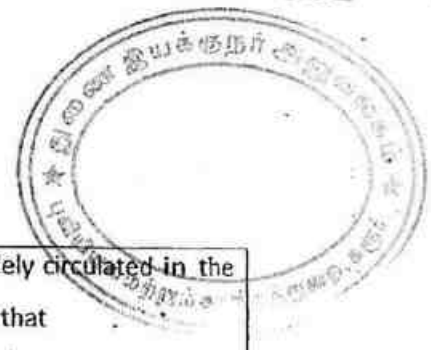
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Partner

MEMBER SECRETARY  
SEIAA-TN

	Taluk	Aravakurichi
	District	Karur
3	<b>Proposed Activity</b>	
	i. Minor mineral	Rough Stone & Gravel
	ii. Mining Lease Area	4.98.0 Ha
	iii. Approved quantity	300425 cu.m of Rough Stone
	iv. Depth of Mining	22m m
	v. Type of mining	Opencast semi mechanized
	vi. Category(B1/B2)	B2
	vii. Precise area communication	Rc. N.o.172/Mines/2014 dated 26.08.2015
	viii. Mining plan approval	Assistant Director Rc. N.o.172/Mines/2014 dated 10.02.2016
	ix. Mining lease period	5 Years
4	Whether Project area attracts any General conditions specified in the EIA notification, 2006 as amended:-	Not attracted. Affidavit furnished
5	Man Power requirement per day:	18 Employees
6	<b>Utilities</b>	
	i. Source of Water :	Water vendors/Borehole
	ii. Quantity of Water Requirement in KLD:	
	a. Domestic	2.5KLD
	b. Industrial	} 1.6KLD
	c. Green Belt & Dust Suppression	
	iii. Power Requirement:	TNEB
	a. Domestic Purpose	
	b. Industrial Purpose	
7	<b>Cost</b>	
	i. Project Cost	Rs.22.50 Lakhs
	ii. EMP Cost	Rs.3.50 Lakhs
8	<b>Public Consultation:-</b>	Not required as per O.M. dated 24.12.2013 of M&E, Gol.
9	<b>Date of Appraisal by SEAC:-</b> Agenda No:	11.11.2016 83-6
10	<b>Date of Review/Discussion by SEIAA and the Remarks:-</b> The proposal was placed before the SEIAA in its 215 <sup>th</sup> Meeting held on 07.06.2017 and the Authority after careful consideration, decided to grant environmental clearance to the said project Mining of Rough Stone & Gravel subject to terms and conditions stipulated under the provisions of Environment Impact Assessment Notification, 2006 as amended.	
11	<b>Validity:</b> This Environmental Clearance is granted to Mining of Rough Stone & Gravel for the production quantity of 300425 cu.m of Rough Stone for the period of 5 Years from the date of execution of the Mining Lease period.	

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SEIAA-TN

For Kousic & Co Bluemetals



**Conditions to be Complied before commencing mining operations:-**

1. The project proponent shall advertise in at least two local newspapers widely circulated in the region, one of which shall be in the vernacular language informing the public that
  - I. The project has been accorded Environmental Clearance.
  - II. Copies of clearance letters are available with the Tamil Nadu Pollution Control Board.
  - III. Environmental Clearance may also be seen on the website of the SEIAA.
  - IV. The advertisement should be made within 7 days from the date of receipt of the clearance letter and a copy of the same shall be forwarded to the SEIAA.

2. Mining activity should be reviewed by the District Collector after three years and decide for further extension.
3. The applicant has to obtain land use classification as industrial use before issue/renewal of mining lease.
4. NOC from the Standing committee of the NBWL shall be obtained, if protected areas are located within 10 Km from the proposed project site.
5. The project proponent shall comply the conditions laid down in the Section V, Rule 36 of Tamil Nadu Minor Minerals Concession Rules 1959.
6. A copy of the Environment Clearance letter shall be sent by the proponent to the concerned Panchayat, Town Panchayat / Panchayat union/ Municipal Corporation, Urban Local Body and the Local NGO, if any, from whom suggestions/ representations, if any, were received while processing the proposal. The clearance letter shall also be put on the website of the proponent and also kept at the site, for the general public to see.
7. Quarry lease area should be demarcated on the ground with wire fencing to show the boundary of the lease area on all sides with red flags on every pillar shall be erected before commencement of quarrying.
8. The proponent shall ensure that First Aid Box is available at site.
9. The excavation activity shall not alter the natural drainage pattern of the area.
10. The excavated pit shall be restored by the project proponent for useful purposes.
11. The proponent shall quarry and remove only in the permitted areas as per the approved Mining Plan details.
12. The quarrying operation shall be restricted between 7AM and 5 PM.
13. The proponent shall take necessary measures to ensure that there shall not be any adverse impacts due to quarrying operation on the nearby human habitations, by way of pollution to the environment.
14. A minimum distance of 15 mts. From any civil structure shall be kept from the periphery of any excavation area.

For Kousic & ...

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15. Depth of quarrying shall be 2m above the ground water table /approved depth of mining whichever is lesser to be considered as a safe guard against Environmental Contamination and over exploitation of resources.
16. The mined out pits should be backfilled where warranted and area should be suitably landscaped to prevent environmental degradation. The mine closure plan as furnished in the proposal shall be strictly followed with back filling and tree plantation.
17. 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.
18. Drilling and blasting shall be done only either by licensed explosive agent or by the proponent after obtaining required approvals from Competent Authorities.
19. The explosives shall be stored at site as per the conditions stipulated in the permits issued by the licensing Authority.
20. Blasting shall be carried out after announcing to the public adequate through public address system to avoid any accident.
21. A study has to be conducted to assess the optimum blast parameters and blast design to keep the vibration limits less than prescribed levels and only such design and parameters should be implemented while blasting is done. Periodical monitoring of the vibration at specified location to be conducted and records kept for inspection.
22. The Proponent shall take appropriate measures to ensure that the GLC shall comply with the revised NAAQ norms notified by MoEF, Govt on 16.11.2009.
23. The following measures are to be implemented to reduce Air Pollution during transportation of mineral
  - i. Roads shall be graded to mitigate the dust emission.
  - ii. Water shall be sprinkled at regular interval on the main road and other service roads to suppress dust
24. The following measures are to be implemented to reduce Noise Pollution
  - i. Proper and regular maintenance of vehicles and other equipment
  - ii. Limiting time exposure of workers to excessive noise.
  - iii. The workers employed shall be provided with protection equipment and earmuffs etc.
  - iv. Speed of trucks entering or leaving the mine is to be limited to moderate speed of 25 kmph to prevent undue noise from empty trucks.
25. Measures should be taken to comply with the provisions laid under Noise Pollution (Regulation and Control) (Amendment) Rules, 2010, dt: 11.01.2010 issued by the MoE&F, Govt to control noise to the prescribed levels.
26. Suitable conservation measures to augment groundwater resources in the area shall be planned and implemented in consultation with Regional Director, CGWB. Suitable measures should be taken for rainwater harvesting.
27. Permission from the competent authority should be obtained for drawl of ground water, if any, required for this project.
28. Topsoil, if any, shall be stacked properly with proper slope with adequate measures and should be used for plantation purpose.
29. The following measures are to be adopted to control erosion of dumps:-
  - i. Retention/ toe walls shall be provided at the foot of the dumps.
  - ii. Worked out slopes are to be stabilized by planting appropriate shrub/ grass species on the slopes.

For Kousic & Co Bluemetals

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SEIAA-TN



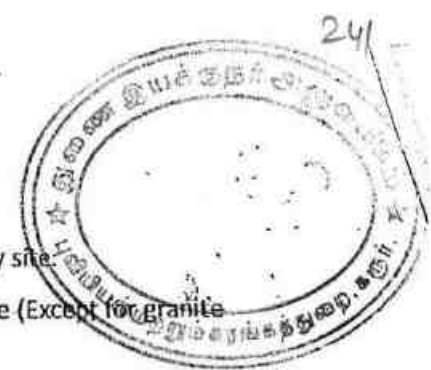
30. Waste oils, used oils generated from the EM machines, mining operations, if any, shall be disposed as per the Hazardous Wastes (Management, Handling, and trans boundary movement) Rules, 2008 and its amendments thereof to the recyclers authorized by TNPCB.
31. Concealing the factual data or failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract action under the provisions of Environment (Protection) Act, 1986.
32. Rain water harvesting to collect and utilize the entire water falling in land area should be provided.
33. Rain water getting accumulated in the quarry floor shall not be discharged directly to the nearby stream or water body. If it is to be let into the nearby water body, it has to be discharged into a silt trap on the surface within the lease area and only the overflow after allowing settling of soil be let into the nearby waterways. The silt trap should be of sufficient dimensions to catch all the silt water being pumped out during one season. The silt trap should be cleaned of all the deposited silt at the end of the season and kept ready for taking care of the silt in the next season.
34. The lease holder shall undertake adequate safeguard measures during extraction of material and ensure that due to this activity, the hydro-geological regime of the surrounding area shall not be affected. Regular monitoring of ground water level and quality shall be carried out around the mine lease area during the mining operation. If at any stage, if it is observed that the groundwater table is getting depleted due to the mining activity; necessary corrective measures shall be carried out. District Collector/mining officer shall ensure this.
35. No tree-felling shall be done in the leased area, except only with the permission from competent Authority.
36. To take up environmental monitoring of the proposed quarry site before, during and after the mining activities including vibration study data, water, air & flora/fauna environment, slurry water generated/disposed and method of disposal, involving a reputed academic Institution.
37. It shall be ensured that the total extent of nearby quarries (existing, abandoned and proposed) located within 500 meter radius from the periphery of this quarry is not exceeding 25 hectares within the mining lease period of this application.
38. It shall be ensured that there is no habitation is located within 300 meter radius from the periphery of the quarry site and also ensure that no hindrance will be caused to the people of the habitation located within 500m radius from the periphery of the quarry site
39. Ground water quality monitoring should be conducted once in 3 Months
40. Transportation of the quarried materials shall not cause any hindrance to the Village people/Existing Village road.
41. Free Silica test should be conducted and reported to TNPCB, Department of Geology and Mining and Regional Director, MoEF, GOI.
42. Air sampling at intersection point should be conducted and reported to TNPCB, Department of Geology and Mining and Regional Director, MoEF, GOI..
43. Bunds to be provided at the boundary of the project site.
44. The project proponent shall undertake plantation/afforestation work by planting the native species on all side of the lease area at the rate of 400/Ha. Suitable tall tree saplings should be planted on the bunds and other suitable areas in and around the work place.

For Kousic & Co Bluemetals

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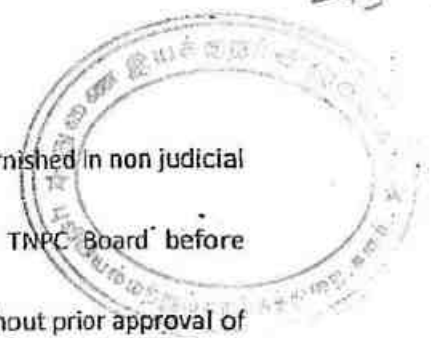
MEMBER SECRETARY  
SEIAA-TN



45. At least 10 Neem trees should be planted around the boundary of the quarry site.
46. Floor of excavated pit to be levelled and sides to be sloped with gentle slope (Except for granite quarries) in the mine closure phase.
47. The Project Proponent shall ensure a minimum of 2.5% of the annual turnover will be utilized for the CSR Activity
48. The Project Proponent shall provide solar lighting system to the nearby villages
49. The CSR funds should be channelized for planting programme, nature conservation support, tribal development and activities that support forest and environment.
50. The Project Proponent shall comply with the mining and other relevant rules and regulations where ever applicable.
51. Rainwater shall be pumped out Via Settling Tank only
52. Earthen bunds and barbed wire fencing around the pits with green belt all along the boundary shall be developed and maintained.
53. As per MoEF&CC, GoI, Office Memorandum dated 30.03.2015, prior clearance from Forestry & Wild Life angle including clearance from standing committee of the National Board for Wild life as applicable shall be obtained before starting the quarrying operation, if the project site is located within 10KM from National Park and Sanctuaries.
54. The quarrying activity shall be stopped if the entire quantity indicated in the Mining plan is quarried even before the expiry of the quarry lease period and the same shall be monitored by the District Authorities.
55. Safety equipments to be provided to all the employees.
56. Safety distance of 50m has to be provided in case of railway, reservoir, canal/odai
57. The Assistant/Deputy Director, Department of Geology & mining shall ensure that the proponent has engaged the blaster with valid Blasting license/certificate obtained from the competent authority before execution of mining lease.
58. The proponent shall furnish the Baseline data covering the Air, Water, Noise and land environment quality for the proposed quarry site before execution of mining lease.
59. The proponent shall erect the pillars in accordance with the Rules for depicting GPS details in the earmarked boundary of the quarry site to monitor electronically before execution of mining.
60. The proponent has to provide insurance protection to the workers in the case of existing mining or provide the affidavit in case of fresh lease before execution of mining lease.
61. The proponent has to display the name board at the quarry site showing the details of Proponent, lease period, extent, etc., with respect to the existing activity before execution of mining.
62. Heavy earth machinery equipments if utilized, after getting approval from the competent authority.
63. The Proponent shall ensure that the project activity including blasting, mining transportation etc should in no way have adverse impact to the other forests, such as reserve forests and social forests, tree plantation and bio diversity, surrounding water bodies etc.
64. The Project Proponent is also directed to strictly adhere to the Sustainable Sand Mining Management Guidelines, 2016, wherever applicable.
65. The proponent shall provide Green Belt development at the rate of not less than 400 trees/Hectare. The tree saplings shall be not less than 1m height.
66. The quarrying activity in no way should disturb the Wildlife habitat, free migratory movement of the wildlife nor disturb the wildlife in any way.

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SEIAA-TN





**General Conditions:**

1. EC is given only on the factual records, documents and the commitment furnished in non judicial stamp paper by the proponent.
2. The Proponent shall obtain the Consent for Establishment from the TNPC Board before commencing the activity.
3. No change in mining technology and scope of working should be made without prior approval of the SEIAA, Tamil Nadu.
4. No change in the calendar plan including excavation, quantum of mineral (minor mineral) should be made.
5. Effective safeguard measures, such as regular water sprinkling shall be carried out in critical areas prone to air pollution and having high levels of particulate matter such as loading and unloading point and all transfer points. Extensive water sprinkling shall be carried out on haul roads. It should be ensured that the Ambient Air Quality parameters conform to the norms prescribed by the Central Pollution Control Board in this regard.
6. Effective safeguards shall be adopted against health risks on account of breeding of vectors in the water bodies created due to excavation of earth.
7. A berm shall be left from the boundary of adjoining field having a width equal to at least half the depth of proposed excavation.
8. Mineral handling area shall be provided with adequate number of high efficiency dust extraction system. Loading and unloading areas including all the transfer points should also have efficient dust control arrangements. These should be properly maintained and operated.
9. Vehicular emissions shall be kept under control and be regularly monitored. The mineral transportation shall be carried out through the covered trucks only and the vehicles carrying the mineral shall not be overloaded.
10. Access and haul roads to the quarrying area should be restored in a mutually agreeable manner where these are considered unnecessary after extraction has been completed.
11. All Personnel shall be provided with protective respiratory devices including safety shoes, Masks, gloves etc. Supervisory people should be provided with adequate training and information on safety and health aspects. Occupational health surveillance program of the workers should be undertaken periodically to observe any contractions due to exposure to dust and take corrective measures, if needed.
12. Periodical medical examination of the workers engaged in the project shall be carried out and records maintained. For the purpose, schedule of health examination of the workers should be drawn and followed accordingly. The workers shall be provided with personnel protective measures such as masks, gloves, boots etc.
13. Workers/labourers shall be provided with facilities for drinking water and sanitation facility for Female and Male separately.
14. The project proponent shall ensure that child labour is not employed in the project as per the sworn affidavit furnished.
15. The funds earmarked for environmental protection measures should be kept in separate account and should not be diverted for other purpose. Year wise expenditure should be reported to the Ministry of Environment and Forests and its Regional Office located at Chennai.

MEMBER SECRETARY  
SEIAA-TN

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- 16. The Environmental Clearance does not absolve the applicant/proponent of his obligation/requirement to obtain other statutory and administrative clearances from other statutory and administrative authorities.
- 17. This Environmental Clearance does not imply that the other statutory / administrative clearances shall be granted to the project by the concerned authorities. Such authorities would be considering the project on merits and be taking decisions independently of the Environmental Clearance
- 18. The SEIAA, Tamil Nadu may alter/modify the above conditions or stipulate any further conditions in the interest of environment protection.
- 19. The SEIAA, Tamil Nadu may cancel the environmental clearance granted to this project under the provisions of EIA Notification, 2006, at any stage of the validity of this environmental clearance, if it is found or if it comes to the knowledge of this SEIAA, TN that the project proponent has deliberately concealed and/or submitted false or misleading information or inadequate data for obtaining the environmental clearance.
- 20. Failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract action under the provisions of the Environment (Protection) Act, 1986.
- 21. The above conditions will be enforced inter-alia, under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, the Public Liability Insurance Act, 1991, along with their amendments, draft Minor Mineral Conservation & Development Rules, 2010 framed under MMDR Act 1957, National Commission for protection of Child Right Rules, 2006 and rules made there under and also any other orders passed by the Hon'ble Supreme Court of India/Hon'ble High Court of Madras and any other Courts Law relating to the subject matter.
- 22. Any other conditions stipulated by other Statutory/Government authorities shall be complied
- 23. Any appeal against this environmental clearance shall lie with the Hon'ble National Green Tribunal, if preferred, within a period of 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010.

*[Signature]*  
MEMBER SECRETARY  
SEIAA-TN

Copy to:

- 1. The Secretary, Ministry of Mines, Government of India, Shastri Bhawan, New Delhi.
- 2. The Principal Secretary, Environment and Forests Department, Government of Tamil Nadu, Tamil Nadu.
- 3. The Additional Chief Secretary, Industries Department, Government of Tamil Nadu, Tamil Nadu.
- 4. The Additional Principal Chief Conservator of Forests, Regional Office (SZ), 34, HEPC Building, 1<sup>st</sup> & 2<sup>nd</sup> Floor, Cathedral Garden Road, Nungambakkam, Chennai - 34.
- 5. The Chairman, Central Pollution Control Board, Parivesh Bhawan, CBD-Cum-Office Complex, East Arjun Nagar, New Delhi-110 032.
- 6. The Chairman, Tamil Nadu Pollution Control Board, 76, Mount Salai, Guindy, Chennai-32
- 7. The District Collector, Karur District
- 8. The Commissioner of Geology and Mines, Guindy, Chennai-32
- 9. E Division, Ministry of Environment & Forests, Parvavaran Bhawan, New Delhi.
- 10. Spare.

For Kousic & Co Bluemetals

*[Signature]*  
Partner

*[Signature]*  
MEMBER SECRETARY  
SEIAA-TN

கரூர் மாவட்ட ஆட்சியர் அவர்களின் செயல்முறை ஆணை  
முன்னிணை:- திரு.கு.கோவிந்தராஜ், இ.ஆ.ப.,

ந.க.எண்.172/ கனிமம் / 2012

நாள்: 07.8.2017

பொருள்: கனிமங்களும் குவாரிகளும் - கரூர் மாவட்டம் - அரவக்குறிச்சி வட்டம் - அஞ்சூர் கிராமம் - புல எண்கள். 770/2B (பகுதி) (1.76.0 ஹெக்டேர்), 778/3B2 (1.03.0 ஹெக்டேர்), 778/3B1 (பகுதி) (2.19.0 ஹெக்டேர்) ஆகியவற்றில் மொத்தம் 4.98.0 ஹெக்டேர் பரப்பில் சாதாரண கற்கள்/கிராவல் வெட்டி எடுக்க 5 ஆண்டுகளுக்கு குவாரி ஒத்தவை உரிமம் - தி/ள்.கெளசிக் அண்கோ புரூ மெட்டல்ஸ் என்ற நிறுவனத்திற்கு வழங்கி உத்தரவிடப்படுகிறது.

- மாண்புமிகு
1. தி/ள்.கெளசிக் அண்கோ புரூ மெட்டல்ஸ், கதவு எண்.24ஏ ஹசில் பூனிட், கொல்லம்பாளையம், காசிபாளையம், சரோடு வட்டம் & மாவட்டம் என்பவரின் மனு நாள்:28.5.2012, மற்றும் கடிதம் நாள்:02.5.2013.
  2. இவ்வலுவலக இதே எண்ணிட்ட கடிதம் நாள்:04.6.2012 மற்றும் 26.11.2012 வருவாய் கோட்டாட்சியருக்கு முகவரியிட்டது.
  3. அரவக்குறிச்சி, வட்டாட்சியர் அவர்களின் அறிக்கை ந.க.எண்.ஆ3/4828/2013, நாள்:29.8.2013.
  4. கரூர், வருவாய் கோட்டாட்சியர் அவர்களின் அறிக்கை ந.க.அ1/1940/2013 நாள்:27.01.2014.
  5. கரூர் புவியியல் மற்றும் சுரங்கத்துறை உதவி புவியியலாளரின் இடப்பார்வை அறிக்கை நாள்:18.8.2015.
  6. இவ்வலுவலக இதே எண்ணிட்ட குறிப்பாணை நாள்:26.8.2015.
  7. உதவி இலக்குதர், புவியியல் மற்றும் சுரங்கத்துறை, கரூர் அவர்களின் ஏற்பளிக்கப்பட்ட சுரங்கத் திட்டம் நாள்:10.02.2016.
  8. மாநில சுற்றுச் சூழல் தாக்க மதிப்பீட்டு ஆணையம், சென்னை ஒப்புதல் ஆணை எண். SEIAA,TN/F.No.5835/1(a)/EC.No.3926/2015 நாள்:07.6.2017.

உத்தரவு:-

கரூர் மாவட்டம், அரவக்குறிச்சி வட்டம், அஞ்சூர் கிராமம், புல எண்கள்.770/2B (பகுதி) (1.76.0 ஹெக்டேர்), 778/3B2 (1.03.0 ஹெக்டேர்), 778/3B1 (பகுதி) (2.19.0 ஹெக்டேர்) ஆகியவற்றில் மொத்தம் 4.98.0 ஹெக்டேர் பரப்பில் சாதாரண கற்கள்/கிராவல் வெட்டியெடுக்க தி/ள்.கெளசிக் அண்கோ புரூ மெட்டல்ஸ், கதவு எண்.24ஏ ஹசில் பூனிட், கொல்லம்பாளையம், காசிபாளையம்,



ஈரோடு வட்டம் & மாவட்டம் என்ற நிறுவனம் ஐந்து ஆண்டுகளுக்கு குவாரி குத்தகை உரிமம் கோரி பார்வை 1ல் கண்டவாறு மனு செய்துள்ளனர்.

2. மனுதாரர் உரிய படிவத்தில் மனு செய்திருப்பதுடன், விண்ணப்பக் கட்டணம் மற்றும் அடிப்படை செலவினங்களுக்காக ரூ.1500/-ஐ சலான் எண்.8, நாள்:23.5.2012-ல் தாந்தோணி பாரத மாநில வங்கியில் செலுத்தியுள்ளார். மேலும், மனுதாரர் செலுத்த வேண்டிய வருவான வரி மற்றும் கனிம வரி எதுவும் நிலுவையில் இல்லை என்பதற்கான சான்றுறுதி ஆவணம் மற்றும் கிராம கணக்கு நகல்களையும் சமர்ப்பித்துள்ளார்.

3. மனுதாரர் சாதாரண கற்கள் வெட்டி எடுக்க உரிமம் கோரிய புலத்தை தணிக்கை செய்து அறிக்கை அளிக்கும்படி பார்வை-2ல் கண்ட கடிதத்தின் வாயிலாக அரவக்குறிச்சி வட்டாட்சியர் மற்றும் கரூர், வருவாய் கோட்டாட்சியரிடம் அறிக்கை கோரப்பட்டது.

4. மனுதாரர் சாதாரண கற்கள் வெட்டி எடுக்க உரிமம் கோரிய பிரஸ்தாப புலத்தை அரவக்குறிச்சி வட்டாட்சியர், கரூர், வருவாய் கோட்டாட்சியர் மற்றும் உதவி இயக்குநர், புவியியல் மற்றும் சுரங்கத்துறை, கரூர் ஆகியோர் இடப்பார்வை செய்து அறிக்கை சமர்ப்பித்துள்ளனர்.

5. பார்வை-3ல் கண்ட அரவக்குறிச்சி, வருவாய் வட்டாட்சியர் அவர்களின் அறிக்கையில் கரூர் மாவட்டம்; அரவக்குறிச்சி வட்டம், அஞ்சூர் கிராம, புல எண்கள்.7702/B, 778/3B2, 778/3B1 ஆகியவற்றில் மொத்த பரப்பு 4.98.0 ஹெக்டேர் பட்டா நிலத்தில் சாதாரண கல்குவாரி / கிராவல் மண் வெட்டியெடுக்க கௌசிக் அன்கோ புளூ மெட்டல்ஸ் என்ற நிறுவனத்தினர் விண்ணப்பம் செய்தது தொடர்பாக தலப்பார்வை மேற்கொள்ளப்பட்டது எனவும், கரூர் மாவட்டம், அரவக்குறிச்சி வட்டம், அஞ்சூர் கிராமத்தைச் சேர்ந்த கௌசிக் அன்கோ புளூ மெட்டல்ஸ் என்ற நிறுவனத்தினர் அஞ்சூர் கிராம புல எண்கள்.770/2B, 778/2B2 ஆகியவற்றில் மொத்த பரப்பு 3.35.5 ஹெக்டேர் நிலத்தில் கரூர் மாவட்ட ஆட்சித்தலைவர் அவர்களின் நக.எண்.பி/123/புமசு/2007, நாள்.12.3.2007ன்படி கல்குவாரி நடத்தி வந்துள்ளனர் எனவும், தற்போது மேற்படி கிராம புல எண்கள்.770/2B, 778/3B2, 778/3B1 ஆகியவற்றில் மொத்த பரப்பு 4.98.0 ஹெக்டேர் பட்டா பூமியிலிருந்து ஐந்து வருடங்களுக்கு சாதாரண கல்கிராவல் மண் வெட்டியெடுக்க கௌசிக் அன்கோ புளூ மெட்டல்ஸ் என்ற நிறுவனத்தினர் மேலும் 5 ஆண்டுகளுக்கு உரிமம் வழங்க வேண்டுமாறு கோரியுள்ளனர் எனவும், மேற்படி நிறுவனத்தின் உரிமையாளர் நிறுவனத்தின் பெயரில் குவாரி உரிமம் வழங்க



வேண்டுமென தெரிவித்து வாக்குமூலம் அளித்துள்ளார் எனவும், மேற்கண்ட நிலங்களில் கல்குவாரி செய்ய கௌசிக் அன்கோ புளூ மெட்டல்ஸ் என்ற நிறுவனத்திற்கு மேற்பரப்பு ஸ்தல பாத்தியதை உள்ளது எனவும், உரிமம் வழங்குதல் தொடர்பாக கிராம நிர்வாக அலுவலர் மற்றும் பொதுமக்களை விசாரணை மேற்கொண்டதில் அஞ்சூர் கிராம புல எண்கள்.770/2B, 778/3B2, 778/3B1 நிலத்தில் சாதாரண கல்/கிராவல் மண் வெட்டியெடுக்க ஐந்து ஆண்டுகளுக்கு உரிமம் வழங்குவதில் ஆட்சேபணை ஏதும் இல்லை என வாக்குமூலம் அளித்துள்ளார் எனவும், உரிமம் வழங்குவது தொடர்பாக கிராமத்தில் "ஏ1" நோட்டீஸ் விளம்பரம் செய்தும் பொதுமக்களிடமிருந்து ஆட்சேபணை ஏதும் வரப்பெறவில்லை எனவும், உரிமம் வழங்குவது தொடர்பாக தலப்பார்வை மேற்கொண்டதில் கல்குவாரி செய்யப்படும் இடத்தில் எல்லைகள் வரையறுக்கப்பட்டு எல்லை கற்கள் நடப்பட்டுள்ளது எனவும், உரிமம் வழங்கும் புலத்திலிருந்து 300 மீட்டர் சுற்றளவிற்குள் கிராம நத்தம், அங்கீகரிக்கப்பட்ட குடியிருப்பு மனைகள் மற்றும் கட்டுமானங்கள் ஏதுமில்லை என்பது கண்டறியப்பட்டது எனவும், மேலும் உத்தேசிக்கப்பட்டுள்ள ஜாகாவில் உயர் அழுத்த தாழ்வு நிலை மின் பாதைகள் ஏதும் ஊடாக செல்லவில்லை எனவும், கேபிள் வயர்கள் ஏதும் ஜாகாவில் ஊடாக செல்லவில்லை எனவும், மேற்படி புலத்தில் புராதன சின்னங்களோ, சர்ச், மசூதி, கோவில்கள், பள்ளிக்கூடங்கள், ஆஸ்பத்திரி, மயானம் போன்றவை ஏதும் இல்லை எனவும் தெரிவித்து அரவக்குறிச்சி வட்டம், அஞ்சூர் கிராம புல எண்கள்.770/2B, 778/3B2, 778/3B1 ஆகியவற்றில் மொத்த பரப்பு 4.98.0 ஹெக்டேர் பட்டா நிலத்தில் சாதாரண கற்கள் / கிராவல் மண் வெட்டியெடுக்க கௌசிக் அன்கோ புளூ மெட்டல்ஸ் என்ற நிறுவனத்திற்கு 5 ஆண்டுகளுக்கு உரிமம் வழங்கலாம் என பரிந்துரை செய்துள்ளார்.

6. பார்வை-4ல் கண்ட கரூர், வருவாய் கோட்டாட்சியர் அவர்களின் அறிக்கையில், அரவக்குறிச்சி வட்டம், அஞ்சூர் கிராமம், புல எண்.770/2பி, 778/3பி2 மற்றும் 778/3பி1 மொத்தப் பரப்பளவு 4.98.0 ஹெக்டேர் நிலத்திலிருந்து கல் குவாரி / கிராவல் செய்ய குத்தகை உரிமம் கோரி வரப்பெற்ற மனு தொடர்பாக புலத்தணிக்கை செய்யப்பட்டது எனவும், உரிமம் கோரும் விண்ணப்ப புல எண்.770/2பி, 778/3பி2க்கு பட்டா எண்.1714, தி/ள்.கௌசிக் அன்கோ புளூ மெட்டல்ஸ் நிறுவனத்திற்க்காக திரு.கே.ஜி.மோகன்ராஜ் என்பவர் பெயரிலும், 778/3பி1க்கு பட்டா எண்.1305, தி/ள்.கௌசிக் அன்கோ புளூ மெட்டல்ஸ் நிறுவனத்திற்க்காக எஸ்.கே.சுப்பிரமணி என்பவர் பெயரிலும் பட்டா பதிவாகியுள்ளது எனவும், விண்ணப்ப புல எண்களுக்கு கீழ்க்கண்டவாறு நான்கு எல்லைகள் அமைந்துள்ளன எனவும்,

For Kousic & Co Bluemetals

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Partner



புல எண்கள்	திசைகள்	எல்லைகள்
770/2பி	வடக்கு	770/2A3
	மேற்கு	769
	தெற்கு	741
	கிழக்கு	778
778/3B2	வடக்கு	778/3B1
	மேற்கு	770
	தெற்கு	741
	கிழக்கு	779

புல எண்கள்	திசைகள்	எல்லைகள்
778/3B1	வடக்கு	778/3A2A, 778/3A2B
	மேற்கு	770/2A1 770/2A3
	தெற்கு	778/3B2 779
	கிழக்கு	803

விண்ணப்ப இடத்தில் கல்குவாரி செய்ய பொது மக்களிடமிருந்து ஆட்சேபணை ஏதும் உள்ளதா என்பது குறித்த "ஏ1" விளம்பரம் செய்யப்பட்டு ஆட்சேபணை இல்லையென ஒப்புதல் பெறப்பட்டுள்ளது எனவும், குவாரி செய்யும் இடத்திலிருந்து 300 மீட்டர் தொலைவில் குடியிருப்புகள் ஏதும் இல்லை எனவும், 50 மீட்டர் தூரத்தில் உயர் தாழ்வழுத்த மின்கம்பிகள் செல்லவில்லை எனவும், கோவில், மதுதி, சர்ச், மயானம் மற்றும் நீர் நிலைகள் ஏதுமில்லை எனவும், இந்த குவாரியினுடைய நீளம் மற்றும் அகலம் அளவிட்டு செய்யப்பட்டு வரைபடத்தில் குறிக்கப்பட்டுள்ளது எனவும், குவாரி செய்யப்படவுள்ள புலத்தில் புறம்போக்கு இடங்கள் ஏதுமில்லை எனவும், உரிமம் கோரும் கல் மற்றும் கிராவல் குவாரி செய்யவுள்ள புல எண்ணிற்கு எல்லைகள் வரையறுக்கப்பட்டு எல்லைக் கற்கள் நடப்பட்டுள்ளது எனவும் தெரிவித்து அரவக்குறிச்சி வட்டம், அஞ்சூர் கிராமம், புல எண்.770/2பி, 778/3பி2 மற்றும் 778/3பி1 மொத்தப் பரப்பு 4.98.0 ஹெக்டேர் நிலத்திலிருந்து கல் குவாரி / கிராவல் வெட்டி எடுப்பதற்கு திள்/கெளசிக் அன்கோ புளூ மெட்டல்ஸ் என்ற நிறுவனத்தின் பெயரில் அரசு விதிமுறைகளுக்குட்பட்டு குத்தகை உரிமை வழங்கலாம் என பரிந்துரை செய்துள்ளார்.

