

EXECUTIVE SUMMARY

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT OF

ROUGH STONE AND GRAVEL QUARRY

(As per EIA Notification, 2006 dated 14.09.2006 and amendments)

Category- B1 - (Cluster)

Project Proponent

Thiru.V.GANGESAN

S/o. K.S. Velusamy,

No. 5/10, Mariyappa Devar Street,

Sulur Taluk,

Coimbatore District

Project Details

Kodangipalayam Rough Stone and Gravel Quarry

S. F. No	:103/3A1A, 103/3A2, 103/3B1
Extent Area	: 1.81.0 Ha
Village	: Kodangipalayam
Taluk	: Palladam
District	: Tiruppur

EIA CONSULTANT



AADHI BOOMI MINING & ENVIRO TECH (P) LTD

(QCI/NABET Accredited EIA Organization)

3/216, K.S.V.Nagar, Narasothipatti, Alagapuram (PO),

Salem - 636004, Tamil Nadu

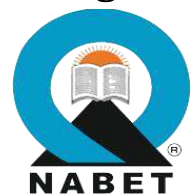
Website: www.abmenvirotec.com

Email: abmenvirotech@gmail.com / suriyakumarsemban@gmail.com

Mob: 98427 29655.



2024



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1. Introduction

Thiru. V.Gangesan Rough stone and gravel quarry over an extent of 1.81.0 Hectares is located in S.F.No: 103/3A1A, 103/3A2 and 103/3B1 patta land of Kodangipalayam Village, Palladam Taluk, Tiruppur District, Tamil Nadu. The area is marked in the survey of India Toposheet No.58E/4. The area lies between northern latitude of 11° 1' 19.75"N to 11° 1'25.26"N and eastern longitude of 77° 12' 2.02"E to 77°12'7.38"E. The precise area communication letter has been given by Assistant Director, Dept of Geology and Mining, Tiruppur Vide Rc No. 48/Kanimam/2023, dated 15.09.2023 for Thiru. V.Gangesan.

The proponent excavated 32m bgl during the duration of the mine's life in this quarry (2018 to 2023), which had been approved by the District level Impact Assessment Authority (DEIAA) at a depth of 44m bgl. In continuation, the Assistant Director of the Department of Geology and Mining, Tiruppur, issued the proponent a precise area communication letter with reference number Vide Rc No.48/Kanimam/2023, dated 15.09.2023. The Assistant Director of the Department of Geology and Mining, Tiruppur, approved the mining plan vide Rc No. 48/Mines/2023 dated 10.11.2023. About 100539 m³ of rough stone will be produced in five years (from the date of excavation) up to a depth of 44 m bgl, (with 12 m bgl remaining).

As per the cluster letter issued by Assistant Director, Department of Geology and Mining, Tiruppur vide Rc.No.48/Mines/2023, dated 05.12.2023 for Thiru. V.Gangesan (1.81.0 Ha) the lease area of above said 11 applicants comes in cluster of 500m radius. The total area of cluster is 17.36.5 Ha.

As per the cluster letter issued by Assistant Director, Department of Geology and Mining, Tiruppur vide Rc.No.48/Mines/2023, dated 05.12.2023 for Thiru. V.Gangesan (1.81.0 Ha) the lease area of above said 11 applicants comes in cluster of 500m radius. The total area of cluster is 17.36.5 Ha.

As per MoEF&CC OM: F.No.L IA3-22/11/2023-IA.III (E208230) dated 28.4.2023, the EIA/EMP report has to be prepared for the cluster area based on ToR recommended by SEIAA. Therefore, the applicant applied for ToR through PARIVESH website vide online proposal no. SIA/TN/MIN/454038/2023 dated 02.12.2023. The ToR proposal was placed in 441th SEAC meeting, dt 31.01.2024 and 698th SEIAA meeting, dated 19.02.2024. Then ToR has been issued by the SEIAA vide TOR Identification No. TO23B0108TN5824253N/File No: 10592 dated

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03.04.2024. The EIA report has been prepared based on the recommended Standard ToR along with Specific ToR. The details are given in below table 1.1.

Table No. 1.1: Details on Terms of Reference

S. No	Name of Applicant	ToR Application No	SEAC and SEIAA Meeting No	TOR Letter No
1	V.Gangesan	SIA/TN/MIN/454038/2023 dated 02.12.2023	441 th SEAC Meeting, dated 31.01.2024 and 698 th SEIAA Meeting dated 19.02.2024	TO23B0108TN58242 53N/File No: 10592 dated 03.04.2024

In TOR letters, it is mentioned that public hearing needs to be conducted for the proposed ordinary stone and gravel quarry of the project proponent for obtaining EC. As per MOEF&CC SO 141 (E) dated 15.01.2016-Appendix XI, there shall be one public consultation for the cluster after which the final Environmental Impact Assessment Report or Environmental Management Plan report for the cluster shall be prepared. Based on the OM issued by MOEF&CC, the Draft EIA/EMP report has been prepared for the quarry in the cluster of 17.36.5 Ha for conducting public hearing. The points raised in the public hearing and the commitments of the project proponent will be given detail in the final EIA report which will be submitted to SEAC/SEIAA, Tamil Nadu for obtaining Environmental clearance.

1.1 Scope of the Project

The proposal for Environmental clearance of rough stone and gravel quarry of Thiru. V.Gangesan require EIA/EMP report as per Terms of Reference (ToR) for conducting public hearing and obtaining Environmental clearance from SEAC/SEIAA-TN.

1.2 Project Description

Table No. 1. 2: Details on Project and Project Proponent

A. Proposed Projects to Conduct Public Hearing	
1. Thiru. V.Gangesan	
Particulars	Details
Address of the Project Proponent	Thiru.V.Gangesan S/o. K.S.Velusamy, No. 5/10, Mariyappa Devar Street, Sulur Taluk, Coimbatore District-639 136, Mobil No: 9842408077