7. பார்வை 5ல் கண்ட கருர், புவியியல் மற்றும் சுரங்கத்துறை, உதவி புவியியலாளரின் இடப்பார்வை அறிக்கையில், அரவக்குறிச்சி வட்டம், அஞ்சூர் கிராமம், புல எண்கள்.770/2B மற்றும் 778/3B2 ஆகியவை பட்டர் எண்.1714ன்படி கெளசிக் அன்கோ புளூ மெட்டல்ஸ் நிறுவனத்திற்காக மோகன்ராஜ் பெயரில் பதிவாகியுள்ளது எனவும், புல எண்.778/3B1 ஆனது பட்டர் எண்.1305ன்படி எஸ்.கே.சுப்பிரமணி பெயரில் பதிவாகியுள்ளது எனவும், மேற்படி புல எண்ணில் சாதாரண கற்கள் வெட்டிக் கொள்ள கெளசிக் அன்கோ நிறுவனத்தின் பங்குதாரர் மோகன்ராஜ் என்பவருக்கு பட்டாதாரர் சுப்பிரமணி என்பவர் சம்மத கடிதம் கொடுத்துள்ளார் எனவும், எனவே மேற்படி புல எண்.778/3B1ல் சாதாரண கற்கள் உடைக்க விண்ணப்ப நிறுவனத்திற்கு உரிமை உள்ளது எனவும், மாவட்ட ஆட்சித்தலைவர் கருர் அவர்களின் செயல்முறை ஆணைகள் நக.எண்.பி/123/புமசு/2007, நாள்.12.3.2007ன் 235 புல எண்.778/3B2ல் 1.03.0



நிபந்தனைகள்:-

1. குத்தகை புலத்தினை அடுத்துள்ள பட்டா நிலங்களுக்கு இடைவெளி அளித்து குவாரிப்பணி புரிய வேண்டும்.
2. பொதுமக்களுக்கோ, பொது சொத்துக்களுக்கோ யாதொரு சேதமும் இன்றி பாதுகாப்பான முறையில் குவாரிப்பணி செய்ய வேண்டும்.
3. பொதுமக்களின் நலன் கருதி பாதுகாப்பான முறையில் குறைந்த அழுத்தமுள்ள வெடிபொருட்கள் பயன்படுத்தியும், கைத்துளைப்பான் கருவி கொண்டு துளையிட்டும், தொழிலாளர்களின் பாதுகாப்பினை உறுதி செய்ய பாதுகாப்பானதும், அகலமான Benches அமைத்து குவாரிப்பணி செய்ய வேண்டும்.
4. மாநில சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையத்தின் பரிந்துரை கடிதம் SEIAA,TN/F.No.5835/1(a)/EC.No.3926/2016 நாள்.07.6.2017ல் கண்ட சிறப்பு நிபந்தனைகளை முறையாக கடைபிடித்து குவாரிப்பணி செய்வதுடன், பொது நிபந்தனை 2ல் கண்டவாறு குவாரிப்பணி ஆரம்பிப்பதற்கு முன்பாக தமிழ்நாடு மாசுக்கட்டுப்பாட்டு வாரியத்தின் தடையின்மை சான்று பெற்று அதில் குறிப்பிடப்பட்டுள்ள சிறப்பு நிபந்தனைகளையும் முறையாக கடைபிடித்து அதன் பின்னரே குவாரிப்பணி துவங்க வேண்டும். மாசுக்கட்டுப்பாட்டு வாரிய தடையின்மை சான்றினை குறித்த காலங்களில் புதுப்பிக்க வேண்டும்.
5. குத்தகைதாரர் தனக்கு அளிக்கப்பட்ட குத்தகை பகுதியின் எல்லைகளை தெளிவாக காட்டும் வகையில் கல் நட்டு வண்ணம் இட்டு குத்தகை காலம் முழுமைக்கும் பராமரிக்க வேண்டும்.
6. குத்தகைதாரர் குவாரியின் அருகே குத்தகைதாரர் பெயர், கிராமத்தின் பெயர், வட்டத்தின் பெயர், புல எண். பரப்பு, குத்தகை ஆணை எண். குத்தகை காலம், கனிமத்தின் பெயர், போன்ற விபரங்கள் குறிக்கப்பட்ட தகவல் பலகையை தமது சொந்த செலவில் வைத்து நன்கு பராமரிக்க வேண்டும்.
7. குவாரிக்கு சென்றுவரும் பாதை வசதிகள் குத்தகைதாரர்கள் அவர் தம் சொந்த பொறுப்பிலேயே அமைத்துக் கொள்ள வேண்டும்.
8. குத்தகை வழங்கப்பட்ட பாறையில் குண்டுக்கல், ஜல்லி, அரளை கல், வேலிக்கற்கள், போன்ற சிறுகனிமங்கள் உடைத்தெடுக்க மட்டுமே அனுமதியுண்டு. வெளிநாடுகளுக்கு ஏற்றுமதியாகும் மெருகூட்டும் கனவடிவ கற்கள் வெட்டி எடுக்கக் கூடாது.
9. குவாரியிலிருந்து கொண்டு செல்லப்படும் மேற்கண்ட வகை கற்களுக்கு 1959ம் ஆண்டு தமிழ்நாடு சிறுகனிம சலுகை விதிகள் பின் இணைப்பு 2ல் கண்டுள்ளவாறு உரிமவரி செலுத்த வேண்டும். அரசு அவ்வப்போது அறிவிக்கும் உரிமவரி மாற்றங்களுக்கு ஏற்ப எவ்வித ஆட்சேபணை இன்றி செலுத்துதல் வேண்டும்.
10. குத்தகை அனுமதி வழங்கப்பட்ட நிலத்திலிருந்து கொண்டு செல்லப்பட்ட கற்களுக்கு முறையான கணக்குகளும், குழிவாயில் பதிவேடும் முறையாக பராமரித்தல் வேண்டும். அவற்றை சம்பந்தப்பட்ட அலுவலர்கள் தணிக்கைக்கு ஆஜர்படுத்த கோரினால் தவறாது சமர்ப்பிக்க வேண்டும்.
11. உதவி இயக்குநர் (புவியியல் மற்றும் தரங்கத்துறை)-ன் அலுவலக முத்திரை, கையொப்ப முத்திரையுடன் கூடிய உரிய அனுப்புகைச் சீட்டை

Partner



வாகனங்களுக்கு கொடுக்கப்படும் போது அனுப்புரைச் சீட்டில் வாகன எண், தேதி, புறப்படும் நேரம், செலுத்துமிடம் ஆகியவற்றை முறையாகக் குறிப்பிட்டு கையொப்பம் இட்ட பின்னரே, குத்தகைதாரரோ அல்லது அவரது அனுமதி பெற்ற நபரோ கொடுக்க வேண்டும். மேற்கண்டவாறு குறிப்பிடுவதில் ஏதேனும் தவறுகள் இருந்தாலோ, கலங்கள் பூர்த்தி செய்யப்படாமல் இருந்தாலோ முறையற்ற வகையில் கனிமம் எடுத்துச் செல்வதாகக் கருதப்பட்டு வாகனத்தை கைப்பற்றி அபராதம் விதிப்பதோடு, அதற்கு குத்தகைதாரரை பொறுப்பாக்கி கனிம விதிகளின் படி மேல் நடவடிக்கை எடுக்கப்படும்.

12. இந்த ஆணையில் குத்தகை அனுமதி வழங்கப்பட்ட புலத்தை முழுமையாகவோ, பகுதியாகவோ எவருக்கும் உள் குத்தகைக்கு விடுவதோ அல்லது கிரையம் செய்வதோ கூடாது.
13. குத்தகைதாரர் ஒவ்வொரு நாளும் குவாரியில் இருந்து எவ்வளவு சிறுகனிமங்கள் எடுக்கப்பட்டது என்பதையும் எந்த அளவு கனிமங்கள் லாரி/வண்டி மூலம் வெளியே அனுப்பப்பட்டது என்ற விபரத்தையும் காட்டும் பதிவேட்டினைப் பராமரித்து வரவேண்டும்.
14. குத்தகைதாரர், தமக்கு குத்தகை வழங்கப்பட்ட பகுதிக்கு அருகில் உள்ள பட்டா நிலத்திற்கு எவ்வித இடையூறும் இல்லாமல் குவாரிப் பணி செய்யப்பட வேண்டும்.
15. வண்டிப்பாதை மற்றும் நடைபாதைகளில் இருந்து 10 மீட்டர் தூரம் தள்ளி குவாரி செய்ய வேண்டும். ரோடுகள், புகைவண்டிப்பாதை, பொதுப்பணித்துறை, வாய்க்கால், பொதுமக்கள் உபயோகத்திற்கான பகுதிகள், மின்சாரம் மற்றும் தொலைபேசி கம்பி செல்லும் பகுதிகள், வழிபாட்டு இடங்கள் மற்றும் பழங்கால சின்னங்கள் உள்ள பகுதிகள் ஆகியவற்றில் இருந்து 50 மீட்டர் பாதுகாப்பு தூரம் விட்டு குவாரி செய்ய வேண்டும்.
16. குத்தகைக்கு விடப்பட்டுள்ள விஸ்தீரணத்தில் மட்டுமே குத்தகைதாரர் குவாரி செய்ய வேண்டும். அதற்கான கூடுதலான விஸ்தீரணத்தில் குவாரி செய்வது தெரியவந்தால் அபராத நடவடிக்கை மேற்கொள்வதுடன் குத்தகை இரத்து செய்ய நடவடிக்கை எடுக்கப்படும்.
17. குத்தகை நிபந்தனை மீறப்பட்டால் குத்தகை இரத்து செய்யவோ, செய்யப்பட்ட தவறுகளுக்கு அபராத நடவடிக்கை எடுத்து தண்டம் விதிக்கவோ அல்லது கிரிமினல் வழக்குத் தொடுக்க மாவட்ட ஆட்சியருக்கு அதிகாரம் உண்டு. குத்தகை ரத்து செய்யப்பட்டால் காப்புத் தொகை உட்பட அனைத்து தொகைகளும் அரசுக்கு ஆதாயமாக்கப்படும்.
18. குத்தகைதாரர் தமிழ்நாடு சிறுவகைக்கனிம சலுகை விதிகள் 1959ல் கண்டுள்ள விதிகளுக்கும் மற்றும் அரசு அவ்வப்போது அறிவிக்கும் சட்டதிட்டங்களுக்கும் உட்பட்டு குவாரிப்பணிகள் செய்ய வேண்டும்.
19. குவாரி குத்தகை உரிமம் காலாவதியான பின்பு எக்காரணத்தை முன்னிட்டும் மீண்டும் புதுப்பிக்கவோ அல்லது கால நீட்டிப்போ செய்து தரப்பட மாட்டாது.
20. வெடிபொருள் சட்டம் 1884ல் தெரிவிக்கப்பட்ட சரத்துக்கள்படி குறைந்த அளவு வெடிபொருளை உபயோகித்து கற்கள் வெளியே சிதறாமலும், சத்தம் அதிகம் ஏற்படாமலும், பொதுமக்களுக்கும், கால்நடைகளுக்கும், எவ்வித பாதிப்பும் இன்றியும் கல்குவாரி பணி செய்யப்பட வேண்டும்.





ஹெக்டேர் பரப்பில் சாதாரண கற்கள் வெட்டிக் கொள்ள வழங்கப்பட்ட உரிமம் 14.3.2012ல் முடிவற்றது எனவும், அனுமதி காலம் 15.3.2007 முதல் 14.3.2012 வரை ஆகும் எனவும், விண்ணப்ப புலங்களில் ஏற்கனவே கற்கள் வெட்டி எடுக்கப்பட்ட பகுதி சமச்சீரற்றும் கற்கள் வெட்டப்படாத பகுதி சமதளமாகவும் காணப்படுகிறது எனவும், கல்லுடைக்கப்பட்ட பகுதியின் நீளம் மற்றும் அகலம் அளவீடு செய்யப்பட்டு வருவாய் கோட்டாட்சியர், கரூர் அவர்களின் அறிக்கையுடன் இணைத்தனுப்பியுள்ள புல வரைபடத்தில் குறிக்கப்பட்டுள்ளது எனவும், கல்லுடைக்கப்பட்ட குழியின் ஆழம் 17 மீட்டர் முதல் 20 மீட்டர் வரை ஆகும் எனவும், இப்புலங்களிலுள்ள சார்னோடைட் பாறையிலிருந்து அரளை, ஜல்லி, சோளிங் போன்றவை உற்பத்தி செய்யலாம் எனவும், விண்ணப்ப புல எண்.778/3B1க்கு வடக்கில் உள்ள சிறிய அளவிலான PWD வாய்க்காலுக்கு 50 மீட்டர் பாதுகாப்பு இடைவெளிவிட்டு குவாரிப்பணி செய்ய வேண்டும் எனவும், புல எண்கள்.779 மற்றும் 803ல் பழைய கற்குழிகள் காணப்படுகிறது எனவும், இது தவிர 300 மீட்டர் சுற்றளவில் கிராம நத்தம் மற்றும் அங்கீகரிக்கப்பட்ட குடியிருப்புகள் ஆகிய ஏதுமில்லை எனவும், மேலும் 50 மீட்டர் சுற்றளவில் வழிப்பாட்டுத் தலங்கள், கல்வி நிலையங்கள், மின்பாதைகள், சாலைகள் ஆகிய ஏதுமில்லை எனவும் தெரிவித்து அவர்களுக்குறிச்சி வட்டம், அஞ்சூர் கிராமம், புல எண்கள். 770/2B (பகுதி), 778/3B2 மற்றும் 778/3B1 ஆகியவற்றில் மொத்தம் 4.98.0 ஹெக்டேர்ஸ் பரப்பில் தி/ள்.கௌசிக் அன்கோ புளூ மெட்டல்ஸ் என்ற நிறுவனத்திற்கு தமிழ்நாடு சிறுகனிம சலுகை விதிகள் 1959ன் விதி எண். 19 (1), 20 மற்றும் 33-ன் கீழ் 5 ஆண்டுகளுக்கு சாதாரண கற்கள் மற்றும் கிராவல் குவாரி குத்தகை உரிமம் கீழ்காணும் நிபந்தனைகளுக்குட்பட்டு வழங்கலாம் என பரிந்துரை செய்துள்ளார்.

- 1) விண்ணப்ப புலங்களில் சாதாரண கற்கள் மற்றும் கிராவல் வெட்டி எடுப்பது தொடர்பாக அங்கீகரிக்கப்பட்ட சுரங்கத்திட்டம் (Approved Mining Plan) மற்றும்
- 2) மாநில அளவிலான சுற்றுச் சூழல் தாக்க மற்றும் மதிப்பீட்டு ஆணையத்தின் சுற்று சூழல் ஒப்புதல் (Environment Clearance) பெற்று சமர்ப்பிக்க வேண்டும்.

8. இந்நிலையில் மேற்கண்ட அலுவலர்களின் பரிந்துரையின் அடிப்படையில் மனுதாரர் விண்ணப்பித்துள்ள புலங்கள் குத்தகை வழங்கத்தக்க பரப்பாக தீர்மானிக்கப்பட்டு ஏற்பளிக்கப்பட்ட சுரங்கத்திட்டம் மற்றும் சுற்றுச்சூழல் ஆணைய முன் அனுமதி பெற்று சமர்ப்பிக்கும்படி பார்வை-6ல் காணும் கடிதத்தின்படி மனுதாரருக்கு அறிவுறுத்தப்பட்டது.

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9. உதவி இயக்குநர், புலியியல் மற்றும் சுரங்கத்துறை, கரூர் அவர்களால் 10.02.2016 அன்று ஏற்பளிக்கப்பட்ட சுரங்கத் திட்டத்தை மனுதாரர் பார்வை-7ல் கண்டவாறு சமர்ப்பித்துள்ளார். மேற்படி சுரங்கத் திட்டத்தில் வரும் ஐந்தாண்டு குத்தகை காலத்தில் 3,00,425 கன மீட்டர் சாதாரண கற்களை வெட்டி எடுத்துக் கொள்வதாக தெரிவிக்கப்பட்டுள்ளது.

10. பார்வை 8-ல் கண்ட சென்னை மாநில சுற்றுப்புற சூழ்நிலை செயல் விளைவு மதிப்பீட்டு குழு, உறுப்பினர் செயலர் அவர்கள் கடிதத்தில் பொது நிபந்தனை எண்.2-ல் கண்டவாறு குவாரிப்பணி ஆரம்பிப்பதற்கு முன்பாக தமிழ்நாடு மாசுக்கட்டுப்பாட்டு வாரியத்தின் ஒப்புதல் பெற வேண்டும் என்ற சிறப்பு நிபந்தனை உட்பட வேறுபல சிறப்பு நிபந்தனைகளுடன் மனுதாரருக்கு குவாரி குத்தகை உரிமம் வழங்கலாம் என பரிந்துரை செய்துள்ளார்.

இவ்வலுவலகத்தில் பராமரிக்கப்படும் ஆவணங்களின் அடிப்படையில் மனுதாரர் செலுத்த வேண்டிய கனிம வரி ஏதும் நிலுவையில் இல்லை.

மேற்கண்ட அலுவலர்களின் பரிந்துரை மற்றும் சிறுகனிம சலுகை விதிகளின் பேரில், மனுதாரருக்கு குவாரி குத்தகை உரிமம் வழங்க ஒப்புதல் தெரிவிக்கப்பட்டதன் பேரில், மனுதாரர் விதிகளின்படி காப்புத் தொகையாக ரூ.5000/-ஐ பாரத மாநில வங்கி, தாந்தோணி சலான் எண். , நாள்: .8.2017ன்படி செலுத்தி அசல் சலானையும், 1959-ம் வருட தமிழ்நாடு சிறுகனிம சலுகை விதிகளின் பின் இணைப்பு V கண்டுள்ள படிவத்தில் உரிய முத்திரைத்தாளில் குத்தகை ஒப்பந்தப் பத்திரம் தயார் செய்து அளித்துள்ளார்.

எனவே, தி/ள்.கௌசிக் அன்கோ புளூ மெட்டல்ஸ், கதவு எண்.24ஏ ஹசிங் யூனிட், கொல்லம்பாளையம், காசிபாளையம், ஈரோடு வட்டம் & மாவட்டம் என்ற நிறுவனத்திற்கு, அரவக்குறிச்சி வட்டம், அஞ்சூர் கிராமம், புல எண்கள்.770/2B (பகுதி) (1.76.0 ஹெக்டேர்), 778/3B2 (1.03.0 ஹெக்டேர்), 778/3B1 (2.19.0 ஹெக்டேர்) ஆகியவற்றில் மொத்தம் 4.98.0 ஹெக்டேர் பரப்பில் சாதாரண கற்கள்/கிராவல் வெட்டியெடுக்க குத்தகை ஒப்பந்தப் பத்திரம் நிறைவேற்றிய நாளில் இருந்து ஐந்து ஆண்டுகளுக்கு 1959-ம் ஆண்டு, தமிழ்நாடு சிறுகனிம சலுகை விதி 19 (1), 20 மற்றும் 33-ன்படி குத்தகை ஒப்பந்தப் பத்திரத்தில் கண்டுள்ள நிபந்தனைகள் மாநில சுற்றுச் சூழல் தாக்க மதிப்பீட்டு ஆணையத்தின் நிபந்தனைகள் மற்றும் 1959ம் வருட தமிழ்நாடு சிறுகனிம சலுகை விதிகளின் பேரிலும் குவாரி குத்தகை உரிமம் வழங்கி ஆணையிடப்படுகிறது.

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21. வெடிபொருள்கள் அரசு உரிமம் பெற்ற விற்பனைதாரரிடம் மட்டுமே பெற்று வெடிப்பதற்கு உரிமம் / அங்கீகாரம் பெற்ற வெடிப்பாளர்களை (Blaster / Mines mate) கொண்டு கல் குவாரியில் வெடி வைக்க வேண்டும்.

22. குழந்தை தொழிலாளர்கள் எவரையும் வேலைக்கு அமர்த்துதல் கூடாது.

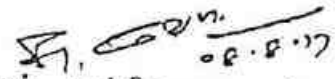
சிறப்பு நிபந்தனைகள்:-

1) விண்ணப்ப புல எண்.778/3B1க்கு வடக்கில் உள்ள சிறிய அளவிலான பொதுப்பணித்துறை வாய்க்காலுக்கு 50 மீட்டர் பாதுகாப்பு இடைவெளிவிட்டு குவாரிப்பணி செய்ய வேண்டும்.

மேற்குறிப்பிட்ட நிபந்தனைகள், மற்றும் கனிம சட்ட விதிகளை மீறியுள்ளது உறுதிபடும் தருணத்தில் விதிமுறைகளுக்கு உட்பட்டு குத்தகை இரத்து செய்ய நடவடிக்கை எடுக்கப்படும். மேற்கண்ட நிபந்தனைகள் ஒப்பந்தப் பத்திரத்தில் கண்டுள்ள நிபந்தனைகள், மாநில சுற்றுச் சூழல் தாக்க மதிப்பீட்டு ஆணையத்தின் நிபந்தனைகள் மற்றும் 1959-ம் ஆண்டு தமிழ்நாடு சிறுகனிம சலுகை விதிகள் ஆகியவற்றின் அடிப்படையில் குத்தகைதாரர் குவாரிப் பணி புரிய வேண்டும்.

ஓம்)/- கு.கோவிந்தராஜ்,  
மாவட்ட ஆட்சித்தலைவர்,  
கரூர்

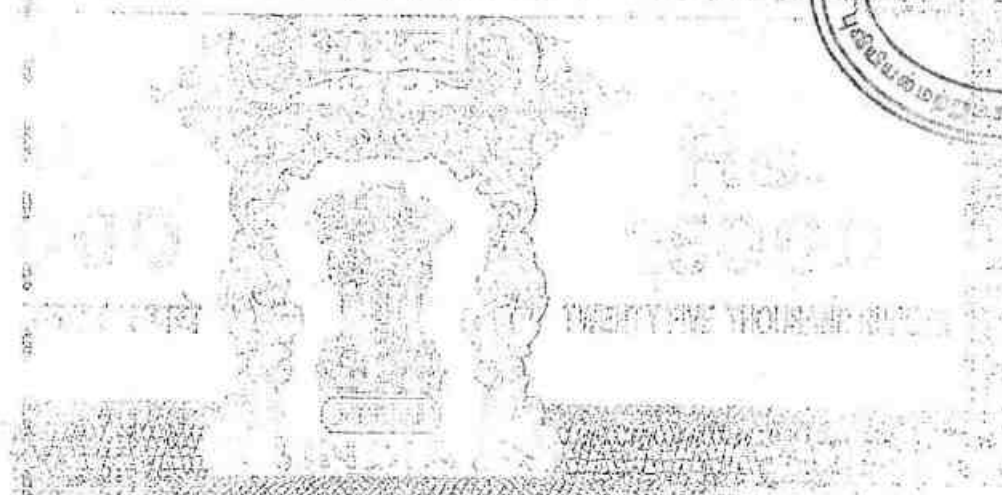
/ உண்மை நகல் / உத்தரவுப்படி /

  
மாவட்ட ஆட்சித்தலைவருக்காக,  
கரூர்.

பெறுநர்  
தி/ள்.கௌசிக் அன்கோ புளூ மெட்டல்ஸ்,  
கதவு எண்.24ஏ ஹசிங் யூனிட்,  
கொல்லம்பாளையம், காசிபாளையம்,  
ஈரோடு வட்டம் & மாவட்டம்.

நகல்:-

1. வருவாய் கோட்டாட்சியர் - கரூர்
2. வருவாய் வட்டாட்சியர் - அரவக்குறிச்சி
3. மாவட்ட சுற்று சூழல் பொறியாளர்,
4. மாசு கட்டுப்பாட்டு வாரியம், கரூர்.
5. கிராம நிர்வாக அலுவலர் - அஞ்சூர்  
(வட்டாட்சியர் மூலமாக)
6. தலைவர், அஞ்சூர் கிராம ஊராட்சி.



தமிழ்நாடு TAMILNADU ரூ. 25000

11329 காமசாமி கோ  
- 4 AUG 2017. 46 சதுரமீட்டர்  
மீட்டர்

B 886099

R. Shanmugam  
R. SHANTHIL, S/O  
KARUR-636 001.  
L.No: 25/2000

**APPENDIX - V**  
(See Rule 19 (1) and 33)  
(Collr.Ref. No.172/ Mines / 2012)

**FORM OF JOINT AGREEMENT FOR QUARRYING AND CARRYING AWAY MINOR MINERALS BY LESSEE IN RYOTWARI LANDS IN WHICH THE MINERALS BELONG TO GOVERNMENT**

THIS AGREEMENT MADE the 07<sup>th</sup> day of August 2017 between Thiru.S.K.Subramani, S/o.Kandasamygounder, Kolanthapalayam, Pandilingapuram Post, Aravakurichi Taluk, Karur District (hereinafter referred to as "the registered holder" which expression shall where the context so admits, include their heirs, executors, administrators legal representatives and assigns) of the first part and Tvi.Kousic & Co Blue Metals, Door No.24A Housing unit, Kollampalayam, Kasipalayam, Erode Taluk & District represented by its Managing Partner Thiru.K.G.Mohanraj, S/o.Karappannagounder, Housing Unit Door No.24A, Kollampalayam, Erode Taluk & District represented by its Managing Partner (hereinafter referred to as "the Registered holder / lessee" which expression shall where the context so admits shall include his heirs, executors, administrators, legal representatives and assigns) of the second part and the Governor of Tamil Nadu (hereinafter referred to as the Government which expression shall where the context so admits shall include also his successors in office and assigns) of the third part.

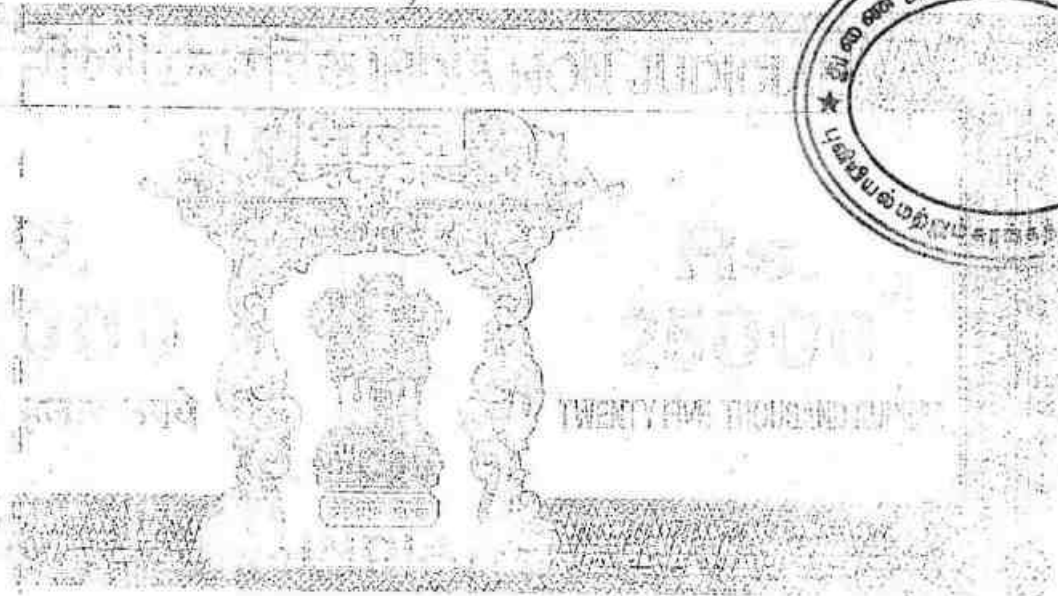
*[Signature]*  
REGISTERED HOLDER



For Kousic & Co Bluemetals  
*[Signature]*  
Partner

*[Signature]*  
DISTRICT COLLECTOR,  
KARUR.

241  
REGISTERED HOLDER / LESSEE  
For Kousic & Co Bluemetals  
*[Signature]*



தமிழ்நாடு தமிழ்நாடு TAMILNADU ரூ. 25000

B 866700

11330 ரெண்டி & கோ  
-4 AUG 2017. 40 ரெண்டி  
on 20/10/2017

R. Shanthil  
R. SHANTIL, S.V  
KARUR-686001.  
L.No:25/2008

WHEREAS, the registered holders holds the lands described in the schedule hereto and intended to lease out to the lessee of the said lands for the purpose of quarrying Rough Stone in the said lands and to deposit mining waste in the said lands and has lodged with the Collector the lease and accurate map or sketch of the said lands.

AND WHEREAS, the lessee or tenant of the registered holders have made application to the Collector of District of Karur (herein after referred to as "the Collector") seeking grant of quarrying lease for quarrying Rough Stone in the said lands and to deposit mining waste in the said lands and has lodged with the Collector an accurate map or sketch of the said lands.

AND WHEREAS, the Collector acting for and on behalf of the Government has granted a quarrying lease to the lessee or tenant of the registered holders and allowed them to commence quarrying operations for Rough Stone in the said land to deposit mining waste thereon by lessee or tenant of the registered holders.

AND WHEREAS, the Collector is prepared to allow the said lessee to commence mining operations and to deposit mining waste in or on the said lands described in the

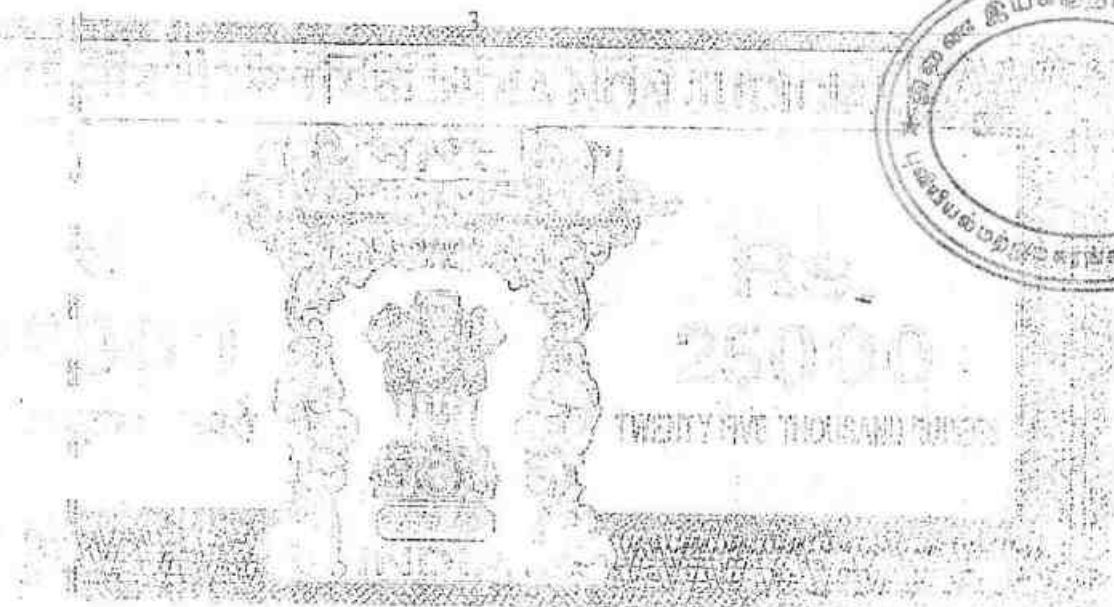
  
REGISTERED HOLDER



  
Partner

  
DISTRICT COLLECTOR  
KARUR.

242  
REGISTERED HOLDER / LESSEE  
For Kousic & Co. Bluenetals



தமிழ்நாடு TAMILNADU ரூ. 25000  
11331  
4 AUG 2017  
Handwritten signatures and notes in Tamil and English.

B 866101  
R. SNANTHI  
KARUR-639 001  
L.No: 25/2016

schedule for a term of five years period from 07.8.2017 To 06.8.2022 upon the registered holders and the lessees entering into the agreement herein contained.

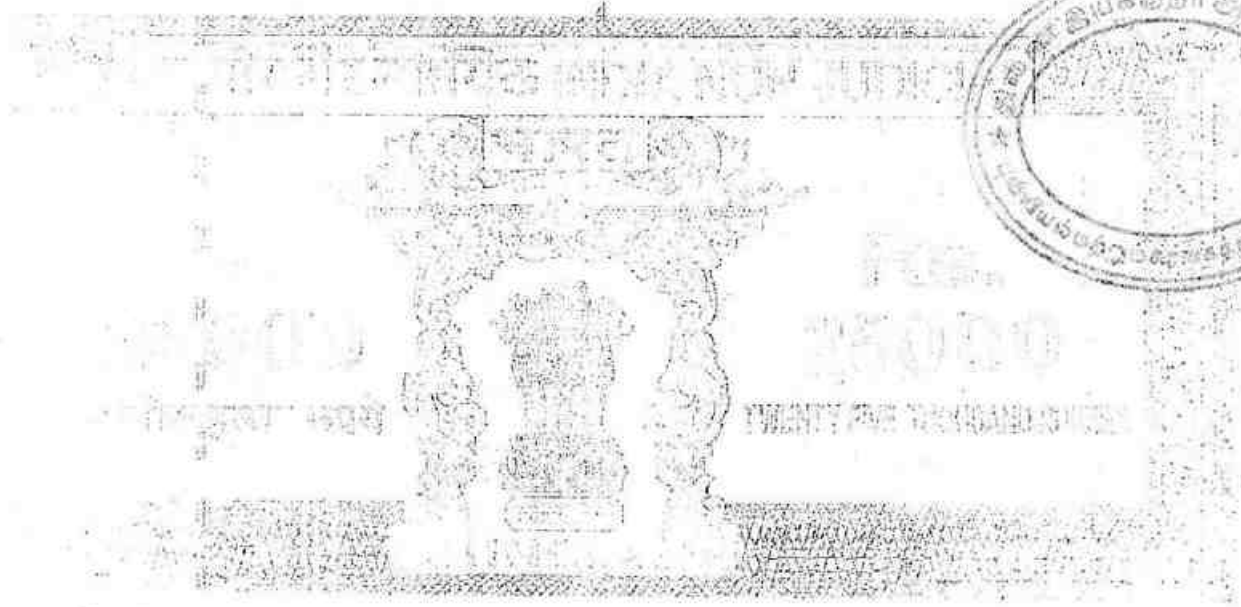
AND WHEREAS, the tenant of registered holder has deposited with the Collector, the sum of Rs.5000/- Chalan No.01, Dated:04.8.2017, State Bank of India, Thanthoni as security for the due performance of the covenants, agreements and provisos or damage which may be incurred by the Government by reason of any of the said lands described in the schedule hereto being rendered unfit for cultivation by the mining operations therein or by the deposit of mining waste thereon by either the registered holders or the lessees.

AND WHEREAS, the lessee has at the request of the registered holders and in consideration of such approval by the Collector of the mining operations as herein before recited agreed to join in these presents for the purpose of entering into covenants, agreements and provisos hereinafter contained as surety for the registered holders.

I. NOW THESE PRESENTS WITNESS and registered holders and the lessee do hereby jointly and severally and each of them doth individually hereby covenants and agree with the Government as follows:-

REGISTERED HOLDER  
REGISTERED HOLDER / LESSEE  
For Kousic & Co. Bluemetals  
Includes a circular stamp of the District Registrar's Office, Karur, and handwritten signatures.

DISTRICT COLLECTOR,  
KARUR.  
Includes a handwritten signature.



தமிழ்நாடு TAMILNADU ரூ. 25000

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11332 கௌசிக் & கோ ப்ளூமெட்ஸ்  
24 AUG 2017. ய.சு. சுவாமிநாதன்  
செட்டி

R. Shanthi  
R. SHANTHI, S.V  
KARUR-639 001.  
L.No: 25/2008

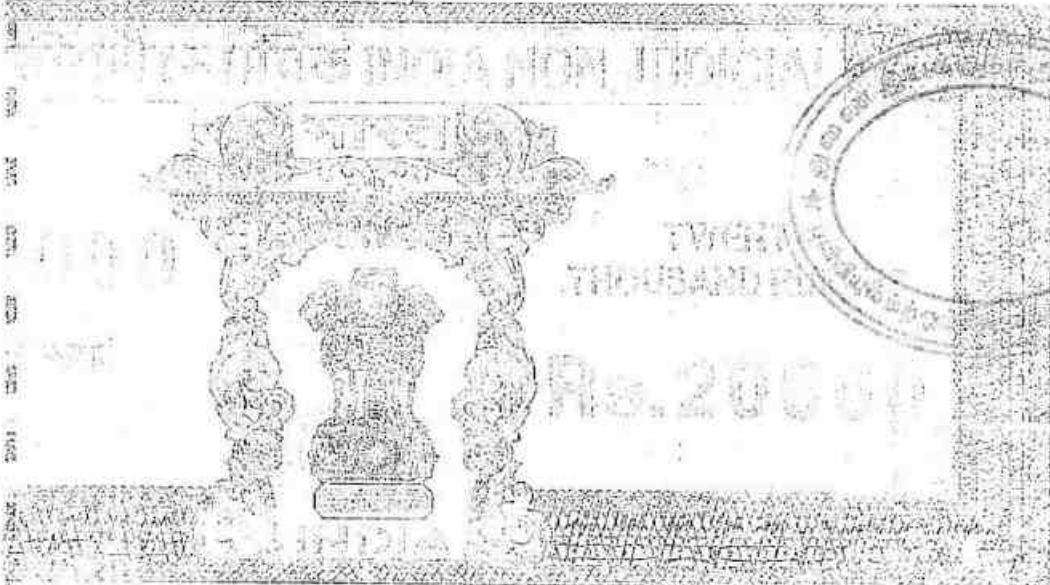
- 01. To carry on mining operations during the said term in a proper and workman like manner and to deposit mining waste on the lands described in the schedule hereto and to answer and to account at all reasonable times to Government for all acts and defaults committed by any servants, agents or workmen employed by the registered holders or lessee in carrying on such operations or in making such deposits.
- 02. To pay into Treasury/State Bank of India at Karur to the credit of the Government in addition to the land assessment for the time being payable in respect of the said lands seigniorage on the minerals mined at the rates prescribed by the Government from time to time.
- 03. To abide by the rules prescribed by the Government from time to time regarding quarrying of minor minerals.
- 04. To keep correct accounts in such form as the Collector shall from time to time require and direct showing the quantities and other particulars of all minerals obtained by the registered holders or the lessees from the said lands and also the number or persons employed in carrying on the said mining operations therein and prepare and maintain from time to time when so directed by the said Collector complete and correct plans of

For Kousic & Co Bluemetals  
REGISTERED HOLDER

Partner

244  
REGISTERED HOLDER/LESSEE  
For Kousic & Co Bluemetals

DISTRICT COLLECTOR,  
KARUR.