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	Email id: gangesanrst@gmail.com
Lease Area	1.81.0 Hec (Patta Land)
Site Location	S.F. No: 103/3A1A, 103/3A2 and 103/3B1, Kodangipalayam Village Palladam Taluk, Tiruppur District, Tamil Nadu.
Geographical Co-ordinates	Latitude: 11° 1' 19.75"N to 11° 1'25.26"N Longitude: 77° 12' 2.02"E to 77° 12'7.38"E
Toposheet No.	58E/4
Elevation	Elevation of the area is 391m above MSL.
Precise Area Communication	Roc.No.48/Kanimam/2023, dated 15.09.2023
Period of Lease	5 years from the date of execution.
Mining Plan Approval Details	Mining plan approved by AD, Dept of Geology and Mining Vide Roc.No.48/Mines/2023, dated 10.11.2023
AD Cluster letter	Rc.No.48/Mines/2023, dated 05.12.2023
B. Existing Quarries	
1. Thiru. D.R. Karuppusamy	
Lease Area	1.19.0 Ha
Site Location	S.F. No: 89/2A, 89/3 Kodangipalayam Village, Palladam Taluk, Tiruppur District, Tamil Nadu.
2. Mrs. M.Subbathal	
Lease Area	1.82.0 Ha
Site Location	S.F. No: 114/2C, 2D, 2E1, 2E2, 2F, 2G1 Kodangipalayam Village, Palladam Taluk, Tiruppur District, Tamil Nadu.
3. Thiru. D.R.Karuppusamy	
Lease Area	1.32.5 Ha
Site Location	S.F. No: 102/1 Kodangipalayam Village, Palladam Taluk, Tiruppur District, Tamil Nadu.
4. Thiru.V.Prakash	
Lease Area	0.86.0 Ha
Site Location	S.F. No: 113/6 Kodangipalayam Village, Palladam Taluk, Tiruppur District, Tamil Nadu.

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C. Proposed Quarries	
1. K.M. Chinnasamy	
Lease Area	2.42.0 Ha
Site Location	S.F. No: 89/4B(P), 92/2 Kodangipalayam Village, Palladam Taluk, Tiruppur District, Tamil Nadu.
2. Thiru. R.Gunasekar	
Lease Area	1.69.5 Ha
Site Location	S.F. No: 103/3B2(P) Kodangipalayam Village, Palladam Taluk, Tiruppur District, Tamil Nadu.
3. Thiru. V.Prakash	
Lease Area	1.55.0 Ha
Site Location	S.F. No: 103/2C Kodangipalayam Village, Palladam Taluk, Tiruppur District, Tamil Nadu.
4. Thiru. P. Gowtham Rathinam	
Lease Area	2.00.0 Ha
Site Location	S.F. No: 91/1A(P) Kodangipalayam Village, Palladam Taluk, Tiruppur District, Tamil Nadu.
5. Thiru.P.Subramaniam	
Lease Area	1.99.5 Ha
Site Location	S.F. No: 114/1B, 114/1C Kodangipalayam Village, Palladam Taluk, Tiruppur District, Tamil Nadu.
D. Abandoned Quarry	
1. Mrs.P.Vijayalakshmi	
Lease Area	0.70.0 Ha
Site Location	S.F. No: 116/3B (P) Kodangipalayam Village, Palladam Taluk, Tiruppur District, Tamil Nadu.

1.3. Environmental Settings and Mining Details

Table No. 1.3: Environmental Settings

Accessibility				
Nearest Village	Kodangipalayam – 1.5km - SE			
Nearest Settlement	S. No	Village Name	Total population as per 2011 census	Distance with Direction
	1	Ichipatti	9527	2.13 km- N
	2	Karanampettai	6987	2 km-SW
	3	Sukkampalayam	4420	3.64 km- NE
	4	Kadampadi	8147	4.24 km - NW
Nearest Town	Palladam – 7.19km - NE			
Nearest Railway station	Somanur Railway Station – 8km - N			
Nearest Airport	Coimbatore International Airport – 17.3 km - NW			
Environmental Sensitiveness				
Interstate Boundary	There is no interstate boundary within 15km radius. Tamil Nadu – Kerala Interstate Boundary – 44 km – W			
Coastal Zone	Arabian Sea -138 km – W			
Reserve Forest	There is no Reserve Forest found within 5km from the lease area. Nearest Reserve Forest Aliyar RF-65 km -SW. The proposed projects site does not attract Forest Conservation Act, 1980.			
Wildlife sanctuary	Nil within 10km radius. The Proposed project site does not the Wildlife (Protection) Act, 1972.			
Water bodies	There are no major river or water bodies, odai track, nallah and ponds found within 500m radius. 1. Sendvipalayam Check Dam – 6 km –NW 2. Noyyai River – 6 km - NW			
Defense Installations	Sulur Air force Runway 3.5km –SW within the lease area			
Critically Polluted area	Nil within 10km radius			
Seismic zone	Zone-III, Moderate damage risk zone as per BMTPC, Vulnerability atlas Seismic zone of India IS: 1893-2002			

Table No. 1.4: Mining Details

R.K. Panneerselvam Ordinary Stone and Gravel Quarry	
Method of Mining	Open cast -Mechanized method of mining
Geological resources (95%)	259467 m ³
Mineable reserves (95%)	Rough stone -100539m ³ for five years and Gravel – 2116m ³ for three years.
Production (95%)	Rough stone -100539 m ³ for five years 20107 m ³ per annum
Top soil	-
Ore: Waste ratio	1: 0.07
Depth of Mining	44 m bgl
Water Table	57 m bgl
Road design	1: 10 inside the pit and ramp / 1:16 for transport
Overall Pit Slope	45°
Period of Lease	5 years (From the date of execution)
Project Cost	Rs 35 Lakhs
EMP Cost	Rs 7.15 lakhs
CER Cost	Rs.5 lakhs

1.4. Description of the Environment

1.4.1 Base Line Environmental Study

Collection of base line data is an integral part of the preparation of environmental impact assessment reports. The baseline monitoring study has been carried out during December 2022 – February 2023 to assess the existing environmental scenario in the area. For the purpose of EIA studies, mine lease area was considered as the cluster core zone and area outside the mine lease boundary up to 10km radius from the lease boundary was considered as buffer zone.

Table No. 1.5: Baseline Data

Particulars	Details	Standards
Meteorology (December 2022 – February 2023)		
Rainfall (Avg.)	134 mm	--
Temperature (Avg.)	19.7-33.4°C	--
Wind speed	2.4 m/s	--
Wind Direction	West to North East	--
Ambient Air Quality (NAAQS)		
PM ₁₀	38-57 µg/m ³	100 µg/m ³
PM _{2.5}	15-32 µg/m ³	60 µg/m ³
SO ₂	9-22 µg/m ³	80 µg/m ³
NO _x	11-32 µg /m ³	80 µg/m ³
Noise Level (CPCB Standards)		