தமிழ்நாடு வங்கி TAMILNADU ₹. 20000

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-4 AUG 2017

S. RAMAMURTHY, S.V  
KARUR-630001.  
L.No: 05/1992



all mines and working in the said lands and to allow any officer thereunto authorized by the (Director of Geology and Mining), Tamil Nadu, from time to time and at all times to examine such accounts and any such plans and to supply and furnish when so required all such information and returns all or any of the matters aforesaid as the Government may from time to time required and direct.

- 05. To allow any officer authorized by the (Director of Geology and Mining), Tamil Nadu in that behalf from time to time and at all times to enter upon any part of the said lands where mining operations may be carried on for the purpose or inspecting the same.
- 06. To forthwith send to the Collector a report of any accident which may occur at or in the said land and also of the discovery therein of any minerals other than Rough Stone.
- 07. Not to claim any remission of assessment in respect of any of the said lands which shall be rendered unfit for surface cultivation by the carrying on of any mining operations or by the deposit of mining waste unless thirty times of the assessment thereon has been deducted under provisos 2 hereunder.

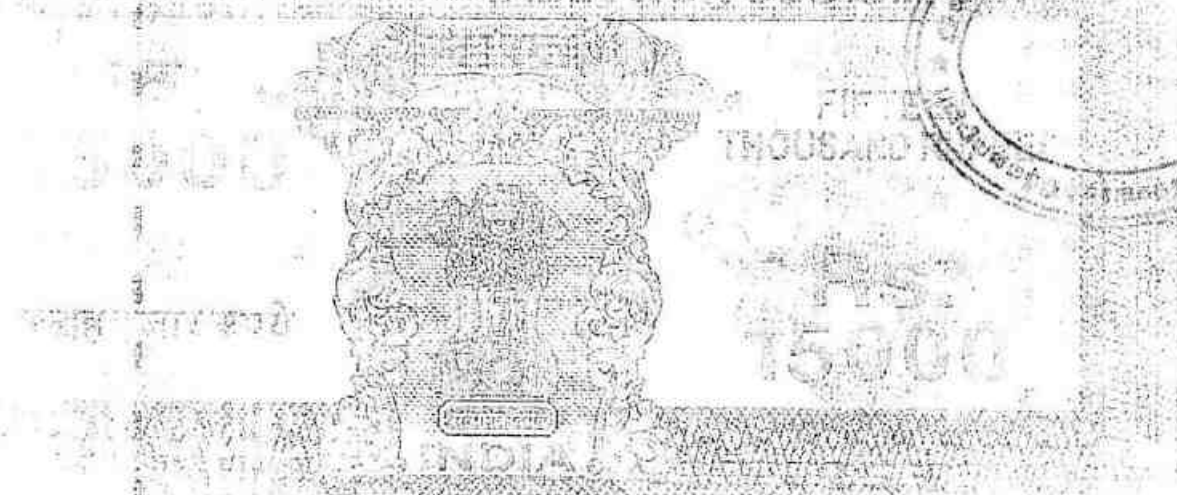
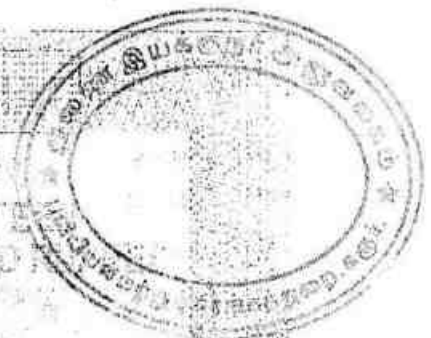


*[Signature]*  
DISTRICT COLLECTOR  
KARUR.

For Kousic & Co Bluemetals  
REGISTERED 245 PARTNER/LESSER

*[Signature]*  
Partner





திருச்சிபுளியூர் காமலாட்சி TAMILNADU 15000

11093 காமலாட்சி & Co.  
4 AUG 2017, 46000 கிளிங்கி  
S. Ramamurthy

875054

S. RAMAMURTHY, S.V  
KARUR-639 001.  
L.No: 00/1992

II. PROVIDED ALWAYS and it is hereby further agreed by and between the parties as follows:

- 01. That it shall be lawful for the registered holders or lessees as the case may be at any time to cease mining operations under these provided the registered holders or lessees shall pay the Government or the Collector the land assessment, cess and seigniorage payable by the registered holders or the lessee under these present unto to the end of the year in which the registered holders or the lessee shall cease such mining operations and shall restore the said lands fence or fill in the abandoned pits and excavations therein if required by the Collector as next hereinafter provided and upon, the registered holders or the lessee so doing these presents shall cease and determine.
- 02. That in case the registered holders shall relinquish the whole or part of the said lands in case of the expiry or sooner determination of this agreement then and in any such case, the registered holders in the case of relinquishment and the registered holders and the lessees in other cases shall restore said lands or the area relinquished or so much thereof as the Collector shall required to be restored to a state fit for cultivation and shall securely and permanently fence or fill in all abandoned pits and excavation therein as the Collector shall require to be fenced or filled in and in case the registered holders or the lessees shall fail, or neglect any such lands with the

*[Signature]*  
REGISTERED HOLDER

*[Signature]*

*[Signature]*  
DISTRICT COLLECTOR,  
KARUR.

246  
REGISTERED HOLDER / LESSEE For Kousic & Co Bluemetals

भारत INDIA



FIVE HUNDRED RUPEES

पंच सौ रुपये

Rs. 500

INDIA NON JUDICIAL

தமிழ்நாடு TAMILNADU ரூ. 500

11094  
14 AUG 2017

சாமா & சா  
46 சாமிநாதர்  
சா சாமா சாமிநாதர்

AK 167950

S. RAMAMURTHY, S.O  
KARUR-639 001.  
L.No: 05/1982

registered holders or the lessees be required to restore to a state fit for cultivation or to so fence or fill in any such abandoned pit or excavation which the registered holders or the lessees shall be required to so fence or fill them and in any such case it shall be lawful for the Collector to so restore any such lands or as the case may be so fence or fill in any pit excavation at the expense of the registered holders lessees and to apply and said sum of Rs. 5000/- so deposited in or towards the cost of so doing and to deduct from amount of the said deposit and retain on behalf of the Government a sum equal to thirty times the assessment of the said lands which shall have been rendered unfit for cultivation. If however the amount of deposit is not sufficient to cover the cost of such restoration or fencing or filling as the case may be or to meet thirty times the assessment of the area rendered uncultivated, it shall be lawful for the Government to recover the balance by resort to Civil court.

*[Signature]*  
REGISTERED HOLDER

For Kousic & Co Bluemetals



*[Signature]*  
Partner

REGISTERED HOLDER / LESSEE

For Kousic & Co Bluemetals

247

*[Signature]*  
Partner

*[Signature]*  
DISTRICT COLLECTOR,  
KARUR.



03. That all land assessment, cesses and seignior age payable under these presents shall be recoverable under the provisions of the Tamil Nadu Revenue Recovery Act, 1864 or any subsisting statutory modification thereof, as if the same were arrear of land revenue.
04. That in the event of any breach of the registered holders of any of the conditions of these presents it shall be lawful for the Government to levy enhanced seignior age subject to the maximum of five times the normal rate or for the Collector to give notice in writing to the registered holders of his intention to cancel these presents whereupon the same shall stand cancelled but without prejudice to any rights which the Government may have against the registered holders in respect of any antecedent claim or breach of covenant or condition.
05. That any notice to be given to registered holders may be addressed to their last know place of abode and where notice has been so addressed it shall be deemed to have been duly served for the purpose of these presents.
06. Should any question or dispute arise regarding an agreement executed in pursuance of these rules or any matter or thing connected therewith or the powers of the registered holders there under, the amount or payment of the seigniorage fee or area assessment made payable thereby, the matter in issue shall be decided by the Director of Geology and Mining. In case the registered holders/lessees are not satisfied with decision of the Director of Geology & Mining, the matter shall be referred to the State Government.
07. The registered holder shall abide by the conditions laid down in the Payment of Wages Act, 1936 (Central Act IV of 1936), the Mines Act, 1952 (Central Act XXXV of 1952) and the Explosives Act, 1884 (Central Act IV of 1884) and the rules made there under:

நிபந்தனைகள்:-

1. குத்தகை புலத்தினை அடுத்துள்ள மட்டா நிலங்களுக்கு 7.5 மீட்டர் இடைவெளி அளித்து குவாரிப்பணி புரிய வேண்டும்.
2. பொதுமக்களுக்கோ, பொது சொத்துக்களுக்கோ யாதொரு சேதமும் இன்றி பாதுகாப்பான முறையில் குவாரிப்பணி செய்ய வேண்டும்.
3. பொதுமக்களின் நலன் கருதி பாதுகாப்பான முறையில் குறைந்த அழுத்தமுள்ள வெடிபொருட்கள் பயன்படுத்தியும், கைத்துளைப்பான் கருவி கொண்டு துளையிட்டும், தொழிலாளர்களின் பாதுகாப்பினை உறுதி செய்ய பாதுகாப்பானதும், அகலமான Benches அமைத்து குவாரிப்பணி செய்ய வேண்டும்.
4. மாநில சுற்றுச்சூழல் தாக்க மதிப்பீட்டு ஆணையத்தின் பரிந்துரை கடிதம் SEIAA, TN/F.No. 5835/1(a)/EC.No.3926/2016 நாள்:07.6.2017ல் கண்ட சிறப்பு நிபந்தனைகளை முறையாக

For Kousic & Co Blisemetals

248

Partner

For Kousic & Co Blisemetals

REGISTERED HOLDER

DISTRICT COLLECTOR

கடைபிடித்து குவாரிப்பணி செய்வதுடன், பொது நிபந்தனை 2ல் கண்டவாறு குவாரிப் பணி ஆரம்பிப்பதற்கு முன்பாக தமிழ்நாடு மாசுக்கட்டுப்பாட்டு வாரியத்தின் தடையின்மை சான்று பெற்று அதன் பின்னரே குவாரிப்பணி துவங்க வேண்டும். மாசுக்கட்டுப்பாட்டு வாரிய தடையின்மை சான்றினை குறித்த காலங்களில் புதுப்பிக்க வேண்டும்.

5. குத்தகைதாரர் தனக்கு அளிக்கப்பட்ட குத்தகை பகுதியின் எல்லைகளை தெளிவாகக் காட்டும் வகையில் கல் நட்டு வண்ணம் இட்டு குத்தகை காலம் முழுமைக்கும் பராமரிக்க வேண்டும்.
6. குத்தகைதாரர் குவாரியின் அருகே குத்தகைதாரர் பெயர், கிராமத்தின் பெயர், வட்டத்தின் பெயர், புல எண், பரப்பு, குத்தகை ஆணை எண், குத்தகை காலம், கனிமத்தின் பெயர், போன்ற விபரங்கள் குறிக்கப்பட்ட தகவல் பலகையை தமது சொந்த செலவில் வைத்து நன்கு பராமரிக்க வேண்டும்.
7. குவாரிக்கு சென்றுவரும் பாதை வசதிகள் குத்தகைதாரர்கள் அவர் தம் சொந்த பொறுப்பிலேயே அமைத்துக் கொள்ள வேண்டும்.
8. குத்தகை வழங்கப்பட்ட பாறையில் குண்டுக்கல், ஜல்லி, அரளை கல், வேலிக்கற்கள், போன்ற சிறுகனிமங்கள் உடைத்தெடுக்க மட்டுமே அனுமதியுண்டு. வெளிநாடுகளுக்கு ஏற்றுமதியாகும் மெருகூட்டும் கனவடிவ கற்கள் வெட்டி எடுக்கக் கூடாது.
9. குவாரியிலிருந்து கொண்டு செல்லப்படும் மேற்கண்ட வகை கற்களுக்கு 1959ம் ஆண்டு தமிழ்நாடு சிறுகனிம சலுகை விதிகள் பின் இணைப்பு 2ல் கண்டுள்ளவாறு உரிமவரி செலுத்த வேண்டும். அரசு அவ்வப்போது அறிவிக்கும் உரிமவரி மாற்றங்களுக்கு ஏற்ப எவ்வித ஆட்சேபணை இன்றி செலுத்துதல் வேண்டும்.
10. குத்தகை அனுமதி வழங்கப்பட்ட நிலத்திலிருந்து கொண்டு செல்லப்பட்ட கற்களுக்கு முறையான கணக்குகளுக்கும், குழிவாயில் பதிவேடும் முறையாக பராமரித்தல் வேண்டும். அவற்றை சம்பந்தப்பட்ட அலுவலர்கள் தணிக்கைக்கு ஆஜர்படுத்த கோரினால் தவறாது சமர்ப்பிக்க வேண்டும்.
11. உதவி இயக்குநர் (புவியியல் மற்றும் சுரங்கத்துறை)-ன் அலுவலக முத்திரை, கையொப்ப முத்திரையுடன் கூடிய உரிய அனுப்புகைச் சீட்டை வாகனங்களுக்கு கொடுக்கப்படும் போது அனுப்புகைச் சீட்டில் வாகன எண், தேதி, புறப்படும் நேரம், செலுத்துமிடம் ஆகியவற்றை முறையாகக் குறிப்பிட்டு கையொப்பம் இட்ட பின்னரே, குத்தகைதாரரோ அல்லது அவரது அனுமதி பெற்ற நபரோ கொடுக்க வேண்டும். மேற்கண்டவாறு குறிப்பிடுவதில் ஏதேனும் தவறுகள் இருந்தாலோ, கலங்கள் பூர்த்தி செய்யப்படாமல் இருந்தாலோ முறையற்ற வகையில் கனிமம் எடுத்துச் செல்வதாகக் கருதப்பட்டு வாகனத்தை கைப்பற்றி அபராதம் விதிப்பதோடு, அதற்கு குத்தகைதாரரை பொறுப்பாக்கி கனிம விதிகளின் படி மேல் நடவடிக்கை எடுக்கப்படும்.
12. இந்த ஆணையில் குத்தகை அனுமதி வழங்கப்பட்ட புலத்ததை முழுமையாகவோ, பகுதியாகவோ எங்குக்கும் உள் குத்தகைக்கு விடுவதோ அல்லது கிரையம் செய்வதோ கூடாது.
13. குத்தகைதாரர் ஒவ்வொரு நாளும் குவாரியில் இருந்து எவ்வளவு சிறுகனிமங்கள் எடுக்கப்பட்டது என்பதையும் எந்த அளவு கனிமங்கள் லாரி/ வண்டி மூலம் வெளியே அனுப்பப்பட்டது என்ற விபரத்தையும் காட்டும் பதிவேட்டினைப் பராமரித்து வரவேண்டும்.
14. குத்தகைதாரர், தமக்கு குத்தகை வழங்கப்பட்ட பகுதிக்கு அருகில் உள்ள பட்டா நிலத்திற்கு எவ்வித இடையூறும் இல்லாமல் குவாரிப் பணி செய்யப்பட வேண்டும்.
15. வண்டிப்பாதை மற்றும் நடைபாதைகளில் இருந்து 10 மீட்டர் தூரம் தள்ளி குவாரி செய்ய வேண்டும். ரோடுகள், புகைவண்டிப்பாதை, பொதுப்பணித்துறை, வாய்க்கால், பொதுமக்கள்

For Kousik & Co Bluemetals

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DISTRICT COLLECTOR

REGISTERED HOLDER



உபயோகத்திற்கான பகுதிகள், மின்சாரம் மற்றும் தொலைபேசி கம்பி செல்லும் பகுதிகள், வழிபாட்டு இடங்கள் மற்றும் பழங்கால சின்னங்கள் உள்ள பகுதிகள் ஆகியவற்றில் இருந்து 50 மீட்டர் பாதுகாப்பு தூரம் விட்டு குவாரி செய்ய வேண்டும்.

16. குத்தகைக்கு விடப்பட்டுள்ள விஸ்தீரணத்தில் மட்டுமே குத்தகைதாரர் குவாரி செய்ய வேண்டும். அதற்கான கூடுதலான விஸ்தீரணத்தில் குவாரி செய்வது தெரியவந்தால் அபராத நடவடிக்கை மேற்கொள்வதுடன் குத்தகை இரத்து செய்ய நடவடிக்கை எடுக்கப்படும்.
17. குத்தகை நிபந்தனை மீறப்பட்டால் குத்தகை இரத்து செய்யவோ, செய்யப்பட்ட தவறுதலுக்கு அபராத நடவடிக்கை எடுத்து தண்டம் விதிக்கவோ அல்லது கிரிமினல் வழக்குத் தொடுக்க மாவட்ட ஆட்சியருக்கு அதிகாரம் உண்டு. குத்தகை ரத்து செய்யப்பட்டால் காப்புத் தொகை உட்பட அனைத்து தொகைகளும் அரசுக்கு ஆதாயமாக்கப்படும்.
18. குத்தகைதாரர் தமிழ்நாடு சிறுவகைக்கனிம சலுகை விதிகள் 1959ல் கண்டுள்ள விதிகளுக்கும் மற்றும் அரசு அவ்வப்போது அறிவிக்கும் சட்டதிட்டங்களுக்கும் உட்பட்டு குவாரிப்பணிகள் செய்ய வேண்டும்.
19. குவாரி குத்தகை உரிமம் காலாவதியான பின்பு எக்காரணத்தை முன்னிட்டும் மீண்டும் புதுப்பிக்கவோ அல்லது கால நீட்டிப்போ செய்து தரப்பட மாட்டாது.
20. வெடிபொருள் சட்டம் 1884ல் தெரிவிக்கப்பட்ட சரத்துக்கள்படி குறைந்த அளவு வெடிபொருளை உபயோகித்து கற்கள் வெளியே சிதறாமலும், சத்தம் அதிகம் ஏற்படாமலும், பொதுமக்களுக்கும், கால்நடைகளுக்கும், எவ்வித பாதிப்பும் இன்றியும் கல்குவாரி பணி செய்யப்பட வேண்டும்.
21. வெடிபொருள்கள் அரசு உரிமம் பெற்ற விற்பனைதாரரிடம் மட்டுமே பெற்று வெடிப்பதற்கு உரிமம் / அங்கீகாரம் பெற்ற வெடிப்பாளர்களை (Blaster / Mines mate) கொண்டு கல்குவாரியில் வெடி வைக்க வேண்டும்.
22. குழந்தை தொழிலாளர்கள் எவரையும் வேலைக்கு அமர்த்துதல் கூடாது.
23. Any other conditions stipulated by other Statutory / Government authorities shall be complied.
24. If any illicit quarrying is found in the area in S.F.Nos.770/2B (Part), 778/3B2, 778/3B1 (Part) of Anjur Village, Aravakurichi Taluk, Karur District before the date of execution of lease deed this lease deed is liable to be cancelled and criminal action will be initiated.

சிறப்பு நிபந்தனைகள்:-

- 1) விண்ணப்ப புல எண்.778/3B1க்கு வடக்கில் உள்ள சிறிய அளவிலான பொதுப்பணித்துறை வாய்க்காலுக்கு 50 மீட்டர் பாதுகாப்பு இடைவெளிவிட்டு குவாரிப்பணி செய்ய வேண்டும்.

மேற்கூறப்பட்ட நிபந்தனைகள், சிறப்பு நிபந்தனைகள் மற்றும் கனிம சட்டம் விதிகளை மீறியுள்ளது உறுதிபடும் தருணத்தில் விதிமுறைகளுக்கு உட்பட்டு குத்தகை இரத்து செய்ய நடவடிக்கை எடுக்கப்படும். மேற்கண்ட நிபந்தனைகள் ஒப்பந்தப் பத்திரத்தில் கண்டுள்ள நிபந்தனைகள், மாநில கற்றுச் சூழல் தாக்க மதிப்பீட்டு ஆணையத்தின் நிபந்தனைகள் மற்றும் 1959-ம் ஆண்டு தமிழ்நாடு சிறுவகை விதிகள் ஆகியவற்றின் அடிப்படையில் குத்தகைதாரர் குவாரிப் பணி புரிய வேண்டும்.

As per Approved Mining Plan, the total production of Roughstone for five years lease period is 3,00,425 cubic meter. Hence, based on the approved Mining Plan, for the purpose of calculating stamp duty the anticipated seigniorage fee is-Rs.1,35,19,125/- (Rupees One Crore Thirty Five Lakhs Nineteen Thousand One Hundred and Twenty Five only) for the entire lease period of 5 years.

For Kousic & Co Bluestals  

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Partner

DISTRICT COLLECTOR,  
 KARUR.

THE SCHEDULE

1. Name of the District : Karur  
 2. Name of the Taluk : Aravakurichi  
 3. Name of the Village : Anjur  
 4. Name of the Sub Registration District : Chinnatharapuram  
 5. Lease Period : 5 years (07.8.2017 to 06.8.2022)



Survey Number	Total Extent Hects.	Area Assessment Rs.	BOUNDARIES			
			North By SF No.	East by SF No.	South by SF No.	West by SF No.
770/23 (Part)	1.76.0	Rs.2500/- (Rs.100/- per hecets, per year)	770/2A3	778/3B2	741	770/2B (P)
778/3B2	1.03.0		778/3B1	779	741	770/2B
778/3B1 (Part)	2.19.0		778/3A2A, 778/3A2B	803	778/3B2, 778/3B1 (P), 779	770/2A4
Total	4.98.0					

IN WITNESS **Thiru.S.K.Subramani,** S/o.Kandasamygounder, Kolantnapalayam, Pandilingapuram Post, Aravakurichi Taluk, Karur District 'the registered holder' and **Tvi.Kousic & Co Blue Metals,** Door No.24A Housing unit, Kollampalayam, Kasipalayam, Erode Taluk & District represented by its Managing Partner **Thiru.K.G.Mohanraj,** S/o.Karuppannagounder, Housing Unit Door No.24A, Kollampalayam, Erode Taluk & District 'the registered holder / lessee' and **Thiru.G.Govindaraj I.A.S.,** District Collector, Karur acting for and on behalf of and by the order and direction of the Governor of Tamil Nadu have hereunto set their hands.



Tvi. Kousic & Co Bluemetals

*(Signature)*  
DISTRICT COLLECTOR,  
KARUR.

*(Signature)*  
REGISTERED HOLDER

*(Signature)*  
Partner

REGISTERED HOLDER / LESSEE

Signed by the above named  
in the presence of

- (Signature)*  
S. L. R. Palaniyand  
S. V. Palayam  
Mangala Prathi CPO  
K. V. For...

*(Signature)*  
Partner

Signed by the above named  
in the presence of

- (Signature)*  
(D. C. VEDIAPPA)  
ASSISTANT DIRECTOR  
GEOLOGY AND MINING  
KARUR

*(Signature)*  
Special Revenue Inspector  
(Witness)

251

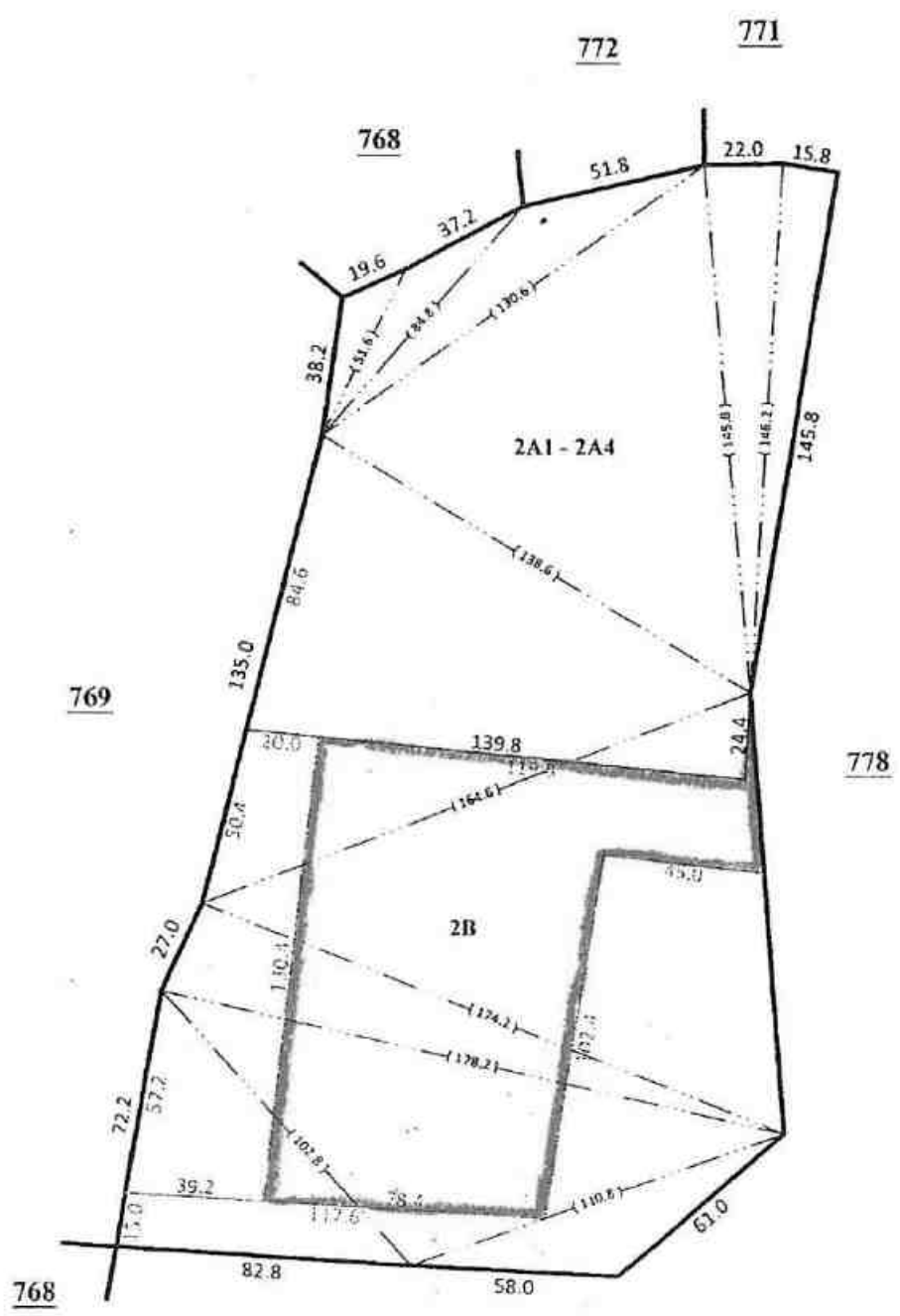
Partner



மாவட்டம் : கரூர்  
வட்டம் : புகளூர்

கிராமம் : எண் :  
பெயர் : அஞ்சூர்  
பரப்பு : ஹெக்டேர் 4. ஏர் 36.0

புல எண் : 770



- குவாரிக்கு உரிமம் கோரும் பகுதியில் வெட்டி எடுக்கப்பட்ட பகுதி 77W/2B பகுதி ஹெக்ட 1.15.00 = ஏர் 2.84 சென்ட்
- குவாரிக்கு உரிமம் கோரும் பகுதியில் வெட்டி எடுக்கப்படாத பகுதி 77W/2B பகுதி ஹெக்ட 0.39.00 = ஏர் 0.96% சென்ட்

For Kousic & Co Bluemetals

*(Signature)*  
Partner

*(Signature)*  
குறுவட்ட அளவர்  
தென்னிடை

*(Signature)*  
கிராம நிர்வாக அலுவலர்  
1. அஞ்சூர் கிராமம்  
புகளூர் வட்டம், கரூர் மாவட்டம்.

மாவட்டம் : கரூர்

வட்டம் : புகளூர்

புல எண் : 778

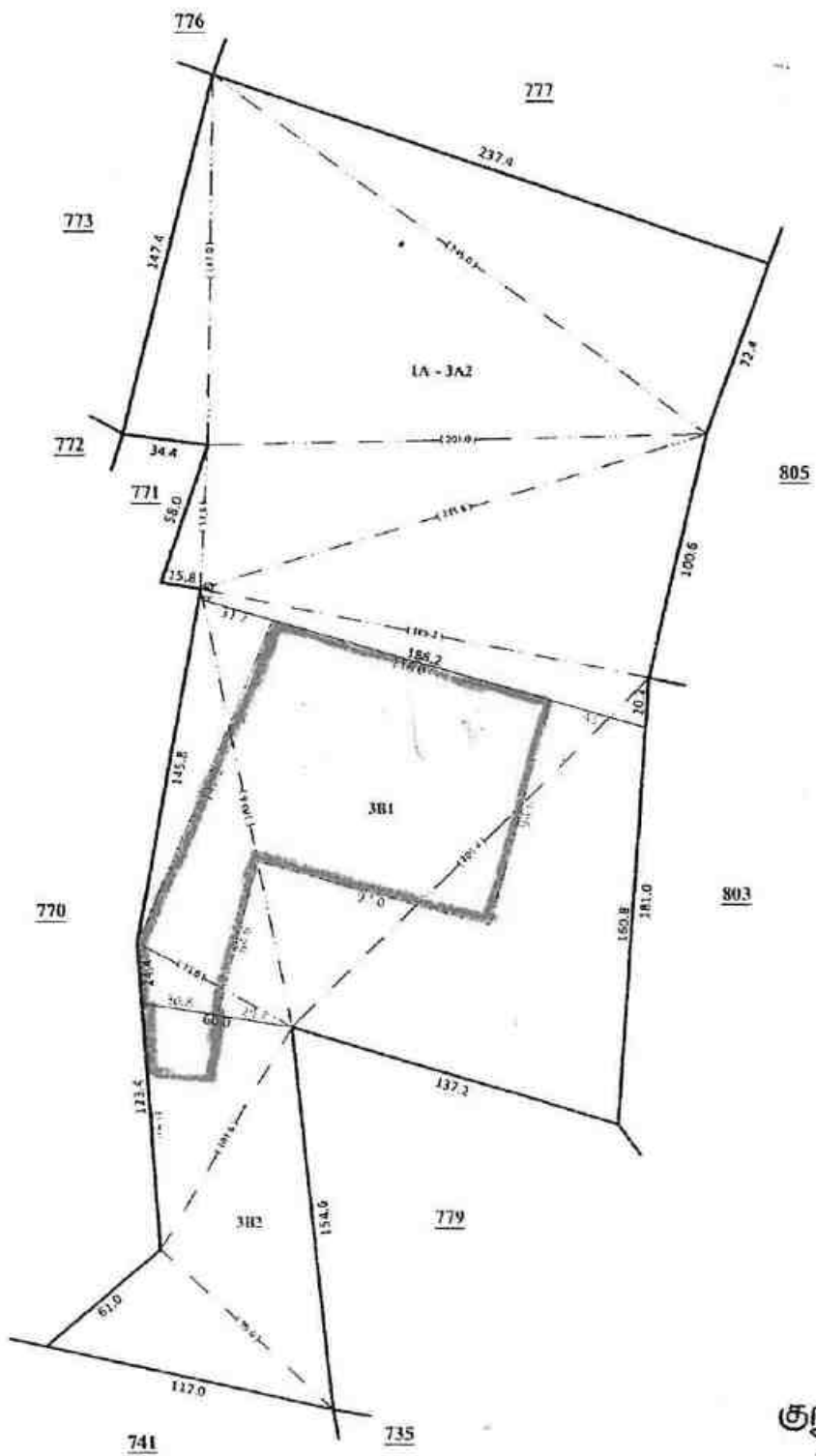
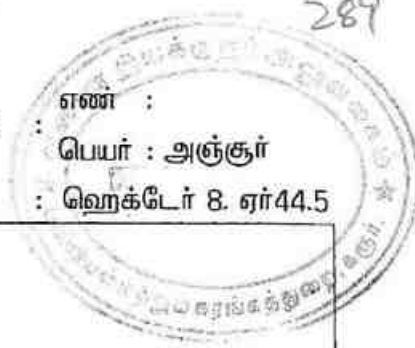
கிராமம் :

எண் :

பெயர் : அஞ்சூர்

பரப்பு :

ஹெக்டேர் 8. ஏர் 44.5



- குவாரிக்கு உரிமம் கோரும் பகுதியில் வெட்டி எடுக்கப்பட்ட பகுதி 778/381 பகுதி ஹெக்டர் 1.40.00 = ஏக்கர் 3.45% சென்ட்.
- குவாரிக்கு உரிமம் கோரும் பகுதியில் வெட்டி எடுக்கப்படாத பகுதி 778/381 பகுதி ஹெக்டர் 0.22.00 = ஏக்கர் 0.54% சென்ட்.

For Kousic & Co Bluemetals

*[Handwritten signature]*  
Partner

253

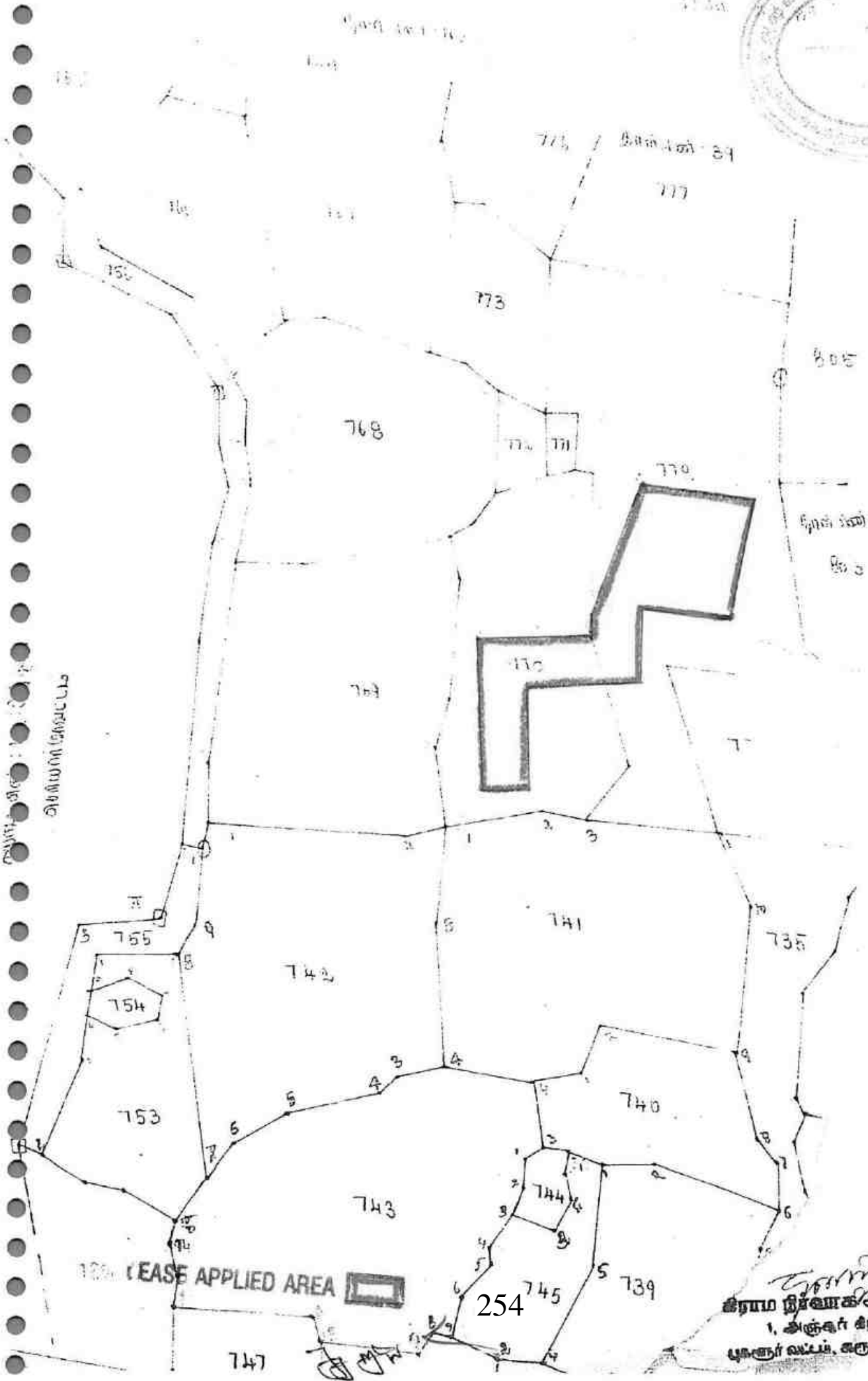
*[Handwritten signature]*  
குறுவட்ட அளவார்  
தென்னிலை

*[Handwritten signature]*  
கிராம நிர்வாக அலுவலர்  
1, அஞ்சூர் கிராமம்  
புகளூர் வட்டம், கரூர் மாவட்டம்.





Scanned with CamScanner



LEASE APPLIED AREA

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சீராம நிர்வாக அலுவலர்  
1, அஞ்சல் சீராமம்  
புகளூர் வட்டம், சூரூர் மாவட்டம்.

## அ-பதிவேடு விவரங்கள்



மாவட்டம் : கரூர்  
வட்டம் : புகழூர்  
கிராமம் : அஞ்சூர்

1. புல எண்	770	9. மண் வயனமும் ரகமும்	8 - 5
2. உட்பிரிவு எண்	2B	10. மண் தரம்	7
3. பழைய புல உட்பிரிவு எண்	770-2B ,	11. தீர்வை (ரூ - ஹெ)	1.09
4. பகுதி	P	12. பரப்பு (ஹெக்டேர் - ஏர்)	2 - 32.50
5. அரசு / ரயத்துவாரி	ரயத்துவாரி	13. மொத்த தீர்வை (ரூ - பை)	2.53
6. நிலத்தின் வகை	பஞ்சை	14. பட்டா எண்	1714
7. பாசன ஆதாரம்	-	15. குறிப்பு	-
8. இரு போகமா	-	16. பெயர்	1.கே.ஜி.மோகன்ராஜ்

## குறிப்பு 1:



1.

மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் <http://eservices.tn.gov.in> என்ற இணைய தளத்தில் 70113 என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.

For Kousic &amp; Co Bluemetals

Partner

## அ-பதிவேடு விவரங்கள்



மாவட்டம் : கரூர்  
வட்டம் : புகழூர்  
கிராமம் : அஞ்சூர்

1. புல எண்	778	9. மண் வயனமும் ரகமும்	8 - 5
2. உட்பிரிவு எண்	3B1	10. மண் தரம்	7
3. பழைய புல உட்பிரிவு எண்	778-3B ,	11. தீர்வை (ரூ - ஹெ)	1.09
4. பகுதி	P	12. பரப்பு (ஹெக்டேர் - ஏர்)	3 - 2.50
5. அரசு / ரயத்துவாரி	ரயத்துவாரி	13. மொத்த தீர்வை (ரூ - பை)	3.28
6. நிலத்தின் வகை	பஞ்சை	14. பட்டா எண்	1305
7. பாசன ஆதாரம்	-	15. குறிப்பு	-
8. இரு போகமா	1	16. பெயர்	1.எஸ்.கே. சுப்பிரமணி

## குறிப்பு 1:



1.

மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் <http://eservices.tn.gov.in> என்ற இணைய தளத்தில் 70129 என்ற குறிப்பு எண்ணை உள்ளிடு செய்து உறுதி செய்துகொள்ளவும்.

For Kousic &amp; Co Bluemetals

Partner

## அ-பதிவேடு விவரங்கள்



மாவட்டம் : கரூர்  
வட்டம் : புகழூர்  
கிராமம் : அஞ்சூர்

1. புல எண்	778	9. மண் வயனமும் ரகமும்	8 - 5
2. உட்பிரிவு எண்	3B2	10. மண் தரம்	7
3. பழைய புல உட்பிரிவு எண்	778-3B ,	11. தீர்வை (ரூ - ஹெ)	1.09
4. பகுதி	P	12. பரப்பு (ஹெக்டேர் - ஏர்)	1 - 3.00
5. அரசு / ரயத்துவாரி	ரயத்துவாரி	13. மொத்த தீர்வை (ரூ - பை)	1.12
6. நிலத்தின் வகை	பஞ்சை	14. பட்டா எண்	1714
7. பாசன ஆதாரம்	-	15. குறிப்பு	-
8. இரு போகமா	1	16. பெயர்	1.கே.ஜி.மோகன்ராஜ்

## குறிப்பு 1:

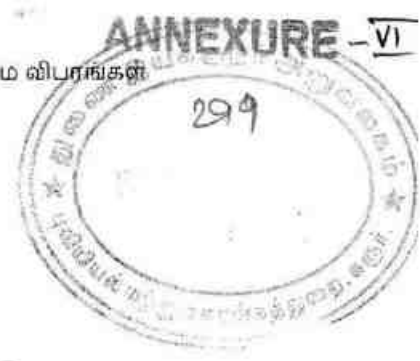


1.

மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை.  
இவற்றை தாங்கள் <http://eservices.tn.gov.in> என்ற இணைய தளத்தில் 70113 என்ற  
குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.

For Kousic &amp; Co Bluemetals

Partner



தமிழ்நாடு அரசு

வருவாய்த் துறை

நில உரிமை விபரங்கள் : இ. எண் 10(1) பிரிவு

மாவட்டம் : கரூர்

வட்டம் : புகழூர்

வருவாய் கிராமம் : அஞ்சூர்

பட்டா எண் : 1714

உரிமையாளர்கள் பெயர்

1. கௌசிக் அன்கோ புளுமெட்டல்ஸ் நிறுவனத்திற்காக

... கே.ஜி.மோகன்ராஜ்



புல எண்	உட்பிரிவு	புன்செய்		நன்செய்		மற்றவை		குறிப்புகள்
		பரப்பு	தீர்வை	பரப்பு	தீர்வை	பரப்பு	தீர்வை	
		ஹெக்ட - ஏர்	ரூ - பை	ஹெக்ட - ஏர்	ரூ - பை	ஹெக்ட - ஏர்	ரூ - பை	
577	A	1 - 56.00	4.31	--	--	--	--	R2110/10--- -- 21-02-2001
577	B1	0 - 3.00	0.07	--	--	--	--	R2110/10--- -- 21-02-2001
770	2B	2 - 32.50	2.53	--	--	--	--	R2110/10--- -- 06-03-2006
778	3B2	1 - 3.00	1.12	--	--	--	--	R2110/10- -1/1416 -- 02- 08-2006
		4 - 94.50	8.03					

குறிப்பு 2 :



- மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் <https://eservices.tn.gov.in> என்ற இணைய தளத்தில் 14/07/001/01714/10113 என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.
- இத் தகவல்கள் 23-09-2023 அன்று 09:49:59 AM நேரத்தில் அச்சடிக்கப்பட்டது.
- கைப்பேசி கேமராவின் 2D barcode படிப்பான் மூலம் படித்து 3G/GPRS வழி இணையதளத்தில் சரிபார்க்கவும்

For Kousic &amp; Co Bluemetals

Partner



தமிழ்நாடு அரசு

வருவாய்த் துறை

நில உரிமை விபரங்கள் : இ. எண் 10(1) பிரிவு

மாவட்டம் : கரூர்

வட்டம் : புகழூர்

வருவாய் கிராமம் : அஞ்சூர்

பட்டா எண் : 1305

உரிமையாளர்கள் பெயர்

1. ஸ்ரீ கணேஷ் புளுமெட்டல்ஸ் நிறுவனத்திற்காக

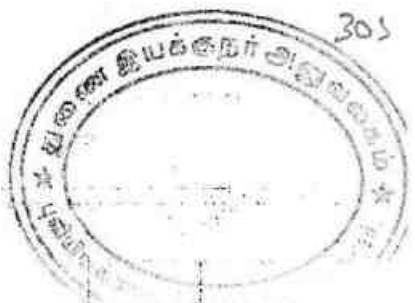
... எஸ்.கே. சுப்பிரமணி

புல எண்	உட்பிரிவு	புன்செய்		நன்செய்		மற்றவை		குறிப்புரைகள்
		பரப்பு	தீர்வை	பரப்பு	தீர்வை	பரப்பு	தீர்வை	
		ஹெக் - ஏர்	ரூ - பை	ஹெக் - ஏர்	ரூ - பை	ஹெக் - ஏர்	ரூ - பை	
770	2A4	0 - 11.50	0.13	--	--	--	--	1019/1415--- - 06-03-2006
778	3B1	3 - 2.50	3.28	--	--	--	--	1556/1415- -1/1416 -- 02- 08-2006
		3 - 14.00	3.41					

குறிப்பு2 :



- மேற்கண்ட தகவல் / சான்றிதழ் நகல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் <https://eservices.tn.gov.in> என்ற இணைய தளத்தில் 14/07/001/01305/10129 என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.
- இத் தகவல்கள் 23-09-2023 அன்று 09:57:28 AM நேரத்தில் அச்சடிக்கப்பட்டது.
- கைப்பேசி கேமராவின் 2D barcode பயன்பாள் மூலம் படித்து 3G/GPRS வழி இணையதளத்தில் சரிபார்க்கவும்



431

ಕೆ.ಎಂ.

ಹಣ

170	2B	2.25	2.53	17A	ಕೆ.ಎಂ. ಕೆ. ಬೆಂಗಳೂರು	ಎ	5
178	3B1	2.25	3.28	17A	ಕೆ.ಎಂ. ಕೆ. ಬೆಂಗಳೂರು	ಎ	5
778	3B2	1.12	1.71	17A	ಕೆ.ಎಂ. ಕೆ. ಬೆಂಗಳೂರು	ಎ	5

*[Signature]*  
 ವಿಭಾಗ ನಿರ್ದೇಶಕರು, ಕೆ.ಎಂ. ಕೆ.  
 1. ಅಧಿಕಾರಿ ನಿರೀಕ್ಷಿಸಿದ  
 1. ಅಧಿಕಾರಿ ನಿರೀಕ್ಷಿಸಿದ, ಅಧಿಕಾರಿ ನಿರೀಕ್ಷಿಸಿದ.

For K... Co Bluemetals  
*[Signature]*  
 Partner



தமிழ்நாடு தமில்நாடு TAMIL NADU 201-717/22 10AC 800809

ச. க. கும்பகரண  
சுட்டி

K.MOHAN,S.V.S.No.21/08  
R.DIS.No.3184/A 2/08  
KARUR WEST

சம்மதக்கடிதம்

திருப்பூர் மாவட்டம், திருப்பூர் வட்டம், முத்தூர் அஞ்சல், சாலியங்காட்டுபள்ளம் என்ற முகவரியில் வசிக்கும் கந்தசாமி அவர்கள் குமாரர் S.K.சுப்பிரமணி ஆகிய நான் எழுதிக் கொடுக்கும் உறுதிமொழி பத்திரம் என்னவென்றால், கரூர் மாவட்டம், புகளூர் வட்டம், அஞ்சூர் கிராமம், புல எண்கள்.776/2A4, 778/3B1(P)ல் (பட்டா எண்.1305)ல் 3.14.00 Ha புஞ்சை நிலம் எனக்கு பாத்தியப்பட்டது. மேற்படி புலத்தில் புல எண்.778/3B1(P)ல் 1.62.00 ஹெக்டேர் நிலப்பரப்பில் மட்டும் ஈரோடு மாவட்டம், ஈரோடு வட்டம், காசிபாளையம், கொல்லம்பாளையம், ஹவுசிங் யூனிட், கதவு எண்.24/A என்ற முகவரியில் இயங்கி வரும் தி/ள்.கெள்சிக் அன் கோ புளூமெட்டல்ஸ் நிறுவனத்திற்கு சாதாரண கற்கள்/கிராவல் வெட்டியெடுக்க அரசு அனுமதி பெற்று கல்குவாரி பணி செய்வதற்கு எனக்கு எவ்வித ஆட்சேபணையும் இல்லை என உறுதி அளிக்கிறேன். கல்குவாரி குத்தகை உரிமம் வழங்க என்னுடைய முழு சம்மதத்தை தெரிவித்துக் கொள்கிறேன்.

பிரமாணதாரர்.



For Kousic & Co Bluemetals

Partner

276/22  
Cell: 99944 45789  
KANMANI, B.A.B.L..  
Advocate & Notary Public  
of India-Regd No:6877/08  
Pudur, Andan Kovil Post,  
KARUR - 639 008. T.N.



207  
 ஸ்ரீ லக்ஷ்மீ அம்மையம்  
 ஸ்ரீ லக்ஷ்மீ அம்மையம்  
 ஸ்ரீ லக்ஷ்மீ அம்மையம்



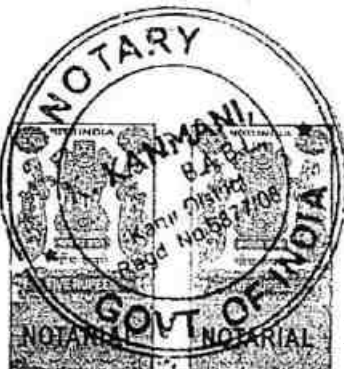
தமிழ்நாடு தமிழ்நாடு TAMIL NADU 0201-719122 10AC 800808

K.G. கோகன்ராஜ்  
 கனம் இயல்பாசாய்  
 K.MOHAN, S.V.S.No.21/08  
 R.DIS.No.3184/A2/08  
 KARUR WEST

**சம்மதக்கடிதம்**

ஈரோடு மாவட்டம், ஈரோடு வட்டம், காசிபாளையம், கொல்லம்பாளையம், ஹவுசிங் யூனிட், கதவு எண்.24/A என்ற முகவரியில் வசிக்கும் கருப்பண்ணகவுண்டர் அவர்கள் குமாரர் K.G.மோகன்ராஜ் ஆகிய நான் எழுதிக்கொடுக்கும் உறுதிமொழி பத்திரம் என்னவென்றால், கருந் மாவட்டம், புகளூர் வட்டம், அஞ்சூர். கிராமம், புல எண்கள்.577/A, 577/B1, 776/2B(P), 778/3B2ல் (பட்டா எண்.1714)ல் 4.94.50 Ha புஞ்சை நிலம் எனக்கு பாத்தியப்பட்டது. மேற்படி புலத்தில் நில எண்.770/2B(P)ல் 1.61.50 ஹெக்டேர் நிலப்பரப்பில் மட்டும் ஈரோடு மாவட்டம், ஈரோடு வட்டம், காசிபாளையம், கொல்லம்பாளையம், ஹவுசிங் யூனிட், கதவு எண்.24/A என்ற முகவரியில் இயங்கி வரும் தி/ள்.கௌசிக் அன் கோ புளுமெட்டல்ஸ் நிறுவனத்திற்கு சாதாரண கற்கள்/கிராவல் வெட்டியெடுக்க அரசு அனுமதி பெற்று கல்குவாரி பணி செய்வதற்கு எனக்கு எவ்வித ஆட்சேபணையும் இல்லை என உறுதி அளிக்கிறேன். கல்குவாரி குத்தகை உரியம் வழங்க என்னுடைய முழு சம்மதத்தை தெரிவித்துக் கொள்கிறேன்.

பிரமோசு காரர்.  
 For Kousic & Co. Bluemetals  
 Partner



For Kousic & Co Bluemetals  
 Partner

07/12/22  
 Cell: 99944 45789  
 KANMANI, B.A.B.L.,  
 Notary Public  
 Karur District, Tamil Nadu-Regd No:5877/08  
 Karur, Andan Kovil Post,  
 KARUR - 639 008. T.N.



FORM B  
CERTIFICATE OF REGISTRATION

AREA CODE: 196  
C.S.T. NUMBER: 827239      TIN : 33603783974

This is to certify that Tvl. KOUSIC & CO BLUE METALS (W.E.F.10.04.2008) whose principal Place of business within the State is situated at

Street Name : SF.561/C2, KOLANTHANPALAYAM, Location : KODUMUDI MUTHUR ROAD  
Town / City : PANDILINGAPURAM POST  
District : KARUR  
Pincode : 639151

has been registered as a dealer under Sec 7(1)/7(2) of the Central Sales Tax Act, 1956 in the office of the Commercial Tax Officer / Deputy Commercial Tax Officer, KARUR (WEST). The business is  
Wholly  
Mainly  
Partly

The Classes of goods specified for the purposes of sub-section 1 and 3 of Section 8 of the Act is /are as follows and sale of those goods in the course of inter-state trade to the dealer shall be taxable at the rate specified in that sub-section to the provision of sub-section 4 of the said Section.

- (A) For Re-sale
- (B) For use in Manufacture of Processing of goods for Sale  
Commodity:- BLUE METALS, TATA HITACHI
- (C) For use in mining
- (D) For use in generation or distribution of Electricity or any other form of Power
- (E) For use in packing of goods for sale/Re-sale
- (F) The dealer manufactures Process or extracts in mining the following Classes of goods or generates or distributes the following form of power namely

The dealer's Year for the purpose of Accounts from the 1st day of April To 31 st of March The dealer has no additional place of business /has additional places of business as detailed below:-

- (a) In the State of Registration
- (b) In other States

The dealer keeps warehouses at the following places within the State of Registration.

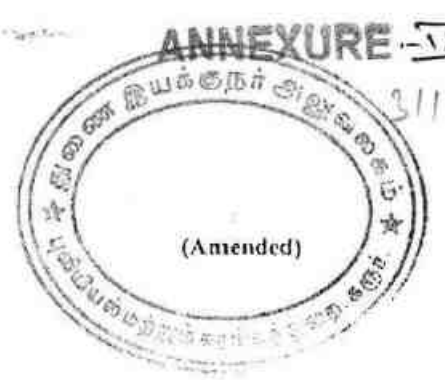
The Certificate is valid from Thursday, October 12, 2006 until Cancelled

Place  
Date  
For Kouxic & Co. Blue Metals

*[Signature]*  
SIGNATURE AND DESIGNATION OF  
THE REGISTERING AUTHORITY

*[Handwritten initials]*

22-5-08



Government of India  
Form GST REG-06  
[See Rule 10(1)]

Registration Certificate

Registration Number :33AAKFK5795LIZO

1.	Legal Name	KOUSIC AND CO BLUE METALS			
2.	Trade Name, if any	KOUSIC AND CO BLUE METALS			
3.	Constitution of Business	Partnership			
4.	Address of Principal Place of Business	561/C2, KOLANTHAPALAYAM, PANDALINGAPURAM, Karur, Tamil Nadu, 639119			
5.	Date of Liability				
6.	Date of Validity	From	10/08/2018	To	Not Applicable
7.	Type of Registration	Regular			
8.	Particulars of Approving Authority	Tamil Nadu Goods and Services Tax Act, 2017			
Signature					
Name		S Sugavaneswara Subramanian			
Designation		State Tax Officer(Circle)			
Jurisdictional Office		KARUR - 4			
9.	Date of issue of Certificate	08/02/2020			
Note: The registration certificate is required to be prominently displayed at all places of Business/Office(s) in the State.					

This is a system generated digitally signed Registration Certificate issued based on the approval of application granted on 08/02/2020 by the jurisdictional authority.

For Kousic & Co Bluemetals



Partner



**Details of Additional Place of Business(s)**

GSTIN                                    33AAKFK5795L1Z0  
 Legal Name                            KOUSIC AND CO BLUE METALS  
 Trade Name, if any                KOUSIC AND CO BLUE METALS

Total Number of Additional Places of Business(s) in the State                2

Sr. No.	Address
1	19/4, KALYANASUNDARAM STREET, ERODE, Erode, Tamil Nadu, 638002
2	1346/3, KOUSIC AND CO BLUE METALS, JEEVANANDAM STREET, ERODE, Erode, Tamil Nadu, 638002


For Kousic & Co Bluemetals

   
 265 Partner



GSTIN 33AAKFK5795L1ZO  
Legal Name KOUSIC AND CO BLUE METALS  
Trade Name, if any KOUSIC AND CO BLUE METALS

**Details of Managing / Authorized Partners**

1		Name	KARUPPANA GOUNDER MOHANRAJ
		Designation/Status	Partner
		Resident of State	Tamil Nadu
2		Name	MOHANRAJ RAJESWARI
		Designation/Status	Partner
		Resident of State	Tamil Nadu

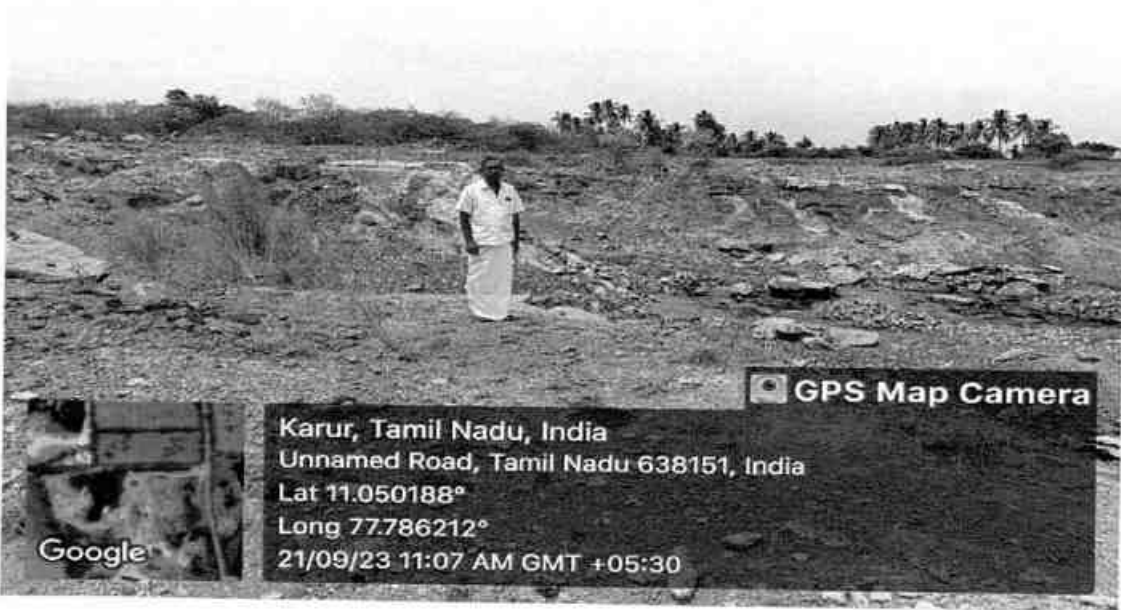
For Kousic & Co Bluemetals

  
Partner



PHOTOCOPY OF THE APPLIED LEASE AREA

Field photos in respect of rough stone and Gravel quarry lease in S.F.No:770/2B(Part), 778/3B1(Part), 778/3B2(Part)- Patta land – over an extent of 3.23.00 hectares– Anjur Village Pugalur Taluk - Karur District - Tamil Nadu State belongs to M/s.Kousic & Co Blue Metals.



for Kousic & Co Bluemetals

267 Partner



भारत सरकार  
GOVERNMENT OF INDIA



ராஜசுவாமி கோர்  
Rajoswami M  
பிறந்த வருடம் / Year of Birth - 1970  
பெண்பால் / Female



5013 0089 7763



இலங்கை குடியரசு  
UNIQUE IDENTIFICATION AUTHORITY OF INDIA

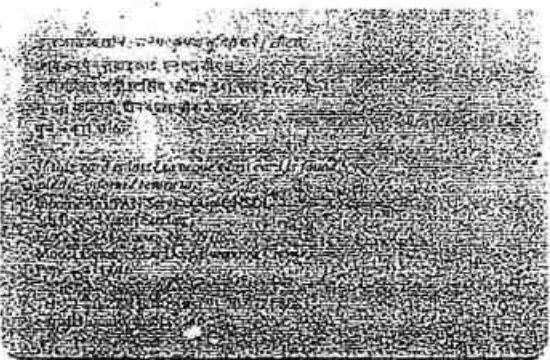
முகவரி:  
W/O மோகன்ராஜ். அ-24,  
ஹவுசிங் யூனிட்,  
கொல்லம்பலாயம், எரோடு,  
எரோடு ரயில்வே காலனி, தமிழ்  
நாடு, 638002

Address:  
W/O Mohanraj, A-24,  
HOUSING UNIT,  
KOLLAMPALAYAM, Erode,  
Erode Railway Colony, Tamil  
Nadu, 638002

ஆதார் - சாதாரண மனிதனின் அதிகாரம்

For Kousic & Co Bluemetals

268 Partner



For Kouxic & Bluemetals

*[Handwritten signature]*  
Partner

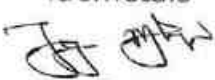




[Heavily obscured and illegible text, likely a stamp or receipt fragment.]

आयकर विभाग      भारत सरकार  
 INCOME TAX DEPARTMENT      GOVT OF INDIA  
 KOUSIC AND COBBLE METALS  
 01/03/2006  
 PAN: AAKEK5795I

For Kousic & Cobble Metals

  
 Partner



*Signature*

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, मॉगनीकाडू, मुत्तमपट्टी पोस्ट, बोम्मीडी वर्यो, ओमलूर तालुक, सेलम डीस्ट्रिक्ट, 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, Manganikadu, Muthampatty (Post), Bommiidi (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.

For Kousic & Co Bluemetals

*Signature*

Partner

क्षेत्रीय खाननियंत्रक / Regional Controller of Mines  
271 भारतीय खानब्यूरो/ Indian Bureau of Mines  
चेन्नई क्षेत्र / Chennai Region



PLATE NO-I

APPLICANT:

M/S.KOUSIC & CO BLUE METALS,  
DOOR NO.24A, HOUSING UNIT,  
KOLLAMPALAYAM,  
KASIPALAYAM,  
ERODE TALUK,  
ERODE DISTRICT.

LEASE APPLIED AREA:

S.F.NO : 770/2B (P), 778/3B1 (P), &  
778/3B2 (P)

EXTENT : 3.23.0 Hect

VILLAGE : ANJUR

TALUK : PUGALUR

DISTRICT : KARUR

INDEX

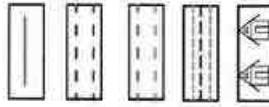
MINE LEASE AREA

APPROACH ROAD

VILLAGE ROAD

SH - 189 ROAD

HABITATIONS



KEY MAP

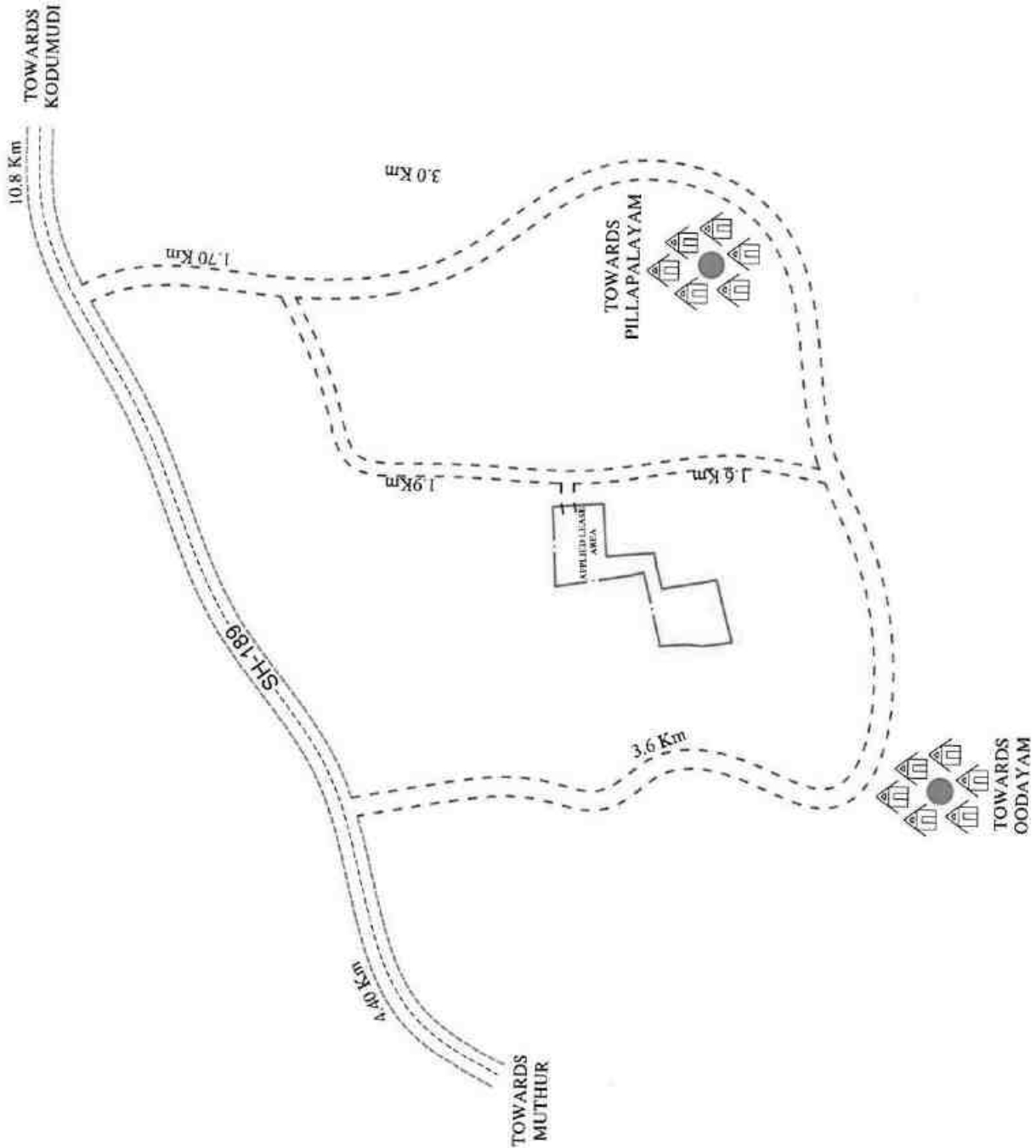
Not to Scale

Prepared By:

I DO HEREBY CERTIFY THAT THE PLATE HAS  
BEEN CHECKED BY ME AND IS CORRECT  
TO THE BEST OF MY KNOWLEDGE

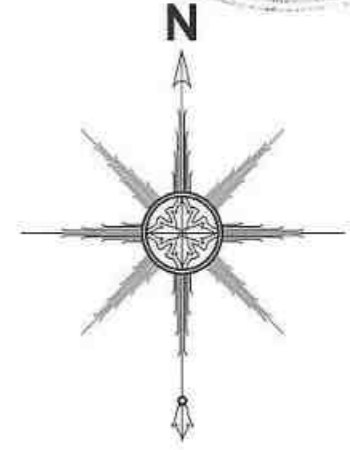
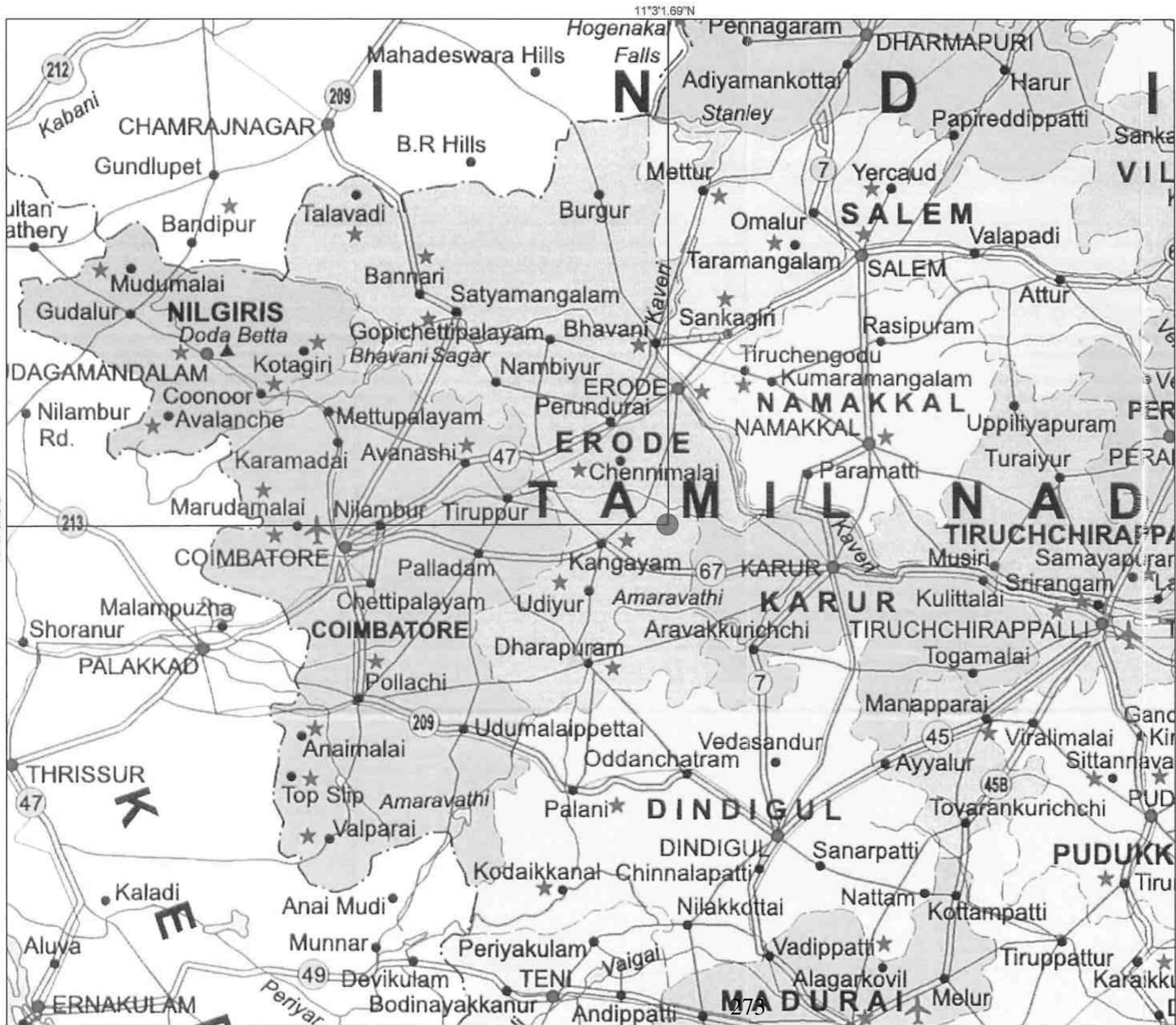


Dr.S.KARUPPANNAN, M.Sc., Ph.D.  
RECOGNIZED QUALIFIED PERSON  
ROP/MAS/263/2004/A



For Kousic & Co Bluemetals

Partner



**PLATE NO-IA**

**APPLICANT:**  
 M/S.KOUSIC & CO BLUE METALS,  
 DOOR NO.24A, HOUSING UNIT,  
 KOLLAMPALAYAM,  
 KASIPALAYAM,  
 ERODE TALUK,  
 ERODE DISTRICT.