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Day time (6:00 am - 10:00 pm)	Core zone – 41.3 dB (A) Buffer zone –37.0 - 49.4 dB (A)	Industrial Area Day Time - 75 dB (A) Residential Area Day Time – 55 dB (A)
Night time (10:00 pm - 06:00 am)	Core zone – 36.4 dB (A) Buffer zone – 31.1-37.7 dB(A)	Industrial Area Night Time – 70 dB(A) Residential Area Night Time – 45 dB (A)
Water Quality IS 10500:2012 (Desirable limits)		
pH	7.07-7.84	6.5 to 8.5
TDS	464-1260 mg/l	500 mg/l
EC at 25°C	758-2100 micromhos/cm	-
Total Hardness as CaCO ₃	190-460 mg/l	200 mg/l
Total suspended solids	1-6 mg/l	IS 3025:P.17: 1984: R.2017
Chlorides Cl	220-430mg/l	250
Total iron Fe	0.06-0.09mg/l	0.3mg/l
Sulfates SO ₄	43-93mg/l	200 mg/l
Soil Quality		
pH	7.5-8.3	Neutral to slightly alkaline
Bulk density	1.04-1.65 g/cc	Favorable physical condition for plant growth.
Hydro Geology		
Depth of Mining	44m bgl	
Water Table	57m bgl	

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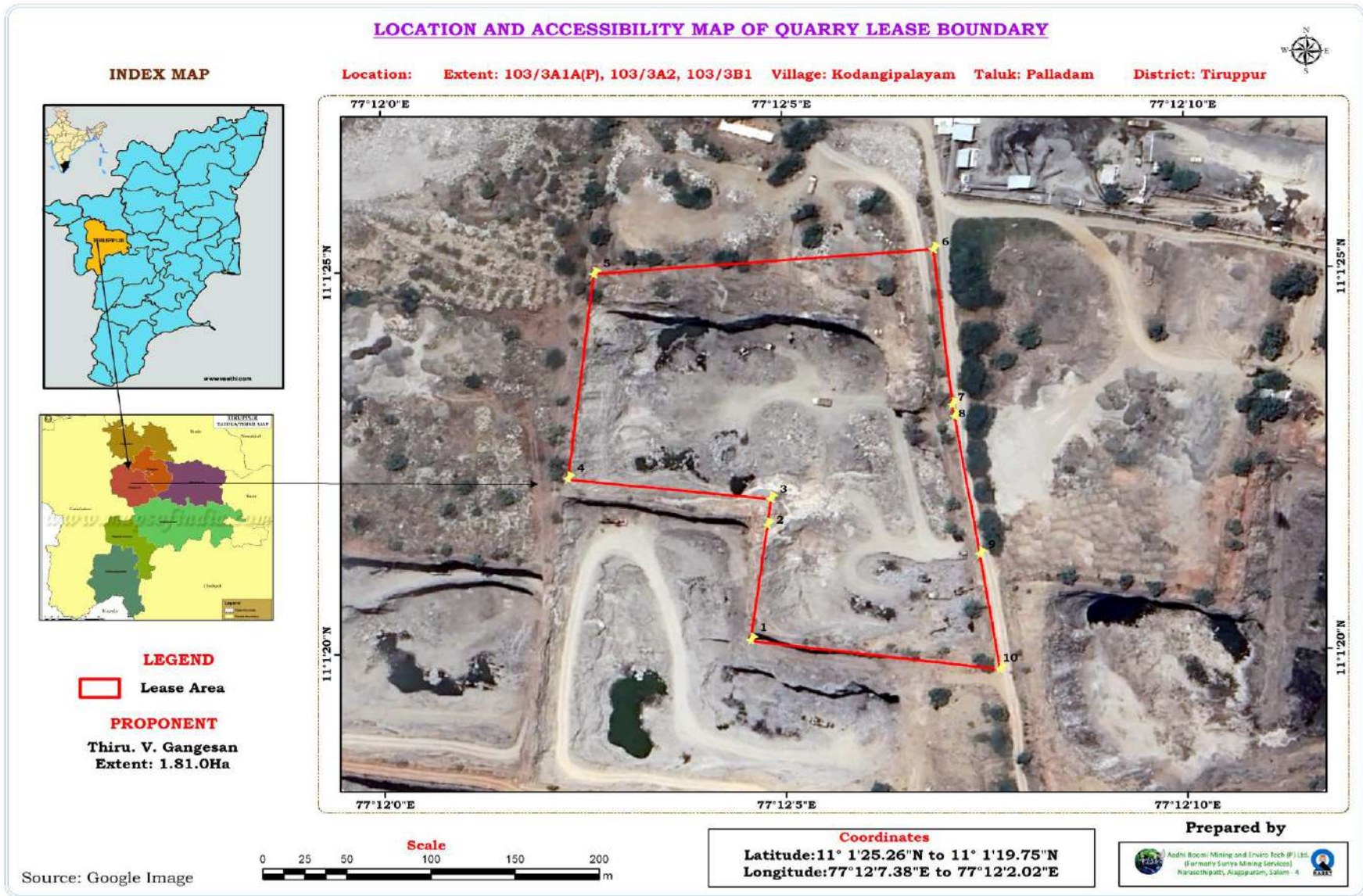


Fig No. 1.2: Map Showing the Location and Accessibility of Quarry Lease Boundary

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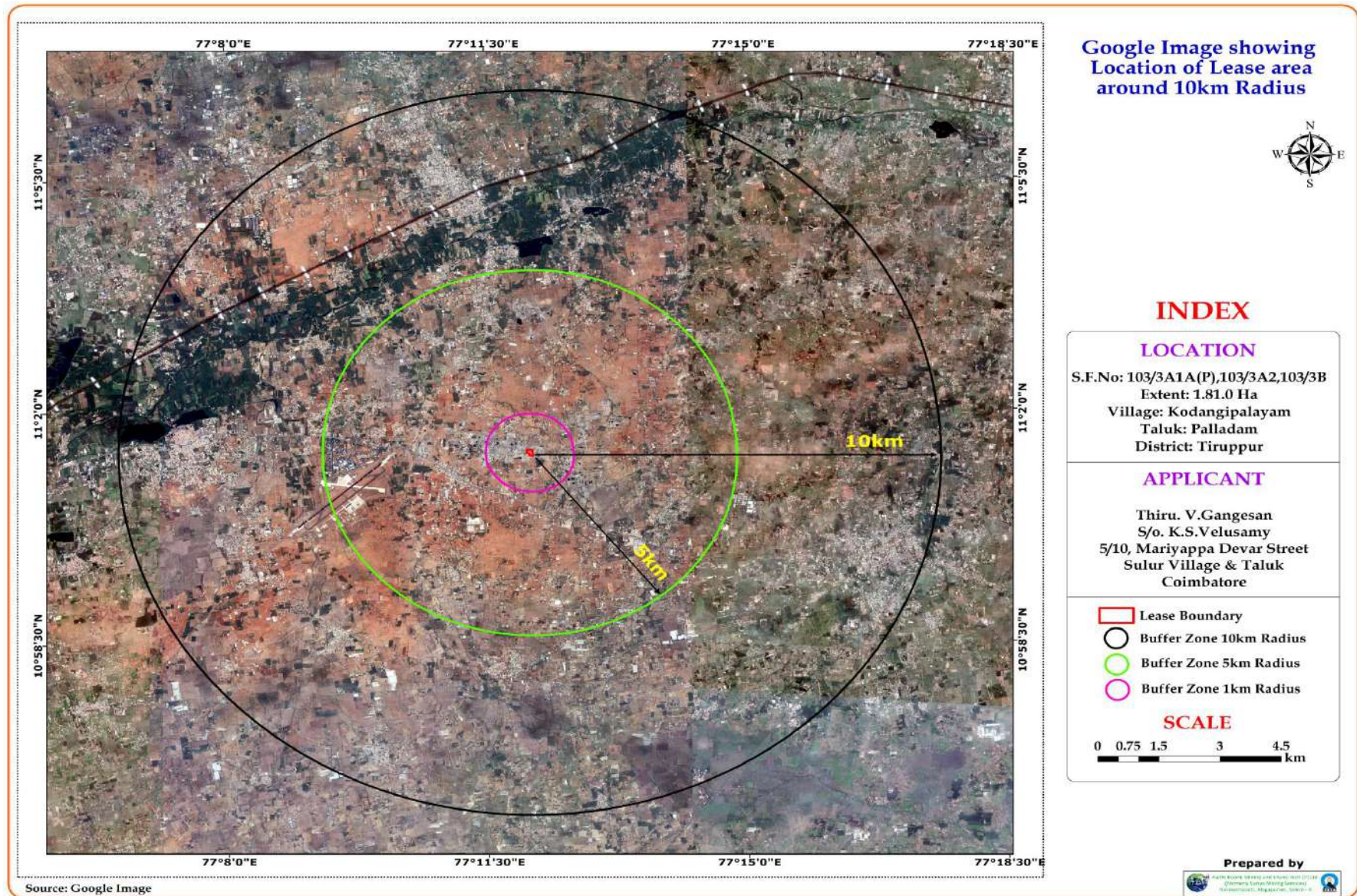


Fig No. 1.3: Google Image showing Location of lease area around 5 km and 10 km radius

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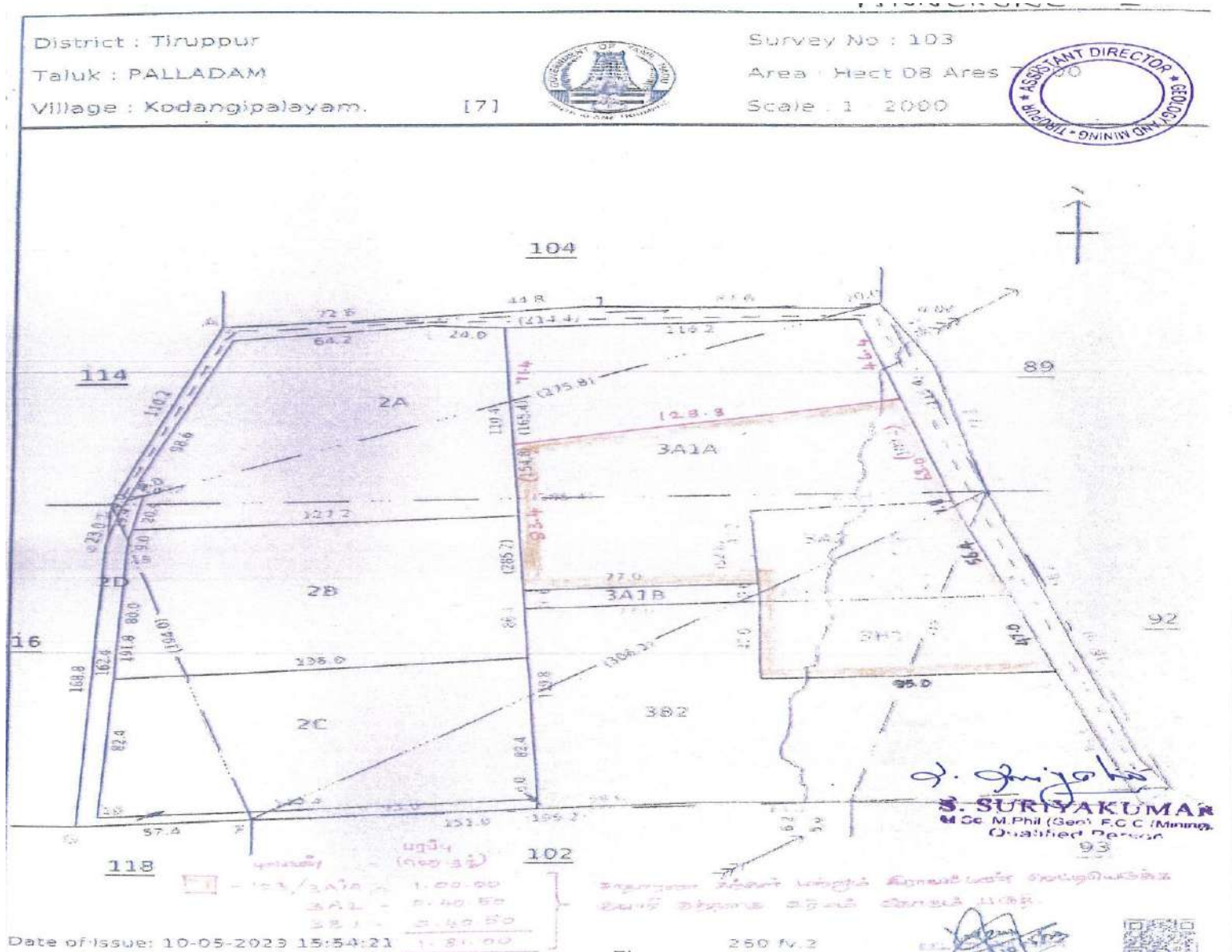