**LEASE APPLIED AREA:**  
 S.F.NO : 770/2B (P), 778/3B1 (P), &  
 778/3B2 (P)  
**EXTENT** : 3.23.0 Hect  
**VILLAGE** : ANJUR  
**TALUK** : PUGALUR  
**DISTRICT** : KARUR

**INDEX**

**MINE LEASE AREA** : ●  
**TOPO SHEET NO** : 58-E/16  
**LATITUDE** : 11°2'50.76"N to 11°3'1.69"N  
**LONGITUDE** : 77°47'3.49"E to 77°47'12.09"E

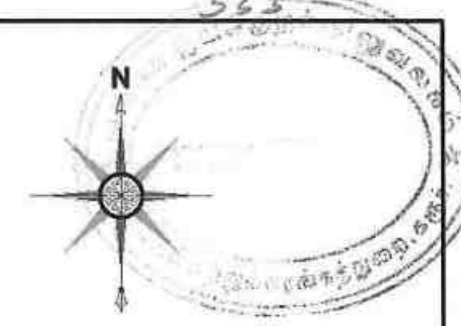
**LOCATION PLAN**  
 NOT TO SCALE

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



11°3'1.69"N







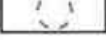
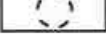




**PLATE NO-IC**

**APPLICANT:**  
 M/S.KOUSIC & CO BLUE METALS,  
 DOOR NO.24A, HOUSING UNIT,  
 KOLLAMPALAYAM,  
 KASIPALAYAM,  
 ERODE TALUK,  
 ERODE DISTRICT.

**LEASE APPLIED AREA:**  
 S.F.NO : 770/2B (P), 778/3B1 (P), &  
 778/3B2 (P)  
 EXTENT : 3.23.0 Hect  
 VILLAGE : ANJUR  
 TALUK : PUGALUR  
 DISTRICT : KARUR

**INDEX**

MINE LEASE AREA	
APPROACH ROAD	
VILLAGE ROAD	
100m RADIUS	
200m RADIUS	
300m RADIUS	
400m RADIUS	
500m RADIUS	
EXISTING PIT	
CANAL	

TOPO SHEET NO : 58-E/16  
 LATITUDE : 11°2'50.76"N to 11°3'1.69"N  
 LONGITUDE : 77°47'3.49"E to 77°47'12.09"E

**SATELITE IMAGERY MAP**

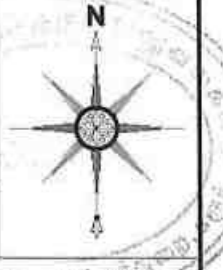
SCALE - 1:5000

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



**PLATE NO-ID**

**APPLICANT:**  
M/S.KOUSIC & CO BLUE METALS,  
DOOR NO.24A, HOUSING UNIT,  
KOLLAMPALAYAM,  
KASIPALAYAM,  
ERODE TALUK,  
ERODE DISTRICT.

**LEASE APPLIED AREA:**

S.F.NO : 770/2B (P), 778/3B1 (P), &  
778/3B2 (P)  
EXTENT : 3.23.0 Hect  
VILLAGE : ANJUR  
TALUK : PUGALUR  
DISTRICT : KARUR

**INDEX**

MINE LEASE AREA	
APPROACH ROAD	
VILLAGE ROAD	
100m RADIUS	
200m RADIUS	
300m RADIUS	
400m RADIUS	
500m RADIUS	
EXISTING PIT	
SHRUBS AND TREES	
WIND DIRECTION	
CANAL	

TOPO SHEET NO : 58-E/16  
LATITUDE : 11°250.76"N to 11°3'1.69"N  
LONGITUDE : 77°47'3.49"E to 77°47'12.09"E

**ENVIRONMENTAL 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



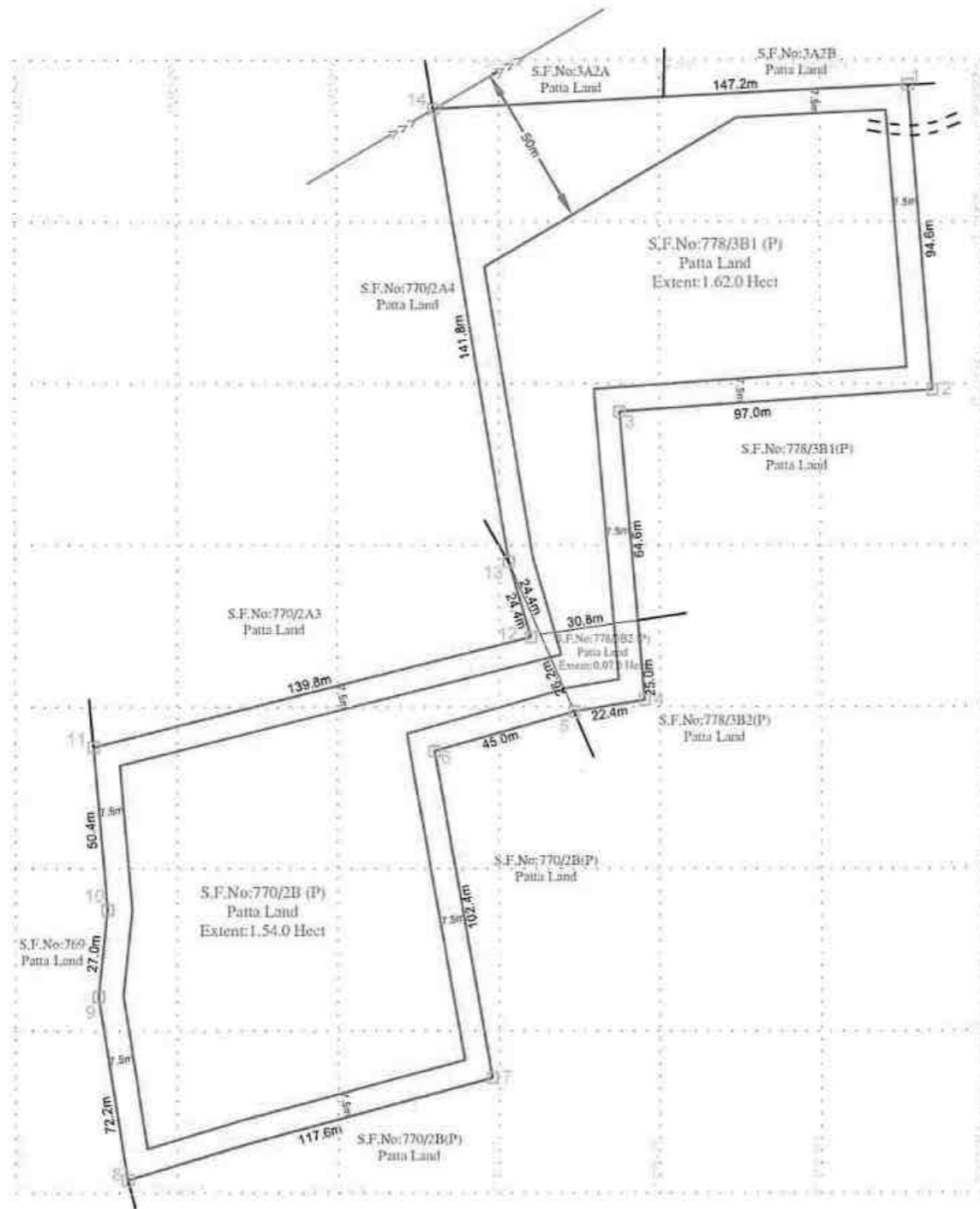
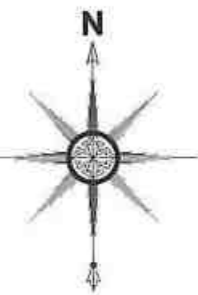
11°3'1.69"N

77°47'3.49"E



JULY TO SEPTEMBER

For Kousic & Co. Blue Metals






Pillar No	Latitude	Longitude
1	11° 3'1.69"N	77°47'11.87"E
2	11° 2'58.62"N	77°47'12.09"E
3	11° 2'58.43"N	77°47'8.90"E
4	11° 2'55.53"N	77°47'9.13"E
5	11° 2'55.42"N	77°47'8.40"E
6	11° 2'55.03"N	77°47'6.97"E
7	11° 2'51.75"N	77°47'7.52"E
8	11° 2'50.76"N	77°47'3.79"E
9	11° 2'52.60"N	77°47'3.51"E
10	11° 2'53.47"N	77°47'3.61"E
11	11° 2'55.11"N	77°47'3.49"E
12	11° 2'56.17"N	77°47'7.96"E
13	11° 2'56.93"N	77°47'7.74"E
14	11° 3'01.49"N	77°47'7.03"E

**PLATE NO-II**

**APPLICANT:**  
M/S.KOUSIC & CO BLUE METALS,  
DOOR NO.24A, HOUSING UNIT,  
KOLLAMPALAYAM,  
KASIPALAYAM,  
ERODE TALUK,  
ERODE DISTRICT.

**LEASE APPLIED AREA:**  
S.F.NO : 770/2B (P), 778/3B1 (P), &  
778/3B2 (P)  
EXTENT : 3.23.0 Hect  
VILLAGE : ANJUR  
TALUK : PUGALUR  
DISTRICT : KARUR

**INDEX**

- MINE LEASE AREA 
- SAFETY BOUNDARY 
- APPROACH ROAD 
- PILLAR STONES 
- VAIKKAL 

**MINE LEASE PLAN**  
SCALE 1: 2000

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

For Kousic & Co Bluemetals

Partner





**PLATE NO-III**

**APPLICANT:**  
 M/S.KOUSIC & CO BLUE METALS,  
 DOOR NO.24A, HOUSING UNIT,  
 KOLLAMPALAYAM,  
 KASIPALAYAM,  
 ERODE TALUK,  
 ERODE DISTRICT.

**LEASE APPLIED AREA:**  
 S.F.NO : 770/2B (P), 778/3B1 (P), &  
 778/3B2 (P)  
 EXTENT : 3.23.0 Hect  
 VILLAGE : ANJUR  
 TALUK : PUGALUR  
 DISTRICT : KARUR

**INDEX**

- MINE LEASE AREA
- SAFETY BOUNDARY
- APPROACH & HAUL ROAD
- PILLAR STONES
- VAIKKAL
- TEMPORARY BENCH MARK
- CONTOUR LINES
- SHRUBS
- TOP SOIL
- ROUGH STONE
- EXISTING PIT
- EARTH BUND

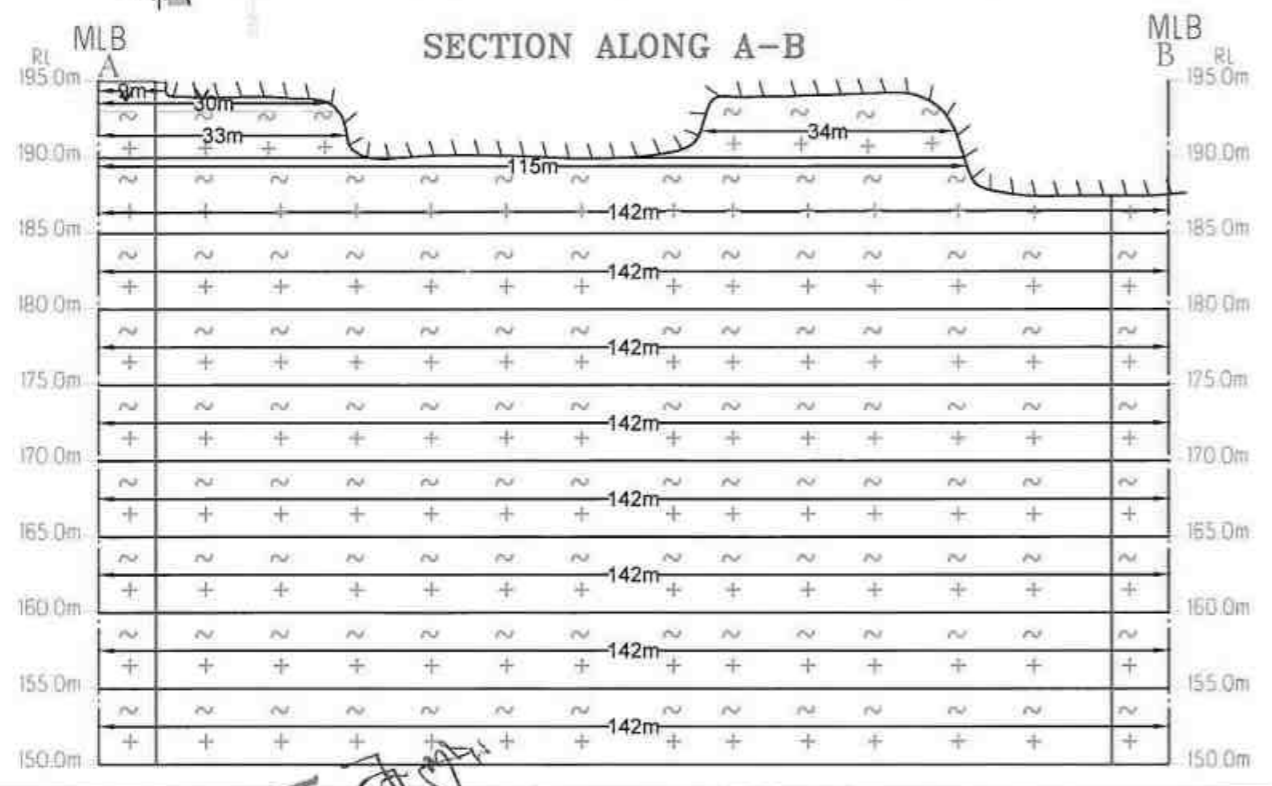
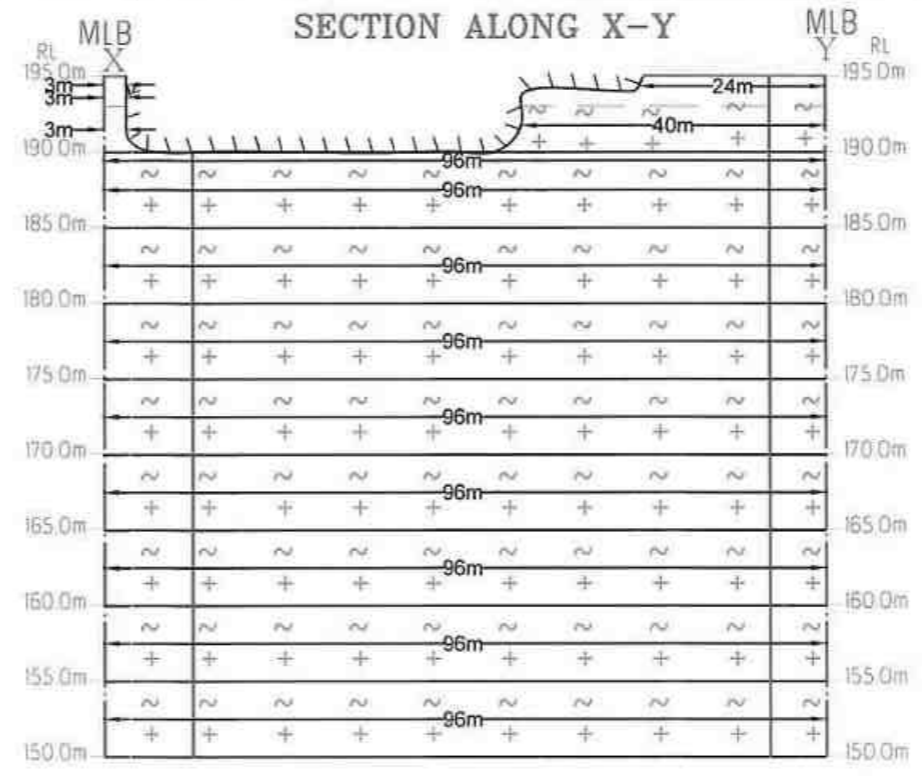
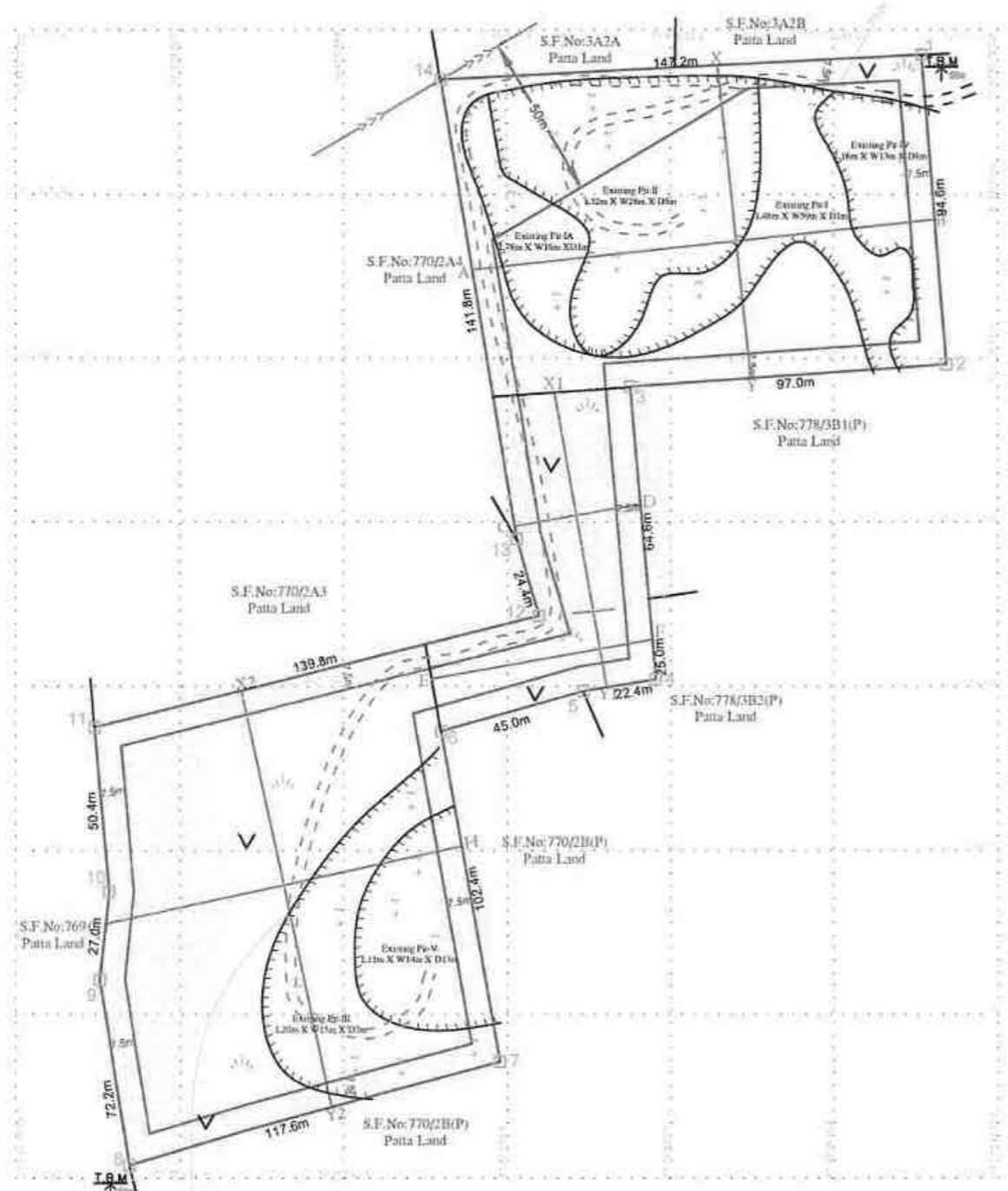
**SURFACE, GEOLOGICAL PLAN**

SCALE 1 : 2000  
 SECTION HOR 1 : 1000 & VER 1 : 500

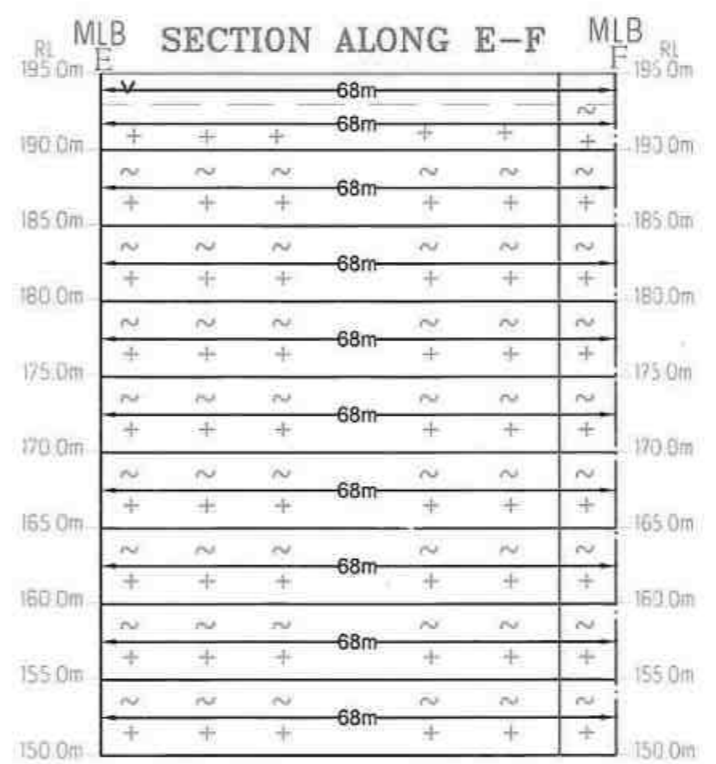
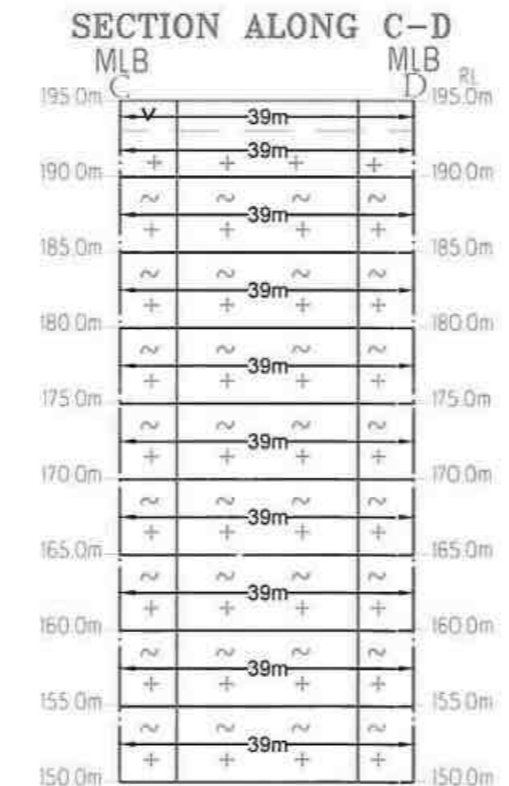
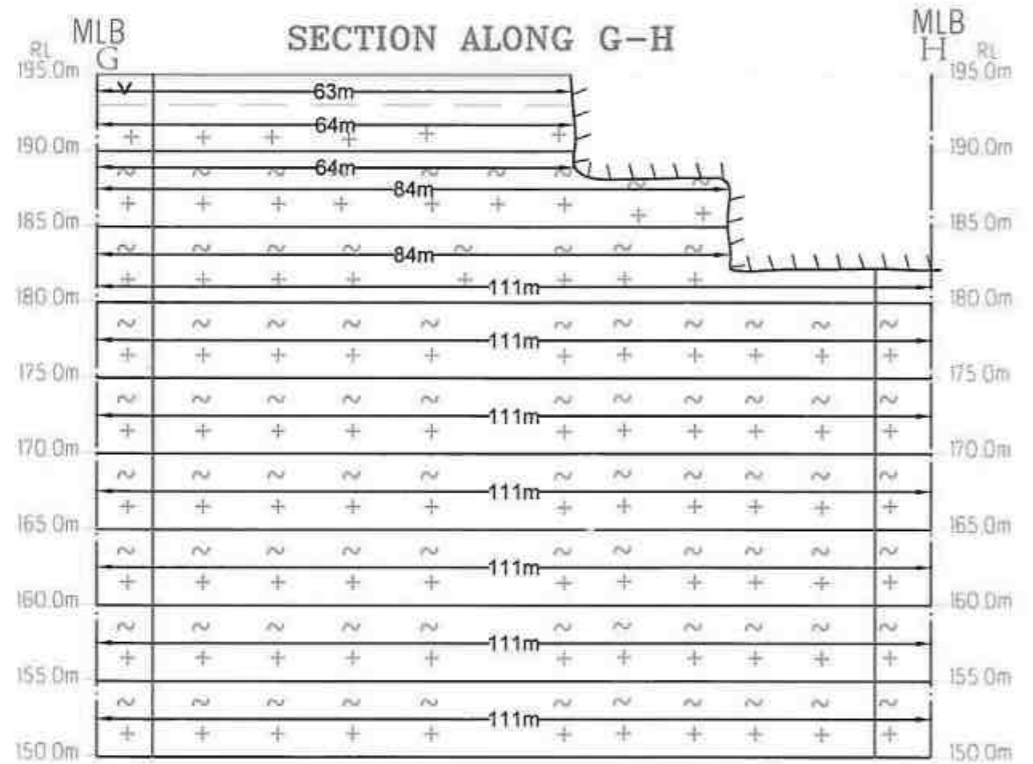
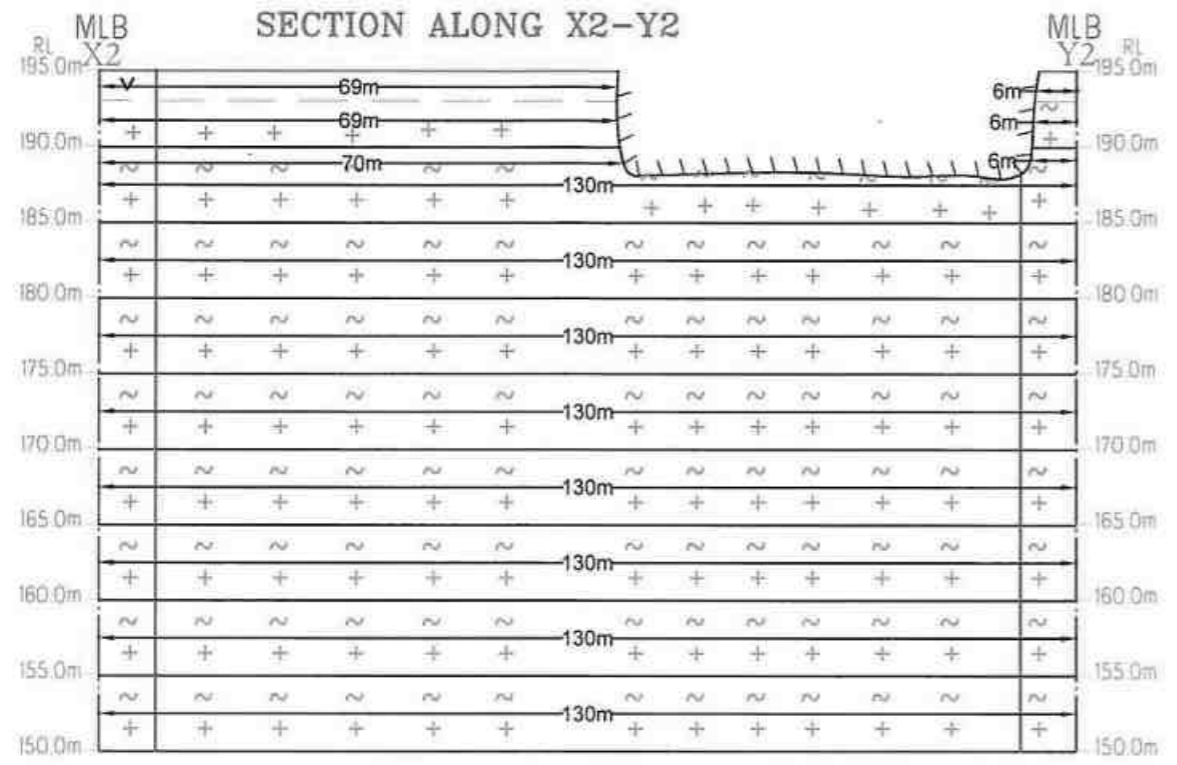
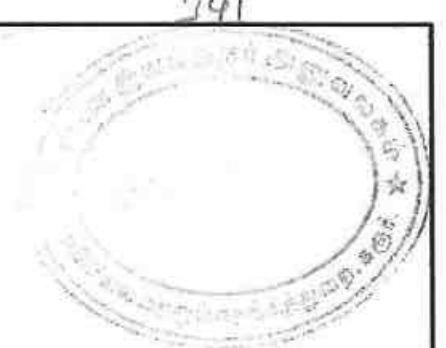
Prepared By:

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 m <sup>3</sup>	Rough Stone in m <sup>3</sup>	Top soil in m <sup>3</sup>
XY-AB	I	27	9	1	243	.....	243
	I	43	64	1	2752	.....	2752
	I	43	67	3	8643	8643	.....
	II	96	115	3	33120	33120	.....
	II	96	142	2	27264	27264	.....
	III	96	142	5	68160	68160	.....
	IV	96	142	5	68160	68160	.....
	V	96	142	5	68160	68160	.....
	VI	96	142	5	68160	68160	.....
	VII	96	142	5	68160	68160	.....
VIII	96	142	5	68160	68160	.....	
IX	96	142	5	68160	68160	.....	
<b>TOTAL</b>				<b>45</b>	<b>549142</b>	<b>546147</b>	<b>2995</b>
XIYI-CD	I	68	39	2	5304	.....	5304
	I	68	39	3	7956	7956	.....
	II	68	39	5	13260	13260	.....
	III	68	39	5	13260	13260	.....
	IV	68	39	5	13260	13260	.....
	V	68	39	5	13260	13260	.....
	VI	68	39	5	13260	13260	.....
	VII	68	39	5	13260	13260	.....
	VIII	68	39	5	13260	13260	.....
	IX	68	39	5	13260	13260	.....
<b>TOTAL</b>				<b>45</b>	<b>119340</b>	<b>114036</b>	<b>5304</b>
XIYI-EF	I	23	68	2	3128	.....	3128
	I	23	68	3	4692	4692	.....
	II	23	68	5	7820	7820	.....
	III	23	68	5	7820	7820	.....
	IV	23	68	5	7820	7820	.....
	V	23	68	5	7820	7820	.....
	VI	23	68	5	7820	7820	.....
	VII	23	68	5	7820	7820	.....
	VIII	23	68	5	7820	7820	.....
	IX	23	68	5	7820	7820	.....
<b>TOTAL</b>				<b>45</b>	<b>70380</b>	<b>67252</b>	<b>3128</b>
X2Y2-GH	I	75	63	2	9450	.....	9450
	I	75	64	3	14400	14400	.....
	II	76	64	2	9728	9728	.....
	II	130	84	3	32760	32760	.....
	III	130	84	3	32760	32760	.....
	III	130	111	2	28860	28860	.....
	IV	130	111	5	72150	72150	.....
	V	130	111	5	72150	72150	.....
	VI	130	111	5	72150	72150	.....
	VII	130	111	5	72150	72150	.....
VIII	130	111	5	72150	72150	.....	
IX	130	111	5	72150	72150	.....	
<b>TOTAL</b>				<b>45</b>	<b>560858</b>	<b>551408</b>	<b>9450</b>
<b>GRAND TOTAL</b>					<b>1299720</b>	<b>1278843</b>	<b>20877</b>



**PLATE NO-III A**

**APPLICANT:**  
M/S.KOUSIC & CO BLUE METALS,  
DOOR NO.24A, HOUSING UNIT,  
KOLLAMPALAYAM,  
KASIPALAYAM,  
ERODE TALUK,  
ERODE DISTRICT.

**LEASE APPLIED AREA:**  
S.F.NO : 770/2B (P), 778/3B1 (P), &  
778/3B2 (P)  
EXTENT : 3.23.0 Hect  
VILLAGE : ANJUR  
TALUK : PUGALUR  
DISTRICT : KARUR

**INDEX**

- MINE LEASE AREA
- SAFETY BOUNDARY
- TOPSOIL
- ROUGH STONE
- EXISTING PIT

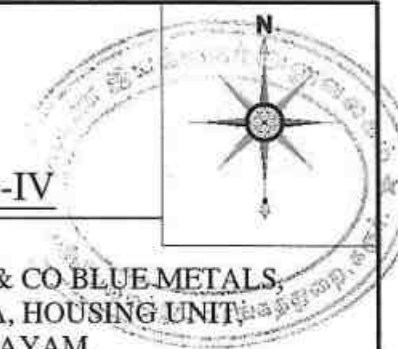
**GEOLOGICAL SECTIONS**  
SECTION HOR 1 : 1000 & VER 1 : 500

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

M/S. Kouasic & Co Bluemetals  
  
Partner



**PLATE NO-IV**

**APPLICANT:**  
 M/S.KOUSIC & CO BLUE METALS,  
 DOOR NO.24A, HOUSING UNIT,  
 KOLLAMPALAYAM,  
 KASIPALAYAM,  
 ERODE TALUK,  
 ERODE DISTRICT.