Fig No 1.4: FMB of the lease area

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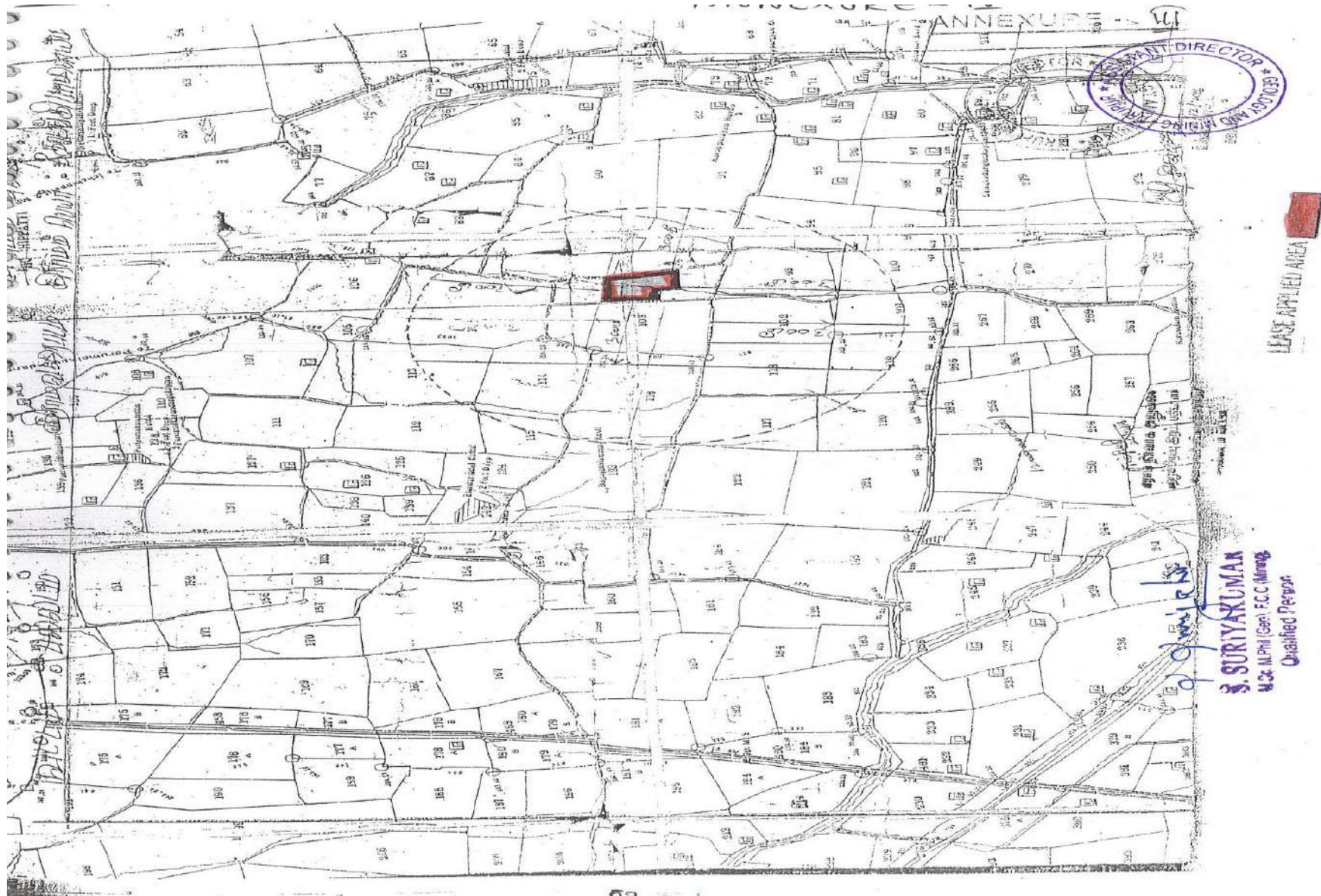