**LEASE APPLIED AREA:**  
 S.F.NO : 770/2B (P), 778/3B1 (P), &  
 778/3B2 (P)  
 EXTENT : 3.23.0 Hect  
 VILLAGE : ANJUR  
 TALUK : PUGALUR  
 DISTRICT : KARUR

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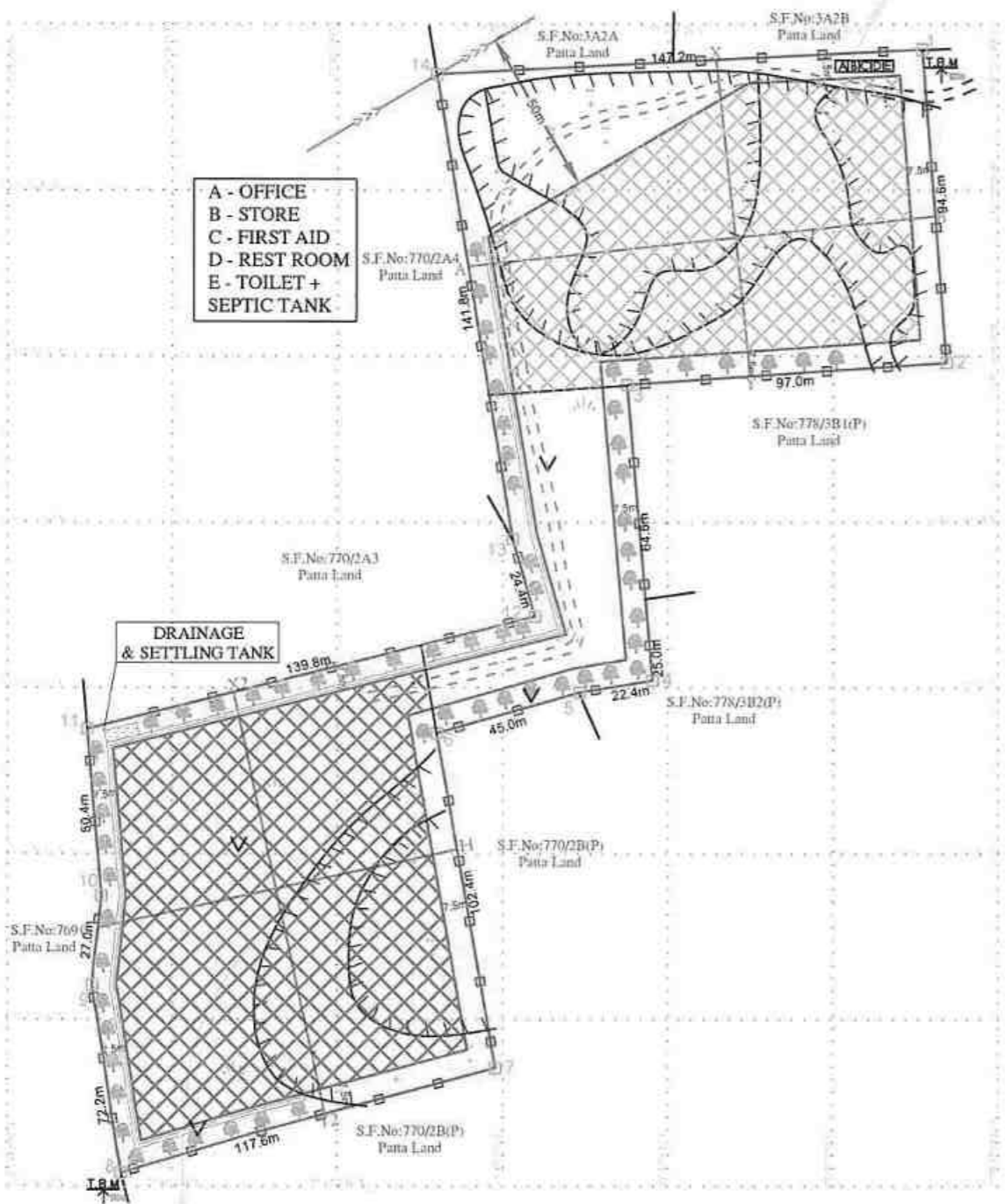
- MINE LEASE AREA
- SAFETY BOUNDARY
- APPROACH ROAD
- PILLAR STONES
- VAIKKAL
- TEMPORARY BENCH MARK
- CONTOUR LINES
- SHRUBS
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- ROUGH STONE
- EXISTING PIT
- PROPOSED BENCH
- EARTH BUND
- FENCING

**YEARWISE DEVELOPMENT & PRODUCTION PLAN**  
 SCALE 1 : 2000

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

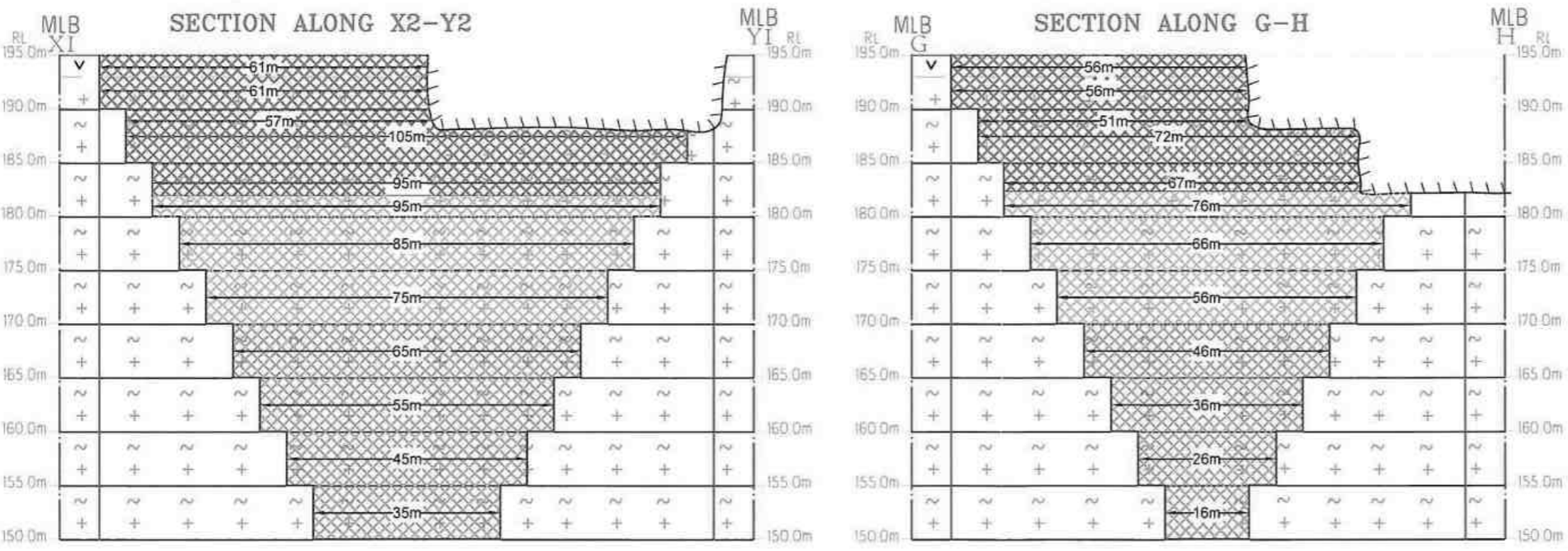
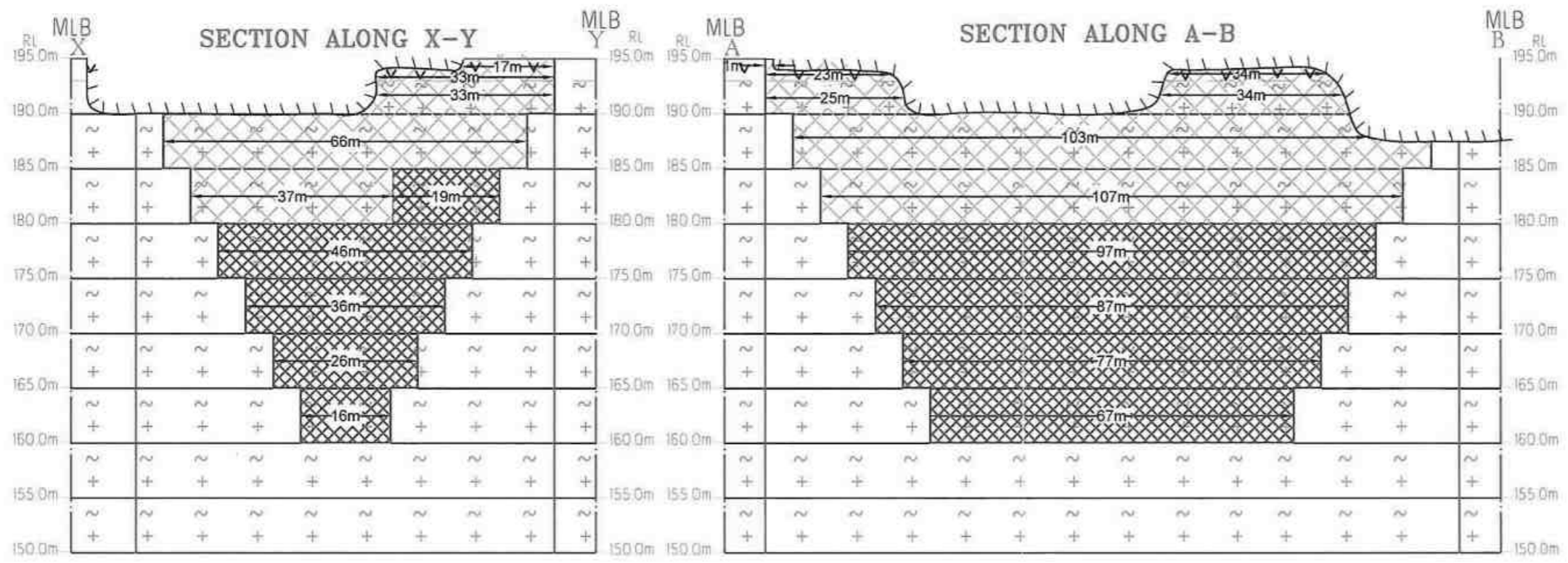
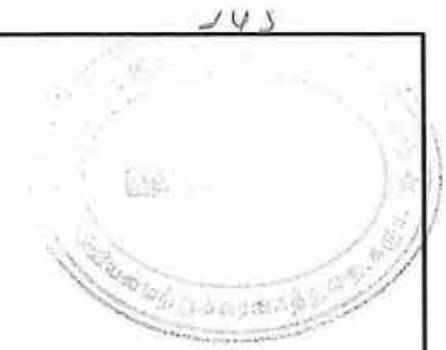


YEARWISE PRODUCTION RESERVES								
Section	Year	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume In m <sup>3</sup>	Rough Stone in m <sup>3</sup>	Top soil in m <sup>3</sup>
XY-AB	I-YEAR	I	17	1	1	17	.....	17
		I	33	57	1	1881	.....	1881
		I	33	59	3	5841	5841	.....
		II	66	103	5	33990	33990	.....
		III	37	107	5	19795	19795	.....
<b>TOTAL</b>						<b>61524</b>	<b>59626</b>	<b>1398</b>
XY-AB	II-YEAR	III	19	107	5	10165	10165	.....
		IV	46	97	5	22310	22310	.....
		V	36	87	5	15660	15660	.....
		VI	26	77	5	10010	10010	.....
		VII	16	67	5	5360	5360	.....
<b>TOTAL</b>						<b>63505</b>	<b>63505</b>	<b>0</b>
X2Y2-GH	III-YEAR	I	61	56	2	6832	.....	6332
		I	61	56	3	10248	10248	.....
		II	57	51	2	5814	5814	.....
		II	105	72	3	22680	22680	.....
		III	95	67	3	19095	19095	.....
<b>TOTAL</b>						<b>64669</b>	<b>57837</b>	<b>6332</b>
X2Y2-GH	IV-YEAR	III	95	76	2	14440	14440	.....
		IV	85	66	5	28050	28050	.....
		V	75	56	5	21000	21000	.....
<b>TOTAL</b>						<b>63490</b>	<b>63490</b>	<b>0</b>
X2Y2-GH	V-YEAR	IX	65	46	5	14950	14950	.....
		IX	55	36	5	9900	9900	.....
		IX	45	26	5	5850	5850	.....
		X	35	16	5	2800	2800	.....
<b>TOTAL</b>						<b>33500</b>	<b>33500</b>	<b>0</b>
<b>GRAND TOTAL</b>						<b>286688</b>	<b>277958</b>	<b>8730</b>

- 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

Plantation Proposed for I-Year

For Kousic & Co Bluemetals  
  
 Partner



**PLATE NO-IVA**  
**APPLICANT:**  
 M/S.KOUSIC & CO BLUE METALS,  
 DOOR NO.24A, HOUSING UNIT,  
 KOLLAMPALAYAM,  
 KASIPALAYAM,  
 ERODE TALUK,  
 ERODE DISTRICT.  
**LEASE APPLIED AREA:**  
 S.F.NO : 770/2B (P), 778/3B1 (P), &  
 778/3B2 (P)  
 EXTENT : 3.23.0 Hect  
 VILLAGE : ANJUR  
 TALUK : PUGALUR  
 DISTRICT : KARUR

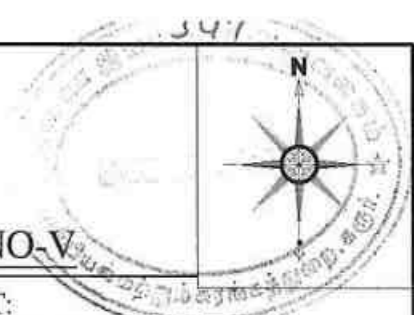
**INDEX**

MINE LEASE AREA	
SAFETY BOUNDARY	
TOP SOIL	
ROUGH STONE	
EXISTING PIT	
PROPOSED BENCH	

**YEARWISE DEVELOPMENT & PRODUCTION SECTIONS**  
 SECTION HOR 1 : 1000 & VER 1 : 500

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  
 ROP/MAS/263/2014/A

For Kousic & Co Bluemetals  
  
 Partner



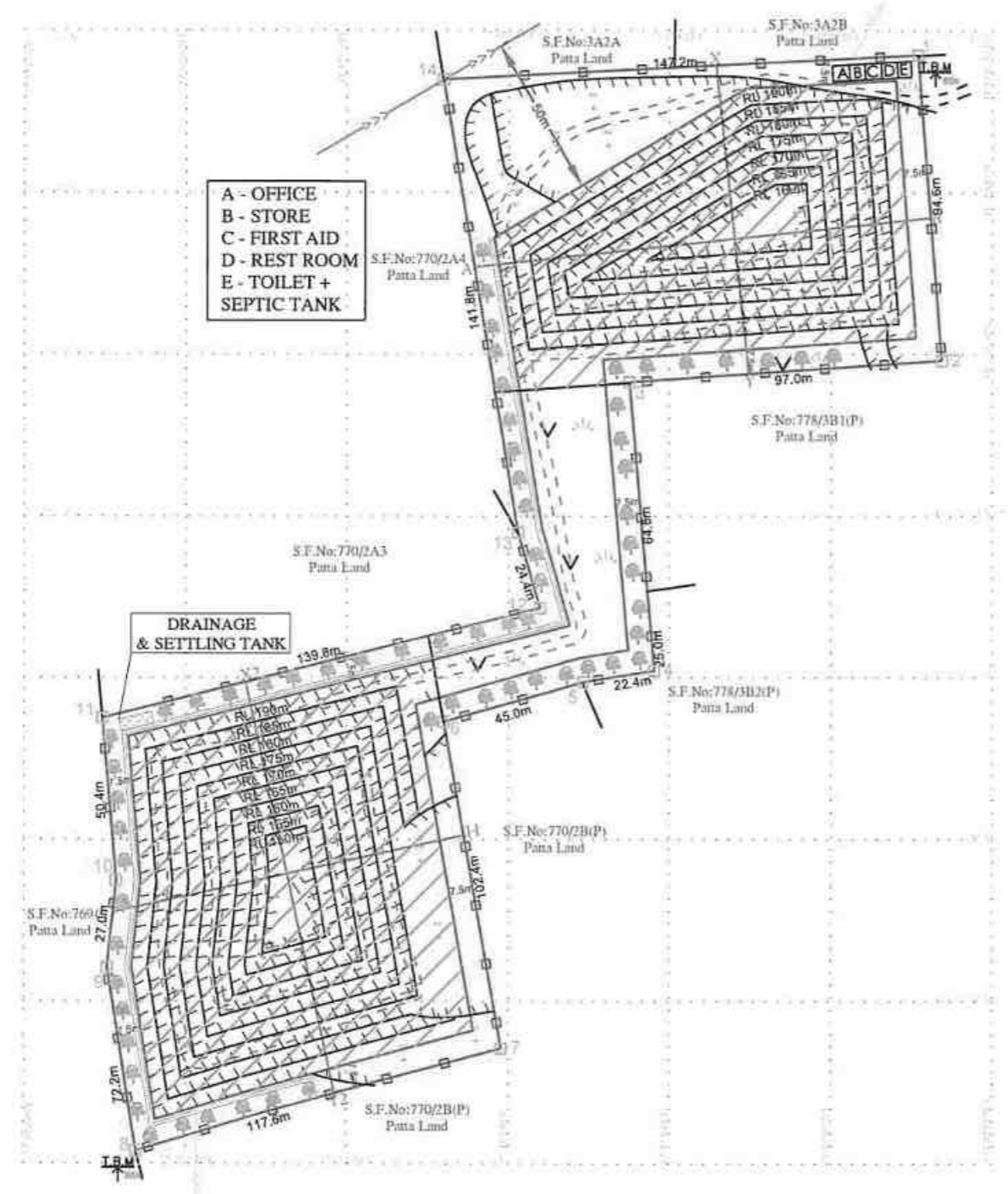
**PLATE NO-V**

**APPLICANT:**  
 M/S.KOUSIC & CO BLUE METALS,  
 DOOR NO.24A, HOUSING UNIT,  
 KOLLAMPALAYAM,  
 KASIPALAYAM,  
 ERODE TALUK,  
 ERODE DISTRICT.

**LEASE APPLIED AREA:**  
 S.F.NO : 770/2B (P), 778/3B1 (P), &  
 778/3B2 (P)  
 EXTENT : 3.23.0 Hect  
 VILLAGE : ANJUR  
 TALUK : PUGALUR  
 DISTRICT : KARUR

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CONTOUR LINES	
SHRUBS	
TOP SOIL	
ROUGH STONE	
EXISTING PIT	
PROPOSED BENCH	
EARTH BUND	
FENCING	



DESCRIPTION	PRESENT AREA (Hect)	AREA IN USE DURING THE QUARRYING PERIOD(Hect)	COLOR CODE
AREA UNDER QUARRYING	1.49.93	2.33.98	
INFRASTRUCTURE	NIL	0.03.0	
ROADS	0.02.0	0.05.0	
GREEN BELT & DUMP	0.66.13	0.24.50	
DRIANGAE & SETTLING TANK	NIL	0.04.37	
UN-UTILIZED AREA	1.04.94	0.52.15	NIL
<b>GRAND TOTAL</b>	<b>3.23.0Hect</b>	<b>3.23.0Hect</b>	NIL

**MINE LAYOUT PLAN & LAND USE PATTERN**

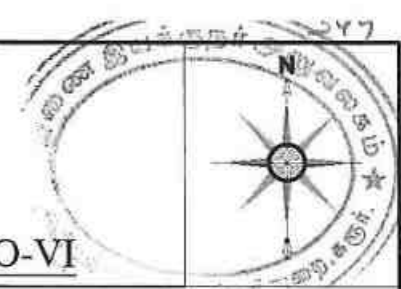
SCALE 1 : 2000

Prepared By:

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Dr.S.KARUPPANNAN, M.Sc., Ph.D.  
 RECOGNIZED QUALIFIED PERSON  
 RQP/MAS/263/2014/A

For Kousic & Co Bluemetals  
  
 Partner



**PLATE NO-VI**

**APPLICANT:**  
**M/s.KOUSIC & CO BLUE METALS,**  
 DOOR NO.24A, HOUSING UNIT,  
 KOLLAMPALAYAM,  
 KASIPALAYAM,  
 ERODE TALUK,  
 ERODE DISTRICT.

**LEASE APPLIED AREA:**  
 S.F.NO : 770/2B (P), 778/3B1 (P), &  
 778/3B2 (P)  
 EXTENT : 3.23.0 Hect  
 VILLAGE : ANJUR  
 TALUK : PUGALUR  
 DISTRICT : KARUR

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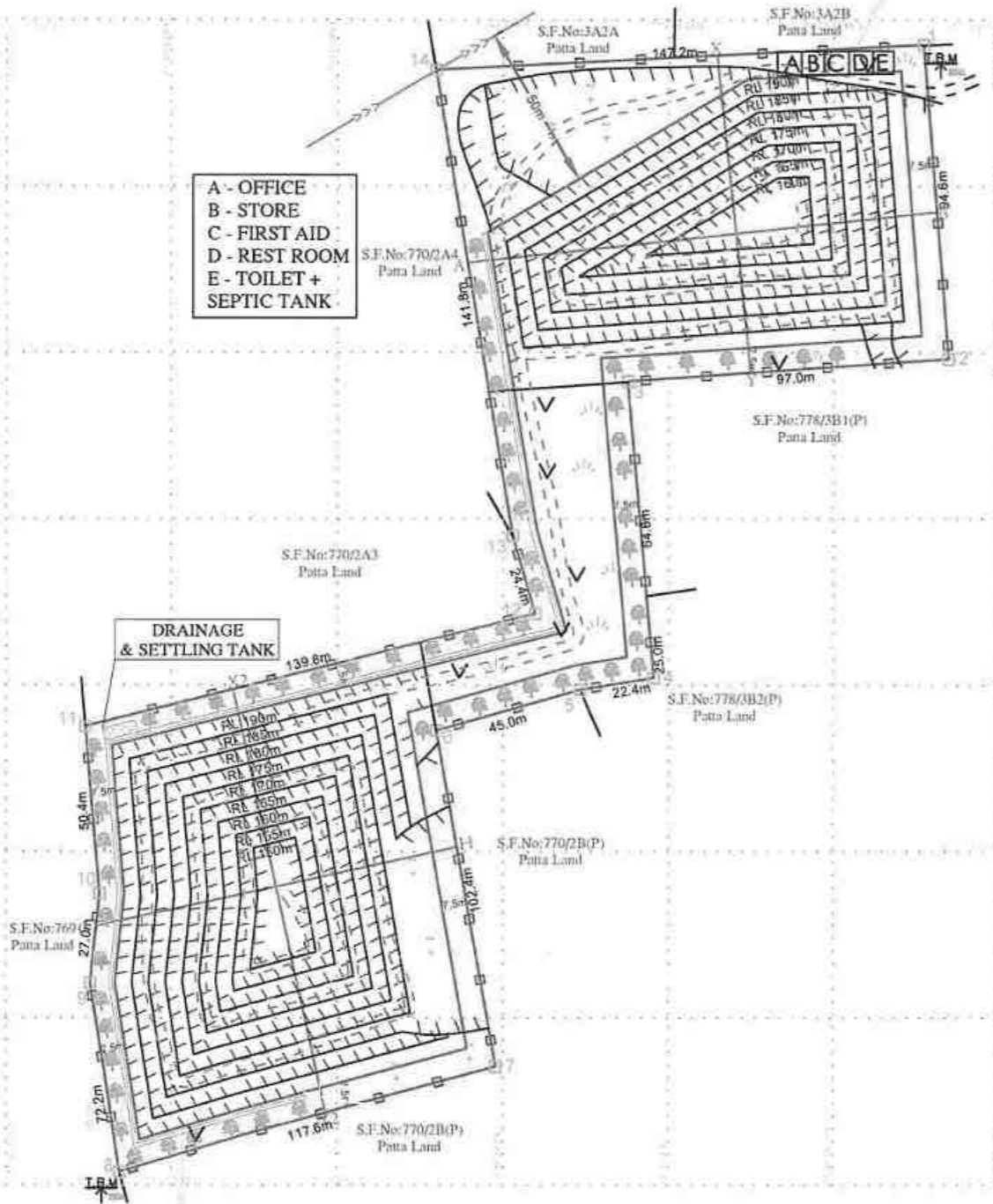
- MINE LEASE AREA
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- VAIKKAL
- TEMPORARY BENCH MARK
- CONTOUR LINES
- SHRUBS
- TOP SOIL
- ROUGH STONE
- EXISTING PIT
- ULTIMATE BENCH
- EARTH BUND
- FENCING

**CONCEPTUAL PLAN**  
 SCALE 1 : 2000

Prepared By:

I DO HEREBY CERTIFY THAT THE PLATE HAS BEEN CHECKED BY ME AND IS CORRECT TO THE BEST OF MY KNOWLEDGE

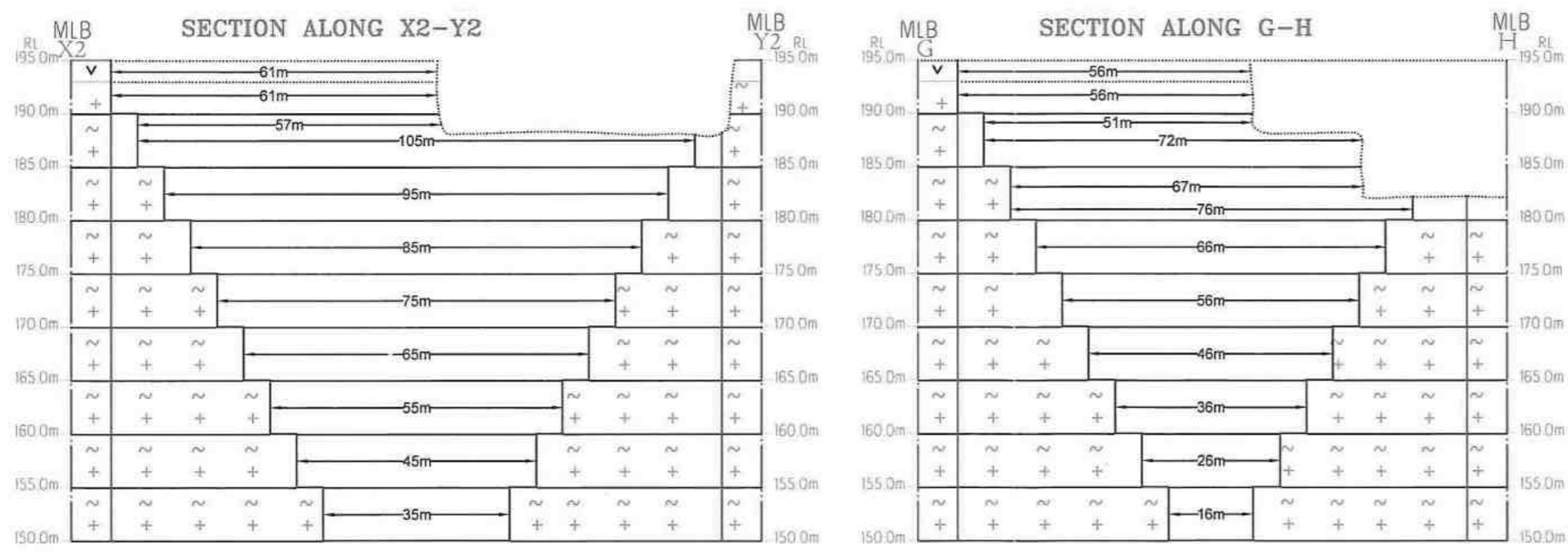
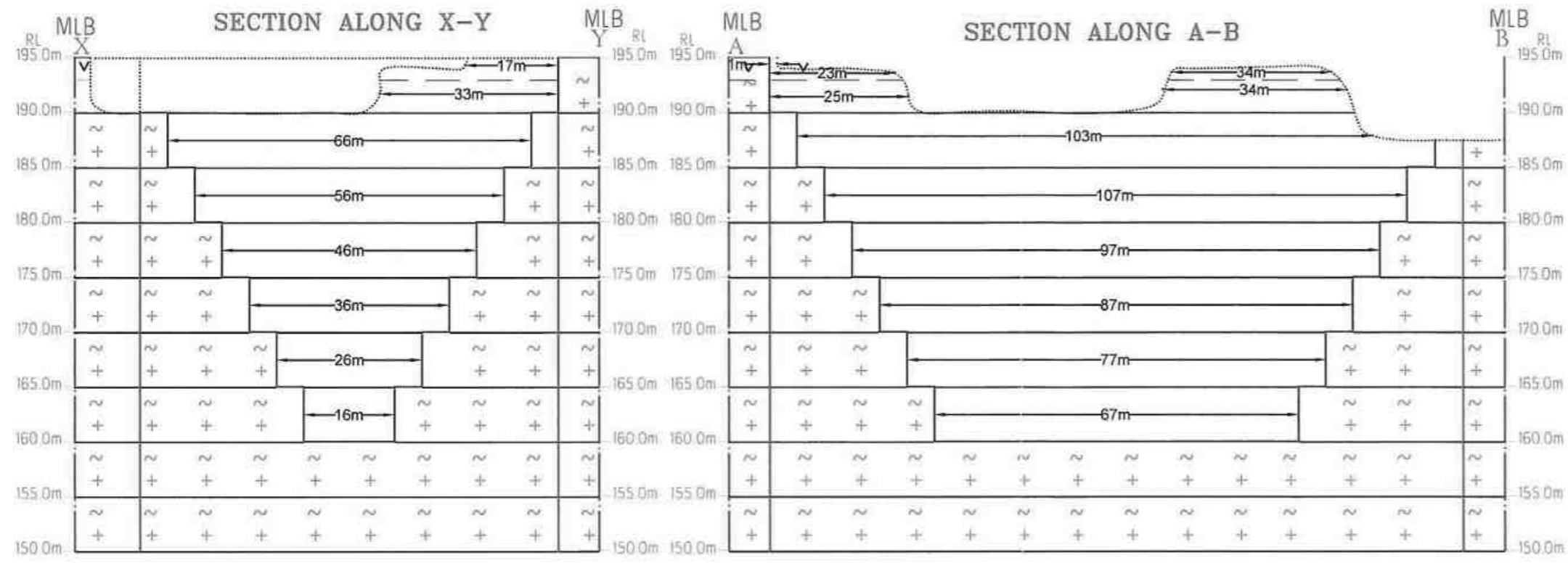
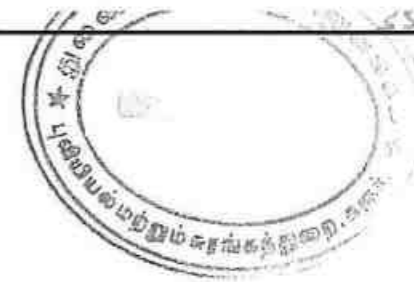
Dr.S.KARUPPANNAN, M.Sc., Ph.D.  
 RECOGNIZED QUALIFIED PERSON  
 RQP/MAS/263/2014/A



For Kousic & Co Bluemetals

Partner

MINEABLE RESERVES								
Section	Bench	Length in (m)	Width in (m)	Depth in (m)	Volume In m <sup>3</sup>	Rough Stone in m <sup>3</sup>	Top soil in m <sup>3</sup>	
XY-AB	I	17	1	1	17	.....	17	
	I	33	57	1	1881	.....	1881	
	I	33	59	3	5841	5841	.....	
	II	66	103	5	33990	33990	.....	
	III	56	107	5	29960	29960	.....	
	IV	46	97	5	22310	22310	.....	
	V	36	87	5	15660	15660	.....	
X2Y2-GH	VI	26	77	5	10010	10010	.....	
	VII	16	67	5	5360	5360	.....	
	<b>TOTAL</b>				<b>35</b>	<b>125029</b>	<b>123131</b>	<b>1898</b>
	I	61	56	2	6832	.....	6832	
	I	61	56	3	10248	10248	.....	
	II	57	51	2	5814	5814	.....	
	II	105	72	3	22680	22680	.....	
	III	95	67	3	19095	19095	.....	
	III	95	76	2	14440	14440	.....	
IV	85	66	5	28050	28050	.....		
V	75	56	5	21000	21000	.....		
VI	65	46	5	14950	14950	.....		
VII	55	36	5	9900	9900	.....		
VIII	45	26	5	5850	5850	.....		
IX	35	16	5	2800	2800	.....		
<b>TOTAL</b>				<b>45</b>	<b>161659</b>	<b>154827</b>	<b>6832</b>	
<b>GRAND TOTAL</b>					<b>286688</b>	<b>277958</b>	<b>8730</b>	



**PLATE NO-VIA**

**APPLICANT:**  
**M/s.KOUSIC & CO BLUE METALS,**  
 DOOR NO.24A, HOUSING UNIT,  
 KOLLAMPALAYAM,  
 KASIPALAYAM,  
 ERODE TALUK,  
 ERODE DISTRICT.

**LEASE APPLIED AREA:**  
 S.F.NO : 770/2B (P), 778/3B1 (P), &  
 778/3B2 (P)  
 EXTENT : 3.23.0 Hect  
 VILLAGE : ANJUR  
 TALUK : PUGALUR  
 DISTRICT : KARUR

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SAFETY BOUNDARY	
TOP SOIL	
ROUGH STONE	
ULTIMATE BENCH	

**CONCEPTUAL SECTIONS**  
 SECTION HOR 1 : 1000 & VER 1 : 500

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

For Kousic & Co Bluemetals

Partner

From  
Dr.P.Jayapal M.Sc., Ph.D.,  
Deputy Director,  
Geology and Mining,  
Karur.

To  
M/s.Kousic & Co Blue Metals,  
Door No.24/A, Housing Unit,  
Kollampalayam,  
Kasipalayam,  
Erode Taluk and District.

Rc.No.510/Mines/2022, Dated:17.10.2023

Sir,

Sub: Mines and Minerals - Minor Mineral -Karur District -  
Pugalur Taluk - Anjur Village -S.F.Nos. 770/2B(Part)  
1.54.0 hectares, 778/3B1(Part) 1.62.0 hectares and  
778/3B2 (Part) 0.07.0 hectares Over an extant  
3.23.00 hectares- Quarry lease application for Rough  
Stone and Gravel - Preferred by M/s.Kousic & Co Blue  
Metals- Mining Plan approved - requested for further  
details - furnished - Regarding.

- Ref: 1. Quarry lease application for Rough stone and  
Gravel preferred by M/s.Kousic & Co Blue  
Metals,Door No.24/A, Housing Unit,  
Kollampalayam, Kasipalayam, Erode Taluk and  
District, dated:13.10.2022.
2. Pricise Area Communication Notice  
Rc.No.510/Mines/2022, Dated:19.09.2023.
3. Mining Plan submitted by M/s.Kousic & Co Blue  
Metals, Letter dated: 26.09.2023.
4. The Deputy Director, Geology and Mining, Karur  
Mining Plan approved letter Rc.No.  
510/Mines/2022, Dated:04.10.2023.
5. M/s.Kousic & Co Blue Metals letter  
dated:06.10.2023.

In the reference 1<sup>st</sup> cited, M/s.Kousic & Co Blue Metals have  
applied quarry lease for quarrying Rough stone and Gravel in S.F.Nos.  
770/2B(Part) 1.54.0 hectares, 778/3B1(Part) 1.62.0 hectares and  
778/3B2 (Part) 0.07.0 hectares Over an extant 3.23.00 hectares of

For Kousic & Co Bluemetals

285

Partner



patta lands in Anjur Village, Pugalur Taluk, Karur District. The Deputy Director of Geology and Mining, Karur had issued precise area letter to the proposed lease area vide reference 2<sup>nd</sup> cited.

Accordingly, the applicant firm have submitted the 3 copies of draft Mining Plan and the same was approved by the Deputy Director, Geology and Mining, Karur vide reference 4<sup>th</sup> cited.

In the reference 5<sup>th</sup> cited, the applicant firm have requested the Deputy Director of Geology and Mining, Karur to provide the following details and the same has been furnished as follows:-

i. Exact depth of existing Pit as per approved Mining plan

Pit Level	Length (m)	Width (m)	Depth (m)
I	48	59	1
IA	78	16	1
II	32	28	5
III	20	15	7
IV	18	13	8
V	11	14	13

ii. Period of Operation and stoppage of earlier mining operations

1. The District Collector's Proceedings B/123/07 Dt:12.03.2007, in S.F.Nos. 770/2B, 778/3B2, in favour of Tvl.Advin Blue Metals, for a period of 5 years from 15.03.2007 - 14.03.2012.
2. The District Collector's Proceedings B/141/07, Dt:07.03.2007 in S.F.Nos.770/2A1 and 778/3B1 in favour of Sri Ganesh Blue Metals, for a period of 5 years from 16.03.2007 - 15.03.2012.
3. The District Collector's Proceedings Rc.No.172/Mines/2012, Dt:07.08.2017 in S.F.Nos. 770/2B Part, 778/3B2 and 778/3B1 part in favour of Tvl.Kowsick & Co Blue Metals for a period of 5 years from 07.08.2017 to 06.08.2022.

iii. Quantity and depth granted in earlier Mining operations and achieved by Proponent.

Approved depth as per EC	:	22M
Approved quantity as per EC	:	300425
Permit obtained Quantity	:	54709

For Kousic & Co Bluemetals

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Partner

iv. Is the project falling under the violation category

> Nil

v. Whether the mining carry out in the non-EC area.

> Nil

*[Handwritten signature]*  
17/10/2023  
Deputy Director,  
Geology and Mining,  
Karur

*[Handwritten signature]*  
17/10/2023

மதுரை மாவட்டம், 14-ஆம் வட்டம்,  
 தொழில்நுட்பமயமாக்கல், தொழில்நுட்பமயமாக்கல் துறையினால்  
 வழங்கிய உருவக் கோப்புகள் 0/0 சாதிப்பலகையால்  
 பதிவுசெய்துள்ள உண்டாகக் கூடிய புகைப்படல்களை சீர்திருத்த  
 கமிட்டி மாவட்டம், புகைப்படல்கள், சிவகாமியா கிராமம்.  
 4வது பக்கம் 778/382 - 1.54.00 ரூபாய், 778/384 - 1.54.00  
 778/382 - 0.07.00 ரூபாய் ஆகிய உண்டாகக் கூடியவை சீர்திருத்த  
 கமிட்டி மாவட்டம் சிவகாமியா கிராமம் வட்டம் -  
 விபிபி மாவட்டம், சிவகாமியா கிராமம், சிவகாமியா,  
 மாவட்டம் மாவட்டம் மாவட்டம் மாவட்டம் மாவட்டம்  
 கமிட்டி மாவட்டம் சிவகாமியா கிராமம்

M. Nirmalan  
 19/10/23  
 கிராம நிர்வாக அலுவலர்  
 1. அஞ்சல் கிராமம்  
 புகைப்படல்கள், கருநாடகம்

  
 Partner

ந.க.எண்.4780/2023 வ

மாவட்ட வன அலுவலகம்,  
கரூர் வனக்கோட்டம்,  
கரூர்.