Fig No 1.5: Village Map

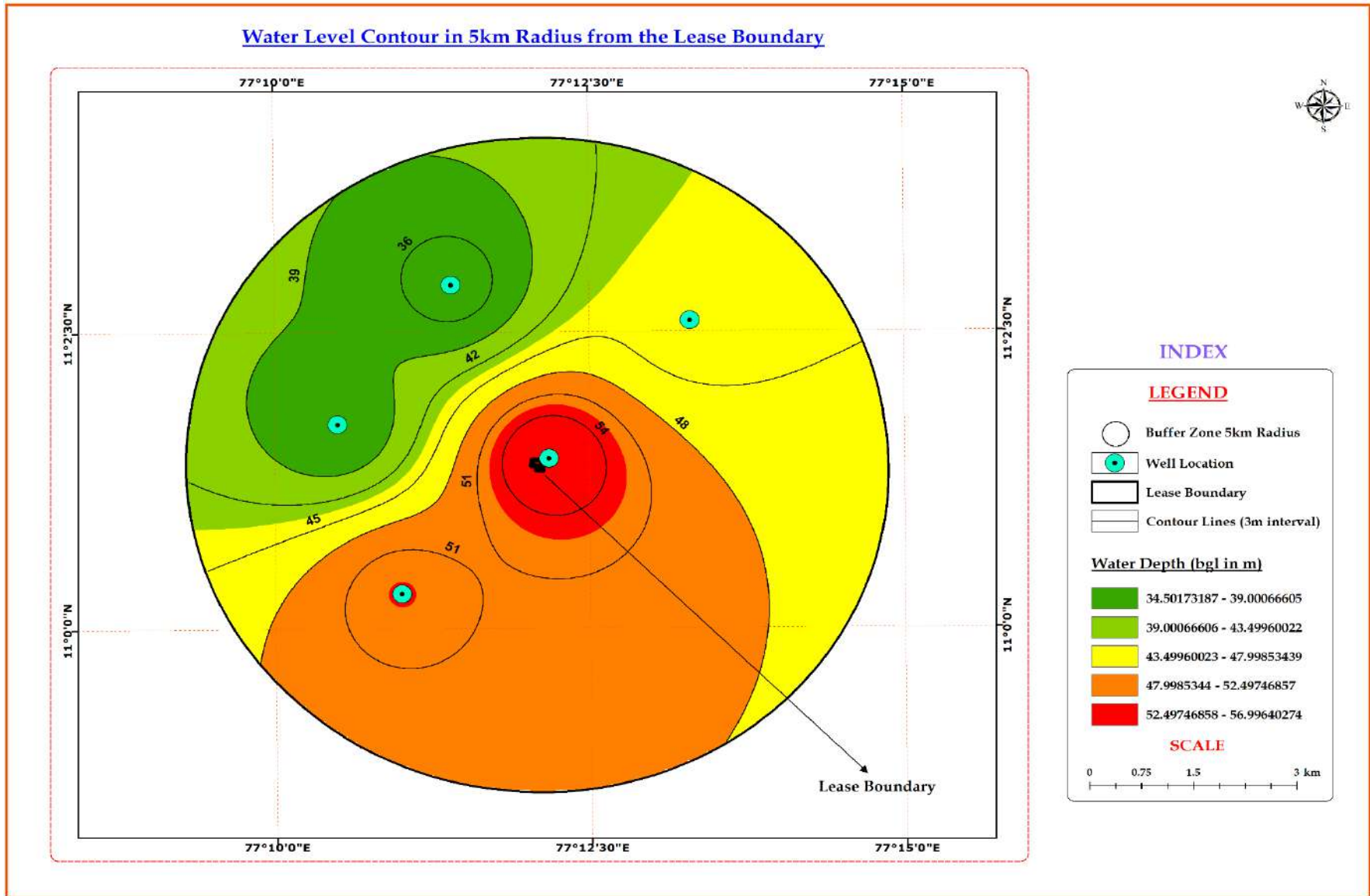


Fig No.1.6: Water level contour in 5km radius from the cluster boundary

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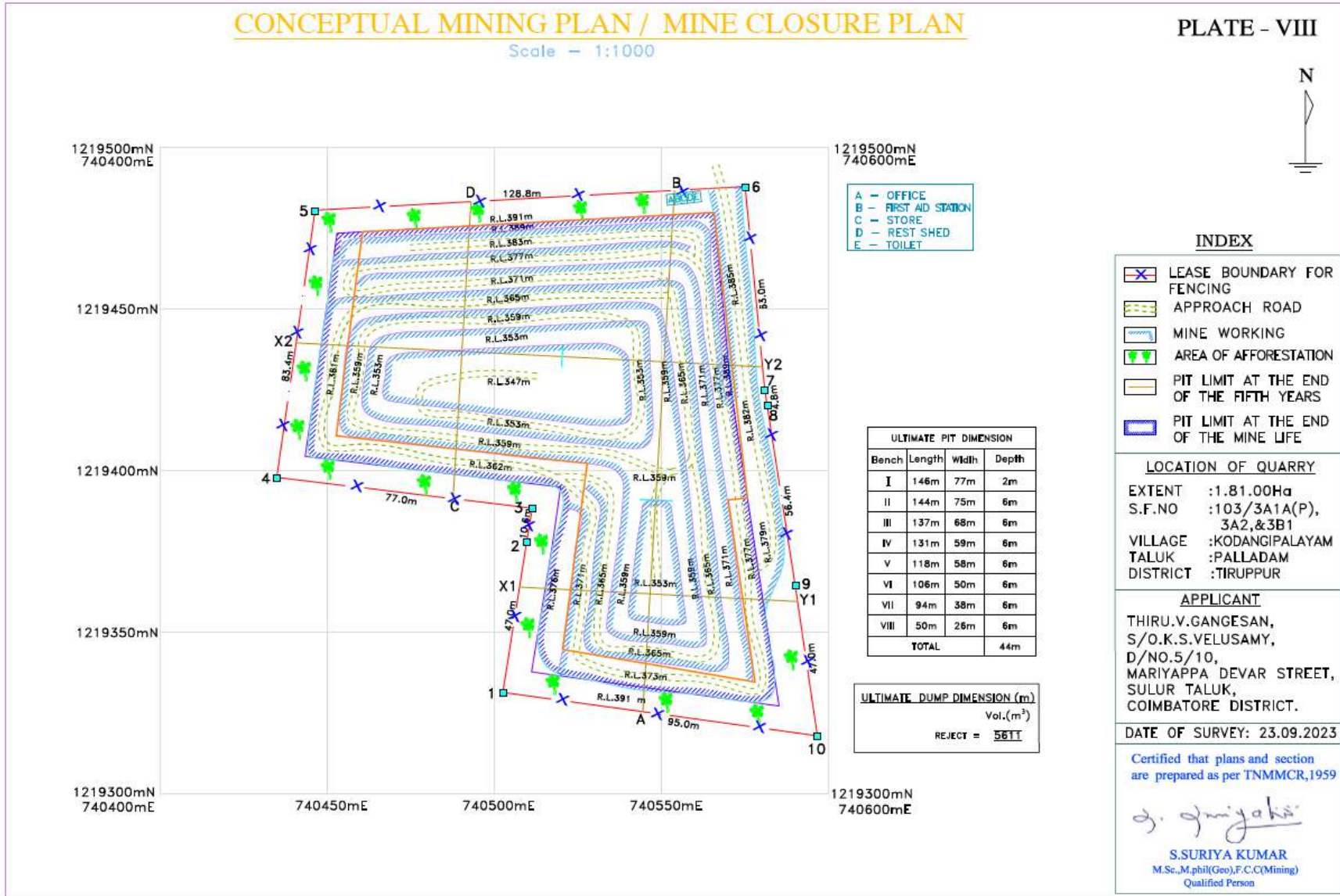


Fig No 1.7: Conceptual plan of the lease area

1.5 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

1.5.1 Air Environment

The air borne particulate matter is the main air pollutant by opencast mining. The mining operation will be carried out by adopting mechanized methods which involves Jack Hammer drilling and blasting, excavation, loading and transportation.

AERMOD - Total predicted 24-h maximum GLC of PM₁₀ at project site for scenario 1 i.e. loading-unloading, transportation and scenario 2 i.e. Blasting was 58.86 µg/m³ and 48.01 µg/m³ respectively after superposition of base-line value 48µg/m³ over the incremental GLC 19.06 µg/m³, 0.59 µg/m³ scenario 1 and 10.86 µg/m³ for scenario 2 respectively due to combined impact of loading, unloading, open pit and transportation over the haul road and due to blasting.

The predicted incremental GLC of SO_x and NO_x for under below the desirable limit. Maximum Impact of PM₁₀ was observed close to the source within the lease area due to moderate wind speeds.

Maximum Impact of PM₁₀, SO_x and NO_x was observed close to the source within the lease area due to moderate wind speeds.

1.5.2 Noise Environment

Noise pollution poses a major health risk to the mine workers. Following are the sources of noise in the existing open cast mine project are being observed such as Drilling, Blasting, Loading and during movement of vehicles.

The noise generated by the mining activity is dissipated within the core zone. This is because of distance involved and other topographical features adding to the noise attenuation. From the results, it can be seen that the ambient noise levels (day time and night time) at all the locations will remain within permissible limits prescribed by CPCB and 90dB (A) norms of DGMS. At present there is no mining activity carried out. However, the expected noise levels are not likely to have any effect. Precaution will be made to keep down the noise exposure level of 85 dB (A) to the operating personnel for 8 hrs duration.

1.5.3 Ground Vibration

The charge per blast of 6 kg is above the Peak Particle Velocity below 5mm/s. So, the proponent will be advised to use five delays to keep the ground vibration within 5mm/s. However, as per statutory requirement additional control measures needs to be adopted to avoid the impacts due to ground vibrations and fly rocks due to blasting.

1.5.4 Water Environment

Mining operations can affect groundwater quality in several ways. The most obvious occurs in the mining below the water table, either in underground workings or open pits. This provides a direct conduit to aquifers. Groundwater quality is also affected when waters (natural or process waters or wastewater) infiltrate through surface materials (including overlying waste or other material) into ground water. But this Rough stone mine is devoid of any such impacts.

The impact due to mining on the water quality is expected to be insignificant because of no use of chemicals or hazardous substances during mining process. The WQI of the samples collected from the study area are given in tables 4.25 and 4.26. It can be seen that the study area has water quality index value ranging from 19.49 to 140 mg/l which reflects the excellent to unsuitable for drinking status of the groundwater quality. The findings demonstrate the varying consistency of groundwater at different locations. All the groundwater samples under excellent to unfit for drinking category; it may be due to the absorption of fertilisers, geological condition, channel water, solid waste, sewer drainage, septic tanks, and agricultural waste. The water should be treated by reverse osmosis to reduce dissolved solids and total hardness to the required rate.

1.5.5 Soil Environment

The limited quantity of top soil generated will be dumped along 7.5m inner boundary of the lease area. The top soil will be used to develop greenbelt within the lease area. Part of top soil will be spread over the non-active dumps along the slope and edges to plant tree saplings to form vegetal cover over the dumps. No chemical or toxic elements will be used during mining activity. So, the health of soil in and around the quarry will not be affected.

1.5.6 Waste Dump

The proposed rate of production of rough stone for five years is about 100539m³ at the rate of 95% recovery up to permissible depth. The 5% reject of 5291m³ shall be dumped as per earmarked site in the approved mining plan.

1.5.7 Biological Environment

There are no notified endangered species in the area, which may be affected due to the mining activities; therefore, the biological environment will not have significant impact due to mining activity. The impact on the biological environment due to amount of dust generation is minimized by well-developed green belt in and around mining lease area.

1.5.8 Land Environment

The Rough stone quarry will result in disturbance of the land use pattern of the mine lease area. The land degradation is unavoidable during mining activities like excavation, overburden dumping, soil extraction etc. So, reclamation of mined out land and proper formation of benches will be given due importance. The land use analyses show that the area is of predominantly Agriculture followed by buffer zones of the study area, which clearly indicates that the development of agriculture land increases over a period of time. At the end of the project, the quarried pit will be act as water storage pond. The stored water will be used for developing agricultural activity around the mining lease area. It is generally agreed that as the total volume of production from year to year may increases. Some fallow land also increases due to seasonal crop production, which shows a positive impact due to mining activity.

1.5.9 Socio Economic Environment

The mining activity will definitely increase the employment opportunity (directly as well as indirectly) in the project area. Some of these impacts would be beneficial. The expectation of the people of the area is concerned towards employment, education, and health facilities.

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Table No. 1.6: Environmental Management Plan

S. No	Parameters	Mining Activity	Mitigation measures
1	Air Environment	Drilling	<ul style="list-style-type: none"> + Dust extractor or wet drilling to be followed to control dust at source of emission + Use of Sharp drill bits for drilling holes and charging the holes by using optimum charge and using time delay detonator
		Blasting	<ul style="list-style-type: none"> + Regular water sprinkling on blasted heaps at regular intervals will help in reducing considerable dust pollution
		Loading	<ul style="list-style-type: none"> + Water sprinkling be done before loading by making it moist
		Transportation	<ul style="list-style-type: none"> + Water sprinklers along the sides of haul road shall be fixed to control fly of dust while transporting minerals and waste + Overloading will be prevented + Trucks/Dumpers covered by tarpaulin covers
		DG Sets	<ul style="list-style-type: none"> + DG sets will be used only during power failure + Adequate stack height for DG sets will be provided as per CPCB norms
		General measures	<ul style="list-style-type: none"> + Avenue trees along roads around ML boundary shall be planted as per the norms of MoEF&CC to control fly of dust. + Labours engaged in such dust prone areas should be provided with safety devices like ear muff, mask, and goggles as per the MMR, 1961 amendments and circulars of DGMS. + Regular health check-up of workers and nearby villagers in the impacted area should be carried out and also regular occupational health assessment of employees should be carried out as per the Factories Act + Ambient Air Quality Monitoring will be conducted on regular basis to assess the quality of ambient air.
2	Water Environment	Surface water	<ul style="list-style-type: none"> + Wastewater discharge from mine will be treated in settling tanks before using for dust suppression and tree plantation purposes.
		Ground water	<ul style="list-style-type: none"> + The mining activity will not intersect the ground water table + Desalting will be carried out before and immediately after the monsoon season

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		Storm water	<ul style="list-style-type: none"> ✚ Pit will be used for Storage of rainwater ✚ Rain water will be collected in sump in the mining pit and will be allowed to store and pumped out to surface setting tank of 15 m x 10m x 3m to remove suspended solids if any. This collected water will be judiciously used for dust suppression onwards and such sites where dust likely to be generated and for developing green belt. ✚ The proponent will collect and judiciously utilize the rainwater as part of rain water harvesting
		General measures	<ul style="list-style-type: none"> ✚ Regular monitoring and analyzing the quality of water
3	Noise Environment	Drilling	<ul style="list-style-type: none"> ✚ Limiting time exposure of workers to excessive noise
		Blasting	<ul style="list-style-type: none"> ✚ Carrying out blasting only during day time and not on cloudy days ✚ Noise levels will be controlled by using optimum explosive charge, proper delay detonators and proper stemming to prevent blow out of holes. ✚ Providing proper noise proof enclosure for the workers separated from the noise source and noise prone equipment
		Transportation	<ul style="list-style-type: none"> ✚ Proper and regular maintenance of vehicles, machinery and other equipments. ✚ The noise generated by the machinery will be reduced by proper lubrication of the machinery and other equipments. ✚ Speed of trucks entering or leaving the mine will be limited to moderate speed to prevent undue noise from empty vehicles. ✚ Adequate silencers will be provided in all the diesel engines of vehicles. ✚ Minimum use of horns and speed limit of 10 km/hr in the village area. ✚ It will be ensured that all transportation vehicles carry a valid PUC Certificates
		General measures	<ul style="list-style-type: none"> ✚ Use of personal protective devices i.e., earmuffs and earplugs by workers, who are working in high noise generating areas ✚ Provision of Quiet areas, where employees can get relief from workplace noise. ✚ The development of green belts around the periphery of the mine to attenuate noise. ✚ Regular medical check-up and proper training to personnel to create awareness about adverse noise level effects.