நாள்.02.12.2023

பொருள் : கனிமம் - சாதாரண கல் குவாரி - கரூர் மாவட்டம், புகளூர் வட்டம், அஞ்சூர் கிராமத்தில் அமையவுள்ள சாதாரண கல் குவாரிக்கும் காப்புக்காடு பகுதிக்கும் இடைப்பட்ட தூர விபரங்களை தெரிவித்தல் - தொடர்பாக.

பார்வை : 1. திள். கௌசிக் & கோ புளூமெட்டல்ஸ், ஹவுசிங் பூனிங் கொல்லம்பாளையம், காசிபாளையம், ஈரோடு வட்டம், ஈரோடு மாவட்டம் கடித எண்.இல்லை நாள்.31.10.2023.  
2. வனச்சரக அலுவலர், கரூர் வனச்சரகம் கடித எண்.203/2023 நாள்.02.12.2023.

\*\*\*\*\*

பார்வை 1-ல் காணும் கடிதத்தில் கரூர் மாவட்டம், புகளூர் வட்டம், அஞ்சூர் கிராம புல எண்கள்.770/2B (பகுதி) (1.54.0 எக்டேர்), 778/3B1 (பகுதி) (1.62.0 எக்டேர்) மற்றும் 778/3B2 (பகுதி) (0.07.0 எக்டேர்)-ல் மொத்தம் 3.23.0 எக்டேர் பரப்பளவில் திள். கௌசிக் & கோ புளூமெட்டல்ஸ் என்ற நிறுவனத்தின் சாதாரண கல் குவாரியை அமைக்க மாநில சுற்றுச்சூழல் ஆணையத்திடம் விண்ணப்பித்துள்ளதால், மேற்படி சாதாரண கல் குவாரியின் புலத்திலிருந்து 25.8 கி.மீ சுற்றளவுக்குள் உள்ள காப்புக்காடுகளின் விபரங்களை தெரிவிக்குமாறும் கோரப்பட்டது.

அதன்படி மேற்படி இடமானது கரூர் வனச்சரக அலுவலரால் களத்தணிக்கை செய்யப்பட்டு பார்வை 2-ல் கண்டவாறு சமர்ப்பித்த அறிக்கையின் படி கரூர் மாவட்டம், புகளூர் வட்டம், அஞ்சூர் கிராம புல எண்கள்.770/2B (பகுதி) (1.54.0 எக்டேர்), 778/3B1 (பகுதி) (1.62.0 எக்டேர்) மற்றும் 778/3B2 (பகுதி) (0.07.0 எக்டேர்)-ல் மொத்தம் 3.23.0 எக்டேர் பரப்பளவில் திள். கௌசிக் & கோ புளூமெட்டல்ஸ் என்ற நிறுவனத்தின் மூலம் அமைக்கப்படவுள்ள கல் குவாரியிலிருந்து 25.8 கிலோமீட்டர் தூரத்தில் தாதம்பாளையம் காப்புக்காடு அமைந்துள்ளது. மேலும் குவாரியின்

For Kousic & Co Bluemetals

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Partner

புலத்திலிருந்து 25 கி.மீ சுற்றளவுக்குள் பாதுகாக்கப்பட்ட வணப்பகுதி புலிகள்  
காப்பகம் மற்றும் சாணாலயங்கள் ஏதுமில்லை என தெரிவிக்கப்படுகிறது.

ஓம்/- வி.ஏ.சரவணன்,  
மாவட்ட வன அலுவலர்,  
கரூர் வனக்கோட்டம்,  
கரூர்

பெறுநர்

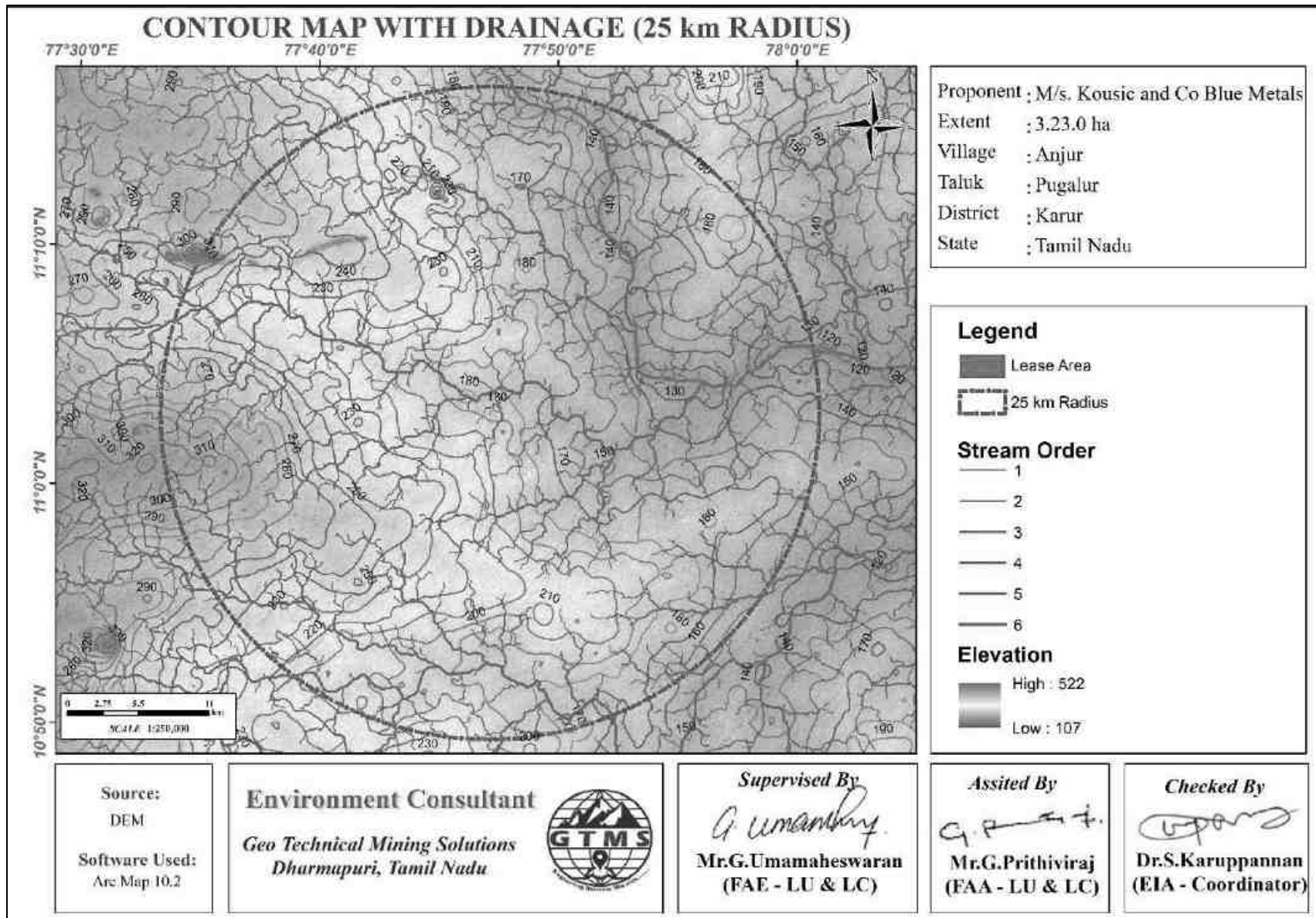
திள். கௌசிக் & கோ புனாமெட்டல்ஸ்,  
கதவு எண்.24/A, ஹவுசிங் யூனிட்,  
கொல்லம்பாளையம்,  
காசிபாளையம், ஈரோடு வட்டம்,  
ஈரோடு மாவட்டம்.

// உ.ந.உ.ப //

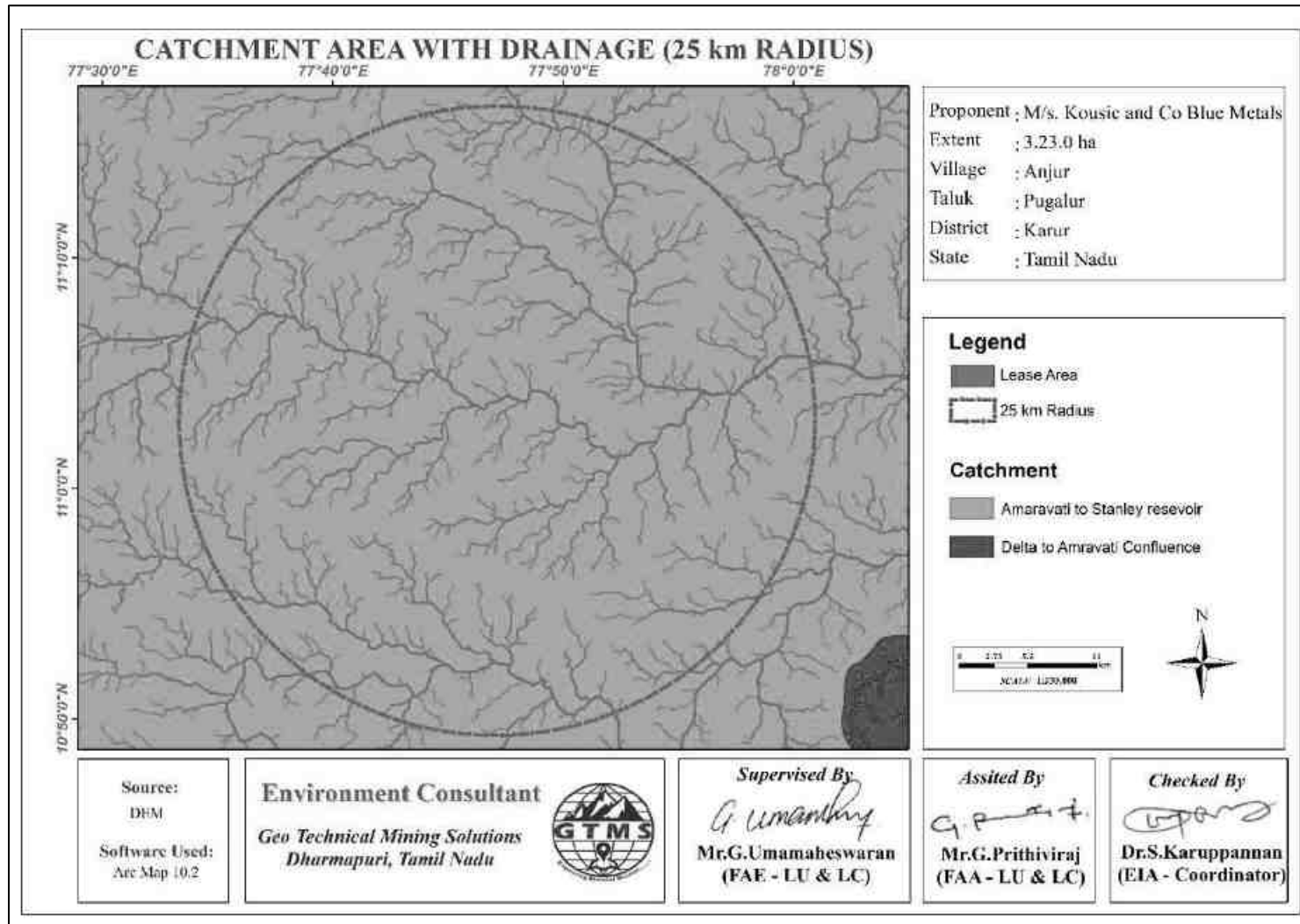
வரைவிதாழில் அலுவலர்.



PVV Map

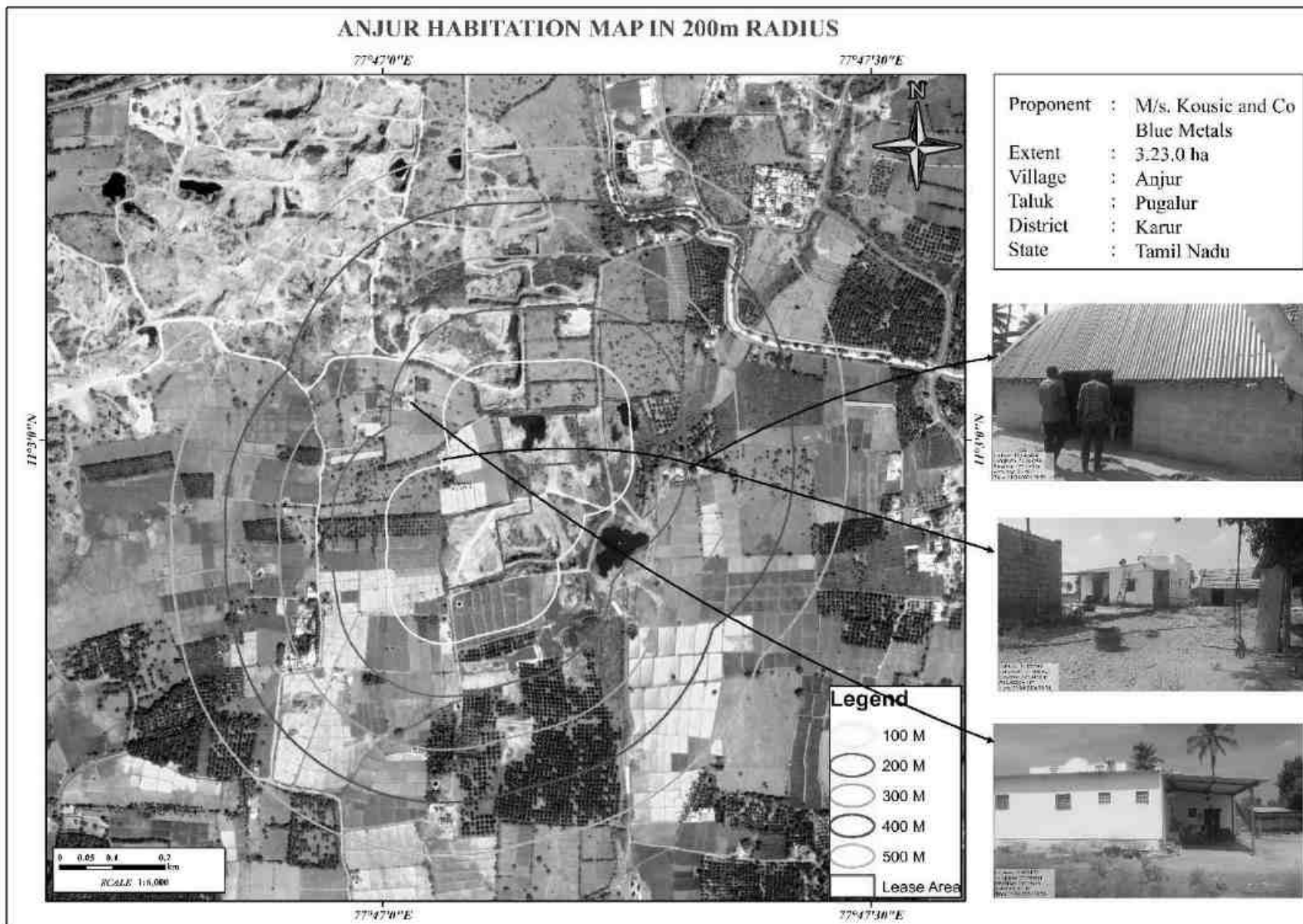


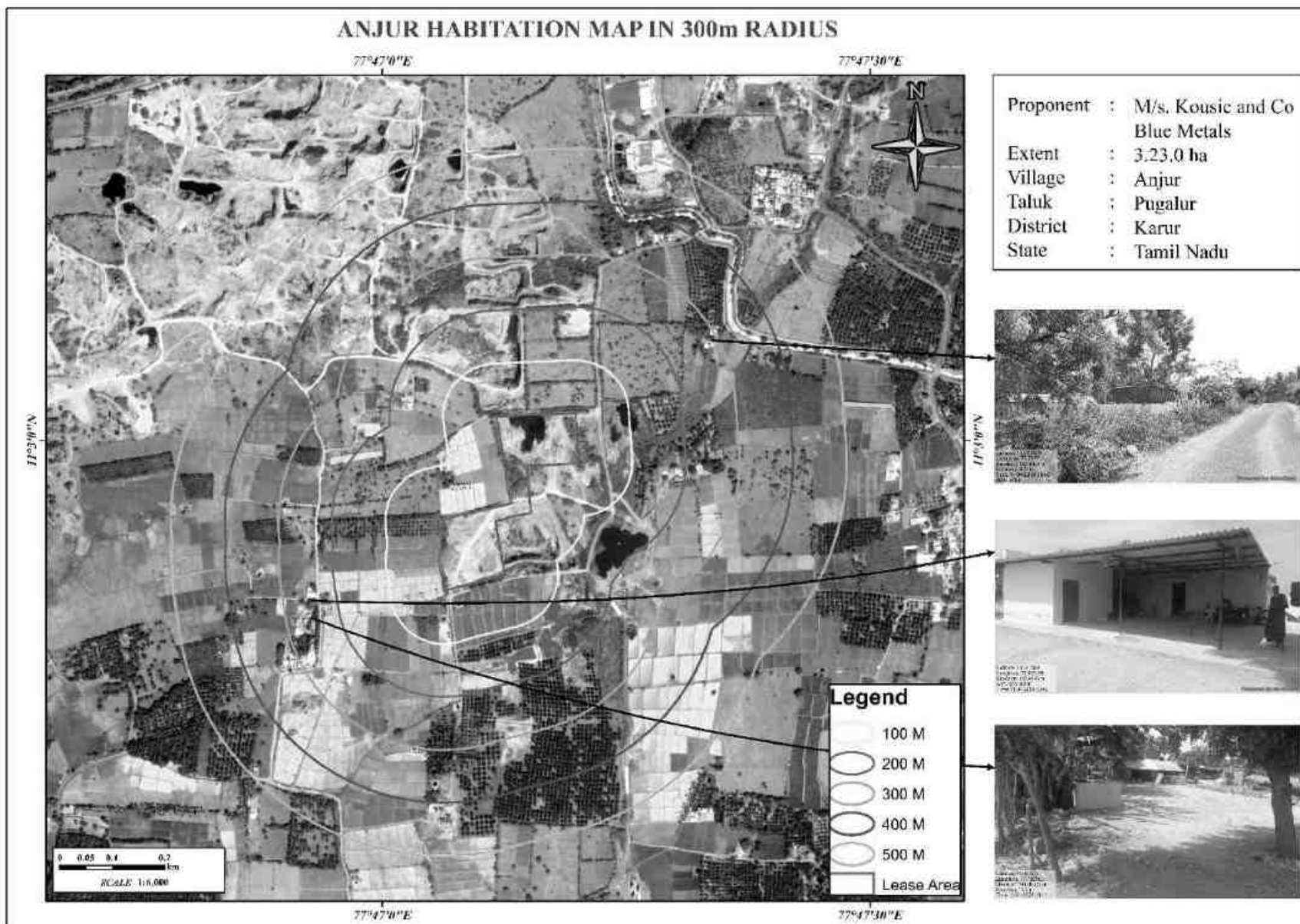
Contour Map

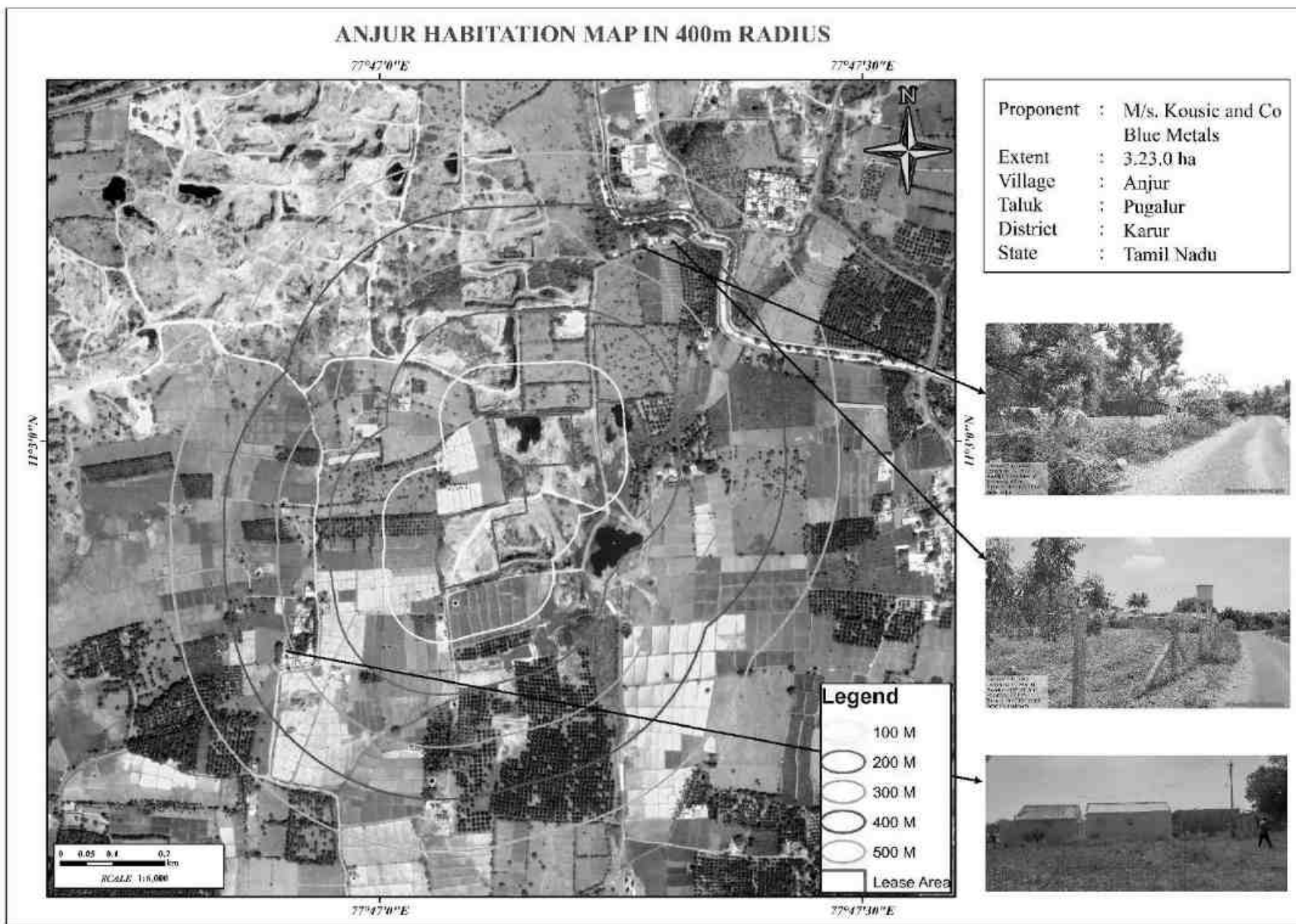


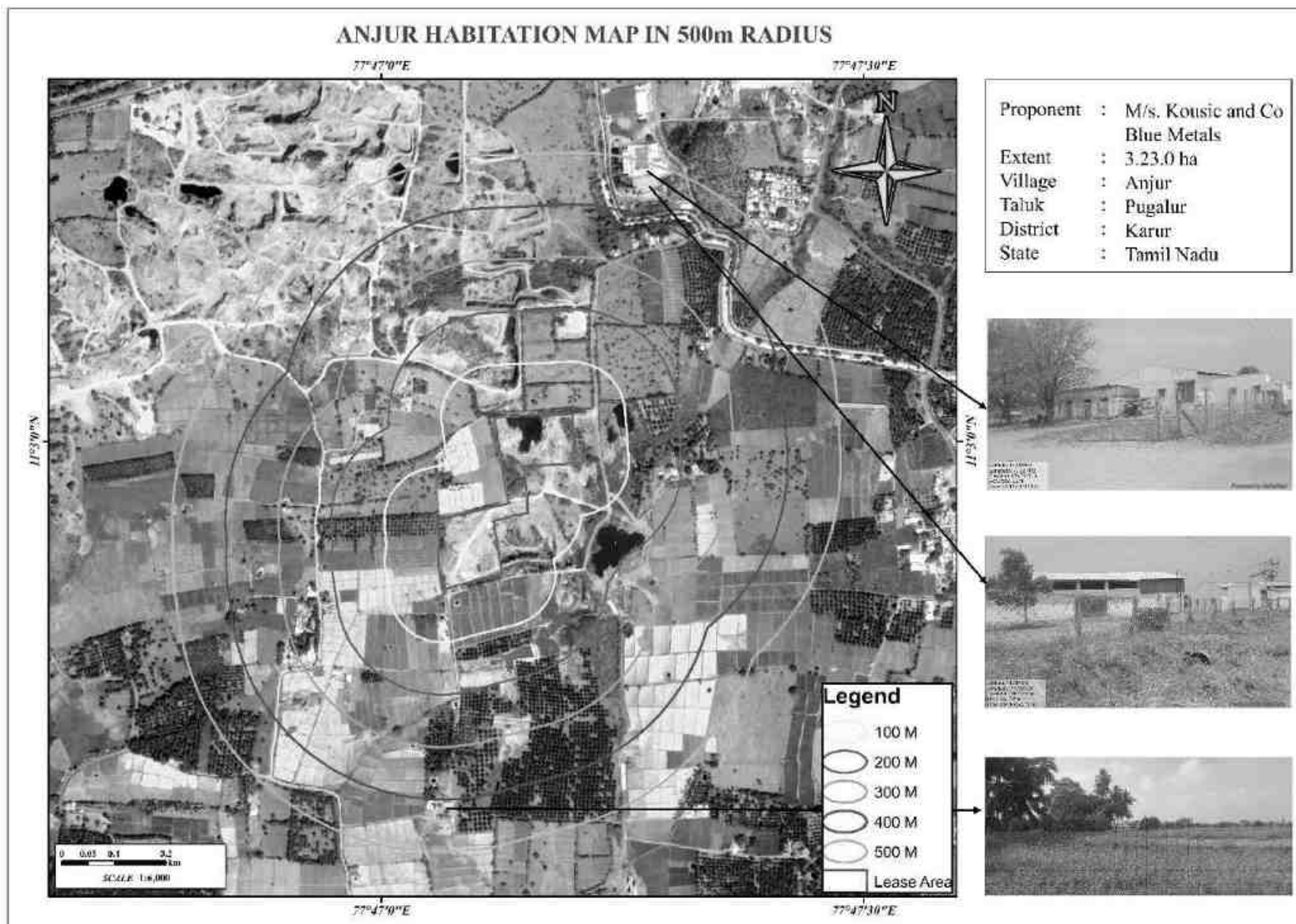
Catchment Area











Habitation Map of 100-500m Radius

# **HYDROLOGICAL STUDY REPORT**

**FOR**

**M/s.Kousic and Co Blue Metals,  
Door.No.24/A, Housing Unit,  
Kollampalayam,  
Kasipalayam,  
Erode Taluk and District**



**BY**

**Dr.S.KARUPPANNAN**

**GEO TECHNICAL MINING SOLUTIONS**

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

## **Brief about the project giving location details, coordinates, google/ toposheet maps, etc.**

### **Demarcating the project area**

**M/s.Kousic and Co Blue Metals**, Door.No.24/A, Housing Unit, Kollampalayam, Kasipalayam, Erode Taluk, Erode District. Tamil Nadu, requires detailed information on groundwater occurrences at proposed site of Anjur Village, Pugalur Taluk, Karur District, Tamil Naddu rough stone and gravel quarry. Hydrogeological assessment to find the availability of groundwater and comment on aspects of depth to potential aquifers, aquifer availability and type, possible yields and water quality in the proposed area.

In view of the mining operations, it is important to understand the hydrogeological environs in and around the mining site to balance the environment by following the suitable mitigation measures. With this background the present hydrogeological report will provide the existing water environment and the impact assessment with a suitable mitigation measure for the sustainable development existing water resources during and after mining operations of the quarry site.

Evaluate the thickness of the aquifer and adequate fracture availability of the proposed Anjur village rough stone and gravel mining lease area. A detailed hydrogeological study was carried out to find the lithological characteristics of rock such as fracture, fissures, fault, fold and other minor structures in and around the proposed site. Also, a geophysical technique was applied to identify the subsurface aquifer availability based on that we decided to prepare hydrogeological report.

Hence, we decided to conduct a groundwater assessment study in the proposed area and decided to undertake a detailed geological and geophysical investigation in the proposed area. Preparation of groundwater assessment report to fulfill their requirement and give suitable suggestion to improve water level as well as manage future demand.

The temperature ranges from a maximum of 38 °C to a minimum of 39 °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 1350.63 mm, with September being the rainiest month.

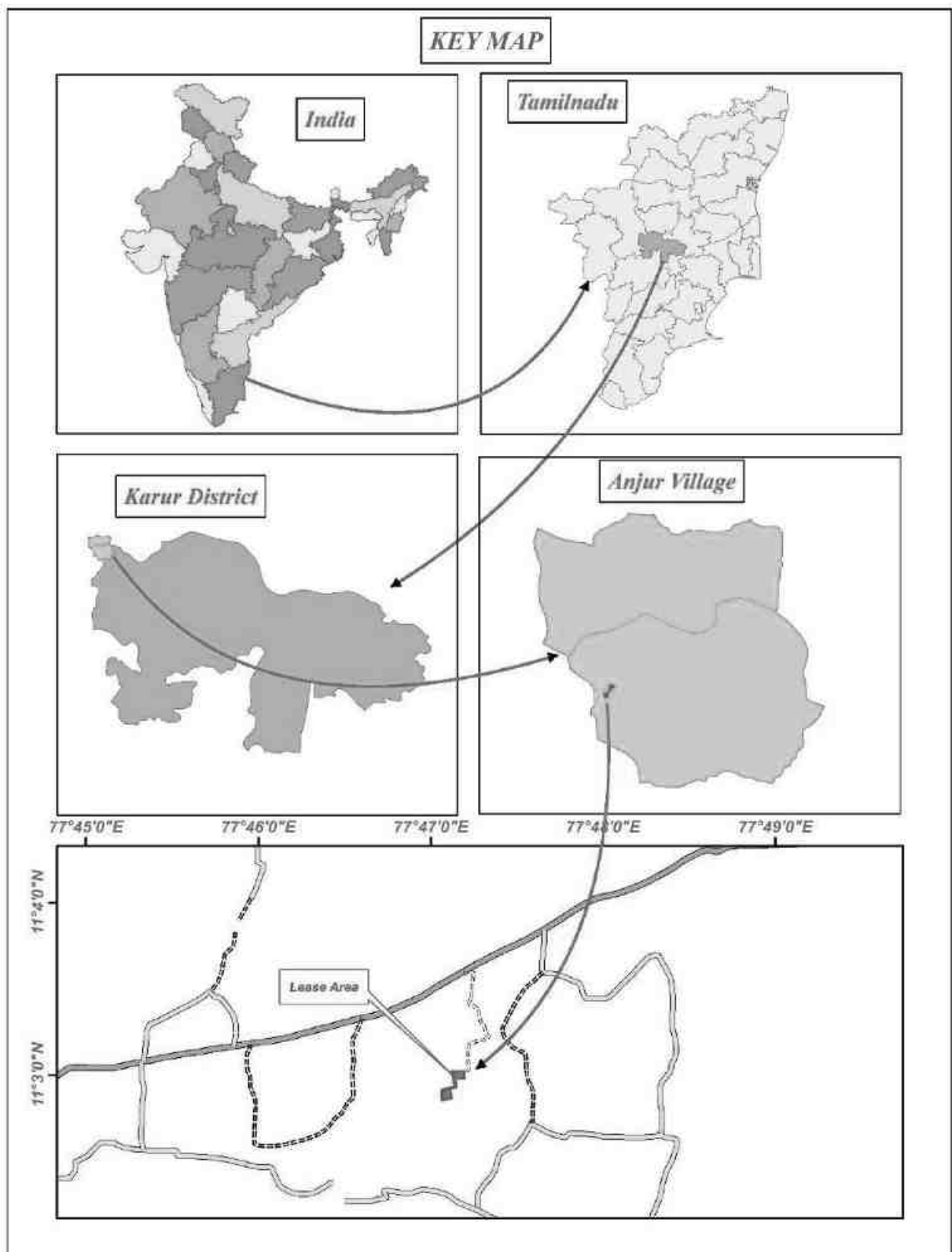


Figure 1: Location Map of the proposed area

## **Objective of Report**

The village Anjur Village, Pugalur Taluk, Karur District, Tamil Nadu State which lies between latitudes 11°2'50.76"N to 11°3'1.69"N and Longitudes from 77°47'3.49"E to 77°47'12.09"E on WGS datum-1984. The proposed area included in the toposheet no: 58-E/16 published by Survey of India. Our valuable client needs for groundwater impact assessment report for his rough stone quarry operation as per Gazette Notification of Ministry of Jal Shakti (Department of Water Resources, River Development and Ganga Rejuvenation) (Central Ground Water Authority), New Delhi, dated 24<sup>th</sup> September, 2020 Impact assessment report for core and buffer zone is mandatory for abstracting ground water/ dewatering to the tune more than 100 KLD. The temperature ranges from a maximum of 39 °C to a minimum of 38° 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 1350.63 mm, with September being the rainiest month.

## ***Hydrological Settings***

Hydrological impact studies were conducted for a 1 km buffer from the boundary of the proposed project site. The primary objective of the hydrological study is to predict the potential impacts of the proposed project on the quality and quantity of both surface water and groundwater resources within the study area.

The field investigation revealed that there are three surface water bodies namely is located 1.39 km North of Noyyal River, 2.70 SE of Aathupalayam Dam. Those water bodies are ephemeral in nature. And 15 dug wells within the buffer area. The diameter of the dug wells varied from 7 m to 11m and the depth of the wells varied from 19.5 m to 24.7 m (BGL). Since the region is made up of hard and compact massive crystalline charnockite and gneissic rocks, ***the groundwater occurs under phreatic semi confining aquifer.*** The proposed mine site primarily comprising of charnockite, gneiss and dolerite in general these rocks doesn't have any primary and secondary porosity. The water only holding in the tiny soil layer and weathered mantle. The groundwater movement takes place only in porous and permeable formation. While enquired about the availability of water in the wells, it is found that all the wells get water during rainy season only and the wells become dry during the summer season. Therefore, the farmers rely on the well water for agricultural activities for short-period only.

## ***Geophysical Investigation***

Electrical resistivity surveys were conducted in 3 locations, as shown in the Figure 5 around the lease area to delineate fractures zones indicating presence of water table below ground level. The graphs showing occurrence of water bearing fractures have been provided in Figures 6 to



Figures 8 show that water bearing fractures are present at depths ranging from 65 m to 70 m below ground level, occurring at depths well below the ultimate depth of mining (45 m below ground level). Studies on the vertical profile of the dug wells showed that highly weathered rocks and presence of fractures are the main factors responsible for presence of water in wells. In addition, no deep bore wells were noted in the study area.

#### ***Impact on the Groundwater Table***

- From the geophysical investigation, it is concluded that the mining activities will not intersect the groundwater table in any manner.
- As the proposed project will purchase water from the nearby approved water vendors, it will not draw groundwater for dust suppression, green belt development, and domestic purposes. Hence, the project will not cause any change to the groundwater table.

#### ***About the Nearby Water Bodies***

The project area of the 1 km buffer includes one water body known as Noyyal river, is located 1.39 km N of lease area it is shown in Figures 2, **two surface water bodies namely is located 1.39 km North of Noyyal River, 2.70 of Aathupalayam Dam SE of the project site.** Those water bodies are ephemeral in nature. The water in those water bodies is mainly used for livestock. The bottom of the surface water bodies is predominantly made up of silt/clay substrates. The hydrological study clearly stated that the surface water in the region does not have any link with groundwater and does not involve in the process of percolation and infiltration. During the summer season, the existing surface water bodies disappear mostly due to evaporation and evapotranspiration.

The groundwater levels within the study area are ranging from 65m bgl to 70m bgl. The long period average groundwater level fluctuations are ranging from 2 to 5m within the one kilo meter of the lease area. Similarly, the groundwater levels within the mine lease area are 65- 70 during pre and post monsoon period. The shallow aquifers are absent within the site.

Based on the groundwater levels, groundwater level contour map for have been prepared. These maps are indicating that the groundwater flow direction is in two ways. The major portion of the study area is showing the trend of flow direction towards west to east along the dip direction. Here the water flow direction is towards east. Central Ground Water Authority has not notified any area in the district. Government of Tamil Nadu vide G.O. No. 53 has banned groundwater development for irrigation in the over exploited blocks of Tamil Nadu. The water level contour maps presented in Fig.4.

Based on the groundwater interaction and flow study reveals lease area located at plain terrain compare from the surrounding area. The groundwater movement towards west to east along the dip direction. The strike of the exposures extends north south direction and sloping towards EW

direction. The strike is arresting the groundwater flow south to north at the same time flow diversified in to northeast direction. As per the resistivity data obtained from 3 different location within the lease area revealed that there is no groundwater interaction up to the depth of 65-70 m below ground level. The proposed mining depth is 40m below ground level hence there is no impact on mining activity in this lease area.

The beneficial/ adverse impacts of the proposed project have been addressed below.

### ***Impact on the Surface Water Bodies***

- The proposed project will not draw water from the surface water bodies. Therefore, no changes to surface water quantity will occur due to the project.
- The contact water (pit water) stored during rainy seasons will be released to the nearby watershed after the water is subjected to treatment to settle down the suspended sediment particles. Therefore, the proposed project will increase the level of surface water and will not affect the quality of surface water.
- The rain water from the haul roads will be collected in drainage along the two sides of the haul roads will be routed to the de-silting ponds and used for green belt development and dust suppression activities. Remaining water will be released to the surface water environment. This kind of action will raise the water level in the surrounding water environment.
- As no acid mine drainage is expected from the proposed project, surface water quality will not be affected.
- As the bottom of the surface water bodies is predominantly made up of silt/clay substrates, this kind of substrates will act as a hydrological barrier between the surface water bodies and the proposed project site. Therefore, the proposed project will not affect the surface water level in the nearby water bodies.
- As the boundaries of the proposed project area are made up of massive rock immediately beneath the topsoil layer, the chances of having hydrological contact with the surface water resources are very less. Therefore, mining activities in the lease area will not lower surface water level in the nearby surface water resources.

### ***Mitigation Measures***

- Trees will be planted all around the lease area and along both sides of the haul roads to the greater densities to prevent dusts from depositing over the surface water bodies.
- Wet drilling will be employed and water will be sprinkled at the time of blasting to arrest the dust particles in the source itself.

- If any seepage occurs from the nearby surface water resources, the seepage will be arrested by applying bentonite clay over the seeping quarry walls.
- Erosion and sediment controls such as garland drainage with check dams will be provided to prevent erosion from occurring around the site and sedimentation from occurring in the surrounding surface water environment.
- Garland drainage system and settling tank will be constructed around the proposed mining lease area. The garland drainage will be connected to settling tanks and sediments will be trapped in the settling tanks and only clear water will be discharged to the natural drainage.

***Impact on groundwater Table***

- The impact of mining on groundwater table and surface water level has been discussed.

***The likely pollution on groundwater due to mining to be studied.***

As the ultimate depth of the proposed project is restricted up to the depth of 45 m below ground level and the groundwater bearing formations occur at depths ranging from 65m to 70m below ground level, the project activity will not directly have any adverse impacts on the quality of groundwater. However, groundwater resources may be contaminated due to mine pit water discharge, domestic sewage, waste water from vehicle washing, washouts from surface exposure or working areas, discharge of oil & grease, and suspended solids due to waste from washing of machineries. To address this impact, the same mitigation measures provided to be followed to avoid pollution of groundwater resources.

***About Drainage Pattern***

As no streams are crossing the proposed project site, it does not involve diversion of streams/alteration of the existing drainage pattern. Figure 1 shows location of streams around the lease area.

***About Surplus Mine Water***

Surplus mine water will be routed to settling tanks through garland drainage channels to settle down suspended particles and will be used for green belt development and dust suppression activities. Rest of the surplus mine water will be discharged to the natural drainage in East of the proposed project site because the runoff flows from both the S and E directions,

***About Surplus Rain Water***

As the surface of the study area is mainly composed of sandy soil, 20 % of the total rainfall will infiltrate into the soil and the remaining 80 % will become runoff. Garland drainage system will be designed in such a way to accommodate more than 80 % of the rainfall during the period of peak flows. Using the garland drainage system, surplus rain water in the form of runoff will be routed to the settling tanks before discharging to the natural drainage system. The surface water flow map

(Figure 4) shows that the runoff flows from both the E and S directions and accumulates in the S of the proposed project site. Based on the surface flow/ runoff direction, locations of settling tanks will be determined. In this case, the settling tanks will be installed along the eastern boundary of the project site. The runoff water and contact water will be discharged from the settling tanks to the natural drainage located in SE of the project site.

***Will the mining result in drawdown effect and affect macro, micro, and mini watershed.***

The proposed project will not result in drawdown effect in the surrounding macro, mini and micro water sheds. Instead, the project will have a number of positive impacts on the surface water environment.

***Impacts on aquifers may also be studied.***

The proposed project will not have adverse impacts on the groundwater aquifers.

***Best mining practice to be deployed***

- Wet drilling will be practiced
- Water will be sprinkled using stationery sprinklers and mobile sprinklers
- Trees will be planted to the greater densities around the mining area
- Haul roads will be properly maintained
- Garland drainage system will be installed around the lease area and will be connected to the settling tanks. The drainage system and the settling tanks will be desilted periodically.
- NONEL blasting will be practiced
- The transportation vehicles will be operated at the speed of < 20 kmph on both haul roads and the village roads

Benches will be formed with dimensions as prescribed in the approved mining plan.

**Water 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 16 open wells at various locations within 1km radius around the proposed project sites.

The open well water level data thus collected onsite are provided in Tables 1. According to the data, average depths to the static water table in open wells range from 19.5 m to 24.7 m (BGL).

**Table 1 Water Level of Open Wells within 1 km Radius**

Statoin ID	Depth of Water Table BGL(m)		Latitude	Longitude
	Water Table BGL(m)	Elevation in (m)		
OW01	22.4	210	11° 2'49.96"N	77°47'4.59"E
OW02	23.2	213	11° 2'43.62"N	77°47'4.50"E
OW03	23.4	216	11° 2'32.88"N	77°46'58.23"E
OW04	23.8	217	11° 2'34.67"N	77°46'49.16"E
OW05	23.2	214	11° 2'38.32"N	77°46'37.86"E
OW06	23.9	213	11° 2'53.68"N	77°46'57.03"E
OW07	23.6	212	11° 3'0.37"N	77°46'43.61"E
OW08	19.5	199	11° 3'20.34"N	77°47'17.33"E
OW09	20.2	202	11° 3'5.09"N	77°47'22.78"E
OW10	21.3	206	11° 2'52.86"N	77°47'29.26"E
OW11	22.6	211	11° 2'44.51"N	77°47'20.21"E
OW12	22.5	209	11° 2'33.00"N	77°47'26.77"E
OW13	23.1	212	11° 2'23.92"N	77°47'20.95"E
OW14	24.2	217	11° 2'27.26"N	77°47'8.99"E
OW15	24.7	219	11° 2'24.71"N	77°47'2.62"E

**Table 1a. Water Level of Bore Wells within 1 km Radius**

Statoin ID	Depth of Water Table BGL(m)		Latitude	Longitude
	Water Table BGL(m)	Elevation in (m)		
BW01	206	204	11° 3'10.71"N	77°47'13.31"E
BW02	210	218	11° 2'40.14"N	77°47'3.93"E
BW03	190	202	11° 2'58.21"N	77°47'17.90"E
BW04	208	213	11° 2'53.96"N	77°46'55.71"E



**Map showing water level measurement in Bore well**



Photograph showing water level measurement in Open well



**Photograph showing water level measurement in Bore well**





**Photograph showing the Surface Water bodies**



**Photograph showing the Surface Water bodies**

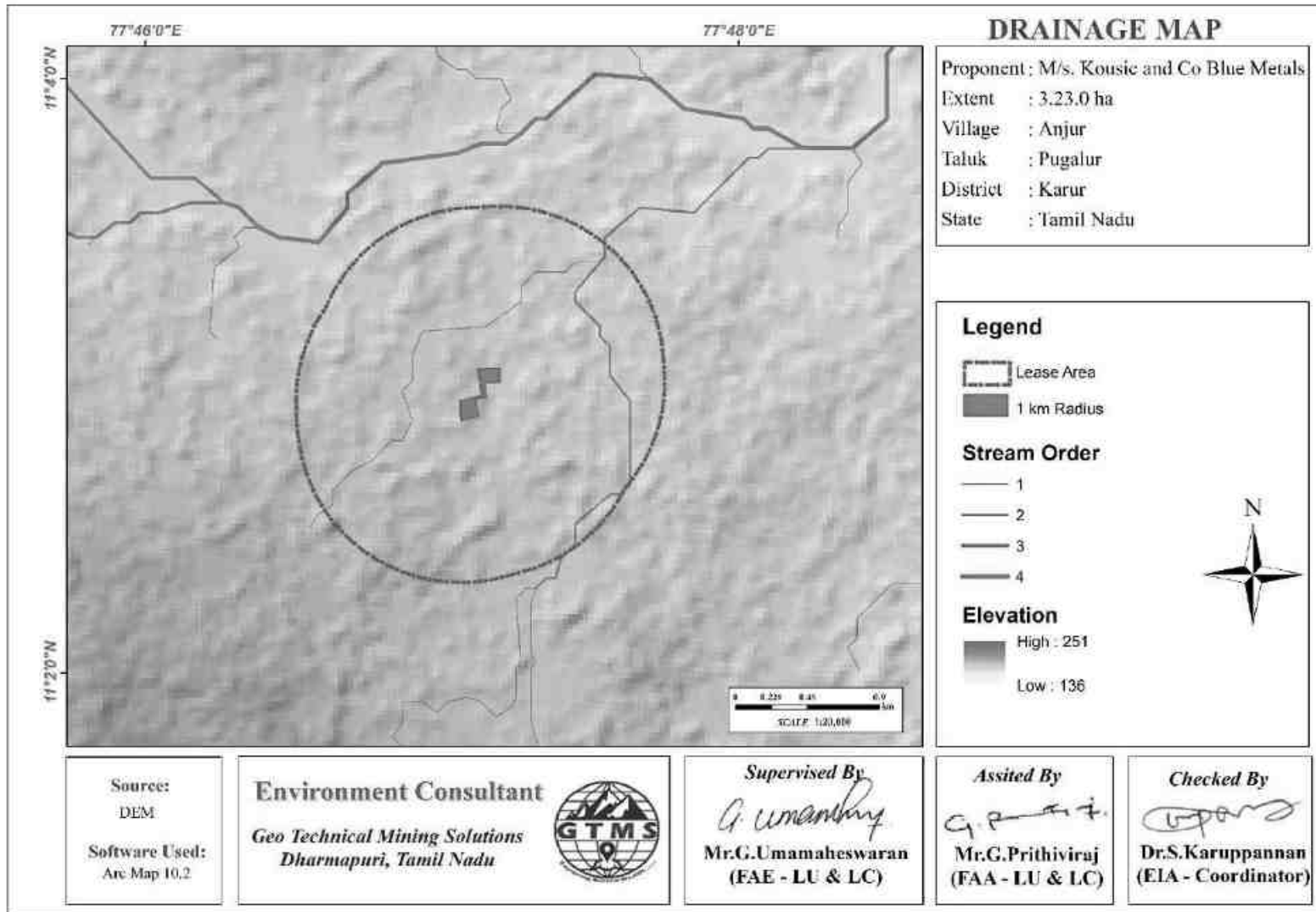
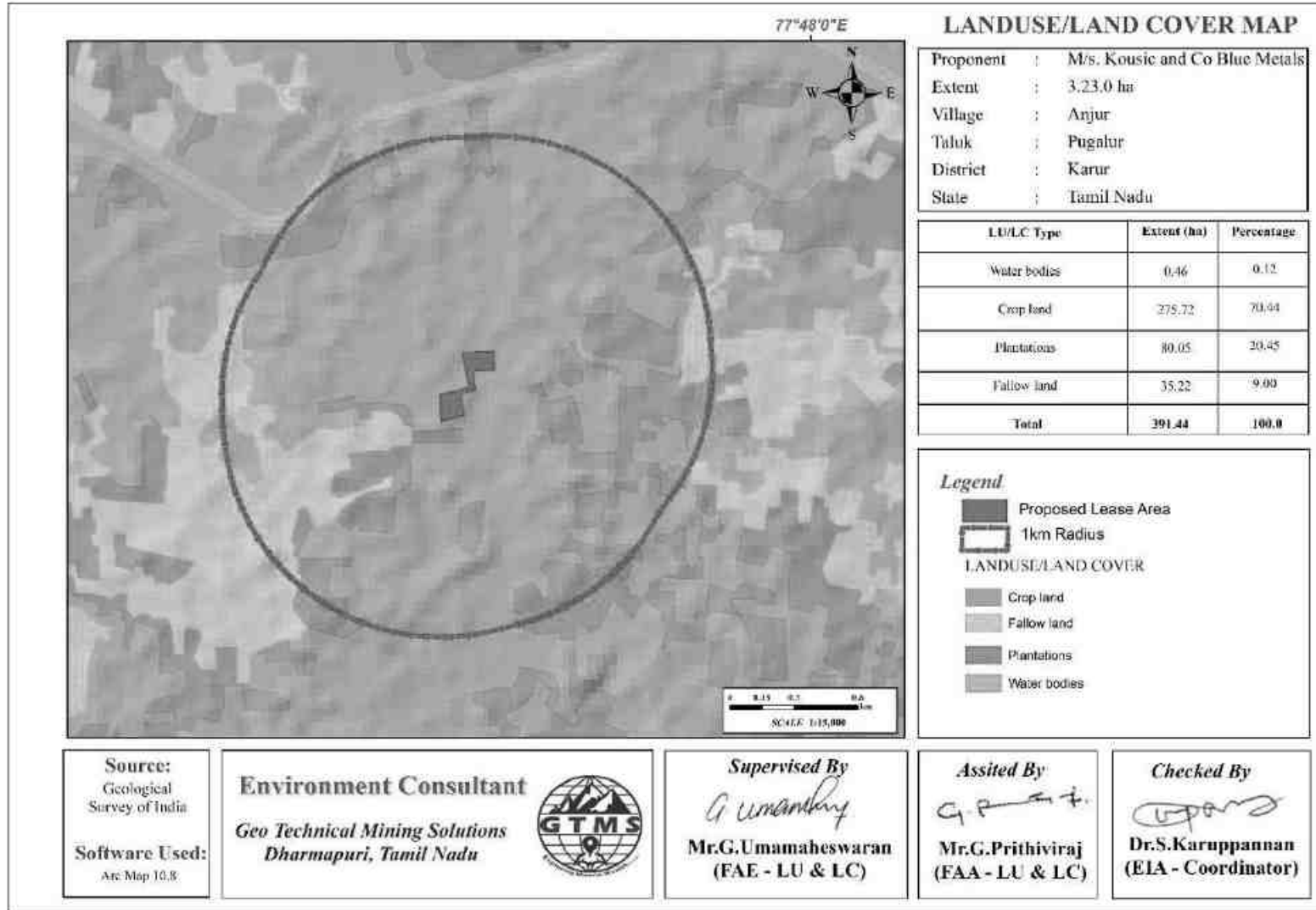


Figure 2. Water bodies showing 1 km Radius from the site.



**Figure 3 Land Use Pattern within Study Area of a 1km Buffer**

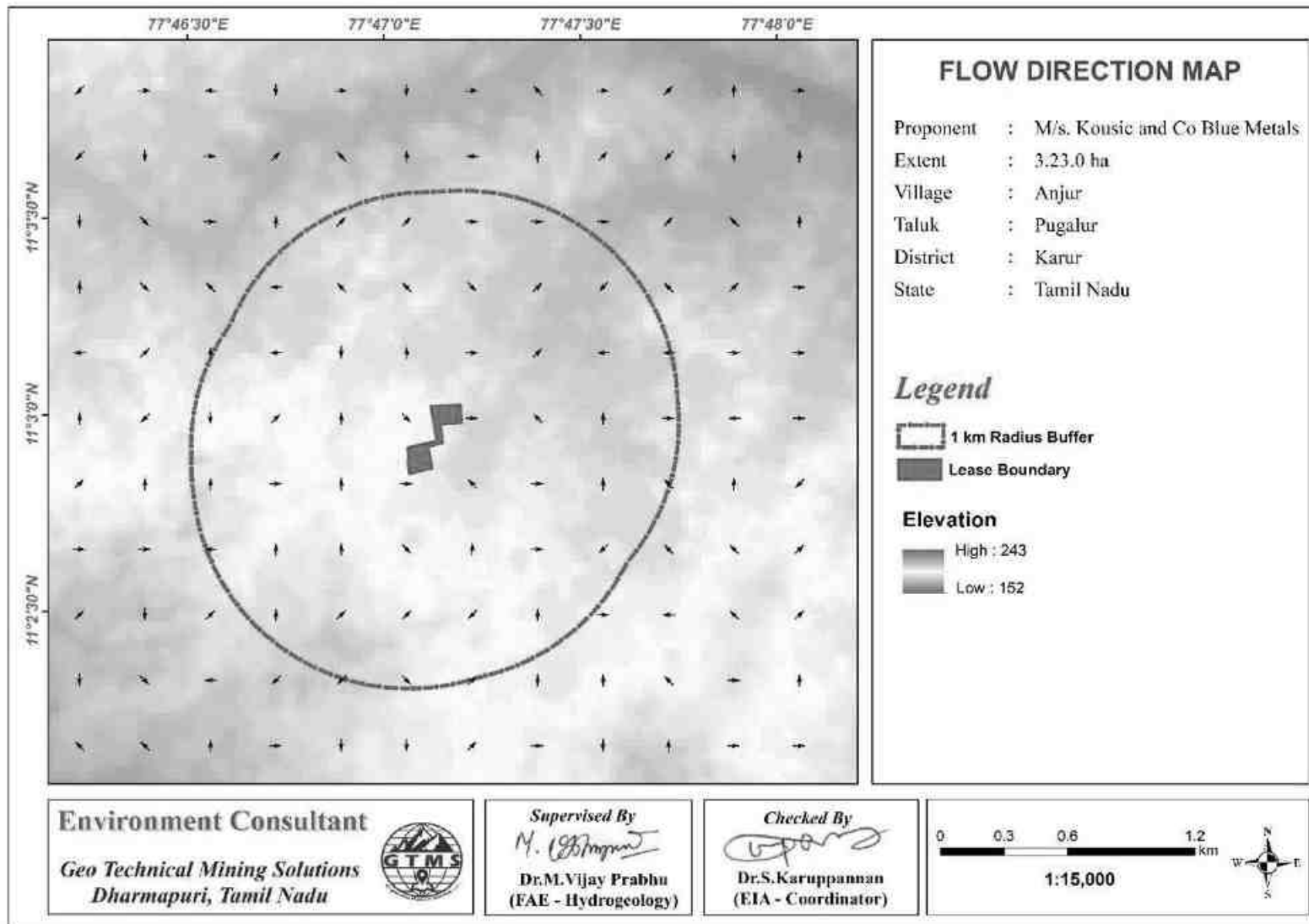


Figure 4. The project site topographically considers as ridge, hence, the surface water run-off is radial

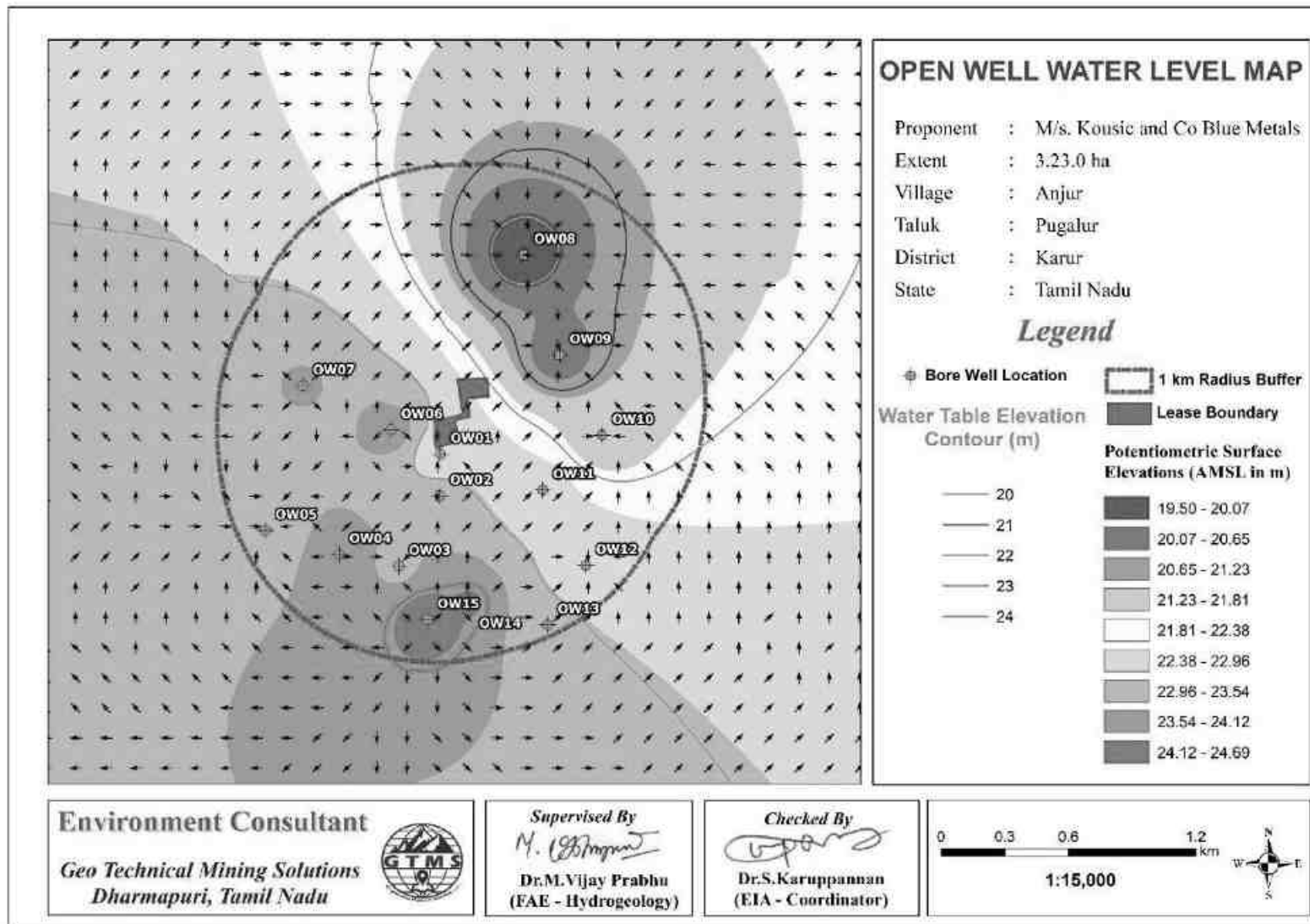


Figure 5. Depth to water level map of 1 km buffer zone



**Figure 6 Geophysical survey locations marked on the project Location**

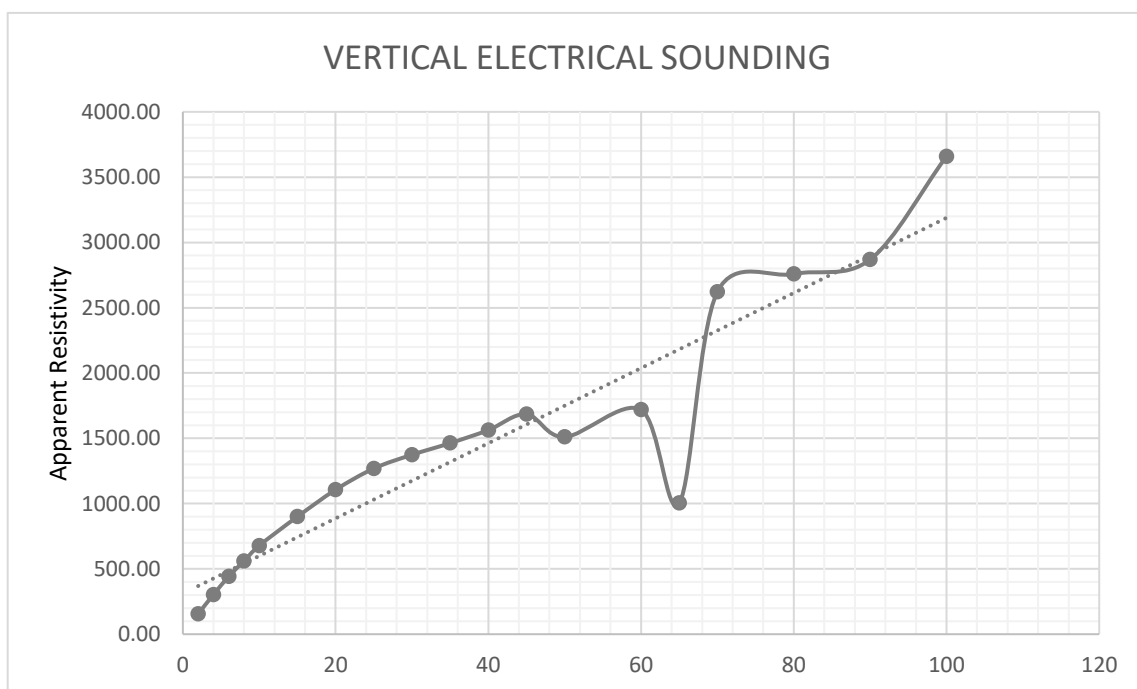


**Figure 7 Photograph showing the Geophysical survey on the project Location**



**Table 2 Geophysical VES survey Data for location No. 1**

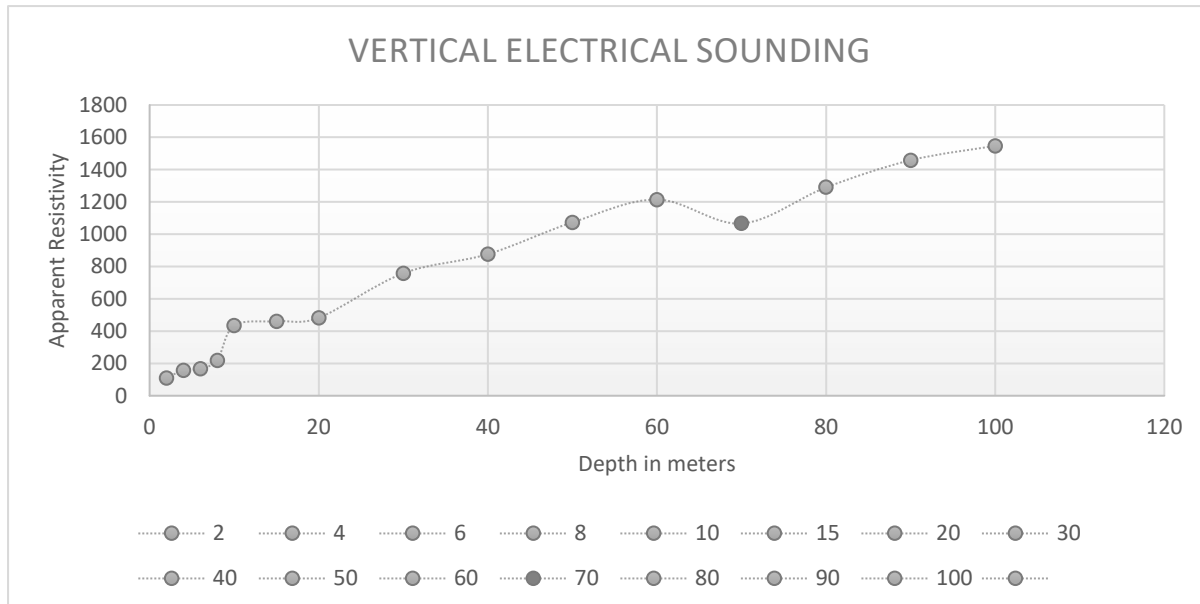
Location Coordinates - 11° 2'56.54"N, 77°47'8.42"E					
S. No.	AB/2 (m)	MN/2 (m)	Geometrical Factor (G)	Resistance in $\Omega$	Apparent Resistivity in $\Omega m$
1	2	2	11.78	13.248	156
2	4	2	49.46	6.127	303
3	6	5	112.26	3.937	442
4	8	5	200.18	2.798	560
5	10	5	75.36	8.997	678
6	15	10	173.49	5.188	900
7	20	10	310.86	3.558	1106
8	25	10	487.49	2.603	1269
9	30	10	274.75	5.001	1374
10	35	10	376.8	3.883	1463
11	40	10	494.55	3.16	1563
12	45	10	628	2.683	1685
13	50	10	777.15	1.943	1650
14	60	20	589.5	2.915	1570
15	70	20	453.6	2.213	1003
16	80	20	989.1	2.651	2622
17	90	20	1256	2.196	2758
18	100	20	1554.3	1.846	2869



**Figure 8 Geophysical VES sounding Inverse Slope graph for location No. 1**

**Table 3 Geophysical VES survey Data for location No. 2**

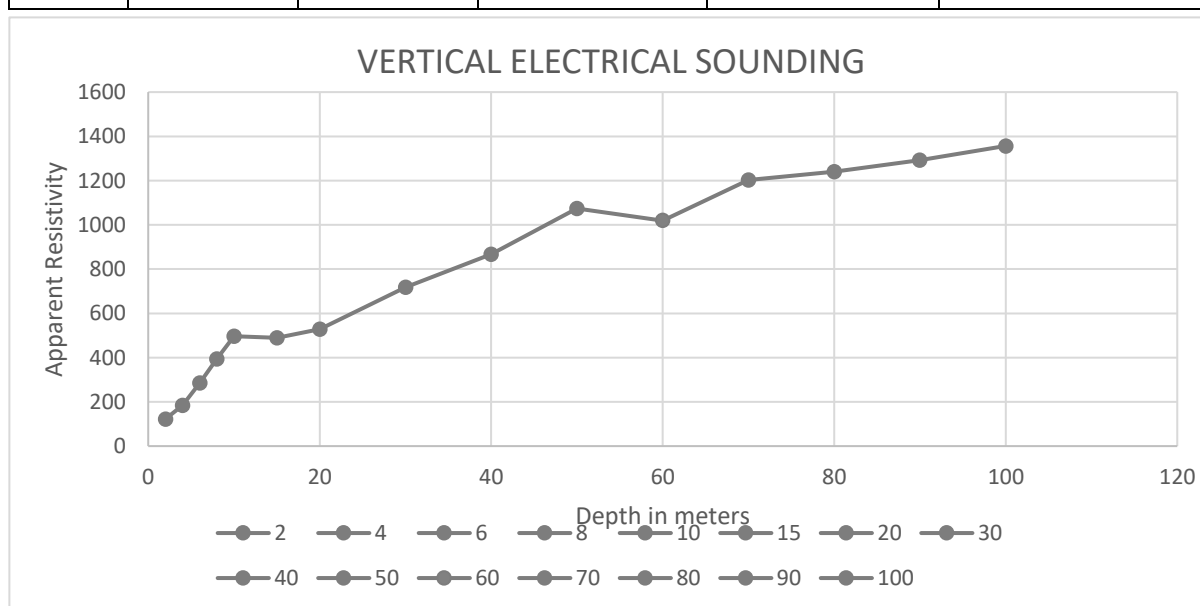
VES 2 Location Coordinates - 11° 2'58.71"N, 77°47'8.62"E					
S. No.	AB/2 (m)	MN/2 (m)	Geometrical Factor (G)	Resistance in $\Omega$	Apparent Resistivity in $\Omega m$
1	2	1	4.71	23.365	110.0505
2	4	1	23.55	6.707	157.95
3	6	2	25.12	6.707	168.485
4	8	2	47.1	4.666	219.784
5	10	2	75.36	5.769	434.748
6	15	5	62.8	7.351	461.615
7	20	5	117.75	4.096	482.304
8	30	10	125.6	6.037	758.275
9	40	10	235.5	3.722	876.525
10	50	10	376.8	2.848	1073.1735
11	60	10	549.5	2.211	1214.78
12	70	10	753.6	1.680	1266.225
13	80	10	989.1	1.102	1089.75
14	90	10	1256	1.161	1458.12
15	100	10	1554.3	0.995	1546.58



**Figure 9 Geophysical VES sounding Inverse Slope graph for location No. 2**

**Table 4 Geophysical VES survey Data for location No. 3**

VES 3 Location Coordinates - 11° 2'58.93"N, 77°47'11.14"E					
S. No.	AB/2 (m)	MN/2 (m)	Geometrical Factor (G)	Resistance in $\Omega$	Apparent Resistivity in $\Omega m$
1	2	1	4.71	25.958	122.26
2	4	1	23.55	7.834	184.48
3	6	2	25.12	11.361	285.38
4	8	2	47.1	8.370	394.22
5	10	2	75.36	6.581	495.96
6	15	5	62.8	7.803	490.05
7	20	5	117.75	4.494	529.12
8	30	10	125.6	5.715	717.76
9	40	10	235.5	3.684	867.48
10	50	10	376.8	2.850	1073.91
11	60	10	549.5	1.856	1019.65
12	70	10	753.6	1.595	1202.23
13	80	10	989.1	1.254	1239.92
14	90	10	1256	0.870	1092.12
15	100	10	1554.3	0.873	1356.68

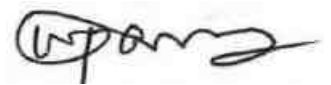


**Figure 10 Geophysical VES sounding Inverse Slope graph for location No. 3**

## CONCLUSIONS

- Based on the available information and the geophysical investigations it is concluded that the proposed project area is considered to have average groundwater potential.
- Productive aquifers are expected at depths between **65 and 70 m below ground level**.
- The ultimate pit limit as per the approved mining plan depth is **45m** below ground level. Therefore, it is concluded that there will be no impact on both the quality and quantity of groundwater.

Prepared By



**Place:** Dharmapuri, TN.

**Date:** 12.04.2024

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

Approved Geologist

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Oddapatti, Collectorate Post office,  
Dharmapuri-636705. Tamil Nadu.



**National Accreditation Board for Education and Training**

**Certificate of Accreditation**

**Geo Technical Mining Solutions, Dharmapuri**

**5/1485-3, Salem Main Road, Elakkiyampatty, Dharmapuri, Tamil Nadu**

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

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


**Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in RAAC minutes dated January 24, 2024, posted on QCI-NABET website.**

*The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in QCI-NABET's letter of accreditation bearing no QCI/NABET/ENV/ACO/24/3142 dated Feb 19, 2024. The accreditation needs to be renewed before the expiry date by Geo Technical Mining Solutions, Dharmapuri following due process of assessment.*

**Issue Date  
Feb 19, 2024**

**Valid up to  
Dec 31, 2026**



  
**Mr. Ajay Kumar Jha  
Sr. Director, NABET**

**Certificate No.  
NABET/EIA/23-26/RA 0319**

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