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4	Vibration	Blasting	<ul style="list-style-type: none"> ✚ Specific charge pattern has to be designed by proper trial vibration studies with varying charge ratios. ✚ Milli second detonators shall be used preferably 25–50ms per delay to control vibrations ✚ If the vibration still exceeds the limit a long Trench to a depth of 6m may cut in the direction of wave’s movement to break longitudinal waves which travel close to surface, preferably near mine buffer zone ✚ In spite of all measures periodical testing of vibration and noise using approved seismograph by DGMS has to be followed as a part of Environmental monitoring
5	Soil Environment	Topsoil	<ul style="list-style-type: none"> ✚ Humus top soil shall be preserved for reuse in afforestation and agriculture ✚ Top soil should not be mixed with other waste or reject materials. It should be conserved by judicious utilization in the mine premises ✚ Garland drains will be provided around the mine and dumps to arrest any soil from the mine area being carried away by the rain water. This will also avoid the soil erosion and siltation in the mining pits and maintaining the stability of the benches
6	Waste Dump	Stabilization of Dumps	<ul style="list-style-type: none"> ✚ The rejects\ waste dump shall be properly terraced in to 1.5m benches with proper repose angle and then the top soil shall be spread over the dumps and slope to make them humus for some time, after the soil suitable for water retention trees will be planted at the top, slope and toe of the stabilized dumps to form vegetation ✚ Garland drainage around dump shall prevent under wash of dump by hydrostatic pressure to be developed by surface water and control wash outs and collapse
7	Plantation	Mine lease boundary and waste dump	<ul style="list-style-type: none"> ✚ Provision of green belt all along the periphery of the lease area for control of dust and to attenuate noise ✚ Stabilization of Dump with plantation ✚ It is strongly recommended that the loss of plant in each year will be counted and again planted in subsequent plantation. ✚ The plant should be planted taken from nursery, where the survival rate is high.

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 Proponent: Thiru.V.Gangesan, Rough Stone and Gravel Quarry, Tiruppur District

8	Land Environment		<ul style="list-style-type: none"> ✚ The restoration of the degraded land would cover backfilling and terracing with the overburden / wastes and surfacing the same with top soil. ✚ Provision of Garland drainage around the dumps ✚ Fast growing trees and other native shrubs would be planted to stabilize the reclaimed land ✚ Appropriate measures will be taken for green belt development. ✚ The rain water will be stored in the pit which will recharge the ground water as a part of rain water harvesting scheme for irrigating the nearby agricultural lands.
9	Socio Economic		<ul style="list-style-type: none"> ✚ Good maintenance practices will be adopted for 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. ✚ Drilling, blasting etc., at specified location will be followed with proper schedule. ✚ Appropriate air pollution control measure will be taken so as to minimize the environmental impact within the core zone. ✚ An emergency preparedness plan will be prepared in advance, to deal with firefighting, evacuation and local communication. ✚ For the safety of workers, personal protective appliances like hand gloves, helmets, safety shoes, goggles, aprons, nose masks and ear protecting devices has been provided which meet 'BIS' (Bureau of Indian Standards). ✚ As a part of CSR activities community welfare measures will be taken by Proponent through local Panchayat.
10	Occupational Health		<ul style="list-style-type: none"> ✚ First-aid facilities as per provisions under Rule (44) of Mines Rules 1955 ✚ Initial and Periodical medical examination shall be conducted for the employees under Rule 29B & 45 (A). ✚ Insurance will be taken in the name of the labourers working in the mines ✚ Workers involved in mining work shall be provided protective equipments such as Thick Gloves, Goggles, ear plugs, safety boot wears, etc...

1.6 Analysis of Alternatives

The mining site is dependent on the geology and mineral deposition of the area. Hence, this project is mineral and site specific and no alternative site considered for this project.

1.7 Environmental Monitoring Program

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

Table No. 1.7: Post Project Environmental Monitoring Program

S. No.	Environment Attributes	Location	Monitoring		Remarks
			Duration	Frequency	
1	Meteorology and Air Quality	Continuous monitoring weather station in core zone/ nearest IMD station	24 hours	Monthly Once	Wind speed, direction, Temperature, Relative humidity and Rainfall.
2	Air Pollution Monitoring – PM _{2.5} , PM ₁₀ , SO _x and NO _x	5 locations (One station in the core zone and at least one in nearby residential, area, one in the upwind, two station on the downwind direction and one in cross wind direction)	8 hours	Once in six months	Fine Dust Sampler and Respirable Dust Sampler
3	Water Pollution Monitoring	Mine effluents, Set of grab samples during pre and post monsoon for ground and surface water in the vicinity.	–	Once in six months	Phyiso-chemical, microbiological characteristics
4	Hydrogeology	Water level in open wells in buffer zone around 1km at specific wells	-	Once in six months	Water level monitoring devices may be used.
5	Noise	Mine Boundary, high noise generating areas within the lease and at the nearest residential area	24 hours	Monthly Once	Sound level meter
6	Vibration	At the nearest habitation (in case of reporting)	–	During blasting operation	Digital Seismograph
7	Soil	Core Zone and Buffer zone	–	Once in six	Physical and

		(Grab samples)		months	Chemical characteristics
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1.8 Project Benefits

The proponent is very much conscious of their obligations to society at large. Under plantation program, it is suggested to develop green belt further all along the boundary of mining lease area. Apart from the green belts and aesthetic plantation for eliminating fugitive emission and noise control, all other massive plantation efforts will be executed with the assistance of experts and cooperation of the local community.

The mining activity will create rural employment. In addition, there will be indirect employment to many more people in the form of contractual jobs like construction of infrastructural facilities, transportation to destinations, sanitation, supply of goods and services to the mine and other community services, etc., The local population will have preference to get an employment. Part of the royalty is given to local bodies by the State Govt. for the welfare and development of the village. The proponent helps in socio economic development of the village by providing education facilities to children's, procuring sports equipments, welfare amenities like drinking water to school, road facilities to villages and employment opportunities to nearby villagers. CSR budget is allocated as 2.5% of the profit.

1.9 Conclusion

As discussed, it is safe to say that the project is not likely to cause significant impact on the ecology and environment of the area, as adequate preventive measures will be adopted to contain the pollutants within permissible limits. The total operation shall be carried out with ease & minimum risk of the workers. The proposed Environmental Management Plan will keep the area in a safe environment with negligible impact on the environment. Plantation will substantiate the impact due to the mining activity. Mining activity will help in improving the socio-economic benefits in areas like employment, communication and infrastructure development etc.